



ARKANSAS DEPARTMENT OF EDUCATION

AGENDA **STATE BOARD OF EDUCATION**

May 15, 2015

Arkansas Department of Education

PCSSD Board Room

9:00 AM

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Reports

Report-1 Chair's Report

Presenter: Sam Ledbetter

Report-2 Commissioner's Report

Presenter: Johnny Key

Report-3 Update on Content Standards and Assessment

This information is provided to keep the State Board of Education apprised of the Department's work activities associated with college and career readiness.

Presenter: Dr. Debbie Jones

Report-4 Progress Report on Schools Newly Classified in Academic Distress

Three schools were newly classified in Academic Distress by the State Board of Education on February 12, 2015. The accompanying reports were developed to keep the Board informed regarding technical assistance activities being provided to the schools and is in accordance with requirements as outlined in Section 10 of the Arkansas Department of Education Rules Governing the Arkansas Comprehensive Testing, Assessment and Accountability Program (ACTAAP) and the Academic Distress Program (September 2014).

Presenter: Annette Barnes and Elbert Harvey

**State Board of Education
Division of Learning Services
May 2015 Report
Dr. Debbie Jones**

Health Services

School Based Mental Health Services, Arkansas Department of Education Research continues to note the rising number of students in need of mental health services. In 1999, the U.S. Surgeon General reported that one in five children and adolescents will experience a significant mental health problem during their education years (U.S. Department of Health and Human Services, 1999). Mental health has a direct impact on student performance and schools are being recognized as the most common place of service. The President's New Freedom Commission on Mental Health (2003) acknowledged this relationship, saying, "Schools are where children spend most of each day. While schools are primarily concerned with education, mental health is essential to learning as well as to social and emotional development. Because of this important interplay between emotional health and school success, schools must be partners in the mental health care of our children" (p. 58). The Substance Abuse and Mental Health Services Administration (SAMHSA) among other national agencies has recognized this on a national level with millions of dollars of available funding for the expansion of mental health services in schools.

The Arkansas Department of Education has fostered the development of best practice school-based mental health programs within Arkansas public school districts for a number of years. These programs are grounded in and based on the following principles:

- Emphasis on early identification
- Integration with the community and its resources
- Placing students and their families at the center of service decisions
- Providing services that are culturally competent
- Focus on promoting school attendance and academic success
- Services and supports validated by research and evidence-based practices

Arkansas is one of the few states in the nation offering mental health services on nearly every campus in the state. Services are offered through either a contract with a mental health service provider and/or a school employed service provider. ADE offers technical support to schools in developing, implementing, and maintaining school based mental health services. Access to a full array of mental health services is promoted at the school site. Best practice school-based mental health services are characterized by the following:

- Student Supports
- An array of "pullout" interventions, including evaluation, crisis services, diagnosis, individual, group, family therapy, case management and day treatment

- Comprehensive intake, referral, and case management processes
- A collaborative partnership between school district and mental health provider staff
- Access to school based mental health services without regard to student or family Medicaid enrollment status and without cost to students and their families
- Appropriate linkages with community, regional, state and national resources
- Participation in Title XIX, Medicaid, either through provider enrollment or purchased service contracts
- Maximum utilization of alternative funding streams, including third party payers, public targeted and competitive grants, and private foundation funds.

Play It Again Arkansas

Play It Again Arkansas (PIAA) has been busy working on the Governor's Award for Musical Excellence, which was created during the fall of 2000. Governor Mike Huckabee approved the creation of the award. Since its inception, it has been presented every school year in the spring semester. The award is presented to a graduating high school senior, in the public schools, who is a member of a performing group: band, choir or orchestra. Applications are sent out in late January to all the high schools in the state. The local director submits the name to the principal for approval. The completed applications are returned to the PIAA office, where the certificates are personalized with the name of the student. After the Governor's signature is placed on each certificate, a medallion is placed with each certificate and they are sent to the schools. The awards are publicly presented, locally, sometime near the end of the year. This year there will present seventy-five awards to graduating high school seniors in Arkansas.

Professional Development

Literacy Design Collaborative and Math Design Collaborative (LDC/MDC)

The Professional Development unit is continuing support of the LDC/MDC 2015 cohort training with approximately 68 schools, 277 LDC participants and 173 MDC participants. The Arkansas Department of Education will provide the First Annual LDC in Arkansas Conference June 17 and 18 titled, *Delving Deeper into the Literacy Design Collaborative*. LDC is a teacher-created instructional design system whose mission is to transform educator practice through the use of online tools and resources that facilitate collaboration, content development, and professional learning to effectively implement College and Career Readiness Standards. To view the conference promotional video, visit this link:

<https://www.youtube.com/watch?v=wN4S5QYDnZQ&feature=youtu.be>

STEM Specialist Work

The Arkansas Network of **Science, Technology, Engineering, and Mathematics (STEM)** Centers serves to enrich the knowledge and teaching practices of teachers in STEM by linking institutions of higher education to K-12 public schools, educational service cooperatives, and businesses. STEM Centers provide services and resources for teachers, administrators, and students.

Educational service cooperative and University STEM Center mathematics specialists met April 7-8 to finalize four new state-initiated, multi-day opportunities available this summer:

- 2 day building the foundation for Data and Statistic for middle school teachers (grades 5-8)
- 2 day building integer concepts and operations conceptually with deeper understanding for teachers of grades 6-9 mathematics
- 2 day proof and reasoning for teachers of high school geometry
- 1 day integrating algebraic and geometric thinking as it applies to vectors for teachers of grades 11-12 mathematics

Educational service cooperative and University STEM Center science specialists met April 7-9 to finalize three new state-initiated, multi-day opportunities available this summer.

- 2 day introduction to the new standards for teachers K-12
- 2 day deeper dive into science and engineering practices for teachers 5-12
- 3 days for elementary teachers – with a focus on the connections between literacy and science

Alternative Education

Rural School District Dropout Prevention Initiative: U.S. Department of Education, Manhattan Strategy Group, Clemson University-Dropout Prevention Center Network, and American Institute of Research (AIR), joined together in October 2013 to provide support for fourteen states with dropout prevention strategies for rural school districts. Rural school districts shared struggles and webinars and are being produced to support many of the areas identified as needs for those districts. The last activity of the initiative is to create a useful video for the state to use that will promote the benefits of living and being educated in a rural school district. The Arkansas video will focus on 2-3 school districts from the target group, it will be created to show the positive natural resources from our Natural State. It will also be created as a recruitment tool for job fairs and to be shared with those applicants considering employment from out of state.

Alternative Education personnel continue to provide technical assistance and support for the Special Training in Remedial Instruction and Vocational Education (STRIVE) initiative. The alternative education program called STRIVE will focus

on academic, social, emotional and vocational training for the students involved. A large amount of the students will be involved with STRIVE as a diversion opportunity provided in partnership between the school district, juvenile courts, community college and vocational training organizations. Upon completion of STRIVE, students will have a diploma or GED, a skills training certificate through Work Keys and possibly other endorsements or certifications. A golden thread to the initiative is an arrangement with the juvenile judge that upon successful completion and participation in employable internships with graduation requirements met, students may have their juvenile records expunged or legally sealed. This will provide a clean record for future employability.

ADE Guidance and School Counseling

Collaboration with the Arkansas Statewide Suicide Prevention Initiative

The Office of Guidance and School Counseling's collaboration with the Arkansas Statewide Suicide Prevention Initiative has included meeting with initiative members to advocate for the support provided to Arkansas schools, students and staff, as well as reviewing and providing feedback on training materials, which will be offered to schools through the Garrett Lee Smith State and Tribal Youth Suicide Prevention Grant.

Assessment

Partnership for Assessment of Readiness for College and Careers (PARCC)

PARCC Window – The PARCC states met on April 12, 13 & 14 to discuss test design for the 2015-2016 school year. All states in the consortium relayed concerns over testing time and the data load put on districts by having two testing windows. It was determined that combining the two testing windows, PBA and EOY, into one, would reduce the data load on districts and allow the state to reduce the testing time required for both math and English language arts. Final decisions continue to be made about the length and dates of the 2015-2016 testing window and any reduction in the test blueprint.

Standard Setting - Standard setting for the PARCC assessment will occur in the summer of 2015. Performance level setting is a process for determining the threshold score a student must earn on a test in order to have his or her performance classified into one of several performance levels. PARCC will report the results of its assessments according to five performance levels, 1 through 5. During the performance level setting process, K-12 and post-secondary content experts will meet in grade-span panels to make judgments about where to establish the performance level threshold scores for each of the PARCC assessments. Standard setting is a vital component of the assessment process that occurs at the beginning of any new assessment program and only as needed for calibration after year one. Twenty-two Arkansas educators from across the state and grade levels were selected to participate in the

panels. These panelists will travel to Denver during July and August to participate in the standard setting process.

PARCC Comparability Study – “According to the *Standard for Educational and Psychological Testing* (American Psychological Association [APA], American Educational Research Association [AERA], & National Council on Measurement in Education [NCME], 2014), whenever a test is administered on both computer and paper modes, comparability studies must be conducted to support claims that test scores earned in either format may be used interchangeably and have the same interpretation. In preparation for this assessment, during the field test administration, PARCC commissioned a research study that examined the comparability of test scores between tests administered on computer (includes all computer types including tablets) and tests administered on paper. The goal of the PARCC assessment system is not strict comparability between the paper and computer modes but rather exchangeability of scores. The results of this research study are designed to be used to inform calibration, scaling, and equating decisions as the PARCC assessment moves to the operational phase.”

Executive Summary PARCC **Mode Comparability Study based on Spring 2014 Field Test Data**

In preparation for the 2014-2015 operational launch of the PARCC assessment program, PARCC led a comprehensive field test effort. The goal of the field test was to collect various forms of data to inform different components of the assessment system ranging from delivery, assessment development, accessibility, psychometrics, etc. Although the long-term goal of the PARCC assessment system is for digital delivery, the initial test rollout will support both paper and online modes of delivery.

PARCC commissioned a mode comparability research study to evaluate to what degree scores from online and paper form versions are comparable. The primary research questions investigated the degree in which the construct was invariant between the modes of administration, and whether student performance was similar between the modes. Several analyses including reliability, DIF, z-score, confirmatory factor analyses, and item response theory were performed. The DIF, z-Score, reliability, and summary test score analyses were conducted on all test forms and grade levels for the performance-based, end-of-year, and full summative assessments. The item response theory and confirmatory factor analyses were conducted on one grade within each of the grade-level bands for each content area.

The results indicated there were marginal differences in the median difficulties across the modes in favor of the paper format for all grades and assessments, with the exception of the math end-of-year assessment in grades 3 to 5. The difficulties of common items between modes were strongly correlated across

grades/subjects in nearly all content areas indicating coherence in measuring the same construct. The overall reliabilities, based on total item and common item raw scores, were consistent across mode. The overall effect sizes associated with mean raw scores for the common items ranged from small in favor of the paper mode for the performance-based assessments to negligible for the end-of-year and full summative assessments. With the exception of the mathematics performance-based assessment, a very small percentage of items were identified as functioning differently in the two modes, for students at the same ability level grouping. The percentage of mathematics performance-based assessment items that functioned different was about 17%. The confirmatory factor analyses revealed that, within each content area and across grades, the paper and online test forms shared a common overall test structure with the exception of the high school mathematics end-of-year assessments. For English language arts/Literacy, the claim structure was supported across grades for the full summative assessments and sub-claim structure was supported across grades for the end-of-year assessments. In contrast to mathematics, the sub-claim structure was supported across most subjects and grades for all mathematics assessments. Moreover, structural invariance, as defined by tau-equivalence, only occurred in English Language Arts\Literacy in grade 11 for the full summative form for the test, claim, and sub-claim score level structure for analyses conducted on common plus unique items. Partial tau-equivalence was achieved for all remaining score structures (total, claim, sub-claim) for both content areas across grade levels. The percentage of factor loadings and intercepts/thresholds that could be held constant across mode varied substantially across content areas and assessments. Lastly, the item response theory difficulties and discriminations estimated separately within mode were highly correlated and were largely unaffected by different calibration approaches.

Overall the research indicated that a small mode effect exists in favor of paper particularly for the performance-based assessments. Though strict comparability was not achieved, by implementing strong form construction guidelines and scaling and equating procedures, score interchangeability is achievable.

English Language Proficiency Assessment (ELPA21)

The Assessment Unit has issued a request for proposal for the 2015-2016 administration of the ELPA21 assessment. Throughout February 2015, 158 Arkansas schools participated in the field test with overwhelming success. ELPA21 is a computer-based assessment that is aligned to the K-12 English Language Proficiency Standards (approved by the Arkansas State Board of Education on March 20, 2014). ELPA21 provides an assessment for Kindergarten and yields objective scores for all grades K-12. This assessment will provide districts with more accurate data about their English Language Learner population that can be used to better serve those students.

The Assessment Unit is in the process of forming an Assessment Advisory Panel. The panel will be made up of district testing coordinators and district leaders from across the state. The Assessment Unit will hold an initial meeting of this group during the end of May to discuss issues around assessment and how ADE's Assessment Unit can better support districts in their testing program. This panel will be a group through which the Assessment Unit can gain district perspective on potential decisions that will affect Arkansas schools.

Mode Comparability Study based on Spring 2014 Field Test Data

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Educational Testing Service

April 9, 2015



Table of Contents

Contents

Executive Summary.....	9
Background	11
Section 1: Overview of Mode Comparability Study for the PARCC Assessments.....	12
1.1 Research Questions	12
1.2 Collection of Data.....	12
1.3 Item/Task Exclusions.....	16
Section 2: Field Test Design	18
2.1 Overview	18
2.2 Common Items across Modes.....	19
Section 3: Analyses and Results Pertaining to Construct Invariance	22
3.1 Overview	22
3.2 Z-score Comparisons.....	22
3.3 Differential Item Functioning.....	28
3.4 Confirmatory Factor Analyses.....	35
3.4.1.1 Preliminary Single Group CFA analyses.....	36
3.4.2 Multiple Group CFA Analyses.....	42
Section 4: Analyses and Results Pertaining to the Similarity of Student Performance across Modes.....	63
4.1 Overview	63
4.2 Summary Test Statistics	63
Section 5: Analyses and Results of IRT Item Parameter Estimates.....	66
5.1 Overview	66
5.2 Separate Calibration of Common Items.....	67
5.3 Joint Calibration of Common Items	68
Section 6: Conclusions and Implications.....	70
Implications.....	71

Limitations	72
References	73
Appendix A.....	75
Appendix B.....	107
Appendix C.....	110
Appendix D.....	195
Appendix E.....	215

List of Tables

Table 1.1 Student Cases Removed for ELA/Literacy and Mathematics by Form Type, Mode, and Grade Level.....	14
Table 1.2 Discrepant Demographic Groups across Modes and Assessments	16
Table 1.3 Summary of Items Excluded from Analyses.....	17
Table 2.1 Mathematics - Number of Common Items between CBT and PBT Forms	20
Table 2.2 ELA/Literacy - Number of Common Items between CBT and PBT Forms	21
Table 3.1 Average p -Values across Administration Mode for ELA/Literacy PBA for Common Items	23
Table 3.2 Average p -Values across Administration Mode for ELA/Literacy EOY for Common Items	23
Table 3.3 Average p -Values across Administration Mode for Mathematics PBA for Common Items.....	24
Table 3.4 Average p -Values across Administration Mode for Mathematics EOY for Common Items.....	25
Table 3.5 Z-Score Correlations and Percentages of Flagged Items Appearing across Modes for ELA/Literacy PBA ...	27
Table 3.6 Z-Score Correlations and Percentages of Flagged Items Appearing across Modes for ELA/Literacy EOY ..	27
Table 3.7 Z-Score Correlations and Percentage of Flagged Items Appearing Across Modes for Mathematics PBA ...	28
Table 3.8 Z-Score Correlations and Percentage of Flagged Items Appearing Across Modes for Mathematics EOY ...	28
Table 3.9 DIF Categories for Selected-Response Items	30
Table 3.10 DIF Categories for Constructed-Response Items	30
Table 3.11 DIF Categories based on Logistic Regression	31
Table 3.12 Summary of Mantel-Haenszel/SMD DIF Results across Assessments	33
Table 3.13 Summary of Logistic Regression DIF Results across Assessments	34
Table 3.14: Summary of Items Excluded from Factor Analyses.....	36
Table 3.15 Summary of Item Counts by Subclaims for ELA/Literacy for PBA and EOY - Common Items.....	38
Table 3.16 Summary of Item Counts by Subclaims for Mathematics for PBA and EOY - Common Items.....	38
Table 3.17 Summary of Item Counts by Subclaims for ELA/Literacy for PBA and EOY - Common + Unique Items	39
Table 3.18 Summary of Item Counts by Subclaims for Math for PBA and EOY - Common + Unique Items.....	39



Table 3.19 Test Level Scores Fit Results for Multigroup CFA Models for ELA/Literacy - Common Items.....46

Table 3.20 Comparison between Strict and Tau-Equivalence for ELA/Literacy FS Test Level Scores for Multigroup CFA Models - Common Items47

Table 3.21 Test Level Scores Fit Results for Multigroup CFA Models for Mathematics - Common Items48

Table 3.22 Test Level Scores Fit Results for Multigroup CFA Models for ELA/Literacy - Common + Unique Items50

Table 3.23 Test Level Scores Fit Results for Multigroup CFA Models for Mathematics - Common + Unique Items ...51

Table 3.24 Claim Level Scores Fit Results for Multigroup CFA Models for ELA/Literacy - Common Items54

Table 3.25 Claim Level Scores Fit Results for Multigroup CFA Models for ELA/Literacy - Common + Unique Items ..55

Table 3.26 Subclaim Level Scores Fit Results for Multigroup CFA Models for ELA/Literacy - Common Items.....58

Table 3.27 Subclaim Level Scores Fit Results for Multigroup CFA Models for Mathematics - Common Items.....59

Table 3.28 Subclaim Level Scores Fit Results for Multigroup CFA Models for ELA/Literacy - Common + Unique Items60

Table 3.29 Subclaim Level Scores Fit Results for Multigroup CFA Models for Mathematics - Common + Unique Items61

Table 5.1 Common Items Excluded from IRT Analyses.....67

Table 5. 2 Correlations between Modes of Discrimination and Difficulty Parameter Estimates for Common Items .68

Table A.1 Distribution of Socio-Economic Status by Grade Level for ELA/Literacy PBA Assessments75

Table A.2 Distribution of Racial Status by Grade Level for ELA/Literacy PBA.....76

Table A.3 Distribution of English Language Classifications Status by Grade Level for ELA/Literacy PBA77

Table A.4 Distribution of Students with Disabilities by Grade Level for ELA/Literacy PBA.....78

Table A.5 Distribution of Socio-Economic Status by Grade Level for ELA/Literacy EOY Assessments79

Table A. 6 Distribution of Racial Status by Grade Level for ELA/Literacy EOY Assessments80

Table A.7 Distribution of English Language Classifications Status by Grade Level for ELA/Literacy EOY Assessments81

Table A.8 Distribution of Students with Disabilities by Grade Level for ELA/Literacy EOY Assessments82

Table A.9 Distribution of Socio-Economic Status by Grade Level for ELA/Literacy Full Summative Assessments83

Table A.10 Distribution of Racial Status by Grade Level for ELA/Literacy Full Summative Assessments84

Table A.11 Distribution of English Language Classifications Status by Grade Level for ELA/Literacy Full Summative Assessments85

Table A.12 Distribution of Students with Disabilities by Grade Level for ELA/Literacy Full Summative Assessments 86

Table A.13 Distribution of Socio-Economic Status by Grade Level for Mathematics PBA.....87

Table A.14 Distribution of Racial Status by Grade Level for Mathematics PBA.....89

Table A.15 Distribution of English Language Classifications Status by Grade Level for Mathematics PBA91

Table A.16 Distribution of Students with Disabilities by Grade Level for Mathematics PBA93

Table A.17 Distribution of Socio-Economic Status by Grade Level for Mathematics EOY Assessments95



Table A.18 Distribution of Racial Status by Grade Level for Mathematics EOY Assessments97

Table A.19 Distribution of English Language Classifications Status by Grade Level for Mathematics EOY Assessments99

Table A.20 Distribution of Students with Disabilities by Grade Level for Mathematics EOY Assessments101

Table A.21 Distribution of Socio-Economic Status by Grade Level for Mathematics Full Summative Assessments .103

Table A.22 Distribution of Racial Status by Grade Level for Mathematics Full Summative Assessments104

Table A.23 Distribution of English Language Classifications Status by Grade Level for Mathematics Full Summative Assessments105

Table A.24 Distribution of Students with Disabilities by Grade Level for Mathematics Full Summative Assessments106

Table B.1 Number of Forms per Grade Administered for each Field Test Condition and Mode of Delivery for ELA/Literacy107

Table B.2 Number of Forms per Grade Administered for each Field Test Condition and Mode of Delivery for Mathematics108

Table B.3 Number of Forms per Integrated Mathematics (IM) EOC for each Field Test Condition and Mode of Delivery109

Table C.1 Summary Difficulty Statistics across Mode by Form Pairs for ELA/Literacy PBA110

Table C.2 Summary Difficulty Statistics across Mode by Form Pairs for ELA/Literacy EOY114

Table C.3 Summary Difficulty Statistics across Mode by Form Pairs for Mathematics PBA118

Table C.4 Summary Difficulty Statistics across Mode by Form Pairs for Mathematics EOY123

Table C.5 Characteristics of Items Flagged for z-Score Differences for ELA/Literacy PBA141

Table C.6 Characteristics of Items Flagged for Flagged for z-Score Differences for ELA/Literacy EOY142

Table C.7 Characteristics of Items Flagged for z-Score Differences for Mathematics PBA143

Table C.8 Characteristics of Items Flagged for z-Score Differences for Mathematics EOY144

Table C.9 Summary of Mantel-Haenszel, SMD, and Logistic Regression DIF Results by Grade Levels for ELA/Literacy PBA145

Table C.10 Summary of Mantel-Haenszel, SMD, and Logistic Regression DIF Results by Grade Levels for ELA/Literacy EOY147

Table C.11 Summary of Mantel-Haenszel, SMD, and Logistic Regression DIF Results by Grade Levels for Mathematics PBA149

Table C.12 Summary of Mantel-Haenszel, SMD, and Logistic Regression DIF Results by Grade Levels for Mathematics EOY152

Table C.13 Characteristics of Items Flagged for C-Level DIF for ELA/Literacy PBA155

Table C.14 Characteristics of Items Flagged for C-Level DIF for ELA/Literacy EOY156

Table C.15 Characteristics of Items Flagged for C-Level DIF for Mathematics PBA157

Table C.16 Characteristics of Items Flagged for C-Level DIF for Mathematics EOY.....158

Table C.17 Test Level Score Results for the Single Group Model for ELA/Literacy PBA by Mode of Administration-
Common Items159

Table C.18 Test Level Score Results for the Single Group Model for ELA/Literacy EOY by Mode of Administration-
Common Items161

Table C.19 Test Level Score Results for the Single Group Model for Mathematics PBA by Mode of Administration-
Common Items163

Table C.20 Test Level Score Results for the Single Group Model for Mathematics EOY by Mode of Administration-
Common Items165

Table C.21 Test Level Score Results for the Single Group Model for ELA/Literacy and Mathematics FS by Mode of
Administration- Common Items167

Table C.22 Test Level Score Results for the Single Group Model for ELA/Literacy PBA by Mode of Administration-
Common + Unique Items168

Table C.23 Test Level Score Results for the Single Group Model for ELA/Literacy EOY by Mode of Administration-
Common + Unique Items170

Table C.24 Test Level Score Results for the Single Group Model for Mathematics PBA by Mode of Administration-
Common + Unique Items172

Table C. 25 Test Level Score Results for the Single Group Model for Mathematics EOY by Mode of Administration-
Common + Unique Items174

Table C.26 Test Level Score Results for the Single Group Model for ELA/Literacy and Mathematics FS by Mode of
Administration- Common + Unique Items176

Table C.27 Claim Level Score Results for the Single Group Model for ELA/Literacy PBA and FS by Mode of
Administration- Common Items177

Table C.28 Claim Level Score Results for the Single Group Model for ELA/Literacy PBA and FS by Mode of
Administration- Common +Unique Items.....178

Table C.29 Subclaim Level Score Results for the Single Group Model for ELA/Literacy PBA, EOY, and FS by Mode of
Administration- Common Items179

Table C. 30 Subclaim Level Score Results for the Single Group Model for Mathematics PBA, EOY, and FS by Mode of
Administration- Common Items180

Table C.31 Subclaim Level Score Results for the Single Group Model for ELA/Literacy PBA, EOY, and FS by Mode of
Administration- Common + Unique Items181

Table C.32 Subclaim Level Score Results for the Single Factor Model for Mathematics PBA, EOY, and FS by Mode of
Administration- Common + Unique Items182

Table C.33 Characteristics of Items Flagged for Lack of Factor Loading Invariance across Mode for ELA/Literacy PBA
.....183

Table C.34 Characteristics of Items Flagged for Lack of Factor Loading Invariance across Mode for ELA/Literacy EOY	184
Table C.35 Characteristics of Items Flagged for Lack of Factor Loading Invariance across Mode for ELA/Literacy FS	185
Table C.36 Characteristics of Items Flagged for Lack of Factor Loading Invariance across Mode for Mathematics PBA	186
Table C.37 Characteristics of Items Flagged for Lack of Factor Loading Invariance across Mode for Mathematics EOY	187
Table C.38 Characteristics of Items Flagged for Lack of Factor Loading Invariance across Mode for Mathematics FS	188
Table C.39 Characteristics of Items Flagged for Lack of Threshold/Intercept Invariance across Mode for ELA/Literacy PBA	189
Table C.40 Characteristics of Items Flagged for Lack of Threshold/Intercept Invariance across Mode for ELA/Literacy EOY	190
Table C.41 Characteristics of Items Flagged for Lack of Threshold/Intercept Invariance across Mode for ELA/Literacy FS	191
Table C.42 Characteristics of Items Flagged for Lack of Threshold/Intercept Invariance across Mode for Mathematics PBA	192
Table C.43 Characteristics of Items Flagged for Lack of Threshold/Intercept Invariance across Mode for Mathematics EOY	193
Table C.44 Characteristics of Items Flagged for Lack of Threshold/Intercept Invariance across Mode for Mathematics FS	194
Table D.1 Test Score Summary for ELA/Literacy PBA by Test Mode	195
Table D.2 Test Score Summary for ELA/Literacy EOY by Test Mode	199
Table D.3 Test Score Summary for ELA/Literacy Full Summative Forms by Test Mode	203
Table D.4 Test Score Summary for Mathematics PBA Forms by Test Mode	204
Table D.5 Test Score Summary for Mathematics EOY Forms by Test Mode	209
Table D. 6 Test Score Summary for Mathematics Full Summative Forms by Test Mode	214
Table E.1 Impact of Calibration Conditions for Difficulty and Discrimination Parameter Estimates for ELA/Literacy PBA and EOY Assessments.....	228
Table E.2 Impact of Calibration Conditions for Difficulty and Discrimination Parameter Estimates for Mathematics PBA and EOY Assessments.....	229

List of Figures

Figure C.1 Z-Score Difficulties across Modes for Common Items for ELA/Literacy PBA	129
Figure C.2 Z-Score Difficulties across Modes for Common Items for ELA/Literacy EOY	132
Figure C.3 Z-Score Difficulties across Modes for Common Items for Mathematics PBA.....	135
Figure C.4 Z-Score Difficulties across Modes for Common Items for Mathematics EOY.....	138
Figure E.1 Correlation between Discrimination Parameter Estimates across Modes for ELA/Literacy	216
Figure E.2 Correlation between Difficulty Parameter Estimates across Modes for ELA/Literacy	219
Figure E.3 Correlation between Discrimination Parameter Estimates across Modes for Mathematics	222
Figure E.4 Correlation between Difficulty Parameter Estimates across Modes for Mathematics	225

Executive Summary

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The results indicated there were marginal differences in the median difficulties across the modes in favor of the paper format for all grades and assessments with the exception of the math end-of-year assessment in grades 3 to 5. The difficulties of common items between modes were strongly correlated across grades/subjects in nearly all content areas indicating coherence in measuring the same construct. The overall reliabilities based on total item and common item raw scores were consistent across mode. The overall effect sizes associated with mean raw scores for the common items ranged from small in favor of the paper mode for the performance-based assessments to negligible for the end-of-year and full summative assessments. With the exception of the Mathematics performance-based assessment, a very small percentage of items was identified as functioning differently in the two modes, for students at the same ability level grouping. The percentage of Mathematics performance-based assessment items that functioned different was about 17%. The confirmatory factor analyses revealed that, within each content area and across grades, the paper and online test forms shared a common overall test structure with the exception of the high school Mathematics end-of-year assessments. For ELA/Literacy the claim structure was supported across grades for the full summative assessments and subclaim structure was supported across grades for the end-of-year assessments. In contrast for Mathematics, the subclaim structure was supported across most subjects and grades for all Mathematics assessments. Moreover, structural invariance, as defined by tau-equivalence only occurred in English Language Arts\Literacy in grade 11 for the full summative form for the test, claim, and subclaim score level structure for analyses conducted on common plus unique items. Partial tau-equivalence was achieved for all remaining score structures (total, claim, subclaim) for both content areas across grade levels. The percentage of factor loadings and intercepts/thresholds that could be held constant across mode varied substantially across content areas and assessments. Lastly, the item response theory difficulties and discriminations estimated separately within mode were highly correlated and were largely unaffected by different calibration approaches.



Mode Comparability Research

Overall the research indicated that a small mode effect exists in favor of paper particularly for the performance-based assessments. Though strict comparability was not achieved, by implementing strong form construction guidelines and scaling and equating procedures, score interchangeability is achievable.

Background

The Partnership for Assessment of Readiness for College and Careers (PARCC) is a state-led consortium working to develop next-generation assessments that more accurately measure student progress toward college and career readiness than do many current assessments. The PARCC assessments is designed to be aligned to the Common Core State Standards (CCSS) and will be administered operationally beginning in the 2014-2015 academic year. The PARCC assessments include both English Language Arts/Literacy (ELA/Literacy) and Mathematics assessments in Grades 3 to 8 and high school. Although PARCC's long-term goal is to move towards digital delivery of these assessments, the operational rollout involves the administration of tests using both paper and online formats.

According to the *Standard for Educational and Psychological Testing* (American Psychological Association [APA], American Educational Research Association [AERA], & National Council on Measurement in Education [NCME], 2014), whenever a test is administered on both computer and paper modes comparability studies must be conducted to support claims that test scores earned in either format may be used interchangeably and have the same interpretation. In preparation for this assessment, during the field test administration, PARCC commissioned a research study that examined the comparability of test scores between tests administered on computer (includes all computer types including tablets) and tests administered on paper. The goal of the PARCC assessment system is not strict comparability between the paper and computer modes but rather exchangeability of scores. The results of this research study are designed to be used to inform calibration, scaling, and equating decisions as the PARCC assessment moves to the operational phase.

This document provides a summary of analyses as well as results for the mode comparability study based on the field test data.

This report is organized as follows:

Section 1: Overview of Mode Comparability Study for the PARCC Assessments

Section 2: Field Test Design

Section 3: Analyses and Results Pertaining to Construct Invariance

Section 4: Analyses and Results Pertaining to the Similarity of Student Performance across Modes

Section 5: Analyses and Results Pertaining to IRT Item Parameter Estimates

Section 6: Conclusion and Implications

Section 7: References

Section 1: Overview of Mode Comparability Study for the PARCC Assessments

1.1 Research Questions

This report summarizes the findings from the mode comparability study conducted using field test data collected during the 2014 PARCC field-test administration. The mode comparability study addressed the following two questions:

1. Is the construct invariant between the two modes of test administration?
2. Given that the construct remains the same, is student performance (such as mean and median) similar between the two modes?

To address the first question, the following analyses were conducted:

- i. Z-score comparisons (Section 3.2)*
- ii. Differential item functioning analyses(Section 3.3)*
- iii. Confirmatory factor analyses (Section 3.4)*
- iv. Analyses of IRT item parameter estimates (Section 5)*

To address the second question, the following were computed and evaluated:

- i. Summary test statistics (Section 4.2)*
- ii. Effect sizes (Section 4.2)*

The analysis methods and results are presented in sections 3, 4, and 5. First, in Section 1, an overview of the data collection effort is described. In Section 2, an overview of the field test design and the number of common items across delivery modes is presented.

1.2 Collection of Data

In conducting the mode comparability study, the goal was to implement a randomly equivalent groups design. This approach involves randomly assigning test takers to either the computer-based test (CBT) or paper-based test condition. The primary advantage of this design in relation to a common person design or quasi-experimental design is “examinees only need to test once” and the resulting groups are “the same on all important characteristics, no further manipulation of the groups is necessary” (Wan, Keng, McClarty & Davis, 2009, p. 1).

Although there was a faithful effort to implement a randomly equivalent group design, there were practical constraints that limited this approach. Particularly, some selected schools declined to participate under the CBT condition due to lack of sufficient infrastructure. Similarly, schools declined to participate under the PBT condition because they extensively use computers in the course of instruction and for testing, and hence did not want to take a step back. In some instances, for schools that declined

to participate in the study for a particular condition, replacement schools were identified. In other instances where there were no replacement schools, in order to obtain a sufficiently large study sample for a particular grade level, schools' mode preferences were honored.

The first step after data collection was the examination of the demographic characteristics of the samples to determine the level of comparability across the modes on key variables. The demographic characteristics that were evaluated across mode for the PBA and EOY assessments included race, socio-economic status, students with disabilities, and students with limited English proficiency. Prior assessment data from PARCC consortium states was not readily available that could be used to further evaluate comparability of groups or implement a propensity score matching approach. In instances where demographic characteristics differed between mode, samples were adjusted by randomly removing cases.

A hierarchy in which sample characteristics were adjusted across modes was established. Specifically, racial differences across modes were adjusted first, followed by socio-economic differences, students with disabilities, and limited English proficient students. For some grade levels and subjects, achieving comparability in terms of demographic characteristics was not pursued due to small sample sizes. Particularly, since a two-parameter logistic (2PL) item response theory model was fit to the assessment data for each mode, no sampling down would occur within mode if the overall sample would fall below 800 cases. The goal of adjusting the samples was to minimize the differences on key demographic variables. Specifically, the target demographic difference was 5% across the modes. In some cases, the 5% demographic difference threshold could not be achieved since the unadjusted demographic differences were substantial (differences in excess of 25%). Table 1.1 summarizes the number of cases that were removed to achieve demographic balance across mode. The demographic disparities in excess of 10% across modes are presented in Table 1.2. A substantial number of demographic subgroups that were discrepant on mode of administration occurred on tests with low test taker counts, which nearly always occurred on the full summative Mathematics assessments and Integrated Mathematics sequence. Table A.1 to Tables A.24 in the appendix provides the adjusted sample demographics for each grade level and subject for the ELA\Literacy and Mathematics PBA, EOY and full summative (FS) assessments.



Mode Comparability Research

Table 1.1 Student Cases Removed for ELA/Literacy and Mathematics by Form Type, Mode, and Grade Level

Test	Form Type	Test Mode	RACE	Students with Disabilities	SES	Limited English Proficient	Total Removed
ELA03	PBA	CBT			520 Free lunch		520
		PBT					
ELA04	PBA	CBT	40 White Students with disabilities		310 Free lunch		350
		PBT					
ELA05	PBA	CBT	70 White Students with disabilities		300 Free lunch		370
		PBT					
ELA06	PBA	CBT	860 White		140 Free lunch, 600 Full Price lunch		1600
		PBT					
ELA08	PBA	CBT	160 White				160
		PBT					
ELA10	PBA	CBT	200 White				200
		PBT					
ELA11	PBA	CBT	200 White				200
		PBT					
ELA05	EOY	CBT	35 White		465 Full Price lunch		500
		PBT					
ELA08	EOY	CBT	80 White				80
		PBT					
ELA09	EOY	CBT	1600 White				1600
		PBT					
ELA10	EOY	CBT					
		PBT	50 Black				50
ELA11	EOY	CBT			140 Full Price lunch		140
		PBT					
ELA03	FS	CBT					
		PBT	34 Hispanic		149 Free lunch		183
ELA04	FS	CBT	72 Hispanic				72
		PBT	169 Whites		34 Free lunch		203
ELA05	FS	CBT					
		PBT			239 Other		239
ELA06	FS	CBT					
		PBT	255 Black		255 Other		510
ELA07	FS	CBT			149 Full Price lunch		149
		PBT					
ELA08	FS	CBT	91 White		323 Full Price lunch		414
		PBT	200 Black				200
ELA09	FS	CBT					
		PBT	368 Black		246 Free lunch		614
ELA10	FS	CBT					
		PBT	30 Black				30



Mode Comparability Research

Table 1.1 Student Cases Removed for ELA/Literacy and Mathematics by Form Type, Mode, and Grade Level
(Cont'd)

Test	Form Type	Test Mode	RACE	Students with Disabilities	SES	LEP	Total Removed
MAT03	PBA	CBT			620 Full Price lunch		620
		PBT					
MAT04	PBA	CBT			641 Full Price lunch		641
		PBT					
MAT05	PBA	CBT			165 Free lunch, 125 Full Price lunch		290
		PBT	150 Hispanic				150
MAT06	PBA	CBT			240 Free lunch		240
		PBT					
ALG01	PBA	CBT	70 Black				70
		PBT			75 Full Price lunch		75
ALG02	PBA	CBT	360 White		150 Free lunch		510
		PBT					
GEO01	PBA	CBT	280 White		190 Full Price lunch		470
		PBT					
MAT1I	PBA	CBT			235 Free lunch		235
		PBT					
MAT04	EOY	CBT			275 Full Price lunch		275
		PBT					
MAT05	EOY	CBT					
		PBT	40 Hispanic				40
MAT08	EOY	CBT			400 Full Price lunch		400
		PBT					
ALG01	EOY	CBT	20 Black				20
		PBT			350 Full Price lunch		350
GEO01	EOY	CBT	450 White				450
		PBT					
MAT1I	EOY	CBT		100 Students with disabilities			100
		PBT					
MAT03	FS	CBT			225 Full Price lunch, 100 Free lunch		325
		PBT					
MAT04	FS	CBT			170 Full Price lunch		170
		PBT	115 Black				115
MAT05	FS	CBT			215 Full Price lunch		215
		PBT					
MAT06	FS	CBT	170 White		80 Full Price lunch, 140 Free lunch		390
		PBT					
MAT07	FS	CBT			140 Free lunch		140
		PBT	125 Black				125
MAT08	FS	CBT			55 Full Price lunch		55
		PBT					

Table 1.2 Discrepant Demographic Groups across Modes and Assessments

Test	Form Type	Demographic Variable	Discrepant Demographic Group	Percentage by Mode		% Discrepant (PBT - CBT)
				PBT	CBT	
ELA09	FS	SES	Full Price Lunch	62.96	49.74	13.22
MAT2I	PBA	SES	Other	38.85	50.15	-11.3
MAT2I	PBA	Race	Black	20.95	8.56	12.39
MAT3I	PBA	SES	Free Lunch	12.19	22.69	-10.5
MAT3I	PBA	SES	Full Price Lunch	49.58	35.53	14.05
MAT1I	EOY	SES	Free Lunch	40.94	26.53	14.41
MAT1I	EOY	SES	Other	9.93	32.92	-22.99
MAT1I	EOY	Race	Black	28.54	7.82	20.72
MAT1I	EOY	Race	White	73.79	49.01	24.78
MAT2I	EOY	SES	Free Lunch	18.85	35.02	-16.17
MAT2I	EOY	SES	Full Price Lunch	16.19	30.83	-14.64
MAT2I	EOY	SES	Other	43.02	28.49	14.53
MAT3I	EOY	Race	Black	17.93	5.04	12.89
MAT3I	EOY	Race	Hispanic/Latino	4.86	26.99	-22.13
MAT03	FS	SES	Other	38.85	23.44	15.41
MAT06	FS	SES	Free Lunch	20.47	31.86	-11.39
MAT06	FS	SES	Other	38.41	21.13	17.28
GEO01	FS	Race	Black	21.83	10.6	11.23
GEO01	FS	Race	White	59.02	69.37	-10.35

1.3 Item/Task Exclusions

Prior to commencing analyses, efforts were made to remove problematic items for the subset of forms used on the mode comparability study based on the following criteria:

- Items with average item scores of zeroes on both forms
- Items with omit rates greater than 50%
- 100% of test takers receiving the same score
- An item/task was identified as do not use (DNU) based on preliminary item analyses, content and scoring reviews

Table 1.3 summarizes the number of items excluded from the analyses.

Table 1.3 Summary of Items Excluded from Analyses

ELA/Literacy					Mathematics				
Grade	Total Number of Items	Number of Items Excluded	Number of Items Included	Percentage of Items Included	Grade/Subject	Total Number of Items	Number of Items Included	Number of Items Excluded	Percentage of Items Included
3	320	69	251	78.4	3	462	398	64	86.1
4	265	34	231	87.2	4	456	369	87	80.9
5	276	43	233	84.4	5	403	310	93	76.9
6	295	43	252	85.4	6	434	337	97	77.6
7	308	50	258	83.8	7	405	335	70	82.7
8	265	53	212	80.0	8	411	334	77	81.3
9	317	55	262	82.6	ALG01	438	319	119	72.8
10	303	55	248	81.8	ALG02	357	241	116	67.5
11	278	39	239	86.0	GEO	421	324	97	77.0
					MAT1I	265	203	62	76.6
					MAT2I	240	159	81	66.3
					MAT3I	224	145	79	64.7

Section 2: Field Test Design

2.1 Overview

The PARCC field test includes nine ELA/Literacy tests (Grades 3 to 11) and 12 Mathematics tests (Grades 3 to 8, and six end-of-course [EOC] tests at the high school level – Algebra I, Geometry, Algebra II, Mathematics I, Mathematics II, and Mathematics III).

All field test forms were constructed to meet the intended operational test blueprints and requirements, and to the extent possible, reflect the operational linking design. Each field test form reflected the full operational test blueprint in terms of content, item types, and test length, as well as expected difficulty and performance along the ability continuum¹.

To meet the goals and constraints of the field test study, the field test design entailed two conditions. In the first condition (Condition 1), selected samples of students participated in both the Performance-based Assessment (PBA) and End-of-Year (EOY) field test administrations, thus approximating the condition of the future operational full summative (FS) assessment. In the second condition, selected samples of students participated in either the PBA field test administration (Condition 2A) or the EOY administration (Condition 2B), but not both.

Within each condition, there were two administration modes and students were assigned to take the PBT or CBT for either ELA/Literacy or Mathematics. Within each condition and mode, all forms for each content area were spiraled at the student level, thus enabling random assignment of test content to students sampled to represent the PARCC student population, as well as subgroups of interest. For the majority of schools, there was one mode of administration for all participating classes, including those selected to participate in the field test for different grades, content areas, and condition.

The initial field test design for Condition 1 included the administration of six CBT and six PBT forms; the CBT and PBT version of one form would be identical in terms of items and item sequence. The remaining CBT and PBT forms would be identical with the exception of those technology enhanced (TE) items that must be replaced on the paper forms. Thus, in total there would be the equivalent of 11 full operational forms; 5 unique to computer, 5 unique to paper, and 1 common to paper and computer. Due to practical constraints, the number of paper forms was greatly reduced. Condition 1 for the PBT was reduced to the administration of one form only and the remaining five forms were administered in Condition 2. In addition, due to insufficient anticipated samples, the number of Integrated Mathematics forms was reduced.

The number of field test forms administered for each grade-level or EOC test are delineated in Tables B.1-B.3 in the appendix.

¹ After the field test forms had been constructed and administered to test takers, PARCC modified the operational ELA/Literacy blueprint for EOY by reducing the number of reading text and associated items corresponding to the Reading Information and Reading Vocabulary subclaims that a test taker needed to complete. The field test forms that were evaluated in this analysis do not reflect the revised operational ELA/Literacy blueprints.

To achieve adequate field test sample sizes to support the goals of the field test phase, the objective was to obtain representative samples with a minimum target sample size of 1,200 valid cases per item/performance task per form. The target sample size of 1,200 valid cases per form was based on the assumption that forms were to be spiraled at the individual student level and the smallest sampling unit was the classroom instead of the school. Spiraling forms at the student level supports the distribution of test forms across randomly equivalent groups. This approach helps mitigate the impact of clustering of students nested within classrooms. Specifically, spiraling test forms within a classroom helps to ensure that all forms of a test are administered to students of differing ability levels and helps to control for any classroom and/or teacher effects.

2.2 Common Items across Modes

In response to several practical constraints, to meet the blueprints (e.g., inclusion of technology enhanced items in CBT forms) there was no one form that serves as a common form between computer and paper delivery modes at each grade level. Instead, multiple forms for each grade were constructed for each grade of ELA/Literacy and Mathematics as presented in Tables B.1 and B.2 in the appendix. As noted in Table B.3, the number of administered EOC forms for Integrated Mathematics (IM) ranges from one to two forms for PBA and four to five for EOY.

The PBT FS form was designed to be identical to a CBT FS form in terms of items and item sequence with the *exception* of those TE and multimedia items that were replaced because they cannot be administered on paper forms or to ensure test blueprint coverage of the CCSS. The remaining five CBT FS and five PBT PBA and EOY forms also share common items. Thus, in total for each grade for ELA/Literacy and for each grade/EOC for Mathematics there were six field test forms that were available for analysis for the mode comparability study (except for IM forms).

Tables 2.1 and 2.2 (one for Mathematics and one for ELA/Literacy) summarize the number of common items between CBT and PBT forms for each grade as administered during the field test. Given the limitations of the data, (as a result of the reduction in number of paper forms) most analyses were conducted at the component level (e.g., PBA and EOY). However, for the one pair of Condition 1 forms, test-level analyses were performed at the full summative (PBA + EOY) level.



Mode Comparability Research

Table 2.1 Mathematics - Number of Common Items between CBT and PBT Forms

			N Items per Form						Common Items per Form Pair						Total over N Forms
			Operational Core		External Section		Total		Operational Core		External Section		Total		
Test	Component	N Form Pairs	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	
G03	PBA	6	17	17	6	6	23	23	6	13	0	5	7	18	46
	EOY	7	39	39	10	10	49	49	18	24	4	6	23	28	121
G04	PBA	6	17	17	6	6	23	23	5	10	2	6	7	16	57
	EOY	7	36	36	10	10	46	46	17	20	5	7	22	25	115
G05	PBA	5	16	16	6	6	22	22	5	8	2	3	7	11	35
	EOY	6	36	36	10	10	46	46	12	22	4	10	16	27	90
G06	PBA	6	17	17	6	6	23	23	7	15	1	3	9	18	54
	EOY	7	36	36	10	10	46	46	17	20	2	7	19	27	110
G07	PBA	6	17	17	6	6	23	23	7	15	1	6	9	21	54
	EOY	7	32	32	10	10	42	42	14	17	4	8	19	23	104
G08	PBA	5	18	18	6	6	24	24	5	9	0	6	5	15	40
	EOY	6	32	33	10	11	43	43	11	17	3	8	14	25	83
A1	PBA	5	18	18	6	6	24	24	5	11	0	4	7	12	40
	EOY	6	35	35	10	10	45	45	5	13	5	7	10	18	60
A2	PBA	4	20	20	6	6	26	26	6	10	1	3	8	13	34
	EOY	5	34	34	10	10	44	44	12	14	0	5	13	17	50
GE	PBA	5	18	18	6	6	24	24	3	12	0	3	3	13	35
	EOY	6	34	34	10	10	44	44	11	16	1	7	14	20	74
M1	PBA	2	18	18	6	6	24	24	7	10	1	4	8	14	22
	EOY	3	34	34	10	10	44	44	7	13	2	5	9	18	42
M2	PBA	2	18	18	6	6	24	24	4	7	3	4	8	10	15
	EOY	3	34	34	10	10	44	44	8	14	2	9	10	23	40
M3	PBA	2	20	20	6	6	26	26	7	8	3	4	10	12	22
	EOY	2	36	36	10	10	46	46	10	19	2	4	12	23	35



Mode Comparability Research

Table 2.2 ELA/Literacy - Number of Common Items between CBT and PBT Forms

			N Items per Form						Common Items per Form Pair						Total over N Forms
			Operational Core		External Section		Total		Operational Core		External Section		Total		
Test	Component	N Form Pairs	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	
03	PBA	5	20	20	0	0	20	20	7	11	0	0	7	11	41
	EOY	6	26	26	8	8	34	34	17	22	4	7	23	28	125
04	PBA	4	23	23	0	0	23	23	8	11	0	0	8	11	24
	EOY	5	26	26	8	8	34	34	16	19	5	6	22	25	100
05	PBA	5	23	23	0	0	23	23	9	17	0	0	9	17	32
	EOY	5	26	26	6	8	32	34	18	21	0	7	18	27	96
06	PBA	6	23	23	0	0	23	23	10	13	0	0	10	13	45
	EOY	5	26	26	6	8	32	34	17	19	3	7	22	26	102
07	PBA	9	23	23	0	0	23	23	10	20	0	0	10	20	45
	EOY	5	26	26	6	6	32	32	16	19	4	4	20	23	94
08	PBA	9	23	23	0	0	23	23	10	18	0	0	10	18	66
	EOY	3	26	26	6	6	32	32	18	19	4	4	22	23	64
09	PBA	5	23	23	0	0	23	23	9	17	0	0	9	17	55
	EOY	5	26	26	6	6	32	32	17	19	4	4	21	23	96
10	PBA	5	23	23	0	0	23	23	10	19	0	0	10	19	57
	EOY	5	26	26	6	6	32	32	16	18	4	5	20	22	94
11	PBA	5	23	23	0	0	23	23	10	16	0	0	10	16	57
	EOY	4	26	26	6	6	32	32	16	19	4	5	20	23	78

Section 3: Analyses and Results Pertaining to Construct Invariance

3.1 Overview

The following analyses were designed to assess whether the same construct is measured by the online and paper versions of the PARCC Field Test assessments. These analyses focus on the internal structure of each test and the degree to which the structures are similar. As noted in the *Standards for Educational and Psychological Testing* (APA, AERA, & NCME, 2014, p. 16), “Analysis of the internal structure of a test can indicate the degree to which the relationships among test items and test components conform to the construct on which the proposed test score interpretations are based.”

3.2 Z-score Comparisons

Summary statistics obtained for the common items administered in each mode were calculated. Percentage correct values (p -values) for dichotomously scored items and average item scores for polytomously scored items were calculated. For each polytomous item, the average item score was rescaled by dividing its value by the maximum score points available so that the difficulty interpretation would be consistent with dichotomous items. Tables 3.1 through 3.4 provide the average and median p -values for the common items appearing in both modes, summarized across form pairs for each grade level². Tables C.1 – C.4 provides summary difficulty statistics (p -values) for common items at the form level for each grade. Overall the common items were slightly easier on paper than on computer with the median p -value differences (paper – online) ranging from 0.02 to 0.06 for ELA/Literacy on PBA. Similar results occurred for ELA/Literacy on EOY and Mathematics PBA with median p -value differences ranging between 0.00 to 0.06 and 0.02 to 0.09. For Mathematics EOY, the common items were more comparable across the modes. Moreover, the common items were slightly easier in grades 3 through 5 on computer. A potential explanation is likely familiarity with EOY item types, that is multiple choice single select or multiple choice multiple selection. Overall the median p -value differences ranged between -0.02 and 0.07.

To examine the consistency of the items’ relative difficulties across the online and paper test modes, the p -values were converted to z-scores and plotted. Then z-scores were calculated using the following formula:

$$z_{im} = \frac{p_{im} - \bar{p}_m}{s_{pm}} \quad (1)$$

where, p_{im} is the p -value for item i within test mode m , \bar{p}_m is the mean of the items in test mode m , and s_{pm} is the standard deviation of the p -values of the items in test mode m .

² Since an item might appear as a common item on multiple form pairs within a grade, there are instances where an item might contribute to the statistics reported in Tables 3.1-3.4 multiple times.

Table 3.1 Average p -Values across Administration Mode for ELA/Literacy PBA for Common Items

grade	Mode	N	Mean	Max	Min	SD	Median
3	CBT	43	0.37	0.67	0.14	0.14	0.35
3	PBT	43	0.42	0.74	0.15	0.15	0.40
4	CBT	35	0.31	0.66	0.15	0.13	0.30
4	PBT	35	0.35	0.72	0.15	0.15	0.35
5	CBT	58	0.42	0.67	0.00	0.16	0.41
5	PBT	58	0.47	0.73	0.17	0.15	0.45
6	CBT	64	0.40	0.84	0.13	0.17	0.39
6	PBT	64	0.43	0.85	0.19	0.16	0.43
7	CBT	105	0.33	0.75	0.00	0.17	0.28
7	PBT	105	0.36	0.77	0.00	0.18	0.33
8	CBT	90	0.47	0.85	0.20	0.16	0.43
8	PBT	90	0.48	0.85	0.22	0.15	0.45
9	CBT	58	0.38	0.78	0.13	0.16	0.35
9	PBT	58	0.42	0.80	0.17	0.15	0.41
10	CBT	54	0.37	0.62	0.15	0.13	0.36
10	PBT	54	0.39	0.64	0.13	0.12	0.39
11	CBT	57	0.34	0.63	0.00	0.13	0.34
11	PBT	57	0.39	0.63	0.21	0.10	0.38

 Table 3.2 Average p -Values across Administration Mode for ELA/Literacy EOY for Common Items

grade	Mode	N	Mean	Max	Min	SD	Median
3	CBT	131	0.37	0.81	0.10	0.13	0.35
3	PBT	131	0.40	0.75	0.13	0.14	0.40
4	CBT	106	0.38	0.71	0.11	0.13	0.34
4	PBT	106	0.39	0.74	0.17	0.13	0.35
5	CBT	103	0.40	0.73	0.15	0.13	0.40
5	PBT	103	0.42	0.72	0.16	0.13	0.41
6	CBT	106	0.37	0.72	0.16	0.12	0.35
6	PBT	106	0.39	0.80	0.10	0.13	0.38
7	CBT	96	0.42	0.82	0.18	0.14	0.43
7	PBT	96	0.44	0.81	0.11	0.15	0.43
8	CBT	62	0.37	0.84	0.11	0.15	0.32
8	PBT	62	0.41	0.85	0.11	0.15	0.38
9	CBT	91	0.34	0.61	0.15	0.12	0.33
9	PBT	91	0.38	0.69	0.14	0.14	0.36
10	CBT	102	0.34	0.69	0.15	0.11	0.33
10	PBT	102	0.41	0.71	0.18	0.13	0.39
11	CBT	82	0.31	0.56	0.10	0.09	0.31
11	PBT	82	0.33	0.60	0.10	0.09	0.33

Table 3.3 Average p -Values across Administration Mode for Mathematics PBA for Common Items

grade	Mode	N	Mean	Max	Min	SD	Median
3	CBT	55	0.33	0.93	0.00	0.23	0.26
3	PBT	55	0.36	0.90	0.06	0.20	0.35
4	CBT	51	0.43	0.96	0.03	0.25	0.35
4	PBT	51	0.42	0.94	0.04	0.22	0.37
5	CBT	27	0.31	0.69	0.04	0.15	0.32
5	PBT	27	0.36	0.69	0.04	0.17	0.35
6	CBT	50	0.25	0.71	0.01	0.18	0.19
6	PBT	50	0.29	0.69	0.02	0.18	0.25
7	CBT	61	0.22	0.78	0.01	0.18	0.15
7	PBT	61	0.24	0.73	0.01	0.16	0.20
8	CBT	27	0.23	0.88	0.03	0.22	0.15
8	PBT	27	0.27	0.84	0.02	0.20	0.22
ALG01	CBT	32	0.19	0.58	0.00	0.15	0.19
ALG01	PBT	32	0.20	0.54	0.00	0.15	0.16
GEO	CBT	21	0.15	0.75	0.01	0.17	0.10
GEO	PBT	21	0.21	0.79	0.02	0.19	0.15
ALG02	CBT	14	0.22	0.59	0.03	0.17	0.17
ALG02	PBT	14	0.25	0.62	0.03	0.17	0.23
MAT1I	CBT	15	0.21	0.67	0.01	0.19	0.12
MAT1I	PBT	15	0.23	0.71	0.03	0.19	0.20
MAT2I	CBT	6	0.25	0.45	0.05	0.19	0.26
MAT2I	PBT	6	0.35	0.72	0.05	0.25	0.32
MAT3I	CBT	8	0.17	0.44	0.04	0.16	0.10
MAT3I	PBT	8	0.18	0.47	0.04	0.15	0.16

Table 3.4 Average p -Values across Administration Mode for Mathematics EOY for Common Items

grade	Mode	N	Mean	Max	Min	SD	Median
3	CBT	174	0.49	0.95	0.06	0.21	0.51
3	PBT	174	0.47	0.95	0.05	0.21	0.49
4	CBT	151	0.49	0.86	0.07	0.18	0.46
4	PBT	151	0.46	0.83	0.06	0.18	0.45
5	CBT	109	0.40	0.84	0.01	0.21	0.40
5	PBT	109	0.39	0.83	0.01	0.20	0.39
6	CBT	127	0.32	0.77	0.00	0.16	0.31
6	PBT	127	0.35	0.75	0.04	0.14	0.35
7	CBT	128	0.28	0.70	0.01	0.17	0.27
7	PBT	128	0.28	0.74	0.01	0.17	0.27
8	CBT	95	0.23	0.68	0.01	0.17	0.19
8	PBT	95	0.26	0.77	0.01	0.17	0.22
ALG01	CBT	76	0.21	0.68	0.01	0.20	0.14
ALG01	PBT	76	0.21	0.75	0.00	0.19	0.15
GEO	CBT	95	0.18	0.66	0.01	0.15	0.14
GEO	PBT	95	0.19	0.72	0.01	0.15	0.17
ALG02	CBT	58	0.19	0.67	0.00	0.17	0.16
ALG02	PBT	58	0.19	0.61	0.00	0.16	0.16
MAT1I	CBT	36	0.20	0.63	0.01	0.17	0.16
MAT1I	PBT	36	0.24	0.66	0.01	0.20	0.18
MAT2I	CBT	38	0.17	0.52	0.00	0.13	0.16
MAT2I	PBT	38	0.24	0.79	0.00	0.17	0.23
MAT3I	CBT	23	0.19	0.50	0.01	0.14	0.20
MAT3I	PBT	23	0.19	0.49	0.02	0.15	0.21

In addition, a first principal axis was fit to the scatterplot of z-scores from the two modes for each grade and content area. For a particular grade level, content area, and assessment (PBA or EOY) items across forms are displayed on the same plot. The first principal axis is the line that minimizes the sum of the squared orthogonal distances between the data points and the line (Niklas, 1994, pp. 328-334). A program called SMATR was used to generate the first principal axis in each plot (Falster, Warton, & Wright, 2006). The resulting plots appear in Figures C.1 – C.4 in the appendix with outliers indicated with arrows. Items are classified as outliers if the difference in z-scores associated with each mode is greater than 0.50 in absolute value. The correlations between the CBT and PBT z-scores were calculated and are presented in Tables 3.5-3.8. For ELA/Literacy PBA, with the exception of grades 5 and 11 the correlations between the CBT and PBT z-scores ranged from 0.92 to 0.98. A small percentage of items had differential performance across mode which resulted in flags. For grade 5, there was one outlier item with a z-score difference of 4.35. This item had a p -value of 0.00 on computer and 0.73 on paper. The discrepancy might be due to issues unrelated to the difficulty of the item. Upon removing this item from the analysis, the correlation improved to 0.96. Similarly, for grade 11 there were two outliers where the item had p -values of 0.00 on computer and p -values near 0.50 on paper. Again these discrepancies might be due to issues unrelated to the difficulty of the item. Upon removing these items

from the analysis, the correlation improved to 0.95. For ELA/Literacy EOY, the correlations between the CBT and PBT z-scores ranged from 0.93 to 0.97. Similar to ELA/Literacy PBA, a very small percentage of items were flagged for differential performance across the modes. For Mathematics PBA, the correlations between the CBT and PBT z-scores ranged from 0.88 to 0.97. With the exception of Algebra 2 and Integrated Mathematics 3, a small percentage of items were flagged for differential performance across the modes. Note for Algebra 2 and the Integrated Mathematics tests, very few common items were administered across modes. Therefore, the correlation and flagging rates should be interpreted with caution. For Mathematics EOY, with the exception of Integrated Mathematics 2, the correlation between the CBT and PBT z-scores ranged from 0.89 to 0.98 with a small percentage of items being flagged for differential performance. For Integrated Mathematics 2, there was one outlier item with a z-score difference of 2.60. This item had a p -value of 0.03 on CBT compared to a p -value of 0.50 on PBT. Upon removing this item from the analysis, the correlation improved to 0.86. Overall for Integrated Mathematics 2, more than a third of items were flagged for differential performance across the modes. Tables C.5 to C.8 provides characteristics of items that were flagged for differential z-score performance. For ELA/Literacy PBA, there weren't substantial differences in the item characteristics, in percent, of items flagged relative to the size of the overall item pool. However for ELA/Literacy EOY, flagged items were more likely to be a two-part multiple choice response type. For Mathematics PBA, there were a disproportionate number of Fill-in-the-Blank and other constructed response item types that were flagged. In addition, there were a disproportionate number of extended text and text entry interaction types flagged. For Mathematics EOY, a disproportionate number of items that were flagged were either a Fill-in-the-Blank response type, text entry interaction type, of low cognitive complexity, or was a Type 1 item worth one point.

Table 3.5 Z-Score Correlations and Percentages of Flagged Items Appearing across Modes for ELA/Literacy PBA

Grade	Number of Items	Correlation	Number of Items Flagged	Percentage Flagged	Largest z-Score Difference
3	43	0.96	3	6.98	0.76
4	35	0.96	5	14.29	0.77
5	58	0.79	3	5.17	4.35
6	64	0.98	1	1.56	0.54
7	105	0.98	3	2.86	1.03
8	90	0.97	5	5.56	0.65
9	58	0.92	8	13.79	1.40
10	54	0.94	6	11.11	0.87
11	57	0.66	11	19.30	4.20
Total	564		45	7.98	4.35

Table 3.6 Z-Score Correlations and Percentages of Flagged Items Appearing across Modes for ELA/Literacy EOY

Grade	Number of Items	Correlation	Number of Items Flagged	Percentage Flagged	Largest z-Score Difference
3	131	0.96	9	6.87	0.91
4	106	0.97	3	2.83	0.65
5	103	0.95	9	8.74	1.56
6	106	0.94	9	8.49	1.81
7	96	0.94	6	6.25	1.68
8	62	0.97	3	4.84	0.73
9	91	0.95	10	10.99	0.73
10	102	0.94	15	14.71	1.12
11	82	0.93	15	18.29	0.98
Total	879		79	8.99	1.81

Table 3.7 Z-Score Correlations and Percentage of Flagged Items Appearing Across Modes for Mathematics PBA

Grade/ Subjects	Number of Items	Correlation	Number of Items Flagged	Percentage Flagged	Largest z- Score Difference
3	55	0.90	5	9.09	1.73
4	51	0.92	5	8.62	1.69
5	27	0.88	7	18.92	1.15
6	50	0.96	3	4.17	0.71
7	61	0.94	7	9.46	1.16
8	27	0.97	1	1.11	0.63
ALG01	32	0.90	7	17.07	1.08
GEO	21	0.96	2	5.13	0.67
ALG02	14	0.90	4	28.57	1.00
MAT1I	15	0.97	0	0.00	0.36
MAT2I	6	0.91	1	16.67	0.70
MAT3I	8	0.90	2	25.00	0.85
Total	367		44	11.99	1.73

Table 3.8 Z-Score Correlations and Percentage of Flagged Items Appearing Across Modes for Mathematics EOY

Grade/ Subjects	Number of Items	Correlation	Number of Items Flagged	Percentage Flagged	Largest z- Score Difference
3	174	0.98	4	2.30	0.79
4	151	0.96	13	8.61	0.99
5	109	0.97	6	4.72	0.81
6	127	0.92	22	13.84	1.68
7	128	0.97	7	4.76	1.34
8	95	0.97	3	2.56	0.93
ALG01	76	0.98	0	0.00	0.50
GEO	95	0.97	6	5.61	0.84
ALG02	58	0.98	1	1.30	0.56
MAT1I	36	0.89	7	19.44	1.27
MAT2I	38	0.77	14	36.84	2.61
MAT3I	23	0.96	1	4.35	0.56
Total	1110		84	7.57	2.61

3.3 Differential Item Functioning

Analyses were carried out to assess differential item functioning (DIF) between the two test modes using the Mantel-Haenszel DIF procedure (MH DIF; Dorans & Holland, 1993; Mantel & Haenszel, 1959) for selected response (SR) items and a combination of the Mantel-Haenszel (MH) ordinal and standardization procedures (Dorans & Schmitt, 1993) for CR items. For the standardization procedure, the DIF statistic was based on the standardized mean difference (SMD) in average item scores between members of two groups (i.e., modes) who have been matched on their ability. Additionally, the logistic regression (LR) method of DIF detection (Swaminathan & Rogers, 1990) was implemented to enable the

modeling of uniform and/or nonuniform DIF. Up to three Mantel-Haenszel/Standardization DIF and LR analyses were conducted for each form (component PBA or EOY), content area, and grade. All DIF analyses conducted in the study used the total raw scores for the common items, between modes, as the matching criteria.

The first Mantel-Haenszel/Standardization and LR analyses used students' unadjusted scores as their ability estimates. For any content areas that identify C-level DIF (defined below in section on classification) in this first analysis, additional analyses were conducted. If no items were flagged for C-level DIF in the first analysis no additional analyses were conducted. In the second and third analyses an adjustment was made to students' ability estimates to simulate a "small effect size" (SmES) due to administration mode. More specifically, in the second analysis a constant reflecting a small effect size was added to the raw scores of students who took the paper form. In the third analysis, the constant reflecting the small effect size was subtracted from students' scores. The constants that were used to make the adjustments were derived using Cohen's (1988, p. 25) definition of a small effect size:

$$\text{SmES} = 0.2\sqrt{(s_{\text{online}}^2 + s_{\text{paper}}^2)/2}, \quad (2)$$

where s_{online}^2 and s_{paper}^2 are the variances of students' total common item raw scores on the CBT and paper tests, respectively.

The logic of assessing DIF using adjusted scores in addition to the unadjusted scores is as follows. The Mantel-Haenszel/Standardization and LR DIF analyses entail comparing the item performance of two groups of test takers after these test takers have been stratified by ability. Ability is usually measured by the test takers' total test scores; students with the same score are grouped together and assumed to be equal in ability. However, given that the study is investigating whether the two modes are equivalent, adjustments are needed to correct for potential test level differences when forming ability groups. The adjustments are designed to address the possibility that a given total common item score on the paper test and on the computer based test may not reflect the same level of ability. It may be, for example, that students taking the paper test received slightly lower scores than did their equally able counterparts who took the computer based test. Or students who tested on paper might have received slightly higher scores than their CBT counterparts. The purpose of adjusting students' paper scores by adding and subtracting one SmES was to adjust for these kinds of negative or positive mode effects in the criterion measure prior to conducting the DIF analyses.

Classification. Based on the DIF statistics and significance tests, items were classified into one of three categories and assigned values of A, B, or C. Category A items contain negligible DIF, Category B items exhibit slight to moderate DIF, and Category C items have moderate to large values of DIF. Negative values imply that, conditional on the matching variable, the focal group (PBT) has a lower mean item score than the reference group (CBT). In contrast, a positive value implies that, conditional on total common item score; the reference group (CBT) has lower mean item score than the focal group (PBT). Consistent with current ETS practice, only Category C DIF was considered to be a potential threat to item fairness and to warrant further investigation (Educational Testing Service, 2002). Tables 3.9 and 3.10

provide the flagging criteria for SR and CR items, respectively. Table 3.11 provides the DIF classification rule using the logistic regression model based approach. The classification was based on calculating effect sizes based on the difference of Nagelkerke’s R^2 from two compared logistic regression models. The logistic regression DIF classification rules presented in Table 3.11 were developed for dichotomous items and more research is needed regarding its applicability for polytomous items. However, to provide baseline information regarding potential uniform and nonuniform DIF, these classification rules were also applied to polytomous items.

Table 3.9 DIF Categories for Selected-Response Items

DIF Category	Criteria
A (negligible)	Absolute value of the MH D-DIF is not significantly different from zero, or is less than one.
B (slight to moderate)	1. Absolute value of the MH D-DIF is significantly different from zero but not from one, and is at least one; OR 2. Absolute value of the MH D-DIF is significantly different from one, but is less than 1.5. Positive values are classified as “B+” and negative values as “B-”.
C (moderate to large)	Absolute value of the MH D-DIF is significantly different from one, and is at least 1.5. Positive values are classified as “C+” and negative values as “C-.”

Table 3.10 DIF Categories for Constructed-Response Items

DIF Category	Criteria
A (negligible)	Mantel Chi-square p -value > 0.05 and $ SMD/SD \leq 0.17$
B (slight to moderate)	Mantel Chi-square p -value < 0.05 and $ SMD/SD > 0.17$
C (moderate to large)	Mantel Chi-square p -value < 0.05 and $ SMD/SD > 0.25$

Table 3.11 DIF Categories based on Logistic Regression

DIF Category	Criteria
A (negligible)	χ^2 test is not significant at .05 level or $\Delta R^2 < .035$
B (slight to moderate)	χ^2 test is significant at .05 level and $.035 \leq \Delta R^2 < .070$
C (moderate to large)	χ^2 test is significant at .05 level and $\Delta R^2 \geq .070$

Tables 3.12 and 3.13 summarize the DIF results across grades for ELA/Literacy and Mathematics PBA and EOY assessments. Tables C.9 to C.12 provide grade and test specific DIF results for ELA/Literacy and Mathematics PBA and EOY assessments. Overall, across grade levels, there are very few instances of C-level DIF based on the Mantel-Haenszel and SMD approaches with flagging rates ranging from 0.7% to 16.7%. The larger percentage of mode DIF occurred for Mathematics. Generally, there was larger percentage of items favoring the CBT mode (C-) over PBT. Expanding the ability groupings by adding and subtracting a small effect size to the paper raw scores did result in increased C-level DIF flags. When the small effect size was added, the C-DIF flagging rates ranged from 7.3% to 33.2% with direction favoring CBT. This was likely due to small mode differences in favor of paper that are further exacerbated when those differences are increased. For the select group of test takers that could be matched on their raw scores, the CBT test takers tend to be more able than their counterparts on PBT. When the effect size was subtracted, the C-DIF flagging rates ranged from 11.5% to 25.4% with the direction favoring PBT. If there were potential test level differences in forming ability groupings in favor of PBT, then the flagging rates associated with subtracting a small effect size from PBT test takers, which minimizes the difference in the common item score distributions across modes, should be viewed as an upper bound estimate with the largest potential impact occurring on Mathematics PBA. Tables C.13 to C.16 provides characteristics of items that were flagged for C-level DIF performance. Given the small number of items flagged on the ELA/Literacy assessments, those results should be interpreted with caution. For both Mathematics assessments, the most informative contrasts to take note of is for DIF analyses without adjustment and the DIF analyses with the small effect size that was subtracted from the paper common item score. If the paper administration mode yields a small positive score benefit to those test takers, then taking it away would make the matching criterion for conducting DIF more comparable and appropriate to evaluate characteristics of items that are flagged for C-level DIF. For Mathematics PBA, there was no consistency in the characteristics of items flagged relative to characteristics of the overall pool. Without the adjustment, there was a disproportionate percentage of Fill-in-the-Blank response types, text entry interaction types, and Type 1-1 point item types that were flagged. When the paper raw scores were adjusted, there were a disproportionate percentage of essay and other constructed response types, extended text interaction types, with medium cognitive complexity, and the items were either Type 2 or Type 3 scored on a 0 to 3 point scale. For Mathematics EOY, there were some

commonalities associated with the characteristics of items that were flagged relative to the characteristics of the overall pool. Specifically, for DIF analyses conducted with and without an adjustment, there were a disproportionate percentage of Fill-in-the-Blank response types and text entry interaction types that were flagged. The DIF analyses conducted without an adjustment also had a disproportionate percentage of multiple choice response types and type 1-1 point items that were flagged.

In evaluating the uniform and nonuniform DIF, there tended to be more instances of uniform DIF across the modes for all assessments. The percentage of uniform C DIF items across modes was minimal across content and assessments ranging from 0.4% to 4.1%. There was a slightly larger percentage of items favoring PBT (C+) for ELA/Literacy PBA and Mathematics EOY. Expanding the ability groupings by adding and subtracting a small effect size to the paper raw scores slightly increased the flagging rates for C-Level DIF. When the effect size was added, the C-DIF flagging rates ranged from 2.8% to 10.3% where the direction varied across tests. When the effect size was subtracted, the C-DIF flagging rates ranged from 0% to 9.8% where the direction also varied across tests. There were two items that were flagged for nonuniform DIF across all content and assessments. Overall nonuniform and uniform mode DIF, as modeled by logistic regression, was minimal across all PARCC assessments.

Table 3.12 Summary of Mantel-Haenszel/SMD DIF Results across Assessments

Test	DIF Category	Mantel-Haenszel/SMD					
		Total Number of Common Items	%	+ 1 Small Effect Size	%	- 1 Small Effect Size	%
ELA/L PBA	A	496	87.9	74	57.8	100	78.1
	B	51	9.0	34	26.6	11	8.6
	C-	9	1.6	16	12.5	2	1.6
	C+	8	1.4	4	3.1	15	11.7
	Total	564		128		128	
ELA/L EOY	A	836	95.1	96	78.7	88	72.1
	B	37	4.2	17	13.9	20	16.4
	C-	4	0.5	7	5.7	3	2.5
	C+	2	0.2	2	1.6	11	9.0
	Total	879		122		122	
Math PBA	A	249	68.4	87	48.1	102	56.7
	B	54	14.8	34	18.8	33	18.3
	C-	46	12.6	59	32.6	8	4.4
	C+	15	4.1	1	0.6	37	20.6
	Total	364		181		180	
Math EOY	A	895	83.0	357	59.9	363	60.9
	B	119	11.0	122	20.5	125	21.0
	C-	38	3.5	111	18.6	8	1.3
	C+	26	2.4	6	1.0	100	16.8
	Total	1078		596		596	

Note: "C-" DIF indicates the item favors the reference group and "C+" indicates the item favors focal group.



Mode Comparability Research

Table 3.13 Summary of Logistic Regression DIF Results across Assessments

Test	DIF Category	Logistic regression						Uniform regression						Non-uniform regression					
		Total Number of Common Items	%	+ 1 Small Effect Size	%	- 1 Small Effect Size	%	Total Number of Common Items	%	+ 1 Small Effect Size	%	- 1 Small Effect Size	%	Total Number of Common Items	%	+ 1 Small Effect Size	%	- 1 Small Effect Size	%
ELA/L PBA	A	559	99.1	44	86.3	46	90.2	559	99.1	44	86.3	46	90.2	563	99.8	50	98.0	50	98.0
	B	0	0.0	2	3.9	0	0.0	0	0.0	2	3.9	2	3.9	1	0.2	1	2.0	1	2.0
	C	2	0.4	1	2.0	2	3.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
	C-	0	0.0	1	2.0	0	0.0	2	0.4	2	3.9	0	0.0	0	0.0	0	0.0	0	0.0
	C+	3	0.5	3	5.9	3	5.9	3	0.5	3	5.9	3	5.9	0	0.0	0	0.0	0	0.0
	Total	564		51		51		564		51		51		564		51		51	
ELA/L EOY	A	875	99.5	80	95.2	80	95.2	875	99.5	80	95.2	80	95.2	877	99.8	82	97.6	82	97.6
	B	0	0.0	0	0.0	1	1.2	0	0.0	1	1.2	1	1.2	0	0.0	0	0.0	0	0.0
	C	3	0.3	3	3.6	3	3.6	0	0.0	0	0.0	0	0.0	2	0.2	2	2.4	2	2.4
	C-	1	0.1	1	1.2	0	0.0	3	0.3	3	3.6	2	2.4	0	0.0	0	0.0	0	0.0
	C+	0	0.0	0	0.0	0	0.0	1	0.1	0	0.0	1	1.2	0	0.0	0	0.0	0	0.0
	Total	879		84		84		879		84		84		879		84		84	
Math PBA	A	329	90.4	25	86.2	24	82.8	339	93.1	25	86.2	25	86.2	360	98.9	28	96.6	28	96.6
	B	20	5.5	1	3.4	5	17.2	12	3.3	2	6.9	4	13.8	4	1.1	1	3.4	1	3.4
	C	6	1.6	1	3.4	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
	C-	8	2.2	2	6.9	0	0.0	11	3.0	2	6.9	0	0.0	0	0.0	0	0.0	0	0.0
	C+	1	0.3	0	0.0	0	0.0	2	0.5	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
	Total	364		29		29		364		29		29		364		29		29	
Math EOY	A	1055	97.9	62	86.1	66	91.7	1060	98.3	62	86.1	66	91.7	1077	99.9	72	100.0	72	100.0
	B	19	1.8	8	11.1	2	2.8	14	1.3	8	11.1	2	2.8	1	0.1	0	0.0	0	0.0
	C	2	0.2	0	0.0	2	2.8	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
	C-	0	0.0	1	1.4	0	0.0	0	0.0	1	1.4	0	0.0	0	0.0	0	0.0	0	0.0
	C+	2	0.2	1	1.4	2	2.8	4	0.4	1	1.4	4	5.6	0	0.0	0	0.0	0	0.0
	Total	1078		72		72		1078		72		72		1078		72		72	

Note: For the three C-level DIF categories listed, "C-" indicates the item favors the reference group, "C+" indicates the item favors focal group, and "C" indicates the item favors one or each group in a certain range of the matching variable.

3.4 Confirmatory Factor Analyses

Factor analyses were conducted on the field test data to support two important scaling decisions:

1. Whether scale scores can be reported at the subscore level (e.g., reading and writing claims; categories within claims), the test level, or both;
2. Whether factor structure is consistent across grades at the subscore level and/or the test level for a content area.

For this study, single group confirmatory factor analyses (CFAs) were carried out to examine the unidimensionality of test structure across test administration modes. Multiple group CFAs were used to assess measurement invariance between the modes. As with the field test scoring and scaling studies, one approach was to examine factor structure at the subscore level. However, given the component-level data, this may be problematic for ELA because reading draws from both PBA and EOY. For consistency across subjects, the subscore level analyses were conducted with item scores as opposed to subscores and were limited to one CBT-PBT form pair for selected grade levels.

The CFA used to test the unidimensionality of the construct as well as the factorial invariance of the paper and computer based modes were conducted in MPLUS (Muthén & Muthén, 2007) using the weighted least squares with means and variances adjusted (WLSMV) estimator. Since most item scores used in the analyses have very few score categories, and cannot be assumed to behave as a continuous variable, WLSMV estimation rather than maximum likelihood estimation (MLE) was chosen for the CFAs based on two considerations. First, for variables with only 2 or 3 categories, WLSMV estimation has been shown to estimate factor loadings more precisely than MLE (Beauducel & Herzberg, 2006). Second, when MLE estimation is used, a logistic regression model is fit for categorical items and the item residual variances are not model parameters and thus cannot be tested for measurement invariance. However, when WLSMV estimation is applied, a probit regression model is used which contains item residual variances as part of the model. Though in the most unconstrained baseline model, the item residual variances have to be fixed at 1 for each mode to allow all factor loadings and threshold parameters to be freely estimated. A discussion regarding how measurement invariance for item residuals can be tested within the WLSMV estimation framework is presented in Section 3.4.2. All analyses described below required some data exclusions in order for models to successfully run. Items were removed if 100% of responses received a score of 0, 40% of test takers omitted a particular item, had perfect correlation with other items, did not contribute to any factor, or prevented the model from converging due to few than two items loading on a factor. Table 3.14 provides a summary of items that were excluded from the factor analyses.



Mode Comparability Research

Table 3.14: Summary of Items Excluded from Factor Analyses

	Grade	SGOF-C		SGOF-A		SGMF-C		SGMF-A		MGOF-C		MGOF-A		MGMF-C		MGMF-A	
		Total Number of Items	N Items Removed	Total Number of Items	N Items Removed	Total Number of Items	N Items Removed	Total Number of Items	N Items Removed	Total Number of Items	N Items Removed	Total Number of Items	N Items Removed	Total Number of Items	N Items Removed	Total Number of Items	N Items Removed
ELA/L	3	146		268		32		79		79		113		32		79	
	4	109		241						72							
	5	116	1	250	1	39		55		75				39		55	
	6	132		263						82							
	7	127		263		44	2	82	16	84		115		44		82	
	8	112		259						90							
	9	131		277						84							
	10	136		265						70							
	11	119		260		53		138		67		126		53		138	
	Grade /Subject	SGOF-C		SGOF-A		SGMF-C		SGMF-A		MGOF-C		MGOF-A		MGMF-C		MGMF-A	
		Total Number of Items	N Items Removed	Total Number of Items	N Items Removed	Total Number of Items	N Items Removed	Total Number of Items	N Items Removed	Total Number of Items	N Items Removed	Total Number of Items	N Items Removed	Total Number of Items	N Items Removed	Total Number of Items	N Items Removed
Mathematics	3	156		391		57		160		70		161		57	1	160	7
	4	148		363						66							
	5	100		308						78							
	6	126		335						71							
	7	131		327		62		155		64		149		62		155	
	8	95		325						49							
	ALG01	68	2	303		10		22		49				10	2	22	2
	ALG02	44		234		23		103		33	1	103		23	2	103	9
	GEO	81		316	1	35		127		39		131		35	1	127	1
	MAT1I	49		193						24							
	MAT2I	27	1	130	2					17							
MAT3I	30	3	130						18								

Note: SGOF-C = Single Group One Factor CFA with common items; SGOF-A = Single Group One Factor CFA with common and unique items; SGMF-C = Single Group Multi Factor CFA with common items; SGMF-A = Single Group Multi Factor CFA with common and unique items; MGOF-C = MultiGroup One Factor CFA with common items; MGOF-A = MultiGroup One Factor CFA with common and unique items; MGMF-C = MultiGroup Multi Factor CFA with common items; MGMF-A = MultiGroup Multi Factor CFA with common and unique items.

3.4.1.1 Preliminary Single Group CFA analyses

Two separate single-group CFA models were fit to the data for each form and each grade, one for the paper and one for the computer based tests. For the single group CFA models, items are specified to load on one factor for test-level analyses and load on one of many factors for claim- and subclaim-level analyses. The single group CFA models were conducted in two ways: 1) including common items only, excluding items that are unique across modes, and 2) including both common and items that are unique across modes. Excluding items that are unique allows for a focused examination of differences due to the way the items are presented (CBT vs. PBT). Including the unique items allows for the investigation of whether the structure of the forms under each mode differs. Model fit was examined using the Tucker-Lewis Index (TLI), the Comparative Fit Index (CFI), the Root Mean Square Error of Approximation (RMSEA), and the model chi-square statistic (χ^2). The TLI compares the χ^2 for the hypothesized model to that of the null or “independence” model, in which all correlations or covariances are zero. Both the CFI and RMSEA indices are based on noncentrality parameters. The CFI measures the improvement of fit between the null model and the hypothesized model, while the RMSEA assesses the error in the hypothesized model predictions. Generally, TLI values greater 0.94, CFI values greater than 0.90, and RMSEA values less than or equal to 0.06 indicate good fit (Hu & Bentler, 1999). The test level score CFAs were performed on all form pairs across all grade levels. Claim level score analyses were conducted only for ELA/Literacy given the two primary claims of interest (Reading and Writing). For the claim- and subclaim-level score CFAs, the original intent was to utilize the full summative form pairs within each of the grade-level bands given that comprehensive claim and subclaim information for ELA/Literacy and comprehensive subclaim information for Mathematics could only be provided for a test taker that completes both PBA and EOY assessments. However for the analysis based on the common items, due to too few items shared between forms and in some cases item attrition, there were no full summative forms for ELA and only one for Mathematics, with at least 2 items per subclaim, the absolute minimum required to identify a multifactor CFA model. Therefore, for ELA/Literacy, for common items, a partial picture of the claim structure was evaluated by performing CFAs on one PBA form pair within each grade level band (Grades 3, 7, 11). No claim-level score CFAs were performed for ELA/Literacy EOY since this test consists of all Reading items and the results would be exactly the same as the test level score analyses. The subclaim-level score CFAs were performed on one PBA and one EOY form pair within each of the grade level bands (ELA: Grades 3, 7, and 11; Mathematics: Grades 3 and 7, Algebra 2, and Geometry). CFAs were still performed at the total, claim (where applicable), and subclaim level scores on the full summative forms. However, some claims or subclaims were not modeled because there were fewer than two items associated with them. For example for ELA/Literacy FS, since there are no common writing items for the selected grade 3 form pair 064PP064EP/184PO114EO, the writing written expression and writing knowledge language and conventions subclaims would not be accounted for in the CFAs.

Tables 3.15 and 3.16 summarize the number of common items associated with each subclaim for the form pairs analyzed. Subclaims with less than 2 item counts are in boldface. A similar issue existed for the analysis based on common and unique items. Tables 3.17 and 3.18 summarize the item counts for

each content area by assessment and subclaim. The larger number of items (greater or equal to 2) within subclaims allowed for a complete picture of the total, claim (where applicable), and subclaim level scores on the full summative forms for ELA/Literacy and for two of four subjects for Mathematics. Additional CFAs were performed on PBA and EOY tests to provide a partial picture of the claim structure on ELA/Literacy PBA and subclaim structures for Mathematics PBA and EOY assessments.

Table 3.15 Summary of Item Counts by Subclaims for ELA/Literacy for PBA and EOY - Common Items

		PBA						EOY									
				Item Counts by Subclaims								Item Counts by Subclaims					
		Grade	Form Pairs	RI	RL	RV	WE	WKL	Form Pairs	RI	RL	RV	WE	WKL			
ELA/L	03	064PP/014PO	2	4	3	2	2	064EP/114EO	7	11	5	0	0				
	07	034PP/034PO	5	7	6	3	3	064EP/114EO	8	5	9	0	0				
	11	034PP/034PO	3	4	6	3	3	034EP/134EO	8	7	7	0	0				
			Full Summative Form														
					Item Counts by Subclaims												
			Grade	Form Pairs	RI	RL	RV	WE	WKL								
			3	064PP064EP/184PO114EO	7	11	5	0	0								
			7	074PP064EP/184PO114EO	8	8	10	1	1								
			11	074PP064EP/184PO114EO	6	3	10	0	0								

Note. RI = Reading Information; RL = Reading Literature; Reading Vocabulary; WE = Writing Written Expression; WKL = Writing Knowledge Language and Conventions.

Table 3.16 Summary of Item Counts by Subclaims for Mathematics for PBA and EOY - Common Items

		PBA						EOY						
				Item Counts by Subclaims						Item Counts by Subclaims				
		Grade	Form Pair	A	B	C	D	Form Pair	A	B	C	D		
Math	03	024PP124PO	5	0	5	3	024EP114EO	19	8	0	0			
	07	014PP114PO	12	0	3	4	064EP154EO	13	6	0	0			
	ALG02	054PP164PO	2	3	1	2	034EP124EO	7	4	0	0			
	GEO	024PP124PO	2	1	3	2	024EP114EO	12	5	0	0			
			Full Summative Form											
					Form Pairs									
			3	064PP074EP/134PO124EO	19	8	2	1						
			7	064PP074EP/134PO124EO	18	2	2	2						
			ALG02	064PP074EP/134PO124EO	8	4	1	1						
			GEO	064PP074EP/134PO124EO	9	5	1	2						

A- Major Content subclaim; B –Additional and Supporting Content subclaim; C –Expressing Mathematical Reasoning subclaim; D – Modeling/Application subclaim.

Table 3.17 Summary of Item Counts by Subclaims for ELA/Literacy for PBA and EOY - Common + Unique Items

		PBA						EOY							
		Item Counts by Subclaims						Item Counts by Subclaims							
	Grade	Form Pairs	RI	RL	RV	WE	WKL	Form Pairs	RI	RL	RV	WE	WKL		
ELA/L	03	064PP/014PO	4	8	4	3	3	064EP/114EO	9	17	5	0	0		
	07	034PP/034PO	6	9	6	3	3	064EP/114EO	11	6	12	0	0		
	11	034PP/034PO	4	7	7	3	3	034EP/134EO	12	6	12	0	0		
	Full Summative Form														
			Item Counts by Subclaims												
		Grade	Form Pairs	RI	RL	RV	WE	WKL							
		3	064PP064EP/184PO114EO	13	25	9	3	3							
		7	074PP064EP/184PO114EO	17	14	17	3	3							
		11	074PP064EP/184PO114EO	21	10	19	3	3							

Note. RI = Reading Information; RL = Reading Literature; RV = Reading Vocabulary; WE = Writing Written Expression; WKL = Writing Knowledge Language and Conventions.

Table 3.18 Summary of Item Counts by Subclaims for Math for PBA and EOY - Common + Unique Items

		PBA					EOY					
		Item Counts by Subclaims					Item Counts by Subclaims					
	Grade	Form Pair	A	B	C	D	Form Pair	A	B	C	D	
Math	03	024PP124PO	12	0	5	3	024EP114EO	27	14	0	0	
	07	014PP114PO	13	0	3	4	064EP154EO	27	10	0	0	
	ALG02	054PP164PO	8	5	1	3	034EP124EO	18	10	0	0	
	GEO	024PP124PO	12	2	1	1	024EP114EO	19	18	0	0	
	Full Summative Form											
			Form Pairs	A	B	C	D					
		3	064PP074EP/134PO124EO	42	14	4	3					
		7	064PP074EP/134PO124EO	40	9	2	2					
		ALG02	064PP074EP/134PO124EO	25	15	1	3					
		GEO	064PP074EP/134PO124EO	32	19	1	3					

A- Major Content subclaim; B –Additional and Supporting Content subclaim; C –Expressing Mathematical Reasoning subclaim; D – Modeling/Application subclaim.

Test Level Score Results

Tables C.17 to C.21 present the single group test level score results from the factor structure investigation for the common items appearing on both modes. Cells for form pairs in which good model fit was not achieved for at least one fit statistics (CFI, TLI, or RMSEA) within a mode are highlighted. For example, Table C.17 indicates that the PBA third grade ELA/Literacy form pair 034PP/054PO differed in their fit to a single factor unidimensional model as measured by RMSEA and TLI. For ELA/Literacy for PBA, out of the 53 form pairs there were four instances where the factor structure appeared to differ across mode. There was one instance where lack of fit occurred on both modes. For ELA/Literacy EOY and FS there were no differences in terms of fit to a single factor unidimensional model. For Mathematics PBA, there were seven form pairs with not enough items associated with each factor to identify the single group CFA model. Out of the remaining 47 form pairs, there were four instances of inconsistent fit across modes (online single group CFA model did not fit) and four instances of lack of fit occurring on both modes. For Mathematics EOY, the single group CFA tended to perform less well in terms of fit. Specifically, out of the 65 form pairs, there were 7 instances of lack of fit occurring for the online mode, 8 on paper, and 4 on both online and paper. For the FS assessment, there were two instance of lack of fit, once online and once on both delivery modes. Most of the lack of model fit for the confirmatory factor analyses tended to occur in the high school Mathematics subjects for all assessments. The consistent factor structure across grade levels does not hold up well across high school Mathematics subjects, particularly for EOY.

Tables C.22 to C.26 present the test level score results from the factor structure investigation where both common and unique items appear across modes. Overall for ELA/Literacy, for both PBA and EOY assessments, there was only one instance where the factor structure appeared to differ across mode. There were no differences in the factor structure across mode for all grade levels on the full summative assessments. For Mathematics PBA, there were more differences in terms of fit to a single factor unidimensional model. The differences were almost exclusively associated with the high school tests. Out of the 54 Mathematics PBA form pairs, the lack of good fit occurred 7 times on the online mode, 3 times on paper, and 3 times on both online and paper. Similar to the Mathematics PBA, there were more differences in fit to a single unidimensional model on the high school tests for Mathematics EOY. Out of the 65 math EOY form pairs, the lack of good fit occurred 7 times on the online mode, 7 times on paper, and 9 times on both. For Mathematics FS, out of the nine form pairs, the lack of fit occurred once online and once on both delivery modes.

In terms of comparing the single group factor structure across the two conditions (e.g. common items only vs. common + unique items); the results depended on the content area assessed. Specifically for ELA, in general there were very few form pairs that were flagged due to lack of fit. For the 6 form pairs (4 online and 2 on both paper and online mode) that were flagged due to lack of fit on the common items, once unique items were added to the CFA model they all achieved good fit. There was only one instance where adding unique items resulted in model fit becoming unsatisfactory. However for Mathematics, adding unique items to the CFA models yielded mixed results. Particularly for PBA, out of 13 form pairs that were flagged due to lack of fit on the common items, once unique items were added to the CFA model, only 6 achieved good fit and 7 still had unsatisfactory fit. Moreover, there were 7

instances where adding unique items resulted in the model fit changing from good to unsatisfactory. Similarly for EOY, out of the 23 form pairs that were flagged due to lack of fit on the common items, once unique items were added to the CFA model, only 7 achieved good fit and 16 still exhibited lack of fit. In addition, there were 15 instances where adding unique items resulted in model fit changing from good to unsatisfactory. For Mathematics FS, adding unique items still resulted in lack of fit, as indicated by TLI, for Algebra 1 and the online Geometry test. Lastly, there was no evidence to indicate adding unique items to common items resulted in better CFA model fit for either delivery mode. Overall across grade levels there appeared to be consistency in the overall test level score factor structure for ELA/Literacy for PBA and EOY. For Mathematics there was consistency in the overall test level score factor structure only in grades 3 to 8 for PBA, EOY, and FS.

Claim Level Score Results

In conducting the preliminary single group CFA models for ELA/Literacy PBA and FS, a two-factor structure which represented each claim (e.g. Reading and Writing) within mode was specified. Upon running these models for some grade levels in MPLUS, a warning message was issued indicating that the estimated correlation (from the model) between two factors was 1 or more. There were two instances of this occurring, one where the CFA was based on common items shared between a form and another where the CFA was based on common and unique items between form pairs. The claim level results for the single factor model for ELA/Literacy by administration mode for the common item and common plus unique item cases are presented in Tables C.27 and C.28. Form pairs in which the estimated correlations between the factors were 1 or more are indicated with a superscript and should be interpreted with caution. In general the preliminary CFA models for the claim level scores did not exhibit good fit across mode and grade-levels regardless of the structure of the test forms based on at least one model-fit index for PBA. For the FS assessment there was good fit across grade levels and modes with the exception of grade 3 PBT for the common plus unique item condition.

Subclaim Level Score Results

As was the case with the claim level score analyses, the analysis of subclaim level scores required the specification of a multifactor structure CFA model within mode where each factor represented a subclaim. Estimating these models in MPLUS resulted in warning messages being issued indicating factors were highly correlated with values of 1 or more. The subclaim level results for ELA/Literacy for PBA and EOY based on common items is presented in Table C.29. Form pairs where the correlations between the factors were 1 or more are indicated with a superscript, and should be interpreted with caution. Similar to the claim level results for PBA, the CFA models did not fit well across mode and grade-level based on at least one model-fit index. However for EOY, all CFA models exhibited good fit across modes and grade levels which indicate the factor structure appears to behave similarly across mode. For the FS assessment, the CFA models exhibited good fit across all modes except grade seven. The results for Mathematics PBA, FS, and EOY assessments are presented in Table C.30. In general, the single group multifactor models provided good fit across all grades/subjects and modes with the exception of Algebra 2 for both PBA and EOY and Geometry on the FS. Specifically, for PBA and FS the

preliminary CFA models did not provide adequate fit for CBT according to TLI. For EOY, the preliminary CFA model did not yield adequate fit for PBT according to TLI and CFI.

Table C.31 summarizes the subclaim level results for the single group model for ELA/Literacy PBA and EOY based on common and unique items for each mode. The results for the common plus unique items case are similar to the common item case for PBA and EOY. According to the RMSEA criteria, all CFA models fit the data poorly on PBA regardless of mode. For EOY, again all CFA Models tended to fit the data well across grade levels regardless of mode. For FS assessments, the CFA model fit well except for grade 3 PBT according to TLI. In general, the inclusion of unique items across modes did not significantly alter the model fit for the multifactor single group CFA model for PBA and EOY. For the FS assessments the inclusion of unique items improved fit in grade 7 and worsened for grade 3 PBT.

Table C.32 summarizes the subclaim level results for the single group multifactor model for Mathematics PBA, FS, and EOY based on common and unique items for each mode. For PBA and FS tests, the models all appeared to fit well regardless of mode with the exception of Algebra 2 for CBT and Geometry FS for CBT. For EOY tests, the models fit well consistently across mode for grades 3 and 7. For Algebra 2 and Geometry the CFA models did not fit well for PBT and CBT according to TLI. With the exception of Geometry, the unique items across modes did not significantly alter the model fit for the multifactor single group CFA models.

3.4.2 Multiple Group CFA Analyses

Additional test level score CFA analyses were performed on one form pair within each grade-level band (ELA/Literacy: Grades 3, 7, 11; Mathematics: Grades 3 and 7, Algebra 2, and Geometry). For reasons discussed in section 3.4.1, claim level score analyses were conducted only for ELA/Literacy given the two primary claims of interest (Reading and Writing) for PBA; subclaim level score CFAs were performed on one PBA, one EOY, and one FS form pair within each grade band. The goal was to determine whether the factorial structure of each test was *equivalent* across the modes using multiple group CFA models. As was the case with the single group CFA model, multiple group CFA analyses were conducted in two ways: 1) including common items only, excluding items that are unique across modes, and 2) including common items and items that are unique across modes.

For the multigroup CFAs performed on the common items shared between modes, the following steps were followed, from least to most restrictive models, to determine the degree of invariance in factor loadings and intercept/threshold parameters:

The multiple group models from least restrictive to most restrictive test the following:

- Model 1: A baseline multiple group model with no equality constraints,
- Model 2: A model with factor loadings and intercepts/thresholds constrained to be equal across groups (*tau-equivalence*),
- Model 3: A model where some, *but not all*, of the factor loadings and intercepts/thresholds are constrained to be equal (only if Model 2 does not hold)

This stepwise process of modeling yields a nested hierarchy of models that allows the use of chi-square difference ($\Delta\chi^2$) tests to evaluate whether the equality constraints are upheld. If the models compared are *not* significantly different, the model is considered equivalent across groups. In this approach, all higher models (2 and 3) are compared to model 1, the baseline model.

The usual analysis progression associated with evaluating measurement invariance across groups if the tau-equivalence model (Model 2) is not significantly different from the baseline model (Model 1) is to evaluate whether strict measurement invariance holds. To test strict measurement invariance, factor loadings, intercepts/thresholds, measurement errors must be constrained to be equal across groups. However, given the categorical nature of the item scores used for analysis, item residuals were fixed at 1 to identify the least constrained baseline model where all factor loadings and intercept/threshold parameters are freely estimated across groups. As a result of fixed residuals in the baseline model, strict measurement invariance cannot be formally tested. In instances where Model 2 was not rejected, there was a secondary evaluation to determine whether strict measurement invariance was achievable. Specifically, the tau-equivalence model was treated as the constrained model where item residuals were held equal at 1 across modes and it was compared to a slightly unconstrained tau-equivalence model with item residuals fixed at 1 in one mode and freely estimated in the other mode. If there is no significant difference between these two models, that is, fixing item residuals at 1 across both modes yields similar model fit as fixing item residuals at 1 in one mode and free in the other, then there is evidence in support of strict measurement invariance. If Model 2 is rejected then some factor loadings and intercepts/thresholds are set free across groups until there is no significant difference between the baseline model and the partial tau-equivalence model (model 3). The factor loadings and intercepts/thresholds that are allowed to be free across groups are chosen based on the model modification indices provided by Mplus, which reflect the expected chi-square change if the constraints are relaxed.

Special considerations were required for the multigroup factor analysis models performed on items that are common and unique across modes. According to Little and Slegers (2005), the most basic form of factorial invariance among multiple groups is configurable invariance. Configurable invariance implies different groups have the same factor structure, that is, the same factors, indicators/items, and fixed and freely-estimated parameters. However, under the multigroup CFA under the common plus unique items condition, the PBT group and CBT group have both common and unique items loaded on the same factor(s), and thus do not achieve the basic factor structure invariance between two groups. In Mplus, this analysis cannot be conducted within the multiple-group CFA framework due to the unique items in each group. Therefore, as an alternative, the two groups were treated as two known classes and mixture models were fit to the data to evaluate the equivalence of the factor loadings and thresholds across groups. To support these analyses, the Multidimensional Discrete Latent Trait Models (MDLTM) software developed by von Davier (2007) was used. In MDLTM, all items are treated as categorical variables and thus threshold parameters for all items are estimated. This is a difference from Mplus where items with more than 10 categories are treated as continuous variables.

For both one-factor and multiple-factor analyses, a baseline unconstrained mixture model was fit first with the factor loadings and thresholds freely estimated between the PBT group and CBT group. Then a tau-equivalence mixture model was fit with factor loadings and thresholds held equal across the two groups for common items. Since the constrained tau-equivalence model is nested within the baseline, the Likelihood Ratio test was utilized to test whether the baseline model with more parameters is significantly better than the constrained model. That is, whether the tau-equivalence model is significantly different from the baseline model was tested. According to Wilks (1938), the distribution of the likelihood ratio test may be approximated by a chi-square distribution if the sample size is sufficiently large. The test statistic for the approximate chi-square test is

$$\Lambda = -2 \log \left(\frac{\text{Likelihood of constrained tau equivalence model}}{\text{Likelihood of unconstrained baseline model}} \right) = -2 \log \left(\frac{\text{Model 2}}{\text{Model 1}} \right) \sim \text{approximately } \chi^2_{DF} \quad (3)$$

where the degrees of freedom (DF) is $DF_{\text{Model 1}}$ minus $DF_{\text{Model 2}}$.

Since the main limitation of chi-square tests is its sensitivity to sample size, model fit indices including -2 log likelihood, AIC, and BIC were used to evaluate whether tau-equivalence models fit similarly or better than baseline models. That is, whether holding factor loadings and thresholds equal across groups does harm to model fit compared to the baseline model.

Test Level Score Results

Table 3.19 present the results from the multigroup CFA models for ELA/Literacy PBA, EOY, and FS assessments for the common items. For all grade levels evaluated, with the exception of Grade 11 for the FS assessment, partial tau-equivalence for the factor loadings and threshold/intercept parameters was achieved. The grade 11 test did not have any writing common items shared between the modes. The percentage of freely estimated factor loadings and threshold parameters is also provided. Smaller percentages indicate that factors and/or intercepts/thresholds are largely invariant across modes whereas large percentages are indicative that factors and/or intercepts/thresholds vary across modes. With the exception of the EOY assessments for grades 3 and 11, the factors tended to be invariant across modes. The vast majority of intercepts/thresholds also tended to be invariant across modes. For the Grade 11, tau equivalence was achieved which led to a follow up analysis to determine whether there was any evidence of strict measurement invariance. The p -value corresponding to the chi-square difference test was 0.137 which supported stronger invariance structure for the factors, thresholds/intercepts, and residual errors (see Table 3.20).

Table 3.21 presents the results from the multigroup CFA models for Mathematics PBA, EOY, and FS assessments for the common items. Partial tau-equivalence was achieved for all grades/subjects and assessments. Invariance properties of factor loadings and intercepts/thresholds tended to hold up better for the EOY assessments in comparison to PBA across grades. The full summative assessment forms tended to have a lower percentage of factor loadings and thresholds/intercepts that were invariant across mode in relation to EOY.

Table 3.22 presents the test level scores significance tests and fit results for the items that are common and unique across modes for ELA/Literacy. According to the Likelihood Ratio test, for all grades and assessments except for grade 11 FS, the tau-equivalence models were significantly different than the baseline models. In other words, there is evidence of lack of invariance for factor loadings and intercepts/thresholds across modes. From a model fit perspective, as indicated by the change in log-likelihood values, freely estimating factor loadings and intercepts/thresholds does not result in substantial improvement in terms of model fit. The other model fit indices provided mixed results in support of either Model 1 (based on BIC) or Model 2 (based on AIC) with the exception of the grade 11 PBA and FS assessments which both support tau-equivalence. This finding is fairly consistent with the common item case where tau-equivalence was not achieved (except for the grade 11 FS assessment) but a substantial number of factor loadings, intercepts, and thresholds were invariant across mode and grades. In other words, the factor structure is somewhere in the middle between Model 1 and Model 2.

Table 3.23 presents the test level scores fit results for items that are common and unique across modes for Mathematics. Based on the Likelihood Ratio test, for all grades/subjects except for grade 7 and Geometry EOY, there was a lack of invariance for factor loadings and intercepts/thresholds across modes. From a model fit perspective, as indicated by the change in log-likelihood values, freely estimating factor loadings and intercepts/ thresholds does not result in substantial improvement in terms of model fit. The other model fit indices did not support factorial invariance for grade 3 and 7 PBA Mathematics, but supported factorial invariance for Mathematics EOY for grades 7, Algebra 2, and Geometry. For the remaining grade levels and Mathematics assessments, the model fit indices provided mixed results in support of either Model 1 (based on BIC) or Model 2 (based on AIC). For Mathematics, according to the fit indices, there were some inconsistencies between the common items and common plus unique item cases regarding the equivalency of the factor structures across modes. Particularly, for some grades, adding unique items provided evidence that favored the baseline model (factor loadings and intercepts/thresholds freely estimated across mode), even though partial invariance was previously achieved, whereas in other grades more evidence in support of tau-equivalence model was provided.



Mode Comparability Research

Table 3.19 Test Level Scores Fit Results for Multigroup CFA Models for ELA/Literacy - Common Items

Content Area	Grade	Form Type	Form Pair	Model	RMSEA	TLI	CFI	$\Delta \chi^2$	$\Delta \chi^2$ -DF	χ^2 p-value	Factor Loadings			Thresholds/Intercepts		
											N	Number Freely Estimated	Percent Freely Estimated	N	Number Freely Estimated	Percent Freely Estimated
ELA/L	3	PBA	064PP/014PO	1	0.057	0.937	0.950	--	--	--						
				2	0.044	0.962	0.955	118.34	36	0.000						
				3	0.036	0.974	0.971	42.32	31	0.085	10	0	0.0%	26	5	19.2%
ELA/L	7	PBA	014PP/014PO	1	0.046	0.923	0.937									
				2	0.037	0.950	0.946	134.90	51	0.000						
				3	0.032	0.962	0.960	62.75	46	0.051	18	1	5.6%	33	4	12.1%
ELA/L	11	PBA	034PO/034PP	1	0.057	0.913	0.926									
				2	0.036	0.965	0.960	60.31	40	0.020						
				3	0.035	0.967	0.962	52.20	39	0.077	12	1	8.3%	28	0	0.0%
ELA/L	3	EOY	134EO/034EP	1	0.023	0.979	0.981									
				2	0.028	0.969	0.968	231.47	66	0.000						
				3	0.020	0.984	0.984	56.02	42	0.072	22	12	54.5%	44	12	27.3%
ELA/L	7	EOY	044EP/144EO	1	0.019	0.985	0.987									
				2	0.023	0.978	0.977	132.97	54	0.000						
				3	0.017	0.989	0.988	55.74	43	0.092	18	2	11.1%	36	9	25.0%
ELA/L	11	EOY	124EO/024EP	1	0.026	0.970	0.973									
				2	0.032	0.955	0.952	186.22	65	0.000						
				3	0.024	0.975	0.975	57.35	42	0.058	22	13	59.1%	43	10	23.3%
ELA/L	3	FS	064PP064EP/184PO114EO	1	0.019	0.987	0.988									
				2	0.020	0.986	0.986	136.15	66	0.000						
				3	0.016	0.991	0.991	77.73	59	0.052	22	3	13.6%	44	4	9.1%
ELA/L	7	FS	074PP064EP/184PO114EO	1	0.027	0.977	0.978									
				2	0.024	0.982	0.981	161.20	77	0.000						
				3	0.021	0.986	0.985	88.83	70	0.064	26	4	15.4%	51	3	5.9%
ELA/L	11	FS	074PP064EP/184PO114EO	1	0.027	0.978	0.981									
				2	0.021	0.987	0.986	70.26	56	0.100	19	0	0.0%	37	0	0.0%
				3												

Updated April 12, 2015

Mode Comparability Research

Table 3.20 Comparison between Strict and Tau-Equivalence for ELA/Literacy FS Test Level Scores for Multigroup CFA Models - Common Items

Content Area	Grade	Form Type	Form Pair	Model	RMSEA	TLI	CFI	$\Delta \chi^2$	$\Delta \chi^2$ --DF	χ^2 <i>p-value</i>
ELA/L	11	FS	074PP064EP/ 184PO114EO	Tau-equivalence-unconstrained	0.023	0.984	0.984	N/A	N/A	N/A
				Tau-equivalence-constrained	0.021	0.987	0.986	25.75	19	0.137



Mode Comparability Research

Table 3.21 Test Level Scores Fit Results for Multigroup CFA Models for Mathematics - Common Items

Content Area	Grade	Form Type	Form Pair	Model	RMSEA	TLI	CFI	$\Delta \chi^2$	$\Delta \chi^2$ --DF	χ^2 p-value	Factor Loadings			Thresholds/Intercepts			
											N	Number Freely Estimated	Percent Freely Estimated	N	Number Freely Estimated	Percent Freely Estimated	
Math	3	PBA	014PP/014PO	1	0.027	0.984	0.986										
				2	0.043	0.960	0.958	490.90	51	0.000							
				3	0.024	0.988	0.989	27.08	19	0.103	17	10	58.8%	34	22	64.7%	
Math	7	PBA	014PP/014PO	1	0.031	0.981	0.983										
				2	0.038	0.972	0.970	405.80	61	0.000							
				3	0.027	0.986	0.987	35.98	24	0.055	19	11	57.9%	42	26	61.9%	
Math	ALG02	PBA	054PP/164PO	1	0.041	0.928	0.948										
				2	0.093	0.619	0.572	436.07	23	0.000							
				3	0.035	0.945	0.952	14.45	9	0.107	8	4	50.0%	15	10	66.7%	
Math	GEO	PBA	024PP/124PO	1	0.010	0.996	0.997										
				2	0.083	0.724	0.670	399.69	27	0.000							
				3	0.016	0.990	0.992	9.29	4	0.054	8	6	75.0%	19	17	89.5%	
Math	3	EOY	024EP/114EO	1	0.036	0.971	0.973										
				2	0.028	0.982	0.982	110.63	55	0.000							
				3	0.028	0.982	0.982	61.58	46	0.062	27	6	22.2%	28	3	10.7%	
Math	7	EOY	054EP/144EO	1	0.028	0.954	0.960										
				2	0.025	0.963	0.962	62.16	36	0.000							
				3	0.023	0.968	0.968	41.96	34	0.164	17	1	5.9%	19	1	5.3%	
Math	ALG02	EOY	034EP/124EO	1	0.021	0.931	0.943										
				2	0.032	0.849	0.845	87.12	27	0.000							
				3	0.021	0.934	0.936	28.48	20	0.099	12	3	25.0%	15	4	26.7%	
Math	GEO	EOY	044EP/134EO	1	0.013	0.991	0.993										
				2	0.018	0.984	0.983	66.13	40	0.010							
				3	0.015	0.989	0.989	47.36	34	0.064	16	3	18.8%	24	3	12.5%	



Mode Comparability Research

Table 3.21 Test Level Scores Fit Results for Multigroup CFA Models for Mathematics – Common Items (Cont'd)

Content Area	Grade	Form Type	Form Pair	Model	RMSEA	TLI	CFI	$\Delta \chi^2$	$\Delta \chi^2$ --DF	χ^2 <i>p-value</i>	Factor Loadings		Thresholds/Intercepts		
											N	Number Freely Estimated	Percent Freely Estimated	N	Number Freely Estimated
Math	3	FS	064PP074EP/ 134PO124EO	1	0.024	0.982	0.983								
				2	0.026	0.979	0.979	237.81	70	0.000					
				3	0.020	0.987	0.987	69.03	52	0.057	30	8	26.7%	40	10
Math	7	FS	064PP074EP/ 134PO124EO	1	0.027	0.968	0.971								
				2	0.033	0.953	0.952	288.85	60	0.000					
				3	0.024	0.975	0.975	51.56	37	0.056	24	12	50.0%	36	11
Math	ALG02	FS	064PP074EP/ 134PO124EO	1	0.022	0.957	0.964								
				2	0.072	0.521	0.500	508.90	36	0.000					
				3	0.022	0.957	0.959	33.21	22	0.059	15	4	26.7%	25	10
Math	GEO	FS	064PP074EP/ 134PO124EO	1	0.044	0.876	0.892								
				2	0.060	0.766	0.756	447.09	45	0.000					
				3	0.040	0.897	0.900	36.00	25	0.072	17	9	52.9%	28	11



Mode Comparability Research

Table 3.22 Test Level Scores Fit Results for Multigroup CFA Models for ELA/Literacy - Common + Unique Items

Content Area	Grade	Form Type	Form Pair	N	Model	Number of Parameters	-2 Log Likelihood	-2 Log Likelihood Δ	$\Delta \chi^2$ --DF	χ^2 p-value	BIC Value	AIC Value
ELA/L	3	PBA	064PP/014PO	2839	Model 1 (Baseline)	219	98683.5				100424.8	99121.5
					Model 2 (Tau-Equivalence)	160	98967.8	284.3	59	0.000	100240.0	99287.8
ELA/L	7	PBA	014PP/014PO	2251	Model 1 (Baseline)	243	91227.2				93102.9	91713.2
					Model 2 (Tau-Equivalence)	156	91640.4	413.2	87	0.000	92844.6	91952.4
ELA/L	11	PBA	034PO/034PP	1642	Model 1 (Baseline)	223	57888.3				59539.4	58334.3
					Model 2 (Tau-Equivalence)	151	58010.1	121.8	72	0.000	59128.1	58312.1
ELA/L	3	EOY	134EO/034EP	3002	Model 1 (Baseline)	239	140555.6				142469.3	141033.6
					Model 2 (Tau-Equivalence)	161	140751.7	196.1	78	0.000	142040.8	141073.7
ELA/L	7	EOY	044EP/144EO	2695	Model 1 (Baseline)	227	120275.7				122068.8	120729.7
					Model 2 (Tau-Equivalence)	158	120450.3	174.6	69	0.000	121698.3	120766.3
ELA/L	11	EOY	124EO/024EP	1626	Model 1 (Baseline)	235	74705.9				76443.4	75175.9
					Model 2 (Tau-Equivalence)	159	74880.7	174.8	76	0.000	76056.3	75198.7
ELA/L	3	FS	064PP064EP/184PO114EO	3059	Model 1 (Baseline)	426	260335.2				263754.2	261187.2
					Model 2 (Tau-Equivalence)	311	260574.8	239.6	115	0.000	263070.9	261196.8
ELA/L	7	FS	074PP064EP/184PO114EO	2746	Model 1 (Baseline)	442	239895.5				243395.3	240779.5
					Model 2 (Tau-Equivalence)	311	240201.5	306.0	131	0.000	242664.0	240823.5
ELA/L	11	FS	074PP064EP/184PO114EO	1767	Model 1 (Baseline)	463	152234.0				155695.9	153160.0
					Model 2 (Tau-Equivalence)	346	152336.9	102.90	117	0.821	154924.0	153028.9



Mode Comparability Research

Table 3.23 Test Level Scores Fit Results for Multigroup CFA Models for Mathematics - Common + Unique Items

Content Area	Grade	Form Type	Form Pair	N	Model	Number of Parameters	-2 Log Likelihood	-2 Log Likelihood Δ	$\Delta \chi^2$ --DF	χ^2 p-value	BIC Value	AIC Value
Math	3	PBA	014PP/114PO	4025	Model 1 (Baseline)	180	104512.5				106006.6	104872.5
					Model 2 (Tau-Equivalence)	124	105246.2	733.7	56	0.000	106275.4	105494.2
Math	7	PBA	014PP/114PO	3821	Model 1 (Baseline)	192	105405.4				106989.1	105789.4
					Model 2 (Tau-Equivalence)	128	106139.7	734.3	64	0.000	107195.5	106395.7
Math	ALG02	PBA	054PP/164PO	2234	Model 1 (Baseline)	153	36194.1				37374.0	36500.1
					Model 2 (Tau-Equivalence)	114	36316.0	121.9	39	0.000	37195.1	36544.0
Math	GEO	PBA	024PP/124PO	2130	Model 1 (Baseline)	154	34008.4				35188.6	34316.4
					Model 2 (Tau-Equivalence)	115	34125.1	116.8	39	0.000	35006.5	34355.1
Math	3	EOY	024EP/114EO	2853	Model 1 (Baseline)	281	131220.6				133456.2	131782.6
					Model 2 (Tau-Equivalence)	192	131510.3	289.8	89	0.000	133037.9	131894.3
Math	7	EOY	054EP/144EO	2395	Model 1 (Baseline)	238	77604.1				79456.0	78080.1
					Model 2 (Tau-Equivalence)	170	77684.2	80.1	68	0.150	79007.0	78024.2
Math	ALG02	EOY	034EP/124EO	1669	Model 1 (Baseline)	254	59273.6				61158.3	59781.6
					Model 2 (Tau-Equivalence)	188	59374.8	101.2	66	0.003	60769.7	59750.8
Math	GEO	EOY	044EP/134EO	1728	Model 1 (Baseline)	265	59714.9				61690.4	60244.9
					Model 2 (Tau-Equivalence)	188	59802.6	87.7	77	0.190	61204.1	60178.6



Mode Comparability Research

Table 3.23 Test Level Scores Fit Results for Multigroup CFA Models for Mathematics - Common + Unique Items (Cont'd)

Content Area	Grade	Form Type	Form Pair	N	Model	Number of Parameters	-2 Log Likelihood	-2 Log Likelihood Δ	$\Delta \chi^2$ --DF	χ^2 p-value	BIC Value	AIC Value
Math	3	FS	064PP074EP/ 134PO124EO	2990	Model 1 (Baseline)	429	211728.4				215161.7	212586.4
					Model 2 (Tau-Equivalence)	292	212268.4	539.99	137	0.000	214605.3	212852.4
Math	7	FS	064PP074EP/ 134PO124EO	2889	Model 1 (Baseline)	366	161903.2				164819.7	162635.2
					Model 2 (Tau-Equivalence)	250	162358.3	455.16	116	0.000	164350.5	162858.3
Math	ALG02	FS	064PP074EP/ 134PO124EO	1614	Model 1 (Baseline)	367	86141.2				88852.0	86875.2
					Model 2 (Tau-Equivalence)	263	86661.6	520.41	104	0.000	88604.3	87187.6
Math	GEO	FS	064PP074EP/ 134PO124EO	1845	Model 1 (Baseline)	370	96432.8				99215.3	97172.8
					Model 2 (Tau-Equivalence)	260	96785.2	352.34	110	0.000	98740.4	97305.2

Claim Level Score Results

As previously discussed, the goals of the claim-level CFA analyses was to determine whether the claim factor structure for ELA/Literacy (i.e., Reading and Writing) was invariant across mode; and whether adding unique items within each mode impacts the overall claim factorial structure. Table 3.24 presents the results for ELA/Literacy for PBA and FS for the common items. According to the model fit indices, for all PBA grades evaluated, the models provided poor fit to the data. Partial tau-equivalence was achieved for all grades, however, for grades 7 and 11, none of the factor loadings could be constrained across mode. The intercept/threshold parameters fared slightly better in regards to invariance across mode. For the FS assessments, except for grade 7 the partial tau-equivalence model provided good fit. In addition, the percentage of factor loadings and intercepts/thresholds that varied across mode was low. Table 3.25 provides the results for the common and unique items. Consistent with the test level score results, the Likelihood Ratio test indicated for all grades and assessments except for grade 11 FS, the tau-equivalence models were significantly different than the baseline models. From a model fit perspective, the model fit indices provided mixed results in support of either Model 1 (based on BIC) or Model 2 (based on AIC) for PBA and grade 7 on the FS assessment. However, for the grade 3 and 11 FS assessments, the tau-equivalence models were recommended based on AIC and BIC fit indices. For PBA these findings were consistent with the common item case. For the FS assessments, adding unique item supported tau-equivalence for two grade levels based on AIC and BIC model fit indices.



Mode Comparability Research

Table 3.24 Claim Level Scores Fit Results for Multigroup CFA Models for ELA/Literacy - Common Items

Content Area	Grade	Form Type	Form Pair	Model	RMSEA	TLI	CFI	$\Delta \chi^2$	$\Delta \chi^2$ --DF	χ^2 p-value	Factor Loadings			Thresholds/Intercepts			
											N*	Number Freely Estimated	Percent Freely Estimated	N*	Number Freely Estimated	Percent Freely Estimated	
ELA/L	3	PBA	064PP/014PO	1	0.119	0.939	0.950										
				2	0.083	0.970	0.967	158.07	44	0.00							
				3	0.082	0.971	0.969	51.57	37	0.06	13	1	7.70%	31	6	19.4%	
ELA/L	7	PBA	034PO/034PP	1 ¹	0.269	0.809	0.825										
				2 ¹	0.192	0.902	0.895	461.32	80	0.00							
				3 ¹	0.221	0.871	0.871	57.94	44	0.08	11*	12	100.0%	59	25	42.4%	
ELA/L	11	PBA	034PO/034PP	1 ²	0.157	0.971	0.975										
				2 ¹	0.107	0.987	0.985	204.08	64	0.00							
				3 ²	0.152	0.973	0.976	19.91	12	0.07	17	17	100.0%	47	35	74.5%	
ELA/L	3	FS	064PP064EP/ 184PO114EO	1	0.019	0.987	0.988										
				2	0.020	0.986	0.986	136.15	66	0.00							
				3	0.021	0.987	0.986	70.257	56	0.10	22	3	13.6%	44	4	9.1%	
ELA/L	7	FS	074PP064EP/ 184PO114EO	1 ¹	0.128	0.828	0.841										
				2 ¹	0.094	0.907	0.903	244.758	87	0.00							
				3 ¹	0.100	0.896	0.894	86.508	69	0.08	26	7	26.9%	54*	11	20.4%	
ELA/L	11	FS	074PP064EP/ 184PO114EO	1 ³	0.027	0.978	0.981										
				2 ³	0.021	0.987	0.986	70.257	56	0.10							
				3 ³	0.021	0.987	0.986	70.257	56	0.10	19	0	0.0%	37	0	0.0%	

*Indicates that the number of factor loadings have been reduced from the original number to support model identification;

¹ Indicates that the estimated correlation between the Reading and Writing claim factors is greater than 1 for both the PBT and the CBT groups;

² Indicates that the estimated correlation between the Reading and Writing claim factors is greater than 1 for the CBT group;

³ Indicates that for these FS form pairs, the Writing items were not in the common item set and thus there is only a Reading factor in the corresponding CFA. models.



Mode Comparability Research

Table 3.25 Claim Level Scores Fit Results for Multigroup CFA Models for ELA/Literacy - Common + Unique Items

Content Area	Grade	Form Type	Form Pair	N	Model	Number of Parameters	-2 Log Likelihood	-2 Log Likelihood Δ	$\Delta \chi^2$ --DF	χ^2 p-value	BIC Value	AIC Value
ELA/L	3	PBA	064PP/014PO	2839	Model 1 (Baseline)	240	105341.0				107249.3	105821.0
					Model 2 (Tau-Equivalence)	177	105596.5	255.4	63	0.00	107003.8	105950.5
ELA/L	7	PBA	034PO/034PP	2251	Model 1 (Baseline)	255	101988.9				103957.2	102498.9
					Model 2 (Tau-Equivalence)	168	102305.7	316.8	87	0.00	103602.5	102641.7
ELA/L	11	PBA	034PO/034PP	1642	Model 1 (Baseline)	239	66158.9				67928.4	66636.9
					Model 2 (Tau-Equivalence)	165	66311.0	152.1	74	0.00	67532.6	66641.0
ELA/L	3	FS	064PP064EP/ 184PO114EO	3059	Model 1 (Baseline)	448	268522.8				272118.4	269418.8
					Model 2 (Tau-Equivalence)	324	268747.8	224.9	124	0.00	271348.1	269395.8
ELA/L	7	FS	074PP064EP/ 184PO114EO	2746	Model 1 (Baseline)	453	252630.3				256217.1	253536.3
					Model 2 (Tau-Equivalence)	317	253011.8	381.5	136	0.00	255521.8	253645.8
ELA/L	11	FS	074PP064EP/ 184PO114EO	1767	Model 1 (Baseline)	490	162485.0				166148.7	163465.0
					Model 2 (Tau-Equivalence)	363	162603.0	118.1	127	0.70	165317.2	163329.0

Subclaim Level Score Results

Similar to the goals of the claim-level CFAs, for the subclaim level score multigroup factor analyses, the goal was to determine whether the subclaim structures for Mathematics and ELA/Literacy were invariant across mode; and whether adding unique items within each mode impacts the overall subclaim factorial structure. Table 3.26 presents the results for the ELA/Literacy PBA, EOY, and FS assessments for the common items. Based on the RMSEA, the model fit was not satisfactory for PBA. However, the overall fit was better than the models based on claim level scores, as there was less complication in running the models since there was a broader covariance structure between the subclaim factors. For ELA/Literacy EOY and FS assessments the model fit was good for the partial tau-equivalent models in all grades. Properties of factorial invariance were well supported for all assessments except grade 7 PBA. The intercept/threshold parameters fared slightly better in regards to invariance across mode for all assessments except grade 3 PBA. Table 3.27 presents the results for the Mathematics PBA, EOY, and FS for the common items. With the exception of Algebra 2 EOY and Geometry for both PBA and FS, the final partial tau-equivalence models exhibited good model fit across all fit indices. The EOY assessment for all grades evaluated tended to have a large percentage of factor loadings and intercepts/thresholds that were invariant across mode. For PBA, a substantial percentage of factor loadings and intercepts/thresholds varied across mode. For the FS assessments, the percentage factor loadings and intercepts/thresholds that were invariant across mode was in between the levels observed for the PBA and EOY assessments.

Table 3.28 presents the results for the common plus unique items for ELA/Literacy. Consistent with the test and claim level score results, the Likelihood Ratio test indicated for all grades and assessments except for 11 FS, the tau-equivalence models were significantly different than the baseline models. From a model fit perspective, there was marginal improvement in log-likelihood values when factor loadings and intercepts/thresholds were freely estimated. With the exception of grade 7 PBA and grade 11 FS, according to the AIC and BIC, there were mixed results in support of either Model 1 or Model 2. This finding is fairly consistent with the common item case where tau-equivalence was not achieved but a large percentage of factor loadings and intercepts/thresholds was invariant across mode for most grades and assessment types. For grade 7 PBA, BIC and AIC suggested that the factor structure varied across mode. This is a slight difference from the common item case where partial tau-equivalence was achieved though this grade had the highest percentage of factor loadings and intercepts/thresholds that varied across mode for the grades assessed. For the grade 11 FS assessment, both AIC and BIC indices and the significance tests supported tau-equivalence. This result is not unreasonable given that in the common item case where only one factor loading was freely estimated across modes. Table 3.29 presents the results for the common plus unique items for Mathematics. For all grades and subjects except Algebra 2 PBA the Likelihood Ratio tests indicated a lack of invariance in the factor loadings and intercepts/thresholds across mode. However, according to the model fit indices, there was more evidence in support of tau-equivalence models for Algebra 2 for PBA, EOY, and FS, Geometry for EOY, and grade 7 Mathematics FS assessment. The results were not surprising given the large percentage of factor loadings and intercepts/thresholds that were invariant across mode in the common item case. The results for the remaining grades and assessments were mixed.

Characteristics of Items Flagged for Lack of Invariance for Multigroup CFA Models

Items that exhibited lack of invariance, either in the factor loadings or intercepts/threshold parameters, across mode in the multigroup CFA models were evaluated to understand the characteristics of these items relative to the characteristics of the overall pool for the grade levels assessed for each content area. Tables C.33 – C.44 summarize the item characteristics for items demonstrating invariance across mode. For each assessment, the tables provide the distribution of the item characteristics for each of the score levels (test level scores, claim level scores, and subclaim level scores). Note for some multigroup CFAs very few items were flagged for lack of invariance across mode, those summary characteristics should be interpreted with caution. For the ELA/Literacy PBA claim level score CFAs, items demonstrating invariance for both the factor loadings and intercept/threshold parameters, a disproportionate percentage of items were other constructed response types, extended text interaction types, and of high cognitive complexity relative to the overall item pool. For ELA/Literacy EOY test level score CFAs, items demonstrating invariance for both factor loadings and intercept/threshold parameters, a disproportionate percentage of items was multiple choice – multiple selection response types and choice interactions relative to the overall item pool. For the Mathematics PBA test and subclaim level CFAs, items demonstrating invariance for both the factor loadings and intercept/threshold parameters, a disproportionate percentage of items was other constructed response types, extended text interaction types and of medium cognitive complexity relative to the overall item pool. Lastly for Mathematics FS test and subclaim level CFAs, items demonstrating invariance for both the factor loadings and intercepts/thresholds parameters, a disproportionate percentage of items was other constructed response types and extended text interaction types.



Mode Comparability Research

Table 3.26 Subclaim Level Scores Fit Results for Multigroup CFA Models for ELA/Literacy - Common Items

Content Area	Grade	Form Type	Form Pair	Model	RMSEA	TLI	CFI	$\Delta \chi^2$	$\Delta \chi^2$ --DF	χ^2 p-value	Factor Loadings			Thresholds/Intercepts				
											N	Number Freely Estimated	Percent Freely Estimated	N	Number Freely Estimated	Percent Freely Estimated		
ELA/L	3	PBA	064PP/014PO	1 ¹	0.109	0.949	0.964											
				2 ¹	0.078	0.974	0.974	171.17	44	0.00								
				3 ¹	0.076	0.975	0.976	48.13	37	0.10	13	1	7.7%	31	6	19.4%		
ELA/L	7	PBA	034PO/034PP	1 ¹	0.093	0.977	0.980											
				2 ¹	0.075	0.985	0.985	468.47	82	0.00								
				3 ¹	0.076	0.985	0.985	60.25	46	0.08	23	12	52.2%	59	24	40.7%		
ELA/L	11	PBA	034PO/034PP	1 ¹	0.142	0.977	0.981											
				2 ¹	0.096	0.989	0.989	157.46	64	0.00								
				3 ¹	0.103	0.988	0.988	60.24	47	0.09	17	6	35.3%	47	11	23.4%		
ELA/L	3	EOY	064EP/114EO	1	0.019	0.987	0.989											
				2 ²	0.021	0.983	0.983	177.89	66	0.00								
				3	0.016	0.991	0.990	68.93	52	0.06	22	6	27.3%	44	8	18.2%		
ELA/L	7	EOY	064EP/114EO	1	0.018	0.992	0.993											
				2	0.020	0.989	0.989	167.37	66	0.00								
				3	0.015	0.994	0.994	67.61	52	0.07	22	9	40.9%	44	5	11.4%		
ELA/L	11	EOY	034EP/134EO	1 ³	0.022	0.975	0.978											
				2 ⁴	0.026	0.965	0.964	145.02	66	0.00								
				3 ⁴	0.020	0.979	0.979	71.84	55	0.06	22	5	22.7%	44	6	13.6%		
ELA/L	3	FS	064PP064EP/ 184PO114EO	1	0.018	0.988	0.990											
				2 ²	0.021	0.985	0.985	150.193	66	0.00								
				3	0.016	0.991	0.991	75.08	58	0.07	22	3	13.6%	44	5	11.4%		
ELA/L	7	FS	074PP064EP/ 184PO114EO	1	0.017	0.991	0.992											
				2	0.021	0.986	0.986	196.275	80	0.00								
				3	0.015	0.993	0.993	87.30	70	0.08	26*	5	19.2%	54*	5	9.3%		
ELA/L	11	FS	074PP064EP/ 184PO114EO	1	0.026	0.980	0.983											
				2	0.022	0.985	0.985	76.719	56	0.03								
				3 ²	0.021	0.987	0.986	69.28	55	0.09	19	1	5.3%	37	0	0.0%		

Indicates the number of factor loadings or intercepts/thresholds has been reduced from the original number to support model identification. ¹ - Indicates the Written Expression subclaim factor has an estimated correlation of at least 1 with one or more additional subclaim factors for both the PBT and the CBT groups; ² Indicates the Reading Vocabulary subclaim factor has an estimated correlation of at least 1 with one or more additional subclaim factors for the CBT group; ³ - Indicates the Reading Vocabulary subclaim factor has an estimated correlation of at least 1 with one or more additional subclaim factors for both the PBT and the CBT groups; ⁴ - Indicates the Reading Vocabulary subclaim factor has an estimated correlation of at least 1 with one or more additional subclaim factors for the PBT group.



Mode Comparability Research

Table 3.27 Subclaim Level Scores Fit Results for Multigroup CFA Models for Mathematics - Common Items

Content Area	Grade	Form Type	Form Pair	Model	RMSEA	TLI	CFI	$\Delta \chi^2$	$\Delta \chi^2$ --DF	χ^2 p-value	N	Factor Loadings			Thresholds/Intercepts				
												Number Freely Estimated	Percent Freely Estimated	N	Number Freely Estimated	Percent Freely Estimated			
Math	3	PBA	024PP/124PO	1	0.015	0.997	0.998												
				2	0.064	0.945	0.939	743.71	49	0.00									
				3	0.015	0.997	0.997	25.45	17	0.09	13	7	53.8%	36	25	69.4%			
Math	7	PBA	014PP/114PO	1	0.031	0.981	0.984												
				2	0.041	0.967	0.966	481.75	61	0.00									
				3	0.026	0.987	0.987	34.28	24	0.08	19	11	57.9%	42	26	61.9%			
Math	ALG02	PBA	054PP/164PO	1	0.042	0.922	0.956												
				2	0.105	0.521	0.521	405.38	18	0.00									
				3	0.036	0.943	0.958	10.64	7	0.16	7*	3	42.9%	13*	8	61.5%			
Math	GEO	PBA	024PP/124PO	1	0.083	0.712	0.829												
				2	0.111	0.477	0.377	462.15	25	0.00									
				3	0.078	0.746	0.831	7.28	3	0.06	7*	5	71.4%	18*	17	94.4%			
Math	3	EOY	024EP/114EO	1	0.037	0.969	0.971												
				2	0.031	0.978	0.978	115.78	52	0.00									
				3	0.030	0.979	0.980	57.55	42	0.06	26*	6	23.1%	26*	4	15.4%			
Math	7	EOY	064EP/154EO	1	0.023	0.975	0.978												
				2	0.030	0.955	0.955	160.53	41	0.00									
				3	0.020	0.980	0.981	45.07	34	0.10	19	2	10.5%	22	5	22.7%			
Math	ALG02	EOY	034EP/124EO	1	0.021	0.933	0.948												
				2	0.031	0.858	0.856	78.05	25	0.00									
				3	0.021	0.935	0.938	26.78	18	0.08	11*	3	27.3%	14*	4	28.6%			
Math	GEO	EOY	024EP/114EO	1	0.023	0.948	0.955												
				2	0.030	0.914	0.913	133.15	42	0.00									
				3	0.021	0.960	0.960	38.92	32	0.19	17	5	29.4%	25	5	20.0%			
Math	3	FS	064PP074EP/ 134PO124EO	1	0.026	0.971	0.974												
				2	0.031	0.957	0.957	271.78	60	0.00									
				3	0.023	0.977	0.978	49.91	37	0.08	24	10	41.7%	36	13	36.1%			
Math	7	FS	064PP074EP/ 134PO124EO	1	0.025	0.979	0.981												
				2	0.025	0.979	0.979	176.856	63	0.00									
				3	0.022	0.985	0.985	64.45	48	0.06	28*	7	25.0%	35*	8	22.9%			
Math	ALG02	FS	064PP074EP/ 134PO124EO	1	0.018	0.967	0.973												
				2	0.032	0.892	0.891	87.177	27	0.00									
				3	0.019	0.960	0.962	33.18	22	0.06	12*	2	16.7%	15*	3	20.0%			
Math	GEO	FS	064PP074EP/1 34PO124EO	1	0.040	0.898	0.913												
				2	0.053	0.814	0.810	332.007	42	0.00									
				3	0.036	0.917	0.920	35.63	26	0.10	16*	6	37.5%	26*	9	34.6%			

*Indicates that the number of factor loadings have been reduced from the original number to support model identification. ¹ - Indicates the Modeling/Application factor has an estimated correlation of at least 1 with one or more additional subclaim factors for the PBT group; ² Indicates that Modeling/Application factor has an estimated correlation of at least 1 with one or more additional subclaim factors for the CBT group; ³ - Indicates that Additional and Supporting Content factor has an estimated correlation of at least 1 with one or more additional subclaim factors for both the PBT and the CBT groups; ⁴ - Indicates that Mathematical Reasoning factor has an estimated correlation of at least 1 with one or more additional subclaim factors for the CBT group; ⁵ - Indicates that Additional and Supporting Content factor has an estimated correlation of at least 1 with one or more additional subclaim factors for the PBT group; ⁶ - Indicates that Additional and Supporting Content factor has an estimated correlation of at least 1 with one or more additional subclaim factors for the CBT group; ⁷ - Indicates that Mathematical Reasoning factor has an estimated correlation of at least 1 with one or more additional subclaim factors for the PBT group.



Mode Comparability Research

Table 3.28 Subclaim Level Scores Fit Results for Multigroup CFA Models for ELA/Literacy - Common + Unique Items

Content Area	Grade	Form Type	Form Pair	N	Model	Number of Parameters	-2 Log Likelihood	-2 Log Likelihood Δ	$\Delta \chi^2$ --DF	χ^2 p-value	BIC Value	AIC Value
ELA	3	PBA	064PP/014PO	2839	Model 1 (Baseline)	654	105747.6				110947.7	107055.6
					Model 2 (Tau-Equivalence)	591	105961.8	214.2	63	0.00	110660.9	107143.8
ELA	7	PBA	034PO/034PP	2251	Model 1 (Baseline)	669	101727.4				106891.5	103065.4
					Model 2 (Tau-Equivalence)	582	102433.8	706.4	87	0.00	106926.3	103597.8
ELA	11	PBA	034PO/034PP	1642	Model 1 (Baseline)	653	67159.9				71994.5	68465.9
					Model 2 (Tau-Equivalence)	579	67315.7	155.8	74	0.00	71602.4	68473.7
ELA	3	EOY	064EP/114EO	3741	Model 1 (Baseline)	618	191003.4				196087.7	192239.4
					Model 2 (Tau-Equivalence)	538	191295.7	292.3	80	0.00	195721.9	192371.7
ELA	7	EOY	064EP/114EO	3733	Model 1 (Baseline)	615	185891.7				190950.1	187121.7
					Model 2 (Tau-Equivalence)	536	186105.3	213.5	73	0.00	190513.8	187177.3
ELA	11	EOY	034EP/134EO	1575	Model 1 (Baseline)	629	75805.8				80436.5	77063.8
					Model 2 (Tau-Equivalence)	546	75980.5	174.7	83	0.00	80000.1	77072.5
ELA/L	3	FS	064PP064EP/184PO114EO	3059	Model 1 (Baseline)	862	270109.9				277028.1	271833.9
					Model 2 (Tau-Equivalence)	738	270413.2	303.3	124	0.00	276336.3	271889.2
ELA/L	7	FS	074PP064EP/184PO114EO	2746	Model 1 (Baseline)	867	254491.7				261356.5	256225.7
					Model 2 (Tau-Equivalence)	731	254768.0	276.3	136	0.00	260556.0	256230.0
ELA/L	11	FS	074PP064EP/184PO114EO	1767	Model 1 (Baseline)	904	163975.7				170735.0	165783.7
					Model 2 (Tau-Equivalence)	777	164108.0	132.3	127	0.36	169917.7	165662.0



Mode Comparability Research

Table 3.29 Subclaim Level Scores Fit Results for Multigroup CFA Models for Mathematics - Common + Unique Items

Content Area	Grade	Form Type	Form Pair	N	Model	Number of Parameters	-2 Log Likelihood	-2 Log Likelihood Δ	$\Delta \chi^2$ --DF	χ^2 <i>p-value</i>	BIC Value	AIC Value
Math	3	PBA	024PP/124PO	3344	Model 1 (Baseline)	575	100707.5				105373.6	101857.5
					Model 2 (Tau-Equivalence)	511	101131.5	424.1	64	0.00	105278.3	102153.5
Math	7	PBA	014PP/114PO	3821	Model 1 (Baseline)	564	105312.1				109964.1	106440.1
					Model 2 (Tau-Equivalence)	500	105672.0	359.9	64	0.00	109796.1	106672.0
Math	ALG02	PBA	054PP/164PO	2234	Model 1 (Baseline)	519	33535.0				37537.3	34573.0
					Model 2 (Tau-Equivalence)	483	33581.5	46.5	36	0.11	37306.2	34547.5
Math	GEO	PBA	024PP/124PO	2130	Model 1 (Baseline)	519	30549.1				34526.6	31587.1
					Model 2 (Tau-Equivalence)	483	30620.6	71.6	36	0.00	34322.3	31586.6
Math	3	EOY	024EP/114EO	2853	Model 1 (Baseline)	263	114349.6				116442.0	114875.6
					Model 2 (Tau-Equivalence)	183	114654.4	304.9	80	0.00	116110.4	115020.4
Math	7	EOY	064EP/154EO	2359	Model 1 (Baseline)	272	87501.8				89614.2	88045.8
					Model 2 (Tau-Equivalence)	195	87741.7	239.9	77	0.00	89256.1	88131.7
Math	ALG02	EOY	034EP/124EO	1669	Model 1 (Baseline)	234	50005.2				51741.5	50473.2
					Model 2 (Tau-Equivalence)	177	50106.1	100.9	57	0.00	51419.4	50460.1
Math	GEO	EOY	024EP/114EO	1909	Model 1 (Baseline)	281	67088.0				69210.8	67650.0
					Model 2 (Tau-Equivalence)	203	67235.9	147.9	78	0.00	68769.4	67641.9



Mode Comparability Research

Table 3.29 Subclaim Level Scores Fit Results for Multigroup CFA Models for Mathematics - Common + Unique Items (Cont'd)

Content Area	Grade	Form Type	Form Pair	N	Model	Number of Parameters	-2 Log Likelihood	-2 Log Likelihood Δ	$\Delta \chi^2$ --DF	χ^2 p-value	BIC Value	AIC Value
Math	3	FS	064PP074EP/ 134PO124EO	2990	Model 1 (Baseline)	859	198454.4				205329.0	200172.4
					Model 2 (Tau-Equivalence)	729	198816.1	361.6	130	0.000	204650.3	200274.1
Math	7	FS	064PP074EP/ 134PO124EO	2889	Model 1 (Baseline)	818	162010.5				190856.5	173436.5
					Model 2 (Tau-Equivalence)	702	162249.1	238.6	116	0.000	190140.7	173418.1
Math	ALG02	FS	064PP074EP/ 134PO124EO	1614	Model 1 (Baseline)	517	74900.1				78718.9	75934.1
					Model 2 (Tau-Equivalence)	426	75046.6	146.5	91	0.000	78193.3	75898.6
Math	GEO	FS	064PP074EP/ 134PO124EO	1845	Model 1 (Baseline)	549	93444.9				97573.5	94542.9
					Model 2 (Tau-Equivalence)	443	93679.1	234.2	106	0.000	97010.5	94565.1

Section 4: Analyses and Results Pertaining to the Similarity of Student Performance across Modes

4.1 Overview

The following section summarizes test statistics used to facilitate “test level” comparisons across groups assessed using different test modes. These score comparisons involve the calculation of effect sizes.

4.2 Summary Test Statistics

As previously discussed in section 1, an effort was made to randomly assign schools to testing modes, which would have yielded randomly equivalent student groups. However, a number of schools sampled for the CBT declined because of lack of infrastructure, and a number of schools sampled for PBT declined because they use computers. Therefore, demographic characteristics were evaluated across mode for the PBA and EOY assessments. Demographic imbalances across modes were adjusted by randomly removing cases from the student samples prior to summarizing test results.

The test score summaries includes the raw score means and standard deviations and stratified alpha for common items shared between the form pairs. These summaries were also provided all items (common and unique items) associated with form pairs.

The stratified alpha reliabilities were computed for each form using the following formula:

$$\text{strata } \rho = 1 - \frac{\sum s_{X_j}^2 (1 - \alpha_j)}{s_X^2} \quad (4)$$

where,

$s_{X_j}^2$ is the variance for strata j of the test, s_X^2 is the total variance of the test, and α_j is the Cronbach’s alpha for strata j of the test.

To compare reliability estimates across modes for all items appearing on a form pair, the stratified alpha estimates were adjusted using the Spearman-Brown formula. Specifically, since some test forms might have included items that could not be scored for various reasons, the overall test length could differ across modes. Therefore, the reliability estimates based on all item raw scores might not be comparable without an adjustment. The Spearman-Brown formula was used to adjust the all-item raw score reliabilities to the intended length of the assessment.

To summarize the relative performance at the test form level, means and standard deviations were provided. However, since many forms differed in terms of items administered and scored, as well as points available, the means and standard deviations were divided by the total number of points available within each form. The relative performance of the common items between forms was summarized by providing the means, standard deviations, and effect sizes. The effect sizes were calculated for each pair of form level common item scores, where groups differed by testing mode. Effect size, d was computed as follows (Cohen, 1988, p. 20):

$$d = (M_{CBT} - M_{PBT}) / s \quad (5)$$

where,

d is the effect size,

M_{CBT} is the mean of the common item scores for the CBT group,

M_{PBT} is the mean of the common item scores for the PBT group,

s is the pooled standard deviation of the PBT and CBT groups.

Table D.1 provides the test score summary for ELA/Literacy PBA by test mode for the raw scores. For the raw scores based on all items appearing on a test form within mode, the median difference in the percentage of raw score points earned was 5.91% in favor of PBT test takers. The effect sizes associated with differences in raw scores for the common items ranged from -0.60 (favoring PBT) to 0 (favors no mode). The median effect size observed across all grade levels was small (-0.30). The reliabilities were comparable across modes with negligible differences across test forms for all-item raw scores and common-item raw scores, with exceptions for 1 form in Grade 3 and 3 forms in Grade 8, where differences exceeded 0.10.

Table D.2 provides the test score summary for ELA/Literacy EOY by test mode for the raw scores. For the all-item raw scores, the median difference in the percentage of raw score points earned was 2.95% in favor of PBT test takers. The effect sizes associated with the common-item raw scores ranged from -0.39 to 0.04. The median effect size observed across all grade levels was negligible (-0.14). The reliabilities were comparable across modes with trivial differences across test forms for all-item and common-item raw scores.

Table D.3 provides the test score summary for ELA/Literacy for the full summative form pairs by mode. For the all-item raw scores, the median difference in the percentage of raw score points earned was 6.11% in favor of PBT test takers. The effect sizes associated with the common-item raw scores ranged from -0.27 to 0.04. The median effect size observed across all grade levels was negligible (-0.14). The reliabilities were comparable across modes with trivial differences across test forms for all-item and common-item raw scores.

Overall for ELA, there were differences in the percentage of points earned in favor of PBT for PBA, EOY, and FS. For PBA, depending on grade level assessed, the expected total raw score difference between modes could range from 4.5 to 5.5 points in favor of paper test takers based on the current operational test blueprints (PARCC, n.d.; PARCC, 2014). For EOY, depending on the grade assessed, the expected total raw score difference between modes could range from 0.7 to 1.3 points in favor of paper test takers based on the current operational test blueprints. In terms of the full summative score, depending

on the grade assessed, the expected total raw score difference between modes could range from 6.1 to 8.4 points in favor of paper test takers based on the current operational test blueprints.

For items administered in both modes, the effect sizes associated with the common-item raw scores were small in favor of PBT for PBA. There were no sizeable effect sizes for the EOY and full summative assessments. The apparent mode effect for PBA and not on EOY might be due to differences in tasks administered to test takers. Particularly, the PBA requires students to write, which might be challenging when conducted on a computer instead of paper. In addition, since the PBA has fewer items, small mode differences are further amplified.

Table D.4 provides the test score summary for Mathematics PBA by test mode for the raw scores. For the raw scores based on all items appearing on a test form within mode, the median difference in the percentages of raw score points earned was 5.12% in favor of paper test takers. The effect sizes associated with differences in the common-item raw scores ranged from -1.03 to 0.24. The median effect size observed across all grade levels was small (-0.28) in favor of PBT. Across test forms, the reliabilities were comparable between modes (estimated reliability differences between modes less than the $|0.10|$) 85% of the time for the all-item raw scores and 81% of the time for the common-item raw scores. There were larger percentages of reliability discrepancies (for all-item and common-item raw scores) between modes occurring in the upper grades (grade 8 and high school Mathematics).

Table D.5 provides the test score summary for Mathematics EOY by test mode for the raw scores. For the raw scores based on all items appearing on a test form within mode, the median difference in the percentages of raw score points earned was 4.77% in favor of paper test takers. The effect sizes associated with differences in the common-item raw scores ranged from -0.56 to 0.22. The median effect size observed across all grade levels was negligible. Across test forms, the reliabilities were comparable between modes (estimated reliability differences between modes less than $|0.10|$) 94% of the time for both all-item raw scores and common-item raw scores. All discrepancies occurred in the high school Mathematics tests.

Table D.6 provides the test score summary for Mathematics full summative form pairs by mode. For the all-item raw scores, the median difference in the percentage of raw score points earned was 1.51% in favor of paper test takers. The effect sizes associated with the common-item raw scores ranged from -0.20 to 0.28. The median effect size observed across all grade levels was negligible (-0.08). The reliabilities were comparable across modes with trivial differences across test forms for all-item and common-item raw scores. However, for Algebra I, the reliabilities for both modes was very low (0.33 for CBT and 0.40 for PBT) in comparison to other subjects and grade levels. The low reliabilities for each mode were likely due to fewer common items and available points in relation to other grades/subjects.

Overall for Mathematics, there were differences in the percentages of points earned in favor of PBT for PBA, EOY, and FS. For PBA, depending on grade/subject assessed, the expected total raw score difference between modes could range from 2.3 to 2.8 points in favor of paper test takers based on the current operational test blueprints. For EOY, depending on grade/subject assessed, the expected total raw score difference between modes could range from 1.8 to 2.6 points in favor of paper test takers

based on the current operational test blueprints (PARCC, 2013). In terms of the full summative score, depending on the grade assessed, the expected total raw score difference between modes could range from 1.2 to 1.6 points in favor of paper test takers based on the current operational test blueprints. For items administered in both modes, the effect sizes associated with the common-item raw scores were small and in favor of PBT for PBA and negligible for EOY and FS assessments. The apparent mode effect for PBA and not on EOY, for the common-item raw scores, might be due to differences in tasks administered to test takers. Particularly, the PBA consist of two task types (Type II and Type III) that don't appear on the EOY. Specifically, these task types require students to reason mathematically and demonstrate their ability to apply mathematical concepts in a real-world context or scenario, and could be more challenging when conducted on a computer instead of on paper. In addition, since the PBA contains fewer items, small mode differences are further amplified.

Section 5: Analyses and Results Pertaining to IRT Item Parameter Estimates

5.1 Overview

The following section describes the item response theory analyses that were used to evaluate both the comparability of parameter estimates across modes and the sensitivity of these parameter estimates across various calibration approaches. The first set of analyses that evaluated the comparability of the parameter estimates for common items were conducted on all forms. The sensitivity analyses were conducted in grades 3, 7, 11 for ELA/Literacy and in grades 3, 7, Algebra 2, and Geometry for Mathematics. The data used as part of this analysis was not restricted to the mode comparability form pairs but included all test forms that shared common items across mode. The additional data were needed to increase the number of common items available for analysis particularly for certain high school Mathematics subjects. These analyses were primarily based on using the two-parameter logistic/generalized partial credit model (2PL/GPC) combination. Due to the lower test taker counts for the Integrated Mathematics subjects, the Rasch/partial credit (Rasch/PC) combination was used. The 2PL/GPC combination was selected since it provides an improved model fit over the Rasch/PC combination. Additionally, since there were very few grade levels in ELA/Literacy (Grades 4, 5, and 6) with multiple choice single select (MCSS) items, a limited number of MCSS items overall in math, and small sample sizes for the Integrated Mathematics sequence, the 3PL/GPC combination was not selected. All analyses were performed using commercial PARSCALE (Muraki & Bock, 2003). All analyses described below required data treatment prior to proceeding with calibration. First, response categories were collapsed when a category had fewer than 30 test takers across all forms³. Second, items were excluded from the analyses if they had low weighted polyserial correlations (below 0.05), 100% of the responses received a score of 0, 40% of test takers omitted a particular item, there were differences in the numbers of item categories after collapsing between modes, or if the item was

³ Due to the low test taker counts for the Integrate Math assessments, categories were collapsed when a category had fewer than 10 test takers across all forms.

flagged for C-level mode DIF based on the MH or SMD procedure. Table 5.1 summarizes the number of common items that were excluded from the IRT analyses.

Table 5.1 Common Items Excluded from IRT Analyses

	Grade	Total Number of Items	Number of Items - IRT Analysis	Number of Items Excluded	Percentage of Items Excluded
ELA/L	3	184	174	10	5.43
	4	172	161	11	6.40
	5	151	134	17	11.26
	6	185	176	9	4.86
	7	174	161	13	7.47
	8	172	157	15	8.72
	9	182	161	21	11.54
	10	181	174	7	3.87
	11	204	190	14	6.86
	Grade/Subject	Total Number of Items	Number of Items - IRT Analysis	Number of Items Excluded	Percentage of Items Excluded
Mathematics	3	169	144	25	14.79
	4	159	135	24	15.09
	5	113	102	11	9.73
	6	134	114	20	14.93
	7	141	119	22	15.60
	8	102	86	16	15.69
	ALG01	79	49	30	37.97
	ALG02	68	48	20	29.41
	GEO	102	76	26	25.49
	MAT1I	51	26	25	49.02
	MAT2I	36	12	24	66.67
MAT3I	34	18	16	47.06	

5.2 Separate Calibration of Common Items

The first analysis focused on whether item parameter estimates derived from separate within mode calibrations functioned differently. Specifically, common items administered on paper were calibrated separately from common items administered on a computer. This was done separately for each grade level/subject where items appearing on PBA and EOY were calibrated together. The resulting difficulty and discrimination parameter estimates were correlated and plotted. Table 5.2 provides the correlation summaries across grades for difficulty and discrimination parameter estimates. Figures E.1 – E.4 in the

appendix provide the corresponding plots. For both ELA/Literacy and Mathematics, the correlations associated with the IRT difficulty parameter estimates tended to be stronger than those for the discrimination parameter estimates. The correlations between modes were less strong for the Algebra 2. The discriminations tended to have weaker associations across modes in comparison to other grades. In fact there was one item that had a difference in discrimination of 0.84 in favor of PBT (1.34 versus 0.50). When this outlier was removed, the correlation increased to 0.82. Similarly for difficulty, closer inspection revealed there was an item that was significantly more difficult on paper than on computer (5.81 versus 2.44). Removing this outlier would result in the correlation improving to 0.90.

Table 5. 2 Correlations between Modes of Discrimination and Difficulty Parameter Estimates for Common Items

	Grade	Number of Items	Discrimination	Difficulty
ELA/L	3	174	0.92	0.96
	4	161	0.90	0.95
	5	134	0.93	0.95
	6	176	0.89	0.95
	7	161	0.88	0.95
	8	157	0.92	0.94
	9	161	0.91	0.96
	10	175	0.87	0.91
	11	190	0.89	0.91
	Grade/Subject	Number of Items	Discrimination	Difficulty
Mathematics	3	144	0.91	0.96
	4	135	0.91	0.96
	5	102	0.90	0.96
	6	114	0.87	0.96
	7	119	0.94	0.96
	8	86	0.88	0.96
	ALG01	49	0.84	0.91
	ALG02	48	0.74	0.84
	GEO	76	0.80	0.90
	MAT1I	26		0.94
	MAT2I	12		0.93
	MAT3I	18		0.98

5.3 Joint Calibration of Common Items

The second analysis focused on the sensitivity of calibration results in the presence and in the absence of uncommon items (e.g. items unique to a particular mode). There were three possible item groups across the modes:

CM: items common to both modes

PP: paper-specific items

CB: computer-based only items

Based on the item groupings, there were four conditions considered in which data were pooled from both modes for calibration in order to estimate parameters for CM:

- (1) Calibrate CM items only
- (2) Joint calibration of CM+ PP items
- (3) Joint calibration of CM+ CB items
- (4) Joint calibration of CM+ PP+CB items

The item parameter estimates corresponding to CM were correlated across the four conditions. Very strong correlations amongst these conditions would provide evidence that the same construct is being measured. Moreover, calibrating items common to both modes would not be impacted if they were also calibrated with items unique to each mode. These analyses were conducted separately for PBA and EOY forms in 3 grades (3, 7, and 11) for ELA/Literacy and 4 grades/subjects (3, 7, Algebra 2, Geometry) for Mathematics. Tables E.1 and E.2 present the results. Overall, the difficulty and discrimination estimates were minimally impacted by the different approaches used to calibrate items. The correlations almost always ranged from 0.99 to 1.00. There was a slight degradation in the correlations when all items were calibrated together for both ELA/Literacy and Mathematics. For Mathematics, both the discrimination and difficulty item parameter estimates tended to experience more degradation in correlation when common items were calibrated with unique CBT items than when common items were calibrated with unique PBT items. These differences were very minor and would likely have no consequence in an operational setting.

Section 6: Conclusions and Implications

The goal of the PARCC mode comparability study was to evaluate to what extent scores from the online and paper form versions of the PARCC assessments can be considered comparable. The first question of interest was whether the construct was invariant between the two test modes. The internal consistency of the common item raw scores and the total item raw scores show little difference across mode for all assessments for all grades. There were marginal differences in the median difficulties across the assessments. Items appearing on the paper forms tended to be easier than on computer with the exception of Mathematics EOY in grades 3-5. In general, the z-score comparisons indicated that there was a strong correspondence in item difficulties across modes for all assessments across grade levels. There were very few items that exhibited substantial performance differences across test modes. Items that were flagged for performance differences across mode tended to be two-part multiple choice response types for ELA/Literacy EOY, Fill-in-the-Blank for both Mathematics PBA and EOY, and other constructed response item types for Mathematics PBA. In some instances, these outlying items were related to technical issues unrelated to the difficulty of the item. Small percentages of items were flagged for performing differently across mode after conditioning on test taker ability, on common items, for all assessments although Mathematics PBA had the largest flagging rate at 16.7%. The direction of the item bias favored the online format is likely due to the differences in item types assessed in comparison to Mathematics EOY. Expanding the ability groupings by subtracting a small effect size from the paper total common item raw scores resulted in elevated flagging rates which had a large impact on Mathematics PBA in favor of the paper format. Even with these elevated flagging rates, approximately 75% of items had no significant problems with bias. The characteristics of items flagged for differences based on DIF were similar those observed for items flagged based on z-score differences.

The confirmatory factor analyses showed that within each content area and across grades, the paper and online test forms shared a common overall test score structure. However, for ELA/Literacy on PBA, the paper and online forms did not share a common claim and subclaim structure overall and across grades as defined in the test blueprint. For ELA/Literacy FS, grades 7 and 11 shared the same claim and subclaim structures across mode. For Mathematics FS, the paper and online test forms shared a common subclaim structure as indicated in the blueprints for grades 3, 7, and Algebra 2. For analyses based on common items, structural invariance at the test, claim and subclaim level was supported in only one grade level on ELA/Literacy grade 11 for the common plus unique item case. Though tau-equivalence was support for ELA/Literacy grade 11 for the common item case, there were no common writing items shared across mode so those results are incomplete. Partial tau-equivalence was achieved for all remaining scores structures (total, claim, subclaim) for both content areas across grade levels. For the test level score structure, the percentage of factor loadings and intercepts/thresholds that was invariant across mode was very high for ELA/Literacy for all assessments except for grades 3 and 11 on EOY. For Mathematics, the percentage of factor loadings and intercepts/thresholds that was invariant across mode was low for PBA, high for EOY, and ranged from low to high for the FS assessments. The claim structure for ELA/Literacy for PBA largely varied across mode and across grade level for PBA but for FS a large percentage of factor loadings and intercepts/thresholds was invariant across mode for all grade levels. For the subclaim structure for ELA/Literacy, the percentage of factor loadings and

intercepts/thresholds that was invariant across mode was high for all assessments except for grade 7 on both PBA and EOY. For Mathematics, there was a high percentage of factor loadings and intercepts/thresholds that was invariant across mode for EOY, a low percentage of factor loadings and intercepts/thresholds that was invariant across mode for PBA, and moderate percentage of factor loadings and intercepts/thresholds that was invariant across mode for FS. For analyses based on common and unique items, the BIC and AIC indices supported tau-equivalence at the test level for ELA/Literacy in grade 11 for both PBA and FS assessments, at the claim level for grade 3 and 11 FS assessments, and at the subclaim level for grade 11 FS. For Mathematics tau-equivalence was supported at the test level for grade 7, Algebra 2, and Geometry EOY assessments. Additionally, tau-equivalence was supported for subclaim level scores for all Algebra 2 assessments, Geometry for EOY, and grade 7 Mathematics FS.

The analysis of IRT parameter estimates revealed that IRT-difficulties and discriminations estimated separately within mode were highly correlated for nearly all grade levels and assessments. For grade levels with lower correlations between modes, removing items with outlier parameter estimates provided substantial improvement. The IRT parameter estimates were largely robust to different calibration approaches.

The second question addressed whether student performance was similar across the two modes. The comparisons of mean total raw scores (as a percentage) indicated small performance differences in favor of the paper mode. This disparity is confounded by the qualitative differences that exist between these forms given that certain item types cannot be administered in the paper format (e.g., technology enhanced item types). When comparing the performance on the common items, there are small effect sizes in favor of PBT for the Mathematics and ELA/Literacy PBA assessments and negligible effect sizes for EOY and full summative assessments.

Overall there appears to be a small mode effect in favor of the paper format at a minimum for the performance -based assessments. Moreover, examining the factor structure suggested evidence of a high degree of partial invariance across mode for the total test level and subclaim score level structures for the Mathematics EOY assessments. For ELA/Literacy, there is evidence suggesting a high degree of partial invariance across mode for the total test level score structure.

Implications

The major implication of this study is that scores from the test forms are not comparable across mode in a strict sense, particularly for PBA. However, there is substantial evidence indicating that the differences in comparability across mode are relatively minor. Developing strong form assembly guidelines and psychometric scaling and equating procedures are needed to ensure that these minor differences do not morph into systematic differences in reported scores. Specifically, given the potential for items to function differently across mode, such items should be excluded from operational forms. Given that future paper and online sister operational forms will not necessarily have all items in common, thus

requiring an equating strategy to support score reporting, any item scaling procedure that places paper items onto an online item scale should exclude all C-level DIF items.

There is still much to learn about the functional differences of the items appearing in both modes particularly for the Mathematics PBA. From an item development perspective, assessment specialists, research scientists, and psychometricians need to understand what construct irrelevant factors are contributing to performance differences across online and paper modes. Additional usability studies and cognitive labs should be considered. From an item banking perspective, until researchers can identify and control causes of major construct irrelevant factors contributing to differential item performance for certain item types, it might be useful to maintain a separate set of item statistics for each mode. This would impact future form assembly efforts as forms would be built to the same blueprints but would largely be constructed to different targets. Additionally, understanding the functional differences of the items could further improve structural invariance properties associated with the total, claim, and subclaim level scores across mode and grade-levels. Improvements in the structural invariance would further support efforts to provide vertical scales at the claim level for ELA/Literacy.

Limitations

There were several notable factors that may have impacted the study findings. First, although there was a major effort to ensure randomly equivalent groups were achieved at the school level, due to a school's infrastructure challenges, or unwillingness to test in a mode that was inconsistent with their instructional/testing practices, this approach was not fully implemented. Even with efforts to make groups comparable in terms of demographics, some differences remain. These differences could have been accounted for if prior student achievement information for each participating PARCC state was available as a matching criterion. Though subsequent adjustments might eliminate some confounds there is an acknowledgement that others may still exist, given the clustering of students within classrooms within schools.

Second, the use of field test data presented some challenges. Since this was a new assessment there was lack of familiarity with the test format and item types on top of the in-progress transition to the Common Core State Standards. Moreover, since there were no stakes associated with the test, motivation was an issue which might have suppressed performance particularly in the upper grades. For tests where the performance on both paper and online modes was poor, it would be difficult to ascertain whether additional items would be flagged for performance differences.

Factor analyses results were impacted by the lack of common items shared between modes, particularly for the full summative forms. Additionally, item attrition further exacerbated the issue whereby very few PBA, EOY, and full summative forms had sufficient numbers of items to reliably identify factor structures associated with the data. A re-analysis using operational data from motivated test takers is warranted.

Lastly, the analysis of uniform and nonuniform DIF utilized the classification rules based on difference of Nagelkerke's R^2 . Though these classification rules have been applied to dichotomously scored items, research is needed to determine its applicability to polytomous items.

References

- American Educational Research Association, American Psychological Association, and the National Council on Measurement in Education. (2014). *Standards for educational and psychological testing*. Washington, DC: American Educational Research Association.
- Beauducel, A., & Herzberg, P.Y. (2006). On the performance of maximum likelihood versus means and variance adjusted weighted least squares estimation in CFA. *Structural Equation Modeling, 13*, 186-203.
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Erlbaum.
- Dorans, N. J., & Holland, P.W. (1993). DIF detection and description: Mantel-Haenszel and standardization. In P. W. Holland & H. Wainer (Eds.), *Differential item functioning* (pp.35-66). Hillsdale, NJ: Erlbaum.
- Dorans, N. J., & Schmitt, A. P. (1991). Constructed response and differential item functioning: A pragmatic approach. (Research Report No. 91-47). Princeton, NJ: Educational Testing Service.
- Educational Testing Service. (2002). *ETS standards for quality and fairness*. Princeton, NJ: Author.
- Falster, D.S., Warton, D. I., & Wright, I. J. (2006). *Standardized major axis tests and routines (SMATR)*. Version 2.0 [Computer software]. New South Wales, Australia.
<http://www.bio.mq.edu.au/ecology/SMATR/>
- Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling, 6*, 1-55.
- Little, T. D., & Slegers, D. W. (2005). Factor analysis: Multiple groups. In B. S. Everitt & D. C. Howell, *Encyclopedia of Statistics in Behavioral Science*, Volume 2 (pp. 617–623). New York, NY: Wiley
- Mantel, N., & Haenszel, W. (1959). Statistical aspects of the analysis of data from retrospective studies of disease. *Journal of the National Cancer Institute, 22*, 719-748.
- Muthén B. O., & Muthén, L. K. (2007). *Mplus 5* [Computer program]. Los Angeles, CA: Authors.
- Muraki, E., & Bock, R. D. (2003). *PARSCALE: IRT item analysis and test scoring for rating-scale data* (Version 4.1). Chicago, IL: Scientific Software International.
- Niklas, K. J. (1994). *Plant allometry: The scaling of form and process*. Chicago, IL: [The University of Chicago Press](#).

- PARCC. (n.d.). *ELA/Literacy form specifications: Grades 3 -5*. Retrieved from <http://www.parcconline.org/sites/parcc/files/PARCC%20Grades%203-5%20ELA%20Literacy%20Combined%20Common%20Form%20Specifications.pdf>
- PARCC. (2014). *ELA/Literacy form specifications: Grades 6 -8*. Retrieved from <http://www.parcconline.org/sites/parcc/files/ParccGrades6-8ELALiteracyCommonFormsSpecifications-Updated11-2014.pdf>
- PARCC. (2014). *ELA/Literacy form specifications: Grades 9 -11*. Retrieved from <http://www.parcconline.org/sites/parcc/files/ParccGrades9-11ELALiteracyCommonFormsSpecifications-Updated11-2014.pdf>
- PARCC. (2013). *Mathematics high level blueprint*. Retrieved from <http://www.parcconline.org/sites/parcc/files/PARCCHighLevelBlueprints-Mathematics043013.pdf>
- Rosenbaum, P. R, & Rubin, B. B. (1985). Constructing a control group using multivariate matched sampling methods that incorporate the propensity score. *American Statistician*, 39, 33-38.
- von Davier, M. (2007). Software for multidimensional discrete latent trait models (mdltn). Princeton, NJ: Educational Testing Service.
- Wan, L., Keng, L., McClarty, K., & Davis, L. (2009). Methods of comparability studies for computerized and paper-based tests (Pearson's Test Measurement & Research Services Bulletin 12-09). retrieved from http://pearsonassessments.com/NR/rdonlyres/7955109E-6724-4EC8-A25F-375FBE360D5F/0/Bulletin_10.pdf.
- Wilks, S. S. (1938). The Large-Sample Distribution of the Likelihood Ratio for Testing Composite Hypotheses. *The Annals of mathematical Statistics*, 9, 60-62.

Appendix A

Table A.1 Distribution of Socio-Economic Status by Grade Level for ELA/Literacy PBA Assessments

Test	Form Type	Test Mode	Student Count	Eligibility Status for School Food Service Programs					
				Free	Reduced Price	Full Price	Other	Blank	Total
ELA03	PBA	CBT	Total	1565	234	1830	536	.	4165
			%	37.58	5.62	43.94	12.87	.	
	PBT	Total	2224	266	2855	1192	269	6806	
		%	32.68	3.91	41.95	17.51	3.95		
ELA04	PBA	CBT	Total	978	129	1194	280	.	2581
			%	37.89	5.00	46.26	10.85	.	
	PBT	Total	1973	284	2311	1168	216	5952	
		%	33.15	4.77	38.83	19.62	3.63		
ELA05	PBA	CBT	Total	1362	201	1622	430	.	3615
			%	37.68	5.56	44.87	11.89	.	
	PBT	Total	2253	269	2785	1117	427	6851	
		%	32.89	3.93	40.65	16.30	6.23		
ELA06	PBA	CBT	Total	1110	204	1139	335	.	2788
			%	39.81	7.32	40.85	12.02	.	
	PBT	Total	2776	354	3332	1826	471	8759	
		%	31.69	4.04	38.04	20.85	5.38		
ELA07	PBA	CBT	Total	2610	344	3003	830	.	6787
			%	38.46	5.07	44.25	12.23	.	
	PBT	Total	2877	405	3454	1036	390	8162	
		%	35.25	4.96	42.32	12.69	4.78		
ELA08	PBA	CBT	Total	2852	430	3827	1247	.	8356
			%	34.13	5.15	45.80	14.92	.	
	PBT	Total	2390	322	2746	551	368	6377	
		%	37.48	5.05	43.06	8.64	5.77		
ELA09	PBA	CBT	Total	1228	171	1906	830	.	4135
			%	29.70	4.14	46.09	20.07	.	
	PBT	Total	1321	204	1881	856	312	4574	
		%	28.88	4.46	41.12	18.71	6.82		
ELA10	PBA	CBT	Total	1255	223	1688	576	.	3742
			%	33.54	5.96	45.11	15.39	.	
	PBT	Total	1292	219	1608	455	249	3823	
		%	33.80	5.73	42.06	11.90	6.51		
ELA11	PBA	CBT	Total	813	151	1529	673	.	3166
			%	25.68	4.77	48.29	21.26	.	
	PBT	Total	1116	197	1877	704	256	4150	
		%	26.89	4.75	45.23	16.96	6.17		

Table A.2 Distribution of Racial Status by Grade Level for ELA/Literacy PBA

Test	Form Type	Test Mode	Student Count	American Indian Alaska Native	Asian	Black or African American	Hispanic Latino Ethnicity	Native Hawaiian or Other Pacific Islander	White	Multiracial	Not Provided	Total
ELA03	PBA	CBT	Total	40	174	615	826	8	2415	87	.	4165
			%	0.96	4.18	14.77	19.83	0.19	57.98	2.09	.	
		PBT	Total	36	213	1273	1085	16	3955	199	29	6806
			%	0.53	3.13	18.70	15.94	0.24	58.11	2.92	0.43	
ELA04	PBA	CBT	Total	33	120	449	509	4	1431	35	.	2581
			%	1.28	4.65	17.40	19.72	0.15	55.44	1.36	.	
		PBT	Total	51	222	1126	981	9	3325	163	75	5952
			%	0.86	3.73	18.92	16.48	0.15	55.86	2.74	1.26	
ELA05	PBA	CBT	Total	27	131	601	759	8	2036	53	.	3615
			%	0.75	3.62	16.63	21.00	0.22	56.32	1.47	.	
		PBT	Total	98	208	978	1348	8	3978	103	130	6851
			%	1.43	3.04	14.28	19.68	0.12	58.06	1.50	1.90	
ELA06	PBA	CBT	Total	39	169	572	647	2	1309	50	.	2788
			%	1.40	6.06	20.52	23.21	0.07	46.95	1.79	.	
		PBT	Total	60	216	2235	1719	23	4273	151	82	8759
			%	0.69	2.47	25.52	19.63	0.26	48.78	1.72	0.94	
ELA07	PBA	CBT	Total	45	262	1224	1268	12	3875	101	.	6787
			%	0.66	3.86	18.03	18.68	0.18	57.09	1.49	.	
		PBT	Total	38	244	1830	1439	24	4385	140	62	8162
			%	0.47	2.99	22.42	17.63	0.29	53.72	1.72	0.76	
ELA08	PBA	CBT	Total	127	310	1195	1550	12	5043	119	.	8356
			%	1.52	3.71	14.30	18.55	0.14	60.35	1.42	.	
		PBT	Total	77	137	1168	1277	14	3562	104	38	6377
			%	1.21	2.15	18.32	20.03	0.22	55.86	1.63	0.60	
ELA09	PBA	CBT	Total	40	136	685	581	6	2634	53	.	4135
			%	0.97	3.29	16.57	14.05	0.15	63.70	1.28	.	
		PBT	Total	23	152	745	715	13	2705	105	116	4574
			%	0.50	3.32	16.29	15.63	0.28	59.14	2.30	2.54	
ELA10	PBA	CBT	Total	33	120	625	626	6	2287	45	.	3742
			%	0.88	3.21	16.70	16.73	0.16	61.12	1.20	.	
		PBT	Total	88	62	688	733	10	2146	53	43	3823
			%	2.30	1.62	18.00	19.17	0.26	56.13	1.39	1.12	
ELA11	PBA	CBT	Total	35	133	584	336	30	2002	46	.	3166
			%	1.11	4.20	18.45	10.61	0.95	63.23	1.45	.	
		PBT	Total	116	112	821	572	46	2400	57	26	4150
			%	2.80	2.70	19.78	13.78	1.11	57.83	1.37	0.63	



Table A.3 Distribution of English Language Classifications Status by Grade Level for ELA/Literacy PBA

Test	Form Type	Test Mode	Student Count	ELL		LEP		English Speaker		Total
				No	Yes	No	Yes	No	Yes	
ELA03	PBA	CBT	Total	3816	349	3813	352	392	3773	4165
			%	91.62	8.38	91.55	8.45	9.41	90.59	
		PBT	Total	6407	399	6385	421	540	6266	6806
			%	94.14	5.86	93.81	6.19	7.93	92.07	
ELA04	PBA	CBT	Total	2464	117	2466	115	138	2443	2581
			%	95.47	4.53	95.54	4.46	5.35	94.65	
		PBT	Total	5690	262	5666	286	326	5626	5952
			%	95.60	4.40	95.19	4.81	5.48	94.52	
ELA05	PBA	CBT	Total	3414	201	3382	233	266	3349	3615
			%	94.44	5.56	93.55	6.45	7.36	92.64	
		PBT	Total	6589	262	6603	248	285	6566	6851
			%	96.18	3.82	96.38	3.62	4.16	95.84	
ELA06	PBA	CBT	Total	2674	114	2666	122	150	2638	2788
			%	95.91	4.09	95.62	4.38	5.38	94.62	
		PBT	Total	8486	273	8349	410	430	8329	8759
			%	96.88	3.12	95.32	4.68	4.91	95.09	
ELA07	PBA	CBT	Total	6506	281	6496	291	337	6450	6787
			%	95.86	4.14	95.71	4.29	4.97	95.03	
		PBT	Total	7920	242	7910	252	276	7886	8162
			%	97.04	2.96	96.91	3.09	3.38	96.62	
ELA08	PBA	CBT	Total	8054	302	8066	290	374	7982	8356
			%	96.39	3.61	96.53	3.47	4.48	95.52	
		PBT	Total	6253	124	6275	102	131	6246	6377
			%	98.06	1.94	98.40	1.60	2.05	97.95	
ELA09	PBA	CBT	Total	4061	74	4053	82	97	4038	4135
			%	98.21	1.79	98.02	1.98	2.35	97.65	
		PBT	Total	4470	104	4497	77	123	4451	4574
			%	97.73	2.27	98.32	1.68	2.69	97.31	
ELA10	PBA	CBT	Total	3636	106	3650	92	121	3621	3742
			%	97.17	2.83	97.54	2.46	3.23	96.77	
		PBT	Total	3771	52	3793	30	57	3766	3823
			%	98.64	1.36	99.22	0.78	1.49	98.51	
ELA11	PBA	CBT	Total	3124	42	3136	30	51	3115	3166
			%	98.67	1.33	99.05	0.95	1.61	98.39	
		PBT	Total	4121	29	4116	34	44	4106	4150
			%	99.30	0.70	99.18	0.82	1.06	98.94	

Table A.4 Distribution of Students with Disabilities by Grade Level for ELA/Literacy PBA

Test	Form Type	Test Mode	Student Count	Students with Disabilities		Total
				No	Yes	
ELA03	PBA	CBT	Total	3639	526	4165
			%	87.37	12.63	
		PBT	Total	6190	616	6806
			%	90.95	9.05	
ELA04	PBA	CBT	Total	2178	403	2581
			%	84.39	15.61	
		PBT	Total	5354	598	5952
			%	89.95	10.05	
ELA05	PBA	CBT	Total	3089	526	3615
			%	85.45	14.55	
		PBT	Total	6314	537	6851
			%	92.16	7.84	
ELA06	PBA	CBT	Total	2433	355	2788
			%	87.27	12.73	
		PBT	Total	8098	661	8759
			%	92.45	7.55	
ELA07	PBA	CBT	Total	6109	678	6787
			%	90.01	9.99	
		PBT	Total	7508	654	8162
			%	91.99	8.01	
ELA08	PBA	CBT	Total	7875	481	8356
			%	94.24	5.76	
		PBT	Total	5924	453	6377
			%	92.90	7.10	
ELA09	PBA	CBT	Total	3715	420	4135
			%	89.84	10.16	
		PBT	Total	4286	288	4574
			%	93.70	6.30	
ELA10	PBA	CBT	Total	3371	371	3742
			%	90.09	9.91	
		PBT	Total	3606	217	3823
			%	94.32	5.68	
ELA11	PBA	CBT	Total	2924	242	3166
			%	92.36	7.64	
		PBT	Total	3892	258	4150
			%	93.78	6.22	

Table A.5 Distribution of Socio-Economic Status by Grade Level for ELA/Literacy EOY Assessments

Test	Form Type	Test Mode	Student Count	Eligibility Status for School Food Service Programs					
				Free	Reduced Price	Full Price	Other	Blank	Total
ELA03	EOY	CBT	Total	4299	454	5173	2023	.	11949
			%	35.98	3.80	43.29	16.93	.	
		PBT	Total	2602	300	2925	1080	457	7364
			%	35.33	4.07	39.72	14.67	6.21	
ELA04	EOY	CBT	Total	3426	424	4542	1299	.	9691
			%	35.35	4.38	46.87	13.40	.	
		PBT	Total	2235	327	2840	936	374	6712
			%	33.30	4.87	42.31	13.95	5.57	
ELA05	EOY	CBT	Total	2700	339	2945	880	.	6864
			%	39.34	4.94	42.91	12.82	.	
		PBT	Total	2203	228	2038	857	386	5712
			%	38.57	3.99	35.68	15.00	6.76	
ELA06	EOY	CBT	Total	3229	489	3728	2356	.	9802
			%	32.94	4.99	38.03	24.04	.	
		PBT	Total	2443	244	2358	1385	327	6757
			%	36.16	3.61	34.90	20.50	4.84	
ELA07	EOY	CBT	Total	3007	464	3450	1570	.	8491
			%	35.41	5.46	40.63	18.49	.	
		PBT	Total	2180	319	2743	839	361	6442
			%	33.84	4.95	42.58	13.02	5.60	
ELA08	EOY	CBT	Total	1557	268	1791	600	.	4216
			%	36.93	6.36	42.48	14.23	.	
		PBT	Total	919	142	1033	322	178	2594
			%	35.43	5.47	39.82	12.41	6.86	
ELA09	EOY	CBT	Total	1705	245	2455	926	.	5331
			%	31.98	4.60	46.05	17.37	.	
		PBT	Total	1936	277	2456	650	323	5642
			%	34.31	4.91	43.53	11.52	5.72	
ELA10	EOY	CBT	Total	1523	250	2547	849	.	5169
			%	29.46	4.84	49.27	16.42	.	
		PBT	Total	1253	234	2154	480	218	4339
			%	28.88	5.39	49.64	11.06	5.02	
ELA11	EOY	CBT	Total	1253	208	2053	697	.	4211
			%	29.76	4.94	48.75	16.55	.	
		PBT	Total	807	143	1282	459	231	2922
			%	27.62	4.89	43.87	15.71	7.91	



Table A. 6 Distribution of Racial Status by Grade Level for ELA/Literacy EOY Assessments

Test	Form Type	Test Mode	Student Count	American Indian Alaska Native	Asian	Black or African American	Hispanic Latino Ethnicity	Native Hawaiian or Other Pacific Islander	White	Multiracial	Not Provided	Total
ELA03	EOY	CBT	Total	48	504	2423	2195	34	6410	335	.	11949
			%	0.40	4.22	20.28	18.37	0.28	53.64	2.80	.	
		PBT	Total	46	259	1452	1248	8	4065	218	68	7364
			%	0.62	3.52	19.72	16.95	0.11	55.20	2.96	0.92	
ELA04	EOY	CBT	Total	132	487	2201	1833	13	4763	262	.	9691
			%	1.36	5.03	22.71	18.91	0.13	49.15	2.70	.	
		PBT	Total	86	290	1417	1039	10	3572	189	109	6712
			%	1.28	4.32	21.11	15.48	0.15	53.22	2.82	1.62	
ELA05	EOY	CBT	Total	62	253	1220	1307	13	3881	128	.	6864
			%	0.90	3.69	17.77	19.04	0.19	56.54	1.86	.	
		PBT	Total	49	176	1021	1239	5	3030	102	90	5712
			%	0.86	3.08	17.87	21.69	0.09	53.05	1.79	1.58	
ELA06	EOY	CBT	Total	43	390	2635	2055	18	4484	177	.	9802
			%	0.44	3.98	26.88	20.97	0.18	45.75	1.81	.	
		PBT	Total	58	177	1760	1339	16	3213	121	73	6757
			%	0.86	2.62	26.05	19.82	0.24	47.55	1.79	1.08	
ELA07	EOY	CBT	Total	32	292	2060	1351	5	4554	197	.	8491
			%	0.38	3.44	24.26	15.91	0.06	53.63	2.32	.	
		PBT	Total	37	242	1472	969	4	3558	111	49	6442
			%	0.57	3.76	22.85	15.04	0.06	55.23	1.72	0.76	
ELA08	EOY	CBT	Total	49	161	675	683	5	2589	54	.	4216
			%	1.16	3.82	16.01	16.20	0.12	61.41	1.28	.	
		PBT	Total	15	64	460	492	8	1463	52	40	2594
			%	0.58	2.47	17.73	18.97	0.31	56.40	2.00	1.54	
ELA09	EOY	CBT	Total	128	172	962	752	13	3212	92	.	5331
			%	2.40	3.23	18.05	14.11	0.24	60.25	1.73	.	
		PBT	Total	73	84	1273	676	6	3375	64	91	5642
			%	1.29	1.49	22.56	11.98	0.11	59.82	1.13	1.61	
ELA10	EOY	CBT	Total	89	145	652	809	17	3404	53	.	5169
			%	1.72	2.81	12.61	15.65	0.33	65.85	1.03	.	
		PBT	Total	31	108	757	506	6	2754	60	117	4339
			%	0.71	2.49	17.45	11.66	0.14	63.47	1.38	2.70	
ELA11	EOY	CBT	Total	61	146	796	596	14	2543	55	.	4211
			%	1.45	3.47	18.90	14.15	0.33	60.39	1.31	.	
		PBT	Total	28	84	480	400	43	1806	38	43	2922
			%	0.96	2.87	16.43	13.69	1.47	61.81	1.30	1.47	

Table A.7 Distribution of English Language Classifications Status by Grade Level for ELA/Literacy EOY Assessments

Test	Form Type	Test Mode	Student Count	ELL		LEP		English Speaker		Total
				No	Yes	No	Yes	No	Yes	
ELA03	EOY	CBT	Total	11406	543	11112	837	896	11053	11949
			%	95.46	4.54	93.00	7.00	7.50	92.50	
	PBT	Total	6956	408	6883	481	549	6815	7364	
		%	94.46	5.54	93.47	6.53	7.46	92.54		
ELA04	EOY	CBT	Total	9333	358	9171	520	552	9139	9691
			%	96.31	3.69	94.63	5.37	5.70	94.30	
	PBT	Total	6480	232	6439	273	309	6403	6712	
		%	96.54	3.46	95.93	4.07	4.60	95.40		
ELA05	EOY	CBT	Total	6527	337	6546	318	359	6505	6864
			%	95.09	4.91	95.37	4.63	5.23	94.77	
	PBT	Total	5385	327	5423	289	353	5359	5712	
		%	94.28	5.72	94.94	5.06	6.18	93.82		
ELA06	EOY	CBT	Total	9563	239	9428	374	399	9403	9802
			%	97.56	2.44	96.18	3.82	4.07	95.93	
	PBT	Total	6604	153	6479	278	302	6455	6757	
		%	97.74	2.26	95.89	4.11	4.47	95.53		
ELA07	EOY	CBT	Total	8309	182	8209	282	324	8167	8491
			%	97.86	2.14	96.68	3.32	3.82	96.18	
	PBT	Total	6306	136	6286	156	172	6270	6442	
		%	97.89	2.11	97.58	2.42	2.67	97.33		
ELA08	EOY	CBT	Total	4103	113	4099	117	133	4083	4216
			%	97.32	2.68	97.22	2.78	3.15	96.85	
	PBT	Total	2543	51	2532	62	65	2529	2594	
		%	98.03	1.97	97.61	2.39	2.51	97.49		
ELA09	EOY	CBT	Total	5260	71	5265	66	83	5248	5331
			%	98.67	1.33	98.76	1.24	1.56	98.44	
	PBT	Total	5546	96	5578	64	108	5534	5642	
		%	98.30	1.70	98.87	1.13	1.91	98.09		
ELA10	EOY	CBT	Total	5123	46	5134	35	52	5117	5169
			%	99.11	0.89	99.32	0.68	1.01	98.99	
	PBT	Total	4278	61	4309	30	64	4275	4339	
		%	98.59	1.41	99.31	0.69	1.47	98.53		
ELA11	EOY	CBT	Total	4144	67	4138	73	75	4136	4211
			%	98.41	1.59	98.27	1.73	1.78	98.22	
	PBT	Total	2886	36	2888	34	44	2878	2922	
		%	98.77	1.23	98.84	1.16	1.51	98.49		

Table A.8 Distribution of Students with Disabilities by Grade Level for ELA/Literacy EOY Assessments

Test	Form Type	Test Mode	Student Count	Students with Disabilities		Total
				No	Yes	
ELA03	EOY	CBT	Total	10822	1127	11949
			%	90.57	9.43	
		PBT	Total	6696	668	7364
			%	90.93	9.07	
ELA04	EOY	CBT	Total	8775	916	9691
			%	90.55	9.45	
		PBT	Total	6129	583	6712
			%	91.31	8.69	
ELA05	EOY	CBT	Total	6290	574	6864
			%	91.64	8.36	
		PBT	Total	5237	475	5712
			%	91.68	8.32	
ELA06	EOY	CBT	Total	8790	1012	9802
			%	89.68	10.32	
		PBT	Total	6213	544	6757
			%	91.95	8.05	
ELA07	EOY	CBT	Total	7725	766	8491
			%	90.98	9.02	
		PBT	Total	5976	466	6442
			%	92.77	7.23	
ELA08	EOY	CBT	Total	3811	405	4216
			%	90.39	9.61	
		PBT	Total	2337	257	2594
			%	90.09	9.91	
ELA09	EOY	CBT	Total	4876	455	5331
			%	91.47	8.53	
		PBT	Total	5261	381	5642
			%	93.25	6.75	
ELA10	EOY	CBT	Total	4812	357	5169
			%	93.09	6.91	
		PBT	Total	4096	243	4339
			%	94.40	5.60	
ELA11	EOY	CBT	Total	3935	276	4211
			%	93.45	6.55	
		PBT	Total	2748	174	2922
			%	94.05	5.95	

Table A.9 Distribution of Socio-Economic Status by Grade Level for ELA/Literacy Full Summative Assessments

Test	Form Type	Test Mode	Student Count	Eligibility Status for School Food Service Programs					Total
				Free	Reduced Price	Full Price	Other	Blank	
ELA03	FS	CBT	Total	487	44	752	306	.	1589
			%	30.65	2.77	47.33	19.26	.	
	PBT	Total	501	76	629	262	2	1470	
		%	34.08	5.17	42.79	17.82	0.14		
ELA04	FS	CBT	Total	414	64	647	241	.	1366
			%	30.31	4.69	47.36	17.64	.	
	PBT	Total	556	75	607	242	1	1481	
		%	37.54	5.06	40.99	16.34	0.07		
ELA05	FS	CBT	Total	451	55	572	157	.	1235
			%	36.52	4.45	46.32	12.71	.	
	PBT	Total	609	67	559	114	4	1353	
		%	45.01	4.95	41.32	8.43	0.30		
ELA06	FS	CBT	Total	474	70	622	403	.	1569
			%	30.21	4.46	39.64	25.69	.	
	PBT	Total	654	74	775	529	.	2032	
		%	32.19	3.64	38.14	26.03	.		
ELA07	FS	CBT	Total	400	63	480	259	.	1202
			%	33.28	5.24	39.93	21.55	.	
	PBT	Total	579	78	541	345	1	1544	
		%	37.50	5.05	35.04	22.34	0.06		
ELA08	FS	CBT	Total	309	48	403	115	.	875
			%	35.31	5.49	46.06	13.14	.	
	PBT	Total	380	58	396	249	2	1085	
		%	35.02	5.35	36.50	22.95	0.18		
ELA09	FS	CBT	Total	255	41	481	190	.	967
			%	26.37	4.24	49.74	19.65	.	
	PBT	Total	156	86	578	90	8	918	
		%	16.99	9.37	62.96	9.80	0.87		
ELA10	FS	CBT	Total	189	36	316	131	.	672
			%	28.13	5.36	47.02	19.49	.	
	PBT	Total	306	60	486	91	.	943	
		%	32.45	6.36	51.54	9.65	.		
ELA11	FS	CBT	Total	221	39	462	134	.	856
			%	25.82	4.56	53.97	15.65	.	
	PBT	Total	279	57	420	155	.	911	
		%	30.63	6.26	46.10	17.01	.		

Table A.10 Distribution of Racial Status by Grade Level for ELA/Literacy Full Summative Assessments

Test	Form Type	Test Mode	Student Count	American Indian Alaska Native	Asian	Black or African American	Hispanic Latino Ethnicity	Native Hawaiian or Other Pacific Islander	White	Multiracial	Not Provided	Total
ELA03	FS	CBT	Total	8	76	296	291	4	874	40	.	1589
			%	0.50	4.78	18.63	18.31	0.25	55.00	2.52	.	
		PBT	Total	5	45	315	145	3	919	38	.	1470
			%	0.34	3.06	21.43	9.86	0.20	62.52	2.59	.	
ELA04	FS	CBT	Total	9	83	296	216	1	711	50	.	1366
			%	0.66	6.08	21.67	15.81	0.07	52.05	3.66	.	
		PBT	Total	25	59	372	179	.	807	39	.	1481
			%	1.69	3.98	25.12	12.09	.	54.49	2.63	.	
ELA05	FS	CBT	Total	8	37	204	248	5	701	32	.	1235
			%	0.65	3.00	16.52	20.08	0.40	56.76	2.59	.	
		PBT	Total	12	47	237	300	1	736	17	3	1353
			%	0.89	3.47	17.52	22.17	0.07	54.40	1.26	0.22	
ELA06	FS	CBT	Total	7	58	390	367	4	712	31	.	1569
			%	0.45	3.70	24.86	23.39	0.25	45.38	1.98	.	
		PBT	Total	10	50	544	388	5	1011	24	.	2032
			%	0.49	2.46	26.77	19.09	0.25	49.75	1.18	.	
ELA07	FS	CBT	Total	4	54	292	200	.	627	25	.	1202
			%	0.33	4.49	24.29	16.64	.	52.16	2.08	.	
		PBT	Total	4	54	446	276	.	752	12	.	1544
			%	0.26	3.50	28.89	17.88	.	48.70	0.78	.	
ELA08	FS	CBT	Total	5	59	126	178	2	485	20	.	875
			%	0.57	6.74	14.40	20.34	0.23	55.43	2.29	.	
		PBT	Total	4	8	140	173	.	740	20	.	1085
			%	0.37	0.74	12.90	15.94	.	68.20	1.84	.	
ELA09	FS	CBT	Total	18	27	116	110	3	676	17	.	967
			%	1.86	2.79	12.00	11.38	0.31	69.91	1.76	.	
		PBT	Total	1	17	118	90	1	676	14	1	918
			%	0.11	1.85	12.85	9.80	0.11	73.64	1.53	0.11	
ELA10	FS	CBT	Total	10	22	72	122	4	436	6	.	672
			%	1.49	3.27	10.71	18.15	0.60	64.88	0.89	.	
		PBT	Total	7	21	142	158	2	597	16	.	943
			%	0.74	2.23	15.06	16.76	0.21	63.31	1.70	.	
ELA11	FS	CBT	Total	14	38	122	128	4	542	8	.	856
			%	1.64	4.44	14.25	14.95	0.47	63.32	0.93	.	
		PBT	Total	10	24	145	122	14	582	14	.	911
			%	1.10	2.63	15.92	13.39	1.54	63.89	1.54	.	

Table A.11 Distribution of English Language Classifications Status by Grade Level for ELA/Literacy Full Summative Assessments

				ELL		LEP		English Speaker		
Test	Form Type	Test Mode	Student Count	No	Yes	No	Yes	No	Yes	Total
ELA03	FS	CBT	Total	1515	74	1470	119	124	1465	1589
			%	95.34	4.66	92.51	7.49	7.80	92.20	
		PBT	Total	1426	44	1407	63	78	1392	1470
			%	97.01	2.99	95.71	4.29	5.31	94.69	
ELA04	FS	CBT	Total	1330	36	1303	63	66	1300	1366
			%	97.36	2.64	95.39	4.61	4.83	95.17	
		PBT	Total	1442	39	1417	64	70	1411	1481
			%	97.37	2.63	95.68	4.32	4.73	95.27	
ELA05	FS	CBT	Total	1183	52	1183	52	56	1179	1235
			%	95.79	4.21	95.79	4.21	4.53	95.47	
		PBT	Total	1289	64	1289	64	67	1286	1353
			%	95.27	4.73	95.27	4.73	4.95	95.05	
ELA06	FS	CBT	Total	1533	36	1509	60	62	1507	1569
			%	97.71	2.29	96.18	3.82	3.95	96.05	
		PBT	Total	1985	47	1917	115	117	1915	2032
			%	97.69	2.31	94.34	5.66	5.76	94.24	
ELA07	FS	CBT	Total	1176	26	1162	40	47	1155	1202
			%	97.84	2.16	96.67	3.33	3.91	96.09	
		PBT	Total	1518	26	1510	34	40	1504	1544
			%	98.32	1.68	97.80	2.20	2.59	97.41	
ELA08	FS	CBT	Total	844	31	846	29	40	835	875
			%	96.46	3.54	96.69	3.31	4.57	95.43	
		PBT	Total	1061	24	1058	27	28	1057	1085
			%	97.79	2.21	97.51	2.49	2.58	97.42	
ELA09	FS	CBT	Total	957	10	958	9	11	956	967
			%	98.97	1.03	99.07	0.93	1.14	98.86	
		PBT	Total	889	29	911	7	29	889	918
			%	96.84	3.16	99.24	0.76	3.16	96.84	
ELA10	FS	CBT	Total	669	3	670	2	3	669	672
			%	99.55	0.45	99.70	0.30	0.45	99.55	
		PBT	Total	932	11	933	10	13	930	943
			%	98.83	1.17	98.94	1.06	1.38	98.62	
ELA11	FS	CBT	Total	845	11	844	12	12	844	856
			%	98.71	1.29	98.60	1.40	1.40	98.60	
		PBT	Total	906	5	903	8	8	903	911
			%	99.45	0.55	99.12	0.88	0.88	99.12	

Table A.12 Distribution of Students with Disabilities by Grade Level for ELA/Literacy Full Summative Assessments

Test	Form Type	Test Mode	Student Count	Students with Disabilities		Total
				No	Yes	
ELA03	FS	CBT	Total	1485	104	1589
			%	93.46	6.54	
		PBT	Total	1355	115	1470
			%	92.18	7.82	
ELA04	FS	CBT	Total	1286	80	1366
			%	94.14	5.86	
		PBT	Total	1369	112	1481
			%	92.44	7.56	
ELA05	FS	CBT	Total	1144	91	1235
			%	92.63	7.37	
		PBT	Total	1264	89	1353
			%	93.42	6.58	
ELA06	FS	CBT	Total	1455	114	1569
			%	92.73	7.27	
		PBT	Total	1892	140	2032
			%	93.11	6.89	
ELA07	FS	CBT	Total	1116	86	1202
			%	92.85	7.15	
		PBT	Total	1475	69	1544
			%	95.53	4.47	
ELA08	FS	CBT	Total	816	59	875
			%	93.26	6.74	
		PBT	Total	1029	56	1085
			%	94.84	5.16	
ELA09	FS	CBT	Total	889	78	967
			%	91.93	8.07	
		PBT	Total	881	37	918
			%	95.97	4.03	
ELA10	FS	CBT	Total	631	41	672
			%	93.90	6.10	
		PBT	Total	914	29	943
			%	96.92	3.08	
ELA11	FS	CBT	Total	810	46	856
			%	94.63	5.37	
		PBT	Total	887	24	911
			%	97.37	2.63	

Table A.13 Distribution of Socio-Economic Status by Grade Level for Mathematics PBA

Test	Form Type	Test Mode	Student Count	Eligibility Status for School Food Service Programs					Total
				Free	Reduced Price	Full Price	Other	Blank	
MAT03	PBA	CBT	Total	4047	481	4536	2007	.	11071
			%	36.55	4.34	40.97	18.13	.	
		PBT	Total	3187	368	3567	2376	408	9906
			%	32.17	3.71	36.01	23.99	4.12	
MAT04	PBA	CBT	Total	3842	442	4019	1491	.	9794
			%	39.23	4.51	41.04	15.22	.	
		PBT	Total	3298	371	3650	2183	626	10128
			%	32.56	3.66	36.04	21.55	6.18	
MAT05	PBA	CBT	Total	3521	455	3866	647	.	8489
			%	41.48	5.36	45.54	7.62	.	
		PBT	Total	2428	321	2786	880	418	6833
			%	35.53	4.70	40.77	12.88	6.12	
MAT06	PBA	CBT	Total	3671	545	4442	1642	.	10300
			%	35.64	5.29	43.13	15.94	.	
		PBT	Total	2714	329	3489	1839	483	8854
			%	30.65	3.72	39.41	20.77	5.46	
MAT07	PBA	CBT	Total	3664	504	4237	1315	.	9720
			%	37.70	5.19	43.59	13.53	.	
		PBT	Total	3284	473	4028	1337	476	9598
			%	34.22	4.93	41.97	13.93	4.96	
MAT08	PBA	CBT	Total	3134	485	3656	766	.	8041
			%	38.98	6.03	45.47	9.53	.	
		PBT	Total	2402	418	2808	597	368	6593
			%	36.43	6.34	42.59	9.06	5.58	
ALG01	PBA	CBT	Total	2097	312	2555	751	.	5715
			%	36.69	5.46	44.71	13.14	.	
		PBT	Total	1424	207	2352	600	176	4759
			%	29.92	4.35	49.42	12.61	3.70	
ALG02	PBA	CBT	Total	1342	227	2360	800	.	4729
			%	28.38	4.80	49.90	16.92	.	
		PBT	Total	810	129	1631	774	215	3559
			%	22.76	3.62	45.83	21.75	6.04	
GEO	PBA	CBT	Total	1948	254	2750	1081	.	6033
			%	32.29	4.21	45.58	17.92	.	
		PBT	Total	1342	200	2018	1128	234	4922
			%	27.27	4.06	41.00	22.92	4.75	

Table A.13 Distribution of Socio-Economic Status by Grade Level for Mathematics PBA (Cont'd)

				Eligibility Status for School Food Service Programs					
Test	Form Type	Test Mode	Student Count	Free	Reduced Price	Full Price	Other	Blank	Total
MAT1I	PBA	CBT	Total	201	88	565	497	.	1351
			%	14.88	6.51	41.82	36.79	.	
		PBT	Total	48	11	180	229	18	486
			%	9.88	2.26	37.04	47.12	3.70	
MAT2I	PBA	CBT	Total	267	50	329	650	.	1296
			%	20.60	3.86	25.39	50.15	.	
		PBT	Total	62	13	90	115	16	296
			%	20.95	4.39	30.41	38.85	5.41	
MAT3I	PBA	CBT	Total	265	40	415	448	.	1168
			%	22.69	3.42	35.53	38.36	.	
		PBT	Total	44	8	179	116	14	361
			%	12.19	2.22	49.58	32.13	3.88	

Table A.14 Distribution of Racial Status by Grade Level for Mathematics PBA

Test	Form Type	Test Mode	Student Count	American Indian Alaska Native	Asian	Black or African American	Hispanic Latino Ethnicity	Native Hawaiian or Other Pacific Islander	White	Multiracial	Not Provided	Total
MAT03	PBA	CBT	Total	74	541	2491	2055	18	5615	277	.	11071
			%	0.67	4.89	22.50	18.56	0.16	50.72	2.50	.	
		PBT	Total	137	370	1950	1756	26	5434	172	61	9906
			%	1.38	3.74	19.69	17.73	0.26	54.86	1.74	0.62	
MAT04	PBA	CBT	Total	47	389	2289	1447	19	5333	270	.	9794
			%	0.48	3.97	23.37	14.77	0.19	54.45	2.76	.	
		PBT	Total	141	357	1922	1692	10	5659	241	106	10128
			%	1.39	3.52	18.98	16.71	0.10	55.87	2.38	1.05	
MAT05	PBA	CBT	Total	99	340	1648	1218	11	5031	142	.	8489
			%	1.17	4.01	19.41	14.35	0.13	59.26	1.67	.	
		PBT	Total	99	177	1183	1325	8	3801	126	114	6833
			%	1.45	2.59	17.31	19.39	0.12	55.63	1.84	1.67	
MAT06	PBA	CBT	Total	90	415	2150	1576	22	5801	246	.	10300
			%	0.87	4.03	20.87	15.30	0.21	56.32	2.39	.	
		PBT	Total	72	295	1857	1576	10	4665	164	215	8854
			%	0.81	3.33	20.97	17.80	0.11	52.69	1.85	2.43	
MAT07	PBA	CBT	Total	54	294	2211	1440	13	5501	207	.	9720
			%	0.56	3.02	22.75	14.81	0.13	56.59	2.13	.	
		PBT	Total	81	241	2154	1670	11	5073	185	183	9598
			%	0.84	2.51	22.44	17.40	0.11	52.85	1.93	1.91	
MAT08	PBA	CBT	Total	30	260	1388	1388	8	4896	71	.	8041
			%	0.37	3.23	17.26	17.26	0.10	60.89	0.88	.	
		PBT	Total	37	160	1285	1237	7	3688	92	87	6593
			%	0.56	2.43	19.49	18.76	0.11	55.94	1.40	1.32	
ALG01	PBA	CBT	Total	26	152	1069	802	9	3590	67	.	5715
			%	0.45	2.66	18.71	14.03	0.16	62.82	1.17	.	
		PBT	Total	70	103	659	795	3	3053	40	36	4759
			%	1.47	2.16	13.85	16.71	0.06	64.15	0.84	0.76	
ALG02	PBA	CBT	Total	23	143	739	527	10	3228	59	.	4729
			%	0.49	3.02	15.63	11.14	0.21	68.26	1.25	.	
		PBT	Total	10	111	558	571	5	2223	54	27	3559
			%	0.28	3.12	15.68	16.04	0.14	62.46	1.52	0.76	
GEO	PBA	CBT	Total	54	182	1048	768	5	3907	69	.	6033
			%	0.90	3.02	17.37	12.73	0.08	64.76	1.14	.	
		PBT	Total	21	159	918	716	10	2959	73	66	4922
			%	0.43	3.23	18.65	14.55	0.20	60.12	1.48	1.34	

Table A.14 Distribution of Racial Status by Grade Level for Mathematics PBA (Cont'd)

Test	Form Type	Test Mode	Student Count	American Indian Alaska Native	Asian	Black or African American	Hispanic Latino Ethnicity	Native Hawaiian or Other Pacific Islander	White	Multiracial	Not Provided	Total
MAT1I	PBA	CBT	Total	62	30	87	121	.	1022	29	.	1351
			%	4.59	2.22	6.44	8.96	.	75.65	2.15	.	
		PBT	Total	1	15	28	20	.	405	13	4	486
			%	0.21	3.09	5.76	4.12	.	83.33	2.67	0.82	
MAT2I	PBA	CBT	Total	19	13	111	118	.	1018	17	.	1296
			%	1.47	1.00	8.56	9.10	.	78.55	1.31	.	
		PBT	Total	.	1	62	7	.	220	5	1	296
			%	.034	0.34	20.95	2.36	.	74.32	1.69	0.34	
MAT3I	PBA	CBT	Total	4	46	124	165	1	805	23	.	1168
			%	0.34	3.94	10.62	14.13	0.09	68.92	1.97	.	
		PBT	Total	1	13	38	19	.	273	14	3	361
			%	0.28	3.60	10.53	5.26	.	75.62	3.88	0.83	

Table A.15 Distribution of English Language Classifications Status by Grade Level for Mathematics PBA

Test	Form Type	Test Mode	Student Count	ELL		LEP		English Speaker		Total
				No	Yes	No	Yes	No	Yes	
MAT03	PBA	CBT	Total	10440	631	10212	859	973	10098	11071
			%	94.30	5.70	92.24	7.76	8.79	91.21	
		PBT	Total	9393	513	9123	783	831	9075	9906
			%	94.82	5.18	92.10	7.90	8.39	91.61	
MAT04	PBA	CBT	Total	9459	335	9387	407	454	9340	9794
			%	96.58	3.42	95.84	4.16	4.64	95.36	
		PBT	Total	9747	381	9747	381	454	9674	10128
			%	96.24	3.76	96.24	3.76	4.48	95.52	
MAT05	PBA	CBT	Total	8149	340	8188	301	357	8132	8489
			%	95.99	4.01	96.45	3.55	4.21	95.79	
		PBT	Total	6598	235	6648	185	262	6571	6833
			%	96.56	3.44	97.29	2.71	3.83	96.17	
MAT06	PBA	CBT	Total	10064	236	10034	266	314	9986	10300
			%	97.71	2.29	97.42	2.58	3.05	96.95	
		PBT	Total	8645	209	8614	240	280	8574	8854
			%	97.64	2.36	97.29	2.71	3.16	96.84	
MAT07	PBA	CBT	Total	9576	144	9552	168	201	9519	9720
			%	98.52	1.48	98.27	1.73	2.07	97.93	
		PBT	Total	9324	274	9316	282	327	9271	9598
			%	97.15	2.85	97.06	2.94	3.41	96.59	
MAT08	PBA	CBT	Total	7812	229	7822	219	242	7799	8041
			%	97.15	2.85	97.28	2.72	3.01	96.99	
		PBT	Total	6373	220	6430	163	231	6362	6593
			%	96.66	3.34	97.53	2.47	3.50	96.50	
ALG01	PBA	CBT	Total	5620	95	5613	102	117	5598	5715
			%	98.34	1.66	98.22	1.78	2.05	97.95	
		PBT	Total	4681	78	4682	77	86	4673	4759
			%	98.36	1.64	98.38	1.62	1.81	98.19	
ALG02	PBA	CBT	Total	4598	131	4601	128	144	4585	4729
			%	97.23	2.77	97.29	2.71	3.05	96.95	
		PBT	Total	3478	81	3499	60	93	3466	3559
			%	97.72	2.28	98.31	1.69	2.61	97.39	
GEO	PBA	CBT	Total	5953	80	5948	85	98	5935	6033
			%	98.67	1.33	98.59	1.41	1.62	98.38	
		PBT	Total	4858	64	4865	57	80	4842	4922
			%	98.70	1.30	98.84	1.16	1.63	98.37	

Table A.15 Distribution of English Language Classifications Status by Grade Level for Mathematics PBA (Cont'd)

				ELL		LEP		English Speaker		
Test	Form Type	Test Mode	Student Count	No	Yes	No	Yes	No	Yes	Total
MAT1I	PBA	CBT	Total	1292	59	1300	51	60	1291	1351
			%	95.63	4.37	96.23	3.77	4.44	95.56	
		PBT	Total	480	6	477	9	9	477	486
			%	98.77	1.23	98.15	1.85	1.85	98.15	
MAT2I	PBA	CBT	Total	1250	46	1276	20	54	1242	1296
			%	96.45	3.55	98.46	1.54	4.17	95.83	
		PBT	Total	296	.	296	.	.	296	296
			%	100.00	.	100.00	.	.	100.00	
MAT3I	PBA	CBT	Total	1099	69	1144	24	70	1098	1168
			%	94.09	5.91	97.95	2.05	5.99	94.01	
		PBT	Total	336	25	359	2	25	336	361
			%	93.07	6.93	99.45	0.55	6.93	93.07	

Table A.16 Distribution of Students with Disabilities by Grade Level for Mathematics PBA

				Students with Disabilities		
Test	Form Type	Test Mode	Student Count	No	Yes	Total
MAT03	PBA	CBT	Total	10172	899	11071
			%	91.88	8.12	
		PBT	Total	9123	783	9906
			%	92.10	7.90	
MAT04	PBA	CBT	Total	8959	835	9794
			%	91.47	8.53	
		PBT	Total	9293	835	10128
			%	91.76	8.24	
MAT05	PBA	CBT	Total	7627	862	8489
			%	89.85	10.15	
		PBT	Total	6412	421	6833
			%	93.84	6.16	
MAT06	PBA	CBT	Total	9399	901	10300
			%	91.25	8.75	
		PBT	Total	8158	696	8854
			%	92.14	7.86	
MAT07	PBA	CBT	Total	8911	809	9720
			%	91.68	8.32	
		PBT	Total	8827	771	9598
			%	91.97	8.03	
MAT08	PBA	CBT	Total	7431	610	8041
			%	92.41	7.59	
		PBT	Total	6273	320	6593
			%	95.15	4.85	
ALG01	PBA	CBT	Total	5362	353	5715
			%	93.82	6.18	
		PBT	Total	4552	207	4759
			%	95.65	4.35	
ALG02	PBA	CBT	Total	4552	177	4729
			%	96.26	3.74	
		PBT	Total	3456	103	3559
			%	97.11	2.89	
GEO	PBA	CBT	Total	5720	313	6033
			%	94.81	5.19	
		PBT	Total	4738	184	4922
			%	96.26	3.74	

Table A.16 Distribution of Students with Disabilities by Grade Level for Mathematics PBA (Cont'd)

Test	Form Type	Test Mode	Student Count	Students with Disabilities		Total
				No	Yes	
MAT1I	PBA	CBT	Total	1175	176	1351
			%	86.97	13.03	
		PBT	Total	413	73	486
			%	84.98	15.02	
MAT2I	PBA	CBT	Total	1181	115	1296
			%	91.13	8.87	
		PBT	Total	276	20	296
			%	93.24	6.76	
MAT3I	PBA	CBT	Total	1054	114	1168
			%	90.24	9.76	
		PBT	Total	317	44	361
			%	87.81	12.19	



Table A.17 Distribution of Socio-Economic Status by Grade Level for Mathematics EOY Assessments

Test	Form Type	Test Mode	Student Count	Eligibility Status for School Food Service Programs					Total
				Free Lunch	Reduced Price Lunch	Full Price Lunch	Other	Blank	
MAT03	EOY	CBT	Total	3771	419	4757	2071	.	11018
			%	34.23	3.80	43.17	18.80	.	
	PBT	Total	3066	313	3340	1737	596	9052	
		%	33.87	3.46	36.90	19.19	6.58		
MAT04	EOY	CBT	Total	3548	408	4302	1418	.	9676
			%	36.67	4.22	44.46	14.65	.	
	PBT	Total	2981	340	3381	1357	445	8504	
		%	35.05	4.00	39.76	15.96	5.23		
MAT05	EOY	CBT	Total	3446	399	3903	574	.	8322
			%	41.41	4.79	46.90	6.90	.	
	PBT	Total	2148	335	2662	627	429	6201	
		%	34.64	5.40	42.93	10.11	6.92		
MAT06	EOY	CBT	Total	3503	507	4394	1488	.	9892
			%	35.41	5.13	44.42	15.04	.	
	PBT	Total	2196	318	3436	1545	227	7722	
		%	28.44	4.12	44.50	20.01	2.94		
MAT07	EOY	CBT	Total	3292	453	4096	1359	.	9200
			%	35.78	4.92	44.52	14.77	.	
	PBT	Total	2957	426	3358	1191	345	8277	
		%	35.73	5.15	40.57	14.39	4.17		
MAT08	EOY	CBT	Total	2879	457	3337	695	.	7368
			%	39.07	6.20	45.29	9.43	.	
	PBT	Total	2157	333	2351	826	164	5831	
		%	36.99	5.71	40.32	14.17	2.81		
ALG01	EOY	CBT	Total	2204	297	2512	792	.	5805
			%	37.97	5.12	43.27	13.64	.	
	PBT	Total	1401	188	1953	316	203	4061	
		%	34.50	4.63	48.09	7.78	5.00		
ALG02	EOY	CBT	Total	1350	198	2361	752	.	4661
			%	28.96	4.25	50.65	16.13	.	
	PBT	Total	831	158	1821	441	378	3629	
		%	22.90	4.35	50.18	12.15	10.42		
GEO	EOY	CBT	Total	1488	225	2357	894	.	4964
			%	29.98	4.53	47.48	18.01	.	
	PBT	Total	1666	236	2463	709	365	5439	
		%	30.63	4.34	45.28	13.04	6.71		



Table A.17 Distribution of Socio-Economic Status by Grade Level for Mathematics EOY Assessments (Cont'd)

Test	Form Type	Test Mode	Student Count	Eligibility Status for School Food Service Programs					Total
				Free	Reduced Price	Full Price	Other	Blank	
MAT1I	EOY	CBT	Total	407	91	531	505	.	1534
			%	26.53	5.93	34.62	32.92	.	
		PBT	Total	330	50	280	80	66	806
			%	40.94	6.20	34.74	9.93	8.19	
MAT2I	EOY	CBT	Total	359	58	316	292	.	1025
			%	35.02	5.66	30.83	28.49	.	
		PBT	Total	85	9	73	194	90	451
			%	18.85	2.00	16.19	43.02	19.96	
MAT3I	EOY	CBT	Total	176	44	227	168	.	615
			%	28.62	7.15	36.91	27.32	.	
		PBT	Total	70	13	153	69	24	329
			%	21.28	3.95	46.50	20.97	7.29	



Mode Comparability Research

Table A.18 Distribution of Racial Status by Grade Level for Mathematics EOY Assessments

Test	Form Type	Test Mode	Student Count	American Indian Alaska Native	Asian	Black or African American	Hispanic Latino Ethnicity	Native Hawaiian or Other Pacific Islander	White	Multiracial	Not Provided	Total
MAT03	EOY	CBT	Total	73	571	2388	2113	17	5578	278	.	11018
			%	0.66	5.18	21.67	19.18	0.15	50.63	2.52	.	
			PBT	Total	123	348	1735	2068	22	4408	174	174
			%	1.36	3.84	19.17	22.85	0.24	48.70	1.92	1.92	
MAT04	EOY	CBT	Total	50	418	2173	1510	24	5229	272	.	9676
			%	0.52	4.32	22.46	15.61	0.25	54.04	2.81	.	
			PBT	Total	108	326	1887	1369	11	4540	198	65
			%	1.27	3.83	22.19	16.10	0.13	53.39	2.33	0.76	
MAT05	EOY	CBT	Total	86	375	1584	1318	11	4771	177	.	8322
			%	1.03	4.51	19.03	15.84	0.13	57.33	2.13	.	
			PBT	Total	80	175	1021	1290	8	3429	95	103
			%	1.29	2.82	16.47	20.80	0.13	55.30	1.53	1.66	
MAT06	EOY	CBT	Total	81	437	1988	1499	15	5644	228	.	9892
			%	0.82	4.42	20.10	15.15	0.15	57.06	2.30	.	
			PBT	Total	109	258	1434	1351	32	4361	139	38
			%	1.41	3.34	18.57	17.50	0.41	56.48	1.80	0.49	
MAT07	EOY	CBT	Total	56	315	2111	1441	11	5064	202	.	9200
			%	0.61	3.42	22.95	15.66	0.12	55.04	2.20	.	
			PBT	Total	64	194	1752	1390	11	4561	175	130
			%	0.77	2.34	21.17	16.79	0.13	55.10	2.11	1.57	
MAT08	EOY	CBT	Total	29	244	1348	1388	7	4293	59	.	7368
			%	0.39	3.31	18.30	18.84	0.10	58.27	0.80	.	
			PBT	Total	55	120	1077	1145	2	3279	78	75
			%	0.94	2.06	18.47	19.64	0.03	56.23	1.34	1.29	
ALG01	EOY	CBT	Total	23	149	1140	911	8	3522	52	.	5805
			%	0.40	2.57	19.64	15.69	0.14	60.67	0.90	.	
			PBT	Total	48	67	630	659	1	2574	35	47
			%	1.18	1.65	15.51	16.23	0.02	63.38	0.86	1.16	
ALG02	EOY	CBT	Total	13	140	651	519	8	3263	67	.	4661
			%	0.28	3.00	13.97	11.13	0.17	70.01	1.44	.	
			PBT	Total	48	78	522	428	3	2418	55	77
			%	1.32	2.15	14.38	11.79	0.08	66.63	1.52	2.12	
GEO	EOY	CBT	Total	64	166	769	706	4	3191	64	.	4964
			%	1.29	3.34	15.49	14.22	0.08	64.28	1.29	.	
			PBT	Total	87	133	1035	765	52	3239	52	76
			%	1.60	2.45	19.03	14.07	0.96	59.55	0.96	1.40	



Mode Comparability Research

Table A.18 Distribution of Race by Grade Level for Mathematics EOY Assessments (Cont'd)

Test	Form Type	Test Mode	Student Count	American Indian Alaska Native	Asian	Black or African American	Hispanic Latino Ethnicity	Native Hawaiian or Other Pacific Islander	White	Multiracial	Not Provided	Total
MAT1I	EOY	CBT	Total	21	26	120	201	1	1132	33	.	1534
			%	1.37	1.69	7.82	13.10	0.07	73.79	2.15	.	
		PBT	Total	2	20	230	122	1	395	20	16	806
			%	0.25	2.48	28.54	15.14	0.12	49.01	2.48	1.99	
MAT2I	EOY	CBT	Total	58	6	148	109	1	686	17	.	1025
			%	5.66	0.59	14.44	10.63	0.10	66.93	1.66	.	
		PBT	Total	2	6	47	60	.	317	11	8	451
			%	0.44	1.33	10.42	13.30	.	70.29	2.44	1.77	
MAT3I	EOY	CBT	Total	3	13	31	166	.	396	6	.	615
			%	0.49	2.11	5.04	26.99	.	64.39	0.98	.	
		PBT	Total	3	5	59	16	.	232	12	2	329
			%	0.91	1.52	17.93	4.86	.	70.52	3.65	0.61	



Table A.19 Distribution of English Language Classifications Status by Grade Level for Mathematics EOY Assessments

Test	Form Type	Test Mode	Student Count	ELL		LEP		English Speaker		Total
				No	Yes	No	Yes	No	Yes	
MAT03	EOY	CBT	Total	10388	630	10143	875	988	10030	11018
			%	94.28	5.72	92.06	7.94	8.97	91.03	
		PBT	Total	8373	679	8125	927	1019	8033	9052
			%	92.50	7.50	89.76	10.24	11.26	88.74	
MAT04	EOY	CBT	Total	9313	363	9257	419	501	9175	9676
			%	96.25	3.75	95.67	4.33	5.18	94.82	
		PBT	Total	8117	387	8113	391	452	8052	8504
			%	95.45	4.55	95.40	4.60	5.32	94.68	
MAT05	EOY	CBT	Total	7992	330	8025	297	349	7973	8322
			%	96.03	3.97	96.43	3.57	4.19	95.81	
		PBT	Total	5926	275	5980	221	292	5909	6201
			%	95.57	4.43	96.44	3.56	4.71	95.29	
MAT06	EOY	CBT	Total	9681	211	9619	273	295	9597	9892
			%	97.87	2.13	97.24	2.76	2.98	97.02	
		PBT	Total	7463	259	7434	288	337	7385	7722
			%	96.65	3.35	96.27	3.73	4.36	95.64	
MAT07	EOY	CBT	Total	8994	206	9001	199	266	8934	9200
			%	97.76	2.24	97.84	2.16	2.89	97.11	
		PBT	Total	7996	281	8016	261	338	7939	8277
			%	96.61	3.39	96.85	3.15	4.08	95.92	
MAT08	EOY	CBT	Total	7128	240	7137	231	258	7110	7368
			%	96.74	3.26	96.86	3.14	3.50	96.50	
		PBT	Total	5711	120	5724	107	130	5701	5831
			%	97.94	2.06	98.16	1.84	2.23	97.77	
ALG01	EOY	CBT	Total	5707	98	5702	103	124	5681	5805
			%	98.31	1.69	98.23	1.77	2.14	97.86	
		PBT	Total	3977	84	3975	86	93	3968	4061
			%	97.93	2.07	97.88	2.12	2.29	97.71	
ALG02	EOY	CBT	Total	4526	135	4533	128	147	4514	4661
			%	97.10	2.90	97.25	2.75	3.15	96.85	
		PBT	Total	3532	97	3586	43	103	3526	3629
			%	97.33	2.67	98.82	1.18	2.84	97.16	
GEO	EOY	CBT	Total	4893	71	4880	84	91	4873	4964
			%	98.57	1.43	98.31	1.69	1.83	98.17	
		PBT	Total	5377	62	5375	64	78	5361	5439
			%	98.86	1.14	98.82	1.18	1.43	98.57	



Mode Comparability Research

Table A.19 Distribution of English Language Classifications Status by Grade Level for Mathematics EOY Assessments (Cont'd)

Test	Form Type	Test Mode	Student Count	ELL		LEP		English Speaker		Total
				No	Yes	No	Yes	No	Yes	
MAT1I	EOY	CBT	Total	1442	92	1503	31	98	1436	1534
			%	94.00	6.00	97.98	2.02	6.39	93.61	
	PBT	Total	770	36	780	26	36	770	806	
		%	95.53	4.47	96.77	3.23	4.47	95.53		
MAT2I	EOY	CBT	Total	987	38	1010	15	40	985	1025
			%	96.29	3.71	98.54	1.46	3.90	96.10	
	PBT	Total	431	20	437	14	24	427	451	
		%	95.57	4.43	96.90	3.10	5.32	94.68		
MAT3I	EOY	CBT	Total	563	52	582	33	58	557	615
			%	91.54	8.46	94.63	5.37	9.43	90.57	
	PBT	Total	300	29	329	.	29	300	329	
		%	91.19	8.81	100.00	.	8.81	91.19		

Table A.20 Distribution of Students with Disabilities by Grade Level for Mathematics EOY Assessments

Test	Form Type	Test Mode	Student Count	Students with Disabilities		Total
				No	Yes	
MAT03	EOY	CBT	Total	10142	876	11018
			%	92.05	7.95	
		PBT	Total	8305	747	9052
			%	91.75	8.25	
MAT04	EOY	CBT	Total	8847	829	9676
			%	91.43	8.57	
		PBT	Total	7750	754	8504
			%	91.13	8.87	
MAT05	EOY	CBT	Total	7476	846	8322
			%	89.83	10.17	
		PBT	Total	5804	397	6201
			%	93.60	6.40	
MAT06	EOY	CBT	Total	9012	880	9892
			%	91.10	8.90	
		PBT	Total	7060	662	7722
			%	91.43	8.57	
MAT07	EOY	CBT	Total	8436	764	9200
			%	91.70	8.30	
		PBT	Total	7498	779	8277
			%	90.59	9.41	
MAT08	EOY	CBT	Total	6778	590	7368
			%	91.99	8.01	
		PBT	Total	5438	393	5831
			%	93.26	6.74	
ALG01	EOY	CBT	Total	5453	352	5805
			%	93.94	6.06	
		PBT	Total	3835	226	4061
			%	94.43	5.57	
ALG02	EOY	CBT	Total	4484	177	4661
			%	96.20	3.80	
		PBT	Total	3539	90	3629
			%	97.52	2.48	
GEO	EOY	CBT	Total	4671	293	4964
			%	94.10	5.90	
		PBT	Total	5193	246	5439
			%	95.48	4.52	

Table A.20 Distribution of Students with Disabilities by Grade Level for Mathematics EOY Assessments (Cont'd)

				Students with Disabilities		
Test	Form Type	Test Mode	Student Count	No	Yes	Total
MAT1I	EOY	CBT	Total	1373	161	1534
			%	89.50	10.50	
		PBT	Total	765	41	806
			%	94.91	5.09	
MAT2I	EOY	CBT	Total	873	152	1025
			%	85.17	14.83	
		PBT	Total	392	59	451
			%	86.92	13.08	
MAT3I	EOY	CBT	Total	523	92	615
			%	85.04	14.96	
		PBT	Total	293	36	329
			%	89.06	10.94	

Table A.21 Distribution of Socio-Economic Status by Grade Level for Mathematics Full Summative Assessments

Test	Form Type	Test Mode	Student Count	Eligibility Status for School Food Service Programs					Total
				Free	Reduced Price	Full Price	Other	Blank	
MAT03	FS	CBT	Total	366	50	466	270	.	1152
			%	31.77	4.34	40.45	23.44	.	
		PBT	Total	495	37	591	714	1	1838
			%	26.93	2.01	32.15	38.85	0.05	
MAT04	FS	CBT	Total	389	52	424	215	.	1080
			%	36.02	4.81	39.26	19.91	.	
		PBT	Total	611	78	612	400	3	1704
			%	35.86	4.58	35.92	23.47	0.18	
MAT05	FS	CBT	Total	452	56	352	94	.	954
			%	47.38	5.87	36.90	9.85	.	
		PBT	Total	566	83	430	223	22	1324
			%	42.75	6.27	32.48	16.84	1.66	
MAT06	FS	CBT	Total	282	47	369	187	.	885
			%	31.86	5.31	41.69	21.13	.	
		PBT	Total	348	43	656	653	.	1700
			%	20.47	2.53	38.59	38.41	.	
MAT07	FS	CBT	Total	215	48	547	188	.	998
			%	21.54	4.81	54.81	18.84	.	
		PBT	Total	534	101	800	313	3	1751
			%	30.50	5.77	45.69	17.88	0.17	
MAT08	FS	CBT	Total	323	51	475	97	.	946
			%	34.14	5.39	50.21	10.25	.	
		PBT	Total	489	104	604	130	2	1329
			%	36.79	7.83	45.45	9.78	0.15	
ALG01	FS	CBT	Total	218	47	341	95	.	701
			%	31.10	6.70	48.64	13.55	.	
		PBT	Total	244	37	514	85	.	880
			%	27.73	4.20	58.41	9.66	.	
ALG02	FS	CBT	Total	206	34	446	146	.	832
			%	24.76	4.09	53.61	17.55	.	
		PBT	Total	211	39	386	146	.	782
			%	26.98	4.99	49.36	18.67	.	
GEO	FS	CBT	Total	210	31	395	128	.	764
			%	27.49	4.06	51.70	16.75	.	
		PBT	Total	318	69	509	185	.	1081
			%	29.42	6.38	47.09	17.11	.	



Mode Comparability Research

Table A.22 Distribution of Racial Status by Grade Level for Mathematics Full Summative Assessments

Test	Form Type	Test Mode	Student Count	American Indian Alaska Native	Asian	Black or African American	Hispanic Latino Ethnicity	Native Hawaiian or Other Pacific Islander	White	Multiracial	Not Provided	Total
MAT03	FS	CBT	Total	4	57	263	236	.	561	31	.	1152
			%	0.35	4.95	22.83	20.49	.	48.70	2.69	.	
		PBT	Total	12	95	414	328	2	968	19	.	1838
			%	0.65	5.17	22.52	17.85	0.11	52.67	1.03	.	
MAT04	FS	CBT	Total	2	48	229	193	3	558	47	.	1080
			%	0.19	4.44	21.20	17.87	0.28	51.67	4.35	.	
		PBT	Total	11	57	363	318	2	913	40	.	1704
			%	0.65	3.35	21.30	18.66	0.12	53.58	2.35	.	
MAT05	FS	CBT	Total	11	45	152	164	1	558	23	.	954
			%	1.15	4.72	15.93	17.19	0.10	58.49	2.41	.	
		PBT	Total	32	38	255	264	.	705	9	21	1324
			%	2.42	2.87	19.26	19.94	.	53.25	0.68	1.59	
MAT06	FS	CBT	Total	8	51	184	173	.	441	28	.	885
			%	0.90	5.76	20.79	19.55	.	49.83	3.16	.	
		PBT	Total	36	82	477	324	1	756	24	.	1700
			%	2.12	4.82	28.06	19.06	0.06	44.47	1.41	.	
MAT07	FS	CBT	Total	10	36	161	153	1	610	27	.	998
			%	1.00	3.61	16.13	15.33	0.10	61.12	2.71	.	
		PBT	Total	7	32	415	235	3	1031	28	.	1751
			%	0.40	1.83	23.70	13.42	0.17	58.88	1.60	.	
MAT08	FS	CBT	Total	4	23	113	179	.	619	8	.	946
			%	0.42	2.43	11.95	18.92	.	65.43	0.85	.	
		PBT	Total	8	12	218	245	1	833	12	.	1329
			%	0.60	0.90	16.40	18.43	0.08	62.68	0.90	.	
ALG01	FS	CBT	Total	10	24	83	133	1	442	8	.	701
			%	1.43	3.42	11.84	18.97	0.14	63.05	1.14	.	
		PBT	Total	3	15	126	171	.	563	2	.	880
			%	0.34	1.70	14.32	19.43	.	63.98	0.23	.	
ALG02	FS	CBT	Total	3	29	88	80	1	620	11	.	832
			%	0.36	3.49	10.58	9.62	0.12	74.52	1.32	.	
		PBT	Total	2	18	127	127	.	491	17	.	782
			%	0.26	2.30	16.24	16.24	.	62.79	2.17	.	
GEO	FS	CBT	Total	6	23	81	112	1	530	11	.	764
			%	0.79	3.01	10.60	14.66	0.13	69.37	1.44	.	
		PBT	Total	13	26	236	154	2	638	12	.	1081
			%	1.20	2.41	21.83	14.25	0.19	59.02	1.11	.	



Table A.23 Distribution of English Language Classifications Status by Grade Level for Mathematics Full Summative Assessments

Test	Form Type	Test Mode	Student Count	ELL		LEP		English Speaker		Total
				No	Yes	No	Yes	No	Yes	
MAT03	FS	CBT	Total	1081	71	1049	103	112	1040	1152
			%	93.84	6.16	91.06	8.94	9.72	90.28	
		PBT	Total	1795	43	1653	185	194	1644	1838
			%	97.66	2.34	89.93	10.07	10.55	89.45	
MAT04	FS	CBT	Total	1035	45	1021	59	64	1016	1080
			%	95.83	4.17	94.54	5.46	5.93	94.07	
		PBT	Total	1647	57	1638	66	75	1629	1704
			%	96.65	3.35	96.13	3.87	4.40	95.60	
MAT05	FS	CBT	Total	905	49	916	38	53	901	954
			%	94.86	5.14	96.02	3.98	5.56	94.44	
		PBT	Total	1273	51	1275	49	58	1266	1324
			%	96.15	3.85	96.30	3.70	4.38	95.62	
MAT06	FS	CBT	Total	874	11	869	16	17	868	885
			%	98.76	1.24	98.19	1.81	1.92	98.08	
		PBT	Total	1663	37	1614	86	89	1611	1700
			%	97.82	2.18	94.94	5.06	5.24	94.76	
MAT07	FS	CBT	Total	992	6	989	9	10	988	998
			%	99.40	0.60	99.10	0.90	1.00	99.00	
		PBT	Total	1729	22	1721	30	33	1718	1751
			%	98.74	1.26	98.29	1.71	1.88	98.12	
MAT08	FS	CBT	Total	925	21	924	22	22	924	946
			%	97.78	2.22	97.67	2.33	2.33	97.67	
		PBT	Total	1309	20	1313	16	20	1309	1329
			%	98.50	1.50	98.80	1.20	1.50	98.50	
ALG01	FS	CBT	Total	691	10	694	7	11	690	701
			%	98.57	1.43	99.00	1.00	1.57	98.43	
		PBT	Total	859	21	859	21	21	859	880
			%	97.61	2.39	97.61	2.39	2.39	97.61	
ALG02	FS	CBT	Total	804	28	802	30	34	798	832
			%	96.63	3.37	96.39	3.61	4.09	95.91	
		PBT	Total	739	43	763	19	45	737	782
			%	94.50	5.50	97.57	2.43	5.75	94.25	
GEO	FS	CBT	Total	751	13	750	14	15	749	764
			%	98.30	1.70	98.17	1.83	1.96	98.04	
		PBT	Total	1071	10	1066	15	15	1066	1081
			%	99.07	0.93	98.61	1.39	1.39	98.61	

Table A.24 Distribution of Students with Disabilities by Grade Level for Mathematics Full Summative Assessments

				Students with Disabilities		
Test	Form Type	Test Mode	Student Count	No	Yes	Total
MAT03	FS	CBT	Total	1081	71	1152
			%	93.84	6.16	
		PBT	Total	1729	109	1838
			%	94.07	5.93	
MAT04	FS	CBT	Total	1005	75	1080
			%	93.06	6.94	
		PBT	Total	1579	125	1704
			%	92.66	7.34	
MAT05	FS	CBT	Total	880	74	954
			%	92.24	7.76	
		PBT	Total	1247	77	1324
			%	94.18	5.82	
MAT06	FS	CBT	Total	839	46	885
			%	94.80	5.20	
		PBT	Total	1586	114	1700
			%	93.29	6.71	
MAT07	FS	CBT	Total	940	58	998
			%	94.19	5.81	
		PBT	Total	1636	115	1751
			%	93.43	6.57	
MAT08	FS	CBT	Total	904	42	946
			%	95.56	4.44	
		PBT	Total	1266	63	1329
			%	95.26	4.74	
ALG01	FS	CBT	Total	661	40	701
			%	94.29	5.71	
		PBT	Total	851	29	880
			%	96.70	3.30	
ALG02	FS	CBT	Total	801	31	832
			%	96.27	3.73	
		PBT	Total	765	17	782
			%	97.83	2.17	
GEO	FS	CBT	Total	729	35	764
			%	95.42	4.58	
		PBT	Total	1047	34	1081
			%	96.85	3.15	

Appendix B

Table B.1 Number of Forms per Grade Administered for each Field Test Condition and Mode of Delivery for ELA/Literacy

			Field Test Administration		Number of Forms per Grade or TM EOC		
Grade	Condition	Form Type	March	April	Accommodated	CBT	PBT
G03	1	FS ¹	PBA portion	EOY portion	.	6	1
	2A	PBA/MYA	PBA	n/a	2	15	5
	2B	EOY	n/a	EOY portion	2	9	5
G04	1	FS	PBA portion	EOY portion	.	6	1
	2A	PBA/MYA	PBA	n/a	.	15	6
	2B	EOY	n/a	EOY portion	.	9	5
G05	1	FS	PBA portion	EOY portion	.	5	1
	2A	PBA/MYA	PBA	n/a	4	15	6
	2B	EOY	n/a	EOY portion	6	9	5
G06	1	FS	PBA portion	EOY portion	.	6	1
	2A	PBA/MYA	PBA	n/a	.	15	6
	2B	EOY	n/a	EOY portion	.	9	5
G07	1	FS	PBA portion	EOY portion	.	6	1
	2A	PBA/MYA	PBA	n/a	.	15	6
	2B	EOY	n/a	EOY portion	.	9	5
G08	1	FS	PBA portion	EOY portion	.	5	1
	2A	PBA/MYA	PBA	n/a	4	15	6
	2B	EOY	n/a	EOY portion	4	9	5
G09	1	FS	PBA portion	EOY portion	.	5	1
	2A	PBA/MYA	PBA	n/a	.	16	6
	2B	EOY	n/a	EOY portion	.	9	5
G10	1	FS	PBA portion	EOY portion	.	5	1
	2A	PBA/MYA	PBA	n/a	.	15	6
	2B	EOY	n/a	EOY portion	.	9	5
G11	1	FS	PBA portion	EOY portion	.	4	1
	2A	PBA/MYA	PBA	n/a	4	15	6
	2B	EOY	n/a	EOY portion	3	9	5

¹ The Full Summative (FS) test consists of two parts – Part 1 is the PBA portion and Part 2 is the EOY portion.

Table B.2 Number of Forms per Grade Administered for each Field Test Condition and Mode of Delivery for Mathematics

			Field Test Administration		Number of Forms per Grade or TM EOC		
Grade	Condition	Form Type	March	April	Accommodated	CBT	PBT
G03	1	FS	PBA portion	EOY portion	.	6	1
	2A	PBA/MYA	PBA	n/a	.	10	5
	2B	EOY	n/a	EOY portion	.	9	6
G04	1	FS	PBA portion	EOY portion	.	6	1
	2A	PBA/MYA	PBA	n/a	4	10	5
	2B	EOY	n/a	EOY portion	5	9	6
G05	1	FS	PBA portion	EOY portion	.	5	1
	2A	PBA/MYA	PBA	n/a	.	10	5
	2B	EOY	n/a	EOY portion	.	9	6
G06	1	FS	PBA portion	EOY portion	.	6	1
	2A	PBA/MYA	PBA	n/a	.	10	5
	2B	EOY	n/a	EOY portion	.	9	6
G07	1	FS	PBA portion	EOY portion	.	6	1
	2A	PBA/MYA	PBA	n/a	4	10	5
	2B	EOY	n/a	EOY portion	5	9	6
G08	1	FS	PBA portion	EOY portion	.	5	1
	2A	PBA/MYA	PBA	n/a	.	10	5
	2B	EOY	n/a	EOY portion	.	9	6
ALG01	1	FS ¹	PBA portion	EOY portion	.	5	1
	2A	PBA/MYA	PBA	n/a	3	10	5
	2B	EOY	n/a	EOY portion	3	9	6
ALG02	1	FS	PBA portion	EOY portion	.	4	1
	2A	PBA/MYA	PBA	n/a	.	10	5
	2B	EOY	n/a	EOY portion	.	9	6
GEO	1	FS	PBA portion	EOY portion	.	5	1
	2A	PBA/MYA	PBA	n/a	2	10	5
	2B	EOY	n/a	EOY portion	2	9	6

¹ The Full Summative (FS) test consists of two parts – Part 1 is the PBA portion and Part 2 is the EOY portion.

Table B.3 Number of Forms per Integrated Mathematics (IM) EOC for each Field Test Condition and Mode of Delivery

				Number of Forms per IM EOC					
		Field Test Administration		IM 1		IM 2		IM 3	
Condition	Form Type	March	April	CBT	PBT	CBT	PBT	CBT	PBT
1	FS ¹	PBA portion	EOY portion	1	.	1	.	1	.
2A	PBA/MYA	PBA	n/a	1	2	1	2	1	2
2B	EOY	n/a	EOY portion	2	3	2	2	2	2

¹The Full Summative (FS) test consists of two parts – Part 1 is the PBA portion and Part 2 is the EOY portion.

Appendix C

Table C.1 Summary Difficulty Statistics across Mode by Form Pairs for ELA/Literacy PBA

Grade	Form Type	Mode	Form Pair	N	Mean	Max	Min	SD	Median
3	PBA	CBT	Total	43	0.37	0.67	0.14	0.14	0.35
			014PO*054PP	6	0.34	0.52	0.16	0.13	0.35
			014PO*064PP	10	0.37	0.61	0.16	0.16	0.35
			014PP*034PO	8	0.40	0.60	0.23	0.12	0.37
			034PP*054PO	10	0.37	0.67	0.14	0.16	0.34
			044PP*074PO	9	0.37	0.53	0.18	0.10	0.35
		PBT	Total	43	0.42	0.74	0.15	0.15	0.40
			014PO*054PP	6	0.38	0.59	0.16	0.15	0.36
			014PO*064PP	10	0.38	0.70	0.15	0.19	0.35
			014PP*034PO	8	0.47	0.68	0.26	0.13	0.43
			034PP*054PO	10	0.42	0.74	0.21	0.16	0.40
			044PP*074PO	9	0.43	0.63	0.32	0.10	0.39
4	PBA	CBT	Total	35	0.31	0.66	0.15	0.13	0.29
			014PO*014PP	9	0.28	0.47	0.15	0.12	0.28
			014PO*064PP	9	0.28	0.47	0.15	0.12	0.28
			014PO*074PP	9	0.28	0.47	0.15	0.12	0.28
			034PO*034PP	8	0.40	0.66	0.26	0.12	0.40
		PBT	Total	35	0.35	0.72	0.15	0.15	0.35
			014PO*014PP	9	0.30	0.53	0.15	0.15	0.26
			014PO*064PP	9	0.34	0.56	0.16	0.15	0.32
			014PO*074PP	9	0.33	0.56	0.16	0.15	0.31
			034PO*034PP	8	0.45	0.72	0.33	0.12	0.42
5	PBA	CBT	Total	58	0.42	0.68	0.00	0.16	0.42
			014PP*024PO	11	0.47	0.68	0.16	0.16	0.50
			024PO*064PP	13	0.45	0.68	0.16	0.16	0.46
			024PO*074PP	10	0.44	0.68	0.16	0.15	0.43
			034PO*034PP	15	0.39	0.64	0.16	0.16	0.42
			044PP*054PO	9	0.33	0.48	0.00	0.15	0.35
		PBT	Total	58	0.47	0.73	0.17	0.15	0.45
			014PP*024PO	11	0.50	0.71	0.29	0.16	0.49
			024PO*064PP	13	0.48	0.71	0.27	0.15	0.49
			024PO*074PP	10	0.49	0.73	0.25	0.16	0.49
			034PO*034PP	15	0.43	0.72	0.17	0.16	0.40
044PP*054PO	9	0.45	0.73	0.32	0.14	0.43			

Table C.1 Summary Difficulty Statistics across Mode by Form Pairs for ELA/Literacy PBA (Cont'd)

Grade	Form Type	Mode	Form Pair	N	Mean	Max	Min	SD	Median
6	PBA	CBT	Total	64	0.40	0.84	0.13	0.17	0.39
			014PO*014PP	11	0.38	0.62	0.15	0.17	0.39
			014PO*064PP	11	0.42	0.84	0.15	0.21	0.41
			014PO*074PP	11	0.40	0.84	0.15	0.22	0.39
			034PO*034PP	8	0.37	0.50	0.23	0.10	0.36
			044PP*054PO	10	0.40	0.54	0.22	0.11	0.40
			054PP*164PO	13	0.39	0.61	0.13	0.16	0.42
		PBT	Total	64	0.43	0.85	0.19	0.16	0.43
			014PO*014PP	11	0.43	0.72	0.21	0.18	0.39
			014PO*064PP	11	0.47	0.85	0.19	0.20	0.46
			014PO*074PP	11	0.44	0.84	0.19	0.19	0.40
			034PO*034PP	8	0.40	0.48	0.32	0.06	0.41
			044PP*054PO	10	0.45	0.62	0.27	0.11	0.46
			054PP*164PO	13	0.42	0.65	0.20	0.15	0.40
7	PBA	CBT	Total	105	0.33	0.75	0.00	0.17	0.28
			014PO*014PP	12	0.33	0.60	0.00	0.16	0.30
			014PO*064PP	11	0.27	0.60	0.00	0.16	0.23
			014PO*074PP	11	0.27	0.60	0.00	0.16	0.23
			024PO*064PP	11	0.29	0.66	0.00	0.18	0.26
			024PO*074PP	11	0.29	0.66	0.00	0.18	0.26
			034PO*034PP	19	0.37	0.75	0.00	0.19	0.36
			044PP*054PO	10	0.37	0.58	0.24	0.11	0.34
			044PP*064PO	10	0.38	0.61	0.20	0.13	0.37
			054PP*164PO	10	0.36	0.68	0.00	0.22	0.27
		PBT	Total	105	0.36	0.77	0.00	0.18	0.33
			014PO*014PP	12	0.36	0.65	0.00	0.18	0.32
			014PO*064PP	11	0.31	0.68	0.00	0.18	0.29
			014PO*074PP	11	0.30	0.69	0.00	0.18	0.28
			024PO*064PP	11	0.32	0.68	0.00	0.18	0.29
			024PO*074PP	11	0.31	0.69	0.00	0.18	0.28
			034PO*034PP	19	0.40	0.77	0.00	0.18	0.38
			044PP*054PO	10	0.41	0.63	0.22	0.11	0.41
			044PP*064PO	10	0.41	0.63	0.22	0.12	0.42
			054PP*164PO	10	0.39	0.77	0.00	0.23	0.33

Table C.1 Summary Difficulty Statistics across Mode by Form Pairs for ELA/Literacy PBA (Cont'd)

Grade	Form Type	Mode	Form Pair	N	Mean	Max	Min	SD	Median
8	PBA	CBT	Total	90	0.47	0.85	0.20	0.16	0.43
			014PO*014PP	13	0.46	0.85	0.20	0.19	0.43
			014PO*024PP	11	0.53	0.85	0.24	0.20	0.49
			034PO*034PP	13	0.44	0.71	0.24	0.18	0.36
			044PP*064PO	8	0.48	0.63	0.33	0.12	0.50
			054PO*054PP	10	0.51	0.84	0.28	0.17	0.48
			064PP*094PO	8	0.46	0.72	0.29	0.15	0.43
			064PP*104PO	9	0.45	0.70	0.29	0.15	0.43
			064PP*114PO	10	0.44	0.70	0.30	0.11	0.42
			064PP*124PO	8	0.45	0.72	0.28	0.13	0.43
		PBT	Total	90	0.48	0.85	0.22	0.15	0.45
			014PO*014PP	13	0.43	0.78	0.22	0.16	0.42
			014PO*024PP	11	0.55	0.85	0.26	0.20	0.53
			034PO*034PP	13	0.45	0.75	0.26	0.17	0.35
			044PP*064PO	8	0.49	0.67	0.36	0.11	0.50
			054PO*054PP	10	0.53	0.81	0.30	0.16	0.50
			064PP*094PO	8	0.47	0.67	0.34	0.13	0.41
			064PP*104PO	9	0.46	0.67	0.34	0.13	0.40
			064PP*114PO	10	0.46	0.66	0.34	0.10	0.44
			064PP*124PO	8	0.47	0.66	0.34	0.11	0.44
9	PBA	CBT	Total	58	0.38	0.78	0.13	0.16	0.35
			014PO:014PP	11	0.33	0.60	0.13	0.16	0.34
			014PO:024PP	13	0.35	0.60	0.19	0.13	0.34
			034PO:034PP	16	0.40	0.66	0.13	0.16	0.37
			054PO:044PP	9	0.33	0.55	0.14	0.13	0.31
			074PO:064PP	9	0.48	0.78	0.21	0.19	0.46
			PBT	Total	58	0.42	0.80	0.17	0.15
		014PO:014PP		11	0.40	0.65	0.17	0.17	0.43
		014PO:024PP		13	0.42	0.60	0.24	0.12	0.41
		034PO:034PP		16	0.43	0.70	0.20	0.15	0.38
		054PO:044PP		9	0.36	0.58	0.19	0.11	0.38
		074PO:064PP		9	0.50	0.80	0.25	0.20	0.45

Table C.1 Summary Difficulty Statistics across Mode by Form Pairs for ELA/Literacy PBA (Cont'd)

Grade	Form Type	Mode	Form Pair	N	Mean	Max	Min	SD	Median
10	PBA	CBT	Total	54	0.37	0.62	0.15	0.13	0.36
			014PO*014PP	12	0.39	0.62	0.22	0.14	0.37
			014PO*074PP	10	0.38	0.62	0.15	0.17	0.36
			034PO*034PP	16	0.36	0.57	0.16	0.12	0.33
			044PP*054PO	7	0.35	0.47	0.21	0.10	0.38
			064PP*104PO	9	0.38	0.59	0.17	0.15	0.35
		PBT	Total	54	0.39	0.64	0.13	0.12	0.39
			014PO*014PP	12	0.38	0.59	0.22	0.12	0.36
			014PO*074PP	10	0.39	0.64	0.13	0.16	0.37
			034PO*034PP	16	0.40	0.55	0.22	0.11	0.41
			044PP*054PO	7	0.38	0.48	0.25	0.08	0.39
			064PP*104PO	9	0.42	0.63	0.20	0.15	0.37
11	PBA	CBT	Total	57	0.34	0.63	0.00	0.13	0.34
			014PO*014PP	12	0.37	0.57	0.20	0.13	0.39
			014PO*024PP	12	0.36	0.57	0.20	0.12	0.36
			034PO*034PP	14	0.32	0.63	0.00	0.17	0.33
			044PP*054PO	9	0.32	0.49	0.23	0.08	0.32
			064PP*074PO	10	0.34	0.52	0.18	0.11	0.35
		PBT	Total	57	0.39	0.63	0.21	0.10	0.38
			014PO*014PP	12	0.38	0.59	0.24	0.11	0.36
			014PO*024PP	12	0.41	0.62	0.25	0.12	0.38
			034PO*034PP	14	0.42	0.63	0.26	0.10	0.41
			044PP*054PO	9	0.37	0.50	0.29	0.06	0.36
			064PP*074PO	10	0.35	0.55	0.21	0.11	0.39

Table C.2 Summary Difficulty Statistics across Mode by Form Pairs for ELA/Literacy EOY

Grade	Form Type	Mode	Form Pair	N	Mean	Max	Min	SD	Median
3	EOY	CBT	Total	131	0.37	0.81	0.10	0.13	0.35
			104EO:014EP	19	0.35	0.63	0.10	0.13	0.39
			114EO:064EP	23	0.35	0.57	0.17	0.11	0.34
			124EO:024EP	23	0.39	0.63	0.20	0.12	0.39
			134EO:034EP	22	0.36	0.61	0.16	0.13	0.32
			144EO:044EP	23	0.36	0.63	0.18	0.12	0.35
			154EO:054EP	21	0.42	0.81	0.16	0.18	0.39
		PBT	Total	131	0.40	0.75	0.13	0.14	0.40
			104EO:014EP	19	0.40	0.66	0.13	0.15	0.43
			114EO:064EP	23	0.36	0.59	0.19	0.11	0.34
			124EO:024EP	23	0.43	0.63	0.19	0.13	0.43
			134EO:034EP	22	0.39	0.63	0.14	0.14	0.35
			144EO:044EP	23	0.41	0.68	0.21	0.13	0.40
			154EO:054EP	21	0.43	0.75	0.19	0.17	0.43
4	EOY	CBT	Total	106	0.38	0.71	0.11	0.13	0.34
			104EO:014EP	18	0.33	0.71	0.11	0.15	0.30
			114EO:064EP	24	0.39	0.65	0.20	0.13	0.33
			124EO:024EP	22	0.42	0.68	0.22	0.15	0.34
			134EO:034EP	21	0.40	0.60	0.26	0.10	0.37
			144EO:044EP	21	0.35	0.61	0.19	0.12	0.31
			PBT	Total	106	0.39	0.74	0.17	0.13
		104EO:014EP		18	0.36	0.74	0.17	0.15	0.33
		114EO:064EP		24	0.40	0.63	0.21	0.14	0.35
		124EO:024EP		22	0.43	0.67	0.22	0.14	0.38
		134EO:034EP		21	0.40	0.68	0.24	0.11	0.39
		144EO:044EP		21	0.36	0.64	0.17	0.12	0.33

Table C.2 Summary Difficulty Statistics across Mode by Form Pairs for ELA/Literacy EOY (Cont'd)

Grade	Form Type	Mode	Form Pair	N	Mean	Max	Min	SD	Median
5	EOY	CBT	Total	103	0.40	0.73	0.15	0.13	0.40
			014EP*104EO	23	0.43	0.69	0.21	0.13	0.42
			024EP*124EO	17	0.37	0.55	0.20	0.11	0.39
			034EP*134EO	20	0.43	0.73	0.15	0.14	0.41
			044EP*144EO	19	0.40	0.73	0.20	0.14	0.38
			064EP*114EO	24	0.36	0.55	0.17	0.11	0.35
		PBT	Total	103	0.42	0.72	0.16	0.13	0.41
			014EP*104EO	23	0.44	0.70	0.22	0.13	0.44
			024EP*124EO	17	0.38	0.58	0.20	0.13	0.41
			034EP*134EO	20	0.46	0.72	0.20	0.14	0.45
			044EP*144EO	19	0.40	0.70	0.17	0.14	0.39
			064EP*114EO	24	0.39	0.62	0.16	0.13	0.37
6	EOY	CBT	Total	106	0.37	0.72	0.16	0.12	0.35
			104EO:014EP	21	0.34	0.51	0.16	0.09	0.36
			114EO:064EP	21	0.38	0.55	0.21	0.12	0.35
			124EO:024EP	22	0.38	0.71	0.20	0.13	0.36
			134EO:034EP	20	0.37	0.72	0.17	0.16	0.32
			144EO:044EP	22	0.37	0.60	0.16	0.12	0.36
		PBT	Total	106	0.39	0.80	0.10	0.13	0.38
			104EO:014EP	21	0.39	0.54	0.19	0.11	0.41
			114EO:064EP	21	0.40	0.58	0.18	0.13	0.38
			124EO:024EP	22	0.39	0.76	0.10	0.14	0.38
			134EO:034EP	20	0.39	0.80	0.17	0.16	0.36
			144EO:044EP	22	0.38	0.66	0.17	0.12	0.39

Table C.2 Summary Difficulty Statistics across Mode by Form Pairs for ELA/Literacy EOY (Cont'd)

Grade	Form Type	Mode	Form Pair	N	Mean	Max	Min	SD	Median		
7	EOY	CBT	Total	96	0.42	0.82	0.18	0.14	0.43		
			104EO:014EP	19	0.37	0.65	0.20	0.11	0.37		
			114EO:064EP	22	0.47	0.81	0.18	0.16	0.46		
			124EO:024EP	17	0.42	0.82	0.25	0.16	0.36		
			134EO:034EP	20	0.41	0.63	0.24	0.12	0.43		
			144EO:044EP	18	0.44	0.64	0.21	0.14	0.43		
		PBT	Total	96	0.44	0.81	0.11	0.15	0.43		
			104EO:014EP	19	0.36	0.67	0.11	0.13	0.39		
			114EO:064EP	22	0.47	0.78	0.18	0.16	0.47		
			124EO:024EP	17	0.45	0.81	0.28	0.16	0.41		
			134EO:034EP	20	0.43	0.64	0.24	0.13	0.43		
			144EO:044EP	18	0.46	0.70	0.24	0.14	0.47		
		8	EOY	CBT	Total	62	0.37	0.84	0.11	0.15	0.32
					014EP*104EO	20	0.34	0.64	0.11	0.14	0.30
034EP*134EO	22				0.39	0.84	0.24	0.15	0.34		
044EP*144EO	20				0.38	0.82	0.12	0.17	0.34		
PBT	Total			62	0.41	0.85	0.11	0.15	0.38		
	014EP*104EO			20	0.38	0.63	0.11	0.14	0.37		
	034EP*134EO			22	0.42	0.85	0.22	0.15	0.38		
	044EP*144EO			20	0.42	0.80	0.13	0.17	0.38		
9	EOY	CBT	Total	91	0.34	0.61	0.15	0.12	0.33		
			014EP*104EO	18	0.33	0.59	0.15	0.13	0.33		
			024EP*124EO	19	0.36	0.60	0.15	0.12	0.35		
			034EP*134EO	17	0.36	0.59	0.16	0.13	0.35		
			044EP*144EO	18	0.31	0.55	0.15	0.12	0.28		
			064EP*114EO	19	0.33	0.61	0.19	0.11	0.31		
		PBT	Total	91	0.38	0.69	0.14	0.14	0.36		
			014EP*104EO	18	0.36	0.61	0.14	0.14	0.39		
			024EP*124EO	19	0.42	0.64	0.14	0.14	0.40		
			034EP*134EO	17	0.41	0.69	0.19	0.15	0.39		
			044EP*144EO	18	0.35	0.62	0.18	0.14	0.32		
			064EP*114EO	19	0.33	0.59	0.18	0.10	0.33		

Table C.2 Summary Difficulty Statistics across Mode by Form Pairs for ELA/Literacy EOY (Cont'd)

Grade	Form Type	Mode	Form Pair	N	Mean	Max	Min	SD	Median
10	EOY	CBT	Total	102	0.34	0.69	0.15	0.11	0.33
			014EP*104EO	21	0.33	0.56	0.15	0.11	0.35
			024EP*124EO	21	0.33	0.53	0.17	0.11	0.31
			034EP*134EO	19	0.39	0.69	0.16	0.14	0.38
			044EP*144EO	20	0.34	0.52	0.23	0.08	0.33
			064EP*114EO	21	0.34	0.55	0.18	0.11	0.32
		PBT	Total	102	0.41	0.71	0.18	0.13	0.39
			014EP*104EO	21	0.41	0.65	0.21	0.14	0.45
			024EP*124EO	21	0.38	0.60	0.20	0.12	0.37
			034EP*134EO	19	0.46	0.71	0.24	0.14	0.43
			044EP*144EO	20	0.43	0.66	0.29	0.10	0.40
			064EP*114EO	21	0.38	0.62	0.18	0.13	0.38
11	EOY	CBT	Total	82	0.31	0.56	0.10	0.09	0.31
			014EP*104EO	19	0.33	0.51	0.19	0.08	0.32
			024EP*124EO	22	0.30	0.40	0.15	0.08	0.31
			034EP*134EO	22	0.29	0.56	0.10	0.10	0.28
			064EP*114EO	19	0.31	0.47	0.11	0.08	0.31
		PBT	Total	82	0.33	0.60	0.10	0.09	0.33
			014EP*104EO	19	0.36	0.60	0.22	0.10	0.36
			024EP*124EO	22	0.34	0.48	0.13	0.09	0.34
			034EP*134EO	22	0.31	0.55	0.10	0.10	0.30
			064EP*114EO	19	0.32	0.49	0.11	0.09	0.31

Table C.3 Summary Difficulty Statistics across Mode by Form Pairs for Mathematics PBA

Grade	Form Type	Mode	Form Pair	N	Mean	Max	Min	SD	Median
3	PBA	CBT	Total	55	0.33	0.93	0.00	0.23	0.26
			014PP*114PO	17	0.35	0.72	0.04	0.22	0.34
			024PP*124PO	13	0.29	0.69	0.07	0.19	0.22
			034PP*144PO	4	0.32	0.64	0.01	0.29	0.31
			044PP*154PO	7	0.40	0.66	0.00	0.28	0.55
			054PP*164PO	7	0.24	0.48	0.03	0.17	0.20
			064PP*134PO	7	0.35	0.93	0.06	0.34	0.20
		PBT	Total	55	0.36	0.90	0.06	0.20	0.35
			014PP*114PO	17	0.35	0.74	0.06	0.20	0.35
			024PP*124PO	13	0.34	0.69	0.08	0.18	0.33
			034PP*144PO	4	0.41	0.57	0.15	0.18	0.47
			044PP*154PO	7	0.45	0.66	0.16	0.20	0.49
			054PP*164PO	7	0.25	0.45	0.06	0.14	0.27
			064PP*134PO	7	0.38	0.90	0.09	0.31	0.35
4	PBA	CBT	Total	51	0.43	0.96	0.03	0.25	0.35
			014PP*114PO	14	0.41	0.84	0.10	0.25	0.33
			024PP*124PO	13	0.39	0.71	0.14	0.20	0.35
			034PP*144PO	6	0.37	0.80	0.15	0.26	0.27
			044PP*154PO	6	0.66	0.87	0.29	0.21	0.71
			054PP*164PO	6	0.35	0.77	0.03	0.29	0.32
			064PP*134PO	6	0.44	0.96	0.06	0.29	0.41
		PBT	Total	51	0.42	0.94	0.04	0.22	0.37
			014PP*114PO	14	0.42	0.82	0.13	0.19	0.40
			024PP*124PO	13	0.40	0.69	0.19	0.17	0.37
			034PP*144PO	6	0.38	0.71	0.23	0.18	0.31
			044PP*154PO	6	0.59	0.83	0.29	0.23	0.69
			054PP*164PO	6	0.34	0.64	0.05	0.24	0.32
			064PP*134PO	6	0.35	0.94	0.04	0.33	0.35

Table C.3 Summary Difficulty Statistics across Mode by Form Pairs for Mathematics PBA (Cont'd)

Grade	Form Type	Mode	Form Pair	N	Mean	Max	Min	SD	Median
5	PBA	CBT	Total	27	0.31	0.69	0.04	0.15	0.32
			024PP*124PO	8	0.34	0.54	0.11	0.14	0.34
			034PP*144PO	3	0.32	0.36	0.26	0.05	0.33
			044PP*154PO	4	0.36	0.49	0.24	0.11	0.35
			054PP*164PO	7	0.28	0.47	0.14	0.14	0.30
			064PP*134PO	5	0.27	0.69	0.04	0.27	0.12
			Total	27	0.36	0.69	0.04	0.17	0.35
		PBT	024PP*124PO	8	0.39	0.56	0.14	0.13	0.40
			034PP*144PO	3	0.46	0.58	0.32	0.13	0.47
			044PP*154PO	4	0.45	0.61	0.28	0.17	0.45
			054PP*164PO	7	0.32	0.51	0.18	0.12	0.28
			064PP*134PO	5	0.25	0.69	0.04	0.27	0.14
			Total	50	0.25	0.71	0.01	0.18	0.19
			014PP*114PO	13	0.27	0.58	0.05	0.18	0.25
6	PBA	CBT	024PP*124PO	7	0.27	0.60	0.05	0.19	0.30
			034PP*144PO	6	0.20	0.51	0.04	0.17	0.14
			044PP*154PO	9	0.30	0.71	0.03	0.21	0.30
			054PP*164PO	11	0.16	0.50	0.01	0.14	0.12
			064PP*134PO	4	0.34	0.58	0.18	0.19	0.31
			Total	50	0.29	0.69	0.02	0.18	0.25
			014PP*114PO	13	0.29	0.66	0.09	0.17	0.28
		PBT	024PP*124PO	7	0.33	0.64	0.10	0.21	0.38
			034PP*144PO	6	0.22	0.51	0.05	0.16	0.18
			044PP*154PO	9	0.35	0.69	0.06	0.21	0.31
			054PP*164PO	11	0.22	0.52	0.02	0.14	0.21
			064PP*134PO	4	0.35	0.61	0.15	0.20	0.32
			Total	50	0.29	0.69	0.02	0.18	0.25
			014PP*114PO	13	0.29	0.66	0.09	0.17	0.28

Table C.3 Summary Difficulty Statistics across Mode by Form Pairs for Mathematics PBA (Cont'd)

Grade	Form Type	Mode	Form Pair	N	Mean	Max	Min	SD	Median
7	PBA	CBT	Total	61	0.22	0.78	0.01	0.18	0.15
			014PP*114PO	19	0.25	0.60	0.01	0.18	0.20
			024PP*124PO	8	0.24	0.68	0.03	0.21	0.17
			034PP*144PO	9	0.21	0.50	0.07	0.14	0.14
			044PP*154PO	8	0.27	0.78	0.01	0.27	0.16
			054PP*164PO	11	0.14	0.36	0.01	0.12	0.14
			064PP*134PO	6	0.15	0.27	0.06	0.07	0.14
		PBT	Total	61	0.24	0.73	0.01	0.16	0.20
			014PP*114PO	19	0.27	0.61	0.01	0.16	0.21
			024PP*124PO	8	0.23	0.59	0.05	0.16	0.19
			034PP*144PO	9	0.24	0.50	0.07	0.12	0.21
			044PP*154PO	8	0.31	0.73	0.02	0.25	0.28
			054PP*164PO	11	0.18	0.40	0.01	0.13	0.13
			064PP*134PO	6	0.18	0.32	0.09	0.08	0.17
8	PBA	CBT	Total	27	0.23	0.88	0.03	0.22	0.15
			024PP*124PO	5	0.20	0.72	0.03	0.29	0.06
			034PP*144PO	2	0.18	0.21	0.15	0.04	0.18
			044PP*154PO	7	0.27	0.88	0.03	0.30	0.14
			054PP*164PO	9	0.27	0.65	0.07	0.19	0.22
			064PP*134PO	4	0.13	0.25	0.03	0.10	0.12
		PBT	Total	27	0.27	0.84	0.02	0.20	0.22
			024PP*124PO	5	0.24	0.71	0.02	0.28	0.17
			034PP*144PO	2	0.21	0.22	0.20	0.01	0.21
			044PP*154PO	7	0.31	0.84	0.04	0.27	0.30
			054PP*164PO	9	0.31	0.65	0.12	0.17	0.26
			064PP*134PO	4	0.17	0.27	0.04	0.10	0.18

Table C.3 Summary Difficulty Statistics across Mode by Form Pairs for Mathematics PBA (Cont'd)

Grade	Form Type	Mode	Form Pair	N	Mean	Max	Min	SD	Median
ALG01	PBA	CBT	Total	32	0.19	0.58	0.00	0.15	0.19
			024PP*124PO	8	0.18	0.58	0.01	0.19	0.13
			034PP*144PO	5	0.05	0.08	0.00	0.04	0.04
			044PP*154PO	3	0.19	0.22	0.16	0.03	0.19
			054PP*164PO	10	0.23	0.46	0.04	0.15	0.22
			064PP*134PO	6	0.22	0.46	0.00	0.17	0.25
		PBT	Total	32	0.20	0.54	0.00	0.15	0.16
			024PP*124PO	8	0.19	0.54	0.01	0.18	0.17
			034PP*144PO	5	0.09	0.18	0.00	0.07	0.10
			044PP*154PO	3	0.19	0.35	0.08	0.14	0.15
			054PP*164PO	10	0.26	0.51	0.06	0.15	0.26
			064PP*134PO	6	0.23	0.49	0.00	0.16	0.21
ALG02	PBA	CBT	Total	14	0.22	0.59	0.03	0.17	0.17
			034PP*144PO	2	0.11	0.17	0.06	0.08	0.11
			044PP*154PO	1	0.08	0.08	0.08		0.08
			054PP*164PO	8	0.25	0.59	0.03	0.18	0.27
			064PP*134PO	3	0.23	0.46	0.05	0.21	0.17
		PBT	Total	14	0.25	0.62	0.03	0.17	0.23
			034PP*144PO	2	0.12	0.16	0.08	0.06	0.12
			044PP*154PO	1	0.08	0.08	0.08		0.08
			054PP*164PO	8	0.29	0.62	0.03	0.18	0.26
			064PP*134PO	3	0.30	0.41	0.11	0.17	0.38

Table C.3 Summary Difficulty Statistics across Mode by Form Pairs for Mathematics PBA (Cont'd)

Grade	Form Type	Mode	Form Pair	N	Mean	Max	Min	SD	Median
GEO	PBA	CBT	Total	21	0.15	0.75	0.01	0.17	0.10
			024PP*124PO	9	0.16	0.37	0.04	0.11	0.16
			034PP*144PO	1	0.25	0.25	0.25		0.25
			044PP*154PO	2	0.11	0.22	0.01	0.14	0.11
			054PP*164PO	6	0.19	0.75	0.01	0.28	0.09
			064PP*134PO	3	0.04	0.07	0.01	0.03	0.04
		PBT	Total	21	0.21	0.79	0.02	0.19	0.15
			024PP*124PO	9	0.21	0.51	0.08	0.14	0.19
			034PP*144PO	1	0.38	0.38	0.38		0.38
			044PP*154PO	2	0.21	0.39	0.04	0.24	0.21
			054PP*164PO	6	0.22	0.79	0.02	0.29	0.12
			064PP*134PO	3	0.10	0.15	0.04	0.06	0.11
MAT1I	PBA	CBT	Total	15	0.21	0.67	0.01	0.19	0.12
			034PP*144PO	5	0.18	0.43	0.01	0.20	0.07
			054PP*064PO	10	0.22	0.67	0.04	0.20	0.13
		PBT	Total	15	0.23	0.71	0.03	0.19	0.20
			034PP*144PO	5	0.20	0.41	0.03	0.18	0.16
			054PP*064PO	10	0.25	0.71	0.03	0.21	0.20
MAT2I	PBA	CBT	Total	6	0.25	0.45	0.05	0.19	0.26
			054PO:044PP	3	0.19	0.40	0.05	0.19	0.11
			144PO:034PP	3	0.32	0.45	0.09	0.20	0.42
		PBT	Total	6	0.35	0.72	0.05	0.25	0.32
			054PO:044PP	3	0.24	0.52	0.05	0.25	0.14
			144PO:034PP	3	0.45	0.72	0.25	0.24	0.39
MAT3I	PBA	CBT	Total	8	0.17	0.44	0.04	0.16	0.10
			034PP*144PO	3	0.18	0.42	0.06	0.21	0.07
			054PP*064PO	5	0.17	0.44	0.04	0.16	0.11
		PBT	Total	8	0.18	0.47	0.04	0.15	0.16
			034PP*144PO	3	0.18	0.47	0.04	0.24	0.04
			054PP*064PO	5	0.18	0.29	0.07	0.09	0.21

Table C.4 Summary Difficulty Statistics across Mode by Form Pairs for Mathematics EOY

Grade	Form Type	Mode	Form Pair	N	Mean	Max	Min	SD	Median
3	EOY	CBT	Total	174	0.49	0.95	0.06	0.21	0.51
			014EP*104EO	24	0.50	0.87	0.12	0.19	0.51
			024EP*114EO	28	0.50	0.95	0.17	0.21	0.50
			034EP*124EO	24	0.52	0.94	0.11	0.22	0.55
			044EP*134EO	23	0.49	0.83	0.14	0.19	0.49
			054EP*144EO	25	0.46	0.84	0.06	0.23	0.50
			064EP*154EO	26	0.47	0.91	0.12	0.20	0.44
			074EP*124EO	24	0.52	0.94	0.11	0.22	0.55
		PBT	Total	174	0.47	0.95	0.05	0.21	0.49
			014EP*104EO	24	0.46	0.87	0.10	0.20	0.47
			024EP*114EO	28	0.47	0.95	0.13	0.21	0.48
			034EP*124EO	24	0.48	0.90	0.10	0.22	0.52
			044EP*134EO	23	0.46	0.82	0.17	0.18	0.46
			054EP*144EO	25	0.44	0.83	0.05	0.22	0.46
			064EP*154EO	26	0.44	0.88	0.10	0.20	0.42
			074EP*124EO	24	0.50	0.91	0.09	0.23	0.55
4	EOY	CBT	Total	151	0.49	0.86	0.07	0.18	0.46
			014EP*104EO	21	0.51	0.77	0.20	0.16	0.50
			024EP*114EO	21	0.50	0.84	0.17	0.18	0.52
			034EP*124EO	20	0.50	0.84	0.17	0.18	0.47
			044EP*134EO	23	0.52	0.86	0.20	0.20	0.44
			054EP*144EO	23	0.45	0.80	0.07	0.21	0.43
			064EP*154EO	23	0.48	0.80	0.21	0.17	0.46
			074EP*124EO	20	0.50	0.84	0.17	0.18	0.47
		PBT	Total	151	0.46	0.83	0.06	0.18	0.45
			014EP*104EO	21	0.46	0.73	0.08	0.16	0.47
			024EP*114EO	21	0.48	0.80	0.17	0.19	0.46
			034EP*124EO	20	0.47	0.81	0.17	0.18	0.44
			044EP*134EO	23	0.50	0.82	0.18	0.18	0.45
			054EP*144EO	23	0.42	0.83	0.06	0.21	0.42
			064EP*154EO	23	0.46	0.78	0.08	0.17	0.43
			074EP*124EO	20	0.45	0.82	0.15	0.19	0.41

Table C.4 Summary Difficulty Statistics across Mode by Form Pairs for Mathematics EOY (Cont'd)

Grade	Form Type	Mode	Form Pair	N	Mean	Max	Min	SD	Median
5	EOY	CBT	Total	109	0.40	0.84	0.01	0.21	0.40
			024EP*114EO	15	0.42	0.66	0.17	0.18	0.41
			034EP*124EO	17	0.41	0.81	0.02	0.24	0.37
			044EP*134EO	23	0.36	0.84	0.03	0.23	0.31
			054EP*144EO	17	0.34	0.54	0.08	0.16	0.38
			064EP*154EO	20	0.45	0.81	0.01	0.20	0.45
			074EP*124EO	17	0.41	0.81	0.02	0.24	0.37
		PBT	Total	109	0.39	0.83	0.01	0.20	0.39
			024EP*114EO	15	0.42	0.68	0.16	0.18	0.36
			034EP*124EO	17	0.41	0.75	0.01	0.23	0.41
			044EP*134EO	23	0.36	0.83	0.04	0.23	0.31
			054EP*144EO	17	0.34	0.52	0.08	0.14	0.35
			064EP*154EO	20	0.43	0.79	0.01	0.18	0.44
			074EP*124EO	17	0.37	0.73	0.02	0.22	0.32
6	EOY	CBT	Total	127	0.32	0.77	0.00	0.16	0.31
			014EP*104EO	17	0.28	0.62	0.00	0.16	0.24
			024EP*114EO	17	0.35	0.71	0.16	0.14	0.35
			034EP*124EO	19	0.35	0.77	0.03	0.17	0.38
			044EP*134EO	18	0.26	0.54	0.08	0.14	0.22
			054EP*144EO	18	0.29	0.55	0.08	0.14	0.26
			064EP*154EO	19	0.33	0.76	0.02	0.18	0.33
		074EP*124EO	19	0.35	0.77	0.03	0.17	0.38	
		PBT	Total	127	0.35	0.75	0.04	0.14	0.35
			014EP*104EO	17	0.35	0.63	0.06	0.15	0.33
			024EP*114EO	17	0.37	0.64	0.16	0.12	0.39
			034EP*124EO	19	0.37	0.71	0.04	0.15	0.36
			044EP*134EO	18	0.32	0.57	0.13	0.13	0.32
			054EP*144EO	18	0.35	0.56	0.12	0.13	0.36
064EP*154EO	19		0.36	0.75	0.04	0.17	0.37		
074EP*124EO	19	0.35	0.75	0.04	0.15	0.34			

Table C.4 Summary Difficulty Statistics across Mode by Form Pairs for Mathematics EOY (Cont'd)

Grade	Form Type	Mode	Form Pair	N	Mean	Max	Min	SD	Median
7	EOY	CBT	Total	128	0.28	0.70	0.01	0.17	0.27
			014EP*104EO	19	0.25	0.58	0.02	0.16	0.25
			024EP*114EO	19	0.35	0.63	0.01	0.17	0.39
			034EP*124EO	18	0.32	0.70	0.07	0.18	0.31
			044EP*134EO	18	0.23	0.57	0.04	0.17	0.19
			054EP*144EO	17	0.22	0.58	0.01	0.16	0.21
			064EP*154EO	19	0.25	0.60	0.03	0.18	0.22
			074EP*124EO	18	0.32	0.70	0.07	0.18	0.31
		PBT	Total	128	0.28	0.74	0.01	0.17	0.27
			014EP*104EO	19	0.24	0.52	0.01	0.15	0.28
			024EP*114EO	19	0.35	0.62	0.03	0.18	0.39
			034EP*124EO	18	0.31	0.74	0.05	0.18	0.30
			044EP*134EO	18	0.24	0.59	0.03	0.17	0.20
			054EP*144EO	17	0.24	0.56	0.01	0.16	0.24
			064EP*154EO	19	0.22	0.56	0.02	0.15	0.25
			074EP*124EO	18	0.32	0.71	0.06	0.18	0.30
8	EOY	CBT	Total	95	0.23	0.68	0.01	0.17	0.19
			024EP*114EO	16	0.26	0.63	0.02	0.19	0.22
			034EP*124EO	16	0.25	0.68	0.04	0.18	0.19
			044EP*134EO	19	0.23	0.56	0.04	0.16	0.18
			054EP*144EO	14	0.19	0.54	0.01	0.15	0.18
			064EP*154EO	14	0.21	0.63	0.04	0.15	0.18
			074EP*124EO	16	0.25	0.68	0.04	0.18	0.19
		PBT	Total	95	0.26	0.77	0.01	0.17	0.22
			024EP*114EO	16	0.28	0.71	0.03	0.19	0.26
			034EP*124EO	16	0.29	0.77	0.06	0.20	0.24
			044EP*134EO	19	0.24	0.53	0.07	0.14	0.20
			054EP*144EO	14	0.22	0.53	0.01	0.15	0.27
			064EP*154EO	14	0.24	0.65	0.06	0.17	0.18
			074EP*124EO	16	0.28	0.74	0.06	0.19	0.23

Table C.4 Summary Difficulty Statistics across Mode by Form Pairs for Mathematics EOY (Cont'd)

Grade	Form Type	Mode	Form Pair	N	Mean	Max	Min	SD	Median
ALG01	EOY	CBT	Total	76	0.21	0.68	0.01	0.20	0.14
			024EP*114EO	9	0.30	0.64	0.01	0.21	0.27
			034EP*124EO	14	0.19	0.68	0.01	0.23	0.10
			044EP*134EO	14	0.24	0.57	0.03	0.20	0.19
			054EP*144EO	15	0.21	0.56	0.01	0.18	0.16
			064EP*154EO	10	0.15	0.33	0.03	0.11	0.14
			074EP*124EO	14	0.19	0.68	0.01	0.23	0.10
		PBT	Total	76	0.21	0.75	0.00	0.19	0.15
			024EP*114EO	9	0.31	0.65	0.00	0.21	0.33
			034EP*124EO	14	0.20	0.75	0.01	0.24	0.10
			044EP*134EO	14	0.22	0.47	0.04	0.16	0.22
			054EP*144EO	15	0.20	0.56	0.02	0.16	0.20
			064EP*154EO	10	0.15	0.34	0.02	0.11	0.14
			074EP*124EO	14	0.19	0.67	0.00	0.22	0.10
ALG02	EOY	CBT	Total	58	0.19	0.67	0.00	0.17	0.16
			034EP*124EO	14	0.19	0.67	0.02	0.17	0.16
			044EP*134EO	12	0.17	0.45	0.01	0.16	0.14
			054EP*144EO	10	0.17	0.40	0.00	0.16	0.15
			064EP*154EO	8	0.22	0.64	0.00	0.21	0.22
			074EP*124EO	14	0.19	0.67	0.02	0.17	0.16
			PBT	Total	58	0.19	0.61	0.00	0.16
		034EP*124EO		14	0.18	0.61	0.02	0.16	0.16
		044EP*134EO		12	0.20	0.46	0.02	0.16	0.17
		054EP*144EO		10	0.18	0.38	0.00	0.16	0.15
		064EP*154EO		8	0.23	0.59	0.00	0.19	0.25
		074EP*124EO		14	0.17	0.57	0.01	0.15	0.14

Table C.4 Summary Difficulty Statistics across Mode by Form Pairs for Mathematics EOY (Cont'd)

Grade	Form Type	Mode	Form Pair	N	Mean	Max	Min	SD	Median
GEO	EOY	CBT	Total	95	0.18	0.66	0.01	0.15	0.14
			024EP*114EO	18	0.18	0.66	0.02	0.17	0.14
			034EP*124EO	15	0.15	0.44	0.01	0.14	0.12
			044EP*134EO	17	0.19	0.41	0.04	0.12	0.19
			054EP*144EO	17	0.20	0.50	0.01	0.17	0.20
			064EP*154EO	13	0.21	0.48	0.02	0.15	0.19
			074EP*124EO	15	0.15	0.44	0.01	0.14	0.12
		PBT	Total	95	0.19	0.72	0.01	0.15	0.17
			024EP*114EO	18	0.19	0.72	0.01	0.18	0.15
			034EP*124EO	15	0.16	0.47	0.01	0.13	0.11
			044EP*134EO	17	0.20	0.40	0.03	0.12	0.20
			054EP*144EO	17	0.21	0.55	0.01	0.17	0.19
			064EP*154EO	13	0.24	0.51	0.01	0.17	0.23
			074EP*124EO	15	0.17	0.47	0.01	0.13	0.13
MAT1I	EOY	CBT	Total	36	0.20	0.62	0.01	0.17	0.16
			024EO:034EP	13	0.20	0.62	0.01	0.18	0.16
			054EO:064EP	8	0.17	0.51	0.04	0.18	0.06
			134EO:044EP	15	0.22	0.52	0.02	0.16	0.21
		PBT	Total	36	0.24	0.66	0.01	0.20	0.18
			024EO:034EP	13	0.21	0.66	0.02	0.20	0.10
			054EO:064EP	8	0.17	0.40	0.01	0.17	0.08
			134EO:044EP	15	0.31	0.63	0.06	0.20	0.32
MAT2I	EOY	CBT	Total	38	0.17	0.52	0.00	0.13	0.16
			044EO:054EP	11	0.18	0.52	0.00	0.16	0.16
			054EO:064EP	10	0.13	0.27	0.01	0.10	0.10
			134EO:044EP	17	0.19	0.43	0.00	0.13	0.22
		PBT	Total	38	0.24	0.79	0.00	0.17	0.23
			044EO:054EP	11	0.23	0.58	0.00	0.15	0.24
			054EO:064EP	10	0.15	0.35	0.02	0.10	0.13
			134EO:044EP	17	0.30	0.79	0.05	0.19	0.31

Table C.4 Summary Difficulty Statistics across Mode by Form Pairs for Mathematics EOY (Cont'd)

Grade	Form Type	Mode	Form Pair	N	Mean	Max	Min	SD	Median
MAT3I	EOY	CBT	Total	23	0.19	0.50	0.01	0.14	0.20
			044EP*134EO	14	0.23	0.50	0.01	0.16	0.21
			054EO*064EP	9	0.12	0.26	0.04	0.07	0.11
		PBT	Total	23	0.19	0.49	0.02	0.15	0.21
			044EP*134EO	14	0.23	0.49	0.02	0.16	0.22
			054EO*064EP	9	0.12	0.25	0.04	0.09	0.07

Figure C.1 Z-Score Difficulties across Modes for Common Items for ELA/Literacy PBA

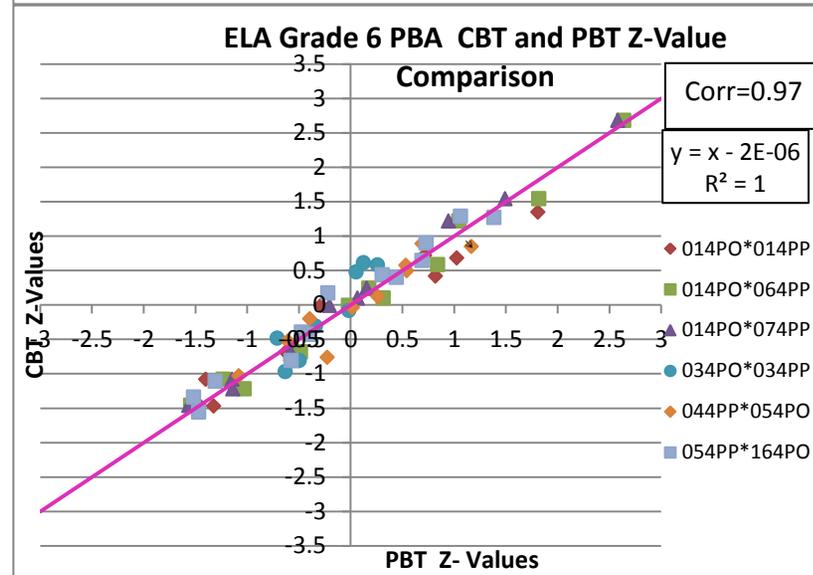
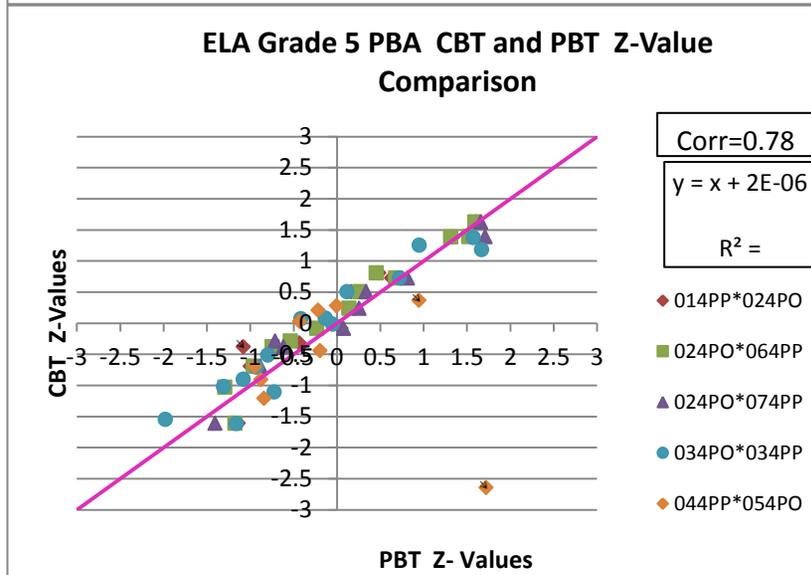
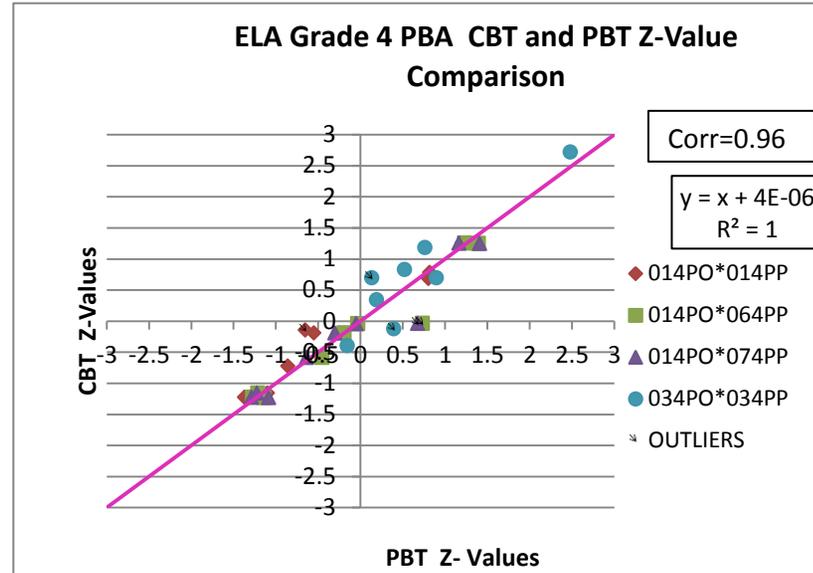
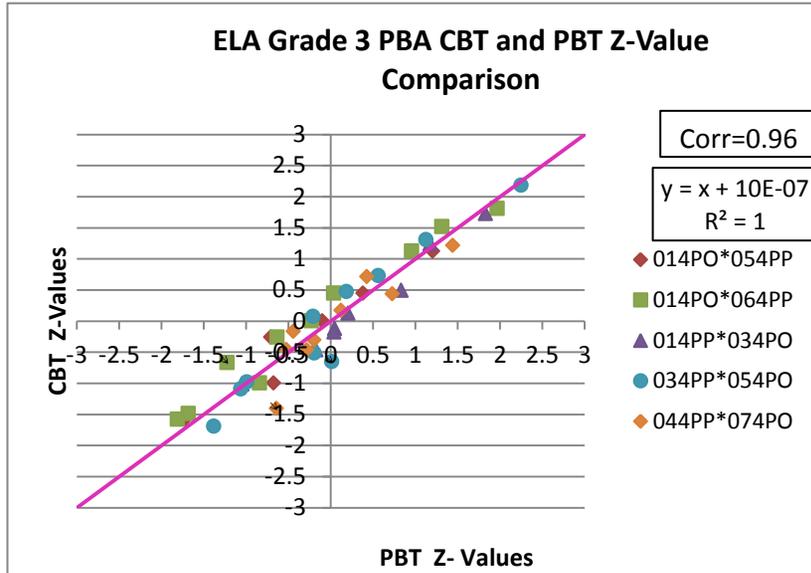


Figure C.1 Z-Score Difficulties across Modes for Common Items for ELA/Literacy PBA (Cont'd)

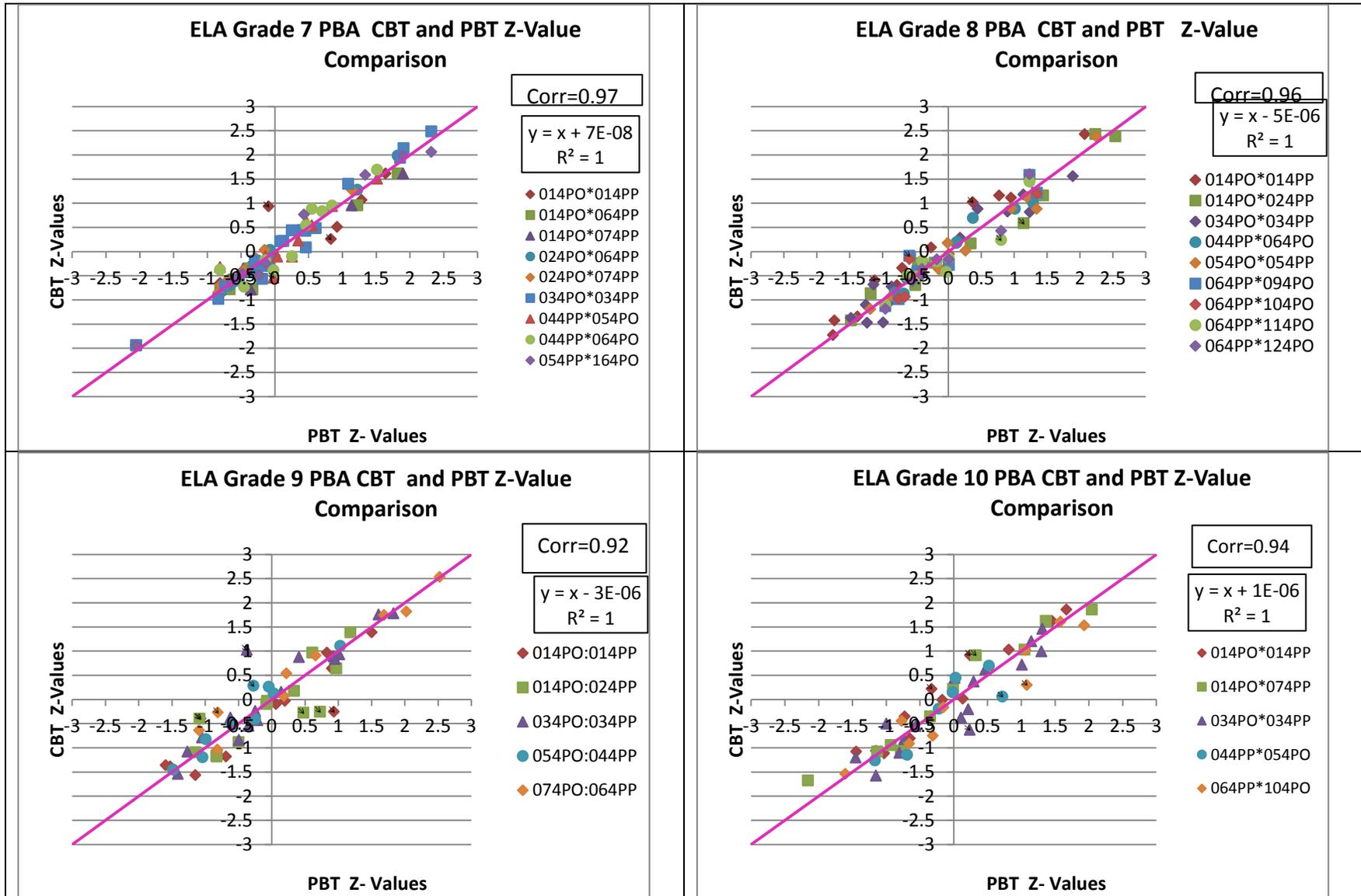


Figure C.1 Z-Score Difficulties across Modes for Common Items for ELA/Literacy PBA (Cont'd)

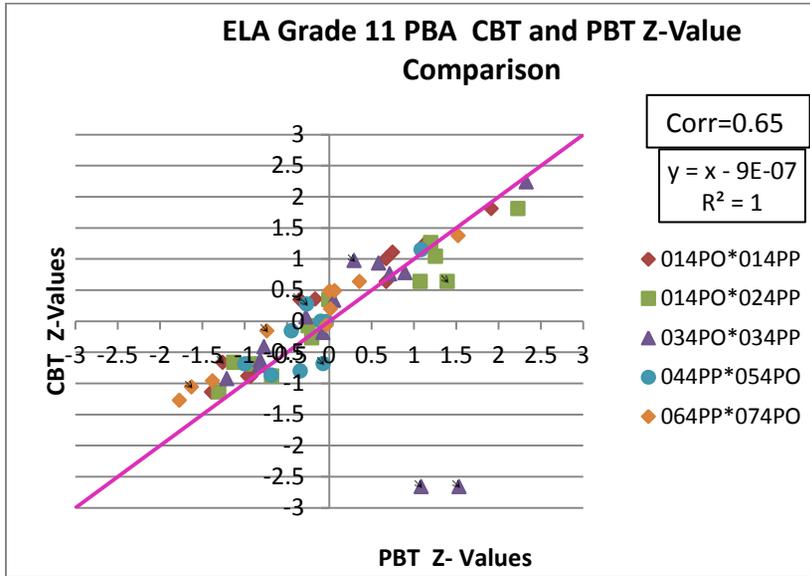


Figure C.2 Z-Score Difficulties across Modes for Common Items for ELA/Literacy EOY

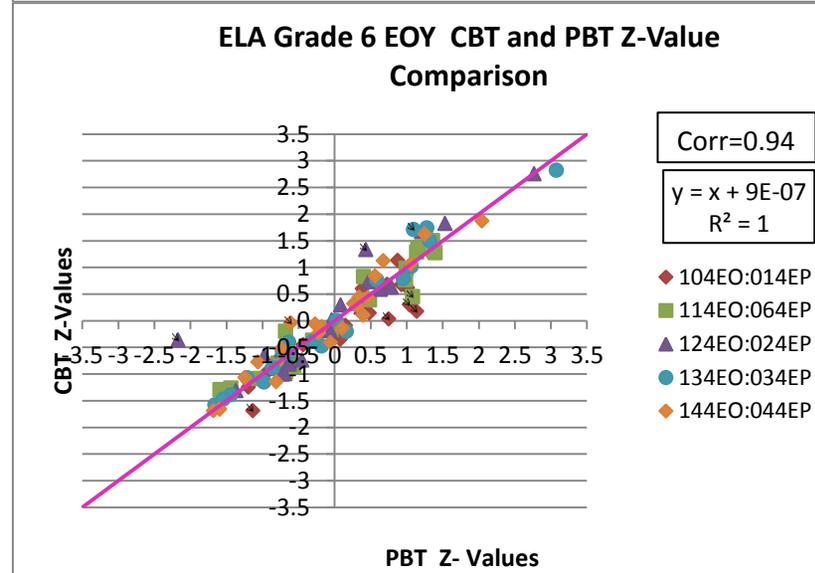
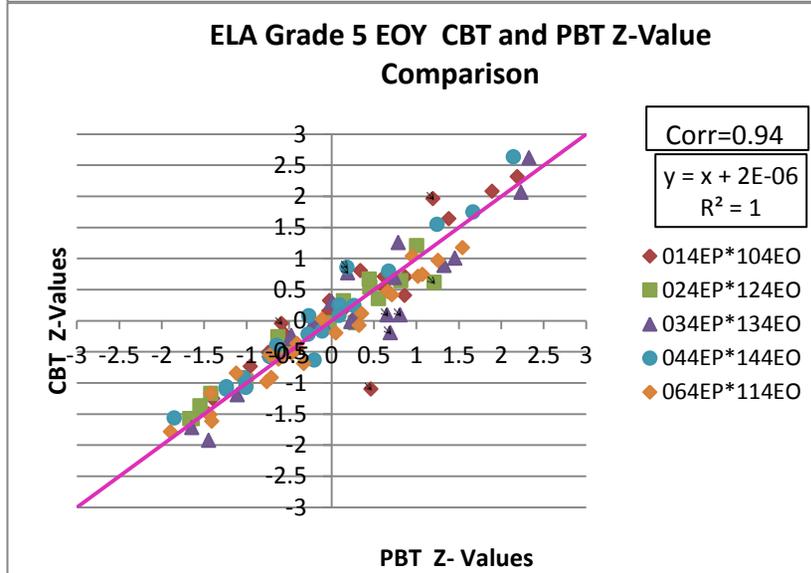
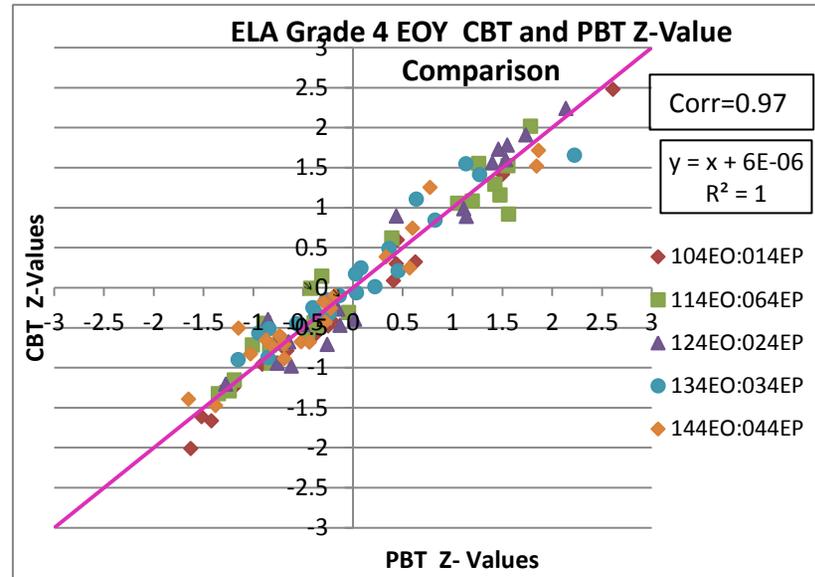
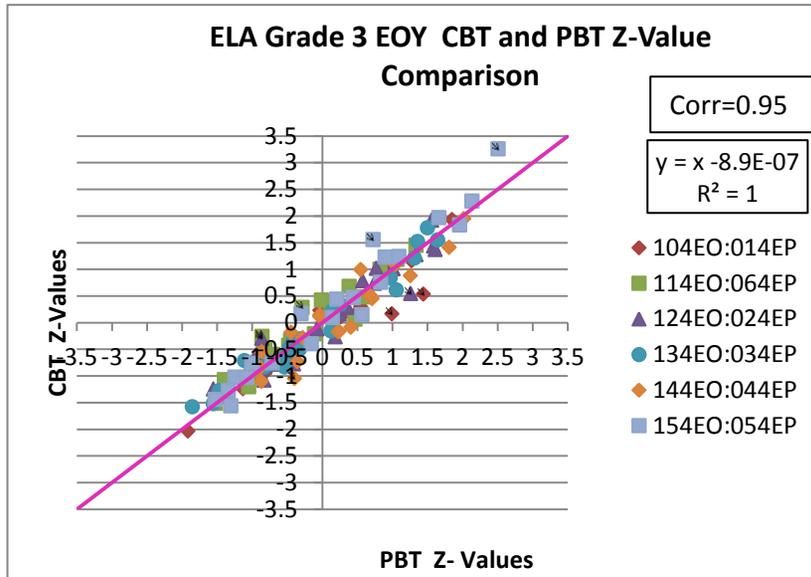


Figure C.2 Z-Score Difficulties across Modes for Common Items for ELA/Literacy EOY (Cont'd)

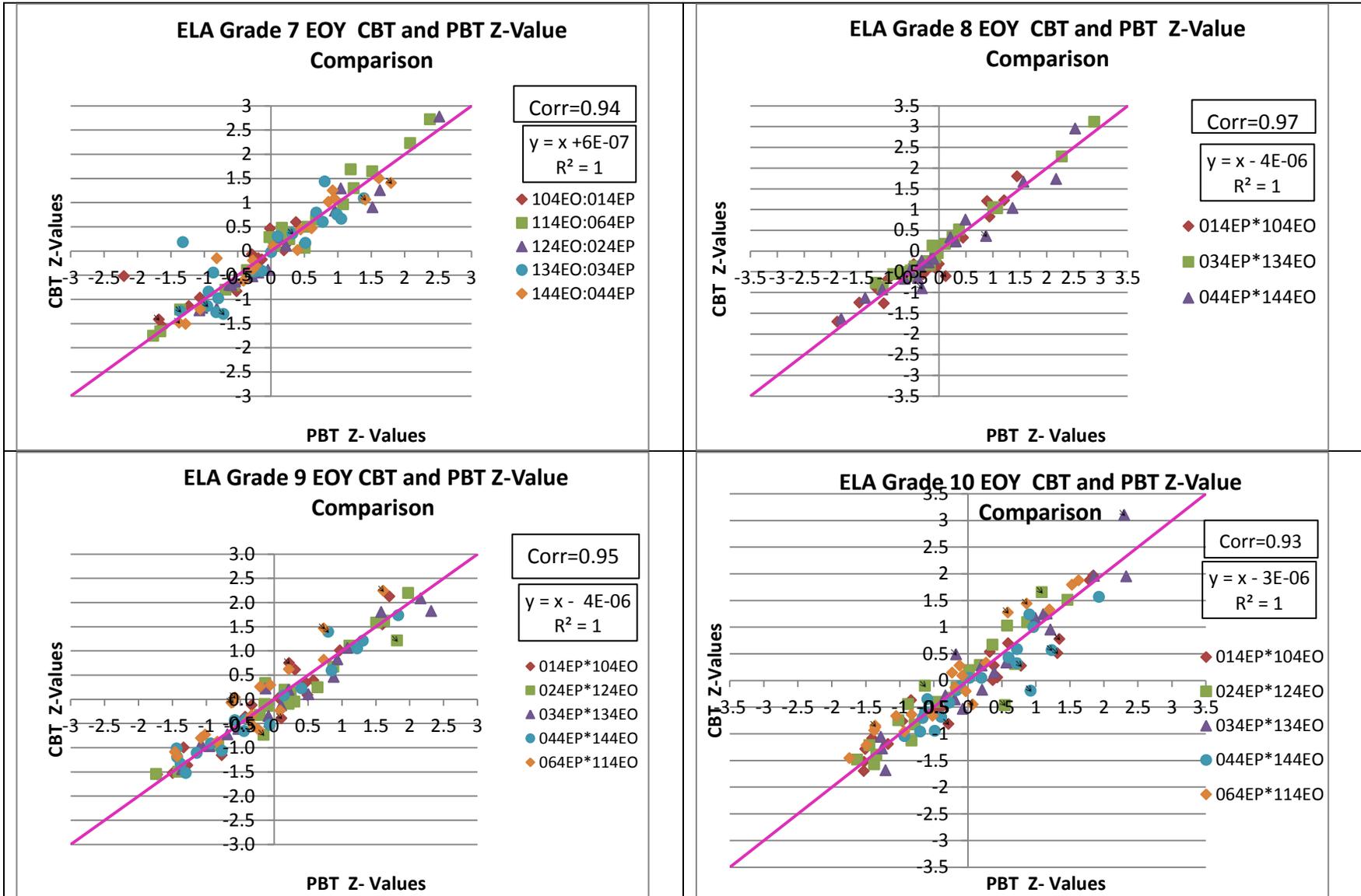


Figure C.2 Z-Score Difficulties across Modes for Common Items for ELA/Literacy EOY (Cont'd)

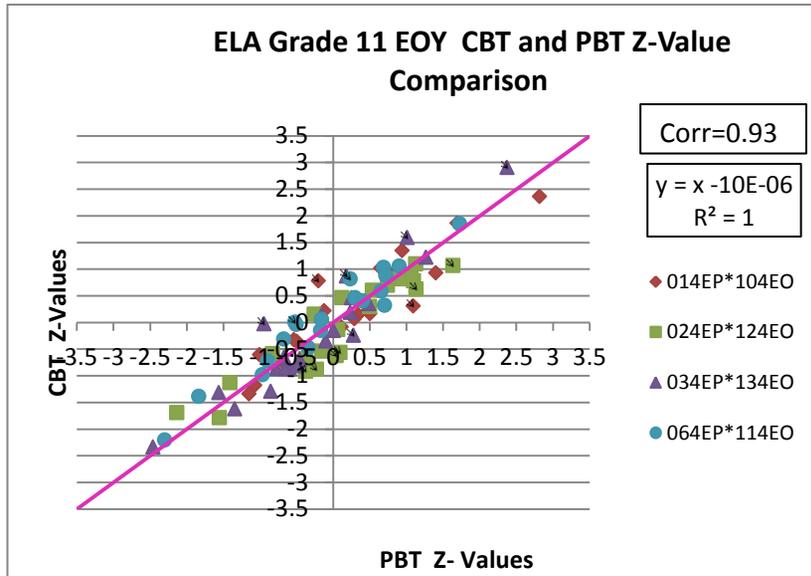


Figure C.3 Z-Score Difficulties across Modes for Common Items for Mathematics PBA

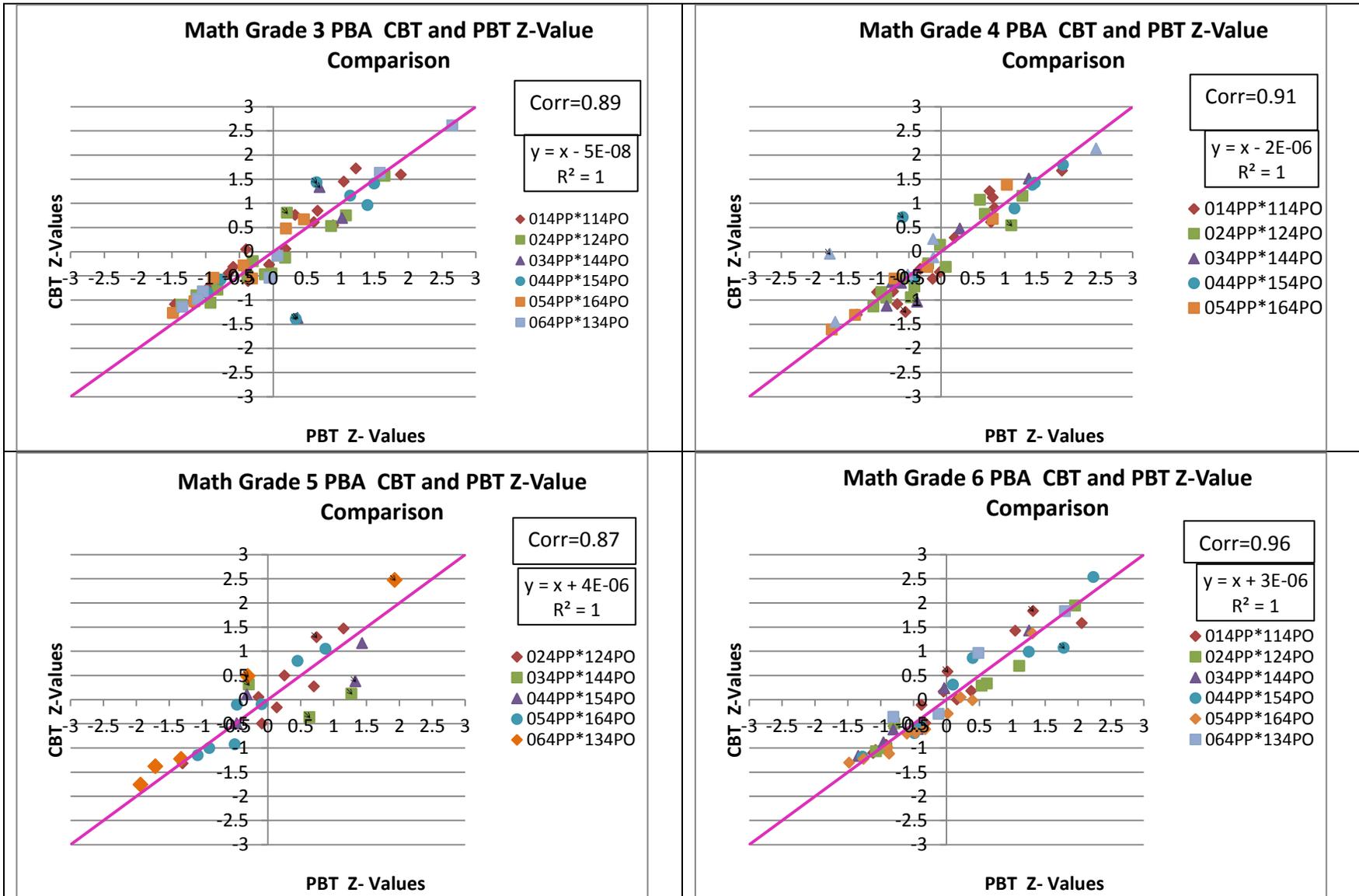


Figure C.3 Z-Score Difficulties across Modes for Common Items for Mathematics PBA (Cont'd)

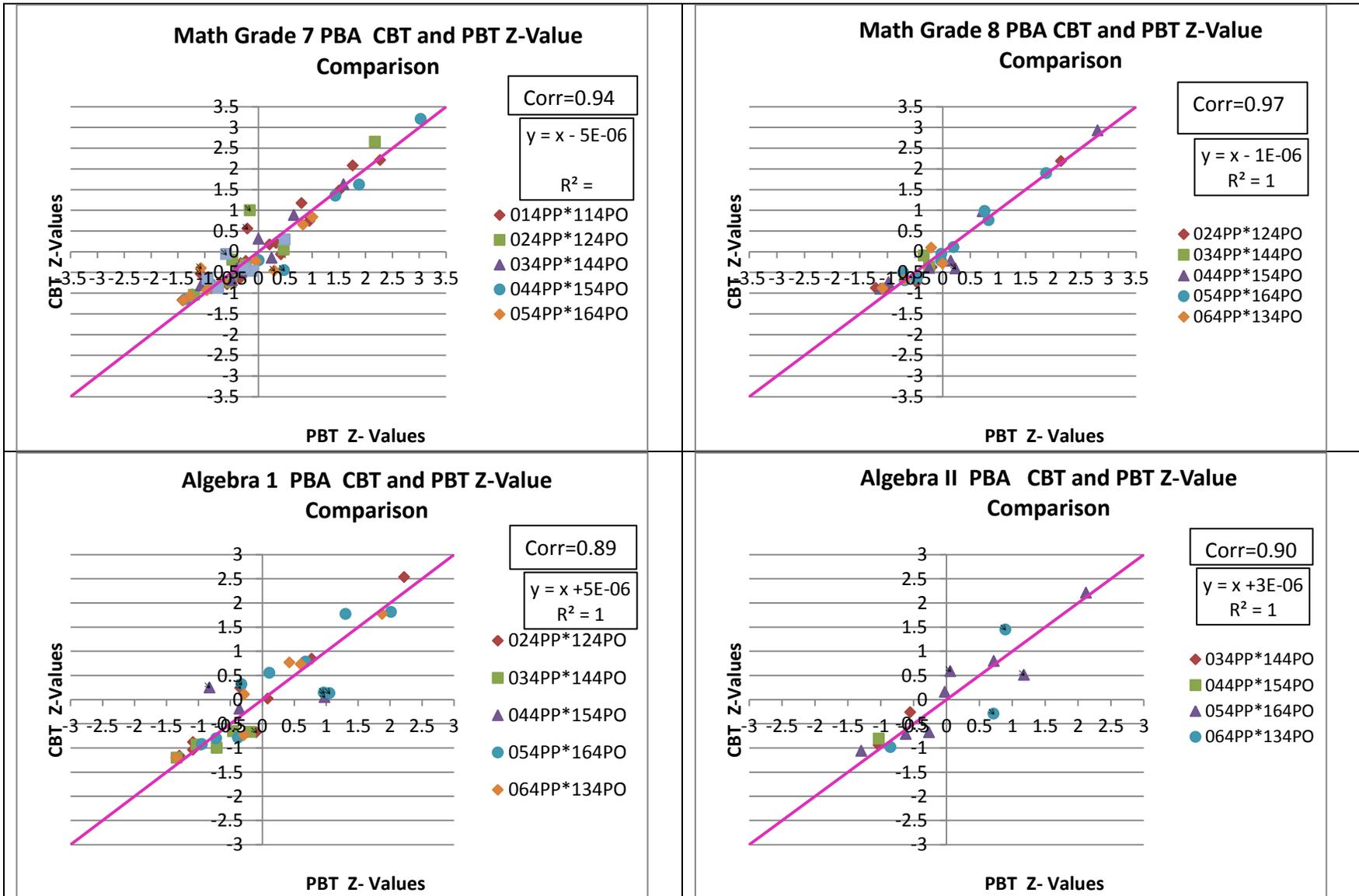


Figure C.3 Z-Score Difficulties across Modes for Common Items for Mathematics PBA (Cont'd)

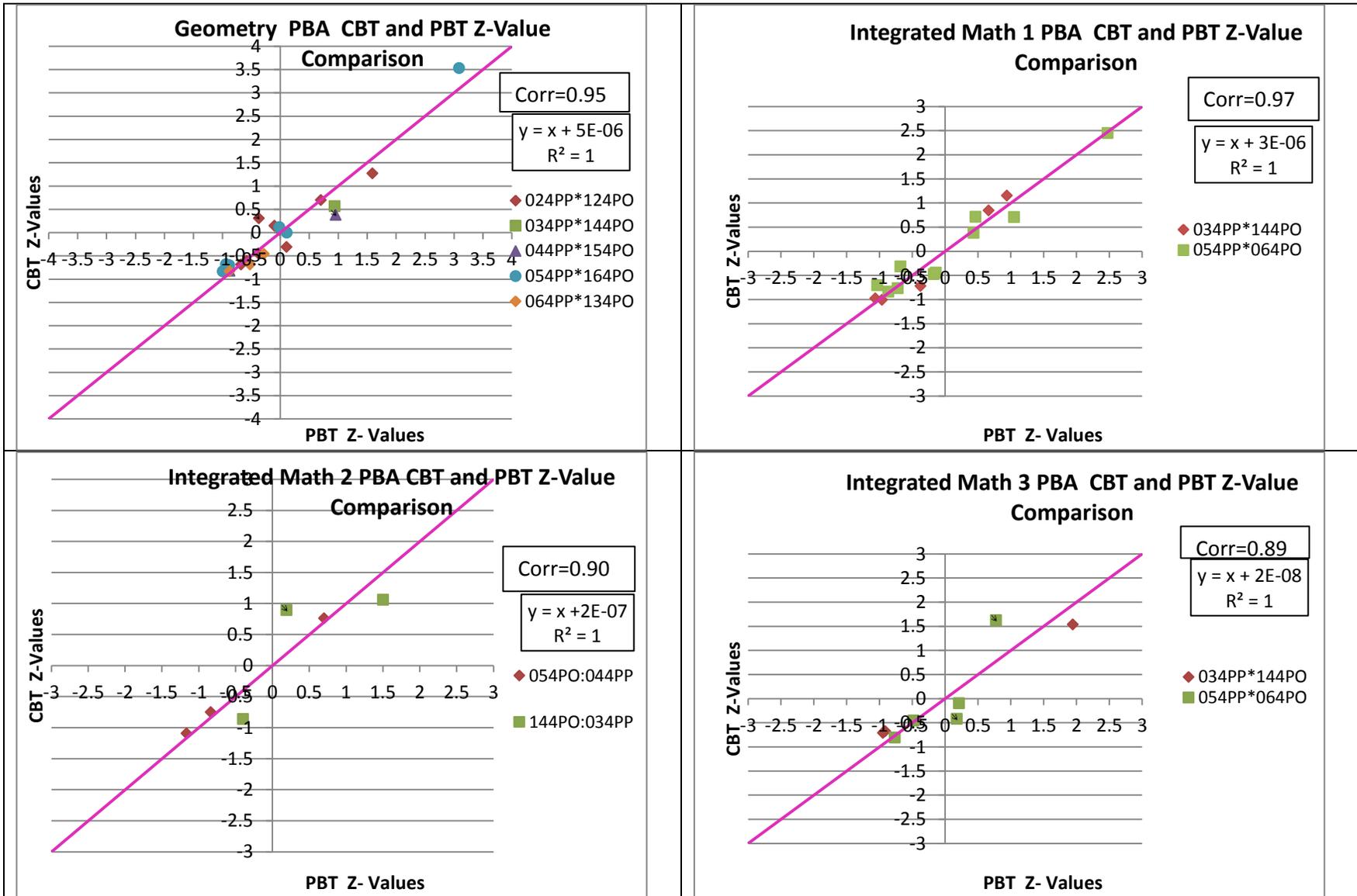


Figure C.4 Z-Score Difficulties across Modes for Common Items for Mathematics EOY

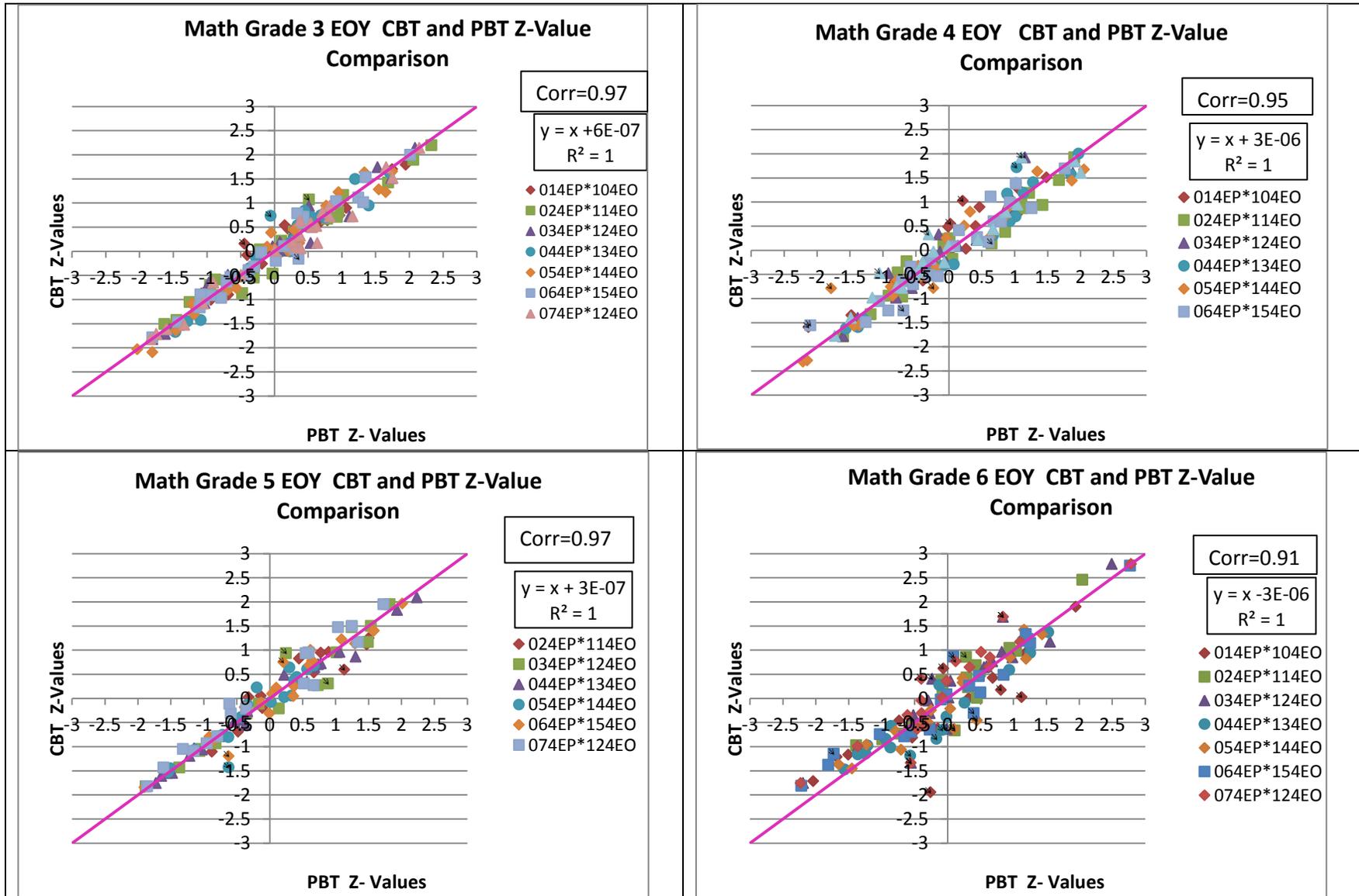


Figure C.4 Z-Score Difficulties across Modes for Common Items for Mathematics EOY (Cont'd)

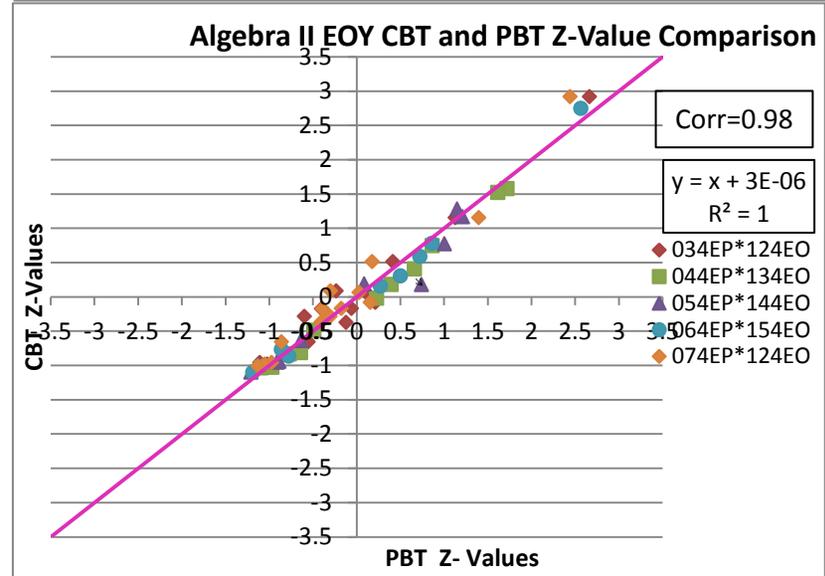
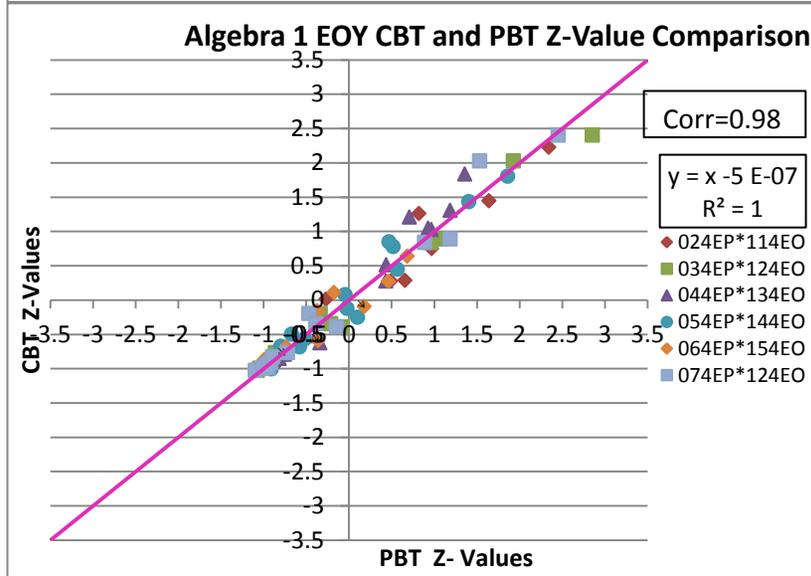
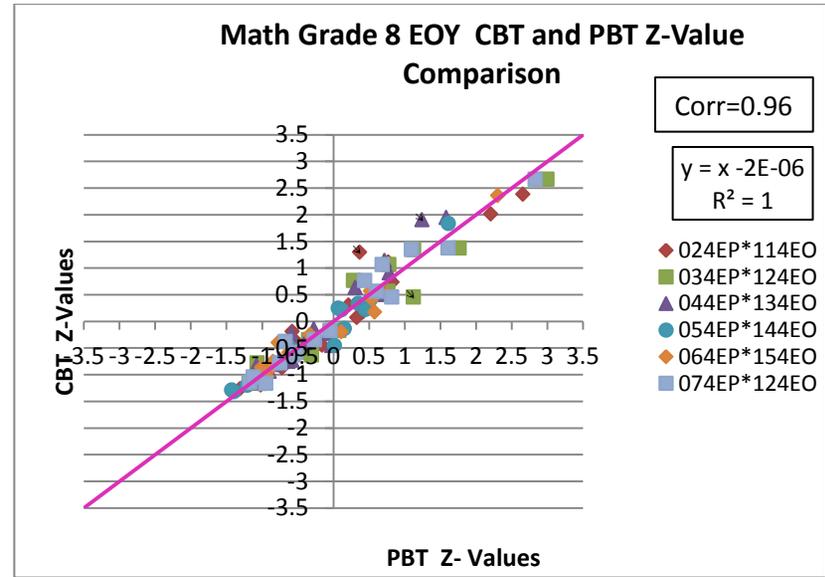
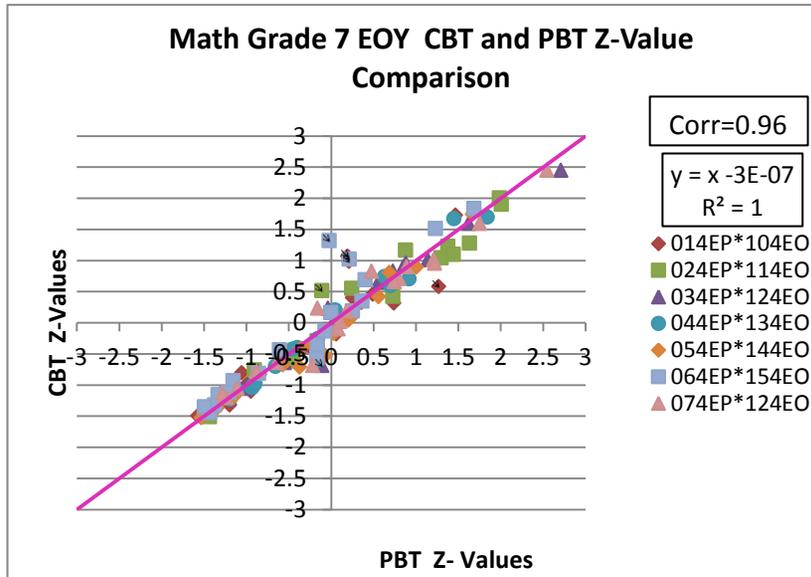


Figure C.4 Z-Score Difficulties across Modes for Common Items for Mathematics EOY (Cont'd)

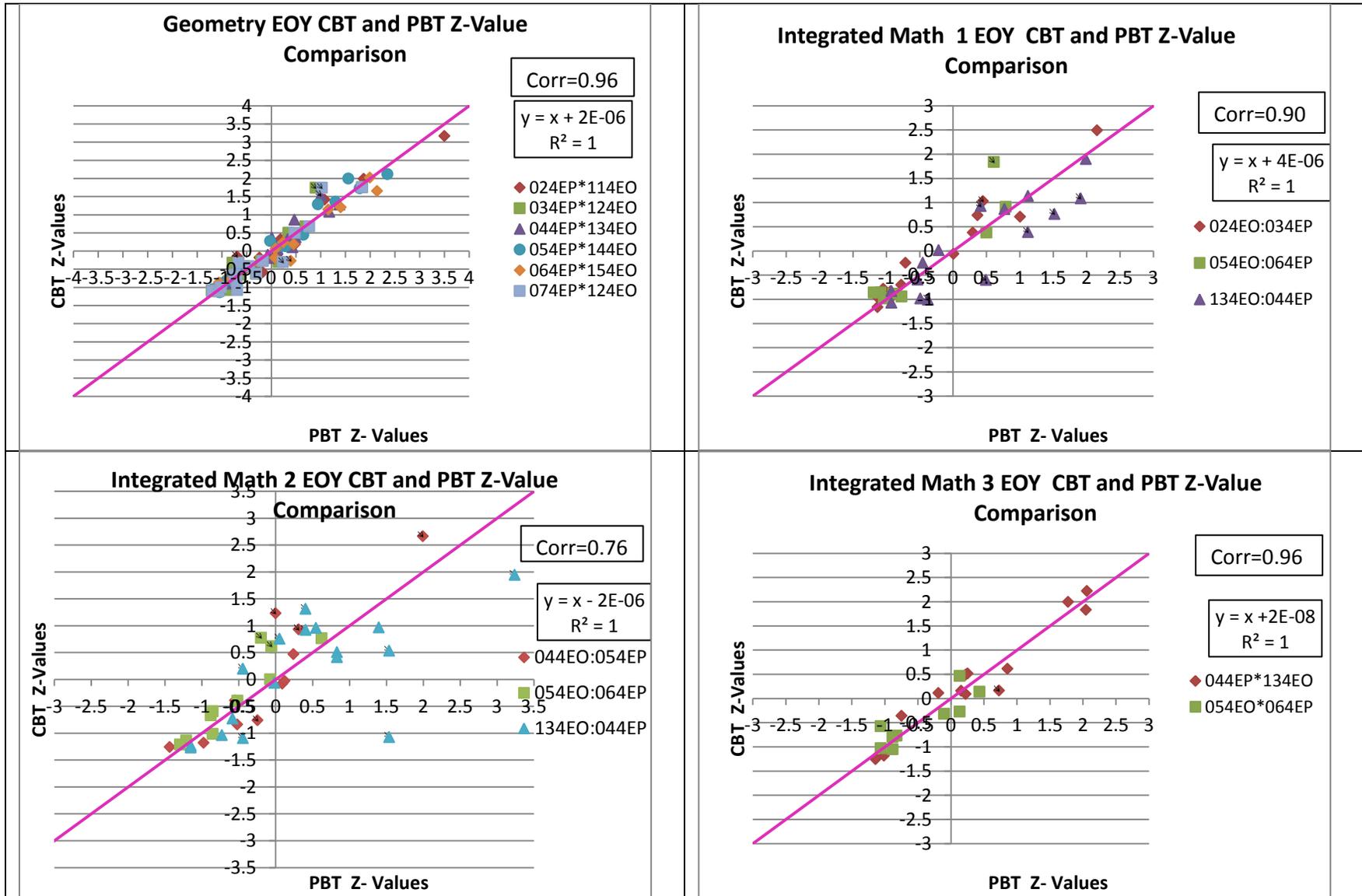




Table C.5 Characteristics of Items Flagged for z-Score Differences for ELA/Literacy PBA

Response Type	Flagged z-Value Items		Item Pool	
	Count	Percentage	Count	Percentage
Essay	4	8.9	65	6.3
MultipleChoice	1	2.2	17	1.7
MultipleChoice:MultipleChoice	33	73.3	745	72.5
MultipleChoice:MultipleChoice:MultipleChoice	1	2.2	23	2.2
OtherConstructedResponse	6	13.3	75	7.3
Other-response-types			102	9.9
Interaction Type	Count	Percentage	Count	Percentage
choiceInteraction	1	2.2	27	2.6
choiceInteraction:choiceInteraction	15	33.3	401	39.0
customInteraction	19	42.2	371	36.1
extendedTextInteraction	10	22.2	140	13.6
other-interaction-types			88	8.6
Cognitive Complexity	Count	Percentage	Count	Percentage
very low			2	0.2
Low	16	35.6	317	30.9
Medium	21	46.7	549	53.5
High	8	17.8	159	15.5
PARCC Number of Points	Count	Percentage	Count	Percentage
EBSR-2 points	35	77.8	747	72.7
PCR Reading-2 points	1	2.2	12	1.2
PCR Reading-3 points	1	2.2	7	0.7
PCR Reading-4 points	8	17.8	121	11.8
TECR-2 points			140	13.6
Passage_Type	Count	Percentage	Count	Percentage
Informational	12	26.7	339	33.0
Literary	33	73.3	687	67.0



Table C.6 Characteristics of Items Flagged for Flagged for z-Score Differences for ELA/Literacy EOY

	Flagged z-Value Items		Item Pool	
Response Type	Count	Percentage	Count	Percentage
MultipleChoice	5	6.3	117	7.3
MultipleChoice:MultipleChoice	74	93.7	1232	77.0
Other-response-types			251	15.7
Interaction Type	Count	Percentage	Count	Percentage
choiceInteraction	5	6.3	84	5.3
choiceInteraction:choiceInteraction	33	41.8	669	41.8
customInteraction	39	49.4	650	40.6
UNKNOWN:choiceInteraction:choiceInteraction	2	2.5	2	0.1
other-interaction-types			195	12.2
Cognitive Complexity	Count	Percentage	Count	Percentage
very low			1	0.1
Low	29	36.7	516	32.3
Medium	48	60.8	914	57.1
High	2	2.5	169	10.6
PARCC Number of Points	Count	Percentage	Count	Percentage
EBSR-2 points	79	100	1275	79.6875
TECR-2 points			325	20.3125
Passage_Type	Count	Percentage	Count	Percentage
Informational	41	51.9	842	52.6
Literary	38	48.1	758	47.4

Table C.7 Characteristics of Items Flagged for z-Score Differences for Mathematics PBA

	Flagged z-Value Items		Item Pool	
	Count	Percentage	Count	Percentage
Response Type				
Essay	6	13.6	93	6.1
FillInTheBlank	16	36.4	255	16.7
MultipleChoice	9	20.5	456	29.8
MultipleChoice:OtherConstructedResponse	2	4.5	13	0.8
OtherConstructedResponse	9	20.5	142	9.3
OtherConstructedResponse:OtherConstructedResponse	1	2.3	42	2.7
OtherConstructedResponse:OtherConstructedResponse:OtherConstructedResponse	1	2.3	11	0.7
Other-Response-Types			518	33.9
Interaction Type	Count	Percentage	Count	Percentage
choiceInteraction	9	20.5	442	28.9
choiceInteraction:extendedTextInteraction	2	4.5	14	0.9
extendedTextInteraction	15	34.1	206	13.5
extendedTextInteraction:extendedTextInteraction	1	2.3	32	2.1
extendedTextInteraction:extendedTextInteraction:extendedTextInteraction	1	2.3	12	0.8
textEntryInteraction	16	36.4	254	16.6
other-interaction-types			570	37.3
Cognitive Complexity	Count	Percentage	Count	Percentage
Low	12	27.3	528	34.5
Medium	23	52.3	666	43.5
High	9	20.5	336	22.0
PARCC Number of Points	Count	Percentage	Count	Percentage
Type 1 - 1 point	25	56.8	869	56.8
Type 1 - 2 points			123	8.0
Type 1 - 4 points			2	0.1
Type 2 - 3 points	7	15.9	129	8.4
Type 2 - 4 points	2	4.5	151	9.9
Type 3 - 3 points	8	18.2	153	10.0
Type 3 - 4 points			2	0.1
Type 3 - 6 points	2	4.5	101	6.6



Mode Comparability Research

Table C.8 Characteristics of Items Flagged for z-Score Differences for Mathematics EOY

Response Type	Flagged z-Value Items		Item Pool	
	Count	Percentage	Count	Percentage
FillInTheBlank	45	53.6	623	20.9
FillInTheBlank:MultipleChoice	2	2.4	57	1.9
MultipleChoice	26	31.0	1102	36.9
MultipleChoice:MultipleChoice	11	13.1	247	8.3
Other-response-types			957	32.0
Interaction Type	Count	Percentage	Count	Percentage
choiceInteraction	26	31.0	1028	34.4
choiceInteraction:choiceInteraction	8	9.5	183	6.1
customInteraction	5	6.0	499	16.7
textEntryInteraction	45	53.6	624	20.9
other-interaction-types			652	21.8
Cognitive Complexity	Count	Percentage	Count	Percentage
low	41	48.8	1127	37.7
medium	41	48.8	1741	58.3
high	2	2.4	118	4.0
PARCC Number of Points	Count	Percentage	Count	Percentage
Type 1 - 1 point	71	84.5	2002	67.0
Type 1 - 2 points	13	15.5	851	28.5
Type 1 - 3 points			3	0.1
Type 1 - 4 points			130	4.4



Mode Comparability Research

Table C.9 Summary of Mantel-Haenszel, SMD, and Logistic Regression DIF Results by Grade Levels for ELA/Literacy PBA

Test	Form Type	DIF Category	Mantel-Haenszel/SMD			Logistic regression			Uniform regression			Non-uniform regression		
			Total Number of Common Items	+ 1 Small Effect Size	- 1 Small Effect Size	Total Number of Common Items	+ 1 Small Effect Size	- 1 Small Effect Size	Total Number of Common Items	+ 1 Small Effect Size	- 1 Small Effect Size	Total Number of Common Items	+ 1 Small Effect Size	- 1 Small Effect Size
ELA03	PBA	A	38	-	-	43	-	-	43	-	-	43	-	-
		B	5	-	-	0	-	-	0	-	-	0	-	-
		C	0	-	-	0	-	-	0	-	-	0	-	-
		C-	0	-	-	0	-	-	0	-	-	0	-	-
		C+	0	-	-	0	-	-	0	-	-	0	-	-
ELA04	PBA	A	33	3	5	35	-	-	35	-	-	35	-	-
		B	1	4	2	0	-	-	0	-	-	0	-	-
		C	0	0	0	0	-	-	0	-	-	0	-	-
		C-	1	1	0	0	-	-	0	-	-	0	-	-
		C+	0	0	1	0	-	-	0	-	-	0	-	-
ELA05	PBA	A	41	25	39	57	6	8	57	6	8	58	9	9
		B	9	14	4	0	2	0	0	2	0	0	0	0
		C	0	0	0	0	0	0	0	0	0	0	0	0
		C-	4	8	0	0	0	0	0	0	0	0	0	0
		C+	4	1	5	1	1	1	1	1	1	0	0	0
ELA06	PBA	A	60	2	6	64	-	-	64	-	-	64	-	-
		B	3	4	1	0	-	-	0	-	-	0	-	-
		C	0	0	0	0	-	-	0	-	-	0	-	-
		C-	1	2	0	0	-	-	0	-	-	0	-	-
		C+	0	0	1	0	-	-	0	-	-	0	-	-
ELA07	PBA	A	100	11	10	104	11	11	104	11	11	104	11	11
		B	4	0	0	0	0	0	0	0	1	1	1	1
		C	0	0	0	1	1	1	0	0	0	0	0	0
		C-	1	1	1	0	0	0	1	1	0	0	0	0
		C+	0	0	1	0	0	0	0	0	0	0	0	0



Mode Comparability Research

Table C.9 Summary of Mantel-Haenszel, SMD, and Logistic Regression DIF Results across Grade Levels for ELA/Literacy PBA (Cont'd)

Test	Form Type	DIF Category	Mantel-Haenszel/SMD			Logistic regression			Uniform regression			Non-uniform regression		
			Total Number of Common Items	+ 1 Small Effect Size	- 1 Small Effect Size	Total Number of Common Items	+ 1 Small Effect Size	- 1 Small Effect Size	Total Number of Common Items	+ 1 Small Effect Size	- 1 Small Effect Size	Total Number of Common Items	+ 1 Small Effect Size	- 1 Small Effect Size
ELA08	PBA	A	83	7	10	90	-	-	90	-	-	90	-	-
		B	6	4	2	0	-	-	0	-	-	0	-	-
		C	0	0	0	0	-	-	0	-	-	0	-	-
		C-	1	2	0	0	-	-	0	-	-	0	-	-
		C+	0	0	1	0	-	-	0	-	-	0	-	-
ELA09	PBA	A	45	13	11	57	15	15	57	15	15	58	16	16
		B	11	1	2	0	0	0	0	0	1	0	0	0
		C	0	0	0	1	0	1	0	0	0	0	0	0
		C-	1	1	1	0	1	0	1	1	0	0	0	0
		C+	1	1	2	0	0	0	0	0	0	0	0	0
ELA10	PBA	A	44	-	-	54	-	-	54	-	-	54	-	-
		B	10	-	-	0	-	-	0	-	-	0	-	-
		C	0	-	-	0	-	-	0	-	-	0	-	-
		C-	0	-	-	0	-	-	0	-	-	0	-	-
		C+	0	-	-	0	-	-	0	-	-	0	-	-
ELA11	PBA	A	52	13	19	55	12	12	55	12	12	57	14	14
		B	2	7	0	0	0	0	0	0	0	0	0	0
		C	0	0	0	0	0	0	0	0	0	0	0	0
		C-	0	1	0	0	0	0	0	0	0	0	0	0
		C+	3	2	4	2	2	2	2	2	2	2	0	0
Total	PBA	A	496	74	100	559	44	46	559	44	46	563	50	50
		B	51	34	11	0	2	0	0	2	2	1	1	1
		C	0	0	0	2	1	2	0	0	0	0	0	0
		C-	9	16	2	0	1	0	2	2	0	0	0	0
		C+	8	4	15	3	3	3	3	3	3	0	0	0



Mode Comparability Research

Table C.10 Summary of Mantel-Haenszel, SMD, and Logistic Regression DIF Results by Grade Levels for ELA/Literacy EOY

Test	Form Type	DIF Category	Mantel-Haenszel/SMD			Logistic regression			Uniform regression			Non-uniform regression		
			Total Number of Common Items	+ 1 Small Effect Size	- 1 Small Effect Size	Total Number of Common Items	+ 1 Small Effect Size	- 1 Small Effect Size	Total Number of Common Items	+ 1 Small Effect Size	- 1 Small Effect Size	Total Number of Common Items	+ 1 Small Effect Size	- 1 Small Effect Size
ELA03	EOY	A	123	-	-	131	-	-	131	-	-	131	-	-
		B	8	-	-	0	-	-	0	-	-	0	-	-
		C	0	-	-	0	-	-	0	-	-	0	-	-
		C-	0	-	-	0	-	-	0	-	-	0	-	-
		C+	0	-	-	0	-	-	0	-	-	0	-	-
ELA04	EOY	A	102	-	-	106	-	-	106	-	-	106	-	-
		B	4	-	-	0	-	-	0	-	-	0	-	-
		C	0	-	-	0	-	-	0	-	-	0	-	-
		C-	0	-	-	0	-	-	0	-	-	0	-	-
		C+	0	-	-	0	-	-	0	-	-	0	-	-
ELA05	EOY	A	97	16	19	102	22	22	102	22	22	103	23	23
		B	5	5	2	0	0	0	0	1	0	0	0	0
		C	0	0	0	1	1	1	0	0	0	0	0	0
		C-	0	1	0	0	0	0	0	0	0	0	0	0
		C+	1	1	2	0	0	0	1	0	1	0	0	0
ELA6	EOY	A	100	18	12	105	21	21	105	21	21	105	21	21
		B	5	2	7	0	0	0	0	0	0	0	0	0
		C	0	0	0	1	1	1	0	0	0	1	1	1
		C-	1	2	1	0	0	0	1	1	1	0	0	0
		C+	0	0	2	0	0	0	0	0	0	0	0	0
ELA7	EOY	A	90	47	40	94	37	37	94	37	37	95	38	38
		B	3	6	10	0	0	1	0	0	1	0	0	0
		C	0	0	0	1	1	1	0	0	0	1	1	1
		C-	3	4	2	1	1	0	2	2	1	0	0	0
		C+	0	0	5	0	0	0	0	0	0	0	0	0



Mode Comparability Research

Table C.10 Summary of Mantel-Haenszel, SMD, and Logistic Regression DIF Results by Grade Levels for ELA/Literacy EOY (Cont'd)

Test	Form Type	DIF Category	Mantel-Haenszel/SMD			Logistic regression			Uniform regression			Non-uniform regression		
			Total Number of Common Items	+ 1 Small Effect Size	- 1 Small Effect Size	Total Number of Common Items	+ 1 Small Effect Size	- 1 Small Effect Size	Total Number of Common Items	+ 1 Small Effect Size	- 1 Small Effect Size	Total Number of Common Items	+ 1 Small Effect Size	- 1 Small Effect Size
ELA08	EOY	A	58	15	17	62	-	-	62	-	-	62	-	-
		B	3	4	1	0	-	-	0	-	-	0	-	-
		C	0	0	0	0	-	-	0	-	-	0	-	-
		C-	0	0	0	0	-	-	0	-	-	0	-	-
		C+	1	1	2	0	-	-	0	-	-	0	-	-
ELA09	EOY	A	90	-	-	91	-	-	91	-	-	91	-	-
		B	1	-	-	0	-	-	0	-	-	0	-	-
		C	0	-	-	0	-	-	0	-	-	0	-	-
		C-	0	-	-	0	-	-	0	-	-	0	-	-
		C+	0	-	-	0	-	-	0	-	-	0	-	-
ELA10	EOY	A	97	-	-	102	-	-	102	-	-	102	-	-
		B	5	-	-	0	-	-	0	-	-	0	-	-
		C	0	-	-	0	-	-	0	-	-	0	-	-
		C-	0	-	-	0	-	-	0	-	-	0	-	-
		C+	0	-	-	0	-	-	0	-	-	0	-	-
ELA11	EOY	A	79	-	-	82	-	-	82	-	-	82	-	-
		B	3	-	-	0	-	-	0	-	-	0	-	-
		C	0	-	-	0	-	-	0	-	-	0	-	-
		C-	0	-	-	0	-	-	0	-	-	0	-	-
		C+	0	-	-	0	-	-	0	-	-	0	-	-
Total	EOY	A	836	96	88	875	80	80	875	80	80	877	82	82
		B	37	17	20	0	0	1	0	1	1	0	0	0
		C	0	0	0	3	3	3	0	0	0	2	2	2
		C-	4	7	3	1	1	0	3	3	2	0	0	0
		C+	2	2	11	0	0	0	1	0	1	0	0	0



Mode Comparability Research

Table C.11 Summary of Mantel-Haenszel, SMD, and Logistic Regression DIF Results by Grade Levels for Mathematics PBA

Test	Form Type	DIF Category	Mantel-Haenszel/SMD			Logistic regression			Uniform regression			Non-uniform regression		
			Total Number of Common Items	+ 1 Small Effect Size	- 1 Small Effect Size	Total Number of Common Items	+ 1 Small Effect Size	- 1 Small Effect Size	Total Number of Common Items	+ 1 Small Effect Size	- 1 Small Effect Size	Total Number of Common Items	+ 1 Small Effect Size	- 1 Small Effect Size
MAT03	PBA	A	31	21	29	43	-	-	45	-	-	52	-	-
		B	8	8	7	4	-	-	3	-	-	3	-	-
		C	0	0	0	4	-	-	0	-	-	0	-	-
		C-	12	15	1	3	-	-	5	-	-	0	-	-
		C+	4	0	7	1	-	-	2	-	-	0	-	-
MAT04	PBA	A	27	12	17	44	-	-	45	-	-	51	-	-
		B	12	6	0	5	-	-	4	-	-	0	-	-
		C	0	0	0	0	-	-	0	-	-	0	-	-
		C-	8	8	3	2	-	-	2	-	-	0	-	-
		C+	4	1	7	0	-	-	0	-	-	0	-	-
MAT05	PBA	A	20	-	-	26	-	-	26	-	-	27	-	-
		B	4	-	-	0	-	-	0	-	-	0	-	-
		C	0	-	-	1	-	-	0	-	-	0	-	-
		C-	2	-	-	0	-	-	1	-	-	0	-	-
		C+	1	-	-	0	-	-	0	-	-	0	-	-
MAT06	PBA	A	40	13	13	50	-	-	50	-	-	50	-	-
		B	6	3	7	0	-	-	0	-	-	0	-	-
		C	0	0	0	0	-	-	0	-	-	0	-	-
		C-	3	6	0	0	-	-	0	-	-	0	-	-
		C+	1	0	2	0	-	-	0	-	-	0	-	-
MAT07	PBA	A	43	23	22	54	16	15	56	16	15	61	19	19
		B	8	8	8	5	1	4	3	1	4	0	0	0
		C	0	0	0	0	0	0	0	0	0	0	0	0
		C-	8	13	4	2	2	0	2	2	0	0	0	0
		C+	2	0	10	0	0	0	0	0	0	0	0	0



Mode Comparability Research

Table C.11 Summary of Mantel-Haenszel, SMD, and Logistic Regression DIF Results by Grade Levels for Mathematics PBA (Cont'd)

Test	Form Type	DIF Category	Mantel-Haenszel/SMD			Logistic regression			Uniform regression			Non-uniform regression		
			Total Number of Common Items	+ 1 Small Effect Size	- 1 Small Effect Size	Total Number of Common Items	+ 1 Small Effect Size	- 1 Small Effect Size	Total Number of Common Items	+ 1 Small Effect Size	- 1 Small Effect Size	Total Number of Common Items	+ 1 Small Effect Size	- 1 Small Effect Size
MAT08	PBA	A	20	2	4	26	-	-	27	-	-	27	-	-
		B	4	1	2	1	-	-	0	-	-	0	-	-
		C	0	0	0	0	-	-	0	-	-	0	-	-
		C-	3	4	0	0	-	-	0	-	-	0	-	-
		C+	0	0	1	0	-	-	0	-	-	0	-	-
ALG01	PBA	A	20	5	6	29	9	9	30	9	10	31	9	9
		B	6	1	1	1	0	1	1	1	0	1	1	1
		C	0	0	0	1	1	0	0	0	0	0	0	0
		C-	4	4	0	1	0	0	1	0	0	0	0	0
		C+	2	0	3	0	0	0	0	0	0	0	0	0
GEO	PBA	A	18	4	3	21	-	-	21	-	-	21	-	-
		B	2	3	4	0	-	-	0	-	-	0	-	-
		C	0	0	0	0	-	-	0	-	-	0	-	-
		C-	1	2	0	0	-	-	0	-	-	0	-	-
		C+	0	0	2	0	-	-	0	-	-	0	-	-
ALG02	PBA	A	11	2	4	13	-	-	13	-	-	14	-	-
		B	1	3	1	1	-	-	1	-	-	0	-	-
		C	0	0	0	0	-	-	0	-	-	0	-	-
		C-	2	3	0	0	-	-	0	-	-	0	-	-
		C+	0	0	2	0	-	-	0	-	-	0	-	-
MAT1I	PBA	A	10	5	4	14	-	-	15	-	-	15	-	-
		B	3	1	3	1	-	-	0	-	-	0	-	-
		C	0	0	0	0	-	-	0	-	-	0	-	-
		C-	2	4	0	0	-	-	0	-	-	0	-	-
		C+	0	0	3	0	-	-	0	-	-	0	-	-



Mode Comparability Research

Table C.11 Summary of Mantel-Haenszel, SMD, and Logistic Regression DIF Results by Grade Levels for Mathematics PBA (Cont'd)

Test	Form Type	DIF Category	Mantel-Haenszel/SMD			Logistic regression			Uniform regression			Non-uniform regression		
			Total Number of Common Items	+ 1 Small Effect Size	- 1 Small Effect Size	Total Number of Common Items	+ 1 Small Effect Size	- 1 Small Effect Size	Total Number of Common Items	+ 1 Small Effect Size	- 1 Small Effect Size	Total Number of Common Items	+ 1 Small Effect Size	- 1 Small Effect Size
MAT2I	PBA	A	3	-	-	3	-	-	3	-	-	3	-	-
		B	0	-	-	0	-	-	0	-	-	0	-	-
		C	0	-	-	0	-	-	0	-	-	0	-	-
		C-	0	-	-	0	-	-	0	-	-	0	-	-
		C+	0	-	-	0	-	-	0	-	-	0	-	-
MAT3I	PBA	A	6	-	-	6	-	-	8	-	-	8	-	-
		B	0	-	-	2	-	-	0	-	-	0	-	-
		C	0	-	-	0	-	-	0	-	-	0	-	-
		C-	1	-	-	0	-	-	0	-	-	0	-	-
		C+	1	-	-	0	-	-	0	-	-	0	-	-
Total	PBA	A	249	87	102	329	25	24	339	25	25	360	28	28
		B	54	34	33	20	1	5	12	2	4	4	1	1
		C	0	0	0	6	1	0	0	0	0	0	0	0
		C-	46	59	8	8	2	0	11	2	0	0	0	0
		C+	15	1	38	1	0	0	2	0	0	0	0	0



Mode Comparability Research

Table C.12 Summary of Mantel-Haenszel, SMD, and Logistic Regression DIF Results by Grade Levels for Mathematics EOY

Test	Form Type	DIF Category	Mantel-Haenszel/SMD			Logistic regression			Uniform regression			Non-uniform regression		
			Total Number of Common Items	+ 1 Small Effect Size	- 1 Small Effect Size	Total Number of Common Items	+ 1 Small Effect Size	- 1 Small Effect Size	Total Number of Common Items	+ 1 Small Effect Size	- 1 Small Effect Size	Total Number of Common Items	+ 1 Small Effect Size	- 1 Small Effect Size
MAT03	EOY	A	151	37	37	174	-	-	174	-	-	174	-	-
		B	18	8	9	0	-	-	0	-	-	0	-	-
		C	0	0	0	0	-	-	0	-	-	0	-	-
		C-	2	6	0	0	-	-	0	-	-	0	-	-
		C+	3	0	5	0	-	-	0	-	-	0	-	-
MAT04	EOY	A	127	102	80	147	-	-	147	-	-	151	-	-
		B	17	9	32	4	-	-	4	-	-	0	-	-
		C	0	0	0	0	-	-	0	-	-	0	-	-
		C-	7	19	5	0	-	-	0	-	-	0	-	-
		C+	0	0	13	0	-	-	0	-	-	0	-	-
MAT05	EOY	A	99	33	35	107	15	16	107	15	16	109	17	17
		B	7	9	11	1	2	0	1	2	0	0	0	0
		C	0	0	0	0	0	0	0	0	0	0	0	0
		C-	1	10	0	0	0	0	0	0	0	0	0	0
		C+	2	2	8	1	0	1	1	0	1	0	0	0
MAT06	EOY	A	94	66	81	123	47	50	123	47	50	127	55	55
		B	18	31	24	1	6	2	1	6	2	0	0	0
		C	0	0	0	2	0	2	0	0	0	0	0	0
		C-	8	27	1	0	1	0	0	1	0	0	0	0
		C+	7	3	21	1	1	1	3	1	3	0	0	0
MAT07	EOY	A	107	44	46	127	-	-	127	-	-	128	-	-
		B	13	20	10	1	-	-	1	-	-	0	-	-
		C	0	0	0	0	-	-	0	-	-	0	-	-
		C-	5	11	1	0	-	-	0	-	-	0	-	-
		C+	3	0	18	0	-	-	0	-	-	0	-	-



Mode Comparability Research

Table C.12 Summary of Mantel-Haenszel, SMD, and Logistic Regression DIF Results by Grade Levels for Mathematics EOY (Cont'd)

Test	Form Type	DIF Category	Mantel-Haenszel/SMD			Logistic regression			Uniform regression			Non-uniform regression		
			Total Number of Common Items	+ 1 Small Effect Size	- 1 Small Effect Size	Total Number of Common Items	+ 1 Small Effect Size	- 1 Small Effect Size	Total Number of Common Items	+ 1 Small Effect Size	- 1 Small Effect Size	Total Number of Common Items	+ 1 Small Effect Size	- 1 Small Effect Size
MAT08	EOY	A	75	45	44	95	-	-	95	-	-	95	-	-
		B	12	20	20	0	-	-	0	-	-	0	-	-
		C	0	0	0	0	-	-	0	-	-	0	-	-
		C-	7	16	0	0	-	-	0	-	-	0	-	-
		C+	1	0	17	0	-	-	0	-	-	0	-	-
ALG01	EOY	A	65	-	-	76	-	-	76	-	-	76	-	-
		B	10	-	-	0	-	-	0	-	-	0	-	-
		C	0	-	-	0	-	-	0	-	-	0	-	-
		C-	0	-	-	0	-	-	0	-	-	0	-	-
		C+	1	-	-	0	-	-	0	-	-	0	-	-
GEO	EOY	A	79	30	40	90	-	-	92	-	-	95	-	-
		B	6	25	19	5	-	-	3	-	-	0	-	-
		C	0	0	0	0	-	-	0	-	-	0	-	-
		C-	4	22	1	0	-	-	0	-	-	0	-	-
		C+	6	1	18	0	-	-	0	-	-	0	-	-
ALG02	EOY	A	48	-	-	57	-	-	58	-	-	58	-	-
		B	10	-	-	1	-	-	0	-	-	0	-	-
		C	0	-	-	0	-	-	0	-	-	0	-	-
		C-	0	-	-	0	-	-	0	-	-	0	-	-
		C+	0	-	-	0	-	-	0	-	-	0	-	-
MAT1I	EOY	A	15	-	-	19	-	-	20	-	-	21	-	-
		B	4	-	-	2	-	-	1	-	-	0	-	-
		C	0	-	-	0	-	-	0	-	-	0	-	-
		C-	2	-	-	0	-	-	0	-	-	0	-	-
		C+	0	-	-	0	-	-	0	-	-	0	-	-



Mode Comparability Research

Table C.12 Summary of Mantel-Haenszel, SMD, and Logistic Regression DIF Results by Grade Levels for Mathematics EOY (Cont'd)

Test	Form Type	DIF Category	Mantel-Haenszel/SMD			Logistic regression			Uniform regression			Non-uniform regression		
			Total Number of Common Items	+ 1 Small Effect Size	- 1 Small Effect Size	Total Number of Common Items	+ 1 Small Effect Size	- 1 Small Effect Size	Total Number of Common Items	+ 1 Small Effect Size	- 1 Small Effect Size	Total Number of Common Items	+ 1 Small Effect Size	- 1 Small Effect Size
MAT2I	EOY	A	15	-	-	18	-	-	18	-	-	21	-	-
		B	2	-	-	3	-	-	3	-	-	0	-	-
		C	0	-	-	0	-	-	0	-	-	0	-	-
		C-	1	-	-	0	-	-	0	-	-	0	-	-
		C+	3	-	-	0	-	-	0	-	-	0	-	-
MAT3I	EOY	A	20	-	-	22	-	-	23	-	-	22	-	-
		B	2	-	-	1	-	-	0	-	-	1	-	-
		C	0	-	-	0	-	-	0	-	-	0	-	-
		C-	1	-	-	0	-	-	0	-	-	0	-	-
		C+	0	-	-	0	-	-	0	-	-	0	-	-
Total	EOY	A	895	357	363	1055	62	66	1060	62	66	1077	72	72
		B	119	122	125	19	8	2	14	8	2	1	0	0
		C	0	0	0	2	0	2	0	0	0	0	0	0
		C-	38	111	8	0	1	0	0	1	0	0	0	0
		C+	26	6	100	2	1	2	4	1	4	0	0	0



Mode Comparability Research

Table C.13 Characteristics of Items Flagged for C-Level DIF for ELA/Literacy PBA

Response Type	Flagged C-DIF Items		Flagged C-DIF + 1 ES		Flagged C-DIF - 1 ES		Item Pool	
	Count	Percentage	Count	Percentage	Count	Percentage	Count	Percentage
Essay	1	5.9			5	29.4	65	6.3
MultipleChoice	1	5.9	2	10.0			17	1.7
MultipleChoice:MultipleChoice	12	70.6	17	85.0	6	35.3	745	72.5
MultipleChoice:MultipleChoice:MultipleChoice	1	5.9			1	5.9	23	2.2
OtherConstructedResponse	2	11.8	1	5.0	5	29.4	75	7.3
Other-response-types							102	9.9
Interaction Type	Count	Percentage	Count	Percentage	Count	Percentage	Count	Percentage
choiceInteraction	1	5.9	2	10.0			27	2.6
choiceInteraction:choiceInteraction	7	41.2	12	60.0	3	17.6	401	39.0
customInteraction	6	35.3	5	25.0	4	23.5	371	36.1
extendedTextInteraction	3	17.6	1	5.0	10	58.8	140	13.6
other-interaction-types							88	8.6
Cognitive Complexity	Count	Percentage	Count	Percentage	Count	Percentage	Count	Percentage
very low							2	0.2
low	7	41.2	9	45.0	3	17.6	317	30.9
medium	7	41.2	9	45.0	7	41.2	549	53.5
high	3	17.6	2	10.0	7	41.2	159	15.5
PARCC Number of Points	Count	Percentage	Count	Percentage	Count	Percentage	Count	Percentage
EBSR-2 points	14	82.4	19	95.0	7	41.2	747	72.7
PCR Reading-2 points							12	1.2
PCR Reading-3 points	1	5.9			2	11.8	7	0.7
PCR Reading-4 points	2	11.8	1	5.0	8	47.1	121	11.8
TECR-2 points							140	13.6
Passage_Type	Count	Percentage	Count	Percentage	Count	Percentage	Count	Percentage
Informational	3	17.6	3	15.0	3	17.6	339	33.0
Literary	14	82.4	17	85.0	14	82.4	687	67.0



Mode Comparability Research

Table C.14 Characteristics of Items Flagged for C-Level DIF for ELA/Literacy EOY

Response Type	Flagged C-DIF Items		Flagged C-DIF + 1 ES		Flagged C-DIF - 1 ES		Item Pool	
	Count	Percentage	Count	Percentage	Count	Percentage	Count	Percentage
MultipleChoice							117	7.3
MultipleChoice:MultipleChoice	6	100	9	100	14	100	1232	77.0
MultipleChoice:MultipleChoice:MultipleChoice							24	1.5
Other-response-types							227	14.2
Interaction Type	Count	Percentage	Count	Percentage	Count	Percentage	Count	Percentage
choiceInteraction							84	5.3
choiceInteraction:choiceInteraction	3	50.0	6	66.7	7	50.0	669	41.8
customInteraction	1	16.7	1	11.1	5	35.7	650	40.6
UNKNOWN:choiceInteraction:choiceInteraction	2	33.3	2	22.2	2	14.3	2	0.1
other-interaction-types							195	12.2
Cognitive Complexity	Count	Percentage	Count	Percentage	Count	Percentage	Count	Percentage
very low							1	0.1
low	3	50.0	4	44.4	6	42.9	516	32.3
medium	3	50.0	5	55.6	6	42.9	914	57.1
high					2	14.3	169	10.6
PARCC Number of Points	Count	Percentage	Count	Percentage	Count	Percentage	Count	Percentage
EBSR-2 points	6	100	9	100	14	100	1275	79.7
TECR-2 points							325	20.3
Passage_Type	Count	Percentage	Count	Percentage	Count	Percentage	Count	Percentage
Informational	2	33.3	3	33.3	10	71.4	842	52.6
Literary	4	66.7	6	66.7	4	28.6	758	47.4



Mode Comparability Research

Table C.15 Characteristics of Items Flagged for C-Level DIF for Mathematics PBA

Response Type	Flagged C-DIF Items		Flagged C-DIF + 1 ES		Flagged C-DIF - 1 ES		Item Pool	
	Count	Percentage	Count	Percentage	Count	Percentage	Count	Percentage
Essay	7	11.5			9	20.0	93	6.1
Essay:Essay			1	1.7	1	2.2	72	4.7
Essay:Essay:Essay					1	2.2	29	1.9
FillInTheBlank	27	44.3	23	38.3	8	17.8	255	16.7
FillInTheBlank:FillInTheBlank	3	4.9	7	11.7			39	2.5
FillInTheBlank:FillInTheBlank:Essay:Essay			1	1.7			3	0.2
MultipleChoice	18	29.5	24	40.0	4	8.9	456	29.8
MultipleChoice:FillInTheBlank			1	1.7			20	1.3
MultipleChoice:OtherConstructedResponse	2	3.3	1	1.7	1	2.2	13	0.8
MultipleChoice:OtherConstructedResponse:OtherConstructedResponse					2	4.4	2	0.1
OtherConstructedResponse	4	6.6	2	3.3	15	33.3	142	9.3
OtherConstructedResponse:OtherConstructedResponse					2	4.4	42	2.7
OtherConstructedResponse:OtherConstructedResponse:OtherConstructedResponse					2	4.4	11	0.7
Other-Response-Types							353	23.1
Interaction Type	Count	Percentage	Count	Percentage	Count	Percentage	Count	Percentage
choiceInteraction	18	29.5	24	40.0	4	8.9	442	28.9
choiceInteraction:extendedTextInteraction	2	3.3	1	1.7	1	2.2	14	0.9
choiceInteraction:extendedTextInteraction:extendedTextInteraction					2	4.4	3	0.2
choiceInteraction:textEntryInteraction			1	1.7			9	0.6
customInteraction	3	4.9	8	13.3	2	4.4	286	18.7
extendedTextInteraction	11	18	2	3.3	24	53.3	206	13.5
extendedTextInteraction:extendedTextInteraction					2	4.4	32	2.1
extendedTextInteraction:extendedTextInteraction:extendedTextInteraction					2	4.4	12	0.8
textEntryInteraction	27	44.3	23	38.3	8	17.8	254	16.6
textEntryInteraction:textEntryInteraction			1	1.7			2	0.1
other-interaction-types							270	17.6
Cognitive Complexity	Count	Percentage	Count	Percentage	Count	Percentage	Count	Percentage
low	22	36.1	22	36.7	4	8.9	528	34.5
medium	30	49.2	36	60.0	32	71.1	666	43.5
high	9	14.8	2	3.3	9	20.0	336	22.0
PARCC Number of Points	Count	Percentage	Count	Percentage	Count	Percentage	Count	Percentage
Type 1 - 1 point	45	73.8	46	76.7	11	24.4	869	56.8
Type 1 - 2 points	3	4.9	9	15.0	1	2.2	123	8.0
Type 1 - 4 points							2	0.1
Type 2 - 3 points	7	11.5	1	1.7	12	26.7	129	8.4
Type 2 - 4 points	2	3.3	2	3.3	5	11.1	151	9.9
Type 3 - 3 points	4	6.6			12	26.7	153	10.0
Type 3 - 4 points							2	0.1
Type 3 - 6 points			2	3.3	4	8.9	101	6.6



Mode Comparability Research

Table C.16 Characteristics of Items Flagged for C-Level DIF for Mathematics EOY

Response Type	Flagged C-DIF Items		Flagged C-DIF + 1 ES		Flagged C-DIF - 1 ES		Item Pool	
	Count	Percentage	Count	Percentage	Count	Percentage	Count	Percentage
FillInTheBlank	42	65.6	80	68.4	39	36.1	623	20.9
FillInTheBlank:FillInTheBlank	1	1.6	4	3.4	3	2.8	217	7.3
FillInTheBlank:MultipleChoice			3	2.6			57	1.9
MultipleChoice	16	25.0	27	23.1	41	38.0	1102	36.9
MultipleChoice:FillInTheBlank					4	3.7	100	3.3
MultipleChoice:MultipleChoice	5	7.8	2	1.7	12	11.1	247	8.3
MultipleChoice:MultipleChoice:FillInTheBlank:FillInTheBlank					3	2.8	11	0.4
MultipleChoice:MultipleChoice:MultipleChoice:FillInTheBlank					2	1.9	9	0.3
MultipleChoice:MultipleChoice:MultipleChoice:MultipleChoice			1	0.9	4	3.7	33	1.1
Other-response-types							587	19.7
Interaction Type	Count	Percentage	Count	Percentage	Count	Percentage	Count	Percentage
choiceInteraction	16	25	27	23.1	41	38.0	1028	34.4
choiceInteraction:choiceInteraction	1	1.6	2	1.7	10	9.3	183	6.1
choiceInteraction:choiceInteraction:choiceInteraction:choiceInteraction			1	0.9	3	2.8	24	0.8
choiceInteraction:choiceInteraction:choiceInteraction:textEntryInteraction					1	0.9	6	0.2
choiceInteraction:choiceInteraction:textEntryInteraction:textEntryInteraction					3	2.8	7	0.2
choiceInteraction:textEntryInteraction					4	3.7	61	2.0
customInteraction	5	7.8	4	3.4	7	6.5	499	16.7
textEntryInteraction	42	65.6	80	68.4	39	36.1	624	20.9
textEntryInteraction:textEntryInteraction			3	2.6			64	2.1
other-interaction-types							490	16.4
Cognitive Complexity	Count	Percentage	Count	Percentage	Count	Percentage	Count	Percentage
low	20	31.3	48	41.0	57	52.8	1127	37.7
medium	42	65.6	67	57.3	49	45.4	1741	58.3
high	2	3.1	2	1.7	2	1.9	118	4.0
PARCC Number of Points	Count	Percentage	Count	Percentage	Count	Percentage	Count	Percentage
Type 1 - 1 point	58	90.6	107	91.5	80	74.1	2002	67.0
Type 1 - 2 points	6	9.4	9	7.7	19	17.6	851	28.5
Type 1 - 3 points							3	0.1
Type 1 - 4 points			1	0.9	9	8.3	130	4.4



Mode Comparability Research

Table C.17 Test Level Score Results for the Single Group Model for ELA/Literacy PBA by Mode of Administration- Common Items

Grade	Form Pair	Mode	RMSEA	TLI	CFI	Grade	Form Pair	Mode	RMSEA	TLI	CFI	Grade	Form Pair	Mode	RMSEA	TLI	CFI
3	014PP/034PO	PBT	0.022	0.991	0.994	4	014PP/014PO	PBT	0.020	0.972	0.980	5	014PP/024PO	PBT	0.017	0.995	0.996
3	034PO/014PP	CBT	0.026	0.986	0.990	4	014PO/014PP	CBT	0.030	0.930	0.950	5	024PO/014PP	CBT	0.010	0.998	0.998
3	034PP/054PO	PBT	0.062	0.908	0.928	4	034PP/034PO	PBT	0.035	0.974	0.981	5	034PP/034PO	PBT	0.026	0.981	0.984
3	054PO/034PP	CBT	0.031	0.980	0.985	4	034PO/034PP	CBT	0.040	0.975	0.982	5	034PO/034PP	CBT	0.026	0.976	0.980
3	044PP/074PO	PBT	0.040	0.938	0.954	4	064PP/014PO	PBT	0.021	0.981	0.986	5	044PP/054PO	PBT	0.013	0.994	0.996
3	074PO/044PP	CBT	0.028	0.967	0.975	4	014PO/064PP	CBT	0.017	0.988	0.992	5	054PO/044PP	CBT	0.016	0.993	0.995
3	054PP/014PO	PBT	0.000	1.008	1.000	4	074PP/014PO	PBT	0.027	0.966	0.976	5	064PP/024PO	PBT	0.000	1.001	1.000
3	014PO/054PP	CBT	0.013	0.997	0.998	4	014PO/074PP	CBT	0.017	0.988	0.992	5	024PO/064PP	CBT	0.014	0.995	0.996
3	064PP/014PO	PBT	0.030	0.982	0.986							5	074PP/024PO	PBT	0.025	0.987	0.990
3	014PO/064PP	CBT	0.021	0.991	0.993							5	024PO/074PP	CBT	0.018	0.993	0.995
Grade	Form Pair	Mode	RMSEA	TLI	CFI	Grade	Form Pair	Mode	RMSEA	TLI	CFI	Grade	Form Pair	Mode	RMSEA	TLI	CFI
6	014PP/014PO	PBT	0.031	0.973	0.978	7	014PP/014PO	PBT	0.030	0.967	0.973	8	014PP/014PO	PBT	0.025	0.983	0.985
6	014PO/014PP	CBT	0.031	0.970	0.976	7	014PO/014PP	CBT	0.027	0.972	0.978	8	014PO/014PP	CBT	0.029	0.974	0.978
6	034PP/034PO	PBT	0.034	0.966	0.975	7	034PP/034PO	PBT	0.027	0.973	0.977	8	024PP/014PO	PBT	0.017	0.992	0.994
6	034PO/034PP	CBT	0.042	0.945	0.960	7	034PO/034PP	CBT	0.029	0.968	0.972	8	014PO/024PP	CBT	0.000	1.000	1.000
6	044PP/054PO	PBT	0.027	0.983	0.987	7	044PP/054PO	PBT	0.000	1.008	1.000	8	034PP/034PO	PBT	0.027	0.984	0.987
6	054PO/044PP	CBT	0.042	0.959	0.968	7	054PO/044PP	CBT	0.017	0.985	0.988	8	034PO/034PP	CBT	0.031	0.975	0.980
6	054PP/164PO	PBT	0.024	0.989	0.990	7	044PP/064PO	PBT	0.019	0.984	0.987	8	044PP/064PO	PBT	0.020	0.991	0.994
6	164PO/054PP	CBT	0.023	0.986	0.989	7	064PO/044PP	CBT	0.020	0.982	0.986	8	064PO/044PP	CBT	0.000	1.014	1.000
6	064PP/014PO	PBT	0.022	0.987	0.989	7	054PP/164PO	PBT	0.014	0.984	0.988	8	054PP/054PO	PBT	0.024	0.984	0.987
6	014PO/064PP	CBT	0.043	0.949	0.959	7	164PO/054PP	CBT	0.035	0.882	0.911	8	054PO/054PP	CBT	0.024	0.988	0.991
6	074PP/014PO	PBT	0.040	0.953	0.962	7	064PP/014PO	PBT	0.014	0.985	0.988	8	064PP/094PO	PBT	0.012	0.997	0.998
6	014PO/074PP	CBT	0.044	0.945	0.956	7	014PO/064PP	CBT	0.013	0.988	0.991	8	094PO/064PP	CBT	0.016	0.994	0.995
						7	064PP/024PO	PBT	0.008	0.994	0.996	8	064PP/104PO	PBT	0.014	0.996	0.997
						7	024PO/064PP	CBT	0.012	0.985	0.989	8	104PO/064PP	CBT	0.024	0.980	0.985
						7	074PP/014PO	PBT	0.016	0.982	0.986	8	064PP/114PO	PBT	0.024	0.988	0.991
						7	014PO/074PP	CBT	0.013	0.988	0.991	8	114PO/064PP	CBT	0.023	0.989	0.991
						7	074PP/024PO	PBT	0.011	0.987	0.990	8	064PP/124PO	PBT	0.020	0.991	0.994
						7	024PO/074PP	CBT	0.012	0.985	0.989	8	124PO/064PP	CBT	0.031	0.972	0.980



Mode Comparability Research

Table C.17 Test Level Score Results for the Single Group Model for ELA/Literacy PBA by Mode of Administration- Common Items (Cont'd)

Grade	Form Pair	Mode	RMSEA	TLI	CFI	Grade	Form Pair	Mode	RMSEA	TLI	CFI	Grade	Form Pair	Mode	RMSEA	TLI	CFI
9	014PP/014PO	PBT	0.041	0.941	0.954	10	014PP/014PO	PBT	0.027	0.979	0.983	11	014PP/014PO	PBT	0.033	0.974	0.979
9	014PO/014PP	CBT	0.031	0.970	0.977	10	014PO/014PP	CBT	0.034	0.962	0.969	11	014PO/014PP	CBT	0.037	0.959	0.966
9	024PP/014PO	PBT	0.032	0.977	0.981	10	034PP/034PO	PBT	0.033	0.971	0.974	11	024PP/014PO	PBT	0.025	0.986	0.988
9	014PO/024PP	CBT	0.030	0.977	0.981	10	034PO/034PP	CBT	0.029	0.974	0.978	11	014PO/024PP	CBT	0.038	0.959	0.966
9	034PP/034PO	PBT	0.026	0.979	0.982	10	044PP/054PO	PBT	0.039	0.957	0.971	11	034PP/034PO	PBT	0.039	0.961	0.968
9	034PO/034PP	CBT	0.033	0.968	0.973	10	054PO/044PP	CBT	0.033	0.965	0.977	11	034PO/034PP	CBT	0.044	0.943	0.953
9	044PP/054PO	PBT	0.052	0.934	0.950	10	064PP/104PO	PBT	0.038	0.969	0.977	11	044PP/054PO	PBT	0.046	0.971	0.979
9	054PO/044PP	CBT	0.057	0.917	0.938	10	104PO/064PP	CBT	0.010	0.997	0.997	11	054PO/044PP	CBT	0.038	0.968	0.976
9	064PP/074PO	PBT	0.015	0.993	0.995	10	074PP/014PO	PBT	0.028	0.979	0.983	11	064PP/074PO	PBT	0.030	0.985	0.988
9	074PO/064PP	CBT	0.025	0.984	0.988	10	014PO/074PP	CBT	0.022	0.985	0.988	11	074PO/064PP	CBT	0.011	0.998	0.998



Mode Comparability Research

Table C.18 Test Level Score Results for the Single Group Model for ELA/Literacy EOY by Mode of Administration- Common Items

Grade	Form Pair	Mode	RMSEA	TLI	CFI	Grade	Form Pair	Mode	RMSEA	TLI	CFI	Grade	Form Pair	Mode	RMSEA	TLI	CFI
3	044EP/144EO	PBT	0.023	0.985	0.986	4	034EP/134EO	PBT	0.018	0.989	0.990	5	014EP/104EO	PBT	0.022	0.982	0.984
3	144EO/044EP	CBT	0.019	0.986	0.987	4	134EO/034EP	CBT	0.019	0.987	0.989	5	104EO/014EP	CBT	0.018	0.986	0.987
3	034EP/134EO	PBT	0.022	0.984	0.985	4	064EP/114EO	PBT	0.022	0.986	0.988	5	064EP/114EO	PBT	0.016	0.987	0.988
3	134EO/034EP	CBT	0.023	0.976	0.979	4	114EO/064EP	CBT	0.022	0.987	0.988	5	114EO/064EP	CBT	0.015	0.989	0.990
3	054EP/154EO	PBT	0.032	0.971	0.974	4	024EP/124EO	PBT	0.020	0.987	0.988	5	034EP/134EO	PBT	0.022	0.977	0.979
3	154EO/054EP	CBT	0.030	0.972	0.975	4	124EO/024EP	CBT	0.025	0.980	0.982	5	134EO/034EP	CBT	0.017	0.985	0.987
3	024EP/124EO	PBT	0.022	0.985	0.987	4	044EP/144EO	PBT	0.018	0.985	0.986	5	044EP/144EO	PBT	0.009	0.997	0.998
3	124EO/024EP	CBT	0.024	0.981	0.983	4	144EO/044EP	CBT	0.027	0.959	0.964	5	144EO/044EP	CBT	0.020	0.981	0.983
3	064EP/114EO	PBT	0.020	0.985	0.987	4	014EP/104EO	PBT	0.013	0.995	0.996	5	024EP/124EO	PBT	0.017	0.984	0.986
3	114EO/064EP	CBT	0.019	0.987	0.988	4	104EO/014EP	CBT	0.030	0.968	0.972	5	124EO/024EP	CBT	0.016	0.985	0.987
3	014EP/104EO	PBT	0.027	0.979	0.982												
3	104EO/014EP	CBT	0.026	0.975	0.977												
Grade	Form Pair	Mode	RMSEA	TLI	CFI	Grade	Form Pair	Mode	RMSEA	TLI	CFI	Grade	Form Pair	Mode	RMSEA	TLI	CFI
6	024EP/124EO	PBT	0.017	0.988	0.989	7	064EP/114EO	PBT	0.021	0.989	0.990	8	014EP/104EO	PBT	0.024	0.976	0.979
6	124EO/024EP	CBT	0.015	0.990	0.991	7	114EO/064EP	CBT	0.016	0.993	0.994	8	104EO/014EP	CBT	0.023	0.973	0.976
6	064EP/114EO	PBT	0.019	0.987	0.989	7	034EP/134EO	PBT	0.016	0.992	0.993	8	034EP/134EO	PBT	0.027	0.970	0.973
6	114EO/064EP	CBT	0.025	0.977	0.979	7	134EO/034EP	CBT	0.020	0.986	0.988	8	134EO/034EP	CBT	0.019	0.985	0.986
6	014EP/104EO	PBT	0.023	0.983	0.985	7	044EP/144EO	PBT	0.018	0.986	0.988	8	044EP/144EO	PBT	0.022	0.980	0.983
6	104EO/014EP	CBT	0.018	0.983	0.985	7	144EO/044EP	CBT	0.020	0.984	0.986	8	144EO/044EP	CBT	0.021	0.976	0.979
6	044EP/144EO	PBT	0.016	0.990	0.991	7	014EP/104EO	PBT	0.012	0.995	0.995						
6	144EO/044EP	CBT	0.015	0.990	0.991	7	104EO/014EP	CBT	0.010	0.996	0.997						
6	034EP/134EO	PBT	0.020	0.979	0.981	7	024EP/124EO	PBT	0.019	0.990	0.991						
6	134EO/034EP	CBT	0.018	0.983	0.985	7	124EO/024EP	CBT	0.022	0.985	0.987						



Mode Comparability Research

Table C.18 Test Level Score Results for the Single Group Model for ELA/Literacy EOY by Mode of Administration- Common Items (Cont'd)

Grade	Form Pair	Mode	RMSEA	TLI	CFI	Grade	Form Pair	Mode	RMSEA	TLI	CFI	Grade	Form Pair	Mode	RMSEA	TLI	CFI
9	064EP/114EO	PBT	0.020	0.983	0.985	10	044EP/144EO	PBT	0.028	0.985	0.987	11	024EP/124EO	PBT	0.028	0.970	0.973
9	114EO/064EP	CBT	0.024	0.975	0.978	10	144EO/044EP	CBT	0.028	0.982	0.984	11	124EO/024EP	CBT	0.024	0.970	0.973
9	024EP/124EO	PBT	0.027	0.982	0.984	10	064EP/114EO	PBT	0.021	0.986	0.988	11	034EP/134EO	PBT	0.017	0.987	0.989
9	124EO/024EP	CBT	0.021	0.987	0.988	10	114EO/064EP	CBT	0.027	0.970	0.973	11	134EO/034EP	CBT	0.030	0.951	0.955
9	034EP/134EO	PBT	0.038	0.942	0.950	10	014EP/104EO	PBT	0.030	0.971	0.974	11	014EP/104EO	PBT	0.028	0.980	0.982
9	134EO/034EP	CBT	0.030	0.959	0.964	10	104EO/014EP	CBT	0.027	0.970	0.973	11	104EO/014EP	CBT	0.029	0.979	0.981
9	044EP/144EO	PBT	0.020	0.981	0.983	10	024EP/124EO	PBT	0.026	0.978	0.980	11	064EP/114EO	PBT	0.027	0.977	0.980
9	144EO/044EP	CBT	0.021	0.976	0.979	10	124EO/024EP	CBT	0.023	0.971	0.974	11	114EO/064EP	CBT	0.028	0.978	0.980
9	014EP/104EO	PBT	0.012	0.994	0.995	10	034EP/134EO	PBT	0.044	0.966	0.970						
9	104EO/014EP	CBT	0.018	0.985	0.987	10	134EO/034EP	CBT	0.039	0.962	0.966						



Mode Comparability Research

Table C.19 Test Level Score Results for the Single Group Model for Mathematics PBA by Mode of Administration- Common Items

Grade	Form Pair	Mode	RMSEA	TLI	CFI		Grade	Form Pair	Mode	RMSEA	TLI	CFI		Grade	Form Pair	Mode	RMSEA	TLI	CFI
3	014PP/114PO	PBT	0.029	0.985	0.987		4	014PP/114PO	PBT	0.037	0.980	0.983		5	024PP/124PO	PBT	0.046	0.977	0.984
3	114PO/014PP	CBT	0.026	0.984	0.986		4	114PO/014PP	CBT	0.024	0.990	0.991		5	124PO/024PP	CBT	0.023	0.994	0.996
3	024PP/124PO	PBT	0.018	0.996	0.996		4	024PP/124PO	PBT	0.026	0.992	0.993		5	034PP/144PO	PBT	0.000	1.000	1.000
3	124PO/024PP	CBT	0.016	0.997	0.997		4	124PO/024PP	CBT	0.025	0.989	0.991		5	144PO/034PP	CBT	0.000	1.000	1.000
3	034PP/144PO	PBT	0.000	1.001	1.000		4	034PP/144PO	PBT	0.060	0.967	0.980		5	044PP/154PO	PBT	0.050	0.967	0.989
3	144PO/034PP	CBT	0.036	0.982	0.994		4	144PO/034PP	CBT	0.065	0.949	0.969		5	154PO/044PP	CBT	0.000	1.001	1.000
3	044PP/154PO	PBT	0.025	0.991	0.994		4	044PP/154PO	PBT	0.022	0.984	0.990		5	054PP/164PO	PBT	0.037	0.980	0.987
3	154PO/044PP	CBT	0.021	0.988	0.992		4	154PO/044PP	CBT	0.007	0.998	0.999		5	164PO/054PP	CBT	0.030	0.978	0.986
3	054PP/164PO	PBT	0.034	0.987	0.991		4	054PP/164PO	PBT	0.046	0.978	0.987		5	064PP/134PO	PBT	0.000	1.004	1.000
3	164PO/054PP	CBT	0.023	0.992	0.995		4	164PO/054PP	CBT	0.036	0.975	0.985		5	134PO/064PP	CBT	0.000	1.005	1.000
3	064PP/134PO	PBT	0.022	0.991	0.994		4	064PP/134PO	PBT	0.032	0.970	0.982							
3	134PO/064PP	CBT	0.016	0.993	0.996		4	134PO/064PP	CBT	0.019	0.994	0.996							
Grade	Form Pair	Mode	RMSEA	TLI	CFI		Grade	Form Pair	Mode	RMSEA	TLI	CFI		Grade	Form Pair	Mode	RMSEA	TLI	CFI
6	014PP/114PO	PBT	0.008	0.999	0.999		7	014PP/114PO	PBT	0.034	0.979	0.981		8	024PP/124PO	PBT	0.000	1.070	1.000
6	114PO/014PP	CBT	0.016	0.996	0.997		7	114PO/014PP	CBT	0.030	0.983	0.985		8	124PO/024PP	CBT	0.000	1.030	1.000
6	024PP/124PO	PBT	0.033	0.993	0.995		7	024PP/124PO	PBT	0.008	0.999	0.999		8	034PP/144PO	PBT	* CFA Models not identifiable. Too few items associated with each factor		
6	124PO/024PP	CBT	0.026	0.993	0.995		7	124PO/024PP	CBT	0.014	0.996	0.997		8	144PO/034PP	CBT			
6	034PP/144PO	PBT	0.022	0.988	0.993		7	034PP/144PO	PBT	0.031	0.961	0.972		8	044PP/154PO	PBT	0.000	1.004	1.000
6	144PO/034PP	CBT	0.008	0.996	0.998		7	144PO/034PP	CBT	0.000	1.009	1.000		8	154PO/044PP	CBT	0.008	0.998	0.999
6	044PP/154PO	PBT	0.032	0.989	0.992		7	044PP/154PO	PBT	0.000	1.008	1.000		8	054PP/164PO	PBT	0.043	0.960	0.970
6	154PO/044PP	CBT	0.044	0.974	0.981		7	154PO/044PP	CBT	0.007	0.998	0.998		8	164PO/054PP	CBT	0.060	0.905	0.929
6	054PP/164PO	PBT	0.020	0.995	0.996		7	054PP/164PO	PBT	0.021	0.987	0.989		8	064PP/134PO	PBT	0.000	1.016	1.000
6	164PO/054PP	CBT	0.004	1.000	1.000		7	164PO/054PP	CBT	0.030	0.965	0.972		8	134PO/064PP	CBT	0.038	0.864	0.955
6	064PP/134PO	PBT	0.000	1.007	1.000		7	064PP/134PO	PBT	0.032	0.988	0.993							
6	134PO/064PP	CBT	0.000	1.004	1.000		7	134PO/064PP	CBT	0.038	0.973	0.984							



Mode Comparability Research

Table C.19 Test Level Score Results for the Single Group Model for Mathematics PBA by Mode of Administration- Common Items (Cont'd)

Grade	Form Pair	Mode	RMSEA	TLI	CFI	Grade	Form Pair	Mode	RMSEA	TLI	CFI	Grade	Form Pair	Mode	RMSEA	TLI	CFI		
ALG01	024PP/124PO	PBT	0.019	0.956	0.971	ALG02	034PP/144PO	PBT	* CFA Models not identifiable. Too few items associated with each factor			GEO	024PP/124PO	PBT	0.014	0.993	0.995		
ALG01	124PO/024PP	CBT	0.017	0.964	0.976	ALG02	144PO/034PP	CBT				GEO	124PO/024PP	CBT	0.007	0.998	0.999		
ALG01	034PP/144PO	PBT	0.016	0.986	0.995	ALG02	044PP/154PO	PBT				GEO	034PP/144PO	PBT	* CFA Models not identifiable. Too few items associated with each factor				
ALG01	144PO/034PP	CBT	0.000	1.057	1.000	ALG02	154PO/044PP	CBT				GEO	144PO/034PP	CBT					
ALG01	044PP/154PO	PBT	0.000	1.000	1.000	ALG02	054PP/164PO	PBT	0.040	0.939	0.957	GEO	044PP/154PO	PBT	* CFA Models not identifiable. Too few items associated with each factor				
ALG01	154PO/044PP	CBT	0.000	1.000	1.000	ALG02	164PO/054PP	CBT	0.041	0.922	0.944	GEO	154PO/044PP	CBT					
ALG01	054PP/164PO	PBT	0.052	0.897	0.920	ALG02	064PP/134PO	PBT	0.000	1.000	1.000	GEO	054PP/164PO	PBT	0.019	0.952	0.971		
ALG01	164PO/054PP	CBT	0.048	0.878	0.905	ALG02	134PO/064PP	CBT	0.000	1.000	1.000	GEO	164PO/054PP	CBT	0.000	1.032	1.000		
ALG01	064PP/134PO	PBT	0.024	0.718	0.906							GEO	064PP/134PO	PBT	0.000	1.000	1.000		
ALG01	134PO/064PP	CBT	0.047	0.511	0.837							GEO	134PO/064PP	CBT	0.000	1.000	1.000		
Grade	Form Pair	Mode	RMSEA	TLI	CFI	Grade	Form Pair	Mode	RMSEA	TLI	CFI	Grade	Form Pair	Mode	RMSEA	TLI	CFI		
MAT1I	034PP/144PO	PBT	0.057	0.747	0.873	MAT2I	034PP/144PO	PBT	* CFA Models not identifiable. Too few items associated with each factor			MAT3I	034PP/144PO	PBT	0.000	1.000	1.000		
MAT1I	144PO/034PP	CBT	0.102	0.394	0.697	MAT2I	144PO/034PP	CBT				MAT3I	144PO/034PP	CBT	0.000	1.000	1.000		
MAT1I	054PP/064PO	PBT	0.032	0.963	0.971	MAT2I	044PP/054PO	PBT				MAT3I	054PP/064PO	PBT	0.000	1.072	1.000		
MAT1I	064PO/054PP	CBT	0.029	0.978	0.983	MAT2I	054PO/044PP	CBT				MAT3I	064PO/054PP	CBT	0.070	0.714	0.857		



Mode Comparability Research

Table C.20 Test Level Score Results for the Single Group Model for Mathematics EOY by Mode of Administration- Common Items

Grade	Form Pair	Mode	RMSEA	TLI	CFI		Grade	Form Pair	Mode	RMSEA	TLI	CFI		Grade	Form Pair	Mode	RMSEA	TLI	CFI
3	014EP/104EO	PBT	0.028	0.981	0.983		4	014EP/104EO	PBT	0.046	0.957	0.962		5	024EP/114EO	PBT	0.029	0.968	0.973
3	104EO/014EP	CBT	0.033	0.971	0.974		4	104EO/014EP	CBT	0.044	0.952	0.957		5	114EO/024EP	CBT	0.019	0.987	0.989
3	024EP/114EO	PBT	0.034	0.972	0.974		4	024EP/114EO	PBT	0.032	0.982	0.983		5	034EP/124EO	PBT	0.022	0.984	0.986
3	114EO/024EP	CBT	0.037	0.970	0.972		4	114EO/024EP	CBT	0.033	0.977	0.979		5	124EO/034EP	CBT	0.039	0.926	0.935
3	034EP/124EO	PBT	0.034	0.975	0.977		4	034EP/124EO	PBT	0.036	0.975	0.978		5	074EP/124EO	PBT	0.027	0.971	0.974
3	124EO/034EP	CBT	0.025	0.983	0.984		4	124EO/034EP	CBT	0.033	0.976	0.978		5	124EO/074EP	CBT	0.039	0.926	0.935
3	074EP/124EO	PBT	0.031	0.977	0.979		4	074EP/124EO	PBT	0.040	0.963	0.967		5	044EP/134EO	PBT	0.028	0.974	0.976
3	124EO/074EP	CBT	0.025	0.983	0.984		4	124EO/074EP	CBT	0.033	0.976	0.978		5	134EO/044EP	CBT	0.027	0.972	0.975
3	044EP/134EO	PBT	0.026	0.980	0.982		4	044EP/134EO	PBT	0.044	0.946	0.951		5	054EP/144EO	PBT	0.034	0.963	0.968
3	134EO/044EP	CBT	0.026	0.982	0.983		4	134EO/044EP	CBT	0.023	0.984	0.986		5	144EO/054EP	CBT	0.027	0.971	0.974
3	054EP/144EO	PBT	0.036	0.958	0.962		4	054EP/144EO	PBT	0.026	0.982	0.984		5	064EP/154EO	PBT	0.046	0.935	0.942
3	144EO/054EP	CBT	0.025	0.980	0.982		4	144EO/054EP	CBT	0.026	0.981	0.983		5	154EO/064EP	CBT	0.027	0.970	0.973
3	064EP/154EO	PBT	0.036	0.972	0.974		4	064EP/154EO	PBT	0.032	0.978	0.980							
3	154EO/064EP	CBT	0.036	0.968	0.970		4	154EO/064EP	CBT	0.038	0.956	0.960							
Grade	Form Pair	Mode	RMSEA	TLI	CFI		Grade	Form Pair	Mode	RMSEA	TLI	CFI		Grade	Form Pair	Mode	RMSEA	TLI	CFI
6	014EP/104EO	PBT	0.051	0.941	0.949		7	014EP/104EO	PBT	0.025	0.984	0.985		8	024EP/114EO	PBT	0.010	0.996	0.997
6	104EO/014EP	CBT	0.039	0.953	0.959		7	104EO/014EP	CBT	0.025	0.977	0.979		8	114EO/024EP	CBT	0.022	0.970	0.974
6	024EP/114EO	PBT	0.043	0.956	0.961		7	024EP/114EO	PBT	0.022	0.984	0.986		8	034EP/124EO	PBT	0.018	0.988	0.990
6	114EO/024EP	CBT	0.035	0.968	0.972		7	114EO/024EP	CBT	0.019	0.990	0.992		8	124EO/034EP	CBT	0.023	0.966	0.971
6	034EP/124EO	PBT	0.028	0.972	0.976		7	034EP/124EO	PBT	0.029	0.953	0.959		8	074EP/124EO	PBT	0.022	0.976	0.979
6	124EO/034EP	CBT	0.029	0.968	0.972		7	124EO/034EP	CBT	0.031	0.945	0.952		8	124EO/074EP	CBT	0.023	0.966	0.971
6	074EP/124EO	PBT	0.039	0.947	0.953		7	074EP/124EO	PBT	0.029	0.957	0.962		8	044EP/134EO	PBT	0.025	0.977	0.980
6	124EO/074EP	CBT	0.029	0.968	0.972		7	124EO/074EP	CBT	0.031	0.945	0.952		8	134EO/044EP	CBT	0.018	0.980	0.983
6	044EP/134EO	PBT	0.052	0.944	0.951		7	044EP/134EO	PBT	0.019	0.987	0.989		8	054EP/144EO	PBT	0.025	0.971	0.976
6	134EO/044EP	CBT	0.038	0.964	0.968		7	134EO/044EP	CBT	0.015	0.989	0.991		8	144EO/054EP	CBT	0.027	0.959	0.966
6	054EP/144EO	PBT	0.037	0.963	0.968		7	054EP/144EO	PBT	0.032	0.944	0.951		8	064EP/154EO	PBT	0.023	0.986	0.988
6	144EO/054EP	CBT	0.028	0.980	0.983		7	144EO/054EP	CBT	0.025	0.961	0.966		8	154EO/064EP	CBT	0.023	0.979	0.982
6	064EP/154EO	PBT	0.034	0.967	0.971		7	064EP/154EO	PBT	0.024	0.969	0.973							
6	154EO/064EP	CBT	0.032	0.967	0.970		7	154EO/064EP	CBT	0.021	0.979	0.981							



Mode Comparability Research

Table C.20 Test Level Score Results for the Single Group Model for Mathematics EOY by Mode of Administration- Common Items (Cont'd)

Grade	Form Pair	Mode	RMSEA	TLI	CFI	Grade	Form Pair	Mode	RMSEA	TLI	CFI	Grade	Form Pair	Mode	RMSEA	TLI	CFI
ALG01	024EP/114EO	PBT	0.039	0.843	0.882	ALG02	034EP/124EO	PBT	0.027	0.816	0.850	GEO	024EP/114EO	PBT	0.023	0.952	0.958
ALG01	114EO/024EP	CBT	0.000	1.017	1.000	ALG02	124EO/034EP	CBT	0.016	0.966	0.972	GEO	114EO/024EP	CBT	0.024	0.948	0.954
ALG01	034EP/124EO	PBT	0.044	0.648	0.726	ALG02	074EP/124EO	PBT	0.016	0.968	0.974	GEO	034EP/124EO	PBT	0.018	0.984	0.987
ALG01	124EO/034EP	CBT	0.003	0.994	0.995	ALG02	124EO/074EP	CBT	0.016	0.966	0.972	GEO	124EO/034EP	CBT	0.025	0.957	0.964
ALG01	074EP/124EO	PBT	0.012	0.958	0.967	ALG02	044EP/134EO	PBT	0.024	0.883	0.905	GEO	074EP/124EO	PBT	0.019	0.979	0.982
ALG01	124EO/074EP	CBT	0.003	0.994	0.995	ALG02	134EO/044EP	CBT	0.010	0.986	0.988	GEO	124EO/074EP	CBT	0.025	0.957	0.964
ALG01	044EP/134EO	PBT	0.030	0.883	0.904	ALG02	054EP/144EO	PBT	0.024	0.702	0.801	GEO	044EP/134EO	PBT	0.014	0.989	0.991
ALG01	134EO/044EP	CBT	0.018	0.946	0.956	ALG02	144EO/054EP	CBT	0.032	0.829	0.886	GEO	134EO/044EP	CBT	0.012	0.993	0.994
ALG01	054EP/144EO	PBT	0.032	0.771	0.809	ALG02	064EP/154EO	PBT	0.015	0.968	0.978	GEO	054EP/144EO	PBT	0.016	0.967	0.971
ALG01	144EO/054EP	CBT	0.016	0.933	0.944	ALG02	154EO/064EP	CBT	0.029	0.819	0.879	GEO	144EO/054EP	CBT	0.012	0.981	0.984
ALG01	064EP/154EO	PBT	0.031	0.829	0.878							GEO	064EP/154EO	PBT	0.031	0.961	0.967
ALG01	154EO/064EP	CBT	0.011	0.986	0.990							GEO	154EO/064EP	CBT	0.018	0.984	0.986
Grade	Form Pair	Mode	RMSEA	TLI	CFI	Grade	Form Pair	Mode	RMSEA	TLI	CFI	Grade	Form Pair	Mode	RMSEA	TLI	CFI
MAT1I	034EP/024EO	PBT	0.016	0.974	0.978	MAT2I	044EP/134EO	PBT	0.081	0.393	0.479	MAT3I	044EP/134EO	PBT	0.020	0.950	0.959
MAT1I	024EO/034EP	CBT	0.071	0.773	0.811	MAT2I	134EO/044EP	CBT	0.043	0.587	0.646	MAT3I	134EO/044EP	CBT	0.031	0.822	0.852
MAT1I	044EP/134EO	PBT	0.040	0.913	0.927	MAT2I	054EP/044EO	PBT	0.023	0.948	0.961	MAT3I	064EP/054EO	PBT	0.000	1.114	1.000
MAT1I	134EO/044EP	CBT	0.022	0.935	0.945	MAT2I	044EO/054EP	CBT	0.030	0.628	0.735	MAT3I	054EO/064EP	CBT	0.000	1.023	1.000
MAT1I	064EP/054EO	PBT	0.034	0.864	0.903	MAT2I	064EP/054EO	PBT	0.011	0.980	0.986						
MAT1I	054EO/064EP	CBT	0.000	1.036	1.000	MAT2I	054EO/064EP	CBT	0.030	0.569	0.692						



Mode Comparability Research

Table C.21 Test Level Score Results for the Single Group Model for ELA/Literacy and Mathematics FS by Mode of Administration- Common Items

Content	Grade	Form Pair	Mode	RMSEA	TLI	CFI	Content	Grade	Form Pair	Mode	RMSEA	TLI	CFI
ELA/L	3	064PP064EP/184PO114EO	PBT	0.020	0.986	0.987	Math	3	064PP074EP/134PO124EO	PBT	0.026	0.980	0.982
	3	184PO114EO/064PP064EP	CBT	0.019	0.988	0.989		3	134PO124EO/064PP074EP	CBT	0.022	0.984	0.985
	4	074PP064EP/184PO114EO	PBT	0.016	0.991	0.992		4	064PP074EP/134PO124EO	PBT	0.033	0.968	0.971
	4	184PO114EO/074PP064EP	CBT	0.020	0.988	0.989		4	134PO124EO/064PP074EP	CBT	0.028	0.979	0.981
	5	074PP064EP/184PO114EO	PBT	0.017	0.984	0.985		5	064PP074EP/134PO124EO	PBT	0.025	0.968	0.971
	5	184PO114EO/074PP064EP	CBT	0.017	0.987	0.988		5	134PO124EO/064PP074EP	CBT	0.025	0.959	0.962
	6	074PP064EP/184PO114EO	PBT	0.016	0.991	0.992		6	064PP074EP/134PO124EO	PBT	0.034	0.954	0.958
	6	184PO114EO/074PP064EP	CBT	0.023	0.979	0.981		6	134PO124EO/064PP074EP	CBT	0.027	0.966	0.969
	7	074PP064EP/184PO114EO	PBT	0.021	0.987	0.988		7	064PP074EP/134PO124EO	PBT	0.027	0.972	0.974
	7	184PO114EO/074PP064EP	CBT	0.015	0.993	0.994		7	134PO124EO/064PP074EP	CBT	0.028	0.958	0.961
	8	074PP064EP/184PO114EO	PBT	0.030	0.964	0.968		8	064PP074EP/134PO124EO	PBT	0.030	0.953	0.958
	8	184PO114EO/074PP064EP	CBT	0.032	0.964	0.967		8	134PO124EO/064PP074EP	CBT	0.022	0.962	0.966
	9	074PP064EP/184PO114EO	PBT	0.020	0.986	0.987		A1	064PP074EP/134PO124EO	PBT	0.019	0.912	0.928
	9	184PO114EO/074PP064EP	CBT	0.025	0.975	0.978		A1	134PO124EO/064PP074EP	CBT	0.014	0.896	0.912
	10	074PP064EP/184PO114EO	PBT	0.025	0.980	0.982		A2	064PP074EP/134PO124EO	PBT	0.022	0.968	0.972
	10	184PO114EO/074PP064EP	CBT	0.025	0.974	0.977		A2	134PO124EO/064PP074EP	CBT	0.020	0.965	0.970
11	074PP064EP/184PO114EO	PBT	0.027	0.978	0.980	GE	064PP074EP/134PO124EO	PBT	0.014	0.989	0.990		
11	184PO114EO/074PP064EP	CBT	0.028	0.978	0.981	GE	134PO124EO/064PP074EP	CBT	0.053	0.743	0.775		



Mode Comparability Research

Table C.22 Test Level Score Results for the Single Group Model for ELA/Literacy PBA by Mode of Administration- Common + Unique Items (Cont'd)

Grade	Form Pair	Mode	RMSEA	TLI	CFI	Grade	Form Pair	Mode	RMSEA	TLI	CFI	Grade	Form Pair	Mode	RMSEA	TLI	CFI
9	014PP/014PO	PBT	0.026	0.968	0.972	10	014PP/014PO	PBT	0.027	0.965	0.969	11	014PP/014PO	PBT	0.027	0.974	0.976
9	014PO/014PP	CBT	0.025	0.977	0.979	10	014PO/014PP	CBT	0.027	0.969	0.973	11	014PO/014PP	CBT	0.036	0.955	0.961
9	024PP/014PO	PBT	0.022	0.985	0.987	10	034PP/034PO	PBT	0.033	0.969	0.973	11	024PP/014PO	PBT	0.028	0.971	0.974
9	014PO/024PP	CBT	0.025	0.977	0.979	10	034PO/034PP	CBT	0.028	0.974	0.977	11	014PO/024PP	CBT	0.036	0.955	0.961
9	034PP/034PO	PBT	0.029	0.969	0.972	10	044PP/054PO	PBT	0.031	0.972	0.975	11	034PP/034PO	PBT	0.036	0.968	0.972
9	034PO/034PP	CBT	0.027	0.977	0.979	10	054PO/044PP	CBT	0.028	0.971	0.974	11	034PO/034PP	CBT	0.034	0.961	0.966
9	044PP/054PO	PBT	0.042	0.952	0.957	10	064PP/104PO	PBT	0.027	0.981	0.983	11	044PP/054PO	PBT	0.039	0.960	0.965
9	054PO/044PP	CBT	0.036	0.955	0.960	10	104PO/064PP	CBT	0.023	0.983	0.986	11	054PO/044PP	CBT	0.033	0.971	0.974
9	064PP/074PO	PBT	0.029	0.964	0.967	10	074PP/014PO	PBT	0.028	0.968	0.971	11	064PP/074PO	PBT	0.024	0.987	0.988
9	074PO/064PP	CBT	0.021	0.985	0.986	10	014PO/074PP	CBT	0.027	0.969	0.973	11	074PO/064PP	CBT	0.022	0.989	0.990



Mode Comparability Research

Table C.23 Test Level Score Results for the Single Group Model for ELA/Literacy EOY by Mode of Administration- Common + Unique Items

Grade	Form Pair	Mode	RMSEA	TLI	CFI	Grade	Form Pair	Mode	RMSEA	TLI	CFI	Grade	Form Pair	Mode	RMSEA	TLI	CFI
3	044EP/144EO	PBT	0.021	0.986	0.987	4	034EP/134EO	PBT	0.020	0.978	0.980	5	014EP/104EO	PBT	0.022	0.979	0.981
3	144EO/044EP	CBT	0.021	0.983	0.984	4	134EO/034EP	CBT	0.019	0.984	0.985	5	104EO/014EP	CBT	0.017	0.987	0.988
3	034EP/134EO	PBT	0.020	0.982	0.984	4	064EP/114EO	PBT	0.019	0.986	0.987	5	064EP/114EO	PBT	0.014	0.988	0.989
3	134EO/034EP	CBT	0.020	0.982	0.983	4	114EO/064EP	CBT	0.020	0.989	0.990	5	114EO/064EP	CBT	0.015	0.989	0.990
3	054EP/154EO	PBT	0.029	0.974	0.976	4	024EP/124EO	PBT	0.016	0.988	0.989	5	034EP/134EO	PBT	0.023	0.972	0.974
3	154EO/054EP	CBT	0.028	0.975	0.977	4	124EO/024EP	CBT	0.020	0.986	0.987	5	134EO/034EP	CBT	0.017	0.982	0.984
3	024EP/124EO	PBT	0.023	0.978	0.980	4	044EP/144EO	PBT	0.018	0.984	0.985	5	044EP/144EO	PBT	0.014	0.993	0.994
3	124EO/024EP	CBT	0.022	0.985	0.986	4	144EO/044EP	CBT	0.025	0.967	0.970	5	144EO/044EP	CBT	0.018	0.981	0.982
3	064EP/114EO	PBT	0.020	0.981	0.983	4	014EP/104EO	PBT	0.016	0.992	0.992	5	024EP/124EO	PBT	0.019	0.979	0.980
3	114EO/064EP	CBT	0.018	0.987	0.988	4	104EO/014EP	CBT	0.023	0.981	0.982	5	124EO/024EP	CBT	0.020	0.978	0.980
3	014EP/104EO	PBT	0.024	0.979	0.980												
3	104EO/014EP	CBT	0.025	0.975	0.977												
Grade	Form Pair	Mode	RMSEA	TLI	CFI	Grade	Form Pair	Mode	RMSEA	TLI	CFI	Grade	Form Pair	Mode	RMSEA	TLI	CFI
6	024EP/124EO	PBT	0.016	0.989	0.990	7	064EP/114EO	PBT	0.020	0.989	0.990	8	014EP/104EO	PBT	0.022	0.978	0.980
6	124EO/024EP	CBT	0.018	0.985	0.986	7	114EO/064EP	CBT	0.018	0.991	0.991	8	104EO/014EP	CBT	0.021	0.969	0.971
6	064EP/114EO	PBT	0.016	0.990	0.991	7	034EP/134EO	PBT	0.019	0.989	0.989	8	034EP/134EO	PBT	0.019	0.980	0.981
6	114EO/064EP	CBT	0.022	0.980	0.982	7	134EO/034EP	CBT	0.017	0.989	0.990	8	134EO/034EP	CBT	0.017	0.986	0.987
6	014EP/104EO	PBT	0.017	0.989	0.990	7	044EP/144EO	PBT	0.017	0.985	0.986	8	044EP/144EO	PBT	0.022	0.976	0.978
6	104EO/014EP	CBT	0.019	0.983	0.984	7	144EO/044EP	CBT	0.020	0.981	0.983	8	144EO/044EP	CBT	0.018	0.984	0.985
6	044EP/144EO	PBT	0.017	0.987	0.988	7	014EP/104EO	PBT	0.017	0.988	0.989						
6	144EO/044EP	CBT	0.013	0.991	0.992	7	104EO/014EP	CBT	0.016	0.991	0.992						
6	034EP/134EO	PBT	0.021	0.978	0.979	7	024EP/124EO	PBT	0.021	0.988	0.989						
6	134EO/034EP	CBT	0.017	0.986	0.987	7	124EO/024EP	CBT	0.023	0.984	0.985						



Mode Comparability Research

Table C.23 Test Level Score Results for the Single Group Model for ELA/Literacy EOY by Mode of Administration- Common + Unique Items (Cont'd)

Grade	Form Pair	Mode	RMSEA	TLI	CFI	Grade	Form Pair	Mode	RMSEA	TLI	CFI	Grade	Form Pair	Mode	RMSEA	TLI	CFI
9	064EP/114EO	PBT	0.022	0.976	0.978	10	044EP/144EO	PBT	0.029	0.982	0.983	11	024EP/124EO	PBT	0.025	0.976	0.977
9	114EO/064EP	CBT	0.024	0.976	0.979	10	144EO/044EP	CBT	0.023	0.983	0.984	11	124EO/024EP	CBT	0.028	0.959	0.962
9	024EP/124EO	PBT	0.025	0.981	0.982	10	064EP/114EO	PBT	0.020	0.986	0.987	11	034EP/134EO	PBT	0.020	0.980	0.981
9	124EO/024EP	CBT	0.021	0.985	0.986	10	114EO/064EP	CBT	0.026	0.973	0.975	11	134EO/034EP	CBT	0.028	0.953	0.956
9	034EP/134EO	PBT	0.028	0.966	0.968	10	014EP/104EO	PBT	0.027	0.975	0.977	11	014EP/104EO	PBT	0.023	0.984	0.985
9	134EO/034EP	CBT	0.025	0.968	0.971	10	104EO/014EP	CBT	0.027	0.969	0.971	11	104EO/014EP	CBT	0.027	0.978	0.979
9	044EP/144EO	PBT	0.019	0.982	0.983	10	024EP/124EO	PBT	0.021	0.983	0.984	11	064EP/114EO	PBT	0.024	0.974	0.976
9	144EO/044EP	CBT	0.021	0.980	0.982	10	124EO/024EP	CBT	0.022	0.971	0.973	11	114EO/064EP	CBT	0.025	0.977	0.979
9	014EP/104EO	PBT	0.013	0.992	0.992	10	034EP/134EO	PBT	0.030	0.978	0.979						
9	104EO/014EP	CBT	0.018	0.984	0.985	10	134EO/034EP	CBT	0.035	0.963	0.966						



Mode Comparability Research

Table C.24 Test Level Score Results for the Single Group Model for Mathematics PBA by Mode of Administration- Common + Unique Items (Cont'd)

Grade	Form Pair	Mode	RMSEA	TLI	CFI	Grade	Form Pair	Mode	RMSEA	TLI	CFI	Grade	Form Pair	Mode	RMSEA	TLI	CFI
ALG01	024PP/124PO	PBT	0.028	0.914	0.927	ALG02	034PP/144PO	PBT	0.037	0.953	0.961	GEO	024PP/124PO	PBT	0.025	0.970	0.975
ALG01	124PO/024PP	CBT	0.027	0.951	0.958	ALG02	144PO/034PP	CBT	0.023	0.965	0.979	GEO	124PO/024PP	CBT	0.014	0.988	0.990
ALG01	034PP/144PO	PBT	0.020	0.918	0.930	ALG02	044PP/154PO	PBT	0.029	0.968	0.973	GEO	034PP/144PO	PBT	0.015	0.993	0.994
ALG01	144PO/034PP	CBT	0.020	0.957	0.963	ALG02	154PO/044PP	CBT	0.027	0.927	0.943	GEO	144PO/034PP	CBT	0.036	0.968	0.974
ALG01	044PP/154PO	PBT	0.017	0.971	0.975	ALG02	054PP/164PO	PBT	0.026	0.962	0.967	GEO	044PP/154PO	PBT	0.024	0.973	0.976
ALG01	154PO/044PP	CBT	0.008	0.998	0.998	ALG02	164PO/054PP	CBT	0.034	0.914	0.926	GEO	154PO/044PP	CBT	0.032	0.966	0.971
ALG01	054PP/164PO	PBT	0.031	0.930	0.937	ALG02	064PP/134PO	PBT	0.031	0.964	0.969	GEO	054PP/164PO	PBT	0.019	0.980	0.983
ALG01	164PO/054PP	CBT	0.039	0.877	0.900	ALG02	134PO/064PP	CBT	0.028	0.983	0.985	GEO	164PO/054PP	CBT	0.035	0.938	0.947
ALG01	064PP/134PO	PBT	0.019	0.955	0.962							GEO	064PP/134PO	PBT	0.014	0.977	0.980
ALG01	134PO/064PP	CBT	0.021	0.971	0.975							GEO	134PO/064PP	CBT	0.019	0.939	0.952
Grade	Form Pair	Mode	RMSEA	TLI	CFI	Grade	Form Pair	Mode	RMSEA	TLI	CFI	Grade	Form Pair	Mode	RMSEA	TLI	CFI
MAT1I	034PP/144PO	PBT	0.055	0.802	0.826	MAT2I	034PP/144PO	PBT	0.000	2.083	1.000	MAT3I	034PP/144PO	PBT	0.044	0.807	0.842
MAT1I	144PO/034PP	CBT	0.047	0.912	0.927	MAT2I	144PO/034PP	CBT	0.000	1.251	1.000	MAT3I	144PO/034PP	CBT	0.032	0.925	0.941
MAT1I	054PP/064PO	PBT	0.016	0.987	0.989	MAT2I	044PP/054PO	PBT	0.033	0.895	0.909	MAT3I	054PP/064PO	PBT	0.000	1.007	1.000
MAT1I	064PO/054PP	CBT	0.016	0.992	0.993	MAT2I	054PO/044PP	CBT	0.000	1.015	1.000	MAT3I	064PO/054PP	CBT	0.035	0.936	0.947



Mode Comparability Research

Table C. 25 Test Level Score Results for the Single Group Model for Mathematics EOY by Mode of Administration- Common + Unique Items

Grade	Form Pair	Mode	RMSEA	TLI	CFI		Grade	Form Pair	Mode	RMSEA	TLI	CFI		Grade	Form Pair	Mode	RMSEA	TLI	CFI
3	014EP/104EO	PBT	0.030	0.967	0.969		4	014EP/104EO	PBT	0.039	0.953	0.955		5	024EP/114EO	PBT	0.032	0.951	0.953
3	104EO/014EP	CBT	0.035	0.961	0.963		4	104EO/014EP	CBT	0.035	0.959	0.961		5	114EO/024EP	CBT	0.025	0.975	0.977
3	024EP/114EO	PBT	0.030	0.968	0.969		4	024EP/114EO	PBT	0.032	0.970	0.971		5	034EP/124EO	PBT	0.029	0.956	0.959
3	114EO/024EP	CBT	0.033	0.966	0.968		4	114EO/024EP	CBT	0.035	0.959	0.961		5	124EO/034EP	CBT	0.031	0.949	0.952
3	034EP/124EO	PBT	0.028	0.973	0.974		4	034EP/124EO	PBT	0.032	0.970	0.972		5	074EP/124EO	PBT	0.039	0.906	0.911
3	124EO/034EP	CBT	0.028	0.968	0.970		4	124EO/034EP	CBT	0.031	0.972	0.973		5	124EO/074EP	CBT	0.031	0.949	0.952
3	074EP/124EO	PBT	0.030	0.965	0.967		4	074EP/124EO	PBT	0.032	0.966	0.968		5	044EP/134EO	PBT	0.039	0.931	0.935
3	124EO/074EP	CBT	0.028	0.968	0.970		4	124EO/074EP	CBT	0.031	0.972	0.973		5	134EO/044EP	CBT	0.033	0.951	0.953
3	044EP/134EO	PBT	0.038	0.942	0.945		4	044EP/134EO	PBT	0.038	0.951	0.953		5	054EP/144EO	PBT	0.038	0.931	0.935
3	134EO/044EP	CBT	0.028	0.968	0.970		4	134EO/044EP	CBT	0.030	0.973	0.975		5	144EO/054EP	CBT	0.044	0.904	0.909
3	054EP/144EO	PBT	0.031	0.953	0.955		4	054EP/144EO	PBT	0.026	0.977	0.978		5	064EP/154EO	PBT	0.033	0.950	0.952
3	144EO/054EP	CBT	0.026	0.972	0.973		4	144EO/054EP	CBT	0.026	0.976	0.978		5	154EO/064EP	CBT	0.029	0.961	0.963
3	064EP/154EO	PBT	0.031	0.964	0.965		4	064EP/154EO	PBT	0.029	0.971	0.972							
3	154EO/064EP	CBT	0.035	0.961	0.962		4	154EO/064EP	CBT	0.033	0.957	0.959							
Grade	Form Pair	Mode	RMSEA	TLI	CFI		Grade	Form Pair	Mode	RMSEA	TLI	CFI		Grade	Form Pair	Mode	RMSEA	TLI	CFI
6	014EP/104EO	PBT	0.037	0.956	0.959		7	014EP/104EO	PBT	0.018	0.986	0.987		8	024EP/114EO	PBT	0.016	0.984	0.985
6	104EO/014EP	CBT	0.036	0.942	0.945		7	104EO/014EP	CBT	0.022	0.978	0.979		8	114EO/024EP	CBT	0.019	0.972	0.974
6	024EP/114EO	PBT	0.032	0.962	0.964		7	024EP/114EO	PBT	0.022	0.977	0.978		8	034EP/124EO	PBT	0.018	0.985	0.986
6	114EO/024EP	CBT	0.028	0.966	0.968		7	114EO/024EP	CBT	0.020	0.985	0.985		8	124EO/034EP	CBT	0.019	0.963	0.965
6	034EP/124EO	PBT	0.024	0.977	0.978		7	034EP/124EO	PBT	0.022	0.972	0.974		8	074EP/124EO	PBT	0.022	0.968	0.970
6	124EO/034EP	CBT	0.025	0.969	0.971		7	124EO/034EP	CBT	0.025	0.957	0.960		8	124EO/074EP	CBT	0.019	0.963	0.965
6	074EP/124EO	PBT	0.032	0.958	0.960		7	074EP/124EO	PBT	0.024	0.973	0.975		8	044EP/134EO	PBT	0.019	0.980	0.982
6	124EO/074EP	CBT	0.025	0.969	0.971		7	124EO/074EP	CBT	0.025	0.957	0.960		8	134EO/044EP	CBT	0.018	0.978	0.980
6	044EP/134EO	PBT	0.030	0.968	0.970		7	044EP/134EO	PBT	0.018	0.987	0.987		8	054EP/144EO	PBT	0.017	0.980	0.982
6	134EO/044EP	CBT	0.027	0.970	0.972		7	134EO/044EP	CBT	0.019	0.975	0.977		8	144EO/054EP	CBT	0.020	0.974	0.975
6	054EP/144EO	PBT	0.032	0.963	0.965		7	054EP/144EO	PBT	0.022	0.969	0.971		8	064EP/154EO	PBT	0.019	0.977	0.978
6	144EO/054EP	CBT	0.026	0.978	0.980		7	144EO/054EP	CBT	0.022	0.974	0.976		8	154EO/064EP	CBT	0.021	0.973	0.975
6	064EP/154EO	PBT	0.026	0.974	0.975		7	064EP/154EO	PBT	0.022	0.968	0.970							
6	154EO/064EP	CBT	0.023	0.979	0.980		7	154EO/064EP	CBT	0.020	0.983	0.984							



Mode Comparability Research

Table C.25 Test Level Score Results for the Single Group Model for Mathematics EOY by Mode of Administration- Common + Unique Items (Cont'd)

Grade	Form Pair	Mode	RMSEA	TLI	CFI	Grade	Form Pair	Mode	RMSEA	TLI	CFI	Grade	Form Pair	Mode	RMSEA	TLI	CFI
ALG01	024EP/114EO	PBT	0.046	0.652	0.673	ALG02	034EP/124EO	PBT	0.020	0.947	0.950	GEO	024EP/114EO	PBT	0.021	0.961	0.964
ALG01	114EO/024EP	CBT	0.015	0.940	0.944	ALG02	124EO/034EP	CBT	0.018	0.953	0.956	GEO	114EO/024EP	CBT	0.033	0.916	0.921
ALG01	034EP/124EO	PBT	0.027	0.869	0.877	ALG02	074EP/124EO	PBT	0.020	0.962	0.965	GEO	034EP/124EO	PBT	0.027	0.921	0.926
ALG01	124EO/034EP	CBT	0.017	0.821	0.833	ALG02	124EO/074EP	CBT	0.018	0.953	0.956	GEO	124EO/034EP	CBT	0.030	0.900	0.906
ALG01	074EP/124EO	PBT	0.016	0.961	0.963	ALG02	044EP/134EO	PBT	0.019	0.937	0.941	GEO	074EP/124EO	PBT	0.028	0.928	0.932
ALG01	124EO/074EP	CBT	0.017	0.821	0.833	ALG02	134EO/044EP	CBT	0.015	0.964	0.966	GEO	124EO/074EP	CBT	0.030	0.900	0.906
ALG01	044EP/134EO	PBT	0.018	0.951	0.954	ALG02	054EP/144EO	PBT	0.019	0.946	0.949	GEO	044EP/134EO	PBT	0.015	0.979	0.980
ALG01	134EO/044EP	CBT	0.012	0.953	0.957	ALG02	144EO/054EP	CBT	0.021	0.925	0.930	GEO	134EO/044EP	CBT	0.037	0.887	0.894
ALG01	054EP/144EO	PBT	0.023	0.862	0.870	ALG02	064EP/154EO	PBT	0.021	0.952	0.955	GEO	054EP/144EO	PBT	0.014	0.979	0.980
ALG01	144EO/054EP	CBT	0.014	0.954	0.957	ALG02	154EO/064EP	CBT	0.016	0.970	0.972	GEO	144EO/054EP	CBT	0.027	0.929	0.933
ALG01	064EP/154EO	PBT	0.018	0.935	0.940							GEO	064EP/154EO	PBT	0.023	0.964	0.966
ALG01	154EO/064EP	CBT	0.019	0.967	0.970							GEO	154EO/064EP	CBT	0.025	0.944	0.947
Grade	Form Pair	Mode	RMSEA	TLI	CFI	Grade	Form Pair	Mode	RMSEA	TLI	CFI	Grade	Form Pair	Mode	RMSEA	TLI	CFI
MAT1I	034EP/024EO	PBT	0.019	0.958	0.960	MAT2I	044EP/134EO	PBT	0.057	0.400	0.445	MAT3I	044EP/134EO	PBT	0.015	0.942	0.946
MAT1I	024EO/034EP	CBT	0.042	0.860	0.868	MAT2I	134EO/044EP	CBT	0.053	0.710	0.735	MAT3I	134EO/044EP	CBT	0.028	0.802	0.819
MAT1I	044EP/134EO	PBT	0.042	0.862	0.870	MAT2I	054EP/044EO	PBT	0.024	0.887	0.894	MAT3I	064EP/054EO	PBT	0.025	0.906	0.912
MAT1I	134EO/044EP	CBT	0.024	0.895	0.902	MAT2I	044EO/054EP	CBT	0.025	0.875	0.889	MAT3I	054EO/064EP	CBT	0.019	0.951	0.954
MAT1I	064EP/054EO	PBT	0.024	0.901	0.907	MAT2I	064EP/054EO	PBT	0.029	0.595	0.619						
MAT1I	054EO/064EP	CBT	0.026	0.936	0.940	MAT2I	054EO/064EP	CBT	0.028	0.841	0.856						



Mode Comparability Research

Table C.26 Test Level Score Results for the Single Group Model for ELA/Literacy and Mathematics FS by Mode of Administration- Common + Unique Items

Content	Grade	Form Pair	Mode	RMSEA	TLI	CFI	Content	Grade	Form Pair	Mode	RMSEA	TLI	CFI
ELA/L	3	064PP064EP/184PO114EO	PBT	0.020	0.980	0.981	Math	3	064PP074EP/134PO124EO	PBT	0.023	0.973	0.974
	3	184PO114EO/064PP064EP	CBT	0.018	0.983	0.984		3	134PO124EO/064PP074EP	CBT	0.021	0.977	0.978
	4	074PP064EP/184PO114EO	PBT	0.016	0.984	0.984		4	064PP074EP/134PO124EO	PBT	0.029	0.960	0.961
	4	184PO114EO/074PP064EP	CBT	0.017	0.988	0.988		4	134PO124EO/064PP074EP	CBT	0.030	0.965	0.967
	5	074PP064EP/184PO114EO	PBT	0.017	0.981	0.982		5	064PP074EP/134PO124EO	PBT	0.026	0.951	0.953
	5	184PO114EO/074PP064EP	CBT	0.018	0.979	0.980		5	134PO124EO/064PP074EP	CBT	0.021	0.962	0.964
	6	074PP064EP/184PO114EO	PBT	0.017	0.984	0.984		6	064PP074EP/134PO124EO	PBT	0.026	0.965	0.966
	6	184PO114EO/074PP064EP	CBT	0.020	0.977	0.978		6	134PO124EO/064PP074EP	CBT	0.019	0.976	0.977
	7	074PP064EP/184PO114EO	PBT	0.019	0.980	0.981		7	064PP074EP/134PO124EO	PBT	0.022	0.974	0.975
	7	184PO114EO/074PP064EP	CBT	0.016	0.987	0.987		7	134PO124EO/064PP074EP	CBT	0.020	0.968	0.969
	8	074PP064EP/184PO114EO	PBT	0.021	0.965	0.967		8	064PP074EP/134PO124EO	PBT	0.020	0.965	0.967
	8	184PO114EO/074PP064EP	CBT	0.020	0.964	0.966		8	134PO124EO/064PP074EP	CBT	0.017	0.966	0.968
	9	074PP064EP/184PO114EO	PBT	0.021	0.971	0.973		A1	064PP074EP/134PO124EO	PBT	0.022	0.908	0.912
	9	184PO114EO/074PP064EP	CBT	0.019	0.976	0.978		A1	134PO124EO/064PP074EP	CBT	0.013	0.929	0.932
	10	074PP064EP/184PO114EO	PBT	0.023	0.967	0.968		A2	064PP074EP/134PO124EO	PBT	0.017	0.975	0.976
	10	184PO114EO/074PP064EP	CBT	0.020	0.973	0.975		A2	134PO124EO/064PP074EP	CBT	0.019	0.962	0.964
	11	074PP064EP/184PO114EO	PBT	0.026	0.954	0.956		GE	064PP074EP/134PO124EO	PBT	0.019	0.948	0.950
	11	184PO114EO/074PP064EP	CBT	0.026	0.961	0.963		GE	134PO124EO/064PP074EP	CBT	0.029	0.846	0.853



Mode Comparability Research

Table C.27 Claim Level Score Results for the Single Group Model for ELA/Literacy PBA and FS by Mode of Administration- Common Items

Grade	Form Pair	Mode	RMSEA	TLI	CFI
3	064PP/014PO	PBT	0.120	0.931	0.943
3	014PO/064PP	CBT	0.118	0.952	0.961
7	034PP/034PO	PBT	0.116	0.974	0.977
7	034PO/034PP	CBT	0.102	0.952	0.956
11	034PP/034PO	PBT	0.158	0.949	0.955
11	034PO ¹ /034PP	CBT	0.156	0.980	0.983
3	FS: 064PP064EP/184PO114EO	PBT	0.020	0.986	0.987
3	FS: 184PO114EO/064PP064EP	CBT	0.019	0.988	0.989
7	FS: 074PP064EP/184PO114EO	PBT	0.035	0.958	0.961
7	FS: 184PO114EO/074PP064EP	CBT	0.033	0.962	0.965
11	FS: 074PP064EP/184PO114EO	PBT	0.027	0.978	0.980
11	FS: 184PO114EO/074PP064EP	CBT	0.028	0.978	0.981

¹ Indicates the estimated correlation between the Reading and Writing claim factors is at least 1.



Mode Comparability Research

Table C.28 Claim Level Score Results for the Single Group Model for ELA/Literacy PBA and FS by Mode of Administration- Common +Unique Items

Grade	Form Pair	Mode	RMSEA	TLI	CFI
3	064PP ¹ /014PO	PBT	0.108	0.917	0.925
3	014PO/064PP	CBT	0.099	0.925	0.932
7	034PP/034PO	PBT	0.107	0.971	0.974
7	034PO/034PP	CBT	0.098	0.947	0.951
11	034PP/034PO	PBT	0.128	0.942	0.948
11	034PO/034PP	CBT	0.127	0.977	0.980
3	FS: 064PP064EP/184PO114EO	PBT	0.042	0.922	0.925
3	FS: 184PO114EO/064PP064EP	CBT	0.024	0.968	0.969
7	FS: 074PP064EP/184PO114EO	PBT	0.029	0.945	0.947
7	FS: 184PO114EO/074PP064EP	CBT	0.028	0.952	0.954
11	FS: 074PP064EP/184PO114EO	PBT	0.048	0.947	0.949
11	FS: 184PO114EO/074PP064EP	CBT	0.029	0.941	0.943

¹ Indicates the estimated correlation between the Reading and Writing claim factors is at least 1.



Mode Comparability Research

Table C.29 Subclaim Level Score Results for the Single Group Model for ELA/Literacy PBA, EOY, and FS by Mode of Administration- Common Items

PBA/FS						EOY					
Grade	Form Pair	Mode	RMSEA	TLI	CFI	Grade	Form Pair	Mode	RMSEA	TLI	CFI
3	064PP ¹ /014PO	PBT	0.109	0.943	0.960	3	064EP/114EO	PBT	0.020	0.985	0.987
3	014PO ¹ /064PP	CBT	0.110	0.959	0.971	3	114EO/064EP	CBT	0.017	0.989	0.991
7	034PP ¹ /034PO	PBT	0.097	0.982	0.984	7	064EP/114EO	PBT	0.020	0.990	0.991
7	034PO ¹ /034PP	CBT	0.088	0.964	0.969	7	114EO/064EP	CBT	0.015	0.994	0.995
11	034PP ¹ /034PO	PBT	0.141	0.959	0.967	11	034EP ² /134EO	PBT	0.014	0.991	0.992
11	034PO ¹ /034PP	CBT	0.143	0.984	0.987	11	134EO ² /034EP	CBT	0.026	0.963	0.967
3	FS: 064PP064EP ³ /184PO114EO	PBT	0.020	0.986	0.987						
3	FS: 184PO114EO ³ /064PP064EP	CBT	0.017	0.991	0.992						
7	FS: 074PP064EP/184PO114EO	PBT	0.107	0.602	0.633						
7	FS: 184PO114EO/074PP064EP	CBT	0.102	0.636	0.664						
11	FS: 074PP064EP ³ /184PO114EO	PBT	0.025	0.981	0.984						
11	FS: 184PO114EO ³ /074PP064EP	CBT	0.027	0.979	0.982						

1- Indicates Written Expression subclaim factor has an estimated correlation of at least 1 with one or more subclaim factors;

2- Indicates Reading Vocabulary subclaim factor has an estimated correlation of at least 1 with one or more subclaim factors;

3- Indicates that for these FS form pairs the writing items were not in the common item set and thus there is only a reading factor in the corresponding CFA models.



Mode Comparability Research

Table C. 30 Subclaim Level Score Results for the Single Group Model for Mathematics PBA, EOY, and FS by Mode of Administration- Common Items

PBA/FS						EOY					
Grade	Form Pair	Mode	RMSEA	TLI	CFI	Grade	Form Pair	Mode	RMSEA	TLI	CFI
3	024PP/124PO	PBT	0.015	0.997	0.998	3	024EP/114EO	PBT	0.035	0.969	0.972
3	124PO/024PP	CBT	0.016	0.997	0.997	3	114EO/024EP	CBT	0.038	0.968	0.970
7	014PP/114PO	PBT	0.033	0.979	0.982	7	064EP ² /154EO	PBT	0.024	0.969	0.973
7	114PO ¹ /014PP	CBT	0.029	0.983	0.985	7	154EO/064EP	CBT	0.021	0.978	0.981
ALG02	054PP ¹ /164PO	PBT	0.031	0.965	0.982	ALG02	034EP/124EO	PBT	0.029	0.802	0.845
ALG02	164PO ² /054PP	CBT	0.048	0.889	0.942	ALG02	124EO/034EP	CBT	0.015	0.974	0.980
GEO	024PP ² /124PO	PBT	0.000	1.002	1.000	GEO	024EP ² /114EO	PBT	0.023	0.951	0.958
GEO	124PO ¹ /024PP	CBT	0.000	1.020	1.000	GEO	114EO ² /024EP	CBT	0.024	0.947	0.954
3	FS: 064PP074EP ³ /134PO124EO	PBT	0.027	0.978	0.980						
3	FS: 134PO124EO ² /064PP074EP	CBT	0.023	0.981	0.982						
7	FS: 064PP074EP/134PO124EO	PBT	0.025	0.975	0.978						
7	FS: 134PO124EO/064PP074EP	CBT	0.027	0.961	0.965						
ALG02	FS: 064PP074EP ² /134PO124EO	PBT	0.012	0.984	0.987						
ALG02	FS: 134PO124EO/064PP074EP	CBT	0.022	0.947	0.957						
GEO	FS: 064PP074EP ¹ /134PO124EO	PBT	0.015	0.987	0.989						
GEO	FS: 134PO124EO/064PP074EP	CBT	0.048	0.794	0.825						

¹ – Indicates Modeling/Application subclaim factor has an estimated correlation of at least 1 with one or more additional subclaim factors.

² – Indicates Additional and Supporting subclaim factor has an estimated correlation of at least 1 with one or more additional subclaim factors;

³ – Indicates Expressing Mathematical Reasoning subclaim factor has an estimated correlation of at least 1 with one or more additional subclaim factors.



Mode Comparability Research

Table C.31 Subclaim Level Score Results for the Single Group Model for ELA/Literacy PBA, EOY, and FS by Mode of Administration- Common + Unique Items

PBA/FS						EOY					
Grade	Form Pair	Mode	RMSEA	TLI	CFI	Grade	Form Pair	Mode	RMSEA	TLI	CFI
3	064PP ¹ /014PO	PBT	0.097	0.933	0.942	3	064EP/114EO	PBT	0.020	0.982	0.983
3	014PO ¹ /064PP	CBT	0.091	0.937	0.945	3	114EO/064EP	CBT	0.017	0.989	0.990
7	034PP ¹ /034PO	PBT	0.088	0.980	0.983	7	064EP/114EO	PBT	0.019	0.990	0.991
7	034PO ¹ /034PP	CBT	0.082	0.963	0.967	7	114EO/064EP	CBT	0.016	0.993	0.994
11	034PP ² /034PO	PBT	0.114	0.954	0.961	11	034EP ² /134EO	PBT	0.019	0.983	0.984
11	034PO ¹ /034PP	CBT	0.114	0.982	0.984	11	134EO ² /034EP	CBT	0.027	0.956	0.960
3	FS: 064PP064EP ³ /184PO114EO	PBT	0.040	0.929	0.932						
3	FS: 184PO114EO ⁴ /064PP064EP	CBT	0.023	0.969	0.970						
7	FS: 074PP064EP ⁴ /184PO114EO	PBT	0.029	0.947	0.949						
7	FS: 184PO114EO ⁴ /074PP064EP	CBT	0.028	0.954	0.956						
11	FS: 074PP064EP ⁴ /184PO114EO	PBT	0.041	0.961	0.963						
11	FS: 184PO114EO ⁴ /074PP064EP	CBT	0.028	0.944	0.947						

¹ – Indicates Writing Written Expression subclaim factor has an estimated correlation of at least 1 with one or more additional subclaim factors.

² – Indicates Reading Vocabulary subclaim factor has an estimated correlation of at least 1 with one or more additional subclaim factors;

³ – Indicates Reading Literature subclaim factor has an estimated correlation of at least 1 with one or more additional subclaim factors;

⁴ – Indicates Writing Knowledge Language and Conventions subclaim factor has an estimated correlation of at least 1 with one or more additional subclaim factors.



Mode Comparability Research

Table C.32 Subclaim Level Score Results for the Single Factor Model for Mathematics PBA, EOY, and FS by Mode of Administration- Common + Unique Items

PBA						EOY					
Grade	Form Pair	Mode	RMSEA	TLI	CFI	Grade	Form Pair	Mode	RMSEA	TLI	CFI
3	024PP/124PO	PBT	0.022	0.989	0.991	3	024EP/114EO	PBT	0.030	0.967	0.969
3	124PO/024PP	CBT	0.023	0.989	0.990	3	114EO/024EP	CBT	0.034	0.963	0.965
7	014PP/114PO	PBT	0.033	0.978	0.981	7	064EP/154EO	PBT	0.022	0.968	0.970
7	114PO ¹ /014PP	CBT	0.029	0.980	0.982	7	154EO/064EP	CBT	0.020	0.983	0.984
ALG02	054PP/164PO	PBT	0.023	0.973	0.977	ALG02	034EP ² /124EO	PBT	0.023	0.929	0.935
ALG02	164PO/054PP	CBT	0.029	0.935	0.947	ALG02	124EO/034EP	CBT	0.019	0.940	0.945
GEO	024PP/124PO	PBT	0.026	0.967	0.973	GEO	024EP ² /114EO	PBT	0.021	0.961	0.963
GEO	124PO/024PP	CBT	0.015	0.987	0.990	GEO	114EO/024EP	CBT	0.033	0.916	0.921
3	FS: 064PP074EP ¹ /134PO124EO	PBT	0.024	0.971	0.972						
3	FS: 134PO124EO/064PP074EP	CBT	0.022	0.975	0.976						
7	FS: 064PP074EP ¹ /134PO124EO	PBT	0.022	0.975	0.976						
7	FS: 134PO124EO/064PP074EP	CBT	0.019	0.969	0.971						
ALG02	FS: 064PP074EP/134PO124EO	PBT	0.016	0.976	0.978						
ALG02	FS: 134PO124EO ² /064PP074EP	CBT	0.019	0.965	0.967						
GEO	FS: 064PP074EP/134PO124EO	PBT	0.020	0.946	0.948						
GEO	FS: 134PO124EO/064PP074EP	CBT	0.028	0.848	0.856						

¹ – Indicates Modeling/Application subclaim factor has an estimated correlation of at least 1 with one or more additional subclaim factors.

² – Indicates Additional and Supporting subclaim factor has an estimated correlation of at least 1 with one or more additional subclaim factors.



Mode Comparability Research

Table C.33 Characteristics of Items Flagged for Lack of Factor Loading Invariance across Mode for ELA/Literacy PBA

Response Type	Freely Estimated Factor Loadings							
	Test Level Score CFA		Claim Level CFA		Subclaim Level Score CFA		Item Pool	
	Count	Percentage	Count	Percentage	Count	Percentage	Count	Percentage
Essay			1	3.4	3	15.8	28	7.8
MultipleChoice							4	1.1
MultipleChoice:MultipleChoice	2	100	14	48.3	9	47.4	265	74.2
MultipleChoice:MultipleChoice:MultipleChoice			1	3.4			9	2.5
OtherConstructedResponse			13	44.8	7	36.8	20	5.6
Other-response-types							31	8.7
Interaction Type	Count	Percentage	Count	Percentage	Count	Percentage	Count	Percentage
choiceInteraction					1	5.3	8	2.2
choiceInteraction:choiceInteraction	2	100	10	34.5	4	21.1	114	31.9
choiceInteraction:choiceInteraction:choiceInteraction			1	3.4			6	1.7
customInteraction			4	13.8	4	21.1	161	45.1
extendedTextInteraction			14	48.3	10	52.6	48	13.4
other-interaction-types							20	5.6
Cognitive Complexity	Count	Percentage	Count	Percentage	Count	Percentage	Count	Percentage
very low							1	0.3
low			6	20.7	5	26.3	95	26.6
medium	2	100	13	44.8	7	36.8	206	57.7
high			10	34.5	7	36.8	55	15.4
PARCC Number of Points	Count	Percentage	Count	Percentage	Count	Percentage	Count	Percentage
EBSR-2 points	2	100	15	51.7	9	47.4	262	73.4
PCR Reading-2 points							11	3.1
PCR Reading-4 points			14	48.3	10	52.6	37	10.4
TECR-2 points							47	13.2
Passage Type	Count	Percentage	Count	Percentage	Count	Percentage	Count	Percentage
Informational			12	41.4	9	47.4	127	35.6
Literary	2	100	17	58.6	10	52.6	230	64.4



Mode Comparability Research

Table C.34 Characteristics of Items Flagged for Lack of Factor Loading Invariance across Mode for ELA/Literacy EOY

			Freely Estimated Factor Loadings			
	Test Level Score CFA		Subclaim Level Score CFA		Item Pool	
Response Type	Count	Percentage	Count	Percentage	Count	Percentage
MultipleChoice	1	3.7			5	0.9
MultipleChoice:MultipleChoice	26	96.3	20	100	426	77.6
Other-response-types					118	21.5
Interaction Type	Count	Percentage	Count	Percentage	Count	Percentage
choiceInteraction	1	3.7			26	4.7
choiceInteraction:choiceInteraction	18	66.7	7	35	229	41.7
customInteraction	8	29.6	13	65	221	40.3
other-interaction-types					73	13.3
Cognitive Complexity	Count	Percentage	Count	Percentage	Count	Percentage
very low					1	0.2
low	6	22.2	4	20	179	32.6
medium	17	63.0	12	60	288	52.5
high	4	14.8	4	20	81	14.8
PARCC Number of Points	Count	Percentage	Count	Percentage	Count	Percentage
EBSR-2 points	27	100	20	100	439	80.0
TECR-2 points					110	20.0
Passage Type	Count	Percentage			Count	Percentage
Informational	15	55.6	11	55	296	53.9
Literary	12	44.4	9	45	253	46.1



Mode Comparability Research

Table C.35 Characteristics of Items Flagged for Lack of Factor Loading Invariance across Mode for ELA/Literacy FS

			Freely Estimated Factor Loadings					
	Test Level Score CFA		Claim Level CFA		Subclaim Level Score CFA		Item Pool	
Response Type	Count	Percentage	Count	Percentage	Count	Percentage	Count	Percentage
MultipleChoice:MultipleChoice	6	85.7	9	90	9	100	195	75.9
OtherConstructedResponse	1	14.3	1	10			11	4.3
Other-response-types							51	19.8
Interaction Type	Count	Percentage	Count	Percentage	Count	Percentage	Count	Percentage
choiceInteraction:choiceInteraction	3	42.9	4	40	5	55.6	128	49.8
customInteraction	3	42.9	5	50	4	44.4	73	28.4
extendedTextInteraction	1	14.3	1	10			17	6.6
other-interaction-types							39	15.2
Cognitive Complexity	Count	Percentage	Count	Percentage	Count	Percentage	Count	Percentage
low	1	14.3			1	11.1	67	26.1
medium	4	57.1	8	80	7	77.8	150	58.4
high	2	28.6	2	20	1	11.1	40	15.6
PARCC Number of Points	Count	Percentage	Count	Percentage	Count	Percentage	Count	Percentage
EBSR-2 points	6	85.7	9	90	9	100	201	78.2
PCR Reading-4 points	1	14.3	1	10			16	6.2
PCR Reading-2 points							1	0.4
TECR-2 points							39	15.2
Passage Type	Count	Percentage	Count	Percentage			Count	Percentage
Informational	3	42.9	6	60	6	60	126	49.0
Literary	4	57.1	4	40	3	30	131	51.0



Mode Comparability Research

Table C.36 Characteristics of Items Flagged for Lack of Factor Loading Invariance across Mode for Mathematics PBA

	Test Level Score CFA		Freely Estimated Factor Loadings		Item Pool	
Response Type	Count	Percentage	Count	Percentage	Count	Percentage
Essay	4	12.9	2	7.7	35	6.1
Essay:Essay	1	3.2	1	3.8	24	4.2
Essay:Essay:Essay	1	3.2			11	1.9
FillInTheBlank	6	19.4	3	11.5	94	16.3
FillInTheBlank:Essay:Essay	1	3.2	1	3.8	2	0.3
MultipleChoice	5	16.1	3	11.5	165	28.6
MultipleChoice:FillInTheBlank	2	6.5	1	3.8	9	1.6
MultipleChoice:MultipleChoice	1	3.2	1	3.8	8	1.4
MultipleChoice:OtherConstructedResponse	1	3.2	1	3.8	7	1.2
OtherConstructedResponse	8	25.8	11	42.3	62	10.7
OtherConstructedResponse:OtherConstructedResponse:OtherConstructedResponse	1	3.2	1	3.8	15	2.6
ShowYourWork:OtherConstructedResponse			1	3.8	2	0.3
Other-response-types					143	24.8
Interaction Type	Count	Percentage	Count	Percentage	Count	Percentage
choiceInteraction	5	16.1	3	11.5	163	28.2
choiceInteraction:choiceInteraction	1	3.2	1	3.8	5	0.9
choiceInteraction:extendedTextInteraction	1	3.2	1	3.8	8	1.4
choiceInteraction:textEntryInteraction	2	6.5	1	3.8	7	1.2
customInteraction	3	9.7	2	7.7	107	18.5
extendedTextInteraction	12	38.7	14	53.8	82	14.2
extendedTextInteraction:extendedTextInteraction:extendedTextInteraction	1	3.2	1	3.8	5	0.9
textEntryInteraction	6	19.4	3	11.5	94	16.3
other-interaction-types					106	18.4
Cognitive Complexity	Count	Percentage	Count	Percentage	Count	Percentage
low	2	6.5	2	7.7	181	31.4
medium	22	71.0	17	65.4	275	47.7
high	7	22.6	7	26.9	121	21.0
PARCC Number of Points	Count	Percentage	Count	Percentage	Count	Percentage
Type 1 - 1 point	11	35.5	6	23.1	329	57.0
Type 1 - 2 points	3	9.7	2	7.7	45	7.8
Type 1 - 4 points					2	0.3
Type 2 - 3 points	4	12.9	4	15.4	46	8.0
Type 2 - 4 points	5	16.1	5	19.2	55	9.5
Type 3 - 3 points	6	19.4	7	26.9	61	10.6
Type 3 - 6 points	2	6.5	2	7.7	39	6.8



Mode Comparability Research

Table C.37 Characteristics of Items Flagged for Lack of Factor Loading Invariance across Mode for Mathematics EOY

Response Type	Test Level Score CFA		Freely Estimated Factor Loadings		Item Pool	
	Count	Percentage	Count	Percentage	Count	Percentage
FillInTheBlank	5	38.5	5	31.25	219	20.5
FillInTheBlank:FillInTheBlank	1	7.7	1	6.25	70	6.6
MultipleChoice	4	30.8	7	43.75	406	38.0
MultipleChoice:MultipleChoice	3	23.1	2	12.5	95	8.9
MultipleChoice:MultipleChoice:MultipleChoice:FillInTheBlank			1	6.25	3	0.3
Other-response-types					275	25.7
Interaction Type	Count	Percentage	Count	Percentage	Count	Percentage
choiceInteraction	4	30.8	7	43.75	385	36.0
choiceInteraction:choiceInteraction	1	7.7	1	6.25	72	6.7
choiceInteraction:choiceInteraction:choiceInteraction:textEntryInteraction			1	6.25	2	0.2
customInteraction	3	23.1	2	12.5	154	14.4
textEntryInteraction	5	38.5	5	31.25	219	20.5
other-interaction-types					236	22.1
Cognitive Complexity	Count	Percentage	Count	Percentage	Count	Percentage
low	4	30.8	6	37.5	408	38.2
medium	8	61.5	9	56.25	628	58.8
high	1	7.7	1	6.25	32	3.0
PARCC Number of Points	Count	Percentage	Count	Percentage	Count	Percentage
Type 1 - 1 point	9	69.2	12	75	723	67.7
Type 1 - 2 points	4	30.8	3	18.75	293	27.4
Type 1 - 3 points					1	0.1
Type 1 - 4 points			1	6.25	51	4.8



Mode Comparability Research

Table C.38 Characteristics of Items Flagged for Lack of Factor Loading Invariance across Mode for Mathematics FS

			Freely Estimated Factor Loadings			
	Test Level Score CFA		Subclaim Level Score CFA		Item Pool	
Response Type	Count	Percentage	Count	Percentage	Count	Percentage
Essay:Essay	1	3.0			6	1.4
FillInTheBlank	4	12.1	5	20	73	16.6
FillInTheBlank:FillInTheBlank	2	6.1	2	8	29	6.6
FillInTheBlank:FillInTheBlank:FillInTheBlank:FillInTheBlank	1	3.0	1	4	3	0.7
FillInTheBlank:MultipleChoice:MultipleChoice:FillInTheBlank	1	3.0	1	4	1	0.2
MultipleChoice	14	42.4	10	40	159	36.1
MultipleChoice:OtherConstructedResponse	1	3.0			1	0.2
OtherConstructedResponse	6	18.2	4	16	18	4.1
OtherConstructedResponse:OtherConstructedResponse	3	9.1	2	8	3	0.7
Other-response-types					147	33.4
Interaction Type	Count	Percentage	Count	Percentage	Count	Percentage
choiceInteraction	14	42.4	10	40	145	33.0
choiceInteraction:extendedTextInteraction	1	3.0			2	0.5
customInteraction	4	12.1	3	12	75	17.0
extendedTextInteraction	6	18.2	4	16	20	4.5
extendedTextInteraction:extendedTextInteraction	3	9.1	2	8	4	0.9
textEntryInteraction	4	12.1	5	20	73	16.6
textEntryInteraction:textEntryInteraction	1	3.0	1	4	14	3.2
other-interaction-types					107	24.3
Cognitive Complexity	Count	Percentage	Count	Percentage	Count	Percentage
low	13	39.4	11	44	165	37.5
medium	17	51.5	13	52	231	52.5
high	3	9.1	1	4	44	10.0
PARCC Number of Points	Count	Percentage	Count	Percentage	Count	Percentage
Type 1 - 1 point	18	54.5	15	60	279	63.4
Type 1 - 2 points	2	6.1	2	8	90	20.5
Type 1 - 4 points	2	6.1	2	8	15	3.4
Type 2 - 3 points	1	3.0	1	4	12	2.7
Type 2 - 4 points	4	12.1	2	8	13	3.0
Type 3 - 3 points	5	15.2	3	12	18	4.1
Type 3 - 6 points	1	3.0			13	3.0



Mode Comparability Research

Table C.39 Characteristics of Items Flagged for Lack of Threshold/Intercept Invariance across Mode for ELA/Literacy PBA

Response Type	Test Level Score CFA		Freely Estimated Intercepts/Thresholds				Item Pool	
	Count	Percentage	Count	Percentage	Count	Percentage	Count	Percentage
Essay	1	11.1	3	10	3	12.5	28	7.8
MultipleChoice:MultipleChoice	4	44.4	10	33.3	7	29.2	265	74.2
MultipleChoice:MultipleChoice:MultipleChoice			1	3.3			9	2.5
OtherConstructedResponse	4	44.4	16	53.3	14	58.3	20	5.6
Other-response-types							35	9.8
Interaction Type	Count	Percentage	Count	Percentage	Count	Percentage	Count	Percentage
choiceInteraction	1	11.1	1	3.3	1	4.2	8	2.2
choiceInteraction:choiceInteraction	3	33.3	8	26.7	4	16.7	114	31.9
choiceInteraction:choiceInteraction:choiceInteraction			1	3.3			6	1.7
customInteraction			1	3.3	2	8.3	161	45.1
extendedTextInteraction	5	55.6	19	63.3	17	70.8	48	13.4
other-interaction-types							20	5.6
Cognitive Complexity	Count	Percentage	Count	Percentage	Count	Percentage	Count	Percentage
very low							1	0.3
low	4	44.4	6	20	6	25.0	95	26.6
medium	3	33.3	11	36.7	6	25.0	206	57.7
high	2	22.2	13	43.3	12	50.0	55	15.4
PARCC Number of Points	Count	Percentage	Count	Percentage	Count	Percentage	Count	Percentage
EBSR-2 points	4	44.4	11	36.7	7	29.2	262	73.4
PCR Reading-2 points							11	3.1
PCR Reading-4 points	5	55.6	19	63.3	17	70.8	37	10.4
TECR-2 points							47	13.2
Passage Type	Count	Percentage	Count	Percentage	Count	Percentage	Count	Percentage
Informational	1	11.1	11	36.7	9	37.5	127	35.6
Literary	8	88.9	19	63.3	15	62.5	230	64.4



Mode Comparability Research

Table C.40 Characteristics of Items Flagged for Lack of Threshold/Intercept Invariance across Mode for ELA/Literacy EOY

	Freely Estimated Intercepts/Thresholds					
	Test Level Score CFA		Subclaim Level Score CFA		Item Pool	
Response Type	Count	Percentage	Count	Percentage	Count	Percentage
MultipleChoice	1	4.2			5	0.9
MultipleChoice:MultipleChoice	23	95.8	17	100	426	77.6
Other-response-types					118	21.5
Interaction Type	Count	Percentage	Count	Percentage	Count	Percentage
choiceInteraction	1	4.2			26	
choiceInteraction:choiceInteraction	17	70.8	10	58.8	229	41.7
customInteraction	6	25.0	7	41.2	221	40.3
other-interaction-types					73	13.3
Cognitive Complexity	Count	Percentage	Count	Percentage	Count	Percentage
very low					1	0.2
low	7	29.2	5	29.4	179	32.6
medium	17	70.8	8	47.1	288	52.5
high			4	23.5	81	14.8
PARCC Number of Points	Count	Percentage	Count	Percentage	Count	Percentage
EBSR-2 points	24	100.0	17	100	439	80.0
TECR-2 points					110	20.0
Passage Type	Count	Percentage	Count	Percentage	Count	Percentage
Informational	11	45.8	6	35.3	296	53.9
Literary	13	54.2	11	64.7	253	46.1



Mode Comparability Research

Table C.41 Characteristics of Items Flagged for Lack of Threshold/Intercept Invariance across Mode for ELA/Literacy FS

			Freely Estimated Intercepts/Thresholds					
	Test Level Score CFA		Claim Level CFA		Subclaim Level Score CFA		Item Pool	
Response Type	Count	Percentage	Count	Percentage	Count	Percentage	Count	Percentage
MultipleChoice:MultipleChoice	6	85.7	7	70	7	87.5	195	75.9
OtherConstructedResponse	1	14.3	3	30	1	12.5	11	4.3
Other-response-types							51	19.8
Interaction Type	Count	Percentage	Count	Percentage	Count	Percentage	Count	Percentage
choiceInteraction:choiceInteraction	5	71.4	6	60	6	75	128	49.8
customInteraction	1	14.3	1	10	1	12.5	73	28.4
extendedTextInteraction	1	14.3	3	30	1	12.5	17	6.6
other-interaction-types							39	15.2
Cognitive Complexity	Count	Percentage	Count	Percentage	Count	Percentage	Count	Percentage
low	3	42.9	4	40	3	37.5	67	26.1
medium	3	42.9	3	30	4	50	150	58.4
high	1	14.3	3	30	1	12.5	40	15.6
PARCC Number of Points	Count	Percentage	Count	Percentage	Count	Percentage	Count	Percentage
EBSR-2 points	6	85.7	7	70	7	87.5	201	78.2
PCR Reading-2 points							1	0.4
PCR Reading-4 points	1	14.3	3	30	1	12.5	16	6.2
TECR-2 points							39	15.2
Passage Type	Count	Percentage	Count	Percentage	Count	Percentage	Count	Percentage
Informational	1	14.3	1		1		126	49.0
Literary	6	85.7	9		7		131	51.0



Mode Comparability Research

Table C.42 Characteristics of Items Flagged for Lack of Threshold/Intercept Invariance across Mode for Mathematics PBA

Response Type	Freely Estimated Intercepts/Thresholds					
	Test Level Score CFA		Subclaim Level Score CFA		Item Pool	
	Count	Percentage	Count	Percentage	Count	Percentage
Essay	4	12.5	2	6.9	35	6.1
Essay:Essay	1	3.1	1	3.4	24	4.2
Essay:Essay:Essay	1	3.1	1	3.4	11	1.9
FillInTheBlank	7	21.9	5	17.2	94	16.3
FillInTheBlank:Essay:Essay	1	3.1	1	3.4	2	0.3
FillInTheBlank:FillInTheBlank:Essay:Essay	1	3.1	1	3.4	2	0.3
MultipleChoice	5	15.6	3	10.3	165	28.6
MultipleChoice:MultipleChoice					8	1.4
MultipleChoice:OtherConstructedResponse	1	3.1	1	3.4	7	1.2
OtherConstructedResponse	10	31.3	12	41.4	62	10.7
OtherConstructedResponse:OtherConstructedResponse:OtherConstructedResponse	1	3.1	1	3.4	15	2.6
ShowYourWork:OtherConstructedResponse			1	3.4	2	0.3
Other-response-types					150	26.0
Interaction Type	Count	Percentage	Count	Percentage	Count	Percentage
choiceInteraction	5	15.6	3	10.3	163	28.2
choiceInteraction:choiceInteraction					5	0.9
choiceInteraction:extendedTextInteraction	1	3.1	1	3.4	8	1.4
choiceInteraction:textEntryInteraction					7	1.2
customInteraction	4	12.5	4	13.8	107	18.5
extendedTextInteraction	14	43.8	15	51.7	82	14.2
extendedTextInteraction:extendedTextInteraction:extendedTextInteraction	1	3.1	1	3.4	5	0.9
textEntryInteraction	7	21.9	5	17.2	94	16.3
other-interaction-types					106	18.4
Cognitive Complexity	Count	Percentage	Count	Percentage	Count	Percentage
low	2	6.3	1	3.4	181	31.4
medium	22	68.8	21	72.4	275	47.7
high	8	25.0	7	24.1	121	21.0
PARCC Number of Points	Count	Percentage	Count	Percentage	Count	Percentage
Type 1 - 1 point	12	37.5	8	27.6	329	57.0
Type 1 - 2 points					45	7.8
Type 1 - 4 points					2	0.3
Type 2 - 3 points	5	15.6	5	17.2	46	8.0
Type 2 - 4 points	5	15.6	5	17.2	55	9.5
Type 3 - 3 points	7	21.9	8	27.6	61	10.6
Type 3 - 6 points	3	9.4	3	10.3	39	6.8



Mode Comparability Research

Table C.43 Characteristics of Items Flagged for Lack of Threshold/Intercept Invariance across Mode for Mathematics EOY

Response Type	Freely Estimated Intercepts/Thresholds					
	Test Level Score CFA		Subclaim Level Score CFA		Item Pool	
	Count	Percentage	Count	Percentage	Count	Percentage
FillInTheBlank	3	27.3	5	27.8	219	20.5
FillInTheBlank:FillInTheBlank	2	18.2	1	5.6	70	6.6
FillInTheBlank:MultipleChoice:MultipleChoice:FillInTheBlank	1	9.1	1	5.6	2	0.2
MultipleChoice	4	36.4	7	38.9	406	38.0
MultipleChoice:FillInTheBlank	1	9.1	1	5.6	27	2.5
MultipleChoice:MultipleChoice			2	11.1	8	0.7
MultipleChoice:MultipleChoice:MultipleChoice:FillInTheBlank			1	5.6	3	0.3
Other-response-types					333	31.2
Interaction Type	Count	Percentage	Count	Percentage	Count	Percentage
choiceInteraction	4	36.4	7	38.9	385	36.0
choiceInteraction:choiceInteraction			1	5.6	72	6.7
choiceInteraction:choiceInteraction:choiceInteraction:textEntryInteraction			1	5.6	2	0.2
choiceInteraction:textEntryInteraction	1	9.1	1	5.6	19	1.8
customInteraction	2	18.2	3	16.7	154	14.4
textEntryInteraction	3	27.3	5	27.8	219	20.5
textEntryInteraction:textEntryInteraction	1	9.1			32	3.0
other-interaction-types					185	17.3
Cognitive Complexity	Count	Percentage	Count	Percentage	Count	Percentage
low	7	63.6	9	50.0	408	38.2
medium	4	36.4	9	50.0	628	58.8
high					32	3.0
PARCC Number of Points	Count	Percentage	Count	Percentage	Count	Percentage
Type 1 - 1 point	7	63.6	12	66.7	723	67.7
Type 1 - 2 points	3	27.3	4	22.2	293	27.4
Type 1 - 3 points					1	0.1
Type 1 - 4 points	1	9.1	2	11.1	51	4.8



Mode Comparability Research

Table C.44 Characteristics of Items Flagged for Lack of Threshold/Intercept Invariance across Mode for Mathematics FS

Response Type	Freely Estimated Intercepts/Thresholds					
	Test Level Score CFA		Subclaim Level Score CFA		Item Pool	
	Count	Percentage	Count	Percentage	Count	Percentage
Essay:Essay	1	3.3			6	1.4
FillInTheBlank	3	10.0	3	12.5	73	16.6
FillInTheBlank:FillInTheBlank	2	6.7	2	8.3	29	6.6
FillInTheBlank:FillInTheBlank:FillInTheBlank:FillInTheBlank	1	3.3	1	4.2	3	0.7
FillInTheBlank:MultipleChoice:MultipleChoice:FillInTheBlank	1	3.3			1	0.2
MultipleChoice	9	30.0	8	33.3	159	36.1
MultipleChoice:FillInTheBlank	2	6.7	1	4.2	11	2.5
MultipleChoice:MultipleChoice	2	6.7	2	8.3	21	4.8
MultipleChoice:OtherConstructedResponse	1	3.3	1	4.2	1	0.2
OtherConstructedResponse	5	16.7	4	16.7	18	4.1
OtherConstructedResponse:OtherConstructedResponse	3	10.0	2	8.3	7	1.6
Other-response-types					111	25.2
Interaction Type	Count	Percentage	Count	Percentage	Count	Percentage
choiceInteraction	9	30.0	8	33.3	145	33.0
choiceInteraction:extendedTextInteraction	1	3.3	1	4.2	2	0.5
choiceInteraction:textEntryInteraction	2	6.7	1	4.2	7	1.6
customInteraction	6	20.0	5	20.8	75	17.0
extendedTextInteraction	5	16.7	4	16.7	20	4.5
extendedTextInteraction:extendedTextInteraction	3	10.0	2	8.3	4	0.9
textEntryInteraction	3	10.0	3	12.5	73	16.6
textEntryInteraction:textEntryInteraction	1	3.3			14	3.2
other-interaction-types					100	22.7
Cognitive Complexity	Count	Percentage	Count	Percentage	Count	Percentage
low	10	33.3	8	33.3	165	37.5
medium	18	60.0	16	66.7	231	52.5
high	2	6.7			44	10
PARCC Number of Points	Count	Percentage	Count	Percentage	Count	Percentage
Type 1 - 1 point	12	40.0	11	45.8	279	63.4
Type 1 - 2 points	6	20.0	5	20.8	90	20.5
Type 1 - 4 points	2	6.7	1	4.2	15	3.4
Type 2 - 3 points	1	3.3	1	4.2	12	2.7
Type 2 - 4 points	3	10.0	2	8.3	13	3.0
Type 3 - 3 points	5	16.7	4	16.7	18	4.1
Type 3 - 6 points	1	3.3			13	3.0



Mode Comparability Research

Appendix D

Table D.1 Test Score Summary for ELA/Literacy PBA by Test Mode

Test	Form Type	Form Mode	Sample Size	Raw Score : All Items								Raw Score : Common Items						
				#items	Min	Max	Mean	SD	Alpha	Mean as a Percent	SD as a Percent	#items	Min	Max	Mean	SD	Alpha	Effect Size
ELA03	PBA	CBT 034PO	1406	14	0	28	11.31	6.40	40.40	22.86	0.86	8	0	16	6.41	3.81	0.68	-0.28
		PBT 014PP	1415	18	0	49	18.30	9.16	37.35	18.70	0.81	8	0	16	7.50	3.96	0.72	
		CBT 054PO	890	15	0	53	16.32	8.83	30.79	16.66	0.83	10	0	43	11.93	7.01	0.71	-0.47
		PBT 034PP	1174	18	0	72	28.10	12.61	39.03	17.52	0.85	10	0	43	15.32	7.38	0.71	
		CBT 074PO	965	13	0	39	11.82	6.36	30.30	16.31	0.67	9	0	31	8.93	5.47	0.49	-0.49
		PBT 044PP	1159	18	0	62	24.66	11.42	39.77	18.41	0.83	9	0	31	11.85	6.42	0.47	
		CBT 014PO	904	18	0	72	21.49	12.42	29.85	17.24	0.88	6	0	22	6.41	4.67	0.51	-0.26
		PBT 054PP	1123	18	0	72	25.08	12.89	34.83	17.90	0.84	6	0	22	7.62	4.79	0.49	
CBT 014PO	904	18	0	72	21.49	12.42	29.85	17.24	0.88	10	0	43	11.89	7.65	0.77	-0.12		
PBT 064PP	1935	17	0	70	21.60	11.62	30.86	16.60	0.87	10	0	43	12.77	7.41	0.75			
ELA04	PBA	CBT 014PO	1624	19	0	74	23.68	11.95	32.00	16.15	0.86	9	0	28	9.17	4.19	0.39	-0.24
		PBT 014PP	1481	20	0	76	27.79	12.31	36.56	16.20	0.84	9	0	28	10.17	4.34	0.43	
		CBT 034PO	957	22	0	80	29.75	15.09	37.18	18.86	0.89	8	0	39	14.19	8.36	0.79	-0.39
		PBT 034PP	1267	21	0	78	30.67	13.14	39.32	16.84	0.85	8	0	39	17.36	8.03	0.75	
		CBT 014PO	1624	19	0	74	23.68	11.95	32.00	16.15	0.86	9	0	31	9.12	5.40	0.44	-0.53
		PBT 064PP	1180	20	0	76	30.05	12.75	39.54	16.78	0.84	9	0	31	12.07	5.64	0.40	
CBT 014PO	1624	19	0	74	23.68	11.95	32.00	16.15	0.86	9	0	31	9.12	5.40	0.44	-0.50		
PBT 074PP	2024	19	0	64	24.93	10.55	38.96	16.49	0.82	9	0	31	11.84	5.51	0.42			
ELA05	PBA	CBT 024PO	1014	21	0	78	23.38	11.85	29.97	15.20	0.86	11	0	35	12.39	6.69	0.67	-0.34
		PBT 014PP	1194	20	0	76	32.27	14.23	42.47	18.72	0.87	11	0	35	14.77	7.13	0.66	
		CBT 034PO	1012	19	0	64	21.50	9.51	33.59	14.85	0.86	15	0	56	17.09	8.55	0.80	-0.47
		PBT 034PP	1152	17	0	60	22.86	10.40	38.10	17.34	0.87	15	0	56	21.38	9.71	0.82	
		CBT 054PO	1589	18	0	72	16.72	11.55	23.23	16.05	0.89	9	0	28	8.15	5.33	0.57	-0.59
		PBT 044PP	1310	21	0	78	28.57	14.61	36.63	18.74	0.89	9	0	28	11.51	5.98	0.59	
		CBT 024PO	1014	21	0	78	23.38	11.85	29.97	15.20	0.86	13	0	39	13.82	7.08	0.69	-0.32
		PBT 064PP	1087	22	0	80	29.13	14.76	36.41	18.45	0.88	13	0	39	16.22	7.73	0.68	
CBT 024PO	1014	21	0	78	23.38	11.85	29.97	15.20	0.86	10	0	33	10.94	6.16	0.64	-0.33		
PBT 074PP	2108	21	0	78	31.49	13.61	40.37	17.45	0.87	10	0	33	13.02	6.29	0.61			



Mode Comparability Research

Table D.1: Test Score Summary for ELA/Literacy PBA by Test Mode (Cont'd)

Test	Form Type	Mode	Form	Sample Size	Raw Score : All Items								Raw Score : Common Items					Effect Size	
					#items	Min	Max	Mean	Percent as a	SD	Percent as a	Alpha	#items	Min	Max	Mean	SD		Alpha
ELA06	PBA	CBT	014PO	588	23	0	93	27.41	29.47	15.84	17.03	0.88	11	0	52	14.59	9.49	0.79	-0.37
		PBT	014PP	1185	23	0	93	35.02	37.66	16.53	17.78	0.89	11	0	52	18.19	9.83	0.80	
		CBT	034PO	1016	19	0	85	26.28	30.92	15.54	18.28	0.91	8	0	46	13.21	9.29	0.81	-0.37
		PBT	034PP	1302	19	0	68	25.18	37.02	12.11	17.80	0.86	8	0	46	16.61	8.93	0.77	
		CBT	054PO	603	22	0	91	29.24	32.14	17.02	18.71	0.89	10	0	50	15.18	10.97	0.81	-0.30
		PBT	044PP	1123	21	0	72	27.63	38.37	14.25	19.80	0.87	10	0	50	18.49	10.83	0.81	
		CBT	164PO	581	23	0	93	29.22	31.42	15.48	16.65	0.87	13	0	43	12.37	7.41	0.66	-0.26
		PBT	054PP	1110	21	0	72	26.88	37.33	14.21	19.73	0.88	13	0	43	14.38	8.23	0.66	
		CBT	014PO	588	23	0	93	27.41	29.47	15.84	17.03	0.88	11	0	39	12.56	6.74	0.57	-0.35
		PBT	064PP	1085	21	0	71	28.87	40.66	13.35	18.80	0.85	11	0	39	15.01	7.26	0.53	
CBT	014PO	588	23	0	93	27.41	29.47	15.84	17.03	0.88	11	0	56	16.52	9.71	0.80	-0.34		
PBT	074PP	2954	20	0	74	27.82	37.59	12.62	17.05	0.86	11	0	56	19.86	9.68	0.77			
ELA07	PBA	CBT	014PO	1593	21	0	89	25.43	28.58	15.47	17.38	0.90	12	0	37	12.62	7.44	0.58	-0.32
		PBT	014PP	1453	22	0	91	32.87	36.12	16.77	18.43	0.87	12	0	37	14.89	6.92	0.56	
		CBT	034PO	1032	21	0	89	27.09	30.43	15.72	17.67	0.88	19	0	85	25.05	14.95	0.86	-0.33
		PBT	034PP	1219	22	0	91	32.34	35.54	16.32	17.93	0.86	19	0	85	30.03	15.38	0.84	
		CBT	054PO	1060	20	0	87	20.77	23.87	12.38	14.23	0.84	10	0	33	10.42	6.12	0.51	-0.36
		PBT	044PP	1207	22	0	91	31.02	34.09	14.86	16.33	0.84	10	0	33	12.73	6.60	0.52	
		CBT	064PO	1030	21	0	89	28.36	31.86	15.06	16.92	0.88	10	0	50	14.39	8.99	0.74	-0.34
		PBT	044PP	1207	22	0	91	31.02	34.09	14.86	16.33	0.84	10	0	50	17.44	9.02	0.72	
		CBT	164PO	1069	20	0	87	25.74	29.58	14.36	16.51	0.86	10	0	20	7.28	3.32	0.50	-0.18
		PBT	054PP	1202	22	0	91	30.42	33.43	15.10	16.59	0.84	10	0	20	7.88	3.52	0.55	
		CBT	014PO	1593	21	0	89	25.43	28.58	15.47	17.38	0.90	11	0	39	9.18	5.79	0.48	-0.49
		PBT	064PP	1154	21	0	89	29.33	32.96	14.65	16.46	0.83	11	0	39	12.03	5.91	0.45	
		CBT	024PO	1003	22	0	91	23.31	25.61	14.23	15.64	0.87	11	0	22	6.42	3.49	0.55	-0.16
		PBT	064PP	1154	21	0	89	29.33	32.96	14.65	16.46	0.83	11	0	22	6.99	3.56	0.53	
CBT	014PO	1593	21	0	89	25.43	28.58	15.47	17.38	0.90	11	0	39	9.18	5.79	0.48	-0.43		
PBT	074PP	1927	20	0	87	29.62	34.04	15.06	17.31	0.87	11	0	39	11.72	6.02	0.46			
CBT	024PO	1003	22	0	91	23.31	25.61	14.23	15.64	0.87	11	0	22	6.42	3.49	0.55	-0.09		
PBT	074PP	1927	20	0	87	29.62	34.04	15.06	17.31	0.87	11	0	22	6.75	3.48	0.53			



Mode Comparability Research

Table D.1: Test Score Summary for ELA/Literacy PBA by Test Mode (Cont'd)

Test	Form Type	Mode	Form	Sample Size	Raw Score : All Items								Raw Score : Common Items						Effect Size
					#items	Min	Max	Mean	Percent as a	SD	Percent as a	Alpha	#items	Min	Max	Mean	SD	Alpha	
ELA08	PBA	CBT	014PO	1091	19	0	72	26.42	36.70	12.78	17.75	0.86	13	0	60	19.62	10.59	0.79	0.00
		PBT	014PP	1222	21	0	89	31.96	35.91	17.39	19.53	0.89	13	0	60	19.64	11.40	0.82	
		CBT	014PO	1091	19	0	72	26.42	36.70	12.78	17.75	0.86	11	0	22	11.69	4.66	0.71	-0.07
		PBT	024PP	1073	22	0	78	33.75	43.27	14.19	18.20	0.87	11	0	22	12.01	4.64	0.71	
		CBT	034PO	1166	18	0	70	23.47	33.53	11.67	16.67	0.90	13	0	60	19.49	10.58	0.85	-0.28
		PBT	034PP	1049	18	0	70	26.75	38.22	13.04	18.63	0.90	13	0	60	22.52	11.38	0.85	
		CBT	064PO	1013	19	0	85	28.67	33.73	15.88	18.69	0.90	8	0	16	7.71	3.26	0.65	-0.05
		PBT	044PP	1037	18	0	83	30.83	37.14	14.90	17.95	0.89	8	0	16	7.88	3.29	0.66	
		CBT	054PO	1059	20	0	87	31.62	36.34	15.33	17.62	0.89	10	0	33	15.32	6.79	0.58	-0.17
		PBT	054PP	1015	20	0	70	29.07	41.52	11.98	17.12	0.85	10	0	33	16.51	6.73	0.58	
		CBT	094PO	1066	17	0	64	23.88	37.31	13.05	20.39	0.91	8	0	16	7.38	3.71	0.68	-0.02
		PBT	064PP	981	18	0	49	22.15	45.21	10.21	20.84	0.78	8	0	16	7.47	3.89	0.71	
		CBT	104PO	852	18	0	66	24.45	37.05	12.90	19.55	0.88	9	0	18	8.02	3.69	0.65	-0.05
		PBT	064PP	981	18	0	49	22.15	45.21	10.21	20.84	0.78	9	0	18	8.21	4.06	0.72	
		CBT	114PO	1085	18	0	83	27.33	32.93	15.76	18.99	0.90	10	0	33	13.79	7.78	0.59	-0.17
		PBT	064PP	981	18	0	49	22.15	45.21	10.21	20.84	0.78	10	0	33	15.08	7.69	0.61	
CBT	124PO	1024	15	0	43	17.66	41.07	8.58	19.94	0.75	8	0	16	7.20	3.53	0.62	-0.09		
PBT	064PP	981	18	0	49	22.15	45.21	10.21	20.84	0.78	8	0	16	7.51	3.65	0.65			
ELA09	PBA	CBT	014PO	1353	20	0	87	20.08	23.08	13.54	15.57	0.89	11	0	56	12.59	8.62	0.81	-0.61
		PBT	014PP	920	19	0	72	23.60	32.78	11.71	16.26	0.86	11	0	56	18.15	9.51	0.80	
		CBT	014PO	1353	20	0	87	20.08	23.08	13.54	15.57	0.89	13	0	56	14.86	9.76	0.83	-0.48
		PBT	024PP	981	21	0	89	32.01	35.97	17.03	19.13	0.88	13	0	56	19.64	10.28	0.81	
		CBT	034PO	907	21	0	89	29.08	32.68	15.95	17.92	0.89	16	0	79	25.43	14.10	0.86	-0.33
		PBT	034PP	918	22	0	91	35.00	38.46	16.23	17.83	0.87	16	0	79	30.15	14.52	0.85	
		CBT	054PO	932	21	0	89	25.16	28.27	14.83	16.67	0.88	9	0	48	12.82	8.33	0.77	-0.29
		PBT	044PP	879	20	0	87	30.59	35.16	15.31	17.59	0.88	9	0	48	15.32	8.71	0.76	
CBT	074PO	943	22	0	78	28.46	36.49	13.76	17.64	0.87	9	0	35	12.17	6.36	0.55	-0.28		
PBT	064PP	876	21	0	89	33.34	37.46	14.88	16.72	0.87	9	0	35	13.91	6.24	0.54			



Mode Comparability Research

Table D.1: Test Score Summary for ELA/Literacy PBA by Test Mode (Cont'd)

Test	Form Type	Mode	Form	Sample Size	Raw Score : All Items								Raw Score : Common Items						Effect Size
					#items	Min	Max	Mean	Percent as a	SD	Percent as a	Alpha	#items	Min	Max	Mean	SD	Alpha	
ELA10	PBA	CBT	014PO	778	18	0	66	20.60	31.21	12.28	18.61	0.88	12	0	54	16.12	10.89	0.83	-0.06
		PBT	014PP	625	20	0	87	23.66	27.19	15.32	17.61	0.89	12	0	54	16.83	11.13	0.83	
		CBT	034PO	1254	18	0	83	22.80	27.47	16.31	19.64	0.93	16	0	79	21.46	15.87	0.90	-0.32
		PBT	034PP	572	19	0	85	28.62	33.67	16.88	19.86	0.91	16	0	79	26.59	16.06	0.89	
		CBT	054PO	870	20	0	87	28.98	33.31	16.83	19.34	0.90	7	0	44	12.73	9.44	0.79	-0.30
		PBT	044PP	567	20	0	87	31.49	36.19	18.41	21.16	0.91	7	0	44	15.69	10.10	0.78	
		CBT	104PO	840	16	0	62	18.72	30.19	11.04	17.81	0.88	9	0	18	6.88	3.44	0.64	-0.20
		PBT	064PP	573	18	0	49	19.40	39.60	10.32	21.05	0.79	9	0	18	7.59	3.73	0.70	
ELA11	PBA	CBT	014PO	778	18	0	66	20.60	31.21	12.28	18.61	0.88	10	0	37	11.54	7.18	0.49	-0.17
		PBT	074PP	1486	21	0	72	24.14	33.53	13.76	19.11	0.86	10	0	37	12.78	7.59	0.50	
		CBT	014PO	769	18	0	83	24.22	29.18	15.53	18.72	0.90	12	0	58	15.99	10.87	0.84	-0.21
		PBT	014PP	910	20	0	87	27.30	31.38	17.09	19.64	0.89	12	0	58	18.32	11.90	0.83	
		CBT	014PO	769	18	0	83	24.22	29.18	15.53	18.72	0.90	12	0	54	15.60	10.31	0.83	-0.27
		PBT	024PP	828	20	0	87	28.91	33.23	16.58	19.05	0.89	12	0	54	18.41	10.31	0.81	
		CBT	034PO	817	19	0	85	24.53	28.85	15.95	18.76	0.91	14	0	75	21.17	14.46	0.86	-0.29
		PBT	034PP	825	19	0	85	29.28	34.44	17.30	20.36	0.90	14	0	75	25.45	15.47	0.85	
CBT	054PO	806	21	0	89	22.74	25.55	14.87	16.71	0.88	9	0	48	12.26	8.27	0.75	-0.40		
PBT	044PP	809	19	0	85	30.04	35.34	17.33	20.39	0.89	9	0	48	15.93	9.96	0.79			
CBT	074PO	774	19	0	68	19.95	29.34	12.56	18.47	0.87	10	0	37	9.79	6.94	0.58	-0.10		
PBT	064PP	778	20	0	70	23.05	32.92	13.70	19.56	0.87	10	0	37	10.54	7.44	0.59			



Mode Comparability Research

Table D.2 Test Score Summary for ELA/Literacy EOY by Test Mode

Test	Form Type	Mode	Form	Sample Size	Raw Score : All Items								Raw Score : Common Items						Effect Size
					#items	Min	Max	Mean	Percent as a	SD	SD as a Percent	Alpha	#items	Min	Max	Mean	SD	Alpha	
ELA03	EOY	CBT	104EO	2374	24	0	48	16.67	34.73	8.58	17.88	0.88	19	0	38	13.30	7.19	0.81	
					29	0	58	21.60	37.24	10.76	18.56	0.90	19	0	38	15.19	7.80	0.83	
		PBT	014EP	1083	27	0	54	20.11	37.25	9.96	18.44	0.89	23	0	46	18.03	8.52	0.84	-0.18
					32	0	64	26.14	40.84	11.61	18.14	0.89	23	0	46	19.56	8.86	0.85	
		CBT	134EO	1950	27	0	54	18.80	34.81	9.29	17.20	0.87	22	0	44	15.61	7.80	0.81	-0.17
					29	0	58	21.79	37.57	10.47	18.04	0.88	22	0	44	17.01	8.43	0.84	
		PBT	034EP	1052	27	0	54	20.20	37.42	10.12	18.74	0.89	23	0	46	16.62	8.62	0.83	-0.22
					27	0	54	21.91	40.57	10.85	20.09	0.90	23	0	46	18.63	9.48	0.86	
		CBT	154EO	1842	25	0	50	19.74	39.49	9.23	18.47	0.89	21	0	42	17.48	8.19	0.84	-0.07
					28	0	56	22.83	40.76	10.88	19.43	0.90	21	0	42	18.07	8.54	0.85	
PBT	054EP	1248	29	0	58	21.12	36.41	10.64	18.35	0.88	23	0	46	16.09	8.40	0.83	-0.05		
			31	0	62	21.40	34.52	10.71	17.27	0.87	23	0	46	16.52	8.46	0.83			
ELA04	EOY	CBT	104EO	2250	26	0	52	16.75	32.22	9.27	17.84	0.90	18	0	36	11.79	6.62	0.80	-0.14
					30	0	60	21.63	36.04	11.60	19.34	0.90	18	0	36	12.75	7.07	0.82	
		PBT	014EP	1164	30	0	60	25.24	42.07	11.05	18.42	0.89	22	0	44	18.44	8.34	0.84	-0.05
					32	0	64	24.38	38.09	11.07	17.30	0.88	22	0	44	18.87	8.47	0.84	
		CBT	134EO	1834	29	0	58	22.05	38.02	10.30	17.76	0.88	21	0	42	16.80	8.22	0.83	0.01
					30	0	60	21.61	36.02	10.56	17.61	0.87	21	0	42	16.71	8.29	0.83	
		PBT	034EP	1275	28	0	56	19.81	35.38	8.97	16.03	0.86	21	0	42	14.84	7.08	0.78	-0.03
					31	0	62	22.03	35.54	10.43	16.82	0.86	21	0	42	15.02	7.21	0.78	
		CBT	144EO	1790	31	0	62	24.73	39.89	12.39	19.98	0.91	24	0	48	18.66	9.79	0.87	-0.04
					33	0	66	25.30	38.33	12.23	18.54	0.88	24	0	48	19.04	9.61	0.86	
PBT	044EP	1093	31	0	62	24.73	39.89	12.39	19.98	0.91	24	0	48	18.66	9.79	0.87	-0.04		
			33	0	66	25.30	38.33	12.23	18.54	0.88	24	0	48	19.04	9.61	0.86			
CBT	114EO	1766	31	0	62	24.73	39.89	12.39	19.98	0.91	24	0	48	18.66	9.79	0.87	-0.04		
			33	0	66	25.30	38.33	12.23	18.54	0.88	24	0	48	19.04	9.61	0.86			
PBT	064EP	2030	31	0	62	24.73	39.89	12.39	19.98	0.91	24	0	48	18.66	9.79	0.87	-0.04		
			33	0	66	25.30	38.33	12.23	18.54	0.88	24	0	48	19.04	9.61	0.86			



Mode Comparability Research

Table D.2: Test Score Summary for ELA/Literacy EOY by Test Mode (Cont'd)

Test	Form Type	Mode	Form	Sample Size	Raw Score : All Items								Raw Score : Common Items						Effect Size
					#items	Min	Max	Mean	Percent as a	SD	Percent as a	Alpha	#items	Min	Max	Mean	SD	Alpha	
ELA05	EOY	CBT	104EO	1551	27	0	54	22.23	41.17	9.49	17.57	0.86	23	0	46	19.75	8.24	0.81	-0.04
		PBT	014EP	1089	28	0	56	22.79	40.70	10.07	17.99	0.87	23	0	46	20.09	8.57	0.83	-0.04
		CBT	124EO	1293	30	0	60	22.66	37.77	9.74	16.23	0.86	17	0	34	12.64	5.56	0.71	-0.08
		PBT	024EP	939	33	0	66	25.74	39.00	10.75	16.28	0.85	17	0	34	13.06	5.49	0.70	-0.08
		CBT	134EO	1303	27	0	52	19.94	38.36	8.51	16.36	0.84	20	0	38	16.15	6.70	0.77	-0.17
		PBT	034EP	937	29	0	56	24.11	43.05	9.82	17.54	0.84	20	0	38	17.31	6.85	0.77	-0.17
		CBT	144EO	1385	29	0	57	22.67	39.77	9.41	16.50	0.85	19	0	37	14.77	6.66	0.78	0.00
		PBT	044EP	925	28	0	55	21.55	39.17	10.24	18.62	0.88	19	0	37	14.76	7.16	0.82	0.00
ELA06	EOY	CBT	114EO	1332	28	0	56	21.10	37.68	9.71	17.34	0.86	24	0	48	17.42	8.27	0.81	-0.18
		PBT	064EP	1822	30	0	60	23.24	38.73	10.00	16.67	0.86	24	0	48	18.91	8.13	0.80	-0.18
		CBT	104EO	2427	32	0	63	21.77	34.55	10.17	16.14	0.86	21	0	41	14.02	6.58	0.74	-0.28
		PBT	014EP	1064	32	0	63	24.55	38.97	11.33	17.98	0.88	21	0	41	15.99	7.48	0.80	-0.28
		CBT	124EO	1766	27	0	54	20.33	37.66	9.39	17.38	0.87	22	0	44	16.67	7.75	0.81	-0.03
		PBT	024EP	976	30	0	60	23.76	39.60	10.25	17.09	0.87	22	0	44	16.92	7.65	0.81	-0.03
		CBT	134EO	1889	24	0	48	17.81	37.09	8.07	16.82	0.85	20	0	40	14.71	6.94	0.77	-0.10
		PBT	034EP	949	29	0	58	23.52	40.55	10.27	17.70	0.86	20	0	40	15.44	6.96	0.77	-0.10
ELA06	EOY	CBT	144EO	1830	27	0	53	18.90	35.65	9.12	17.21	0.86	22	0	43	15.78	7.74	0.81	-0.09
		PBT	044EP	940	28	0	55	21.14	38.43	9.98	18.15	0.87	22	0	43	16.47	7.96	0.82	-0.09
		CBT	114EO	1890	26	0	52	19.51	37.52	9.17	17.63	0.88	21	0	42	15.78	7.64	0.81	-0.14
		PBT	064EP	2828	29	0	58	23.99	41.37	10.97	18.92	0.89	21	0	42	16.86	7.92	0.82	-0.14

Table D.2: Test Score Summary for ELA/Literacy EOY by Test Mode (Cont'd)

Test	Form Type	Mode	Form	Sample Size	Raw Score : All Items								Raw Score : Common Items						Effect Size
					#items	Min	Max	Mean	Percent as a	SD	SD as a Percent	Alpha	#items	Min	Max	Mean	SD	Alpha	
ELA07	EOY	CBT	104EO	1997	23	0	46	17.39	37.80	8.56	18.60	0.88	19	0	38	14.10	7.19	0.81	0.04
		PBT	014EP	1201	28	0	56	20.08	35.86	9.52	17.00	0.87	19	0	38	13.83	6.71	0.78	
		CBT	124EO	1576	23	0	46	19.66	42.74	8.90	19.35	0.89	17	0	34	14.26	6.70	0.79	-0.16
		PBT	024EP	1066	26	0	52	24.97	48.02	10.60	20.39	0.90	17	0	34	15.36	6.95	0.80	
		CBT	134EO	1592	25	0	50	20.23	40.47	8.97	17.94	0.87	20	0	40	16.47	7.54	0.81	-0.07
		PBT	034EP	1073	30	0	60	26.42	44.04	11.96	19.93	0.90	20	0	40	17.01	7.70	0.82	
		CBT	144EO	1632	24	0	48	19.81	41.27	8.23	17.14	0.86	18	0	36	15.97	7.08	0.79	-0.10
		PBT	044EP	1063	28	0	56	24.76	44.22	9.79	17.47	0.86	18	0	36	16.67	6.87	0.77	
CBT	114EO	1694	28	0	56	27.08	48.36	11.24	20.06	0.90	22	0	44	20.72	8.88	0.86	-0.02		
PBT	064EP	2039	29	0	58	27.11	46.74	11.90	20.52	0.90	22	0	44	20.88	9.13	0.86			
ELA08	EOY	CBT	104EO	1569	25	0	50	15.00	30.01	7.01	14.01	0.81	20	0	40	13.53	6.33	0.76	-0.23
		PBT	014EP	939	27	0	54	20.68	38.29	9.10	16.86	0.86	20	0	40	15.05	6.96	0.79	
		CBT	134EO	1258	25	0	50	19.34	38.68	8.16	16.32	0.85	22	0	44	17.17	7.57	0.81	-0.14
		PBT	034EP	835	31	0	62	24.54	39.58	10.07	16.24	0.84	22	0	44	18.27	7.70	0.81	
		CBT	144EO	1389	26	0	52	19.79	38.06	8.80	16.91	0.85	20	0	40	15.26	6.74	0.77	-0.24
PBT	044EP	820	28	0	56	23.08	41.22	9.78	17.47	0.86	20	0	40	16.93	7.28	0.79			
ELA09	EOY	CBT	104EO	1244	26	0	52	17.41	33.48	8.26	15.89	0.85	18	0	36	11.71	5.88	0.76	-0.22
		PBT	014EP	1049	26	0	52	18.04	34.69	8.44	16.23	0.85	18	0	36	13.05	6.17	0.76	
		CBT	124EO	1032	25	0	50	16.69	33.37	9.08	18.17	0.88	19	0	38	13.68	7.33	0.82	-0.28
		PBT	024EP	964	29	0	58	24.67	42.54	11.28	19.45	0.89	19	0	38	15.80	7.73	0.83	
		CBT	134EO	1029	22	0	44	14.95	33.98	7.29	16.58	0.85	17	0	34	12.11	6.07	0.74	-0.32
		PBT	034EP	954	26	0	52	22.25	42.79	9.18	17.66	0.86	17	0	34	14.07	6.24	0.75	
		CBT	144EO	1036	25	0	50	16.13	32.27	8.00	16.01	0.85	18	0	36	11.13	5.90	0.73	-0.24
PBT	044EP	937	26	0	52	19.34	37.19	8.62	16.58	0.84	18	0	36	12.58	6.15	0.74			
CBT	114EO	990	20	0	40	13.07	32.66	6.92	17.31	0.87	19	0	38	12.46	6.50	0.80	-0.03		
PBT	064EP	1738	26	0	52	17.41	33.49	8.65	16.64	0.87	19	0	38	12.67	6.53	0.79			



Mode Comparability Research

Table D.2: Test Score Summary for ELA/Literacy EOY by Test Mode (Cont'd)

Test	Form Type	Mode	Form	Sample Size	Raw Score : All Items							Raw Score : Common Items						Effect Size	
					#items	Min	Max	Mean	Percent	SD	Alpha	#items	Min	Max	Mean	SD	Alpha		
ELA10	EOY	CBT	104EO	1151	28	0	56	17.86	31.90	9.68	17.29	0.88	21	0	42	13.91	7.58	0.81	-0.39
		PBT	014EP	857	31	0	62	24.32	39.23	11.99	19.34	0.89	21	0	42	17.00	8.21	0.83	
		CBT	124EO	923	27	0	54	16.30	30.19	8.71	16.13	0.85	21	0	42	13.67	7.17	0.79	-0.27
		PBT	024EP	794	31	0	62	24.06	38.81	12.31	19.86	0.89	21	0	42	15.78	8.35	0.84	
		CBT	134EO	968	25	0	50	17.88	35.77	9.87	19.74	0.90	19	0	38	14.61	8.04	0.85	-0.32
		PBT	034EP	785	29	0	58	24.82	42.78	12.43	21.43	0.92	19	0	38	17.30	8.90	0.87	
		CBT	144EO	1214	27	0	54	18.02	33.37	10.05	18.60	0.90	20	0	40	13.69	8.41	0.86	-0.39
		PBT	044EP	767	26	0	52	22.01	42.33	11.49	22.09	0.92	20	0	40	17.11	9.16	0.88	
CBT	114EO	913	22	0	44	15.08	34.27	7.82	17.77	0.87	21	0	42	14.31	7.50	0.81	-0.18		
PBT	064EP	1136	29	0	58	21.78	37.56	10.91	18.82	0.88	21	0	42	15.74	8.07	0.84			
ELA11	EOY	CBT	104EO	1190	25	0	50	15.00	30.00	9.44	18.88	0.90	19	0	38	12.54	8.06	0.85	-0.12
		PBT	014EP	662	27	0	54	17.37	32.17	10.72	19.85	0.91	19	0	38	13.53	8.12	0.85	
		CBT	124EO	1019	26	0	52	14.94	28.73	8.41	16.17	0.87	22	0	44	13.05	7.15	0.81	-0.23
		PBT	024EP	607	30	0	60	20.91	34.84	10.87	18.12	0.89	22	0	44	14.80	7.83	0.83	
		CBT	134EO	982	30	0	60	15.60	26.01	8.77	14.62	0.85	22	0	44	12.66	6.87	0.80	-0.12
		PBT	034EP	593	31	0	62	19.43	31.34	10.49	16.93	0.88	22	0	44	13.53	7.50	0.83	
CBT	114EO	1020	29	0	58	16.89	29.13	9.85	16.98	0.89	19	0	38	11.80	7.15	0.83	-0.04		
PBT	064EP	1060	30	0	60	17.64	29.40	9.92	16.53	0.88	19	0	38	12.12	7.23	0.83			



Mode Comparability Research

Table D.3 Test Score Summary for ELA/Literacy Full Summative Forms by Test Mode

Test	Form Type	Mode	Form	Sample Size	Raw Score : All Items								Raw Score : Common Items						Effect Size
					#items	Min	Max	Mean	Percent	SD	SD as a Percent	Alpha	#items	Min	Max	Mean	SD	Alpha	
ELA03	FS	CBT	184PO114EO	1589	47	0	120	41.32	34.43	20.21	16.84	0.93	23	0	46	16.31	8.55	0.83	0.04
		PBT	064PP064EP	1470	48	0	132	37.16	28.15	18.04	13.67	0.93	23	0	46	15.97	8.09	0.83	
ELA04	FS	CBT	184PO114EO	1366	49	0	124	51.11	41.22	23.73	19.14	0.94	28	0	69	26.97	13.12	0.84	-0.11
		PBT	074PP064EP	1481	52	0	130	44.68	34.37	19.33	14.87	0.92	28	0	69	28.38	12.98	0.83	
ELA05	FS	CBT	184PO114EO	1235	50	0	136	55.82	41.04	21.81	16.04	0.92	24	0	48	17.76	8.34	0.81	-0.05
		PBT	074PP064EP	1353	51	0	138	50.15	36.34	20.73	15.02	0.92	24	0	48	18.20	7.99	0.79	
ELA06	FS	CBT	184PO114EO	1569	43	0	133	45.30	34.06	22.02	16.55	0.93	21	0	42	15.75	7.67	0.82	-0.26
		PBT	074PP064EP	2032	49	0	132	44.82	33.95	18.92	14.33	0.92	21	0	42	17.72	7.70	0.83	
ELA07	FS	CBT	184PO114EO	1202	45	0	137	51.50	37.59	23.03	16.81	0.93	26	0	69	26.88	11.94	0.83	-0.27
		PBT	074PP064EP	1544	49	0	145	51.92	35.81	22.83	15.75	0.93	26	0	69	30.20	12.98	0.82	
ELA08	FS	CBT	184PO114EO	875	47	0	141	51.19	36.31	20.06	14.22	0.90	20	0	57	21.56	9.65	0.74	-0.14
		PBT	074PP064EP	1085	49	0	132	49.08	37.19	18.41	13.95	0.90	20	0	57	22.91	9.22	0.73	
ELA09	FS	CBT	184PO114EO	967	39	0	112	37.14	33.16	18.14	16.20	0.93	19	0	38	12.57	6.67	0.81	-0.22
		PBT	074PP064EP	918	48	0	143	41.70	29.16	17.87	12.49	0.92	19	0	38	14.07	7.20	0.81	
ELA10	FS	CBT	184PO114EO	672	41	0	129	36.82	28.54	21.72	16.84	0.94	21	0	42	14.52	7.50	0.81	-0.21
		PBT	074PP064EP	943	50	0	130	42.30	32.54	19.50	15.00	0.93	21	0	42	16.15	7.80	0.83	
ELA11	FS	CBT	184PO114EO	856	50	0	147	47.37	32.23	27.45	18.67	0.95	19	0	38	12.29	7.27	0.83	0.04
		PBT	074PP064EP	911	51	0	149	47.68	32.00	23.04	15.46	0.93	19	0	38	11.97	7.09	0.83	



Mode Comparability Research

Table D.4 Test Score Summary for Mathematics PBA Forms by Test Mode

Test	Form Type	Mode	Form	Sample Size	Raw Score : All Items							Raw Score : Common Items							Effect Size
					#items	Min	Max	Mean	Percent as a	SD	Alpha	Percent as a	SD	Alpha	#items	Min	Max	Mean	
MAT03	PBA	CBT	114PO	2227	19	0	38	10.96	28.83	6.29	16.56	0.86	17	0	34	9.78	5.71	0.82	-0.17
		PBT	014PP	1798	20	0	39	12.59	32.28	7.14	18.32	0.87	17	0	34	10.79	6.39	0.83	
		CBT	124PO	1814	21	0	45	13.13	29.18	7.79	17.31	0.87	13	0	36	9.70	6.24	0.82	-0.36
		PBT	024PP	1530	20	0	43	16.12	37.50	8.03	18.68	0.87	13	0	36	12.10	7.12	0.82	
		CBT	144PO	1736	15	0	24	5.67	23.64	3.48	14.50	0.85	4	0	8	1.42	1.18	0.50	-1.03
		PBT	034PP	1515	18	0	32	9.59	29.97	5.73	17.92	0.88	4	0	8	3.10	1.98	0.62	
		CBT	154PO	1800	16	0	23	7.91	34.37	3.65	15.87	0.82	7	0	12	3.12	1.83	0.58	-0.74
		PBT	044PP	1478	18	0	30	10.07	33.58	5.61	18.70	0.88	7	0	12	4.81	2.65	0.69	
		CBT	164PO	1785	18	0	28	8.33	29.75	4.58	16.35	0.84	7	0	15	2.78	2.48	0.70	-0.15
		PBT	054PP	1429	19	0	35	11.77	33.62	6.87	19.62	0.87	7	0	15	3.16	2.71	0.71	
CBT	134PO	1709	19	0	37	9.86	26.64	5.78	15.62	0.86	7	0	16	4.04	2.28	0.59	-0.32		
PBT	064PP	2156	20	0	42	13.36	31.81	6.74	16.05	0.87	7	0	16	4.86	2.81	0.64			
MAT04	PBA	CBT	114PO	1985	19	0	39	11.63	29.81	6.58	16.88	0.87	14	0	27	8.99	4.91	0.80	-0.20
		PBT	014PP	1799	20	0	38	13.48	35.49	7.77	20.46	0.89	14	0	27	10.07	5.77	0.82	
		CBT	124PO	1545	21	0	44	15.21	34.58	7.55	17.16	0.87	13	0	33	10.69	5.79	0.82	-0.23
		PBT	024PP	1572	19	0	41	15.01	36.62	8.27	20.18	0.89	13	0	33	12.16	6.83	0.83	
		CBT	144PO	1440	14	0	21	5.79	27.58	3.80	18.11	0.85	6	0	10	2.82	2.09	0.65	-0.26
		PBT	034PP	1515	14	0	24	6.92	28.83	4.95	20.64	0.89	6	0	10	3.42	2.60	0.70	
		CBT	154PO	1557	14	0	19	8.10	42.63	3.33	17.51	0.82	6	0	7	4.23	1.67	0.53	0.23
		PBT	044PP	1521	14	0	22	8.91	40.49	4.54	20.64	0.88	6	0	7	3.84	1.73	0.52	
		CBT	164PO	1737	19	0	40	9.56	23.91	5.64	14.09	0.86	6	0	12	3.01	1.98	0.63	0.00
		PBT	054PP	1468	20	0	41	13.68	33.37	7.27	17.74	0.88	6	0	12	3.01	2.32	0.71	
CBT	134PO	1530	16	0	27	8.84	32.72	4.33	16.05	0.85	6	0	13	4.56	2.30	0.62	0.24		
PBT	064PP	2253	18	0	33	10.40	31.50	5.39	16.34	0.85	6	0	13	4.02	2.15	0.55			



Mode Comparability Research

Table D.4 Test Score Summary for Mathematics PBA Forms by Test Mode (Cont'd)

Test	Form Type	Mode	Form	Sample Size	Raw Score : All Items								Raw Score : Common Items						Effect Size
					#items	Min	Max	Mean	Percent as a	SD	SD as a Percent	Alpha	#items	Min	Max	Mean	SD	Alpha	
MAT05	PBA	CBT	124PO	2196	17	0	33	10.60	32.12	6.20	18.80	0.88	8	0	20	5.99	4.22	0.79	-0.32
		PBT	024PP	1316	13	0	29	10.41	35.91	5.91	20.39	0.89	8	0	20	7.42	4.63	0.78	
		CBT	144PO	1527	14	0	24	6.09	25.36	4.16	17.33	0.85	3	0	7	2.11	1.64	0.28	-0.77
		PBT	034PP	1285	14	0	21	8.98	42.75	4.22	20.07	0.85	3	0	7	3.46	1.87	0.51	
		CBT	154PO	1602	14	0	29	9.02	31.09	6.17	21.28	0.88	4	0	8	2.64	1.95	0.59	-0.45
		PBT	044PP	1255	11	0	26	10.38	39.91	5.11	19.67	0.86	4	0	8	3.54	2.06	0.61	
		CBT	164PO	1561	20	0	42	10.37	24.68	6.68	15.89	0.85	7	0	15	3.96	2.79	0.63	-0.24
		PBT	054PP	1240	15	0	33	10.22	30.96	6.29	19.06	0.88	7	0	15	4.70	3.38	0.72	
CBT	134PO	1603	15	0	23	5.75	24.98	3.55	15.44	0.81	5	0	8	1.66	1.30	0.42	0.06		
PBT	064PP	1737	15	0	23	6.51	28.32	3.76	16.36	0.83	5	0	8	1.57	1.32	0.46			
MAT06	PBA	CBT	114PO	2148	17	0	42	8.97	21.35	7.69	18.30	0.91	13	0	32	6.53	5.54	0.84	-0.20
		PBT	014PP	1501	16	0	40	9.85	24.62	8.24	20.61	0.92	13	0	32	7.77	6.69	0.87	
		CBT	124PO	1656	15	0	32	7.82	24.43	5.94	18.55	0.87	7	0	23	4.91	4.36	0.75	-0.32
		PBT	024PP	1343	16	0	34	11.24	33.06	7.38	21.71	0.89	7	0	23	6.43	5.26	0.79	
		CBT	144PO	1528	16	0	36	6.73	18.71	4.88	13.56	0.85	6	0	14	1.88	1.71	0.46	-0.24
		PBT	034PP	1313	16	0	27	7.35	27.20	4.23	15.68	0.84	6	0	14	2.34	2.11	0.63	
		CBT	154PO	1611	17	0	38	9.92	26.11	6.60	17.36	0.90	9	0	24	5.67	3.95	0.78	-0.38
		PBT	044PP	1314	15	0	31	9.54	30.78	5.94	19.15	0.89	9	0	24	7.30	4.63	0.80	
CBT	164PO	1703	19	0	42	9.52	22.67	6.79	16.17	0.88	11	0	30	4.66	4.52	0.80	-0.43		
PBT	054PP	1246	17	0	39	11.03	28.29	8.23	21.09	0.92	11	0	30	7.01	6.31	0.85			
CBT	134PO	1654	15	0	22	5.81	26.43	3.99	18.12	0.84	4	0	6	1.76	1.32	0.38	-0.12		
PBT	064PP	2137	15	0	20	7.70	38.49	3.97	19.84	0.84	4	0	6	1.93	1.54	0.42			



Mode Comparability Research

Table D.4 Test Score Summary for Mathematics PBA Forms by Test Mode (Cont'd)

Test	Form Type	Mode	Form	Sample Size	Raw Score : All Items							Raw Score : Common Items							
					#items	Min	Max	Mean	SD as a Percent	SD	SD as a Percent	Alpha	#items	Min	Max	Mean	SD	Alpha	Effect Size
MAT07	PBA	CBT	114PO	2158	21	0	46	10.74	23.35	7.56	16.44	0.88	19	0	42	9.82	7.18	0.86	-0.21
		PBT	014PP	1663	20	0	43	11.55	26.87	8.28	19.25	0.89	19	0	42	11.45	8.17	0.88	-0.21
		CBT	124PO	1505	18	0	35	6.31	18.03	5.91	16.88	0.88	8	0	18	3.36	3.02	0.70	-0.15
		PBT	024PP	1459	17	0	29	7.53	25.97	5.27	18.17	0.85	8	0	18	3.84	3.50	0.71	-0.15
		CBT	144PO	1500	18	0	33	4.85	14.70	3.88	11.76	0.77	9	0	19	3.30	2.48	0.56	-0.34
		PBT	034PP	1458	22	0	45	10.40	23.12	6.76	15.03	0.84	9	0	19	4.22	2.98	0.59	-0.34
		CBT	154PO	1592	18	0	37	7.17	19.37	4.32	11.69	0.82	8	0	17	3.16	2.24	0.59	-0.39
		PBT	044PP	1377	18	0	37	8.65	23.39	5.02	13.58	0.82	8	0	17	4.12	2.68	0.63	-0.39
		CBT	164PO	1475	18	0	34	6.30	18.52	4.50	13.23	0.80	11	0	26	4.54	3.66	0.71	-0.32
		PBT	054PP	1377	19	0	37	9.47	25.59	5.82	15.73	0.83	11	0	26	5.83	4.34	0.73	-0.32
MAT08	PBA	CBT	134PO	1490	17	0	33	5.97	18.08	5.19	15.72	0.86	6	0	15	2.25	2.36	0.66	-0.27
		PBT	064PP	2264	16	0	26	6.37	24.49	4.43	17.05	0.84	6	0	15	2.98	2.99	0.72	-0.27
		CBT	124PO	1827	16	0	39	7.03	18.02	5.69	14.59	0.86	5	0	9	1.40	1.19	0.44	-0.39
		PBT	024PP	1279	15	0	25	5.84	23.35	3.50	14.02	0.76	5	0	9	1.92	1.50	0.39	-0.39
		CBT	144PO	1715	16	0	27	5.67	20.99	3.68	13.63	0.78	2	0	7	0.99	1.45	0.03	-0.27
		PBT	034PP	1263	17	0	30	8.36	27.86	5.04	16.79	0.85	2	0	7	1.42	1.75	0.05	-0.27
		CBT	154PO	1525	17	0	31	7.07	22.79	4.78	15.42	0.83	7	0	18	3.21	2.86	0.63	-0.39
		PBT	044PP	1224	20	0	39	12.28	31.48	6.63	17.01	0.85	7	0	18	4.46	3.47	0.62	-0.39
		CBT	164PO	1476	17	0	35	7.33	20.94	4.85	13.87	0.85	9	0	22	4.82	3.38	0.72	-0.28
		PBT	054PP	1180	18	0	36	9.20	25.56	6.04	16.78	0.86	9	0	22	5.85	4.08	0.72	-0.28
MAT08	PBA	CBT	134PO	1498	20	0	43	8.42	19.58	5.79	13.47	0.84	4	0	8	0.99	1.24	0.35	-0.29
		PBT	064PP	1647	16	0	21	6.15	29.27	3.25	15.48	0.71	4	0	8	1.39	1.56	0.44	-0.29



Mode Comparability Research

Table D.4 Test Score Summary for Mathematics PBA Forms by Test Mode (Cont'd)

Test	Form Type	Mode	Form	Sample Size	Raw Score : All Items								Raw Score : Common Items						Effect Size
					#items	Min	Max	Mean	Percent as a	SD	Percent as a	Alpha	#items	Min	Max	Mean	SD	Alpha	
ALG01	PBA	CBT	124PO	1270	15	0	25	4.63	18.50	3.06	12.23	0.76	7	0	11	1.76	1.38	0.37	-0.25
		PBT	024PP	928	14	0	24	4.64	19.33	3.10	12.91	0.69	7	0	11	2.14	1.58	0.38	
		CBT	144PO	1156	17	0	31	5.78	18.65	3.91	12.63	0.69	5	0	14	0.67	1.06	0.42	-0.5
		PBT	034PP	903	16	0	25	4.01	16.04	2.58	10.33	0.63	5	0	14	1.31	1.5	0.37	
		CBT	154PO	925	12	0	24	4.41	18.37	3.83	15.96	0.86	3	0	5	0.95	1.15	0.24	-0.27
		PBT	044PP	874	16	0	23	4.64	20.16	3.28	14.28	0.75	3	0	5	1.28	1.29	0.10	
		CBT	164PO	1250	15	0	26	3.95	15.19	2.87	11.04	0.72	10	0	21	3.54	2.80	0.64	-0.44
		PBT	054PP	886	20	0	36	8.60	23.88	5.22	14.50	0.79	10	0	21	4.95	3.60	0.68	
CBT	134PO	1114	17	0	31	6.40	20.63	4.43	14.28	0.76	6	0	10	1.48	1.14	0.20	-0.18		
PBT	064PP	1168	16	0	24	4.66	19.41	2.61	10.88	0.58	6	0	10	1.70	1.22	0.17			
ALG02	PBA	CBT	144PO	1071	6	0	6	1.34	22.35	0.93	15.51	0.65	2	0	2	0.23	0.44	0.02	-0.02
		PBT	034PP	749	13	0	23	4.25	18.48	3.16	13.73	0.81	2	0	2	0.23	0.45	0.03	
		CBT	154PO	1005	10	0	10	1.99	19.94	1.31	13.13	0.66	1	0	1	0.08	0.27	-	0.00
		PBT	044PP	837	14	0	21	4.81	22.89	3.33	15.87	0.83	1	0	1	0.08	0.27	-	
		CBT	164PO	1463	15	0	24	4.09	17.05	3.15	13.12	0.79	8	0	17	3.19	2.53	0.60	-0.47
		PBT	054PP	771	17	0	31	7.01	22.60	4.54	14.63	0.80	8	0	17	4.56	3.28	0.62	
CBT	134PO	1190	15	0	34	5.47	16.08	5.23	15.38	0.89	3	0	10	1.60	1.86	0.39	-0.63		
PBT	064PP	1202	16	0	27	5.66	20.95	4.43	16.42	0.81	3	0	10	2.99	2.50	0.43			



Mode Comparability Research

Table D.4 Test Score Summary for Mathematics PBA Forms by Test Mode (Cont'd)

Test	Form Type	Mode	Form	Sample Size	Raw Score : All Items							Raw Score : Common Items							
					#items	Min	Max	Mean	Mean as a Percent	SD	SD as a Percent	Alpha	#items	Min	Max	Mean	SD	Alpha	Effect Size
GEO	PBA	CBT	124PO	1333	13	0	29	4.39	15.15	3.07	10.57	0.76	8	0	20	2.21	2.00	0.55	-0.46
		PBT	024PP	869	15	0	28	4.88	17.43	3.77	13.47	0.80	8	0	20	3.34	2.85	0.64	
		CBT	144PO	1163	13	0	24	3.68	15.33	3.63	15.14	0.84	1	0	6	1.29	1.70	-	-0.44
		PBT	034PP	854	18	0	34	8.65	25.43	5.71	16.79	0.83	1	0	6	2.11	2.04	-	
		CBT	154PO	1120	15	0	31	4.97	16.02	3.99	12.87	0.83	2	0	9	1.08	1.61	0.14	-0.68
		PBT	044PP	859	18	0	34	8.22	24.17	4.89	14.38	0.79	2	0	9	2.42	2.24	0.26	
		CBT	164PO	1196	16	0	30	4.67	15.55	3.53	11.75	0.81	6	0	7	1.90	1.04	0.33	-0.19
		PBT	054PP	778	16	0	25	5.65	22.61	3.79	15.15	0.74	6	0	7	2.11	1.03	0.28	
MAT1I	PBA	CBT	134PO	1221	11	0	22	2.85	12.94	1.85	8.41	0.58	3	0	10	0.35	0.79	0.31	-0.48
		PBT	064PP	1562	16	0	26	4.22	16.25	3.17	12.2	0.73	3	0	10	0.90	1.45	0.49	
		PBT	034PP	150	18	0	30	8.05	26.84	4.45	14.83	0.80	5	0	9	1.42	1.43	0.50	-0.30
		CBT	144PO	427	15	0	27	3.92	14.51	3.29	12.18	0.75	5	0	9	1.05	0.97	0.15	
MAT2I	PBA	PBT	054PP	336	18	0	31	7.67	24.73	4.45	14.36	0.81	10	0	21	4.47	3.00	0.68	-0.28
		CBT	064PO	924	18	0	36	6.77	18.81	5.30	14.73	0.87	10	0	21	3.65	2.85	0.71	
		CBT	144PO	414	11	0	13	1.70	13.04	1.11	8.53	*	3	0	5	1.15	0.85	*	-0.73
		PBT	034PP	76	14	0	18	4.11	22.81	1.60	8.87	*	3	0	5	1.83	1.00	*	
MAT3I	PBA	CBT	054PO	882	11	0	13	2.26	17.37	1.49	11.46	0.68	3	0	3	0.56	0.63	0.04	-0.24
		PBT	044PP	220	17	0	24	5.39	22.44	3.34	13.9	0.71	3	0	3	0.71	0.67	0.10	
		CBT	144PO	320	11	0	16	2.26	14.14	1.80	11.25	0.65	3	0	3	0.54	0.63	0.11	-0.01
		PBT	034PP	204	13	0	18	4.12	22.90	2.48	13.76	0.57	3	0	3	0.55	0.64	0.29	
MAT3I	PBA	CBT	064PO	848	13	0	19	3.41	17.95	2.77	14.57	0.81	5	0	9	1.14	1.39	0.40	-0.16
		PBT	054PP	157	15	0	24	3.63	15.13	3.87	16.14	0.88	5	0	9	1.40	1.86	0.58	



Mode Comparability Research

Table D.5 Test Score Summary for Mathematics EOY Forms by Test Mode

Test	Form Type	Mode	Form	Sample Size	Raw Score : All Items							Raw Score : Common Items					Effect Size		
					#items	Min	Max	Mean	Percent	SD	Alpha	#items	Min	Max	Mean	SD		Alpha	
MAT03	EOY	CBT	104EO	2225	44	0	49	21.54	43.95	10.72	21.88	0.94	24	0	25	12.49	5.73	0.87	0.18
		PBT	014EP	1427	44	0	49	21.00	42.85	10.56	21.56	0.94	24	0	25	11.47	5.77	0.87	
		CBT	114EO	1790	46	0	53	23.99	45.26	10.53	19.86	0.92	28	0	29	14.04	6.47	0.89	0.09
		PBT	024EP	1131	45	0	50	23.15	46.30	10.59	21.19	0.94	28	0	29	13.44	6.39	0.88	
		CBT	124EO	1697	45	0	51	23.59	46.25	9.90	19.41	0.93	24	0	25	12.79	5.41	0.86	0.15
		PBT	034EP	1111	46	0	50	23.96	47.92	10.71	21.43	0.93	24	0	25	11.94	5.65	0.87	
		CBT	134EO	1755	44	0	50	22.30	44.61	9.87	19.73	0.93	23	0	25	12.19	5.55	0.86	0.13
		PBT	044EP	1118	46	0	50	21.34	42.69	10.45	20.91	0.92	23	0	25	11.47	5.61	0.86	
		CBT	144EO	1787	45	0	49	21.85	44.60	9.83	20.06	0.93	25	0	27	12.13	5.63	0.86	0.12
		PBT	054EP	1082	49	0	56	23.10	41.25	10.69	19.09	0.92	25	0	27	11.45	5.51	0.86	
CBT	154EO	1764	44	0	50	20.96	41.91	10.91	21.83	0.94	26	0	28	12.68	6.33	0.89	0.11		
PBT	064EP	1069	47	0	53	24.05	45.38	11.27	21.26	0.93	26	0	28	11.95	6.50	0.90			
CBT	124EO	1697	45	0	51	23.59	46.25	9.90	19.41	0.93	24	0	25	12.79	5.41	0.86	0.07		
PBT	074EP	2114	46	0	50	25.09	50.18	10.34	20.68	0.92	24	0	25	12.43	5.47	0.86			
MAT04	EOY	CBT	104EO	1960	38	0	45	20.31	45.14	9.89	21.98	0.93	21	0	24	12.21	5.57	0.86	0.22
		PBT	014EP	1288	41	0	49	20.74	42.33	11.11	22.67	0.94	21	0	24	10.98	5.77	0.87	
		CBT	114EO	1500	37	0	45	21.69	48.20	9.66	21.46	0.93	21	0	25	12.47	5.79	0.87	0.07
		PBT	024EP	1077	38	0	46	22.26	48.40	10.24	22.26	0.93	21	0	25	12.06	5.85	0.88	
		CBT	124EO	1483	39	0	48	21.90	45.62	10.65	22.18	0.93	20	0	24	11.39	5.51	0.85	0.14
		PBT	034EP	1038	35	0	41	19.31	47.10	9.10	22.18	0.93	20	0	24	10.62	5.71	0.87	
		CBT	134EO	1524	40	0	47	22.35	47.55	9.81	20.88	0.92	23	0	26	13.40	5.00	0.80	0.14
		PBT	044EP	1036	40	0	47	21.36	45.44	9.36	19.92	0.91	23	0	26	12.70	5.13	0.81	
		CBT	144EO	1513	40	0	48	19.94	41.55	9.81	20.44	0.92	23	0	28	11.62	5.63	0.85	0.15
		PBT	054EP	1003	40	0	48	18.82	39.21	9.68	20.16	0.93	23	0	28	10.79	5.62	0.86	
CBT	154EO	1696	39	0	46	18.75	40.76	9.33	20.29	0.92	23	0	26	12.39	5.76	0.86	0.11		
PBT	064EP	981	41	0	47	18.99	40.41	10.08	21.45	0.93	23	0	26	11.73	6.30	0.89			
CBT	124EO	1483	39	0	48	21.90	45.62	10.65	22.18	0.93	20	0	24	11.39	5.51	0.85	0.21		
PBT	074EP	2081	35	0	41	18.76	45.74	8.57	20.90	0.92	20	0	24	10.27	5.35	0.85			



Mode Comparability Research

Table D.5 Test Score Summary for Mathematics EOY Forms by Test Mode (Cont'd)

Test	Form Type	Mode	Form	Sample Size	Raw Score : All Items							Raw Score : Common Items							Effect Size
					#items	Min	Max	Mean	Percent as a	SD	Percent as a	Alpha	#items	Min	Max	Mean	SD	Alpha	
MAT05	EOY	CBT	114EO	2105	35	0	42	13.40	31.91	7.34	17.48	0.91	15	0	17	7.12	3.17	0.70	0.02
		PBT	024EP	931	36	0	42	18.24	43.44	7.73	18.39	0.90	15	0	17	7.07	3.23	0.70	
		CBT	124EO	1599	37	0	42	13.54	32.23	7.19	17.12	0.90	17	0	18	7.08	3.23	0.71	0.02
		PBT	034EP	930	33	0	37	15.18	41.02	6.70	18.10	0.90	17	0	18	7.03	3.64	0.78	
		CBT	134EO	1547	40	0	47	17.34	36.89	8.79	18.69	0.91	23	0	27	9.35	4.99	0.83	0.01
		PBT	044EP	922	38	0	44	18.19	41.35	8.32	18.92	0.91	23	0	27	9.32	5.23	0.85	
		CBT	144EO	1567	38	0	46	18.57	40.37	8.81	19.15	0.91	17	0	20	6.47	3.91	0.78	0.05
		PBT	054EP	903	35	0	41	15.73	38.37	7.69	18.75	0.91	17	0	20	6.25	4.11	0.81	
		CBT	154EO	1504	40	0	48	20.75	43.22	9.37	19.52	0.91	20	0	22	10.11	4.34	0.79	0.09
		PBT	064EP	892	38	0	45	18.93	42.06	8.25	18.33	0.90	20	0	22	9.68	4.75	0.82	
CBT	124EO	1599	37	0	42	13.54	32.23	7.19	17.12	0.90	17	0	18	7.08	3.23	0.71	0.21		
PBT	074EP	1623	33	0	37	14.24	38.50	6.23	16.85	0.87	17	0	18	6.38	3.33	0.74			
MAT06	EOY	CBT	104EO	1930	35	0	41	10.43	25.45	7.12	17.37	0.91	17	0	19	5.09	3.63	0.80	-0.35
		PBT	014EP	1007	37	0	45	17.60	39.12	9.38	20.85	0.93	17	0	19	6.48	4.23	0.83	
		CBT	114EO	1575	36	0	43	13.39	31.15	8.09	18.81	0.92	17	0	20	6.64	4.23	0.82	-0.13
		PBT	024EP	1166	38	0	47	17.94	38.16	9.72	20.67	0.93	17	0	20	7.20	4.44	0.83	
		CBT	124EO	1652	38	0	45	14.38	31.96	7.60	16.89	0.90	19	0	20	6.93	3.64	0.75	-0.12
		PBT	034EP	916	39	0	49	18.92	38.62	9.21	18.80	0.91	19	0	20	7.39	3.94	0.77	
		CBT	134EO	1504	36	0	45	14.51	32.25	8.28	18.40	0.92	18	0	23	6.00	4.42	0.82	-0.31
		PBT	044EP	910	37	0	48	19.50	40.63	9.38	19.53	0.92	18	0	23	7.44	4.96	0.84	
		CBT	144EO	1578	33	0	41	12.12	29.55	8.28	20.20	0.93	18	0	23	6.27	4.80	0.83	-0.27
		PBT	054EP	899	35	0	44	16.91	38.42	9.32	21.18	0.93	18	0	23	7.60	5.04	0.83	
CBT	154EO	1653	36	0	42	12.44	29.61	8.03	19.11	0.92	19	0	21	6.59	4.21	0.82	-0.17		
PBT	064EP	919	39	0	47	18.34	39.02	9.79	20.82	0.92	19	0	21	7.34	4.49	0.83			
CBT	124EO	1652	38	0	45	14.38	31.96	7.60	16.89	0.90	19	0	20	6.93	3.64	0.75	-0.03		
PBT	074EP	1905	39	0	49	18.00	36.73	8.97	18.30	0.91	19	0	20	7.03	3.78	0.76			



Mode Comparability Research

Table D.5 Test Score Summary for Mathematics EOY Forms by Test Mode (Cont'd)

Test	Form Type	Mode	Form	Sample Size	Raw Score : All Items							Raw Score : Common Items							Effect Size
					#items	Min	Max	Mean	Percent	SD	Alpha	#items	Min	Max	Mean	SD	Alpha		
MAT07	EOY	CBT	104EO	1937	34	0	43	8.65	20.12	7.02	16.33	0.91	19	0	22	5.30	3.80	0.79	0.01
		PBT	014EP	1218	36	0	45	11.56	25.70	7.66	17.02	0.90	19	0	22	5.26	4.04	0.82	
		CBT	114EO	1435	36	0	46	13.22	28.73	7.65	16.64	0.90	19	0	25	8.08	4.57	0.81	0.01
		PBT	024EP	1007	38	0	49	15.21	31.04	8.09	16.50	0.89	19	0	25	8.03	4.44	0.79	
		CBT	124EO	1495	37	0	45	12.36	27.46	6.59	14.64	0.87	18	0	21	6.11	3.39	0.70	0.02
		PBT	034EP	980	37	0	46	12.57	27.33	7.20	15.65	0.88	18	0	21	6.04	3.26	0.68	
		CBT	134EO	1449	35	0	44	10.69	24.29	6.03	13.70	0.85	18	0	20	4.36	3.00	0.71	-0.04
		PBT	044EP	977	36	0	46	11.88	25.83	7.36	16.01	0.89	18	0	20	4.49	3.23	0.74	
		CBT	144EO	1459	33	0	42	10.61	25.26	6.34	15.10	0.88	17	0	19	4.19	2.96	0.69	-0.12
		PBT	054EP	936	33	0	41	11.03	26.90	6.25	15.24	0.87	17	0	19	4.54	3.10	0.70	
CBT	154EO	1425	37	0	47	12.61	26.84	8.04	17.10	0.90	19	0	22	5.36	3.69	0.78	0.13		
PBT	064EP	934	37	0	46	12.68	27.57	7.13	15.50	0.87	19	0	22	4.88	3.53	0.76			
CBT	124EO	1495	37	0	45	12.36	27.46	6.59	14.64	0.87	18	0	21	6.11	3.39	0.70	0.01		
PBT	074EP	2225	37	0	46	12.56	27.30	7.46	16.21	0.89	18	0	21	6.09	3.33	0.69			
MAT08	EOY	CBT	114EO	1677	37	0	49	10.14	20.69	6.61	13.49	0.87	16	0	23	5.61	3.27	0.67	-0.23
		PBT	024EP	863	37	0	49	13.73	28.02	7.72	15.76	0.89	16	0	23	6.43	3.96	0.77	
		CBT	124EO	1374	36	0	47	10.45	22.23	6.55	13.93	0.87	16	0	20	4.81	3.00	0.68	-0.24
		PBT	034EP	856	34	0	44	13.81	31.38	8.23	18.70	0.91	16	0	20	5.62	3.63	0.76	
		CBT	134EO	1555	30	0	39	8.04	20.61	5.08	13.02	0.85	19	0	27	6.07	3.66	0.71	-0.14
		PBT	044EP	844	35	0	46	13.17	28.63	7.76	16.87	0.90	19	0	27	6.64	4.48	0.80	
		CBT	144EO	1392	36	0	47	8.44	17.95	6.95	14.79	0.91	14	0	17	3.48	2.67	0.66	-0.19
		PBT	054EP	837	37	0	46	12.55	27.29	7.13	15.50	0.87	14	0	17	4.03	2.93	0.69	
		CBT	154EO	1370	40	0	51	10.75	21.09	7.31	14.34	0.89	14	0	20	4.48	3.19	0.72	-0.23
PBT	064EP	819	42	0	55	15.34	27.89	8.84	16.08	0.89	14	0	20	5.30	3.82	0.80			
CBT	124EO	1374	36	0	47	10.45	22.23	6.55	13.93	0.87	16	0	20	4.81	3.00	0.68	-0.17		
PBT	074EP	1612	34	0	44	13.01	29.57	7.45	16.93	0.89	16	0	20	5.35	3.26	0.71			



Mode Comparability Research

Table D.5 Test Score Summary for Mathematics EOY Forms by Test Mode (Cont'd)

Test	Form Type	Mode	Form	Sample Size	Raw Score : All Items								Raw Score : Common Items						
					#items	Min	Max	Mean	SD	Alpha	Mean as a Percent	SD as a Percent	#items	Min	Max	Mean	SD	Alpha	Effect Size
ALG01	EOY	CBT	114EO	1162	35	0	49	9.60	4.25	0.70	19.60	44.21	9	0	12	3.52	1.74	0.30	-0.09
		PBT	024EP	681	35	0	52	12.50	5.09	0.74	24.03	40.73	9	0	12	3.68	1.87	0.40	
		CBT	124EO	1090	32	0	45	9.52	3.67	0.63	21.16	38.49	10	0	11	2.63	1.36	0.26	-0.04
		PBT	034EP	582	37	0	59	16.31	6.54	0.80	27.65	40.11	10	0	11	2.69	1.49	0.41	
		CBT	134EO	1168	33	0	53	10.90	4.26	0.69	20.58	39.05	12	0	16	3.65	1.97	0.41	0.07
		PBT	044EP	559	34	0	51	13.63	6.02	0.81	26.72	44.15	12	0	16	3.50	2.10	0.47	
		CBT	144EO	1102	32	0	47	8.69	3.71	0.69	18.48	42.71	13	0	14	2.94	1.68	0.36	0.02
		PBT	054EP	559	37	0	57	14.31	5.59	0.73	25.10	39.08	13	0	14	2.91	1.74	0.37	
		CBT	154EO	1283	25	0	38	6.74	3.99	0.79	17.75	59.18	8	0	9	1.29	1.13	0.24	0.01
		PBT	064EP	542	31	0	53	13.98	5.15	0.73	26.38	36.83	8	0	9	1.28	1.15	0.29	
ALG02	EOY	CBT	124EO	1090	32	0	45	9.52	3.67	0.63	21.16	38.49	10	0	11	2.63	1.36	0.26	0.10
		PBT	074EP	1138	37	0	59	15.43	6.73	0.82	26.15	43.59	10	0	11	2.50	1.42	0.35	
		CBT	124EO	1132	32	0	52	10.52	5.06	0.80	20.24	9.73	12	0	18	3.48	2.07	0.51	0.05
		PBT	034EP	618	33	0	55	14.37	6.24	0.82	26.12	11.35	12	0	18	3.37	1.94	0.41	
		CBT	134EO	1172	35	0	56	11.09	5.50	0.79	19.81	9.82	12	0	15	2.54	1.67	0.36	-0.20
		PBT	044EP	611	30	0	48	13.18	5.46	0.80	27.45	11.37	12	0	15	2.88	1.75	0.35	
		CBT	144EO	1063	31	0	51	9.14	4.64	0.77	17.91	9.09	9	0	12	1.89	1.34	0.20	-0.14
		PBT	054EP	599	37	0	58	15.86	6.25	0.79	27.34	10.77	9	0	12	2.08	1.45	0.27	
		CBT	154EO	1294	27	0	44	8.79	4.72	0.80	19.98	10.72	8	0	10	2.16	1.40	0.30	-0.05
		PBT	064EP	607	30	0	48	13.43	5.88	0.84	27.98	12.26	8	0	10	2.23	1.49	0.35	
CBT	124EO	1132	32	0	52	10.52	5.06	0.80	20.24	9.73	12	0	18	3.48	2.07	0.51	0.15		
PBT	074EP	1194	33	0	55	13.11	6.49	0.84	23.83	11.80	12	0	18	3.17	2.03	0.49			



Mode Comparability Research

Table D.5 Test Score Summary for Mathematics EOY Forms by Test Mode (Cont'd)

Test	Form Type	Mode	Form	Sample Size	Raw Score : All Items								Raw Score : Common Items						
					#items	Min	Max	Mean	SD	Alpha	Mean as a Percent	SD as a Percent	#items	Min	Max	Mean	SD	Alpha	Effect Size
GEO	EOY	CBT	114EO	1077	35	0	54	10.17	6.53	0.87	18.83	12.09	17	0	25	4.54	3.02	0.66	-0.19
		PBT	024EP	892	37	0	54	12.56	7.02	0.87	23.26	13.00	17	0	25	5.14	3.29	0.67	
		CBT	124EO	879	35	0	49	8.20	5.57	0.83	16.73	11.38	14	0	20	3.28	2.44	0.63	-0.12
		PBT	034EP	820	39	0	58	15.20	7.48	0.85	26.22	12.89	14	0	20	3.60	2.81	0.70	
		CBT	134EO	963	32	0	48	8.90	6.09	0.88	18.54	12.69	16	0	24	5.38	3.61	0.73	-0.04
		PBT	044EP	820	37	0	54	13.69	7.12	0.86	25.36	13.19	16	0	24	5.52	3.65	0.73	
		CBT	144EO	961	36	0	53	11.12	6.75	0.86	20.98	12.74	17	0	21	4.55	2.70	0.57	-0.07
		PBT	054EP	807	38	0	59	13.80	7.35	0.86	23.39	12.47	17	0	21	4.75	2.64	0.54	
		CBT	154EO	1084	39	0	60	12.50	7.13	0.85	20.83	11.89	13	0	20	4.84	2.84	0.62	-0.19
		PBT	064EP	801	40	0	61	18.07	8.87	0.89	29.63	14.54	13	0	20	5.41	3.20	0.68	
MAT1I	EOY	CBT	024EO	486	34	0	51	9.30	6.14	0.86	18.24	12.05	13	0	16	3.23	2.54	0.70	-0.05
		PBT	034EP	370	37	0	56	14.90	6.90	0.83	26.61	12.31	13	0	16	3.34	2.17	0.51	
		CBT	134EO	591	32	0	46	8.53	4.47	0.76	18.54	9.72	14	0	20	4.63	2.37	0.46	-0.56
		PBT	044EP	65	37	0	58	18.54	8.78	0.89	31.96	15.13	14	0	20	6.31	3.53	0.74	
		CBT	054EO	457	32	0	41	8.01	5.33	0.85	19.53	13.01	8	0	9	1.43	1.20	0.37	0.05
		PBT	064EP	371	38	0	61	14.69	6.47	0.80	24.08	10.60	8	0	9	1.37	1.18	0.36	
MAT2I	EOY	CBT	044EP	42	31	0	51	15.50	5.28	0.76	30.39	10.36	16	0	23	7.38	3.15	0.61	-1.13
		PBT	134EO	421	26	0	35	6.73	2.81	0.53	19.23	8.02	16	0	23	4.39	2.01	0.21	
		CBT	044EO	289	26	0	35	6.36	2.99	0.64	18.16	8.55	10	0	13	2.99	1.54	0.18	-0.27
		PBT	054EP	195	36	0	56	12.11	5.35	0.76	21.63	9.55	10	0	13	3.45	1.88	0.39	
		CBT	054EO	307	27	0	35	5.64	3.15	0.70	16.13	8.99	9	0	11	1.76	1.22	0.18	-0.08
PBT	064EP	214	38	0	59	11.67	4.77	0.66	19.78	8.08	9	0	11	1.86	1.41	0.30			
MAT3I	EOY	CBT	134EO	286	27	0	36	7.38	3.47	0.71	20.50	9.63	14	0	20	5.13	2.54	0.50	-0.01
		PBT	044EP	215	34	0	55	12.15	5.22	0.72	22.09	9.49	14	0	20	5.14	2.40	0.43	
		CBT	054EO	329	31	0	43	6.59	4.68	0.83	15.32	10.88	9	0	11	1.24	1.39	0.48	0.00
PBT	064EP	114	36	0	60	12.76	5.94	0.77	21.27	9.90	9	0	11	1.24	1.38	0.51			



Mode Comparability Research

Table D. 6 Test Score Summary for Mathematics Full Summative Forms by Test Mode

Test	Form Type	Mode	Form	Sample Size	Raw Score : All Items								Raw Score : Common Items						Effect Size
					#items	Min	Max	Mean	Percent	SD	SD as a Percent	Alpha	#items	Min	Max	Mean	SD	Alpha	
MAT03	FS	CBT	134PO124EO	1152	64	0	88	33.55	38.12	15.00	17.04	0.95	31	0	41	16.82	7.07	0.87	-0.11
		PBT	064PP074EP	1838	66	0	92	36.85	40.05	15.14	16.46	0.94	31	0	41	17.64	7.66	0.88	
MAT04	FS	CBT	134PO124EO	1080	55	0	75	30.75	41.01	14.67	19.56	0.95	26	0	37	15.86	7.42	0.88	0.28
		PBT	064PP074EP	1704	53	0	74	26.54	35.86	11.70	15.81	0.95	26	0	37	13.85	6.85	0.87	
MAT05	FS	CBT	134PO124EO	954	52	0	65	18.87	29.02	9.63	14.81	0.92	22	0	26	8.60	3.91	0.75	0.14
		PBT	064PP074EP	1324	48	0	60	18.32	30.53	7.94	13.24	0.92	22	0	26	8.04	4.24	0.79	
MAT06	FS	CBT	134PO124EO	885	53	0	67	20.50	30.59	11.02	16.45	0.93	23	0	26	8.78	4.44	0.78	-0.09
		PBT	064PP074EP	1700	54	0	69	23.06	33.42	10.68	15.48	0.94	23	0	26	9.20	4.83	0.79	
MAT07	FS	CBT	134PO124EO	998	54	0	78	19.66	25.21	11.27	14.45	0.92	24	0	36	8.88	5.26	0.80	-0.08
		PBT	064PP074EP	1751	53	0	72	17.03	23.65	9.83	13.65	0.93	24	0	36	9.32	5.92	0.83	
MAT08	FS	CBT	134PO124EO	946	56	0	90	19.80	22.00	11.84	13.16	0.92	20	0	28	5.99	3.85	0.73	-0.20
		PBT	064PP074EP	1329	50	0	65	18.51	28.47	9.43	14.51	0.91	20	0	28	6.80	4.28	0.76	
ALG01	FS	CBT	134PO124EO	701	49	0	76	16.76	22.05	7.22	9.50	0.81	15	0	20	4.09	1.86	0.33	0.22
		PBT	064PP074EP	880	53	0	83	14.45	17.41	6.15	7.41	0.85	15	0	20	3.67	1.99	0.40	
ALG02	FS	CBT	134PO124EO	832	47	0	86	17.15	19.94	10.02	11.65	0.91	15	0	28	5.45	3.45	0.61	-0.20
		PBT	064PP074EP	782	49	0	82	15.51	18.91	8.49	10.36	0.91	15	0	28	6.19	3.76	0.67	
GEO	FS	CBT	134PO124EO	764	46	0	71	11.60	16.34	6.68	9.40	0.85	17	0	30	3.85	2.84	0.65	-0.20
		PBT	064PP074EP	1081	55	0	84	16.59	19.75	9.25	11.02	0.90	17	0	30	4.47	3.53	0.74	
MAT11	FS	CBT	144PO134EO	403	47	0	73	12.79	17.53	7.22	9.89	0.86	19	0	29	5.80	2.86	0.54	0.16
		PBT	034PP044EP	53	55	0	88	21.19	24.08	9.22	10.48	0.92	19	0	29	5.30	3.43	0.80	
MAT21	FS	CBT	144PO134EO	278	37	0	48	8.68	18.08	3.30	6.87	0.59	19	0	28	5.66	2.40	0.29	-0.01
		PBT	034PP044EP	40	45	0	69	10.93	15.83	3.27	4.74	0.77	19	0	28	5.68	2.25	0.58	
MAT31	FS	CBT	144PO134EO	195	38	0	52	10.19	19.60	4.90	9.43	0.82	17	0	23	5.90	2.84	0.55	0.94
		PBT	034PP044EP	159	47	0	73	9.05	12.40	4.17	5.71	0.81	17	0	23	3.54	2.15	0.47	



Mode Comparability Research

Appendix E

Updated April 12, 2015

Figure E.1 Correlation between Discrimination Parameter Estimates across Modes for ELA/Literacy

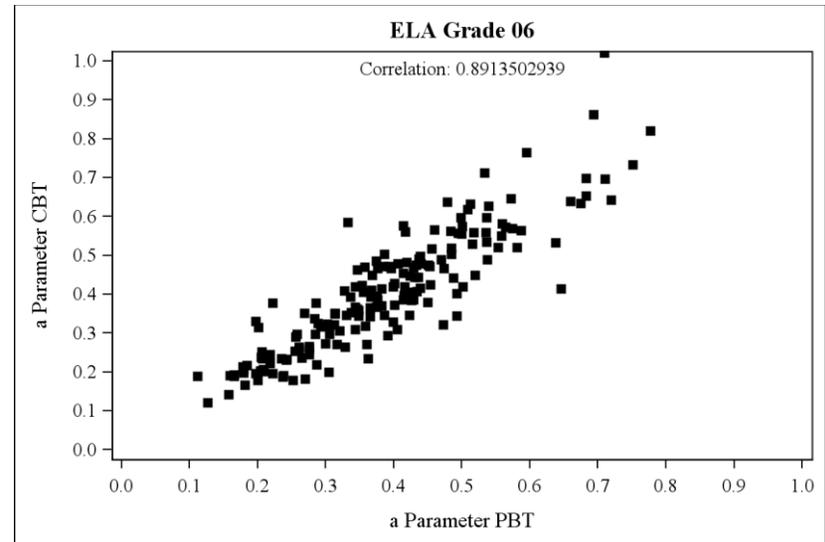
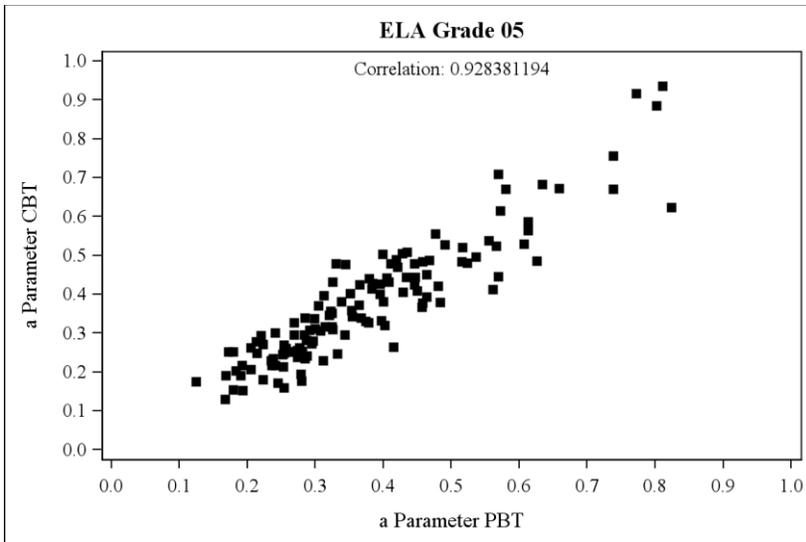
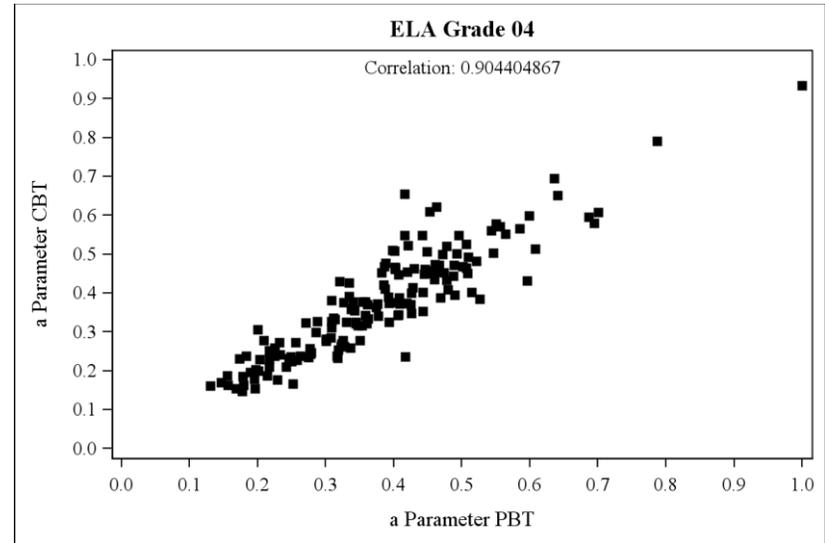
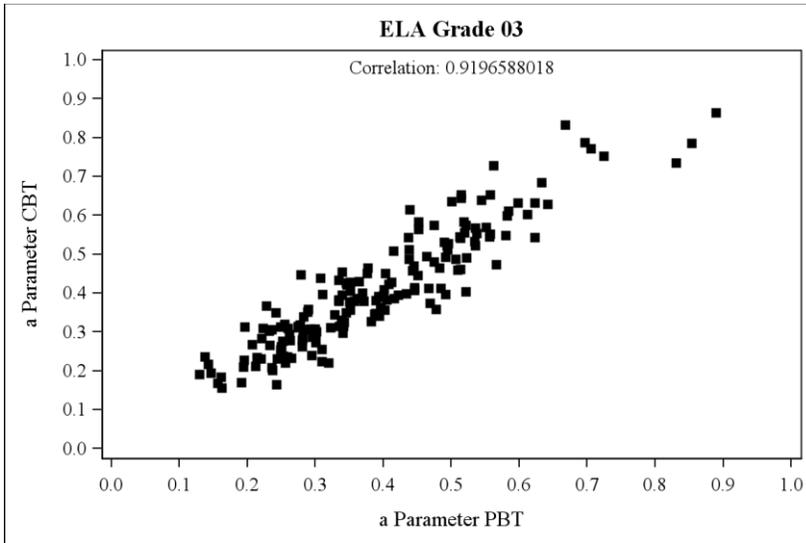


Figure E.1: Correlation between Discrimination Parameter Estimates across Modes for ELA/Literacy (Cont'd)

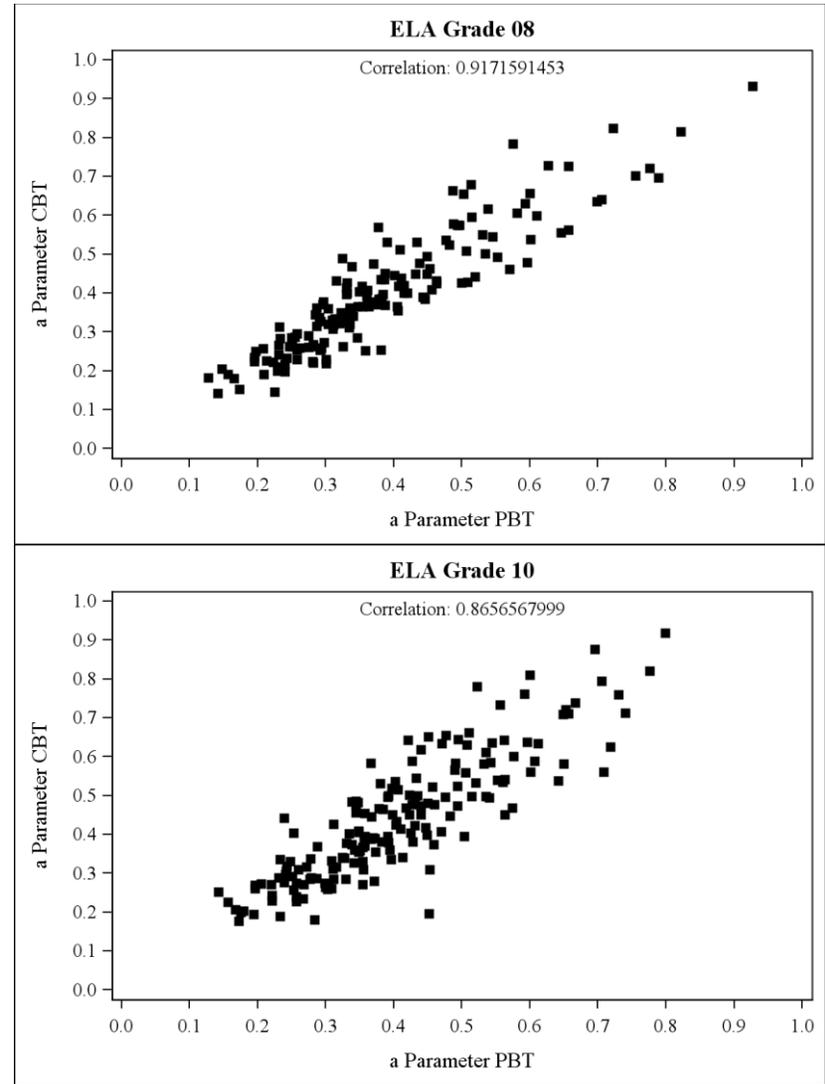
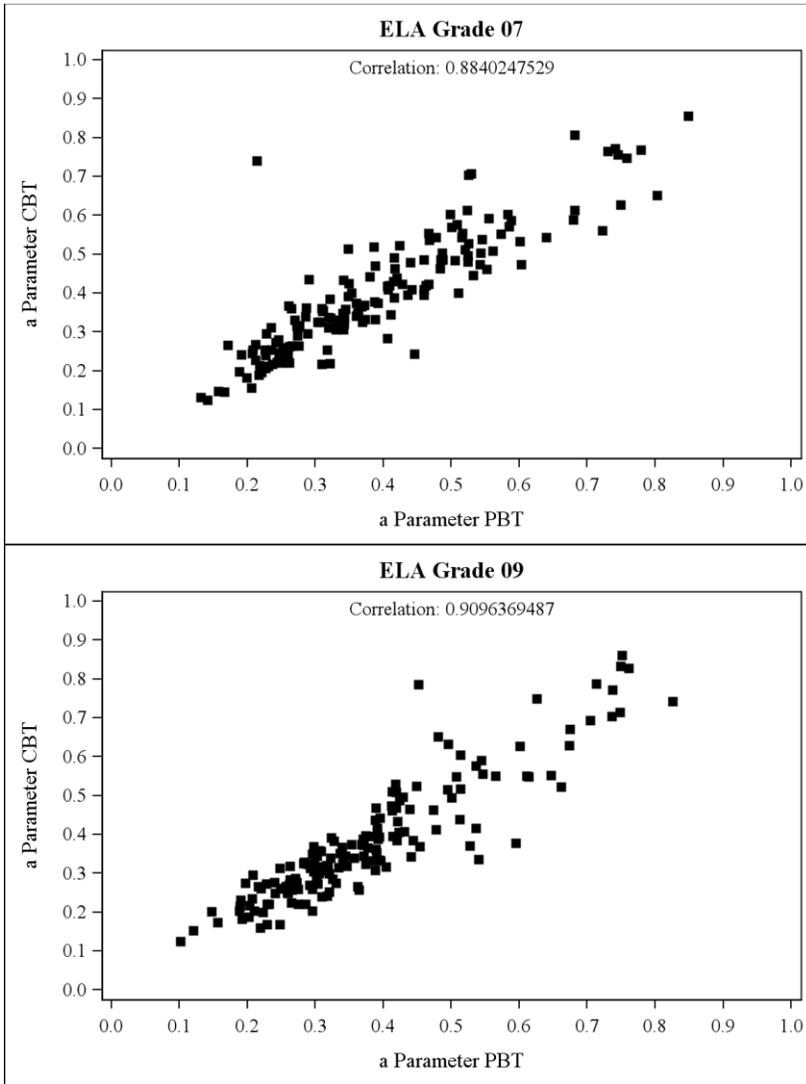


Figure E.1: Correlation between Discrimination Parameter Estimates across Modes for ELA/Literacy (Cont'd)

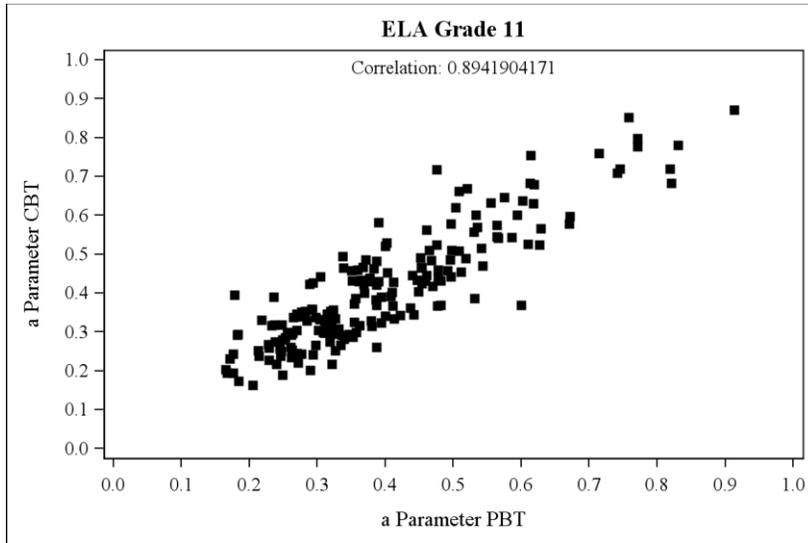


Figure E.2 Correlation between Difficulty Parameter Estimates across Modes for ELA/Literacy

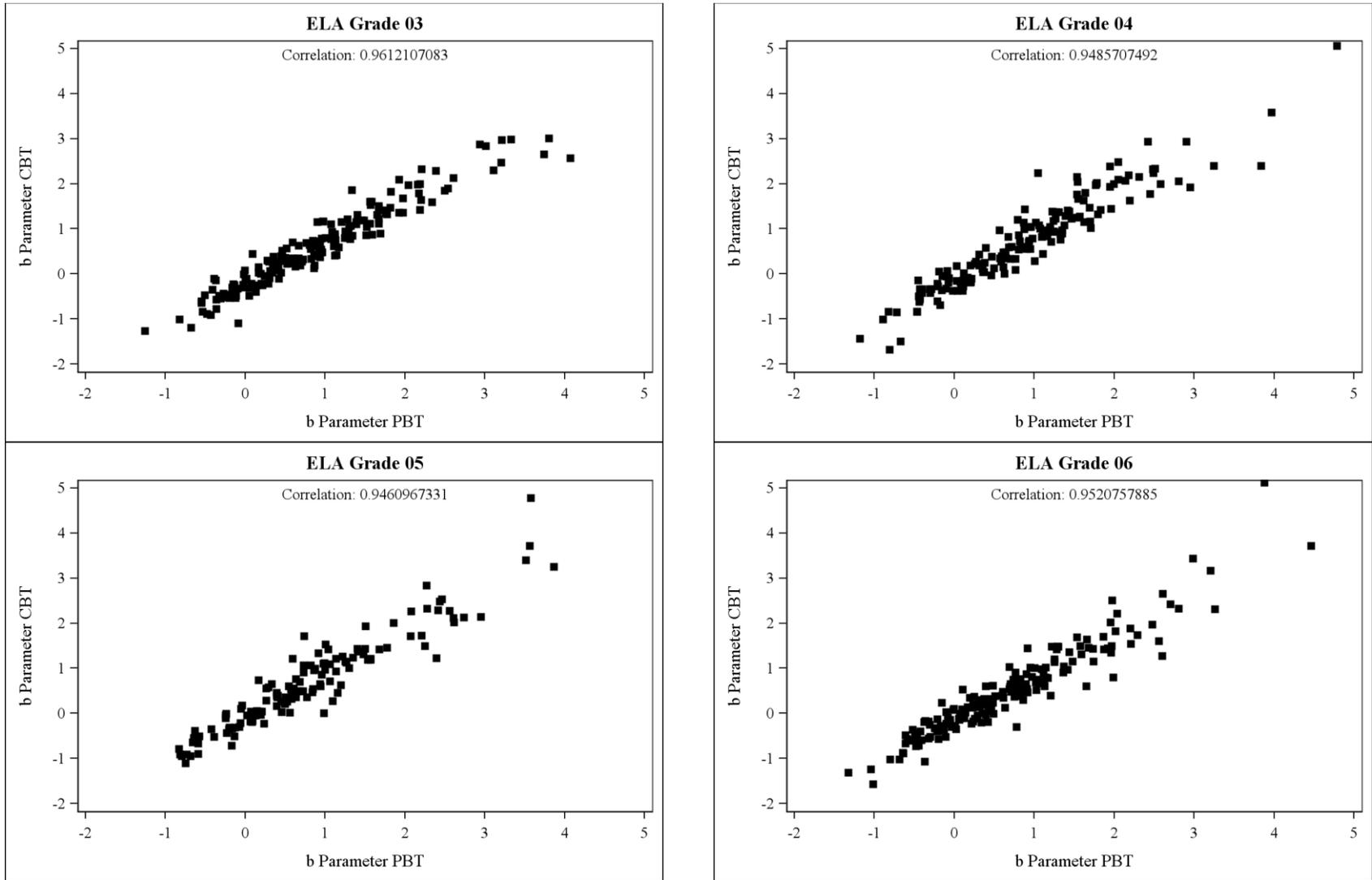


Figure E.2 Correlation between Difficulty Parameter Estimates across Modes for ELA/Literacy (Cont'd)

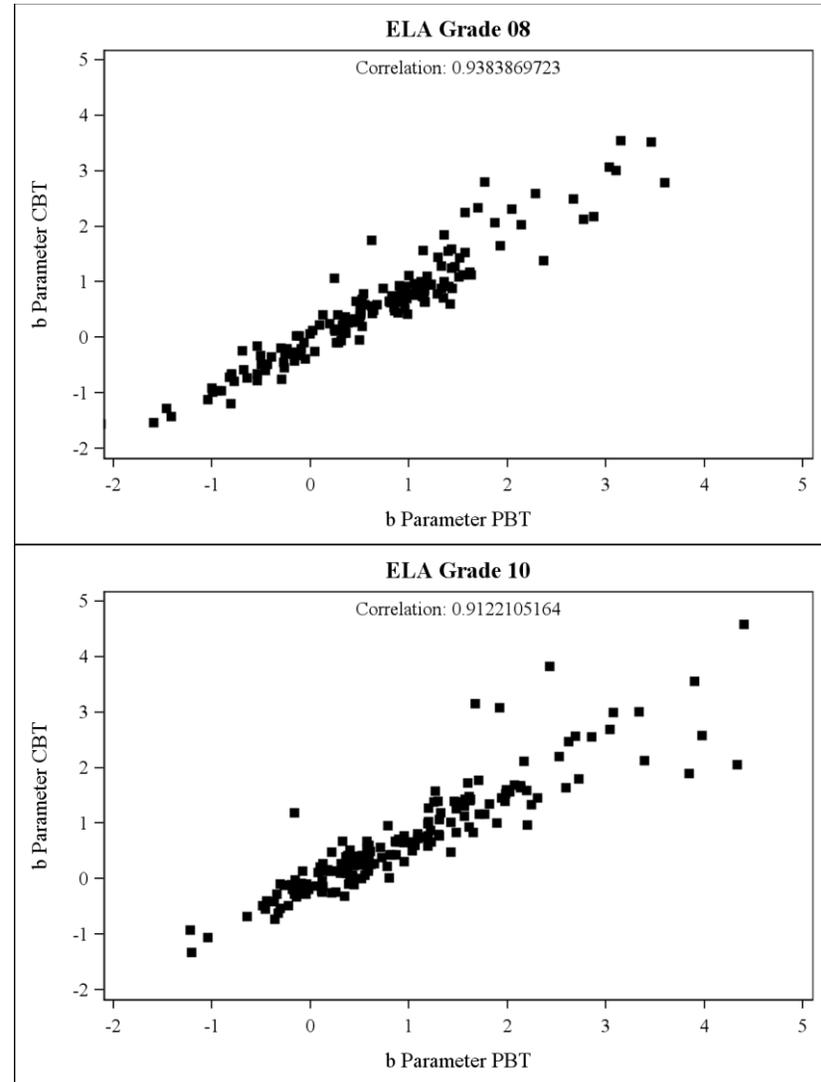
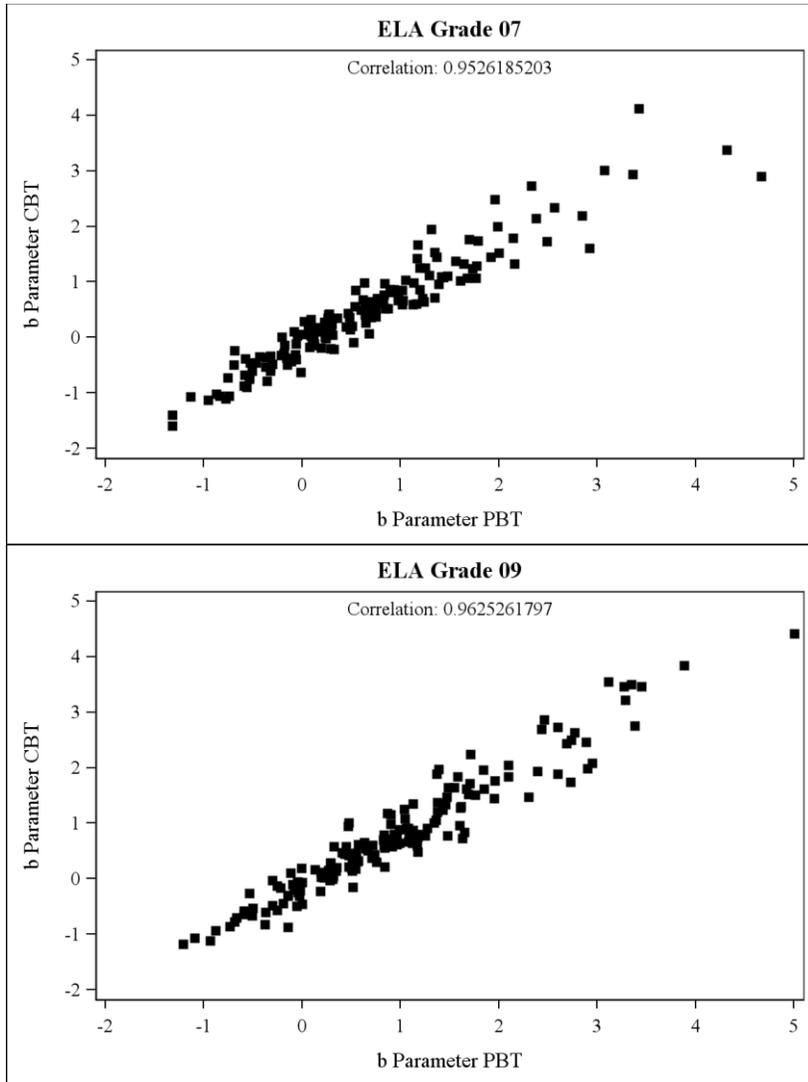


Figure E.2 Correlation between Difficulty Parameter Estimates across Modes for ELA/Literacy (Cont'd)

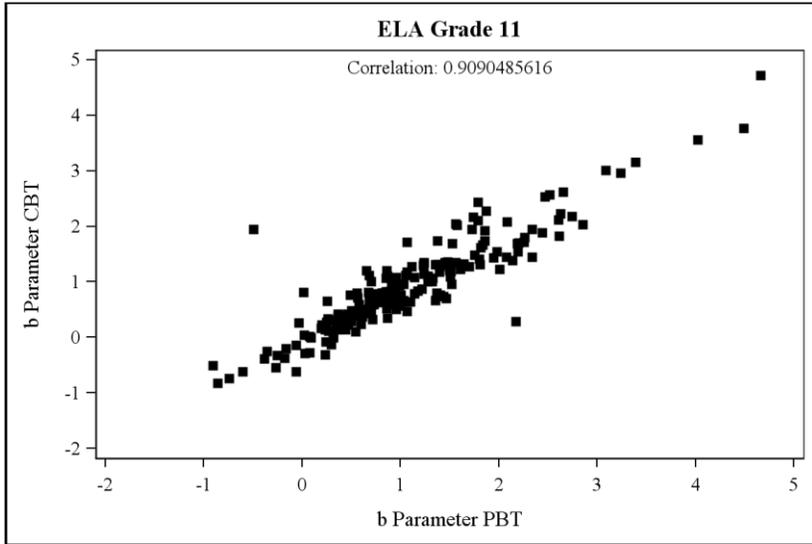


Figure E.3 Correlation between Discrimination Parameter Estimates across Modes for Mathematics

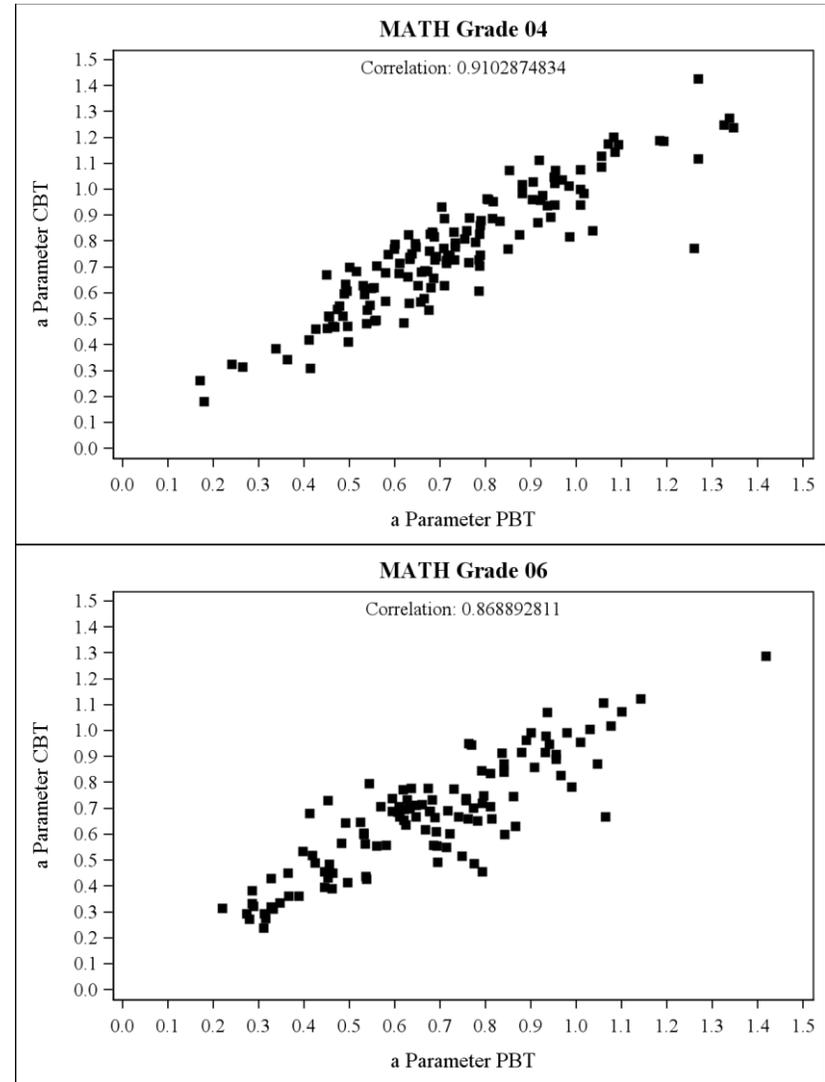
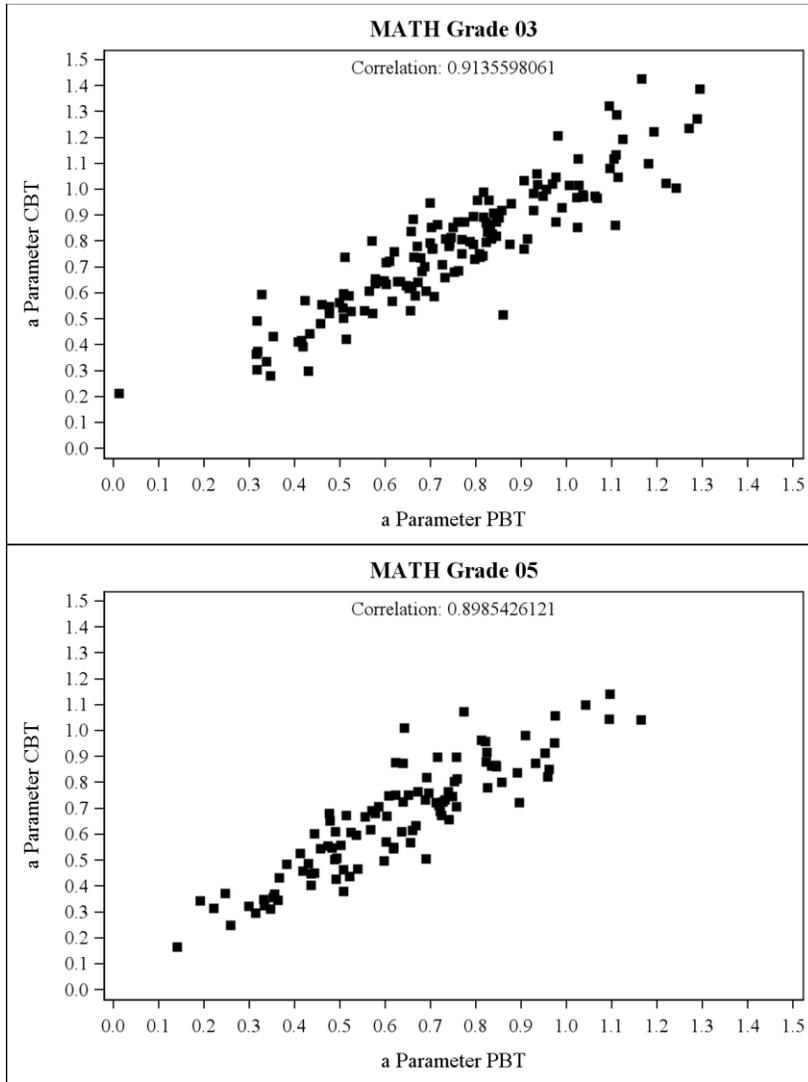


Figure E.3 Correlation between Discrimination Parameter Estimates across Modes for Mathematics (Cont'd)

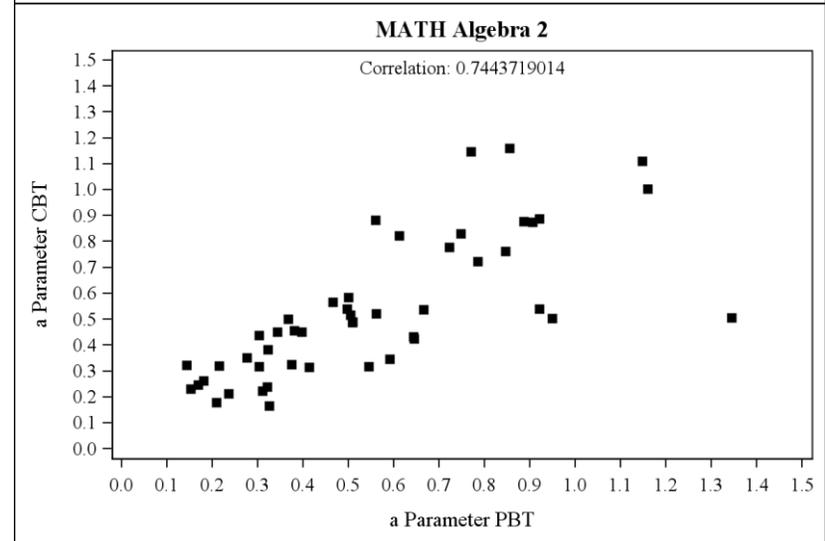
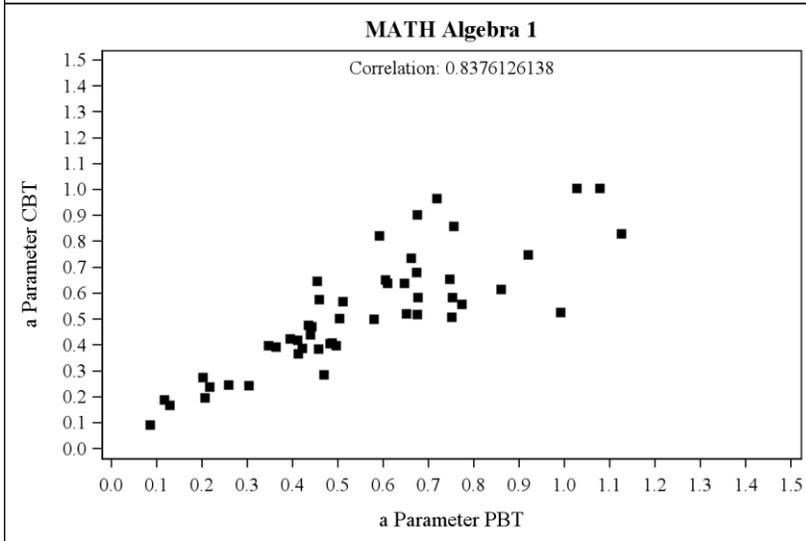
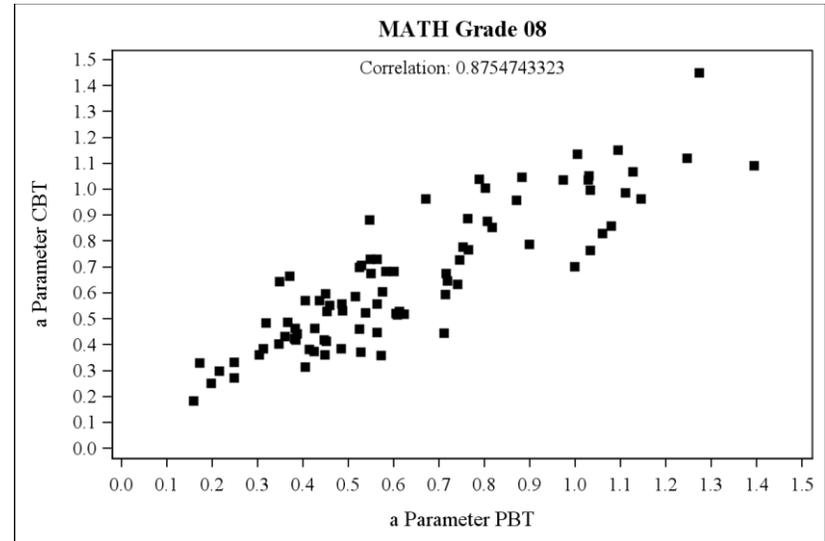
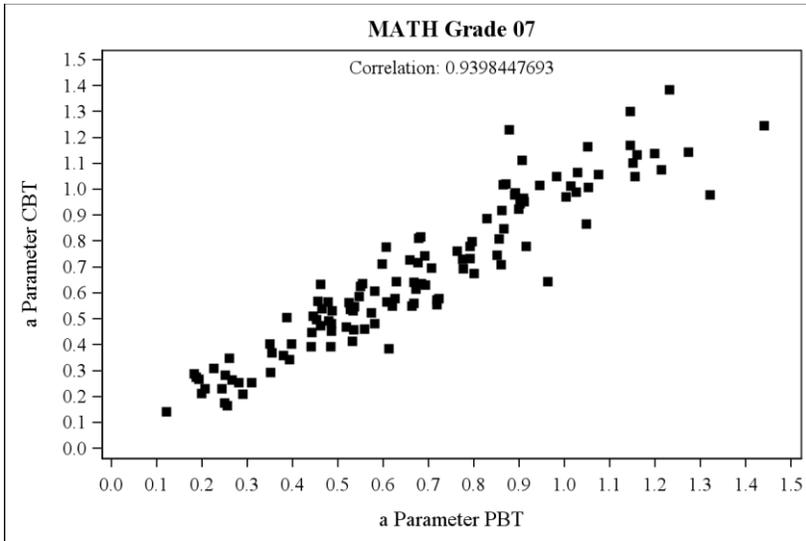


Figure E.3 Correlation between Discrimination Parameter Estimates across Modes for Mathematics (Cont'd)

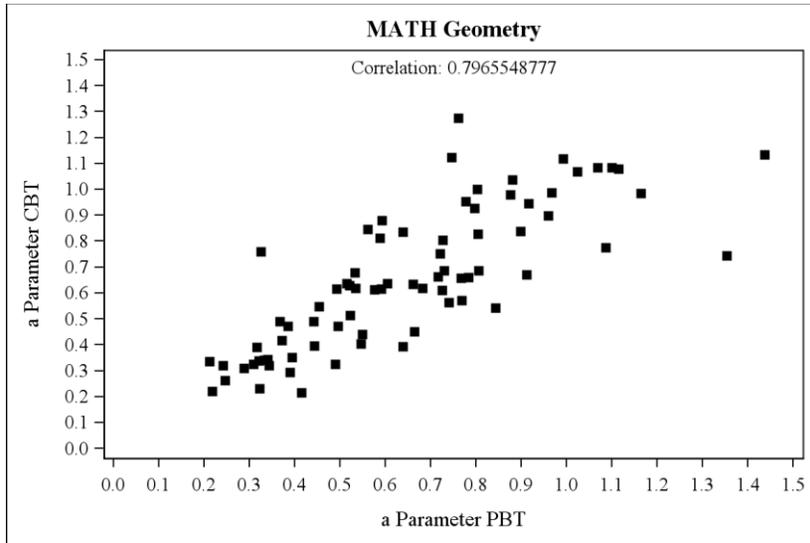


Figure E.4 Correlation between Difficulty Parameter Estimates across Modes for Mathematics

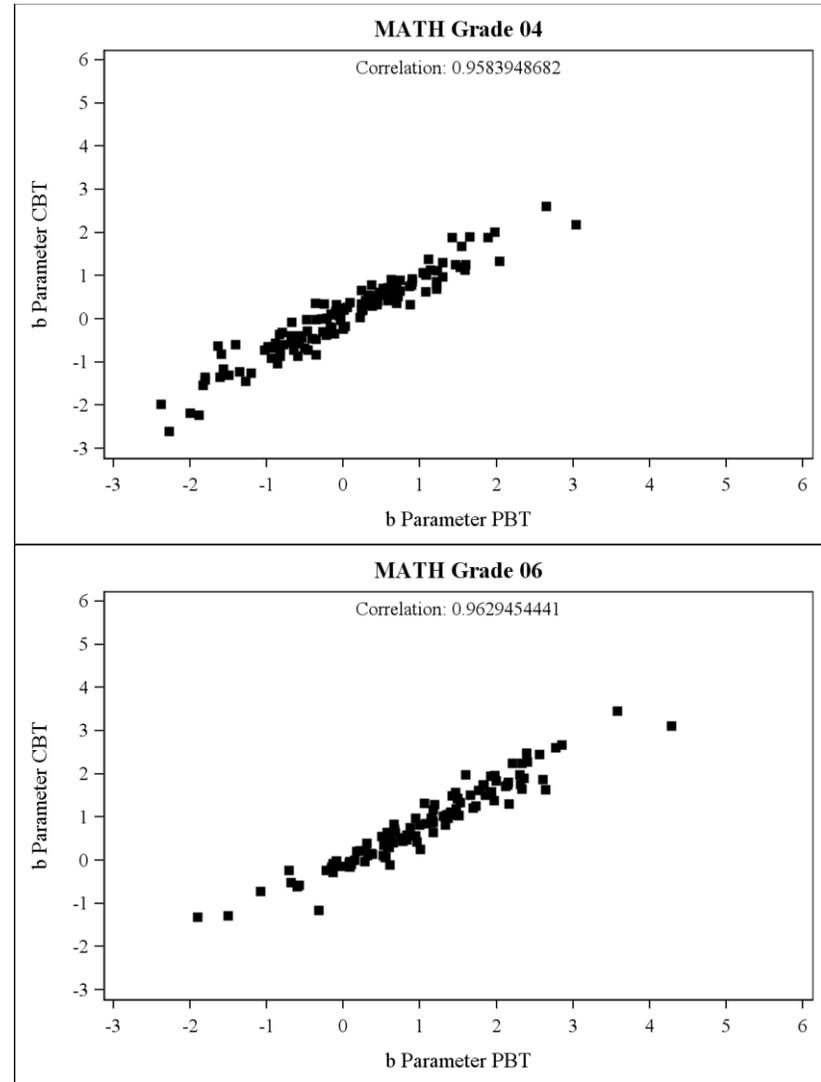
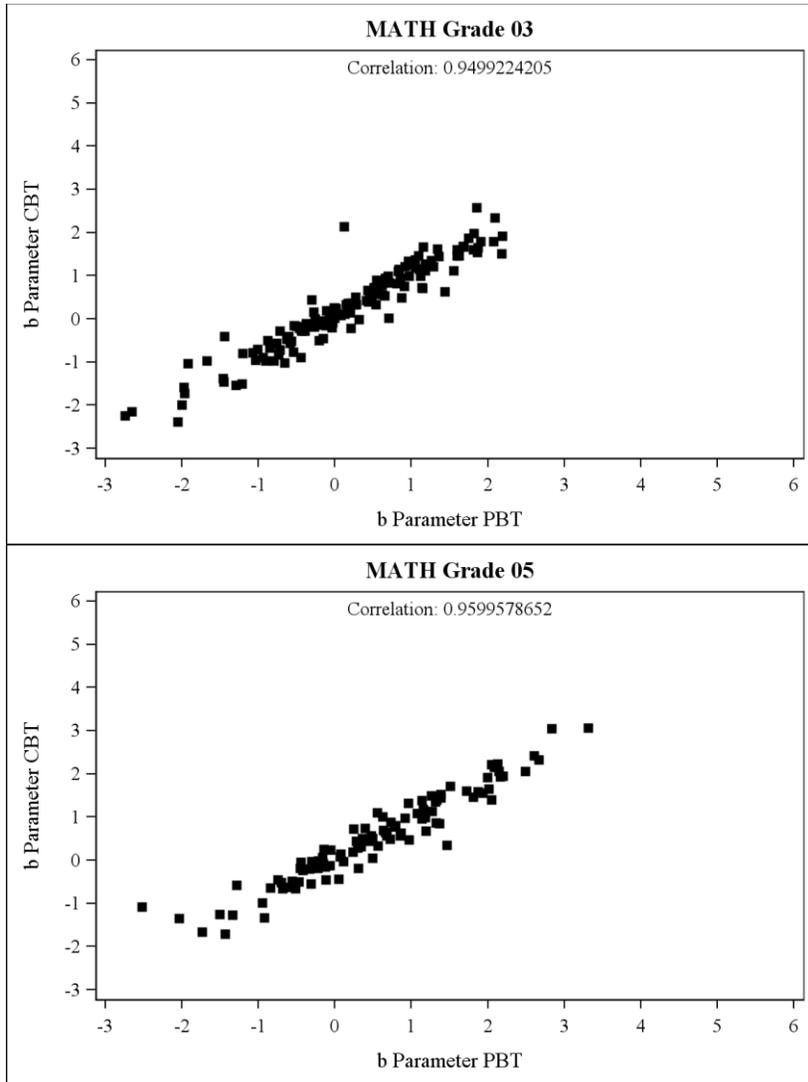


Figure E.4 Correlation between Difficulty Parameter Estimates across Modes for Mathematics (Cont'd)

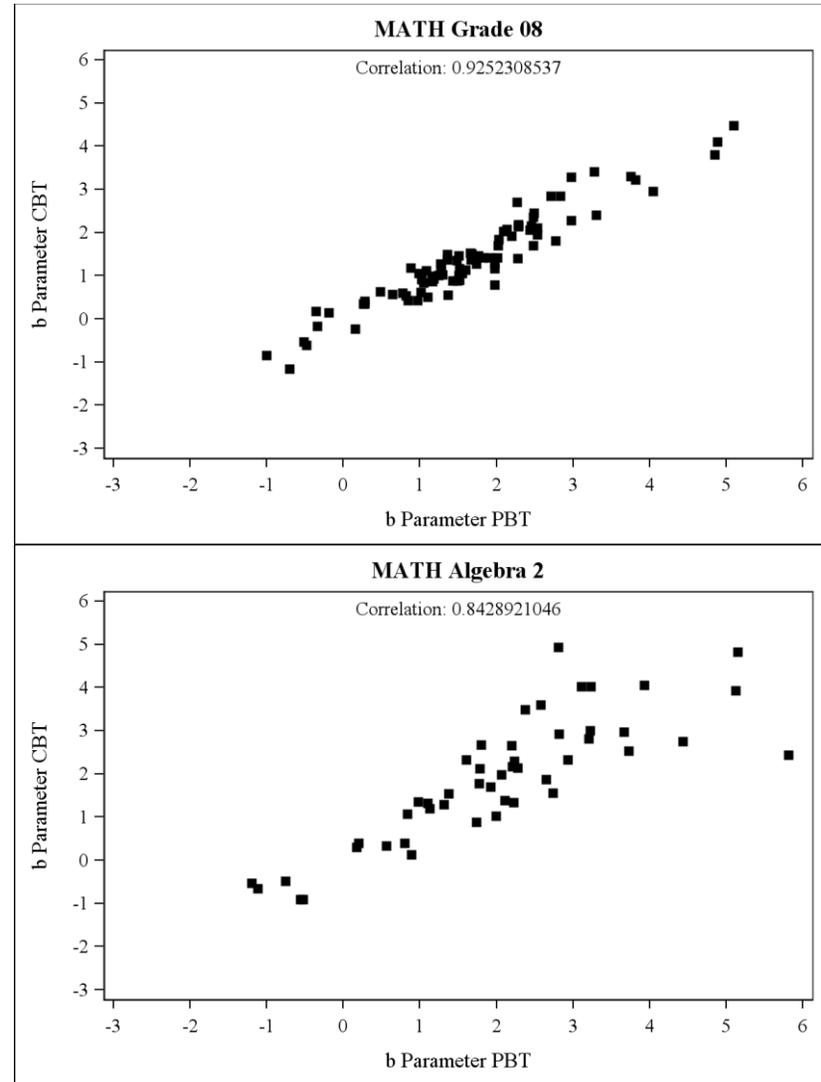
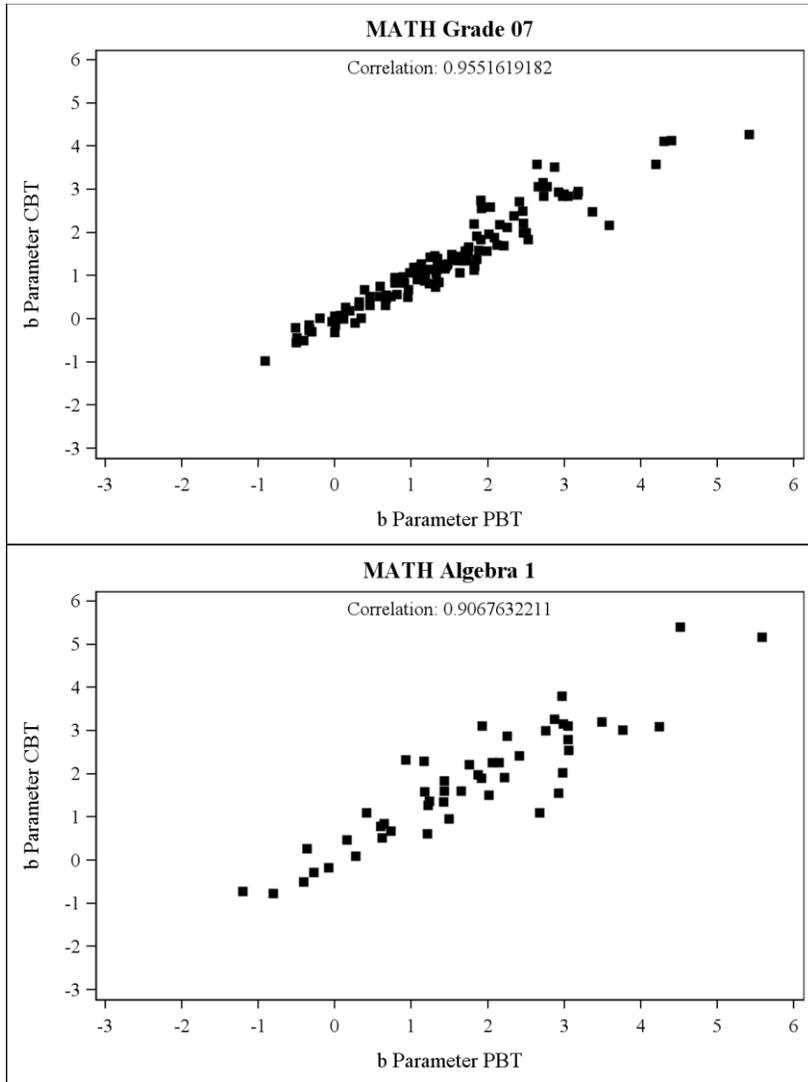
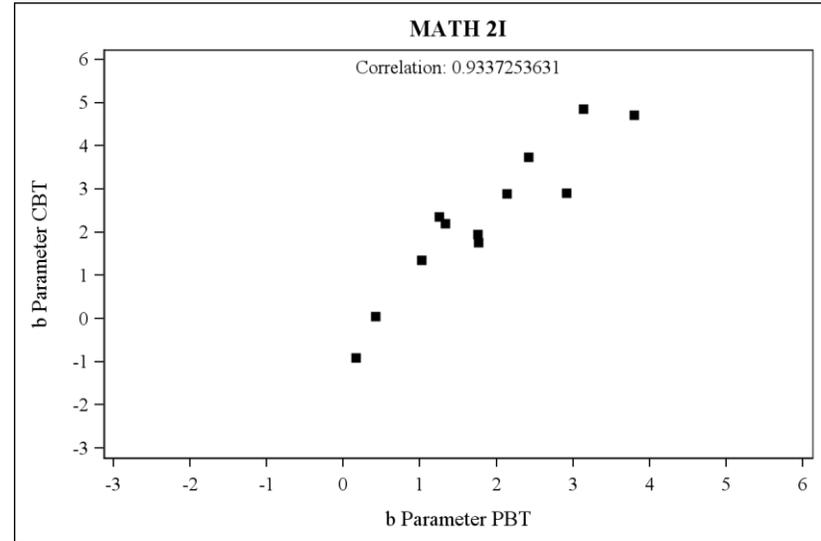
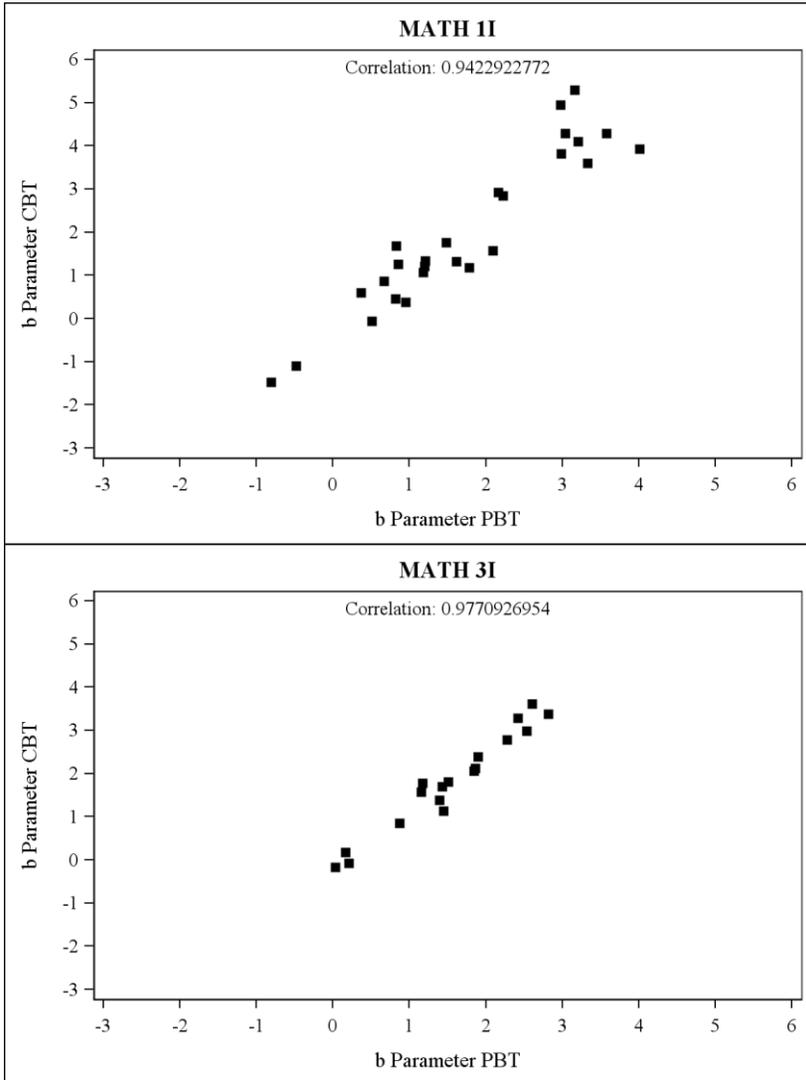


Figure E.4 Correlation between Difficulty Parameter Estimates across Modes for Mathematics (Cont'd)





Mode Comparability Research

Table E.1 Impact of Calibration Conditions for Difficulty and Discrimination Parameter Estimates for ELA/Literacy PBA and EOY Assessments

Test	Form Type	Calibration Condition	Discrimination			Difficulty		
			CM Only	CM + PBT	CM + CBT	CM Only	CM + PBT	CM + CBT
ELA03	PBA	CM Only	1			1		
		CM + PBT	0.9982	1		0.9999	1	
		CM + CBT	0.9977	0.9981	1	0.9997	0.9999	1
		CM + PBT + CBT	0.9949	0.9983	0.9987	0.9993	0.9998	0.9999
	EOY	CM Only	1			1		
		CM + PBT	0.9998	1		0.9999	1	
		CM + CBT	0.9997	0.9996	1	0.9999	0.9998	1
		CM + PBT + CBT	0.9994	0.9997	0.9998	0.9998	0.9999	0.9999
ELA07	PBA	CM Only	1			1		
		CM + PBT	0.9992	1		0.9999	1	
		CM + CBT	0.9994	0.9993	1	1.0000	1.0000	1
		CM + PBT + CBT	0.9981	0.9995	0.9993	0.9998	1.0000	0.9999
	EOY	CM Only	1			1		
		CM + PBT	0.9987	1		0.9999	1	
		CM + CBT	0.9988	0.9973	1	1.0000	0.9999	1
		CM + PBT + CBT	0.9979	0.9989	0.9987	0.9999	1.0000	0.9999
ELA11	PBA	CM Only	1			1		
		CM + PBT	0.9826	1		0.9984	1	
		CM + CBT	0.9943	0.9952	1	0.9996	0.9995	1
		CM + PBT + CBT	0.9679	0.9970	0.9884	0.9970	0.9998	0.9987
	EOY	CM Only	1			1		
		CM + PBT	0.9995	1		0.9997	1	
		CM + CBT	0.9998	0.9997	1	0.9998	0.9992	1
		CM + PBT + CBT	0.9989	0.9998	0.9996	0.9998	0.9998	0.9997



Mode Comparability Research

Table E.2 Impact of Calibration Conditions for Difficulty and Discrimination Parameter Estimates for Mathematics PBA and EOY Assessments

Test	Form Type	Calibration Condition	Discrimination			Difficulty		
			CM Only	CM + PBT	CM + CBT	CM Only	CM + PBT	CM + CBT
MAT03	PBA	CM Only	1	.	.	1	.	.
		CM + PBT	0.9999	1	.	1.0000	1	.
		CM + CBT	0.9998	0.9997	1	1.0000	1.0000	1
		CM + PBT + CBT	0.9997	0.9998	0.9999	1.0000	1.0000	1.0000
	EOY	CM Only	1	.	.	1	.	.
		CM + PBT	0.9975	1	.	0.9999	1	.
		CM + CBT	0.9972	0.9982	1	1.0000	1.0000	1
		CM + PBT + CBT	0.9916	0.9975	0.9975	0.9998	1.0000	0.9999
MAT07	PBA	CM Only	1	.	.	1	.	.
		CM + PBT	0.9999	1	.	1.0000	1	.
		CM + CBT	0.9998	0.9998	1	1.0000	1.0000	1
		CM + PBT + CBT	0.9997	0.9998	1.0000	1.0000	1.0000	1.0000
	EOY	CM Only	1	.	.	1	.	.
		CM + PBT	0.9950	1	.	0.9985	1	.
		CM + CBT	0.9950	0.9988	1	0.9978	0.9991	1
		CM + PBT + CBT	0.9864	0.9973	0.9975	0.9938	0.9981	0.9986
ALG02	EOY	CM Only	1	.	.	1	.	.
		CM + PBT	0.9935	1	.	0.9967	1	.
		CM + CBT	0.9921	0.9907	1	0.9910	0.9943	1
		CM + PBT + CBT	0.9869	0.9954	0.9959	0.9862	0.9938	0.9986
GEO	EOY	CM Only	1	.	.	1	.	.
		CM + PBT	0.9993	1	.	0.9999	1	.
		CM + CBT	0.9988	0.9984	1	0.9994	0.9992	1
		CM + PBT + CBT	0.9981	0.9991	0.9994	0.9995	0.9995	0.9999

Pre-Kindergarten Through Grade 2 Assessment Task Force

Summary Report of Process, Outcomes, and Recommendations

The Arkansas Department of Education and the Office of Innovation for Education (OIE) recruited Arkansas Pre-Kindergarten through Grade 2 (PK-2) teachers for the purpose of gathering information on current PK-2 assessments and assessment practices to inform future assessment selection processes for these grade levels. Members were recruited from all regions. Each member of the PK-2 Assessment Task Force had a minimum of 10 years of experience at the PK-2 grade levels. The Task Force met five times throughout the 2014-2015 school year. Each meeting focused on reviewing and discussing salient information to facilitate the work of the Task Force. Members completed the following tasks.

- Reviewed the latest research on developmentally appropriate assessment practices for PK-2;
- Reviewed the technical requirements necessary for assessments to be considered high quality and developmentally appropriate;
- Learned the principles for selection of developmentally appropriate assessments and intended use of the scores from these assessments;
- Discussed the requirements in Arkansas's statutes and rules, as well as local assessment policies that impact student assessment at these grade levels;
- Developed and administered a survey to current PK-2 teachers on their perceptions of the strengths and concerns regarding currently required assessments required; and
- Reviewed results of the 2,187 responses to the survey and compiled the results into reflections and recommendations for the ADE and State Board of Education.

Major Findings of the PK-2 Assessment Task Force

1. PK teachers responding to the survey indicated overall satisfaction with the assessments currently in use in PK programs. A major concern was the vague definition of PK assessment requirements which gives districts and programs a lot of latitude in the choice of PK screeners. This is perceived to result in a lack of standardization in the information used by teachers across locations.
2. Kindergarten and Grades 1 and 2 teachers expressed general dissatisfaction with the assessments currently required for their grade levels (QELI and ITBS, respectively). Teachers responding to the perceptual survey cited the following major concerns.
 - a. Lack of alignment of the assessments with the Common Core standards required for instruction at these grade levels;
 - b. Whether current K-2 assessments were aligned with the most recent research regarding developmentally appropriateness for the purpose of meeting the requirements of ACA-15-404;
 - c. Usefulness (or lack thereof) of the results and information received from the assessments due to the first two concerns, as well as the lack of timeliness in receiving the results. In particular, K-2 teachers expressed a need for valid, reliable, developmentally appropriate screening assessments at the beginning of the school year. The current assessments are viewed by the teachers as not useful for these purposes, particularly given the timing of the assessments and/or the receipt of the results; and
 - d. Teachers expressed strong concerns that developmentally appropriate assessment of students should minimize time away from instruction, and that time used for assessment should include screeners/assessments that provide teachers with rich information that can be used to drive planning for student learning.

Pre-Kindergarten Through Grade 2 Assessment Task Force

3. In general, PK-2 teachers feel the need for more information and professional development regarding developmentally appropriate assessment instruments, how to administer the assessments, and how to use the data to inform instruction.

General Recommendations of the PK-2 Assessment Task Force

The Task Force provides the following recommendations for consideration.

1. Recommend selection of assessments consider the following priorities.
 - a. Usefulness for screening students, informing instruction, and benchmarking growth based on alignment with developmental research and required standards,
 - b. Technical quality (reliability and validity of results (scores) for stated purpose),
 - c. Consideration for time required for administration and timeliness of results.
2. Recommend consideration of an annual three day screening and review period prior to the start of mandatory school attendance for Pre-Kindergarten and Kindergarten students. This three day period would be used to screen students for readiness to learn using a developmentally appropriate screening tool designed to provide more immediate feedback. Teachers would review student data provided by the screeners and use the information to make more accurate placements of students, and more aligned instructional plans based on students' learning needs.
3. Build on the work of the Task Force. Continue collaboration among ADE leaders, Early Childhood Education leaders, and PK-2 teachers to align expectations, instruction, and assessment across the transition from PK to K-2 with the developmental research and the required standards.
4. Provide professional development for teachers regarding developmentally appropriate assessment, assessment administration, and the use of assessment results. Further, encourage professional development opportunities that include observation of others' assessment and instruction practices in the classroom, as well as networking through professional learning communities (PLCs) to help improve use of data in the classroom.

"As to methods, there may be a million and then some, but principles are few. The man who grasps principles can successfully select his own methods. The man who tries methods, ignoring principles, is sure to have trouble."-- **Ralph Waldo Emerson**

PK-2 SURVEY RESULTS

PK-2 Taskforce Meeting

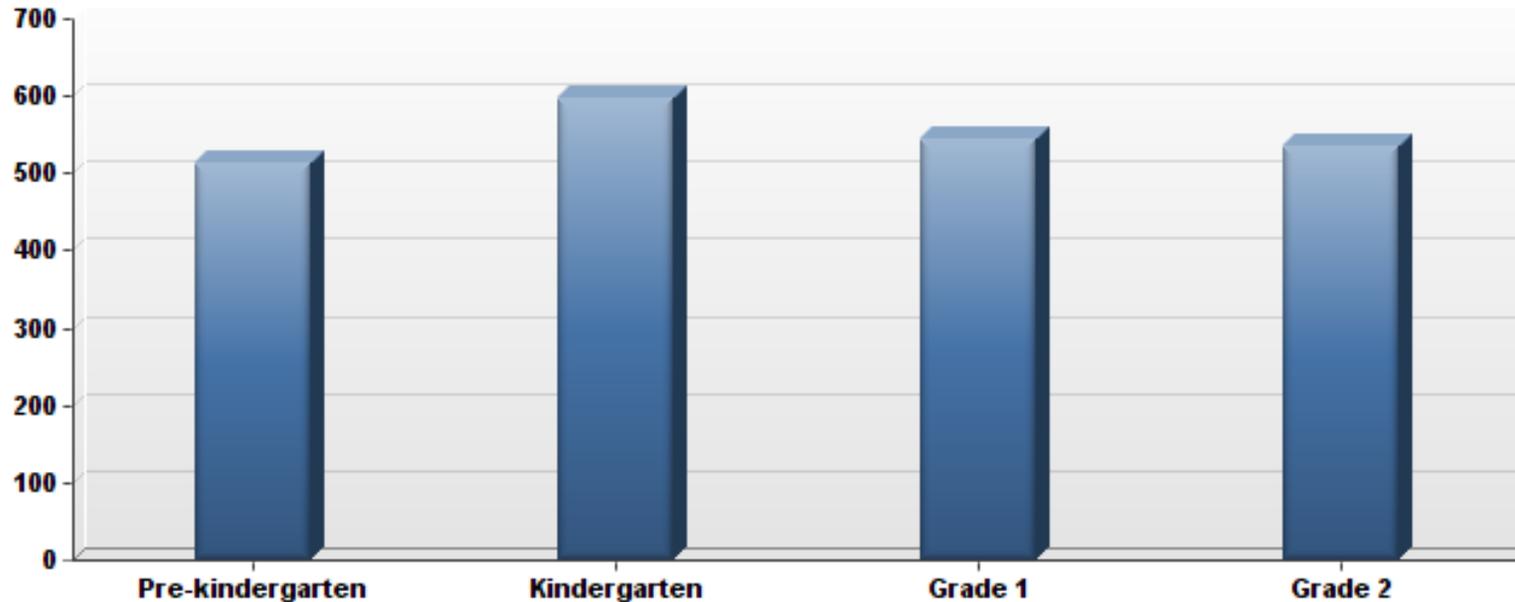
April 29th, 2015



Are you currently employed in a Pre-kindergarten through Grade 2 classroom?

Answer	Response	%
Yes	2,209	90%
No	234	10%
Total	2,443	100%

At which grade level do you currently work?



Answer	Response	%
Pre-kindergarten	512	23%
Kindergarten	598	27%
Grade 1	543	25%
Grade 2	534	24%
Total	2,187	100%

Which position describes your current role?

Position	Response	%
Licensed teacher	1,902	87%
PK Coordinators	29	1%
Interventionist	35	2%
Literacy Coach	23	1%
Math Coach	<10	0%
Instructional Assistant	48	2%
Family service worker	<10	0%
Education Specialist	19	1%
Other	110	5%
Total	2,177	100%

Other responses include:

- ❖ Administrators, Directors, and Principals
- ❖ CDA, GT, SPED, Art, Music, ESL, and other non-licensed teachers
- ❖ Counselors, Speech Pathologists, and Paraprofessionals

Years of Experience by Grade Level

Years in
Current Role

	Pre-K	Kindergarten	Grade 1	Grade 2	Total
Less than a year	37 7.49%	28 4.74%	31 5.78%	44 8.27%	140 6.50%
1 - 2 years	56 11.34%	48 8.12%	50 9.33%	50 9.40%	204 9.48%
3-5 years	94 19.03%	94 15.91%	78 14.55%	81 15.23%	347 16.12%
6-9 years	110 22.27%	91 15.40%	88 16.42%	78 14.66%	367 17.05%
10-14 years	87 17.61%	112 18.95%	87 16.23%	91 17.11%	377 17.51%
15-19 years	50 10.12%	58 9.81%	64 11.94%	60 11.28%	232 10.78%
20-24 years	29 5.87%	58 9.81%	57 10.63%	53 9.96%	197 9.15%
25-29 years	14 2.83%	57 9.64%	39 7.28%	35 6.58%	145 6.73%
30 or more years	17 3.44%	45 7.61%	42 7.84%	40 7.52%	144 6.69%

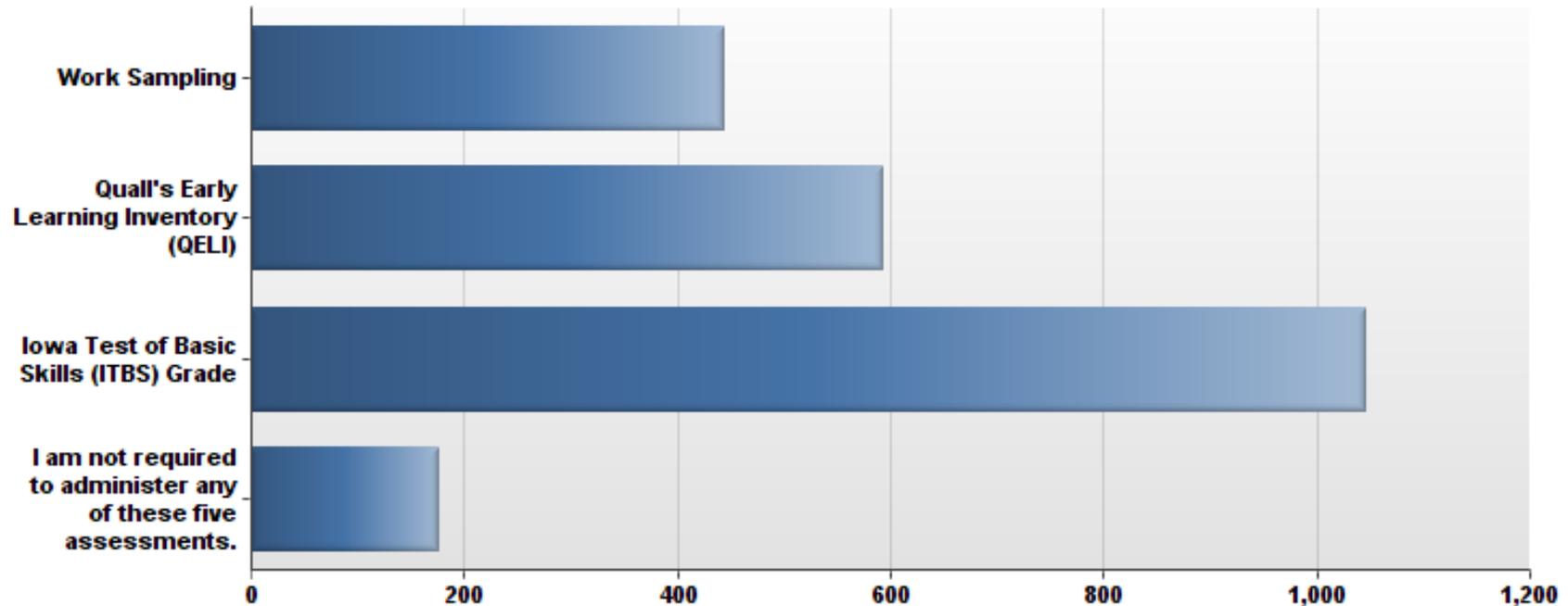
Years at current
Grade Level

Less than a year	20 4.13%	32 5.48%	46 8.71%	51 9.70%	149 7.02%
1 - 2 years	53 10.95%	62 10.62%	74 14.02%	84 15.97%	273 12.87%
3-5 years	110 22.73%	126 21.58%	114 21.59%	120 22.81%	470 22.15%
6-9 years	119 24.59%	100 17.12%	85 16.10%	96 18.25%	400 18.85%
10-14 years	100 20.66%	91 15.58%	78 14.77%	63 11.98%	332 15.65%
15-19 years	38 7.85%	49 8.39%	51 9.66%	37 7.03%	175 8.25%
20-24 years	23 4.75%	51 8.73%	34 6.44%	33 6.27%	141 6.64%
25-29 years	13 2.69%	37 6.34%	27 5.11%	26 4.94%	103 4.85%
30 or more years	8 1.65%	36 6.16%	19 3.60%	16 3.04%	79 3.72%

Children Assigned by Grade Level

	At which grade level do you currently work?				Total
	Pre-kindergarten	Kindergarten	Grade 1	Grade 2	
Fewer than 10	16	10	8	13	47
10-15	45	41	27	25	138
16-20	355	435	166	134	1090
21-25	16	84	296	304	700
More than 25	58	19	38	56	171
Total	490	589	535	532	2146

Overall Required Standardized Assessments





The Next Section shows the results by Grade Level regarding the following aspects:

- Perceptions about current required assessment usefulness and appropriateness
- Answers to questions about other assessments:
 - Frequency of each
 - Class time used for each
 - Purpose of each
 - Usefulness of each

PRE-KINDERGARTEN RESULTS

Pre-K ONLY please rank your response to the following statements based on your experience with the required Pre-K Work Sampling assessment.

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
This is an acceptable screener/assessment for understanding what children know and are able to do upon entering prekindergarten.	20	38	54	221	44
This screener/assessment will contribute to an overall understanding of students' skills within 45 days of entry into the classroom.	17	49	51	218	42
The diverse skill set of children entering prekindergarten justifies the use of this screener/assessment.	11	34	69	215	48
I support continued use of this screener/assessment without the need for further refinements.	15	79	85	164	34
This screener/assessment is developmentally appropriate for children of prekindergarten age.	12	27	52	232	54
I like this screener/assessment.	21	53	99	169	35
I understand the purpose of the PK screener/assessment.	8	10	35	245	79
Overall, the screener/assessment provides beneficial information about children within 45 days of entry into the classroom.	19	47	62	208	41

Which of the following other screeners and/or assessments do you administer at your school for Pre- Kindergarten?

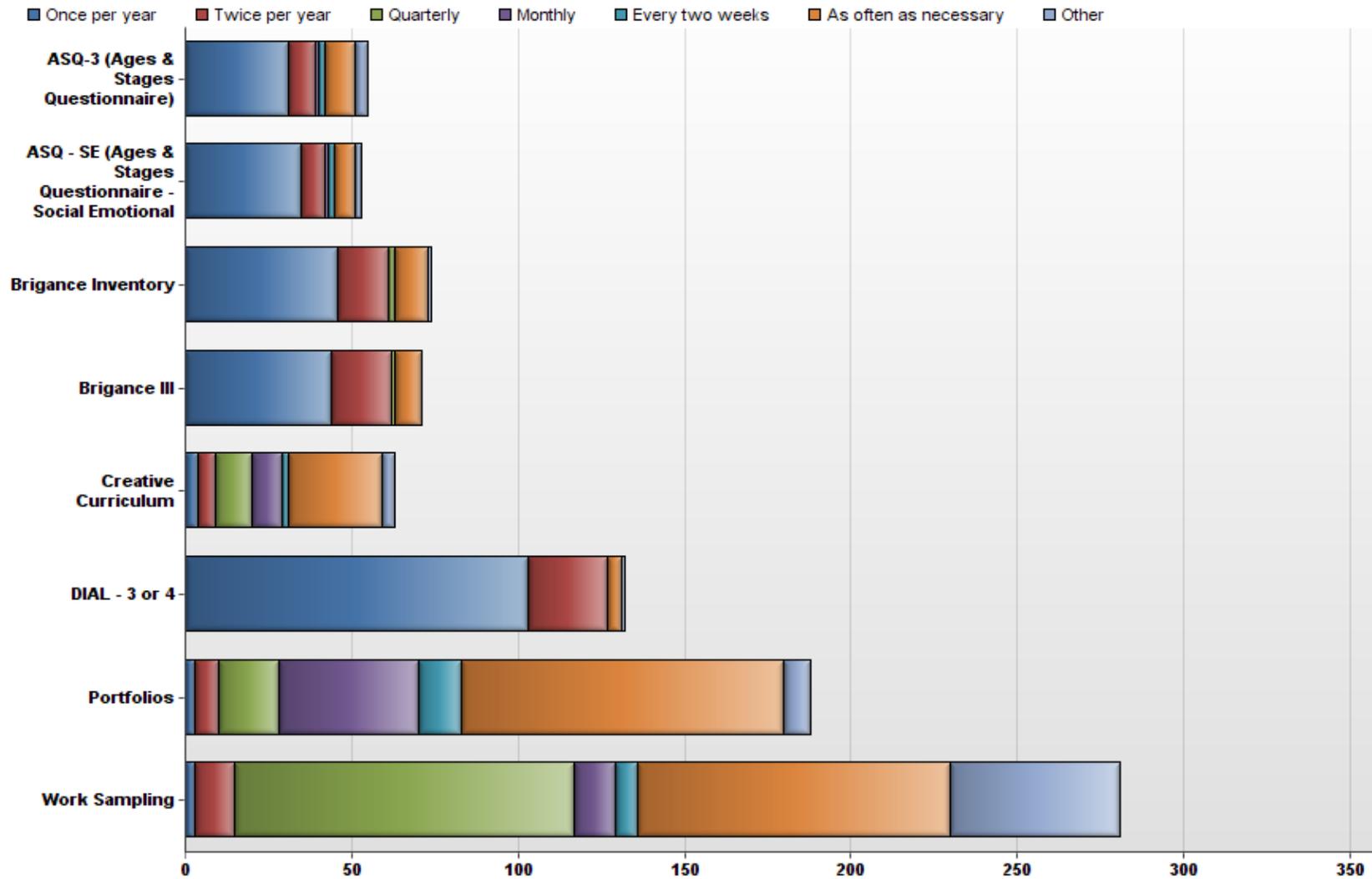
Answer	Response	%
ASQ-3 (Ages & Stages Questionnaire)	62	13%
ASQ - SE (Ages & Stages Questionnaire - Social Emotional)	58	12%
Brigance Inventory	78	16%
Brigance III	79	17%
Core Knowledge*	21	4%
Creative Curriculum	67	14%
DECA*	32	7%
Denver Screening*	<10	1%
DIAL - 3 or 4	138	29%
E-LAP (Early Learning Accomplishment Profile)*	23	5%
LAP-3 (Learning Accomplishment Profile -3)*	15	3%
LAP -D *	<10	2%
Portfolios	195	41%
TSG (Teaching Strategies Gold)*	42	9%
Work Sampling	295	62%
Other, please indicate other assessment instruments below	82	17%
N/A - we do not use any other assessments	32	7%

Other Responses include:

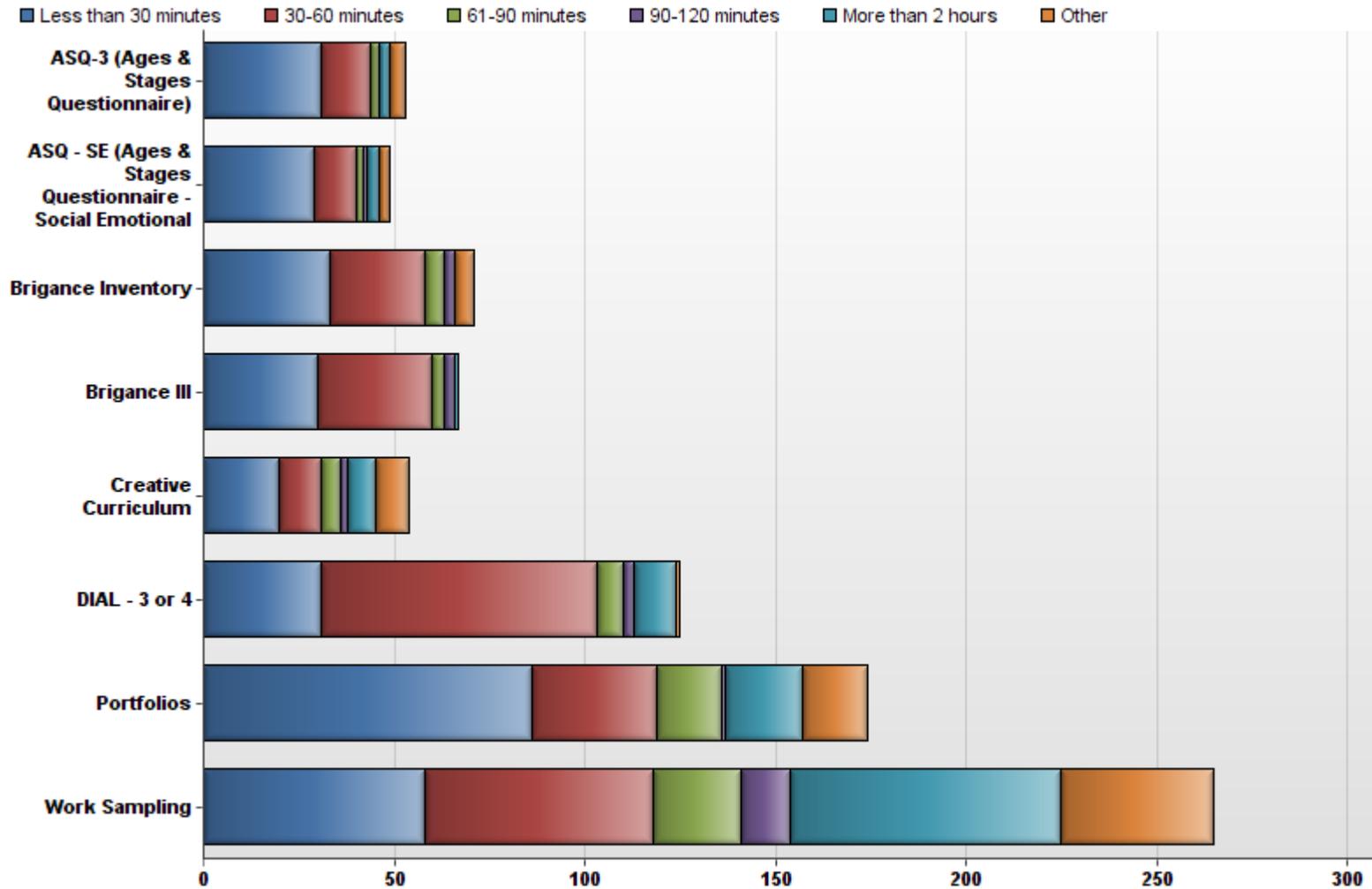
- ABAS-II
- ABC Mouse
- AEC Developmental
- Batelle
- ESI
- EVT
- Handwriting w/o tears
- KRIC
- PKSA
- P3SA
- Progress reports

***Note:** Assessments used by less than 10% of the respondents will not be included on the following slides. These include: Core Knowledge, DECA, Denver Screening, E-Lap, LAP-3, LAP-D and TSG.

How often do you administer each Pre-K assessment.

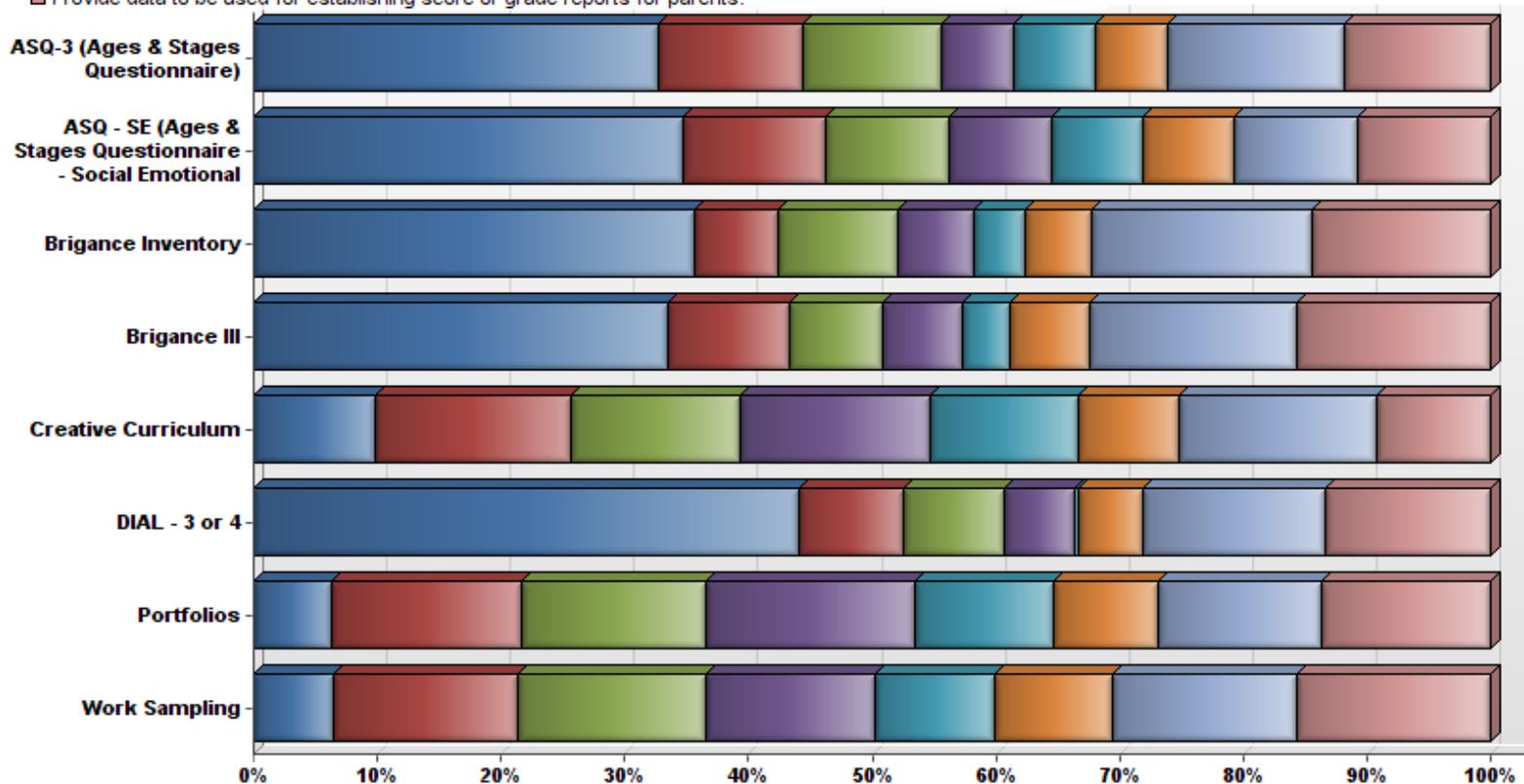


Pre-K class time used to administer each:



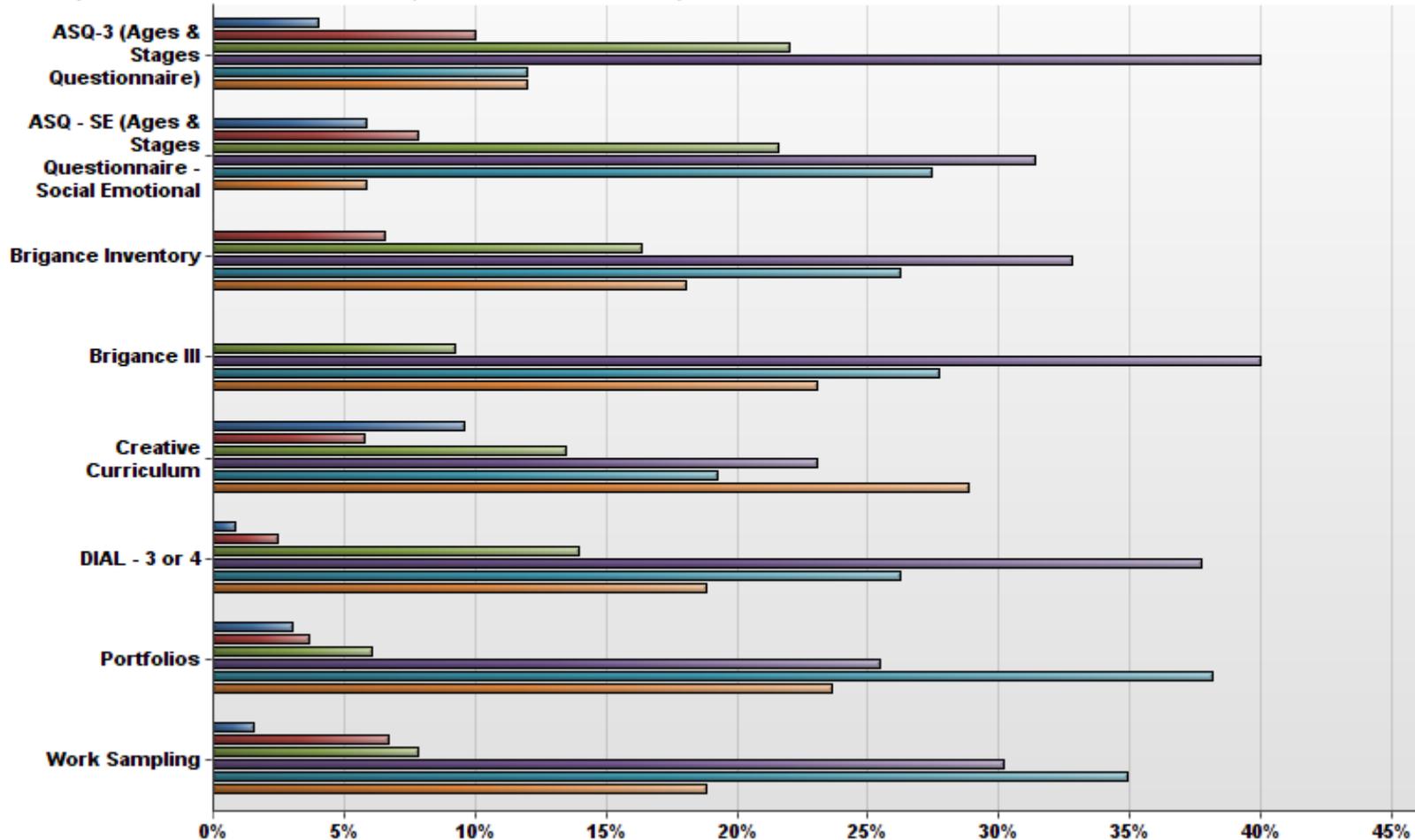
For what purpose does your district administer each Pre-K screener/assessment?

- Screen students to determine who may need intervention/remediation or enrichment beyond grade level standards.
- Benchmark students' growth throughout the year compared to growth of other students (norm-referenced growth)
- Benchmark students' growth throughout the year compared to standards students are expected to attain.
- Benchmark students' achievement on smaller, different chunks of standards throughout the year.
- Progress monitor students every two weeks to inform intensive intervention.
- Predict how the student will perform on grade level summative test at the end of the year.
- Provide data to inform instructional strategies for specific students or groups of students.
- Provide data to be used for establishing score or grade reports for parents.

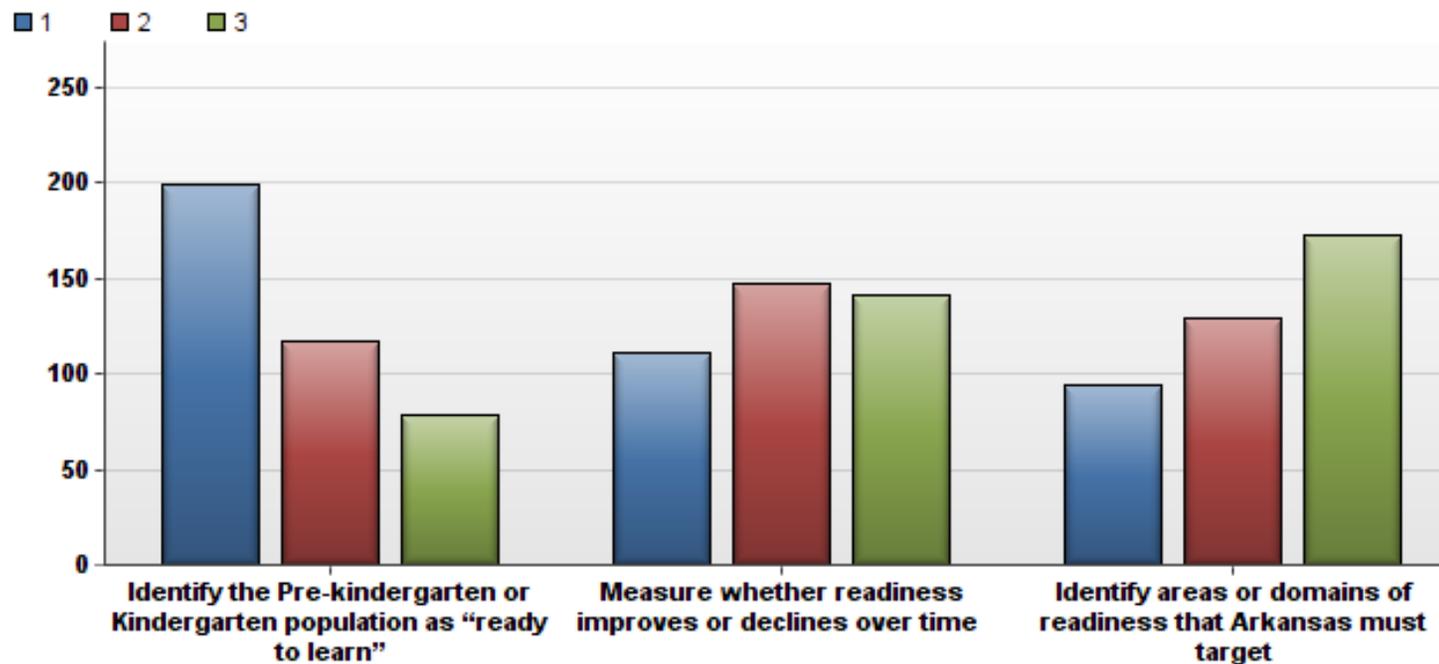


How useful is each Pre-K screener/assessment?

- Not useful at all - I don't use the results for anything.
- Not very useful - I may report the results or use it in a discussion with a teacher team but we don't use it for decisions.
- Somewhat useful - I report the results and I use it in a teacher team.
- Somewhat useful - I report the results and I use it to decide on how to adjust my instruction sometimes.
- More useful - I use the results regularly to learn more about the effectiveness of my instruction and the alignment of my curriculum.
- Very useful - I couldn't make instructional plans and learn more about my own effectiveness without it.



If you have a limited amount of time to screen/ assess Pre-K students which of the following purposes is most important to you?



KINDERGARTEN RESULTS

Kindergarten **ONLY** please rank your response to the following statements based on your experience with the required **QELI** assessment.

■ Strongly Disagree
 ■ Disagree
 ■ Neither Agree nor Disagree
 ■ Agree
 ■ Strongly Agree

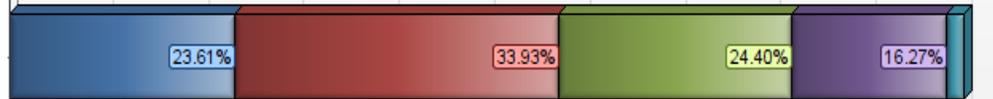
This is an acceptable assessment for understanding what children know and are able to do upon entering kindergarten.



This assessment will contribute to an overall understanding of students' skills as they enter my classroom.



The diverse skill set of children entering kindergarten justifies the use of this assessment.



I support continued use of this assessment without the need for further refinements.



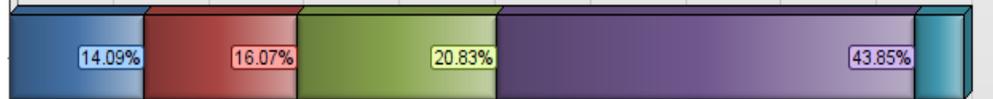
This assessment is developmentally appropriate for children of kindergarten age.



I like this assessment.



I understand the purpose of the QELI kindergarten assessment.



Overall, the assessment provides beneficial information about children entering kindergarten in Arkansas.



% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

Which of the following other screeners and/or assessments do you administer at your school for Kindergarten?

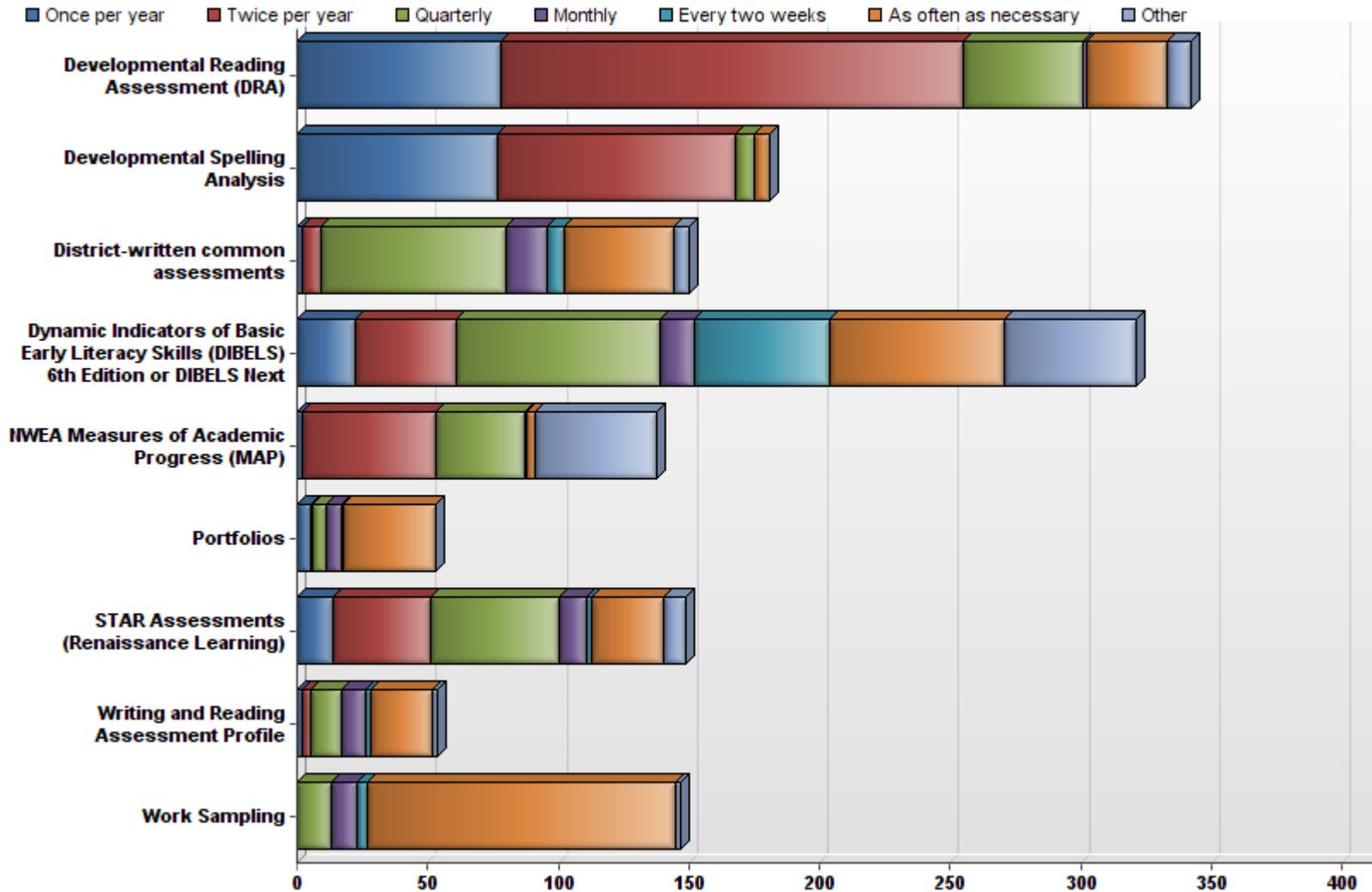
Answer	Response	%
Brigance Inventory*	30	6%
Core Knowledge*	13	2%
Developmental Reading Assessment (DRA)	352	65%
Developmental Spelling Analysis	183	34%
District-written common assessments	157	29%
Dynamic Indicators of Basic Early Literacy Skills (DIBELS) 6th Edition or DIBELS Next	335	62%
NWEA Measures of Academic Progress (MAP)	143	27%
Portfolios	57	11%
STAR Assessments (Renaissance Learning)	153	28%
The Learning Institute (TLI) Module Tests*	24	4%
Writing and Reading Assessment Profile	57	11%
Work Sampling	156	29%
Other, please indicate other assessment instruments below	101	19%
N/A - we do not use any other assessments	17	3%

Other Responses include:

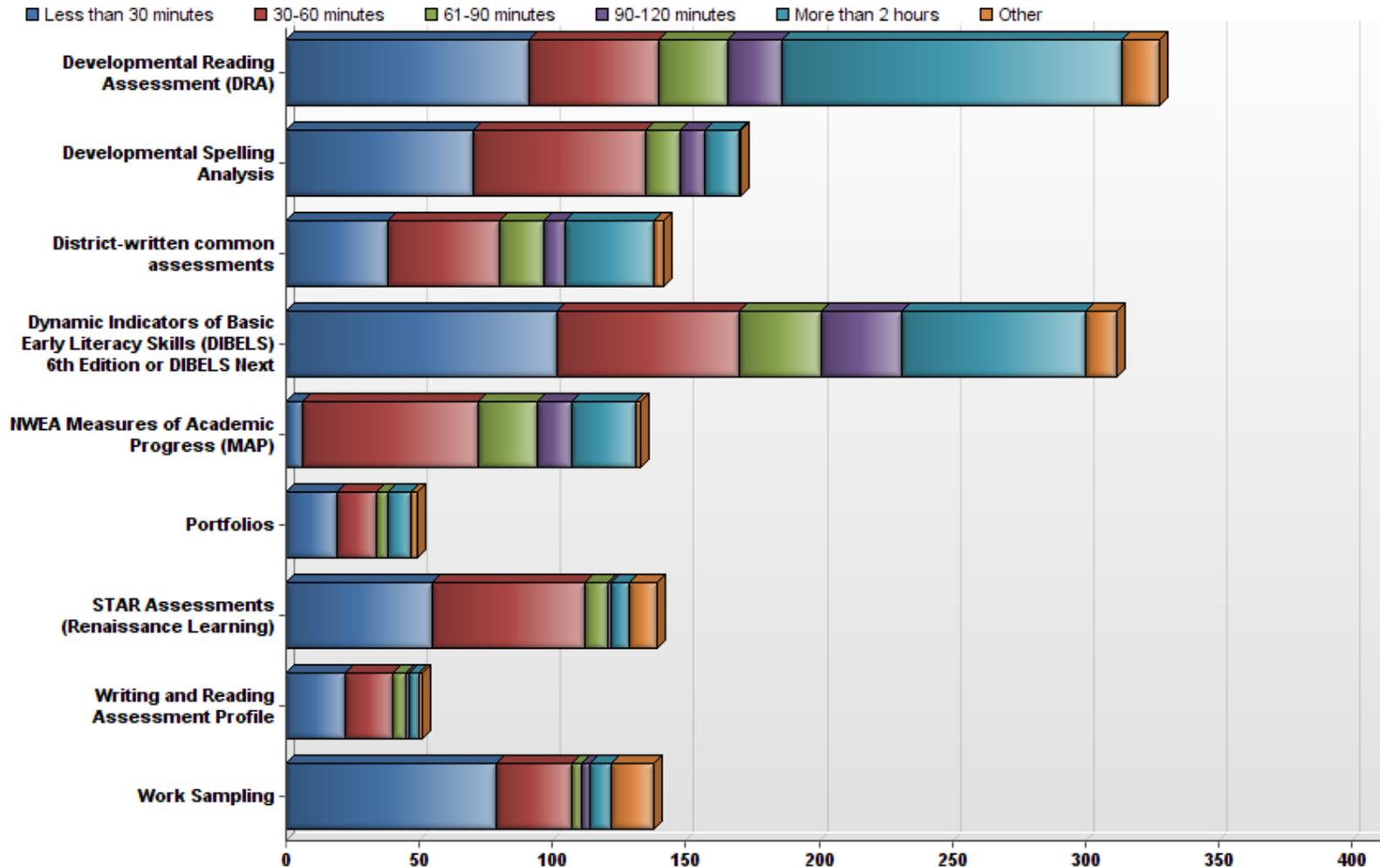
- Aimsweb
- Arkansas (RAN) Rapid naming screener
- ASPENS
- Bebop
- Burst: TRC for reading and Mclass for math
- CAPS
- Classworks
- Dyslexia screeners
- Fountas & Pinnell
- KRIC
- Observation survey
- SMART
- TENS
- TRC
- Teacher generated assessments

***Note:** Assessments used by less than 10% of the respondents will not be included on the following slides. These include: Brigance Inventory, Core Knowledge, and TLI.

How often do you administer each Kindergarten assessment.

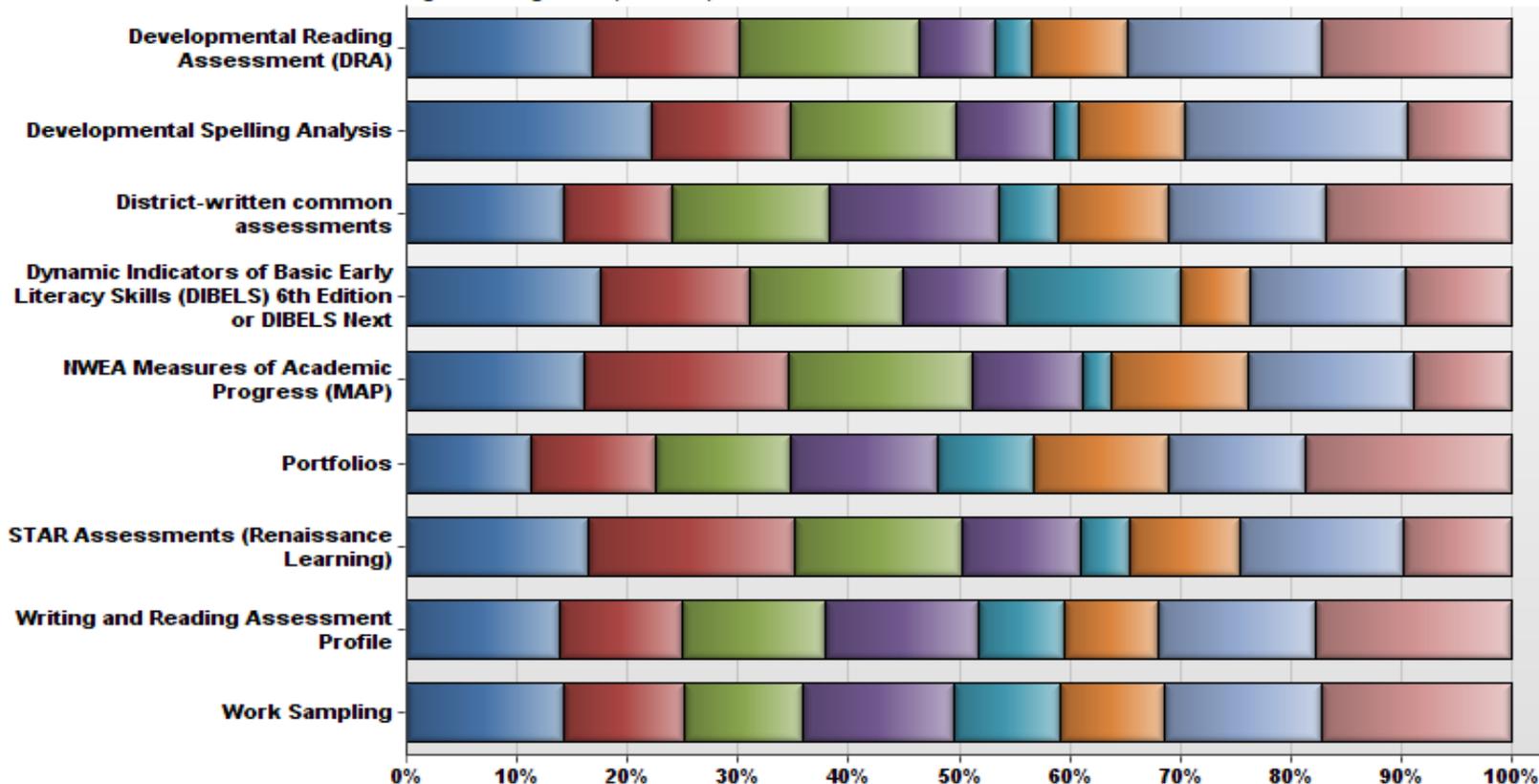


Kindergarten class time used to administer each:



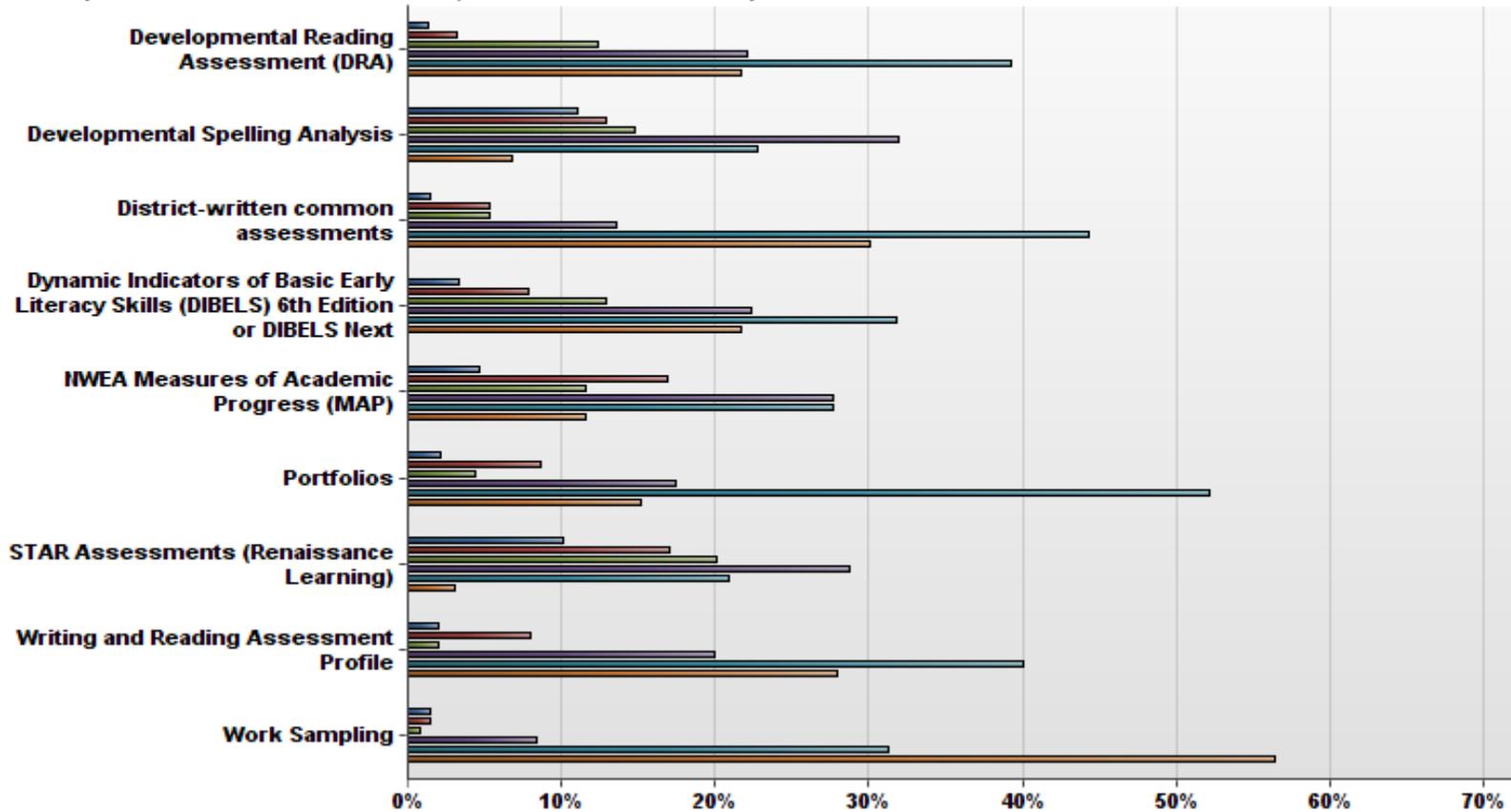
For what purpose does your district administer each Kindergarten assessment?

- Screen students to determine who may need intervention/remediation or enrichment beyond grade level standards.
- Benchmark students' growth throughout the year compared to growth of other students (norm-referenced growth)
- Benchmark students' growth throughout the year compared to standards students are expected to attain.
- Benchmark students' achievement on smaller, different chunks of standards throughout the year.
- Progress monitor students every two weeks to inform intensive intervention.
- Predict how the student will perform on grade level summative test at the end of the year.
- Provide data to inform instructional strategies for specific students or groups of students.
- Provide data to be used for establishing score or grade reports for parents.

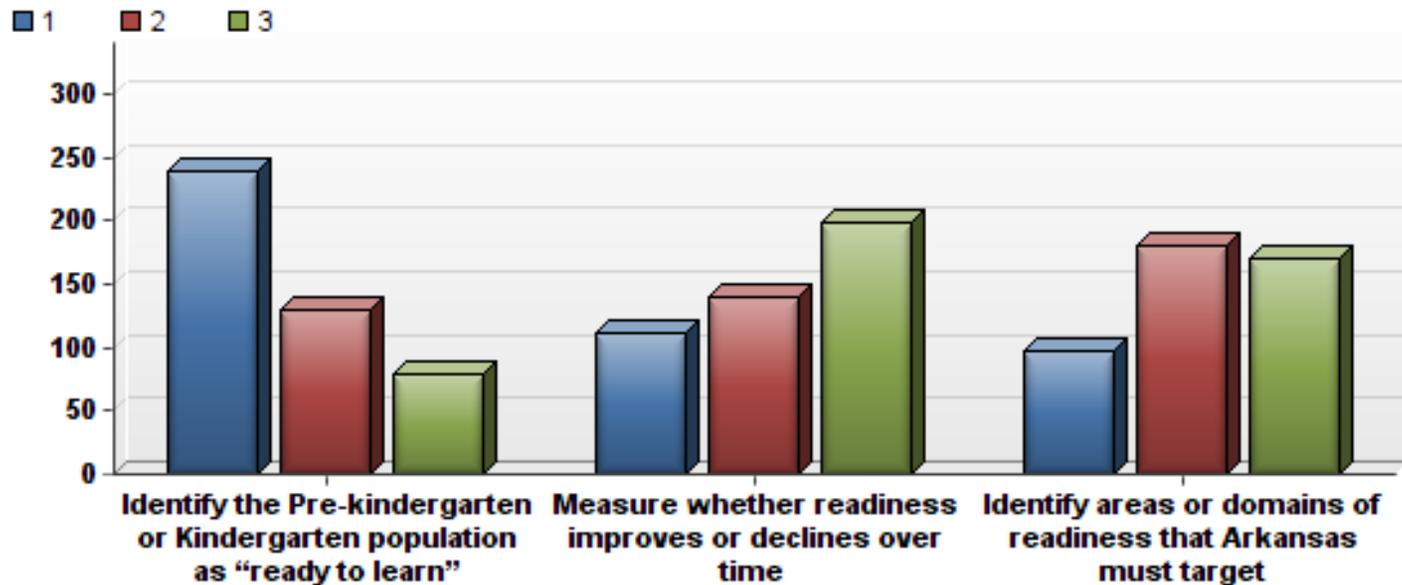


How useful is each Kindergarten assessment?

- Not useful at all - I don't use the results for anything.
- Not very useful - I may report the results or use it in a discussion with a teacher team but we don't use it for decisions.
- Somewhat useful - I report the results and I use it in a teacher team.
- Somewhat useful - I report the results and I use it to decide on how to adjust my instruction sometimes.
- More useful - I use the results regularly to learn more about the effectiveness of my instruction and the alignment of my curriculum.
- Very useful - I couldn't make instructional plans and learn more about my own effectiveness without it.



If you have a limited amount of time to screen/ assess Kindergarten students which of the following purposes is most important to you?

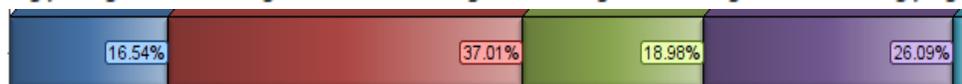


GRADES 1 AND 2 RESULTS

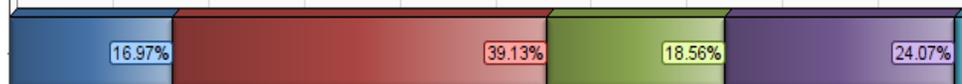
1st & 2nd grades ONLY Please rank your response to the following statements based on your experience with the ITBS.

■ Strongly Disagree ■ Disagree ■ Neither Agree nor Disagree ■ Agree ■ Strongly Agree

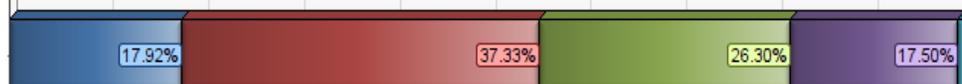
This is an acceptable assessment for understanding what children know and are able to do at the end of Grades 1 or 2.



This assessment will contribute to an overall understanding of the skills students learned as they exit my classroom.



The diverse skill set of children justifies the use of this assessment.



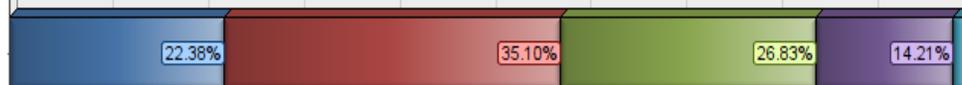
I support continued use of this assessment without the need for further refinements.



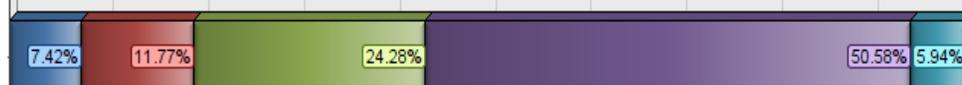
This assessment is developmentally appropriate for children in Grades 1 or 2.



I like this assessment.



I understand the purpose of this assessment.



Overall, the assessment provides beneficial information about children exiting Grades 1 or 2 in Arkansas.



This is an appropriate assessment for identifying students for Intensive Reading Interventions or Academic Improvement Plans.



% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

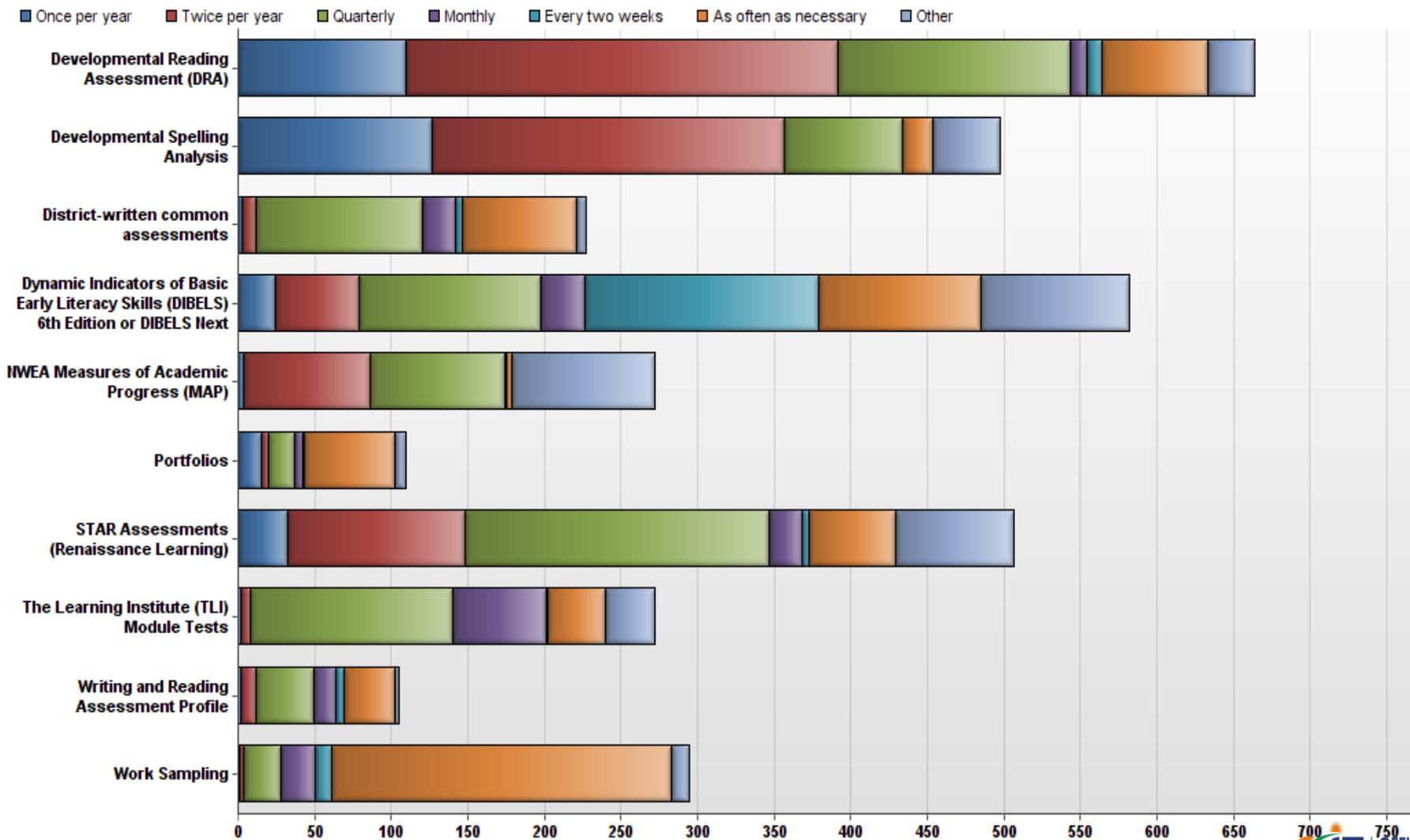
Which of the following **other** screeners and/or assessments do you administer at your school for 1st & 2nd grades?

Answer	Response	%
Developmental Reading Assessment (DRA)	684	70%
Developmental Spelling Analysis	507	52%
District-written common assessments	233	24%
Dynamic Indicators of Basic Early Literacy Skills (DIBELS) 6th Edition or DIBELS Next	596	61%
NWEA Measures of Academic Progress (MAP)	276	28%
Portfolios	119	12%
STAR Assessments (Renaissance Learning)	523	53%
The Learning Institute (TLI) Module Tests	284	29%
Writing and Reading Assessment Profile	106	11%
Work Sampling	309	32%
Other, please indicate other assessment instruments below	168	17%
N/A - we do not use any other assessments	19	2%

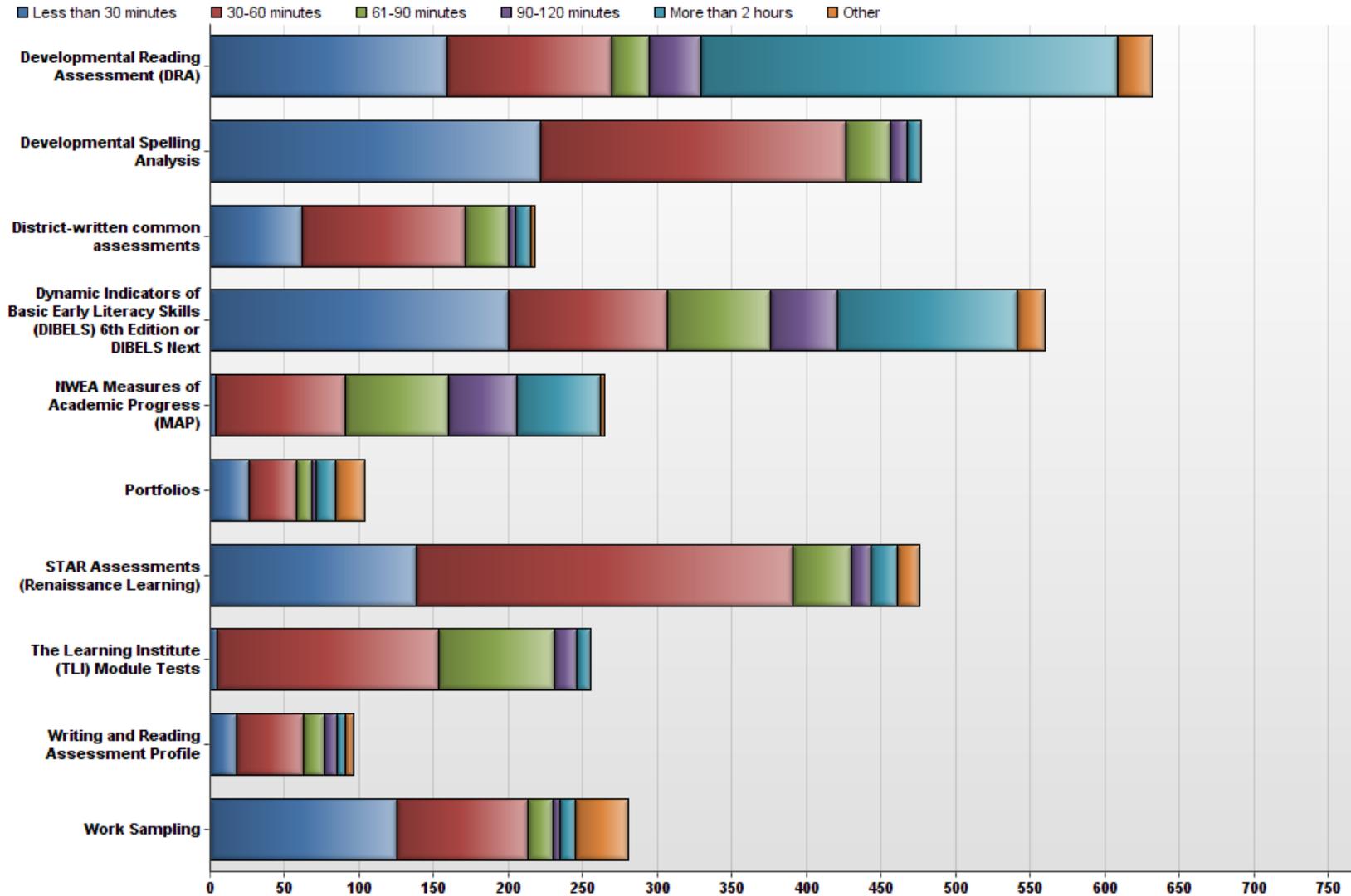
Other Responses include:

- Aimsweb
- Arkansas (RAN) Rapid naming screener
- Bebop
- Burst: TRC for reading and Mclass for math
- CAPS
- Classworks
- Dyslexia screeners
- Fountas & Pinnell
- Observation survey
- PSI
- SMART
- Teacher generated assessments

How often do you administer each assessment in 1st & 2nd grade?

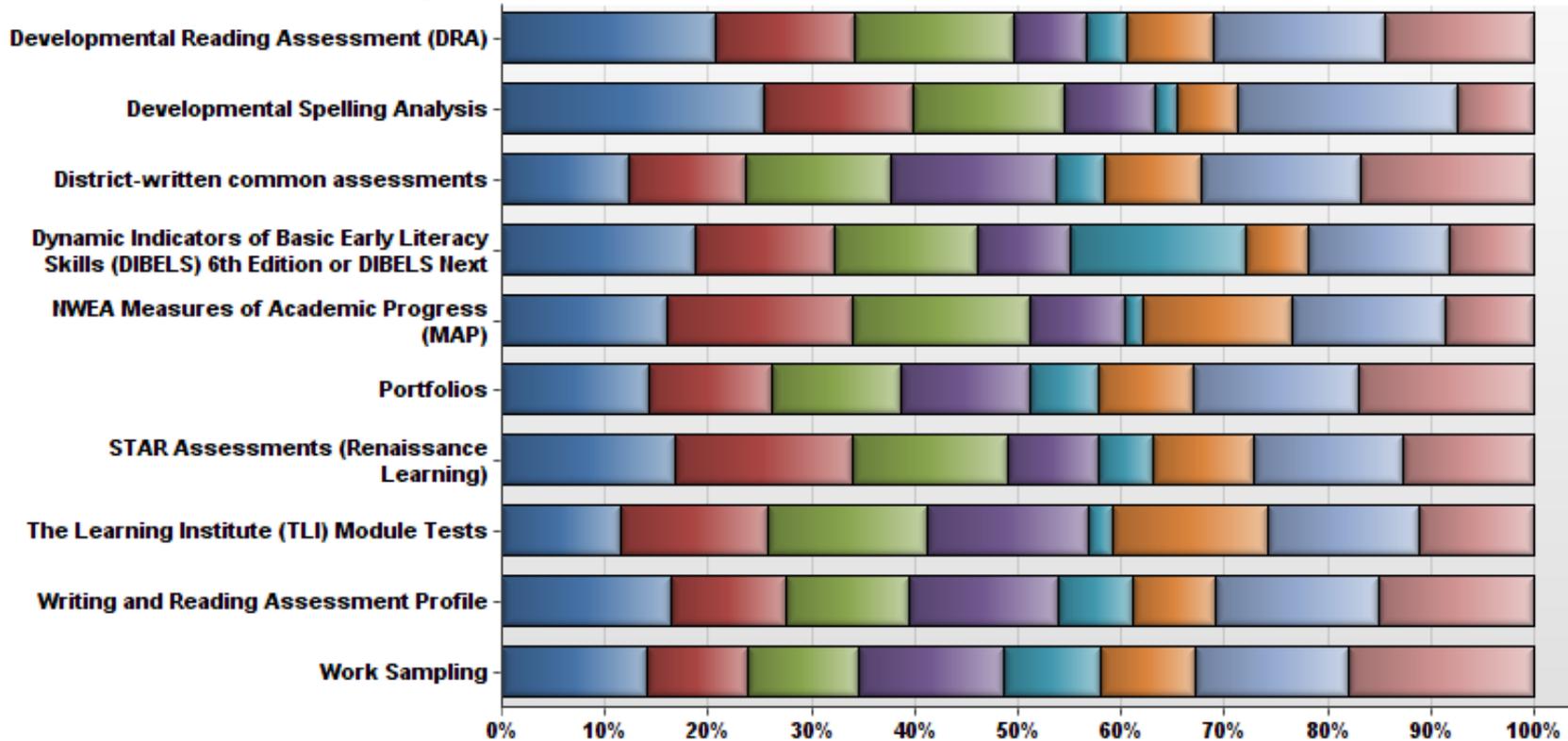


1st & 2nd Grade class time used to administer each:



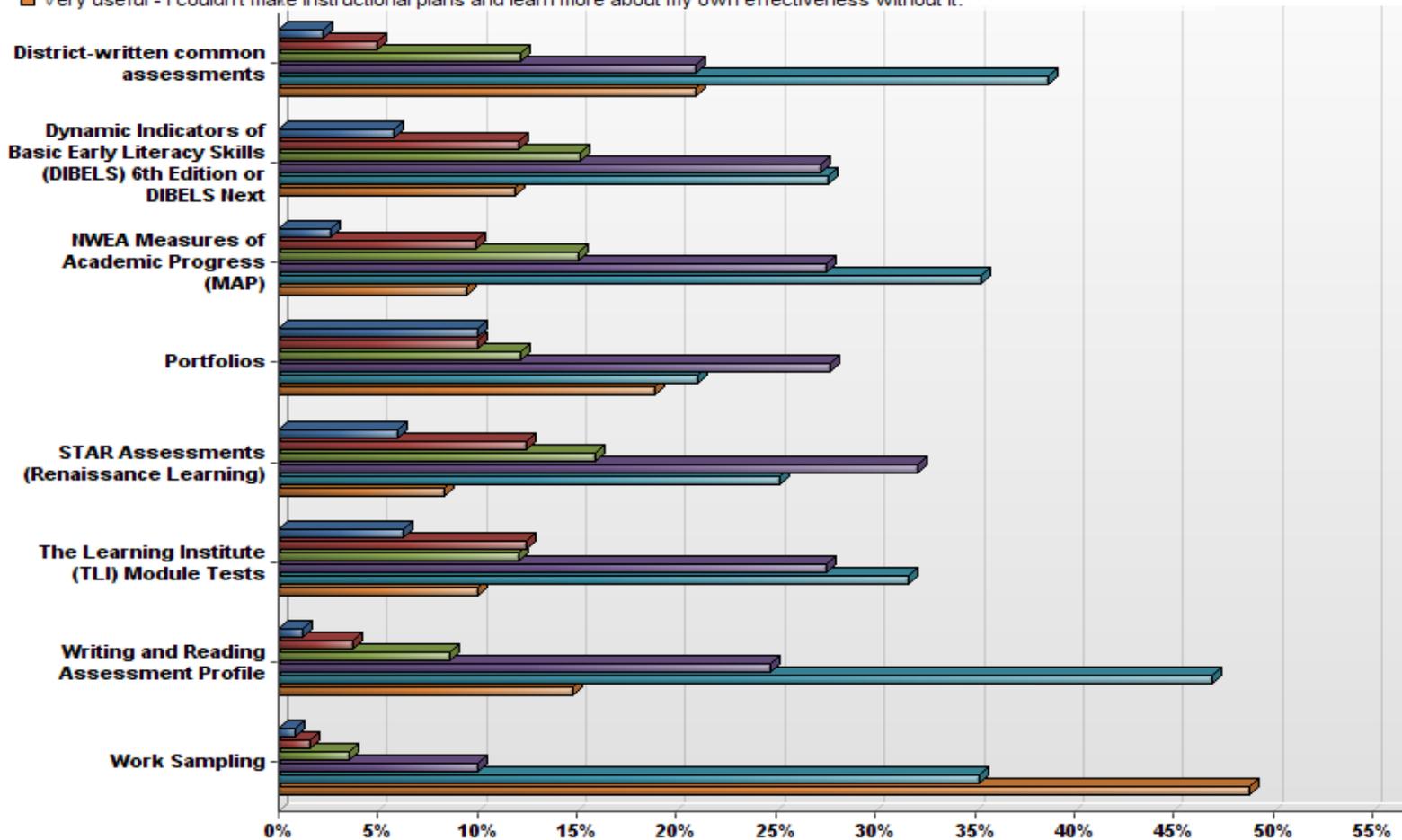
For what purpose does your district administer each assessment to 1st & 2nd grade?

- Screen students to determine who may need intervention/remediation or enrichment beyond grade level standards.
- Benchmark students' growth throughout the year compared to growth of other students (norm-referenced growth)
- Benchmark students' growth throughout the year compared to standards students are expected to attain.
- Benchmark students' achievement on smaller, different chunks of standards throughout the year.
- Progress monitor students every two weeks to inform intensive intervention.
- Predict how the student will perform on grade level summative test at the end of the year.
- Provide data to inform instructional strategies for specific students or groups of students.
- Provide data to be used for establishing score or grade reports for parents.

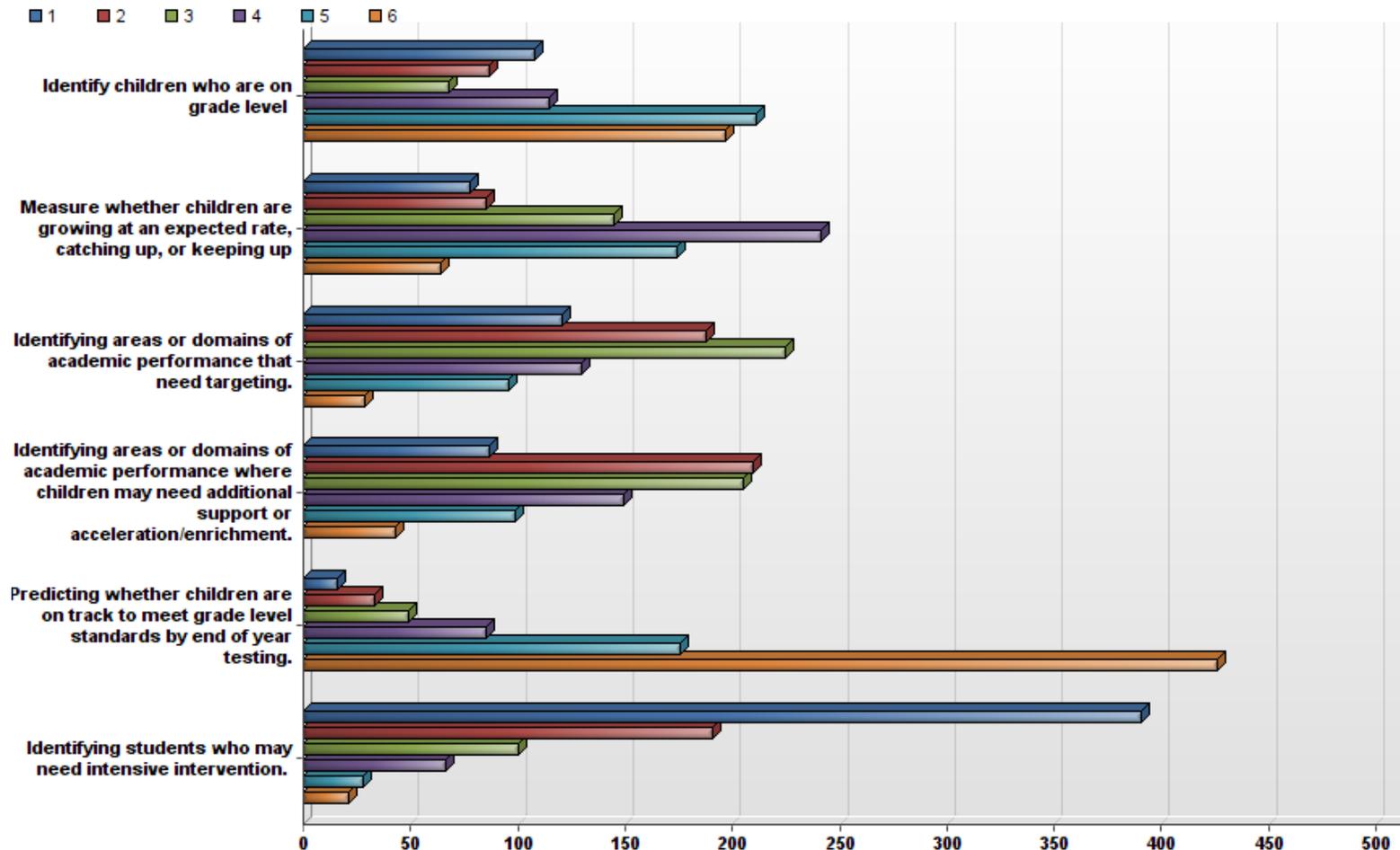


How useful is each assessment to 1st & 2nd grade?

- Not useful at all - I don't use the results for anything.
- Not very useful - I may report the results or use it in a discussion with a teacher team but we don't use it for decisions.
- Somewhat useful - I report the results and I use it in a teacher team.
- Somewhat useful - I report the results and I use it to decide on how to adjust my instruction sometimes.
- More useful - I use the results regularly to learn more about the effectiveness of my instruction and the alignment of my curriculum.
- Very useful - I couldn't make instructional plans and learn more about my own effectiveness without it.



If you have a limited amount of time to assess 1st and 2nd Grade students which of the following purposes is most important to you?



Appropriate amount of time preferred for each test session by grade level

	Less than 10 minutes	10 to 15 minutes	16 to 20 minutes	21 to 30 minutes	More than 30 minutes
Pre-kindergarten	226 53.68%	144 34.20%	25 5.94%	18 4.28%	<10 1.90%
Kindergarten	119 25.37%	213 45.42%	96 20.47%	37 7.89%	<10 0.85%
Grade 1	22 5.10%	104 24.13%	157 36.43%	131 30.39%	17 3.94%
Grade 2	<10 1.69%	35 8.47%	134 32.45%	204 49.39%	33 7.99%

Early Achievement tests given by grade level

Reading

Math

Self-Regulation

	Yes	No	I don't know. I'm not sure.	Yes	No	I don't know. I'm not sure.	Yes	No	I don't know. I'm not sure.
Pre-kindergarten	387 92.58%	25 5.98%	<10 1.44%	393 94.02%	21 5.02%	<10 0.96%	379 90.67%	29 6.94%	10 2.39%
Kindergarten	440 95.86%	<10 1.53%	12 2.61%	425 92.59%	17 3.70%	17 3.70%	254 55.34%	148 32.24%	57 12.42%
Grade 1	377 89.76%	24 5.71%	19 4.52%	331 78.81%	61 14.52%	28 6.67%	138 32.86%	204 48.57%	78 18.57%
Grade 2	309 77.83%	63 15.87%	25 6.30%	283 71.28%	82 20.65%	32 8.06%	131 33.00%	183 46.10%	83 20.91%

Social-Emotional

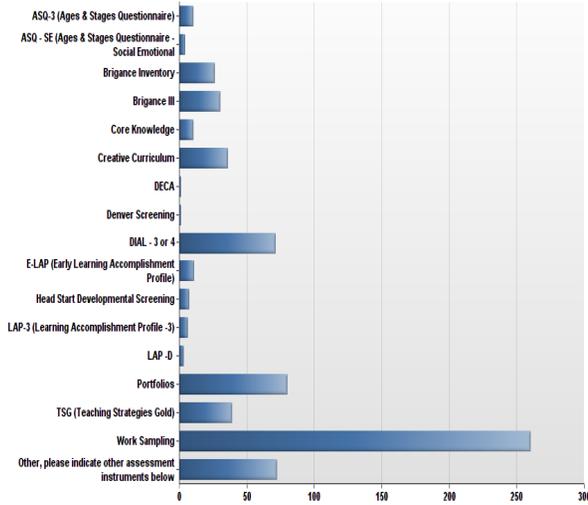
General Knowledge

Motor Skills

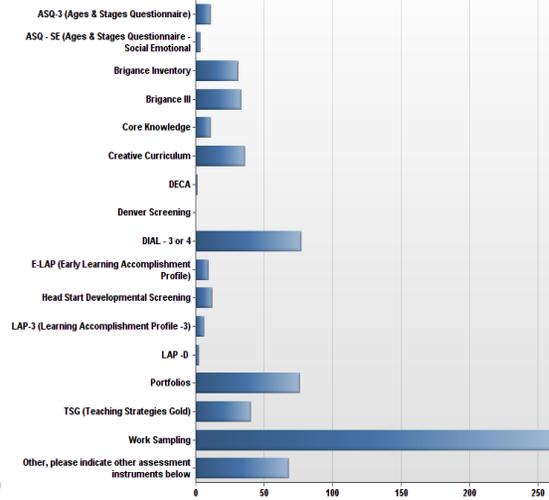
	Yes	No	I don't know. I'm not sure.	Yes	No	I don't know. I'm not sure.	Yes	No	I don't know. I'm not sure.
Pre-kindergarten	395 94.50%	21 5.02%	<10 0.48%	390 93.30%	26 6.22%	<10 0.48%	398 95.22%	17 4.07%	<10 0.72%
Kindergarten	233 50.76%	175 38.13%	51 11.11%	403 87.80%	38 8.28%	18 3.92%	260 56.64%	162 35.29%	37 8.06%
Grade 1	114 27.14%	236 56.19%	70 16.67%	257 61.19%	110 26.19%	53 12.62%	113 26.90%	252 60.00%	55 13.10%
Grade 2	102 25.69%	229 57.68%	66 16.62%	267 67.25%	85 21.41%	45 11.34%	89 22.42%	246 61.96%	62 15.62%

Pre-K Early Achievement tests used

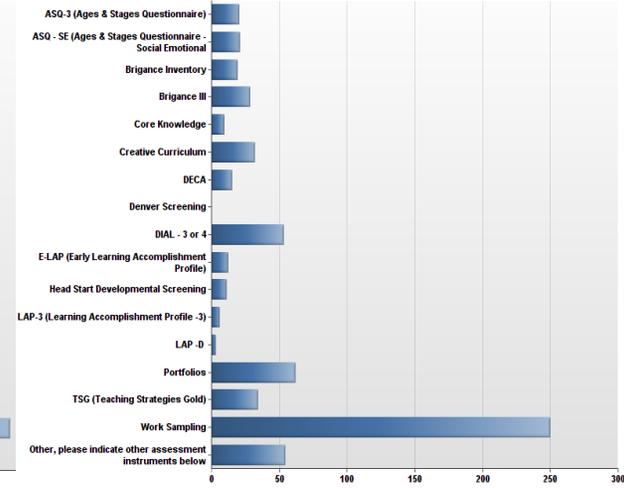
Reading Skills



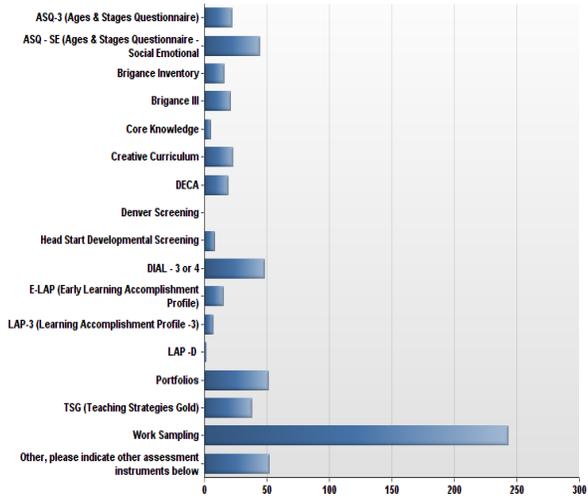
Math Skills



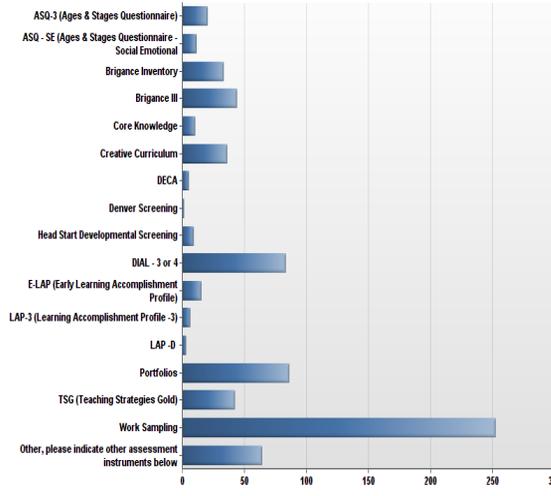
Self-Regulation



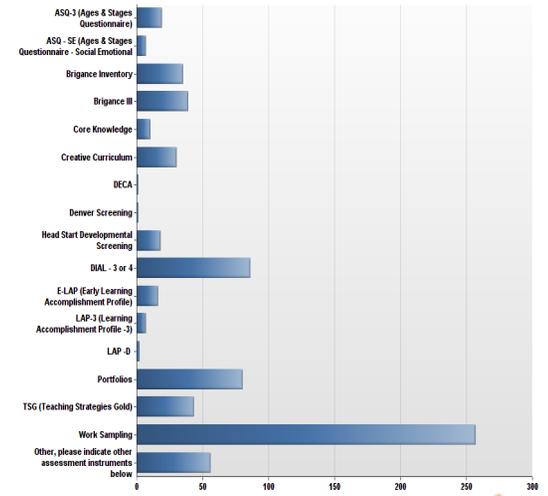
Social/Emotional



General Knowledge

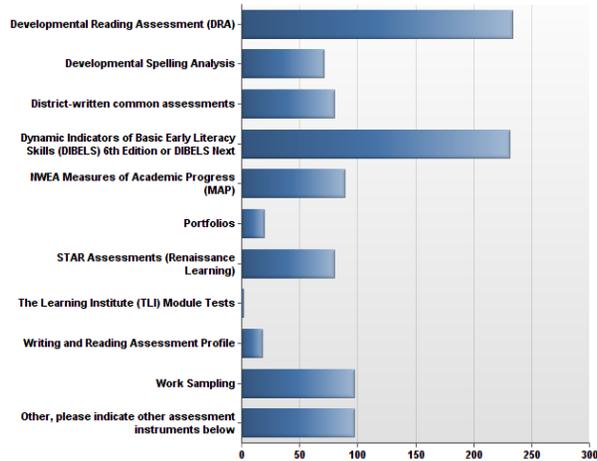


Motor Skills

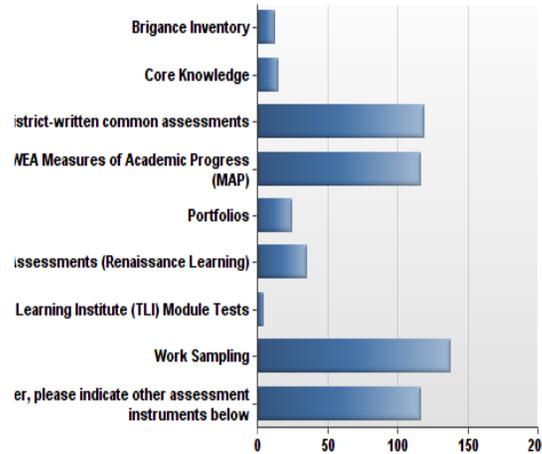


Kindergarten Early Achievement tests used

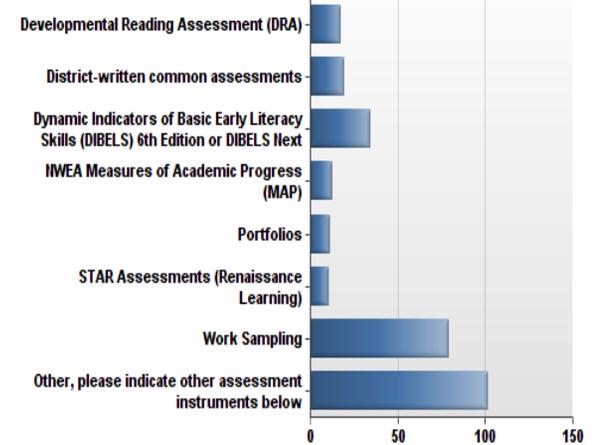
Reading Skills



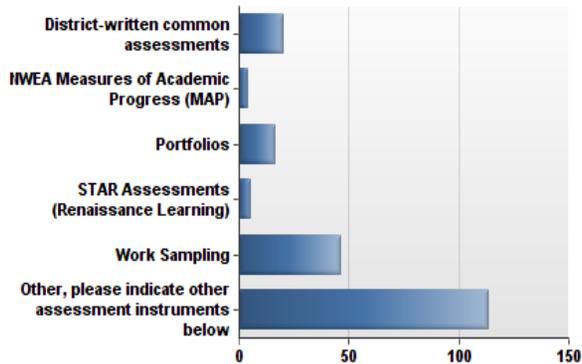
Math Skills



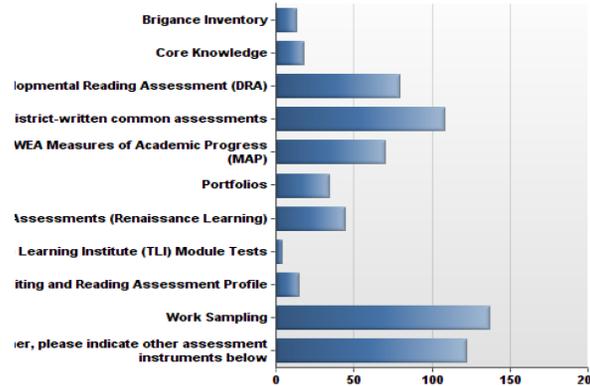
Self-Regulation



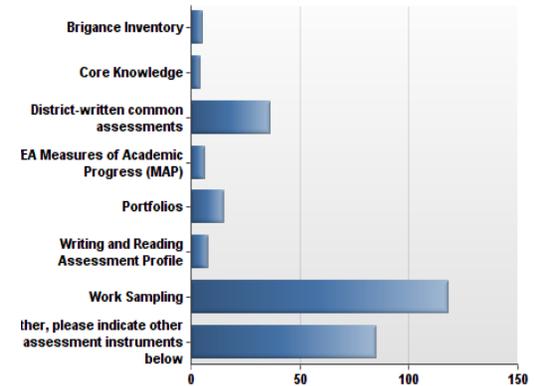
Social/Emotional



General Knowledge



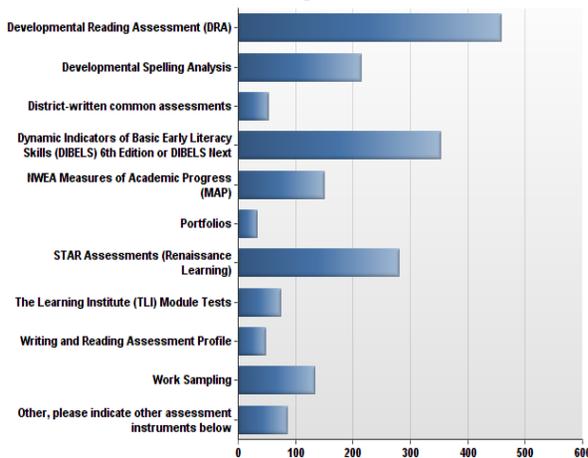
Motor Skills



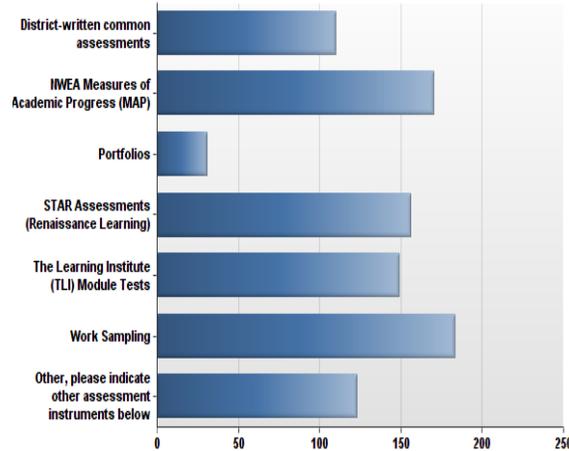
**Other responses are largely made up of the QELI, teacher produced assessments and teacher observations

1st and 2nd Grade Early Achievement tests used

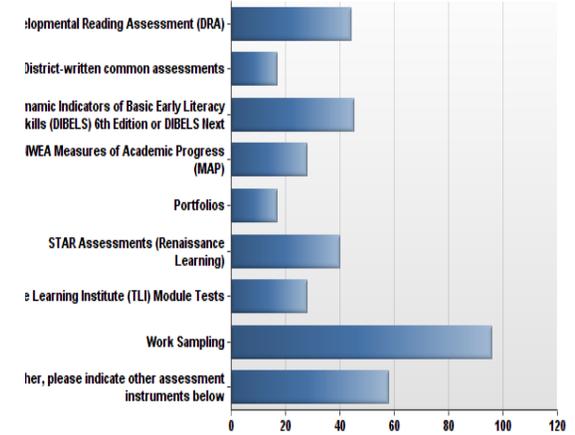
Reading Skills



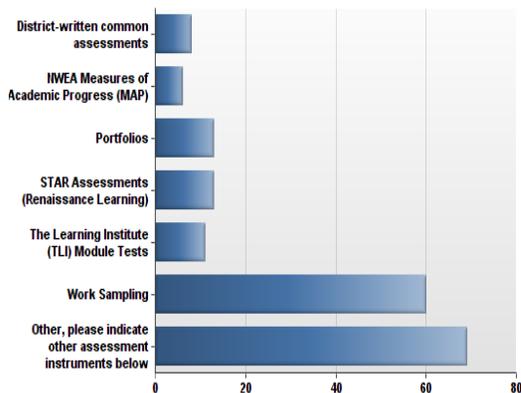
Math Skills



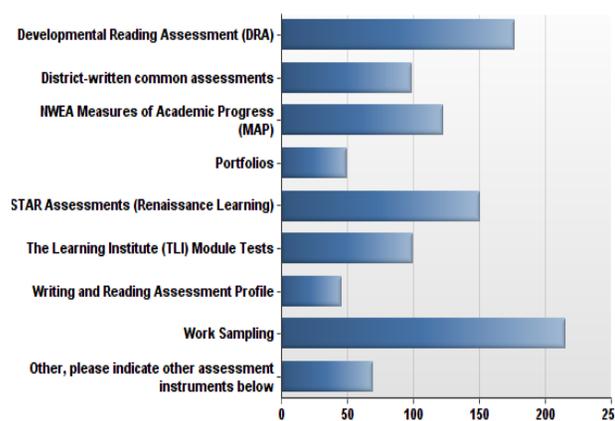
Self-Regulation



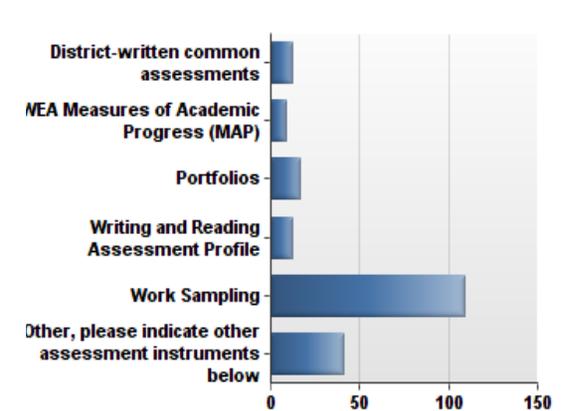
Social/Emotional



General Knowledge



Motor Skills



**Other responses are largely made up of the ITBS, DIBELS Math, teacher produced assessments and teacher observations

If the state of Arkansas were to select a new assessment what would be the most useful:

- **Pre-K teachers**

1. Screen students to determine who may need intervention/remediation, support to access grade level standards, or enrichment beyond grade level standards.
2. Provide data to inform instructional strategies for specific students or groups of students.
3. Benchmark students' growth throughout the year compared to growth of other students (norm-referenced growth)
4. Benchmark students' achievement on smaller, different chunks of standards throughout the year.
5. Benchmark students' growth throughout the year compared to standards students are expected to attain.
6. Provide data to be used for establishing score or grade reports for parents.
7. Progress monitor students every two weeks to inform intensive intervention.
8. Predict how the student will perform on grade level summative test at the end of the year.

- **Kindergarten**

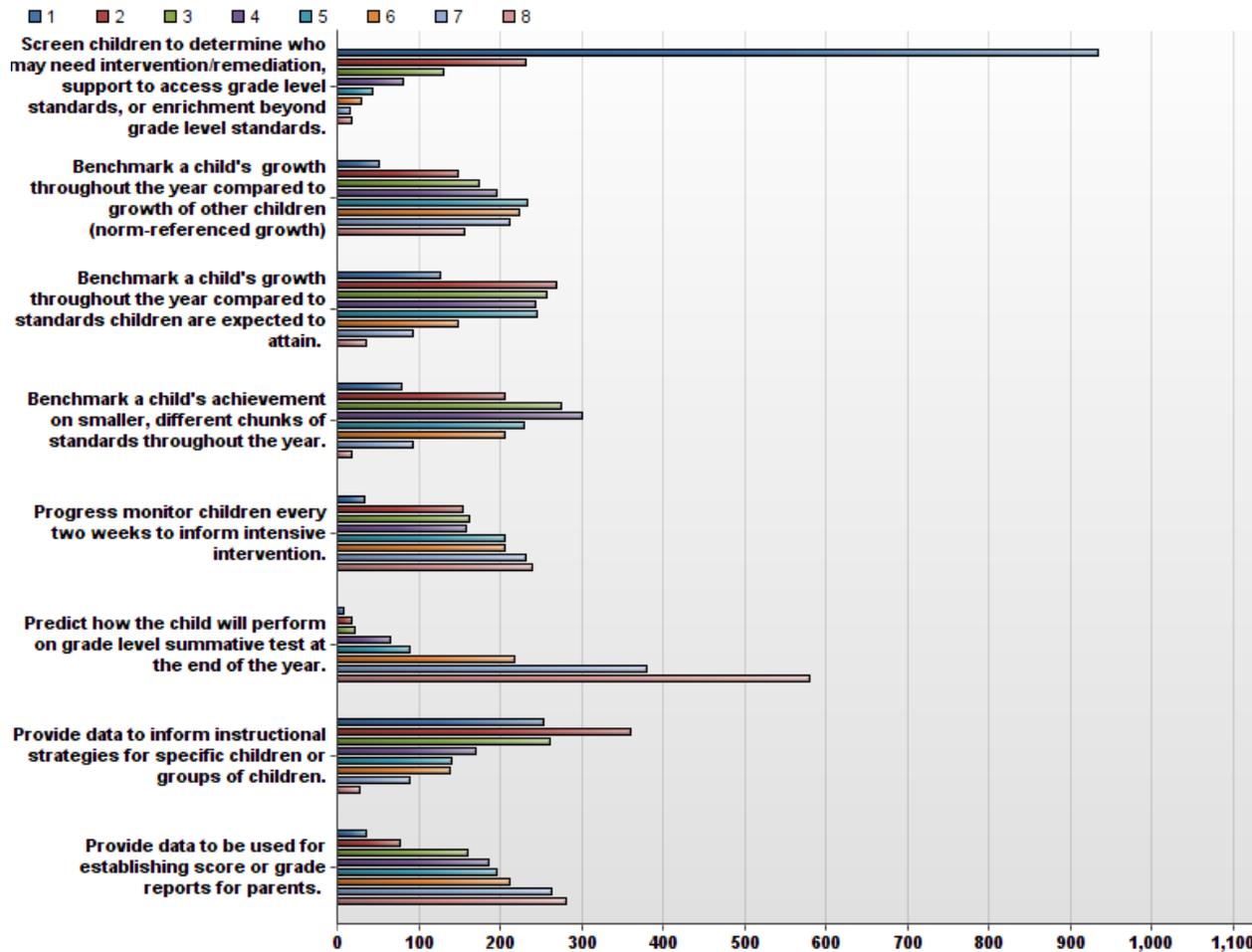
1. Screen students to determine who may need intervention/remediation, support to access grade level standards, or enrichment beyond grade level standards.
2. Provide data to inform instructional strategies for specific students or groups of students.
3. Benchmark students' growth throughout the year compared to standards students are expected to attain.
4. Benchmark students' achievement on smaller, different chunks of standards throughout the year.
5. Benchmark students' growth throughout the year compared to growth of other students (norm-referenced growth)
6. Progress monitor students every two weeks to inform intensive intervention.
7. Provide data to be used for establishing score or grade reports for parents.
8. Predict how the student will perform on grade level summative test at the end of the year.

If the state of Arkansas were to select a new assessment what would be the most useful:

- **1st and 2nd Grades**

1. Screen students to determine who may need intervention/remediation, support to access grade level standards, or enrichment beyond grade level standards.
2. Provide data to inform instructional strategies for specific students or groups of students.
3. Benchmark students' growth throughout the year compared to growth of other students (NRT)
4. Benchmark students' achievement on smaller, different chunks of standards throughout the year.
5. Benchmark students' growth throughout the year compared to standards students are expected to attain.
6. Progress monitor students every two weeks to inform intensive intervention.
7. Provide data to be used for establishing score or grade reports for parents.
8. Predict how the student will perform on grade level summative test at the end of the year.

If the state of Arkansas were to select a new assessment ...the most useful to ALL teachers



What type of support should the state provide with a new assessment by grade

	At which grade level do you currently work?				Total
	Pre-kindergarten	Kindergarten	Grade 1	Grade 2	
Professional Development on how to use the scores to adjust instruction	292	311	311	299	1213
Professional Development on how to interpret the reports	252	277	289	272	1090
Professional Development on which screeners/assessments are developmentally appropriate for PK-2	325	326	313	281	1245
Provide technical assistance to the teachers during screener/assessment administration	251	246	236	231	964
Total	402	426	388	374	1590

If students' growth scores are used to measure teacher effectiveness what would be the most important:

- **Pre-K teachers**

1. Assessment results should provide useful information to inform my instruction
2. Assessment scores should be valid and reliable
3. Growth scores should be valid and reliable
4. Compliance with state laws for AIP's and IRI's

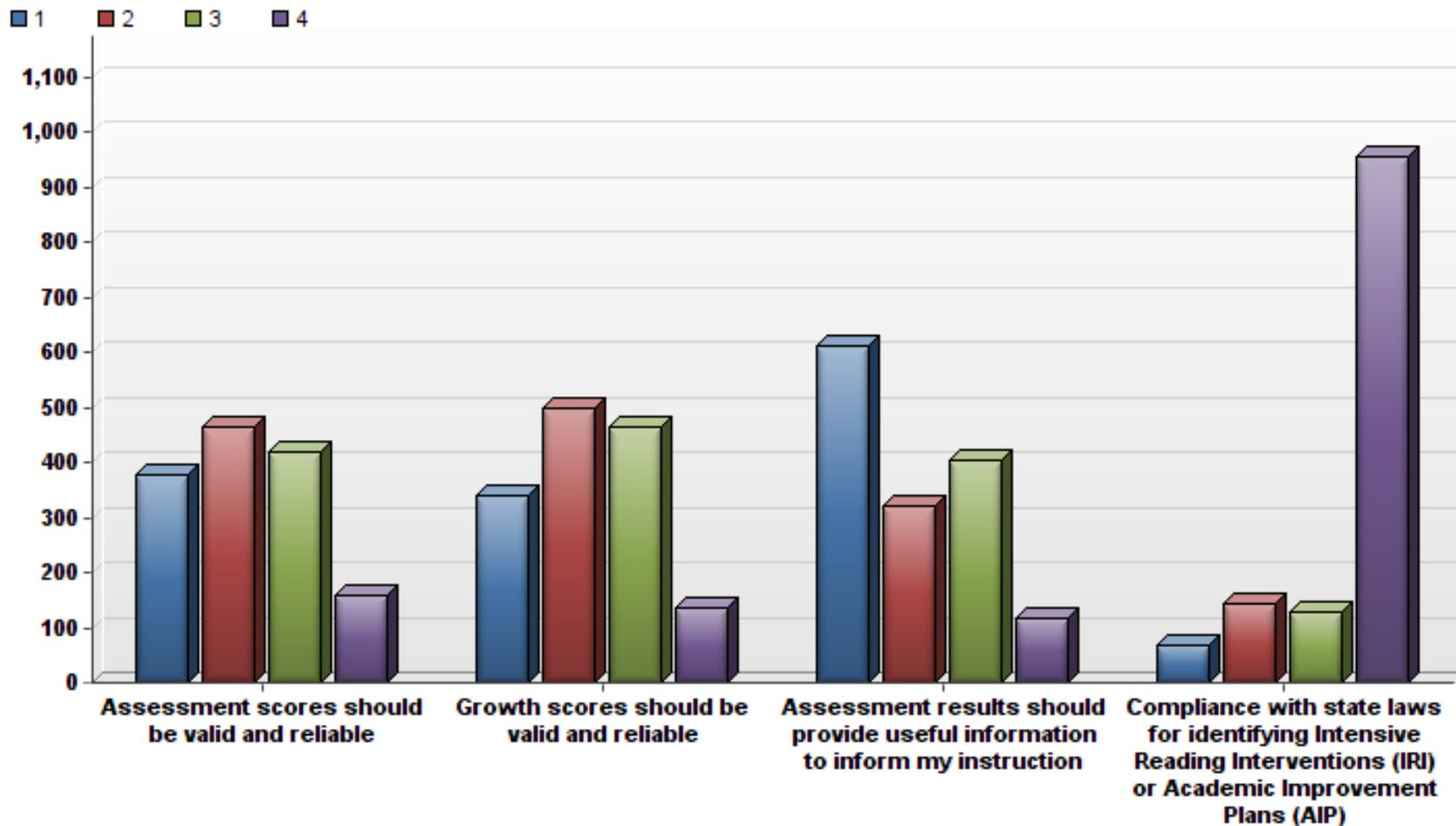
- **Kindergarten**

1. Assessment results should provide useful information to inform my instruction
2. Assessment scores should be valid and reliable
3. Growth scores should be valid and reliable
4. Compliance with state laws for AIP's and IRI's

- **1st and 2nd Grades**

1. Assessment results should provide useful information to inform my instruction
2. Growth scores should be valid and reliable
3. Assessment scores should be valid and reliable
4. Compliance with state laws for AIP's and IRI's

If students' growth scores are used to measure teacher effectiveness what would be the most important to ALL teachers?



Other Comments

- The common themes for these comments included:
 - Time concerns: too much time testing not enough teaching
 - Concerns about how the current assessments are not developmentally appropriate
 - Concerns that the current assessments do not align with what is being taught at that grade level
 - Concerns about TESS



Academic Distress Recommendation Development Process

**Blytheville Middle School
Jacksonville Middle School
Dermott High School**

Once a school is classified as in “Academic Distress,” the assistant commissioner for the Public School Accountability Division authorizes the selection of a site review team. This task is delegated to the program manager of the School Improvement Unit. School improvement specialists within the unit are assigned to serve as members of the site review team. The onsite review and subsequent recommendations are completed within 60 days of the official announcement of the school’s “Academic Distress” classification. In preparation for the required site review, team members are tasked with reviewing available data related to the school and/or district. Additionally, team members collaboratively review the purpose for the visit, analyze the intent of interview questions, and review protocols for conducting the review.

Data Review

Prior to conducting the onsite review, school improvement specialists are assigned to serve as members of a data analysis team. Members of this team are tasked with summarizing state assessment data and/or ADE reports such as Scholastic Audit. The site review team collaboratively reviews these data to confirm or dispute previously-reported concerns have been addressed. The data analysis team also reviews the school’s current ACSIP in order to identify interventions included in the plan and whether expenditures included in the plan are targeted or generic in nature. Questions may be identified by the data analysis team and provided to the onsite review team for clarification.

Onsite Review

The team follows a standard set of questions (Appendices A, B, C) and uses a protocol in which responses to initial inquiries are followed with additional questions to better understand systems currently in place at the school.

The onsite review team interviews the following focus groups:

1. District Leadership Team and Internal/External School Improvement Specialists:
As the district leadership team and specialists are interviewed, site review team members seek to determine the district’s approach for addressing key indicators for school improvement. Indicators include the principal’s ability to lead a school turnaround process and the targeted support provided by the district.

2. **School Leadership Team:**
The site review team members attempt to uncover the purpose, structure, practices, and goals of the school's improvement efforts through interviews with members of the school leadership team. Questions are intended to determine currently-implemented interventions designed to improve student outcomes, how these interventions were selected, what training is provided, and how effectiveness of these interventions is monitored and evaluated.
3. **Instructional Facilitators:**
During interviews with instructional facilitators, team members seek to understand the support that is provided to teachers and levels of collaborative planning among instructional teams. Additionally, team members seek to obtain information regarding assessment practices, including the primary types and use of assessments and teachers' willingness to engage in analyses of student progress and achievement compared to personal instructional practices.
4. **Representative Teacher and Student Groups:**
Questions asked of teacher and student focus groups are intended to define the school's climate and culture. Support provided to teachers, safety and academic support for students, and teacher and student voice are a few of the topics addressed during these focus group interviews.
5. **Principal and/or Administrative Team:**
The purpose of the principal interview is to confirm congruity between district and school leadership's perceptions of support for reaching school improvement goals. Additionally, the principal's responses provide evidence of his/her knowledge of and experience in the science of school turnaround.

In addition to these interviews, the site review team may conduct a campus walk-through, but does not visit classrooms. School leadership is asked to complete a self-evaluation (Appendix D) of the school's current status related to key turnaround capacity indicators. This self-assessment is then compared and contrasted with results from onsite observations and interviews and data analyses conducted by the ADE site review and data analysis teams.

Recommendation Development

Following the onsite review, team members meet with data analysis team members to debrief and crosswalk findings. During this reflective conversation, the following essential questions are considered:

- Do the principal and leadership team members have the capacity to lead a school turnaround effort? How can necessary capacity be built?
- Is district leadership prepared to provide additional support? How?
- Is a system in place to monitor school improvement efforts and provide interventions if necessary?

- Has a plan been developed that defines the following key indicators for school improvement?
 - A vision collaboratively developed with representatives from all stakeholder groups that is reasonably calculated to create buy-in across the school community
 - Measurable levels of improvement anticipated
 - Roles and responsibilities of school and district leaders in the school improvement process
 - Research-based school improvement interventions that will be implemented to improve student outcomes, especially those of students who perform below proficient levels
 - Specific tools for monitoring levels of implementation grounded in student assessment
 - Methods for evaluating effectiveness of interventions.

Team members consider the school's current plan to determine the need for narrowed focus, modification, or complete redesign.

Based upon school improvement needs identified through the data review and onsite visit, team members consider various interventions and expected outcomes to determine two to five school-specific recommendations based on school turnaround research.



ARKANSAS DEPARTMENT OF EDUCATION

Johnny Key
Commissioner

April 13, 2015

**State Board
of Education**

Dear Mr. Atwill,
Superintendent of Blytheville School District

Sam Ledbetter
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Chair*

Toyce Newton
*Crossett
Vice Chair*

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Newport

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Diane Zook
Melbourne

As you are aware, your district has a school (or schools) identified to be in "Academic Distress" per the Arkansas Department of Education Rules Governing the Arkansas Comprehensive Testing, Assessment and Accountability Program (ACTAAP) and the Academic Distress Program, Revised September 2014.

Section 10 of the Arkansas Department of Education Rules Governing the Academic Distress Program required a team of educators evaluate the public school's need for technical assistance and make written recommendations to the public school and the public school district. Attached is the set of recommendations developed from the required data review in combination with an onsite review.

The recommendations are not intended to be a list of activities for compliance implementation, but rather guidance to strengthen key processes of school improvement. In addition to the recommendations, the School Improvement Unit of the Public School Accountability Division of the Arkansas Department of Education has been assigned to provide technical assistance and or to broker Department expertise as resources to provide technical assistance to the school and district.

A copy of the recommendations will be posted to the May 15, 2015, State Board of Education public meeting agenda. The meeting will begin at 9 a. m. and the recommendations will be discussed with the State Board. Questions may be asked at this meeting that the Superintendent and or School Leader might want to respond to as it relates to present plans of action being taken to move a school or district out of the classification of "Academic Distress".

If you have questions or would like further clarification related to the recommendations, please do not hesitate to contact Dr. Richard Wilde at 501-683-3434.

Respectfully submitted,

A handwritten signature in blue ink, appearing to read "M. Annette Barnes".

M. Annette Barnes, Assistant Commissioner
Public School Accountability

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ARKANSAS
DEPARTMENT
OF EDUCATION

**ACADEMIC DISTRESS ADE EVALUATION TEAM
RECOMMENDATIONS
BLYTHEVILLE MIDDLE SCHOOL**

Date: April 13, 2015

District: Blytheville School District

School: Blytheville Middle School

School Improvement Team Members: Dr. Richard Wilde, Roxie Browning, Pam Clark, Charlotte Earwood, Dr. Mitzi Smith and LaDonna Spain

School Improvement Specialist: To Be Determined

The following recommendations are based on research that indicates, when implemented with fidelity, there is a high probability of achieving school improvement goals. However, implementation of these recommendations does not guarantee immediate removal of Academic Distress status. Recommendations are not listed in order of priority.

Sources	Evidence/Background/Findings	Recommendations
<p>Interviews Team Meeting Agendas, Minutes, and Work Products</p>	<p>Members of the school leadership team reported data regarding school improvement efforts have not been systematically analyzed to determine effectiveness (pre-advanced placement courses, special education services, and Tier II interventions, etc.)</p> <p>While the leadership team collects and reviews data sources, no evidence of deep data analyses and program evaluations was evident during the site visit.</p>	<p>Recommendation 1: <u>School leadership will develop and implement a system for the effective use of data to inform all school improvement decisions and efforts.</u></p> <p>Clarification: The system will include procedures for analyzing data (i.e., student achievement; personnel recruitment and retention; professional development programs; leader and teacher evaluation results; aligned, standards-based curriculum; instructional and assessment strategies, community and family engagement; and student groupings and services) to evaluate the level of effectiveness of efforts and interventions to improve student outcomes.</p>

Sources	Evidence/Background/Findings	Recommendations
Interviews	<p>Members of the leadership team identified high teacher turnover as a concern/barrier to improved student outcomes; however, no data regarding teacher recruitment, retention, and/or separation have been systematically collected and analyzed for the purpose of stabilizing staff and/or having cumulative benefit from professional learning.</p>	<p>Recommendation 2: <u>School leadership, in collaboration with district administration, will plan and implement a program designed to recruit, induct, and retain high-quality employees for all employment categories within the school/district.</u></p> <p>Clarification: The plan will identify the following:</p> <ul style="list-style-type: none"> • an induction system that accelerates the assimilation of new staff • specific monthly activities related to recruitment, induction, and retention • quarterly evaluation of the activities • an analysis of the reasons teachers leave the district or remain.

Sources	Evidence/Background/Findings	Recommendations
<p>Interviews Team Meeting Agendas, Minutes, and Work Products Scholastic Audit Report</p>	<p>Staff members indicated the school has created a leadership team and content-area professional learning communities (PLCs); however, instructional teams (PLCs) do not provide student learning data related to units of instruction to the leadership team.</p> <p>Members of the leadership team indicated the school has not created structured parent/community or student teams to collect input regarding decision-making related to school improvement efforts.</p> <p>Evidence provided by the school leadership team during the site visit was consistent with a finding in the 2009 Scholastic Audit Report that stated, "All stakeholders are not involved in decision-making regarding teaching and learning."</p>	<p>Recommendation 3: <u>School leadership will implement a team structure that supports student learning and improved achievement as its primary purpose.</u></p> <p>Clarification: The leadership team is the recipient of data from instructional teams and provides guidance and support for improved student outcomes. Instructional teams are the primary source for planning, implementing, and assessing teaching and learning. In addition to instructional teams, the leadership team also develops a structure of support teams that include parent teams, student teams (when appropriate) and community teams.</p>

Sources	Evidence/Background/Findings	Recommendations
<p>ESEA IMO Quarterly Reports</p> <p>School Report Card</p> <p>Interviews</p> <p>ACSIP</p>	<p>As reported in the 2014-2015 ACSIP and confirmed during school and district interviews, a majority of students are reading significantly below grade level.</p> <p>"All Students" math data from the last three years of state assessments indicate a downward trend:</p> <ul style="list-style-type: none"> • 2012: 55.99% proficient and advanced • 2013: 52.37% proficient and advanced • 2014: 38.78% proficient and advanced <p>The high number of interventions and actions included in the 2014-2015 ACSIP reflects a sense of urgency regarding school improvement efforts. However, evaluation actions related to these interventions are not systematically completed.</p> <p>Concerns identified in the ESEA IMO Quarterly Report and verified during interviews with staff indicate that, based on recent STAR assessments, 65% of entering sixth-graders, 74% of entering seventh-graders, and 75% of entering eighth-graders read two or more levels below grade. Additionally, it was reported and verified that 32% of all students perform two or more levels below grade in math.</p>	<p>Recommendation 4: <u>School leadership, in collaboration with district administration, will facilitate an analysis of current English/language arts and math curricula across all grade levels and articulate in writing the process for deep curriculum alignment.</u></p> <p>Clarification: An aligned curriculum will address state and local standards, courses of study, pacing guides, instructional unit plans, daily lesson plans, and assessment and instructional strategies. The primary assessment of student learning will occur following the completion of each instructional unit (approximately two – three weeks) by the instructional team that is responsible for the planning and implementing instruction. This assessment will result in interventions for students who need additional support to master standards and enrichment for students who have mastered unit standards. The focus on unit assessments does not preclude the need for ongoing, daily, formative assessments within a classroom or assessments that occur at longer intervals, such as quarterly or semester exams. Leadership will regularly evaluate the process and determine the need for modifications.</p>

**Academic Distress
Rationale for Recommendations
Blytheville Middle School**

The ADE onsite review team conducted a review of various data sets prior to an onsite visit to Blytheville Middle School, and identified key findings related to school improvement needs. The onsite review was conducted on March 3, 2015, and members of the onsite review team identified key findings from interviews with numerous focus groups related to school improvement needs. Based on collaborative analysis of all findings the team identified four research-based recommendations to the school that support school improvement efforts.

Recommendation: School leadership will develop and implement a system for the effective use of data to inform all school improvement decisions and efforts.

Rationale/Explanation: The Onsite Review Team found that school and district leaders collected data from various sources that, on the surface, appear to inform school improvement efforts. A structure for collecting and analyzing data is in place. However, there was little evidence that the data was systematically analyzed to yield evaluative decisions about the school's improvement efforts, such as interventions to support student learning, instructional programs, methods of assessing student learning, and schedule development. This recommendation is intended to guide school leadership to utilize the existing structure to develop and implement a formal, systematic process to collect and analyze from all relevant sources in order to inform all school improvement decisions.

Recommendation: School leadership, in collaboration with district administration, will plan and implement a program designed to recruit, induct, and retain high-quality employees for all employment categories within the school/district.

Rationale/Explanation: District and school leadership indicated high teacher turnover is a barrier to improving student outcomes. District leaders pointed out this same barrier applies to the high school. As a result, district leaders conducted informal exit interviews when teachers left the district. However, little evidence was provided to indicate this practice was consistently implemented and that information gleaned from interviews was used to inform recruitment, induction, and retention practices. These human resource functions require efforts at both the district and school levels. This recommendation is intended to guide district and school leadership to develop a systematic process for the recruitment, induction, and retention of quality staff are data based and consistently evaluated for effectiveness.

Recommendation: School leadership will implement a team structure that supports student learning and improved achievement as its primary purpose.

Rationale/Explanation: A team structure is in place at Blytheville Middle School. Leadership teams have been established at the district and building levels. These teams conduct approximately two meetings every month. Instructional teams, comprised of content-area teachers and instructional facilitators, have been established at the school. The master schedule includes one period each day for instructional teams to meet. Instructional teams do not collaboratively analyze classroom-level assessment data to determine instructional next steps. No structured parent and community team or student team has been established to collect input regarding school improvement efforts. This recommendation is intended to guide school leadership to expand the current team structure to include a parent/community team and an avenue for student voice, when appropriate, as well as ensuring each team understands its purpose and scope of work.

Recommendation: School leadership, in collaboration with district administration, will facilitate an analysis of current English/language arts and math curricula across all grade levels and articulate in writing the process for deep curriculum alignment.

Rationale/Explanation: District and school staff reported that a substantial number of students throughout the district read and solve math problems at levels significantly below grade-level expectations. This recommendation is intended to guide leadership's development of a systematic process for verifying implementation of the written curriculum and the depth of curriculum alignment.

**Academic Distress
Data Review Key Findings
Blytheville Middle School**

Members of the ADE Data Review Team for Blytheville Middle School were Dr. Sally Robison, Richard Myrick, and Dr. Robert Toney. This team was tasked with summarizing various data sets and reporting key findings to the ADE Onsite Review Team prior to that team's visit to the school.

Data sources include the following:

- District, elementary, and middle school report cards for 2011-2013
- Arkansas ESEA Accountability Reports for the middle school and district from 2012-2014
- Arkansas Consolidated School Improvement Plans (ACSIP) for 2013-14 and 2014-2015
- Scholastic Audit Report from 2009
- Arkansas Department of Education (ADE) Quarterly ESEA Interim Measurable Objectives Reports
- Blytheville School District website

Highlights from the data review include the following:

- District enrollment declined by 409 students between the 2009-2010 and 2012-2013 school years. Blytheville Middle School reported a drop of 82 students in 2012-2013.
- Blytheville Middle School was reconfigured from grades 7-8 to grades 6-8 to begin the in 2013-2014 school year.
- The percentage of students eligible for free and reduced meals reported on the district's school report card for 2013-2014 exceeds 82.9%.
- The percentages of students graduating and the student attendance rate were near the state averages. The 2013 graduation percentage was 83.9% and the district's attendance rate was 92.1%.
- The 2012 to 2014 ESEA Accountability reports benchmark percentages for all students who scored proficient and advanced were as follows:

Subject	2011-12	2012-13	2013-14
Literacy %	52.47	54.76	47.14
Mathematics %	55.99	52.37	38.78

- From the district's report cards and ACSIP report, a longitudinal analysis of literacy and mathematics percentages for all students scoring proficient and advanced is noted below:

Subject	2009-2010	2010-2011	2011-2012	2012-13	2013-14
Literacy 6	XX (2 nd)	51 (3 rd)	72.2 (4 th)	54.94 (5 th)	48 (6 th)
Literacy 7	49.8 (3 rd)	62.3 (4 th)	67.4 (5 th)	48.92 (6 th)	46 (7 th)
Literacy 8	62.1 (4 th)	43.6 (5 th)	48.3 (6 th)	46.97 (7 th)	32 (8 th)

Subject	2009-2010	2010-2011	2011-2012	2012-13	2013-14
Math 6	XX (2 nd)	71.8 (3 rd)	64.1 (4 th)	33.95 (5 th)	33 (6 th)
Math 7	64.7 (3 rd)	66.5 (4 th)	59 (5 th)	45.45 (6 th)	39 (7 th)
Math 8	68.5 (4 th)	59.7 (5 th)	50.3 (6 th)	48.48 (7 th)	35 (8 th)

- From the 2013-14 ESEA Accountability report, White students outperformed the African American students in both literacy and mathematics. A 22.54% literacy gap between White (64.84%) and African American students (42.30%) was identified. A 24.40% mathematics gap between White (58.16%) and African American students (33.76%) was identified. Of those taking the 2014 test, approximately 19% were identified as White and 78% as African American.
- The 2012-13 school report card identified the graduation rate for Students with Disabilities as 86.2%. The middle school attendance rate for Students with Disabilities was 95.3%. The percentage of Students with Disabilities who scored proficient and advanced in literacy and math from the ESEA Accountability report follow:

Item	2010-11	2011-12	2012-13
SPED Literacy %	11.32	13.51	6.25
SPED Math %	13.21	16.22	1.56

- The school report cards from 2010-11 to 2012-13 indicated approximately 100 Advanced Placement exams are taken per year. Yearly percentages range between 0% (2013-14) and 6% (2010-11) for students earning a grade of 3 or higher.

**Academic Distress
Onsite Review Key Findings
Blytheville Middle School**

The Arkansas Department of Education onsite review team visited Blytheville Middle School on March 3, 2015. The team consisted of Dr. Robert Toney, Dr. Richard Wilde, Dr. Mitzi Smith, Ms. Pam Clark, Ms. Roxie Browning, and Ms. Charlotte Earwood. The purpose of the visit was to conduct interviews with numerous focus groups in order to understand systems currently in place at the school. Key findings gleaned from the onsite review, along with key data findings, identified prior to the onsite review, were essential to the development of four school-specific recommendations that support implementation of research-based school improvement interventions.

The Arkansas Department of Education-School Improvement Unit team sought to determine the effectiveness of the school's use of data to inform school improvement decisions. A common theme was apparent during interviews with several of the focus groups. The ADE team found that, while the school collected data from various sources, the thorough analysis of the data was missing. In the absence of an effective analysis of the data, it was impossible for the school to use the information to develop informed decisions concerning their improvement efforts. The ADE team found that there were numerous interventions or programs used at the school, however the school focus groups were unable to tell how or why such programs were selected and there was little information available to describe the effectiveness of specific instructional interventions. The school could not produce a systematic plan for the evaluation of the interventions in place and, therefore could not make informed decisions concerning whether to continue or eliminate a specific program.

The limited effectiveness of the school's use of data was also apparent during conversations with the focus groups concerning other topics. The school and district leaders stated that high rates of teacher turnover were a barrier to consistent improvement in student outcomes. This was identified as a barrier at the middle school as well as at the high school. The campus and district leaders could point to an exit interview for departing teachers as the only source of data regarding teachers who left the district. The district leaders revealed that there was a lack of a systematic plan for collecting information about hiring practices, effective supports for new employees, or why teachers would either remain in the district or chose to leave. Without a plan to secure this information, the district's efforts to reduce the teacher turnover rate was, at best, sporadic.

The school focus groups described a team structure utilized in the school that included a leadership team and instructional teams comprised of teachers and instructional facilitators. These teams conduct regularly scheduled meetings and work from agenda and minutes. However, the limited use of data also reduced the teams' ability to effectively improve student outcomes. The instructional teams did not collect student learning data based on short term instructional units and, therefore could not

communicate this information to the leadership team. Without access to current student learning data, the leadership team could not identify concerns nor provide support to the instructional teams. The team structure, as described by the campus focus groups, did not include a parent-community team nor did the school have a vehicle to allow for student input.

The student achievement data revealed that a significant percentage of students' reading and math levels were well below their grade level expectations. During the interviews this was identified as a concern for the entire district. The school and district leaders reported that efforts to analyze the district curricula for literacy and math had been initiated. A plan to evaluate the congruency of the written curriculum and the taught curriculum had not been developed. The curriculum analysis and development initiative will examine the entire district curricula and instructional programs for literacy and math, with the goal to produce an aligned curriculum, classroom instruction, and assessment plan that can be systemically monitored.

The district leadership team was more knowledgeable of the turnaround process than many other school leaders. Their knowledge level of the district's concerns and the turnaround principles that could lead to improvement allowed the ADE team to develop recommendations that reflected this advanced knowledge. The Superintendent of Schools clearly "owned" the district's current status and a sense of urgency was evident from the district and campus leaders.



ARKANSAS DEPARTMENT OF EDUCATION

Johnny Key
Commissioner

April 13, 2015

State Board
of Education

Dear Dr. Guess,
Superintendent of Pulaski County Special School District

Sam Ledbetter
Little Rock
Chair

Toyce Newton
Crossett
Vice Chair

Dr. Jay Barth
Little Rock

Joe Black
Newport

Kim Davis
Fayetteville

Alice Mahony
El Dorado

Mireya Reith
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Vicki Saviers
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Diane Zook
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As you are aware, your district has a school (or schools) identified to be in "Academic Distress" per the Arkansas Department of Education Rules Governing the Arkansas Comprehensive Testing, Assessment and Accountability Program (ACTAAP) and the Academic Distress Program, Revised September 2014.

Section 10 of the Arkansas Department of Education Rules Governing the Academic Distress Program required a team of educators evaluate the public school's need for technical assistance and make written recommendations to the public school and the public school district. Attached is the set of recommendations developed from the required data review in combination with an onsite review.

The recommendations are not intended to be a list of activities for compliance implementation, but rather guidance to strengthen key processes of school improvement. In addition to the recommendations, the School Improvement Unit of the Public School Accountability Division of the Arkansas Department of Education has been assigned to provide technical assistance and or to broker Department expertise as resources to provide technical assistance to the school and district.

A copy of the recommendations will be posted to the May 15, 2015, State Board of Education public meeting agenda. The meeting will begin at 9 a. m. and the recommendations will be discussed with the State Board. Questions may be asked at this meeting that the Superintendent and or School Leader might want to respond to as it relates to present plans of action being taken to move a school or district out of the classification of "Academic Distress".

If you have questions or would like further clarification related to the recommendations, please do not hesitate to contact Dr. Richard Wilde at 501-683-3434.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "M. Annette Barnes".

M. Annette Barnes, Assistant Commissioner
Public School Accountability

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**ACADEMIC DISTRESS ADE EVALUATION TEAM
RECOMMENDATIONS
JACKSONVILLE MIDDLE SCHOOL**

Date: April 14, 2015

District: Pulaski County Special School District

School: Jacksonville Middle School

School Improvement Team Members: Dr. Richard Wilde, Roxie Browning, Pam Clark, Charlotte Earwood, Dr. Mitzi Smith, and LaDonna Spain

School Improvement Specialist: To Be Determined

The following recommendations are based on research that indicates, when implemented with fidelity, a high probability of achieving school improvement goals exist. However, implementation of these recommendations does not guarantee removal of Academic Distress status. Recommendations are not listed in order of priority.

Sources	Evidence/Background/Findings	Recommendations
2014-15 ACSIP 2010 Scholastic Audit ESEA Accountability Reports School Report Card Interviews	<p>District-level administrators indicated that the teacher turnover rate at Jacksonville Middle School is at least 20% annually. Additionally, the school has had five principals in the last four years.</p> <p>Staff members also reported multiple principals, as well as multiple plans for school improvement during the past three years.</p> <p>Staff members reported the lack of improvement in student achievement is due to a lack of parent involvement and student motivation.</p> <p>Student interviews revealed most believe their school is a "bad school." Students recommended hiring additional security staff.</p> <p>The assigned interim principal has limited experience in schools with low student achievement.</p> <p>Several testimonial accounts also indicated that the strongest teachers are not typically recruited to teach at the school.</p> <p>The Advanced Executive Summary dated March 8, 2013, lists areas of improvement for leadership to address which include the following:</p> <ul style="list-style-type: none"> • impassivity of teachers • low teacher efficacy • lack of a sense of urgency • culture of low expectations <p>(continued on page 3)</p>	<p>Recommendation 1: Prior to the 2015-2016 school year, the school leadership team and representatives from district administration will meet with ADE School Improvement Unit personnel to develop for implementation a systemic plan for improving student outcomes that will be monitored quarterly for fidelity of implementation.</p> <p>Clarification: The systemic plan will include, but not be limited to the following:</p> <ul style="list-style-type: none"> • a quantifiable school vision • roles and responsibilities of leadership personnel • research-based innovations aligned to improve school culture and climate • actions to ensure development of high-quality staff • quarterly objectives to measure progress toward meeting school improvement goals outlined in the plan • data to be collected, analyzed, and reported quarterly to the State Board of Education.

	<p>The 2010 Scholastic Audit Report includes the following findings:</p> <ul style="list-style-type: none"> • School leadership has not established and communicated high academic and behavioral expectations for all administrators, faculty, and students. • The committees for discipline equity monitoring and school climate have little impact on resource allocations at the building level. • The school's mission statement does not serve as the guiding focus for all instructional decisions. <p>The ADE Evaluation Team validated these findings from AdvanCED, and Scholastic Audit reports through a review of relevant data, as well as interviews and observations conducted during the on-site visit.</p>	
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Sources	Evidence/Background/Findings	Recommendations
2014 ACSIP 2010 Scholastic Audit ESEA Accountability Reports School Report Card Interviews	<p>Two consecutive years (2013 and 2014) scores fell below 49.5% in math and literacy for <i>All Students</i>.</p> <p>Three consecutive years (2012-2014) the <i>Targeted Achievement Gap Group</i> fell below 51% in math and literacy.</p> <p>Two consecutive years of data for <i>Students with Disabilities</i> reveals a downward trend in mathematics (11.24% in 2013 to 10.98% in 2014) and a slight upward trend in literacy (9.09% in 2013 to 12.20% in 2014).</p> <p>Members of the leadership team reported the school implemented a planned intervention time for all students which focuses on one content area per day. The school leadership team could not identify research that would suggest this strategy might be effective. No data has been collected or analyzed to measure growth in student performance or instructional effectiveness.</p> <p>The leadership team was reconstructed in December of 2014 and no training was provided for new members.</p>	<p>Recommendation 2: School leadership will fully implement a team structure for producing and analyzing relevant data, and use results from these analyses to inform all decisions relating to student achievement, instructional programs, pedagogy, school culture and climate, and parent-community engagement.</p> <p>Clarification: The team structure will be grounded around the school's instructional teams. Support teams will include a leadership team, a community-parent engagement team, and a team designed for student voice. Teachers will be organized into instructional teams to collaboratively plan units of instruction with differentiated lessons and set goals for student growth to be measured within the planned instructional unit. Instructional team members will analyze unit pre-/post-assessment data and submit findings to the school leadership team. The school leadership team will use data submitted by instructional teams to evaluate effectiveness of instructional programs and identify areas for improvement. The school leadership team will communicate data analysis results, findings, and steps for improvement to the staff on a regular basis.</p>

(continued on page 5)

	<p>Interviews among district and building leadership, faculty, students, and staff members at the school revealed a need for a plan for the following:</p> <ul style="list-style-type: none"> • address the school culture and climate • a school-wide instructional plan inclusive of providing teachers with more explicit support for implementing district-wide systems • a follow-through strategy of analysis and evaluation of instructional programs and professional development. <p>Various building-level staff members reported a lack of consistent program implementation within the district.</p>	
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**Academic Distress
Rationale for Recommendations
Jacksonville Middle School**

The ADE Onsite Review Team conducted a review of various data sets prior to an onsite visit to Jacksonville Middle School (JMS), and identified key facts related to school improvement needs. The onsite review was conducted on March 10, 2015, and members of the onsite review team interviewed key groups within the school. From the interviews, key information and perceptions related to the school and reasons for being in Academic Distress were collected. Based on analysis of all key points of information the ADE Review team identified two initial recommendations for the school.

Recommendation: Prior to the 2015-2016 school year, the school leadership team and representatives from district administration will meet with ADE School Improvement Unit personnel to develop for implementation a systemic plan for improving student outcomes that will be monitored quarterly for fidelity of implementation.

Explanation: Jacksonville Middle School has had multiple principals in the past five years. No principal has stayed long enough for a turnaround plan to be developed collegially with staff and then fully implemented. Thus, the staff reports a feeling tone of reluctance to embrace another set of new ideas; and, there is disbelief that the next principal will be there long enough for any meaningful change to occur. The school's current principal was assigned during late fall of 2014. He has been an assistant principal at other schools within the district, but is a first year principal and has minimal background in school turnaround. The ADE Onsite Review Team concluded that his primary role for this year was to maintain management of the school and the safety of the children and staff. JMS will become part of the newly-defined "Jacksonville" area School District in 2016. The school will be relocated to other sites each of the next two years and staff has not yet been selected. Leadership of Pulaski County Special School District and the Interim Planning Superintendent for Jacksonville have committed to the concept the Principal hired for the 2015-16 school year will remain with the school during the transition.

In interviewing the school leadership team, it was noted that the new principal restructured the team but no training had yet been provided related to purpose, parameters for decision making, and/or expectations. The ADE Review Team found that for the most part, the school staff lacked a school improvement focus, measurable objectives, or knowledge of how to create a systemic plan for improving student outcomes. Over the last three years, the highest percent of students scoring proficient within the TAGG population was in 2012 at 50.74 percent for literacy. The school has not been identified as a Focus or a Priority School and therefore no targeted support

under the ESEA Flexibility Waiver has been provided and no capacity development plan has been developed.

Therefore, the ADE Review Team concluded that most important activity to correspond with the school's new start at a new location was to have a comprehensive plan in place by the start of the school year so that the new Principal could focus on implementation of a plan and so that the assigned ADE School Improvement Specialist could assist with fidelity of implementation rather than spending months working to create a plan.

Recommendation: School leadership will fully implement a team structure for producing and analyzing relevant data, and use results from these analyses to inform all decisions relating to student achievement, instructional programs, pedagogy, school culture and climate, and parent-community engagement.

Explanation: Teachers reported low trust for the district leadership, low morale, and a general sense of helplessness. District leadership acknowledged that providing the level of needed support was a challenge. Everyone reported that transition to a new district complicated the establishment of a collegial approach.

The ADE Onsite Review Team concluded that the most important action in addition to the implementation of a well thought out plan was the creation of a team structure to support the classroom teacher, and thus, the students. Since school improvement occurs from the classroom out, the focus of the instructional teams, building level leadership team, and the district leadership team must be on supporting and evaluating the day to day learning in the classroom. Rather than the district deciding on the professional development, the instructional teams should be assesses and analyzing the learning occurring on a frequent basis (3 to 4 times per quarter). Based on student progress, teachers would be receiving support and professional development. This would occur by the analysis of instruction passing from the instructional team to the leadership team who would then direct available supports and resources to help individual teachers improve his/her outcomes.

**Academic Distress
Data Review Key Findings
Jacksonville Middle School**

Members of the ADE Data Review Team for Jacksonville Middle School were Dr. Sally Robison, Tiah Frazier, and Richard Myrick. This team was tasked with summarizing various data sets and reporting key findings to the ADE Onsite Review Team prior to that team's visit to the school.

Data sources included the following:

- District, high, middle, and elementary schools ADE Report Cards from 2010-2014
- Arkansas ESEA Accountability Reports for the high school and district from 2012-2014
- Arkansas Comprehensive School Improvement Plans (ACSIP) for 2013-14 and 2014-15 for the district and middle school
- Scholastic Audit Report dated December 10, 2010
- AdvanceEd Accreditation Progress Report dated April 1, 2014
- Arkansas Department of Education Quarterly ESEA Interim Measurable Objectives Reports
- Jacksonville Middle School and District websites

Key findings from the data review follow:

- Jacksonville Middle School was not identified as a priority or focus school in the 2014-15 school year.
- In 2013-14, Jacksonville Middle School (grades 6-8) reported a student population of 606 students.
- The school reconfigured from two gender-specific schools to an integrated gender school to begin the 2009-2010 school year.
- The percentage of students eligible for free and reduced meals reported on the District's school report cards has exceeded 70% the past four years.
- The 2013-14 district graduation rate was 72.7%, below the state percentage of 86.9%. The middle school's student attendance rate was 94.1%, slightly below the state percentage of 94.4%.

- The 2012-2014 ESEA Accountability Reports identifies the following percentages for all and TAGG students who scored proficient and advanced. The TAGG percentage tested represents approximately 80% of the all students tested.

<u>Subject</u>	<u>2011-12</u>	<u>2012-13</u>	<u>2013-14</u>
Literacy All %	56.36	45.15	49.22
Literacy TAGG %	50.74	37.91	45.92
Mathematics %	52.12	47.35	45.96
Mathematics TAGG %	45.97	42.53	40.31

- Due to multiple elementary schools feeding into Jacksonville Middle School, a longitudinal analysis was not performed. Yearly literacy and mathematics percentages for grades 6-8 scoring proficient and advanced are noted below.

<u>Subject</u>	<u>2009-10</u>	<u>2010-11</u>	<u>2011-12</u>	<u>2012-13</u>	<u>2013-14</u>
Literacy 6	44.5	46.8	52.8	38.89	46.3
Literacy 7	49.3	37.6	61.9	37.42	50.8
Literacy 8	51	55.3	53.9	53.19	50.69

<u>Subject</u>	<u>2009-10</u>	<u>2010-11</u>	<u>2011-12</u>	<u>2012-13</u>	<u>2013-14</u>
Math 6	62.5	56.6	49.7	50.28	51.5
Math 7	62.9	55.2	59.7	49.08	47.5
Math 8	29.2	37.8	39.7	34.57	28.55
EOC Algebra	75	93	95.7	NA	NA

- The 2013-2014 middle school attendance rate for Students with Disabilities was 93.7%, versus the state average of 94.1%. The percentages of Students with Disabilities who scored proficient and advanced from the ESEA Accountability reports, followed by the number of students tested are indicated below.

	<u>2011-12</u>	<u>2012-13</u>	<u>2013-14</u>
SPED Literacy %	14.77 (88)	9.09 (88)	12.20 (82)
SPED Math %	13.64 (88)	11.24 (89)	10.98 (82)

- Jacksonville Middle School has experienced high administrator turnover rates. A different principal is cited on the three ESEA Accountability reports reviewed. Presently an interim principal is serving the school.
- The 2014 AdvancED and 2010 Scholastic Audit reports cited deficiencies with regard to school leadership, organization, comprehensive and effective planning, professional development, curriculum, instruction, classroom assessments, resources/support, use of data, and culture.

**Academic Distress
Onsite Review Key Findings
Jacksonville Middle School**

The site visit to Jacksonville Middle School on March 10, 2015 consisted of multiple open forums with the district leadership team, the building leadership team, the instructional leadership team, faculty representatives, and student representatives. The ADE onsite review team consisted of: Dr. Richard Wilde, Roxie Browning, Pam Clark, Charlotte Earwood, Dr. Mitzi Smith, LaDonna Spain, and Tiah Frazier. The format consisted of a set of specific questions preselected to initiate dialogue with school personnel. The responses received were followed with additional questions to better understand the circumstances specific to the Jacksonville Middle School population. The intent was to determine the implementation and effectiveness of the Jacksonville Middle School's initiatives and acquisition of resources identified in their most recent ACSIP plans along with an assessment of the principles identified as research based best practices of effective schools. The questions were used to initiate dialogue within the forums to determine the current situation and to determine appropriate and specific recommendations towards a school improvement plan.

Identified key findings include:

- a lack of leadership consistency and high turnover
- high teacher turnover
- an unclear plan for school improvement
- the inability of the district to provide the level of support needed
- concerns for sustainability of a plan with the pending reconfiguration
- the current school climate and culture
- the selection and analysis of interventions being implemented
- the future direction of the school's capacity to implement the research based turnaround principles for school improvement

Inconsistency in building level leadership and a high teacher turnover rates are barriers to the school improvement process. The leadership team did not clearly articulate their purpose or provide insight into their perceptions regarding team structures and support. The school implemented a planned intervention time in the master schedule for all students focusing on a content area per day however, the team members could not identify research that would suggest this strategy might be effective; data has not been collected or analyzed to measure growth in student performance or instructional effectiveness. The schedule reflects Pre AP and general classes but no data was analyzed to reflect the intent of this grouping.

The level of support provided by the district support to implement or educate the staff on school turnaround processes or models has not been adequate to improve the number of students proficient or advanced. Instructional teams reported a lack of systematic processes for acquisition of professional development and support which fosters research-based teacher practices. The team could not provide evidence verifying a systemic plan in place to collect or use existing data to guide decision making. Furthermore, individual student data assessments have not been used to measure the effectiveness of the curriculum, existing programs and practices, or current interventions.

Evidence collected from teacher and staff focus groups indicated an overall low morale within the building. In addition, an overall lack of urgency and a sense of helplessness came across that can be characterized as survival mode rather than a proactive, focused, positive approach directed at school improvement and supported by the research on school turnaround. A climate and culture of low expectations and a disorganized environment is prevalent to school visitors.

Evidence collected from the student focus group indicated a lack of consistency from teacher to teacher with regard to grades, assignments, rules, and overall expectations for behavior and learning. Additionally, students reported feeling unsafe while on the school campus due to open gates and visitors without name badges roaming the hallways. Students also reported a lack of student voice or appreciation. The group indicated they do not have a student advisory council and they lack incentives for high effort.



ARKANSAS DEPARTMENT OF EDUCATION

Johnny Key
Commissioner

April 13, 2015

State Board
of Education

Dear Ms. Ridgell,
Superintendent of Dermott School District

Sam Ledbetter
Little Rock
Chair

Toyce Newton
Crossett
Vice Chair

Dr. Jay Barth
Little Rock

Joe Black
Newport

Kim Davis
Fayetteville

Alice Mahony
El Dorado

Mireya Reith
Fayetteville

Vicki Saviers
Little Rock

Diane Zook
Melbourne

As you are aware, your district has a school (or schools) identified to be in "Academic Distress" per the Arkansas Department of Education Rules Governing the Arkansas Comprehensive Testing, Assessment and Accountability Program (ACTAAP) and the Academic Distress Program, Revised September 2014.

Section 10 of the Arkansas Department of Education Rules Governing the Academic Distress Program required a team of educators evaluate the public school's need for technical assistance and make written recommendations to the public school and the public school district. Attached is the set of recommendations developed from the required data review in combination with an onsite review.

The recommendations are not intended to be a list of activities for compliance implementation, but rather guidance to strengthen key processes of school improvement. In addition to the recommendations, the School Improvement Unit of the Public School Accountability Division of the Arkansas Department of Education has been assigned to provide technical assistance and or to broker Department expertise as resources to provide technical assistance to the school and district.

A copy of the recommendations will be posted to the May 15, 2015, State Board of Education public meeting agenda. The meeting will begin at 9 a. m. and the recommendations will be discussed with the State Board. Questions may be asked at this meeting that the Superintendent and or School Leader might want to respond to as it relates to present plans of action being taken to move a school or district out of the classification of "Academic Distress".

If you have questions or would like further clarification related to the recommendations, please do not hesitate to contact Dr. Richard Wilde at 501-683-3434.

Respectfully submitted,

M. Annette Barnes, Assistant Commissioner
Public School Accountability

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Little Rock, AR
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ArkansasEd.org

Encl.



ARKANSAS
DEPARTMENT
OF EDUCATION

**ACADEMIC DISTRESS ADE EVALUATION TEAM
RECOMMENDATIONS
DERMOTT HIGH SCHOOL**

Date: April 13, 2015

District: Dermott School District

School: Dermott High School

Arkansas Department of Education Assigned Review Team: Dr. Richard Wilde, Roxie Browning, Pam Clark, Charlotte Earwood, Dr. Mitzi Smith and LaDonna Spain

School Improvement Specialist: To Be Determined

The following recommendations are based on research that indicates, when implemented with fidelity, there is a high probability of achieving school improvement goals. However, implementation of these recommendations does not guarantee immediate removal of Academic Distress status. Recommendations are not listed in order of priority.

Sources	Evidence/Background/Findings	Recommendations
<p>Interviews, Scholastic Audit (2012)</p>	<ul style="list-style-type: none"> • The instructional leaders at the district and building levels indicated specific roles and responsibilities were not clearly articulated and/or understood. This was confirmed by ADE SIS reports. • Members of the leadership team reported participating in meetings but could not articulate a clear purpose of the team. • It was unclear to the ADE Review Team the distinction of duties between the federal program coordinator, local school improvement specialist, principal, instructional facilitators, and curriculum coordinator. • District personnel indicated that there is no written plan for fast track induction for new teachers. <p><u>Scholastic Audit (2012).</u></p> <ul style="list-style-type: none"> • “School leadership must assist teachers in identifying professional development needs.” • “Professional development is not on-going and job-embedded.” 	<p>Recommendation 1: <u>District leadership in collaboration with the school will define roles of the district and school instructional support personnel to specify duties and responsibilities and establish quarterly goals for each position.</u></p> <p>Clarification: The roles to be clarified for current employees will include but not limited to the following:</p> <ul style="list-style-type: none"> • superintendent • federal program’s coordinator • K-12 curriculum coordinator • district school improvement specialist • LEA Special Education Supervisor • principal • instructional facilitators

Sources	Evidence/Background/Findings	Recommendations
Interviews, Scholastic Audit (2012), ESEA Accountability Reports	<p>From Interviews:</p> <ul style="list-style-type: none"> It was identified that there was a high teacher turnover in mathematics and literacy. Principal turnover has resulted in teacher evaluation facilitating the continuance of minimally effective teachers. Teachers reported to the team strategies that they found successful in their instructional practice. They indicated these strategies were implemented on an individual basis, rather than as a collaborative effort across all grade levels and content areas. <p>Scholastic Audit (2012) From the Nov. 11-16, 2012 Scholastic Audit, the following findings support the need for a systemic plan to improve student outcomes. The following deficiencies were noted in the Scholastic Audit:</p> <ul style="list-style-type: none"> “Evidence that the leadership team disaggregates data, and has a planning process that involves collecting, managing and analyzing data and using the data for school improvement planning as well as analyzing the students’ unique learning needs.” “Effective, research-based instructional strategies are not consistently used by most teachers.” 	<p>Recommendation 2: <u>It is recommended that the district and school leadership teams, with their defined roles and expectations, will meet with representatives from ADE School Improvement Unit to develop for implementation a systemic plan for improving student outcomes prior to the start of the 2015-2016 student school year.</u></p> <p>Clarification: The plan will include, but not be limited to the following:</p> <ul style="list-style-type: none"> the quantifying of the district vision; analysis of data that will inform instructional decisions development of clear measurable quarterly objectives to be reported to the State Board process of alignment for standards-based curriculum and research-based strategies analysis of professional development needs evaluation of interventions parent-community engagement strategies process for recruitment, induction, and retention of highly qualified employees. the plan reflects roles and responsibilities reflected in the recommendation, ongoing training and analysis of the effectiveness by each position
	Continued on page 4	

	<p>ESEA Accountability Reports (2014)</p> <ul style="list-style-type: none"> • The school's math scores fell below 49.5% for 3 consecutive years (2012-43.80%, 2013-46.73%, and 2014-44.53%). • The TAGG scores for Special Education from 2012 to 2014 from the ESEA Accountability Reports fell below 49.5% in both literacy and mathematics (respectively, Literacy 10.00%, 14.29%, and 7.14%; Mathematics 25%, 13.33%, and 6.67 %). 	
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Sources	Evidence/Background/Findings	Recommendations
Interviews	<p>The district has approximately 400 students FTE (Full time enrollment) and has an internal school improvement specialist, curriculum coordinator, federal programs coordinator, instructional facilitator (math), and an instructional facilitator (literacy). However, math interim measurable objectives (IMO) tracking indicates no progress.</p> <p>Interview statements:</p> <ul style="list-style-type: none"> • There was no data plan to drive decision making. <p>When selected as interim superintendent, the interim superintendent was a 2nd year elementary principal. The high school principal is in his first year with the Dermott School District and had no formal background in school turnaround.</p>	<p>Recommendation 3: <u>Using the defined roles and expectations and plan of implementation, it is recommended that the novice leadership team report monthly to a site review team from the Arkansas Department of Education (ADE).</u></p> <p>Clarification: The site review team from ADE will meet with the building principal and the building leadership team to determine what supports if any, they need. The team will also meet with district leadership to determine if any additional supports or training is needed. Implementation of the plan will also be evaluated at this time.</p>

**Academic Distress
Rationale for Recommendations
Dermott High School**

The ADE onsite review team conducted a review of various data sets prior to an onsite visit to Dermott High School, and identified key findings related to school improvement needs. The onsite review was conducted on March 31, 2015, and members of the onsite review team identified key information related to the school and reasons for being in Academic Distress were collected from interviews with numerous focus groups related to school improvement efforts. Based on collaborative analysis of all findings, the team identified three research-based recommendations to the school that support school improvement efforts.

Recommendation: District leadership in collaboration with the school will define roles of the district and school instructional support personnel to specify duties and responsibilities and establish quarterly goals for each position.

Rationale/Explanation. After reflecting on the interviews, members of the onsite review team were unable to make clear distinctions between the duties of the superintendent, federal programs coordinator, district curriculum coordinator, district school improvement specialist, principal, and instructional facilitators. In order to move forward, the ADE review team concluded the district and building staff must know the individual roles and responsibilities as a foundational requirement in order to improve student achievement and prevent any overlaps and gaps in role responsibilities.

Recommendation: It is recommended that the district and school leadership teams, with their defined roles and expectations, will meet with representatives from ADE School Improvement Unit to develop for implementation a systemic plan for improving student outcomes prior to the start of the 2015-2016 student school year.

Rationale/Explanation. The Dermott School District has an adequate number of support staff and an appropriate combination inclusive of a curriculum coordinator, federal programs coordinator, principal, locally hired school improvement specialist, instructional facilitators, and superintendent. However, with the exception of the federal program coordinator, all leaders are new to their position and with no experience in turnaround processes. In order to fast-track the turnaround process and to maximize the effectiveness of each specific role to the improvement process, the essential recommendation is for the team to meet with representatives from ADE school improvement unit to develop the improvement plan so that the focus of next school year is on implementation rather than development.

Recommendation: Using the defined roles and expectations and plan of implementation, it is recommended that the novice leadership team report monthly to a site review team from the Arkansas Department of Education (ADE).

Rationale/Explanation. The ADE team members reviewed the data and onsite findings and found that the math interim measurable objectives (IMO) tracking indicated no progress. With the onsite interviews indicating that there was no data plan to drive the instructional decisions, the ADE team concluded that the school leadership would benefit from technical assistance to monitor student achievement. Beyond the development of a school improvement plan, the School Improvement Unit provides individualized coaching to support effective implementation of school improvement interventions. In the case of novice leadership, coaching is provided through monthly meetings to review various data sets to determine progress toward school improvement goals and participate in reflective conversations regarding the cause and effect relationship of professional practice with student outcomes. Given that there is a locally hired School Improvement Specialist and adequate staffing support, ADE School Improvement Unit will provide, as needed, technical assistance based on a monthly review of progress towards implementing the school improvement plan.

**Academic Distress
Data Review Key Findings
Dermott High School**

Members of the ADE Data Review Team for Dermott High School were Dr. Sally Robison, Wendy Allen, Jamie Holliman, Lasonia Johnson, and Richard Myrick. This team was tasked with summarizing various data sets and reporting key findings to the ADE Onsite Review Team prior to that team's visit to the school.

Data sources included the following:

- School Report Cards from 2010-2011 to 2012-2013 for the district, elementary, and high school
- Arkansas School ESEA Accountability Reports from 2012–2014 for the high school and district
- Arkansas Comprehensive School Improvement Plans (ACSIP) for 2013-14 and 2014-15
- Scholastic Audit Report dated November 11, 2012
- Arkansas Department of Education Quarterly ESEA Interim Measurable Objectives Reports
- Dermott School District website

Highlights from the data review include the following:

- In 2013-2014, Dermott School District reported a total student population of 398, 188 of those students attending the 7-12 high school program.
- District enrollment declined by 50 students from 2009-2010 to 2013-2014.
- Dermott High School reported a drop of 21 students over the same time period.
- The percentage of students eligible for free or reduced meals reported on the district school report cards exceeds 94% the past three years.
- Graduation and attendance rates reported for the 2013-2014 school year were above state averages. The percent of students who graduated that year was 87.1% and the school's attendance rate then was 99.7%.
- The 2012-2014 ESEA Accountability Reports indicate the following percentages for all students who scored proficient and advanced on state assessments:

<u>Subject</u>	<u>2011-2012</u>	<u>2012-2013</u>	<u>2013-2014</u>
Literacy %	51.16	56.82	52.08
Mathematics %	43.80	46.73	44.53

- From the district's report cards, a longitudinal analysis of literacy and mathematics percentages for all students scoring proficient and advanced is noted below. The yearly TAGG and non-TAGG percentages are identical.

Subject	2009-2010	2010-2011	2011-2012	2012-13	2013-14
Literacy 7	37.9 (3 rd)	51.7 (4 th)	63 (5 th)	38.46 (6 th)	33.3 (7 th)
Literacy 8	78.1 (4 th)	69 (5 th)	69 (6 th)	58.06 (7 th)	67.8 (8 th)
Literacy 11	48.3 (7 th)	59.4 (8 th)	NA (9 th)	NA (10 th)	54.3 (11 th)

Subject	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014
Math 7	51.7 (3 rd)	37.9 (4 th)	37 (5 th)	26.92 (6 th)	26.63 (7 th)
Math 8	81.3 (4 th)	62.1 (5 th)	75.9 (6 th)	51.61 (7 th)	48.4 (8 th)
EOC Algebra	36.8 (5 th)	44.4 (6 th)	35.1 (7 th)	29.41 (8 th)	55.2 (9 th)
EOC Geometry	37.5 (6 th)	36.4 (7 th)	35.7 (8 th)	59.09 (9 th)	44.85(10 th)

- The 2012-2013 Dermott High School report card identified a graduation rate of 100% for Students with Disabilities, above the state average of 83.1%. The school attendance rate for Students with Disabilities was 99.2%, also above the state average. The percentages of proficient and advanced scores for Students with Disabilities from ESEA Accountability Reports, along with the number of students who scored at proficient and advanced levels and the number of students that took the test are indicated below.

	2011-12	2012-13	2013-14
SPED Literacy %	10 (1/10)	14.29 (2/14)	7.14 (1/14)
SPED Math %	25 (3/12)	13.33 (2/15)	n<10

- The school report card for 2013-2014 indicated that no students earned a grade of 3 or higher on Advanced Placement Exams. The 2013-2014 state average percent of students earning a 3 or more was 31.84%.
- Dermott High School has experienced high administrator turnover rates. A different principal each year and two different superintendents are cited on the three ESEA Accountability reports reviewed.

**Academic Distress
Onsite Review Key Findings
Dermott High School**

The Arkansas Department of Education (ADE) Onsite Review Team visited Dermott High School on March 31, 2015. The team was comprised of Ms. LaDonna Spain, Dr. Richard Wilde, Dr. Mitzi Smith, Ms. Pam Clark, Ms. Roxie Browning, and Ms. Charlotte Earwood. The purpose of the visit was to conduct interviews with numerous focus groups in order to understand systems currently in place at the school. Key findings gleaned from the onsite review, along with key data findings identified prior to the onsite review, were essential to the development of three school-specific recommendations that support implementation of research-based school improvement efforts.

Interviews identified that there has been recent turnover in campus and district leadership. The Onsite Review Team sought to determine if these changes in leadership attributed to the lack of improvement in student outcomes and or if the changes could result in acceleration of improvement.

The ADE Onsite Review Team could not clearly distinguish between the roles of the support personnel and noted that there were no clear and concise descriptions of the roles and responsibilities of district-level leaders. With so many new to their position, the lack of clarity in duties regarding how and when each should interact with campus leadership has resulted in some confusion and in some instances contradictory directives.

The impact of novice leadership was evident in conversations with the campus focus groups. In most cases there was minimal understanding of the purpose of school teams. While a school leadership team has been established, members could not articulate the fundamental purpose for this team or how the team supported teachers. A similar issue existed among instructional teams. These teams meet each week, but they do not collaboratively analyze student work. The school groups reported a high teacher turnover rate yet little evidence was apparent for analyzing these personnel issues. Teachers reported that some research-based instructional strategies were used in individual classrooms, but there is no systematic plan for such strategies to be used throughout the school.

Each of these concerns has as an underlying element - the lack of systematic plans to address these issues. The recent and sudden change in district and campus leadership contributes to the inability to develop and implement systematic plans to alleviate these recurring issues.

The current superintendent and the high school principal have each been in their positions for less than one year. These employees have not had formal training or experience in the school turnaround process. The district's efforts to produce positive results in increased student outcomes will be, to some degree, dependent on the

district's ability to retain effective leaders, which is in part dependent upon having a clear and shared vision. With the majority of the district and school leadership still attempting to understand their roles, it is difficult to expand the vision to all staff.



**ACADEMIC DISTRESS ADE EVALUATION TEAM
INTERVIEW QUESTIONS
DISTRICT LEVEL**

District:
School:
School Improvement Specialist:
Date:

Leadership

1. Describe the district's plan for raising achievement in high-needs schools.
2. What support do you have from the school board regarding this initiative?

Infrastructure to Provide Differentiated Support and Accountability

3. What financial or material resources are available to turnaround schools?
4. Who will oversee the turnaround initiative? How do you see their day-to-day responsibilities?

Conditions for Effective Talent Management

5. What is the process for identifying and addressing underperformance?

Effective Instructional Infrastructure

6. What data systems are in place, and how do they inform practice?



School Site: _____

Date: ___ / ___ / ___

****Academic Distress Questions & Note-Taking with Indicators****

Principals

Indicator Reference	Question	Response/Notes:
N/A	1. What have been your successes?	
IE06, IID02	2. What is your plan to maintain the students who are proficient or advanced? What is your plan to increase the number of students proficient?	
IIIA35, IIIC08, IIIC04	3. Describe your plan for establishing a culture for learning and expectation?	

<p>IE06, IE08</p>	<p>4. What percentage of time is spent focused on instruction?</p> <p>*How are you tracking this focus?</p>	
<p>IE09</p>	<p>5. What are your limitations preventing change?</p> <p>What latitude has the district given you to overcome the limitations</p>	

Leadership Team:

ID02	<p>1. What is the purpose of the Leadership Team on your campus?</p> <p>*Describe successes accomplished as a Leadership Team.</p>	
IID07, IID06	<p>2. How has the Leadership Team planned to improve the percent of students proficient? Describe the strategies you are using.</p>	
IE06, IID02	<p>3. What is your plan to maintain the percentage of students who are proficient / advanced?</p>	
IE09	<p>4. What are your limitations preventing change? How do you plan to overcome the limitations?</p>	

IE06, IE07, IE08	5. What have you done to cultivate a culture of high expectations among all staff members?	
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Student Focus Group:

N/A	1. What do you like about your school?	
N/A	2. If you were in charge, what would you change?	
N/A	3. Describe ways that teachers or the principal value what you think?	
N/A	4. Would you say the majority of the students feel safe?	

<p>N/A</p>	<p>5. Share a good experience that you had with a teacher, principal, or staff member.</p>	
<p>N/A</p>	<p>6. Share a bad experience that you had with a teacher, principal, or staff member.</p>	
<p>N/A</p>	<p>7. Are you treated fairly at school? Why/Why not?</p>	

<p>N/A</p>	<p>8. Elementary/Middle School *Do you feel that your teachers are preparing you to do well in the next grade?</p> <p>*What are your teachers doing to help you learn?</p> <p>*What could your teachers do better to help you learn?</p>	
<p>n/a</p>	<p>High School Do you feel that you will be prepared for college or the workforce because of the instruction you are receiving while here at this school?</p> <p>*What is being done to prepare you?</p>	

	<p>*What could be done to better prepare you?</p>	
<p>n/a</p>	<p>9. How did you perform on the assessments (ITBS, Benchmark, ACTAAP, EOC, etc.) last year?</p>	

Teacher Focus Group:

<p>IIIA01, IIIA02, IIIA05, IIIA06, *IIB04</p>	<p>1. How has the principal established a culture of learning in your classroom(s)?</p>	
<p>IE06, IID02</p>	<p>2. How many of the students you teach are currently proficient or advanced? How are you measuring the progress of your students?</p>	
<p>IE06,IID03, IIIA01, *IIIA05, *IIIA07, *IIIA06, *IIB01, IIB04, IIB05, IIC01</p>	<p>3. What strategies do you as a faculty have in place for increasing the number of proficient and advanced students?</p>	

<p>IE06, *IIIA05, *IIIA06, *IIIA07</p>	<p>4. What strategies do you have in place for maintaining the proficient and advanced students in your classroom?</p>	
<p>*IIA01</p>	<p>5. What is the purpose in this school for PLCs, grade level, faculty meetings?</p>	
<p>*IIB04, *IIC01, IIIA02, *IIIA07</p> <p>*IIA01</p>	<p>6. What percentage of your time is spent planning?</p> <p>Collaborating with other teachers?</p>	

<p>N/A</p>	<p>7. What are some limitations preventing better student achievement results?</p> <p>*What strategies do you have for overcoming the limitations?</p>	
<p>IIID03, IIIA01, IIIA05, IIIA06, *IIB01, *IIB04, IIB05, *IIC01</p>	<p>8. Describe ways that you use data to influence instruction in your classroom.</p>	
<p>n/a</p>	<p>9. Where are Students with Disabilities receiving instruction?</p> <p>*Where are English Language Learners receiving instruction?</p>	
<p>N/A</p>	<p>10. What types of disabilities do students you teach have?</p>	
<p>*IF07</p>	<p>11. What types of training have you received related to instructional strategies to support Students with Disabilities in your classroom?</p>	

*IF07	12. What types of training have you received related to the instructional strategies to support TAGG students? *How are you using the required PD in your classroom?	
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**denotes indicators beyond Year 1*

School Improvement Specialist's: (Print): _____

Signature: _____

Additional Notes/Concerns:

Turnaround Principles Implementation Rubric

Turnaround Principle #1- Providing School Leadership

TURNAROUND PRINCIPLE 1		Ensure that the principal has the ability to lead the turnaround effort				
INDICATORS		Sources of Evidence	1 Ineffective	2 Improvement Necessary	3 Effective/Implemented with Fidelity	4 Highly Effective
1.1	The principal uses data to establish a coherent vision that is understood and supported by the entire school community	<ul style="list-style-type: none"> School Improvement Plan School vision & belief statements School climate surveys School focus groups School documents, meetings, & artifacts showing vision, core beliefs in action 	There may be a school mission and vision but it is not evident in the daily life at the school	The principal uses data from multiple sources to develop a school mission and vision and articulates it to the school community	The school leadership team uses data from multiple sources in its development. The school mission is clearly articulated, understood, and supported by all.	Representatives from all stakeholders use data from multiple sources to establish a coherent vision that guides leadership actions and decisions.
			The mission, vision, and underlying core beliefs do no influence and guide decision-making or student achievement.	The mission, vision, and underlying core beliefs direct and influence decision-making on student achievement and school outcomes.	The mission, vision, and underlying core beliefs direct, influence, and guide decision-making on student academic excellence (college/career readiness) and healthy social/emotional development.	The mission, vision, and underlying core beliefs direct, influence, and guide decision-making at all levels of the school community.
			The actions and comments from staff contradict the vision and its core beliefs about what students are capable of achieving	The mission and vision are referenced in public forums.	The principal continuously articulates and inspires the school community to enact the vision.	The principal and other staff members continuously articulate and inspire the school community to enact the vision.
			There is no visible alignment between school practices and rituals and vision.	The principal and some teachers may be the only ones to align school practices and rituals with the vision.	There is a visible alignment between school practices and rituals and the vision.	The school community demonstrates commitment to the school vision and core beliefs through behaviors and actions consistent with the vision.
			There are no benchmarks or milestones to monitor progress towards the realization of the vision.	The principal inconsistently uses benchmarks to monitor towards the realization of the vision.	The principal uses benchmarks to check the progress of the vision and regularly communicates these milestones to the school community.	The school community is engaged in step-backs to take a data-based assessment of their progress towards the realization of the school vision.
1.2	The principal develops and promotes a coherent strategy and plan for	<ul style="list-style-type: none"> School Improvement Plan School vision and mission 	There is no comprehensive diagnosis of the school's data.	The principal shares past student achievement data with staff.	Results from a comprehensive diagnosis of the school's strengths/weaknesses are publicly shared with the staff and members of the community.	Diagnostic protocols and process (including review of data, school and instructional practices) are clear to all staff; staff members have opportunities to engage in analyses of data.

	implementing the school vision, which includes clear measurement goals, aligned strategies, and a plan for monitoring progress and driving continuous improvement.	<ul style="list-style-type: none"> statements School climate surveys School focus groups Evidence of monitoring of action plan goals frequently and continuously Administrative Walk-through data Formative Achievement data 	The principal develops a school improvement plan to comply with regulations and refers to the plan infrequently.	The principal uses past student achievement data to inform the development of a school improvement plan which includes goals, some milestones, and benchmarks of progress.	A school improvement plan is developed by the leadership team and aligned to the school's needs assessment with SMART goals, milestones, and strategies and assigned accountabilities with the urgent goal of making dramatic student achievement gains within the first two years.	A school improvement plan is developed by key leaders with broad input from staff and community, SMART goals, milestones and strategies are aligned and assigned.
			Staff is unaware of the school's priorities for the year.	Staff has heard about the priorities of the school but cannot articulate actionable details or school goals; however, the school leadership team focuses on implementing some of the key points of the plan.	Staff is familiar with priorities for improvement and details of the school improvement plan.	Staff are actively engaged and invested in the success of the school improvement plan.
			Results are not systematically reviewed to assess progress and adjust strategies.	Results are informally reviewed to assess progress and adjust strategies.	Regular reviews are in place to assess progress to goals and make adjustments to strategies as needed.	Rigorous and regular reviews are in place to assess progress to goals, make adjustments to strategies as needed, and guided systematic professional development, support, and monitoring efforts.
1.3	The principal uses data to work collaboratively with staff to maintain a safe, orderly and equitable learning environment	<ul style="list-style-type: none"> Administrative walk-through data – student engagement indicator School climate surveys School focus group School Discipline plan School faculty/student handbook Teacher observation & evaluation data Master & bell schedules 	The school building is not well cared for and has significant areas of disrepair.[6.1]	The principal ensures that the school building is safe and clean, but limited facilities issues persist. [6.1]	The principal ensures that students and adults feel safe and ready to engage in teaching and learning; the facility is clean and in good working order. [6.1]	The principal ensures students and adults feel safe and welcomed, ready to learning and teach; the facility is exemplary. [6.1]
			The principal has not successfully put in place a clear and consistent student behavior system, either state or in practice and accepts that teacher's response to classroom incidents varies from classroom to classroom. [6.1]	The principal has in place a stated and consistent behavior system of rewards and consequences, though does not consistently track implementation data and deals with issues as they arise. [6.1]	The principal has in place and monitors a behavior system of rewards and consequences to ensure consistent implementation (with age appropriate differentiation) across classrooms, grades and content areas. [6.1]	There is a clear and consistent behavior systems of rewards and consequences in use, goals are consistently met or surpassed. [6.1]
			The principal does not have procedures to monitor a safe and orderly environment. [6.1]	The principal has in place procedures to monitor and support a safe and orderly environment but they are not followed consistently by staff.	The principal ensures a safe, orderly and equitable learning environment and has systems in place for monitoring. [6.1]	The school community ensures a safe, orderly, and equitable learning environment exists for all students and regularly monitors its implementation.
			The principal does not review data on attendance, tardies, office referrals, and suspensions. [5.1]	The principal reviews data on attendance, tardies, office referrals and suspensions, but systems are not in place for quick interventions for students most frequently referred and/or suspended [5.1]	The principal is using and engaging team leaders to use established systems to easily and routinely review accurate data on attendance, tardies, office referrals and suspensions,	The principal engages the school community in reviewing culture and climate data, including surveys and observable data, and solicits feedback about what needs to happen to ensure

Appendix D

					especially to identify and address students most frequently referred and/or suspended; the principal engages the staff in these reviews. [5.1]	explicit goals are met and that the school community takes pride in their school. The school is the center of community activity. [5.1]
1.4	The principal communicates high expectations to staff, students, and families, and supports students to achieve them.	<ul style="list-style-type: none"> Administrative walk-through data School climate surveys School focus groups School discipline plan School staff, student, parent handbooks Posted behavior standards Posted academic Standards and rubric School vision and belief statements 	The principal may express a vision for high quality teaching, but does not have systems in place to foster or monitor it in every classroom. [2.3 4.2]	The principal expects high quality teaching in every classroom and conducts weekly formal and informal observations and administrative walkthroughs. [2.3, 4.2]	The principal is committed to high quality teaching and ensures classrooms are visited daily to support and monitor high quality instruction. [2.3 4.2]	The principal and teachers are continuously engaged in inquiring about instructional improvement, the principal and instructional leaders continuously monitor to ensure high quality instruction is present in every classroom all the time. [2.3 4.2]
			The principal leaves it to each teacher to foster student learning expectations, with little or no calibration of what it means for students to produce grade level work. [6.3]	The principal sets high expectations for students by ensuring the curriculum is aligned to the Standards. [6.3]	The principal sets high expectations for students by ensuring student work is intellectually challenging, is cognitively demanding, demonstrates mastery of Standards, and that students receive meaningful feedback. [6.3]	The instructional leadership team has multiple methods for students to demonstrate mastery of cognitively demanding material aligned to the Standards, including exhibitions, portfolios, and other assessments. [6.3]
			The principal does not persuasively communicate a belief in the potential of all students.	The principal persuasively communicates a belief in the potential of all students.	The principal fosters an unwavering belief in the potential of all students by communicating this belief frequently and passionately.	Students, staff and community members articulate a belief in the potential of students and adults. This belief is codified and express in the daily rituals of the school.
			The principal accepts low assumptions about student potential.	The principal notes when adults display low assumptions about student potential	The principal responds when adults display low assumptions about student potential.	All adults display an unwavering belief in the potential of all students.
			The principal communicates infrequently with families about the students' academic, social-emotional, behavioral, and attitudinal progress. [7.1]	The principal communicates high expectations by ensuring frequent interactions with families about student's academic, social-emotional, behavioral, and attitudinal progress. [7.1]	The principal demonstrates a commitment to high expectations through frequent interactions with families about the students' academic, social-emotional, behavioral, and attitudinal progress toward SMART goals. [7.1]	Families are seen as, and consider themselves, partners in ensuring their children achieve explicit and rigorous goals. [7.1]
1.5	The principal ensures that a rigorous and coherent standards-based	<ul style="list-style-type: none"> Administrative Walk-through data Teacher observation & 	The principal enables teachers to develop independent lessons that are not systematically linked to the Standards. [4.2]	The principal articulates the expectations that all teachers will implement a coherent Standards-aligned curriculum and assessment system. [4.2]	The principal articulates the expectations that all teachers will implement a rigorous and coherent Standards-aligned curriculum and assessment systems with fidelity. [4.2]	All teachers implement a rigorous and coherent Standards-aligned curriculum and assessment system with fidelity. [4.2]

Appendix D

	<p>curriculum and aligned assessment system are implemented with fidelity.</p>	<p>evaluation data</p> <ul style="list-style-type: none"> • District curriculum guides • Lesson plan format • formative assessments • data management systems • PLC agendas and minutes • Grade level & content level meeting agendas and minutes 	<p>The principal's classroom observations are infrequent and unstructured. [4.2]</p>	<p>Staff is not observed at least weekly to determine the extent to which teacher instruction is aligned with the Standards across all classrooms. [4.2]</p>	<p>All staff is observed, at least 10 minutes on a weekly basis, by some member of school leadership to ensure instructional and pacing alignment with the Standards-aligned curriculum; teachers are on pace and teaching lessons are aligned to the Standards. [4.2]</p>	<p>All staff is observed on a weekly basis by some member of the school leadership to ensure that teachers are teaching lessons aligned to the Standards across classrooms and on pace with the established sequence. [4.2]</p>
			<p>The district may have formative assessments in literacy and math, but using teacher-developed assessments is the norm. There is not a system in place to collect and analyze formative assessment data. [4.3]</p>	<p>The principal monitors implementation of district provided formative assessments in ELA and math; challenges persist keeping to the district formative assessment schedule. [4.3]</p>	<p>The principal implements formative assessments with fidelity and analyzes results in ELA and math across all grade-levels linked to the Standards-aligned curriculum and ensures that the results are returned to teachers in a teacher-friendly manner for timely analysis. [4.3]</p>	<p>The principal monitors and analyzes formative assessments in ELA and math across all grade-levels linked to the Standards aligned curriculum, and uses the data to inform instructional improvement.</p>
			<p>There is not a system in place to collect and review lesson plans. [4.2]</p>	<p>The principal has systems in place to review lesson plans to ensure implementation fidelity, though systematic review and feedback remains a challenge. [4.2]</p>	<p>The principal puts in place systems to ensure that lesson plans are written and reviewed on a set schedule. [4.2]</p>	<p>Systematic reviews of lesson plans indicate consistent alignment with the Standards and a level of rigor that exceeds those standards, at times. [4.2]</p>
			<p>The principal does not ensure that all teachers have access to Standards-aligned materials and resources. [4.4]</p>	<p>The principal ensures access to Standards-aligned materials and resources. Teachers may also be using their own materials not necessarily aligned to the Standards. [4.4]</p>	<p>The principal walk-throughs provide data indicating teachers are using engaging instructional materials and resources aligned to the Standards. [4.4]</p>	<p>The principal ensures that all teachers have access to appropriate 21st Century resources, materials, and equipment aligned to the Standards and school improvement plan. [4.4]</p>
<p>1.6</p>	<p>The principal ensures that classroom level instruction is adjusted based upon formative and summative results from aligned assessments.</p>	<ul style="list-style-type: none"> • Administrative walk-through data • Common Assessments • Professional development plan • Grade & content level meeting 	<p>The principal does not set expectations for how teachers use collaboration time to collect and analyze formative assessment data. [4.3]</p>	<p>The principal sets the expectations and ensures that teachers use collaboration time to focus on formative assessment data, but does not monitor implementation and rigor. [4.3]</p>	<p>The principal sets the expectation that teachers use collaboration time to review formative assessment data to determine if students met specific goals for improvement and make instructional adjustments as necessary. [4.3]</p>	<p>The principal provides teachers with a data management system with analytic tools to gain insight into how students are performing, how to design ongoing instruction, and monitors the teachers' use during collaboration time. [4.3]</p>

Appendix D

		<p>agendas and minutes</p> <ul style="list-style-type: none"> • PLC agendas and minutes • Data team agenda and minutes 	<p>Leader walk-throughs are not schedule or do not focus on instructional improvement. [5.3]</p>	<p>Leader walk-throughs are scheduled and mostly adhered to; walk-throughs focus on general best practices for teachers. [5.3]</p>	<p>Leader walk-throughs are scheduled and adhered to. The principal and leader walk- throughs focus on monitoring and supporting instructional decisions made by teachers, including student grouping, differentiation and targeted</p>	<p>Leader walk-throughs are scheduled and adhered to, strategically targeting teachers with particular development needs, while supporting all. [5.3]</p>
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					interventions, based on their analysis of multiple forms of data, including observations, interim and formative assessments (daily, weekly, end-of-unit) [5.3]	
1.7	The principal uses informal and formal observation data and on-going student learning outcome data to monitor and improve school-wide instructional practices and ensure the achievement of learning goals for all students (including SWD and ELs).	<ul style="list-style-type: none"> Administrative walkthrough data Common assessment data Teacher observation and evaluation data Grade & content level meeting agendas and minutes PLC agendas Data team agendas and minutes 	The principal does not use data to identify school-wide instructional practices for improvement. [5.2]	The principal is using multiple forms of disaggregated data to select and monitor a select number of key school-wide priorities for instructional improvement. [5.2]	The principal has on-demand access to and is using a comprehensive set of disaggregated data to identify and monitor a select number of school-wide priorities for instructional improvement. [5.2]	The principal and leadership team have and use on-demand access to a comprehensive set of disaggregated data to identify and monitor key school-wide priorities for instructional improvement that become a foundation for the School Improvement Plan. [5.2]
			Based on informal and formal observations and available student assessment data, limited progress on key instructional practices exist. [5.3]	Based on informal and formal observation data, leader walk-throughs, and multiple measures of student assessment data, progress is evident for some teachers on some priorities; student learning outcomes can be linked to these improvements. [5.3]	Based on informal and formal observation data, leader walk-throughs, and multiple measures of student assessment data, the principal and instructional leaders identify and focus on a select number of school-wide teaching practices through targeted and job-embedded PD. [5.3]	Based on informal and formal observation data, leader walk-throughs and multiple measures of student assessment data, progress is evident for all teachers on all instructional priorities and student outcomes are positively impacted. [5.3] Students who are not mastering lesson objectives are quickly identified and provided additional instructional supports until they achieve mastery. [2.5]
1.8	The principal ensures that the schedule is intentionally aligned with the school improvement plan in order to meet the agreed upon school level learning goals.	<ul style="list-style-type: none"> Master schedule School Improvement Plan Lesson plans PLC agendas Grade & content level meeting agendas and minutes 	The principal creates the master schedule, but errors are not swiftly addressed, causing confusion regarding student assignment. [3.1]	The principal completes the master schedule in a timely manner and all students are enrolled in level appropriate classrooms. [3.1]	The principal and instructional leaders create a master schedule that ensures core content areas have sufficient time allocated at a time when learning is best for students. [3.1]	The principal and instructional leaders create a master schedule that prioritizes time for core content areas and may include increased time for literacy and mathematics instruction. [3.1]
			The master schedule does not adequately address the need for instructional interventions for students two grade levels behind. [7.2]	The master schedule provides time for ELA and Math intervention, though the time allocated does not meet research-based guidelines, and is inflexible to make reintegration into grade appropriate core content classes cumbersome and complicated. [7.2]	The master schedule enables students who are two or more years behind in ELA or Math to be enrolled in intervention programs with sufficient time allocated to allow for implementation fidelity. [7.2]	All students who are two or more years behind in ELA or Math are enrolled in intervention programs with sufficient time allocated to allow for implementation fidelity. [7.2]

			There is not a calendar developed that includes staff professional development, teacher team meetings, or common meeting times. [7.3]	There is a basic calendar of teacher collaboration time. [7.3]	The principal and instructional leaders ensure teachers have sufficient planning time for grade/content level meetings, as well as vertical staff collaboration. [7.3]	Teachers have ongoing consistent and sufficient times for grade/content meetings, as well as vertical staff collaboration. [7.3]
			There is not time in the master schedule for teachers to learn from each other or outside the teacher's community [7.3]	Through the master schedule, the principal creates time for teachers to have opportunities to learn from others outside the teacher's community. [7.3]	The principal and instructional leaders ensure the master schedule includes opportunities to learn from other teachers at the school, as well as others outside of the immediate teachers' community. [7.3]	The master schedule includes opportunities for teachers to learn from each other, as well as experts in the field. [7.3]
1.9	The principal effectively employs staffing practices (recruitment and selection, assignment, shared leadership, job-embedded professional development, observations with meaningful instructional feedback, evaluation) in order to continuously improve instruction and meet student learning goals.	<ul style="list-style-type: none"> • Master schedule • Policy for teacher placement • Staffing assignment chart • School Climate surveys • School focus group • School Improvement plan • Formal and Informal observations and evaluations • Grade & content agenda and minutes • PLC agenda and minutes • Data team agenda and minutes 	The principal has the district HR select and assign teaching staff based on vacancies with recruitment efforts not well-defined. [2.7]	The principal uses traditional channels and procedures to recruit new teachers. [2.7]	The principal and instructional leaders use established processes to identify staffing needs proactively and early and manages recruitment efforts by casting a wide net for candidates including, but not limited to traditional venues. [2.7]	The principal uses creative and traditional means to proactively recruit teachers with the expertise to deliver quality instruction using a research-based teacher screening process (e.g. Habermann) and ensures there are no persistent teacher vacancies. [2.7]
			The principal has no clear selection criteria or processes in place for interviewing candidates. [2.7]	The principal ensures clear selection criteria and processes are in place for interviewing candidates. [2.7]	The principal ensures that content/grade level teams or teacher leaders participates in and informs staff selection and is present at demo lessons and formal interview. [2.7]	The principal includes grade level/content peers and other instructional leaders to inform staff selection based upon the needs of the school. They are all present at demo lessons and formal interviews. [2.7]
			Staff assignment is based on something other than matching student learning needs with staff's instructional strengths. [2.10]	The principal and instructional leaders do not have clear selection processes when matching staff to specific position expectations. [2.10]	The principal and instructional leaders operate from clear selection process that focus on matching staff to specific position expectations and are based on prior student learning outcomes for non-first year teachers. [2.10]	The principal bases staffing assignment decisions on teacher effectiveness data, as well as student outcomes data; assignments put teachers with proven effectiveness with students demonstrating the greatest learning needs. [2.10]
			There are neither the systems in place nor the urgency to dismiss chronically underperforming teachers. [2.11]	The principal has some documentation on consistently underperforming staff. [2.11]	The principal has evidence that classrooms are staff with teachers with the right skills, competencies and content knowledge necessary to achieve student learning outcomes. [2.11]	All classrooms are staffed with effective or highly effective teachers, or comparable designation, based on district evaluations. [2.11]
			There is little or no evidence that teachers receive instructional feedback from the principal that impacts practice. [2.8]	The principal visits classrooms when time permits and provides teachers with constructive feedback. Follow-up monitoring is inconsistent. [2.8]	The principal and leadership team enact their role as instructional improvement leaders by consistently providing teachers with constructive	The principal and leadership team member feedback is the norm, providing all teachers with meaningful feedback to improve the quality of instruction. [2.8]

					feedback linked to improvement plans, support and then follow-up to ensure instructional improvement. [2.8]	
			The principal secures professional development that is not linked to teacher evaluation, learning outcomes, or school-wide goals. [2.11]	The principal ensures the school has a clear professional development calendar and topics are aligned to established school improvement goals. [2.11]	The principal and leadership team ensures professional development is designed and linked to teacher observations, formative assessment results, and school-wide goals. [2.11]	The principal and leadership team ensures professional development is designed and linked to teacher observations, formative assessment results, and school-wide goals,. The principal consistently monitors the implementation of learned instructional strategies. [2.11]
			The principal does not set expectations for or monitor teacher collaboration time to ensure it is focused on improving instructional priorities. [2.9]	The principal ensures teachers collaboratively review student work to build a shared understanding curricular goals and rigor. [2.9]	The principal and leadership team ensure that teachers' collaboration time is focused on instructional priorities identified through an analysis of data. [2.9]	The principal and leadership team ensure that every possible opportunity for teacher collaboration time is focused on instructional priorities identified through an analysis of data and linked to school-wide goals. [2.9]
			There are neither the systems in place nor the urgency to dismiss chronically underperforming teachers. [2.8]	The principal has some documentation on consistently underperforming staff. [2.8]	The principal communicates performance expectations for each position, implements an evaluation process aligned with district expectations, places "ineffective" staff on improvement plans, provides appropriate support, extensively documents consistently underperforming staff and follows the protocols for removal of ineffective teachers. [2.8]	The principal makes clear performance expectations aligned with the mission and vision for each position, implements a systematic evaluation process aligned with district expectations; places "ineffective" staff on improvement plans, provides appropriate support, extensively documents consistently underperforming staff and follows the protocols for removal of ineffective teachers. [2.8]
1.10	The principal uses data and research-based practices to work with staff to increase academically-focused family	<ul style="list-style-type: none"> School climate surveys School focus group School, staff, parent, student 	The principal ensures progress reports and report cards are sent to parents and/or guardians, but there are not systems in place for further engagement. [7.1]	The principal ensures family members are informed about student learning progress through traditional means such as parent-teacher conferences, progress reports and reports cards. [7.1]	The principal and instructional leaders create high value opportunities to engage family members in discussing student learning progress toward explicit goals; successes are celebrated and gaps are acknowledged addressed. [7.1]	The principal, parents and community members are actively involved in key student learning demonstrations (presentations, student-parent-teacher conferences) [7.1]

Appendix D

	<p>and community engagement.</p>	<p>handbooks</p> <ul style="list-style-type: none"> • List of family and community engagement activities and attendance • List of outreach programs for families with struggling students. 	<p>Parents only receive additional information about students when they are failing or in behavioral trouble. [7.1]</p>	<p>The principal supports and encourages structures such as PTOs, PTAs, and Parent Councils. [7.1]</p>	<p>The principal recruits families and community members as active participants in sessions geared to solicit input on school decisions through PTOs, PTAs, and Parent Councils; school leaders take such input seriously and make decisions accordingly. [7.1]</p>	<p>The principal puts in place measurable systems to engage families in a variety of school activities, ranging from celebrations to school leadership councils. The principal also recruits families and community members as active participants in sessions geared to solicit input on school decisions and implements, evaluates and adjusts programs and strategies that create supportive, academically focused relationships between teachers and families. [7.1]</p>
			<p>Organizations and programs exist in the community but the principal has not formed partnerships to serve students in need. [7.2]</p>	<p>The principal has some partnerships with and has contact information for support services and organizations in the community. [7.2]</p>	<p>School leaders identify and cultivate relationships with community partners who offer services to families that reduce barriers to students' academic and personal growth. [7.2]</p>	<p>The principal and staff are student advocates, ensuring students who are struggling academically and/or socially are receiving quality and integrated support services by a network of providers invested in the student's well-being; positive results from such programs are clear. [7.2]</p>

Turnaround Principle Rubric

Turnaround Principle #2- Effective Teachers and Improved Instruction

TURNAROUND PRINCIPLE 2		Ensure that teachers utilize research-based, rigorous and effective instruction to meet the needs of all students and aligned with State Standards.				
INDICATORS		Sources of Evidence	1 Ineffective	2 Improvement Necessary	3 Effective/Implemented with Fidelity	4 Highly Effective
2.1	Teachers ensure that student-learning objectives are specific, measurable, attainable, realistic and timely, and are aligned to the standards-based curriculum.	<ul style="list-style-type: none"> Administrative walkthrough data Informal and formal teacher observations Lesson plans Posted lesson objectives 	Teachers may post learning objectives, but they lack clarity and are not measurable.	Teachers pose and explain student learning objectives, though they are not always clear and measurable.	Student learning objectives are posted and explained to students, they are consistently clear and measurable.	Student learning objectives are high, clear, and measurable that students master after good first instruction.
			Students are unable to articulate the learning objectives.	Students can articulate what the learning objective is, but not always why it matters to their learning and growth.	Students can articulate what the learning objectives are and why it matters to their learning and growth.	Students can clearly articulate the learning objective and its application to larger concepts.
			The "taught" curriculum does not match the standards.	Lesson objectives are not consistently aligned to the standards-based curriculum.	Lesson objectives are aligned to the district/state curriculum, Standards, and assessments.	Lesson objectives are vertically and horizontally aligned to the district/state curriculum, Standards, and assessments.
2.2	Teachers use multiple instructional strategies and multiple response strategies that actively engage and meet student learning needs.	<ul style="list-style-type: none"> Administrative walkthrough data Informal and formal teacher observations Lesson plans Examples of student work Student surveys and interviews 	Teachers demonstrate little variation in their instructional and response strategies and little student engagement is present.	Teachers use a few instructional and response strategies and students are moderately engaged.	Teachers use a variety of instructional and response strategies and students are actively engaged in their learning.	An instructional framework is infused into every lesson and staff display mastery of instructional and response strategies.
			There is little evidence that the employed instructional strategy or strategies are intentionally chosen to meet student learning needs.	The teacher can articulate a rationale for selecting specific instructional strategies that tie to addressing student learning needs.	Teachers use student learning data to inform their selection of instructional and response strategies.	Students are actively engaged in their own learning and consider the teacher as a critical guide in their learning endeavors.
2.3	Teachers use frequent checks for understanding throughout each lesson to gauge student learning, and to inform,	<ul style="list-style-type: none"> Walkthrough observations Lesson plans Student grouping plan 	Teachers teach the lesson without monitoring whether or not all students are mastering the lesson objective.	Teachers occasionally use periodic checks for understanding, but do not always know where students are in terms of mastering the learning objectives.	Throughout the lesson, teachers are clear about where students are in terms of mastering the learning objective.	Throughout the lesson, teachers are clear about where every student is in terms of mastering the lesson objective, particularly those who have demonstrated past challenges mastering the learning objectives.

Appendix D

	monitor and adjust instruction.		Once the lesson is complete, teachers move on to the next lesson without regard to	Instructional strategies and groupings remain largely fixed even while the teacher seeks to	Instructional strategies and groupings are based on teachers' periodic checks for	The teacher plans instructional strategies and groupings based on student learning needs and
			whether or not all students mastered the prior learning objective.	address gaps in student understanding.	understanding as well as other forms of data.	makes adjustments based on periodic checks for understanding.
			There are inadequate interventions in place for students who do not master the learning objectives on first instruction.	Interventions for students who do not master student learning objectives are sporadic and not embedded into instructional practice.	Most students master lesson objectives on first instruction; alternative strategies are in place for students who do not.	All students master lesson objective on first instruction.
			Administrators monitor instruction infrequently and are not focused on having teachers ensure that all student master the learning objectives.	Administrators occasionally monitor the use of periodic checks for understanding as an instructional strategy, and occasionally provide input to foster teacher's effective use.	Administrators monitor the use of checks for understanding as an instructional strategy and provide feedback to teachers individually, but may not provide additional supports.	Administrators allocate and adapt instructional supports based on data from their administrative walk-throughs.
2.4	Teachers demonstrate necessary content knowledge	<ul style="list-style-type: none"> Walkthrough observations Teacher certifications School climate surveys School focus groups Lesson plans 	Teachers make factual error delivering content and do not explain content clearly.	Teachers rely heavily on text to deliver lessons that are factually accurate, though not always made relevant for students.	Teachers are highly qualified in the content taught. Lessons are rich with relevant content connected to Standards.	Principal verifies content knowledge through informal and formal observations supplemented with observations by the administrative team and central office and/or state content experts so that all staff is rated proficient.
			Content is delivered with little rigor or relevance for the students.	There is little evidence that teachers plan and use strategies that engage various learning styles in the instructional delivery.	Teachers approach content from many angles to support all learning styles.	Teachers present material in multiple ways as well as assess student learning in various ways to reach all learning styles.
			Most of the students are not engaged or on task.	Some students are engaged and on task, others are passive or confused.	Students are engaged and asking relevant questions that are clearly addressed, either by the teacher or other students.	Teachers intentionally plan for engagement strategies. They quickly recognize students that are not engaged and respond immediately.
2.5	Teachers demonstrate the necessary skills to use multiple measures of data, including the use of diagnostic, formative, and summative data to differentiate instruction to improve student	<ul style="list-style-type: none"> Data protocols Content/grade level meeting agendas and minutes Common assessments and rubrics 	Data are not used in instructional planning.	Teachers based instructional decisions on few sources of evidence, though the changes to instruction do not always adequately address student-learning needs.	Teachers base instructional decisions on multiple sources of data on a weekly or end-of-unit basis.	Instructional decisions, including student grouping, differentiation, and targeting for interventions are based on multiple forms of data, including observations, periodic checks for understanding, interim and formative assessments (daily, weekly, end-of-unit)
			Data are not used in teacher meetings; interim or formative assessments are not analyzed.	Data are used in some teacher team meetings, but is not a standard part of every meeting.	Multiple measures of data are present and reviewed in every teacher meeting.	Teachers use an established protocol to review multiple measures of data in every teacher meeting.

Appendix D

	achievement.		There is little or no evidence of readiness for learning through pre-teaching or re-teaching.	Lessons rarely include pre-teach, re-teach, or spiraling based on evidence of student learning.	Lessons include re-teaching and spiraling based on periodic checks for understanding and evidence of student learning.	Students who are not mastering lesson objectives are quickly identified and provided additional instructional supports until they achieve mastery.
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Appendix D

			The principal may share data with staff once or twice a year, but there is not a data review process in place.	A data review process takes place several times a year or at special data “events” or faculty meetings.	Data is reviewed regularly with staff to identify students who are not mastering basic skills and are provided with appropriate diagnostic assessments to target learning needs.	Through consistent data review systems, diagnostic and language proficiency assessments are systematically implemented to target early interventions for all students.
2.6	Teachers hold high expectations for all students academically and behaviorally as evidenced in their practice.	<ul style="list-style-type: none"> Administrative walkthrough data Formative and summative assessment data School process data Discipline reports Student/parent handbook School climate surveys School focus groups 	Teachers’ actions, such as showing the inability to define effective classroom practice, being unable to articulate strategies for improving instruction, and a lack of mastery of objectives, demonstrate low expectations.	High quality work and meaningful feedback is not evident.	Academic progress is monitored through discussions of student data with the leadership team.	Academic progress is monitored weekly by the leadership in instructional team meetings and shared with staff on a regular basis.
			Behavior expectations are not clearly communicated or consistently reinforced.	School rules and routines are enforced with consistent responses to and consequences for misbehavior.	Classroom behavior is consistent and student exhibit habits of self-discipline and self-management.	Students demonstrate traits of self-regulated learners. They contribute to school and/or classroom rules and hold one another accountable for adhering to expectations; students have been taught habits of self-discipline and self-management.
2.7	Hiring timelines and processes allow the school to competitively recruit effective teachers.	<ul style="list-style-type: none"> Staff vacancy list Position control roster Performance task to utilize for hiring decisions HR procedures and policies 	Hiring criteria are not defined and it is not clear why teachers are selected.	Processes are in place to identify staffing needs.	The principal and instructional leaders use established processes to identify staffing needs proactively and early.	Selection process is managed by leadership team and includes input of other key stakeholders (e.g. students, family members, and other members of the community)
			School does not recruit teachers. Hiring is based primarily on candidate availability and personality rather than expertise and demonstrated results.	Recruitment efforts are implemented using traditional channels and procedures.	Recruitment efforts cast a wide net for candidates including, but not limited to traditional venues.	School has intensive recruitment selection (demo lesson, formal interview, interview with a panel of students and other stakeholders), induction and mentoring processes for any new staff.
			The principal has no clear selection criteria or processes in place for interviewing candidates.	The principal uses clear selection criteria and processes are in place for interviewing candidates.	The principal ensures that content/grade level teams or teachers leaders participates in and informs staff selection and is present at demo lessons and formal interviews.	The principal includes grade level/content peers and other instructional leaders to inform staff selection based upon the needs of the school. They are all present at demo lessons and formal interviews.

			The principal and instructional leaders do not have clear selection processes when matching staff to specific position expectations.	The principal operates from clear selection processes that focus on matching staff to specific position expectations	The principal and instructional leaders operate from clear selection processes that focus on matching staff to specific position expectations and are based on prior student-learning outcomes from non-first year teachers.	The principal bases staffing assignment decisions on teacher effectiveness data, as well as student outcomes data; assignments put teachers with proven effectiveness with students demonstrating the greatest learning needs.
			Paraprofessionals are untrained and/or unqualified.	Paraprofessionals may have received some training, but are utilized ineffectively.	Para-professionals have received necessary training to be instructional assistants rather than providing clerical support.	Para-professionals develop highly qualified status and are utilized effectively to maximize student learning.
			Staff vacancies persist throughout the year. Long-term subs are used to fill these vacancies.	Classrooms may be staffed with full-time, certified and effective teachers.	Classrooms are staffed with full-time certified and effective teachers.	All classrooms are staff with full-time, certified and highly effective teachers.
2.8	School leadership uses teacher evaluation to provide feedback for improving classroom practices, informing professional development and increasing learning outcomes	<ul style="list-style-type: none"> Walkthrough observations School climate surveys Teacher development practices 	Not all teachers are evaluated.	The school leadership uses evaluations to ensure compliance with instructional expectations and regularly provides feedback aligned with that evaluation.	The school leadership engages in school-wide observations and provides feedback using aligned on protocols.	The school leadership has a systematic and frequent approach to engaging in school-wide observations and provide feedback based on a consistent set of expectations and protocols.
			Allocation of instructional resources and professional development choices are not based on teacher evaluations or student learning data.	Allocation of additional classroom-based instructional supports, professional development and monitoring are based on student-learning data OR classroom observations.	Allocation of additional classroom-based instructional supports, professional development and monitoring are based on student-learning data AND classroom observations.	Allocation of instructional resources and professional development choices are based on ongoing evaluations of teacher practice and student learning data.
			There is little or no evidence that teachers receive instructional feedback that impacts practice.	Some teachers receive constructive feedback and additional instructional support based on teacher evaluation. Monitoring is inconsistent.	Teachers consistently receive constructive feedback, support, and follow-up to ensure instructional improvement.	Teachers can articulate their areas for growth; support and monitoring are in place to ensure teachers reach specific growth goals.
			Data are not analyzed in regard to teacher practice and teachers are not held accountable for student learning.	Teacher evaluations do not systematically link teacher practice data with student outcomes data.	Multiple data sources are used to evaluate teachers including teacher practice inputs and student learning outcomes when examining the effectiveness of teacher practice.	Multiple data sources are used to evaluate teachers, including teacher practice inputs and student learning outcomes.
2.9	Teachers are provided professional development that	<ul style="list-style-type: none"> School climate surveys Professional development 	Professional development is not linked to teacher evaluation, learning outcomes or school-wide goals.	School has a clear professional development calendar and topics aligned to established school goals and the school improvement plan.	Professional development is designed and linked to teacher observations, formative assessment results and school-wide goals.	Professional development is designed and linked teacher practice needs as determined by student learning data and school wide goals.

Appendix D

	<p>enables them to continuously reflect, revise, and evaluate their classroom practices to improve learning outcomes in both a structured collaborative setting and individually.</p>	<ul style="list-style-type: none"> plan Evaluations of PD providers PD topics links to data from teacher observations 	<p>Teacher collaboration is not based on student learning objectives, student learning data or common research-based planning practices</p>	<p>During collaborative learning, teacher teams review student work to build a shared understanding of curricular goals and rigor.</p>	<p>Structures are established and used for job-embedded collaborative learning.</p>	<p>Master teachers are providing professional development and follow-up to ensure mastery of professional development learning objectives.</p>
			<p>Professional development is considered an “event” and not part of an on-going system of structures in the school.</p>	<p>Professional development is high quality, though primarily considered an “event” and not part of an on-going system of structures in the school.</p>	<p>Professional development is followed up with classroom monitoring and feedback to ensure learning objectives are incorporated into practice and professional development was effective.</p>	<p>Teachers are operating in self-directed Professional Development Communities focused on student learning outcomes.</p>
			<p>New teachers are not provided with a mentor.</p>	<p>All new teachers are provided with a mentor.</p>	<p>All new teachers and all teachers with specific development needs are mentored by highly skilled peers.</p>	<p>All new teachers and all teachers with specific development needs are mentored by highly skilled peers.</p>
			<p>Teachers not rated as effective are still ineffective at the end of the years.</p>	<p>Teachers not rated as effective are still ineffective at the end of the year and are on an improvement plan.</p>	<p>All teachers not previously rated as effective are effective by the end of the year.</p>	<p>All teachers are rated effective or highly effective.</p>
<p>2.10</p>	<p>Staff assignment is intentional to maximize the opportunities for all students to have access to the staff’s instructional strengths</p>	<ul style="list-style-type: none"> Mast schedule Staffing assignment chart School climate surveys School focus groups 	<p>Staff assignment is based on something other than matching student learning needs with staff’s instructional strengths.</p>	<p>Classrooms are staffed with teachers with the right content knowledge necessary to achieve student learning outcomes.</p>	<p>Classrooms are staffed with teachers with the right skills, competencies and content knowledge necessary to achieve student learning outcomes.</p>	<p>Classrooms are staffed with highly effective teachers with the right skills, competencies and content knowledge necessary to achieve student learning outcomes.</p>
			<p>Learning interventions are not staffed with certified effective or highly effective teachers.</p>	<p>Staff provided for learning interventions is effective teachers.</p>	<p>Staff provided for learning interventions is effective teachers with specific content knowledge in the assigned intervention.</p>	<p>Learning interventions are staffed with effective or highly effective certified teachers, with content knowledge and language proficiency required for success.</p>
			<p>Staff evaluations are not rigorous and inhibit the identification of staff that would benefit from improvement plans.</p>	<p>Staff evaluated below effective is identified and supports are provided through an improvement plan.</p>	<p>Each staff position has clear performance expectations aligned with the mission and school wide expectations for instructional practice and student behavior.</p>	<p>All staff are meeting or surpassing clear performance expectations for instructions, student behavior and learning outcomes.</p>
			<p>There are neither the systems in place nor the urgency to dismiss chronically underperforming teachers.</p>	<p>There is some documentation on consistently underperforming staff.</p>	<p>Staff identified as “not aligned” and/or unskilled are put on improvement plans and appropriate support is provided; there is extensive documentation on consistently underperforming staff and an urgency to dismiss them.</p>	<p>Struggling staff are quickly identified and supported to meet standards for instructional expectations. There are no consistently underperforming staff members.</p>

2.11	Teachers are provided professional development that promotes independent, collaborative, and shared reflection opportunities for professional growth.	<ul style="list-style-type: none"> • Professional development plans • School climate surveys • School focus groups 	Professional development is not focused on student learning.	Professional development focuses on student learning.	Teacher driven professional development focuses on student learning, progress toward student learning challenges and progress toward student achievement goals.	Staff shares a collective awareness of individual skills and growth areas. They self-direct professional development based on student achievement outcomes.
			Professional development does not provide any time for teacher reflections.	Professional development may provide optional opportunities for reflection.	Professional development includes individual, collaborative and shared reflective opportunities.	Professional development includes observation protocol/practice that is not only consistent with school-wide expectations but promotes individual teacher development areas and the student of specific student sub-groups as identified by data.

Turnaround Principle Rubric

Turnaround Principle #3- Effective Use of Time

TURNAROUND PRINCIPLE 3		Redesign time to better meet student and teacher learning needs and increase teacher collaboration focusing on improving teaching and learning.				
INDICATORS		Sources of Evidence	1 Ineffective	2 Improvement Necessary	3 Effective/Implemented with Fidelity	4 Highly Effective
3.1	The master schedule is clearly designed and structured to meet the needs of all students.	<ul style="list-style-type: none"> Master schedule Professional development plan School climate surveys 	The master schedule has errors causing confusion regarding student assignment.	The master schedule is complete and all students are enrolled in level appropriate classes on the first day of school.	The master schedule is ready for distribution to teachers and students before the first day of school; it ensures core content areas have sufficient time allocated at a time when learning is best for students.	The master schedule maximizes instructional time for core content areas aligned to the latest research and is ready for distribution to teachers and students before the first day of school, and also allows for credit recovery that does not interrupt core content time.
			The school does not know where students should be enrolled, therefore many students are not enrolled in appropriate classes on the first day of school.	Most students are enrolled in level appropriate classes on the first day of school, however many changes are required.	Students are enrolled in level appropriate classes on the first day of school with few changes required.	All students are enrolled in level appropriate classes on the first day of school (no changes are required).
			The schedule is based on teacher availability, not student need.	The schedule aims to protect academic learning time with limited interruptions. The principal designs a schedule for teachers and students that will be adjusted as needed.	Instructional time is protected with few interruptions.	Instructional time is protected with only urgent interruptions.
			Transition times are not well executed and waste instructional time.	Transition times are orderly and efficient.	Transition times are used effectively to maximize learning.	Transition times are orderly and efficient and effectively maximize learning time.
3.2	The master schedule is clearly designed to meet the intervention needs of all students who are two or more years behind in ELA or Mathematics.	<ul style="list-style-type: none"> Master schedule Samples of individual student schedules Scheduled intervention time School climate surveys 	The school has not enrolled students in intervention programs to address the needs of students two or more years behind in ELA or Math.	Some students two or more years behind ELA or Math are enrolled in intervention programs, though the time allocated might not meet research-based guidelines.	At least 85% of student who are two or more years behind in ELA or Math are enrolled in interventions programs with sufficient time allocated to allow for implementation fidelity.	All students who are two or more years behind in ELA or Math are enrolled in intervention programs with sufficient time allocated to allow for implementation fidelity.
			The master schedule dictates the instructional time students receive rather than student needs dictating the master schedule.	The master schedule is rigid, making reintegration into grade appropriate core content classes cumbersome and complicated.	The master schedule has sufficient flexibility to allow accelerations, interventions and/or return to core content areas.	The master schedule has sufficient flexibility to allow for students to enter and exit interventions throughout the year.

Appendix D

			Diagnostic assessments are not used. Instructional time for interventions does not account for research-based practices.	The master schedule has students two or more grade levels behind in classes that are not level appropriate due to a lack of diagnostic assessments (e.g. at grade level).	The master schedule has sufficient flexibility to allow for diagnostic assessments to target students two or more years below grade level.	All students two or more years below grade level receive diagnostic assessments.
3.3	The master schedule is clearly structured and designed to meet the professional development needs of staff.	<ul style="list-style-type: none"> • Master schedule • Professional development plan • Minutes of teacher meetings 	Teachers do not have a scheduled time for grade/content meetings.	Teachers have time scheduled for grade/content level meetings.	Teachers have planning time for grade/content level meetings, as well as vertical staff collaboration.	Teachers have on-going consistent and sufficient times for grade/content level meetings, as well as vertical staff collaboration.
			The master schedule does not include opportunities for teachers to learn from others.	The master schedule includes opportunities to learn from others outside the teacher's community.	The master schedule includes opportunities to learn from peers and other experts through job-embedded professional development.	The master schedule requires teachers to learn from each other, as well as experts in the field through job-embedded professional development.
			Teachers choose what to do during teacher collaboration time.	The principal creates a basic calendar of teacher collaboration time.	Topics for the use of teacher collaboration time are clearly outlined and aligned to the goals of the School Improvement Plan.	Topics for teachers collaboration time are clearly outlined and aligned to the School Improvement Plan and the master schedule takes advantage of time such as assemblies, faculty meetings and duty schedules, to provide teacher release time for the purpose of professional development.

Turnaround Principle Rubric

Turnaround Principle #4-Strengthening the Instructional Program

TURNAROUND PRINCIPLE 4		Ensure that teachers have the foundational documents and instructional materials needed to teach to the rigorous college and career ready state standards.				
INDICATORS		Sources of Evidence	1 Ineffective	2 Improvement Necessary	3 Effective/Implemented with Fidelity	4 Highly Effective
4.1	The district or school curriculum is aligned with State Academic Standards	<ul style="list-style-type: none"> District curriculum guides Lesson plans Walkthrough observations 	The district curriculum is not aligned to the State Academic Standards.	Staff use State Academic Standards and develop lessons where the learning objectives are aligned to those standards with some variability across classrooms.	The curriculum has grade-by-grade and content articulation of student learning objectives linked to the State Academic Standards.	The curriculum has grade-by-grade and content horizontal and vertical articulation of student learning objectives linked to the State Academic Standards and goes beyond State Standards and tested areas to require higher levels of learning.
			Teachers cannot describe what each child should know of do for a given lesson.	The instructional sequence is mapped for each grade level, but not articulated across grade levels.	The instructional sequence is mapped and calendared across all grade levels.	The instructional sequence is mapped and calendared across all grade levels and is aligned vertically as well.
			District does not have a comprehensive curriculum map aligned to State Academic Standards with accompanying student learning objectives.	Teachers do not always know how to access the District curriculum which is mapped to align with State Academic Standards and includes students learning objectives.	Each teacher is aware of and has easy access to the student-learning objectives and sequence map of the district curriculum.	District curriculum maps and student-learning objectives are readily accessible in teachers' classrooms and discussed and reviewed at teacher collaboration meetings.
4.2	Teachers and school leaders collect classroom level data to verify that the adopted curriculum is aligned to State Academic Standards and is the "taught" curriculum.	<ul style="list-style-type: none"> Administrative walkthrough data Informal and formal teacher observations and evaluations Lesson plans Common assessments PLC meeting 	Classroom observations are infrequent and not focused on ensuring the adopted curriculum is the taught curriculum.	Regular observations take place, though there is not a systematic way to determine the extent to which teacher instruction is aligned with the State Academic Standards across classrooms.	All staff is observed, at least briefly, on a weekly basis, by some member of school leadership to monitor instructional alignment with the State Academic Standards across classrooms.	All staff is observed on a weekly basis by some member of the school leadership team to ensure instructional alignment with the State Academic Standards across classrooms.
			Teachers develop lessons that are not systematically linked to the State Academic Standards.	Data from observations indicate that a majority of teachers are teaching lessons aligned to the State Academic Standards, with variability on pacing.	Data from weekly observations of all teachers indicate that teachers are teaching lessons aligned to the State Academic Standards with some variability on pacing.	Data from weekly observations indicate that teachers are teaching lessons aligned to the State Academic Standards and are on pace with the established sequence.

Appendix D

		<ul style="list-style-type: none"> agendas and minutes Grade and content level meeting agendas and minutes 	<p>The district does not have consistent curriculum and teachers largely develop their independent lessons that use teacher developed pacing and student-learning objectives.</p> <p>There are no systems in place to review lesson plans or monitor alignment with State Academic Standards.</p>	<p>Some teachers are using curriculum maps with sequences student-learning objectives to plan instruction.</p> <p>Lesson plans are occasionally reviewed and limited feedback given; there is not a systematic approach to reviewing written lesson plans or alignment to State Academic Standards.</p>	<p>Teachers are using curriculum maps with sequences student learning objectives to plan instruction.</p> <p>Systems are in place to ensure that lesson plans are written and reviewed on a set schedule and demonstrate overall alignment with State Academic Standards.</p>	<p>Teachers are planning lessons collaboratively using curriculum maps with sequences student-learning objectives.</p> <p>Systematic reviews of lesson plans indicate consistent alignment with the State Academic Standards and a level of rigor that exceeds those standards, at times.</p>
4.3	<p>The district provides formative assessments in literacy and math to enable teachers to effectively gauge student progress and inform instructional decisions at the classroom and team levels.</p>	<ul style="list-style-type: none"> Common assessments Professional development plan/agenda 	<p>The district may have formative assessments in literacy and math, but using teacher-developed assessments is the norm.</p> <p>A formative assessment schedule is not in use.</p> <p>There are not systems in place to collect and analyze formative assessment data.</p> <p>The principal does not set expectations for how teachers use collaboration time to collect and analyze formative assessment data.</p>	<p>Teachers are implementing district provided formative assessments in LEA and math in most classrooms.</p> <p>A formative assessment schedule is in place with some variability in its use.</p> <p>Teachers have a sense of what students need to know and be able to do and are using this understanding to guide lesson planning and instructions.</p> <p>The principal sets the expectation and ensures that teachers use collaboration time to focus on formative assessment data, but does not monitor implementation and rigor.</p>	<p>Teachers are consistently implementing district provided formative assessments in LEA and math across all grade levels link to the State Academic Standards aligned curriculum.</p> <p>A formative assessment schedule aligned to the curriculum pacing guide is in use, with some variability across classrooms.</p> <p>Teachers know exactly how student-learning objectives will be assessed and use this information to guide their lesson planning and instruction.</p> <p>The principal sets the expectation that teachers use collaboration time to review formative assessment data to determine if students met specific goals for improvement and make instructional adjustments as needed.</p>	<p>Teachers are consistently implementing district provided formative assessments in ELA and math across all grade levels linked to the State Academic Standards aligned curriculum. Teachers collaborate to use data to inform instruction.</p> <p>A formative assessment schedule aligned to the curriculum pacing guide is in use across all classrooms.</p> <p>Systematic and collaborative lesson planning occurs using formative assessments to guide teacher decisions.</p> <p>A data management system provides teachers with analytic tools to gain insight into how students are performing and how to design ongoing instruction.</p>
4.4	<p>Instructional materials and resources are aligned to the standards-based curriculum documents.</p>	<ul style="list-style-type: none"> Inventory of instructional materials and resources Lesson plans District and/or 	<p>Instructional curriculum and materials are not aligned to the State Academic Standards or the school goals.</p>	<p>Instructional materials and resources aligned to the State Academic Standards are available. Teachers may be using their own materials not aligned to the State Academic Standards.</p>	<p>All teachers have access to and are using engaging Instructional materials and resources aligned to the State Academic Standards.</p>	<p>The principal ensures that teachers have access to and use appropriate 21st century resources, materials and equipment aligned to the school improvement plan and State Academic Standards.</p>

Appendix D

		<ul style="list-style-type: none"> State model curriculum School-based budget 	The budget is not systematically developed or allocated so instructional materials and resources are either outdated or not aligned to school priorities or current State Academics Standards.	Processes for developing and allocating the budget focuses primarily on accounting for materials not on ensuring their distribution and use or reviewing the alignment of instructional resources to State Academic Standards.	The principal allocates the school budget and expenditures to ensure resources are available and aligned to school priorities. There are systems in place and in use to ensure effective allocation, use and care of instructional resources.	The principal and leadership team collaboratively develop the budget and monitor expenditures so that resources are used as allocated. School routinely ensures the alignment of instructional material, equipment, and other resources.
4.5	An intervention plan is designed to meet the learning needs of students who are two or more years behind in ELA and Mathematics is planned, monitored and evaluated for effectiveness based on defined student learning goals.	<ul style="list-style-type: none"> Master schedule School improvement plan Walkthrough observations Data protocol and discussion results Meeting agendas and minutes 	There is no systematic means to determine if students are two or more grade levels behind.	Diagnostic data are used to identify some students two or more years below grade level in LEA and Mathematics.	Diagnostic data are used to identify students who are two or more years below grade level in ELA and Mathematics.	There is a systematic approach, employing multiple measures, to identifying students two or more years below grade level in ELA and Mathematics.
			Interventions in ELA and math are not research-based and may be taught by a certified teacher. Interventions groupings remain fixed for substantial periods of time.	Research-based interventions in ELA and Math are in place for some students and taught by a certified teacher and interventions grouping remain fixed for substantial periods of time.	All students two or more years behind are placed in research-based intervention programs taught by effective teachers who regularly analyze both diagnostic data and intervention data to ensure rapid regrouping, either into or out of intervention programs.	All students two or more years behind grade-level are placed in research-based interventions, taught by highly effective teachers. Students make accelerated progress and are rapidly reintegrated into core-content instruction.
			Inadequate time modifications, if any, were made to accelerate the learning of students two or more grade levels behind.	Some time modifications are made to meet the learning needs of students two or more years behind.	Time is allocated to ensure program fidelity.	Time is allocated to ensure program fidelity and is adjusted to best meet student needs.
			Whole group is the primary means of instruction, with few exceptions. Whole group instruction is the primary mode of instruction.	Whole group and small skills group instruction is being employed. The strategies are not aligned with best practices.	Whole group and small skill group instruction is being employed. The strategies are aligned with best practices.	Instructional leaders know how students in interventions are progressing and are allocating resources to ensure program fidelity leads to continuous and accelerated progress.

Turnaround Principle Rubric

Turnaround Principle #5- Effective Use of Data

TURNAROUND PRINCIPLE 5		Ensure the school-wide use of data focused on improving teaching and learning.				
INDICATORS		Sources of Evidence	1 Ineffective	2 Improvement Necessary	3 Effective/Implemented with Fidelity	4 Highly Effective
5.1	Multiple forms of data are presented in user-friendly formats and in a timely manner to drive all decisions for improving climate and culture.	<ul style="list-style-type: none"> Needs assessment data School climate surveys School focus groups Discipline and referral data Attendance data Data from social workers and guidance staff Artifacts and student progress 	Data on attendance, tardies, office referrals and suspensions are not accurate and rarely analyzed to inform decisions for improvement.	Data on attendance, tardies, office referrals and suspensions are available with some effort, though there is inconsistent analysis to identify and address students most frequently referred and/or suspended.	Systems are in place to easily and routinely review accurate data on attendance, tardies, office referrals and suspensions, especially to identify and address students most frequently referred and/or suspended.	Culture and climate indicators are identified, data are collected and school stakeholders analyze results to make continuous refinements.
			Notice of school events go out to families.	Families know about special events at the school and their participation is tracked.	Artifacts of consistent communication between families and school are present in clear and user-friendly formats (student progress reports, parent participation meetings, parent access to grades).	Clear systems with multiple pathways for family and community voice and participation in school are evident. Parent perspective is included in plans for school improvement. Community leaders and school system managers are active partners in the leader's decision making process.
			Input and dialogue from stakeholders regarding school climate and culture is not considered. Decisions are not communicated to stakeholders	Climate and culture surveys are given to students, families, teachers and other stakeholders and are analyzed by school leadership.	Climate and culture surveys are given to students, families, teachers and some stakeholders. The results are analyzed by the school leadership team with some community representatives who develop and ensure implementation of plans for improvement.	Climate and culture surveys are given to all stakeholders. Response rates are above 50%. Survey results are discussed as a community and plans for improvement are developed and implemented.
5.2	Multiple forms of data are presented in user-friendly formats in a timely manner to drive all decisions for	<ul style="list-style-type: none"> Samples of data presented to staff Data analysis documentation Data analysis 	Systems are not in place that enable staff to review and analyze data to inform decisions.	A range of student data are collected across classrooms and manually managed to create user-friendly formats for analysis.	Data management systems are in place and actively used by staff to enable the easy and systematic collection and analysis of a range of student data.	The use of data management systems is institutionalized across the school, providing teachers and other leaders instant access to a range of data and analyses to information decision-making.

	<p>improving student achievement.</p>	<ul style="list-style-type: none"> • summaries/reports • Needs assessment data • School focus groups 	<p>Teachers do not access data in user-friendly formats information instruction.</p>	<p>Teachers have periodic access to and are using data to inform instructional strategies, student groupings and targeted interventions.</p>	<p>Teachers have on-demand access to and are using data that are clear and easy to analyze. Instructional strategies, student groupings and targeted interventions are informed by the data.</p>	<p>Teachers have on-demand access to and are using data that are clear and easy to analyze collaboratively. Instructional strategies, student groupings and targeted interventions are informed by the data and positive results are linked to these interventions.</p>
			<p>Data review protocols are not in place, therefore, data is rarely used to guide decision making.</p>	<p>Data review protocols are used sporadically to track and monitor the progress of all students.</p>	<p>Effective protocols guide the use of user-friendly data in reviewing disaggregated data to track and monitor the progress of all students, as well as monitoring on the implementation of the School Improvement Plan.</p>	<p>The school community is dedicated to reviewing disaggregated data to track and monitor the progress of all students, as well as monitoring the implementation of the School Improvement Plan to drive continuous improvements.</p>
<p>5.3</p>	<p>A specific schedule and process for the analysis of on-going formative assessment data tied to state aligned curriculum that includes the specific goals for improvement, defined strategies, progress monitoring and evaluation</p>	<ul style="list-style-type: none"> • Master schedule • Data team work • Samples of data presented to staff • Data analysis documentation • Data analysis summaries and reports • Needs assessment data • School improvement plan 	<p>There is not a specific schedule and process in place for the analysis of on-going formative assessment data.</p>	<p>Teachers have data “events” where they focus on analyzing formative assessment data.</p>	<p>Teachers have regularly scheduled collaboration time and focus on analyzing formative assessment data.</p>	<p>Teachers have scheduled time and a systematic process for analyzing formative assessment data.</p>
			<p>Professional development is not intentionally linked to teacher learning needs as identified through a rigorous analysis of multiple sources of data.</p>	<p>Professional development is loosely linked to addressing instructional needs of teachers.</p>	<p>As a result of principal analyses of multiple sources of data, professional development is scheduled and dedicated to addressing instructional needs.</p>	<p>As a result of principal and teacher analysis of multiple sources of data, professional development is differentiated and targets the specific learning needs of teachers.</p>
			<p>Leader walk-throughs are not scheduled and do not systematically focus on addressing high priority needs.</p>	<p>Leader walk-throughs are scheduled and mostly adhered to focusing on general best practices for teachers.</p>	<p>Walk-throughs are scheduled and adhered to focusing on ensuring that agreed upon practices and improvements are implemented with quality.</p>	<p>Leader walk-throughs are scheduled and adhered to, strategically targeting teachers with particular development needs while supporting all.</p>

Turnaround Principle Rubric

Turnaround Principle #6- School Climate and Culture

TURNAROUND PRINCIPLE 6		Establish a school environment that supports the social, emotional, and learning needs of all students.				
INDICATORS		Sources of Evidence	1 Ineffective	2 Improvement Necessary	3 Effective/Implemented with Fidelity	4 Highly Effective
6.1	The school community supports a safe, orderly and equitable learning environment	<ul style="list-style-type: none"> School/district safety plan Student/parent/staff handbooks School climate surveys Disaggregated discipline data (violence & vandalism, suspension, referrals, bullying, etc.) Student behavior management plan/code of conduct Attendance records Facility inspection reports Violence prevention programs Walkthrough observations School accident/student health reports 	The school building has significant areas of disrepair.	The school building is safe and clean with limited facility issues	Students and adults feel safe and ready to engage in teaching and learning. The facility is clean and in good working order.	Students and adults feel safe, welcomed and ready to learn and teach; the facility supports major academic priorities/initiatives (e.g. reading nooks, improved library, enhanced computer lab, comfortable staff lounge/meeting area).
			There is not a clear and consistent policy for behavior, either stated or in practice.	There is a stated clear and consistent behavior system of rewards and consequences though implementation data are not tracked.	There is a clear and consistent behavior system of rewards and consequences in use, with clear goals and a means to track progress and to share results with the entire school community.	There is a clear and consistent behavior system of rewards and consequences in use and goals are consistently met or surpassed.
			Teachers' response to classroom incidents varies from classroom to classroom.	Some teachers do not implement the behavior policies consistently.	There is evidence that teachers' responses to incidents in their classrooms look and feel similar across classrooms.	Students report high behavioral expectations from all teachers with similar expectations across all classrooms.
			Procedures to monitor and support a safe and orderly environment are not evident.	Procedures to monitor and support a safe and orderly environment are in place but are not followed consistently.	Indicators of a safe, orderly and equitable learning environment are established, goals are set and data are collected and analyzed to determine progress toward goals; adjustments to strategies are made based on analysis of evidence.	Surveys and observable data indicate that the school community takes pride in their building and procedures are consistently and effectively implemented and monitored.

6.2	The school community maintains a culture that values learning and promotes the academic and personal growth of students and staff	<ul style="list-style-type: none"> Administrative walkthrough data PLC agenda and minutes Professional development plan School climate surveys School focus groups Student and staff handbooks Student growth percentiles Discipline and behavioral referrals Disaggregated staff and student attendance data 	Academic learning time is not bell-to-bell. There is evidence that the school community does not prioritize learning and the personal growth of students or staff.	Academic learning time is respected with minimal interruption.	Academic learning time is protected and prioritized.	Academic learning time is protected and there is evidence that the community values learning and the promotion of social growth.
			There are no common classroom routines or instructional strategies in place. Classrooms are visited randomly without a systematic focus targeting specific instructional strategies.	The quality of instruction varies from classroom to classroom and little instructional differentiation is in place to meet varied student needs. A few classrooms are regularly monitored without a systematic focus targeting specific instructional strategies.	High quality of instruction is the norm and is monitored through daily observations and walk-throughs. All classrooms are regularly monitored and targeted feedback is provided that focuses on targeted instructional strategies.	Systematic and regular analysis of student learning data informs the selection and development of the highest priority strategies for improving instructional practices. High quality of instruction is the norm and is monitored through daily observations and walk-throughs. All classrooms are regularly monitored and targeted feedback is provided that focuses on the targeted instructional strategies.
			There are not defined expectations for classroom practice and there are not academic interventions or supports for students in need.	There are sporadic attempts to address academic interventions and supports.	Students quickly receive academic interventions and supports to ensure continuous academic, personal and social-emotional growth.	There are consistent structures for instructional differentiation where effective instructional strategies are varied to meet all students' needs and to ensure that all students master content.
			Staff is randomly engaged in practices to promote professional growth.	Staff is encouraged to be involved in practices promoting professional growth.	Staff is continuously engaged in practices to promote professional growth.	All staff is continuously engaged in practices to promote professional growth that is tied to increasing student academic and social growth.
6.3	High expectations* are communicated to staff, students and families; students are supported to achieve them. <i>*Expectations of professionalism, instruction, communication and other elements of the school's common</i>	<ul style="list-style-type: none"> Administrative walkthrough frequency Informal classroom observations Family friendly walkthrough action plan School climate surveys School focus groups School discipline plan Student/parent 	There are no clear expectations for instructional practices. Instructional strategies and data are not used to improve instruction.	The importance of high expectations is communicated and there is evidence of rigorous instruction and student learning in some classrooms.	High expectations for staff and students are exhibited and high quality teaching is the norm.	Systematically and regular diagnoses instructional practices to identify and articulate the highest priority strategies for improving instructional practices.
			Classroom instruction is not monitored and expectations are not communicated.	Student work varies in its rigor and is not always consistent with the Standards.	Student work is intellectually and cognitively challenging and consistent with the Standards, at a minimum.	Teachers practice the use of a variety of instructional strategies that are intellectually and cognitively challenging, and use the strategies outline in an instructional framework. Students take responsibility for their own learning.

Appendix D

<p><i>teaching framework to staff. Expectations of attendance, academic performance, behavior, postsecondary attainment, etc. to families.</i></p>	<p>handbooks</p> <ul style="list-style-type: none"> • Posted behavior standards • Posted academic standard/rubrics • School mission, belief and vision statements 	<p>The principal does not challenge actions that demonstrate low expectations, and provide no feedback to staff or students.</p>	<p>Students and adults receive sporadic feedback without systems in place to ensure improvement occurs.</p>	<p>Students and adults receive meaningful feedback and interventions that contribute to continuous improvement.</p>	<p>Teachers and students receive consistent feedback around instructional practices including discussions of specific student work and data.</p>
		<p>There is no communication or system of support in place to meet students' academic social/emotional and behavioral needs.</p>	<p>A systems of support has been identified to address students' academic, social/emotional and behavioral needs. However, there is little evidence the systems is being utilized.</p>	<p>The commitment to high expectations is communicated frequently to families about the student's academic, social/emotional and behavioral progress.</p>	<p>There is a clearly identified active social network to provide academic, social/emotional, and behavioral support to students and their families and to communicate high expectations.</p>

Turnaround Principle Rubric

Turnaround Principle #7- Effective Family and Community Engagement

TURNAROUND PRINCIPLE 7		Increase academically focused family and community and engagement.				
INDICATORS		Sources of Evidence	1 Ineffective	2 Improvement Necessary	3 Effective/Implemented with Fidelity	4 Highly Effective
7.1	Families are engaged in academically related activities, school decision-making, and an open exchange of information regarding students' progress in order to increase student learning for all students.	<ul style="list-style-type: none"> School climate surveys School focus groups Student and parent handbooks Job description of family/ community engagement staff List of family and community engagement activities 	Progress reports and report cards are sent to parents, but there are not systems in place for further engagement.	Family members are informed about student learning progress through traditional means such as parent-teacher conferences, progress reports and report cards.	Family members are actively informed about student progress toward learning goals and feel included in instructional decisions through regularly scheduled parent-teacher conferences, progress reports, report cards and other means.	In addition to having family members actively informed about student progress toward learning goals and feel included in instructional decisions through regularly scheduled parent-teacher conferences, progress reports, and report cards, parents and community members are actively involved in key student learning demonstrations (presentations, student-parent-teacher conferences)
			Parent surveys are not used. Student/parent feedback is not used as part of the school's improvement efforts.	Structures such as PTOs, PTAs, and Parent Councils are attended by a few consistently active parents. Input on school decisions is not solicited.	Families and community members are active participants in sessions geared to solicit input on school decisions through PTOs, PTAs, Parent Councils and School Leadership Councils; school leaders use the input to make decisions accordingly.	Programs and strategies that create supportive, academically-focused relationships between teachers and families are developed, implemented and evaluated for effectiveness. Input on school decisions are solicited and school leaders consider this input when making decisions accordingly.
			Parents only receive additional information about students when they are failing or are in behavioral trouble.	Individual staff members reach out to parents/guardians to engage them in the academic progress of their student.	School leaders and faculty teacher families how to use parent portals that provide real-time information on student performance.	Families are engaged in a variety of school activities ranging from celebrations to school leadership councils. School staff and families celebrate student success and recognize the importance of their mutual partnership to increase student learning.

7.2	Community groups and families of students who are struggling academically and/or socially are active partners in the educational process and work together to reduce barriers and accelerate the academic and personal growth of students.	<ul style="list-style-type: none"> School climate surveys School focus groups Student and parent handbooks Job description of family and community engagement staff List of family and community engagement activities and attendance List of advertised student support services, including data on which students are eligible, receiving services and their attendance Family surveys Community provider surveys School guidance plans List of family and community education programs List of outreach programs for families with struggling students 	Organizations and programs exist in the community but there is no formal partnership to serve students in need.	Some struggling students are receiving additional supports from school and community programs.	Students who are struggling academically and/or socially are supported by a network of providers invested in the student's well-being; results from these programs are monitored and results are promising.	Students who are struggling academically and/or socially are receiving quality and integrated support services by a network of providers invested in the student's well-being; positive results from such programs are evident.
			There is no evidence of successfully reducing the barriers and accelerate the academic and personal growth of students.	Support services and organizations are identified in the community.	School leaders identify and cultivate relationships with community partners who offer services to families that reduce barriers to students' academic and personal growth.	Existing community partnerships offer a range of services to address the needs of students and families proactively; there are ample data to reflect that these services are making a substantive difference for students.
			School staff are not actively seeking additional supports for students in need.	Students in need either self-identify or are identified by an alert adult and are provided with additional supports.	Adults in the school are quick to identify struggling students and ensure they are connected with the appropriate services to ensure their well-being.	Systems are in place to ensure a coherent approach to selecting, monitoring and evaluating the efficacy of student and family support organizations; and adults in the school are trained to identify early indications of troubling student behavior and are quick to take appropriate action.