

# ACTAAP

Arkansas Comprehensive Testing, Assessment, and Accountability Program

**RELEASED ITEM**

**BOOKLET**

**GRADE 7**

**AUGMENTED BENCHMARK EXAMINATION**

**April 2013**

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**Arkansas Department of Education**

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The criterion-referenced tests implemented as part of the Arkansas Comprehensive Testing, Assessment, and Accountability Program (ACTAAP) are being developed in response to Arkansas Legislative Act 35, which requires the State Board of Education to develop a comprehensive testing program that includes assessment of the challenging academic content standards defined by the Arkansas Curriculum Frameworks.

As part of this program, all grade 7 students in Arkansas public schools participated in the *Grade 7 Augmented Benchmark Examination* in April 2013.

This Released Item Booklet for the *Grade 7 Augmented Benchmark Examination* contains test questions or items that were asked of students during the April 2013 operational administration. The test items included in Part II of this booklet are some of the items that contributed to the student performance results for that administration.

Students were given between two and three hours each day to complete assigned test sessions during the five days of testing in April 2013. Students were permitted to use a calculator for the mathematics items (both multiple-choice and open-response), with the exception of mathematics questions 1–7 in this Released Item Booklet (items 1–10 in the test booklet). Students were also supplied with a reference sheet to be used during the mathematics sessions so that all students would have equal access to this information during testing. (See the reference sheet on page 33 of this booklet.) All of the reading, writing, mathematics, and science multiple-choice items within this booklet have the correct response marked with an asterisk (\*). The open-response questions for reading, mathematics, science, and the essay prompt for writing are listed with scoring guides (rubrics) immediately following. These rubrics provide information on the scoring model used for each subject, with the scoring model for writing defining the overall curricular and instructional link for that subject with the *Arkansas English Language Arts Curriculum Framework*. The domain scoring model, implemented within Arkansas for a number of years, illustrates the appropriate instructional approaches for writing within the state.

The development of the *Grade 7 Augmented Benchmark Examination* was based on the Arkansas Curriculum Frameworks. These frameworks have common distinct levels: Strands to be taught in concert, Content Standards within each Strand, and Student Learning Expectations within each Content Standard. Abridged versions of the *Arkansas English Language Arts Curriculum Framework—Reading Strand*, *Arkansas English Language Arts Curriculum Framework—Writing Strand*, *Arkansas Mathematics Curriculum Framework*, and *Arkansas Science Curriculum Framework* can be found in Part III of this booklet. It is important to note that these abridged versions list only the predominant Strand, Content Standard, and Student Learning Expectation associated with each item. However, since many key concepts within the Arkansas Curriculum Frameworks are interrelated, in many cases there are other item correlations or associations across Strands, Content Standards, and Student Learning Expectations.

Part III of the Released Item Booklet also contains a tabular listing of the Strand, Content Standard, and Student Learning Expectation that each question was designed to assess. The multiple-choice and open-response items found on the *Grade 7 Augmented Benchmark Examination* were developed in close association with the Arkansas education community. Arkansas teachers participated as members of Content Advisory Committees for each subject area, providing routine feedback and recommendations for all items. The number of items associated with specific Strands, Content Standards, and Student Learning Expectations was based on approximate proportions suggested by the Content Advisory Committee, and their recommendations were accommodated to the greatest extent possible given the overall test design. Part III of the Released Item Booklet provides Arkansas educators with specific information on how the *Grade 7 Augmented Benchmark Examination* items align or correlate with the Arkansas Curriculum Frameworks to provide models for classroom instruction.

## PART I Scoring Student Responses to Open-Response Items

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While multiple-choice items are scored by machine to determine if the student chose the correct answer from four options, responses to open-response items must be scored by trained “readers” using a pre-established set of scoring criteria.

The Arkansas Benchmark Rangefinding Committee assisted in the development of the scoring criteria. The committee comprises active Arkansas educators with expertise in science, math, English, and/or language arts education.

### Reader Training

Readers are trained to score only one content area. Qualified readers for Arkansas scoring will be those with a four-year college degree in science, math, English, language arts, education, or related fields.

Before readers are allowed to begin assigning scores to any student responses, they go through intensive training. The first step in that training is for the readers to read the writing prompt, the science open-response item, the math open-response item, or the reading passage and its open-response item as it appeared in the test booklet and to respond—just as the student test takers are required to do. This step gives the readers some insight into how the students might have responded. The next step is the readers’ introduction to the scoring rubric. All of the specific requirements of the rubric are explained by the Scoring Director who has been specifically trained to lead the scoring group. Then, responses (anchor papers) that illustrate the score points of the rubric are presented to the readers and discussed. The goal of this discussion is for the readers to understand why a particular response (or type of response) receives a particular score. After discussion of the rubric and anchor papers, readers practice scoring sets of responses that have been pre-scored and selected for use as training papers. Detailed discussion of the responses and the scores they receive follows.

After three or four of these practice sets, readers are given “qualifying rounds.” These are additional sets of pre-scored papers, and, in order to qualify, each reader scoring responses must score in exact agreement on at least 80% of the responses, and each reader scoring writing responses must score in exact agreement with 70% of the responses in each domain. Readers who do not score within the required rate of agreement are not allowed to score the *Grade 7 Augmented Benchmark Examination* responses.

Once scoring of the actual student responses begins, readers are monitored constantly throughout the project to ensure that they are scoring according to the criteria. Daily and cumulative statistics are posted and analyzed, and the Scoring Director or Team Leaders reread selected responses scored by the readers. These procedures promote reliable and consistent scoring. Any reader who does not maintain an acceptable level of agreement is dismissed from the project.

### Scoring Procedures

All student responses to the *Grade 7 Augmented Benchmark Examination* open-response test items are scored independently by two readers. Those two scores are compared, and responses that receive scores that are non-adjacent (a “1” and a “3,” for example) are scored a third time by a Team Leader or the Scoring Director for resolution.

**1** Aristotle taught that a force was always required to keep an object moving.

Which of the following states what Newton believed?

- A** Aristotle was correct.
- B** Aristotle was correct for objects on Earth but not in space.
- \* **C** An object will keep moving unless an unbalanced force stops it.
- D** A moving object will eventually stop even though an unbalanced force keeps pushing on it.

**2** Why is the structure of a sperm cell very different from the structure of an egg cell?

- \* **A** A sperm cell must move in order to reach the egg cell.
- B** An egg cell must divide into many separate sperm cells.
- C** An egg cell must move in order to reach the sperm cell.
- D** A sperm cell must combine with many different egg cells.

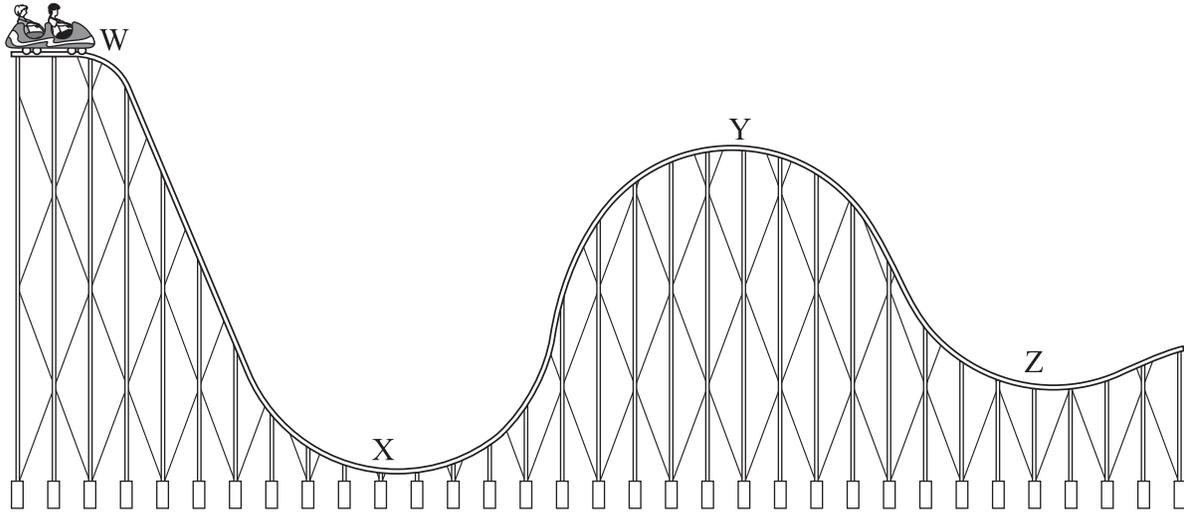
**3** Which biological process in mammals occurs largely due to cell division?

- \* **A** healing
- B** respiration
- C** decomposition
- D** photosynthesis

**4** Which factor is responsible for the presence of equatorial deserts?

- A** global warming
- B** asteroid impacts
- \* **C** tilt of the Earth's axis
- D** the solar activity cycle

5 This diagram shows a portion of a roller coaster ride.



If energy losses due to friction can be ignored, which of the following statements is correct?

- A At Position Z, kinetic energy is greater than at Position X.
- B At Position Y, potential energy is greater than at Position W.
- \* C At Position X, potential energy is lowest and kinetic energy is greatest.
- D At Position W, potential energy is lowest and kinetic energy is greatest.

6 Currently, Antarctica is the coldest and driest place on Earth. Paleontologists have found dinosaur fossils in rock layers below the ice.

Based on this evidence, which is a reasonable conclusion about the climate of Antarctica in the past?

- A Antarctica has always had the same climate as at present.
- B At some time in the past, Antarctica was a hot, dry desert.
- \* C At some time in the past, Antarctica was much warmer and wetter.
- D At some time in the past, Antarctica was colder and wetter than it is now.

**7** The table below lists the masses and distances from the Sun for four planets.

**Planetary Data**

	<b>Mass (kg)</b>	<b>Distance from Sun (km)</b>
Saturn	$568 \times 10^{24}$	$1433.5 \times 10^6$
Jupiter	$1899 \times 10^{24}$	$778.6 \times 10^6$
Uranus	$86.8 \times 10^{24}$	$2872.5 \times 10^6$
Neptune	$102 \times 10^{24}$	$4495.1 \times 10^6$

Based on the data in the table, which of these planets takes the longest time to circle the Sun?

- A** Saturn
- B** Jupiter
- C** Uranus
- \* **D** Neptune

**8** Which are caused by the Coriolis Effect?

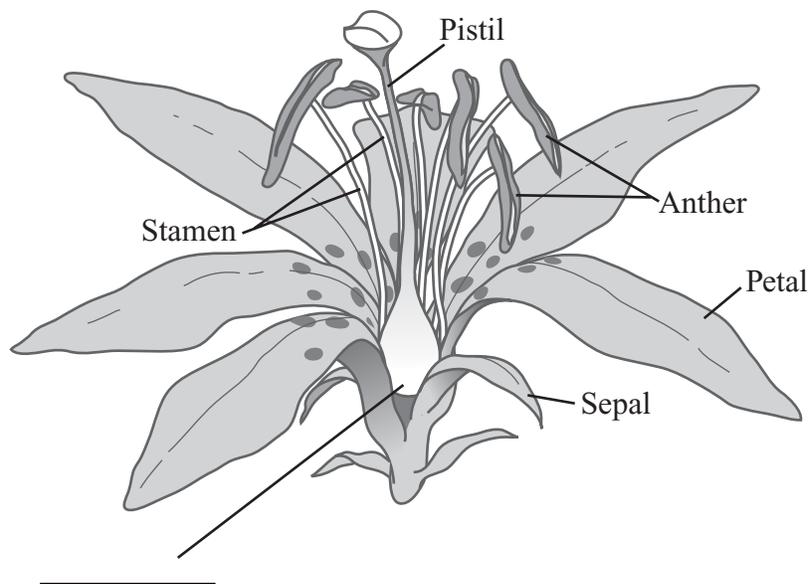
- A** tornadoes
- B** volcanoes
- \* **C** wind patterns
- D** stationary fronts

**9** Why should plants be included in investigations about the water cycle?

- A** Plants speed up the water cycle by removing carbon from the air.
- B** Plants start the water cycle when they make water in photosynthesis.
- \* **C** Plants are part of the water cycle through the process of transpiration.
- D** Plants stop the water cycle because they absorb it and stop the flow to streams.

- 10** Which statement about gravity is written as a law?
- A** The reason gravity works is because masses bend time and space.
  - B** The effect of gravity on plants might be reduced if certain minerals are added to the soil.
  - \* **C** The force of gravity between two objects depends upon their masses and the distance between them.
  - D** The experiments being done on gravity today are better than what were done in the past and a full understanding is only a few years away.

- 11** The diagram below shows a flower with labels pointing to different structures. One structure has been left unlabeled.

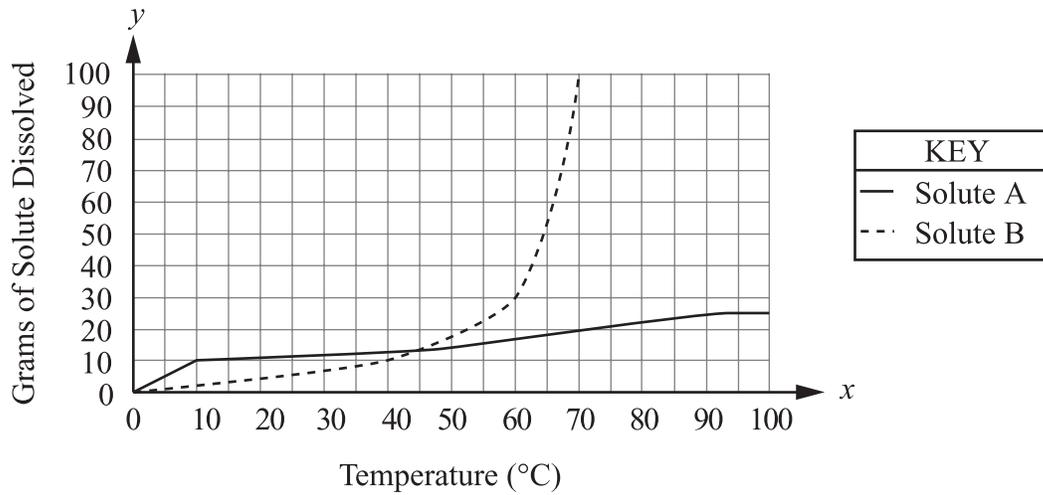


What is the function of the unlabeled structure on this flower diagram?

- A** attracts pollinators
- \* **B** receives sperm cells
- C** produces food for the plant
- D** protects the bud before blooming

12 The graph below shows the solubility of two solutes.

Solubility Curve of Solutes A and B



At what temperature is the solubility of solutes A and B the same?

- A 35°C
- \* B 45°C
- C 55°C
- D 65°C

- 13** Xylem cells have very thick walls. They make up most of a tree trunk and its branches.

What system in vertebrates provides the same function as the xylem cells in a tree?

- \* **A** the skeletal system
- B** the endocrine system
- C** the respiratory system
- D** the integumentary system

- 14** Sodium chloride is formed when sodium and chlorine chemically combine.

Which term **best** describes sodium chloride?

- A** mixture
- B** element
- C** solution
- \* **D** compound

- 15** Which is an advantage of sexual reproduction in the survival of a population?

- A** prevents mutation
- \* **B** maintains genetic diversity
- C** reduces the number of genes
- D** creates competition between siblings

- 16** Which substance is a compound?

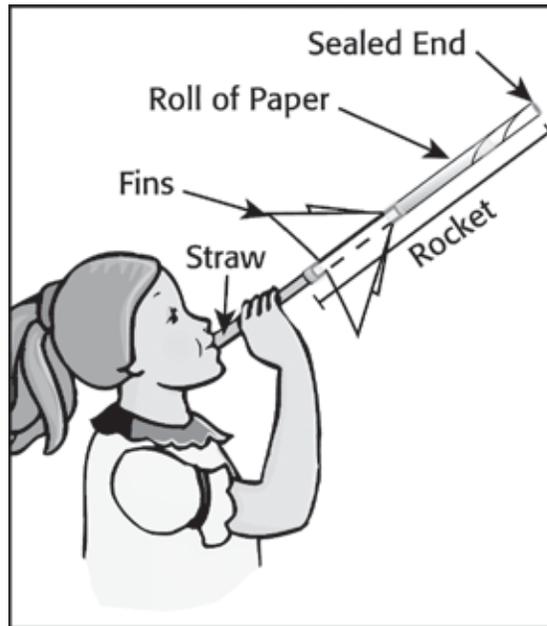
- A** butter
- B** nitrogen
- C** hydrogen
- \* **D** ammonia

- 17** A group wants to find out if the number of water birds flying through Arkansas changes each year. Which method should they use to gather this information?

- A** Catch as many birds as possible one year. Collect data on the location of each bird.
- B** On the first day of spring next year, count the number of birds at the biggest lake in the state. Compare the data to last year.
- C** Put an observer at a location on the state line. Have that person count the birds as they fly into the state. Do this for two years.
- \* **D** Pick one day a year during the migration. Count the number of birds at ten different lakes across the state. Do this on the same day every year for ten years.

## Science Item A—2013 Grade 7

- A** Amy and Barb made a rocket by taping fins to a rolled up piece of paper and sliding the paper over a straw. They sealed the end of the roll of paper with tape. The picture below shows how to launch the rocket.



1. Newton identified three laws of motion. Describe the law of motion that explains why the rocket does not take off unless someone forces air into the straw.
2. Explain how the law you described in part 1 applies to the rocket before air is forced into the straw.
3. Describe the law of motion that explains why the rocket slows down and eventually stops after the launch.
4. Describe the law of motion that explains why a large puff of air will send the rocket a greater distance than a small puff of air.

BE SURE TO LABEL YOUR RESPONSES 1, 2, 3, AND 4.

**Science Item A Scoring Rubric—2013 Grade 7**

<b>Score</b>	<b>Description</b>
<b>4</b>	Response shows a complete understanding of Newton’s three laws of motion. The student presents correct descriptions to all parts of the task.
<b>3</b>	Response shows a nearly complete understanding of Newton’s three laws of motion. The student presents nearly all descriptions to all parts of the task. The response may contain minor errors.
<b>2</b>	Response shows a limited understanding of Newton’s three laws of motion. The student presents some descriptions correctly to most parts of the task. The response may contain a major error.
<b>1</b>	Response shows a minimal understanding of Newton’s three laws of motion. The student presents some descriptions. The response contains incomplete descriptions and major errors.
<b>0</b>	Response shows insufficient understanding of Newton’s three laws of motion. The descriptions, if any, contain major errors. There may be no descriptions, or the reader may not be able to understand the explanation. The reader may not be able to understand how and why decisions were made.
<b>B</b>	Blank—No response. A score of “B” will be reported as “NA.” (No attempt to answer the item. Score of “0” is assigned for the item.)

**Solution and Scoring**

<b>Part</b>	<b>Points</b>
<b>1</b>	<b>1 point possible:</b> 1 point for identifying which of Newton’s laws applies to the stationary rocket. A description is needed, not the number of the law.
<b>2</b>	<b>1 point possible:</b> 1 point for an explanation of how the law applies to the stationary rocket.
<b>3</b>	<b>1 point possible:</b> 1 point for describing Newton’s law that explains why the rocket slows down after the launch. A description is needed, not the number of the law.
<b>4</b>	<b>1 point possible:</b> 1 point for explaining how the launch applies to this law.

**Science Item B—2013 Grade 7**

**B** Many organs work together to make up the digestive system.

1. List one organ that is part of the digestive system and describe how the organ functions in digestion.
2. List another organ that is part of the digestive system and describe how the organ functions in digestion.
3. Explain how the two organs listed in Parts 1 and 2 work together during the process of digestion.

BE SURE TO LABEL YOUR RESPONSES 1, 2, AND 3.

**Science Item B Scoring Rubric—2013 Grade 7**

<b>Score</b>	<b>Description</b>
<b>4</b>	Response shows a complete understanding of how two or more organs work together to perform a function. The student presents correct descriptions to all parts of the task.
<b>3</b>	Response shows a nearly complete understanding of how two or more organs work together to perform a function. The student presents nearly all descriptions to all parts of the task. The response may contain minor errors.
<b>2</b>	Response shows a limited understanding of how two or more organs work together to perform a function. The student presents some descriptions correctly to most parts of the task. The response may contain a major error.
<b>1</b>	Response shows a minimal understanding of how two or more organs work together to perform a function. The student presents some descriptions. The response contains incomplete descriptions and major errors.
<b>0</b>	Response shows insufficient understanding of how two or more organs work together to perform a function. The descriptions, if any, contain major errors. There may be no descriptions, or the reader may not be able to understand the explanation. The reader may not be able to understand how and why decisions were made.
<b>B</b>	Blank—No response. A score of “B” will be reported as “NA.” (No attempt to answer the item. Score of “0” is assigned for the item.)

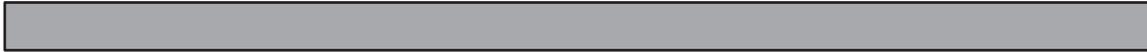
**Solution and Scoring**

<b>Part</b>	<b>Points</b>
<b>1</b>	<b>1½ points possible:</b> ½ point: Student lists a body part that is part of the digestive system. 1 point: Student describes the function of the body part listed above.
<b>2</b>	<b>1½ points possible:</b> ½ point: Student lists a body part that is part of the digestive system. 1 point: Student describes the function of the body part listed above.
<b>3</b>	<b>1 point possible:</b> Student describes the interaction of the two organs.

CALCULATOR NOT PERMITTED—ITEMS 1–7



- 1** Ira is making a rectangular picture frame for his woodworking class. One side length is shown below.



Ira needs the other side length to be shorter by exactly  $\frac{13}{16}$  inch. Which side length shown below does Ira need?



- 2** Before the Morton Middle School elections for Student Council President, Josh wants to find out who is most likely to receive the greatest number of votes from the seventh grade class.

Which sample should Josh survey to get the information he wants?

- A** all the students in a seventh grade art class
- B** a random group of students from the entire school
- C** all the students in the cafeteria at noon
- \* **D** a random group of students from the seventh grade

- 3** Which expression represents the statement below?

The quantity three plus a number is squared then increased by 5.

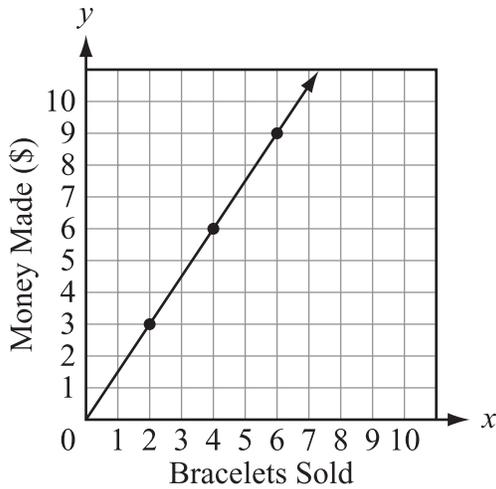
- A**  $3^2 + x + 5$
- B**  $3 + x^2 + 5$
- \* **C**  $(3 + x)^2 + 5$
- D**  $(3 + x)^2 - 5$

- 4 Petra makes bracelets and sells them at a flea market for 4 dollars apiece. The equation representing how much profit Petra makes,  $y$ , for each bracelet sold,  $x$ , is shown below.

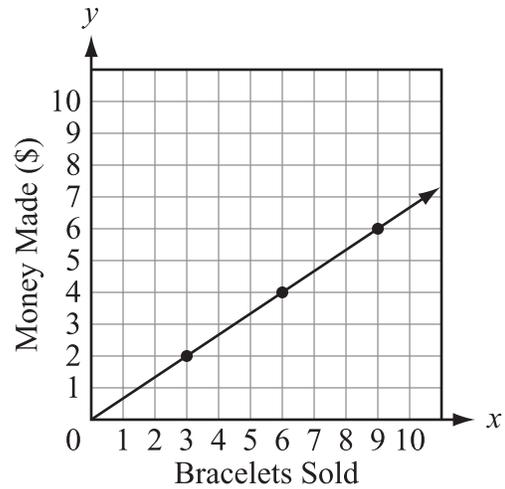
$$y = 1.5x$$

Which graph models this equation?

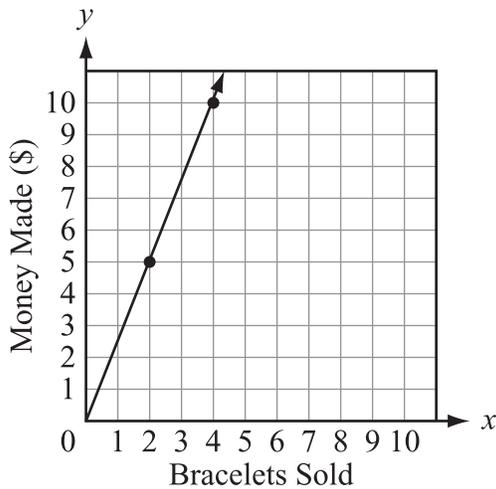
\* A



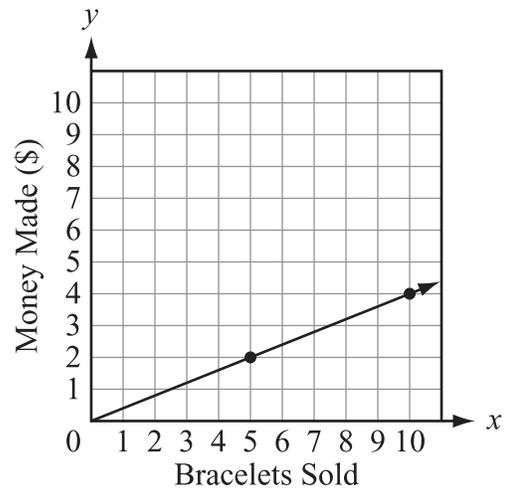
B



C



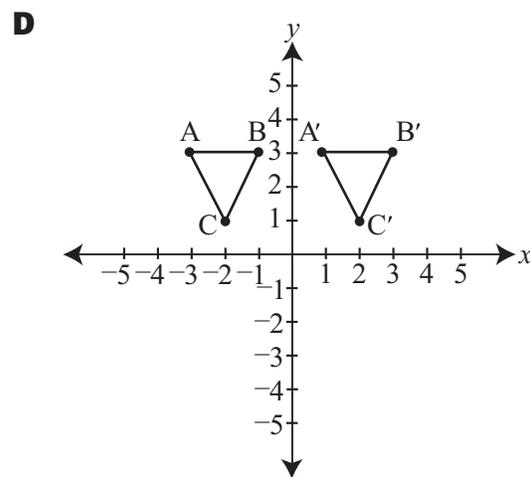
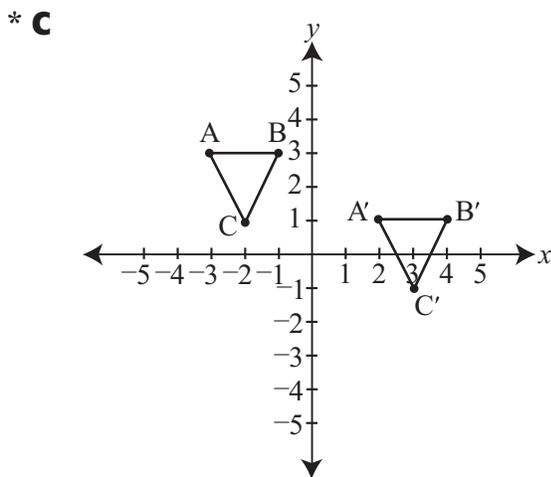
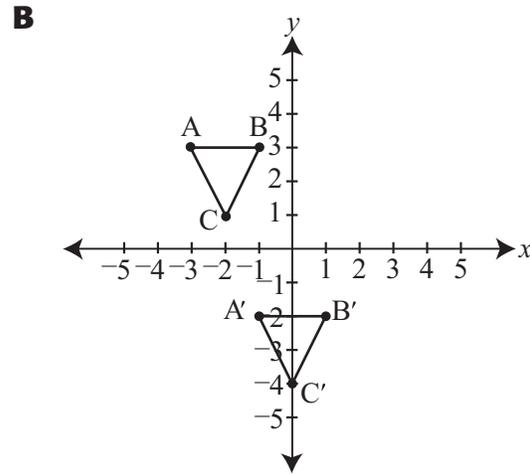
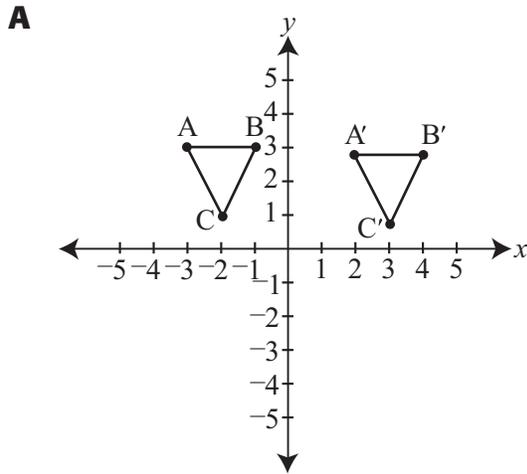
D



**5** The population of New York City can be written as  $1.78 \times 10^7$ . Which is another way to write this number?

- A** 1,780,000
- \* B** 17,800,000
- C** 17,880,000
- D** 1,780,000,000

**6** Which graph shows  $\triangle ABC$  and its image  $\triangle A'B'C'$  after  $\triangle ABC$  has been translated 5 units to the right and 2 units down?

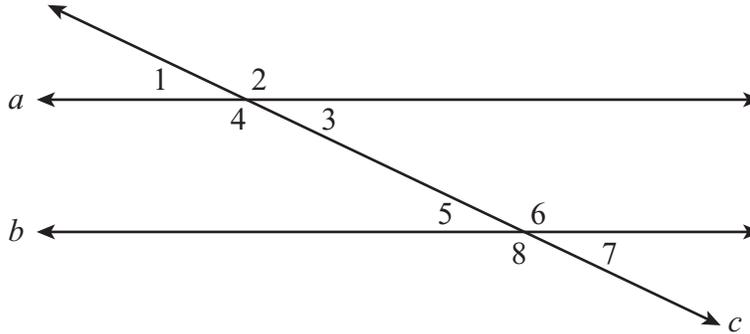


- 7** A student wants to illustrate how his grade-point average increased during his four years of college. Which type of graph would be **best** for that purpose?
- \* **A** line graph
  - B** scatter plot
  - C** circle graph
  - D** box-and-whisker plot

## CALCULATOR PERMITTED—ITEMS 8–20 and A–C



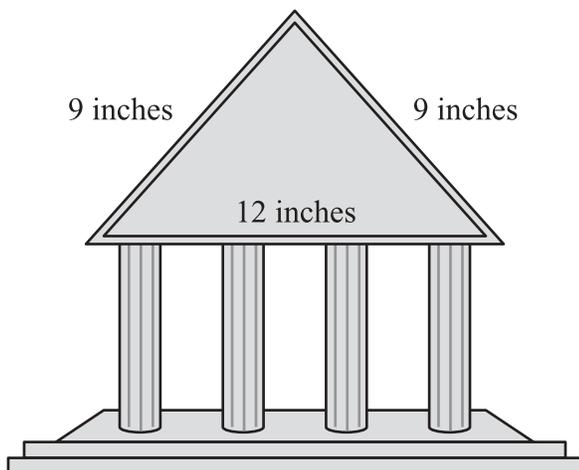
- 8 In the diagram below, parallel lines  $a$  and  $b$  are cut by transversal  $c$ .



If  $m\angle 1 = 25^\circ$ , what is  $m\angle 7$ ?

- \* **A**  $25^\circ$
- B**  $50^\circ$
- C**  $65^\circ$
- D**  $180^\circ$

- 9 In her art class, Tami uses cardboard tubes and cut-up boxes to make a model of an old-style building.



Tami then makes a smaller model of the same building. In the smaller model, the longest side of the triangular front is 4 inches. What is the perimeter of the triangular front in the smaller model?

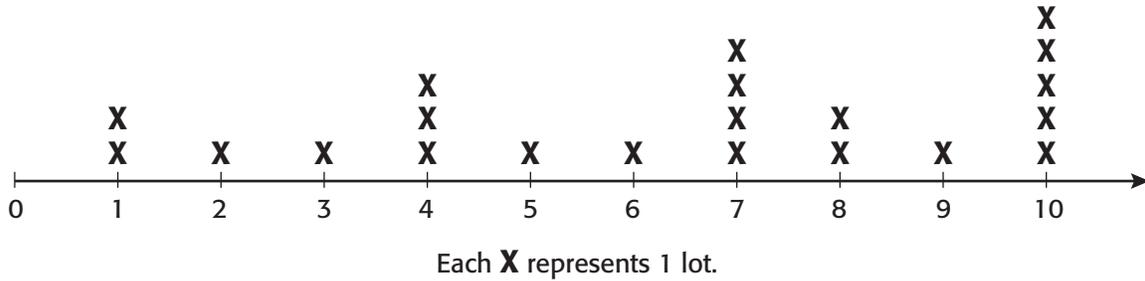
- A 3 inches
- B 6 inches
- C 7 inches
- \* D 10 inches

- 10 Eric's recipe for lentil soup calls for  $3\frac{1}{2}$  cups of water. How many fluid ounces of water is this?

- \* A 28 fluid ounces
- B 32 fluid ounces
- C 35 fluid ounces
- D 56 fluid ounces

11 The line plot represents the number of trees per lot in a neighborhood.

Number of Trees in Neighborhood Lots



What is the median of this data?

- A 5
- B 6
- \* C 7
- D 10

12 Which function table was created using this rule?

$$x - 6y = 30$$

**A**

$x$	$y$
-12	-42
0	30
6	66
36	246

\* **B**

$x$	$y$
-12	-7
0	-5
6	-4
36	1

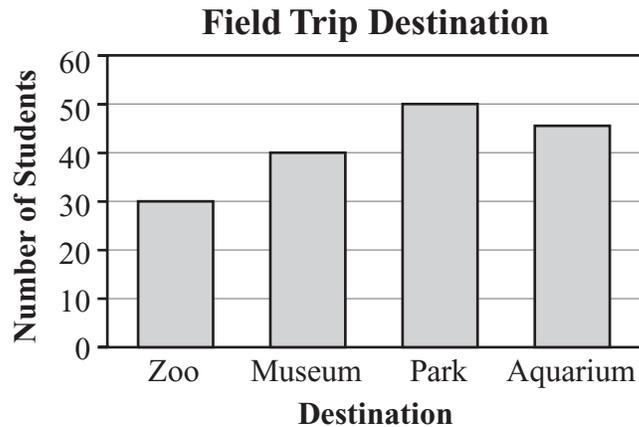
**C**

$x$	$y$
-12	-18
0	-6
6	0
36	30

**D**

$x$	$y$
-12	$-1\frac{2}{3}$
0	-5
6	0
36	1

- 13** The bar graph below shows where the 7th-grade students prefer to go on a field trip.



Kara looked at the graph and said “Twice as many students want to go to the Museum than want to go to the Zoo.” Which of the following best describes Kara’s statement?

- \* **A** It is incorrect because the value for the Museum, 40, is not twice the value for the Zoo, 30.
  - B** It is correct because the bar for the Museum is twice the height of the bar for the Zoo.
  - C** It is incorrect because the value for the Zoo is less than  $\frac{1}{5}$  of the total number of students.
  - D** It is correct because the bar for the Museum is  $\frac{1}{2}$  the height of the bar for the Zoo.
- 
- 14** A student measured the outer diameter and outer circumference of several sizes of a type of pipe and recorded the measurements.

**Pipe Measurements**

Diameter (in inches)	0.375	0.625	0.875
Circumference (in inches)	1.1775	1.9625	2.7475

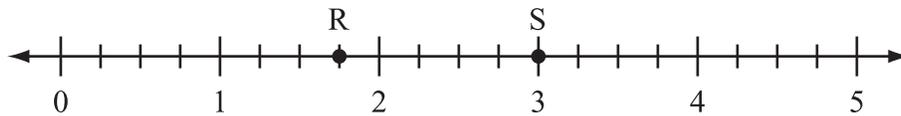
What is the outer circumference of this type of pipe that has an outer diameter of 1.375 inches?

- A** 2.1775 inches
- B** 3.2475 inches
- C** 3.5325 inches
- \* **D** 4.3175 inches

**15** Abe is making a scale drawing of the front of his school building. In his drawing, the building is 18 inches wide, and each window is  $\frac{1}{2}$  inch wide. If the actual building is 108 feet wide, how long is each window?

- \* **A** 3 feet
- B** 6 feet
- C** 9 feet
- D** 12 feet

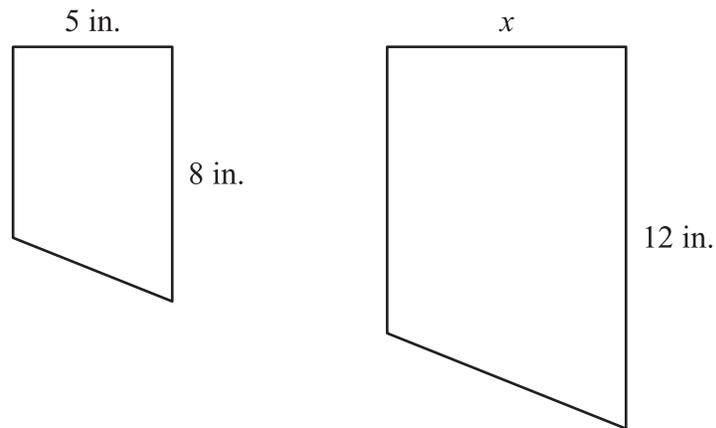
**16** Val drew points R and S on the number line. She is about to draw point T.



Val wants point S to become the midpoint between points R and T. Where should she put point T?

- A**  $2\frac{3}{8}$
- B**  $3\frac{3}{4}$
- \* **C**  $4\frac{1}{4}$
- D**  $4\frac{3}{4}$

- 17 The shapes shown below are similar.

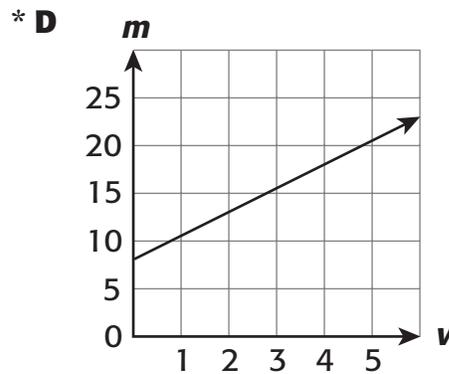
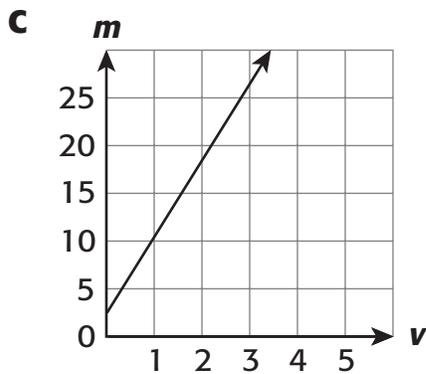
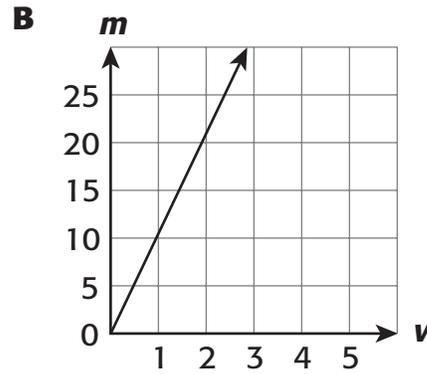
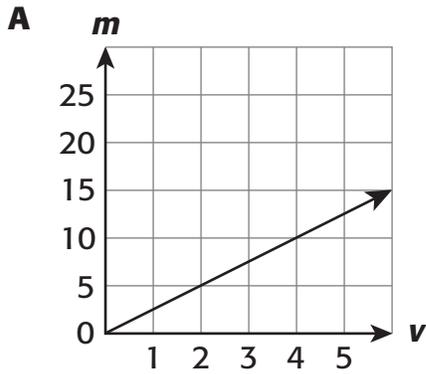


What is the length of side  $x$ ?

- A  $3\frac{1}{3}$  in.
- \* B  $7\frac{1}{2}$  in.
- C 8 in.
- D 10 in.

- 18** Marci uses the equation  $m = 2.5v + 8$  to calculate the amount of money,  $m$ , she spends renting video games,  $v$ , each month from a video game rental club.

Which graph models the amount of money Marci spends renting video games each month?



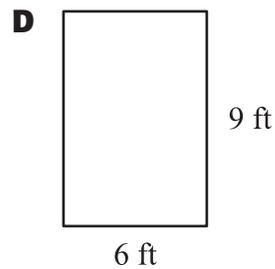
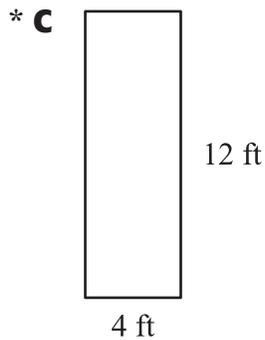
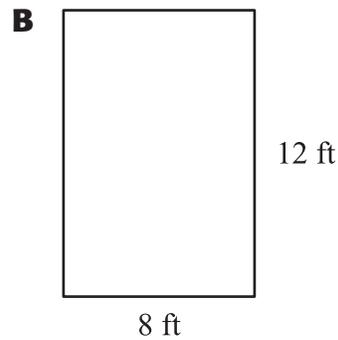
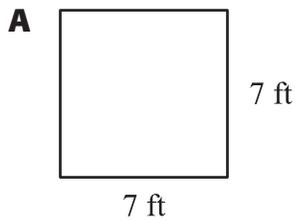
- 19** Which three-dimensional figure would have a net with exactly 2 triangles?

- A** triangular pyramid
- B** square pyramid
- \* C** triangular prism
- D** square prism

- 20** Farley owns a company that makes glass for windows. One type of window glass sells for \$2 per square foot. His employees can cut the glass to fit any size of window, including the window shown below.



Which window costs the same as the window shown above?



<b>Mathematics Item A—2013 Grade 7</b>
--

**A** Patrice bowls 5 games in a row. Her score for each game is shown below.

140, 165, 130, 145, 160

1. What are the mean, median, and mode of the bowling scores shown above? Be sure to label each measure. Show your work and/or explain your answer.
2. Patrice bowls one last game. She wants her average (mean) for all of the games to be 150 or greater. What is the **lowest** score Patrice can get and have a mean of at least 150? Show your work and/or explain your answer.
3. How does including your answer to Part 2 in Patrice’s new score totals for 6 games affect the values of the median and the mode from Part 1? Show your work and/or explain your answer.

BE SURE TO LABEL YOUR RESPONSES 1, 2, AND 3.

<b>Mathematics Item A Scoring Rubric—2013 Grade 7</b>
---

Score	Description
4	The student earns 6 points. The response contains no incorrect work.
3	The student earns 4 – 5½ points.
2	The student earns 2 – 3½ points.
1	The student earns ½ – 1½ points, or some minimal understanding is shown.
0	The student earns 0 points. No understanding is shown.
<b>B</b>	Blank—No Response. A score of “B” will be reported as “NA.” (No attempt to answer the item. Score of “0” is assigned for the item.)

## Solution and Scoring

Part	Points
1	<p><b>3 points possible:</b></p> <p>½ point: Correct answer: Mean of 148</p> <p><b>AND</b></p> <p>½ point: Correct and complete explanation or work shown <i>Work may contain an arithmetic or copy error</i> Give credit for the following or equivalent: Ex. <math>140 + 165 + 130 + 145 + 160 = 740</math> <math>740 \div 5 = 148</math></p> <p><b>AND</b></p> <p>½ point: Correct answer: Median of 145</p> <p><b>AND</b></p> <p>½ point: Correct and complete explanation or work shown <i>Work may contain an arithmetic or copy error</i> Give credit for the following or equivalent: Ex. 130, 140, 145, 160, 165; “145 is the middle number”</p> <p><b>AND</b></p> <p>½ point: Correct answer: There is no mode</p> <p><b>AND</b></p> <p>½ point: Correct and complete explanation or work shown <i>Work may contain an arithmetic or copy error</i> Give credit for the following or equivalent: Ex. No value occurs more than once</p>
2	<p><b>1½ points possible:</b></p> <p>½ point: Correct answer: 160 <i>Or correct answer based on Part 1</i></p> <p><b>AND</b></p> <p>1 point: Correct and complete explanation or work shown <i>Work may contain an arithmetic or copy error</i> Give credit for the following or equivalent: Ex. <math>\frac{740 + x}{6} = 150</math></p>

Part	Points
3	<p data-bbox="329 275 589 306"><b>1½ points possible:</b></p> <p data-bbox="423 338 1166 401">½ point: Correct answer: 152.5 for new median <i>Or correct answer based on Parts 1 &amp; 2</i></p> <p data-bbox="423 436 488 468"><b>AND</b></p> <p data-bbox="423 499 1218 632">½ point: Correct and complete explanation or work shown <i>Work may contain an arithmetic or copy error</i> Give credit for the following or equivalent: Ex. <math>(145 + 160) \div 2</math></p> <p data-bbox="423 667 488 699"><b>AND</b></p> <p data-bbox="423 730 1117 793">½ point: Correct answer: 160 for new mode <i>Or correct answer based on Parts 1 &amp; 2</i></p>

<b>Mathematics Item B—2013 Grade 7</b>
--

- B** Anna has a square piece of construction paper with an area of 49 square inches.
1. What is the length of one side of Anna’s construction paper in inches? Explain how you got your answer.
  2. If Anna makes a cube using only pieces of construction paper the same size and shape as the square in Part 1, what will be the cube’s surface area in square inches? Show your work or explain how you got your answer.
  3. What will be the volume in cubic inches of Anna’s cube? Show your work or explain how you got your answer.

BE SURE TO LABEL YOUR RESPONSES 1, 2, AND 3.

<b>Mathematics Item B Scoring Rubric—2013 Grade 7</b>
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Score	Description
4	The student earns 6 points. The response contains no incorrect work. Unit labels are present in the question so are unnecessary; there’s only an error when a student uses incorrect labels.
3	The student earns 4 – 5 points.
2	The student earns 2 – 3 points.
1	The student earns 1 point, or some minimal understanding is shown.
0	The student earns 0 points. No understanding is shown.
<b>B</b>	Blank—No Response. A score of “B” will be reported as “NA.” (No attempt to answer the item. Score of “0” is assigned for the item.)

**Solution and Scoring**

Part	Points
1	<p><b>2 points possible:</b></p> <p>1 point: Correct answer: 7 (in. not required)</p> <p><b>AND</b></p> <p>1 point: Correct and complete explanation or work shown  <i>Work may contain an arithmetic or copy error</i>                      Give credit for the following or equivalent:                      Ex. <math>\sqrt{49}</math> or a correct verbal explanation</p>
2	<p><b>2 points possible:</b></p> <p>1 point: Correct answer: 294 (in<sup>2</sup> not required)  <i>Or correct answer based on their Part 1 answer</i></p> <p><b>AND</b></p> <p>1 point: Correct and complete explanation or work shown  <i>Work may contain an arithmetic or copy error</i>                      Give credit for the following or equivalent:                      Ex. 49×6</p>
3	<p><b>2 points possible:</b></p> <p>1 point: Correct answer: 343 (in<sup>3</sup> not required)  <i>Or correct answer based on their Part 1 answer</i></p> <p><b>AND</b></p> <p>1 point: Correct and complete explanation or work shown  <i>Work may contain an arithmetic or copy error</i>                      Give credit for the following or equivalent:                      Ex. 49×7 or 7×7×7</p>

<b>Mathematics Item C—2013 Grade 7</b>
--

- C** John created the following equation.

$$y = \frac{1}{2}x - 4$$

1. Copy and complete the table of values for  $x$  and  $y$  that make John's equation true.

$x$	$y$
-6	
0	
	1
13	

2. On the grid in your Student Answer Document, draw and label a coordinate plane. Draw a graph of John's equation on your coordinate plane.

BE SURE TO LABEL YOUR RESPONSES 1 AND 2.

<b>Mathematics Item C Scoring Rubric—2013 Grade 7</b>
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Score	Description
4	The student earns 4 points. The response contains no incorrect work.
3	The student earns 3 points.
2	The student earns 2 points.
1	The student earns 1 point, or some minimal understanding is shown.
0	The student earns 0 points. No understanding is shown.
B	Blank—No Response. A score of "B" will be reported as "NA." (No attempt to answer the item. Score of "0" is assigned for the item.)

**Solution and Scoring**

Part	Points										
1	<p><b>2 points possible:</b></p> <p>2 points: Table is correctly filled Ex.</p> <table border="1" data-bbox="768 489 995 657"> <thead> <tr> <th><math>x</math></th> <th><math>y</math></th> </tr> </thead> <tbody> <tr> <td>-6</td> <td>-7</td> </tr> <tr> <td>0</td> <td>-4</td> </tr> <tr> <td><b>10</b></td> <td>1</td> </tr> <tr> <td>13</td> <td><b>2.5</b></td> </tr> </tbody> </table> <p><b>OR</b></p> <p>1 point: At most 2 incorrect values, 2 missing values, or a combination thereof present</p>	$x$	$y$	-6	-7	0	-4	<b>10</b>	1	13	<b>2.5</b>
$x$	$y$										
-6	-7										
0	-4										
<b>10</b>	1										
13	<b>2.5</b>										
2	<p><b>2 points possible:</b></p> <p>2 points: Values from the table are correctly graphed and coordinate grid axes have equal intervals and are numbered. <i>Values are based on the table from Part 1 (Can use the (x,y) labels for intervals in graph)</i></p> <p><b>OR</b></p> <p>1 point: The coordinate grid axes do not have equal intervals and/or the grid lacks numbering, but the response has 4 correctly plotted values. <i>Values are based on the table from Part 1</i></p> <p><b>OR</b></p> <p>1 point: The coordinate grid axes have equal intervals and are numbered, but the response has only 1 incorrectly plotted value. <i>Values are based on the table from Part 1 (Can use the (x,y) labels for intervals in graph)</i></p>										

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## Mathematics Reference Sheet Grade 7

*Use the information below, as needed, to answer questions on the Mathematics test.*

<b>Square</b> Area = $s^2$ Perimeter = $4s$	<b>Rectangle</b> Area = $lw$ Perimeter = $2(l + w)$	<b>Triangle</b> Area = $\frac{1}{2}bh$ Perimeter = $a + b + c$
<b>Circle</b> Area = $\pi r^2$ Circumference = $2\pi r$	<b>Parallelogram</b> Area = $bh$ Perimeter = $2a + 2b$	<b>Equilateral Triangle</b> Perimeter = $3s$
<b>Cube</b> Volume = $s^3$	<b>Cone</b> Volume = $\frac{1}{3}\pi r^2 h$	<b>Rectangular Prism</b> Volume = $lwh$
<b>Pyramid</b> Volume = $\frac{1}{3}(\text{area of base})h$	<b>Sphere</b> Volume = $\frac{4}{3}\pi r^3$	<b>Cylinder</b> Volume = $\pi r^2 h$
<b>Miscellaneous Formulas and Conversions</b>		<b>Trapezoid</b> Area = $\frac{1}{2}h(b_1 + b_2)$

$$\pi \approx 3.14$$

$$\text{distance} = \text{rate} \times \text{time}$$

$$1 \text{ foot} = 12 \text{ inches}$$

$$1 \text{ cup} = 8 \text{ ounces (oz)}$$

$$1 \text{ kilogram} = 1000 \text{ grams}$$

$$1 \text{ yard} = 3 \text{ feet}$$

$$1 \text{ pint} = 2 \text{ cups}$$

$$1 \text{ meter} = 100 \text{ centimeters}$$

$$1 \text{ mile} = 5,280 \text{ feet}$$

$$1 \text{ quart} = 2 \text{ pints}$$

$$1 \text{ decimeter} = 10 \text{ centimeters}$$

$$1 \text{ gallon} = 4 \text{ quarts}$$

$$1 \text{ centimeter} = 10 \text{ millimeters}$$

$$1 \text{ kilometer} = 1000 \text{ meters}$$

$$1 \text{ liter} = 1000 \text{ milliliters}$$

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Arkansas Department of Education April 2011.



For a copy of the passage  
“The One You Don’t See Coming”  
by Harold Courlander and George Herzog,  
used in the 2013 operational test,  
please refer to the hard copy version  
of the Released Item Booklet.

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1 Read this dictionary entry.

**great**

*adj* 1 remarkably skilled 2 numerous 3 large 4 worth noting

Which definition from the dictionary entry matches the word great as it is used in paragraph 2?

- A definition 1
- B definition 2
- \* C definition 3
- D definition 4

2 According to the passage, those who hunt for Sleep

- \* A are unable to see or hear him.
- B can track him by his footprints.
- C must seek for him in small groups.
- D believe he travels through the trees.

3 Which word can **best** replace the word stealthiest as it is used in paragraph 3?

- A drowsiest
- \* B sneakiest
- C scariest
- D loudest

**4** While hunting Sleep, one hunter hides in a tree and the others hide in

- A** a cave.
- \* **B** the brush.
- C** the river.
- D** a cloud.

**5** In paragraph 39 of the passage, the phrase “The misty night grew old” is an example of

- A** hyperbole.
- B** alliteration.
- C** onomatopoeia.
- \* **D** personification.

**6** The climax of the passage occurs when

- A** Deeba and Gunde refuse to climb the tree.
- B** Deeba and Gunde emerge from the bushes.
- C** Biafu sits dripping by the edge of the river.
- \* **D** Biafu falls from the tree branch into the river.

**7** The author organizes the passage by

- \* **A** telling the story from beginning to end.
- B** ordering the events according to importance.
- C** dividing the passage into different subtopics.
- D** comparing ancient beliefs with modern beliefs.

**8** The purpose of this passage is to

- A** describe a cultural tradition.
- B** explain the process of sleep.
- \* **C** amuse readers with a story.
- D** argue for a scientific theory.

**Reading Item A—2013 Grade 7**

- A** Provide two words to describe the mood of the passage. Support each word with an example from the passage.

**Reading Item A Scoring Rubric—2013 Grade 7**

<b>Score</b>	<b>Description</b>
<b>4</b>	The response provides two words to describe the mood of the passage, and an example from the passage to support each descriptive word.
<b>3</b>	The response provides two words to describe the mood of the passage, but only includes one example from the passage to support the descriptive word.
<b>2</b>	The response provides one word to describe the mood of the passage and one example from the passage to support the descriptive word.
<b>1</b>	The response provides one appropriate word to describe the mood of the passage. <b>OR</b> The response demonstrates minimal understanding of the question.
<b>0</b>	The response is totally incorrect and shows no evidence that the student understands the task. The response may be off topic or completely irrelevant.
<b>B</b>	Blank—No response. A score of “B” will be reported as “NA.” (No attempt to answer the item. Score of “0” is assigned for the item.)

## Make Your Own Paint

by Maxine Anderson

If you were a painter in the Renaissance, you wouldn't be able to run to the hobby shop to pick up a couple tubes of oil paint or grab your watercolor kit out of the craft cupboard. During the Renaissance, artists made all of their own paints, turning many into very skilled chemists.

- 2 Most artists in the early 1500s painted with tempera paints on wood panels. Tempera is a fast-drying paint made from a combination of egg yolks and other ingredients that have been ground into a fine powder. Different ingredients made different colors. Shades of yellow, for example, could be made by grinding down crocuses, the stamens of lilies, or even saffron, a bright yellow spice. Ultramarine blue, a very bright blue often seen in Renaissance paintings, was made by grinding a precious stone called lapis lazuli. Purple could be made from ground mollusk shells.

What set Leonardo da Vinci apart from most other artists of his time was his constant experimenting with different kinds of material to use for paint. He was one of the first Italian artists to use oil paints—invented by painters from the Netherlands—rather than egg tempera.

- 4 The problem was that Leonardo the Scientist often prevented Leonardo the Artist from successfully finishing his work. Leonardo often painted with experimental mixtures of materials that didn't work especially well, or tried new combinations of paints and painting surfaces with sometimes disastrous results. Leonardo painted his famous masterpiece, *The Last Supper*, on the wall of the monastery of Santa Maria delle Grazie, which had plaster walls. Instead of using egg tempera upon a wet plaster base, which is what had been used very successfully for centuries, Leonardo used tempera on dry plaster so he could work more slowly. He first treated the plaster with a varnish to seal it against moisture, but the varnish reacted badly with the acid and salt in the walls of the church. The plaster began to chip and flake off the wall almost immediately, and only a few years after Leonardo finished the painting, it had already deteriorated badly. Today, even after centuries of attempted restoration, many parts of *The Last Supper* are lost forever.

**What you'll need**

- dirt and two rocks
- egg yolk
- brush
- painting surface

**What to do**

1. Here's an easy way to make your own paint. Go outside and find some interesting colored dirt, or even a crumbly piece of brick. Scoop up a little, let it dry overnight, and then crush the dirt between two rocks so it's powdery.
2. Mix the dirt with some egg yolk, and paint it on a piece of paper, a board, or even a flat rock. Try experimenting with dirt taken from different locations—you'll be surprised at the variety of colors plain old dirt can have.
3. Try other ingredients: the pistils or stamens of daylilies, for example, will make a bright yellow paint, as will crumbled saffron. Charcoal will make a grayish black paint. Experiment with natural ingredients you can find around your house, yard, or park. Just remember that in order to work well, they need to be crushed to a fine powder, then mixed with the egg yolk.

**9** According to the passage, many Renaissance artists were also

- A** biologists.
- \* **B** chemists.
- C** teachers.
- D** farmers.

**10** Based on information in paragraph 2, what is tempera?

- A** quick-hardening plaster made for painting
- B** newly developed varnish made with oil
- \* **C** fast-drying paint made with egg yolk
- D** a watercolor kit to be used with dirt

**11** The sentence “He was one of the first Italian artists to use oil paints—invented by painters from the Netherlands—rather than egg tempera” represents an example of

- \* **A** a fact.
- B** an outline.
- C** an opinion.
- D** a judgment.

**12** In paragraph 4, which of the following words help the reader understand what deteriorated means?

- \* **A** chip and flake
- B** acid and salt
- C** wet plaster base
- D** finished the painting

**13** What is the main idea of paragraph 4?

- A** Some early scientists were also painters.
- B** Rocks and dirt were used to make paints.
- C** Most early painters made their own paints.
- \* **D** Experimenting sometimes ruined paintings.

**14** According to the passage, which of the following was **not** used to make tempera paint during the Renaissance?

- A** flowers
- B** stones
- \* **C** water
- D** yolk

**15** Which of the following could **best** replace the section header “What you’ll need”?

- A** Restoration
- \* **B** Materials
- C** Contents
- D** Color

**16** What is the main idea of #3 in the section titled “What to do”?

- A** Dirt can be used to make paint.
- B** Add only powdered substances to egg yolk.
- C** Flowers are good for making bright yellow paint.
- \* **D** Natural ingredients can produce a variety of colors.

Reading Item B—2013 Grade 7

**B** In what two ways was da Vinci’s painting in the Santa Maria delle Grazie experimental? Explain two results of this experimentation.

Reading Item B Scoring Rubric—2013 Grade 7

Score	Description
4	The response identifies two ways that da Vinci’s painting in the Santa Maria delle Grazie was experimental and explains two results of this experimentation.
3	The response identifies two ways that da Vinci’s painting in the Santa Maria delle Grazie was experimental and explains one result of this experimentation. <b>OR</b> The response identifies one way that da Vinci’s painting in the Santa Maria delle Grazie was experimental and explains two results of this experimentation.
2	The response identifies two ways that da Vinci’s painting in the Santa Maria delle Grazie was experimental. <b>OR</b> The response explains two results of this experimentation.
1	The response identifies one way that da Vinci’s painting in the Santa Maria delle Grazie was experimental. <b>OR</b> The response explains one result of this experimentation. <b>OR</b> The response demonstrates minimal understanding of the question.
0	The response is totally incorrect and shows no evidence that the student understands the task. The response may be off topic or completely irrelevant.
B	Blank—No response. A score of “B” will be reported as “NA.” (No attempt to answer the item. Score of “0” is assigned for the item.)

1 Read the paragraph.

The lake was shimmering in the fading sunlight. It was getting dark and soon, I knew, people would walk inside to eat dinner. I could smell a charcoal fire and hear the sizzle of food starting to cook. The stars started to come out: one, two, then more than I could count. \_\_\_\_\_

---

Everyone walked toward the house, but I stayed outside and just looked at the sky and the stars. For some reason, I remember that night more clearly than any other night that whole summer.

Which sentence containing a figurative device **best** fits the blank in the paragraph?

- A I saw that the lake was like a cat getting ready to sleep for the night.
- B The fire started to dance and leap wildly above the grill.
- C I could hear stomachs growling like hungry bears.
- \* D The stars winked happily at each other and at me.

2 Emma has to write a letter to her teachers. Which closing would be **most** appropriate?

- A Thanks a lot,
- B See you later,
- \* C Thank you for your attention,
- D Hope to hear from you soon,

- 3** <sup>1</sup>Last year, we had record rainfall. <sup>2</sup>Meteorologists say one reason for the increase is the rising temperature of the Pacific Ocean. <sup>3</sup>Meteorologists are scientists who study the weather. <sup>4</sup>When the surface of the Pacific Ocean grows warmer, it warms the air above it. <sup>5</sup>This creates strong winds that carry large storms across the United States.

Which is the **best** way to combine sentences 2 and 3?

- A** Meteorologists say one reason for the increase is the rising temperature of the Pacific Ocean, since they are scientists who study the weather.
- B** Meteorologists are scientists who study the weather, and they say one reason for the increase is the rising temperature of the Pacific Ocean.
- \* **C** Meteorologists, scientists who study the weather, say one reason for the increase is the rising temperature of the Pacific Ocean.
- D** Meteorologists say one reason for the increase is the rising temperature of the Pacific Ocean; meteorologists are scientists who study the weather.

- 4** Which of the following is an example of personification?

- A** The house is located at the top of a small rise.
- \* **B** The wind screeched as it raced through the house.
- C** My grandmother's house is full of wonderful smells and sounds.
- D** The velvet voice coming from the CD player put Sara to sleep.

**WRITING PROMPT**

Your social studies teacher has asked you to write about this topic:

**Explain why you would or would not want to live in a large city.**

Before you begin to write, think about living in a large city. Would you like or dislike it? **Why** do you think the way you do?

Now write an essay for your teacher about whether or not you would want to live in a large city. Give specific reasons explaining why you think the way you do.

**WRITER'S CHECKLIST**

- |  |   |
|--|---|
| <p>1. Look at the ideas in your response.</p> <ul style="list-style-type: none"><li><input type="checkbox"/> Have you focused on one main idea?</li><li><input type="checkbox"/> Have you used enough detail to explain yourself?</li><li><input type="checkbox"/> Have you put your thoughts in order?</li><li><input type="checkbox"/> Can others understand what you are saying?</li></ul> <p>2. Think about what you want others to know and feel after reading your paper.</p> <ul style="list-style-type: none"><li><input type="checkbox"/> Will others understand how you think or feel about an idea?</li><li><input type="checkbox"/> Will others feel angry, sad, happy, surprised, or some other way about your response? (Hint: Make your reader feel like you do about your paper's subject.)</li><li><input type="checkbox"/> Do you have sentences of different lengths? (Hint: Be sure you have a variety of sentence lengths.)</li></ul> | <ul style="list-style-type: none"><li><input type="checkbox"/> Are your sentences alike? (Hint: Use different kinds of sentences.)</li></ul> <p>3. Look at the words you have used.</p> <ul style="list-style-type: none"><li><input type="checkbox"/> Have you described things, places and people the way they are? (Hint: Use enough detail.)</li><li><input type="checkbox"/> Are you the same person all the way through your paper? (Hint: Check your verbs and pronouns.)</li><li><input type="checkbox"/> Have you used the right words in the right places?</li></ul> <p>4. Look at your handwriting.</p> <ul style="list-style-type: none"><li><input type="checkbox"/> Can others read your handwriting with no trouble?</li></ul> |
|--|---|

## Domain Scoring Rubric

### Content (C)

The Content domain includes the focusing, structuring, and elaborating that a writer does to construct an effective message for a reader. It is the creation of a product, the building of a composition intended to be read. The writer crafts his/her message for the reader by focusing on a central idea, providing elaboration of the central idea, and delivering the central idea and its elaboration in an organized text. Features are:

- Central idea
- Elaboration
- Unity
- Organization

### Style (S)

The Style domain comprises those features that show the writer purposefully shaping and controlling language to affect readers. This domain focuses on the vividness, specificity, and rhythm of the piece and the writer's attitude and presence. Features are:

- Selected vocabulary
- Sentence variety
- Tone
- Voice
- Selected information

### Sentence Formation (F)

The Sentence Formation domain reflects the writer's ability to form competent, appropriately mature sentences to express his/her thoughts. Features are:

- Completeness
- Absence of fused sentences
- Expansion through standard coordination and modifiers
- Embedding through standard subordination and modifiers
- Standard word order

### Usage (U)

The Usage domain comprises the writer's use of word-level features that cause written language to be acceptable and effective for standard discourse. Features are:

- Standard inflections
- Agreement
- Word meaning
- Conventions

### Mechanics (M)

The Mechanics domain includes the system of symbols and cueing devices a writer uses to help readers make meaning. Features are:

- Capitalization
- Punctuation
- Formatting
- Spelling

### Scoring Scale

Each domain is scored independently using the following scale.

4 =The writer demonstrates **consistent**, though not necessarily perfect, control\* of almost all of the domain's features.

3 =The writer demonstrates **reasonable**, but not consistent, control\* of most of the domain's features, indicating some weakness in the domain.

2 =The writer demonstrates **inconsistent** control\* of several of the domain's features, indicating significant weakness in the domain.

1 =The writer demonstrates **little** or **no** control\* of most of the domain's features.

\*Control: The ability to use a given feature of written language effectively at the appropriate grade level. A response receives a higher score to the extent that it demonstrates control of the features in each domain.

The application of the scale, using actual student writing, is done with the assistance of a committee of Arkansas teachers, language arts supervisors, and representatives of the Arkansas Department of Education.

### Nonscoreable and Blank Papers

Nonscoreable papers include student responses that are off-topic, illegible, incoherent, written in a language other than English, or too brief to assess. Nonscoreable papers will receive a score of "0." Blank papers indicate no response was written and will be reported as NA (no attempt), which translates into a score of "0."

**PART III Item Correlation with Curriculum Framework—Grade 7**

**The Arkansas Science Curriculum Framework\***

Strands	Content Standards	Student Learning Expectations
1— Nature of Science (N)	1. Characteristics and Processes of Science: Students shall demonstrate and apply knowledge of the characteristics and processes of science using appropriate safety procedures, equipment, and technology.	2. Analyze components of <i>experimental design</i> used to produce <i>empirical evidence</i> : <ul style="list-style-type: none"> <li>• <i>hypothesis</i></li> <li>• replication</li> <li>• sample size</li> <li>• appropriate use of <i>control</i></li> <li>• use of standardized <i>variables</i></li> </ul> 5. Communicate results and conclusions from scientific inquiry. 6. Develop and implement strategies for long-term, accurate data collection. 9. Compare and contrast hypotheses, <i>laws</i> , and <i>theories</i> .
2— Life Science (L)	2. Living Systems: Characteristics, Structure, and Function: Students shall demonstrate and apply knowledge of living systems using appropriate safety procedures, equipment, and technology.	2. Analyze how two or more <i>organs</i> work together to perform a function (e.g., mouth and stomach to digest food). 4. Analyze the structure and function of <i>tissues, organs, and organ systems</i> of a <i>vertebrate</i> and an <i>angiosperm</i> using various models or methods of dissection. 5. Compare and contrast <i>vertebrate</i> systems and plant <i>organ systems</i> . 6. Identify human body systems: <ul style="list-style-type: none"> <li>• nervous</li> <li>• digestive</li> <li>• circulatory</li> <li>• respiratory</li> <li>• excretory</li> <li>• integumentary</li> <li>• skeletal/muscular</li> <li>• endocrine</li> <li>• reproductive</li> </ul> 8. Investigate functions of human body systems.
	3. Life Cycles, Reproduction, and Heredity: Students shall demonstrate and apply knowledge of life cycles, reproduction, and heredity using appropriate safety procedures, equipment, and technology.	2. Distinguish between <i>sperm cells</i> and <i>egg cells</i> . 3. Compare and contrast the structure and function of the <i>sperm cell</i> and the <i>egg cell</i> in <i>vertebrates</i> and plants and their role in <i>sexual reproduction</i> . 6. Dissect a flower to analyze the reproductive system of <i>angiosperms</i> (e.g., paper, plastic, or <i>clay</i> models; virtual dissection; or specimen dissection). 9. Identify the number and source of chromosomes in human sex <i>cells</i> . 10. Explain the role of <i>cell</i> division.
	4. Populations and Ecosystems: Students shall demonstrate and apply knowledge of populations and ecosystems using appropriate safety procedures, equipment, and technology.	1. Explain the role of <i>reproduction</i> in the continuation of a <i>species</i> .

\* The Content Standards and Student Learning Expectations listed are those that specifically relate to the released and non-released test items in this booklet.

The Arkansas Science Curriculum Framework\* (continued)

Strands	Content Standards	Student Learning Expectations
3— Physical Science (P)	5. Matter: Properties and Changes: Students shall demonstrate and apply knowledge of matter, including properties and changes, using appropriate safety procedures, equipment, and technology.	<ol style="list-style-type: none"> <li>1. Explain how a small number of naturally-occurring <i>elements</i> can result in the large variety of substances found in the world.</li> <li>3. Identify <i>compounds</i> as substances consisting of two or more <i>elements</i> chemically combined.</li> <li>4. Compare and contrast properties of <i>compounds</i> to those of the <i>elements</i> that compose them:               <ul style="list-style-type: none"> <li>• salt: sodium, chlorine</li> <li>• water: hydrogen, oxygen</li> <li>• carbon dioxide: carbon, oxygen</li> </ul> </li> <li>6. Classify substances as               <ul style="list-style-type: none"> <li>• <i>elements</i></li> <li>• <i>compounds</i></li> <li>• <i>mixtures</i></li> </ul> </li> <li>8. Investigate the effect of <i>variables</i> on <i>solubility rates</i>.</li> <li>9. Interpret solubility graphs.</li> </ol>
	6. Motion and Forces: Students shall demonstrate and apply knowledge of motion and forces using appropriate safety procedures, equipment, and technology.	<ol style="list-style-type: none"> <li>1. Compare and contrast Newton's three laws of motion.</li> <li>5. Explain how Newton's three laws of motion apply to real world situations (e.g., sports, transportation).</li> <li>6. Investigate careers, scientists, and historical breakthroughs related to laws of motion.</li> </ol>
	7. Energy and Transfer of Energy: Students shall demonstrate and apply knowledge of energy and transfer of energy using appropriate safety procedures, equipment, and technology.	<ol style="list-style-type: none"> <li>3. Conduct investigations to identify types of <i>potential energy</i> and <i>kinetic energy</i>.</li> <li>4. Investigate alternative <i>energy</i> sources.</li> <li>5. Investigate careers, scientists, and historical breakthroughs related to <i>natural resources</i>, alternative resources, <i>electricity</i>, and <i>magnetism</i>.</li> </ol>

\* The Content Standards and Student Learning Expectations listed are those that specifically relate to the released and non-released test items in this booklet.

**PART III Item Correlation with Curriculum Framework—Grade 7**

**The Arkansas Science Curriculum Framework\* (continued)**

Strands	Content Standards	Student Learning Expectations
<p>4— Earth and Space Science (E)</p>	<p>8. Earth Systems: Students shall demonstrate and apply knowledge of Earth's structure and properties using appropriate safety procedures, equipment, and technology.</p>	<p>2. Investigate the influence of global patterns on local weather:</p> <ul style="list-style-type: none"> <li>• movement of air masses</li> <li>• <i>Coriolis effect</i></li> <li>• <i>jet stream</i></li> <li>• global wind belts</li> </ul> <p>5. Identify <i>elements</i> of weather:</p> <ul style="list-style-type: none"> <li>• <i>temperature</i></li> <li>• air pressure</li> <li>• <i>wind speed</i></li> <li>• wind direction</li> <li>• <i>humidity</i></li> </ul> <p>7. Predict weather conditions using data on the following:</p> <ul style="list-style-type: none"> <li>• <i>temperature</i></li> <li>• air pressure: highs, lows, fronts</li> <li>• clouds</li> <li>• <i>wind speed</i></li> <li>• wind direction</li> <li>• <i>humidity</i></li> </ul> <p>9. Explain tornado belt weather patterns using a map of the United States.</p> <p>11. Describe and map <i>climates</i> of major Earth regions.</p> <p>12. Analyze the effect of the shape of Earth and the tilt of Earth's <i>axis</i> on <i>climate</i>.</p> <p>16. Conduct investigations demonstrating the <i>water cycle</i>.</p> <p>18. Investigate cloud formation.</p> <p>20. Research how human activities may contribute to <i>global warming</i>.</p> <p>21. Explain examples of actual events that cause temporary <i>climate</i> changes:</p> <ul style="list-style-type: none"> <li>• volcanic dust</li> <li>• drought</li> <li>• <i>meteor</i> impact</li> </ul>
	<p>9. Earth's History: Students shall demonstrate and apply knowledge of Earth's history using appropriate safety procedures, equipment, and technology.</p>	<p>1. Analyze charts to infer past atmospheric conditions based on the <i>organisms</i> found in the <i>fossil</i> record.</p> <p>2. Demonstrate that Earth has a magnetic field that is detectable at the surface with a compass.</p>
	<p>10. Objects in the Universe: Students shall demonstrate and apply knowledge of objects in the universe using appropriate safety procedures, equipment, and technology.</p>	<p>3. Identify and model the cause of <i>planetary years</i>.</p>

\* The Content Standards and Student Learning Expectations listed are those that specifically relate to the released and non-released test items in this booklet.

**Released Items for Science\***

<b>Item</b>	<b>Strand</b>	<b>Content Standard</b>	<b>Student Learning Expectation</b>
1	P	6	6
2	L	3	3
3	L	3	10
4	E	8	12
5	P	7	3
6	E	9	1
7	E	10	3
8	E	8	2
9	E	8	16
10	N	1	9
11	L	3	6
12	P	5	9
13	L	2	5
14	P	5	3
15	L	4	1
16	P	5	6
17	N	1	6
A	P	6	1
B	L	2	2

\* Only the predominant Strand, Content Standard, and Student Learning Expectation are listed for the Science items.

**Non-Released Items for Science\***

<b>Strand</b>	<b>Content Standard</b>	<b>Student Learning Expectation</b>
L	2	8
P	5	9
E	8	11
P	7	5
P	7	4
E	8	7
L	3	9
L	2	4
N	1	9
L	2	6
P	5	4
E	8	5
P	5	6
E	8	21
P	5	8
L	3	2
E	8	9
E	8	20
E	9	2
P	5	1
N	1	2
L	2	8
E	8	18
P	6	5
N	1	2
N	1	5

\* Only the predominant Strand, Content Standard, and Student Learning Expectation are listed for the Science items.

The Arkansas Mathematics Curriculum Framework\*

Strands	Content Standards	Student Learning Expectations
1—Number and Operations (N)	1. Number Sense: Students shall understand numbers, ways of representing numbers, relationships among numbers, and number systems.	1. Relate, with and without models and pictures, concepts of <i>ratio</i> , <i>proportion</i> , and <i>percent</i> , including <i>percents</i> less than 1 and greater than 100. 3. Convert between <i>scientific notation</i> and standard <i>notation</i> using numbers greater than one. 4. Find decimal and <i>percent equivalents</i> for mixed numbers and explain why they represent the same value. 5. Compare and represent <i>integers</i> , fractions, decimals and mixed numbers and find their approximate location on a number line.
	2. Properties of Number Operations: Students shall understand meanings of operations and how they relate to one another.	2. Apply the addition, subtraction, multiplication and division properties of equality to one-step <i>equations</i> with <i>integers</i> , fractions, and decimals. 3. Apply rules (conventions) for <i>order of operations</i> to <i>integers</i> and positive <i>rational numbers</i> including parentheses, brackets or exponents.
	3. Numerical Operations and Estimation: Students shall compute fluently and make reasonable estimates.	1. Compute, with and without appropriate <i>technology</i> , with <i>integers</i> and positive <i>rational numbers</i> using real world situations to solve problems. 2. Solve with and without appropriate <i>technology</i> , multi-step problems using a variety of methods and tools (i.e., objects, mental computation, paper and pencil). 4. Apply <i>factorization</i> , <i>LCM</i> , and <i>GCF</i> to solve problems using more than two numbers and explain the solution.
2—Algebra (A)	4. Patterns, Relations, and Functions: Students shall recognize, describe, and develop patterns, relations, and functions.	1. Create and complete a <i>function table (input/output)</i> using a given rule with two operations. 2. Identify and extend <i>patterns</i> in real world situations.
	5. Algebraic Representations: Students shall represent and analyze mathematical situations and structures using algebraic symbols.	1. Solve and graph one-step <i>linear equations</i> and <i>inequalities</i> using a variety of methods (i.e., hands-on, <i>inverse operations</i> , symbolic) with real world application with and without <i>technology</i> . 2. Solve simple <i>linear equations</i> using <i>integers</i> and graph on a <i>coordinate plane</i> . Ex. use a T chart 3. Translate phrases and sentences into <i>algebraic expressions</i> and <i>equations</i> including parentheses and positive and <i>rational numbers</i> and simplify <i>algebraic expressions</i> by combining like terms.
	6. Algebraic Models: Students shall develop and apply mathematical models to represent and understand quantitative relationships.	1. Use tables and graphs to represent <i>linear equations</i> by plotting, with and without appropriate <i>technology</i> , points in a <i>coordinate plane</i> . 3. Create and complete a <i>function table (input/output)</i> using a given rule with two operations in real world situations.
	7. Analysis of Change: Students shall analyze change in various contexts.	1. Use, with and without appropriate <i>technology</i> , tables and graphs to compare and identify situations with constant or varying <i>rates</i> of change.

\* The Content Standards and Student Learning Expectations listed are those that specifically relate to the released and non-released test items in this booklet.

**PART III Item Correlation with Curriculum Framework—Grade 7**

**The Arkansas Mathematics Curriculum Framework\* (continued)**

Strands	Content Standards	Student Learning Expectations
3—Geometry (G)	8. Geometric Properties: Students shall analyze characteristics and properties of 2- and 3-dimensional geometric shapes and develop mathematical arguments about geometric relationships.	<ol style="list-style-type: none"> <li>1. Identify, draw, classify and compare geometric figures using models and real world examples.</li> <li>3. Recognize the pairs of angles formed and the relationship between the angles including two <i>intersecting lines</i> and <i>parallel lines</i> cut by a <i>transversal</i> (<i>vertical, supplementary, complementary, corresponding, alternate interior, alternate exterior angles</i> and <i>linear pair</i>).</li> <li>4. Use paper or physical models to determine the sum of the measures of <i>interior angles</i> of triangles and <i>quadrilaterals</i>.</li> <li>5. Model and develop the concept that pi (<math>\pi</math>) is the <i>ratio</i> of the <i>circumference</i> to the <i>diameter</i> of any circle.</li> <li>6. Develop the properties of <i>similar figures</i> (<i>ratio of sides</i> and <i>congruent angles</i>).</li> </ol>
	9. Transformation of Shapes: Students shall apply transformations and the use of symmetry to analyze mathematical situations.	2. Perform <i>translations</i> and <i>reflections</i> of <i>two-dimensional</i> figures using a variety of methods (paper folding, tracing, graph paper).
	10. Coordinate Geometry: Students shall specify locations and describe spatial relationships using coordinate geometry and other representational systems.	2. Plot points that form the <i>vertices</i> of a geometric figure and draw, identify and classify the figure.
	11. Students shall use visualization, spatial reasoning, and geometric modeling.	1. Build <i>three-dimensional</i> solids from <i>two-dimensional patterns</i> ( <i>nets</i> ).
4—Measurement (M)	12. Physical Attributes: Students shall use attributes of measurement to describe and compare mathematical and real-world objects.	<ol style="list-style-type: none"> <li>2. Understand relationships among units within the same system.</li> <li>3. Find different <i>areas</i> for a given <i>perimeter</i> and find a different <i>perimeter</i> for a given <i>area</i>.</li> </ol>
	13. Systems of Measurement: Students shall identify and use units, systems, and processes of measurement.	<ol style="list-style-type: none"> <li>1. Solve real world problems involving two or more <i>elapsed times</i>, counting forward and backward (calendar and clock).</li> <li>2. Draw and measure distance to the nearest mm and 1/16 inch accurately.</li> <li>3. Develop and use <i>strategies</i> to solve problems involving <i>area</i> of a <i>trapezoid</i> and <i>circumference</i> and <i>area</i> of a circle.</li> <li>4. Derive and use formulas for <i>surface area</i> and <i>volume</i> of <i>prisms</i> and <i>cylinders</i> and justify them using geometric models and common materials.</li> <li>5. Apply properties (<i>scale factors, ratio, and proportion</i>) of <i>congruent</i> or <i>similar</i> triangles to solve problems involving missing lengths and angle measures.</li> <li>6. Find the distance between two points on a number line and locate the midpoint.</li> </ol>
5—Data Analysis And Probability (D)	14. Data Representation: Students shall formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them.	<ol style="list-style-type: none"> <li>1. Identify different ways of selecting samples and compose appropriate questions. Ex. survey response, random sample, representative sample and convenience sample</li> <li>2. Explain which types of display are appropriate for various data sets (<i>line graph</i> for change over time, <i>circle graph</i> for part-to-whole comparison, <i>scatter plot</i> for trends).</li> </ol>
	15. Data Analysis: Students shall select and use appropriate statistical methods to analyze data.	<ol style="list-style-type: none"> <li>1. Analyze data displays, including ways that they can be misleading.</li> <li>2. Analyze, with and without appropriate <i>technology</i>, a set of data by using and comparing measures of <i>central tendencies</i> (<i>mean, median, mode</i>) and <i>measures of spread</i> (<i>range, quartile, interquartile range</i>).</li> </ol>
	17. Probability: Students shall understand and apply basic concepts of probability.	1. Understand that <i>probability</i> can take any value between 0 and 1 (events that are not going to occur have <i>probability</i> 0, events certain to occur have <i>probability</i> 1).

\* The Content Standards and Student Learning Expectations listed are those that specifically relate to the released and non-released test items in this booklet.

**Released Items for Mathematics\***

<b>Item</b>	<b>Strand</b>	<b>Content Standard</b>	<b>Student Learning Expectation</b>
1	M	13	2
2	D	14	1
3	A	5	3
4	A	5	1
5	N	1	3
6	G	9	2
7	D	14	2
8	G	8	3
9	M	13	5
10	M	12	2
11	D	15	2
12	A	4	1
13	D	15	1
14	G	8	5
15	N	1	1
16	M	13	6
17	G	8	6
18	A	6	1
19	G	11	1
20	M	12	3
A	D	15	2
B	M	13	4
C	A	5	2

\* Only the predominant Strand, Content Standard, and Student Learning Expectation are listed for the Mathematics items.

**Non-Released Items for Mathematics\***

<b>Strand</b>	<b>Content Standard</b>	<b>Student Learning Expectation</b>
G	8	6
N	3	4
G	10	2
A	6	3
M	13	3
M	13	1
G	8	4
A	7	1
N	3	1
N	3	2
N	1	5
G	8	1
N	2	2
D	17	1
D	15	2
A	4	2
N	2	3
A	5	3
N	1	4
A	5	1
D	15	1
N	3	2

\* Only the predominant Strand, Content Standard, and Student Learning Expectation are listed for the Mathematics items.

**The Arkansas English Language Arts Curriculum Framework—Reading Strand\***

<b>Content Standards</b>	<b>Student Learning Expectations</b>
<p>9. Comprehension: Students shall apply a variety of strategies to read and comprehend printed material.</p>	<p>6. Connect own background knowledge and personal experience to make inferences and to respond to new information presented in text.              8. Infer mood of text.              9. Analyze literary elements of fiction with emphasis on plot development, including conflict, rising action, climax, falling action, and resolution.              11. Distinguish among stated fact, reasoned judgment, and opinion in text.              12. Identify main ideas and supporting evidence in short stories and novels.              14. Use knowledge of text structure(s) to enhance understanding with emphasis on problem/solution.              16. Use skimming, scanning, note-taking, outlining, and questioning as study strategies.</p>
<p>10. Variety of Text: Students shall read, examine, and respond to a wide range of texts for a variety of purposes.</p>	<p>5. Use skimming, scanning, note taking, outlining, and questioning as study strategies.              7. Read a variety of literature, including short stories, science fiction, legends, and myths.</p>
<p>11. Vocabulary, Word Study, and Fluency: Students shall acquire and apply skills in vocabulary development and word analysis to be able to read fluently.</p>	<p>4. Use knowledge of root words and affixes and word relationships to determine meaning.              7. Determine useful and relevant words.              8. Identify and explain idioms and comparisons such as analogies, metaphors and similes to infer the literal and figurative meanings or phrases.              10. Use context to determine meaning of multiple meaning words.</p>

\* The Content Standards and Student Learning Expectations listed are those that specifically relate to the released and non-released test items in this booklet.

**Released Items for Reading\***

<b>Item</b>	<b>Strand</b>	<b>Content Standard</b>	<b>Student Learning Expectation</b>
1	R	11	10
2	R	9	9
3	R	11	4
4	R	10	5
5	R	11	8
6	R	9	9
7	R	9	14
8	R	9	6
A	R	9	8
9	R	10	5
10	R	11	7
11	R	9	11
12	R	11	4
13	R	9	12
14	R	10	5
15	R	9	6
16	R	9	12
B	R	9	14

\* Only the predominant Strand, Content Standard, and Student Learning Expectation are listed for the English Language Arts items.

**Non-Released Items for Reading\***

<b>Strand</b>	<b>Content Standard</b>	<b>Student Learning Expectation</b>
R	11	8
R	9	16
R	11	7
R	11	4
R	9	12
R	9	16
R	9	14
R	10	7
R	9	6

\* Only the predominant Strand, Content Standard, and Student Learning Expectation are listed for the English Language Arts items.

## PART III Item Correlation with Curriculum Framework—Grade 7

### The Arkansas English Language Arts Curriculum Framework—Writing Strand\*

Content Standards	Student Learning Expectations
<p>4. Process: Students shall employ a wide range of strategies as they write, using the writing process appropriately.</p>	<p>8. Revise content for</p> <ul style="list-style-type: none"> <li>• Central Idea</li> <li>• Organization</li> <li>• Unity</li> <li>• Elaboration (e.g., explanation, examples, description, etc.)</li> <li>• Clarity</li> </ul> <p>11. Edit individually or in groups for appropriate grade-level conventions, within the following features:</p> <ul style="list-style-type: none"> <li>• <i>Sentence formation</i> <ul style="list-style-type: none"> <li>• Completeness</li> <li>• Absence of fused sentences</li> <li>• Expansion through standard coordination and modifiers</li> <li>• <i>Embedding</i> through standard subordination and modifiers</li> <li>• Standard word order</li> </ul> </li> <li>• <i>Usage</i> <ul style="list-style-type: none"> <li>• Standard inflections</li> <li>• Agreement</li> <li>• Word meaning</li> <li>• Conventions</li> </ul> </li> <li>• <i>Mechanics</i> <ul style="list-style-type: none"> <li>• Capitalization</li> <li>• Punctuation</li> <li>• Formatting</li> <li>• Spelling</li> </ul> </li> </ul>
<p>5. Purpose, Topics, Forms, and Audiences: Students shall demonstrate competency in writing for a variety of purposes, topics, and audiences employing a wide range of forms.</p>	<p>2. Select the form of writing that addresses the intended audience.</p>
<p>6. Students shall apply knowledge of Standard English conventions in written work.</p>	<p>2. Write effective sentences by <i>embedding</i> clauses, prepositional and appositive phrases, and all compound elements.</p>
<p>7. Craftsmanship: Students shall develop personal style and voice as they approach the craftsmanship of writing.</p>	<p>1. Use figurative language purposefully, such as personification and hyperbole, to shape and control language to affect readers.</p>

\* The Content Standards and Student Learning Expectations listed are those that specifically relate to the released and non-released test items in this booklet.

**Released Items for Writing\***

<b>Item</b>	<b>Strand</b>	<b>Content Standard</b>	<b>Student Learning Expectation</b>
1	W	7	1
2	W	5	2
3	W	6	2
4	W	7	1

\* Only the predominant Strand, Content Standard, and Student Learning Expectation are listed for the Writing items.

**Non-Released Items for Writing\***

<b>Strand</b>	<b>Content Standard</b>	<b>Student Learning Expectation</b>
W	4	11
W	4	11
W	4	11
W	4	8

\* Only the predominant Strand, Content Standard, and Student Learning Expectation are listed for the Writing items.



# ACTAAP

**Arkansas Comprehensive Testing, Assessment, and Accountability Program**

DEVELOPED FOR THE ARKANSAS DEPARTMENT OF EDUCATION, LITTLE ROCK, AR 72201

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