

ACTAAP

Arkansas Comprehensive Testing, Assessment, and Accountability Program

RELEASED ITEM

BOOKLET

GRADE 5

AUGMENTED BENCHMARK EXAMINATION

April 2014

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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 5 students in Arkansas public schools participated in the *Grade 5 Augmented Benchmark Examination* in April 2014.

This Released Item Booklet for the *Grade 5 Augmented Benchmark Examination* contains test questions or items that were asked of students during the April 2014 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 2014. Students were permitted to use a calculator for the mathematics items (both multiple-choice and open-response), with the exception of mathematics questions 1–6 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 31 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 5 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 5 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 5 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

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 5 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 5 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.

Do-It-Yourself Recipe

ICE CREAM

by Joey Green

WHAT YOU NEED

From the supermarket:

- 1 quart cream
- $\frac{3}{4}$ cup sugar
- $\frac{1}{8}$ teaspoon salt
- $\frac{1}{2}$ teaspoon vanilla extract
- 1 small, clean, empty coffee can (net weight 13-ounce) with lid
- 1 large, clean, empty coffee can (net weight 39-ounce) with lid
- Rock salt

From the hardware store or drugstore:

- Electrical tape

From the kitchen:

- Mixing bowl
- Measuring cup
- Whisk
- Ice

WHAT TO DO

Heat one cup cream (without boiling) and add sugar and salt, stirring until dissolved. Add the vanilla extract. Chill. Then add three cups cream and mix well with a whisk.

Pour the mixture into the small, clean coffee can. Secure the plastic lid



in place and use the electrical tape to make the lid watertight.

Place the small coffee can into the large coffee can. Fill the rest of the large can with ice up to the top of the small can. Fill the rest of the space with rock salt. Secure the plastic lid in place and use the electrical tape to make the lid watertight.

Take the can outside and roll it across the lawn or patio for fifteen minutes. Bring the can back inside, peel the tape from the lid of the large can, pour out the melted ice and salt, and refill with fresh ice and fresh salt. Secure the lid in place again, and roll the can outside for another fifteen minutes.

Bring the can back inside, peel off the tape from the larger can, pour out the melted ice and salt, and wash off the smaller can with tap water from the sink. Dry the can.

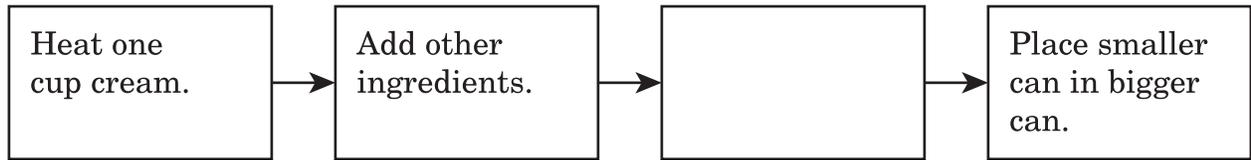
Store in the freezer for twelve hours. Peel off the tape from the smaller can, remove the lid, and scoop the contents into bowls.

STRANGE FACTS

- Mixing ice with salt in the compartment around the small can creates freezing temperatures, causing the mixture inside the small can to freeze. Rolling the large can causes the smaller can to roll around in the ice. As the smaller can rolls, air bubbles are whipped into the ice cream, increasing the volume of the mix.
- No one knows when ice cream was first invented or who invented it. In the late 1500s, Europeans used ice and snow to freeze mixtures of cream, fruit, and spices.
- Almost all ice cream was made at home until 1851, when Baltimore milk dealer Jacob Fussell established the first ice-cream factory.
- The edible ice-cream cone, invented by Italo Marchiony of Hoboken, New Jersey, was first served at the 1904 World's Fair in St. Louis, Missouri.

- The most popular flavor of ice cream in the United States is vanilla, accounting for approximately one-third of all the ice cream sold in the country. The second most popular flavor is chocolate, followed by strawberry.
- The United States produces more than one billion gallons of ice cream, ice milk, sherbet, and water ice every year.
- Approximately ten percent of all the milk produced in the United States is used to make ice cream and other frozen desserts.
- Americans eat more ice cream than do the people of any other nation in the world.
- The average American eats roughly 14.5 quarts of ice cream in a year.
- On July 24, 1988, Palm Dairies Ltd. of Alberta, Canada, created the world's largest ice-cream sundae—made from 44,689 pounds, 8 ounces of ice cream, 9,688 pounds, 2 ounces of syrup, and 537 pounds, 3 ounces of topping.

1 Read the graphic organizer.



Which step belongs in the empty rectangle?

- A Add the vanilla extract.
- * B Pour mixture into smaller can.
- C Fill the larger can with ice and salt.
- D Roll the can outdoors for fifteen minutes.

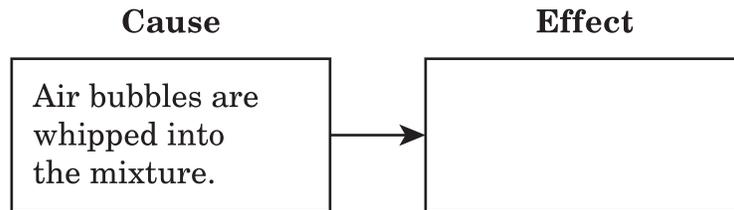
2 An important function of the larger coffee can is to

- A contain the ice cream mixture.
- B prevent the smaller can from turning.
- C keep the ice cream mixture from spoiling.
- * D hold the ingredients that freeze the ice cream mixture.

3 Which step in this recipe would **probably not** happen in an ice cream factory?

- A filling the space between containers with ice and salt
- * B rolling the container outside for fifteen minutes
- C heating up the mixture without boiling it
- D securing the lid to make it watertight

4 Read the graphic organizer.



Which belongs in the empty box?

- * **A** The ice cream increases in volume.
- B** The ice cream becomes well frozen.
- C** The ingredients are blended together.
- D** The small can moves around on the ice.

5 According to this passage, who invented ice cream?

- A** Palm Dairies Ltd.
- B** Italo Marchiony
- * **C** No one knows.
- D** Jacob Fussell

6 How would you change the recipe to make the second-most-popular ice cream flavor?

- A** Add strawberries to the recipe.
- * **B** Add chocolate to the recipe.
- C** Use milk instead of cream.
- D** Use fruit instead of sugar.

7 Which meaning of the word roughly is used in the next-to-last bullet under STRANGE FACTS?

- * **A** approximately
- B** unevenly
- C** violently
- D** crudely

8 The author **most likely** included the section STRANGE FACTS to

- A** provide facts about other ways to make ice cream.
- B** tell a story about the person who invented ice cream.
- C** persuade readers that ice cream is delicious and healthy.
- * **D** provide interesting information on the topic of ice cream.

Reading Item A—2014 Grade 5

- A** Ice cream is very popular in the United States. Identify at least four facts from the passage that support this conclusion.

Reading Item A Scoring Rubric—2014 Grade 5

Score	Description
4	The response identifies at least four facts from the passage that support the idea that ice cream is very popular in the United States.
3	The response identifies three facts from the passage that support the idea that ice cream is very popular in the United States.
2	The response identifies two facts from the passage that support the idea that ice cream is very popular in the United States.
1	The response identifies one fact from the passage that supports the idea that ice cream is very popular in the United States. OR 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.)

Helen Keller’s Teacher

by William J. Bennett

Some of the luckiest boys and girls are the ones who have teachers as heroes.

Helen Keller was not like most little girls. She could not see the flowers blooming in her yard, or the butterflies floating from blossom to blossom, or the white clouds drifting in the high, blue sky. She could not hear the birds singing in the treetops outside her window, or the laughing and singing of other children at play. Little Helen was blind and deaf.

2 And because she could not hear people talking, Helen had never learned to speak. She could clutch her mother’s dress and follow her around the house, but she did not know how to say to her, “I love you.” She could climb into her father’s lap, but she could not ask him, “Will you read me a story?” She lived in a dark, quiet world, where she felt all alone.

One afternoon when she was almost seven years old, Helen stood on her porch. She could feel a warm glow on her face, but she did not know it came from the sun. She smelled the sweetness of the honeysuckle vine growing beside her house, but she did not know what it was.

Suddenly Helen felt two arms wrap around her and hold her close. She knew at once it was not her mother or her father. At first she kicked and scratched and hit, trying to drive this stranger away. But then she began to wonder who it might be. She reached out and felt the stranger’s face, then her dress, and then the big suitcase she carried with her.

How was Helen to understand that this young woman was Annie Sullivan, who had come to live with Helen and be her teacher?

Annie had brought a present. She gave Helen a doll. Then she put her fingers against Helen’s hand, and made signs that Helen could feel. Annie slowly spelled D-O-L-L with her fingers. Helen felt Annie’s fingers moving, but she did not know what this woman was trying to tell her. She did not understand that each of these finger signs was a letter, and that the letters spelled the word *doll*. She pushed Annie away.

The new teacher did not give up. She gave Helen a piece of cake, and spelled the word C-A-K-E against her hand. Helen made the signs with her own fingers, but still she did not understand what they meant.

Over the next days and weeks, Annie put many different things into Helen's hands, and spelled out the words. She tried to teach her words like *pin*, and *hat*, and *cup*. To Helen it all seemed very odd. She grew tired of this strange woman always taking her hand. Sometimes she grew angry with Annie, and began striking out at the darkness around her. She kicked and scratched. She screamed and growled. She broke plates and lamps.

Sometimes Annie wondered if she would ever be able to help little Helen break out of her lonely world of darkness and silence. But she promised herself she would not give up.

Then one morning Helen and Annie were walking outside when they passed an old well. Annie took Helen's hand and held it under the spout while she pumped. As the cold water rushed forth, Annie spelled W-A-T-E-R.

Helen stood still. In one hand she felt the cool, gushing water. In the other hand she felt Annie's fingers, making the signs over and over again. Suddenly a thrill of hope and joy filled her little heart. She understood that W-A-T-E-R meant the wonderful, cool something that was flowing over her hand. She understood at last what Annie had been trying to show her for days and weeks. She saw now that everything had a name, and that she could use her fingers to spell out each name!



Helen ran laughing and crying back to the house, pulling Annie along with her. She touched everything she could lay her hands on, asking for their names—*chair*, *table*, *door*, *mother*, *father*, *baby*, and many more. There were so many wonderful words to learn! But none was more wonderful than the word Helen learned when she touched Annie to ask her name, and Annie spelled T-E-A-C-H-E-R.

13 Helen Keller never stopped learning. She learned to read with her fingers, and how to write, and even how to speak. She went to school and to college, and Annie went with her to help her learn. Helen and Annie became friends for life.

14 Helen Keller grew up to be a great woman. She devoted her life to helping people who could not see or hear. She worked hard, and wrote books, and traveled across the seas. Everywhere she went, she brought people courage and hope. Presidents and kings greeted her, and the whole world grew to love her. A childhood that had begun in darkness and loneliness turned into a life full of much light and joy.

15 “And the most important day in my life,” Helen said, “was the day my teacher came to me.”

9 What is the meaning of clutch as it is used in paragraph 2?

- A** rip
- B** embrace
- * **C** grip tightly
- D** snatch away

10 Helen tries to drive Annie away when the teacher first hugs her because

- A** she feels alone in her dark, quiet world.
- B** she does not want another day of lessons.
- C** she does not like the cake that Annie gives her.
- * **D** she can tell that Annie is not her mother or father.

11 Which detail from the passage supports the idea that Annie is patient?

- * **A** She keeps teaching in spite of Helen’s anger.
- B** She can teach people who cannot see or hear.
- C** She gives Helen a piece of cake.
- D** She brings Helen a doll.

12 Why are the events at the well so important?

- A** Helen and Annie pass a well as they take a walk.
- B** Annie is glad that Helen is not angry or screaming.
- * **C** Helen finally understands that finger spelling identifies things.
- D** Annie pumps water over Helen’s hand and spells W-A-T-E-R.

13 When Helen finally understood that the finger signs meant something, she felt

- * **A** hope and joy.
- B** like most girls.
- C** sun and warmth.
- D** tired of learning.

14 Which word is a synonym for devoted as it is used in paragraph 14?

- A** tried
- B** declared
- C** awarded
- * **D** dedicated

15 The author organizes paragraphs 13–15 by

- A** describing Helen’s college life.
- * **B** summarizing Helen’s adult life.
- C** listing everything Helen did as an adult.
- D** persuading others to be like Helen Keller.

16 In which area of the library would this passage **most likely** be found?

- A** Reference
- * **B** Biography
- C** Science
- D** Fiction

Reading Item B—2014 Grade 5

- B** Describe Annie’s goal for Helen. Use at least three examples from the passage that show actions Annie took to accomplish this goal.

Reading Item B Scoring Rubric—2014 Grade 5

Score	Description
4	The response describes Annie’s goal and provides at least three examples of actions she took to accomplish it.
3	The response describes Annie’s goal and provides two examples of actions she took to accomplish it.
2	<p>The response describes Annie’s goal and provides one example of an action she took to accomplish it.</p> <p style="text-align: center;">OR</p> <p>The response provides at least two examples of actions Annie took to accomplish her goal for Helen.</p>
1	<p>The response describes Annie’s goal but does not include any examples of actions she took to accomplish it.</p> <p style="text-align: center;">OR</p> <p>The response provides one example of an action Annie took to accomplish her goal for Helen.</p> <p style="text-align: center;">OR</p> <p>The response demonstrates minimal understanding of the question.</p>
0	The response is totally incorrect and shows no evidence that the student understands the task. The response may be off topic or 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 Barry wants to write something for the school newspaper about a place where his family goes for picnics. What would be the **best** type of writing to use?

- * **A** descriptive article
- B** persuasive essay
- C** business letter
- D** research report

2 Which is the strongest lead sentence for a paper on reasons for planting trees?

- A** Trees grow through their entire lives.
- B** People enjoy shade on hot summer days.
- * **C** Trees offer many significant benefits to us all.
- D** Trees provide fruits, nuts, and shelter for birds.

3 Ginny left the butter in the hot sun. ____, it melted all over the counter.

Which of the following is the **best** transition between the sentences?

- A** So that
- B** Because of
- C** Whenever
- * **D** As a result

4 Manny made a beautiful painting for his mother. Then Manny hung up the painting for his mother.

Which revision **best** uses pronouns to correct the problem of repetition in these sentences?

- A** Manny made a beautiful painting for his mother. Then her son hung up his painting for his mother.
- * **B** Manny made a beautiful painting for his mother. Then he hung it up for her.
- C** He made a beautiful painting for her. Then Manny hung it up for his mother.
- D** He made a beautiful painting for his mother. Then Manny hung it up for his mother.

WRITING PROMPT

Your teacher has asked you to write an essay about **one** thing you do very well.

Before you begin to write, think about something you do well. It could be school work or sports. It could be a special talent that you have or a hobby you enjoy. It can be anything you do well. What is **one** thing that you do very well?

Now write an essay about **one** thing you do very well. Give enough detail so that your teacher will understand.

WRITER'S CHECKLIST

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

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.

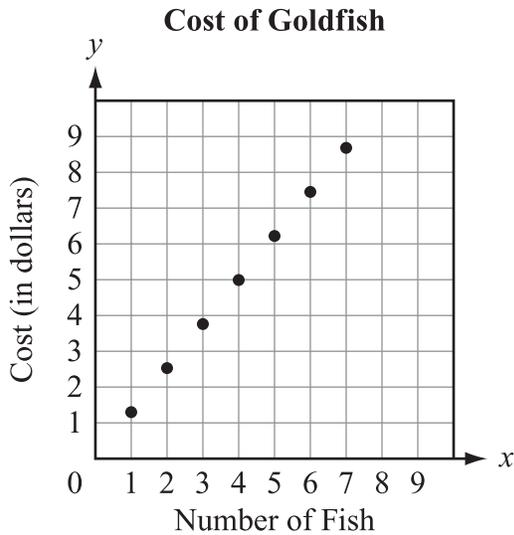
Nonscoreable and Blank Papers

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."

CALCULATOR NOT PERMITTED—ITEMS 1–6



- 1** The graph shows $C = 1.25 \times g$, the cost of purchasing different numbers of goldfish.



Harry spent \$6.25 for goldfish. How many goldfish did he buy?

- * **A** 5
- B** 6
- C** 7
- D** 8

- 2** Suzanne wants to make a graph that shows the trend in the amount of rain that fell in her hometown over the last 50 years. Which type of graph should she make?

- A** bar graph
- * **B** line graph
- C** line plot
- D** stem-and-leaf plot

3 Which array represents a number that is a perfect square?



4 Tom plotted a point on a coordinate plane using these steps:

- Start at the origin.
- Move 6 units horizontally.
- Move 7 units vertically.
- Plot the point.

Which ordered pair describes this point?

- * **A** (6, 7)
- B** (7, 6)
- C** (7, 8)
- D** (8, 7)

5 For a science project, Alexa is measuring the dimensions of several rooms at her school. Which of the following are the **best** units that Alexa should use to measure the dimensions?

- A** centimeters
- B** inches
- * **C** feet
- D** miles

6 Last year the school baseball team won t games. This year the baseball team won 3 games fewer than last year.

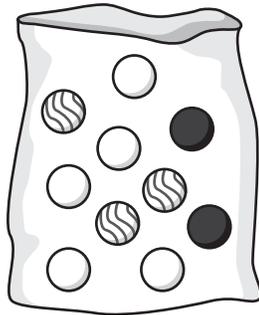
Which expression represents the number of games the baseball team won this year?

- * **A** $t - 3$
- B** $t \div 3$
- C** $t + 3$
- D** $t \times 3$

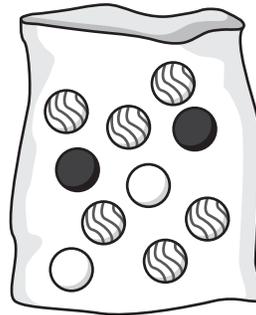
CALCULATOR PERMITTED—ITEMS 7–20 and A–C



- 7 Jim and Tony each have a bag of 10 marbles.



Jim

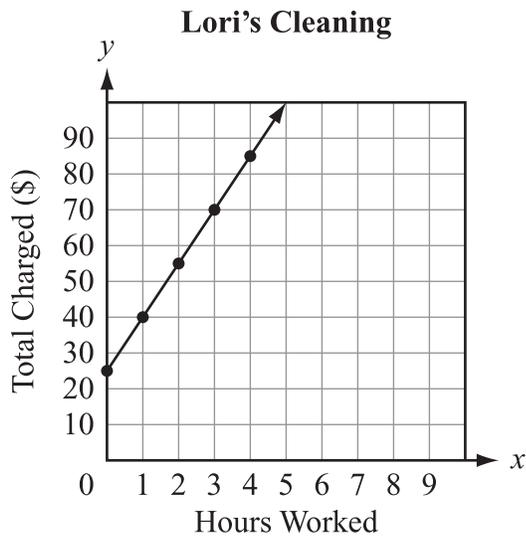


Tony

Which of the following is **most likely**?

- A** Jim draws out a white marble.
- * **B** Tony draws out a striped marble.
- C** Jim draws out a striped or a black marble.
- D** Tony draws out a white or a black marble.
-
- 8 During an evening fundraising event, a donor pledges he will give double the amount of money, p , raised between 5:00 and 6:00. Which expression and amount represents the donor's pledge if \$325 is raised during that hour?
- * **A** $2p$; \$650
- B** $p + 2$; \$327
- C** $p \div 2$; \$162.50
- D** $p \times p$; \$105,625
- 9 Trevor poured 4 gallons of paint into a bucket. How many quarts of paint are in 4 gallons?
- A** 1
- B** 8
- * **C** 16
- D** 32

- 10** Lori cleans homes. The line graph below shows how much money Lori makes starting from the time she begins working.



Based on the graph, which statement is true?

- A** Lori charges exactly \$25 for each hour worked.
- B** Lori charges exactly \$40 for each hour worked.
- C** Lori charges a \$25 initial fee and \$25 for each hour worked.
- * **D** Lori charges a \$25 initial fee and \$15 for each hour worked.

- 11** Which of the following situations involving the painting of a room describes a surface area?

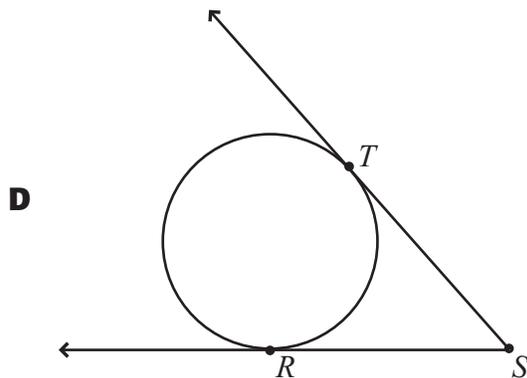
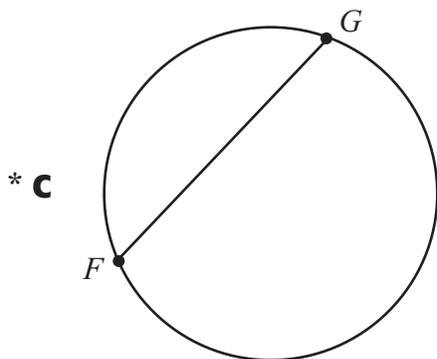
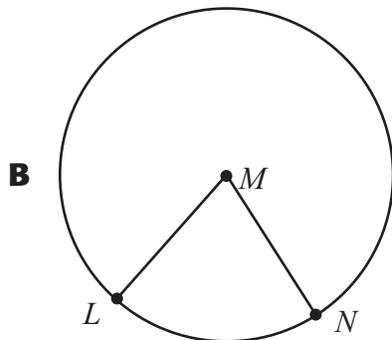
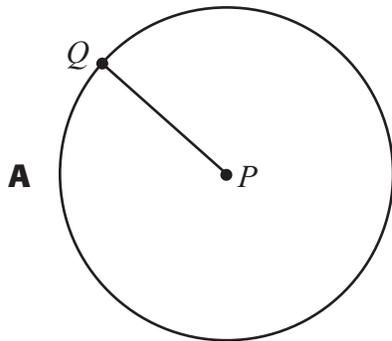
- A** the amount of paint the can holds
- * **B** the amount of wall covered in paint
- C** the thickness of the paint on the wall
- D** the amount of paint poured into a drip pan

- 12** Which number is equivalent to the following expression?

$$40.962 \div 3 \div 4$$

- * **A** 3.4135
- B** 5.4616
- C** 34.135
- D** 54.616

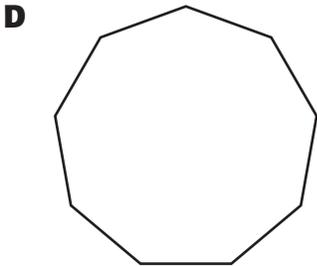
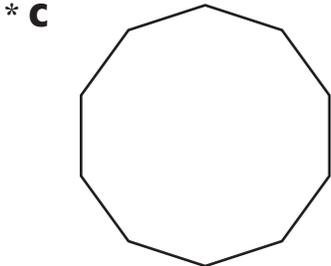
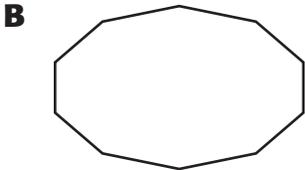
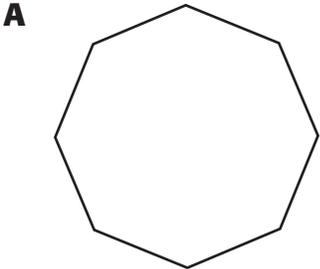
13 Which of these shows a chord?



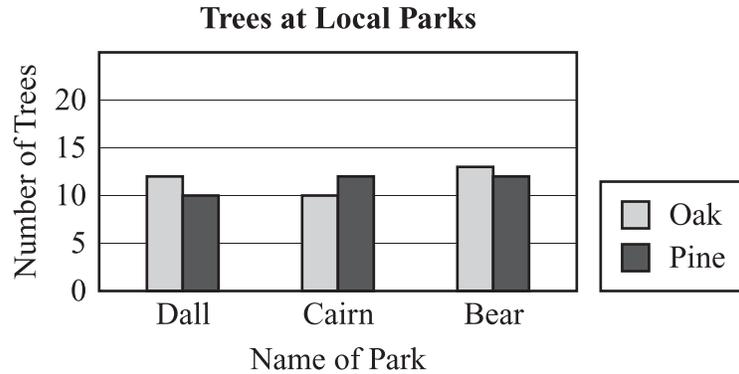
14 Pia is surveying her class about sports. Which survey question will generate data that can be **best** recorded in a frequency table?

- A** What is your favorite sports memory?
- B** Why do you like soccer more than basketball?
- C** If you spent a day at a lake in the summer, what would you do?
- * D** Which sport do you like the most: basketball, football, soccer, or tennis?

15 Craig designed a room in the shape of a regular decagon. Which illustration shows the shape of the room?



- 16** A scientist made a double bar graph comparing the number of oak trees to pine trees he saw among all the trees at three local parks.



Based on the situation and the graph, which statement **best** describes the data?

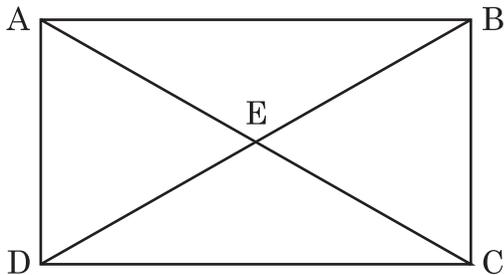
- A** At each park, oak trees outnumber pine trees.
- B** At each park, pine trees outnumber oak trees.
- C** Dall Park has more oak and pine trees than Cairn Park does.
- * **D** Each park contains about the same number of oak trees and pine trees.

- 17** Kristin made an input-output table as shown.

Input (x)	Output (y)
3	9
14	42
18	54
26	78
36	108

What is the rule for Kristin's table?

- A** add 3
 - B** add 6
 - * **C** multiply by 3
 - D** multiply by 6
- 18** A rectangle is divided using its diagonals as shown.



Which of the following figures are congruent?

- A** $\triangle ABE$ and $\triangle BCD$
- * **B** $\triangle ABE$ and $\triangle DCE$
- C** $\triangle AED$ and $\triangle BCD$
- D** $\triangle AED$ and $\triangle DEC$

- 19** Which measurement best describes the height of a can of soup?

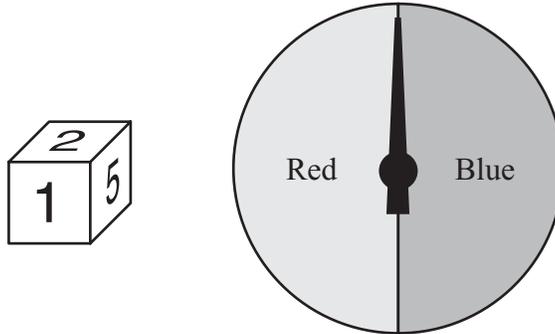
- * **A** 11 centimeters
- B** 11 kilometers
- C** 11 meters
- D** 11 millimeters

- 20** What is the expression $x - 12$ evaluated for $x = 30$?

- A** 12
- * **B** 18
- C** 28
- D** 42

Mathematics Item A—2014 Grade 5

A Carson rolled the 6-sided number cube numbered 1 to 6 and spun the spinner shown below.



1. Make a list of all the possible combinations Carson could get when he rolls the cube and spins the spinner.
2. How many more outcomes would there be if the spinner had 3 equal sections; red, blue, and green? Show your work or explain your answer.

BE SURE TO LABEL YOUR RESPONSES 1 AND 2.

Mathematics Item A Scoring Rubric—2014 Grade 5

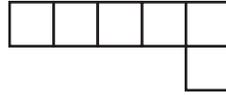
Score	Description
4	The student earns 4 points. The response contains no incorrect work.
3	The student earns 3 points.
2	The student earns 2 points.
1	The student earns 1 point, or some minimal understanding is shown.
0	The student earns 0 points. No understanding is shown.
B	Blank—No Response. A score 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>2 points possible:</p> <p>2 points: Correct answer: Carson lists all possible combinations Give credit for the following or equivalent: Ex. Red-1, Red-2, Red-3, Red-4, Red-5, Red-6 Blue-1, Blue-2, Blue-3, Blue-4, Blue-5, Blue-6</p> <p>OR</p> <p>1 point: Partial correct answer: Carson 8 – 11 possible combinations</p>
2	<p>2 points possible:</p> <p>1 point: Correct answer: 6 <i>Or correct answer based on previous parts</i></p> <p>AND</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. Green-1, Green-2, Green-3, Green-4, Green-5, Green-6 6 more pairings</p>

Mathematics Item B—2014 Grade 5
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- B** Trevor drew the following net that **cannot** be folded to form a cube.



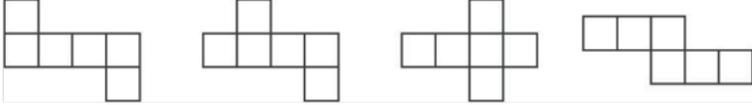
1. On the grid in your answer document, draw two **different** nets that could be folded into a cube.
2. Explain why Trevor's net **cannot** be folded to form a cube. Be as specific as possible.

BE SURE TO LABEL YOUR RESPONSES 1 AND 2.

Mathematics Item B Scoring Rubric—2014 Grade 5

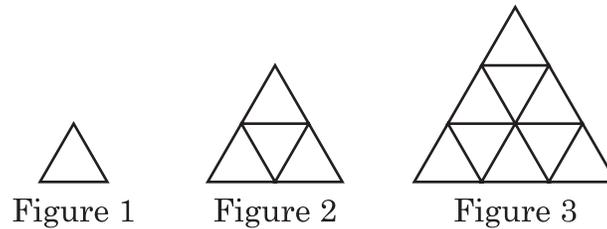
Score	Description
4	The student earns 4 points. The response contains no incorrect work.
3	The student earns 3 points.
2	The student earns 2 points.
1	The student earns 1 point, or some minimal understanding is shown.
0	The student earns 0 points. No understanding is shown.
B	Blank—No Response. A score 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
<p>1</p>	<p>2 points possible:</p> <p>2 points: Correctly draws or describes 2 different nets that form a cube Give credit for the following or equivalent:</p> <p>Ex. </p> <p>Note: Student cannot receive 2 points if they have an incorrect net.</p> <p>OR</p> <p>1 point: Correctly draws or describes 1 net that forms a cube</p>
<p>2</p>	<p>2 points possible:</p> <p>2 points: Student gives a correct and complete explanation. Give credit for the following or equivalent: Ex. It will not be a cube because two sides will overlap and one side would not be there.</p> <p>OR</p> <p>1 point: Student gives a correct, but incomplete explanation. Give credit for the following or equivalent: Ex. Two sides will overlap.</p>

Mathematics Item C—2014 Grade 5
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- C** Ariana is drawing a picture using small triangles. The drawing will include the growing pattern shown here.



1. Ariana is going to add more figures to her drawing. Copy and complete the table in your answer document with the number of small triangles for the next two figures.

Figure Number	Total Number of Small Triangles
1	1
2	4
3	9
4	
5	

2. What is the rule for the relationship shown in the table?
3. If Ariana continues the pattern, how many small triangles will be included in the seventh figure she draws? Show your work and/or explain your answer.

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

Mathematics Item C Scoring Rubric—2014 Grade 5

Score	Description
4	The student earns 4 points. The response contains no incorrect work.
3	The student earns 3 – 3½ points.
2	The student earns 2 – 2½ points.
1	The student earns ½ – 1½ point(s), 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>1 point possible:</p> <p>1 point: Fills in table with 2 correct values:</p> <table border="1" data-bbox="630 464 964 772"> <thead> <tr> <th>Figure Number</th> <th>Total Number of Small Triangles</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>1</td> </tr> <tr> <td>2</td> <td>4</td> </tr> <tr> <td>3</td> <td>9</td> </tr> <tr> <td>4</td> <td>16</td> </tr> <tr> <td>5</td> <td>25</td> </tr> </tbody> </table> <p>OR</p> <p>½ point: Fills in table with 1 correct value</p>	Figure Number	Total Number of Small Triangles	1	1	2	4	3	9	4	16	5	25
Figure Number	Total Number of Small Triangles												
1	1												
2	4												
3	9												
4	16												
5	25												
2	<p>1 point possible:</p> <p>1 point: Student gives the correct rule. Ex. The total is the figure number times itself. Ex. The number is the sum of the previous number plus the next odd number starting with 3.</p>												
3	<p>2 points possible:</p> <p>1 point: Correct answer: 49 Or correct answer based on previous parts</p> <p>AND</p> <p>1 point: Correct and complete explanation or work shown Give credit for the following or equivalent: Ex. $7 \times 7 = 49$ Ex. $25 + 11 + 13 = 49$</p>												

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Mathematics Reference Sheet Grade 5

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

Square	Rectangle	Triangle
Area = $s \times s$ Perimeter = $4 \times s$	Area = $l \times w$ Perimeter = $(2 \times l) + (2 \times w)$	Perimeter = $a + b + c$

1 foot = 12 inches

1 yard = 3 feet

1 mile = 5,280 feet

1 pound (lb) = 16 ounces (oz)

1 cup = 8 ounces (oz)

1 pint = 2 cups

1 quart = 2 pints

1 gallon = 4 quarts

1 kilogram = 1000 grams

1 meter = 100 centimeters

1 centimeter = 10 millimeters

1 kilometer = 1000 meters

1 liter = 1000 milliliters

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Arkansas Department of Education April 2011.



- 1** Dawn brought a chocolate bar for lunch, but the chocolate melted in her backpack. Dawn wants to perform a scientific investigation to determine the reason her chocolate bar melted in her backpack.

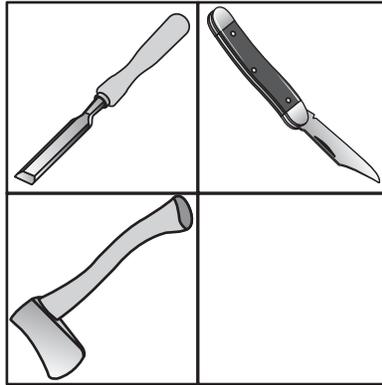
Which hypothesis should Dawn use for her investigation?

- A** Chocolate will taste better when melted.
- B** Chocolate will taste the same even when melted.
- C** If the chocolate is broken then the chocolate will melt.
- * **D** If heat is added to chocolate then the chocolate will melt.

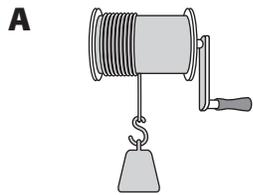
- 2** What happens during photosynthesis?

- A** Insects pollinate plants.
- B** Plants change soil into food energy.
- C** Animals get carbon dioxide from plants.
- * **D** Plants change light energy into food energy.

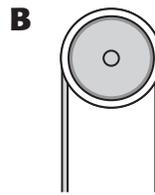
3 Below are three examples of simple machines.



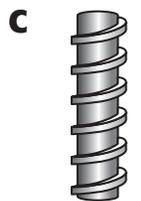
Which simple machine is in the same category as the machines shown above?



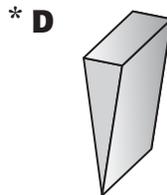
Wheel and Axle



Pulley



Screw



Wedge

4 What is a characteristic of sedimentary rock?

- A high hardness
- B glassy texture
- * C contains fossils
- D shiny silver luster

5 A student is investigating the properties of a mineral. The student tests the mineral by putting it under an ultraviolet light.

Which property of the mineral can be identified using this test?

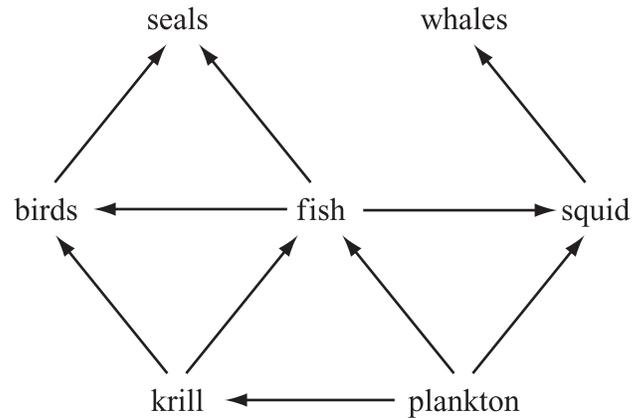
- A color
- B streak
- C luster
- * D fluorescence

6 Scientists found large areas of fossilized wood in a desert in Arizona. The fossilized wood is evidence of the ancient environment.

Based on the evidence, what was the ancient environment in this area?

- * A forest
- B desert
- C glacier
- D grasslands

7 An aquatic food web is shown below.



A scientist observes that a whale population is decreasing.

Which population change is **most likely** causing the whale population to decrease?

- A increasing fish
- B decreasing seals
- * C decreasing squid
- D increasing plankton

8 Which **best** describes how the sun might compare to a different-sized star, if they were right next to each other?

- A The sun would be enormous next to an average star.
- * B The sun would be tiny next to one of the largest stars.
- C The sun would be extremely bright next to an average star.
- D The sun would be very dim next to one of the smallest stars.

- 9** Scientists wonder how the Egyptian pyramids were built. They think that the huge blocks of stone may have been put into place by pushing them up a sloping pathway.

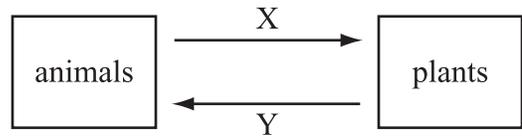
The pathway is which type of simple machine?

- A** lever
 - B** pulley
 - * **C** inclined plane
 - D** wheel and axle
- 10** A robin catches and eats a cricket.

Which statement **best** describes the roles of each animal?

- A** The robin is the prey and the cricket is the predator.
- * **B** The robin is the predator and the cricket is the prey.
- C** The robin is the consumer and the cricket is the producer.
- D** The robin is the producer and the cricket is the consumer.

- 11** The diagram below represents the carbon dioxide – oxygen cycle. Animals produce X and take in Y. Plants produce Y and take in X.



Which processes produce X and Y?

- A** Decomposition produces X and nitrogen fixation produces Y.
 - B** Nitrogen fixation produces X and decomposition produces Y.
 - C** Photosynthesis produces X and cellular respiration produces Y.
 - * **D** Cellular respiration produces X and photosynthesis produces Y.
- 12** A blacksmith bends a metal rod into a round wheel. Which statement **best** describes the wheel?
- A** The wheel weighs less than the rod.
 - B** The wheel weighs more than the rod.
 - * **C** The wheel is made of the same substance as the rod.
 - D** The wheel is made of a different substance than the rod.

13 Which is an example of a physical property of an object?

- * **A** The object bends without breaking.
- B** The object bubbles when put into an acid.
- C** The object burns when touched by a flame.
- D** The object gives off sparks when put into water.

14 What is the role of chlorophyll in photosynthesis?

- A** absorbing oxygen
- B** reflecting green light
- * **C** absorbing light energy
- D** blocking carbon dioxide

15 Which of these **best** demonstrates the characteristics of science?

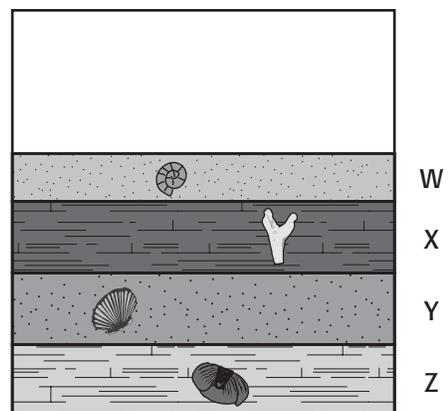
- A** One student lifts a rock and skips it across a stream.
- B** One student thinks about rocks and writes down his opinion.
- * **C** Two students study a rock and then compare their observations.
- D** Two students remove rocks from a garden and then plant flowers.

16 The temperature in a hot star is high enough to pull electrons away from atoms.

What state of matter results from this process?

- A** gas
- B** solid
- C** liquid
- * **D** plasma

17 The diagram below shows fossils in different layers of rock.

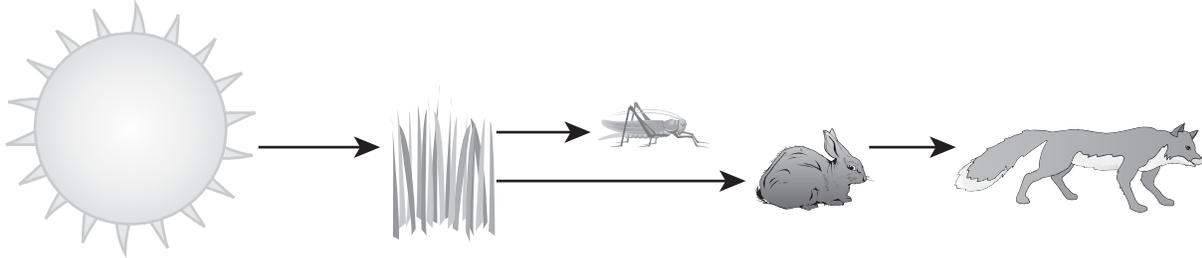


Which layer in the diagram has the youngest fossil?

- * **A** Layer W
- B** Layer X
- C** Layer Y
- D** Layer Z

Science Item A—2014 Grade 5

A The diagram below represents a food chain in an ecosystem.



1. What would happen to the fox population if the rabbit population became larger? Explain your answer.
2. What would happen to the grass if the fox population became smaller? Explain your answer.
3. What would happen to the rabbit population if an insect-eating bird were introduced? Explain your answer.
4. What would happen to the insect population if there were a three-month period with no rain? Explain your answer.

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

Science Item A Scoring Rubric—2014 Grade 5

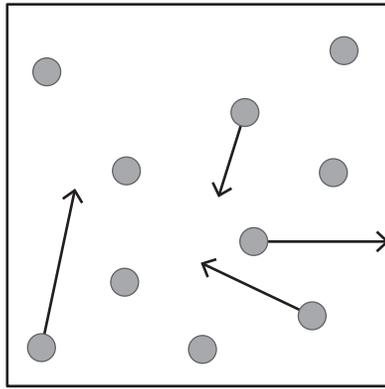
Score	Description
4	Response shows a complete understanding of the role of limiting factors on the carrying capacity of an ecosystem. The student presents correct descriptions to all parts of the task.
3	Response shows a nearly complete understanding of the role of limiting factors on the carrying capacity of an ecosystem. The student presents nearly all descriptions to all parts of the task. The response may contain minor errors.
2	Response shows a limited understanding of the role of limiting factors on the carrying capacity of an ecosystem. The student presents some descriptions correctly to most parts of the task. The response may contain a major error.
1	Response shows a minimal understanding of the role of limiting factors on the carrying capacity of an ecosystem. The student presents some descriptions. The response contains incomplete descriptions and major errors.
0	Response shows insufficient understanding of the role of limiting factors on the carrying capacity of an ecosystem. 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	Blank—No response. A score of “B” will be reported as “NA.” (No attempt to answer the item. Score of “0” is assigned for this item.)

Solution and Scoring

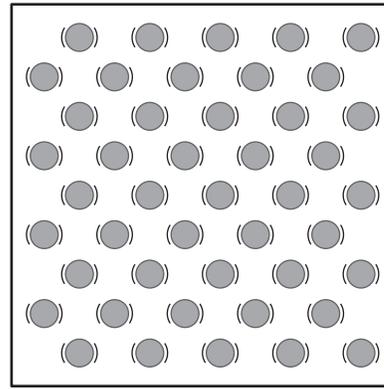
Part	Points
1	1 point possible: ½ point: The student correctly indicates that the fox population would increase. ½ point: The student provides a reasonable explanation for the change in the fox population when the rabbit population increases.
2	1 point possible: ½ point: The student correctly indicates that the amount of grass will decrease. ½ point: The student provides a reasonable explanation for the change in the amount of grass when the fox population decreases.
3	1 point possible: ½ point: The student correctly indicates that the rabbit population would increase. ½ point: The student provides a reasonable explanation for the change in the rabbit population when an insect eating bird is introduced into the ecosystem.
4	1 point possible: ½ point: The student correctly indicates that the insect population would decrease. ½ point: The student provides a reasonable explanation for the change in the insect population if there was no rain for a 3-month period.

Science Item B—2014 Grade 5

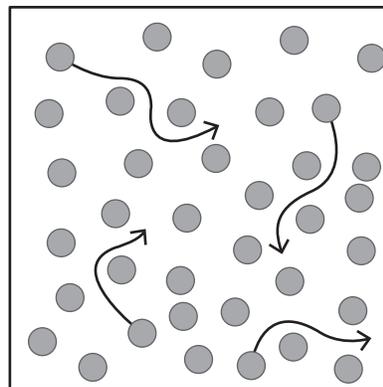
- B** The motion and position of molecules in three states of matter are represented in the models below.



Model A



Model B



Model C

1. Identify the state of matter **most likely** represented by Model A. Describe a characteristic of the molecules that helps identify the state of matter represented by Model A.
2. Identify the state of matter **most likely** represented by Model B. Describe a characteristic of the molecules that helps identify the state of matter represented by Model B.
3. Identify the state of matter **most likely** represented by Model C. Describe a characteristic of the molecules that helps identify the state of matter represented by Model C.
4. Identify the model that **best** represents the state of matter that has the highest average kinetic energy. Explain your answer.

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

Science Item B Scoring Rubric—2014 Grade 5

Score	Description
4	Response shows a complete understanding of modeling the motion and position of molecules in solids, liquids, and gases in terms of kinetic energy. The student presents correct descriptions to all parts of the task.
3	Response shows a nearly complete understanding of modeling the motion and position of molecules in solids, liquids, and gases in terms of kinetic energy. The student presents nearly all descriptions to all parts of the task. The response may contain minor errors.
2	Response shows a limited understanding of modeling the motion and position of molecules in solids, liquids, and gases in terms of kinetic energy. The student presents some descriptions correctly to most parts of the task. The response may contain a major error.
1	Response shows a minimal understanding of modeling the motion and position of molecules in solids, liquids, and gases in terms of kinetic energy. The student presents some descriptions. The response contains incomplete descriptions and major errors.
0	Response shows insufficient understanding of modeling the motion and position of molecules in solids, liquids, and gases in terms of kinetic energy. 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	Blank—No response. A score of “B” will be reported as “NA.” (No attempt to answer the item. Score of “0” is assigned for this item.)

Solution and Scoring

Part	Points
1	1 point possible: ½ point for correct identification. ½ point for description.
2	1 point possible: ½ point for correct identification. ½ point for description.
3	1 point possible: ½ point for correct identification. ½ point for description.
4	1 point possible: ½ point for correct identification. ½ point for explanation.

PART III Item Correlation with Curriculum Framework—Grade 5

The Arkansas English Language Arts Curriculum Framework—Reading Strand*

Content Standards	Student Learning Expectations
9. Comprehension: Students shall apply a variety of strategies to read and comprehend printed material.	7. Make inferences supported by a character's thoughts, words and actions, or the narrator's description. 11. Use such comprehension strategies as establishing purpose, inferring, and summarizing, to determine essential information. 12. Identify main ideas and supporting evidence in short reading passages. 14. Use knowledge of text structure(s) to enhance understanding with emphasis on sequence and description. 16. Scan materials to locate specific information. 20. Evaluate a character's decision/action.
10. Variety of Text: Students shall read, examine, and respond to a wide range of texts for a variety of purposes.	5. Identify cause/effect and problem/solution relationships. 6. Skim materials to locate specific information. 8. Locate information to support opinions, predictions, and conclusions. 10. Read a variety of literature, including historical fiction, biography, and realistic fiction. 14. Use graphic organizers to analyze information.
11. Vocabulary, Word Study, and Fluency: Students shall acquire and apply skills in vocabulary development and word analysis to be able to read fluently.	5. Use context to determine meaning of multiple meaning words. 8. Identify figurative language such as idioms, similes and metaphors. 10. Use context clues to select appropriate dictionary definition.

* 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*

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

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

Non-Released Items for Reading*

Strand	Content Standard	Student Learning Expectation
R	9	11
R	9	11
R	9	16
R	9	14
R	9	14
R	9	7
R	11	8
R	11	5
R	9	20

* 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 5

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>11. Edit individually or in groups for appropriate grade-level conventions, within the following features:</p> <ul style="list-style-type: none"> • <i>Sentence formation</i> <ul style="list-style-type: none"> • Completeness • Absence of fused sentences • Expansion through standard coordination and modifiers • <i>Embedding</i> through standard subordination and modifiers • Standard word order • <i>Usage</i> <ul style="list-style-type: none"> • Standard inflections • Agreement • Word meaning • Conventions • <i>Mechanics</i> <ul style="list-style-type: none"> • Capitalization • Punctuation • Formatting • Spelling
<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. Conventions: Students shall apply knowledge of Standard English conventions in written work.</p>	<p>6. Define and identify the parts of speech to construct effective sentences:</p> <ul style="list-style-type: none"> • Common and proper nouns • Pronouns to avoid repetition • Active and linking verbs • Adjectives to modify nouns and pronouns • Adverbs to modify verbs, adjectives, and other adverbs • Conjunctions to join • Interjections for excitement • Prepositions to indicate relationships
<p>7. Craftsmanship: Students shall develop personal style and voice as they approach the craftsmanship of writing.</p>	<p>3. Use transition words. 5. Create a strong lead and conclusion.</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*

Item	Strand	Content Standard	Student Learning Expectation
1	W	5	2
2	W	7	5
3	W	7	3
4	W	6	6

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

Non-Released Items for Writing*

Strand	Content Standard	Student Learning Expectation
W	4	11

* Only the predominant Strand, Content Standard, and Student Learning Expectation are listed for the Writing 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. Use models and visual representations to develop the concepts of the following: Fractions: <ul style="list-style-type: none"> • parts of unit wholes • parts of a collection • locations on number lines • locations on ruler (<i>benchmark fractions</i>) • divisions of whole numbers Ratios: <ul style="list-style-type: none"> • part-to-part (2 boys to 3 girls) • part-to-whole (2 boys to 5 people) Percents: <ul style="list-style-type: none"> • part-to-100 2. Develop understanding of decimal <i>place value</i> using models. 6. Use models to differentiate between <i>perfect squares</i> up to 100 and other numbers.
	2. Properties of Number Operations: Students shall understand meanings of operations and how they relate to one another.	2. Identify <i>commutative</i> and <i>associative properties</i> .
	3. Numerical Operations and Estimation: Students shall compute fluently and make reasonable estimates.	1. Develop and use a variety of <i>algorithms</i> with <i>computational fluency</i> to perform <i>whole number</i> operations using addition and subtraction (up to five- <i>digit</i> numbers), multiplication (up to three- <i>digit</i> x two- <i>digit</i>), division (up to two- <i>digit</i> divisor), interpreting remainders, including real world problems. 2. Develop and use <i>algorithms</i> : <ul style="list-style-type: none"> • to add and subtract numbers containing decimals (up to thousandths place) • to multiply decimals (hundredths x tenths) • to divide decimals by <i>whole number</i> divisors • to add and subtract fractions with like denominators 3. Solve, with and without appropriate <i>technology</i> , two-step problems using a variety of methods and tools (i.e. objects, mental computation, paper and pencil).
2—Algebra (A)	4. Patterns, Relations, and Functions: Students shall recognize, describe, and develop patterns, relations, and functions.	1. Solve problems by finding the next term or missing term in a <i>pattern</i> or <i>function</i> table using real world situations. 2. Interpret and write a rule for a one operation <i>function table</i> . Ex. adding 3
	5. Algebraic Representations: Students shall represent and analyze mathematical situations and structures using algebraic symbols.	1. Model and solve simple <i>equations</i> by informal methods using manipulatives and appropriate <i>technology</i> . 2. Write <i>expressions</i> containing one <i>variable</i> (a letter representing an unknown quantity) using rules for addition and subtraction. 3. Select, write and evaluate <i>algebraic expressions</i> with one <i>variable</i> by substitution. Ex. Evaluate $x+4$ if $x=7$
	6. Algebraic Models: Students shall develop and apply mathematical models to represent and understand quantitative relationships.	1. Draw conclusions and make predictions, with and without appropriate <i>technology</i> , from models, tables and <i>line graphs</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.

PART III Item Correlation with Curriculum Framework—Grade 5

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"> 1. Identify and model regular and <i>irregular polygons</i> including decagon. 2. Identify and draw <i>congruent, adjacent, obtuse, acute, right</i> and <i>straight angles</i> (Label parts of an angle: <i>vertex, rays, interior</i> and <i>exterior</i>). 3. Model and identify circle, <i>radius, diameter, center, circumference</i> and <i>chord</i>. 4. Model and identify the properties of <i>congruent</i> figures.
	9. Transformation of Shapes: Students shall apply transformations and the use of symmetry to analyze mathematical situations.	<ol style="list-style-type: none"> 1. Predict and describe the results of <i>translation (slide), reflection (flip), rotation (turn)</i>, showing that the transformed shape remains unchanged.
	10. Coordinate Geometry: Students shall specify locations and describe spatial relationships using coordinate geometry and other representational systems.	<ol style="list-style-type: none"> 1. Use geometric vocabulary (<i>horizontal/x-axis, vertically-axis, ordered pairs</i>) to describe the location and plot points in <i>Quadrant I</i>.
	11. Visualization and Geometric Models: Students shall use visualization, spatial reasoning, and geometric modeling.	<ol style="list-style-type: none"> 1. Using grid paper, draw and identify <i>two-dimensional patterns (nets)</i> for <i>cubes</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"> 1. Identify and select appropriate units and tools to measure. Ex. angles with degrees, distance with feet 2. Make conversions within the customary measurement system in real world problems. Ex. hours to minutes, feet to inches, quarts to gallons, etc. 3. Establish through experience benchmark prefixes of milli-, centi-, and kilo-. 5. Model the differences between covering the <i>faces (surface area/nets)</i> and filling the <i>interior (volume of cubes)</i>.
	13. Systems of Measurement: Students shall identify and use units, systems, and processes of measurement.	<ol style="list-style-type: none"> 1. Solve real world problems involving one <i>elapsed time</i>, counting forward (calendar and clock). 2. Determine which unit of measure or measurement tool matches the context for a problem situation. 5. Count the distance between two points on a horizontal or vertical line and compare the lengths of the paths on a grid. Ex. shortest path, paths of equal length, etc.
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"> 1. Develop appropriate questions for surveys. 2. Collect <i>numerical</i> and <i>categorical data</i> using surveys, observations, and experiments that would result in <i>bar graphs, line graphs, line plots, and stem-and-leaf plots</i>. 3. Construct and interpret <i>frequency tables, charts, line plots, stem-and-leaf plots</i> and <i>bar graphs</i>.
	15. Data Analysis: Students shall select and use appropriate statistical methods to analyze data.	<ol style="list-style-type: none"> 1. Interpret graphs such as <i>line graphs, double bar graphs, and circle graphs</i>. 2. Determine, with and without appropriate <i>technology</i>, the <i>range, mean, median</i> and <i>mode (whole number data sets)</i> and explain what each indicates about the set of data.
	17. Probability: Students shall understand and apply basic concepts of probability.	<ol style="list-style-type: none"> 1. Identify and predict the <i>probability</i> of events within a simple experiment. 2. List and explain all possible <i>outcomes</i> in a given situation.

* 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*

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

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

Non-Released Items for Mathematics*

Strand	Content Standard	Student Learning Expectation
M	13	5
G	9	1
A	5	2
M	13	1
A	4	2
G	8	2
A	6	1
D	17	2
A	4	1
M	13	1
G	11	1
G	10	1
N	3	3
N	3	1
N	1	1
D	14	3
M	12	1
D	15	2
N	2	2
N	1	2
N	3	1
N	3	3

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

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. Identify and define components of <i>experimental design</i> used to produce <i>empirical evidence</i> : <ul style="list-style-type: none"> • <i>hypothesis</i> • replication • sample size • appropriate use of control • use of standardized <i>variables</i> 4. Interpret scientific data using <ul style="list-style-type: none"> • data tables/charts • bar graphs • circle graphs • line graphs • <i>stem and leaf plots</i> • Venn diagrams 5. Communicate results and conclusions from scientific inquiry. 7. Summarize the characteristics of science. 9. Define and give examples of hypotheses.
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.	4. Model and identify the parts of animal <i>cells</i> and plant <i>cells</i> : <ul style="list-style-type: none"> • <i>cell wall</i> • <i>cell membrane</i> • <i>nucleus</i> • cytoplasm • chloroplast 7. Identify the role of chlorophyll in the process of photosynthesis. 8. Explain and illustrate photosynthesis.
	4. Populations and Ecosystems: Students shall demonstrate and apply knowledge of populations and ecosystems using appropriate safety procedures, equipment, and technology.	2. Identify the transfer of <i>energy</i> using <i>energy pyramids</i> : <ul style="list-style-type: none"> • terrestrial • aquatic 4. Evaluate food webs under conditions of stress: <ul style="list-style-type: none"> • overgrazing • overpopulation • natural disaster • introduction of non-native <i>species</i> • human impact/urban development 5. Examine the role of <i>limiting factors</i> on the <i>carrying capacity</i> of an <i>ecosystem</i> : <ul style="list-style-type: none"> • food • space • water • shelter 6. Describe and diagram the nitrogen cycle in <i>ecosystems</i> . 8. Describe and diagram the <i>carbon dioxide-oxygen cycle</i> in <i>ecosystems</i> . 13. Construct, compare, and contrast <i>environments</i> in <i>open</i> and <i>closed</i> aquaria. 14. Categorize <i>organisms</i> by the function they serve in <i>ecosystems</i> and food webs: <ul style="list-style-type: none"> • <i>predator/prey</i> • <i>parasitism</i> • <i>producer/consumer/decomposer</i> • <i>scavenger</i> • <i>herbivore/carnivore/omnivore</i> 15. Conduct <i>field studies</i> identifying and categorizing <i>organisms</i> in a given area of an ecosystem. 17. Describe and illustrate various symbiotic relationships: <ul style="list-style-type: none"> • <i>parasitism</i> • <i>mutualism</i> • <i>commensalism</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.

PART III Item Correlation with Curriculum Framework—Grade 5

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.	2. Conduct <i>scientific investigations</i> on <i>physical properties</i> of objects. 3. Identify common examples of <i>physical properties</i> : <ul style="list-style-type: none"> • length • mass • area • perimeter • texture • taste • odor • color • elasticity 4. State characteristics of physical changes. 6. Explain how heat influences the states of matter of a substance: <ul style="list-style-type: none"> • solid • liquid • gas • plasma 8. Model the motion and position of <i>molecules</i> in solids, liquids, and gases in terms of <i>kinetic energy</i> .
	6. Motion and Forces: Students shall demonstrate and apply knowledge of motion and forces using appropriate safety procedures, equipment, and technology.	1. Classify <i>simple machines</i> . 2. Conduct investigations using <ul style="list-style-type: none"> • levers (e.g., toothbrush) • pulleys • inclined planes-ramps, wedges, and screws • wheels and axles 6. Conduct investigations using <i>potential energy</i> and <i>kinetic energy</i> .
	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.	1. Summarize how light can interact with <i>matter</i> through <i>absorption</i> , <i>refraction</i> , and <i>reflection</i> . 4. Design and conduct investigations of transparent, <i>translucent</i> , and <i>opaque</i> as applied to light.

* 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
4— Earth and Space Science (E)	8. Earth Systems: Students shall demonstrate and apply knowledge of Earth's structure and properties using appropriate safety procedures, equipment, and technology.	3. Identify characteristics of minerals. 4. Conduct investigations on mineral properties: <ul style="list-style-type: none"> • luster • hardness • streak • acid test for calcite • fluorescence 5. Identify the following minerals: <ul style="list-style-type: none"> • halite (salt) • feldspar • sulfur • quartz • diamonds • gypsum • calcite • talc • hematite (iron) • precious <i>metals</i> (gold, silver) 6. Identify minerals found in Arkansas: <ul style="list-style-type: none"> • bauxite • diamonds • quartz • galena 7. Identify characteristics of <i>sedimentary, igneous, and metamorphic</i> rocks. 11. Investigate the formation of soil.
	9. Earth's History: Students shall demonstrate and apply knowledge of Earth's history using appropriate safety procedures, equipment, and technology.	2. Analyze <i>fossil record evidence</i> about plants and animals that lived long ago. 3. Infer the nature of ancient <i>environments</i> based on <i>fossil record evidence</i> .
	10. Objects in the Universe: Students shall demonstrate and apply knowledge of objects in the universe using appropriate safety procedures, equipment, and technology.	1. Compare the physical characteristics of the sun to other stars: <ul style="list-style-type: none"> • size • color • brightness 3. Compare the properties of planets in our <i>solar system</i> : <ul style="list-style-type: none"> • size • shape • <i>density</i> • <i>atmosphere</i> • distance from the sun • orbital path • moons • surface • composition 6. Investigate careers, scientists, and historical breakthroughs related to planets.

* 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*

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

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

Non-Released Items for Science*

Strand	Content Standard	Student Learning Expectation
L	2	4
E	10	6
L	4	14
P	7	4
P	7	1
L	4	2
E	10	6
L	4	15
E	8	6
E	8	5
P	6	6
E	8	11
E	10	1
E	10	3
N	1	4
P	6	2
L	4	6
E	8	3
L	4	17
L	4	13
P	5	2
P	7	1
N	1	2
N	1	4
P	6	2
N	1	5

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

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