

ACTAAP

Arkansas Comprehensive Testing, Assessment, and Accountability Program

RELEASED ITEM

BOOKLET

GRADE 5

AUGMENTED BENCHMARK EXAMINATION

April 2012

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Arkansas Department of Education

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Text

Pages 2–4: “Spider-Man” by Sy Montgomery. Excerpted from *Ranger Rick Magazine*, October 2004. Copyright © 2004 by National Wildlife Federation, Reston, Virginia.

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Part I Overview—2012 Augmented Benchmark Grade 5

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 2012.

This Released Item Booklet for the *Grade 5 Augmented Benchmark Examination* contains test questions or items that were asked of students during the April 2012 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 2012. Students were permitted to use a calculator for the mathematics items (both multiple-choice and open-response), with the exception of mathematics questions 1–4 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 32 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.

Read the passage. Then answer multiple-choice questions 1 through 8 and open-response question A.

Spider Man

by Sy Montgomery

“C’mon, Sweetie!” says scientist Sam Marshall. He’s lying on his belly in a South American jungle. His face is just inches away from a burrow with a fist-sized opening, and he’s calling to the creature that lives inside it.

Sam has come to the jungle to study the biggest, hairiest, and (most people think) scariest spiders on Earth: tarantulas. And now he’s found a burrow belonging to what may be the largest species of all—the Goliath birdeater tarantula.

Is he crazy?

“Come out!” Sam says. “I want to meet you!” He wiggles a twig in front of the burrow. Then he sees something fuzzy start to move. He whispers, “Here she comes!”

A huge tarantula races from the hole. And she’s not even full grown. A big Goliath can weigh a quarter pound. With its long legs, it can cover a Frisbee™.

Yet Sam doesn’t flinch when the giant races toward his face. “The last thing it wants to do is bite me,” he says. Tarantula fangs are full of venom for killing its prey. But no tarantula’s venom is strong enough to kill a human.

“Everybody ‘knows’ about tarantulas,” Sam says. “But most of what they ‘know’ is wrong!”

Very little actually is known about tarantulas. So Sam has come to the jungle to learn all he can about these super spiders.



SHE’S OUT!

Scientist Sam Marshall eyes a Goliath birdeater tarantula as it races out of its burrow. This may very well be the largest spider species on Earth.



“FANGS” A LOT

A tarantula rears up to show its fangs, and hisses. That’s usually enough to scare away most enemies.

IN THE SPIDER LAB

Sometimes, Sam scoops up tarantulas in the jungle and takes them back with him to his lab in Ohio. There, he looks into other tarantula mysteries—like, why are they so hairy?

Tarantula hairs are mighty handy weapons. North and South American tarantulas don’t defend themselves by biting. Instead, they kick clouds of hairs into the air. Each hair is covered with tiny, itchy barbs. The hairs are light enough to float on air—and into a predator’s eyes, onto its skin, or even up its nose. *Yowch!*

In his lab, Sam watches the female spiders using these irritating hairs in a different way. They cover their silken egg sacs with them. Sam thinks that helps to keep away predators, such as spiders and wasps.

12 Other tarantulas shed hairs on a special mat. Then they lie on the mat when it’s time to shed their “skin” or exoskeleton (EX-oh-SKEL-uh-tun). (Because spiders wear their skeletons on the outside, they must shed them as they grow.) The barbed hairs probably keep pests away while the spiders’ new exoskeletons are hardening.

Sam discovered that Goliath birdeaters have toothed hairs on their front legs. By rubbing the legs together, the spiders make a sound like a hissing cat! The sound helps scare away enemies.

WEIRD AND WONDERFUL

Tarantulas are big and strong and hairy. But they also might be in danger. People capture many thousands each year and sell them as tourist souvenirs.

Pesticides and pollution kill tarantulas—and many other kinds of spiders. Lots of people are afraid of spiders and kill them. Yet, while there are many laws protecting big animals such as tigers and polar bears, there are almost no laws anywhere protecting spiders.

SPREAD THE WORD

So, while Sam is studying tarantulas, he also keeps an eye on their future. “We need young people to care about tarantulas,” he says, “and to make sure there’s always a place for tarantulas in this world.”

That’s why Sam loves to share tarantulas with kids. Some wild tarantulas are so gentle that Sam even lets the kids hold them. After all, the spiders’ future really is in their hands.

FAST FACTS

- Some tarantulas can live 30 years. (Most garden spiders live a year or less.)
- Tarantulas make silk but don’t weave webs. Instead, they use the silk to wrap their eggs and line their burrows.
- Tarantulas grab their prey with their front legs, bite it, inject it with venom, and then grind it up with teeth behind their fangs.
- Goliath birdeater tarantulas don’t eat birds. Like most tarantulas, they eat whatever they can find and grab—including worms, insects, and other small animals.
- If a tarantula injures a leg, it might pull it off and eat it—and then grow a new one.

1 The title “Spider Man” is **most** appropriate for this passage because

- A** the author is trying to make a joke.
- B** the passage is mostly about spiders.
- C** the tarantula in the passage is so huge.
- * **D** the scientist in the passage studies spiders.

2 What is another word for exoskeleton as it is used in paragraph 12?

- A** legs
- B** hair
- * **C** skin
- D** bones

- 3** According to the passage, tarantulas are different from other spiders in that tarantulas do **not**
- * **A** weave webs.
 - B** eat insects.
 - C** lay eggs.
 - D** capture prey.
- 4** Female tarantulas protect their eggs by
- A** sitting on top of the egg sacs.
 - * **B** covering the egg sacs with hairs.
 - C** injecting enemies with poison.
 - D** kicking clouds of hairs at them.
- 5** Which statement in the passage expresses an opinion?
- A** A large tarantula can weigh a quarter pound.
 - B** Scientists know very little about tarantulas.
 - * **C** Tarantulas are the scariest spiders.
 - D** Tarantulas are becoming endangered.
- 6** Which two words from the passage are **most** the same in meaning?
- A** burrow, web
 - B** capture, scare
 - C** rubbing, irritating
 - * **D** enemies, predators
- 7** According to the Fast Facts in the box, how are tarantulas different from garden spiders?
- A** Tarantulas eat birds.
 - B** Tarantulas are in danger.
 - C** Tarantulas are much smarter.
 - * **D** Tarantulas can live 30 years.
- 8** The **most likely** reason the author wrote this passage was to
- * **A** inform readers about tarantulas so they can help save them.
 - B** convince readers to become scientists who study spiders.
 - C** warn readers about the dangers of poisonous spiders.
 - D** inform readers about the size of the tarantulas.

Reading Item A—2012 Grade 5

- A** Describe two ways North and South American tarantulas protect themselves. Use information from the passage to support each answer.

Reading Item A Scoring Rubric—2012 Grade 5

Score	Description
4	The response describes two ways North and South American tarantulas protect themselves and provides two accurate and relevant details from the passage to support each way.
3	The response describes two ways North and South American tarantulas protect themselves and provides one accurate and relevant detail from the passage supporting one of these ways.
2	The response describes two ways that North and South American tarantulas protect themselves. OR The response describes one way North and South American tarantulas protect themselves and provides one accurate and relevant detail from the passage for support.
1	The response describes one way that North and South American tarantulas protect themselves. 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.)

Read the passage. Then answer multiple-choice questions 9 through 16 and open-response question B.

The Year of Miss Agnes

by Kirkpatrick Hill

Frederika and Bertha have seen many teachers come and go from their small Alaskan fishing village. Sometimes there is no school at all because they have no teacher. Then one day, a new teacher arrives.

I ran to the Nickoli house to see if Bertha was there. She was in the back of the house, helping her mother with a moose skin. They were twisting it and twisting it with a long spruce stick so it could get really soft. Good enough to sew.

“Bertha, we got a new teacher.” Bertha’s eyes got big and worried.

“Is she nice?”

“I don’t know. Sam said she was strict.”

Bertha dropped the stick and we ran.

We ran to the teacher’s cabin and then stopped short in the dusty road. There was a skinny woman whacking the dust out of a rug on the side of the cabin porch.

She was wearing pants. We never saw a woman wear pants. Our moms always wore dresses, with thick socks and moccasins. And us girls, too. Sometimes if it was really cold, we’d have pants under our skirts. But never just pants.

We looked hard at her to see what we could find out.

- 9 She was strong, that was for sure. The way she whacked that rug. The dust was just flying. She was making an ugly face to keep the dust out of her eyes. Then she dropped the rug in the dead grass by the door and went back inside.

We walked to her door and peeked in. She didn’t even hardly look up, but she saw us.

“Good, just what I need. Two girls to give me a hand,” she said. She didn’t ask our names or nothing. Didn’t even smile or tell us what a pretty village we had or any of the other teacher stuff. She just handed the slop bucket to Bertha and told her to dump it out back. And then she stripped the blankets off the bed and told me to hang them out back on the line.

We did what she told us for a while, and then she stopped and said, “We need some tea.” Just like we were grown women.

She took the kettle off the back of the stove and poured water into a fat little brown teapot. I wanted to put my hands around that pot, it was so round.

She got three cups down from the shelf and three saucers, and took three spoons out of the jar on the table. Then she took a little silver thing and poured the tea through that so the tea leaves wouldn't get in our cups. I never saw that before.

And that tea was good. She put as much sugar in hers as we put in ours. Then she opened a can of milk and put some of that in her tea. Bertha and I looked surprised at each other. We didn't know you could put milk in tea. She saw us look and said, "Try it."

Bertha shook her head no. She never liked to do anything new. But I tried it. The tea was even better with milk than without.

The new teacher drank her tea straight down and then poured herself another cup.

"Thank heavens for tea," she said. She looked at us carefully. "Now then, who are you?" She had a funny way of talking, not like us. More short like. Like each letter made a hard sound.

"You talk funny," I said.

"That's because I'm English," she said.

I thought about that for a minute. English was what we talked. Mamma said she couldn't talk English until she was married, because then they got a radio and she learned it from the radio. So it didn't make sense, the teacher saying she was English.

The new teacher went to the shelf over her bed and took down a big book. She showed us a map. She put her finger on one part and said, "This is Alaska, where we are." And then she put her finger on the map on the other side. "This is England, where I come from." Her finger covered the place, it was so small. She looked at me and said, "The people from England are English."

"Oh," I said.

"And the language we speak is called English as well."

"Oh," I said again.

I think she could tell I was still a little mixed up, because she said, "The English that we speak in England sounds different from the way you speak English here. But it's the same language."

"Oh, yeah," I said, and this time I knew what she meant. Like how you can tell when someone is from Nulato or Hughes just because they say their words different.

"My name is Agnes Sutterfield," she said. "What are your names?"

- 9** Why do the girls consider it peculiar that Miss Agnes is wearing pants?
- A** The pants are made in a different style.
 - B** The day is too warm for heavy clothing.
 - * **C** Women in the village usually wear skirts.
 - D** Teachers are required to dress formally.
- 10** In paragraph 9, what does the word whacked mean?
- A** swung
 - B** carried
 - C** threw
 - * **D** hit
- 11** What does Miss Agnes do that makes the girls feel like adults?
- * **A** She serves them cups of hot tea.
 - B** She shows them how to whack a rug.
 - C** She gives them difficult chores to complete.
 - D** She shows them on the map where she came from.
- 12** How are Frederika and Bertha different from each other?
- A** Frederika likes to wear pants, but Bertha prefers dresses.
 - * **B** Frederika likes to try new things, but Bertha would rather not.
 - C** Frederika thinks Miss Agnes is strict, but Bertha thinks she is fair.
 - D** Frederika likes to go to school, but Bertha would rather stay home.
- 13** What statement in the passage **best** supports the idea that people in Frederika’s village live close to nature?
- * **A** She was in the back of the house, helping her mother with a moose skin.
 - B** Sometimes if it was really cold, we’d have pants under our skirts.
 - C** Bertha dropped the stick and we ran.
 - D** The dust was just flying.
- 14** Which of these is a fact in this passage?
- A** Tea is a drink enjoyed by adults.
 - B** A woman wearing pants is strange.
 - C** Teachers dislike teaching in a fishing village.
 - * **D** One language can be spoken differently.

15 What is the **most likely** reason Miss Agnes explains to the girls twice about her country and language?

- * **A** She notices the girls are still confused after her first explanation.
- B** She is proud of her country and her language and likes to brag about them.
- C** She wants the girls to think she is intelligent, since she will be their teacher.
- D** She wants to know the girls, so she keeps talking in hopes they will stay longer.

16 This passage is an example of

- A** folk tale.
- * **B** realistic fiction.
- C** science fiction.
- D** a biography.

Reading Item B—2012 Grade 5

- B** Explain two ways Miss Agnes tries to help Frederika and Bertha feel comfortable in her cabin. Use information from the passage to support each answer.

Reading Item B Scoring Rubric—2012 Grade 5

Score	Description
4	The response explains two ways Miss Agnes tries to help Frederika and Bertha feel comfortable in her cabin and uses information from the passage to support each way.
3	The response explains two ways Miss Agnes tries to help Frederika and Bertha feel comfortable in her cabin and uses information from the passage to support one of the ways.
2	The response explains one way Miss Agnes tries to help Frederika and Bertha feel comfortable in her cabin and uses information from the passage to support it. OR The response explains two ways Miss Agnes tries to help Frederika and Bertha feel comfortable in her cabin.
1	The response explains one way Miss Agnes tries to help Frederika and Bertha feel comfortable in her cabin. 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.)

WRITING PROMPT

Your teacher has asked you to write about this topic:

What are you most thankful for?

Before you begin to write, think about what you are most thankful for. For example, it could be your good health, your friends, or your family. What are you thankful for and **why**?

Now write about what you are most thankful for. Give enough reasons 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."

1 Read the sentence.

The trainer was able to ride the tame horse in the field near the barn.

Which of the underlined words in the sentence above is used as an adjective?

- A trainer
- B ride
- * C tame
- D field

2 Read the paragraph.

Tracking a Mouse
by Sean

¹The cat stopped. ²Its ears flattened to the top of its head as it watched something move in the corner. ³A mouse appeared from under the stove, its whiskers twitching. ⁴Still, the cat remained a statue. ⁵The mouse scampered across the floor only to stop at a crumb of bread. ⁶The cat's tail twitched once as it waited for the right moment to pounce.

Which type of figurative language is present in sentence 4 of the paragraph?

- A Simile
- * B Metaphor
- C Alliteration
- D Personification

3 Read the sentence.

Bobby's parents decided they would take a trip to the grand Teton National Park during his summer vacation.

Which word in the sentence should be capitalized?

- A parents
- B trip
- * C grand
- D summer

4 Read the letter.

Dear Mr. Riley,

The meeting of the community camp council was very successful. We were able to agree on the eating schedule and the events for the weekend. We were also able to get a variety of food donations from the many volunteers. All of the guest campers are registered, and the camp counselors have assigned cabins. A letter will go home to all of the campers this week explaining the events and times for the weekend.

Thank you,
Kiley
Camp Counselor

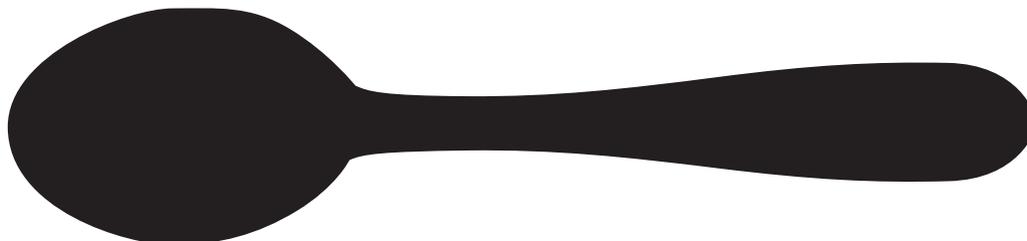
What is the purpose of the letter above?

- A** To describe what a community camp council is to Mr. Riley
- B** To persuade Mr. Riley to attend the community camp council meeting
- * **C** To inform Mr. Riley about the results of the community camp council meeting
- D** To entertain Mr. Riley with a funny story about a community camp council

CALCULATOR NOT PERMITTED—ITEMS 1–4



- 1 For homework, Dana must measure and record the length of some objects in his home.



What is the length, to the nearest centimeter, of the spoon?

- A 5 centimeters
 - B 6 centimeters
 - C 13 centimeters
 - * D 14 centimeters
-
- 2 Alex is preparing a survey to find which foods students would like to have in the cafeteria. Which of the following questions will be **best** for him to use?
- A Why should we have pizza more for lunch?
 - B Why should we not have salads for lunch?
 - * C Which foods do you prefer for the cafeteria?
 - D Should there be more ice cream in the cafeteria?

- 3** Amy has $\frac{3}{4}$ pound of blueberries to make smoothies. She made the first batch with $\frac{1}{8}$ pound of the blueberries.



How many pounds of blueberries were left?

- A** $\frac{3}{32}$
- * **B** $\frac{5}{8}$
- C** $\frac{7}{8}$
- D** $\frac{2}{4}$

- 4** Mr. Ang owns a bakery. He uses the table below to determine the number of boxes he needs when baking different numbers of muffins.

Number of Muffins	Number of Boxes
36	6
30	5
24	4
18	3

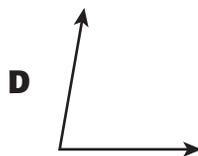
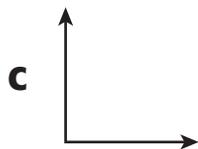
What rule does Mr. Ang use to find the number of boxes he needs for the muffins?

- * **A** divide by 6
- B** divide by 4
- C** multiply by 6
- D** add 6

CALCULATOR PERMITTED—ITEMS 5–20 and A–C 

- 5** The members of the student council plan to sell frozen yogurt.
- Which method of collecting data would be **best** for the student council to use in determining the flavors to sell?
- A** Experiment
 - B** Library research
 - C** Observation
 - * **D** Survey

6 Which figure is a straight angle?



7 If the equation below is true, which of the following must also be true?

$$\text{Hexagon} - \text{Concentric Circles} = \text{Crescent}$$

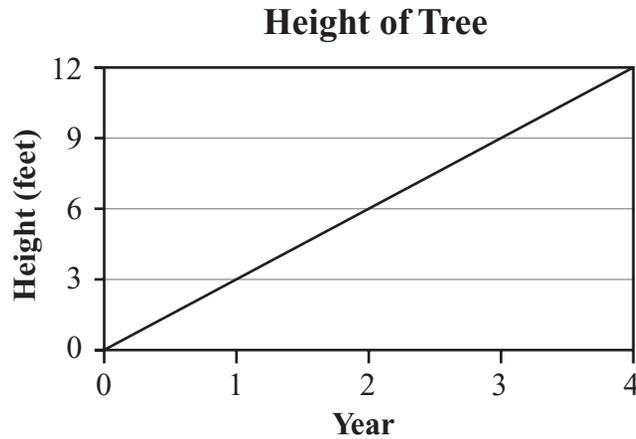
* **A** $\text{Concentric Circles} + \text{Crescent} = \text{Hexagon}$

B $\text{Crescent} + \text{Crescent} = \text{Hexagon}$

C $\text{Hexagon} - \text{Crescent} = \text{Crescent}$

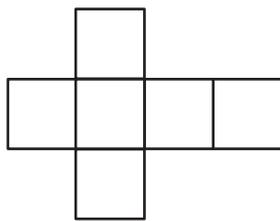
D $\text{Hexagon} - \text{Concentric Circles} = \text{Concentric Circles}$

- 8 Cole planted a tree in his yard 4 years ago. He has recorded the height each year, which is shown in the line graph below.

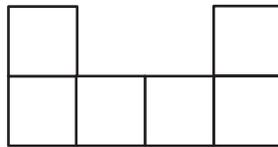


Based on the graph, how tall will the tree be in the 6th year?

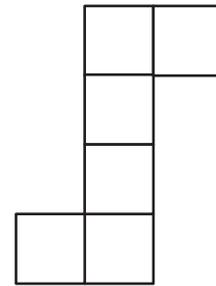
- A 13 feet
 - B 15 feet
 - C 16 feet
 - * D 18 feet
-
- 9 Which of these nets, when folded, can produce a cube with no overlapping sides?



I



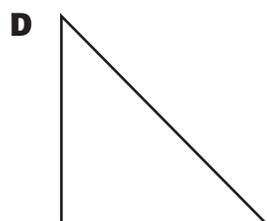
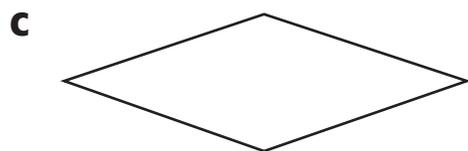
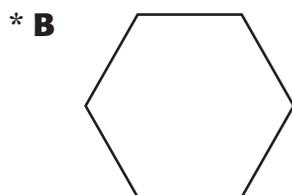
II



III

- A I only
- B II only
- * C I and III
- D II and III

- 10** Ms. McKinney drew a hexagon on the board. Which polygon is a hexagon?



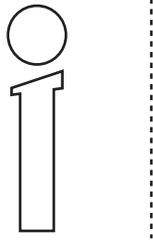
- 11** The number of fish that Marco saw at the aquarium is represented by the expression below.

$$(5 + 20) \times 6$$

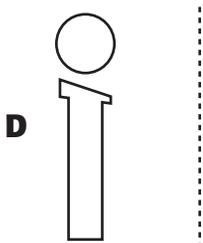
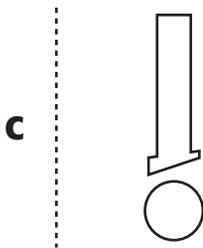
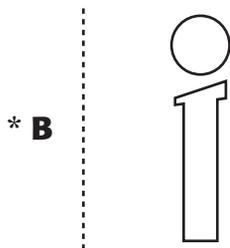
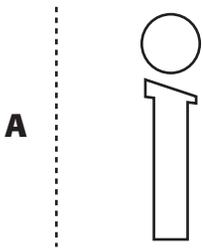
Based on this expression, what is the total number of fish that Marco saw?

- A** 50 fish
B 125 fish
C 130 fish
* **D** 150 fish
- 12** Mr. Diaz owns a restaurant. For the past 6 weeks, he has noticed that the cost for a pound of potatoes has increased weekly by \$0.15. Yesterday he paid \$2.10 per pound. If the pattern continues, how much will a pound of potatoes cost in 5 weeks?
- A** \$0.65
B \$2.70
* **C** \$2.85
D \$3.00

- 13** Vicky drew the letter shown below.



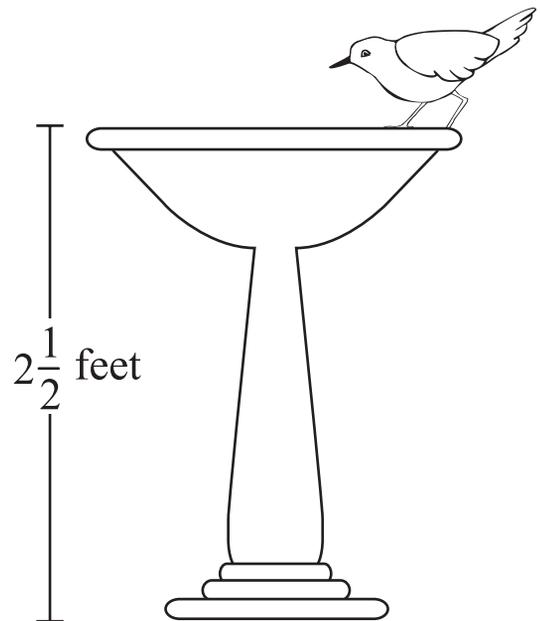
Which of the following shows the figure after a translation (slide) across the line?



- 14** Zoe is 6 years older than her brother. Which expression can be used to determine Zoe's age if you know her brother's age?

- * A** $b + 6$
- B** $b - 6$
- C** $b \div 6$
- D** $6 - b$

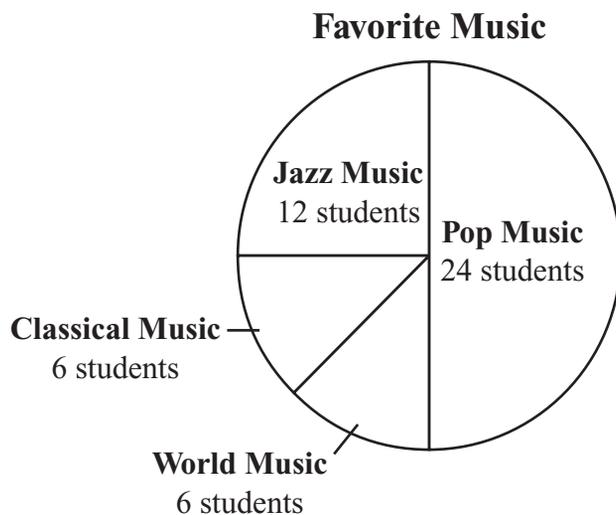
- 15** Justin has a birdbath in his backyard, as shown below.



How tall is the birdbath, in inches?

- A** 12 in.
- B** 24 in.
- * C** 30 in.
- D** 36 in.

- 16** Students listened to different types of music in music class last week. At the end of the week, the teacher asked which type of music students liked the most. The circle graph below shows the results.



What percent of the students said that Pop Music, World Music, or Classical Music is their favorite?

- A** 18%
- B** 36%
- C** 50%
- * **D** 75%

- 17** Ramon works for a company that sells baseball uniforms to teams. He packs 4 hats per box for shipping. He uses the expression below to determine how many boxes he needs when he knows the number of hats that have been ordered.

$$h \div 4$$

How many boxes will he need in order to ship 68 hats?

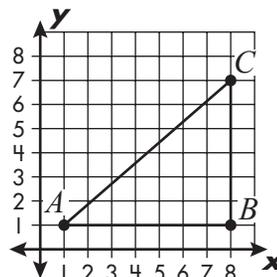
- A** 16 boxes
 - * **B** 17 boxes
 - C** 64 boxes
 - D** 72 boxes
- 18** Caitlin is measuring ingredients for a muffin recipe she is using. Which of the following would **most likely** be the units of measure she is using?
- * **A** cups
 - B** hours
 - C** inches
 - D** cubic feet

- 19** The school librarian recorded the number of students that used the copy machine each day for 8 days. She recorded the results below.

4, 13, 4, 11, 4, 9, 8, 3

What is the mean of the data set?

- A** 4
 - B** 6
 - * **C** 7
 - D** 8
- 20** Use the grid to answer the question.



Which line segment is the shortest?

- A** \overline{AB}
- * **B** \overline{BC}
- C** \overline{AC}
- D** \overline{AB} and \overline{BC}

Mathematics Item A—2012 Grade 5
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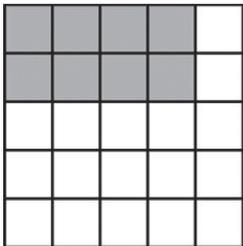
- A** Four schools participated in a bowling tournament. The number of players on each team is: Central, 6; Northern, 8; Southern, 5; Western, 6.
1. Draw or describe a fraction model to represent the total number of players on the Northern team to the total number of players in the tournament. If you draw a model on the grid in your answer document, use shading to represent the number of Northern players.
 2. Write a ratio of the total number of Central and Northern players to the total number of Southern and Western players.
 3. Write a ratio of Central and Northern players to all the players in the tournament.

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

Mathematics Item A Scoring Rubric—2012 Grade 5

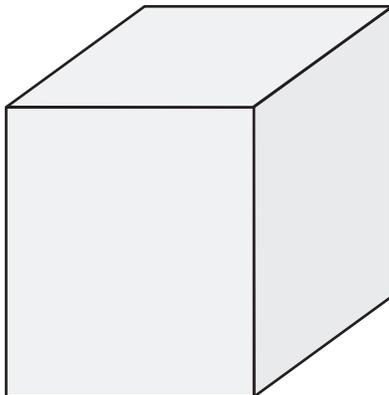
Score	Description
4	The student earns 4 points. The response contains no incorrect work.
3	The student earns 3 points.
2	The student earns 2 points.
1	The student earns 1 point, or some minimal understanding is shown.
0	The student earns 0 points. No understanding is shown.
B	Blank – No Response. A score 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 fraction model is drawn and/or described. Give credit for the following or equivalent:</p> <div style="text-align: center;">  </div> <p>Ex: A 25 square grid with 8 parts shaded.</p> <p>Ex: $\frac{8}{25}$</p> <p>OR</p> <p>1 point: Correctly shading or describing 8 parts to represent the numerator.</p> <p>or</p> <p>Correctly drawing or describing 25 parts to represent the denominator.</p>
2	<p>1 point possible:</p> <p>1 point: Correct answer: 14 to 11, 14:11, or $\frac{14}{11}$</p> <p>or</p> <p>Correct answer based on an incorrect Part 1.</p>
3	<p>1 point possible:</p> <p>1 point: Correct answer: 14 to 25, 14:25, or $\frac{14}{25}$</p> <p>or</p> <p>Correct answer based on an incorrect Part 1 or 2.</p>

Mathematics Item B—2012 Grade 5

- B** Liam has a cardboard box shaped like the one shown.



1. Liam wants to cover each side of the box with a different colored piece of paper. How many pieces of paper will Liam need to cover all the sides of the box? Explain how you determined your answer.
2. Explain how covering the sides of the box differs from finding the volume of the box.
3. If the top of the box measures 6 inches wide and 8 inches long, what is the area of the top of the box? Show your work and/or explain your answer.

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

Mathematics Item B Scoring Rubric—2012 Grade 5

Score	Description
4	The student earns 5 points. The response contains no incorrect work.
3	The student earns 3 - 4 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: 6 Correct explanation shown and/or explained. Give credit for the following or equivalent: Ex: A cube has 6 sides Ex: A rectangular prism has 6 sides</p> <p>OR</p> <p>1 point: Correct answer: 6 Explanation is incomplete, incorrect or missing</p> <p>or</p> <p>Answer is incorrect due to a calculation, counting or copy error Correct explanation is shown and/or explained.</p>
2	<p>1 point possible:</p> <p>1 point: Correct explanation of how covering the sides differs from finding the volume of the box. Give credit for the following or equivalent: Ex: Volume is like filling the cube with water Ex: Volume is how much space there is inside the cube. Ex: Volume is how much it can hold. Ex: Covering the box is finding surface area, volume is filling the box. Ex: Area is the outside not inside.</p>
3	<p>2 points possible:</p> <p>2 points: Correct answer: 48 (sq. inches) Correct procedure shown and/or explained. Give credit for the following or equivalent Ex: $8 \times 6 = 48$</p> <p>OR</p> <p>1 point: Correct answer: 48 (sq. inches) Procedure is incomplete, incorrect or missing.</p> <p>or</p> <p>Answer is incorrect due to a calculation, counting or copy error Correct procedure is shown and/or explained.</p> <p><i>Note: At the 4 level, correct units of square inches must be included.</i></p>

Mathematics Item C—2012 Grade 5

C Ms. Krane’s class is working with function tables.

1. What is the rule for finding the output in the function table below?

Input (x)	Output (y)
2	6
3	9
A	12
5	B

2. Complete the function table in Part 1 by filling in the two missing values (A and B). Show all your work and/or explain your answer.
3. Ms. Krane asked the class to state a rule for the relationship of the numbers in the function table below. Jimmy said the rule was “subtract 12 from the input number to get the output number.” Is Jimmy correct? Explain your reasoning.

Input (x)	Output (y)
16	4
20	5
24	6
28	7

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

Mathematics Item C Scoring Rubric—2012 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>1 point possible:</p> <p>1 point: Correct rule is given. Give credit for the following or equivalent: Ex: Multiply the input by 3. Ex: Input x 3 = Output.</p>								
2	<p>2 points possible:</p> <p>2 points: Correct answers: A=4 and B=15 Correct procedure shown and/or explained Give credit for the following or equivalent Ex: “A = 4 12 ÷ 3 = 4 , B=15 5 × 3 = 15.”</p> <p>Ex:</p> <table border="1" data-bbox="772 789 935 1003"> <tbody> <tr> <td>2</td> <td>6</td> </tr> <tr> <td>3</td> <td>9</td> </tr> <tr> <td>4</td> <td>12</td> </tr> <tr> <td>5</td> <td>15</td> </tr> </tbody> </table> <p>OR</p> <p>1 point: Correct answers: A=4 and B=15 Procedure is incomplete, incorrect or missing</p> <p>or</p> <p>1 Correct answer: A=4 or B=15 Correct procedure shown and/or explained</p>	2	6	3	9	4	12	5	15
2	6								
3	9								
4	12								
5	15								
3	<p>1 point possible:</p> <p>1 point: Correct response: No Clear explanation of why it does not work. Give credit for the following or equivalent Ex: “No, Jimmy’s rule works for the first one (16-12=4). His rule does not work for the others (20-12=8 not 5, 24-12=12 not 6, and 28-12=16 not 7).” Ex: “No the rule is divide by 4 not subtract 12.”</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 For a science fair project, Jordan collects data on which types of insects live in different areas of the neighborhood. He collects insects and uses a field guide to identify them. Which pieces of information should Jordan record in his notebook for each insect collected?

- A** the size of the insect and the number of legs
- * **B** the name of the insect and the location found
- C** the weight of the insect and the time it was collected
- D** the color of the insect and the number of body segments

2 Which process uses carbon from the air to make food for plants?

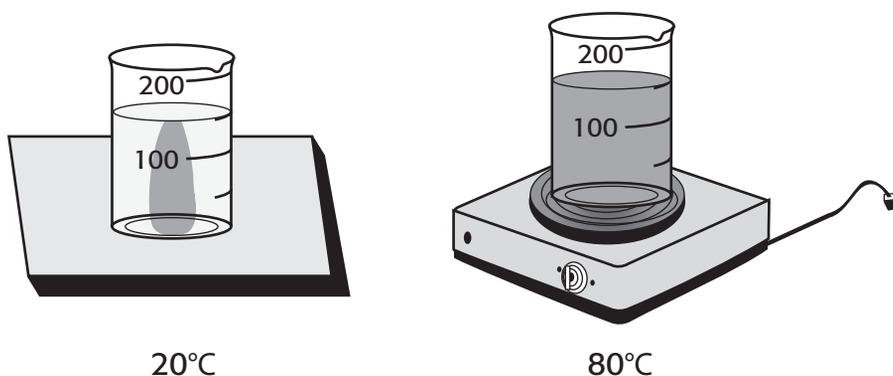
- A** growth
- B** respiration
- C** decomposition
- * **D** photosynthesis

3 A large amount of sediment is picked up by water as the water flows downhill in rivers and streams.

When water in a river or a stream has been flowing fast and then begins to slow down, what is likely to happen to the sediment particles the water is carrying?

- A** The amount of larger sediment particles being carried by the water will increase.
- B** The amount of smaller sediment particles being carried by the water will increase.
- * **C** The amount of larger sediment particles being carried by the water will decrease.
- D** The amount of smaller sediment particles being carried by the water will decrease.

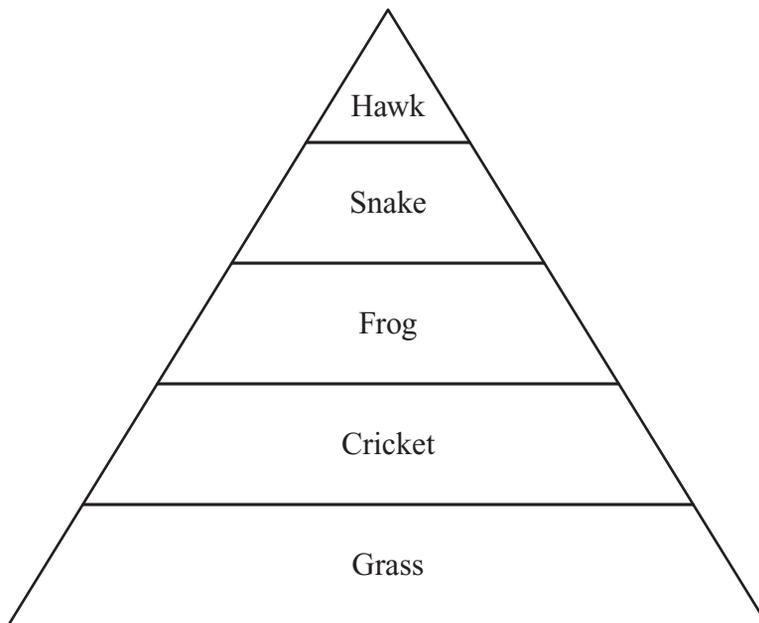
- 4 Four drops of red food coloring are added to each beaker of water. The results, after one minute, are shown below.



Why does the red food coloring spread throughout the water at 80°C faster than in the water at 20°C?

- A Water molecules at 20°C or lower do not move.
- B Water molecules at 20°C or lower repel the food coloring molecules.
- * C Water molecules at 80°C move faster than water molecules at 20°C.
- D Water molecules at 80°C or greater attract the food coloring molecules.

5 Study the energy pyramid below.



From which level of this pyramid does the frog get its energy directly?

- A** hawk
- B** snake
- C** grass
- * **D** cricket

6 Which mineral, found in Arkansas, is an ore that can be used to produce aluminum?

- A** quartz
- B** galena
- * **C** bauxite
- D** diamond

7 In the 1600s Sir Isaac Newton discovered that sunlight is made up of all the colors of the rainbow.

What tool did Sir Isaac Newton **most likely** use to make his discovery?

- A** A lens
- B** A mirror
- * **C** A prism
- D** A telescope

8 A scientist studies cellular respiration. He measures the rate of cellular respiration in people doing different activities. Which activity will increase cellular respiration the most?

- A** sleeping
- B** breathing
- * **C** jumping rope
- D** digesting food

- 9** Which set of descriptions correctly states the difference between a population and a community?
- A** Population: one species in an area
Community: one species worldwide
 - B** Population: organisms in a small area
Community: organisms in a large area
 - C** Population: living parts of an area
Community: living and nonliving parts of an area
 - * **D** Population: one type of organism in an area
Community: many types of organisms in an area

10 During a walk through the Arkansas River Valley, Alex found a rock that she determined was a sedimentary rock. Which characteristics of the rock would lead Alex to this conclusion?

- A** thin flaky sheets and very hard
- B** glassy texture and a shiny black color
- C** very rough texture with obvious crystals
- * **D** sand-sized particles and a light brown color

11 Scientists dig in a dry area at the bottom of a mountain range. Fossilized shells of freshwater mussels are found in the area. Which is a likely conclusion that scientists will draw based on this evidence?

- * **A** Rivers once flowed through the area.
- B** Volcanoes were once active in the area.
- C** The ocean shoreline once reached this area.
- D** Floods were a common occurrence in this area.

- 12** There are many different processes that take place in plant and animal cells. Cellular respiration is one of those processes.

What is the purpose of cellular respiration?

- A** To make and store food
- B** To add oxygen to the atmosphere
- * **C** To release energy from stored food
- D** To remove carbon dioxide from the atmosphere

- 13** Which statement best describes the size of the Sun?

- * **A** The Sun is medium-sized compared to other stars.
- B** The Sun is the largest and brightest star in the universe.
- C** Most of the stars in the universe would fit inside the Sun.
- D** Most of the stars in the universe are smaller than the Sun.

- 14** Which structure controls what enters both plant cells and animal cells?

- A** nucleus
- B** cell wall
- C** chloroplast
- * **D** cell membrane

- 15** Which occurs as the kinetic energy of water molecules increases?

- A** Water vapor becomes ice.
- B** Liquid water becomes ice.
- C** Water vapor becomes liquid water.
- * **D** Liquid water becomes water vapor.

- 16** Pat dissolves some table salt in water. She then puts a drop of the water on a microscope slide and turns on the lamp. As the water evaporates, Pat observes small cubic structures being formed. What process is Pat seeing through the microscope?

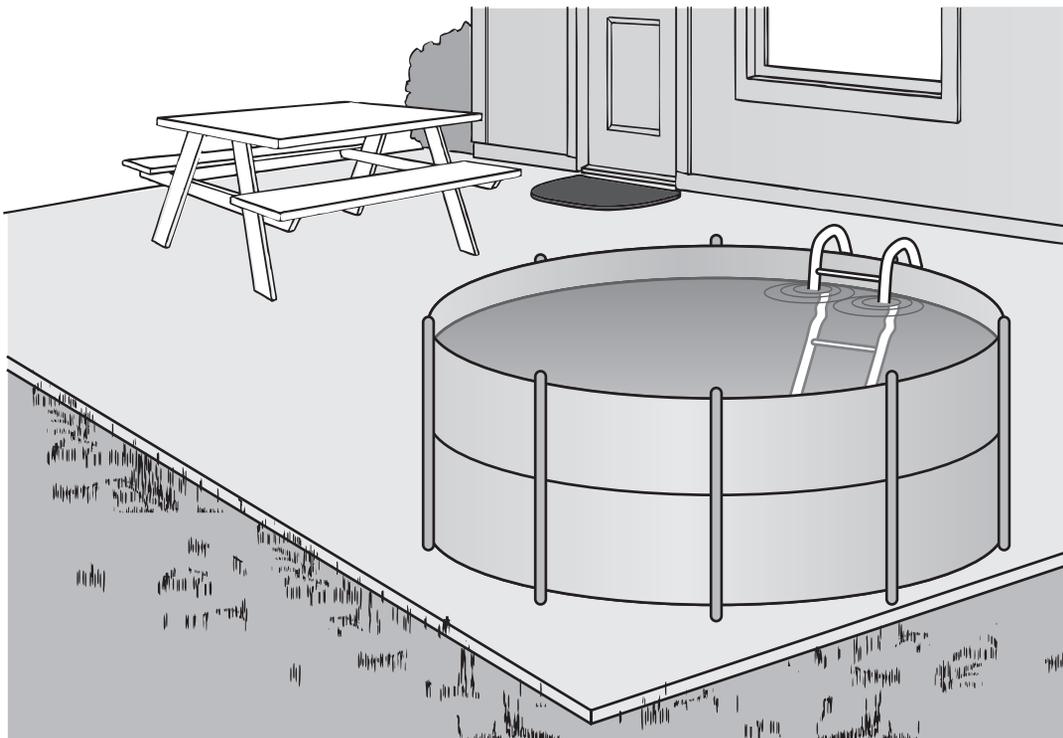
- A** purification of an ore
- * **B** the growth of a crystal
- C** a liquid becoming a solid
- D** sedimentation of granules

- 17** Which types of objects are most easily seen by the human eye?

- * **A** objects that reflect most of the light that strikes them
- B** objects that refract most of the light that strikes them
- C** objects that diffract most of the light that strikes them
- D** objects that absorb most of the light that strikes them

Science Item A—2012 Grade 5

- A** Below is a picture of Joe's deck. On the deck are a white picnic table, a swimming pool, and a black door mat. The sun is shining and light rays are hitting all three objects.



1. Name the process demonstrated by the light rays as they pass from the air into the water. Explain why the portion of the ladder that is in the water looks different than the portion of the ladder that is out of the water.
2. Explain what happens to the light rays as they hit the white picnic table.
3. Name the process demonstrated by the light rays as they hit the black door mat. Explain why the door mat might feel much warmer than the deck or the table.

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

Science Item A Scoring Rubric—Grade 5
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Score	Description
4	The student earns 4 points. The response shows a complete understanding of the interaction of light and matter. The response correctly addresses four out of the four tasks with no errors.
3	The student earns 3 points. The response shows a nearly complete understanding of the interaction of light and matter. The response correctly addresses three out of the four tasks.
2	The student earns 2 points. The response shows a limited understanding of the interaction of light and matter. The response correctly addresses two out of the four tasks.
1	The student earns 1 point. The response shows a minimal understanding of the interaction of light and matter. The response correctly addresses one out of the four tasks.
0	The student earns 0 points. Response shows insufficient understanding of the interaction of light and matter. The response, if any, contains major errors or may be entirely irrelevant or incoherent.
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	1 ½ points possible: ½ point for identifying refraction 1 point for an adequate explanation
2	1 point possible: Identifies the phenomenon as reflection.
3	1 ½ points possible: ½ point for identifying absorption 1 point for an adequate explanation

Science Item B—2012 Grade 5

B There are eight true planets in our solar system. There are two major groups of planets, the inner planets (Mercury, Venus, Earth, and Mars) and the outer planets (Jupiter, Saturn, Uranus, and Neptune).

1. List one property common to all the inner planets that is very different than the outer planets.
2. Describe how the property listed in Part 1 is different for the inner planets compared to the outer planets.
3. List another property common to all the inner planets that is very different than the outer planets.
4. Describe how the property listed in Part 3 is different for the inner planets compared to the outer planets.

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

Science Item B Scoring Rubric—Grade 5
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Score	Description
4	The student earns 4 points. The response shows a complete understanding of the properties of planets in our solar system. The response correctly addresses four out of the four tasks with no errors.
3	The student earns 3 points. The response shows a nearly complete understanding of the properties of planets in our solar system. The response correctly addresses three out of the four tasks.
2	The student earns 2 points. The response shows a limited understanding of the properties of planets in our solar system. The response correctly addresses two out of the four tasks.
1	The student earns 1 point. The response shows a minimal understanding of the properties of planets in our solar system. The response correctly addresses one out of the four tasks.
0	The student earns 0 points. Response shows insufficient understanding of the properties of planets in our solar system. The response, if any, contains major errors or may be entirely irrelevant or incoherent.
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	1 point possible: Lists a difference.
2	1 point possible: Describes the difference.
3	1 point possible Lists a difference.
4	1 point possible: Describes the difference.

The Arkansas English Language Arts Curriculum Framework—Reading Strand*

Content Standards	Student Learning Expectations
<p>9. Comprehension: Students shall apply a variety of strategies to read and comprehend printed material.</p>	<p>1. Use previewing, activating prior knowledge, predicting content of text, formulating questions, and establishing purposes for reading. 4. Generate questions relevant to text and topics. 6. Connect own background knowledge and personal experience to make inferences and to respond to new information presented in text. 9. Compare/contrast the actions, motives and appearance of characters in a work of fiction and discuss the importance of the contrasts to the plot. 10. Distinguish among facts and inferences supported by evidence and opinions in text. 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. 16. Scan materials to locate specific information. 19. Summarize information including main idea and significant supporting details. 20. Evaluate a character’s decision/action.</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>4. Read a variety of informational text, including textbooks, newspapers, magazines, and other instructional materials. 6. Skim materials to locate specific information. 8. Locate information to support opinions, predictions, and conclusions. 9. Use knowledge of text structure to locate information and aid comprehension. 10. Read a variety of literature, including historical fiction, biography, and realistic fiction.</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>1. Automatically decode words to ensure focus on comprehension. 5. Use context to determine meaning of multiple meaning words. 10. Use context clues to select appropriate dictionary definition.</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*

Item	Strand	Content Standard	Student Learning Expectation
1	R	9	6
2	R	10	6
3	R	10	8
4	R	10	6
5	R	9	10
6	R	11	1
7	R	10	9
8	R	9	1
A	R	10	6
9	R	9	16
10	R	11	5
11	R	9	20
12	R	9	9
13	R	9	12
14	R	9	10
15	R	9	6
16	R	10	10
B	R	9	20

* 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	11	10
R	9	12
R	9	19
R	9	16
R	9	4
R	9	11
R	10	6
R	10	4
R	9	19

* 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
4. Process: Students shall employ a wide range of strategies as they write and use different writing process elements appropriately.	11. Edit individually or in groups for appropriate grade-level conventions, within the following features: <ul style="list-style-type: none"> • Sentence formation <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 • Usage <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
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.	1. Write to describe, to inform, to entertain, to explain, and to persuade.
6. Conventions: Students shall apply knowledge of Standard English conventions in written work.	6. Define and identify the parts of speech to construct effective sentences: 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 10. Apply conventional rules of capitalization in writing.
7. Craftsmanship: Students shall develop personal style and voice as they approach the craftsmanship of writing.	1. Use figurative language purposefully, such as simile and metaphor, to shape and control language.

* 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	6	6
2	W	7	1
3	W	6	10
4	W	5	1

* 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
<p>1—Number and Operations (NO)</p>	<p>1. Number Sense: Students shall understand numbers, ways of representing numbers, relationships among numbers and number systems.</p>	<p>1. Use models and visual representations to develop the concepts of the following: <u>Fractions:</u> <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 <u>Ratios:</u> <ul style="list-style-type: none"> • part-to-part (2 boys to 3 girls) • part-to-whole (2 boys to 5 people) <u>Percents:</u> <ul style="list-style-type: none"> • part-to-100 </p> <p>2. Develop understanding of decimal place value using models.</p>
	<p>2. Properties of Number Operations: Students shall understand meanings of operations and how they relate to one another.</p>	<p>2. Identify <i>commutative</i> and <i>associative properties</i>.</p> <p>4. Apply rules (conventions) for <i>order of operations</i> to <i>whole numbers</i> where the left to right computations are modified only by the use of parentheses.</p> <p>5. Model addition, subtraction, and multiplication of fractions with like and unlike denominators and decimals.</p>
	<p>3. Numerical Operations and Estimation: Students shall compute fluently and make reasonable estimates.</p>	<p>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.</p> <p>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).</p>
<p>2—Algebra (A)</p>	<p>4. Patterns, Relations, and Functions: Students shall recognize, describe, and develop patterns, relations, and functions.</p>	<p>1. Solve problems by finding the next term or missing term in a <i>pattern</i> or <i>function table</i> using real world situations.</p> <p>2. Interpret and write a rule for a one operation <i>function table</i> Ex. adding 3.</p>
	<p>5. Algebraic Representations: Students shall represent and analyze mathematical situations and structures using algebraic symbols.</p>	<p>1. Model and solve simple <i>equations</i> by informal methods using manipulatives and appropriate <i>technology</i>.</p> <p>2. Write <i>expressions</i> containing one <i>variable</i> (a letter representing an unknown quantity) using rules for addition and subtraction.</p> <p>3. Select, write and evaluate <i>algebraic expressions</i> with one <i>variable</i> by substitution. Ex. Evaluate $x+4$ if $x=7$.</p>
	<p>6. Algebraic Models: Students shall develop and apply mathematical models to represent and understand quantitative relationships.</p>	<p>1. Draw conclusions and make predictions, with and without appropriate <i>technology</i>, from models, tables and <i>line graphs</i>.</p>
	<p>7. Analysis of Change: Students shall analyze change in various contexts.</p>	<p>1. Model and describe quantities that change using real world situations Ex. age and height.</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

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</i> angles (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 (horizontal/x-axis, vertical/y-axis, <i>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 and tools 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. 4. Understand when to use linear units to describe <i>perimeter</i>, square units to describe <i>area</i> or <i>surface area</i>, and cubic units to describe <i>volume</i>, in real world situations. 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. 3. Draw and measure distance to the nearest cm and $\frac{1}{4}$ inch accurately. 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 (DAP)	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</i> and <i>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</i>, and <i>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.

* 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	M	13	3
2	D	14	1
3	N	2	5
4	A	4	2
5	D	14	2
6	G	8	2
7	A	5	1
8	A	6	1
9	G	11	1
10	G	8	1
11	N	2	4
12	A	4	1
13	G	9	1
14	A	5	2
15	M	12	2
16	D	15	1
17	A	5	3
18	M	13	2
19	D	15	2
20	M	13	5
A	N	1	1
B	M	12	5
C	A	4	2

* 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
G	8	1
A	4	1
D	17	1
M	12	4
D	14	3
G	8	4
A	4	2
M	13	1
G	10	1
A	7	1
G	8	3
G	9	1
D	14	3
N	3	3
N	3	1
N	1	1
M	12	1
D	15	2
N	2	2
N	3	1
N	3	3
N	1	2

* 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 (NS)	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.	1. Make accurate observations. 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.
2— Life Science (LS)	2. Living Systems: Characteristics, Structure, and Function: Students shall demonstrate and apply knowledge of living systems using appropriate safety procedures, equipment, and technology.	2. Examine cells on a microscopic level. 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 5. Compare and contrast plant and animal <i>cells</i> . 8. Explain and illustrate photosynthesis. 9. Explain <i>cellular respiration</i> . 10. Conduct investigations demonstrating the process of <i>cellular respiration</i> . 11. Investigate careers, scientists, and historical breakthroughs related to <i>cells</i> .
	4. Populations and Ecosystems: Students shall demonstrate and apply knowledge of populations and ecosystems using appropriate safety procedures, equipment, and technology.	1. Distinguish among and model <ul style="list-style-type: none"> • <i>organisms</i> • <i>populations</i> • <i>communities</i> • <i>ecosystems</i> • <i>biosphere</i> 2. Identify the transfer of <i>energy</i> using <i>energy</i> pyramids: <ul style="list-style-type: none"> • terrestrial • aquatic 7. Describe and diagram the <i>carbon cycle</i> in <i>ecosystems</i> . 9. Conduct investigations demonstrating the role of the <i>carbon dioxide-oxygen cycle</i> in <i>ecosystems</i> . 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> 16. Evaluate positive and negative human effects on <i>ecosystems</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 (PS)	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 • <i>mass</i> • area • perimeter • texture • taste • odor • color • elasticity 5. Identify characteristics and common examples of physical changes. 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 <i>forces</i> using appropriate safety procedures, equipment, and technology.	2. Conduct investigations using <ul style="list-style-type: none"> • levers (e.g., toothbrush) • pulleys • inclined planes-ramps, wedges, and screws • wheels and axles 3. Relate <i>simple machines</i> to inventions and discoveries. 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> . 2. Investigate how light travels and interacts with an object or material. 3. Conduct investigations demonstrating how an object can be seen. 6. Investigate careers, scientists, and historical breakthroughs related to <i>light energy</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
4— Earth and Space Science (ES)	8. Earth Systems: Students shall demonstrate and apply knowledge of Earth's structure and properties using appropriate safety procedures, equipment, and technology.	2. Investigate the growth of crystals. 4. Conduct investigations on mineral properties: <ul style="list-style-type: none"> • luster • hardness • streak • acid test for calcite • fluorescence 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. 9. Classify the three basic types of rocks. 12. Conduct investigations on sedimentation. 13. Describe and illustrate the rock cycle.
	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 2. Demonstrate the order of planets and other space objects in our <i>solar system</i> . 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

* 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	1
2	L	4	7
3	E	8	12
4	P	5	8
5	L	4	2
6	E	8	6
7	P	7	6
8	L	2	10
9	L	4	1
10	E	8	7
11	E	9	3
12	L	2	9
13	E	10	1
14	L	2	4
15	P	5	8
16	E	8	2
17	P	7	3
A	P	7	1
B	E	10	3

* 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
E	8	4
P	6	3
L	4	16
E	10	2
L	2	5
E	8	9
L	4	14
N	1	7
L	2	2
E	8	13
P	6	6
E	9	2
P	5	5
N	1	4
L	4	9
L	2	11
P	7	2
E	8	12
P	5	3
L	2	8
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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