

Grade 4



CRCT



Study






Guide



Reading
English/Language Arts
Mathematics
Science
Social Studies



Table of Contents

	Using the CRCT Study Guide	1
	About the CRCT <u>Overview of the CRCT</u>	2
	What is the CRCT?	
	What does the CRCT measure?	
	How are CRCT questions scored?	
	<u>Preparing for the CRCT</u>	4
	Test-Taking Strategies	
	Related Links	
	Chapter 1 <u>Reading</u>	10
	Reading Skills and Vocabulary Acquisition	
	Literary Comprehension	
	Information and Media Literacy	
	Practice Quiz	
	Solutions	
	Chapter 2 <u>English/Language Arts</u>	26
	Grammar/Sentence Construction	
	Research/Writing Process	
	Practice Quiz	
	Solutions	
	Chapter 3 <u>Mathematics</u>	40
	Number and Operations	
	Measurement	
	Geometry	
	Algebra	
	Data Analysis and Probability	
	Practice Quiz	
	Solutions	



Chapter 4

Science

66

Earth Science
Physical Science
Life Science
Practice Quiz
Solutions



Chapter 5

Social Studies

82

History
Geography
Government/Civics
Economics
Practice Quiz
Solutions

Using the CRCT Study Guide

This Study Guide focuses on the knowledge and skills that are tested on the Georgia Criterion-Referenced Competency Tests (CRCT). It is designed for teachers to use with their students and for parents to use with their children. Go to www.gadoe.org/ to find further information about and support for the CRCT.



Use the following section of this guide, *About the CRCT*, for an overview of the CRCT and for test-taking strategies to review with your students.

- The content tested on the CRCT is based on the Georgia Performance Standards, which describe what all students should know, understand, and be able to do.



The chapters of this guide are organized by subject. In each chapter you can explore the skills needed to succeed in a specific, tested domain (grouping of similar content standards). The subject chapters include a snapshot of each domain, instructional **Activities** that address covered skills, and a **Practice Quiz** with annotated **Solutions** to help assess student progress.

Overview of the CRCT

What is the CRCT?

The CRCT is a series of state-mandated achievement tests for students in Grades 1 through 8. In Grades 3 through 8, the subject areas of reading, English/language arts, mathematics, science, and social studies are covered.

What does the CRCT measure?

The CRCT measures how well students have acquired the knowledge and skills covered by the state curriculum for their grade level. A new statewide curriculum, known as the Georgia Performance Standards (GPS), sets academic standards and expectations for all students in Georgia's public schools. The CRCT corresponds to the new standards.

The tests accomplish the following:

- Ensure that students are learning
- Provide data to teachers, schools, and school districts so they can make better instructional decisions
- Measure accountability, including Adequate Yearly Progress (AYP) as measured by the federal No Child Left Behind Act

CRCT results measure the academic achievement of students, classes, schools, school systems, and the state. This information can be used to identify individual student strengths and weaknesses or, more generally, to measure the quality of education throughout Georgia.

How are CRCT questions scored?

The CRCT currently uses only selected-response (multiple-choice) questions. There are four choices for each question, labeled A, B, C, and D.

Students are not compared to each other. They are measured on their achievement in meeting the standards. Scores are reported according to three performance levels: Does Not Meet the Standard, Meets the Standard, and Exceeds the Standard. For more information, go to the website www.gadoe.org/ci_testing.aspx?PageReq=CI_TESTING_CRCT and click the link for "2008 CRCT Interpretive Guide."

Since the spring of 2006, performance on the reading portion of the CRCT has been linked to the Lexile scale. Visit www.gadoe.org/lexile.aspx for more information on this national reading measure.

Preparing for the CRCT

Test-Taking Strategies

**Weeks
Before
the Test**

Set academic goals with students for the upcoming weeks and months (short and long term). Write down and post students' goals where they can be seen at least once a day.

Help students gather study materials ahead of time.

Set up a place to work that is free of distractions.

Build in time to review what was learned in the last study session.

Divide assignments into manageable chunks. Studying for a long time non-stop is not productive!

Model and have students mark the main idea of each paragraph with a pencil as they read. This will help them focus on what they are reading.

Have students ask questions that arise while they are studying and encourage them to find the answers.

At the end of each study session, review what they have learned.

Preparing for the CRCT

Day Before the Test

Remind students to get a good night's rest.

Remind students that they can talk to a teacher or parent if they are feeling nervous about the test.

Assure students that this test is only one measure of their knowledge.

During the Test

Remind students of the following strategies to use during the test:

Relax by taking slow, deep breaths.

Read the directions carefully. Make sure you understand what you need to do. If you are not sure, ask the teacher.

Read each question carefully.

When you use scratch paper, make sure that you copy the problem correctly from the test onto your paper.

You can underline and make marks on your test to help you while you work, but the only answers that will be scored are those in the correct locations on your answer sheet.

Fill in the corresponding circle fully when you choose your answer. Erase any marks outside of the circle.

Use your time wisely. Leave a question blank if you are unsure of the answer, then return to it at the end.

Don't spend too much time on one question.

Be sure to answer all of the questions.

Review your answers when you have finished the test.

Try to stay calm during the test. This is a chance for you to show what you know. Do the best you can!

Related Links

Below are links to important resources that contain information related to the CRCT.

Georgia Performance Standards:
www.georgiastandards.org/

CRCT Content Descriptions:
www.gadoe.org/ci_testing.aspx?PageReq=CI_TESTING_CRCT

GPS Frameworks:
www.georgiastandards.org/

Lexile Framework for Reading:
www.gadoe.org/lexile.aspx

Best practices in education indicate that teachers should first model new skills for students. Next, teachers should provide opportunities for guided practice. Only then should teachers expect students to successfully complete an activity independently.

The activities in this guide are no exception. They are designed to be used by teachers and parents to help students with the skills on the Georgia CRCT.

Since different students have different strengths and needs, the activities in this study guide can be scaffolded for students who need more support, extended to challenge advanced students, or presented as is (with appropriate modeling) for grade-level students.



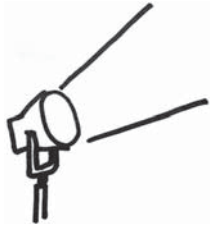
Reading

Students in Grade 4 expand and deepen their knowledge of reading, writing, and speaking, as well as their understanding of the connections among different types of communication. Students read and comprehend texts from a variety of genres (fiction, nonfiction, poetry, and drama), and they can understand and learn from texts without having a teacher preview the material for them. Grade 4 students also read and understand informational texts from other subject areas in addition to language arts. As they read, students in Grade 4 independently use a variety of meta-cognitive strategies to deepen and expand their understanding of the material. These strategies include using self-questioning techniques when reading materials seem contradictory or hard to understand.

The Reading activities are focused on some of the concepts that are assessed on the Grade 4 CRCT Reading domains. These domains are as follows:

- 1 Reading Skills and Vocabulary Acquisition**
- 2 Literary Comprehension**
- 3 Information and Media Literacy**

Activities



1 Reading Skills and Vocabulary Acquisition

Georgia Performance Standard ELA4R3

Within the Reading Skills and Vocabulary Acquisition domain, students learn the skills necessary to read, interpret, and apply difficult text. Students in Grade 4 will distinguish among and apply the appropriate usage of antonyms (opposites), synonyms (words with similar meanings), and homophones (words that sound the same). They will learn to determine the meanings of unknown words by identifying and inferring the meaning of common root words, by recognizing the meaning of common prefixes (e.g., *un-*, *re-*, *dis-*, *in-*), and by using context clues. Grade 4 students will use grade-level words with multiple meanings and will determine the meaning of words and alternate word choices using a dictionary or thesaurus.

The following activities develop skills in this domain:

- To increase students’ understanding of antonyms, synonyms, and homophones, play a game of *Fishing for Words*. Write the words from the tables below on index cards, one word per card. Students should sit in a circle with the cards spread out, face up, in the middle. Call out a clue such as *Which word is the opposite of deep? Which word means the same as humorous? or Which word means a flat piece of wood?* Students should raise their hands if they spot the target word. Call on a student to fish the word out of the pond. If the student chooses the right word and uses it correctly in a sentence, he or she can keep the word. The student with the most word cards at the end of the game wins.

Antonyms

deep/shallow	gigantic/small
fortunate/unfortunate	silent/loud
rapid/slow	entertaining/dull
careful/careless	possible/impossible

Synonyms

talk/speak	humorous/funny
probable/likely	excellent/superb
remember/recall	believe/think
listen/hear	foreign/unfamiliar



Homophones

board/bored	close/clothes
heard/herd	piece/peace
knew/new	their/there
threw/through	whole/hole

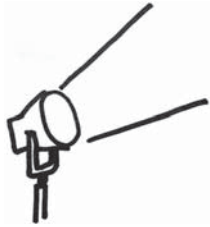
- To develop students' understanding of root words and prefixes, present students with word-building tasks. Write prefixes (e.g., *un-*, *re-*, *dis-*, *in-*) and root words (see table below) on index cards. Create at least one task card for each word in the table. Task cards should direct students to form words based on the definitions. For example, *Make a word that means to find something for the first time*. Students should combine prefixes and root words until they build the word that fits the given meaning (in this case, the word *discover*). Students should write their own sentences using the newly formed word. They will see how a word's meaning is often the sum of its parts.

able	cycle	frequent	pack
appear	different	interest	play
certain	equal	kind	read
comfort	fair	like	real
cover	fill	obey	search

- To provide students with practice using the thesaurus, challenge them to a game of *Break the Code*. Present individual students or pairs of students with a sentence that contains advanced vocabulary. For example, *The garrulous professor gesticulated wildly as he articulated his ideas*. Students should read the sentence and circle any words they don't understand. They should look up the unknown words in a thesaurus or on an Internet thesaurus site. They will rewrite the sentence replacing the unknown words with words they understand. Students should read the original sentence to the class and then present their translations.
- To familiarize students with dictionary entries, set up a word hunt. Assign each student one word that has multiple definitions. Students will look up the words using a dictionary or a dictionary website. They will copy the word's pronunciation, parts of speech, and corresponding definitions onto a piece of lined paper. At the bottom of the paper they will write a sentence using the word. They will present their word and definitions, share the sentences they wrote, and explain which definition of the word they used. Students should tell whether they found their words in a dictionary or on the Internet and explain the steps they took to find their words. Once the presentations are finished, students should discuss the pros and cons of using an actual dictionary versus looking up a word on a dictionary website.



Activities



2 Literary Comprehension

Georgia Performance Standard ELA4R1

Within the Literary Comprehension domain, Grade 4 students learn a variety of skills to comprehend and explore literary works. They will recognize and analyze literary elements such as setting, characterization, and plot and will identify the speaker of a poem or story. They will make judgments and inferences about setting, characters, and events and will recognize the relevance of foreshadowing clues. Students in Grade 4 will also recognize and interpret sensory details and figurative language such as personification (description of an inanimate object as animate), simile (comparison using *like* or *as*), and metaphor (comparison using *is*), as well as rhyme, rhythm, and repetition in poems. Students will determine themes and lessons in fiction passages and draw comparisons between literary content and the actual experiences of an author's life.

The following activities develop skills in this domain:

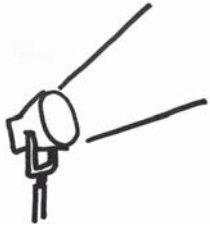
- To help students analyze the setting of a literary work, provide time for them to draw their favorite scene from a book containing no pictures. Students should reread passages that describe where and when their favorite event takes place. They should visualize what the text describes and draw what they imagine. While students work, write the following questions on the board: *Could your favorite scene have taken place anywhere else or at any other time? Why or why not?* Students should think about these questions and prepare to present their answers to the class. When presenting, students should begin with a brief overview of the book (title, author, and characters) and a short summary of the scene they have drawn (where and when it takes place, who is there, and what is happening). Next, students should explain whether they think the scene they drew could have taken place anywhere else or at any other time. Students will see the different ways that setting influences the characters and events of a text.
- Foreshadowing suggests events that have yet to occur in a literary text. To build students' abilities to recognize foreshadowing, retrace the steps that lead to a plot's culminating event. After students read a short story, fable, folktale, or drama, work together to identify the text's main ending event. Write it down on a piece of construction paper labeled *Main Event* and tape it high up on a wall. Students should reread the text looking for clues leading up to the event. Clues may tell how a character was feeling, explain how an event occurred, or describe the setting in which an event takes place. Trace footprints on construction paper so that students can cut them out. Students will write each clue they found on a separate footprint. They will group any repeated clues together and arrange the rest in the order that they occurred in the text. Attach the footprints to the wall starting with the first clue at the bottom so they lead up to the culminating event.



- To develop students' understanding of figurative language, present them with examples to interpret. Take examples of personification, metaphor, and simile from texts students are reading, or write them from scratch. Give each student one example of figurative language. Students should read their examples and answer the question, *What does this sentence make you see, taste, feel, hear, or smell?* Remind students that not every sentence will appeal to all of the senses. Students should paste their examples on the top of a piece of construction paper. Then they should think about which sense (sight, taste, touch, sound, or smell) is most central to the sentence and draw an eye, a tongue, a hand, an ear, or a nose below it. Students will read their examples to the class and explain which sense is primary to the sentence, as well as what it makes them see, taste, feel, hear, or smell. Post the examples around the room as reminders of the sensory effects of figurative language.
- To help students draw connections between a text's setting, characters, and events and the actual experiences of the author's life, set up Ask the Author interviews. After reading a short story, poem, or narrative, students should research the author's life. They should look for biographies in the library and search for information on the Internet. Students will work in pairs to prepare and role-play interviews. One student will pretend to be the author of the text, while the other is the interviewer. They will come up with questions that ask the author how his or her writing is related to experiences from his or her life. Sample questions are *Were you ever in a place similar to the setting of your book? Do you have anything in common with any of your characters? What character are you most like?* Students will rehearse answers to their questions before performing their interviews in front of the class.



Activities



3 Information and Media Literacy

Georgia Performance Standards ELA4R1 and ELA4LSV2

Within the Information and Media Literacy domain, students in Grade 4 learn to read, recall, and analyze details and information from various texts such as informational essays, articles, subject-area texts, and reference sources. They also learn the skills required to analyze and evaluate various types of workplace, consumer, and media reading materials. Grade 4 students will analyze text to summarize the main idea and supporting details, determine and explain cause-and-effect relationships, and distinguish between facts and opinions. They will analyze text and sentence structure (e.g., chronological and cause-and-effect) and interpret both textual features (e.g., paragraphs, topic sentences, concluding sentences, glossary) and graphic features (e.g., diagrams, illustrations, charts, maps). Grade 4 students will recall explicit facts, draw conclusions, and make predictions. They will understand how media play a part in dispensing information and forming public opinion, in addition to providing entertainment.

The following activities develop skills in this domain:

- To help students analyze text structure, challenge them to put the scrambled sentences of a chronological paragraph in order. Type a short paragraph that describes a sequence of events or explains the steps necessary to complete a task. Reorder the sentences and leave two blank lines after each sentence so that students can cut them out. Students should look for chronological language such as *first*, *then*, *next*, and *finally* as they move the sentences around to find the original order. They should look for a sentence that introduces the topic in a broad way and position it as the topic sentence. They should look for a sentence that closes the topic and position it as the concluding sentence. Students will order any remaining sentences using other context clues. After students have tried the challenge on their own, come together and arrange the paragraph as a group. Students will share their reasoning for the order they chose and discuss why the original sequence makes sense.
- To develop students' abilities to recognize and explain cause-and-effect relationships, create two-part posters. Students should read an informational text that describes cause-and-effect relationships (e.g., a science article that explains why a species became extinct, a history text that explains the causes of a war, or a biography that explains what contributed to a leader's success). They will fold a piece of paper in half and label the top left *Cause* and the top right *Effect*. They will locate an effect in the text and write it on the top right side of their papers. Next, they will reread the text looking for causes that lead to the effect they chose. They will write them on the top left side of their papers. Finally, they will draw pictures to illustrate the cause(s) and effect and present their posters to the class.



- To help students identify the best supporting details for a given main idea, provide them with supporting details to sort. Prepare a worksheet with a list of the supporting details contained in an informational text they have read. Include one sentence that summarizes the main idea, and add details that are not relevant to the topic at hand. Students should read the sentences on the worksheet and decide which one represents the main idea. They will cut out that sentence, place it at the top of a piece of construction paper, and draw a line underneath it. Next, they will read the rest of the sentences, cut out those that support the main idea, and place them at the bottom part of their papers. Before gluing any of the sentences in place, students should make sure they have the main idea above and all relevant supporting details below. Go over the sentences together so that students can explain how each detail supports the main idea.
- To show students how to analyze a media message, present them with a television or magazine advertisement and prompt them to discuss and respond to the following questions: *What is the message of the advertisement? Are there multiple interpretations of the message? What information is communicated? Is it factual or does it represent someone's opinion? Who created the message? Is it an individual or a corporation? What do the creators of the message want viewers to do? For whom did the creators make the advertisement? How did the creators design the ad so that people in the target audience would like it? Have students ever seen or heard a message that was similar? Do they think the advertisement is effective? Why or why not?*



Practice Quiz



Genre: Fiction

Read the passage below and answer the questions that follow.

The Fair

Jenna always looked forward to the annual “School’s Out!” Fair. It was the best part about the end of the school year. Whenever Jenna went to the fair, she usually went with Grandma. Grandma would walk with Jenna and her friends and laugh as they explored the colorful booths and rides with the blinking lights. As Jenna and her friends ran off to play the games, Grandma would always joke, “Win the stuffed giraffe for me!”

When the day of the fair came, Jenna was excited. All day, she waited impatiently for school to end. On the way home from school, she could see people setting up the rides in the park. She tried to imagine the smell of popcorn and the bright rides, like necklaces of lights in the night sky. She couldn’t wait for evening to come!

However, when Jenna got home, her mother had bad news. Grandma had called. She had to babysit for Jenna’s new cousin Andrew. Since Andrew wasn’t old enough to go to the fair yet, Grandma wouldn’t be able to take Jenna to the fair that night. Right away, Jenna was very upset. She knew that her mother was busy and wouldn’t be able to take her. That meant that she wouldn’t be able to go to the fair at all!

Jenna’s mother tried to console her. “I’m sorry, dear,” Jenna’s mother said. “You can always go next year. You can go keep Grandma company tonight, though.”

“But, Mom,” Jenna said, “I don’t want to miss the fair!”

After seeing how disappointed Jenna was, Jenna’s mother made a phone call. Jenna’s older cousin Rachel said that she would be able to take her. When Jenna found out, she felt better. At first, Jenna thought it would be strange to be at the fair without Grandma. When she thought of all the fun she would have at the fair, though, she forgot all about it.

Once Jenna got to the fair, she had an empty feeling. She talked to her friends, ate cotton candy, and rode the fast rides, but something was missing.

“Something is not right,” Jenna thought to herself as she roamed through the fair.

Jenna didn’t really feel like playing the games, but she played them anyway. She barely even noticed when she won a prize at the Frisbee toss. Before she knew it, a man was handing her a big, stuffed giraffe. When she saw the giraffe, Jenna suddenly realized what was wrong. Without Grandma there, the fair just wasn’t the same. Jenna knew what she had to do.



She immediately said goodbye to Rachel and ran to Grandma's house. When she got there, she used her key to let herself in. Grandma was sitting on the couch, holding the baby. She was surprised to see Jenna. Jenna walked over to Grandma with a huge smile on her face.

"Here, Grandma. This is for you," Jenna said proudly, as she presented Grandma with the big giraffe. Grandma's eyes lit up, and a smile of surprise spread across her face.

"Oh, Jenna!" Grandma said. "What a wonderful gift!"

Suddenly, everything felt right.

1 Which of these events from the passage happens LAST?

- A Grandma calls Jenna's mother.
- B Jenna runs to Grandma's house.
- C Jenna goes to the fair with her friends.
- D Grandma jokes about the stuffed giraffe.

2 When does the passage take place?

- A at the end of summer
- B in the middle of summer
- C at the end of the school year
- D in the middle of the school year

3 What is the MAIN problem in the passage?

- A Grandma cannot take Jenna to the fair.
- B Jenna needs to win a prize for Grandma.
- C Jenna does not want to give Grandma the giraffe.
- D Grandma forgets about going to the fair with Jenna.

4 Which of these is used in the sentence?

She tried to imagine the smell of popcorn and the bright rides, like necklaces of lights in the night sky.

- A idiom
- B simile
- C metaphor
- D personification



- 5 **Which of these senses is MOST important to the sentence?**

Grandma would walk with Jenna and her friends as they explored the colorful booths and rides with the blinking lights.

- A taste
- B sight
- C touch
- D sound

- 6 **Why does the author MOST LIKELY include the following sentences?**

At first, Jenna thought it would be strange to be at the fair without Grandma. When she thought of all the fun she would have at the fair, though, she forgot all about it.

- A to show that Jenna does not want to go to the fair
- B to suggest that Jenna will not enjoy herself at the fair
- C to show that Jenna cannot go on the rides without Grandma
- D to suggest that Jenna has not spent much time with Grandma

- 7 **Which of these is MOST LIKELY true about Grandma?**

- A She is tired of going to the fair.
- B She likes visiting the fair by herself.
- C She likes spending time with Jenna.
- D She wants Jenna to help with the baby.

- 8 **Which of these BEST describes why the stuffed giraffe is important to the passage?**

- A It is a gift from Grandma.
- B It is a prize Grandma wins for Jenna.
- C It reminds Jenna of time spent with Grandma.
- D It reminds Jenna of how much she enjoys the fair.

- 9 **What does the word *console* mean in the sentence?**

Jenna's mother tried to console her.

- A tell someone a story
- B give a gift to someone
- C make someone feel better
- D explain a problem to someone



10 **Which of these is the root word of *impatiently* in the sentence?**

All day, she waited impatiently for school to end.

- A im
- B pat
- C patient
- D impatient



Solutions

Number	Correct Answer	Explanation
1	B	<p><i>Identifies and analyzes the elements of plot, character, and setting in stories read, written, viewed, or performed. (ELAR41b)</i></p> <p>The correct answer is Choice (B) Jenna runs to Grandma's house. The last main event of the story is Jenna's visit to her grandmother's house. Choices (A) and (C) are incorrect because they are both events that happened <i>before</i> the last part of the story. Choice (D) is incorrect because although Grandma receives the stuffed giraffe at the end of the story, she does not joke about it then.</p>
2	C	<p><i>Identifies and analyzes the elements of plot, character, and setting in stories read, written, viewed, or performed. (ELAR41b)</i></p> <p>The correct answer is Choice (C) at the end of the school year. The passage describes the "School's Out!" Fair, which takes place at the end of the school year. Choices (A) and (B) are incorrect because the end of the school year does not take place in the summer. Choice (D) is incorrect because the "School's Out!" Fair does not take place in the middle of the school year.</p>
3	A	<p><i>Identifies and analyzes the elements of plot, character, and setting in stories read, written, viewed, or performed. (ELAR41b)</i></p> <p>The correct answer is Choice (A) Grandma cannot take Jenna to the fair. The main problem of the passage is that Grandma cannot take Jenna to the fair because she has to baby-sit for Jenna's new cousin. Choice (B) is incorrect because Jenna does not <i>need</i> to win a prize for Grandma—that is just something they joke about. Choice (C) is incorrect because Jenna <i>does</i> want to give Grandma the giraffe—she wants to do it so badly she leaves the fair early. Choice (D) is incorrect because Grandma does not forget about going to the fair with Jenna.</p>



Number	Correct Answer	Explanation
4	B	<p><i>Identifies sensory details and figurative language. (ELA4R1d)</i></p> <p>The correct answer is Choice (B) simile. In the sentence provided, the “bright rides” are compared to “necklaces of lights in the night sky.” The use of the word “like” signals that this comparison is a simile. Choice (A) is incorrect because the sentence does not use an <i>idiom</i> (an expression particular to a given language). Choice (C) is incorrect because although the sentence compares two things, it does not use the word <i>is</i> as would be the case with a <i>metaphor</i>. Choice (D) is incorrect because the sentence does not incorporate <i>personification</i> (description of an inanimate object as animate).</p>
5	B	<p><i>Identifies sensory details and figurative language. (ELA4R1d)</i></p> <p>The correct answer is Choice (B) sight. The sentence describes visual imagery such as “colorful booths” and “blinking lights.” It appeals mostly to the sense of sight. Choices (A), (C), and (D) are incorrect because taste, touch, and sound are not the senses most important to the sentence.</p>
6	B	<p><i>Identifies and shows the relevance of foreshadowing clues. (ELA4R1e)</i></p> <p>The correct answer is Choice (B) to suggest that Jenna will not enjoy herself at the fair. The author includes the sentences to foreshadow that Jenna will not enjoy herself at the fair because she will miss her grandmother. Choice (A) is incorrect because these sentences do not show that Jenna does not want to go to the fair—in fact, they show her thinking of all the fun she will have there. Choice (C) is incorrect because these sentences do not show that Jenna cannot go on the rides without Grandma. Choice (D) is incorrect because these sentences do not suggest that Jenna has been able to spend much time with Grandma.</p>



Number	Correct Answer	Explanation
7	C	<p><i>Makes judgments and inferences about setting, characters, and events, and supports them with elaborating and convincing evidence from the text. (ELA4R1f)</i></p> <p>The correct answer is Choice (C) She likes spending time with Jenna. The first paragraph of the passage explains how “Grandma would walk with Jenna and her friends and laugh as they explored the colorful booths and rides with the blinking lights.” It also describes how she would joke. Choice (A) is incorrect because there is nothing in the passage that states or implies that Grandma is tired of going to the fair. Choice (B) is incorrect because there is nothing in the passage that states or implies that Grandma likes visiting the fair by herself. Choice (D) is incorrect because there is nothing in the passage that states or implies that Grandma wants Jenna to help her with the baby.</p>
8	C	<p><i>Summarizes main ideas and supporting details. (ELA4R1f)</i></p> <p>The correct answer is Choice (C) It reminds Jenna of time spent with Grandma. The stuffed giraffe is important to the passage because it represents a joke Jenna and her Grandma shared. Choices (A) and (B) are incorrect because the giraffe was not a gift or prize that Grandma gave to Jenna. Choice (D) is incorrect because although the giraffe may remind Jenna of the fair, it more directly reminds Jenna of her grandmother.</p>
9	C	<p><i>Determines meanings of unknown words using their context. (ELA4R3b)</i></p> <p>The correct answer is Choice (C) make someone feel better. The context for the sentence provided can be found in the third and fourth paragraphs. Jenna’s mother tries to make Jenna feel better after she finds out her grandmother won’t be able to take her to the fair. Choices (A), (B), and (D) are incorrect because “console” does not mean to <i>tell someone a story, to give a gift to someone, or to explain a problem to someone</i>.</p>



Number	Correct Answer	Explanation
10	C	<i>Identifies the meaning of common root words to determine the meaning of unfamiliar words. (ELA4R3c)</i> The correct answer is Choice (C) patient . Once the prefix <i>im-</i> and the suffix <i>-ly</i> are removed from the word <i>impatiently</i> , the root word <i>patient</i> is left. Choices (A) and (B) are incorrect because <i>im</i> and <i>pat</i> are not root words of <i>impatiently</i> . Choice (D) is incorrect because <i>impatient</i> contains the prefix <i>-im</i> .



English/Language Arts

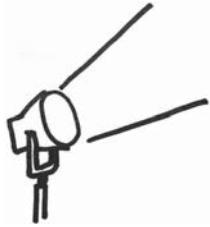
Students use writing as a tool for learning, and they write for a variety of purposes and audiences. Grade 4 students write daily in order to maximize and formalize their writing skills. Students communicate their personal voices in writing, expressing ideas through journals, notes, and e-mail. Students are aware of the connections between reading and writing, and they begin to use reading and writing strategies interchangeably. Grade 4 students are ready for opportunities to discuss books and to expand their vocabularies for deeper comprehension of texts. They understand and articulate how authors use a variety of techniques and craft in their writing, and they show evidence of the author's craft in their own writing.

The English/Language Arts activities focus on some of the concepts that are assessed on the Grade 4 CRCT English/Language Arts domains. These domains are as follows:

- 1 Grammar/Sentence Construction**
- 2 Research/Writing Process**



Activities



1 Grammar/Sentence Construction

Georgia Performance Standard ELA4C1

Within the Grammar/Sentence Construction domain, students learn to recognize the subject-predicate relationship in sentences, the four basic parts of speech (noun, verb, adverb, adjective), and correct mechanics (end marks, commas for series, capitalization). Students use and identify words or word parts from other languages that have been adopted into the English language and write legibly in cursive. They use knowledge of letter sounds, word parts, word segmentation, and syllables to monitor and correct spelling. Finally, students spell common homophones correctly, vary sentence structure by type, and eliminate fragments and run-ons from writing.

The following activities develop skills in this domain:

- To give students practice spelling words correctly, play the *Tic-Tac-Toe Spelling Game*. Using masking tape, make a large tic-tac-toe board on the floor. Divide the students into two teams: Xs and Os. Give students index cards with their team symbol written on one side. Say a word to spell. If the student writes it on the chalk board with correct spelling, he or she gets to choose a square on the game board. The student will hold up the card showing an X or an O and place it on the game board. If the word is misspelled, the other team gets a chance to spell it correctly and choose a square. This activity may be adapted to review syllables, word parts, and proper use of punctuation symbols. Using either a large or small hand-drawn tic-tac-toe board, the review game is also effective when played one-on-one.
- Help students understand the two parts of a sentence—the subject and predicate—by playing *Break Point*. Write a series of sentences on the board, one at a time. For each sentence, students take turns going up to the board and marking a slash where the break between the subject and predicate occurs. Here are some examples:
 - *Chelsea / ate her dinner quickly.*
 - *Daniel and his puppy / walked to the park, the store, and to the neighbor’s house.*
 - *The sisters / needed to finish their homework before playing outside.*

After students mark the slashes, ask other students to identify which words form the subject and which form the predicate. Continue with the activity until each student understands the two necessary parts of a complete sentence.

- Using correct homophones is an essential part of accurately expressing ideas in writing. To help students with this skill, divide them into two teams and read aloud a sentence with a common homophone such as there/their/

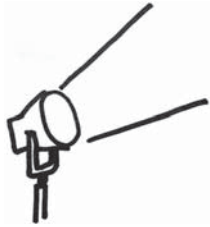


they're or too/to/two. Teams will get one point for each round by sending a representative up to the board to write the correct homophone. If the team representative writes the incorrect homophone, the other team gets its chance at the board. To conduct the activity one-on-one, simply read sentences to a student and ask him or her to write the correct homophone on a sheet of paper. After the game is over, discuss the experience using guiding questions such as the following: *Which homophones are easy to confuse? What are some ways to remember them more easily?*

- To give students practice identifying errors in grammar and mechanics, pair students up, and hand each student a red pencil. Then, using a regular pencil, each student should write a sentence that his or her partner will proofread and correct with the red pencil. When writing sentences, students should give their partners opportunities to find different types of errors and to recognize correctly written sentences. Students should switch papers each time both partners have finished their writing or proofreading tasks. This activity may also be used when working one-on-one with a student.



Activities



2 Research/Writing Process

Georgia Performance Standards ELA4W1, ELA4W2, ELA4W3, and ELA4W4

Within the Research/Writing Process domain, students select a focus, organizational structure, and point of view for their writing. Students use transition elements, sensory details, and concrete language to ensure coherence and develop reader interest. Students locate information in reference texts by using organizational features such as prefaces, indices, and glossaries. Students use various reference materials (electronic information, almanacs, atlases, magazines, newspapers, and key words), display keyboarding skills, and demonstrate familiarity with computer terminology (hard drive, software, memory). Students revise drafts by consolidating and rearranging text, excluding extraneous details, editing to correct errors in punctuation, and giving closure to their writing.

The following activities develop skills in this domain:

- To help students identify unnecessary details and extraneous information in a text, modify several newspaper articles and magazine features by adding sentences that do not belong. These sentences should be off-topic or unnecessary. Hand out the revised versions to students and challenge students to eliminate extraneous sentences. Encourage students to help each other and discuss their reasoning. At the end of the activity, clear up any sentences students missed or that caused confusion during the discussion.
- To help students identify and determine the purpose of a text's organizational features, such as its preface, appendix, index, glossary, and table of contents, students will perform a book dissection. Working in small groups, students will first choose a book and find an example of each of the features listed above. They will label each feature with a sticky note. Then, make a copy of each labeled page. Next, give students poster board and tape. Students will tape the copies of the different features of the book on the poster board and label each of the organizational features. These labels should also explain the purpose of the feature. For example, the label for an index might say, *An index has an alphabetical list of words found in the book and tells on which page you can find information on that word.* When students are done with their dissection, they should have a poster-sized display of all the parts of a book to keep in the classroom as a reference. Finally, lead a discussion about the organizational features of a book, encouraging students to refer to their displays while they answer. Here are some sample guiding questions:
 - *Cynthia wants to know on what page the word _____ is found. What feature should she use?*
 - *When does it make more sense to use a table of contents instead of an index?*



- *Charles needs to find the definition of a bolded word in his book. Where should he look?*

- To help students learn to revise text for coherence and logical progression, students will play *Paragraph Puzzle*. First, copy and paste a paragraph from an Internet site into a blank document and increase the font size. Put each sentence in the paragraph on its own line. Print out the paragraph and cut up the sentences into individual strips. Working together, students will put the strips in the correct order. When the activity is complete, facilitate a discussion about how students figured out the correct order of their sentences. Ask guiding questions such as, *What clues did you use? Can any of the sentences in the paragraph be removed altogether?* and *What organizational pattern does this paragraph use (chronological, similarity and difference)?* As extension activities, students should play *Paragraph Puzzle* using paragraphs their classmates have written. They should also practice writing paragraphs according to specified organizational patterns.



Practice Quiz



- 1 **What is the subject of the sentence?**

The girl bounced the orange ball.

- A girl
- B bounced
- C orange
- D ball

- 2 **What part of speech is the underlined word in the sentence?**

Our neighbors waved cheerfully from across the street.

- A noun
- B verb
- C adverb
- D adjective

- 3 **Where is the BEST place to separate the run-on sentence into two sentences?**

Stuart has the key he will have to unlock the door.

- A after *Stuart*
- B after *key*
- C after *he*
- D after *unlock*

- 4 **The sentence below has a spelling error. Which of the underlined words in the sentence is spelled incorrectly?**

The mysterious man with the mustache sat on the stool and drank a gallen of milk.

- A mysterious
- B mustache
- C stool
- D gallen



5 **Which type of sentence is this?**

Walk to school with us.

- A declarative
- B imperative
- C interrogative
- D exclamatory

6 **Where would this information most likely be found?**

The town of Livingston was founded in 1825. Henry Keane was elected the first mayor of Livingston in 1835. The Keane House is the oldest home still standing in Essex County.

- A a visitor's guide to Livingston
- B a map of the town of Livingston
- C an interview with a family who lives in Livingston
- D a newspaper article about Livingston's new mayor

7 **What kind of organization does the paragraph use?**

Choosing the best spot is the first step to growing a great garden. Look around your yard to find a spot where your plants will get plenty of sunlight. Usually a spot that is on the south side of a building works best. Next, plan your garden so that it will not be in the way of people walking through the yard. Finally, once you have chosen your spot, the real gardening can begin.

- A cause and effect
- B chronological order
- C question and answer
- D similarity and difference



- 8 **Which sentence would BEST support the information in the paragraph?**

After the Louisiana Purchase in 1803, President Jefferson sent Lewis and Clark to explore the new land bought by the United States. A Native American woman, Sacagawea, agreed to help them on their journey. Together, they led a group of explorers through the new territory west of the Mississippi River, over the Rocky Mountains, and on to the Pacific Ocean.

- A The travelers drew maps of the land that they explored.
- B Lewis and Clark brought their dog along for the journey.
- C The Rocky Mountains are the great backbone of North America.
- D It is interesting to visit the places that Lewis and Clark explored.

- 9 **Which sentence is unrelated to the paragraph?**

¹I learned many new things during my week at camp. ²I learned to paddle a canoe and to sail a sailboat. ³I learned how to make a campfire. ⁴I also learned how to identify the footprints of the animals in the woods. ⁵I did not see a skunk. ⁶My week at camp was fun and full of learning.

- A sentence 2
- B sentence 3
- C sentence 4
- D sentence 5

- 10 **What is the BEST closing sentence for the paragraph?**

Cezar waited patiently for his parents to come home from the pet store. They were bringing home a new puppy! Cezar made a soft bed for the puppy to sleep in. The water and food bowls were filled. A basket of puppy toys sat on the front porch.

- A Cezar's parents were always on time.
- B Cezar was prepared for his new puppy.
- C The food and water bowls were made out of plastic.
- D The pet store had everything that the new puppy needed.



Solutions

Number	Correct Answer	Explanation
1	A	<p><i>Recognizes the subject-predicate relationship in sentences. (ELA4C1a)</i></p> <p>The correct answer is Choice (A) girl. The subject of the sentence answers the question <i>who?</i> or <i>what?</i> Who bounced the orange ball? The girl. Choice (B) is incorrect because <i>bounced</i> is the verb. Choice (C) is incorrect because <i>orange</i> is an adjective that describes the noun <i>ball</i>. Choice (D) is incorrect because <i>ball</i> is the object of the sentence.</p>
2	C	<p><i>Uses and identifies four basic parts of speech (adjective, noun, verb, adverb). (ELA4C1b)</i></p> <p>The correct answer is Choice (C) adverb. An adverb modifies a verb. In the sentence, “cheerfully” describes the way the neighbors waved, so it functions as an <i>adverb</i>. Many, though not all, adverbs end in <i>-ly</i>. Choice (A) is incorrect because “cheerfully” is not a <i>noun</i>. It is not a person, place, or thing. Choice (B) is incorrect because “cheerfully” is not a <i>verb</i>. Verbs show an action or state of being. Choice (D) is incorrect because “cheerfully” is not an <i>adjective</i>. Adjectives modify nouns, not verbs.</p>



Number	Correct Answer	Explanation
3	B	<p><i>Uses and identifies correct mechanics (end marks, commas for series, capitalization), correct usage (subject and verb agreement in a simple sentence), and correct sentence structure (elimination of sentence fragments). (ELA4C1c)</i></p> <p>The correct answer is Choice (B) after key. You can break up a run-on sentence by separating two thoughts or ideas. "Stuart has the key" has both a subject and a predicate. A period can be added after this phrase to create a complete sentence. "He will have to unlock the door" can also stand alone as a complete sentence because it has both a subject and a predicate. Choice (A) is incorrect because placing a period after <i>Stuart</i> creates an incomplete sentence. Sentences must have a subject and a predicate and <i>Stuart</i> by itself is only a subject. Choice (C) is also incorrect because a period placed after <i>he</i> creates another incomplete sentence. "Will have to unlock the door" does not have a subject, so it is not complete. Choice (D) is incorrect because if a period is placed after <i>unlock</i>, it creates the incomplete sentence "the door."</p>
4	D	<p><i>Uses knowledge of letter sounds, word parts, word segmentation, and syllabication to monitor and correct spelling. (ELA4C1f)</i></p> <p>The correct answer is Choice (D) gallen. <i>Gallen</i> is an incorrect spelling of the word <i>gallon</i>. Choices (A), (B), and (C) are all incorrect because these words are spelled correctly.</p>



Number	Correct Answer	Explanation
5	B	<p><i>Varies the sentence structure by kind (declarative, interrogative, imperative, and exclamatory sentences and functional fragments), order, and complexity (simple, compound). (ELA4C1h)</i></p> <p>The correct answer is Choice (B) imperative. An imperative sentence gives a command or makes a request. “Walk to school with us” is a command and therefore an <i>imperative</i> sentence. Choice (A) is incorrect because a <i>declarative</i> sentence makes a statement with an explicit subject and “Walk to school with us” does not do this. The subject is understood to be <i>you</i>. Choice (C) is incorrect because an <i>interrogative</i> sentence asks a question and “Walk to school with us” <i>does not</i> ask a question. Choice (D) is incorrect because an <i>exclamatory</i> sentence makes a statement of emotion or urgency and “Walk to school with us” does not do this.</p>
6	A	<p><i>Locates information in reference texts by using organizational features (i.e., prefaces, appendices, indices, glossaries, and tables of contents). (ELA4W3b)</i></p> <p>The correct answer is Choice (A) a visitor’s guide to Livingston. The selection tells about Livingston’s town history. This type of information would be found in a visitor’s guide. Choice (B) is incorrect because a map would include a visual representation of the town instead of a text description of it. Choice (C) is incorrect because the selection gives town history. An interview with a family who lives there would be more likely to include information and details about what it is like there today, and read more informally in style. Choice (D) is incorrect because the selection doesn’t give any information about the town’s current mayor. It mentions only a mayor who lived many generations ago.</p>



Number	Correct Answer	Explanation
7	B	<p><i>Uses traditional structures for conveying information (e.g., chronological order, cause and effect, similarity and difference, and posing and answering a question). (ELA4W1c)</i></p> <p>The correct answer is Choice (B) chronological order. Words such as “next” and “finally” are transition words that organize the directions in a step-by-step manner through time. Choice (A) is incorrect because the selection doesn’t give any causes or effects related to the topic. Choice (C) is incorrect because the selection doesn’t pose questions or offer answers. Choice (D) is incorrect because the selection doesn’t compare and contrast two things.</p>
8	A	<p><i>Supports a position with relevant evidence. (ELA4W2c)</i></p> <p>The correct answer is Choice (A) The travelers drew maps of the land they explored. This detail gives relevant information about an action directly connected to the purpose of Lewis and Clark’s expedition. Choice (B) is incorrect because it is not important whether the explorers brought a dog with them. Choice (C) is incorrect because it is an opinion about the Rocky Mountains instead of a relevant fact about the explorers. Choice (D) is incorrect because it speaks to a modern-day tourist instead of giving information about Lewis and Clark and what they did, like the rest of the paragraph.</p>
9	D	<p><i>Excludes extraneous details and inconsistencies. (ELA4W2e)</i></p> <p>The correct answer is Choice (D) sentence 5. “I did not see a skunk” does not support the main idea of the paragraph. The topic sentence states that the paragraph will be about things learned at camp. Choices (A), (B), and (C) are incorrect because these sentences each give an example of something learned at camp, which means that these sentences fit with the main idea and give relevant details.</p>



Number	Correct Answer	Explanation
10	B	<i>Provides a sense of closure to the writing. (ELA4W2h)</i> The correct answer is Choice (B) Cezar was prepared for his new puppy . The closing sentence should summarize the paragraph. The paragraph describes Cezar preparing for the arrival of his new puppy, so this sentence is the summary of that process. Choice (A) is incorrect because it gives an irrelevant detail about Cezar’s parents. Choice (C) is incorrect because it gives an unnecessary detail about the food and water bowls instead of summarizing the paragraph. Choice (D) is incorrect because it gives an unnecessary detail about the pet store instead of summarizing what Cezar did in the paragraph.

Mathematics



Chapter 3

Mathematics

By the end of Grade 4, students will add and subtract decimals and common fractions with common denominators. They will also understand how and when it is appropriate to use rounding. Students will use common measurement units to determine weight. Students will develop their understanding of measuring angles with appropriate units and tools. Students will understand the characteristics of geometric plane and solid figures. They will also use tables, graphs, and charts to record and analyze data.

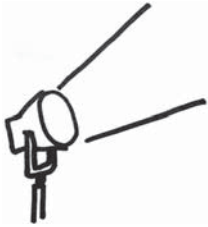
The Mathematics activities focus on some of the concepts that are assessed on the Grade 4 CRCT Mathematics domains. These domains are as follows:

- 1 Number and Operations**
- 2 Measurement**
- 3 Geometry**
- 4 Algebra**
- 5 Data Analysis and Probability**

The *Mathematical Process Skills* are integrated throughout the domains. These are skills used to acquire and apply content knowledge.

Mathematical Process Skills refer to students' dexterity in applying concepts and skills in the context of authentic problems, and understanding concepts rather than merely following a sequence of procedures. Process skills are used to acquire and apply content knowledge. Process skills include solving problems that arise in mathematics and other contexts; reasoning and evaluating mathematical arguments; communicating mathematically; making connections among mathematical ideas and to other content areas; and representing mathematical ideas in multiple ways.

Activities



1 Number and Operations

Georgia Performance Standards M4N1, M4N2, M4N3, M4N4, M4N5, M4N6, and M4N7

Within the Number and Operations domain, students will identify place value from hundredths through one million and equate a number's word name, its standard form, and its expanded form. They will determine situations in which rounding numbers would be appropriate. Students will round numbers to the nearest ten, hundred, or thousand and round decimals to the nearest whole number. They will determine to which whole number or tenth a given decimal is closest using tools such as a number line and/or charts. They will round the results of computation and use rounding to estimate sums. Students will know the division facts with understanding and fluency. They will solve problems involving multiplication of 2–3 digit numbers by 1–2 digit numbers and division by a 2-digit number, including those generating a remainder. Students will understand the relationship between dividend, divisor, quotient, and remainder and explain the effect on the quotient of multiplying or dividing both the divisor and dividend by the same number. They will understand decimals as part of the base-ten system and order them by size. Students will add and subtract 1- and 2-digit decimals, and multiply and divide 1- and 2-digit decimals by whole numbers. They will understand simple equivalent common fractions and/or decimal fractions, and add and subtract fractions and mixed numbers with common denominators no greater than 12. Students will use mixed numbers and improper fractions interchangeably. They will describe the relationships among the four operations (+, −, ×, ÷) and use mental math and estimation strategies. Students will compute using the order of operations (including parentheses) and the commutative, associative, and distributive properties.

The following activities develop skills in this domain:

- Students will improve their understanding of addition and subtraction of fractions and mixed numbers by using counters and egg cartons. Gather 12 egg cartons, about 140 small counters (e.g., dried beans or popcorn kernels), and about 100 cotton balls. Prepare the cartons for the denominator used by filling unnecessary cups with cotton balls. For example, to show fractions with a denominator of 8, you would fill 4 cups with cotton balls. The 8 open cups would each represent one equal part $\frac{1}{8}$ of the whole $\frac{8}{8}$. The fraction $\frac{3}{8}$ would then be shown by placing counters in 3 of the 8 open cups. The cartons can be adjusted in this way to accommodate fractions with denominators ranging from 2 to 12. Arrange the egg cartons on a large table so there are a few inches between two sets of 6 cartons each. Make two index cards, one labeled with a plus sign (+) and the other with a minus sign (−). Place the appropriate card between the two sets of cartons to show addition or subtraction. Students will use this arrangement to perform manipulatives-based addition and subtraction of fractions, improper fractions, or mixed numbers with like denominators. (All numbers should be less than 6 to fit into 6 cartons.) Give



students a problem to solve, building to include the need for regrouping. Students should fill each set of egg cartons with enough counters to represent the number. For improper fractions and mixed numbers, you will need more than one egg carton to represent the number. For example, to represent the number $3\frac{3}{4}$ students should fill the 4 open cups in each of three cartons and 3 open cups in a fourth. Students will use the same process for the second number and then tally the result of the addition or subtraction by combining or removing counters. They should check to confirm that the results match their paper calculations and discuss any differences.

- To improve skills solving problems involving division by a two-digit number, students will play a game with number cubes. Create a game board on a piece of paper or cardboard. Draw a series of 40–50 boxes that form a winding pathway from one corner of the board to the opposite corner. Write a 3-digit number in each space. To play the game, students will roll a six-sided number cube two times. The first roll will show how many squares to move forward and also determine the first digit of a divisor. The second roll will determine the second digit of the divisor. For instance, a student rolling a 3 will move 3 spaces. If the second roll is a 6, the student will divide the number in the box by 36 and calculate the result on a piece of paper, including remainder. If the calculation is correct, the student rolls again. The goal is to make it all the way across the game board in the fewest turns.
- The following application gives opportunities for students to use values from hundredths to millions. Tell students to imagine that they just won a contest. The prize will be awarded in one of two ways. They can choose to receive:
 - One million dollars in cash immediately
 - One penny on the first day, two pennies on the second day, and so on, doubling the amount they receive each day for a month

Students should write down their choices before starting any calculations. To increase suspense, students will calculate the amount one week at a time, using a table like the one on the next page. Students should explain the operation used in each column and read amounts aloud for practice identifying place values. Ask if any students would like to round the value to the nearest dollar (from \$1.28 to \$1.00) at the beginning of the second week so they don't have to keep track of so many pennies. Students who choose this will continue the same process with whole dollar amounts, knowing that they might lose some money. At the end of the activity, discuss the difference between the results for those who opted for a million up front, those who rounded after week 1, and those who continued doubling the original amount without rounding.

Week 1

Day	Amount collected each day	Total amount collected
1	\$0.01	\$0.01
2	\$0.02	\$0.03
3	\$0.04	\$0.07
4	\$0.08	\$0.15
5	\$0.16	\$0.31
6	\$0.32	\$0.63
7	\$0.64	\$1.27

- The following story problems use the basic operations including the order of operations. Students will write a mathematical expression to demonstrate how they solved the problems along with their solutions.

A veterinarian wants to be sure that she has enough dog food available. She will be taking care of four dogs. The amount of food each dog eats per day is listed below:

- one pug: 1 cup of food
- two terriers: 2 cups of food each
- one German shepherd: 4 cups of food

How many cups of food will she need to feed all four dogs for the day?

Students will determine the proper operations and remember to follow the order of operations as they calculate the answer. After they have finished, students will discuss their results and the expressions they wrote to solve the problem. Students will then write mathematical expressions to demonstrate how they solved the problem along with their solutions.

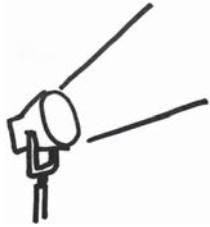
The next day the veterinarian will be taking care of five dogs. The amount of food each dog eats per day is listed below:

- the same two terriers: 2 cups of food each
- one collie: 3 cups of food
- two Tibetan mastiffs: 7 cups of food each

The veterinarian has 30 cups of food remaining. How many cups will she have left after feeding all five dogs for the day? If she splits the remaining food equally among three containers, how many cups of food will there be in each container?



Activities



2 Measurement

Georgia Performance Standards M4M1 and M4M2

Within the Measurement domain, students will know and use metric and standard units (grams, kilograms, ounces, pounds, and tons) to measure the weight of objects. They will compare one unit to another within a single system of measurement. Students will use tools (e.g., protractor, angle ruler) and other methods (e.g., paper folding, drawing a diagonal in a square) to measure angles. They will understand the meaning of a half rotation (180°) and a full rotation (360°). They will determine that the sum of the three angles of a triangle is always 180° .

The following activities develop skills in this domain:

- Students will compare different units of weight within the standard system using an everyday object. Tell students the following about what happened to the penny before they were born. Explain that even though all pennies look alike, they are not all the same. Pennies made before 1983 are 95% copper and 5% zinc. To cut the cost of making them, pennies made after 1983 are 2.4% copper and 97.6% zinc. (Pennies made in 1983 can be either.) If there is access to a scale that can measure ounces, weigh 25 pennies from 1984 or later and compare them with 25 pennies from 1982 or earlier. If not, use the following base weights:
 - 1982 or earlier pennies: 25 pennies weigh about 2.7 oz
 - 1984 or later pennies: 25 pennies weigh about 2.2 oz

From this information, students should work out why the pennies weigh different amounts. They should ascertain, through questioning, that zinc weighs slightly more than copper.

Students will use these base weights to determine the weights of larger groups of pennies. Students should find answers to the following questions:

- *If you had \$1.00 in 1979 pennies, what would be the total weight in ounces?*
- *If you had \$8.00 in 1999 pennies, what would be the total weight in ounces? In pounds?*
- *If you had \$20.00 in pennies with half from 1979 and half from 1999, how much would they weigh in ounces? In pounds?*

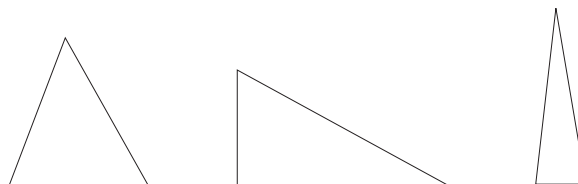
To extend the activity, students should figure out how much one ton of each type of penny would be worth in dollars.



-
- Using the weights of common objects is a fun way to estimate with standard and metric units. Choose a number of objects that cover a wide range of weights and find or print pictures of them from a magazine, a newspaper, or the Internet. Here are a few examples:
 - Hen’s egg (large): about 2 oz or 57 g
 - Mobile phone: about 8 oz or 227 g
 - Gallon of milk: about 8.5 lbs or 3.9 kg
 - Refrigerator: about 150 lbs or 68 kg
 - Mid-size motorcycle: about 450 lbs or 204 kg
 - Adult milk cow: about 1,400 lbs or 635 kg
 - 62-passenger school bus: about 10 tons or 9,071 kg
 - Mid-size passenger jet: about 45 tons or 41,145 kg

Show students the objects without listing their weights. Students should choose the appropriate unit of weight for each, in both metric (grams, kilograms) and standard (ounces, pounds, tons) measures. Students will share results and discuss the reasoning behind each of their choices. Share the actual weights with students and confirm the appropriate unit for each.

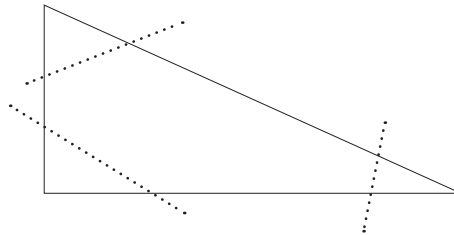
- Students will develop skills measuring angles with tools using drawings of real-world structures. Provide copies of drawings of buildings or other everyday items found in books and magazines on architecture and interior design at the local library or on the Internet. Choose images that contain a variety of shapes and angle measures distinct enough for students to work with. Use a magic marker to outline common shapes and various angles found on each drawing. Students will identify each shape and use a protractor or angle ruler to measure each angle. Students should compare and discuss their findings.
- To reinforce knowledge of the measurement of angles, students will practice using a protractor and discuss the sum of a triangle’s angles as always being 180° . Prepare ahead of time by cutting a number of triangles of different sizes and shapes out of construction paper, similar to the following samples (templates of triangles can be found online and as part of some word processing programs). Make sure that the angles of your triangles have whole-number measures.



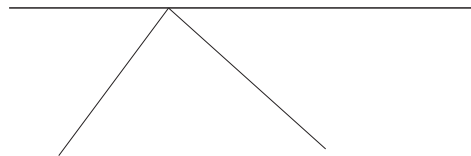
Distribute a paper triangle, protractor, and work paper to each student. Explain or review with the class that the sum of the measures of the three angles of a triangle always equals 180° . Students will use the protractor to



measure and record two angles of their triangles. Next, students will find the measurement of the third angle by subtracting the sum of the first two angles from 180. Have students check their work by using the protractor to measure the third angle. Extend the activity by having students prove, in another way, that the sum of the angles of a triangle equals 180° . First review or explain to the class that a straight line is also a straight angle and that a straight angle measures 180° . Then students will cut off the three angles of a triangle, as shown by the dashed lines in the figure below.

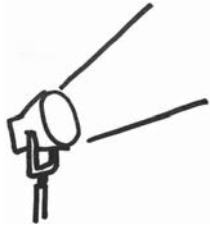


Finally students will lay the angle vertices edge-to-edge, as shown in the diagram below, and observe that a straight line is formed, reinforcing that the sum of a triangle's angles is 180° .





Activities



3 Geometry

Georgia Performance Standards M4G1, M4G2, and M4G3

Within the Geometry domain, students will classify and identify triangles by their angles. They will describe parallel and perpendicular lines in plane geometric figures. Students will examine and classify quadrilaterals (including parallelograms, squares, rectangles, trapezoids, and rhombi) and compare and contrast the relationships among them. They will compare and contrast a cube and a rectangular prism in terms of the number and shape of their faces, edges, and vertices. Students will describe parallel and perpendicular lines and planes in connection with the rectangular prism. They will build and collect models for solid geometric figures (cube, prism, cylinder, etc.). Students will also understand, locate, graph, and apply points in the first quadrant in the coordinate plane and name the ordered pairs.

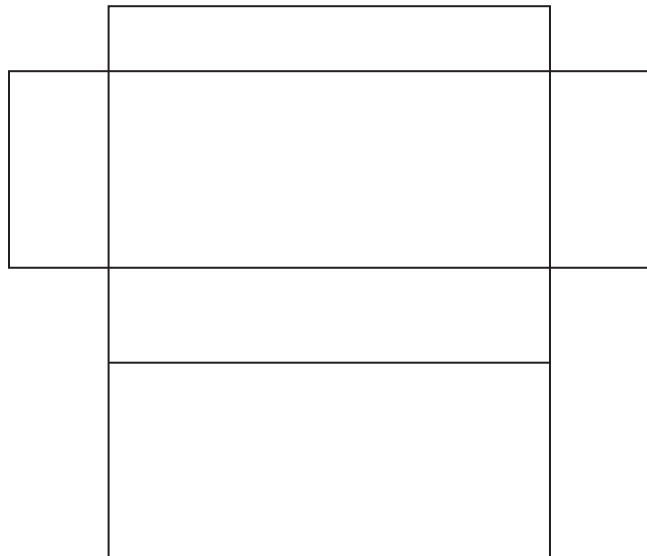
The following activities develop skills in this domain:

- Students will improve understanding of ordered pairs in the coordinate plane by physically moving to different points on a large grid. Use masking tape to create x - and y -axes that form the first quadrant of a coordinate plane on a floor with square tiles. Each tile will represent one unit on the grid. Label positive values from 1 through 10 on each axis, and the origin at the point $(0, 0)$. If an outdoor play area is more convenient, create the grid using chalk. Using spinners or pieces of paper drawn from a hat, students will generate two values between 1 and 10. Students will write down a coordinate pair, using the first number as the x -value and the second as the y -value. A student will move to the grid and stand on the origin. He or she should then walk to his or her point one unit at a time to the right of and then above the origin, stopping at the locations matching his or her ordered pair.
- To describe parallel and perpendicular lines and planes in a rectangular prism, students will work with box-shaped objects. Gather several cereal boxes, shoe boxes, and other real-life examples of rectangular prisms. Students will examine each object and identify pairs of parallel and perpendicular lines. Students should be able to explain their choices by showing how a pair of lines displays the characteristics of parallels or perpendiculars. Next, students will create a list of other objects they encounter that have parallel and perpendicular lines, such as comb teeth, bookshelves, street intersections, and railroad tracks. Students will create and label simple drawings for each object to reinforce the concepts of parallel and perpendicular lines.
- Students will examine and classify quadrilaterals using the attributes of figures. On a piece of blank white copy paper, draw a set of 8 figures: 2 squares, 2 rectangles, 2 trapezoids, and 2 rhombi. Vary the order of figures so that pairs of the same figure are not necessarily adjacent and not identical



in size and orientation. Make copies of the sheet to hand out to students. On the board or on a piece of posterboard, draw a large example of each of the 4 types of shapes with space below each to fill in attributes as the game progresses. Figures are identified based on the presence of a given attribute. For example, if the first attribute is *I am a figure with 2 sets of parallel sides* students should circle the 2 squares, 2 rectangles and 2 rhombi. If the second attribute is *I am a figure with 4 right angles* students should cross off the 2 squares and the 2 rectangles. As each shape is identified, students should state what attribute(s) they used to make their decisions, and write the attribute(s) under the same shape on the board. Depending on the given attributes, students may end up with only one pair or more than one pair of shapes. Since each shape differs slightly in size or orientation from its partner, the students will develop an understanding of how figures differ by attributes rather than merely appearance. Repeat using different attributes or different sheets of shapes, building the attribute lists on the board as the activity progresses.

- Students will understand the characteristics of certain solid geometric figures using models of solid geometric figures to create a mathematical net. First, give each student a rectangular prism, such as a small empty raisin box with the lid glued closed. Next, demonstrate to the class how to cut apart the rectangular prism to create a flat pattern, similar to the one that follows. Explain that this flat pattern is called a net. Point out how the net of a rectangular prism consists of six connecting, four-sided shapes.

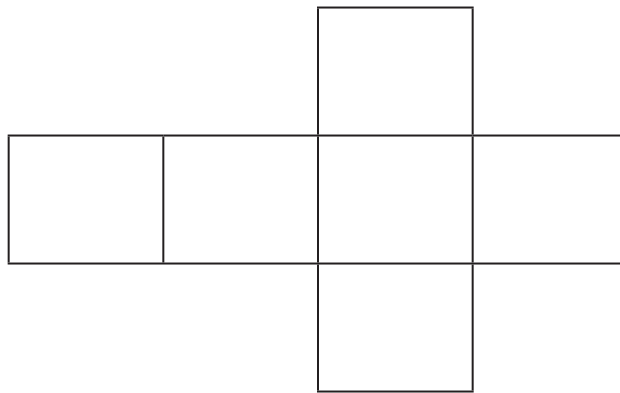


Next, students will use scissors to cut along the edges of their rectangular prisms so that each lies flat and remains in one piece. Students will trace the outline of the flattened prism on a large sheet of sturdy paper to make a net. Students will decorate their nets (for example, create their own brand of cereal), then fold and tape together the net to make a new rectangular prism.

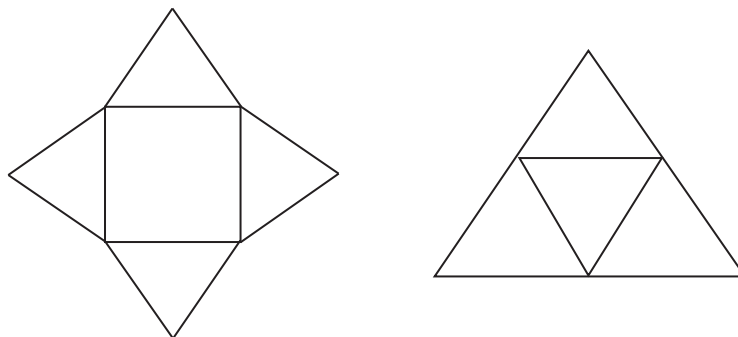
Once students understand how to make a net, the activity can be extended as follows:

- Students will make their own rectangular prisms by creating nets of other three-dimensional shapes. Explore the nets of other solid geometric figures. Find examples of other solids, and demonstrate what the nets would look like. Use templates similar to those below for students to assemble solids from.

Cube

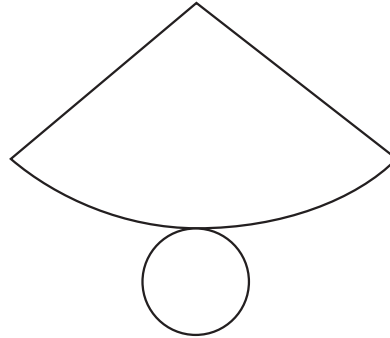


Pyramid

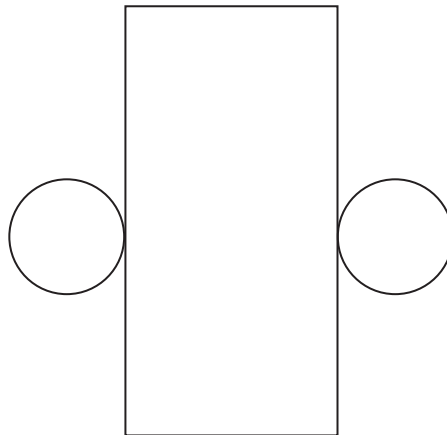




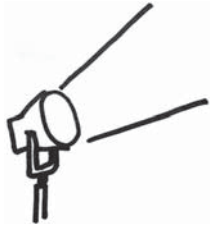
Cone



Cylinder



Activities



4 Algebra

Georgia Performance Standard M4A1

Within the Algebra domain, students will understand and apply patterns and rules to describe relationships and solve problems. They will write and evaluate mathematical expressions, using symbols (such as \square or \triangle) and different values to represent unknown quantities.

The following activities develop skills in this domain:

- To apply writing and evaluating expressions using symbols, show students a page from any monthly calendar. One student should pick any four dates that form a square (as shown by the shaded area below), keeping the choice secret. The student should find the total when the four dates are added together. Using the example below, the student's total would be $10 + 11 + 17 + 18 = 56$. The student will read just the total out loud. On a small sheet of paper, quickly divide the total by 4 and then subtract 4. Impress the student by revealing the first of the four dates he or she chose. Reveal to students that using algebra is the secret to the trick. Represent the first unknown value with the symbol \triangle . Through questioning, students will understand the relationships of the other three numbers to the first unknown value. They should discover that they may represent the other unknown dates using the same symbol: the second unknown will be $\triangle + 1$; the third will be $\triangle + 7$; and the fourth will be $\triangle + 8$. Students will write an expression to show the relationship between the four unknowns and the sum of the chosen dates: $\triangle + (\triangle + 1) + (\triangle + 7) + (\triangle + 8) = \text{Sum of the Chosen Dates}$. Fill in the total and solve for \triangle . The result is the value of the first date. Students should use different blocks of dates.

1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30					

- Students will develop their ability to understand and apply patterns by solving word problems such as the one shown below:

A band is going to march in a parade. The first row has 1 flute player, the second row has 2 saxophone players, the third row has 3 trumpet players, and so on. If there are a total of 10 rows and the same pattern continues for all rows, how many band members are marching in the parade?



Students should develop the pattern using numbers, pictures, or pattern blocks and add to find the total. Students should answer the question, *What if the band director adds 5 new rows of members following the same pattern?* After students have found the solution, they should work with another pattern formed by an odd number of members in each row: the first row with 1 flute player, the second row with 3 saxophone players; the third row with 5 trumpet players; and so on. Students should develop a pattern to find the total for 10 rows and then for 15 rows of band members.

- Students will use symbols to represent unknowns by matching the correct number sentence to a given situation. Write a number sentence for each operation: addition, subtraction, multiplication, and division. Think of a few real-life situations to match each number sentence. Keep the fixed numbers consistent in each number sentence so that students will not be able to match on that basis alone. Here are some examples:
 - Expression: $\triangle = 12 \div 4$
 - Situation: *4 students share 12 pieces of pizza equally. How many pieces of pizza does each student get?*
 - Situation: *A coach has each of 4 basketball players run the same number of laps. The total number of laps they run is 12. How many laps does each basketball player run?*
 - Situation: *Alicia rents 4 videos each costing the same amount. She spends a total of \$12. How much does each video rental cost?*
 - Expression: $12 = 4 + \square$
 - Situation: *Jon has 12 marbles. 4 of them are red and the rest are blue. How many marbles are blue?*
 - Situation: *Marcus is 12 years old. Tonya is 4 years younger than Marcus. How old is Tonya?*
 - Situation: *Arturo looks at his watch and sees that it is 12:00 p.m. He started work four hours ago. What time did he start work?*

Write copies of each number sentence on three or four strips of paper and tape them up on the board. Divide students into teams. Read one of the real-life situations out loud. Once a team is ready, select a member of the team to come to the board and choose the matching number sentence. Students should explain how the number sentence matches the situation. Students can remove correct matches from the board. Continue until all situations have been matched.

- In this activity, students will create codes to practice using symbols in mathematical equations.

Distribute work paper to each student. Explain that they will be creating a code.

On one sheet of paper, students will write four numbers, and will create a simple symbol for each of the numbers.

2	3	1	5
●	♥	◆	▲

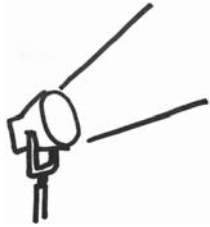
On a separate sheet of paper, students will write equations using the symbols they created. Students will write at least one equation for each symbol, using the symbols to represent code values, in the following manner:

- The symbols were assigned the following values: ● = 2, ♥ = 3, ◆ = 1, and ▲ = 5.
- Possible equations for the key are
 - $2 + \bullet = 4$
 - $10 - \heartsuit = 7$
 - $3 \times \blacklozenge = 3$
 - $\blacktriangle \times 4 = 20$

Next, students will exchange their sheets of paper (the equations) with classmates. The challenge for students is to break the other students' codes by finding the number that each symbol represents.



Activities



5 Data Analysis and Probability

Georgia Performance Standard M4D1

Within the Data Analysis and Probability domain, students will gather, organize, and display data in bar graphs, line graphs, and pictographs. They will investigate the features and tendencies of graphs and compare different graphical representations for a given set of data. Students will identify missing information and duplications in data. They will determine and justify the range, mode, and median of a set of data.

The following activities develop skills in this domain:

- Students will improve skills representing data in line graphs by watching and recording the growth of a plant in the classroom. Choose a fast-growing plant that is easy to care for in the classroom (e.g., corn, *Brassica rapa*, marigolds, mung beans). Students will measure the height of the plant in centimeters every Monday, Wednesday, and Friday and record the results in a table. At the end of the chosen period of time, they should represent their results in a line graph. Students should choose a title for the graph. Ask the students what measurement should be represented on the vertical scale and what should be represented along the bottom of the graph. Ask students what the line of the graph represents and what they think would happen to the line if they continued to measure the growth of the plant.
- To develop students' abilities to identify missing information in graphs of data, gather up a number of examples of bar graphs and pictographs. Make a photocopy of each graph and then remove one piece of information. For instance, cut out the labels from one axis or tape a piece of white paper over the key. After altering each graph, make another copy so that the changes won't be obvious. Divide students into teams. Hold up an altered graph and award points to the first team that identifies what is missing from the graph. Students should develop questions about the graph that cannot be answered without the missing information. For instance, a bar graph about weather is missing labels showing the type of weather indicated by each bar, so the question *How many days did it rain during the month?* cannot be answered. Students should also develop questions that can still be answered using the graph. In the example above, students can still answer the question *How many different types of weather were observed?*
- Students will improve the ability to compare different graphical representations of a given set of data by evaluating their own data shown in different forms. On one sheet of paper, list tables of data collected in previous student work. On another sheet create a graph representing each data table: a pictograph (e.g., using previously collected data about the number of students participating in each of four sports), a bar graph (e.g., using data about attendance at the school talent show in each of the last five years), or a line graph (e.g., using data about the high temperature each day

over the course of a week). To save time, use a spreadsheet program or tools for creating graphs that you can easily find on the Internet. Label each data table with a large colored letter and each graph with a large colored number. Spread all sheets out on a large, flat surface. Students will choose a data table, find its matching graph, and explain how they made their choices. Students should answer questions about the features of each graph, such as *What do the numbers at the bottom of the graph represent?* or *What is the title of the graph?* Next, have at least one example prepared that shows the same data set represented by more than one graph. Students should compare the features of the different graphs.

- Students will practice finding measures of central tendency by determining the range, mode, and median of a set of data about the number of family members each student has.

Before the activity, prepare a worksheet similar to the one that follows:

Family members	
Range =	
Mode =	
Median =	

Next, write the names of all students on the board or chart paper. Have each student write the number of family members he or she has beside his or her name. Distribute copies of the worksheet.



Tell students that they will use the number of family members per student as a data set to find the range, mode, and median. First, have students list all of the numbers written on the board in order from least to greatest. To find the range, students will subtract the smallest number from the largest number. To find the mode, students will find the most common number in the data set—the number that is repeated most. Explain that sometimes there may be more than one number that occurs more than the others. In those cases there will be more than one mode. To find the median, students will locate the middle value from the list. If there is an even number of students in the class, students need to find the number between the two middle values. They can do this by placing the numbers on a number line and counting to find the number between the two middle values. Extend the activity: groups of students will gather sets of data and determine the range, mode, and median. Make available a variety of resources from which groups can gather data, such as sports scores, weather forecasts, musical group information, or numbers relating to other grade-four subjects. Data sources may include:

- Newspapers, magazines, and other periodicals
- Age-appropriate and grade-level-appropriate websites
- School texts

Groups will write short descriptions of their gathered data sets and a paragraph explaining how they determined the range, mode, and median. Conclude the activity by creating a display of the groups' findings.



Practice Quiz



- 1 **Milton bought a video game for \$50.25 and a pack of trading cards for \$5.55.**

How much, to the nearest dollar, did Milton spend in all?

- A \$55.00
- B \$55.80
- C \$56.00
- D \$60.00

- 2 **Mira is putting 100 colored pencils into boxes. Each box holds 16 pencils.**

How many boxes are needed to hold ALL of Mira's pencils?

- A 4
- B 5
- C 6
- D 7

- 3 **Cathy has 1.3 ounces of dried cherries. Marley has 0.76 ounces of dried cherries.**

How many MORE ounces of dried cherries does Cathy have than Marley?

- A 0.54 ounces
- B 0.63 ounces
- C 2.06 ounces
- D 1.46 ounces

- 4 **Julius uses $3\frac{2}{3}$ cups of flour to bake a cake.**

Which improper fraction represents the cups of flour Julius used to bake a cake?

- A $\frac{5}{3}$
- B $\frac{11}{6}$
- C $\frac{8}{3}$
- D $\frac{11}{3}$



5 **Solve.**

$$18 + 6 + (3 + 3) =$$

- A 4
- B 18
- C 19
- D 23

6 **Lenny took three of his textbooks home one night. He wanted to find how much his backpack weighed.**

Which of these units is MOST appropriate for measuring the weight of Lenny's backpack?

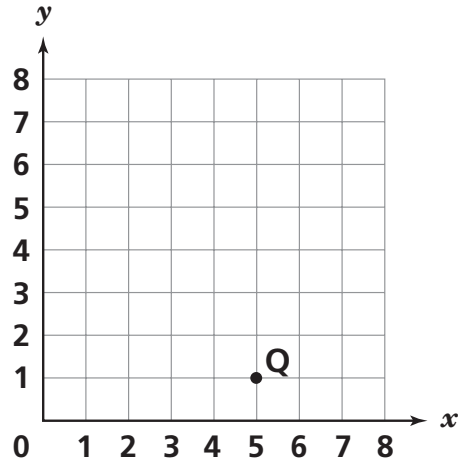
- A tons
- B grams
- C pounds
- D ounces

7 **Wanda drew a triangle that had two 45° angles and one 90° angle.**

What type of triangle did Wanda draw?

- A right
- B acute
- C obtuse
- D equilateral

8 **Point Q is plotted on the coordinate grid.**



Which ordered pair shows the location of point Q on the coordinate grid?

- A (1, 5)
- B (5, 1)
- C (0, 0)
- D (5, 5)

9 **Look at the number sentence.**

$$\triangle + \square = 25$$

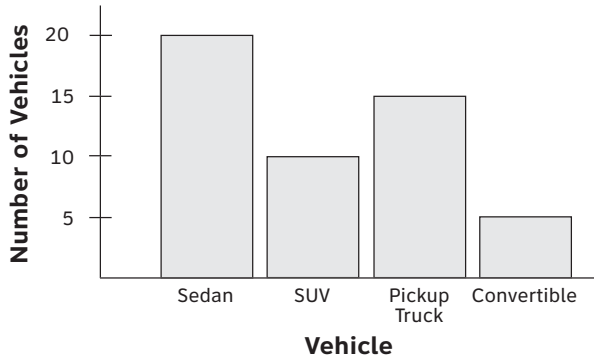
Which number belongs in the \triangle to make this number sentence true?

- A $\triangle = 20$; $\square = 5$
- B $\triangle = 2$; $\square = 5$
- C $\triangle = 5$; $\square = 5$
- D $\triangle = 30$; $\square = 5$



10 The bar graph shows the number and type of vehicles in the school parking lot.

Vehicles in the School Parking Lot



Which pictograph shows the same data as the bar graph?

A Vehicles in the School Parking Lot

Vehicle	Number of Vehicles
Sedan	
SUV	
Pickup Truck	
Convertible	

KEY
= 5 vehicles

B Vehicles in the School Parking Lot

Vehicle	Number of Vehicles
Sedan	
SUV	
Pickup Truck	
Convertible	

KEY
= 10 vehicles

C Vehicles in the School Parking Lot

Vehicle	Number of Vehicles
Sedan	
SUV	
Pickup Truck	
Convertible	

KEY
= 2 vehicles

D Vehicles in the School Parking Lot

Vehicle	Number of Vehicles
Sedan	
SUV	
Pickup Truck	
Convertible	

KEY
= 5 vehicles



Solutions

Number	Correct Answer	Explanation
1	C	<p><i>Represent the results of computation as a rounded number when appropriate and estimate a sum or difference by rounding numbers. (M4N2e)</i></p> <p>The correct answer is Choice (C) \$56.00. The sum of \$50.25 and \$5.55 is \$55.80. Dollar values ending in .50 or greater are rounded up, so the total rounded to the nearest dollar is \$56.00. Choice (A) is incorrect because \$55.00 is the result when rounding down, not up. Choice (B) is incorrect because \$55.80 is the exact value before rounding. Choice (D) is incorrect because \$60.00 is rounded to the nearest ten dollars, not the nearest dollar.</p>
2	D	<p><i>Solve problems involving division by 1- or 2-digit numbers (including those that generate a remainder). (M4N4b)</i></p> <p>The correct answer is Choice (D) 7. To find out how many boxes Mira needs, divide the number of pencils by the number of pencils each box can hold: $100 \div 16$. The result is 6 full boxes and 4 pencils left over. To hold <i>all</i> of the pencils, 7 boxes are needed. Choices (A), (B), and (C) are incorrect because they are all too small. Choice (C) is closest, but doesn't account for the box needed to hold the 4 pencils left over.</p>
3	A	<p><i>Add and subtract both one- and two-digit decimals. (M4N5c)</i></p> <p>The correct answer is Choice (A) 0.54 ounces. The problem asks students to compare the two amounts of dried cherries. Students should subtract to compare the two values: $1.30 - 0.76 = 0.54$. Choice (B) is incorrect because 0.63 is the result of mistakenly moving the decimal and subtracting 0.13 from 0.76. Choice (C) is incorrect because 2.06 is the result of adding both numbers. Choice (D) is incorrect because 1.46 is greater than each original amount.</p>



Number	Correct Answer	Explanation
4	D	<p><i>Use mixed numbers and improper fractions interchangeably. (M4N6c)</i></p> <p>The correct answer is Choice (D) $\frac{11}{3}$. The question asks for an improper fraction. Choice (A) is incorrect because $\frac{5}{3}$ results from improperly adding $3 + 2$. Choice (B) is incorrect because $\frac{11}{6}$ results from improperly using incorrect denominator. Choice (C) is incorrect because $\frac{7}{3}$ results from improperly adding denominator to whole number.</p>
5	C	<p><i>Compute using the order of operations, including parentheses. (M4N7b)</i></p> <p>The correct answer is Choice (C) 19. Use the order of operations to solve, starting with the values inside the parentheses, moving on to division, and finally performing addition: $18 + 6 \div (3 + 3) = 18 + 6 \div 6 = 18 + 1 = 19$. Choice (A) is incorrect because 4 is the result of adding $18 + 6$ <i>before</i> dividing $6 \div 6$. Choice (B) is incorrect because 18 results from incorrectly dividing 6 by 6 and getting 0. Choice (D) is incorrect because 23 results from performing division <i>before</i> solving the contents of the parentheses.</p>
6	C	<p><i>Know units used to measure weight (gram, kilogram, ounces, pounds, and tons). (M4M1b)</i></p> <p>The correct answer is Choice (C) pounds. The weight of three textbooks and a backpack is most likely between 5 and 10 <i>pounds</i>. Choice (A) is incorrect because <i>tons</i> is a unit used for very large weights (1 ton = 2000 lb). Choices (B) and (D) are incorrect because <i>grams</i> and <i>ounces</i> are units used for very small weights.</p>



Number	Correct Answer	Explanation
7	A	<p><i>Examine and compare angles in order to classify and identify triangles by their angles. (M4G1a)</i></p> <p>The correct answer is Choice (A) right. The measure of a right angle is 90° and any triangle containing a right angle is a right triangle. Choice (B) is incorrect because in an <i>acute</i> triangle all angles must be less than 90°. Choice (C) is incorrect because in an <i>obtuse</i> triangle one angle must be greater than 90°. Choice (D) is incorrect because an <i>equilateral</i> triangle must have three equal angles of 60°.</p>
8	B	<p><i>Understand and apply ordered pairs in the first quadrant of the coordinate system. (M4G3a)</i></p> <p>The correct answer is Choice (B) (5, 1). Points in the first quadrant have positive x and y coordinates. Point Q is located further to the right of the y-axis than it is above the x-axis, which indicates that its x-coordinate should be larger than its y-coordinate. Choice (A) is incorrect because (1, 5) indicates the point is further above the x-axis than it is right of the y-axis, and may indicate the student has the x and y coordinates confused. Choice (C) is incorrect because (0, 0) assumes y- coordinate's value for both coordinates. Choice (D) is incorrect because (5, 5) assumes x- coordinate's value for both coordinates.</p>
9	A	<p><i>Represent unknowns using symbols, such as \square and \triangle. (M4A1b)</i></p> <p>The correct answer is Choice (A) $\triangle = 20$; $\square = 5$; for $20 + 5 = 25$. Choice (B) is incorrect because $2 + 5$ does not equal 25. Choice (C) is incorrect because the student uses multiplication (5×5) rather than addition. Choice (D) is incorrect for the student uses subtraction rather than addition.</p>



Number	Correct Answer	Explanation
10	D	<p><i>Compare different graphical representations for a given set of data. (M4D1c)</i></p> <p>The correct answer is the pictograph in Choice (D). Choice (D) is the only option with the key and the number of car pictures matching the bar graph. There are fewer convertibles than any other vehicle type, so the number of car pictures in the convertible column should be much smaller than the others. There are 20 Sedans, 10 SUVs, 15 Pickup Trucks and 5 Convertibles. Choice (A) is incorrect because the number of car pictures in the Pick-up Truck and Convertible is reversed. Choices (B) and (C) are incorrect; each uses the wrong key.</p>



Science

Grade 4 students differentiate between observations and ideas, and speculate about observations they make. They list common materials for making simple mechanical constructions and for repairing things. Grade 4 students use records, tables, or graphs to identify patterns of change. They write instructions and make sketches that allow others to carry out a scientific procedure. They determine whether or not a comparison is fair, if conditions are different for each thing being compared, and question claims or statements made by people outside their field of expertise (such as “4 out of 5 dentists say....”). They know that safety is a fundamental concern in all experimental science and adhere to rules and guidelines to show they are responsible with materials and equipment. Grade 4 students gather and interpret data. They add, subtract, multiply, and divide whole numbers on paper, mentally, and with calculators. They are able to construct meaningful models that allow them to gain understandings of the natural world, and are active learners. They do not simply read about science; they *do* science. As a result, they are able to differentiate observations from ideas and engage in investigations inside and outside the classroom.

Students in Grade 4 will use models in the study of interactions and interdependence of ecosystems. They will gain a basic understanding of how weather relates to the stages of the water cycle. Students will investigate the stars in the universe and our Solar System. They will look at characteristics of sound and light, and how they interact with the environment.

The Science activities focus on some of the concepts that are assessed on the Grade 4 CRCT Science domains. These domains are as follows:

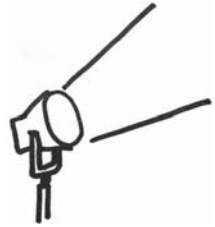
- 1 Earth Science**
- 2 Physical Science**
- 3 Life Science**

The *Characteristics of Science* skills are integrated throughout the domains. These skills are co-requisites for understanding the content of each science domain.

Characteristics of Science refer to understanding the process skills used in the learning and practice of science. These skills include testing a hypothesis, record keeping, using correct safety procedures, using appropriate tools and instruments, applying math and technology, analyzing data, interpreting results, and communicating scientific information. *Characteristics of Science* also refer to understanding how science knowledge grows and changes, and the processes that drive those changes.



Activities



1 Earth Science

Georgia Performance Standards S4E1, S4E2, S4E3, and S4E4

Within the Earth Science domain, students are expected to investigate the stages of the water cycle and how each stage is formed, by relating it to the states of water. They will understand how clouds are formed and learn about the use of weather instruments in predicting weather. Students will study stars in the universe and our Solar System by observing stars in the night sky. They will use various texts and media resources to learn about the number, colors, sizes, and positions of stars in the sky. They will also identify constellations and planets in our Solar System according to appearance, position, and number, as viewed in the night sky. They will compare and contrast planets and stars using reference materials and models to explore their relative size and order from the Sun. They should describe relationships involving Earth, the Moon, and the Sun. Students will use models, graphic displays, and written reports to explain Earth's day/night cycle, phases of the moon, and seasonal changes on Earth.

The following activities develop skills in this domain:

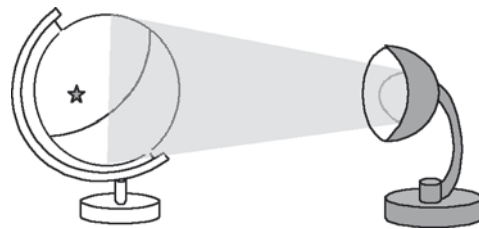
- Creating a true scale model of the Solar System will help students understand the differences among planets and their locations in space. Students will represent the solar system at a ten-billion-to-one scale. They will choose and measure objects (beads, pins, candy-coated chocolate candies, balls) to represent the Sun, asteroids, and planets and attach them to large index cards or cardboard squares labeled with names and pertinent information (mass, diameter, etc.). For this activity, accompany students outdoors, where they will place each card along the ground, at distances that scale to actual distances from the Sun. At this scale, the distance is less than half a mile. Along the way, explain the characteristics of the terrestrial planets (Mercury, Venus, Earth, Mars), asteroids, and gas giants (Jupiter, Saturn, Uranus, Neptune). Discuss with students the differences between this model and other models of the Solar System they have seen. The table on the next page may serve as a guide.

Object	Scaled Diameter (cm)	Suggested Materials	Scaled Distance from Sun (m)	Scaled Distance from Previous Object (m)
Sun	20	ball or balloon	0	0
Mercury	0.1	pinhead or small bead	9	9
Venus	0.2	candy or bead	16	7
Earth	0.2	candy or bead	24	8
Mars	0.1	pinhead or small bead	37	13
Asteroid belt (spreads out farther than this model shows)	varies	fine sand (sprinkled on a streak of glue)	56	19
Jupiter	2.3	gumball or small ball	124	87
Saturn	1.8	marble or pebble	226	102
Uranus	0.8	candy or bead	453	227
Neptune	0.8	candy or bead	710	257

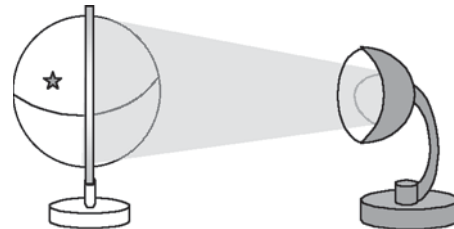
- Hands-on activities that demonstrate the evaporation and condensation of water will allow students to understand the water cycle. Students should fill a wide-mouth glass jar one-quarter full with room-temperature water. They should fill a second jar with the same amount of water that has been heated to a temperature of 55°C and then mark the water levels on the outside of the jars. Students will find that more of the warmer water will evaporate in a given amount of time. Students will also explore condensation using a chilled glass rod (or small glass, spoon, etc.) and a warm one. They will partially fill two jars with hot water, and then insert a glass rod into each. The cooler rod will have more water droplets on it. If a heat source is not available, placing one jar in a sunny window and one away from the window may show the same principle due to the heat from the Sun. Next, demonstrate fog formation by filling a jar with a half-inch of very hot water and placing a strainer with crushed ice over the mouth of the jar. (First rinse the jar with hot water to equilibrate its temperature and prevent it from cracking.) Discuss how cooler temperatures lead to more condensation, while warmer temperatures encourage evaporation. Relate these observations to the water cycle. Ask, *Will more water evaporate in cool or warm weather? When will clouds be more likely to form?*

- A hands-on demonstration will help students better understand how Earth's tilt causes seasonal changes. Required materials for this activity include a small desk lamp or flashlight, a globe, and a marker (piece of clay or small flag) placed at Georgia's location on the globe. In a darkened room, position the lamp on a table so that the light is centered on the globe. Ask students, *What causes the seasons?* and discuss how the Northern and Southern Hemispheres have opposite seasons. Position the globe as on June 22 (the northern tip of the axis is toward the lamp) and spin the globe on its axis. Students should notice that Georgia spends more time in daylight than in darkness. Discuss how the reverse phenomenon occurs in the Southern Hemisphere, such as in South America. Repeat the demonstration for the remaining solstice (the northern tip of the axis positioned away from the lamp) and equinoxes (the axis tilted to the left and right of the lamp). See diagram below.

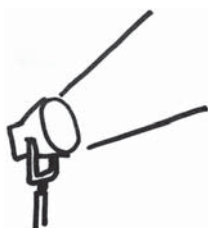
The December 22 solstice



The September 22/23 equinox



Activities



2 Physical Science

Georgia Performance Standards S4P1, S4P2, and S4P3

Within the Physical Science domain, students are expected to describe how tools such as mirrors, prisms, and lenses affect light, and how sound is produced and changed. They are also expected to explain how simple machines are used. They will have a variety of experiences in getting objects to move or to stop moving, in changing the direction or speed of objects that are already in motion, and in exploring how simple machines use motion to make work easier. Students will understand that forces are the “pushes and pulls” that are responsible for movement in our world.

The following activities develop skills in this domain:

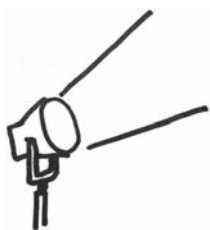
- Students can better understand the nature of forces by observing their effects in familiar situations, such as playground activities. Students will play tug-of-war to demonstrate pulling forces. (Note: In the interest of safety, this activity is best done in cooperation with an experienced physical education teacher.) Vary the number of students on each side of the rope to show the effect of unequal forces. Ask, *How did the different forces move the rope? What happened when there were more students on one side? Why?* Next, students will use swings to demonstrate how forces add together. Push a student on the swing and compare the effect to having a smaller student push a larger person on a swing. Ask, *Which caused the person on the swing to go higher? Why?* Student volunteers should hang by their arms from monkey bars or other climbing structures to observe the force of gravity acting on them. Students should feel the force on their arms as they pull themselves against gravity. Ask, *How does this compare to the tug of war? What force are you pulling against?* Discuss how gravity is a force pulling everything toward Earth’s center.
- Observing simple machines in everyday use will help students better understand the function of these devices. Students will observe one simple machine (lever, pulley, wedge, inclined plane, screw, or wheel and axle) in use around them each day. In their journals, students will record answers to the following questions: *Which simple machine was used in this device? What was its function? How did it make work easier?* Students should draw or paste a picture of the device in their journals. For example, students may record that the lid on a jar of peanut butter features a screw (an inclined plane that winds around itself). Its function is to keep the lid attached to the jar. It makes work easier by allowing the lid to be attached and removed by turning it many times, instead of applying a large force all at once. Other examples of simple machines include hammers, bottle openers, bicycle wheels, knives, window blind pulls, and access ramps.



- Students will investigate how light behaves when it hits transparent, translucent, and opaque surfaces. They will use materials that differ in these qualities, such as an aluminum pie plate, clear plastic from a picture frame, large sunglasses, a glass of milk, a piece of cardboard, or waxed paper. To begin, students will aim a lamp or flashlight beam at a surface, such as a wall. They should then place each of the materials in the path of the beam and observe the effects on the light hitting the surface. Discuss with students that these materials can also be reflective (like the aluminum and plastic) or absorbent (like the cardboard).

- Performing a hands-on investigation of changes in pitch will help students to understand the nature of sound waves. (Emphasize safety as students perform this activity, and ensure that students wear safety goggles.) Students will stretch a large, strong rubber band across two pencils held parallel by a partner. They will pluck the rubber band to observe the sound it produces. They should stretch the rubber band to varying degrees by moving the pencils farther apart or closer together. They also should pluck the rubber band and note the effect of distance on the sound produced. Keeping the pencils the same distance apart, the person holding the pencils should change the length of the rubber band by pinching it along its length. Students should again investigate the resulting sounds. Students should then repeat the procedure using thinner or thicker rubber bands. They should observe the bands' vibrations and draw diagrams of the motion. Following the activity, discuss how the variations affected the sounds the bands produced.

Activities



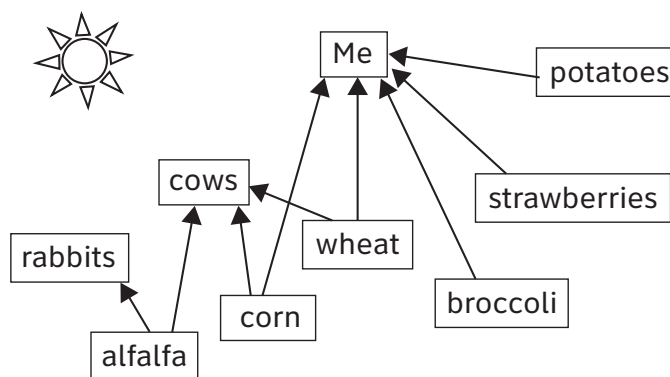
3 Life Science

Georgia Performance Standards S4L1 and S4L2

Within the Life Science domain, students should understand the roles of organisms, explain how energy moves in an ecosystem, and predict how changes to part of the system affect the other parts. Students will identify features that affect the survival of organisms and factors that may lead to their extinction.

The following activities develop skills in this domain:

- Students will better understand the energy relationships depicted by a food web if they include themselves in a web. Students should think about what organisms they eat and create a food chain or web that includes them. They should start with the Sun and include some of their favorite foods. If students eat milk, eggs, or meat, they should include the foods that the animals feed on. (You may want to research with students common animal feed ingredients. For example, commercial chickens are fed anchovies, corn, and kelp, among other staples.) A sample food web is shown below. To find more specific or complex food webs, consult reference sources in a library or on the Internet.



- To learn about the relationships depicted by food chains and food webs, students will take part in an ecosystem simulation. Draw a food chain on an erasable board and write values representing population numbers beneath each organism or population. The numbers don't need to be exact, just an approximation (e.g., 100,000 for grass, 10,000 for crickets, 1,000 shrews, 100 hawks, etc.). Students will choose an event to begin the game (e.g., a drought reduces the amount of grass, more hawks are born one season, etc.). Change the relevant number (e.g., 50,000 for grass) and discuss how, because crickets eat grass, the cricket population will subsequently decrease. Ask, *Which other populations will now be affected? How will they change?* Simply estimate the numbers; the important point is that each population affects the other populations in the web. Reset the numbers when extinction occurs.



- Researching and characterizing adaptations will show students understand how specialized traits help organisms to survive. Students will create a *Wall of Adaptations* featuring various organisms with unusual traits. To create the *Wall of Adaptations*, divide a wall, bulletin board, or other large surface into the categories below. Throughout the year, students will use library and/or Internet resources to investigate organisms with various types of adaptations. Students will draw or find a picture of each organism and write a short description of how its adaptation helps it survive. Place students' work in the appropriate place on the wall. The chart below lists some common types of adaptations.

Common Types of Adaptations

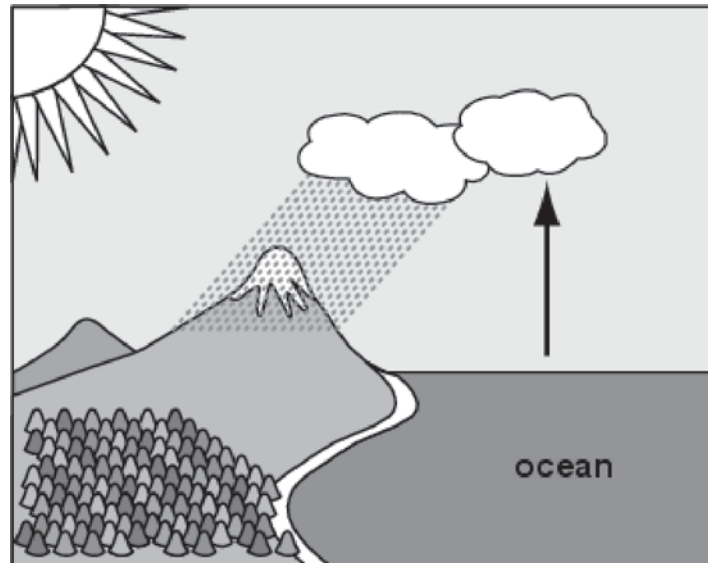
Energy-Related	Defense	Camouflage/Mimicry	Sensory
hibernation	release unpleasant substances	skin or fur that blends in	sight
migration	hard outer shell	changing skin color to blend in	hearing
slow movement or specialized diet	poisonous bites or stings	body that looks like a common object	touch
heat-saving	bitter taste	body that looks like a similar, poisonous organism	smell
cooling	thorns or spines	other color or pattern that fools predators	other

- Learning about native species and their interdependence will lead to a better understanding of how producers and consumers interact in an ecosystem. Students will choose a Georgia habitat or ecosystem (e.g., marsh, coastal plain, etc.) and research six to ten organisms that inhabit it. Students will create posters showing how each ecosystem's organisms interact in a food web. Students should include feeding relationships as well as other ways that organisms depend on other types of organisms (e.g., the gopher tortoise burrows are also used by other creatures). Posters should show information about threats to particular species (e.g., pollution, hunting, climate changes) and how this would affect other populations (e.g., with fewer gopher tortoises, animals that depend on their burrows will have a harder time surviving).

Practice Quiz



- 1 **The picture shows part of the water cycle.**



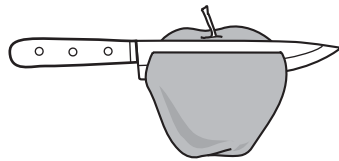
What causes the water vapor rising from the ocean to become a cloud?

- A cooling of the air temperature
 - B warming of the air temperature
 - C cooling of the ocean temperature
 - D warming of the ocean temperature
- 2 **In a certain area, mice eat grass and snakes eat mice.**
- Which statement describes what will MOST LIKELY happen to the snakes and mice if the grass population decreases due to a lack of rain?**
- A The populations of both mice and snakes will increase.
 - B The populations of both mice and snakes will decrease.
 - C The population of mice will decrease, and the population of snakes will increase.
 - D The population of mice will increase, and the population of snakes will decrease.
- 3 **Which of these shows the processes water goes through, in order, as it moves from the surface of the ocean to when it becomes part of the cloud?**
- A evaporation, then precipitation
 - B precipitation, then evaporation
 - C evaporation, then condensation
 - D condensation, then evaporation



- 4 **Mauricio heard a horn honk. Later, he heard students whispering. Which statement BEST explains how each sound was made?**
- A Both sounds were made with vibrations.
 - B Both sounds were made with magnetic energy.
 - C The honking horn sound was made with vibrations, and the whispering sound was made with magnetic energy.
 - D The honking horn sound was made with magnetic energy, and the whispering sound was made with vibrations.

- 5 **Helen uses a knife to cut an apple in half.**



Which kind of simple machine is the knife blade as it cuts the apple?

- A lever
 - B pulley
 - C screw
 - D wedge
- 6 **A student is using an encyclopedia to study the dodo bird, a bird that became extinct in the 1600s. She learns these facts.**

- The dodo bird was a large bird that could not fly.
- It lived only on one island in the Indian Ocean.
- It ate fruit that fell from trees.
- Female dodos laid one egg at a time.
- Several different animals ate the dodos eggs.

Which sentence from the paragraph explains the MOST LIKELY reason why dodo birds became extinct?

- A The dodo bird was a large bird that could not fly.
 - B It lived only on one island in the Indian Ocean.
 - C It ate fruit that fell from trees.
 - D Several different animals ate the dodos eggs.
- 7 **A cuttlefish can change its color to match the area around it. Which statement BEST explains how changing its color could help the cuttlefish to survive?**
- A It helps the cuttlefish to avoid predators.
 - B It helps the cuttlefish to find a place to live.
 - C It helps the cuttlefish to keep its body warm in the cold ocean waters.
 - D It helps the cuttlefish to see its prey more clearly in cloudy ocean waters.

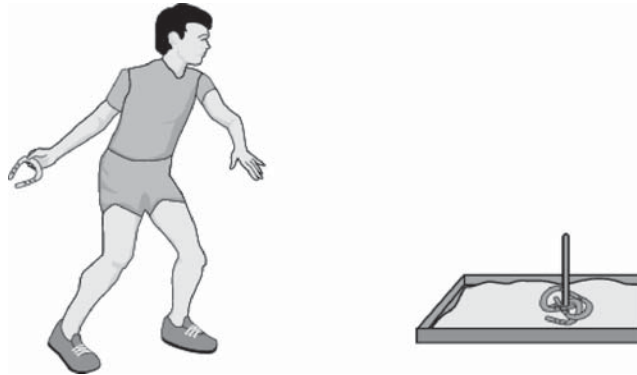


- 8 **Garlic mustard is a plant that is not naturally found in Georgia. When it is brought into an area, it causes a decrease in the population of some kinds of wildflowers.**

Which of these describes what will MOST LIKELY happen to other organisms in the area if garlic mustard is planted in an area where these wildflowers now grow?

- A The populations of trees in the area will increase.
- B The populations of trees in the area will decrease.
- C The populations of animals that eat wildflowers will increase.
- D The populations of animals that eat wildflowers will decrease.

- 9 **The picture shows Eli throwing a horseshoe.**



Which force causes the horseshoe to curve downward after Eli throws it?

- A friction
 - B gravity
 - C magnetism
 - D wind
- 10 **A student uses a telescope to look at different objects in the night sky.**

Which of these objects is farthest away from the student as she looks at it?

- A the Sun
- B the Moon
- C the North Star
- D the planet Mars



Solutions

Number	Correct Answer	Explanation
1	A	<p><i>Investigate how clouds are formed. (S4E3c)</i></p> <p>The correct answer is Choice (A) cooling of the air temperature. When air temperature cools, water vapor in the air condenses to form clouds. Choice (B) is incorrect because <i>warming of the air temperature</i> allows the air to hold more moisture, not less. Choices (C) and (D) are incorrect because <i>cooling or warming of the ocean temperature</i> affects the rate of evaporation, not cloud formation.</p>
2	B	<p><i>Predict effects on a population if some of the plants or animals in the community are scarce or if there are too many. (S4L1d)</i></p> <p>The correct answer is Choice (B) The populations of both mice and snakes will decrease. Less grass to eat means fewer mice, which in turn means less food for the snake population. Choices (A) and (D) are incorrect because a shortage of grass will lead to a decrease, not an increase, in mice. Choice (C) is incorrect because fewer mice will cause a food shortage for the snakes, causing their population to decrease, not increase.</p>
3	C	<p><i>Explain the water cycle (evaporation, condensation, and precipitation). (S4E3d)</i></p> <p>The correct answer is Choice (C) evaporation, then condensation. Water droplets in the ocean evaporate to form water vapor, which then cools and condenses to form clouds. Choices (A) and (B) are incorrect because <i>precipitation</i> describes how water leaves a cloud. Choice (D) is incorrect because, in cloud formation, the evaporation allowing ocean water to move into the air must occur before <i>condensation</i>.</p>
4	A	<p><i>Investigate how sound is produced. (S4P2a)</i></p> <p>The correct answer is Choice (A) Both sounds were made with vibrations. All sound waves are vibrations in air or another medium. Choices (B), (C), and (D) are incorrect because sounds are not made by magnetic energy.</p>

Number	Correct Answer	Explanation
5	D	<p><i>Identify simple machines and explain their uses (lever, pulley, wedge, inclined plane, screw, wheel and axle). (S4P3a)</i></p> <p>The correct answer is Choice (D) wedge. A wedge is a modified inclined plane that can be used to force something apart or open. The knife acts as a wedge when it forces the two halves of the apple apart. Choice (A) is incorrect because the knife does not act as a <i>lever</i> in this example. Choices (B) and (C) are incorrect because a knife does not act as a <i>screw</i> or a <i>pulley</i>.</p>
6	D	<p><i>Identify factors that may have led to the extinction of some organisms. (S4L2b)</i></p> <p>The correct answer is Choice (D) Several different animals ate the dodo's eggs. Because several different animals ate the eggs of the dodo bird and each female dodo laid only one egg at a time, the dodos could not produce enough young to survive. Choices (A), (B), and (C) are incorrect because they do not give a reason that explains why the dodo birds became extinct.</p>
7	A	<p><i>Identify external features of organisms that allow them to survive or reproduce better than organisms that do not have these features (for example: camouflage, use of hibernation, protection, etc.). (S4L2a)</i></p> <p>The correct answer is Choice (A) It helps the cuttlefish to avoid predators. Choice (B) is incorrect because camouflage does not help the cuttlefish to find places to live. Choice (C) is incorrect because camouflage does not help the cuttlefish to regulate its body temperature. Choice (D) is incorrect because camouflage does not help the cuttlefish to see its prey more clearly in cloudy water.</p>



Number	Correct Answer	Explanation
8	D	<p><i>Predict how changes in the environment would affect a community (ecosystem) of organisms. (S4L1c)</i></p> <p>The correct answer is Choice (D) The populations of animals that eat wildflowers will decrease. A decrease in wildflowers will reduce the food available to animals that eat them, resulting in a population decrease for those animals. Choices (A) and (B) are incorrect because the introduction of garlic mustard will not affect the tree populations. Choice (C) is incorrect because the organisms that eat wildflowers would have a reduction in their food source and, as a result, the organisms that eat wildflowers would decrease in number.</p>
9	B	<p><i>Demonstrate the effect of gravitational force on the motion of an object. (S4P3d)</i></p> <p>The correct answer is Choice (B) gravity. Though the force from the throw propels the horseshoe toward the stake, the gravitational force pulls it toward the ground. Choice (A) is incorrect because <i>friction</i> may slow the motion of an object, but it does not pull objects toward the ground. Choice (C) <i>magnetism</i> is incorrect because magnets are not involved. Choice (D) is incorrect because <i>wind</i> does not pull things toward the ground.</p>
10	C	<p><i>Compare the similarities and differences of planets to the stars in appearance, position, and number in the night sky. (S4E1b)</i></p> <p>The correct answer is Choice (C) the North Star. The North Star is outside our Solar System, which makes it the object that is farthest away from the student. Choices (A), (B), and (D) are incorrect because they all are objects within our Solar System.</p>



Chapter 5

Social Studies

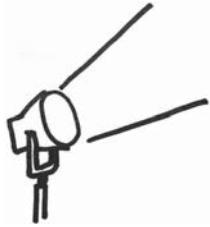
In Grade 4, students begin the formal study of United States history. At this grade, the four domains (History, Geography, Government/Civics, and Economics) are fully integrated. Students begin their study of United States history with the development of Native American cultures and conclude with the antebellum period ending in 1860. The Geography domain emphasizes the influence of geography on early U.S. history. The Government/Civics domain examines concepts and rights development during the formation of our government. The Economics domain uses material from the History domain to further students' understanding of economic concepts.

The Social Studies activities focus on some of the topics that are assessed on the Grade 4 CRCT Social Studies domains. These domains are as follows:

- 1 History**
- 2 Geography**
- 3 Government/Civics**
- 4 Economics**



Activities



1 History

Georgia Performance Standards SS4H1, SS4H2, SS4H3, SS4H4, SS4H5, SS4H6, and SS4H7

Grade 4 begins students' formal study of the history of the United States. The main focus of this domain is United States history from the development of Native American cultures to the antebellum period ending in 1860. The History domain also examines life in America from the time of the Native Americans through the Colonial era. Throughout the History domain, students will examine key individuals, events, and documents and their influence on modern times. Knowledge and understanding will continue with a discussion of the changing American society in the 19th century, including westward expansion and the impact of key inventions during the century. The goal of the History domain is for students to begin to understand the people and major events that have shaped the modern era.

The following activities develop skills in this domain:

- Students will better understand the influence of geography in the development of the Native Americans by locating historic settlements on a map of North America and then predicting how this geography affected their society. Distribute physical maps of North America. Assist the students in highlighting the area inhabited by the Inuit. Students will discuss the geography of the region highlighted and make predictions about the food, clothing, shelter, tools, and animals that would be found and useful in this region. Students will write their predictions on a graphic organizer similar to the one that follows. Provide students with factual information about the Inuit so they can complete the "Results" column of the organizer. As a class, students will discuss how their predictions compare to the facts, why their predictions were correct or incorrect, and how environment influenced the Inuit. Next divide the class into five groups and assign each group one of the following cultures: Kwakiutl (Northwest), Nez Perce (Plateau), Hopi (Southwest), Pawnee (Plains), or Seminole (Southeast). First groups will locate the areas settled by their assigned Native American nation on the physical map. Then using another copy of the graphic organizer, each group will make predictions and research their assigned Native American nation using grade-level appropriate websites (.edu, .gov, or .org) and reading materials, or library reference books. After a discussion of all the completed organizers, students will conclude the activity by writing a brief report/essay about the various Native American nations, comparing and contrasting how the different societies used their environments.



Name of Native American Group

My Prediction	Results from research and class discussion
Type of Shelter	
Primary Foods	
Important Animals	
Tools and Weapons	

- Students will gain a better understanding of various events in the American revolutionary movement by completing Cause and Effect charts. Draw on the board or poster paper several cause and effect charts: a box labeled “cause” with an arrow pointing toward a box labeled “effect.” Write one of the following events in the “cause” box (French and Indian War, British Imperial Policy, 1765 Stamp Act) or one of the following in the “effect” box (the slogan “no taxation without representation,” the activities of the Sons of Liberty, the Boston Tea Party). As a class, research the information needed to complete each chart. For example, if you wrote the French and Indian War in the “cause” box, you would include the effects: France had to give up its settlements in the New World, colonists could not settle lands west of the Appalachians, and Britain began taxing the colonists to pay for its war debts. Conclude the activity by tracing all these events on a timeline and discussing how the various events are related to each other. Include in the discussion the fact that events can have many causes and create many effects.

- Students will describe key individuals in American history and identify their important roles. First list the following historical individuals: King George III, George Washington, Benjamin Franklin, Thomas Jefferson, Benedict Arnold, Patrick Henry, John Adams, James Madison, and Lewis and Clark. As a class, gather information for each individual as it relates to his importance to the American Revolution, the Constitutional Convention, or westward American expansion. Assign each student an individual. Each student will create a 3 × 5 clue card. First, they will write the name of their assigned individual on the card. Next on the other side of the card, students will write clues as to the individual’s identity. Explain that students are to write clues starting with the general and moving to the specific so as not to give away the identity with the first clue. For example
 - *He was on the colonial side during the Revolution.*
 - *He led soldiers during battles.*



- *His soldiers spent time in Valley Forge.*
- *He was accused of committing treason.*

Each student will have a turn reading clues from his or her card. The class will guess the identity, giving reasons for their guesses. For example, for the clues above a guess might be “The person is Thomas Jefferson, because he was on the side of the colonists.” Guessing will continue until the individual is correctly identified. Conclude the activity by using the clue cards to review key individuals and major leaders.

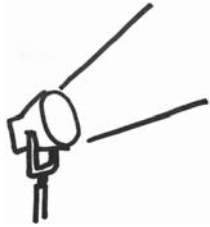
- Students will identify the three branches of government, describe their functions, and identify how a system of checks and balances is used. Explain to the class that in the United States, both the national government and state governments are made up of three branches. Identify these branches through a class discussion, and list them on poster paper. Group students into teams and assign each team one of the three branches. Students will complete an informational chart, similar to the one below, using their research skills and grade-appropriate reading materials.

Branch	Purpose	Responsibilities	Checks on the Other Branches

As a class, discuss all the information gathered by the teams. List, on a piece of poster paper, all the researched purposes and responsibilities for each branch. Next, teams will share with the class the various checks and balances they found for their particular branches. Discuss the checks and balances as a way to separate power. Students will conclude this activity by writing a brief summary essay explaining how the federal system of checks and balances helps safeguard the American people from having one branch of government become too powerful.



Activities



2 Geography

Georgia Performance Standards SS4G1 and SS4G2

The focus of the Grade 4 Geography domain is to locate physical and man-made features in the United States and to understand how physical systems affect human systems. This domain will help students understand and explain the impact of geography on Native American groups, the early explorers, and on the economic development of the colonies. Students should be able to analyze and evaluate the impact geography had on key battles of the American Revolution, as well as its impact on westward expansion and development.

The following activities develop skills in this domain:

- To better understand the importance of major physical features of the United States, students will identify highlights of a particular feature and role play the part of a park ranger. First each student will choose one of the following physical features: the Atlantic Coastal Plain, the Great Plains, the Continental Divide, the Great Basin, Death Valley, the Gulf of Mexico, the St. Lawrence River, or the Great Lakes. Next, using their research skills and grade-level appropriate reading materials, library resources, and websites (.edu, .gov, or .org), students will create a tri-fold brochure by folding an $8\frac{1}{2} \times 11$ piece of copy or construction paper into thirds horizontally. The brochure will include the location of the feature on a map of the United States, its description and unique characteristics, and drawings or reproduced images highlighting key qualities of the feature. The qualities will address the importance of geography on U.S. history to 1860. Each student will play the role of park ranger, introducing visitors to the location and pointing out distinguishing traits and little-known facts to make their visit more enjoyable. At the end of the presentation, the park ranger will lead a question-and-answer session for the group.
- Students will locate important man-made and physical features on a map of the United States. Give each pair of students a blank map of the United States and have them cut twelve two-inch square cards of paper or card stock. Students will label the front of each piece of paper with one of the following features: the Atlantic Coastal Plain, the Great Plains, the Continental Divide, the Great Basin, Death Valley, the Gulf of Mexico, the St. Lawrence River, the Great Lakes, New York, NY, Boston, MA, Philadelphia, PA, and the Erie Canal. Students should research each feature to identify an important fact about it and write that on the reverse of the pieces. Pairs of students should partner with another pair and share their facts by placing their set of cards on a desk or table with the name of the feature face-down and the fact face-up. The pair of students who didn't create this set of cards will now use the information on each card to guess the feature. When a pair guesses a feature correctly, the card should be flipped over. Once all features have been guessed correctly, the pairs should switch and repeat with the



other set of cards. Finally, the students will take turns identifying the correct location of each feature on a map of the United States.

- Students will study the three regions of colonial America to connect a region’s physical geography with the economic activities it developed. Divide the class into small groups. As a class, and using a blank map of the colonies posted on the board, identify which colonies comprised each region. Assign each group one of the following regions: New England, Mid-Atlantic, or the Southern Colonies. Discuss what would constitute an important physical feature. The discussion will include rivers, forests, natural harbors, mountains, sea coast, and flatlands. Each group will determine the important physical features of their assigned region and write their findings in a chart similar to the one below. Students will then determine the types of economic activities in which their assigned region participated during colonial times and complete the second column of the chart. Students will write and share with the class a short report describing what they learned about their region’s geographic features and drawing conclusions as to how these affected the region’s economic activities.

Region

Physical Geography	Economic Activities

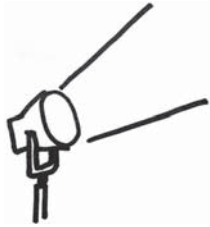
- Students will gain a better understanding of physical barriers and gateways by discussing the roles each played in American westward expansion. First, introduce the concept of physical barriers and gateways. Ask students for definitions and examples of physical barriers. Information should include that a physical barrier is something in geography that makes travel difficult, such as a large river to cross, mountains to climb, or a desert to traverse. Explain that gateways are just the opposite: features that make travel easier. Have students suggest examples. Their examples will include navigable rivers and flatlands. Assign groups of students one of the following events from American territorial expansion: the Lewis and Clark expedition, traveling the Oregon Trail, and moving to and developing mining towns during the California Gold Rush. Provide students with grade-appropriate reading and Internet materials.



Students will gather information so that they can accurately draw on a blank map of the United States the travel route their group followed. Next, students will indicate and identify the barriers or gateways encountered along the way. Conclude the activity with each student pretending that he or she is making a westward trek and writing a letter home describing the journey and the barriers or gateways that were encountered.



Activities



3 Government/Civics

Georgia Performance Standards SS4CG1, SS4CG2, SS4CG3, SS4CG4, and SSCG5

Within the Government/Civics domain of Grade 4 Social Studies, students will learn to explain important topics and rights developed during the formation of the United States government. Students should be able to describe the meaning of key passages of the Declaration of Independence and the Constitution and explain the important concepts they express. Students will also explore the role of government in relation to laws, rights, defense, power limits, fiscal responsibility, and civic life. Students will be able to identify positive character traits of important historical figures and government leaders.

The following activities develop skills in this domain:

- To better understand the importance of freedoms granted to citizens, students will discuss the importance of the rights established by the First Amendment to the U.S. Constitution. First students will research, using grade-appropriate materials and websites (.edu, .gov, or .org), the freedoms listed in the First Amendment. They will write each freedom on a 3 × 5 index study card. On the reverse of each card, students will describe their understanding of this freedom. Lead a class discussion to arrive at a clear, consensual definition of each freedom. Students should adjust their definitions as needed to reflect the outcomes of the class discussion. Post a chart on the board that is similar to the one below. Complete the first row using the consensual definition.

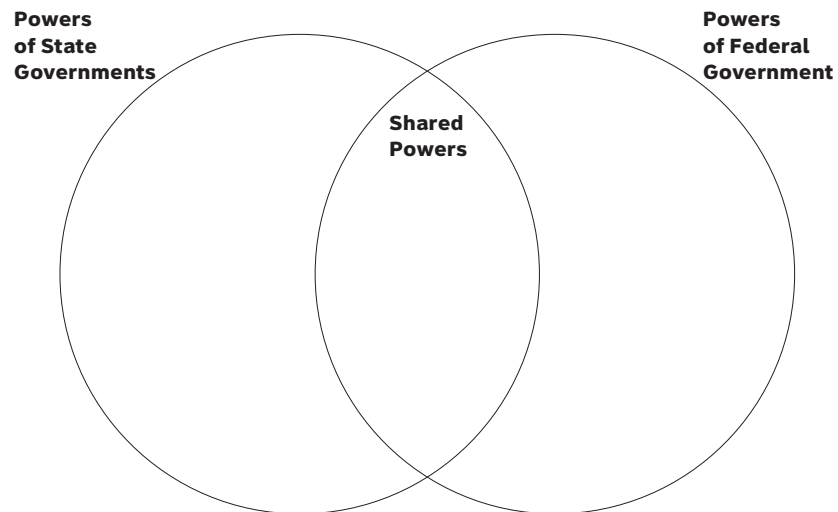
	Freedom of Religion	Freedom of Speech	Freedom of the Press	Freedom to Assemble in Groups	Freedom to Address the Government
What does this mean?					
Why did the Framers of the Constitution include this freedom?					
How would life be different without this freedom?					



Complete the second row of the chart while discussing the events that occurred during the time period of the framing of the Constitution. Complete the third row with various suggestions from the class. Conclude the activity with students selecting a suggestion for each freedom from the third row and including it on their study cards.

- Students will better understand the character traits of honesty, patriotism, courage, and trustworthiness by discussing events from the lives of key historic figures. Write each trait at the top of a sheet of chart paper. Students will decide upon a definition of each trait by proposing examples of actions that would demonstrate a particular quality. List these actions, and the class definition of each trait, on the appropriate chart. Assign groups one of the following figures: Christopher Columbus, Henry Hudson, George Washington, Benjamin Franklin, Thomas Jefferson, Benedict Arnold, Patrick Henry, John Adams, Harriet Tubman, or Elizabeth Cady Stanton. Each group will research its figure, using grade-appropriate reading and informational materials, to find examples of actions demonstrating one or more of the positive character traits. As a class, groups will discuss the information they found. Conclude the activity with each student choosing a character trait and writing an essay discussing which historic figure best exemplified that trait.

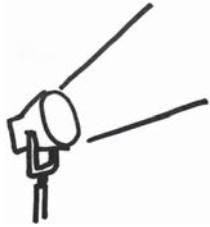
- Students will gain a better understanding of the federal system of government in the United States by researching and discussing how the national and state governments work. Students will work in pairs with one student researching powers of the national government and the other student researching powers of state governments. As part of their research, pairs will also find shared powers. Once the students have completed their research, they will discuss the acquired information and fill in a two-circle Venn diagram like the one on the next page. The class will then share the information on their diagrams. Ensure that all pairs add to their diagrams examples of powers that their research did not provide. Each student will then find a current-events example of a power of his or her choice. The activity will conclude with the students creating a display of their examples of state powers, federal powers, and shared powers.



- Students will gain better understanding of the roles of government by developing definitions and researching examples of specific functions. Divide the class into four groups. Assign one of the following functions of the government to each group: making and enforcing laws, managing conflicts and protecting rights, limiting the power of people in authority, or fiscal responsibility of government. First guide a discussion of the meaning of each function. List each definition on separate poster paper. Groups will search various sources, such as newspapers, magazines, and grade-appropriate reading materials, research materials, and websites (.edu, .gov, or .org) for articles and examples of their assigned functions and write each example on paper. Collect all the papers and then randomly distribute one to each student. In turn, students will read the item they were given and explain which function they believe it addresses. A class discussion, especially eliciting responses from the group assigned the function, will determine if a student's answer is correct. Conclude the activity with a class display of all the examples found for each of the functions of government.



Activities



4 Economics

Georgia Performance Standards SS4E1 and SS4E2

Throughout the Economics domain of Grade 4 Social Studies, students will focus on analyzing the effect of economics on historical events and explaining the importance of economics in students' lives. The Economics domain will emphasize the ability to apply economic principles such as opportunity cost, price incentives, voluntary exchange, and the benefits of specialization. Students will demonstrate an understanding of the importance of trade to the economy and of the key technological advances of the era. Students will also be able to identify and explain key elements of a personal budget.

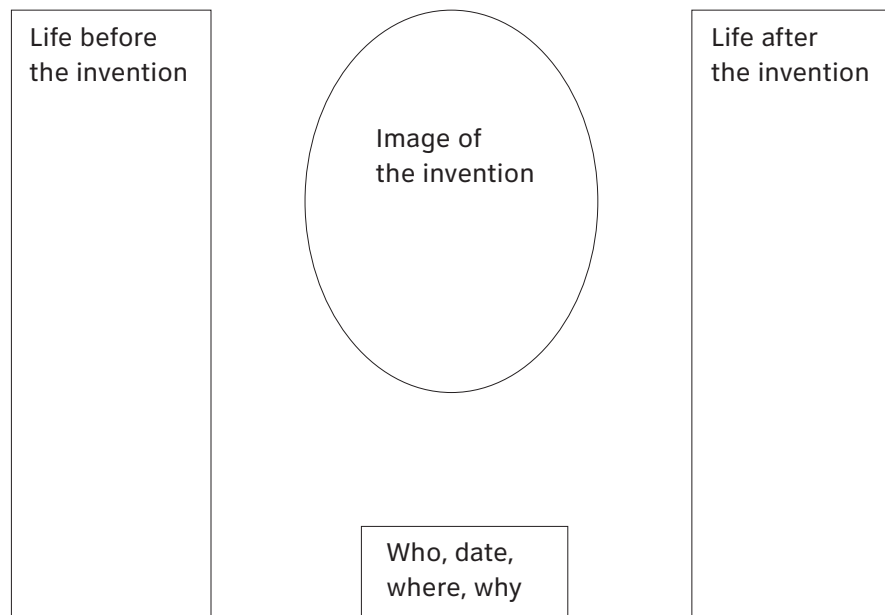
The following activities develop skills in this domain:

- To better understand specialization, voluntary exchange, trade, and effects upon the standard of living, students will participate in a role-playing exercise in which they will research the impact of geography and develop a specialized skill. Randomly assign each student a location in one of the three colonial regions. Each student will begin the activity by attempting to be a self-sufficient colonist. Students will research the geography of their areas in order to determine and list what products, crops, and necessities would be available there. Next, students will list items they might be able to sell or trade to other colonists. Then students will list things they need or want that are not available in their respective locations. Post all lists so that they can be examined by students during a class discussion. By region, students will share their three lists with the class. Discuss the availability and lack of certain items in particular regions and the resulting difficulties of being self-sufficient. Elicit from students suggestions for how unavailable items might be made available. These suggestions will include possible voluntary exchange and trade within and among regions. Discuss and explain the terms “specialization” and “standard of living.” Students will conclude the activity with a short essay in which they each choose a colonial item that they will specialize in, explain their reasoning for choosing that item, and describe the effects upon their colonial standard of living through the exchange and trade of their item.
- Students will better understand how voluntary exchange benefits both buyers and sellers by participating in an open town-market simulation. Assign the students various roles: the roles of suppliers of raw materials (including farmers and hunters), craftspeople and manufacturers, and consumers in need of finished products. The suppliers will draw pictures of what they are going to provide (including wood, grain, fur, and food products). Craftspeople will create a “list of needed supplies” and draw pictures of what they are producing. Consumers will create a “family shopping list.” Provide each person with an amount of Colonial dollars. Explain that business can be conducted using money or that individuals can determine a fair trade for items. For example, a farmer brings his eggs to market, a baker needs eggs, and a family needs a loaf



of bread. How will each make exchanges? Open the town market for voluntary exchange. Allow enough time for individuals to make a number of purchases and/or exchanges. Conclude the activity with students describing their experiences in attempting to gain what they needed. Include in the discussion examples of individuals gaining payment that was not in the form of money.

- Students will analyze the ways that technological advances (steamboat, steam locomotives, telegraph) affected life in early America. Divide the class into three groups. Give each group one of the inventions listed above. Have the groups research the invention while answering these questions:
 - *What did the invention look like?*
 - *Who invented it (when, where, why)?*
 - *What was life like before this invention?*
 - *How did life change after this invention?*
- Groups will design and present a poster using the following format:



Lead a class discussion comparing and contrasting the inventions. Discuss the effects on life and conducting business during the development of the United States.

- Students will gain a better understanding of the elements of spending and saving by creating their own budget of time for the school day, minimizing time spent after school completing assignments. Make copies of the daily class schedule and distribute them to the students. As a class, identify times when there are no lessons or school activities scheduled. For example, students may wait to be dismissed at the end of the day. Discuss how this



time can be spent. Include in the discussion the use of this time to do a part of their homework or unfinished class assignments. For a week, each student will decide how to spend this unassigned time. At the end of the week, students will compare how they spent this time and discuss the implications. Analyze the elements of this personal time budget by discussing how spending the unassigned time doing some homework actually saved time after school for an activity other than homework. Include in the discussion the possibility of the unexpected and how this could affect a time budget. For example, students were expecting to use saved, unassigned time to complete an assignment, but the time was spent on an unexpected fire drill, or how time after school intended for homework was suddenly needed for an errand.



Practice Quiz



- 1 **Which Native American people settled in the Arctic?**
 - A Inuit
 - B Hopi
 - C Pawnee
 - D Seminole

- 2 **What did Native Americans teach early English settlers in Plymouth Colony?**
 - A how to use clay to make bowls
 - B how to grow new crops such as corn
 - C how to make homes from animal skins
 - D how to weave baskets from marsh grasses

- 3 **What did indentured servants agree to do in exchange for receiving a trip across the ocean to colonial America?**
 - A serve as soldiers
 - B bring their families
 - C help sail the ship that carried them
 - D spend several years working for no pay

- 4 **Which of these people played an important role in the American Revolution?**
 - A Patrick Henry
 - B Henry Hudson
 - C Harriet Tubman
 - D Sojourner Truth

- 5 **Which of these is the MAIN reason people moved to California in the late 1840s?**
 - A to find gold
 - B to claim land
 - C to start cattle ranches
 - D to seek religious freedom



6 **Which letter on the map shows the Gulf of Mexico?**



- A A
- B B
- C C
- D D

7 **Which of these was the GREATEST physical barrier for settlers heading to the West between 1801 and 1861?**

- A the Great Plains
- B the Great Salt Lake
- C the Mississippi River
- D the Rocky Mountains

8 **What must happen AFTER a bill is approved by Congress before it becomes a new law?**

- A The Senate must veto the bill.
- B The president must sign the bill.
- C The governor must write a draft of the bill.
- D The public must propose ideas for a new bill.

9 **Which person depends on freedom of expression to do their work?**

- A store owner
- B police officer
- C cattle rancher
- D newspaper reporter



-
- 10 **Tina’s friend invited her to a pool party on Saturday, but Tina’s basketball team is playing in a championship game that same day. If Tina decides to play in the championship game, what is her opportunity cost?**
- A a pool party
 - B a swimming suit
 - C a basketball game
 - D a first-place trophy



Solutions

Number	Correct Answer	Explanation
1	A	<p><i>Locate where the Native Americans settled with emphasis on Arctic (Inuit), Northwest (Kwakiutl), Plateau (Nez Perce), Southwest (Hopi), Plains (Pawnee), and Southeastern (Seminole). (SS4H1a)</i></p> <p>The correct answer is Choice (A) Inuit. The Inuit people settled and lived in the Arctic region. Choice (B) is incorrect because the Hopi lived in the Southwest. Choice (C) is incorrect because the Pawnee lived in the Plains region. Choice (D) is incorrect because the Seminole people lived in the Southeastern part of the present day United States.</p>
2	B	<p><i>Describe examples of cooperation and conflict between Europeans and Native Americans. (SS4H2b)</i></p> <p>The correct answer is Choice (B) how to grow new crops such as corn. Squanto helped the Pilgrims learn to plant corn, catch fish, and gather fruit in order to survive in the early years. Choice (A) is incorrect because even though the New England area Native Americans did use clay for bowls and cooking pots, the Europeans already had these items. Choice (C) is incorrect because the Plymouth Colony was in a heavily forested area so the settlers built their homes from wood. The use of animal skins for homes was more common in the Plains. Choice (D) is incorrect because the Plymouth Colony was not near marsh lands.</p>
3	D	<p><i>Describe colonial life in America as experienced by various people, including large landowners, farmers, artisans, women, indentured servants, slaves, and Native Americans. (SS4H3b)</i></p> <p>The correct answer is Choice (D) spend several years working for no pay. People agreed to serve as indentured servants because they could not afford the cost of passage to the New World. Choice (B) is incorrect because the people who agreed to become indentured servants could not afford to pay for themselves alone. Choices (A) and (C) are incorrect because the people who agreed to become indentured servants were normally contracted to do household or field work in order to pay for the passage.</p>



Number	Correct Answer	Explanation
4	A	<p><i>Describe key individuals in the American Revolution with emphasis on King George III, George Washington, Benjamin Franklin, Thomas Jefferson, Benedict Arnold, Patrick Henry, and John Adams. (SS4H4d)</i></p> <p>The correct answer is Choice (A) Patrick Henry. Patrick Henry was one of the most influential advocates of the American Revolution. Choice (B) is incorrect because Henry Hudson was an explorer in the 17th century. Choice (C) is incorrect because Harriet Tubman gained fame as a “conductor” for the Underground Railroad in the 19th century. Choice (D) is incorrect because Sojourner Truth was an advocate for the abolition of slavery and for women’s rights in the 19th century.</p>
5	A	<p><i>Describe territorial expansion with emphasis on the Louisiana Purchase, the Lewis & Clark expedition, and the acquisitions of Texas (the Alamo and independence), Oregon (Oregon Trail), and California (Gold Rush and the development of mining towns). (SS4H6a)</i></p> <p>The correct answer is Choice (A) to find gold. Following news of the discovery of gold in 1848, approximately 300,000 settlers came to California in search of gold. Choices (B), (C), and (D) are all incorrect because the primary reason people traveled across the country or around the tip of South America to get to California was to get rich by mining gold. They were able to farm the land, raise cattle, and practice religious freedom much closer to their homes in the east.</p>
6	C	<p><i>Locate major physical features of the United States; include the Atlantic Coastal Plain, Great Plains, the Continental Divide, the Great Basin, Death Valley, Gulf of Mexico, the St. Lawrence River, and the Great Lakes. (SS4G1a)</i></p> <p>The correct answer is Choice (C). The letter C is located in the Gulf of Mexico on the map. Choice (A) is incorrect because it is located in the Pacific Ocean. Choice (B) is incorrect because it is located in Hudson Bay. Choice (D) is incorrect because it is located in the Atlantic Ocean.</p>



Number	Correct Answer	Explanation
7	D	<p><i>Describe physical barriers that hindered and physical gateways that benefited territorial expansion from 1801 to 1861. (SS4H6a) (SS4G2e)</i></p> <p>The correct answer is Choice (D) the Rocky Mountains. The Rocky Mountains were a physical barrier or hindrance to westward expansion of the United States. Choices (A) and (C) are incorrect because the Great Plains and the Mississippi River both served as gateways to the west. Choice (B) is incorrect because the settlers could travel westward without having to encounter the Great Salt Lake.</p>
8	B	<p><i>Explain the process for making and enforcing laws. (SS4CG3a)</i></p> <p>The correct answer is Choice (B) The president must sign the bill. If the president does not sign the bill, it must return to Congress and be passed by a two-thirds majority in both houses in order to become law. Choice (A) is incorrect because for the bill to become a law, the Senate must approve it with a majority vote. Choice (C) is incorrect because drafting a bill would occur at the beginning of the process, not at the end. A governor might write the draft for a new bill, but it would have to be introduced and passed by the legislature. Choice (D) is incorrect because the public would propose ideas for new bills to their legislators.</p>
9	D	<p><i>The student will explain the importance of freedom of expression guaranteed by the First Amendment to the U.S. Constitution. (SS4CG2)</i></p> <p>The correct answer is Choice (D) newspaper reporter. Newspaper reporters depend upon freedom of speech to do their jobs. Choices (A), (B), and (C) are incorrect because while people in these occupations may enjoy freedom of speech at times, they do not depend upon this freedom to do their jobs effectively.</p>



Number	Correct Answer	Explanation
10	A	<p><i>Describe opportunity costs and their relationship to decision-making across time (such as decisions to send expeditions to North and South America). (SS4E1a)</i></p> <p>The correct answer is Choice (A) a pool party. The cost of choosing to play in the basketball game is the opportunity to attend the pool party. Choice (B) is incorrect because Tina won't need a swimming suit if she chooses to play basketball. Choice (C) is incorrect because she chose to play in the basketball game. Choice (D) is incorrect because a first-place trophy is the potential reward for playing in the basketball game. The trophy could be an opportunity cost if she had chosen to attend the pool party.</p>
