



Grade 3

CRCT



Study



Guide



Reading
English/Language Arts
Mathematics
Science
Social Studies To be available 2008–09



Table of Contents

Using the CRCT Study Guide		1
About the CRCT	<u>Overview of the CRCT</u> What is the CRCT? What does the CRCT measure? How are CRCT questions scored?	2
	<u>Preparing for the CRCT</u> Test-Taking Strategies Related Links	3
Chapter 1	<u>Reading</u> Reading Skills and Vocabulary Acquisition Reading for Literary Comprehension Reading for Information Practice Quiz Solutions	9
Chapter 2	<u>English/Language Arts</u> Grammar/Sentence Construction Research/Writing Process Practice Quiz Solutions	27
Chapter 3	<u>Mathematics</u> Number and Operations Measurement Geometry Algebra Data Analysis Practice Quiz Solutions	39





Chapter 4

Science

Earth Science
Physical Science
Life Science
Practice Quiz
Solutions

59

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 learned 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. Each is measured on his or her 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 "2007 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=CITestingCRCTDesc

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



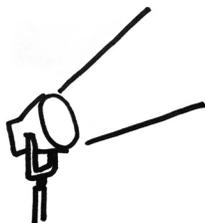
Reading

In Grade 3, students are making the transition from learning to read, to reading to learn. They read much more widely on a variety of topics. Grade 3 students increase their ability to read aloud with fluency and comprehension. They read more thoughtfully, discover more details, extract deeper meaning in what they read, and read more complex texts. They enjoy a variety of genres, including fiction and nonfiction texts and poetry.

The Reading activities focus on some of the concepts that are assessed on the Grade 3 CRCT Reading domains. These domains are as follows:

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

Activities



1 Reading Skills and Vocabulary Acquisition

Georgia Performance Standard ELA3R2

Within the Reading Skills and Vocabulary Acquisition domain, students will acquire the skills necessary to read and interpret difficult text. They will also obtain new vocabulary from a variety of texts. Skills in this domain include recognizing and using homophones, homographs, antonyms and synonyms, as well as using grade-level words with multiple meanings. By understanding the meanings of common suffixes and prefixes, identifying common root words, and using context, students will uncover the meaning of unknown words.

The following activities develop skills in this domain:

- To reinforce students' understanding of antonyms (opposites) and synonyms (words with similar meanings), play *Word-Pair Bingo*. Using plain white paper and a ruler, show students how to create Bingo card grids with four empty columns and rows. Compile a list of sixteen antonym and synonym pairs (see tables below), and write the first word only of each antonym pair on the board. Students should choose eight of the words on the board to write randomly in empty squares on their Bingo card (one word per square). Repeat the process with the synonyms. Pass out pre-cut circles of construction paper for chips. Call out the *second* word of any of the antonym or synonym pairs, use it in a sentence, and repeat the word. Keep track of the words used by writing them in order on the board. Students should scan their Bingo cards, and if they have the called word's antonym or synonym on their boards, they may cover the called word with a chip. The first student to get four chips in a horizontal, vertical or diagonal row should raise his or her hand. In order to win, the student must name the words covered, and identify whether they were antonyms or synonyms of the words called.

Antonyms

tall / short	round / flat
high / low	quiet / noisy
fast / slow	wrong / right
messy / neat	back / front
light / heavy	up /down
stop /go	black / white
out / in	strong /weak
hot /cold	young / old

Synonyms

clever / smart	finish / end
fine / good	look / see
start / begin	unhappy / sad
job / task	filthy / dirty
wealthy / rich	woman / lady
strange / weird	hard / difficult
thin / slim	ill / sick
listen / hear	late / tardy

- To increase students' awareness of homophones (words that sound the same, like *sum* and *some*), and homographs (words spelled the same, such as the noun and verb versions of *bark*), play the card game *Concentration*. Before working with students, brainstorm different homophone and homograph word pairs. Write each word on a separate index card and provide an example



sentence so that students see the word in context. For example, the homograph *present* could have one card with the sentence *The scientist will present his findings* and the other card with the sentence *The girl opened her birthday present*. Write each word on a separate index card and place the cards face-down. Students should take turns flipping one card over, and then another to see if they can find a homophone or homograph pair. When the overturned words do not make a match, students return the cards to their face-down position and the next student takes a turn. When students locate a matched word pair, they remove the pair and use each word in a sentence. If they use each word correctly, they take another turn. Once all the pairs have been found, the game is complete.

- To help students see how words grow from roots, prefixes, and suffixes, create posters with flowers, roots, stems, and petals. Show students how to draw the roots and stem of a flower and add a circle to the top of the stem. Present students with a list of root words (see table below) and choose one to write below your drawing. Draw a petal coming out from the circle at the top of the stem. Think of a word that has the root you have chosen and write it in your petal (e.g., for the root word *luck*, write the word *lucky*). Next, think of other words that share the same root and write them in additional petals (e.g., *luckily*). Students can choose their own root words to work with as they draw their own flowers. To help students think of words that share their root, show them a list of possible prefixes (*un-*, *re-*, *dis-*, *in-*, *mis-*, *pre-*, *sub-*, *im-*, *tri-*) and suffixes (*-tion*, *-ous*, *-ly*, *-s*, *-es*, *-ed*, *-ing*, *-er*, *-est*, *-ful*, *-less*, *-ness*, *-y*). Remind students that not every prefix or suffix will work with every root word. Show them that some words may contain both a prefix *and* a suffix (e.g., *unlucky*), and highlight examples where the spelling of the root word changes when adding affixes (e.g., *run* becomes *running*, *celebrate* becomes *celebration*, and *try* becomes *tried*).

behave	fear	noise
calm	friend	perfect
care	group	power
celebrate	happy	proud
close	hard	quick
color	kind	read
concentrate	lead	real
correct	learn	sad
count	light	smooth
cover	like	trust
cycle	locate	try
decorate	loud	turn
direct	luck	use
ease	merge	view
fame	near	wonder



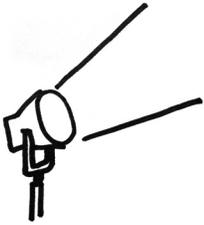
- To improve students' understanding of words with multiple meanings, provide sentences with context clues that correspond to the words' different definitions. The following sentences show the multiple meanings of the word *bat*. *The bat flew out of the cave. Sarah is the next person to bat the ball. The baseball player carried his bat.* Students should read the sentences and write an explanation of what the word means in the sentence. Student explanations for the example above could include the following: *In the first sentence the word bat means a black animal with wings. In the second sentence the word bat means to hit. In the third sentence the word bat means a wooden or metal stick.* Next, give students sentence strips where they will write their own sentences for each different meaning of the words. Once all the sentences are written, students can use them in a future activity where they group sentences that use the same definition of a given word. See the table below for a list of words with multiple meanings:

bank	cut	mean	ring	smell
bark	dash	might	rock	snap
bat	deck	mind	roll	sound
bear	face	nail	rose	stick
bend	fast	order	row	tape
bowl	jump	paint	run	tip
box	kind	pen	season	trick
can	lap	pet	shell	trip
check	light	play	ship	watch
color	look	race	sink	whistle

Further support can be found in the GPS Reading Framework at www.georgiastandards.org/elaframework.aspx



Activities



2 Reading for Literary Comprehension

Georgia Performance Standard ELA3R3

Within the Literary Comprehension domain, students are expected to comprehend and explore literary works by identifying and analyzing the different elements of short stories, fairy tales, fables, folktales, and poetry. Skills in this domain include summarizing, predicting, making inferences, drawing conclusions, and identifying the author's purpose.

The following activities develop skills in this domain:

- To develop students' summarizing skills, present them with three different summaries of a text they have read and let them judge which summary is best. One summary should provide inaccurate information, one summary should provide accurate information but be too specific, and one summary should provide both accurate information and a general overview of the story's main idea. Write the summaries from scratch, or use unidentified student work samples. Students should vote for the summary they think is best and be ready to explain their reasoning. Engage students in a discussion about the differences between the three summaries. Remind students that a summary should only include information found in the text. It should neither be too specific nor present false information. Repeat this activity with different texts and post the best summaries on the wall. Students can use them as models when they write their own summaries.
- To get students thinking about character motivations, prepare a session of *Character Court*. Serving as the judge, select a student volunteer to role-play the main character from a text students have read. The other students will role-play the jury. First, ask the student playing the main character to take the following oath: *Do you swear to tell the truth, the whole truth, and nothing but the truth?* The student role-playing the character will raise his or her right hand and say that he or she does. Ask the student role-playing the main character pre-written questions such as: *Why did you decide to _____? Why did you decide not to _____? Where were you when _____ happened? Where do you usually _____? How did you feel when _____?* The student role-playing the character will offer answers to the best of his or her ability, but members of the jury can counter the claims if they find evidence in the text to prove the answers are unfounded. Once all the evidence is presented, members of the jury will vote to determine whether the character has a justifiable case.
- To emphasize the importance of using evidence from the text to support inferences and conclusions, stage a text investigation. Pre-read a text you will read with students. Write six inferences or conclusions about it on sentence strips or chart paper. Three of the sentences should be supported by evidence in the text, and three sentences should be unsupported inferences or conclusions that are *not* based on evidence in the text. After students read the text, present them with the six inferences and conclusions, one at a time. Explain that together you are on a mission to find out whether each

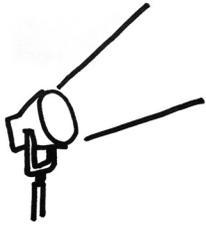


statement is supported by evidence in the text. With a magnifying glass in hand, model literary detective work by carefully reading over the text. Students should help look for sentences that either state or imply that the inferences and conclusions are valid. Circle or underline the supporting evidence you find in the text and display the supported inferences and conclusions on the board. Give students a template of a magnifying glass image where they will write the evidence found in the text for each valid inference and conclusion. Discuss why the three inferences and conclusions *not* supported by evidence in the text are invalid. Students' detective skills will improve with each different text you read and investigate.

Further support can be found in the GPS Reading Framework at www.georgiastandards.org/elaframework.aspx



Activities



3 Reading for Information

Georgia Performance Standard ELA3R3

Within the Reading for Information domain, students are expected to read, recall, and analyze information from various texts. These texts may include nonfiction articles, biographies, subject-area texts, and reference sources. Skills in this domain include summarizing, predicting, making inferences, drawing conclusions, recognizing cause-and-effect relationships, and identifying the author's purpose.

The following activities develop skills in this domain:

- To help students learn the difference between facts and opinions, read an informational text together and categorize the information provided as either facts or opinions. Select a complex text with sophisticated language or a mix of fantasy and facts. Write each sentence of the text on a separate strip of paper. Explain to students that a fact is a statement that can be proven true or false. For example, *Spacecrafts are equipped to travel outside the earth's atmosphere* is a fact. An opinion, on the other hand, is what someone believes, thinks, or feels. Opinions cannot necessarily be proven true or false, and they may differ from person to person. *The best planet to visit in a spacecraft is Venus* is a good example of such an opinion. In addition, some sentences contain opinions and factual information. Consider the following example: *The most fascinating part of a spacecraft is its engine system, which includes the fuel, valves, pipes, and thrusters.* While it is a fact that a spacecraft's engine system includes the parts mentioned, it is an opinion that they make up the most fascinating feature. Give each student one of the sentences from the text, and one colored marker or crayon. Students should underline only the factual information in their sentence. Go over each sentence together. Students should explain *why* they think the underlined information is factual and the unmarked information represents an opinion. Discuss as a class whether students' distinctions are accurate.
- To gain information and help students develop the skills to make judgments about the best way to display information, read an informational text and create a graphic representation of the information described. If the text you read already has a graphic feature, help students present the information in a new format. For example, if the text contains a line graph, create a bar graph that displays the same information. Students can discuss the benefits and drawbacks of each method. Does one representation highlight certain information more effectively? If the text does not contain a graphic organizer, consider whether the information would be best portrayed in a Venn diagram (compare and contrast with similarities), a T chart (compare and contrast with no similarities), a concept web (conceptual relationships), or a bar graph (correlation of one factor with another). Once the graphic representation is complete, students should answer questions that ask them to compare the data. For example, a question for a pie chart showing the ethnic breakdown of a population might be *Which ethnicity makes up the*



*biggest percentage of the total population? A question for a bar graph showing how polar ice has melted over time might be *In which two years did the amount of polar ice stay almost the same?**

- To boost students' abilities to infer the main idea of an informational text, give them magazine or newspaper articles and books with the titles covered up so they will invent titles of their own. Students will read the text and, based on the information they read, as well as the way it is presented, they will come up with two possible titles. Once they have written their ideas down, they should write brief explanations of why they wrote each title and circle the one they think is closest to the title the real author used. Reveal the title used by the author, and students will see how their interpretations match up. If students' titles are very different from the one the author used, engage them in a discussion about why the author may have chosen the title he or she used. Were the students' titles more general or more specific than the authors'?
- To build students' understanding of informational genres, play a game of librarian. Divide students into groups and pass out a variety of informational texts from your classroom library. Include nonfiction magazine articles, biographies, autobiographies, subject-area texts, and reference materials such as encyclopedias and dictionaries. Working together in groups, students should examine the texts inside and out, and decide which ones belong in each of the following categories: informational article, biography, subject-area text, and reference source. Assign each group one of the four categories of texts. Students should choose one example of their groups' type of text to present to the class. They should explain not only why it belongs to the category it is in, but also how they know it is a nonfiction text.

Further support can be found in the GPS Reading Framework at www.georgiastandards.org/elaframework.aspx



Practice Quiz



Genre: Nonfiction

Read the passage below and answer the questions that follow.

The Snow Day

This year, my family moved from Georgia to Indiana. Ever since we moved, we've had to get used to some differences. One of the biggest changes is the weather. It hardly ever snows in Georgia. When it does snow, it's nothing like this!

One morning we woke up and saw eight inches of snow on the ground! I had never seen a big snowfall like that. Everything was covered with snow! After these large snowstorms, schools close. People in Indiana call that a *snow day*. I was happy because I did not have to go to school and could sleep late. I was beginning to love Indiana!

When I finally got out of bed, Mom and I decided to go outside. We wanted to explore our snow-covered yard. We knew to wear lots of warm clothes. We wore so many layers that we looked puffy in our coats, gloves, and boots.

We had never shoveled snow before, but we cleared the driveway. The snow was very light. It was crisp and sparkling white. We shoveled a little snow at a time. It didn't take us very long to get the job done. After we finished, we decided to build our first snowman. We used peanuts for the eyes, a carrot for the nose, and red candies for the mouth. We then wrapped a scarf around its neck.

Mom saw kids taking their sleds to a big hill of snow. She thought it would be fun to join them. I was nervous when I saw the steep hill. Mom said she would ride with me. We climbed to the top of the hill. With one quick breath, we jumped onto our sled. Seconds later, we slid all the way down to the bottom of the hill. The sled raced down the hill as if it were on ice skates. The wind blew through our hair. The cold air burned our cheeks. When we reached the bottom, we felt great! Mom and I liked it so much that we wanted to do it over and over again.

When we got tired, Mom and I walked back to the house. We were so cold! We felt like frozen ice cream cones. Mom made a big pot of hot chocolate. We baked some chocolate chip cookies. The house smelled like a chocolate factory!

I had fun spending time with my mom on that first big snow day! We both agreed that the snow was better than we expected. Who knew it would be this much fun? Of all the changes we had to adjust to, this has been my favorite.

1 Which BEST describes what happens in the passage?

- A A boy teaches his mother how to ride a sled.
- B A boy and his mother enjoy a day in the snow.
- C A boy asks his mother to let him stay home from school.
- D A boy and his mother work all day to shovel the driveway.



- 2 **Which is MOST LIKELY true about the main character?**
- A He usually sleeps late.
 - B He does not like sledding.
 - C He always shovels the driveway.
 - D He has never had a snow day before.
- 3 **Why does the main character sleep late?**
- A He has to shovel the snow.
 - B He does not have warm clothes.
 - C He does not have to go to school.
 - D He has to play outside with his mother.
- 4 **What happens AFTER the main character and his mother walk back to the house?**
- A They shovel the snow.
 - B They make hot chocolate.
 - C They eat ice cream cones.
 - D They take a ride on the sled.
- 5 **Which of these is MOST LIKELY true about the main character's mother?**
- A She likes to play outside.
 - B She likes to eat ice cream.
 - C She wishes that school were open.
 - D She wishes that they had not moved.
- 6 **Which of these BEST explains why the main character's mother sleds down the hill?**
- A because the hill is steep
 - B because the hill is bumpy
 - C because the main character is tired
 - D because the main character is nervous
- 7 **Which BEST describes the main idea of the passage?**
- A Baking cookies is difficult.
 - B Making new friends is easy.
 - C Playing in the snow can be fun.
 - D Moving somewhere new can be hard.
- 8 **How will the main character MOST LIKELY feel the next time it snows?**
- A proud
 - B lonely
 - C excited
 - D nervous



- 9 **Which is an ANTONYM of *sparkling* as it is used in the sentence?**

The snow was very light. It was crisp and sparkling white.

- A dull
- B fresh
- C pretty
- D heavy

- 10 **What is the meaning of the word *raced* as it is used in the sentence?**

The sled raced down the hill as if it were on ice skates. The wind blew through our hair. The cold air burned our cheeks.

- A moved quickly
- B moved strangely
- C moved sideways
- D moved backwards



Solutions

Number	Correct Answer	Explanation
1	B	<p><i>Summarizes text content. (ELA3R3g)</i></p> <p>The correct answer is Choice (B) A boy and his mother enjoy a day in the snow. This sentence provides an accurate description of what the overall passage is about. Choice (A) is not correct because, although the passage describes a boy and his mother going sledding, the boy does not <i>teach</i> his mother how to sled, and sledding is not what the overall passage is about. Choice (C) is not correct because the boy does not ask his mother to let him stay home from school. The boy gets to stay home from school because it is a snow day. Choice (D) is not correct because the boy and his mother do not spend the whole day shoveling the driveway. The fourth paragraph of the passage, which describes the mother and son shoveling the driveway, explicitly states, “It didn’t take us very long to get the job done.”</p>
2	D	<p><i>Makes judgments and inferences about setting, characters, and events, and supports them with evidence from the text. (ELA3R3f)</i></p> <p>The correct answer is Choice (D) He has never had a snow day before. The first two paragraphs of the passage explain how one of the biggest differences between Georgia and Indiana is the weather. It snows a lot more in Indiana, and, as the main character learns, “After these large snowstorms, schools close. People in Indiana call that a snow day.” It can be inferred that the main character has never had a snow day before. Choice (A) is incorrect because there is nothing in the passage that states or implies he <i>usually</i> sleeps late. On the contrary, his excitement about getting to sleep late implies it is something he does not get to do often. Choice (B) is incorrect because although the fifth paragraph of the passage explains that the main character was nervous when he saw the steep sledding hill, at the end of the paragraph the main character writes, “Mom and I liked it so much that we wanted to do it over and over again.” Choice (C) is incorrect because the first sentence of the fourth paragraph explicitly states, “We had never shoveled snow before, but we cleared the driveway.”</p>



Number	Correct Answer	Explanation
3	C	<p><i>Identifies and infers cause-and-effect relationships and draws conclusions. (ELA3R3l)</i></p> <p>The correct answer is Choice (C) He does not have to go to school. The second to last sentence of the second paragraph explicitly states, "I was happy because I did not have to go to school and could sleep late." Choice (A) is incorrect because, although the passage describes the boy shoveling snow, it is never stated or implied that he slept late in order to shovel the snow. Choice (B) is incorrect because the passage never states or implies that the boy slept late because he did not have warm clothes. In fact, the third paragraph describes all the warm clothes he put on. Choice (D) is incorrect because although the passage describes the boy and his mother playing outside, it is never stated or implied that he slept late in order to play outside with his mother.</p>
4	B	<p><i>Recalls explicit facts and infers implicit facts. (ELA3R3m)</i></p> <p>The correct answer is Choice (B) They make hot chocolate. The sixth paragraph of the passage describes the boy and his mother getting tired and walking back to their house. After describing how cold they were, the passage explicitly states, "Mom made a big pot of hot chocolate." Choice (A) is incorrect because shoveling snow was the <i>first</i> thing the boy and his mother did when they got outside. Choice (C) is incorrect because the passage never states or implies that they boy and his mother ate ice cream cones. The third paragraph states, "We felt like frozen ice cream cones," but this is a way of describing how cold they were. Choice (D) is incorrect because the boy and his mother took a ride on the sled <i>before</i> they got tired and walked back to the house, not after.</p>



Number	Correct Answer	Explanation
5	A	<p><i>Makes judgments and inferences about setting, characters, and events, and supports them with evidence from text. (ELA3R3f)</i></p> <p>The correct answer is Choice (A) She likes to play outside. The second paragraph of the passage explains how the boy and his mother <i>wanted</i> to explore their snow-covered yard. The fifth paragraph describes how the mother saw kids sledding and explicitly states, “She thought it would be fun to join them.” Both of these details support the assertion that the boy’s mother liked to play outside. Choice (B) is incorrect because the passage does not state or imply that the mother likes ice cream. Ice cream cones are only mentioned to describe how cold the boy and his mother felt. Choice (C) is incorrect because there is no evidence in the passage to suggest that the boy’s mother wishes school were open. Choice (D) is incorrect because there is no evidence in the passage that suggests the boy’s mother wishes they had not moved.</p>
6	D	<p><i>Identifies and infers cause-and-effect relationships and draws conclusions. (ELA3R3l)</i></p> <p>The correct answer is Choice (D) because the main character is nervous. In the fifth paragraph of the passage, the main character explains, “I was nervous when I saw the steep hill. Mom said she would ride with me.” It can be inferred that the mother rode with the boy to make him feel less nervous. Choice (A) is incorrect because although the steepness of the hill is what led the boy to feel nervous, it is not the direct cause of the mother deciding to ride with the boy. Choice (B) is incorrect because the passage does not state or imply that the hill was bumpy. Choice (C) is incorrect because the main character does not get tired until after he and his mom go sledding.</p>



Number	Correct Answer	Explanation
7	C	<p><i>Identifies and infers main idea and supporting details. (ELA3R3j)</i></p> <p>The correct answer is Choice (C) Playing in the snow can be fun. The main idea can be thought of as the central message of the passage and can be interpreted from the text and the title. The passage describes several events, such as building a snowman and sledding, that show how playing in the snow can be fun. Choice (A) is incorrect because although baking cookies is one event that takes place in the passage, it is not central to the passage as a whole. Also, the passage does not state or imply that baking cookies is difficult. Choice (B) is incorrect because the passage is not about making new friends. Choice (D) is incorrect because although the characters in the story have moved, the main message of the passage is not that moving somewhere new can be hard. In fact, the passage describes how experiencing new things in a new place can be fun.</p>
8	C	<p><i>Makes predictions from text content. (ELA3R3b)</i></p> <p>The correct answer is Choice (C) excited. In the last paragraph of the passage, the main character expresses his excitement about the fun he and his mother had on their first snow day. It is safe to predict that he will feel excited the next time it snows. Choices (A) and (B) are incorrect because the emotion the main character feels throughout his first snow day is not pride or loneliness. It is not likely that he will feel proud or lonely the next time it snows. Choice (D) is incorrect because the main character only felt nervous before going sledding. His overall feeling about the whole day was not nervousness and it is not likely he will feel nervous the next time it snows.</p>
9	A	<p><i>Recognizes and applies the appropriate usage of homophones, homographs, antonyms, and synonyms. (ELA3R2c)</i></p> <p>The correct answer is Choice (A) dull. "Sparkling" is another way of saying shiny or bright. The antonym or opposite of "sparkling" is <i>dull</i>. Choices (B), (C), and (D) are incorrect because <i>fresh</i>, <i>pretty</i>, and <i>heavy</i> are not opposites of "sparkling."</p>



Number	Correct Answer	Explanation
10	A	<p><i>Determines the meaning of unknown words on the basis of context. (ELA3R2f)</i></p> <p>The correct answer is Choice (A) moved quickly. In the sentence “The sled raced down the hill as if it were on ice skates,” the word <i>raced</i> means moved quickly. The sentences that follow, “The wind blew through our hair” and, “The cold air burned our cheeks” provide clues that the sled must have been moving fast. Choice (B) is incorrect because racing does not mean moving strangely. Choice (C) is incorrect because the sled raced “as if it were on ice skates” and ice skates do not move sideways. Choice (D) is incorrect because racing does not mean moving backwards.</p>

English / Language Arts



English/Language Arts

Grade 3 students are more able to work independently on research projects, making their writing more sophisticated and meaningful. With some guidance, they use all aspects of the writing process in producing their own compositions and reports. They are much more adept at summarizing main points from fiction and nonfiction texts, and they use more abstract skills of synthesis and evaluation in writing. By the end of Grade 3, students are aware of the importance of the conventions of language. Grade 3 students understand the importance of spelling and the importance of correct language.

The English/Language Arts activities focus on some of the concepts that are assessed on the Grade 3 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 ELA3C1

Within the Grammar/Sentence Construction domain, students understand and control the rules of the English language to use correct capitalization, punctuation, and standard spelling. Students should also identify and use complex sentence structure with subject-verb agreement and adjectives. Students know when to use formal or informal language. Finally, students should identify nouns, personal and possessive pronouns, and contractions, and use them correctly.

The following activities develop skills in this domain:

- To practice subject-verb agreement, adjectives, and pronouns, students will complete cloze passages (in which students fill in blanks in a story). For this activity, provide high-interest stories with strategically placed blanks in place of nouns, verbs, adjectives, or pronouns. Each blank has a part-of-speech label (e.g., verb, noun, adjective, or pronoun). Students should choose words that fit grammatically into the sentences. Here are a few examples with a blank and two possible fill-ins at the end of each sentence.
 - *Dexter and Lisa _____ across the field. (runs, hurry)*
 - *My friends and I are going swimming this weekend. _____ want to go to the beach instead of the community pool. (We, Them)*
 - *The black horse was spooked and _____ across the field to the barn. (run, galloped)*

Before students begin the activity, explain and model the process of looking for context clues to choose a word that fits grammatically into the story.

- To practice accurate spelling, punctuation, and complex sentence structure, students will create stories in a round robin using their assigned spelling words. Each student will write one sentence on paper and pass the paper to the next student, or back to you, to write a second sentence. Keep the exchange going until the story naturally ends. At the end of the activity, direct students to read over the whole story to check for accurate spelling and punctuation, combine simple sentences into complex sentences, and make other corrections if needed.
- Correct use of contractions is an important skill for developing writers. To enhance learning, students will create *contraction equations*. Students will write all the contractions they know and the words that make up each contraction on individual paper word tiles cut out from a larger sheet. For example, one tile will say *isn't* and the matching tiles will say *is* and *not*. On another set of paper tiles made from a different color paper, students will write addition symbols (e.g., +), and arrows (e.g., →). Students can then arrange *contraction equations* on the board or on a tabletop, and explain aloud how they formed the contractions by dropping one or more letters and adding the apostrophe. Example: *do + not → don't*.



-
- To help students understand when to use formal or informal language in their writing, have a short discussion about the differences between the two. For example, informal language may include slang words, while formal language does not. Another difference between the two is that informal language uses contractions, while formal language does not. Engage students in the discussion by asking which slang words they use when they write a note to a friend.

Next, students will create a simple chart with examples of writing that fits in each category. The chart should look like the following partially-completed table:

Informal language	Formal language
Note to a friend	School report
Personal journal entry	

Further support can be found in the GPS English/Language Arts Framework at www.georgiastandards.org/elaframework.aspx



Activities



2 Research/Writing Process

Georgia Performance Standard ELA3W1 and ELA3C1

Within the Research/Writing Process domain, students begin to use specific sensory details, such as strong verbs and descriptive adjectives, as well as relevant examples, facts, and anecdotes. Students begin to use structures such as transition words and phrases, bullets, subheadings, and numbering to ensure coherence in their writing. In addition, students begin to select a focus and an organizational pattern for their writing, such as sequence of events, cause and effect, compare and contrast, as well as question and answer. Finally, students use a variety of resources to research and share information on a topic.

The following activities develop skills in this domain:

- Writing with coherence is an important skill that involves selecting a focus, choosing an organizational structure, and using transition words. Students will write organized paragraphs based on sequences of events. They will either describe an exciting experience, such as a trip, or write a set of instructions for doing something they enjoy. Before the students begin writing, they will describe the focus, or main purpose, of their paragraphs and create a list of transition words that they can use throughout their paragraphs (first, second, next, then, last, finally, etc.). Encourage students to use a numbered list of steps or bullet points, if appropriate.
- In order to practice using sensory details, students can rewrite short stories in their own words. Sensory details are the parts of the story that describe how something looks, sounds, feels, smells, or tastes. Encourage students to be as descriptive as possible by including adjectives and using a thesaurus as necessary. Students may copy parts of the story they have chosen to rewrite, word-for-word. The main idea of the activity is for students to see how any piece of writing can be enriched with sensory details. Students will share their rewritten stories when they are finished.
- To help students see the difference between relevant and irrelevant facts and details in writing, prepare three short paragraphs on subjects of student interest. Each paragraph should be only five sentences long, and include a sentence with information that does not belong. For example, a paragraph about an upcoming town festival could have a sentence about school hours. Students will identify the sentence that does not fit, and explain in their own words why it should be taken out.



-
- Finding good information quickly using a variety of resources is an important skill. Help students practice finding facts and definitions in reference books or on the Internet by creating a grab bag of challenges. This grab bag should have several strips of paper with questions such as: *What is the capital of Madagascar?* and *What is the definition of an isthmus?* Write the grab bag challenges around a specific unit of study (*Africa*), or keep the questions random. Explain that students will receive one point for each correct answer they write on the back of a strip.

Further support can be found in the GPS English/Language Arts Framework at www.georgiastandards.org/elaframework.aspx



Practice Quiz



- 1 **Which subject BEST completes the sentence?**

_____ love to read books.

- A It
- B He
- C They
- D Their

- 2 **What is the plural noun in the sentence?**

Three letters came to my house for Lukas.

- A Three
- B letters
- C house
- D Lukas

- 3 **Which word in the sentence needs an apostrophe?**

Anitas friend will go to the zoo on both days.

- A Anitas
- B will
- C both
- D days

- 4 **Which word is a pronoun?**

Did her pen run out of ink?

- A her
- B pen
- C out
- D ink

- 5 **Which is an incomplete sentence?**

- A I want to go to sleep.
- B Malcolm grinned at the baby.
- C The dog ran across the street.
- D Blue and gold paint on my hands.



- 6 **The sentence below has a spelling error. Which underlined word is NOT spelled correctly?**

We took a journey through the forest to the meadow.

- A journey
- B through
- C forest
- D meadow

- 7 **What is the BEST order for the sentences?**

Sentence 1: Then, we raked the leaves.
Sentence 2: First, my sister and I picked weeds.
Sentence 3: We enjoyed lemonade after all of our hard work.
Sentence 4: Dad said it was time to get to work.

- A 2, 4, 3, 1
- B 4, 2, 1, 3
- C 3, 2, 4, 1
- D 1, 2, 3, 4

- 8 **Which transition word fits BEST in the sentence?**

The bus brought the children home _____ school was over.

- A also
- B after
- C again
- D across

- 9 **Under which heading of a magazine article would a student MOST LIKELY find information about brushing teeth?**

- A Animal Teeth
- B The Inside of Teeth
- C Human Teeth
- D Keeping Teeth Healthy

- 10 **Which sentence BEST describes the horse?**

- A I think my horse is nice.
- B I like to ride my horse in the field.
- C My horse's braided mane is pretty.
- D My horse lives in my dad's brown barn.



Solutions

Number	Correct Answer	Explanation
1	C	<p><i>Correctly identifies and uses subject/verb agreement and adjectives. (ELA3C1a)</i></p> <p>The correct answer is Choice (C) They. The verb <i>love</i> does not end in an <i>s</i>, which means it is plural. <i>They</i> is correct because it is a plural pronoun, so it agrees with the verb in the sentence. Choices (A) and (B) are both incorrect because they are singular pronouns. Choice (D) is incorrect because it is a possessive pronoun. Though it is plural like the correct answer, it is not grammatically correct to use a possessive pronoun in this sentence.</p>
2	B	<p><i>Identifies and uses nouns (singular, plural, possessive) correctly. (ELA3C1b)</i></p> <p>The correct answer is Choice (B) letters. <i>Letters</i> is a plural noun. It means <i>more than one letter</i>. Plural nouns, which are often formed by adding an <i>-s</i> to a singular noun, represent more than one person, place, animal or thing. Choice (A) is incorrect because <i>three</i> describes the noun, so it is an adjective. Choice (C) is incorrect because <i>house</i> is singular. Choice (D) is incorrect because <i>Lukas</i> is one person. Sometimes a noun can end in an <i>-s</i> and still be singular, as is the case with some proper names.</p>
3	A	<p><i>Uses appropriate capitalization and punctuation (end marks, commas, apostrophes, quotation marks). (ELA3C1m)</i></p> <p>The correct answer is Choice (A) Anita's. <i>Anita's</i> requires an apostrophe because it shows possession. <i>Anita's</i> is a possessive noun. The apostrophe takes the place of the word <i>of</i>. It stands for <i>a friend of Anita</i>. Choices (B) and (C) are incorrect because they do not show ownership and they are not contractions of two words. Therefore, no apostrophe is necessary. Choice (D) is incorrect because <i>days</i> does not show possession and it is not a contraction of two words. <i>Days</i> is simply a plural noun, which is why it has an <i>-s</i> at the end.</p>



Number	Correct Answer	Explanation
4	A	<p><i>Identifies and uses personal and possessive pronouns. (ELA3C1d)</i></p> <p>The correct answer is Choice (A) her. A pronoun takes the place of a noun, and <i>her</i> is the only word in this sentence that takes the place of a noun. In this case, the pronoun is replacing the name of a person, the owner of the pen. Choices (B) and (D) are incorrect because they do not stand in for another noun. Choice (C) is incorrect because it is a preposition and does not stand in for another noun.</p>
5	D	<p><i>Distinguishes between complete and incomplete sentences. (ELA3C1g)</i></p> <p>The correct answer is Choice (D) Blue and gold paint on my hands. It does not have a predicate, so it is not a complete sentence. Complete sentences must have a subject and a predicate. A predicate tells readers what the subject is like or what it does. Choices (A), (B), and (C) all have a subject and a predicate, which means they are complete sentences. Because the question asks for the incomplete sentence, these choices are incorrect.</p>
6	A	<p><i>Uses common rules of spelling, and correct words using dictionaries and other resources. (ELA3C1l)</i></p> <p>The correct answer is Choice (A) journey. This is not the right spelling of the word. The word <i>journey</i> is spelled with an <i>o</i> before the <i>u</i>. Choices (B), (C), and (D) are incorrect because these words are all spelled accurately.</p>
7	B	<p><i>Uses organizational patterns for conveying information (e.g., chronological order, cause and effect, similarity and difference, questions and answers). (ELA3W1d)</i></p> <p>The correct answer is Choice (B) 4,2,1,3. This choice puts the sentences in the most logical order. Transition words, such as <i>first</i>, <i>next</i>, or <i>last</i>, can help put information in chronological order. Choice (A) is likely to be chosen because its first sentence begins with the word <i>first</i>. However, it is incorrect because Sentence 3 (with the phrase “after all of our hard work”) comes before sentence 1 (where the work happens). Choice (C) is incorrect because it begins with the sentence that explains what happened after the work was done. Choice (D) is incorrect because the first word of Sentence 1, <i>then</i>, means it should come in the middle or at the end.</p>



Number	Correct Answer	Explanation
8	B	<p><i>Begins to use appropriate structures to ensure coherence (e.g., transition words and phrases, bullets, subheading, numbering). (ELA3W1e)</i></p> <p>The correct answer is Choice (B) after. The word <i>after</i> makes the most sense in the sentence and it is the only transition word. <i>After</i> is a transition word because it deals with the order of things over time. Choice (A) is incorrect because <i>also</i> doesn't show the relationship in time between both parts of the sentence. Choices (C) and (D) are incorrect because <i>again</i> and <i>across</i> are not transition words.</p>
9	D	<p><i>Uses resources (encyclopedias, Internet, books) to research and share information about a topic. (ELA3C1j)</i></p> <p>The correct answer is Choice (D) Keeping Teeth Healthy. The paragraphs under this heading would MOST LIKELY supply information about brushing teeth, because we know this is something people do in order to keep teeth healthy. Answers (A) and (C) are incorrect because these headings do not reference tooth care in any way. Answer (B) is incorrect because <i>The Inside of Teeth</i> will have content about the internal structure of the tooth itself, not what one should do to the outside to take care of them.</p>
10	C	<p><i>Begins to use specific sensory details (e.g., strong verbs, adjectives) to enhance descriptive effect. (ELA3W1f)</i></p> <p>The correct answer is Choice (C) My horse's braided mane is pretty. This sentence best describes the horse and its mane by using two adjectives, <i>braided</i> and <i>pretty</i>. Choices (A) and (B) are incorrect because they are opinions that describe the speaker's relationship to the horse more than the horse itself. Choice (D) is incorrect because it describes where the horse lives, but not the horse itself.</p>

Mathematics



Mathematics

By the end of Grade 3, students will understand place value. They will further develop their understanding of and skills in addition and subtraction of whole numbers and decimals. They will also expand their knowledge base of multiplication and division of whole numbers. Students will understand the concepts of length, perimeter, area, and time. Students will broaden their understanding of the characteristics of previously-studied geometric figures. They will solve problems by collecting, organizing, displaying, and interpreting data.

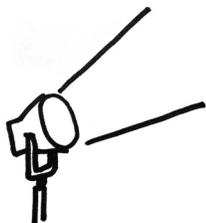
The Mathematics activities focus on some of the concepts that are assessed on the Grade 3 CRCT Mathematics domains. These domains are as follows:

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

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 M3N1, M3N2, M3N3, M3N4, and M3N5

Within the Number and Operations domain, students will identify place value from tenths through ten thousands, and understand the relative sizes of digits in place-value notation. Students will use the properties of addition and subtraction to compute and verify results, use mental math and estimation strategies, and solve problems. Students will further develop an understanding of how multiplication and addition are related, how division and subtraction are related, and how multiplication and division affect quantities and are related to one another. They will know multiplication facts to 10×10 , understand the effect on a product when multiplying by multiples of 10, and use mental math and estimation strategies to multiply. They will use arrays and area models to understand the distributive property and partial products, and apply the identity, commutative, and associative properties of multiplication. Students will recognize that division may be used to determine the number of equal parts of a given size that may be taken away from the whole (repeated subtraction) or to separate a whole into a given number of equal parts (sharing model), and write corresponding mathematical expressions in problem-solving situations. Students will explain the meaning of a remainder in division in different circumstances and divide a 2- and 3-digit number by a 1-digit divisor. Students will understand the meaning of decimal fractions and common fractions in simple cases, and apply them in problem-solving situations. They will understand and model the concept of addition and subtraction of decimal fractions and common fractions with like denominators.

The following activities develop skills in this domain:

- To develop understanding of place value in context, students will work with money values and base-ten blocks. Find a newspaper flier or other store advertisement. Students will make a list of three or four inexpensive things they would like to buy from the store. Include the price of each item on the list. Once they write down a list, choose items from the list and underline one digit of each price. Students can then practice identifying the place value of the underlined digits. Students should calculate the total using various methods. They can work with play money using pennies (ones), dimes (tens), and dollars (hundreds). They should model the same operations using trading and regrouping of base-ten blocks with units = pennies, rods = dimes, and flats = dollars. Finally, students can practice decimal addition of the values to reinforce how place value connects dollars and cents.
- Students can apply the properties of addition and subtraction after creating a menu of their favorite foods. Students should come up with several side dishes, main dishes, drinks, and desserts to include, and list a price for each item. Students can choose a meal from the menu and calculate the total cost. Choosing another meal, they can practice mental math and estimation strategies. They can use computation to figure out the correct change for a whole value payment (such as \$25.00). If more than one student orders the same item, ask them how they might rewrite the problem using another



operation to figure out the group total (such as defining repeated addition as multiplication).

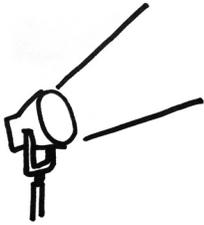
- Give students practice with division by setting up various scenarios for how a group of people could be regrouped for participation in team sports. Tell students that their class (or a set group, such as 25 students) needs to be split up. Present the following groups: teams of 5 players for basketball, teams of 9 players for baseball, and teams of 11 players for football or soccer. Ask students questions like: *How many teams can the class make for each sport? Are there any students left over after splitting up the group into teams? Why are there leftovers?* Help students to relate the remainder to an incomplete whole. For example, if a group of 25 gives 2 teams of 11 players with 4 students left over, those 4 represents $\frac{4}{11}$ of a whole group. Stress the whole you were trying to make, and that the remainder is the portion of the whole that was left. Ask students to explain the difference between “splitting the group into 5 teams” and “splitting the group into teams of 5.”
- By participating in the following game, students can improve mental math skills using the properties of operations (addition, subtraction, multiplication, division). Use index cards or a flip chart to write out a number of examples—both correct and incorrect—of the following: the identity property of multiplication (e.g., $5 \times 1 = 5$); the commutative property of multiplication (e.g., $4 \times 3 = 3 \times 4$); the associative property of multiplication (e.g., $2 \times (3 \times 6) = (2 \times 3) \times 6$); multiplication defined as repeated addition (e.g., $5 \times 2 = 10$ and $2 + 2 + 2 + 2 + 2 = 10$); the relationship between division and multiplication (e.g., $3 \times 6 = 18$ and $18 \div 6 = 3$); and the relationship between division and subtraction (e.g., $12 \div 3$ and $12 - 4 - 4 - 4$). Create examples that vary in complexity and difficulty, saving the most challenging as bonus questions. Students should identify whether the examples are correct and explain their responses.

Further support can be found in the GPS Mathematics Framework: Unit 1: *Addition and Subtraction of Whole Numbers*; Unit 2: *Multiplication and Division of Whole Numbers*; and Unit 4: *Fractions and Decimals*.

The Mathematics Framework documents are available at www.georgiastandards.org/mathframework.aspx



Activities



2 Measurement

Georgia Performance Standards M3M1, M3M2, M3M3, and M3M4

Within the Measurement domain, students will further develop their understanding of the concept of time by determining elapsed time of a full, half, and quarter hour. Students will measure length, choosing appropriate units and tools. They will measure long distances using kilometers (km) and miles (mi), and small dimensions to the nearest $\frac{1}{4}$ inch, $\frac{1}{2}$ inch, and millimeter (mm). They will estimate length in appropriate units and compare one unit to another within a single system of measurement. Students will measure and understand the perimeter and area of simple geometric figures (squares and rectangles). They will understand the meaning of measurement in perimeter (linear unit) and measurement in area (square unit). Students will understand the concept of perimeter as being the boundary of a simple geometric figure and will model (by tiling) the area of a simple geometric figure using square units (square inch, foot, etc.). They will determine the perimeter of a simple geometric figure by measuring and adding together the lengths of the sides. They will determine the area of squares and rectangles by counting, addition, and multiplication with models.

The following activities develop skills in this domain:

- Students will determine elapsed time of a full, half, and quarter hour using real-life examples. Students should keep a log during the course of one or more days of the times they start and stop certain activities. Students should first identify activities that took an hour, then look for activities that took a half hour, and finally a quarter hour. Using the start and end times, students count by fives to determine elapsed time. Students may use representations of clocks as they work, or for extra challenge, identify elapsed time without pictorial assistance.
- Measuring and adding together the lengths of the sides of everyday square and rectangular objects will develop students' skills for determining the perimeter of simple geometric figures. Choose a few flat objects or surfaces that students can measure, such as a piece of notebook paper, a sticky note, and the lid on a pencil box. Students will measure the length of each side to the nearest half inch and record the measurement in a chart, similar to the partially-completed sample on the following page. They will then write an expression for the perimeter and calculate the result. Next, students should find several other square or rectangular objects in the room, such as a light switch plate, book cover, CD/DVD case, window, or door. They will measure the sides of each object and calculate the perimeter. Then they should use the length of a piece of string stretched around the edges of the object to confirm their answers. Students should compare their results and explain how they arrived at an answer using words, numbers, and pictures. Ask students if they can explain why it might be necessary to determine perimeter for objects such as these. For example, a builder needs to make the frame to hold the window before installing it.

Object	Length	Width	Perimeter
Sheet of paper	11 in	8.5 in	11 in + 8.5 in + 11 in + 8.5 in = 39 in
Sticky note	2 in	2 in	
Pencil box lid			

- To practice measuring to the nearest fraction of an inch (or the nearest millimeter), place students into groups of three and give each group a few benchmark objects, such as a paper clip, pencil, and shoelace. The students should measure the objects to the nearest quarter-inch and write down the length. Students can use this measurement to estimate the length of other objects. For example, students might find the length of a crayon to be $3\frac{1}{2}$ inches and, using that, estimate that a stapler is twice as big, or 7 inches. Students should then take turns using their benchmark objects to estimate the lengths of other objects, and compare and discuss their findings.

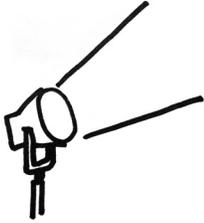
- When working with square units to measure area, students can create basic figures (squares and rectangles) on grid paper. Students should draw a rectangle on 1-inch square (or 1-centimeter square) grid paper using a ruler with the same units. They can measure the length and width of the rectangle by counting the squares on the grid and checking with the ruler. Students can then count the number of squares inside the rectangle, which represents the total area of the figure. They should record length, width, and area in a table. Repeat this for several rectangles of different sizes. Students should discover that a 6 cm x 3 cm rectangle will have eighteen 1 x 1 cm squares inside, or a total of 18 square centimeters. Students can use this information to make the connection to the formula for simple area: $A = l \times w$. This concept may be related to the Numbers and Operations strand concerning understanding the meaning of multiplication. Students should begin to see this process as one way to model the concept.

Further support can be found in the GPS Mathematics Framework:
 Unit 3: *Geometry and Measurement*.

The Mathematics Framework documents are available at
www.georgiastandards.org/mathframework.aspx



Activities



3 Geometry

Georgia Performance Standard M3G1

Within the Geometry domain, students will further develop their understanding of geometric figures by drawing and classifying previously-learned fundamental figures, as well as scalene, isosceles, and equilateral triangles. They will identify and explain the properties of fundamental geometric figures, and examine and compare their angles. Students will identify the center, diameter, and radius of circles.

The following activities develop skills in this domain:

- Games and activities can build skills in classifying shapes and explaining their properties. For example, reveal one characteristic of one shape at a time, using clues such as: *My shape has no square corners.* or *My shape has six faces.* In another round, draw one part of the shape so students can guess what shape it could be and why. Unlike a guess-the-shape approach, where a whole shape is given to start with, students benefit from hearing the thought processes of others trying to understand an undefined shape. Additionally, draw various figures on small pieces of paper and fold them up. Students will take one from a hat or other container. The students then describe the figure using only properties, and have others guess the figure's name. Students can compare and contrast their figures with other figures if they get stuck. For example, if no one has guessed *cone* but someone has already guessed *cylinder*, students can say, *This figure is like a cylinder, but comes to a point.*
- To develop students' familiarity with the three basic features of a circle, students should think of examples of circles in their daily surroundings. Examples include bicycle wheels, analog clocks, CDs and DVDs, plates and cups, Frisbees, and so on. Students can find images of these in magazines or newspapers. Students should cut out and glue them to large pieces of paper. They should use markers to draw the center in about one-third of the images, the diameter in another third, and the radius in the remaining images. Students should exchange papers with other students to identify which elements were drawn in marker on each image. Finally, they should add the other two elements (e.g., if the radius was marked, students should add the center and a diameter). Model this procedure as necessary prior to having the students complete the activity.
- Students will draw and classify fundamental geometric figures as they create shape puzzles. Create a sample puzzle for students using a piece of construction paper or card stock. Use a straightedge to draw a large figure and draw lines to divide it into smaller shapes. For example, a trapezoid could be divided into a square, a rectangle, and a few scalene triangles. Place the pieces in an envelope and draw the outline of the completed figure on the outside of the envelope. Identify each shape as it is removed from the envelope, saying, *"This shape is a scalene triangle in which all three sides are different lengths."* Model an approach to arranging the pieces into the



completed figure shown on the envelope. After seeing the process modeled, students should create their own shape puzzles for others to solve. Students will choose from the following list of shapes: triangles (scalene, isosceles, and equilateral), rectangles, squares, trapezoids, pentagons, and hexagons. As students solve the puzzles, they should use other sheets of paper to draw and label each different shape they encounter.

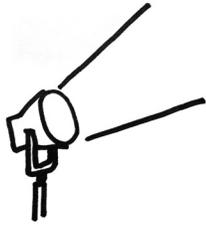
- To reinforce the properties of new figures, students will work together to develop verbal and visual memory cues. Model a few examples with students before beginning the activity. To begin, ask students if anything about the term *quadrilateral* reminds them in some way of the meaning. Elicit student input to model a mnemonic (memory aid) for the term, emphasizing the importance of connecting the word to its meaning. Students should create mnemonics using drawings, word roots, and other associations for a list of 10 geometric terms. Next, they will use these terms in crosswords or similar puzzles. Crossword puzzles help students to connect terms and their meanings, while word search puzzles allow students to practice correct spelling of terms. The Internet has many resources to make and customize such puzzles. Students may work alone or in groups with rotating roles.

Further support can be found in the GPS Mathematics Framework:
Unit 3: *Geometry and Measurement*.

The Mathematics Framework documents are available at
www.georgiastandards.org/mathframework.aspx



Activities



4 Algebra

Georgia Performance Standard M3A1

Within the Algebra domain, students will use mathematical expressions to represent relationships between quantities and interpret given expressions. They will describe and extend numeric and geometric patterns. They will describe and explain a quantitative relationship represented by a formula (such as the perimeter of a geometric figure). Students will use a symbol (such as \triangle or \square) to represent an unknown and find the value of the unknown in a number sentence.

The following activities develop skills in this domain:

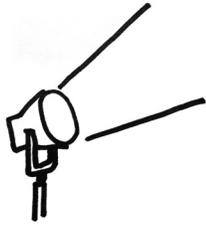
- Students can describe and extend numeric and geometric patterns using pattern blocks and numbers, or using movements such as skipping, hopping, or clapping. After creating their own patterns, students can analyze other students' patterns to figure out the steps used to make each. Students should discuss how they figured out the patterns and how they would describe them to a friend in words or letters (e.g., a pattern of green/red/green/red could be represented as ABAB). Students can then work together to develop a real-life situation consisting of a pattern. For instance, a student might visit the YMCA on Monday, Wednesday, and Thursday and visit his or her grandmother on Tuesday and Friday. Ask students if the real-life pattern matches any of those already created.
- Use flash cards or a flip chart to give students practice working with a quantitative relationship represented by a formula. Create a set of examples of number sentences that represent the perimeter of a rectangle (e.g., $2+4+2+4=12$), the area of a rectangle (e.g., $3\times 6=18$), the perimeter of a square (e.g., $4+4+4+4=16$), and the area of a square (e.g., $5\times 5=25$). Students can guess individually or work as teams to come up with the formula that each number sentence represents. For example, if the number sentence is $3+6+3+6=18$, students should answer, "The perimeter of a rectangle," since they see the sum of two pairs of equal sides.
- For practice using symbols to represent an unknown amount, students should create real-life examples. Provide a few symbols (such as \triangle or \square) to use in place of the unknown, and write them on the board or a flip chart. Students can think of a situation involving an unknown and write it down as a word problem. For example, *A video game costs \$24. I have \$13 saved. How many more dollars do I need to buy the game?* They should then write out a number sentence to represent this problem, such as $24 = 13 + \square$. Rewrite this using another symbol, such as $24 = 13 + \triangle$, and ask students if the value of the unknown changes. Ask them if they can think of a change in the situation they chose that would result in a change in the number sentence. For example, if the video game actually cost \$26, the value of the unknown would change. Students should solve the number sentences and explain their results in the context of the real-life situation. Using the example above, students will solve for $\square = 11$ and explain that they would need \$11 more than what they have already saved to buy the video game.

Further support can be found in the GPS Mathematics Framework:
Unit 1: *Addition and Subtraction of Whole Numbers*; Unit 6: *Algebra*.

The Mathematics Framework documents are available at
www.georgiastandards.org/mathframework.aspx



Activities



5 Data Analysis

Georgia Performance Standard M3D1

Within the Data Analysis and Probability domain, students will create and interpret simple tables and graphs. They will solve problems by organizing and displaying data in bar graphs (using scale increments of 1, 2, 5, and 10) and tables. They will develop and evaluate mathematical arguments and proofs using various types of reasoning and methods of proof.

The following activities develop skills in this domain:

- Take advantage of students' curiosity about their surroundings as they pose information questions and gather data. Students should develop a list of information to gather from friends or neighbors (such as favorite ice cream flavors or colors of bicycles). Students will decide on a category and develop a plan for gathering the data. They should display their data using a bar graph or table.
- Use the results of the activity above, or another set of data displayed in a similar format, as students solve problems using real-life contexts. For each completed graph or table, create a couple of word problems based on the data. For example, if a student has recorded the daily high temperature over the course of a week, generate a word problem based on the graph, such as: *How many degrees greater was the high temperature on Monday than on Thursday?* or *During the week shown on the graph above, how many days had a high temperature of greater than 65° F?* Students should solve the problems using the information displayed in their graph or table.
- To help students interpret simple tables and graphs, choose one set of data and display it in several different forms. For example, use the results of a survey about the different types of pets owned by each student. Some students are likely to own more than one type of pet, so the results can be displayed as a chart, a bar graph, a pictograph, and a Venn diagram. Ask students to answer a question about the data, and explain which display of data they used to determine the answer. Students should understand that some questions can be answered using any display. For example, the question *How many students own a dog?* could be answered using the chart, bar graph, pictograph, or Venn diagram. Other questions can be answered only using certain types of display. For example, the answer to *How many students own both a cat and a dog?* may only be clear from a Venn diagram.
- Students will apply and explain reasoning as they order fractions and mixed numbers. Begin by writing a series of fractions on the board, each with a numerator of 1 such as: $\frac{1}{3}, \frac{1}{6}, \frac{1}{4}, \frac{1}{2}, \frac{1}{5}$. Students will represent each fraction by drawing rectangles divided into the number of equal parts indicated by the denominator, and coloring in the part represented by the numerator. Students can also use fraction strips to visualize the relationship of part to whole. Ask students if they notice a pattern between the fractions



and the sizes of the pieces in each. Students should order the fractions using their visual representations, and explain the reasoning they used to arrive at their answers. Next, write a list of four anchor numbers such as: 0, $\frac{1}{2}$, 1, 2. Leave enough space to draw a bucket between the numbers. Give students a series of fractions and ask them to place each fraction into the appropriate bucket. Students should use reasoning to make decisions, comparing each fraction with the anchor numbers. For example, students might explain the reasoning for placing $\frac{1}{3}$ in the bucket between 0 and $\frac{1}{2}$ using what they learned in the first half of the activity about fractions with the same numerator. Students might explain the decision to place $\frac{5}{8}$ between $\frac{1}{2}$ and 1 by showing how $\frac{1}{2} = \frac{4}{8}$ and $1 = \frac{8}{8}$. The student can then reason that $\frac{5}{8}$ must fall between them. Students should explain each choice using words, pictures, and their knowledge of numbers.

Further support can be found in the GPS Mathematics Framework:
Unit 5: *Data Analysis*.

The Mathematics Framework documents are available at
www.georgiastandards.org/mathframework.aspx



Practice Quiz

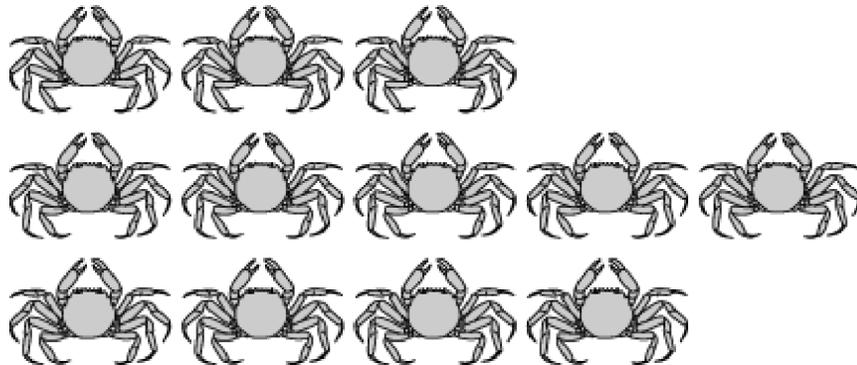


- Which statement is true about the number sentence $20 \times 4 = 80$?**
 - It is the area of a square with 20 cm sides.
 - It is the area of a square with 80 cm sides.
 - It is the area of a rectangle with length 20 cm and width 4 cm.
 - It is the area of a rectangle with length 80 cm and width 4 cm.

- Randy has 47 CDs and his sister has 21 CDs. About how many CDs do they have in all?**
 - 50
 - 60
 - 70
 - 80

- Jamal stores his toy cars in a case. The case has 7 rows, with 6 cars in each row. Which number sentence shows the total number of cars in Jamal's case?**
 - $7 + 6 = 13$
 - $7 \times 6 = 42$
 - $6 + 6 + 6 + 6 + 6 + 6 = 36$
 - $7 + 7 + 7 + 7 + 7 + 7 + 7 = 49$

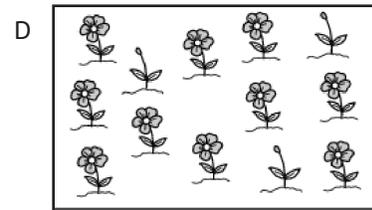
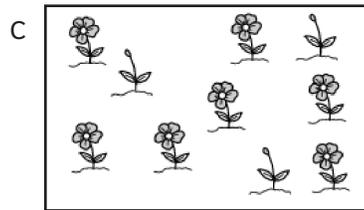
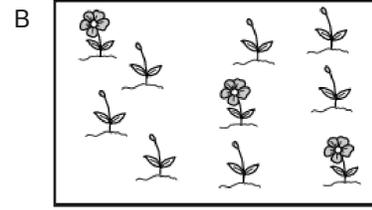
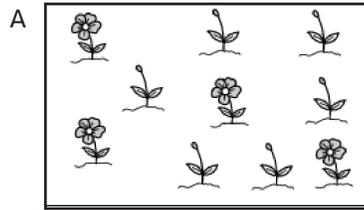
- Ms. Jenkins must put ALL of the crabs she found at the beach into buckets.**



Which of these describes how each bucket can have an equal number of crabs?

- 2 buckets with 4 crabs each
- 3 buckets with 3 crabs each
- 3 buckets with 4 crabs each
- 4 buckets with 4 crabs each

- 5 **Maria planted 10 daisies in her flower garden. On Monday, $\frac{4}{10}$ of the daisies were blooming. By Wednesday $\frac{3}{10}$ MORE of the daisies were blooming. Which picture shows the garden on Wednesday?**



- 6 **Ricky's mom dropped him off at the library at the time shown. She picked him up a half-hour later.**

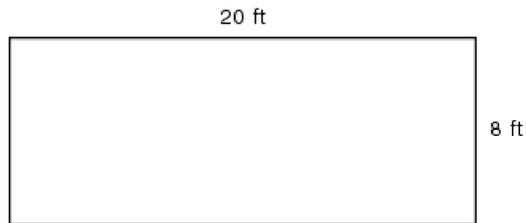


What time did Ricky's mom pick him up?

- A 5:00
- B 5:15
- C 5:30
- D 5:45

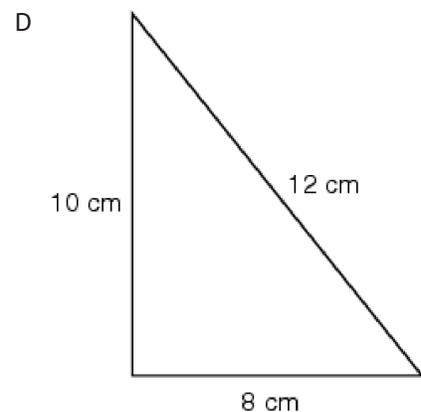
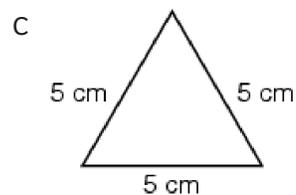
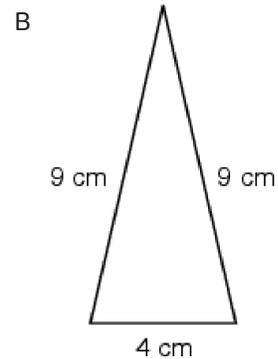
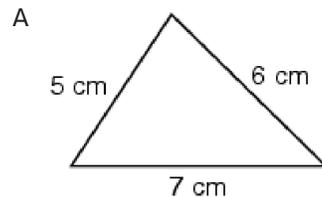


- 7 **Pleasant Hill Elementary School has an outdoor picnic space for students to use on warm days. This year the principal wants to put a fence around the space.**



How many feet of fencing does the principal need?

- A 28 ft
 - B 56 ft
 - C 160 ft
 - D 320 ft
- 8 **Tracy cuts a piece of cloth into the shape of an equilateral triangle. Which of these is an equilateral triangle?**

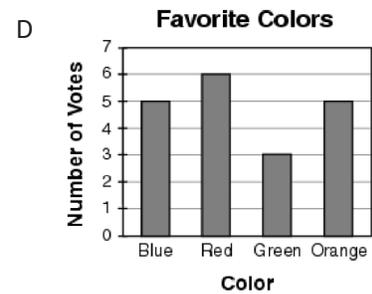
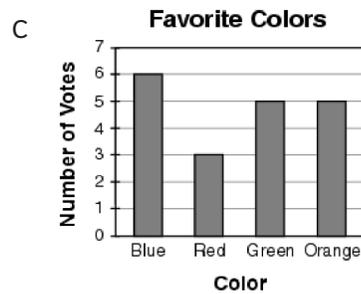
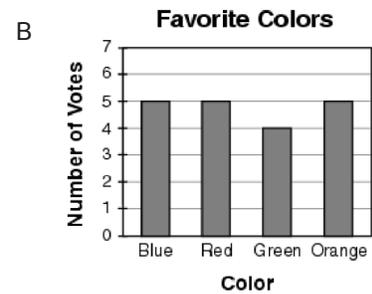
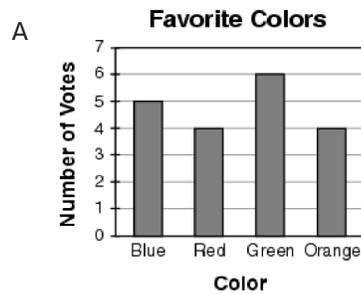


- 9 **Mr. Arrito rewards his students by putting marbles in a jar. The jar can hold 25 marbles. The students have earned 8 marbles so far. Mr. Arrito uses this number sentence to find the number of marbles the students still need to earn.**

$$8 + \triangle = 25$$

How many marbles do the students still need to earn?

- A 8 marbles
 - B 17 marbles
 - C 27 marbles
 - D 33 marbles
- 10 **Ms. Clark surveyed her students to find out their favorite colors. She found that more students like red than blue. Which bar graph shows this information?**





Solutions

Number	Correct Answer	Explanation
1	C	<p><i>Understand the meaning of the square unit and measurement in area. (M3M4a)</i></p> <p>The correct answer is Choice (C) It is the area of a rectangle with length 20 cm and width 4 cm. The area of a rectangle is found by multiplying the length by the width. Choice (A) is incorrect because the number sentence for the area of a square with 20 cm sides would be $20 \times 20 = 400$. Choice (B) is incorrect because the number sentence for the area of a square with 80 cm sides would be $80 \times 80 = 6400$. Choice (D) is incorrect because the number sentence for the area of a rectangle with 80 cm and 4 cm sides would be $80 \times 4 = 320$.</p>
2	C	<p><i>Use mental math and estimation strategies to add and subtract. (M3N2b)</i></p> <p>The correct answer is Choice (C) 70. The phrase <i>About how many...in all?</i> is a cue to <i>estimate</i> the sum. 47 is close to 50 and 21 is close to 20, so $50 + 20 = 70$ is a good estimate. Choice (A) is incorrect because 50 is close to the number of CDs Randy has, but ignores those his sister has. Choices (B) and (D) are incorrect because they are significantly smaller and larger, respectively, than the estimated sum.</p>
3	B	<p><i>Know the multiplication facts with understanding and fluency to 10 x 10. (M3N3b)</i></p> <p>The correct answer is Choice (B) $7 \times 6 = 42$. The number of cars in each row must be added seven times to get the total ($6+6+6+6+6+6+6=42$). Using the distributive property of multiplication, this can also be expressed as $7 \times 6 = 42$. Choice (A) is incorrect because it uses addition, not multiplication. Choice (C) is incorrect because it represents 6 rows of 6 cars each. Choice (D) is incorrect because it represents 7 rows of 7 cars each.</p>

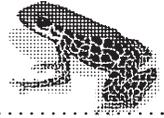


Number	Correct Answer	Explanation
4	C	<p><i>Recognize that division may be two situations: the first is determining how many equal parts of a given size or amount may be taken away from the whole, as in repeated subtraction, and the second is determining the size of the parts when the whole is separated into a given number of equal parts, as in a sharing model. (M3N4b)</i></p> <p>The correct answer is Choice (C) 3 buckets with 4 crabs each. There are 12 crabs in total. There is more than one way to divide the crabs evenly among buckets with none left over (e.g., 6 buckets with 2 crabs each, 2 buckets with 6 crabs each). But Choice (C) is the only option given that equals exactly 12 crabs with no crabs left over. Choice (A) is incorrect because the total is only 8 crabs. Choice (B) is incorrect because the total is only 9 crabs. Choice (D) is incorrect because the total is 16 crabs.</p>
5	C	<p><i>Solve problems involving fractions. (M3N5g)</i></p> <p>The correct answer is Choice (C). The word MORE is capitalized as a clue to understand that the daisies blooming on Wednesday must be added to the original number of daisies blooming on Monday: 4 out of 10 plus 3 out of 10 equals 7 out of 10. This picture shows 7 of the 10 daisies blooming. Choice (A) is incorrect because the picture represents 4 flowers blooming out of 10, or the number blooming on Monday alone. Choice (B) is incorrect because the picture represents 3 flowers blooming out of 10, or the number blooming on Wednesday alone. Choice (D) is incorrect because it shows 10 flowers blooming out of a total of 13 flowers.</p>
6	B	<p><i>Students will further develop their understanding of the concept of time by determining elapsed time of a full, half- and quarter-hour. (M3M1)</i></p> <p>The correct answer is Choice (B) 5:15. The clock shows 4:45. A half-hour later is 30 minutes more. Choice (A) is incorrect because 5:00 is only 15 minutes later than shown. Choice (C) is incorrect because 5:30 is 45 minutes later than shown. Choice (D) is incorrect because 5:45 is one hour later than shown.</p>



Number	Correct Answer	Explanation
7	B	<p><i>Determine the perimeter of a simple geometric figure by measuring and summing the lengths of the sides. (M3M3c)</i></p> <p>The correct answer is Choice (B) 56 ft. The perimeter is the sum of the sides of the rectangle: 20 ft. + 8 ft. + 20 ft. + 8 ft. = 56 ft. Choice (A) is incorrect because 28 feet is the sum of only two sides labeled on the figure. Choice (C) is incorrect because 160 feet is the result when 20 feet is multiplied by 8 feet, which gives the <i>area</i> of the rectangle, rather than the perimeter. Choice (D) is incorrect because 320 feet is twice the area of the rectangle.</p>
8	C	<p><i>Draw and classify previously-learned fundamental geometric figures and scalene, isosceles, and equilateral triangles. (M3G1a)</i></p> <p>The correct answer is Choice (C). An equilateral triangle is characterized by 3 equal sides. Choice (A) is incorrect because the triangle shown is a scalene triangle, with three sides of different lengths. Choice (B) is incorrect because it is an isosceles triangle, with two equal sides. Choice (D) is incorrect because it is a scalene right triangle, with three sides of different lengths.</p>
9	B	<p><i>Use a symbol, such as \square and \triangle, to represent an unknown and find the value of the unknown in a number sentence (M3A1c).</i></p> <p>The correct answer is Choice (B) 17 marbles. The triangle represents the number of marbles the students still need to earn, and the expression indicates that the number 8, plus some number, will total 25. Whether working with a subtraction problem or counting up from 8, the number needed to complete the number sentence is 17. Choice (A) is incorrect because 8 is the number of marbles the students have already earned, not the number they still need to earn. Choices (C) and (D) are incorrect because the jar can hold only 25 marbles.</p>
10	D	<p><i>Solve problems by organizing and displaying data in bar graphs and tables. (M3D1a)</i></p> <p>The correct answer is Choice (D). The words “more students like red than blue” indicate that the bar representing the number of votes for red must be higher than the bar for blue. Choices (A) and (C) are incorrect because the opposite is true; the bar for blue is higher than the bar for red. Choice (B) is incorrect because the bars for red and blue are equal.</p>

Science



Science

Students in Grade 3 will use inquiry to focus on questions about the world around them. They will observe, construct, and measure objects using ordinary hand tools. They will represent objects in the real world with geometric figures, number sequences, graphs, diagrams, maps, and stories. Grade 3 students will be able to explain how heat is produced and the effects of heating and cooling; describe the effect of magnets on common objects and in other magnets; describe the ways in which the parts of an object influence or interact with one another; recognize the effects of pollution and humans on the environment; and differentiate between regions in Georgia and the organisms that live in our state. In Grade 3, students will use information about the relationship between the form and shape of an object, and that object's use, operation, or function, to explain fossils, rock cycles, and features of plants and animals.

The Science activities focus on some of the concepts that are assessed on the Grade 3 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 S3E1 and S3E2

Within the Earth Science domain, students are expected to understand the differences between rocks and minerals and identify the physical characteristics of each. Students will use tools of observation to compare and contrast types of topsoil and recognize how wind and water cause rock and soil to change over time. They will investigate fossils as evidence of organisms that lived long ago by observing authentic fossils or using information resources, and will describe how fossils form.

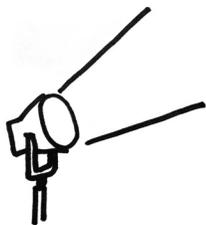
The following activities develop skills in this domain:

- Characterizing and comparing the texture, particle size, color, and absorption of soils is essential to understanding how soil types differ. Provide students with 3 cups of labeled topsoil to test (clay, loam potting soil, and sand). Students will compare soils using readily available materials (e.g., coffee filters, strainers/sieves, jars, water). Students may add water to soil and filter it through a coffee filter, recording how long it takes the water to drain; use strainers or sieves to separate soils into different-sized particles; and/or add soil to water in a jar, shake it thoroughly, and record the different soil layers that settle out over 24 hours. Each student will develop a procedure for classifying soils and write a lab report describing the method so that others can reproduce it. Students' reports should also include the results of their methods for each soil type tested.
- An identification activity can help students learn the distinguishing characteristics of rocks and minerals. With students, research ways to identify rocks and minerals using readily available equipment (e.g., a penny, coarse grit sandpaper, a hand lens, a piece of quartz). Set up "stations" around the room, each with a rock or mineral, an identification question (e.g., *Is this mineral harder than a penny? Will this mineral sink or float in water? Is this an example of a rock or a mineral? Which of these rocks contains quartz? How is this rock containing fluorite different from a sample of fluorite?*), and the tools needed to answer it (including simple descriptions of different rocks). Students will bring their notebooks to each station to record their answers to each question.
- To help students understand how some fossils were created, create plaster casts of organisms. Explain to students that a fossil can be created when an organism leaves its imprint behind in soft mud, either from its remains or by touching the ground. Pour out some plaster of Paris (or another hardening mixture, such as flour and water) onto paper plates. Students will create imprints by pressing items such as shells, leaves, twigs, seeds, and rubber insects into the plaster and lifting them quickly, then letting the plaster dry. Ask students, *How is your fossil different from the organism you used to make it?* Discuss with students famous fossils created in this way (such as the *Laetoli hominid* footprints or dinosaur tracks) then compare and contrast natural fossil formation with the casts the students made.

Further support can be found in the GPS Science Framework: *Fossils and Rocks and Soils*.

The Science Framework documents are available at
www.georgiastandards.org/scienceframework.aspx

Activities



2 Physical Science

Georgia Performance Standards S3P1 and S3P2

Within the Physical Science domain, students are expected to categorize ways that heat is produced (burning, friction, and mixing certain compounds together). Students will understand that temperature reflects heat and explain how heat can be transferred. They will use thermometers to measure the changes in temperature of water samples (hot, warm, cold) over time. Students will investigate transfer of heat from the sun to various materials. They will investigate the effects of insulation on heating and cooling. Students will identify common objects that are attracted by magnets, and describe how magnets repel and attract one another.

The following activities develop skills in this domain:

- To explain conductivity, demonstrate the transfer of heat through different materials. Place a wooden spoon and a similar-sized metal spoon in water heated to below the boiling point. Students should predict which spoon will become hotter the fastest. (Do not allow students to handle the water or equipment.) Measure the temperature of the spoons and discuss whether students' predictions were accurate. Explain that heat moved through the metal spoon faster than the wooden spoon. Tell students to touch a metal object, such as a desk leg, and a wooden object, such as a desktop. Ask, *Which feels colder?* Relate this experience to heat conduction. Next, heat two metal spoons to different temperatures and place each into a beaker of room-temperature water. Measure the change in the water's temperature. Students should conclude that thermal energy from the spoons moved into the water, causing its temperature to rise. Students will understand the term *conductor of heat* and distinguish poor conductors from good conductors.
- Students will use magnets (such as refrigerator magnets) and simple objects made of various materials (pennies, nails, paper clips, teaspoons, rubber bands, chalk, rubber combs, plastic pen caps, glass marbles, etc.) to investigate magnetism in a real-life context. Hold up each item and ask, *Do you think this will be attracted to a magnet?* Students will record their predictions on a sheet of paper. They will then manipulate the objects to determine which are magnetic. Students should classify the objects according to their magnetic properties, and describe characteristics that they have in common. At the end of the exercise, students should explain whether their predictions were correct and if any results were surprising.
- A *Mystery Magnet Challenge* will allow students to apply their understanding of how magnetic poles behave. Provide students with three to five bar magnets with unlabeled poles (if needed, cover pole labels with electrical tape). Students will manipulate the magnets to determine which poles are the same and which are different. Set up a station with a single bar magnet with labeled poles. Students will take *one* of their mystery magnets to the station and determine how it attracts and repels the labeled magnet. They should

then return to their mystery magnets and use the information to correctly label all the poles.

- The following investigation will help students understand the factors affecting heat transfer. Students should perform an experiment to determine how container color and container material affect the cooling of a heated cup of water. For each experiment, students will use three to four containers, heated water (100 mL per container), a thermometer, and a watch or clock. (If testing color of container, the cups should be placed in direct sunlight.) Students should record the temperature of the water at the beginning of the experiment and then at one-minute intervals. They will enter this data in a pre-formatted table and (optionally) graph it.

Example of pre-formatted table:

Temperature of Water Over Time

Time:	0 min	1 min	2 min	3 min	4 min	5 min	6 min	...
-------	-------	-------	-------	-------	-------	-------	-------	-----

Cup 1								
-------	--	--	--	--	--	--	--	--

Cup 2								
-------	--	--	--	--	--	--	--	--

Cup 3								
-------	--	--	--	--	--	--	--	--

Further support can be found in the GPS Science Framework: *Heat and Magnets*

The Science Framework documents are available at
www.georgiastandards.org/scienceframework.aspx



Activities



3 Life Science

Georgia Performance Standards S3L1 and S3L2

Within the Life Science domain, students will investigate the habitats of different organisms and the ways organisms depend on their habitat. They will differentiate among the regions of Georgia (mountains, marsh/swamp, coast, Piedmont, Atlantic Ocean) and the organisms that live there. Students will identify features of green plants and animals that allow organisms to live and thrive in different regions of Georgia. They will explain what will happen to an organism if its habitat is changed, and recognize the effects of pollution and human beings on the environment. Students will explain the effects of pollution on habitats and identify ways to protect the environment (e.g., conservation, recycling).

The following activities develop skills in this domain:

- Studying the physical components of a habitat is important for understanding how that habitat supports living things. Students will create and play a quiz show game using 5x8 inch index cards. On one side of each card, students will write the name of one of Georgia's major regions (mountains, marsh/swamp, coast, Piedmont, Atlantic Ocean). Supply students with books or Internet sites that have relevant information, such as relative elevation, soil type, landscape features, temperature, rainfall, and seasonal changes. On the other side of each card, students will write or draw a physical characteristic of the region. Play by placing the cards at random on a board or table, turned to their informational sides. Students will name the correct region.
- To understand that pollution comes from many sources, students will investigate the components of daily household trash. Students will record in their journals which items are thrown away in the kitchen, office, or family room garbage (being careful only to look at and not touch the garbage). They should answer the following questions about the trash items:
 - *What is it made of (paper, plastic, metal, food, etc.)?*
 - *Can it be recycled?*
 - *Will it break down naturally in a landfill? (Is it biodegradable?)*
 - *Could it have been reused instead of discarded?*
 - *How could we do without this item?*

Students will discuss the major sources of household garbage and research how long it takes plastic materials to break down. They should come up with ways to reduce and reuse non-recyclable materials.

- To understand that plants and animals are adapted to their habitats, students will explore one plant and one animal native to a Georgia region. With teacher guidance, students will research each organism's characteristics and habitat using library and/or Internet resources. They should write a description of each organism's traits and explain how these traits help it survive in its habitat. The following thought questions will help students organize their writing:



-
- *What does the animal eat? How does the plant get energy and nutrients?* (Remember that plants' nutrients come from the soil or water.)
 - *Which predators eat the animal? Which consumers eat the plant?*
 - *How does the habitat of the organism help it to thrive?* (For example, an area with few large trees may help smaller plants that require a lot of sunlight. Fish may lay eggs among plants to keep them hidden. Other animals may hide in burrows they dig in the soil.)

Students should produce a written description and a diagram or illustration of each organism.

- Exploring the relationships among pollution, habitat, and organism will help students recognize the harmful effects of pollution. Create a short list of endangered or threatened Georgia wildlife. Discuss with students how various types of pollution affect Georgia's air, rivers, marshes, swamps, soil, and coastal waters. (Pollution can include the effects of development.) Students will research the effects of pollution on a Georgia region and the resulting effect on an endangered organism. Students will then write letters to their state or congressional representatives explaining the harmful effects of pollution and suggesting appropriate action.

Further support can be found in the GPS Science Framework: *Habitats and Interdependence of Man—Pollution and Conservation*

The Science Framework documents are available at
www.georgiastandards.org/scienceframework.aspx



Practice Quiz



- 1 Maleka places four gym bags of different colors in the sun. She then puts a cold can of soda in each bag. Which color bag would MOST LIKELY keep the soda coolest in the summer?**
 - A white
 - B yellow
 - C blue
 - D black

- 2 Manuel is using a magnet to see if certain objects are attracted to it. Which item would be attracted to the magnet?**
 - A nail
 - B penny
 - C rubber band
 - D piece of string

- 3 The Gopher Tortoise is Georgia's state reptile. It lives in underground burrows in the coastal plain. Which of these would BEST help the Gopher Tortoise live in this area?**
 - A long legs for climbing steep cliffs
 - B sharp claws for digging in loamy soil
 - C long neck for finding food in tall grasses
 - D flipper-shaped front legs for digging in sand

- 4 The brown thrasher is a bird that lives in shrubs, overgrown fields, and thickets in Georgia. Recently, scientists discovered that the Brown Thrasher population was decreasing. What MOST LIKELY caused this to happen?**
 - A The Brown Thrashers stopped growing.
 - B The Brown Thrasher's life cycle changed.
 - C Other kinds of birds left the Thrasher's habitat.
 - D New buildings were built in the Thrasher's habitat.

- 5 Which of these would MOST LIKELY be a direct effect of dumping plastic bags in Georgia's forests?**
 - A The bags would break down dead plants.
 - B The bags would provide fertilizer for plants.
 - C Animals would be hurt by trying to eat the bags.
 - D Animals would make better homes with the bags.

- 6 A class determined that cups made of foam kept water cold longer than cups made of glass. Why do foam cups insulate better than glass cups?**
 - A Foam gets cold faster than glass.
 - B Foam keeps heat away from the water.
 - C Foam lets extra cold air reach the water.
 - D Foam allows more heat through than glass.



- 7 Lee made a poster that shows ways people protect the environment. Which of these activities might be on Lee's poster?

A



B



C



D



- 8 James is at a museum and sees a pattern of a fern leaf on the side of a rock. He knows that this pattern is a fossil.



Which of these describes how the fossil of the fern leaf was MOST LIKELY made?

- A The sun baked the leaf pattern into the rock.
- B Rainwater stained the leaf pattern on the rock.
- C Minerals from the air caused the leaf to appear on the rock.
- D Minerals in the ground replaced the fern leaf as the leaf broke down.



- 9 **Scott concludes that a sample of soil is sand. Which of these features would support Scott's conclusion?**
- A small particle size and water flows through slowly
 - B small particle size and water flows through quickly
 - C large particle size and water flows through slowly
 - D large particle size and water flows through quickly
- 10 **A large, rough rock sits at the edge of a river. Over a period of many years, how will the rock MOST LIKELY change?**
- A It will become larger and less smooth.
 - B It will become larger and smoother.
 - C It will become smaller and less smooth.
 - D It will become smaller and smoother.



Solutions

Number	Correct Answer	Explanation
1	A	<p><i>Investigate the transfer of heat from the sun to various materials. (S3P1c)</i></p> <p>The correct answer is Choice (A) white. White objects reflect more light than other colors, and therefore, heat up the slowest. Choices (B) <i>yellow</i>, (C) <i>blue</i>, and (D) <i>black</i> are all darker colors, and therefore absorb more light than white. This absorbed light causes the bags to heat up more quickly.</p>
2	A	<p><i>Investigate to find common objects that are attracted to magnets. (S3P2a)</i></p> <p>The correct answer is Choice (A) nail. Nails are made of iron. A magnet attracts anything made of iron or steel. Choices (B) <i>penny</i>, (C) <i>rubber band</i>, and (D) <i>piece of string</i> are not made of materials that are attracted to magnets. While pennies are made of a 95-percent copper alloy, this metal is not attracted to magnets.</p>
3	D	<p><i>Identify features of animals that allow them to live and thrive in different regions of Georgia. (S3L1c)</i></p> <p>The correct answer is Choice (D) flipper-shaped front legs for digging in sand. This trait would best help the Gopher Tortoise in its natural habitat, the coastal plain, which features wet sand. Choices (A) <i>long legs for climbing steep cliffs</i>, (B) <i>sharp claws for digging in loamy soil</i>, and (C) <i>long neck for finding food in tall grasses</i> describe features that are not found on the coastal plain, and traits that are not shared by the Gopher Tortoise.</p>
4	D	<p><i>Explain what will happen to an organism if the habitat is changed. (S3L1d)</i></p> <p>The correct answer is Choice (D) New buildings were built in the Thrasher's habitat. Development often destroys natural habitats, which leads to animal population declines. Choices (A) and (B) are unlikely to occur, while Choice (C) would most likely lead to an increase in the Thrasher population, due to decreased competition.</p>



Number	Correct Answer	Explanation
5	C	<p><i>Explain the effects of pollution (such as littering) on the habitats of plants and animals. (S3L2a)</i></p> <p>The correct answer is Choice (C) Animals would be hurt by trying to eat the bags. Plastic does not break down and is likely to harm organisms when it is dumped in natural settings. Plastic does not (A) <i>break down dead plants</i>, nor (B) <i>provide fertilizer for plants</i>. A possible, but unlikely choice is (D) <i>Animals would make better homes with the bags</i>. However, it is more likely that the bags will have a harmful effect on the environment.</p>
6	B	<p><i>Investigate how insulation affects heating and cooling. (S3P1b)</i></p> <p>The correct answer is Choice (B) Foam keeps heat away from the water. Foam is a good insulator, which helps keep outside temperatures from affecting the liquid inside the cup. Choices (A), (C), and (D) are incorrect because they describe features of poor insulators rather than good insulators, and foam is a good insulator. Good insulators do not: (A) get cold faster than glass, (C) let extra cold air reach the water, nor (D) let more heat through than glass.</p>
7	C	<p><i>Identify ways to protect the environment. (S3L2b)</i></p> <ul style="list-style-type: none">• <i>Conservation of resources</i>• <i>Recycling of materials</i> <p>The correct answer is Choice (C). Choice (A), which depicts littering, and (D), which depicts wasting water, are both harmful to the environment. Choice (B), which depicts building a snowman, is neither harmful nor protective.</p>
8	D	<p><i>Describe how a fossil is formed. (S3E2b)</i></p> <p>The correct answer is Choice (D) Minerals in the ground replaced the fern leaf as the leaf broke down. Choice (A) is incorrect because fossils don't develop by baking in the sun. Choice (B) is incorrect because fossils do not form by staining from rainwater. Choice (C) is incorrect because fossils do not develop in the open air. They are made in rock formations and sedimentary layers.</p>

Number	Correct Answer	Explanation
9	D	<p><i>Use observation to compare the similarities and differences of texture, particle size, and color in topsoil (such as clay, loam, potting soil, and sand). (S3E1c)</i></p> <p>The correct answer is Choice (D) large particle size and water flows through quickly. Choices (A) and (B) are incorrect because they include <i>small particle size</i>, which is a characteristic of clay soils. Choices (A) and (C) are incorrect because they include that <i>water flows through slowly</i>, a characteristic of absorbent, loamy soils.</p>
10	D	<p><i>Determine how water and wind can change rocks and soil over time, using observation and research. (S3E1d)</i></p> <p>The correct answer is Choice (D) It will become smaller and smoother. Moving water wears away at rock, causing it to become smaller and smoother over a period of time. It does not cause rocks to become <i>larger</i>, as in choices (A) and (B). It does not result in rock becoming <i>less smooth</i>, as in choices (A) and (C).</p>

