The Study/Resource Guides are intended to serve as a resource for parents and students. They contain practice questions and learning activities for each content area. The standards identified in the Study/Resource Guides address a sampling of the state-mandated content standards.

For the purposes of day-to-day classroom instruction, teachers should consult the wide array of resources that can be found at www.georgiastandards.org.
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Dear Student,

This Georgia Milestones Grade 5 Study/Resource Guide for Students and Parents is intended as a resource for parents and students. It contains sample questions and helpful activities to give you an idea of what test questions look like on Georgia Milestones and what the Grade 5 End-of-Grade (EOG) assessment covers.

These sample questions are fully explained and will tell you why each answer is either correct or incorrect.

*Get ready—open this guide—and get started!*
HOW TO USE THIS GUIDE

Let’s get started!

★ Get it together!
- This guide
- Pen or pencil
- Highlighter
- Paper

★ Gather materials
- Classroom notebooks
- Textbooks

★ Study space
- Find a comfortable place to sit.
- Use good lighting.
- Time to focus—no TV, games, or phones!

★ Study time
- Set aside some time after school.
- Set a goal—how long are you going to study?
- Remember—you cannot do this all at one time.
- Study a little at a time every day.

★ Study buddy
- Work with a friend, sister, brother, parent—anyone who can help!
- Ask questions—it is better to ask now and get answers.
- Make sure you know what you need to do—read the directions before you start.
- Ask your teacher if you need help.

★ Test-taking help
- Read each question and all of the answer choices carefully.
- Be neat—use scratch paper.
- Check your work!
PREPARING FOR TAKING TESTS

Getting ready!

Here are some ideas to think about before you take a test.

- Get plenty of rest and eat right. Take care of your body and your mind will do the rest.

- If you are worried about a test, don’t be. Talk with a teacher, parent, or friend about what is expected of you.

- Review the things you have learned all year long. Feel good about it.

- Remember that a test is just one look at what you know. Your class work, projects, and other tests will also show your teachers how much you have learned throughout the year.

Try your best!
OVERVIEW OF THE END-OF-GRADE ASSESSMENT

What is on the End-of-Grade Assessment?

✽ English Language Arts (ELA)
✽ Mathematics
✽ Science
✽ Social Studies

TYPES OF ITEMS

✽ Selected-response items—also called multiple-choice
  - English Language Arts (ELA), Mathematics, Science, and Social Studies
  - There is a question, problem, or statement that is followed by four answer choices.
  - There is only ONE right answer, so read EACH answer choice carefully.
  - Start by eliminating the answers that you know are wrong.
  - Then look for the answer that is the BEST choice.

✽ Constructed-response items
  - English Language Arts (ELA) and Mathematics only
  - There is a question, problem, or statement but no answer choices.
  - You have to write your answer or work out a problem.
  - Read the question carefully and think about what you are asked to do.
  - In English Language Arts (ELA), go back to the passage to look for details and information.
  - You will be scored on accuracy and how well you support your answer with evidence.

✽ Extended constructed-response items
  - English Language Arts (ELA) and Mathematics only
  - These are similar to the constructed-response items.
  - Sometimes they have more than one part, or they require a longer answer.
  - Check that you have answered all parts of the question.

✽ Extended writing prompt
  - English Language Arts (ELA) only
  - There is a question, problem, or statement.
  - You may be asked to do more than one thing.
  - In English Language Arts (ELA), you will be asked to read two passages and then write an essay.
  - You will be scored on how well you answer the question and the quality of your writing.
  - Organize your ideas clearly.
  - Use correct grammar, punctuation, and spelling.
  - Support your answer with evidence from the text.
DEPTH OF KNOWLEDGE

Test questions are designed with a Depth of Knowledge (DOK) level in mind. As you go from Level 1 to Level 4, the questions get more and more challenging. They take more thinking and reasoning to answer. You may have experienced these types of questions in your classroom as your teachers find ways to challenge you each day.

A Level 1 item may not require as much thinking as a Level 4 item—but that does not mean it’s easy.

A Level 4 item may have more than one part or ask you to write something.

Here is some information to help you understand just what a DOK level really is.

**Level 1 (Recall of Information)**
- Identify, list, or define something.
- Questions may start with who, what, when, and where.
- Recall facts, terms, or identify information.

**Level 2 (Basic Reasoning)**
- Think about things—it is more than just remembering something.
- Describe or explain something.
- Answer the questions “how” or “why.”

**Level 3 (Complex Reasoning)**
- Go beyond explaining or describing “how and why.”
- Explain or justify your answers.
- Give reasons and evidence for your response.
- Make connections and explain a concept or a “big idea.”

**Level 4 (Extended Reasoning)**
- Complex thinking required!
- Plan, investigate, or apply a deeper understanding.
- These items will take more time to write.
- Connect and relate ideas.
- Show evidence by doing a task, creating a product, or writing a response.
## Depth of Knowledge

### Level 1—Recall of Information

Level 1 asks you to identify, list, or define. You may be asked to recall who, what, when, and where. You may also be asked to recall facts and terms or identify information in documents, quotations, maps, charts, tables, graphs, or illustrations. Items that ask you to “describe” and/or “explain” could be Level 1 or Level 2. A Level 1 item requires that you just recall, recite, or repeat information.

<table>
<thead>
<tr>
<th>Skills Demonstrated</th>
<th>Question Cues</th>
</tr>
</thead>
<tbody>
<tr>
<td>Make observations</td>
<td>Tell who, what, when, or where</td>
</tr>
<tr>
<td>Recall information</td>
<td>Find</td>
</tr>
<tr>
<td>Recognize formulas, properties, patterns, processes</td>
<td>List</td>
</tr>
<tr>
<td>Know vocabulary, definitions</td>
<td>Define</td>
</tr>
<tr>
<td>Know basic concepts</td>
<td>Identify; label; name</td>
</tr>
<tr>
<td>Perform one-step processes</td>
<td>Choose; select</td>
</tr>
<tr>
<td>Translate from one representation to another</td>
<td>Compute; estimate</td>
</tr>
<tr>
<td>Identify relationships</td>
<td>Express as</td>
</tr>
<tr>
<td></td>
<td>Read from data displays</td>
</tr>
<tr>
<td></td>
<td>Order</td>
</tr>
</tbody>
</table>

### Level 2—Basic Reasoning

Level 2 includes some thinking that goes beyond recalling or repeating a response. A Level 2 “describe” and/or “explain” item would require that you go beyond a description or explanation of information to describe and/or explain a result or “how” or “why.”

<table>
<thead>
<tr>
<th>Skills Demonstrated</th>
<th>Question Cues</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apply learned information to abstract and real-life situations</td>
<td>Apply</td>
</tr>
<tr>
<td>Use methods, concepts, and theories in abstract and real-life situations</td>
<td>Calculate; solve</td>
</tr>
<tr>
<td>Perform multi-step processes</td>
<td>Complete</td>
</tr>
<tr>
<td>Solve problems using required skills or knowledge (requires more than habitual response)</td>
<td>Describe</td>
</tr>
<tr>
<td>Make a decision about how to proceed</td>
<td>Explain how; demonstrate</td>
</tr>
<tr>
<td>Identify and organize components of a whole</td>
<td>Construct data displays</td>
</tr>
<tr>
<td>Extend patterns</td>
<td>Construct; draw</td>
</tr>
<tr>
<td>Identify/describe cause and effect</td>
<td>Analyze</td>
</tr>
<tr>
<td>Recognize unstated assumptions; make inferences</td>
<td>Extend</td>
</tr>
<tr>
<td>Interpret facts</td>
<td>Connect</td>
</tr>
<tr>
<td>Compare or contrast simple concepts/ideas</td>
<td>Classify</td>
</tr>
<tr>
<td></td>
<td>Arrange</td>
</tr>
<tr>
<td></td>
<td>Compare; contrast</td>
</tr>
</tbody>
</table>
### Level 3—Complex Reasoning

Level 3 requires reasoning, using evidence, and thinking on a higher level than Level 1 and Level 2. You will go beyond explaining or describing “how and why” to justifying the “how and why” through reasons and evidence. Level 3 items often involve making connections across time and place to explain a concept or a “big idea.”

<table>
<thead>
<tr>
<th>Skills Demonstrated</th>
<th>Question Cues</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solve an open-ended problem with more than one correct answer</td>
<td>Plan; prepare</td>
</tr>
<tr>
<td>Create a pattern</td>
<td>Predict</td>
</tr>
<tr>
<td>Generalize from given facts</td>
<td>Create; design</td>
</tr>
<tr>
<td>Relate knowledge from several sources</td>
<td>Ask “what if?” questions</td>
</tr>
<tr>
<td>Draw conclusions</td>
<td>Generalize</td>
</tr>
<tr>
<td>Make predictions</td>
<td>Justify; explain why; support; convince</td>
</tr>
<tr>
<td>Translate knowledge into new contexts</td>
<td>Assess</td>
</tr>
<tr>
<td>Compare and discriminate between ideas</td>
<td>Rank; grade</td>
</tr>
<tr>
<td>Assess value of methods, concepts, theories, processes, and formulas</td>
<td>Test; judge</td>
</tr>
<tr>
<td>Make choices based on a reasoned argument</td>
<td>Recommend</td>
</tr>
<tr>
<td>Verify the value of evidence, information, numbers, and data</td>
<td>Select</td>
</tr>
<tr>
<td></td>
<td>Conclude</td>
</tr>
</tbody>
</table>

### Level 4—Extended Reasoning

Level 4 requires the complex reasoning of Level 3 with the addition of planning, investigating, applying deeper understanding, and/or developing that will require a longer period of time. You may be asked to connect and relate ideas and concepts within the content area or among content areas in order to be at this highest level. The Level 4 items would be a show of evidence—through a task, a product, or an extended response—that the higher level demands have been met.

<table>
<thead>
<tr>
<th>Skills Demonstrated</th>
<th>Question Cues</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analyze and synthesize information from multiple sources</td>
<td>Design</td>
</tr>
<tr>
<td>Examine and explain alternative perspectives across a variety of sources</td>
<td>Connect</td>
</tr>
<tr>
<td>Describe and illustrate how common themes are found across texts from different cultures</td>
<td>Synthesize</td>
</tr>
<tr>
<td>Apply mathematical models to illuminate a problem or situation</td>
<td>Apply concepts</td>
</tr>
<tr>
<td>Design a mathematical model to inform and solve a practical or abstract situation</td>
<td>Critique</td>
</tr>
<tr>
<td>Combine and synthesize ideas into new concepts</td>
<td>Analyze</td>
</tr>
<tr>
<td></td>
<td>Create</td>
</tr>
<tr>
<td></td>
<td>Prove</td>
</tr>
</tbody>
</table>
DESCRIPTION OF TEST FORMAT AND ORGANIZATION

The Grade 5 Mathematics EOG assessment consists of a total of 73 items.

You will answer a variety of item types on the test. Some of the items are selected-response (multiple-choice), which means you choose the correct answer from four choices. Some items will ask you to write your response.

The test will be given in two sections.

- You may have up to 85 minutes per section to complete Sections 1 and 2.
- The test will take about 120 to 170 minutes.

CONTENT

The Grade 5 Mathematics EOG assessment will measure the Grade 5 standards that are described at www.georgiastandards.org.

The content of the assessment covers standards that are reported under these domains:

- Operations and Algebraic Thinking
- Number and Operations in Base 10
- Number and Operations—Fractions
- Measurement and Data
- Geometry

ITEM TYPES

The Mathematics portion of the Grade 5 EOG assessment consists of selected-response (multiple-choice) items, constructed-response items, and extended constructed-response items.
MATHEMATICS DEPTH OF KNOWLEDGE EXAMPLE ITEMS

Example items that represent applicable DOK levels present in the Math assessment are provided for you on the following pages. The items and explanations of what is expected of you to answer them will help you prepare for the test.

All example and sample items contained in this guide are the property of the Georgia Department of Education.

Example Item 1

DOK Level 1: This is a DOK level 1 item because it asks students to use what they know about place value and determining how much greater the same digit is in the tens place versus the ones place.

Mathematics Grade 5 Content Domain: Number and Operations in Base 10

Standard: MGSE5.NBT.1. Recognize that in a multi-digit number, a digit in one place represents 10 times as much as it represents in the place to its right and 1/10 of what it represents in the place to its left.

Look at these two numbers:

563   436

How much greater is the digit 6 in 563 than the digit 6 in 436?

A. 6 times greater
B. 10 times greater
C. 60 times greater
D. 100 times greater

Correct Answer: B

Explanation of Correct Answer: The correct answer choice is (B) 10 times greater. The digit 6 is in the tens place in 563 and in the ones place for 436. The value of the same digit in the tens place is always ten times greater than the value of that digit in the ones place. Choice (A) is incorrect because it shows a lack of understanding of place value. Choice (C) is incorrect because it shows the value of the digit in 563, but this does not compare the value of the digit in the two numbers. Choice (D) is incorrect because it shows what the difference would be if the digit 6 were in the hundreds place rather than the tens place.
Example Item 2

**DOK Level 2:** This is a DOK level 2 item because it assesses the ability to evaluate multi-step expressions with and without parentheses and apply the order of operations rules.

**Mathematics Grade 5 Content Domain:** Operations and Algebraic Thinking.

**Standard:** MGSE5.OA.1. Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.

Evaluate these two expressions.

a) \((7 + 5) \times 4\)

b) \(7 + 5 \times 4\)

Part A: Which expression has a greater value—a or b?

**Correct Answer:** a

Part B: Explain why this expression has a greater value.

**Explanation of Correct Answer:** The correct answer is choice (a). This expression has a value of 48, which is greater than choice b, which has a value of 27. Expression (a) has parentheses around 7 and 5, so you have to add these numbers first to find a sum of 12. Next you multiply the sum 12 by 4. The total value is 48. For the second expression, there are no parentheses. The order of operations states that you perform operations in parentheses first. If there are no parentheses in an expression, multiplication comes before addition. For expression (b), you must multiply 5 times 4, which is 20. Next you add 7, which is a total of 27.
## Scoring Rubric

<table>
<thead>
<tr>
<th>Points</th>
<th>Description</th>
</tr>
</thead>
</table>
| 2      | The response achieves the following:  
• Response demonstrates a complete understanding of how to evaluate multi-step expressions with and without parentheses.  
• Give 2 points for a correct response and a valid process.  
• Response is correct and complete.  
• Response shows application of a reasonable and relevant strategy.  
• Mathematical ideas are expressed coherently through a clear, complete, logical, and fully developed response using words, calculations, and/or symbols as appropriate. |
| 1      | The response achieves the following:  
• Response demonstrates a partial understanding of how to evaluate multi-step expressions with and without parentheses.  
• Give 1 point for a correct response but no valid process, or give one point for a calculation mistake made in an otherwise correct process.  
• Response is mostly correct but contains either a computation error or an unclear or incomplete explanation.  
• Response shows application of a relevant strategy, though it may be only partially applied or remain unexplained.  
• Mathematical ideas are expressed only partially using words, calculations, and/or symbols as appropriate. |
| 0      | The response achieves the following:  
• The response demonstrates no understanding of how to evaluate multi-step expressions with and without parentheses.  
• Response shows no application of a strategy.  
• Mathematical ideas cannot be interpreted or lack sufficient evidence to support even a limited understanding. |

**Exemplar Response**

<table>
<thead>
<tr>
<th>Points Awarded</th>
<th>Sample Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>a; This expression has a value of 48, which is greater than the value of b, which is 27. Expression a has parentheses around 7 plus 5, so you have to add these numbers first to find a sum of 12. Next you multiply the sum of 12 by 4. The total value is 48. For the second expression, there are no parentheses. The order of operations states that you perform operations in parentheses first. If there are no parentheses in an expression, multiplication comes before addition. For expression b you must multiply 5 times 4, which is 20. Next you add 7 to 20, which is 27.</td>
</tr>
<tr>
<td>1</td>
<td>a</td>
</tr>
<tr>
<td>0</td>
<td>Response is irrelevant, inappropriate, or not provided.</td>
</tr>
</tbody>
</table>
Example Item 3

DOK Level 3: This is a DOK level 3 item because it asks students to assess the reasonableness of a given answer and justify their assessment. The students then must determine how to correct the error and explain their reasoning.

Mathematics Grade 5 Content Domain: Use equivalent fractions as a strategy to add and subtract fractions.

Standard: MGSE5.NF.2. Solve word problems involving addition and subtraction of fractions, including cases of unlike denominators (e.g., by using visual fraction models or equations to represent the problem). Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers. For example, recognize an incorrect result $\frac{2}{5} + \frac{1}{2} = \frac{3}{7}$, by observing that $\frac{3}{7} < \frac{1}{2}$.

Use the fraction bars to help you solve the problem.

Anita is making chocolate fudge brownies. She needs $\frac{1}{3}$ cup of water and $\frac{3}{4}$ cup of vegetable oil for the recipe. Anita pours both the water and vegetable oil into a large mixing bowl. She measures the combined total amount of the water and vegetable oil and sees that it is more than one cup.
Part A: How much more than one cup is Anita’s mixture of water and vegetable oil?

Correct Answer: Adding $\frac{1}{3}$ and $\frac{3}{4}$ is the same as adding $\frac{4}{12}$ and $\frac{9}{12}$ because $\frac{1}{3} = \frac{4}{12}$ and $\frac{3}{4} = \frac{9}{12}$. 

$\frac{3}{4} = \frac{9}{12}$, $\frac{4}{12} + \frac{9}{12} = \frac{13}{12}$ and $\frac{13}{12} = 1 \frac{1}{12}$ which is $\frac{1}{12}$ more than 1 cup.

Part B: How could Anita know, without measuring, that $\frac{1}{3}$ cup of water and $\frac{3}{4}$ cup of oil together is less than 2 cups?

Correct Answer: Both $\frac{1}{3}$ and $\frac{3}{4}$ are each less than 1, so their sum must be less than 2.

Part C: How much less than 2 is the sum of $\frac{1}{3}$ and $\frac{3}{4}$?

Correct Answer: $2 = \frac{24}{12}$ and $1 \frac{1}{12} = \frac{13}{12}$, so $\frac{24}{12} - \frac{13}{12} = \frac{11}{12}$. 
### Scoring Rubric

<table>
<thead>
<tr>
<th>Points</th>
<th>Description</th>
</tr>
</thead>
</table>
| 3      | The response achieves the following:  
• The response demonstrates a complete understanding of using benchmark fractions and number sense to estimate mentally and assess the reasonableness of answers when solving a real-world problem involving fraction addition.  
• Give 3 points for 3 parts answered correctly.  
• Response is correct and complete.  
• Response shows application of a reasonable and relevant strategy.  
• Mathematical ideas are expressed coherently through a clear, complete, logical, and fully developed response using words, calculations, and/or symbols as appropriate. |
| 2      | The response achieves the following:  
• The response demonstrates a good understanding of using benchmark fractions and number sense to estimate mentally and assess the reasonableness of answers when solving a real-world problem involving fraction addition.  
• Give 2 points for 2 out of 3 parts answered correctly or for making 1 error in any of the 3 parts.  
• Response is mostly correct but contains either a computation error or an unclear or incomplete explanation.  
• Response shows application of a relevant strategy, though it may be only partially applied or remain unexplained.  
• Mathematical ideas are expressed only partially using words, calculations, and/or symbols as appropriate. |
| 1      | The response achieves the following:  
• The response demonstrates a limited understanding of using benchmark fractions and number sense to estimate mentally and assess the reasonableness of answers when solving a real-world problem involving fraction addition.  
• Give 1 point for 1 out of 3 parts answered correctly or for making 2 errors in any of the 3 parts.  
• Response is only partially correct.  
• Response shows incomplete or inaccurate application of a relevant strategy.  
• Mathematical ideas are expressed only partially using words, calculations, and/or symbols as appropriate. |
| 0      | The response achieves the following:  
• The response demonstrates no understanding of using benchmark fractions and number sense to estimate mentally and assess the reasonableness of answers when solving a real-world problem involving fraction addition.  
• Response shows no application of a strategy.  
• Mathematical ideas cannot be interpreted or lack sufficient evidence to support even a limited understanding. |
### Exemplar Response

<table>
<thead>
<tr>
<th>Points Awarded</th>
<th>Sample Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Part A: Adding $\frac{1}{3}$ and $\frac{3}{4}$ is the same as adding $\frac{4}{12}$ and $\frac{9}{12}$ because $\frac{1}{3} = \frac{4}{12}$ and $\frac{3}{4} = \frac{9}{12}$. $\frac{4}{12} + \frac{9}{12} = \frac{13}{12}$ and $\frac{13}{12} = 1 \frac{1}{12}$ which is $\frac{1}{12}$ more than 1 cup.</td>
</tr>
<tr>
<td>2</td>
<td>Part B: Both $\frac{1}{3}$ and $\frac{3}{4}$ are each less than 1, so their sum must be less than 2.</td>
</tr>
<tr>
<td>1</td>
<td>Part C: $2 = \frac{24}{12}$ and $1 \frac{1}{12} = \frac{13}{12}$, so $\frac{24}{12} - \frac{13}{12} = \frac{11}{12}$.</td>
</tr>
<tr>
<td>0</td>
<td>Response is irrelevant, inappropriate, or not provided.</td>
</tr>
</tbody>
</table>
MATHEMATICS CONTENT DESCRIPTION AND ADDITIONAL SAMPLE ITEMS

In this section, you will find information about what to study in order to prepare for the Grade 5 Mathematics EOG assessment. This includes main ideas and important vocabulary words. This section also contains practice questions with an explanation of the correct answers and activities that you can do on your own or with your classmates or family to prepare for the test.

All example and sample items contained in this guide are the property of the Georgia Department of Education.

CONTENT DESCRIPTION

- Develop an understanding of addition and subtraction of fractions and of the multiplication and division of fractions in limited cases.
- Divide with two-digit divisors, integrate decimals into the place value system, and develop an understanding of operations with decimals to the hundredths.
- Develop an understanding of volume, and be able to convert like measurement units within a given system.
- Graph points on a coordinate plane, and extend your understanding of classifications of two-dimensional figures.
- Write and interpret numerical expressions and analyze patterns and relationships.
Unit 1: Order of Operations and Whole Numbers

In this unit, you will understand the place value system. You will be able to perform operations in the correct order using the distributive, commutative, and associative properties.

**KEY TERMS**

A **numerical expression** is a set of numbers and operations including addition, subtraction, multiplication, and division. The expression may also contain parentheses, brackets, or braces. (OA.1)

**Evaluate a numerical expression:** Find the value of the expression by completing the operations for each number in the expression. (OA.2)

To evaluate a numerical expression in the correct order, use the **order of operations** to complete each step in the expression. Operations in **parentheses**, **brackets**, or **braces** are completed first, then division and multiplication of digits from left to right. Finally, subtraction and addition can be completed from left to right. (OA.1)

A multiplication equation or expression has three parts. The **multiplicand** and **multiplier** are numbers that are multiplied to result in the **product**. (NBT.5)

Dividing whole numbers includes partitioning the **dividend** into an equal number of groups or into groups of equal size that are equivalent to the **divisor**. The **quotient** shows the size of each group or the total number of groups that are created. (NBT.6)

Multiplication and division of whole numbers can be solved using multiple strategies.

- One strategy for multiplication is the **standard algorithm**. The standard algorithm is a method used to solve a problem that includes a set of specific steps. (NBT.5)
- Other strategies for multiplication and division include using the properties of operations or models such as **rectangular arrays**, **area models**, and **fair-sharing**. (NBT.6)

**Properties of Operations:**

- The **distributive property** multiplies a factor that is outside of a set of parentheses with each addend within the parentheses to solve.
- The **commutative property** allows for addends in addition equations or factors in a multiplication equations to be moved or placed in a different order while solving.
- The **associative property** allows for addends in addition equations or factors in multiplication equations to be grouped together into different pairs while solving. (NBT.6)

**Place value** is the numerical value of a digit in a number based on its location related to the decimal point. A digit in the tens place of a number is $10$ times the value of the same digit in the ones place. A digit in the tens place is $\frac{1}{10}$ the value of the same digit in the hundreds place. (NBT.1)
A power of 10 refers to a multiple of 10. For example, $10^3$ is 10 with an exponent of 3. The exponent shows the number of times to multiply ten ($10 \times 10 \times 10 = 1000$). Multiplying a number by $10^3$ is the same as multiplying by 1000. The effect on the number is that it becomes 10 times greater 3 times. (NBT.2)

Important Tip

Look at each multiplication and division equation individually to determine the best strategy to use when solving. The standard algorithm can be used. A model can also be used including Rectangular Arrays, Area Models, Lattice Methods, Partial Products, and Fair-Sharing models.

Sample Items 1–3

Item 1

There are 14 students making sculptures with craft sticks. There are 644 craft sticks in a box. Each student gets an equal number of craft sticks.

Part A: Explain each step needed to determine the maximum number of craft sticks that each student can get.

<p>| |</p>
<table>
<thead>
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</tbody>
</table>
Part B: How does the equation $644 \div 14 = \square$ model the problem and what number should go in the box?

Item 2

Which expression has a total value of 40?

A. $3 + 2 \times (13 - 5)$
B. $3 + 2 \times 13 - 5$
C. $(3 + 2) \times (13 - 5)$
D. $(3 + 2) \times 13 - 5$
**Item 3**

Rita wants to find the number that is 3 times as large as the sum of 5 and 7.
She writes this expression: $3 \times 5 + 7$.

Part A: Explain why Rita cannot use this expression to find the number.

Part B: How could Rita change the expression to find the correct number?
Unit 2: Decimals

In this unit, you will work with decimals. You will add and subtract decimal numbers, compare decimal numbers, and use place value to determine the numerical value of a number. You will also learn about expanded notation and rounding numbers.

KEY TERMS

A **decimal** is another way to write a **fraction**. Both a decimal and a fraction show a value that is between whole numbers. For example, \( \frac{1}{2} \) or 0.5 is a value between the whole numbers 0 and 1. (NBT.7)

**Decimal point**: A marker to indicate the value of each digit in a number. Digits on the left of the decimal point indicate whole units (ones, tens, hundreds). Digits to the right of the decimal point indicate fractions, or parts, of a unit (tenths, hundredths, thousandths). (NBT.3)

**Place value** is the numerical value of a digit in a number based on its location related to the decimal point. A digit in the tenths place of a number is 10 times the value of the same digit in the hundredths place. A digit in the tenths place is \( \frac{1}{10} \) the value of the same digit in the ones place. (NBT.1)

- **Tenths place**: This is the first place to the right of the decimal point. A decimal of 0.1 would have a value equivalent to \( \frac{1}{10} \).
- **Hundredths place**: This is the second place to the right of the decimal point. A decimal of 0.01 would have a value equivalent to \( \frac{1}{100} \).
- **Thousandths place**: This is the third place to the right of the decimal point. A decimal of 0.001 would have a value equivalent to \( \frac{1}{1000} \). (NBT.3a)

Decimal numbers can be written using numerals or number words. They can also be written using expanded notation. **Expanded notation** creates an addition expression by writing the value for each place of the number separately. For example, 302.4 can be written as \( 300 + 2 + \frac{4}{10} \). (NBT.3a)

To **compare decimal numbers**, determine the value of two or more decimal numbers and identify the number that has a greater value, if possible.

- **Greater than**: When the decimal number has a greater value than the other number in the comparison, use the symbol >.
- **Less than**: When the decimal number has a smaller value than the other number in the comparison, use the symbol <.
- **Equal to**: When both numbers in the comparison have the same value, use the symbol =. (NBT.3b)

Decimal numbers can be **rounded** to a given place value. Models such as number lines can be used to determine the nearest number of the given place value. (NBT.4)
Addition and subtraction of decimal numbers require close attention to the place value of each digit. Operations must be completed on the digit in the same location such as adding the tenths place in one number with the tenths place in another number. Models such as area models and place value charts can be used as a visual representation of the problem while solving. (NBT.7)

**Important Tips**

- When comparing decimal numbers, look at the place value of each digit. The location of the digit determines its value.
- When adding or subtracting decimal numbers, estimate the value first. Then a place value chart can be used to solve the equation. Each operation should be completed on digits in the same location or place value.

**Sample Items 4–6**

**Item 4**

Miguel, Jane, and Robert rode 8.7 miles in a bike relay race. They each rode the same distance. Jane shaded the models shown to determine how many miles each person rode. Each hundred model stands for 1 mile.

Miguel:

Jane:

Robert:
Part A: What is the total number of miles each person rode?

Part B: Explain how the models illustrate the problem and answer.

Item 5

Which shows the decimal form for this expression?

\[ 8 \times \left( \frac{1}{10} \right) + 3 \times \left( \frac{1}{100} \right) + 9 \times \left( \frac{1}{1000} \right) \]

A. 0.0839  
B. 0.839  
C. 8.39  
D. 83.9

Item 6

What is 5.816 rounded to the nearest tenth?

A. 5.8  
B. 5.82  
C. 5.9  
D. 6.00
Unit 3: Multiplying and Dividing with Decimals

In this unit, you will continue to work with decimals. You will multiply and divide with decimals. You will use estimation and work with models like rectangular arrays and area models.

**KEY TERMS**

A **decimal** is another way to write a **fraction**. Both a decimal and fraction show a value that is between whole numbers. For example, $\frac{1}{2}$ or 0.5 is a value between the whole numbers 0 and 1. (NBT.7)

**Place value** is the numerical value of a digit based on its location related to the decimal point. A digit in the tenths place of a number is 10 times the value of the same digit in the hundredths place. A digit in the tenths place is $\frac{1}{10}$ the value of the same digit in the ones place.

- **Tenths place**: This is the first place to the right of the decimal point. A decimal of 0.1 would have a value equivalent to $\frac{1}{10}$.
- **Hundredths place**: This is the second place to the right of the decimal point. A decimal of 0.01 would have a value equivalent to $\frac{1}{100}$. (NBT.7)

The same strategies used to multiply and divide whole numbers can be used with decimals. (NBT.7)

When **multiplying** a whole number by a decimal number, the product will have a smaller value than the whole number factor. The equation $2 \times 0.01 = 0.02$ shows that 2 groups of 1 hundredth are equal to 2 hundredths. (NBT.7)

When **dividing** a whole number by a decimal number, the **quotient** will have a greater value than the **dividend**. The equation $2 \div 0.01 = 200$ shows that there are 200 hundredths in the number 2. (NBT.7)

Along with strategies based on place value and the properties of operations, models can be used to multiply and divide decimal numbers. **Rectangular arrays** and **area models** can be used to represent the equation. (NBT.7)

Using a **power of 10** creates a pattern in the number of zeros in a number. For example, $10^3$ is 10 with an **exponent** of 3. The exponent shows the number of times to multiply ten ($10 \times 10 \times 10 = 1000$). Multiplying a number by $10^3$ is the same as multiplying by 1000. The effect on the number is that it becomes 10 times greater 3 times and the decimal point moves 3 places to the right. When dividing by a power of 10, the decimal point will move to the left. (NBT.2)

**Important Tip**

Estimation can be used before computing the product or quotient of the equation. Decimal numbers can be rounded to the nearest whole number to determine a reasonable estimate.
Sample Items 7–9

Item 7

Hannah multiplies 0.542 by powers of 10.

\[
\begin{align*}
0.542 \times 10^1 &= 5.42 \\
0.542 \times 10^2 &= 54.2 \\
0.542 \times 10^3 &= 542 \\
0.542 \times 10^4 &= 5,420
\end{align*}
\]

By what power of 10 would Hannah multiply 0.542 to get a product of 5,420,000?

A. \(10^5\)  
B. \(10^6\)  
C. \(10^7\)  
D. \(10^8\)
Item 8

The area model illustrates the product of $2.6 \times 3.2$.

What is the product?

A. 6.232  
B. 7.8  
C. 8.32  
D. 9.6
Item 9

Ted is using a model to find the quotient of $6.9 \div 2.3$. He starts by modeling the dividend, 6.9, as shown.

He will now separate the model into equal groups to model the division. How many equal groups of 2.3 should he make?

A. 0.3
B. 3
C. 30
D. 300
Unit 4: Adding, Subtracting, Multiplying, and Dividing Fractions

In this unit, you will work with fractions. You will practice adding, subtracting, multiplying, and dividing fractions. You will work with fractions that have common and uncommon denominators, as well as equivalent fractions. You will use fraction models, number lines, and other visual models.

KEY TERMS

A fraction represents the division of two numbers. (NF.3) The dividend of the expression becomes the numerator, and the divisor becomes the denominator. (NF.3) The fraction often represents a value between two whole numbers. (NF.2)

Fractions greater than 1 are written as improper fractions where the numerator is greater than the denominator or as mixed numbers, which include a whole number and a fraction. (NF.1)

Before adding or subtracting fractions, find a common denominator. If the fractions in the equation have unlike denominators, replace each fraction with equivalent fractions that have the same denominator. (NF.1)

After creating a common denominator, add the numerators to find the sum, or subtract the numerators to find the difference. (NF.1)

When adding and subtracting fractions, an estimate can be made by comparing each fraction with a benchmark fraction such as \( \frac{1}{2} \). For example, if both fractions are greater than \( \frac{1}{2} \), then a reasonable sum would be greater than 1. (NF.2)

Multiplying fractions: Multiply the numerators of each fraction to find the numerator of the product. Multiply the denominator of each fraction to find the denominator of the product. Whole numbers can be written with a denominator of 1. (NF.4a)

Multiplication of fractions is used to find the area of a figure with fractional side lengths. The area can also be found by tiling the figure with square units that have fractional side lengths. (NF.4b)

Scaling: Comparing the value of one object to the value of another using a fraction. An example of scaling would be saying, “That rope is \( \frac{1}{3} \) as long as this rope.”

Unit fraction: A fraction with a numerator of 1. (NF.7)

Dividing fractions: Use fraction models, number lines, and other visual models to represent the division of whole numbers and unit fractions. Models can be partitioned into equal parts based on the equation. (NF.7)

Important Tip

Fractions in an equation must represent parts of the same whole. When using models to solve the equations, use models that are also parts of the same whole by using models that are the same size and shape.
Sample Items 10–12

Item 10

A teacher has a 60-pound bag of sand. She pours all the sand into 8 buckets. She puts an equal amount of sand in each bucket. What is the total amount of sand in each bucket?

A. \( \frac{2}{15} \) pounds
B. \( 6 \frac{1}{2} \) pounds
C. \( 7 \frac{1}{2} \) pounds
D. \( 8 \frac{1}{2} \) pounds

Item 11

What is the difference of these fractions?

\[ \frac{5}{8} - \frac{2}{3} \]

A. \( \frac{2}{24} \)
B. \( \frac{16}{24} \)
C. \( \frac{23}{24} \)
D. \( \frac{11}{5} \)
Item 12

Four students each draw a circle. They each shade $\frac{3}{4}$ of their circles, as shown.

Which equation shows how much of the circles are shaded altogether?

A. $4 \times \frac{1}{4} = \frac{4}{4} = 1$

B. $4 \times \frac{3}{4} = \frac{7}{4} = 1 \frac{3}{4}$

C. $4 \times \frac{3}{4} = \frac{3}{16}$

D. $4 \times \frac{3}{4} = \frac{12}{4} = 3$
Unit 5: Geometry and the Coordinate Plane

In this unit, you will use geometry. You will become familiar with coordinate planes, ordered pairs, quadrants, and points. You will follow rules to create numerical patterns.

**KEY TERMS**

**Numerical patterns**: A sequence of numbers that are created by following a set of rules such as “add 5.” Generate two numerical patterns using a given rule. Using the terms created, form and graph ordered pairs on a coordinate plane. A line can be generated from the pattern. (OA.3)

**Ordered pairs**: A set of numbers that are used to label the location of a point on the coordinate plane. Ordered pairs are written as (1, 2). (OA.3)

A **coordinate plane** is created by intersecting two perpendicular number lines at 0. The point where the two lines meet is called the **origin**. The **horizontal number line** is called the **x-axis** and the **vertical number line** is called the **y-axis**. (G.1)

The **First quadrant** of the coordinate plane has values of 0 and greater for the x-axis and the y-axis. (G.1)

**Point**: a location on the coordinate plane that is labeled by the values of the **x-coordinate** and **y-coordinate**. (G.1)

The x-coordinate represents the value on the x-axis, moving horizontally from the origin. The y-coordinate represent the value on the y-axis moving vertically from the origin. For example, the point (2, 3) moves to the right 2 units, then up 3 units. (G.1)

**Line**: A line connects multiple points on the coordinate plane. (G.1)

The coordinate plane can be used to represent real-world situations by **graphing** points and finding the value of points as it relates to the situation. (G.2)

**Important Tip**

$arrows An ordered pair lists the x-coordinate first, then the y-coordinate. When graphing a point using the ordered pair, move across the x-axis using the x-coordinate and then move up the y-axis using the y-coordinate.
Sample Items 13–15

Item 13

Which graph shows the points (1, 4), (7, 0), and (4, 6)?

A. 

B. 

C. 

D.
**Item 14**

Kirk wants to show two number patterns on a coordinate grid.

Use the coordinate grid and the table to help Kirk show his patterns.

<table>
<thead>
<tr>
<th>Row</th>
<th>x</th>
<th>y</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>C</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>D</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Part A: Identify the missing numbers in the table and write each row as an ordered pair.**

Row A: (1, _____)

Row B: (_____, 4)

Row C: (3, 6)

Row D: (______, _____)

Row E: (______, _____)

**Part B: Describe the relationship between the x-values and the y-values that are in the same row of the table.**

---

---
**Item 15**

Felipe made a triangle on a coordinate grid.

What are the coordinates for point C?

A. (3, 4)
B. (5, 8)
C. (8, 2)
D. (2, 8)
Unit 6: Two-Dimensional (2-D) Figures

In this unit, you will work with two-dimensional figures. You will learn about plane figures, two-dimensional figures, and their attributes. You will learn to identify geometric shapes.

**KEY TERMS**

**Two-Dimensional Figures**: A **plane figure** that has two dimensions, such as a rectangle that has the dimension of length and one of width. (G.3)

The **attributes** of a 2-D figure are **properties** including the following:

- **Angles**
  - **Acute**: an angle measure less than 90°.
  - **Obtuse**: an angle measure greater than 90°.
  - **Right**: an angle measure equal to 90°.
- **Parallel lines**: two lines that are always an equal distance apart.
- **Perpendicular lines**: two lines that intersect at a 90° angle.
- **Number of sides**: how many lines are used to create a figure.
- **Length of sides**: measurement of the length of each line used to create a figure.
- **Congruent**: two figures that are the same size and shape.
- **Vertex**: the point where two lines of the figure meet. (G.3)

**Category**: A large group of two-dimensional figures that share at least one attribute. For example, all shapes with four sides belong to the category of quadrilateral. (G.3)

**Subcategory**: A smaller group of items within a category that share at least one attribute. (G.3)

**Geometric shapes** include triangles, rectangles, squares, rhombi, pentagons, hexagons, trapezoids, quadrilaterals, quarter circles, half circles, and circles.

- **Polygon**: A closed geometric shape with multiple straight sides.
- **Regular polygon**: A geometric shape with multiple sides that all have equal angles and lengths.
- **Irregular polygon**: A geometric shape with multiple sides where the side lengths vary. (G.4)

Geometric shapes can be placed in a **hierarchy**, or a set of categories and subcategories, based on their attributes. For example, in the category of quadrilaterals, there is the subcategory of rectangles. Within the subcategory of rectangles, there is the sub-category of squares. (G.4)

**Important Tip**

Exactly one two-dimensional figure can belong in more than one category as well as more than one subcategory.
Sample Items 16–18

Item 16

Which figure has four right angles?

A.

B.

C.

D.
Item 17

What attributes do these two figures have in common?

A. Both figures have four right angles.
B. Both figures have two pairs of equal sides.
C. Both figures have two pairs of parallel sides.
D. Both figures have at least one pair of parallel sides.
Item 18

Look at this figure.

Part A: Name the type of figure shown.

Part B: Explain why you gave the figure this name.

Part C: What other name could you give this figure?
Unit 7: Volume and Measurement

In this unit, you will work with different kinds of measurement: customary, metric, and time. You will convert between measurement units. You will use a line plot to record measurements.

**KEY TERMS**

**Conversion:** changing between units within the same measurement system. (MD.1)

**Customary Measurements:**

- **Liquid volume** is measured in cups, pints, quarts, and gallons.
- **Length** is measured in inches, feet, yards, and miles.
- **Mass** is measured in ounces, pounds, and tons. (MD.1)

**Metric Measurements:**

- **Liquid volume** is measured in liters and milliliters.
- **Length** is measured in centimeters, meters, and kilometers.
- **Mass** is measures in grams and kilograms. (MD.1)

**Time** is measured in seconds, minutes, and hours. (MD.1)

A **line plot** is used to record measurements for a group of objects. The measurement values are shown, and a picture or mark is placed above the value for each object being measured. A line plot can include fractional measurements. (MD.4)

A **solid figure**, or 3-D figure, has a volume. One example of a solid figure is a **right rectangular prism**. Each face of the right rectangular prism is a rectangle. (MD.3)

A cube with all side lengths equal to 1 unit is called a **unit cube** and has a volume of 1 cubic unit. A solid figure can be packed with unit cubes leaving no **gaps** and without **overlapping** cubes. The number of unit cubes packed into the solid figure represents the volume of the figure. (MD.3)

The volume of a shape is the number of unit cubes that fit in the three-dimensional shape.

Volume is measured in **cubic units**. These may include cubic centimeters, cubic inches, cubic feet, or other length measurements. (MD.4)

The volume of a solid figure can also be determined using two formulas:

- \( I \times w \times h \) multiplies the **length**, **width**, and **height** of the figure to find the cubic units of volume.
- \( B \times h \) finds the **area of the base** using the width and length, and then multiplies it by the **height** of the figure to find the cubic units of volume. (MD.5b)
Volume is an additive value. This means that a solid figure can be separated into two rectangular prisms. The volume of each rectangular prism can be added together to find the total volume for the solid figure. (MD.5c)

**Important Tips**

- To convert a measurement, choose another unit used to measure the same dimension within the customary or within the metric measurement systems.
- Comparing the volume of two figures requires using all three dimensions of length, width, and height. A figure may appear to have a greater volume based on one dimension such as height, but the size of the base will affect the total volume as well.
Sample Items 19–21

Item 19

Ten students measured the amount of water in their water bottles. Here are the measurements found in liters:

\[ \frac{5}{8}, \frac{3}{8}, 1, \frac{3}{8}, 1, \frac{6}{8}, 6, 3, \frac{1}{8}, \frac{7}{8}, 6, 4, \frac{8}{8}, \frac{8}{8}, \frac{8}{8}, \frac{8}{8}, \frac{8}{8}, \frac{8}{8}, \frac{8}{8}, \frac{8}{8} \]

Which line plot shows the data?

A. [Line plot with X marks at \(\frac{1}{8}, \frac{2}{8}, \frac{3}{8}, \frac{4}{8}, \frac{5}{8}, \frac{6}{8}, \frac{7}{8}, \frac{8}{8}, \frac{8}{8}\)]

B. [Line plot with X marks at \(0, \frac{1}{8}, \frac{2}{8}, \frac{3}{8}, \frac{4}{8}, \frac{5}{8}, \frac{6}{8}, \frac{7}{8}, \frac{8}{8}\)]

C. [Line plot with X marks at \(0, \frac{1}{8}, \frac{2}{8}, \frac{3}{8}, \frac{4}{8}, \frac{5}{8}, \frac{6}{8}, \frac{7}{8}, \frac{8}{8}\)]

D. [Line plot with X marks at \(0, \frac{1}{8}, \frac{2}{8}, \frac{3}{8}, \frac{4}{8}, \frac{5}{8}, \frac{6}{8}, \frac{7}{8}, \frac{8}{8}\)]
Item 20

Ms. Reyes wants to display three students’ paintings on a wall. The lengths of the paintings are 54 inches, 3.5 feet, and 1 yard.

**Unit Conversions**

1 yard = 3 feet  
1 foot = 12 inches

**Part A:** What is the total length of the paintings, in feet? Explain your answer.

Total length of paintings: _______________ feet

**Part B:** What is the total length of the paintings, in inches? Explain your answer.

Total length of paintings: _______________ inches
**Item 21**

Find the volume of the rectangular prism using the formula

\[ \text{Volume} = (\text{area of base}) \times (\text{height}) \]

What is the maximum number of unit cubes that will fit inside the rectangular prism?

A. 6  
B. 16  
C. 24  
D. 48
### MATHEMATICS ADDITIONAL SAMPLE ITEM KEYS

<table>
<thead>
<tr>
<th>Item</th>
<th>Standard/Element</th>
<th>DOK Level</th>
<th>Correct Answer</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
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<td>MGSE5.NBT.6</td>
<td>2</td>
<td>N/A</td>
<td>See scoring rubric and sample response beginning on page 115.</td>
</tr>
<tr>
<td>2</td>
<td>MGSE5.OA.1</td>
<td>1</td>
<td>C</td>
<td>The correct answer is choice (C) ((3 + 2) \times (13 – 5)). The order of operations requires that you solve the operations within the parentheses first, and then multiply and divide and add and subtract from left to right. The values inside the two parentheses in ((3 + 2) \times (13 – 5)) are 5 and 8, which are multiplied together for a product of 40. Choice (A) is multiply 2 by the difference within the parentheses, 8, which is 16. Next you add 3, which has a total value of 19. Choice (B) is incorrect because you must first multiply 2 \times 13, which is 26. The order of operations requires that you add next, so 26 + 3 = 29. Finally, you subtract 29 – 5, which is 24. Choice (D) is incorrect because you first multiply the sum of 3 and 2, which is 5, by 13, for a product of 65. Finally you subtract, 65 – 5 = 60.</td>
</tr>
<tr>
<td>3</td>
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<td>See scoring rubric and sample response beginning on page 117.</td>
</tr>
<tr>
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<td>See scoring rubric and sample response on page 119.</td>
</tr>
<tr>
<td>5</td>
<td>MGSE5.NBT.3</td>
<td>1</td>
<td>B</td>
<td>The correct answer is choice (B) 0.839. This is the decimal form for the given expression. Choice (A) is incorrect because it shows the decimal form for (8 \times \left(\frac{1}{100}\right) + 3 \times \left(\frac{1}{1000}\right) + 9 \times \left(\frac{1}{10000}\right)). Choice (C) is incorrect because it shows the decimal form for (8 \times \left(\frac{1}{10}\right) + 3 \times \left(\frac{1}{10}\right) + 9 \times \left(\frac{1}{100}\right)). Choice (D) is incorrect because it shows the decimal form for (8 \times (10) + 3 \times (1) + 9 \times \left(\frac{1}{10}\right)).</td>
</tr>
<tr>
<td>Item</td>
<td>Standard/Element</td>
<td>DOK Level</td>
<td>Correct Answer</td>
<td>Explanation</td>
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<tr>
<td>6</td>
<td>MGSE5.NBT.4</td>
<td>1</td>
<td>A</td>
<td>The correct answer is choice (A) 5.8. When rounding to the nearest tenth, use the digit in the hundredths place. If that digit is less than 5, round down. Since the digit 1, in 5.816, is less than 5, round down to 8 in the tenths place. Choice (B) is incorrect because the response shows 5.816 rounded to the nearest hundredth rather than the nearest tenth. Choice (C) is incorrect because it indicates rounding up to 9 tenths, rather than round down to 8 tenths. Choice (D) is incorrect because it indicates rounding to the nearest whole number rather than to the nearest tenth.</td>
</tr>
<tr>
<td>7</td>
<td>MGSE5.NBT.2</td>
<td>1</td>
<td>C</td>
<td>The correct answer is choice (C) 10^7. When you multiply by 10, each digit's value becomes 10 times larger. If you multiply by 10 seven times, the decimal moves to the left 7 places. Choice (A) is incorrect because it shows a movement to the left of only 5 places. This number is 54,200. Choice (B) is incorrect because it shows a movement to the left of only 6 places. This number is 542,000. Choice (D) is incorrect because it shows a movement to the left of 8 places, rather than 7. This number is 54,200,000.</td>
</tr>
<tr>
<td>8</td>
<td>MGSE5.NBT.7</td>
<td>1</td>
<td>C</td>
<td>The correct answer is choice (C) 8.32. This response shows that the student multiplied correctly. Choice (A) is incorrect because the response indicates an error in regrouping tenths and hundredths. Choice (B) is incorrect because the response indicates rounding 3.2 to 3 before multiplying. Choice (D) is incorrect because the response indicates rounding 2.6 to 3 before multiplying.</td>
</tr>
<tr>
<td>9</td>
<td>MGSE5.NBT.7</td>
<td>1</td>
<td>B</td>
<td>The correct answer is choice (B) 3. The student divided correctly and understood that in this case, the quotient is the number of equal groups. Choice (A) is incorrect because the response shows that the decimal portion of the number was not considered. Choice (C) is incorrect because the response indicates the student misplaced the decimal point when dividing. Choice (D) is incorrect because the response indicates the student misplaced the decimal point when dividing.</td>
</tr>
<tr>
<td>Item</td>
<td>Standard/Element</td>
<td>DOK Level</td>
<td>Correct Answer</td>
<td>Explanation</td>
</tr>
<tr>
<td>------</td>
<td>------------------</td>
<td>-----------</td>
<td>----------------</td>
<td>-------------</td>
</tr>
<tr>
<td>10</td>
<td>MGSE5.NF.3</td>
<td>1</td>
<td>C</td>
<td>The correct is choice (C) $7\frac{1}{2}$ pounds. This response indicates that student wrote division as a fraction, $\frac{60}{8}$, and evaluated the expression. Choice (A) is incorrect because the response indicates the student reversed the dividend and divisor. Choice (B) is incorrect because the response indicates the student subtracted 8 before dividing. Choice (D) is incorrect because the response indicates the student added 8 before dividing.</td>
</tr>
<tr>
<td>11</td>
<td>MGSE5.NF.1</td>
<td>1</td>
<td>C</td>
<td>The correct answer is choice (C) $\frac{23}{24}$. This response shows that the mixed number was made into an improper fraction, $\frac{13}{8}$, and a common denominator, 24, was found for the minuend and subtrahend. Choice (A) is incorrect because the response indicates an error was made when the mixed number was changed to an improper fraction. Choice (B) is incorrect because the response shows the subtrahend of the new fraction with the common denominator. No subtraction was performed. Choice (D) is incorrect because the response indicates the student did not find a common denominator needed for the minuend and subtrahend.</td>
</tr>
<tr>
<td>12</td>
<td>MGSE5.NF.4</td>
<td>1</td>
<td>D</td>
<td>The correct answer is choice (D) $4 \times \frac{3}{4} = \frac{12}{4} = 3$. This response shows that the total of 4 groups of $\frac{3}{4}$ is 3. Choice (A) is incorrect because it finds the total of the circles that is not shaded. Choice (B) is incorrect because it shows the numerators added instead of multiplied. Choice (C) is incorrect because it shows the numerator of the first fraction multiplied by the denominator of the second.</td>
</tr>
<tr>
<td>13</td>
<td>MGSE5.G.2</td>
<td>1</td>
<td>D</td>
<td>The correct answer is choice (D) graph with points on (1, 4), (7, 0), and (4, 6). This response shows the points graphed correctly. Choice (A) is incorrect because the response shows a graph with the point (4, 1) rather than (1, 4). Choice (B) is incorrect because the response shows a graph with the points (4, 1), (0, 7), and (6, 4) rather than (1, 4), (7, 0), and (4, 6). Choice (C) is incorrect because the response shows a graph with a point (7, 1) rather than (7, 0).</td>
</tr>
<tr>
<td>Item</td>
<td>Standard/Element</td>
<td>DOK Level</td>
<td>Correct Answer</td>
<td>Explanation</td>
</tr>
<tr>
<td>------</td>
<td>------------------</td>
<td>-----------</td>
<td>----------------</td>
<td>-------------</td>
</tr>
<tr>
<td>14</td>
<td>MGSE5.OA.3</td>
<td>2</td>
<td>N/A</td>
<td>See scoring rubric and sample response beginning on page 120.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>The correct answer is choice (C) (8, 2). To locate coordinates for a point on a coordinate plane, start at (0, 0), move across the x-axis, and then move up or down the y-axis. To get to point C, first move across 8, then up 2. Choice (A) is incorrect because its coordinates show the location for point A. Choice (B) is incorrect because its coordinates show the location for point B. Choice (D) is incorrect because it reverses the x- and y-coordinates, showing a movement of across 2, then up 8, which would locate a point at a different location than point C.</td>
</tr>
<tr>
<td>15</td>
<td>MGSE5.G.2</td>
<td>1</td>
<td>C</td>
<td>The correct answer is choice (C). This shape is a rectangle. It has four right angles. Choice (A) is incorrect because this quadrilateral is a trapezoid with no right angles. Choice (B) is incorrect because this quadrilateral is a trapezoid with only has two right angles. Choice (D) is incorrect because it is a right triangle, which has only one right angle.</td>
</tr>
<tr>
<td>16</td>
<td>MGSE5.G.3</td>
<td>1</td>
<td>C</td>
<td>The correct answer is choice (C). This shape is a rectangle. It has four right angles. Choice (A) is incorrect because this quadrilateral is a trapezoid with no right angles. Choice (B) is incorrect because this quadrilateral is a trapezoid with only has two right angles. Choice (D) is incorrect because it is a right triangle, which has only one right angle.</td>
</tr>
<tr>
<td>17</td>
<td>MGSE5.G.3</td>
<td>1</td>
<td>D</td>
<td>The correct answer is choice (D) Both figures have at least one pair of parallel sides. The first figure is a trapezoid, and the top and bottom sides are parallel. It has one set of parallel sides. The second figure is a rectangle and it has two pairs of parallel sides. Choice (A) is incorrect because only the rectangle has four right angles. Choice (B) is incorrect because the trapezoid has only one pair of equal sides, while the rectangle has two. Choice (C) is incorrect because only the rectangle has two sets of parallel sides.</td>
</tr>
<tr>
<td>18</td>
<td>MGSE5.G.4</td>
<td>3</td>
<td>N/A</td>
<td>See scoring rubric and sample response beginning on page 122.</td>
</tr>
<tr>
<td>19</td>
<td>MGSE5.MD.2</td>
<td>1</td>
<td>B</td>
<td>The correct answer is choice (B). This line plot shows the correct representation of the provided data. Choice (A) is incorrect because the line plot shows X’s for fraction amounts that were not recorded by students, such as $\frac{2}{8}$ and $\frac{8}{8}$. Choice (C) is incorrect because the line plot is missing the data value $\frac{7}{8}$. Choice (D) is incorrect because the line plot is missing one of the $\frac{3}{8}$ measurements.</td>
</tr>
<tr>
<td>Item</td>
<td>Standard/Element</td>
<td>DOK Level</td>
<td>Correct Answer</td>
<td>Explanation</td>
</tr>
<tr>
<td>------</td>
<td>------------------</td>
<td>-----------</td>
<td>----------------</td>
<td>-------------</td>
</tr>
<tr>
<td>20</td>
<td>MGSE5.MD.1</td>
<td>2</td>
<td>N/A</td>
<td>See scoring rubric and sample response beginning on page 124.</td>
</tr>
<tr>
<td>21</td>
<td>MGSE5.MD.5</td>
<td>1</td>
<td>D</td>
<td>The correct answer is choice (D) 48. This response shows that the student correctly multiplied the length and width to find the area of the base and then multiplied that product by the height to find the volume, or counted rows and columns of unit cubes. Choice (A) is incorrect because it shows the area of the one side, or how many unit cubes are needed to cover that side, not the volume of the entire prism. Student only multiplied width times height. Choice (B) is incorrect because it shows the area of the base, or how many unit cubes are needed to cover the base, not the volume of the entire prism. The student only multiplied length times width. Choice (C) is incorrect because it shows the volume for only half of the figure rather than the whole figure. The student only multiplied length times height.</td>
</tr>
</tbody>
</table>
### Item 1

#### Scoring Rubric

<table>
<thead>
<tr>
<th>Points</th>
<th>Description</th>
</tr>
</thead>
</table>
| **2**  | The response achieves the following:  
|        | • Response demonstrates a complete understanding of using division to solve a real-world problem.  
|        | • Give 2 points for a correct response and valid explanations.  
|        | • Response is correct and complete.  
|        | • Response shows application of a reasonable and relevant strategy.  
|        | • Mathematical ideas are expressed coherently through a clear, complete, logical, and fully developed response using words, calculations, and/or symbols as appropriate. |
| **1**  | The response achieves the following:  
|        | • Response demonstrates a partial understanding of using division to solve a real-world problem.  
|        | • Give 1 point for correct responses but no valid explanations or calculation mistakes made in an otherwise correct process.  
|        | • Response is mostly correct, but contains either a computation error or an unclear or incomplete explanation.  
|        | • Response shows application of a relevant strategy, though it may be only partially applied or remain unexplained.  
|        | • Mathematical ideas are expressed only partially using words, calculations, and/or symbols as appropriate. |
| **0**  | The response achieves the following:  
|        | • The response demonstrates no understanding of using division to solve a real-world problem.  
|        | • Response is incorrect.  
|        | • Response shows no application of a strategy.  
<p>|        | Mathematical ideas cannot be interpreted or lack sufficient evidence to support even a limited understanding. |</p>
<table>
<thead>
<tr>
<th>Points Awarded</th>
<th>Sample Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Part A: To find the number of craft sticks, find the number of sets of 14 there are in 644. If you multiply 14 by 46, the answer is 644. Each student gets 46 craft sticks. AND Part B: The equation models the problem because it shows a total of 644 craft sticks separated into 14 equal groups. Each student can get a maximum of 46 craft sticks.</td>
</tr>
<tr>
<td>1</td>
<td>Part A: To find the number of craft sticks, find the number of sets of 14 there are in 644. If you multiply 14 by 46, the answer is 644. Each student gets 46 craft sticks. AND Each student can get a maximum of 48 craft sticks.</td>
</tr>
<tr>
<td>0</td>
<td>Student does not produce a correct response or a correct process.</td>
</tr>
</tbody>
</table>
### Item 3

**Scoring Rubric**

<table>
<thead>
<tr>
<th>Points</th>
<th>Description</th>
</tr>
</thead>
</table>
| 2      | The response achieves the following:  
  - The response demonstrates a complete understanding of writing expressions, identifying incorrect expressions, and justifying errors.  
  - Give 2 points for a correct response and valid explanation.  
    - Response is correct and complete.  
    - Response shows application of a reasonable and relevant strategy.  
    - Mathematical ideas are expressed coherently through a clear, complete, logical, and fully developed response using words, calculations, and/or symbols as appropriate. |
| 1      | The response achieves the following:  
  - The response demonstrates a partial understanding of writing expressions, identifying incorrect expressions, and justifying errors.  
  - Give 1 point for 1 part answered correctly.  
    - Response is mostly correct.  
    - Response shows inaccurate application of a relevant strategy.  
    - Mathematical ideas are expressed only partially using words, calculations, and/or symbols as appropriate. |
| 0      | The response achieves the following:  
  - The response demonstrates no understanding of writing expressions, identifying incorrect expressions, or justifying errors.  
  - Response is incorrect.  
  - Response shows no application of a strategy.  
  - Mathematical ideas cannot be interpreted or lack sufficient evidence to support even a limited understanding. |
<table>
<thead>
<tr>
<th>Points Awarded</th>
<th>Sample Response</th>
</tr>
</thead>
</table>
| 2             | Part A: Rita wants to find the value of three times the sum of 5 and 7, so the expression must show that 5 and 7 must be added first and then that sum is multiplied by 3. As the expression is now, it shows that 3 and 5 are multiplied first and then 7 is added to that product.  
AND  
Part B: She should write the addition part first in the expression to show that the addition must be done before the multiplication.  
AND  
Part C: 36 |
| 1             | Part A: Rita wants to find the value of three times the sum of 5 and 7, so the expression must show that 5 and 7 must be added first and then that sum is multiplied by 3. As the expression is now, it shows that 3 and 5 are multiplied first and then 7 is added to that product.  
AND  
Part B: She should write the addition part first in the expression to show that the addition must be done before the multiplication.  
AND  
Part C: 22 |
| 0             | Response is irrelevant, inappropriate, or not provided. |
Scoring Rubric

<table>
<thead>
<tr>
<th>Points</th>
<th>Description</th>
</tr>
</thead>
</table>
| 2      | The response achieves the following:  
|        | • Response demonstrates a complete understanding of dividing a decimal number by a whole number.  
|        | • Give 2 points for a correct response and valid explanation.  
|        | • Response is correct and complete.  
|        | • Response shows application of a reasonable and relevant strategy.  
|        | • Mathematical ideas are expressed coherently through a clear, complete, logical, and fully developed response using words, calculations, and/or symbols as appropriate. |
| 1      | The response achieves the following:  
|        | • Response demonstrates a partial understanding of dividing a decimal number by a whole number.  
|        | • Give 1 point for a correct response but no valid explanation or a calculation mistake made in an otherwise correct response.  
|        | • Response is mostly correct, but contains either a computation error or an unclear or incomplete explanation.  
|        | • Response shows application of a relevant strategy, though it may be only partially applied or remain unexplained.  
|        | • Mathematical ideas are expressed only partially using words, calculations, and/or symbols as appropriate. |
| 0      | The response achieves the following:  
|        | • The response demonstrates no understanding of dividing a decimal number by a whole number.  
|        | • Response is incorrect.  
|        | • Response shows no application of a strategy.  
|        | • Mathematical ideas cannot be interpreted or lack sufficient evidence to support even a limited understanding. |

Exemplar Response

<table>
<thead>
<tr>
<th>Points Awarded</th>
<th>Sample Response</th>
</tr>
</thead>
</table>
| 2             | Each person rode 2.9 or 2.90 miles.  
|               | AND  
|               | A total of 8 ones and 7 tenths are shaded to model the total length of the race. The shading is equally divided into 3 groups to model the 3 riders. And each group has 2 ones and 9 tenths shaded to model the distance each person rode. |
| 1             | Each person rode 2.9 or 2.90 miles. [NO explanation of models is given.] |
| 0             | Response is irrelevant, inappropriate, or not provided. |
### Item 14

#### Scoring Rubric

<table>
<thead>
<tr>
<th>Points</th>
<th>Description</th>
</tr>
</thead>
</table>
| 2      | The response achieves the following:  
|        | • Response demonstrates a complete understanding of how to identify a two-numerical pattern given examples and form ordered pairs from corresponding terms in the two patterns.  
|        | • Give 2 points for a correct response and valid process.  
|        | • Response is correct and complete.  
|        | • Response shows application of a reasonable and relevant strategy.  
|        | • Mathematical ideas are expressed coherently through a clear, complete, logical, and fully developed response using words, calculations, and/or symbols as appropriate. |
| 1      | The response achieves the following:  
|        | • Response demonstrates a partial understanding of how to identify a two-numerical pattern given examples and form ordered pairs from corresponding terms in the two patterns.  
|        | • Give 1 point for a correct response but no valid process or a calculation mistake made in an otherwise correct process.  
|        | • Response is mostly correct, but contains either a computation error or an unclear or incomplete explanation.  
|        | • Response shows application of a relevant strategy, though it may be only partially applied or remain unexplained.  
|        | • Mathematical ideas are expressed only partially using words, calculations, and/or symbols as appropriate. |
| 0      | The response achieves the following:  
|        | • The response demonstrates no understanding of how to identify a two-numerical pattern given examples and form ordered pairs from corresponding terms in the two patterns.  
|        | • Response is incorrect.  
|        | • Response shows no application of a strategy.  
|        | • Mathematical ideas cannot be interpreted or lack sufficient evidence to support even a limited understanding. |
## Exemplar Response

<table>
<thead>
<tr>
<th>Points Awarded</th>
<th>Sample Response</th>
</tr>
</thead>
</table>
| 2              | Part A:  
Row A: 2  
Row B: 2  
Row D: 4, 8  
Row E: 5, 10  
AND  
Part B:  
The x-values in each row are doubled to get the y-values of the same row. |
| 1              | Completes only one part correctly or completes both parts with no more than two errors.  
Part A:  
Row A: 2  
Row B: 2  
Row D: 4, 8  
Row E: 5, 10  
OR  
Part B:  
The x-values in each row are doubled to get the y-values of the same row. |
| 0              | *Response is irrelevant, inappropriate, or not provided.* |
## Item 18

### Scoring Rubric

<table>
<thead>
<tr>
<th>Points</th>
<th>Description</th>
</tr>
</thead>
</table>
| 3      | The response achieves the following:  
- The response demonstrates a complete understanding of classifying two-dimensional figures based on properties.  
- Give 3 points for 3 parts answered correctly.  
- Response is correct and complete.  
- Response shows application of a reasonable and relevant strategy.  
- Mathematical ideas are expressed coherently through a clear, complete, logical, and fully developed response using words, calculations, and/or symbols as appropriate. |
| 2      | The response achieves the following:  
- The response demonstrates a good understanding of classifying two-dimensional figures based on properties.  
- Give 2 points for correct identification of the given figure and identification of another figure that fits the criteria for the classification in Part B. However, the student only provides one attribute to describe the given figure or both figures.  
- Response is mostly correct, but contains either a computation error or an unclear or incomplete explanation.  
- Response shows application of a relevant strategy, though it may be only partially applied or remain unexplained.  
- Mathematical ideas are expressed only partially using words, calculations, and/or symbols as appropriate. |
| 1      | The response achieves the following:  
- The response demonstrates a limited understanding of classifying two-dimensional figures based on properties.  
- Response is only partially correct.  
- Response shows incomplete or inaccurate application of a relevant strategy.  
- Mathematical ideas are expressed only partially using words, calculations, and/or symbols as appropriate. |
| 0      | The response achieves the following:  
- The response demonstrates no understanding of classifying two-dimensional figures based on properties.  
- Response is incorrect.  
- Response shows no application of a strategy.  
- Mathematical ideas cannot be interpreted or lack sufficient evidence to support even a limited understanding |
### Exemplar Response

<table>
<thead>
<tr>
<th>Points Awarded</th>
<th>Sample Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Part A: (Answers may vary.) quadrilateral, rhombus, or parallelogram; Part B: (Or other correct response.) The figure has four sides, which makes it a quadrilateral. The fact that it has two pairs of parallel sides with opposite sides being equal in length as well as opposite angles being equal makes it a parallelogram. The fact that all four sides are congruent makes it a rhombus or other correct response. AND Part C: quadrilateral, rhombus, or parallelogram; (Whichever term was not used in Part A.)</td>
</tr>
<tr>
<td>2</td>
<td>Student gives two correct responses.</td>
</tr>
<tr>
<td>1</td>
<td>Student gives one correct response.</td>
</tr>
<tr>
<td>0</td>
<td>Response is irrelevant, inappropriate, or not provided.</td>
</tr>
</tbody>
</table>
### Item 20

**Scoring Rubric**

<table>
<thead>
<tr>
<th>Points</th>
<th>Description</th>
</tr>
</thead>
</table>
| 2      | The response achieves the following:  
  • Response demonstrates a complete understanding of how to convert among customary units of length and use the conversions in solving a real-world problem.  
  • Give 2 points for a correct response and valid process.  
  • Response is correct and complete.  
  • Response shows application of a reasonable and relevant strategy.  
  • Mathematical ideas are expressed coherently through a clear, complete, logical, and fully developed response using words, calculations, and/or symbols as appropriate. |
| 1      | The response achieves the following:  
  • Response demonstrates a partial understanding of how to convert among customary units of length and use the conversions in solving a real-world problem.  
  • Give 1 point for a correct response but no valid process or a calculation mistake made in an otherwise correct process.  
  • Response is mostly correct, but contains either a computation error or an unclear or incomplete explanation.  
  • Response shows application of a relevant strategy, though it may be only partially applied or remain unexplained.  
  • Mathematical ideas are expressed only partially using words, calculations, and/or symbols as appropriate. |
| 0      | The response achieves the following:  
  • The response demonstrates no understanding of how to convert among customary units of length and use the conversions in solving a real-world problem.  
  • Response is incorrect.  
  • Response shows no application of a strategy.  
  • Mathematical ideas cannot be interpreted or lack sufficient evidence to support even a limited understanding |
<table>
<thead>
<tr>
<th>Points Awarded</th>
<th>Sample Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Part A: The total length of the three paintings is 11 feet. Since 12 inches is 1 foot, I converted 54 inches to feet by dividing by 12. I know that 1 yard is 3 feet. Then I added the three lengths, in feet, to get a total length of 11 feet. AND Part B: The total length of the three paintings is 132 inches. Since each foot is 12 inches, I multiplied 11 feet by 12 to convert the total length in inches to feet. OR Part B: The total length of the three paintings is 132 inches. Since each foot is 12 inches, I multiplied the length given in feet by 12 to get 42 inches. Since 1 yard is 3 feet, I multiplied 3 by 12 to convert 1 yard to 36 inches. Then I added the three lengths, in inches, to get a total length of 132 inches.</td>
</tr>
<tr>
<td>1</td>
<td>Part A: The length of the three paintings is 11 feet. Part B: The length of the three paintings is 132 inches. OR Part A: The total length of the three paintings is 11 feet. Since 12 inches is 1 foot, I converted 54 inches to feet by dividing by 12. I know that 1 yard is 3 feet. Then I added the three lengths, in feet, to get a total length of 11 feet. OR Part B: The total length of the three paintings is 132 inches. Since each foot is 12 inches, I multiplied 11 feet by 12 to convert the total length in inches to feet. OR Part B: The total length of the three paintings is 132 inches. Since each foot is 12 inches, I multiplied the length given in feet by 12 to get 42 inches. Since 1 yard is 3 feet, I multiplied 3 by 12 to convert 1 yard to 36 inches. Then I added the three lengths, in inches, to get a total length of 132 inches.</td>
</tr>
<tr>
<td>0</td>
<td>Response is irrelevant, inappropriate, or not provided.</td>
</tr>
</tbody>
</table>
ACTIVITY

The following activity develops skills in Unit 1: Order of Operations and Whole Numbers.

Standards: MGSE.5.OA.1, MGSE.5.OA.2, MGSE.5.OA.3

Place Value
You can do this activity yourself or with your family. For this activity, you will need a large quantity of small objects, such as paper clips, pennies, or seeds.

Directions:
• Put all of the objects in a bowl, or spread them out on a table or on the ground.
• Estimate the number of objects. Record each person’s estimate.
• Separate the objects into groups of tens, hundreds, and thousands (if you have that many). Record the number of ones, tens, hundreds, and thousands on a place value chart like the one shown below, and use it to find the total number of objects.

<table>
<thead>
<tr>
<th>Thousands</th>
<th>Hundreds</th>
<th>Tens</th>
<th>Ones</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

• Find the difference between each estimate and the actual number of objects. Whose estimate is closest?
• Write and solve addition, subtraction, multiplication, and division problems based on the number of objects.
• Choose three fractions in halves, quarters, thirds, fourths, fifths, sixths, or eighths.
• Find each fraction of the whole group of objects. Represent these quantities in fraction and decimal forms.
**ACTIVITY**

The following activity develops skills in Unit 7: Volume and Measurement.

**Standards:** MGSE.5.G.1, MGSE.5.G.2, MGSE.5.G.3

You can do this activity yourself or in small groups with your family.

**Directions:** Imagine you are going to put on a play.

- Choose a location in the house to serve as a stage area, and choose at least two large and two small objects to use as furniture or props.
- Use attributes to classify the shape of the stage area and the shape of each object. Try to classify each in as many ways as you can.
- Describe the different ways the stage area and each object could be measured.
- Measure the stage area and objects and explain why you chose the units you used. At least one measurement should involve volume.
- Use a coordinate grid to represent the stage area, and plot points to represent the locations of props and actors. There is only one entrance to the stage. Make the origin on the grid the location of the stage entrance for actors. Then use the grid to write stage directions that tell each actor how to get from the stage entrance to his or her correct place on the stage.
- Write ten sentences of dialogue for the play. Use a stopwatch or online timer to determine how long it takes to say each sentence to the nearest quarter minute. Record the time data on a line plot. Use the plot to determine how long each sentence would be if you redistributed the total amount of time needed to say all the sentences equally among the ten sentences.
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CONSTRUCTED-RESPONSE ITEM

MGSE5.NBT.7

5. Peyton has a goal to walk 10,000 steps each day. On Tuesday afternoon, Peyton walked 7,338 steps. She averages 2.5 feet per step.

How many more feet does Peyton need to walk to reach her goal of 10,000 steps? Explain how you found your answer. Write your answer in the space provided on your answer document.

#5 Item Information

<table>
<thead>
<tr>
<th>Standard: MGSE5.NBT.7</th>
<th>Item Depth of Knowledge: 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.</td>
<td>Basic Application of Skill/Concept</td>
</tr>
<tr>
<td>Student uses information, conceptual knowledge, and procedures.</td>
<td></td>
</tr>
</tbody>
</table>

Write your answer in the space provided on your answer document.
### ITEM-SPECIFIC SCORING GUIDELINE

<table>
<thead>
<tr>
<th>Score Point</th>
<th>Description</th>
</tr>
</thead>
</table>
| 2           | Response demonstrates a complete understanding of the standard.  
Give 2 points for student identifying that there are 6655 feet remaining and providing a correct explanation.  
**Exemplar Response:**  
6655 feet (1 point)  
AND  
Subtract 7338 steps from 10,000 to get 2662 steps remaining. 2662 steps multiplied by 2.5 feet per step equals 6655 feet remaining. (1 point)  
OR  
Other valid response |
| 1           | Response demonstrates partial understanding of the standard.  
Student earns 1 point for answering 1 key element. |
| 0           | Response demonstrates limited to no understanding of the standard.  
Student earns 0 points because the student does not show understanding of adding, subtracting, multiplying, and dividing decimals. |
5. Peyton has a goal to walk 10,000 steps each day. On Tuesday afternoon, Peyton walked 7,338 steps. She averages 2.5 feet per step.

How many more feet does Peyton need to walk to reach her goal of 10,000 steps? Explain how you found your answer. **Type your answer in the space provided.**

6655

10,000 - 7,338 = 2,662
2,662 x 2.5 = 6,655

The response demonstrates complete understanding by providing the correct answer (6,655) with an explanation of how to calculate the number of remaining feet. The student subtracts 7,338 from 10,000 to get 2,662 remaining steps. The student then calculates the number of feet remaining by multiplying 2,662 by 2.5 feet per step.
MGSE5.NBT.7

Response Score: 2

5. Peyton has a goal to walk 10,000 steps each day. On Tuesday afternoon, Peyton walked 7,338 steps. She averages 2.5 feet per step.

How many more feet does Peyton need to walk to reach her goal of 10,000 steps? Explain how you found your answer. Write your answer in the space provided on your answer document.

I got 6,655 feet. I took 10,000 times 2.5 to get 25,000 and 7,338 times 2.5 to get 18,345 and then 1 subtracted.

The response demonstrates complete understanding by providing the correct answer (6655) and an explanation that shows how to calculate the number of remaining feet. The student selects the total number of steps (10,000) and the number of steps walked (7,338) and converts them to number of feet by multiplying by 2.5 feet per step. The student subtracts the number of feet walked (18,345) from the total feet (25,000) to get the number of remaining feet.
MATHEMATICS

MGSE5.NBT.7

Response Score: 1

5. Peyton has a goal to walk 10,000 steps each day. On Tuesday afternoon, Peyton walked 7,338 steps. She averages 2.5 feet per step.

How many more feet does Peyton need to walk to reach her goal of 10,000 steps? Explain how you found your answer. Type your answer in the space provided.

I took 7,338 from 10,000 to get 3,662 steps. 3,662 steps times 2.5 feet per step is 9,115 feet.

The response demonstrates partial understanding by providing an explanation that shows how to calculate the number of remaining feet. The student subtracts 7,338 from 10,000 and makes a calculation error, getting 3,662 instead of 2,662. The student understands that this is the number of steps remaining and calculates the number of remaining feet by multiplying 3,662 by 2.5 feet per step. The product 9,115 is incorrect due to the calculation error in the first step.
5. Peyton has a goal to walk 10,000 steps each day. On Tuesday afternoon, Peyton walked 7,338 steps. She averages 2.5 feet per step.

How many more feet does Peyton need to walk to reach her goal of 10,000 steps? Explain how you found your answer. Write your answer in the space provided on your answer document.

I subtracted to get the steps and then multiplied by 2.5 to get 6665.

The response demonstrates partial understanding by providing a valid but incomplete explanation that shows the number of remaining feet. The student subtracts to get the remaining steps, but the values subtracted are not shown. The student understands that to calculate the number of remaining feet, the number of steps is multiplied by 2.5 feet per step. The answer of 6665 is incorrect.
5. Peyton has a goal to walk 10,000 steps each day. On Tuesday afternoon, Peyton walked 7,338 steps. She averages 2.5 feet per step.

How many more feet does Peyton need to walk to reach her goal of 10,000 steps? Explain how you found your answer. **Type your answer in the space provided.**

Peyton needs to walk 2662 more

I got this by taking 10,000 minus 7,338 and got 2,662

The response demonstrates inadequate understanding of the concepts being tested. The student begins the process correctly by subtracting 7,338 from 10,000 but does not convert the value of 2,662 remaining steps to the number of remaining feet.
CONSTRUCTED-RESPONSE ITEM

MCC5.NBT.7

6. Chris has 70 jpeg files on his computer. Each file is 6.8 megabytes in size.

Part A: What is the total size, in megabytes, of Chris's jpeg files? Write your answer in the space provided on your answer document.

Part B: If Chris deletes 8 jpeg files, what will be the total size, in megabytes, of Chris's remaining jpeg files? Explain how you found your answer. Write your answer in the space provided on your answer document.

Part C: Amaya has 81 jpeg files that have a total size of 583.2 megabytes. If each jpeg file is the same size, what is the size, in megabytes, of each of Amaya's jpeg files? Write your answer in the space provided on your answer document.

#6 Item Information

<table>
<thead>
<tr>
<th>Standard: MCC5.NBT.7</th>
<th>Item Depth of Knowledge: 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.</td>
<td>Strategic Thinking</td>
</tr>
<tr>
<td>Student uses reasoning and develops a plan or sequence of steps; process has some complexity.</td>
<td></td>
</tr>
</tbody>
</table>
**ITEM-SPECIFIC SCORING GUIDELINE**

<table>
<thead>
<tr>
<th>Score Point</th>
<th>Rationale</th>
</tr>
</thead>
</table>
| 4 | Response demonstrates a complete understanding of the standard.  
Give 4 points for correctly identifying the total size of Chris’s files, identifying the total size of Chris’s files after 8 files are deleted, explaining how the new total size was determined, and identifying the size of each of Amaya’s files.  

**Exemplar Response:**  
**Part A:** 476  (1 point)  
**Part B:** 421.6  (1 point)  
**AND**  
8 jpegs are 54.4 megabytes. I subtracted 54.4 from 476.  (1 point)  
**Part C:** 7.2  (1 point)  
**OR**  
Other valid response |
| 3 | Response demonstrates nearly complete understanding of the standard.  
Student earns 3 points for answering 3 key elements.* |
| 2 | Response demonstrates partial understanding of the standard.  
Student earns 2 points for answering 2 key elements.* |
| 1 | Response demonstrates minimal understanding of the standard.  
Student earns 1 point for answering 1 key element.* |
| 0 | Response demonstrates limited to no understanding of the standard.  
Student earns 0 points because the student does not show understanding of adding, subtracting, multiplying, and dividing decimals. |

*If a student makes an error in Part A that is carried through to Part B (or subsequent parts), then the student is not penalized again for the same error.*
MCC5.NBT.7

Response Score: 4

6. Chris has 70 jpeg files on his computer. Each file is 6.8 megabytes in size.

Part A: What is the total size, in megabytes, of Chris’s jpeg files? **Type your answer in the space provided.**

Part B: If Chris deletes 8 jpeg files, what will be the total size, in megabytes, of Chris’s remaining jpeg files? Explain how you found your answer. **Type your answer in the space provided.**

Part C: Amaya has 81 jpeg files that have a total size of 583.2 megabytes. If each jpeg file is the same size, what is the size, in megabytes, of each of Amaya’s jpeg files? **Type your answer in the space provided.**

\[
\begin{align*}
A: \quad &70 \times 6.8 = 476 \\
B: \quad &62 \times 6.8 = 421.6 \\
C: \quad &583.2 \div 81 = 7.2
\end{align*}
\]

The response demonstrates a complete understanding by providing the correct answer in Part A (476) and in Part C (7.2) and by providing an explanation of how to determine the correct size of the files (421.6) if 8 of the files are deleted. The calculation shown in Part B is equivalent to a correct written explanation. The student multiplies 6.8 megabytes per file by 62 files (the number of files remaining if 8 files are deleted from the total of 70) to get the total file size of 421.6 megabytes.
6. Chris has 70 jpeg files on his computer. Each file is 6.8 megabytes in size.

Part A: What is the total size, in megabytes, of Chris’s jpeg files? Type your answer in the space provided.

Part B: If Chris deletes 8 jpeg files, what will be the total size, in megabytes, of Chris’s remaining jpeg files? Explain how you found your answer. Type your answer in the space provided.

Part C: Amaya has 81 jpeg files that have a total size of 583.2 megabytes. If each jpeg file is the same size, what is the size, in megabytes, of each of Amaya’s jpeg files? Type your answer in the space provided.

476-6.8-6.8-6.8-6.8-6.8-6.8-6.8=421.6

The response demonstrates a partially complete understanding by providing a correct answer in Part A (476) and in Part B (421.6) and by providing an explanation (or work shown) that correctly shows how the total file size is diminished as files are deleted. The student shows a correct strategy of subtracting 6.8 megabytes from the total of 476 for each file that is removed. The student does not address Part C.
MCC5.NBT.7

Response Score: 3

6. Chris has 70 jpeg files on his computer. Each file is 6.8 megabytes in size.

   Part A: What is the total size, in megabytes, of Chris’s jpeg files? **Type your answer in the space provided.**
   
   Part B: If Chris deletes 8 jpeg files, what will be the total size, in megabytes, of Chris’s remaining jpeg files? Explain how you found your answer. **Type your answer in the space provided.**

   Part C: Amaya has 81 jpeg files that have a total size of 583.2 megabytes. If each jpeg file is the same size, what is the size, in megabytes, of each of Amaya’s jpeg files? **Type your answer in the space provided.**

   476
   
   421.6, I got it by subtracting
   
   7.2

The response demonstrates a partially complete understanding by providing the correct answer in Part A (476), Part B (421.6), and Part C (7.2). The explanation provided in Part B (“I got it by subtracting”) is insufficient to demonstrate complete understanding.
MCC5.NBT.7

Response Score: 2

6. Chris has 70 jpeg files on his computer. Each file is 6.8 megabytes in size.

Part A: What is the total size, in megabytes, of Chris’s jpeg files? **Type your answer in the space provided.**

Part B: If Chris deletes 8 jpeg files, what will be the total size, in megabytes, of Chris’s remaining jpeg files? Explain how you found your answer. **Type your answer in the space provided.**

Part C: Amaya has 81 jpeg files that have a total size of 583.2 megabytes. If each jpeg file is the same size, what is the size, in megabytes, of each of Amaya’s jpeg files? **Type your answer in the space provided.**

![The total number of megabytes for Chris’s files is 474. To get the number of megabytes for Chris’s files if he deletes 8 files I took 8 times 6.8 to get 54.4 and then I took 474 minus 54.4 to get 419.6. Each of Amaya’s files is 6.8 megabytes.](image)

The response demonstrates partial understanding by providing an explanation of how to determine the correct size of the files if 8 files are removed. The student has an incorrect answer in Part A but used that answer (474) to correctly determine the total size of the files if 8 files were deleted by subtracting $8 \times 6.8 = 54$ from the total of 474. The total remaining file size of 419.6 is correct based on the previous incorrect value, so credit is given for both the answer and the process in Part B. The response for Part C is a restatement of the file size of Chris’s files, not the file size of Amaya’s files.
MCC5.NBT.7

Response Score: 1

6. Chris has 70 jpeg files on his computer. Each file is 6.8 megabytes in size.

   Part A: What is the total size, in megabytes, of Chris’s jpeg files? Write your answer in the space provided on your answer document.

   Part B: If Chris deletes 8 jpeg files, what will be the total size, in megabytes, of Chris’s remaining jpeg files? Explain how you found your answer. Write your answer in the space provided on your answer document.

   Part C: Amaya has 81 jpeg files that have a total size of 583.2 megabytes. If each jpeg file is the same size, what is the size, in megabytes, of each of Amaya’s jpeg files? Write your answer in the space provided on your answer document.

   Part a: 476 megabytes

   Part b: Subtract 8 to get 468 megabytes

   Part c: 502.2 megabytes

The response demonstrates minimal understanding, providing the correct answer for Part A only (476 megabytes). The process provided for Part B is incorrect, as the student subtracts the number of files being deleted from the total file size rather than subtracting the total size of the files being deleted. This misconception is carried forward to Part C, where the answer is incorrect and is the difference between the total file size and the number of files.
6. Chris has 70 jpeg files on his computer. Each file is 6.8 megabytes in size.

Part A: What is the total size, in megabytes, of Chris’s jpeg files? **Type your answer in the space provided.**

Part B: If Chris deletes 8 jpeg files, what will be the total size, in megabytes, of Chris’s remaining jpeg files? Explain how you found your answer. **Type your answer in the space provided.**

Part C: Amaya has 81 jpeg files that have a total size of 583.2 megabytes. If each jpeg file is the same size, what is the size, in megabytes, of each of Amaya’s jpeg files? **Type your answer in the space provided.**

70 plus 6.8 is 76.8

The response demonstrates inadequate understanding of the concepts being measured. The process shown is not appropriate for finding the size of an individual file. The student adds the number of files and the size of the files.