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<tbody>
<tr>
<td>1</td>
<td>Equation Item</td>
<td>Use equivalent fractions as a strategy to add and subtract fractions. (Fractions need not be simplified).</td>
<td>Solve word problems involving addition and subtraction of fractions referring to the same whole, 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} &lt; \frac{1}{2} ). (5.NF.2)</td>
<td>Level 1</td>
<td>---</td>
<td>1 point</td>
</tr>
<tr>
<td>2</td>
<td>Multiple Choice Item</td>
<td>Perform operations with multi-digit whole numbers and with decimals to hundredths.</td>
<td>Solve real-world problems by adding, subtracting, multiplying, and dividing decimals using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction, or multiplication and division; relate the strategy to a written method and explain the reasoning used. (5.NBT.7) a. Recall, identify, or make conversions between and among representations or numbers (fractions, decimals, and percents), or within and between customary and metric measures.</td>
<td>Level 1</td>
<td>B</td>
<td>1 point</td>
</tr>
</tbody>
</table>

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<th>Answer Key</th>
<th>Points</th>
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<tbody>
<tr>
<td>5</td>
<td>Multiple Choice Item</td>
<td>Apply and extend previous understandings of multiplication and division to multiply and divide fractions. (Fractions need not be simplified).</td>
<td>Interpret a fraction as division of the numerator by the denominator ( \frac{a}{b} = a ÷ b ). Solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers, e.g., by using visual fraction models or equations to represent the problem. For example, interpret ( \frac{3}{4} ) as the result of dividing 3 by 4, noting that ( \frac{3}{4} ) multiplied by 4 equals 3, and that when 3 wholes are shared equally among 4 people each person has a share of size ( \frac{3}{4} ). If 9 people want to share a 50-pound sack of rice equally by weight, how many pounds of rice should each person get? Between what two whole numbers does your answer lie? ( (5.NF.3) )</td>
<td>Level 2</td>
<td>C</td>
<td>1 point</td>
</tr>
<tr>
<td>6</td>
<td>Equation Item</td>
<td>Write and interpret numerical expressions.</td>
<td>Use parentheses in numerical expressions, and evaluate expressions with this symbol. Formal use of algebraic order of operations is not necessary. ( (5.0A.1) )</td>
<td>Level 1</td>
<td>---</td>
<td>1 point</td>
</tr>
</tbody>
</table>

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</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>Equation Item</td>
<td>Convert like measurement units within a given measurement system.</td>
<td>Know relative sizes of these U.S. customary measurement units: pounds, ounces, miles, yards, feet, inches, gallons, quarts, pints, cups, fluid ounces, hours, minutes, and seconds. Convert between pounds and ounces; miles and feet; yards, feet, and inches; gallons, quarts, pints, cups, and fluid ounces; hours, minutes, and seconds in solving multi-step, real-world problems. <em>(5.MD.1)</em></td>
<td>Level 1</td>
<td>---</td>
<td>1 point</td>
</tr>
<tr>
<td>12</td>
<td>Matching Item</td>
<td>Classify two-dimensional figures into categories based on their properties.</td>
<td>Identify and describe commonalities and differences between types of quadrilaterals based on angle measures, side lengths, and the presence or absence of parallel and perpendicular lines, e.g., squares, rectangles, parallelograms, trapezoids, and rhombuses. <em>(5.G.4)</em></td>
<td>Level 2</td>
<td>---</td>
<td>1 point</td>
</tr>
<tr>
<td>14</td>
<td>Multiple Choice Item</td>
<td>Apply and extend previous understandings of multiplication and division to multiply and divide fractions. (Fractions need not be simplified).</td>
<td>Interpret multiplication as scaling (resizing). <em>(5.NF.5)</em> a. Compare the size of a product to the size of one factor on the basis of the size of the other factor, without performing the indicated multiplication.</td>
<td>Level 2</td>
<td>A</td>
<td>1 point</td>
</tr>
<tr>
<td>17</td>
<td>Grid Item</td>
<td>Represent and interpret data.</td>
<td>Display and interpret data in graphs (picture graphs, bar graphs, and line plots) to solve problems using numbers and operations for this grade, e.g., including U.S. customary units in fractions 1/2, 1/4, 1/8, or decimals. <em>(5.MD.2)</em></td>
<td>Level 2</td>
<td>---</td>
<td>1 point</td>
</tr>
</tbody>
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<tbody>
<tr>
<td>19</td>
<td>Equation Item</td>
<td>Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions. (Fractions need not be simplified).</td>
<td>5.NF.7.c</td>
<td>Level 2</td>
<td>---</td>
<td>1 point</td>
</tr>
<tr>
<td>23</td>
<td>Equation Item</td>
<td>Perform operations with multi-digit whole numbers and with decimals to hundredths.</td>
<td>5.NBT.6</td>
<td>Level 2</td>
<td>---</td>
<td>1 point</td>
</tr>
</tbody>
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</thead>
<tbody>
<tr>
<td>25</td>
<td>Equation Item</td>
<td>Understand the place value system.</td>
<td>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. (5.NBT.1)</td>
<td>Level 2</td>
<td>---</td>
<td>1 point</td>
</tr>
<tr>
<td>29</td>
<td>Grid Item</td>
<td>Graph points on the coordinate plane to solve real-world and mathematical problems.</td>
<td>Represent real-world and mathematical problems by graphing points in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation. (5.G.2)</td>
<td>Level 3</td>
<td>---</td>
<td>1 point</td>
</tr>
<tr>
<td>30</td>
<td>Equation Item</td>
<td>Use equivalent fractions as a strategy to add and subtract fractions. (Fractions need not be simplified).</td>
<td>Add and subtract fractions with unlike denominators (including mixed numbers and fractions greater than 1) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators. For example, use visual models and properties of operations to show $\frac{2}{3} + \frac{3}{5} = \frac{6}{15} + \frac{15}{15} = \frac{23}{15}$. In general, $\frac{a}{b} + \frac{c}{d} = \left[\frac{a}{b} \times \frac{d}{d}\right] + \left[\frac{c}{d} \times \frac{b}{b}\right] = \frac{ad + bc}{bd}$. (5.NF.1)</td>
<td>Level 2</td>
<td>---</td>
<td>1 point</td>
</tr>
<tr>
<td>31</td>
<td>Multi Select Item</td>
<td>Understand the place value system.</td>
<td>Read, write, and compare decimals to thousandths. (5.NBT.3) b. Compare two decimals to thousandths based on meanings of the digits in each place, using $\textgreater$, $\text{=}$, and $\textless$ symbols to record the results of comparisons.</td>
<td>Level 2</td>
<td>B, E</td>
<td>1 point</td>
</tr>
</tbody>
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<th>Points</th>
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<tbody>
<tr>
<td>32</td>
<td>Equation Item</td>
<td>Apply and extend previous understandings of multiplication and division to multiply and divide fractions. (Fractions need not be simplified).</td>
<td>Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction. <em>(5.NF.4)</em> a. Interpret the product <em>(a/b) × q</em> as <em>a</em> parts of a partition of <em>q</em> into <em>b</em> equal parts, equivalently, as the result of a sequence of operations <em>a × q ÷ b</em>. For example, use a visual fraction model to show <em>(2/3) × 4 = 8/3,</em> and create a story context for this equation. Do the same with <em>(2/3) × (4/5) = 8/15.</em> <em>(In general, (a/b) × (c/d) = ac/ bd.)</em></td>
<td>Level 3</td>
<td>---</td>
<td>1 point</td>
</tr>
<tr>
<td>33</td>
<td>Equation Item</td>
<td>Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.</td>
<td>Relate volume to the operations of multiplication and addition and solve real-world and mathematical problems involving volume. <em>(5.MD.5)</em></td>
<td>Level 3</td>
<td>---</td>
<td>2 points</td>
</tr>
<tr>
<td>34</td>
<td>Multiple Choice Item</td>
<td>Understand the place value system.</td>
<td>Explain patterns in the number of zeros of the product when multiplying a number by powers of 10, and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. Use whole-number exponents to denote powers of 10. <em>(5.NBT.2)</em></td>
<td>Level 1</td>
<td>C</td>
<td>1 point</td>
</tr>
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</tr>
</thead>
<tbody>
<tr>
<td>35</td>
<td>Equation Item</td>
<td>Apply and extend previous understandings of multiplication and division to multiply and divide fractions. (Fractions need not be simplified).</td>
<td>Solve real world problems involving multiplication of fractions and mixed numbers, e.g., by using visual fraction models or equations to represent the problem. (5.NF.6)</td>
<td>Level 2</td>
<td>---</td>
<td>1 point</td>
</tr>
<tr>
<td>41</td>
<td>Multi Select Item</td>
<td>Classify two-dimensional figures into categories based on their properties.</td>
<td>Identify and describe commonalities and differences between types of triangles based on angle measures (equiangular, right, acute, and obtuse triangles) and side lengths (isosceles, equilateral, and scalene triangles). (5.G.3)</td>
<td>Level 2</td>
<td>B, E</td>
<td>1 point</td>
</tr>
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**Depth of Knowledge (DOK)**

DOK refers to the complexity of thinking required to complete a task in a given item. Items with a DOK 1 designation focus on the recall of information, such as definitions and terms, and simple procedures. Items with a DOK 2 designation require students to make decisions, solve routine problems, perform calculations, or recognize patterns. Items with a DOK 3 designation feature higher-order cognitive tasks. These DOK 3 tasks include but are not limited to: critiquing a statement and forming a conclusion; explaining, justifying, or proving a statement; or approaching abstract, complex, open-ended, and non-routine problems. Each grade’s blueprint contains information about the number of points of opportunity students will encounter at each DOK level.

**Table 1: Math Descriptors – Applying Depth of Knowledge Levels for Mathematics (Webb, 2002) & NAEP 2002 Mathematics Levels of Complexity**
(M. Petit, Center for Assessment 2003, K. Hess, Center for Assessment, updated 2006)

<table>
<thead>
<tr>
<th>Level 1 Recall</th>
<th>Level 2 Skills/Concepts</th>
<th>Level 3 Strategic Thinking</th>
<th>Level 4 Extended Thinking</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Recall, observe, or recognize a fact, definition, term, or property</td>
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<tr>
<td>b. Apply/compute a well-known algorithm (e.g., sum, quotient)</td>
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<tr>
<td>c. Apply a formula</td>
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<tr>
<td>d. Determine the area or perimeter of rectangles or triangles given a drawing and labels</td>
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<tr>
<td>e. Identify a plane or three-dimensional figure</td>
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<tr>
<td>f. Measure</td>
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<tr>
<td>g. Perform a specified or routine procedure (e.g., apply rules for rounding)</td>
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<tr>
<td>h. Evaluate an expression</td>
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</tr>
<tr>
<td>i. Solve a one-step word problem</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>j. Retrieve information from a table or graph</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>a. Classify plane and three-dimensional figures</td>
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</tr>
<tr>
<td>b. Interpret information from a simple graph</td>
<td></td>
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<tr>
<td>c. Use models to represent mathematical concepts</td>
<td></td>
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<tr>
<td>d. <strong>Solve a routine problem</strong> requiring multiple steps/decision points, or the application of multiple concepts</td>
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<tr>
<td>e. Compare and/or contrast figures or statements</td>
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<tr>
<td>f. Construct 2-dimensional patterns for 3-dimensional models, such as cylinders and cones</td>
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<tr>
<td>g. Provide justifications for steps in a solution process</td>
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<tr>
<td>h. Extend a pattern</td>
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</tr>
<tr>
<td>a. Interpret information from a complex graph</td>
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<tr>
<td>b. Explain thinking when more than one response is possible</td>
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<tr>
<td>c. Make and/or justify conjectures</td>
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<tr>
<td>d. Use evidence to develop logical arguments for a concept</td>
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<tr>
<td>e. Use concepts to solve non-routine problems</td>
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<tr>
<td>f. Perform procedure with multiple steps and multiple decision points</td>
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<tr>
<td>g. Generalize a pattern</td>
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<tr>
<td>h. Describe, compare, and contrast solution methods</td>
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<tr>
<td>i. Formulate a mathematical model for a complex situation</td>
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<tr>
<td>j. Provide mathematical justifications</td>
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</tr>
<tr>
<td>a. Relate mathematical concepts to other content areas</td>
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<tr>
<td>b. Relate mathematical concepts to real-world applications in new situations</td>
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<tr>
<td>c. Apply a mathematical model to illuminate a problem, situation</td>
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<tr>
<td>d. Conduct a project that specifies a problem, identifies solution paths, solves the problem, and reports results</td>
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<tr>
<td>e. Design a mathematical model to inform and solve a practical or abstract situation</td>
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<tr>
<td>f. Develop generalizations of the results obtained and the strategies used and apply them to new problem situations</td>
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</table>

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<th>Level 1</th>
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<th>Level 4</th>
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</thead>
<tbody>
<tr>
<td>Recall</td>
<td>Skills/Concepts</td>
<td>Strategic Thinking</td>
<td>Extended Thinking</td>
</tr>
<tr>
<td>k. Recall, identify, or make conversions between and among representations or numbers (fractions, decimals, and percents), or within and between customary and metric measures</td>
<td>i. Retrieve information from a table, graph, or figure and use it to solve a problem requiring multiple steps</td>
<td>k. Solve a multiple-step problem and provide support with a mathematical explanation that justifies the answer</td>
<td>g. Apply one approach among many to solve problems</td>
</tr>
<tr>
<td>l. Locate numbers on a number line, or points on a coordinate grid</td>
<td>j. Translate between tables, graphs, words and symbolic notation</td>
<td>l. Solve 2-step linear equations/inequalities in one variable over the rational numbers, interpret solution(s) in the original context, and verify reasonableness of results</td>
<td>h. Apply understanding in a novel way, providing an argument/justification for the application</td>
</tr>
<tr>
<td>m. Solve linear equations</td>
<td>k. Make direct translations between problem situations and symbolic notation</td>
<td>m. Translate between a problem situation and symbolic notation that is not a direct translation</td>
<td></td>
</tr>
<tr>
<td>n. Represent math relationships in words, pictures, or symbols</td>
<td>l. Select a procedure according to criteria and perform it</td>
<td>n. Formulate an original problem, given a situation</td>
<td></td>
</tr>
<tr>
<td>o. Read, write, and compare decimals in scientific notation</td>
<td>m. Specify and explain relationships between facts, terms, properties, or operations</td>
<td>o. Analyze the similarities and differences between procedures</td>
<td></td>
</tr>
<tr>
<td></td>
<td>n. Compare, classify, organize, estimate, or order data</td>
<td>p. Draw conclusion from observations or data, citing evidence</td>
<td></td>
</tr>
</tbody>
</table>

**NOTE:** Level 4 involves such things as complex restructuring of data or establishing and evaluating criteria to solve problems.
Grade 5 Math
Spring 2019 Item Release

Question 1

Question and Scoring Guidelines
Kim’s cookie recipe requires $\frac{3}{4}$ cup of brown sugar. Kim has $\frac{1}{2}$ cup of brown sugar.

How much more brown sugar does Kim need? Enter the number in the box.
Scoring Guidelines

Exemplar Response

- $\frac{1}{4}$

Other Correct Responses

- Any equivalent value

For this item, a full-credit response includes:

- the correct number (1 point).
Sample Response: 1 point

Kim’s cookie recipe requires $\frac{3}{4}$ cup of brown sugar. Kim has $\frac{1}{2}$ cup of brown sugar.

How much more brown sugar does Kim need? Enter the number in the box.

$\frac{1}{4}$ cup
Notes on Scoring

This response earns full credit (1 point) because it correctly identifies how much more brown sugar Kim needs.

- The student may use the model to find the difference between $\frac{3}{4}$ cup and $\frac{1}{2}$ cup using an equivalent fraction for $\frac{1}{2}$.

\[ \frac{3}{4} - \frac{1}{2} = \frac{3}{4} - \frac{2}{4} = \frac{1}{4} \]
Kim’s cookie recipe requires $\frac{3}{4}$ cup of brown sugar. Kim has $\frac{1}{2}$ cup of brown sugar.

How much more brown sugar does Kim need? Enter the number in the box.

$\frac{2}{8}$ cup

<table>
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<tr>
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<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>7</td>
<td>8</td>
<td>9</td>
</tr>
<tr>
<td>0</td>
<td>.</td>
<td>$\frac{9}{8}$</td>
</tr>
</tbody>
</table>
Notes on Scoring

This response earns full credit (1 point) because it correctly identifies how much more brown sugar Kim needs.

- The student may use the model to find the difference between \( \frac{3}{4} \text{ cup} \) and \( \frac{1}{2} \text{ cup} \) using equivalent fractions with common denominators, \( \frac{6}{8} - \frac{4}{8} \).

\[
\begin{align*}
\frac{6}{8} & = \frac{3}{4} \\
\frac{4}{8} & = \frac{1}{2} \\
\frac{2}{8} & = \frac{1}{4}
\end{align*}
\]
Kim’s cookie recipe requires \( \frac{3}{4} \) cup of brown sugar. Kim has \( \frac{1}{2} \) cup of brown sugar.

How much more brown sugar does Kim need? Enter the number in the box.

\[
\begin{array}{c}
\frac{2}{2} \\
\text{cup}
\end{array}
\]
Notes on Scoring

This response earns no credit (0 points) because it incorrectly identifies how much more brown sugar Kim needs.

- The student may subtract $\frac{3}{4} - \frac{1}{2}$ without finding equivalent fractions with common denominators.
Sample Response: 0 points

Kim’s cookie recipe requires $\frac{3}{4}$ cup of brown sugar. Kim has $\frac{1}{2}$ cup of brown sugar.

How much more brown sugar does Kim need? Enter the number in the box.

$\frac{5}{4}$ cup

---

1 2 3
4 5 6
7 8 9
0 . \frac{5}{4}
Notes on Scoring

This response earns no credit (0 points) because it incorrectly identifies how much more brown sugar Kim needs.

- The student may use the model to find the sum of \( \frac{3}{4} \) cup and \( \frac{1}{2} \) cup instead of the difference using an equivalent fraction for \( \frac{1}{2} \).

\[
\begin{align*}
2 \text{ cups} & \\
1 \frac{3}{4} & \\
1 \frac{1}{4} & \\
1 \frac{1}{2} & \\
\frac{4}{4} = 1 \text{ cup} & \\
2 \frac{2}{4} = \frac{3}{4} & \\
\end{align*}
\]

\[
\frac{5}{4} \neq \frac{3}{4} + \frac{2}{4}
\]
Grade 5 Math
Spring 2019 Item Release

Question 2

Question and Scoring Guidelines
Question 2

What is $\frac{1}{10}$ of 4?

A 0.04  
B 0.4  
C 40  
D 4

Points Possible: 1

Content Cluster: Perform operations with multi-digit whole numbers and with decimals to hundredths.

Content Standard: Solve real-world problems by adding, subtracting, multiplying, and dividing decimals using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction, or multiplication and division; relate the strategy to a written method and explain the reasoning used. (5.NBT.7)

a. Recall, identify, or make conversions between and among representations or numbers (fractions, decimals, and percents), or within and between customary and metric measures.

Depth of Knowledge: Level 1

a. Recall, observe, or recognize a fact, definition, term, or property
**Scoring Guidelines**

**Rationale for Option A:** This is incorrect. The student may shift the digit 4 two places to the right instead of one place to the right.

**Rationale for Option B:** **Key** – The student correctly determines that multiplying by \(\frac{1}{10}\) will result in shifting the digits in a number one place to the right.

**Rationale for Option C:** This is incorrect. The student may misunderstand that \(\frac{1}{10}\) of a number is a lesser value than the original number.

**Rationale for Option D:** This is incorrect. The student may misunderstand that \(\frac{1}{10}\) of a number is a lesser value than the original number.

**Sample Response: 1 point**

![Sample Response Image]
Grade 5 Math
Spring 2019 Item Release

Question 5

Question and Scoring Guidelines
Question 5

Petra has 6 feet (ft) of ribbon. She wants to make 8 bows that are exactly the same, and use all of her ribbon.

Which model best represents how Petra should divide the ribbon?

(A) \[ \frac{8}{6} \text{ ft} \]

(B) \[ \frac{8}{6} \text{ ft} \]

(C) \[ \frac{6}{8} \text{ ft} \]

(D) \[ \frac{6}{8} \text{ ft} \]
Points Possible: 1

Content Cluster: Apply and extend previous understandings of multiplication and division to multiply and divide fractions. (Fractions need not be simplified).

Content Standard: Interpret a fraction as division of the numerator by the denominator \((a/b = a \div b)\). Solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers, e.g., by using visual fraction models or equations to represent the problem. For example, interpret \(3/4\) as the result of dividing 3 by 4, noting that \(3/4\) multiplied by 4 equals 3, and that when 3 wholes are shared equally among 4 people each person has a share of size \(3/4\). If 9 people want to share a 50-pound sack of rice equally by weight, how many pounds of rice should each person get? Between what two whole numbers does your answer lie? (5.NF.3)

Depth of Knowledge: Level 2

  c. Use models to represent mathematical concepts

Scoring Guidelines

Rationale for Option A: This is incorrect. The student may correctly identify that there should be 8 segments and the length of each segment involves division of the two numbers, but may switch the order of the division and divide the number of segments by the length of the total ribbon.

Rationale for Option B: This is incorrect. The student may correctly identify that the length of each segment involves division of the two numbers, but may switch the order of the division, divide the number of segments by the length of the total ribbon, and choose an option with the incorrect number of segments.

Rationale for Option C: Key – The student identifies the correct method to divide the 6 feet of ribbon into 8 equal parts, choosing the option with the correct total length, the correct number of segments, and the correct segment length.

Rationale for Option D: This is incorrect. The student may correctly identify that the length of each segment is 6/8 feet, but may choose an option that has an incorrect total length with an incorrect number of segments of ribbon.
Petra has 6 feet (ft) of ribbon. She wants to make 8 bows that are exactly the same, and use all of her ribbon.

Which model best represents how Petra should divide the ribbon?

- A
  \[ \frac{8}{6} \text{ ft} \]

- B
  \[ \frac{8}{6} \text{ ft} \]

- C
  \[ \frac{6}{8} \text{ ft} \]

- D
  \[ \frac{6}{8} \text{ ft} \]
Grade 5 Math
Spring 2019 Item Release

Question 6

Question and Scoring Guidelines
Question 6

An expression is given.

$3 \times (3.5 + 1.77)$

What is the value of the expression? Enter the number in the box.

Points Possible: 1

Content Cluster: Write and interpret numerical expressions.

Content Standard: Use parentheses in numerical expressions, and evaluate expressions with this symbol. Formal use of algebraic order of operations is not necessary. (5.0A.1)

Depth of Knowledge: Level 1

g. Perform a specified or routine procedure (e.g., apply rules for rounding)
h. Evaluate an expression
Scoring Guidelines

Exemplar Response

• 15.81

Other Correct Responses

• Any equivalent value

For this item, a full-credit response includes:

• The correct value (1 point).
Sample Response: 1 point

An expression is given.

$$3 \times (3.5 + 1.77)$$

What is the value of the expression? Enter the number in the box.

15.81

Notes on Scoring

This response earns full credit (1 point) because it identifies a correct value of the expression.

- The student may add 3.5 and 1.77 before multiplying by 3.

$$3 \times (3.5 + 1.77)$$
$$= 3 \times (5.27)$$
$$= 3 \times 5 + 3 \times 0.2 + 3 \times 0.07$$
$$= 15.81$$
Sample Response: 0 points

An expression is given.

\[ 3 \times (3.5 + 1.77) \]

What is the value of the expression? Enter the number in the box.

12.27

Notes on Scoring

This response earns no credit (0 points) because it identifies an incorrect value of the expression.

- The student may multiply 3.5 by 3 before adding 1.77.

\[
3 \times 3.5 + 1.77 \\
= 3.5 + 3.5 + 3.5 + 1.77 \\
= 12.27
\]
Sample Response: 0 points

An expression is given.

$3 \times (3.5 + 1.77)$

What is the value of the expression? Enter the number in the box.

12.81

Notes on Scoring

This response earns no credit (0 points) because it identifies an incorrect value of the expression.

- The student may make an error regrouping when adding 3.5 and 1.77 before multiplying by 3.

\[
\begin{align*}
3.5 + 1.77 &= 4.27 \\
3 \times 4.27 &= 12.81
\end{align*}
\]

\[
\begin{align*}
3 \times 4 &= 12 \\
3 \times 0.2 &= 0.6 \\
3 \times 0.07 &= 0.21
\end{align*}
\]

\[
12 + 0.6 + 0.21 = 12.81
\]
Question 10

How many inches are there in $4 \frac{1}{2}$ feet? Enter the number in the box.

[Image of a box with inches indicated]

Points Possible: 1

Content Cluster: Convert like measurement units within a given measurement system.

Content Standard: Know relative sizes of these U.S. customary measurement units: pounds, ounces, miles, yards, feet, inches, gallons, quarts, pints, cups, fluid ounces, hours, minutes, and seconds. Convert between pounds and ounces; miles and feet; yards, feet, and inches; gallons, quarts, pints, cups, and fluid ounces; hours, minutes, and seconds in solving multi-step, real-world problems. (5.MD.1)

Depth of Knowledge: Level 1

k. Recall, identify, or make conversions between and among representations or numbers (fractions, decimals, and percents), or within and between customary and metric measures
Scoring Guidelines

Exemplar Response

- 54

Other Correct Responses

- Any equivalent value

For this item, a full-credit response includes:

- The correct number (1 point).
Grade 5 Math
Spring 2019 Item Release

Question 10

Sample Responses
Sample Response: 1 point

How many inches are there in $4 \frac{1}{2}$ feet? Enter the number in the box.

54 inches

Notes on Scoring

This response earns full credit (1 point) because it identifies the correct number of inches in $4 \frac{1}{2}$ feet.

- The student may multiply $4 \frac{1}{2}$ feet by 12.

\[
\begin{array}{c}
4 \quad + \quad \frac{1}{2} \\
\hline
12 \\
\hline
12 \times 4 = 48 \\
12 \times \frac{1}{2} = 6
\end{array}
\]
Sample Response: 0 points

How many inches are there in $4\frac{1}{2}$ feet? Enter the number in the box.

$48\frac{1}{2}$ inches

Notes on Scoring

This response earns no credit (0 points) because it identifies an incorrect number of inches in $4\frac{1}{2}$ feet.

- The student may multiply 4 feet by 12 and then add $\frac{1}{2}$ to the product.

\[
\begin{align*}
4\frac{1}{2} \times 12 &= 12 + 12 + 12 + 12 + \frac{1}{2} \\
&= 4 \times 12 + \frac{1}{2} \\
&= 48\frac{1}{2}
\end{align*}
\]
Sample Response: 0 points

How many inches are there in $4 \frac{1}{2}$ feet? Enter the number in the box.

$48$ inches

Notes on Scoring

This response earns no credit (0 points) because it identifies an incorrect number of inches in $4 \frac{1}{2}$ feet.

- The student may only multiply $4$ feet by $12$.

$$4 \frac{1}{2} \times 12 \\ = 12 + 12 + 12 + 12 \\ = 4 \times 12 \\ = 48$$

$48$ inches
Grade 5 Math
Spring 2019 Item Release

Question 12

Question and Scoring Guidelines
Question 12

Two shapes are shown.

Select whether each statement describes a way in which the two shapes are alike or a way in which they are different.

<table>
<thead>
<tr>
<th>Ways They Are Alike</th>
<th>Ways They Are Different</th>
</tr>
</thead>
<tbody>
<tr>
<td>All four sides are an equal length.</td>
<td>☐</td>
</tr>
<tr>
<td>All four angles are equal in size.</td>
<td>☐</td>
</tr>
<tr>
<td>There are two pairs of parallel sides.</td>
<td>☐</td>
</tr>
<tr>
<td>There are four pairs of perpendicular sides.</td>
<td>☐</td>
</tr>
</tbody>
</table>

Points Possible: 1

Content Cluster: Classify two-dimensional figures into categories based on their properties.

Content Standard: Identify and describe commonalities and differences between types of quadrilaterals based on angle measures, side lengths, and the presence or absence of parallel and perpendicular lines, e.g., squares, rectangles, parallelograms, trapezoids, and rhombuses. (5.G.4)

Depth of Knowledge: Level 2
m. Specify and explain relationships between facts, terms, properties, or operations
Scoring Guidelines

Exemplar Response

<table>
<thead>
<tr>
<th>Ways They Are Alike</th>
<th>Ways They Are Different</th>
</tr>
</thead>
<tbody>
<tr>
<td>All four sides are an equal length.</td>
<td>✓</td>
</tr>
<tr>
<td>All four angles are equal in size.</td>
<td>✓</td>
</tr>
<tr>
<td>There are two pairs of parallel sides.</td>
<td></td>
</tr>
<tr>
<td>There are four pairs of perpendicular sides.</td>
<td></td>
</tr>
</tbody>
</table>

Other Correct Responses

- N/A

For this item, a full-credit response includes:

- The correct table (1 point).
Sample Response: 1 point

Two shapes are shown.

Select whether each statement describes a way in which the two shapes are alike or a way in which they are different.

<table>
<thead>
<tr>
<th>Ways They Are Alike</th>
<th>Ways They Are Different</th>
</tr>
</thead>
<tbody>
<tr>
<td>All four sides are an equal length.</td>
<td>□</td>
</tr>
<tr>
<td>All four angles are equal in size.</td>
<td>□</td>
</tr>
<tr>
<td>There are two pairs of parallel sides.</td>
<td>✔</td>
</tr>
<tr>
<td>There are four pairs of perpendicular sides.</td>
<td>□</td>
</tr>
</tbody>
</table>

Notes on Scoring

This response earns full credit (1 point) because it identifies the correct statements that describe a way in which the two shapes are alike and a way in which they are different.
Sample Response: 0 points

Two shapes are shown.

Select whether each statement describes a way in which the two shapes are alike or a way in which they are different.

<table>
<thead>
<tr>
<th></th>
<th>Ways They Are Alike</th>
<th>Ways They Are Different</th>
</tr>
</thead>
<tbody>
<tr>
<td>All four sides are an equal length.</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>All four angles are equal in size.</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>There are two pairs of parallel sides.</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>There are four pairs of perpendicular sides.</td>
<td>✓</td>
<td></td>
</tr>
</tbody>
</table>

Notes on Scoring

This response earns no credit (0 points) because it identifies an incorrect statement that describes a way in which the two shapes are alike.

- The student may think the rhombus appears to contain four right angles because the shape is shown with a partial rotation.
Sample Response: 0 points

Two shapes are shown.

Select whether each statement describes a way in which the two shapes are alike or a way in which they are different.

<table>
<thead>
<tr>
<th>Ways They Are Alike</th>
<th>Ways They Are Different</th>
</tr>
</thead>
<tbody>
<tr>
<td>All four sides are an equal length.</td>
<td>☐</td>
</tr>
<tr>
<td>All four angles are equal in size.</td>
<td>✓</td>
</tr>
<tr>
<td>There are two pairs of parallel sides.</td>
<td>✓</td>
</tr>
<tr>
<td>There are four pairs of perpendicular sides.</td>
<td>☐</td>
</tr>
</tbody>
</table>

Notes on Scoring

This response earns no credit (0 points) because it identifies an incorrect statement that describes a way in which the two shapes are alike.

- The student may think the rhombus appears to contain four angles equal in size because the rhombus is shown with a partial rotation.
Grade 5 Math
Spring 2019 Item Release
Question 14
Question and Scoring Guidelines
Question 14

Kelsey’s mom bought a cell phone for $200. Now the cell phone is worth half as much as Kelsey’s mom paid for it.

Which expression represents the amount of money, in dollars, the cell phone is worth now?

A. $200 \times \frac{1}{2}$
B. $200 + \frac{1}{2}$
C. $200 \div \frac{1}{2}$
D. $200 - \frac{1}{2}$

Points Possible: 1

Content Cluster: Apply and extend previous understandings of multiplication and division to multiply and divide fractions. (Fractions need not be simplified).

Content Standard: Interpret multiplication as scaling (resizing). (5.NF.5)

a. Compare the size of a product to the size of one factor on the basis of the size of the other factor, without performing the indicated multiplication.

Depth of Knowledge: Level 2

k. Make direct translations between problem situations and symbolic notation
Scoring Guidelines

Rationale for Option A: **Key** – The student notes that taking half of something is the same as multiplying by \( \frac{1}{2} \).

Rationale for Option B: This is incorrect. The student may think that a decrease in price indicates addition rather than multiplication by half.

Rationale for Option C: This is incorrect. The student may think that a decrease in price indicates division rather than multiplication by half.

Rationale for Option D: This is incorrect. The student may think that a decrease in price indicates subtraction rather than multiplication by half.

Sample Response: 1 point

Kelsey’s mom bought a cell phone for $200. Now the cell phone is worth half as much as Kelsey’s mom paid for it.

Which expression represents the amount of money, in dollars, the cell phone is worth now?

- \( 200 \times \frac{1}{2} \)
- \( 200 + \frac{1}{2} \)
- \( 200 \div \frac{1}{2} \)
- \( 200 - \frac{1}{2} \)
Grade 5 Math
Spring 2019 Item Release

Question 17

Question and Scoring Guidelines
A student has a piece of tape that is 3 inches long. She cuts the tape into 7 pieces. Then, she records the length of 6 of the pieces in a line plot, as shown. Move the X to the line plot to show where the length of the seventh piece of tape should be recorded.

**Points Possible:** 1

**Content Cluster:** Represent and interpret data.

**Content Standard:** Display and interpret data in graphs (picture graphs, bar graphs, and line plots) to solve problems using numbers and operations for this grade, e.g., including U.S. customary units in fractions $\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{8}$, or decimals. (5.MD.2)

**Depth of Knowledge:** Level 2
i. Retrieve information from a table, graph, or figure and use it to solve a problem requiring multiple steps
Scoring Guidelines

Exemplar Response

Line Plot of Tape Piece Lengths

Other Correct Responses

- N/A

For this item, a full-credit response includes:

- a correctly placed X (1 point).
Grade 5 Math
Spring 2019 Item Release

Question 17

Sample Responses
Sample Response: 1 point

A student has a piece of tape that is 3 inches long. She cuts the tape into 7 pieces. Then, she records the length of 6 of the pieces in a line plot, as shown. Move the X to the line plot to show where the length of the seventh piece of tape should be recorded.

Notes on Scoring

This response earns full credit (1 point) because it identifies the correct length of the seventh piece of tape.

- The student may identify equivalent fractions with a common denominator and count down from 3 inches with a number line using the six known lengths.
Sample Response: 0 points

A student has a piece of tape that is 3 inches long. She cuts the tape into 7 pieces. Then, she records the length of 6 of the pieces in a line plot, as shown.

Move the X to the line plot to show where the length of the seventh piece of tape should be recorded.

Notes on Scoring

This response earns no credit (0 points) because it identifies an incorrect length of the seventh piece of tape.

- The student may identify equivalent fractions with a common denominator and use a number line to count on from 0 to 3 inches using the six known lengths of tape without including the seventh piece.
Sample Response: 0 points

A student has a piece of tape that is 3 inches long. She cuts the tape into 7 pieces. Then, she records the length of 6 of the pieces in a line plot, as shown.

Move the X to the line plot to show where the length of the seventh piece of tape should be recorded.

Notes on Scoring

This response earns no credit (0 points) because it identifies an incorrect length of the seventh piece of tape.

- The student may use a number line to count on from 0 inches using the six known lengths of tape and think the total length of all seven pieces of tape is supposed to be less than 3 inches.

\[
\frac{7}{8} + \frac{4}{8} + \frac{2}{8} + \frac{2}{8} + \frac{2}{8} \neq 3
\]

\[
\frac{7}{8} + \frac{1}{2} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4} \neq 3
\]
Question 19

Molly makes 5 gallons of soup in a pot. Then, she fills bowls that each hold \(\frac{1}{16}\) gallon of soup until the pot is empty.

How many bowls does Molly fill? Enter the number in the box.
Points Possible: 1

Content Cluster: Apply and extend previous understandings of multiplication and division to multiply and divide fractions. (Fractions need not be simplified).

Content Standard: Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions. In general, students able to multiply fractions can develop strategies to divide fractions by reasoning about the relationship between multiplication and division, but division of a fraction by a fraction is not a requirement at this grade. (5.NF.7)

c. Solve real world problems involving division of unit fractions by non-zero whole numbers and division of whole numbers by unit fractions, e.g., by using visual fraction models and equations to represent the problem. For example, how much chocolate will each person get if 3 people share 1/2 lb of chocolate equally? How many 1/3-cup servings are in 2 cups of raisins?

Depth of Knowledge: Level 2
d. Solve a routine problem requiring multiple steps/decision points, or the application of multiple concepts

Scoring Guidelines

Exemplar Response

- 80

Other Correct Responses

- Any equivalent value

For this item, a full-credit response includes:

- a correct value (1 point).
Grade 5 Math
Spring 2019 Item Release

Question 19

Sample Responses
Sample Response: 1 point

Molly makes 5 gallons of soup in a pot. Then, she fills bowls that each hold \( \frac{1}{16} \) gallon of soup until the pot is empty.

How many bowls does Molly fill? Enter the number in the box.

80

Notes on Scoring

This response earns full credit (1 point) because it correctly identifies the number of bowls Molly fills.

- The student may use a model to find the number of bowls of soup in 1 gallon and then multiply the number of bowls of soup in 1 gallon by 5.

1 gallon produces 16 bowls of soup
16 bowls + 16 bowls + 16 bowls + 16 bowls + 16 bowls
= 5 gallons \times 16 \text{ soup bowls} = 80 \text{ soup bowls}

\( 5 \div \frac{1}{16} = 80 \text{ bowls} \)
Sample Response: 1 point

Molly makes 5 gallons of soup in a pot. Then, she fills bowls that each hold $\frac{1}{16}$ gallon of soup until the pot is empty.

How many bowls does Molly fill? Enter the number in the box.

\[
\begin{align*}
80 \\
1 
\end{align*}
\]

Notes on Scoring

This response earns full credit (1 point) because it correctly identifies the number of bowls Molly fills.

- The student may use common denominators to divide 5 by $\frac{1}{16}$.

\[
\begin{align*}
5 \div \frac{1}{16} &= \frac{80}{1} \\
\frac{1}{16} \times 1 &= \frac{1 \times 1}{16 \times 1} = \frac{1}{16} \\
\text{AND} \quad 5 \times \frac{1}{16} &= \frac{5 \times 16}{1 \times 16} = \frac{80}{16} = \frac{80}{16} \div 16 = \frac{80}{1} = \frac{80}{1} \\
5 \div \frac{1}{16} &= \frac{80}{1}
\end{align*}
\]
Sample Response: 0 points

Molly makes 5 gallons of soup in a pot. Then, she fills bowls that each hold $\frac{1}{16}$ gallon of soup until the pot is empty.

How many bowls does Molly fill? Enter the number in the box.

\[
\frac{5}{16}
\]

Notes on Scoring

This response earns no credit (0 points) because it incorrectly identifies the number of bowls Molly fills.

- The student may use a number line to multiply 5 by $\frac{1}{16}$ instead of dividing 5 by $\frac{1}{16}$.

\[
5 \times \frac{1}{16} = \frac{5}{16}
\]

\[
\frac{1}{16} + \frac{1}{16} + \frac{1}{16} + \frac{1}{16} + \frac{1}{16}
\]

\[
0 \quad \frac{1}{16} \quad \frac{2}{16} \quad \frac{3}{16} \quad \frac{4}{16} \quad \frac{5}{16} \quad \frac{6}{16} \quad \frac{7}{16} \quad \frac{8}{16}
\]

\[
5 \div \frac{1}{16} \neq \frac{5}{16}
\]
Sample Response: 0 points

Molly makes 5 gallons of soup in a pot. Then, she fills bowls that each hold $\frac{1}{16}$ gallon of soup until the pot is empty.

How many bowls does Molly fill? Enter the number in the box.

16

Notes on Scoring

This response earns no credit (0 points) because it incorrectly identifies the number of bowls Molly fills.

- The student may use a model to find the number of bowls in only 1 gallon of soup.
### Question 23

At a school, 294 students are going on a field trip. They are put into groups of 14 students each. How many groups of students are there? Enter the whole number in the box.

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>7</td>
<td>8</td>
<td>9</td>
</tr>
<tr>
<td>0</td>
<td>.</td>
<td>⅓</td>
</tr>
</tbody>
</table>

**Points Possible:** 1

**Content Cluster:** Perform operations with multi-digit whole numbers and with decimals to hundredths.

**Content Standard:** Find whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models. (5.NBT.6)

**Depth of Knowledge:** Level 2

d. Solve a routine problem requiring multiple steps/decision points, or the application of multiple concepts
Scoring Guidelines

Exemplar Response

• 21

Other Correct Responses

• Any equivalent whole number

For this item, a full-credit response includes:

• The correct quotient (1 point).
Grade 5 Math
Spring 2019 Item Release
Question 23
Sample Responses
Sample Response: 1 point

At a school, 294 students are going on a field trip. They are put into groups of 14 students each. How many groups of students are there? Enter the whole number in the box.

21

Notes on Scoring

This response earns full credit (1 point) because it correctly identifies the number of groups of students as a whole number.

- The student may use an area model to divide 294 by 14 to find the whole number of groups of students.

\[
\begin{array}{c|c|c}
\hline
10 & 10 & 4 \\
\hline
94 & 80 & 4 \\
\hline
20 & 20 & 1 \\
\hline
\end{array}
\]

20 + 1 = 21
294 ÷ 14 = 21
Sample Response: 0 points

At a school, 294 students are going on a field trip. They are put into groups of 14 students each. How many groups of students are there? Enter the whole number in the box.

\[
\frac{294}{14}
\]

Notes on Scoring

This response earns no credit (0 points) because it incorrectly identifies the number of groups of students as a whole number.

- The student may understand the quotient of \(294 \div 14\) is equal to \(\frac{294}{14}\) and leave the answer as a fraction rather than perform the division to identify the number of groups of students as a whole number.
Sample Response: 0 points

At a school, 294 students are going on a field trip. They are put into groups of 14 students each. How many groups of students are there? Enter the whole number in the box.

4116

Notes on Scoring

This response earns no credit (0 points) because it incorrectly identifies the number of groups of students as a whole number.

- The student may multiply 294 × 14 using an area model instead of dividing 294 by 14.

\[14 \times 294 = (10 + 4) \times (200 + 90 + 4)\]

<table>
<thead>
<tr>
<th></th>
<th>200</th>
<th>+ 90</th>
<th>+ 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>2000</td>
<td>900</td>
<td>40</td>
</tr>
<tr>
<td>+ 4</td>
<td>800</td>
<td>360</td>
<td>16</td>
</tr>
</tbody>
</table>

\[2000 + 800 + 900 + 360 + 40 + 16 = 4116\]

\[294 \div 14 \neq 4116\]
Question 25

How many times greater is the value of the 4 in 547 than the value of the 4 in 84? Enter the number in the box.

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>7</td>
<td>8</td>
<td>9</td>
</tr>
<tr>
<td>0</td>
<td>.</td>
<td>4</td>
</tr>
</tbody>
</table>

Points Possible: 1

Content Cluster: Understand the place value system.

Content Standard: 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 \( \frac{1}{10} \) of what it represents in the place to its left. (5.NBT.1)

Depth of Knowledge: Level 2
m. Specify and explain relationships between facts, terms, properties, or operations
Scoring Guidelines

Exemplar Response

- 10

Other Correct Responses

- Any equivalent value

For this item, a full-credit response includes:

- The correct value (1 point).
Sample Response: 1 point

How many times greater is the value of the 4 in 547 than the value of the 4 in 84? Enter the number in the box.

10
Notes on Scoring

This response earns full credit (1 point) because it correctly identifies how many times greater the value of the 4 in 547 is than the value of the 4 in 84.

- The student may draw a picture to represent the value of the 4 in each number and recognize that 40 is 10 times greater than 4.
Sample Response: 1 point

How many times greater is the value of the 4 in 547 than the value of the 4 in 84? Enter the number in the box.

10.000

Notes on Scoring

This response earns full credit (1 point) because it correctly identifies how many times greater the value of the 4 in 547 is than the value of the 4 in 84.

- The student may create a place value chart to compare the value of the digits.

<table>
<thead>
<tr>
<th>Tens</th>
<th>Ones</th>
<th>.</th>
<th>Tenths</th>
<th>Hundredths</th>
<th>Thousandths</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>0</td>
<td>.</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>0</td>
<td>4</td>
<td>.</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

40.000 ÷ 4.000 = □
40.000 ÷ 4.000 = 10.000
□ = 10.000
Sample Response: 0 points

How many times greater is the value of the 4 in 547 than the value of the 4 in 84? Enter the number in the box.

40

Notes on Scoring

This response earns no credit (0 points) because it incorrectly identifies how many times greater the value of the 4 in 547 is than the value of the 4 in 84.

- The student may only identify the value of the 4 in 547 as 40 without comparing it to the value of the 4 in 84.
Sample Response: 0 points

How many times greater is the value of the 4 in 547 than the value of the 4 in 84? Enter the number in the box.

463

Notes on Scoring

This response earns no credit (0 points) because it incorrectly identifies how many times greater the value of the 4 in 547 is than the value of the 4 in 84.

- The student may think they are supposed to find the difference between 547 and 84 instead of finding the comparison between the value of the 4 in 547 and the value of the 4 in 84.

  \[547 - 84 = 463\]
  \[40 \div 4 \neq 463\]
Grade 5 Math
Spring 2019 Item Release

Question 29

Question and Scoring Guidelines
Question 29

Point P is located at \((x, y)\).

Point Q is located 2 units to the right of point P and 3 units up.

Place points P and Q on the coordinate plane to show their possible locations.

- There may be more than one correct answer.

**Points Possible:** 1

**Content Cluster:** Graph points on the coordinate plane to solve real-world and mathematical problems.

**Content Standard:** Represent real-world and mathematical problems by graphing points in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation. (5.G.2)

**Depth of Knowledge:** Level 3
e. Use concepts to solve non-routine problems
Scoring Guidelines

For 1 point, the response satisfies the bullet below.

- The student correctly plotted the points, providing evidence of the ability to graph points in the first quadrant of the coordinate plane.

Exemplar Response

Other Correct Responses

- any placement where point P is located at \((x, y)\) and point Q is located at \((x+2, y+3)\)
Sample Response: 1 point

Point P is located at $(x, y)$.

Point Q is located 2 units to the right of point P and 3 units up.

Place points P and Q on the coordinate plane to show their possible locations.

- There may be more than one correct answer.
Notes on Scoring

This response earns full credit (1 point) because it identifies a correct location for Point Q that is 2 units to the right of Point P and 3 units up from Point P.

- The student places Point P at (2, 2) and Point Q at (4, 5).
Sample Response: 1 point

Point P is located at \((x, y)\).

Point Q is located 2 units to the right of point P and 3 units up.

Place points P and Q on the coordinate plane to show their possible locations.

- There may be more than one correct answer.
Notes on Scoring

This response earns full credit (1 point) because it identifies a correct location for Point Q that is located 2 units to the right of Point P and 3 units up from Point P.

- The student places Point P at (0, 0) and Point Q at (2, 3).
Sample Response: 0 points

Point $P$ is located at $(x, y)$.
Point $Q$ is located 2 units to the right of point $P$ and 3 units up.
Place points $P$ and $Q$ on the coordinate plane to show their possible locations.
• There may be more than one correct answer.
Notes on Scoring

This response earns no credit (0 points) because it identifies an incorrect location for Point Q.

- The student places Point Q to the right 3 units and up 2 units from Point P instead of 2 units to the right and 3 units up.
Sample Response: 0 points

Point P is located at \((x, y)\).

Point Q is located 2 units to the right of point P and 3 units up.

Place points P and Q on the coordinate plane to show their possible locations.

- There may be more than one correct answer.
Notes on Scoring

This response earns no credit (0 points) because it identifies an incorrect location for Point Q.

- The student places Point Q 2 units to the left and 3 units down from Point P.
Question 30

Fernando represents an expression using the model shown.

Key

= one whole

What is the sum of the fractions represented by the model? Enter the number in the box.
Points Possible: 1

Content Cluster: Use equivalent fractions as a strategy to add and subtract fractions. (Fractions need not be simplified).

Content Standard: Add and subtract fractions with unlike denominators (including mixed numbers and fractions greater than 1) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators. For example, use visual models and properties of operations to show $\frac{2}{3} + \frac{5}{4} = \frac{8}{12} + \frac{15}{12} = \frac{23}{12}$. In general, $\frac{a}{b} + \frac{c}{d} = \left(\frac{a}{b} \times \frac{d}{d}\right) + \left(\frac{c}{d} \times \frac{b}{b}\right) = \frac{ad + bc}{bd}$. (5.NF.1)

Depth of Knowledge: Level 2
c. Use models to represent mathematical concepts
d. Solve a routine problem requiring multiple steps/decision points, or the application of multiple concepts

Scoring Guidelines

Exemplar Response

• $\frac{29}{8}$

Other Correct Responses

• any equivalent value

For this item, a full-credit response includes:

• the correct sum (1 point).
Grade 5 Math
Spring 2019 Item Release

Question 30

Sample Responses
Sample Response: 1 point

Fernando represents an expression using the model shown.

Key

= one whole

What is the sum of the fractions represented by the model? Enter the number in the box.

\[3 \frac{5}{8}\]
Notes on Scoring

This response earns full credit (1 point) because it correctly identifies the sum represented by the model.

- The student may use the fraction models to create equivalent fractions and then add the fractions together.

\[
\frac{8}{8} + \frac{8}{8} + \frac{8}{8} + \frac{2}{8} + \frac{3}{8} = 1 + 1 + \frac{1}{8} + \frac{2}{8} + \frac{3}{8} = 3 + \frac{5}{8} = 3\frac{5}{8}
\]
Sample Response: 1 point

Fernando represents an expression using the model shown.

What is the sum of the fractions represented by the model? Enter the number in the box.

\[ \frac{20}{32} \]
Notes on Scoring

This response earns full credit (1 point) because it correctly identifies the sum represented by the model.

- The student may use common denominators to create equivalent fractions and add the mixed number and fraction together.

\[3 \frac{1}{4} + \frac{3}{8}\]

\[= 3 \frac{8}{32} + \frac{12}{32} = 3 \frac{20}{32}\]

Equivalent Fractions:

\[3+ \frac{1}{4} \times \frac{8}{8}\]

\[= 3 + \frac{1}{4} \times \frac{8}{8}\]

\[= 3 \frac{8}{32}\]

\[= 3 \frac{1}{4} = 3 \frac{8}{32}\]

AND

\[\frac{3}{8} = \frac{3}{8} \times \frac{4}{4} = \frac{12}{32}\]
Sample Response: 0 points

Fernando represents an expression using the model shown.

\[
\begin{array}{ccc}
\text{ } & \text{ } & \text{ } \\
\text{ } & \text{ } & \text{ } \\
\text{ } & \text{ } & \text{ } \\
\end{array} +
\begin{array}{c}
\text{ } \\
\text{ } \\
\text{ } \\
\end{array}
\]

Key

\[
\begin{array}{c}
\text{ } \\
\text{ } \\
\end{array} = \text{ one whole}
\]

What is the sum of the fractions represented by the model? Enter the number in the box.

\[
\frac{3}{3}
\]

Notes on Scoring

This response earns no credit (0 points) because it incorrectly identifies the sum represented by the model.

\[
\begin{array}{ccc}
\text{ } & \text{ } & \text{ } \\
\text{ } & \text{ } & \text{ } \\
\text{ } & \text{ } & \text{ } \\
\end{array} +
\begin{array}{c}
\text{ } \\
\text{ } \\
\text{ } \\
\end{array}
\]

\[
\begin{array}{c}
\text{ } \\
\text{ } \\
\text{ } \\
\end{array} = 3 \frac{1}{3}
\]
Sample Response: 0 points

Fernando represents an expression using the model shown.

What is the sum of the fractions represented by the model? Enter the number in the box.

16

Notes on Scoring

This response earns no credit (0 points) because it incorrectly identifies the sum represented by the model.

- The student may count the number of shaded parts shown in the model.
Question 31

A comparison is given.
0.45 > ?

Select the two decimals that make the comparison true.

- 0.64
- 0.28
- 0.52
- 0.73
- 0.39

Points Possible: 1

Content Cluster: Understand the place value system.

Content Standard: Read, write, and compare decimals to thousandths. (5.NBT.3)

b. Compare two decimals to thousandths based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons.

Depth of Knowledge: Level 2
m. Specify and explain relationships between facts, terms, properties, or operations
Scoring Guidelines

Rationale for First Option: This is incorrect. The student may compare the hundredths place before the tenths place and think that because the 4 in 0.64 is less than the 5 in 0.45, 0.64 is less than 0.45.

Rationale for Second Option: Key – The student correctly identifies that 0.28 is less than 0.45 because the value of the tenths in 0.28 is less than the value of the tenths in 0.45.

Rationale for Third Option: This is incorrect. The student may compare the hundredths place before the tenths place and think that because the 2 in 0.52 is less than the 5 in 0.45, 0.52 is less than 0.45.

Rationale for Fourth Option: This is incorrect. The student may compare the hundredths place before the tenths place and think that because the 3 in 0.73 is less than the 5 in 0.45, 0.73 is less than 0.45.

Rationale for Fifth Option: Key – The student correctly identifies that 0.39 is less than 0.45 because the value of the tenths in 0.39 is less than the value of the tenths in 0.45.

Sample Response: 1 point
Grade 5 Math
Spring 2019 Item Release

Question 32

Question and Scoring Guidelines
Question 32

Franklin has a bag of 24 gumballs. There are red, blue, and green gumballs.

- \( \frac{3}{8} \) of the gumballs are red.
- \( \frac{5}{12} \) of the gumballs are blue.

How many of the gumballs in Franklin’s bag are green?
Points Possible: 1

Content Cluster: Apply and extend previous understandings of multiplication and division to multiply and divide fractions. (Fractions need not be simplified).

Content Standard: Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction. (5.NF.4)
a. Interpret the product \((a/b) \times q\) as a parts of a partition of q into b equal parts, equivalently, as the result of a sequence of operations \(a \times q \div b\). For example, use a visual fraction model to show \((2/3) \times 4 = 8/3\), and create a story context for this equation. Do the same with \((2/3) \times (4/5) = 8/15\). (In general, \((a/b) \times (c/d) = ac/ bd\).)

Depth of Knowledge: Level 3
f. Perform procedure with multiple steps and multiple decision points

Scoring Guidelines

Exemplar Response

- 5

Other Correct Responses

- \(\frac{5}{24}\)

For this item, a full-credit response includes:

- A correct value (1 point).
Grade 5 Math
Spring 2019 Item Release

Question 32

Sample Responses
Sample Response: 1 point

Franklin has a bag of 24 gumballs. There are red, blue, and green gumballs.

- $\frac{3}{8}$ of the gumballs are red.
- $\frac{5}{12}$ of the gumballs are blue.

How many of the gumballs in Franklin’s bag are green?

5
Notes on Scoring

This response earns full credit (1 point) because it correctly identifies the number of green gumballs in Frank’s bag.

- The student may use a model to identify the number of red, blue, and green gumballs in Frank’s bag.

24 gumballs – 9 red gumballs – 10 blue gumballs = 5 green gumballs

<table>
<thead>
<tr>
<th>Red Gumballs</th>
<th>Blue Gumballs</th>
<th>Green Gumballs</th>
</tr>
</thead>
<tbody>
<tr>
<td>( \frac{3}{6} \times 24 )</td>
<td>( \frac{5}{12} \times 24 )</td>
<td>24 total gumballs – 9 red gumballs – 10 blue gumballs = 5 green gumballs</td>
</tr>
<tr>
<td>= ( \frac{72}{6} )</td>
<td>= ( \frac{120}{12} )</td>
<td></td>
</tr>
<tr>
<td>= 12</td>
<td>= 10</td>
<td></td>
</tr>
</tbody>
</table>
Sample Response: 1 point

Franklin has a bag of 24 gumballs. There are red, blue, and green gumballs.

- \( \frac{3}{8} \) of the gumballs are red.
- \( \frac{5}{12} \) of the gumballs are blue.

How many of the gumballs in Franklin’s bag are green?

\[
\frac{5}{24}
\]

Notes on Scoring

This response earns full credit (1 point) because it correctly identifies the number of green gumballs in Frank’s bag.

- The student may draw a picture that represents the situation in order to identify the number of red, blue, and green gumballs in Frank’s bag.
Franklin has a bag of 24 gumballs. There are red, blue, and green gumballs.

- \(\frac{3}{8}\) of the gumballs are red.
- \(\frac{5}{12}\) of the gumballs are blue.

How many of the gumballs in Franklin’s bag are green?

\[\frac{1}{24}\]
Notes on Scoring

This response earns no credit (0 points) because it incorrectly identifies the number of green gumballs in Frank’s bag.

- The student may create equivalent fractions with common denominators and find the difference between \( \frac{10}{24} \) and \( \frac{9}{24} \) instead of adding them and then subtracting their sum from the total number of gumballs.

\[
\frac{3}{8} \times \frac{3}{3} = \frac{9}{24} \quad \text{AND} \quad \frac{5}{12} \times \frac{2}{2} = \frac{10}{24}
\]
Sample Response: 0 points

Franklin has a bag of 24 gumballs. There are red, blue, and green gumballs.

• \( \frac{3}{8} \) of the gumballs are red.
• \( \frac{5}{12} \) of the gumballs are blue.

How many of the gumballs in Franklin’s bag are green?

\[
\begin{array}{c}
\frac{19}{24}
\end{array}
\]

Notes on Scoring

This response earns no credit (0 points) because it incorrectly identifies the number of green gumballs in Frank’s bag.

• The student may create equivalent fractions with common denominators and add them together to find their total.
Grade 5 Math
Spring 2019 Item Release

Question 33

Question and Scoring Guidelines
Question 33

This item has two parts.

**Part A.** A company sells snack bars in a small box in the shape of a rectangular prism. The small box is shown, with dimensions in inches (in.).

![Diagram of a rectangular prism with dimensions 8 in. x 6 in. x 2 in.]

What is the volume, in cubic inches, of the small box? Enter the number in the box.

`cubic inches`

```
1  2  3
4  5  6
7  8  9
0  .  
```
Part B. The company ships the small boxes of snack bars in a larger box. The larger box is shown, with dimensions in inches (in.).

What is the greatest number of small boxes of snack bars that can be shipped in one larger box? Enter the number in the box.

1  2  3
4  5  6
7  8  9
0  .  ÷
Points Possible: 2

Content Cluster: Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.

Content Standard: Relate volume to the operations of multiplication and addition and solve real-world and mathematical problems involving volume. (5.MD.5)

Depth of Knowledge: Level 3
f. Perform procedures with multiple steps and multiple decision points
Scoring Guidelines

Score 2

For 2 points, the response satisfies both of the bullets below.

- The student determined the volume, providing evidence of the ability to apply the formula $V = l \times w \times h$ for regular prisms to find volumes of right rectangular prisms with whole-number edge lengths in the context of solving real-world and mathematical problems.
- The student determined the number of small boxes, from the information given or the responses in Part A, providing evidence of the ability to recognize volume is additive.

Exemplar Response

Part A. 96
Part B. 54

Score 1

For 1 point, the response satisfies one of the bullets.

Exemplar Response

Part A. 96
Part B. 6, or the response to Part B is equal to 5,184 divided by the answer in Part A, or that quotient rounded up or down to the nearest whole number
Grade 5 Math
Spring 2019 Item Release
Question 33
Sample Responses
Sample Response: 2 points

This item has two parts.

**Part A.** A company sells snack bars in a small box in the shape of a rectangular prism. The small box is shown, with dimensions in inches (in.).

What is the volume, in cubic inches, of the small box? Enter the number in the box.

\[ 96 \text{ cubic inches} \]
**Part B.** The company ships the small boxes of snack bars in a larger box. The larger box is shown, with dimensions in inches (in.).

What is the greatest number of small boxes of snack bars that can be shipped in one larger box? Enter the number in the box.

54
Notes on Scoring

This response earns full credit (2 points) because it correctly identifies the volume, in cubic inches, of the small box and the correct number of small boxes of snacks that can be shipped in one larger box.

- In PART A, the student may apply the Associative Property of Multiplication to find the volume.
  \[ 8 \times (2 \times 6) = 8 \times 12 = 96 \text{ cubic inches} \]
- In PART B, the student may use strategies based on place value to find the volume of the larger box and use division to determine the number of smaller boxes that can be shipped in one larger box.

\[
\begin{array}{c|c|c|c|c}
\text{Halves} & \times & \text{Doubles} & = & ? \\
\hline
16 & \times & 18 & = & ? \\
8 & \times & 36 & = & ? \\
4 & \times & 72 & = & ? \\
2 & \times & 144 & = & ? \\
1 & \times & 288 & = & 288
\end{array}
\]

\[
16 \times 18 = 288
\]

\[
\begin{array}{c|c|c|c|c|c|c|c}
2 & 8 & 8 & \times & 1 & 8 & = & 8 \times 8 \\
6 & 4 & 0 & = & 8 \times 80 \\
1 & 6 & 0 & = & 8 \times 200 \\
8 & 0 & = & 10 \times 8 \\
8 & 0 & = & 10 \times 80 \\
4 & 0 & = & 10 \times 200 \\
5 & 1 & 8 & 4
\end{array}
\]

\[
288 \times 18 = 5184
\]

\[
96 \\ 5 \ 4 \\ \\ - 0 \ 9 \ 6 \ 0 = 96 \times 10 \\
4 \ 2 \ 2 \ 4 \\ - 0 \ 9 \ 6 \ 0 = 96 \times 10 \\
3 \ 2 \ 6 \ 4 \\ - 0 \ 9 \ 6 \ 0 = 96 \times 10 \\
2 \ 3 \ 0 \ 4 \\ - 1 \ 9 \ 2 \ 0 = 96 \times 20 \\
0 \ 3 \ 8 \ 4 \\ - 1 \ 9 \ 7 = 96 \times 2 \\
1 \ 9 \ 2 \\ - 1 \ 9 \ 2 = 96 \times 2 \\
0 \ 0 \ 0
\]

\[
10 + 10 + 10 + 2 + 2 = 54 \\
5184 \div 96 = 54
\]
Sample Response: 1 point

This item has two parts.

Part A. A company sells snack bars in a small box in the shape of a rectangular prism. The small box is shown, with dimensions in inches (in.).

What is the volume, in cubic inches, of the small box? Enter the number in the box.

96 cubic inches
Part B. The company ships the small boxes of snack bars in a larger box. The larger box is shown, with dimensions in inches (in.).

What is the greatest number of small boxes of snack bars that can be shipped in one larger box? Enter the number in the box.

5184
Notes on Scoring

This response earns partial credit (1 point) because it correctly identifies the volume, in cubic inches, of the small box but identifies the incorrect number of small boxes of snacks that can be shipped in one larger box.

- In PART A, the student may apply the Associative Property of Multiplication to find the volume.

\[8 \times 2 \times 6\]
\[= 8 \times 6 \times 2\]
\[= 48 \times 2 = 96 \text{ cubic inches}\]

- In PART B, the student may use partial products to only find the volume of the larger box without dividing to find the number of small boxes that will fit in it.

\[(16 \times 18 \times 18) \div 96 \neq 5184\]
Sample Response: 1 point

This item has two parts.

Part A. A company sells snack bars in a small box in the shape of a rectangular prism. The small box is shown, with dimensions in inches (in.).

What is the volume, in cubic inches, of the small box? Enter the number in the box.

12 cubic inches
Part B. The company ships the small boxes of snack bars in a larger box. The larger box is shown, with dimensions in inches (in.).

What is the greatest number of small boxes of snack bars that can be shipped in one larger box? Enter the number in the box.

432

1  2  3
4  5  6
7  8  9
0  a  a
Notes on Scoring

This response earns partial credit (1 point) because it incorrectly identifies the volume, in cubic inches, of the small box but identifies the correct number of small boxes of snacks that can be shipped in one larger box based on the incorrect response in PART A.

- In PART A, the student may only find the area of the base of the rectangular prism.
  
  \[2 \times 6 = 12\]
  
  \[8 \times 6 \times 2 \neq 12 \text{ cubic inches}\]

- In PART B, the student may use partial products to find the correct volume of the larger box, then use division to find the number of small boxes with a volume of 12 cubic inches that can be shipped in one large box.
  
  \[18 \times 18 \times 16\]

\[
\begin{array}{c|cc}
\hline
& 10 & 8 \\
\hline
10 & 10 \times 10 = 100 & 10 \times 8 = 80 \\
+ & 8 & 8 \times 8 = 64 \\
\hline
& 100 + 80 + 80 + 64 = 324 \\
\end{array}
\]

\[
\begin{array}{c|ccc}
\hline
& 300 & + & 20 & + & 4 \\
\hline
10 & 10 \times 300 = 3000 & 10 \times 20 = 200 & 10 \times 4 = 40 \\
6 & 6 \times 300 = 1800 & 6 \times 20 = 120 & 6 \times 4 = 24 \\
\hline
& 3000 + 1800 + 200 + 120 + 40 + 24 = 5184 \\
\end{array}
\]

\[
\begin{array}{c|c}
\hline
10 & 4 \times 3 \times 2 \\
\hline
5 & 1 & 8 & 4 \\
1 & 2 & 0 & 0 & = 12 \times 100 \\
\hline
3 & 9 & 8 & 4 \\
1 & 2 & 0 & 0 & = 12 \times 100 \\
\hline
2 & 7 & 8 & 4 \\
2 & 4 & 0 & 0 & = 12 \times 200 \\
\hline
0 & 3 & 8 & 4 \\
3 & 5 & 0 & 0 & = 12 \times 30 \\
\hline
0 & 2 & 4 \\
0 & 2 & 4 & = 12 \times 2 \\
\hline
0 & 0 & 0 \\
\hline
& 100 \times 1 + 200 \times 3 + 30 \times 2 = 432 \\
\end{array}
\]

\[5184 \div 12 = 432\]
Sample Response: 0 points

This item has two parts.

**Part A.** A company sells snack bars in a small box in the shape of a rectangular prism. The small box is shown, with dimensions in inches (in.).

What is the volume, in cubic inches, of the small box? Enter the number in the box.

16 cubic inches
Part B. The company ships the small boxes of snack bars in a larger box. The larger box is shown, with dimensions in inches (in.).

What is the greatest number of small boxes of snack bars that can be shipped in one larger box? Enter the number in the box.

3

1 2 3
4 5 6
7 8 9
0
Notes on Scoring

This response earns no credit (0 points) because it incorrectly identifies the volume, in cubic inches, of the small box and identifies the incorrect number of small boxes of snacks that can be shipped in one larger box.

- In PART A, the student may add the three dimensions instead of multiplying.
  
  \[8 + 6 + 2 = 16\]

  \[8 \times 6 \times 2 \neq 16\] cubic inches

- In PART B, the student may divide each dimension by 16 and add up the quotients.
  
  \[18 \div 16 = 1 \text{ remainder } 2\]

  \[18 \div 16 = 1 \text{ remainder } 2\]

  \[16 \div 16 = 1\]

  \[1 + 1 + 1 = 3\]

  \[(18 \times 18 \times 16) \div (8 \times 2 \times 6) \neq 3\]
Sample Response: 0 points

This item has two parts.

Part A. A company sells snack bars in a small box in the shape of a rectangular prism. The small box is shown, with dimensions in inches (in.).

What is the volume, in cubic inches, of the small box? Enter the number in the box.

12 cubic inches
Part B. The company ships the small boxes of snack bars in a larger box. The larger box is shown, with dimensions in inches (in.).

What is the greatest number of small boxes of snack bars that can be shipped in one larger box? Enter the number in the box.

27
Notes on Scoring

This response earns no credit (0 points) because it incorrectly identifies the volume, in cubic inches, of the small box and identifies the incorrect number of small boxes of snacks that can be shipped in one larger box.

- In PART A, the student may only find the area of the base.
  \[6 \times 2 = 12\]
  \[8 \times 6 \times 2 \neq 12\] cubic inches

- In PART B, the student may use strategies to find a related multiplication problem for \(18 \times 18\) and only find the area of the base before dividing the area of the base of the larger rectangular prism by the area of the base of the smaller rectangular prism.

\[
\begin{array}{c|c|c|c}
\text{Halves} & \times & 18 \times 18 & = \ ? \\
18 & 18 & = \ ? \\
9 & 36 & = \ ? \\
\end{array}
\]

\[
18 \times 18 = 9 \times 36
\]

\[
\begin{array}{c}
9 \\
\times 30 = 270 \\
\times 6 = 54
\end{array}
\]

\[
\begin{array}{c}
9 \times 36 \\
= 9 \times (30 + 6) \\
= 9 \times 30 + 9 \times 6 \\
= 270 + 54 = 324 \\
9 \times 36 = 324
\end{array}
\]

\[
\begin{array}{c|c|c}
2 & 7 \\
3 & 4 \\
- 2 & 4 \\
0 & 8 \\
\hline
84 \\
- 84 \\
0
\end{array}
\]

\[
324 \div 12 = 27
\]

\[
(18 \times 18 \times 16) \div (8 \times 2 \times 6) \neq 27
\]
Question 34

Which expression is equivalent to $10^4$?

- A. $10 \times 4$
- B. $10 + 4$
- C. $10 \times 10 \times 10 \times 10$
- D. $10 + 10 + 10 + 10$

Points Possible: 1

Content Cluster: Understand the place value system.

Content Standard: Explain patterns in the number of zeros of the product when multiplying a number by powers of 10, and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. Use whole-number exponents to denote powers of 10. (5.NBT.2)

Depth of Knowledge: Level 1
a. Recall, observe, or recognize a fact, definition, term, or property
Scoring Guidelines

Rationale for Option A: This is incorrect. The student may think 10 should be multiplied by the exponent.

Rationale for Option B: This is incorrect. The student may think that 10 should be added to the exponent.

Rationale for Option C: Key – The student represents $10^4$ as its equivalent $10 \times 10 \times 10 \times 10$.

Rationale for Option D: This is incorrect. The student may think that the exponent is the number of times that 10 is added.

Sample Response: 1 point

Which expression is equivalent to $10^4$?

- A $10 \times 4$
- B $10 + 4$
- C $10 \times 10 \times 10 \times 10$
- D $10 + 10 + 10 + 10$
Grade 5 Math
Spring 2019 Item Release

Question 35

Question and Scoring Guidelines
Question 35

At a school, $\frac{3}{5}$ of the students play a musical instrument. Of those students, $\frac{3}{16}$ play the trumpet.

What fraction of all of the students in the school play the trumpet? Enter the number in the box.

Points Possible: 1

Content Cluster: Apply and extend previous understandings of multiplication and division to multiply and divide fractions. (Fractions need not be simplified).

Content Standard: Solve real world problems involving multiplication of fractions and mixed numbers, e.g., by using visual fraction models or equations to represent the problem. (5.NF.6)

Depth of Knowledge: Level 2
d. Solve a routine problem requiring multiple steps/decision points, or the application of multiple concepts
Scoring Guidelines

Exemplar Response

- $\frac{9}{80}$

Other Correct Responses

- Any equivalent value

For this item, a full-credit response includes:

- A correct value (1 point).
Sample Response: 1 point

At a school, \( \frac{3}{5} \) of the students play a musical instrument. Of those students, \( \frac{3}{16} \) play the trumpet.

What fraction of all of the students in the school play the trumpet? Enter the number in the box.

\[
\frac{9}{80}
\]

Notes on Scoring

This response earns full credit (1 point) because it correctly identifies the fraction of all students that play trumpet at the school.

- The student may use a model to multiply \( \frac{3}{5} \times \frac{3}{16} \).
Sample Response: 0 points

At a school, \( \frac{3}{5} \) of the students play a musical instrument. Of those students, \( \frac{3}{16} \) play the trumpet.

What fraction of all of the students in the school play the trumpet? Enter the number in the box.

\[
\frac{16}{5}
\]
Notes on Scoring

This response earns no credit (0 points) because it incorrectly identifies the fraction of all students that play trumpet at the school.

- The student may divide $\frac{3}{5}$ by $\frac{3}{16}$ using common denominators.

\[
\frac{3}{5} \div \frac{3}{16} = \frac{3 \times 16}{5 \times 3} = \frac{48}{15} = \frac{16}{5}
\]

AND

\[
\frac{3}{16} \times \frac{5}{5} = \frac{15}{80}
\]

While division of fractions is introduced in grade 5, students are only expected to be able to divide unit fractions by non-zero whole numbers and divide whole numbers by unit fractions. Students are not expected to be able to interpret and compute quotients of fractions and solve word problems involving division of fractions by fractions until grade 6.
Sample Response: 0 points

At a school, $\frac{3}{5}$ of the students play a musical instrument. Of those students, $\frac{3}{16}$ play the trumpet.

What fraction of all of the students in the school play the trumpet? Enter the number in the box.

\[
\begin{array}{c}
\frac{6}{21}
\end{array}
\]

Notes on Scoring

This response earns no credit (0 points) because it incorrectly identifies the fraction of all students that play trumpet at the school.

- The student may add the fractions $\frac{3}{5}$ and $\frac{3}{16}$ without creating equivalent fractions with common denominators.

\[
\frac{3}{5} + \frac{3}{16} \neq \frac{6}{21}
\]

\[
\frac{3}{5} \times \frac{3}{16} \neq \frac{6}{21}
\]
Grade 5 Math
Spring 2019 Item Release

Question 41

Question and Scoring Guidelines
Question 41

Select the two triangles that can be described as acute isosceles.

☐ △ 3 5 4

☐ △ 4 4 5

☐ △ 8 13 10

☐ △ 8 10 6

☐ △ 6 11 11

☐ △ 10 12 10
Scoring Guidelines

Rationale for First Option: This is incorrect. The student may think a triangle with any acute angles is acute, and overlook the fact that a triangle with no congruent sides is not isosceles.

Rationale for Second Option: Key – The student correctly identifies that a triangle that has three acute angles is acute and that a triangle that has at least two congruent sides is isosceles.

Rationale for Third Option: This is incorrect. The student may correctly identify that a triangle with three acute angles is acute, but overlook the fact that a triangle with no congruent sides is not isosceles.

Rationale for Fourth Option: This is incorrect. The student may correctly identify a triangle with two acute angles but overlook that an acute triangle has three acute angles.

Rationale for Fifth Option: Key – The student correctly identifies that a triangle that has three acute angles is acute and that a triangle that has at least two congruent sides is isosceles.

Rationale for Sixth Option: This is incorrect. The student may correctly identify that a triangle with at least two sides of the same length is isosceles, but overlook the fact that a triangle with an obtuse angle is not an acute triangle.
Sample Response: 1 point

Select the two triangles that can be described as acute isosceles.

- [ ]

- [x] 4 4 5

- [ ] 8 13 10

- [ ] 8 10 6

- [x] 6 11 11

- [ ] 10 12 10