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# Grade 5 Mathematics Item Specifications

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The draft Florida Standards Assessment (FSA) *Test Item Specifications (Specifications)* are based upon the Florida Standards and the Florida Course Descriptions as provided in [CPALMs](#). The *Specifications* are a resource that defines the content and format of the test and test items for item writers and reviewers. Each grade-level and course *Specifications* document indicates the alignment of items with the Florida Standards. It also serves to provide all stakeholders with information about the scope and function of the FSA.

### Item Specifications Definitions

**Also assesses** refers to standard(s) closely related to the primary standard statement.

**Clarification statements** explain what students are expected to do when responding to the question.

**Assessment limits** define the range of content knowledge and degree of difficulty that should be assessed in the assessment items for the standard.

**Acceptable response mechanisms** describe the characteristics from which a student must answer a question.

**Context** defines types of stimulus materials that can be used in the assessment items.

Content Standard	<b>MAFS.5.OA Operations and Algebraic Thinking</b>	
	<b>MAFS.5.OA.1 Write and interpret numerical expressions.</b>	
	<b>MAFS.5.OA.1.1</b> Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.	
Assessment Limits	Whole numbers and simple fraction expressions (single digit denominators, fraction multiplied by a whole number). Expressions should not be more complex than those used in associative or distributive property situations.	
Calculator	No	
Acceptable Response Mechanisms	Equation Response Multiple Choice Response Multi-Select Response Graphic Response – Drag and Drop, Hot Spot	
Context	No context	
Example		
Context	Use two operations inside the grouping symbols. Use more than one set of grouping symbols with one operation inside the grouping symbols. Use only whole numbers. <ul style="list-style-type: none"> <li>Evaluate the expression <math>6 \times (4 + 3 \times 2) + 100</math>.</li> <li>Evaluate the expression <math>(6 + 3) \times (4 + 2)</math>.</li> </ul>	
Context easier	Use one operation inside the grouping symbols. Use only whole numbers. <ul style="list-style-type: none"> <li>Evaluate the expression <math>6 \times (4 + 2) + 100</math>.</li> </ul>	
Context more difficult	Use fractions. Use more than one set of grouping symbols with two operations inside the grouping symbols. <ul style="list-style-type: none"> <li>Evaluate the expression <math>\frac{1}{2} \times (4 + 8 \times 2) - 9</math>.</li> <li>Evaluate the expression <math>(6 + 3 \times 3) - (4 \times 2 + 2)</math>.</li> </ul>	
Sample Item Stem	Response Mechanism	Notes, Comments
An expression is shown.  $6 \times (4 + 2) + 100$  What is the value of the expression?	Equation Response	
An expression is shown.  $3 + 8 - 4 \times 2 - 12$  Create an equivalent expression that includes a set of parentheses so that the value of the expression is 2.	Equation Response	
An expression is shown.  $6 \times (4 + 2 \times 4) + 10$	Equation Response	

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<p>What is the value of the expression?</p>		
<p>An expression is shown.</p> $\frac{1}{2} \times [4 + 6 \times 3] - 9$ <p>What is the value of the expression?</p>	<p>Equation Response</p>	
<p>A numerical expression is evaluated as shown.</p> $\frac{1}{2} \times \{6 \times 1 + 7\} + 11$ <p>Line 1: <math>\frac{1}{2} \times \{6 \times 8\} + 11</math></p> <p>Line 2: <math>\frac{1}{2} \times 48 + 11</math></p> <p>Line 3: <math>24 + 11</math></p> <p>Line 4: 35</p> <p>In which line does a mistake first appear?</p> <ul style="list-style-type: none"> <li>A. Line 1</li> <li>B. Line 2</li> <li>C. Line 3</li> <li>D. Line 4</li> </ul>	<p>Multiple Choice Response</p>	

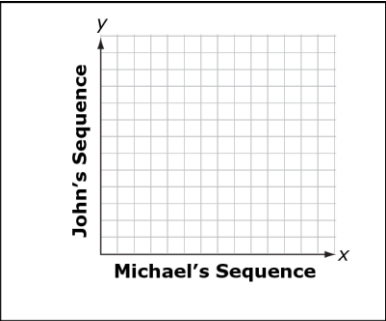
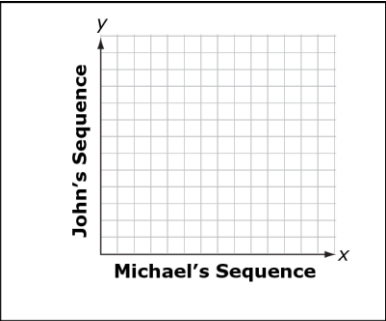
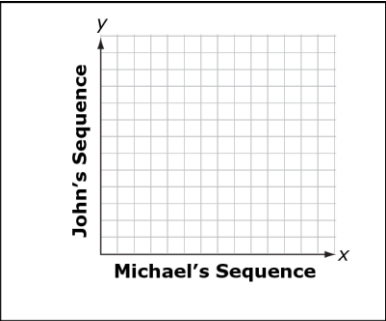
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Content Standard	<p><b>MAFS.5.OA Operations and Algebraic Thinking</b></p> <p><b>MAFS.5.OA.1 Write and interpret numerical expressions.</b></p> <p><b>MAFS.5.OA.1.2</b> Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them. For example, express the calculation "add 8 and 7, then multiply by 2" as <math>2 \times (8 + 7)</math>. Recognize that <math>3 \times (18932 + 921)</math> is three times as large as <math>18932 + 921</math>, without having to calculate the indicated sum or product.</p>	
Assessment Limits	<p>Whole numbers only. Simple fraction expressions. Do not use nested parentheses. Use numeric expressions only. Multiplication cross symbol is the only acceptable symbol for multiplication. Do not use the c-dot. When grouping symbols are part of the expression, the associative property or distributive property should be found in that expression.</p>	
Calculator	No	
Acceptable Response Mechanisms	<p>Equation Response Multiple Choice Response Natural Language Response</p>	
Context	No context	
Example		
Context	<p>Use 4 numbers with expressions that do not require grouping (Multiply 3 and 4, then add 5). Use 3 numbers with expressions that require grouping (Add 3 and 4, then multiply by 5).</p>	
Context easier	<p>Use only 3 numbers. Use direct words for the operations (add, subtract, multiply, divide, plus, minus, times). Use only whole numbers. Expressions that do not require grouping.</p>	
Context more difficult	<p>Use 5 numbers with expressions that do not require grouping ("Multiply 3 and 4, then add 5"). Use 4 numbers with expressions that require grouping (Add 3 and 4, then multiply by 5). Use indirect words for the operations (double, triple, sum, product) Include a fraction.</p>	
Sample Item Stem	Response Mechanism	Notes, Comments
<p>An expression is described in words.</p> <p>Divide 10 by 2, then subtract 3.</p> <p>Create the expression using numbers and symbols.</p>	Equation Response	

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<p>An expression is described in words.</p> <p>Subtract 6 from 9, then divide by 3.</p> <p>Create the expression using numbers and symbols.</p>	<p>Equation Response</p>	
<p>An expression is described in words.</p> <p>Add 5 and 14, triple the sum, and then add four-fifths.</p> <p>Create the expression using numbers and symbols.</p>	<p>Equation Response</p>	
<p>An expression is shown.</p> $18 + \frac{1}{2}(9 - 4)$ <p>Which statement describes this expression?</p> <ul style="list-style-type: none"> <li>A. Half the difference of 9 and 4 added to 18</li> <li>B. Subtract half the quantity of 9 and 4 from 18</li> <li>C. The sum of 18 and half the product of 9 and 4</li> <li>D. Half of 9 added to 18 minus 4</li> </ul>	<p>Multiple Choice Response</p>	
<p>An expression is shown.</p> $3 \times 4 \times 5 - 5 + 3$ <p>Which statement describes this expression?</p> <ul style="list-style-type: none"> <li>A. Three more than 5 subtracted from the sum of 3, 4, and 5</li> <li>B. The product of 3, 4, and 5 subtracted from 5 plus 3</li> <li>C. Multiply 3, 4, and 5, then subtract 5 and add 3.</li> <li>D. Three added to 5, then subtracted from the product of 3, 4, and 5</li> </ul>	<p>Multiple Choice Response</p>	

Content Standard	<p><b>MAFS.5.OA Operations and Algebraic Thinking</b></p> <p><b>MAFS.5.OA.2 Analyze patterns and relationships.</b></p> <p><b>MAFS.5.OA.2.3</b> Generate two numerical patterns using two given rules. Identify apparent relationships between corresponding terms. Form ordered pairs consisting of corresponding terms from the two patterns, and graph the ordered pairs on a coordinate plane. <i>For example, given the rule “Add 3” and the starting number 0, and given the rule “Add 6” and the starting number 0, generate terms in the resulting sequences, and observe that the terms in one sequence are twice the corresponding terms in the other sequence. Explain informally why this is so.</i></p>	
Assessment Limits	<p>Whole numbers and fractions with denominators less than 10.          Quadrant I on coordinate plane.          Acceptable operations: addition, subtraction, multiplication, and division.          The rule should be no more complex than one finds in an application of the associative or distributive property. Examples should not contain nested grouping symbols.</p>	
Calculator	No	
Acceptable Response Mechanisms	<p>Equation Response          Graphic Response – Drawing/Graphing          Multiple Choice Response          Multi-Select Response          Natural Language Response          Table Response</p>	
Context	Allowable	
Example		
Context	<p>Use two one-step patterns that use different operations.</p> <p>Michael uses the rule “multiply by 2.” John uses the rule “add 10.”</p>	
Context easier	<p>Use two patterns which use the same operation.</p> <p>Michael uses the rule “multiply by 2.” John uses the rule “multiply by 10.”</p>	
Context more difficult	<p>Use at least one multi-operation pattern.</p> <p>Michael uses the rule “multiply by 2, then add 4.” John uses the rule “subtract 2, then multiply by 3.”</p>	

Sample Item Stem	Response Mechanism	Notes, Comments																				
<p>Michael and John are creating patterns. Each pattern starts at 1.</p> <ul style="list-style-type: none"> <li>Michael uses the rule “multiply by 2.”</li> <li>John uses the rule “multiply by 4.”</li> </ul> <p>Complete the table to show the next two numbers in each pattern.</p> <table border="1" data-bbox="191 562 675 772"> <thead> <tr> <th colspan="2">Michael's Pattern</th> <th colspan="2">John's Pattern</th> </tr> <tr> <th>Term</th> <th>Number</th> <th>Term</th> <th>Number</th> </tr> </thead> <tbody> <tr> <td>1</td> <td></td> <td>1</td> <td></td> </tr> <tr> <td>2</td> <td></td> <td>2</td> <td></td> </tr> <tr> <td>3</td> <td></td> <td>3</td> <td></td> </tr> </tbody> </table>	Michael's Pattern		John's Pattern		Term	Number	Term	Number	1		1		2		2		3		3		Table Response	
Michael's Pattern		John's Pattern																				
Term	Number	Term	Number																			
1		1																				
2		2																				
3		3																				
<p>Michael and John are creating patterns.</p> <ul style="list-style-type: none"> <li>Michael uses the rule “multiply by 2” and starts at 5.</li> <li>John uses the rule “add 8” and starts at 16.</li> </ul> <p>For which term is Michael’s number equal to John’s number?</p>	Equation Response																					
<p>Michael and John are creating patterns. Each pattern starts at 1.</p> <ul style="list-style-type: none"> <li>Michael uses the rule “multiply by 2, then add 3.”</li> <li>John uses the rule “multiply by 2, then add 4.”</li> </ul> <p>Use the Add Point tool to plot the ordered pairs that are created from the first three terms of the sequences.</p> <div data-bbox="191 1562 652 1881"> <table border="1"> <tr> <td style="width: 50px; height: 150px;"></td> <td style="text-align: center;">  </td> </tr> </table> </div>			Graphic Response – Drawing/Graphing																			
																						



<p>Michael and John each created a numeric pattern. Both patterns start with 0.</p> <p>The terms in Michael's pattern are always two times the same terms in John's pattern.</p> <p>What could be the rules for the two patterns?</p> <p>A. Michael: Add 2 John: Add 0</p> <p>B. Michael: Add 6 John: Add 3</p> <p>C. Michael: Multiply by 2 John: Multiply by 0</p> <p>D. Michael: Multiply by 6 John: Multiply by 3</p>	<p>Multiple Choice Response</p>	
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Content Standard	<p><b>MAFS.5.NBT</b> <i>Number and Operations in Base Ten</i></p> <p><b>MAFS.5.NBT.1</b> <i>Understand the place value system.</i></p> <p><b>MAFS.5.NBT.1.1</b> 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 <math>\frac{1}{10}</math> of what it represents in the place to its left.</p>	
Assessment Limits	Whole numbers up to millions and decimals to thousandths.	
Calculator	No	
Acceptable Response Mechanisms	Equation Response Multi-Select Response	
Context	Allowable	
Example		
Context	Working with numbers to the right of the decimal. Identifying number patterns across only one place value.	
Context easier	Working with numbers only to the left of the decimal.	
Context more difficult	Working with numbers to the right and left of the decimal. Identifying number patterns across several place values.	
Sample Item Stem	Response Mechanism	Notes, Comments
<p>An expression is shown.</p> $3,400 \times \frac{1}{10}$ <p>What is the value of the expression?</p>	Equation Response	
<p>An equation is shown.</p> $? \times \frac{1}{10} = 0.034$ <p>What is the missing number?</p>	Equation Response	
<p>An equation is shown.</p> $0.34 \times ? = 3.4$ <p>What is the value of the missing number?</p>	Equation Response	
<p>How many times larger is the value 0.34 than the value 0.0034?</p>	Equation Response	

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<p>Which statements about the values 0.034 and 3.40 are true?</p> <ul style="list-style-type: none"><li><input type="radio"/> 0.034 is <math>\frac{1}{10}</math> of 340</li><li><input type="radio"/> 0.034 is 100 times more than 340</li><li><input type="radio"/> 3.40 is 100 times more than 0.034</li><li><input type="radio"/> 0.034 is <math>\frac{1}{100}</math> of 3.4</li><li><input type="radio"/> 0.034 is <math>\frac{1}{10}</math> of 340</li></ul>	Multi-Select Response	
<p>One coin weighs 11 grams. How many grams do 10 coins weigh?</p>	Equation Response	
<p>Ten coins weigh 25 grams. How many grams does 1 coin weigh?</p>	Equation Response	

Content Standard	<p><b>MAFS.5.NBT</b> <i>Number and Operations in Base Ten</i></p> <p><b>MAFS.5.NBT.1</b> <i>Understand the place value system.</i></p> <p><b>MAFS.5.NBT.1.2</b> 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.</p>	
Assessment Limits	Whole number exponents with a base of 10.	
Calculator	No	
Acceptable Response Mechanisms	Equation Response Multiple Choice Response Multi-Select Response Natural Language Response	
Context	No context	
Example		
Context	Working with numbers to the right of the decimal.	
Context easier	Working with numbers to the left of the decimal. Generally, multiplication is easier.	
Context more difficult	Working with numbers to the right and left of the decimal. Generally, division is more difficult.	
Sample Item Stem	Response Mechanism	Notes, Comments
What is the value of $10^2$ ?	Equation Response	
What is $5.23 \times 10^2$ ?	Equation Response	
What is $0.000523 \div 10^2$ ?	Equation Response	
What is $0.0523 \times 10^2$ ?	Equation Response	
<p>An equation is shown.</p> $523 \div 10^{\square} = 52.3$ <p>What is the value of the missing exponent?</p>	Equation Response	

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<p>Which is equivalent to multiplying a number by <math>10^3</math>?</p> <p>A. Adding 10 three times B. Adding 3 ten times C. Multiplying by 10 three times D. Multiplying by 3 ten times</p>	<p>Multiple Choice Response</p>															
<p>When dividing a number by <math>10^3</math>, how is the decimal point moved?</p> <p>A. 3 places to the right B. 3 places to the left C. 4 places to the right D. 4 places to the left</p>	<p>Multiple Choice Response</p>															
<p>David multiplies and divides original numbers by powers of 10 to create new numbers.</p> <table border="1" data-bbox="191 848 531 1142"> <thead> <tr> <th>Original number</th> <th>New number</th> </tr> </thead> <tbody> <tr> <td>523</td> <td>523,000</td> </tr> <tr> <td>0.005</td> <td>5</td> </tr> <tr> <td>100</td> <td>0.001</td> </tr> <tr> <td>600</td> <td>60,000</td> </tr> <tr> <td>4.56</td> <td>4,560</td> </tr> <tr> <td>37.6</td> <td>3,760</td> </tr> </tbody> </table> <p>Which original numbers were multiplied by <math>10^3</math> to create the new numbers?</p>	Original number	New number	523	523,000	0.005	5	100	0.001	600	60,000	4.56	4,560	37.6	3,760	<p>Multi-Select Response</p>	
Original number	New number															
523	523,000															
0.005	5															
100	0.001															
600	60,000															
4.56	4,560															
37.6	3,760															

Content Standard	<p><b>MAFS.5.NBT</b> <i>Number and Operations in Base Ten</i></p> <p><b>MAFS.5.NBT.1</b> <i>Understand the place value system.</i></p> <p><b>MAFS.5.NBT.1.3</b> Read, write, and compare decimals to thousandths.</p> <p><b>MAFS.5.NBT.1.3a</b> Read and write decimals to thousandths using base-ten numerals, number names, and expanded form, e.g., <math>347.392 = 3 \times 100 + 4 \times 10 + 7 \times 1 + 3 \times \left(\frac{1}{10}\right) + 9 \times \left(\frac{1}{100}\right) + 2 \times \left(\frac{1}{1,000}\right)</math>.</p> <p><b>MAFS.5.NBT.1.3b</b> Compare two decimals to thousandths based on meanings of the digits in each place, using <math>&gt;</math>, <math>=</math>, and <math>&lt;</math> symbols to record the results of comparisons.</p>	
Assessment Limits	Decimals to thousandths.	
Calculator	No	
Acceptable Response Mechanisms	Equation Response Graphic Response – Drag and Drop Matching Item Response Multiple Choice Response Multi-Select Response	
Context	Allowable	
Example		
Context	Hundredths or thousandths place.	
Context easier	Limit to tenths place.	
Context more difficult	To the thousandths place with a zero in the tenths or hundredths place.	
Sample Item Stem	Response Mechanism	Notes, Comments
What is “nine-tenths” in decimal form?	Equation Response	
What is “two hundred sixty-five thousandths” in decimal form?	Equation Response	

<p>Select the decimal form for each number name.</p> <table border="1" data-bbox="269 275 691 525"> <tr> <td></td> <td><b>0.650</b></td> <td><b>0.605</b></td> <td><b>0.065</b></td> <td><b>6.050</b></td> </tr> <tr> <td><i>Sixty-five thousandths</i></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td><i>Six hundred five thousandths</i></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> </table>		<b>0.650</b>	<b>0.605</b>	<b>0.065</b>	<b>6.050</b>	<i>Sixty-five thousandths</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<i>Six hundred five thousandths</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<p>Matching Item Response</p>	
	<b>0.650</b>	<b>0.605</b>	<b>0.065</b>	<b>6.050</b>													
<i>Sixty-five thousandths</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>													
<i>Six hundred five thousandths</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>													
<p>A number in expanded form is shown.</p> $4 \times 1 + 3 \times \left(\frac{1}{10}\right)$ <p>What is the number in decimal form?</p>	<p>Equation Response</p>																
<p>A number in expanded form is shown.</p> $3 \times 1 + 2 \times \left(\frac{1}{10}\right) + 6 \times \left(\frac{1}{100}\right) + 5 \times \left(\frac{1}{1,000}\right)$ <p>What is the number in decimal form?</p>	<p>Equation Response</p>																
<p>Select all the expressions that show 2.059 written in expanded form.</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> <math>2 \times 1 + 0 \times \left(\frac{1}{10}\right) + 5 \times \left(\frac{1}{100}\right) + 9 \times \left(\frac{1}{1,000}\right)</math></li> <li><input type="checkbox"/> <math>2 \times 1 + 5 \times \left(\frac{1}{10}\right) + 9 \times \left(\frac{1}{100}\right)</math></li> <li><input type="checkbox"/> <math>2 \times 1 + 0 \times \left(\frac{1}{10}\right) + 59 \times \left(\frac{1}{1,000}\right)</math></li> <li><input type="checkbox"/> <math>20 \times \left(\frac{1}{10}\right) + 59 \times \left(\frac{1}{100}\right)</math></li> <li><input type="checkbox"/> <math>20 \times \left(\frac{1}{10}\right) + 5 \times \left(\frac{1}{100}\right) + 9 \times \left(\frac{1}{1,000}\right)</math></li> </ul>	<p>Multi-Select Response</p>																
<p>Select all the statements that correctly compare the two numbers.</p> <ul style="list-style-type: none"> <li><input type="radio"/> <math>1.309 &gt; 1.315</math></li> <li><input type="radio"/> <math>5.029 &lt; 5.128</math></li> <li><input type="radio"/> <math>7.250 &gt; 7.255</math></li> <li><input type="radio"/> <math>2.001 &lt; 2.100</math></li> <li><input type="radio"/> <math>9.401 &gt; 9.309</math></li> </ul>	<p>Multi-Select Response</p>																

<p>Grace, Logan, and Kevin are growing bean plants. They each measured the height of their plant.</p> <p>Drag the measurements to order them from least to greatest.</p> <div data-bbox="305 453 659 520" style="border: 1px solid black; padding: 2px; margin-bottom: 5px;"><b>Grace</b> 2.1 inches</div> <div data-bbox="305 537 659 604" style="border: 1px solid black; padding: 2px; margin-bottom: 5px;"><b>Logan</b> 2.3 inches</div> <div data-bbox="305 621 659 688" style="border: 1px solid black; padding: 2px;"><b>Kevin</b> 2.0 inches</div>	<p>Graphic Response – Drag and Drop</p>	
<p>A number in expanded form is shown.</p> $4 \times 1 + 3 \times \left(\frac{1}{100}\right) + 9 \times 10 + 5 \times \left(\frac{1}{10}\right)$ <p>What is the number in decimal form?</p>	<p>Equation Response</p>	



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Content Standard	<p><b>MAFS.5.NBT</b> <i>Number and Operations in Base Ten</i></p> <p><b>MAFS.5.NBT.1</b> <i>Understand the place value system.</i></p> <p><b>MAFS.5.NBT.1.4</b> Use place value understanding to round decimals to any place.</p>																
Assessment Limits	Decimals to thousandths.																
Calculator	No																
Acceptable Response Mechanisms	<p>Equation Response</p> <p>Matching Item Response</p> <p>Multiple Choice Response</p> <p>Multi-Select Response</p> <p>Table Response</p>																
Context	Allowable																
Example																	
Context	Round a decimal number by one digit to the nearest hundredth.																
Context easier	Round a decimal number by one digit to the nearest tenth or ones place.																
Context more difficult	Round a decimal number by more than one digit to the nearest hundredth, tenth, or ones place.																
Sample Item Stem	Response Mechanism	Notes, Comments															
<p>Select all the numbers that round to 4.3 when rounded to the nearest tenth.</p> <ul style="list-style-type: none"> <li><input type="radio"/> 4.25</li> <li><input type="radio"/> 4.24</li> <li><input type="radio"/> 4.21</li> <li><input type="radio"/> 4.35</li> <li><input type="radio"/> 4.34</li> <li><input type="radio"/> 4.31</li> </ul>	Multi-Select Response																
What is 3.149 rounded to the nearest hundredth?	Equation Response																
<p>Select the value of each decimal number when it is rounded to the nearest whole number.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td></td> <td style="text-align: center;">5</td> <td style="text-align: center;">6</td> </tr> <tr> <td>5.06</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> <tr> <td>5.59</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> <tr> <td>5.47</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> <tr> <td>5.92</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> </table>		5	6	5.06	<input type="checkbox"/>	<input type="checkbox"/>	5.59	<input type="checkbox"/>	<input type="checkbox"/>	5.47	<input type="checkbox"/>	<input type="checkbox"/>	5.92	<input type="checkbox"/>	<input type="checkbox"/>	Matching Item Response	
	5	6															
5.06	<input type="checkbox"/>	<input type="checkbox"/>															
5.59	<input type="checkbox"/>	<input type="checkbox"/>															
5.47	<input type="checkbox"/>	<input type="checkbox"/>															
5.92	<input type="checkbox"/>	<input type="checkbox"/>															

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Numbers are rounded to the nearest tenth and hundredth, as shown in the table.

Complete the table to show the numbers that could be rounded.

Number	Rounded to Nearest Tenth	Rounded to Nearest Hundredth
<input type="text"/>	1.5	1.55
<input type="text"/>	3.2	3.18
<input type="text"/>	9.4	9.35

Table Response

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Content Standard	<p><b>MAFS.5.NBT</b> <i>Number and Operations in Base Ten</i></p> <p><b>MAFS.5.NBT.2</b> <i>Perform operations with multi-digit whole numbers and with decimals to hundredths.</i></p> <p><b>MAFS.5.NBT.2.5</b> <i>Fluently multiply multi-digit whole numbers using the standard algorithm.</i></p>	
Assessment Limits	Multiplication should not exceed 5 digits by 2 digits.	
Calculator	No	
Acceptable Response Mechanisms	Equation Response	
Context	Allowable	
Example		
Context	Include multiplication by two-digit numbers with no carrying required. Multiplication by a one-digit number with limited carrying required.	
Context easier	Include only multiplication by a one-digit number. Use small digits that do not require carrying.	
Context more difficult	Include multiplication by a two-digit number with carrying. Increase the amount of carrying required.	
Sample Item Stem	Response Mechanism	Notes, Comments
Multiply 213 x 12.	Equation Response	
Multiply 423 x 79.	Equation Response	
<p>A multiplication problem is shown.</p> $243 \times \square = 2,916$ <p>What is the missing digit?</p>	Equation Response	
<p>A multiplication problem is shown.</p> $\begin{array}{r} 402 \\ \times \square 6 \\ \hline 34,572 \end{array}$ <p>What is the missing digit?</p>	Equation Response	

Content Standard	<p><b>MAFS.5.NBT</b> <i>Number and Operations in Base Ten</i></p> <p><b>MAFS.5.NBT.2</b> <i>Perform operations with multi-digit whole numbers and with decimals to hundredths.</i></p> <p><b>MAFS.5.NBT.2.6</b> 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.</p>	
Assessment Limits	Only 3-digit or 4-digit dividend and 2-digit divisor.	
Calculator	No	
Acceptable Response Mechanisms	Equation Response Graphic Response – Drag and Drop Multi-Select Response Natural Language Response	
Context	Allowable	
Example		
Context	Include 2-digit divisors that are not multiples of 5. Zero is not included in the middle of the quotient.	
Context easier	2-digit divisor includes multiples of 5.	
Context more difficult	Quotient includes a zero in the middle of nonzero values (ex: $1,248 \div 12 = 104$ ). Quotient requires the student to look at the dividend or part of the dividend as a whole (ex: $105 \div 15$ , because 15 does not divide into the first two digits of 105, 10).	
Sample Item Stem		Response Mechanism
An expression is shown.  $2,000 \div 50$  What is the value of the expression?		Equation Response
An expression is shown.  $432 \div 12$  What is the value of the expression?		Equation Response
Select all the expressions that have a value of 34.  <ul style="list-style-type: none"> <li><input type="radio"/> <math>340 \div 16</math></li> <li><input type="radio"/> <math>380 \div 13</math></li> <li><input type="radio"/> <math>408 \div 12</math></li> <li><input type="radio"/> <math>510 \div 15</math></li> <li><input type="radio"/> <math>680 \div 24</math></li> </ul>		Multi-Select Response

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An expression is shown.  $1,575 \div 21$  What is the value of the expression?	Equation Response	
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Content Standard	<b>MAFS.5.NBT</b> <i>Number and Operations in Base Ten</i>	
	<b>MAFS.5.NBT.2</b> <i>Perform operations with multi-digit whole numbers and with decimals to hundredths.</i>	
	<b>MAFS.5.NBT.2.7</b> 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.	
Assessment Limits	Decimals within hundredths place in all numbers involved (divisors, dividends, quotients and likewise for other operations).	
Calculator	No	
Acceptable Response Mechanisms	Equation Response Multi-Select Response Natural Language Response	
Context	Allowable	
Example		
Context	Include multiplication and division. Permit value up to the hundredths place. Include limited carrying and/or borrowing.	
Context easier	Restrict the operations to addition and subtraction. Restrict decimals to tenths. Include values that do not require carrying or borrowing.	
Context more difficult	Use multiple operations in a single problem. Increase the amount of carrying and/or borrowing required.	
Sample Item Stem	Response Mechanism	Notes, Comments
An expression is shown.  5.4 + 3.2  What is the value of the expression?	Equation Response	
An expression is shown.  5.2 x 10.3  What is the value of the expression?	Equation Response	
An expression is shown.  12.25 + 3.05 x 0.6  What is the value of the expression?	Equation Response	

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<p>Allen ran 5.4 miles on Monday and 3.2 miles on Tuesday.</p> <p>How many miles did Allen run altogether?</p>	Equation Response	
<p>During the first race, 12 people ran a 1.5 mile race. During the second race, 4 people ran a 2.2 mile race.</p> <p>How many more total miles were run during the first race compared to the second race?</p>	Equation Response	

Content Standard		<p><b>MAFS.5.NF</b> Numbers and Operations – Fractions</p> <p><b>MAFS.5.NF.1</b> Use equivalent fractions as a strategy to add and subtract fractions.</p> <p><b>MAFS.5.NF.1.1</b> Add and subtract fractions with unlike denominators (including mixed numbers) 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, <math>\frac{2}{3} + \frac{5}{4} = \frac{8}{12} + \frac{15}{12} = \frac{23}{12}</math>. (In general, <math>\frac{a}{b} + \frac{c}{d} = \frac{(ad+bc)}{bd}</math>.)</p>	
Assessment Limits		<p>Improper fractions and mixed numbers included. Least common denominator is not necessary to calculate sums of fractions. Do not use the terms “simplify” or “lowest terms.” Denominators should be one-digit or two-digit.</p>	
Calculator		No	
Acceptable Response Mechanisms		<p>Equation Response Graphic Response – Hot Spot Multiple Choice Response Multi-Select Response</p>	
Context	No context		
Example			
Context	<p>Addition or subtraction of two fractions, where the denominator of one is not a multiple of the other. Addition or subtraction of a fraction and a mixed number, or two mixed numbers, where the denominator of one fraction is a multiple of the other.</p>		
Context easier	Addition or subtraction of two fractions, where the denominator of one is a multiple of the other.		
Context more difficult	<p>Addition or subtraction of a fraction and a mixed number, or two mixed numbers, where the denominator of one fraction is not a multiple of the other. Add/subtract three fractions/mixed numbers (use sparingly, and all items that use this parameter should be labeled “hard”). Add or subtract two mixed numbers where regrouping into the whole number is necessary.</p>		
Sample Item Stem		Response Mechanism	Notes, Comments
<p>An expression is shown.</p> $\frac{5}{6} + \frac{8}{12}$ <p>What is the value of the expression?</p>		Equation Response	
<p>An expression is shown.</p> $2\frac{2}{5} + \frac{6}{10}$ <p>What is the value of the expression?</p>		Equation Response	



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An expression is shown. $6\frac{1}{3} - 4\frac{3}{4}$ What is the value of the expression?	Equation Response	
An equation is shown. $\frac{3}{4} + \frac{?}{2} = \frac{13}{4}$ What is the missing number?	Equation Response	
An equation is shown. $\frac{11}{14} - \frac{?}{4} = \frac{4}{14}$ What is the missing number?	Equation Response	
An equation is shown. $2\frac{3}{12} + \frac{3}{?} = 2\frac{5}{8}$ What is the missing number?	Equation Response	

Content Standard	<p><b>MAFS.5.NF</b> <i>Number and Operations - Fractions</i></p> <p><b>MAFS.5.NF.1</b> <i>Use equivalent fractions as a strategy to add and subtract fractions.</i></p> <p><b>MAFS.5.NF.1.2</b> 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. <i>For example, recognize an incorrect result <math>\frac{2}{5} + \frac{1}{2} = \frac{3}{7}</math>, by observing that <math>\frac{3}{7} &lt; \frac{1}{2}</math>.</i></p>	
Assessment Limits	<p>Improper fractions and mixed numbers included. Least common denominator is not necessary to calculate sums of fractions. Do not use the term “simplify” or “lowest terms.”</p>	
Calculator	No	
Acceptable Response Mechanisms	<p>Equation Response Multiple Choice Response Natural Language Response</p>	
Context	Required	
Example		
Context	Addition or subtraction of two fractions with unlike denominators.	
Context easier	Addition or subtraction of two fractions with like denominators.	
Context more difficult	<p>Addition or subtraction of a fraction and a mixed number, or two mixed numbers. Add/subtract three fractions/mixed numbers (use sparingly, and all items that use this parameter should be labeled “hard”). Add or subtract two mixed numbers where regrouping into the whole number is necessary.</p>	
Sample Item Stem	Response Mechanism	Notes, Comments
<p>John brought <math>\frac{1}{4}</math> cup of chocolate chips to Sue’s house so they can bake cookies. Sue already has <math>\frac{3}{8}</math> cup of chocolate chips.</p> <p>How many cups of chocolate chips do they have altogether?</p>	Equation Response	
<p>John and Sue are baking cookies. The recipe lists <math>\frac{3}{4}</math> cup of flour. They only have <math>\frac{3}{8}</math> cup of flour left.</p> <p>How many more cups of flour do they need to bake the cookies?</p>	Equation Response	



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<p>Javon, Sam, and Antoine are baking cookies. Javon has <math>\frac{1}{2}</math> cup of flour, Sam has <math>1\frac{1}{6}</math> cups of flour, and Antoine has <math>1\frac{3}{4}</math> cups of flour.</p> <p>How many cups of flour do they have altogether?</p>	<p>Equation Response</p>	
<p>Richard and Gianni each bought a pizza. The pizzas are the same size.</p> <ul style="list-style-type: none"> <li>• Richard cut his pizza into 12 slices.</li> <li>• Gianni cut his pizza into 6 slices, and ate 2 slices.</li> <li>• Together, Richard and Gianni ate <math>\frac{9}{12}</math> of one pizza.</li> </ul> <p>How many slices of his pizza did Richard eat?</p>	<p>Equation Response</p>	
<p>Jasmine has <math>\frac{1}{2}</math> cup of flour in a mixing bowl. She adds more flour.</p> <p>Jasmine claims that she now has <math>\frac{3}{7}</math> cup of flour in the mixing bowl.</p> <p>Which statement explains why Jasmine's claim is incorrect?</p> <ul style="list-style-type: none"> <li>A. 7 is not a multiple of 2</li> <li>B. 1 is less than 3</li> <li>C. <math>\frac{3}{7}</math> is less than <math>\frac{1}{2}</math></li> <li>D. <math>\frac{3}{7}</math> is not a multiple of <math>\frac{1}{2}</math></li> </ul>	<p>Multiple Choice Response</p>	

Content Standard	<p><b>MAFS.5.NF</b> Numbers and Operations – Fractions</p> <p><b>MAFS.5.NF.2</b> Apply and extend previous understandings of multiplication and division to multiply and divide fractions.</p> <p><b>MAFS.5.NF.2.3</b> Interpret a fraction as division of the numerator by the denominator (<math>\frac{a}{b} = a \div b</math>). 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. <i>For example, interpret <math>\frac{3}{4}</math> as the result of dividing 3 by 4, noting that <math>\frac{3}{4}</math> multiplied by 4 equals 3, and that when 3 wholes are shared equally among 4 people each person has a share of size <math>\frac{3}{4}</math>. 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?</i></p>	
Assessment Limits	<p>Quotients in division problems should not be equivalent to a whole number. Do not use the term “simplify” or “lowest terms.” Only use whole numbers for the divisor and dividend of a fraction.</p>	
Calculator	No	
Acceptable Response Mechanisms	<p>Equation Response Multiple Choice Response Natural Language Response Table Response</p>	
Context	Allowable	
<b>Example</b>		
Context	Use of double-digit divisors or dividends that share common factors.	
Context easier	Simple fractions with single-digit divisor and dividend.	
Context more difficult	Division with a double- or single-digit dividend and/or divisor as well as improper fraction/quotients.	
Sample Item Stem	Response Mechanism	Notes, Comments
<p>An expression is shown.</p> <p><math>9 \div 3</math></p> <p>What is the quotient expressed as a fraction?</p>	Equation Response	

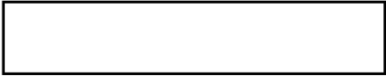


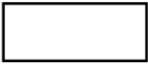

<p>A fraction is shown.</p> $\frac{8}{15}$ <p>Which expression is equivalent to this fraction?</p> <p>A. <math>8 - 15</math> B. <math>15 - 8</math> C. <math>8 \div 15</math> D. <math>15 \div 8</math></p>	<p>Multiple Choice Response</p>	
<p>Joe has an 8-foot-long board. He needs to cut it into 9 equal length parts.</p> <p>How many feet long should each section of the board be?</p>	<p>Equation Response</p>	
<p>Joe has a 6-foot-long board. He needs to cut it into 15 equal length parts.</p> <p>How many feet long should each section of the board be?</p>	<p>Equation Response</p>	
<p>Joe has a 28-foot-long board. He needs to cut it into 24 equal length parts.</p> <p>How many feet long should each section of the board be?</p>	<p>Equation Response</p>	
<p>An expression is shown.</p> $78 \div 14$ <p>Between which two consecutive whole numbers does this value lie? Enter your numbers in the boxes.</p> <p>Between <input type="text"/> and <input type="text"/></p>	<p>Table Response</p>	

Content Standard	<p><b>MAFS.5.NF</b> <i>Number and Operations – Fractions</i></p> <p><b>MAFS.5.NF.2</b> <i>Apply and extend previous understanding of multiplication and division to multiply and divide fractions.</i></p> <p><b>MAFS.5.NF.2.4</b> <i>Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction.</i></p> <p><b>MAFS.5.NF.2.4a</b> <i>Interpret the product <math>\left(\frac{a}{b}\right) \times q</math> as <math>a</math> parts of a partition of <math>q</math> into <math>b</math> equal parts; equivalently, as the result of a sequence of operations <math>a \times q \div b</math>. For example, use a visual fraction model to show <math>\left(\frac{2}{3}\right) \times 4 = \frac{8}{3}</math>, and create a story context for this equation. Do the same with <math>\left(\frac{2}{3}\right) \times \left(\frac{4}{5}\right) = \frac{8}{15}</math>. (In general, <math>\left(\frac{a}{b}\right) \times \left(\frac{c}{d}\right) = \frac{ac}{bd}</math>).</i></p> <p><b>MAFS.5.NF.2.4b</b> <i>Find the area of a rectangle with fractional side lengths by tiling it with unit squares of the appropriate unit fraction side lengths, and show that the area is the same as would be found by multiplying the side lengths. Multiply fractional side lengths to find areas of rectangles, and represent fraction products as rectangular areas.</i></p>
Assessment Limits	<p>Multiply whole numbers by fractions or fractions by fractions. Visual models:</p> <ul style="list-style-type: none"> <li>• Any appropriate fraction model (e.g., circles, tape, polygons, etc.)</li> <li>• Rectangle models only, tile with unit squares</li> </ul> <p>For tiling, the dimensions of the tile should be unit fractions with the same denominator as the given rectangular shape (see p. 13 of the progression document for demonstration). Do not use the term “simplify” or “lowest terms.”</p>
Calculator	No
Acceptable Response Mechanisms	<p>Equation Response Graphic Response – Drag and Drop, Drawing/Graphing, Hot Spot Multiple Choice Response Multi-Select Response</p>
Context	Allowable
Example	
Context	Multiply two proper fractions, with denominator(s) between 5 and 10.
Context easier	<p>Include a fraction multiplied by a whole number. Fractions with denominator less than or equal to 5. Include unit fractions. Items where the final answer is a step in the process.</p>
Context more difficult	<p>Multiply two fractions, which can include improper fractions. At least one fraction has a double-digit denominator.</p>

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Sample Item Stem	Response Mechanism	Notes, Comments
<p>An expression is shown.</p> $\frac{1}{3} \times \frac{2}{5}$ <p>What is the value of the expression?</p>	Equation Response	
<p>An expression is shown.</p> $\frac{3}{8} \times \frac{4}{9}$ <p>Which expression is equivalent?</p>	Multiple Choice Response	
<p>An expression is shown.</p> $\frac{8}{3} \times \frac{5}{12}$ <p>What is the value of the expression?</p>	Equation Response	
<p>A baker has 5 pounds of sugar. She divides them equally into 3 containers. She then uses 1 container to bake pies.</p> <p>Which expression shows how many pounds of sugar the baker used?</p>	Multiple Choice Response	
<p>A rectangle is shown with dimensions in inches (in.).</p> <div style="text-align: center; margin: 10px 0;"> <math>\frac{3}{7}</math> in.         </div>  <p style="margin-left: 10px;"><math>\frac{2}{9}</math> in.</p> <p>What is the area of the rectangle in square inches?</p>	Equation Response	



<p>Select all the rectangles that have an area of <math>\frac{15}{24}</math> square inches.</p> <p><input type="radio"/> <math>\frac{5}{8}</math> in. </p> <p><input type="radio"/> <math>\frac{5}{3}</math> in. </p> <p><input type="radio"/> <math>\frac{8}{6}</math> in. </p> <p><input type="radio"/> <math>\frac{3}{6}</math> in. </p> <p><input type="radio"/> <math>\frac{5}{15}</math> in. </p>	<p>Multi-Select Response</p>	
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Content Standard	<p><b>MAFS.5.NF</b> <i>Number and Operations — Fractions</i></p> <p><b>MAFS.5.NF.2</b> <i>Apply and extend previous understandings of multiplication and division to multiply and divide fractions.</i></p> <p><b>MAFS.5.NF.2.5</b> Interpret multiplication as scaling (resizing), by:</p> <p><b>MAFS.5.NF.2.5a</b> Comparing 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.</p> <p><b>MAFS.5.NF.2.5b</b> Explaining why multiplying a given number by a fraction greater than 1 results in a product greater than the given number (recognizing multiplication by whole numbers greater than 1 as a familiar case); explaining why multiplying a given number by a fraction less than 1 results in a product smaller than the given number; and relating the principle of fraction equivalence <math>\frac{a}{b} = \frac{(n \times a)}{(n \times b)}</math> to the effect of multiplying <math>\frac{a}{b}</math> by 1.</p>
Assessment Limits	Base numbers should be large to discourage students from calculating products. Scaling is explored or demonstrated only in terms of quantity. Scaling geometric figures should not be assessed at this standard. Scaling quantities of <b>any</b> kind in 2 dimensions is strictly beyond the scope of this standard.
Calculator	No
Acceptable Response Mechanisms	Multiple Choice Response Multi-Select Response Natural Language Response
Context	Allowable
Example	
Context	Comparisons are made based on a mix of benchmark fractions, whole numbers, non-benchmark fractions, and mixed numbers/improper fractions.
Context easier	Comparisons are made based strictly on benchmark unit fractions ( $\frac{1}{2}$ and $\frac{1}{4}$ ), whole numbers, and mixed numbers where the fractional part is a benchmark unit fraction.
Context more difficult	Comparisons are made based strictly on non-benchmark fractions and mixed numbers/improper fractions.

Sample Item Stem	Response Mechanism	Notes, Comments
<p>Two newspapers are comparing sales from last year.</p> <ul style="list-style-type: none"> <li>• The Post sold 34,859 copies.</li> <li>• The Tribune sold <math>34,589 \times \frac{1}{2}</math> copies.</li> </ul> <p>Which statement compares the numbers of newspapers sold?</p> <p>A. The Post sold half the number of newspapers that the Tribune sold.</p> <p>B. The Tribune sold half the number of newspapers that the Post sold.</p> <p>C. The Tribune sold twice the number of newspapers that the Post sold.</p> <p>D. The Post sold the same number of newspapers that the Tribune sold.</p>	<p>Multiple Choice Response</p>	
<p>Two newspapers are comparing sales from last year.</p> <ul style="list-style-type: none"> <li>• The Post sold 34,859 copies.</li> <li>• The Tribune sold three-fourths as many copies as the Post.</li> </ul> <p>Which expression describes the number of newspapers the Tribune sold?</p> <p>A. <math>34,859 \times \frac{1}{2}</math></p> <p>B. <math>34,859 \div \frac{1}{2}</math></p> <p>C. <math>34,859 \times 1\frac{1}{2}</math></p> <p>D. <math>34,859 \div 1\frac{1}{2}</math></p>	<p>Multiple Choice Response</p>	

<p>Two newspapers are comparing sales from last year.</p> <ul style="list-style-type: none"><li>• The Post sold 34,859 copies.</li><li>• The Tribune sold one-and-a-half times as many copies as The Post.</li></ul> <p>Which expression describes the number of newspapers The Tribune sold?</p> <p>A. <math>34,859 \times 1\frac{1}{2}</math></p> <p>B. <math>34,859 \div 1\frac{1}{2}</math></p> <p>C. <math>34,859 \times \frac{1}{2}</math></p> <p>D. <math>34,859 \div \frac{1}{2}</math></p>	Multiple Choice Response	
<p>Select all the expressions that have a value greater than 1,653.</p> <p>A. <math>1,653 \times \frac{1}{4}</math></p> <p>B. <math>1,653 \times 4</math></p> <p>C. <math>1,653 \times 13</math></p> <p>D. <math>1,653 \times \frac{1}{4}</math></p> <p>E. <math>1,653 \times 1\frac{1}{2}</math></p>	Multi-Select Response	
<p>Logan multiplied 54,216 by a number. The product was less than 54,216.</p> <p>Select all the numbers that Logan could have multiplied.</p> <p>A. <math>\frac{7}{12}</math></p> <p>B. <math>\frac{4}{4}</math></p> <p>C. <math>1\frac{1}{4}</math></p> <p>D. <math>\frac{1}{2}</math></p> <p>E. 3</p> <p>F. <math>\frac{8}{4}</math></p>	Multi-Select Response	

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Content Standard	<b>MAFS.5.NF</b> <i>Number and Operations – Fractions</i>	
	<b>MAFS.5.NF.2</b> <i>Apply and extend previous understandings of multiplication and division to multiply and divide fractions.</i>	
	<b>MAFS.5.NF.2.6</b> Solve real-world problems involving multiplication of fractions and mixed numbers, e.g., by using visual fraction models or equations to represent the problem.	
Assessment Limits	Items should require student to interpret the context to determine operations.	
Calculator	No	
Acceptable Response Mechanisms	Equation Response Multiple Choice Response	
Context	Required	
Example		
Context	Multiply a non-unit fraction by a non-unit fraction, proper or improper.	
Context easier	Multiply a fraction by a whole number. Multiply a fraction by a unit fraction.	
Context more difficult	Multiply a fraction by a mixed number.	
Sample Item Stem	Response Mechanism	Notes, Comments
Roger has $\frac{3}{4}$ gallon of milk. He gives $\frac{1}{2}$ of it to a friend.  How many gallons of milk does Roger have left?	Equation Response	
Roger has $\frac{3}{4}$ gallon of milk. He gives $\frac{3}{7}$ of it to a friend.  How many gallons of milk does Roger have left?	Equation Response	
Roger has $2\frac{3}{4}$ gallons of milk. He gives $\frac{3}{7}$ of it to a friend.  How many gallons of milk does Roger have left?	Equation Response	

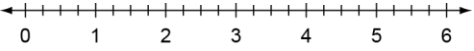
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<p>Roger has 6 gallons of milk. He uses <math>\frac{1}{2}</math> of it to make hot chocolate.</p> <p>Then, he uses <math>\frac{2}{3}</math> of the milk he has left to make cookies.</p> <p>How many gallons of milk does Roger have left after making hot chocolate and cookies?</p>	Equation Response	
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Content Standard	<p><b>MAFS.5.NF</b> <i>Number and Operations – Fractions</i></p> <p><b>MAFS.5.NF.2</b> <i>Apply and extend previous understandings of multiplication and division to multiply and divide fractions.</i></p> <p><b>MAFS.5.NF.2.7</b> <i>Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions.</i></p> <p><b>MAFS.5.NF.2.7a</b> <i>Interpret division of a unit fraction by a non-zero whole number, and compute such quotients. For example, create a story context for <math>\left(\frac{1}{3}\right) \div 4</math>, and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that <math>\left(\frac{1}{3}\right) \div 4 = \frac{1}{12}</math> because <math>\left(\frac{1}{12}\right) \times 4 = \frac{1}{3}</math>.</i></p> <p><b>MAFS.5.NF.2.7b</b> <i>Interpret division of a whole number by a unit fraction, and compute such quotients. For example, create a story context for <math>4 \div \left(\frac{1}{5}\right)</math>, and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that <math>4 \div \left(\frac{1}{5}\right) = 20</math> because <math>20 \times \left(\frac{1}{5}\right) = 4</math>.</i></p> <p><b>MAFS.5.NF.2.7c</b> <i>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 <math>\frac{1}{2}</math> lb. of chocolate equally? How many <math>\frac{1}{3}</math>-cup servings are in 2 cups of raisins?</i></p>
Assessment Limits	Division of unit fractions by a non-zero whole number, or Division of a non-zero whole number by a unit fraction.
Calculator	No
Acceptable Response Mechanisms	Equation Response Graphic Response – Drag and Drop, Drawing/Graphing, Hot Spot Multiple Choice Response Natural Language Response
Context	Allowable
Example	
Context	Either the whole number or the denominator of the fraction is between 5 and 10.
Context easier	Both the whole number and the denominator of the fraction are less than or equal to 5.
Context more difficult	Either the whole number or the denominator of the fraction is greater than or equal to 10.

Sample Item Stem	Response Mechanism	Notes, Comments
<p>An expression is shown.</p> $5 \div \frac{1}{3}$ <p>What is the value of the expression?</p>	Equation Response	
<p>An expression is shown.</p> $5 \div \frac{1}{7}$ <p>What is the value of the expression?</p>	Equation Response	
<p>An expression is shown.</p> $12 \div \frac{1}{7}$ <p>What is the value of the expression?</p>	Equation Response	
<p>Julio has 4 pounds of candy. He wants to put the candy into bags so that each bag has <math>\frac{1}{3}</math> pound.</p> <p>Which expression shows how to calculate the number of bags of candy Julio can make?</p> <p>A. <math>3 \times \frac{1}{4}</math></p> <p>B. <math>\frac{1}{4} \times 3</math></p> <p>C. <math>3 \div \frac{1}{4}</math></p> <p>D. <math>\frac{1}{4} \div 3</math></p>	Multiple Choice Response	
<p>Julio wrote the division equation shown.</p> $8 \div \frac{1}{2} = 16$ <p>Which multiplication equation can Julio use to show that his work is correct?</p> <p>A. <math>16 \times \frac{1}{2} = 8</math></p> <p>B. <math>16 \times 2 = 32</math></p> <p>C. <math>16 \times 8 = \frac{1}{2}</math></p> <p>D. <math>16 \times 8 = 128</math></p>	Multiple Choice Response	



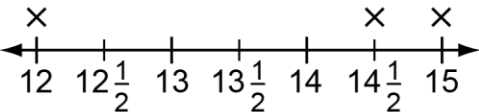
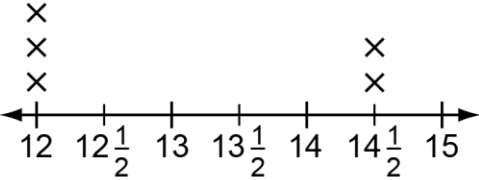
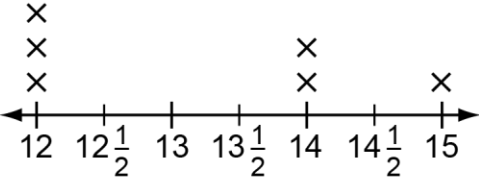
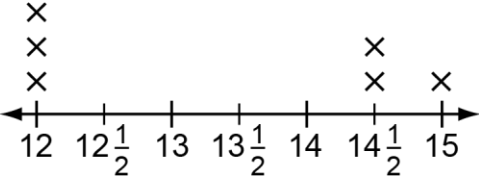
<p>Julio has 12 pounds of candy. He wants to put the candy into bags so that each bag has <math>\frac{1}{6}</math> pound of candy.</p> <p>How many bags of candy can Julio make?</p>	Equation Response	
<p>Julio has 6 pounds of candy. He wants to put the candy into bags so that each bag has <math>\frac{1}{2}</math> pound of candy.</p> <p>How many bags of candy can Julio make?</p> <p>A. Click on the number line to create sections that model the solution to this problem.</p>  <p>B. Select the number of bags that Julio can make.</p>	Graphic Response – Hot Spot	


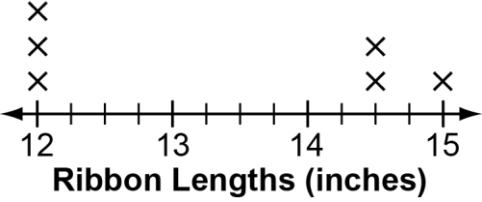
Content Standard	<p><b>MAFS.5.MD</b> <i>Measurement and Data</i></p> <p><b>MAFS.5.MD.1</b> <i>Convert like measurement units within a given measurement system.</i></p> <p><b>MAFS.5.MD.1.1</b> <i>Convert among different-sized standard measurement units (i.e., km, m, cm; kg, g; lb, oz.; l, ml; hr, min, sec) within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step, real-world problems.</i></p>		
Assessment Limits	<p>Measurement values can be whole, decimal, and/or fractional values. Conversion is within the same system. Units of measurement include: kilometer, meter, centimeter, millimeter, liter, milliliter, kilogram, gram, milligram, mile, yard, foot, inch, gallon, quart, pint, cup, ton, pound, and ounce.</p>		
Calculator	No		
Acceptable Response Mechanisms	<p>Equation Response Multi-Select Response Multiple Choice Response Table Response</p>		
Context	Allowable		
<b>Example</b>			
Context	Michael is measuring and converting distances in and around his school using whole numbers and decimals.		
Context easier	<p>Whole-number values. One-step conversions. Measurement conversions are from larger to smaller units.</p>		
Context more difficult	<p>Whole, decimal, and fractional values. Multi-step conversions. Measurement conversions can go in either direction. Conversions of non-adjacent units that are separated by two or more (i.e., cups to gallons).</p>		
Sample Item Stem	Response Mechanism	Notes, Comments	
Michael is helping with the school play by measuring fabric for the costumes. He needs 9 yards of fabric. He has 12 feet of fabric. How many more feet of fabric does he need?	Equation Response		
Michael is helping with the school play by measuring fabric for the costumes. He needs 11.5 yards of fabric. He has 13.5 feet of fabric. How many more feet of fabric does he need?	Equation Response		


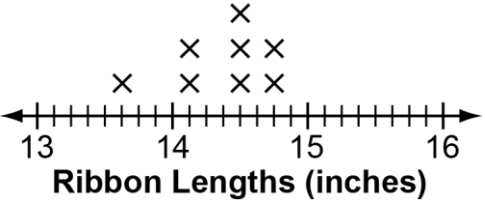
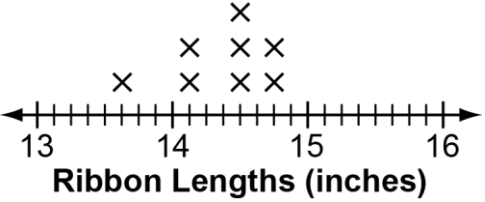
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<p>Michael is helping with the school play by measuring fabric for the costumes. He needs 46 feet of fabric. He has 12.5 yards of fabric. How many more yards of fabric does he need?</p>	<p>Equation Response</p>	
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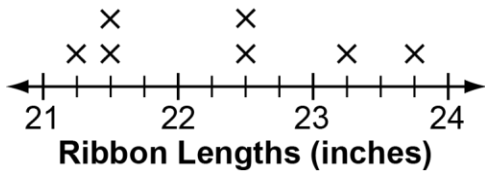
Content Standard	<p><b>MAFS.5.MD</b> <i>Measurement and Data</i></p> <p><b>MAFS.5.MD.2</b> <i>Represent and interpret data.</i></p> <p><b>MAFS.5.MD.2.2</b> Make a line plot to display a data set of measurements in fractions of a unit (<math>\frac{1}{2}</math>, <math>\frac{1}{4}</math>, <math>\frac{1}{8}</math>). Use operations on fractions for this grade to solve problems involving information presented in line plots. <i>For example, given different measurements of liquid in identical beakers, find the amount of liquid each beaker would contain if the total amount in all the beakers were redistributed equally.</i></p>
Assessment Limits	<p>Measurement units are limited to halves, quarters, and eighths.</p> <p>Division is limited to a whole number divided by a unit fraction or a unit fraction divided by a whole number.</p>
Calculator	No
Acceptable Response Mechanisms	<p>Equation Response</p> <p>Graphic Response – Hot Spot</p> <p>Multiple Choice Response</p> <p>Table Response</p>
Context	Allowable
<b>Example</b>	
Context	<p>For line plot construction or identification, all data are at four or five specific measures.</p> <p>For problem solving, if one operation is used, it is subtraction or multiplication. If multiple operations are used, they are addition and subtraction.</p>
Context easier	<p>For line plot construction or identification, all data are at two or three specific measures.</p> <p>For problem solving, addition is used.</p>
Context more difficult	<p>For line plot construction or identification, all data are at more than five specific measures.</p> <p>For problem solving, if one operation is used, it is division. If multiple operations are used, one must be multiplication or division.</p>

Sample Item Stem	Response Mechanism	Notes, Comments							
<p>Kelly has strips of ribbon with lengths as shown.</p> <table border="1" data-bbox="191 310 412 844"> <thead> <tr> <th>Ribbon Lengths (inches)</th> </tr> </thead> <tbody> <tr><td>12</td></tr> <tr><td><math>14\frac{1}{2}</math></td></tr> <tr><td>12</td></tr> <tr><td>15</td></tr> <tr><td><math>14\frac{1}{2}</math></td></tr> <tr><td>12</td></tr> </tbody> </table> <p>Which line plot represents these data?</p> <p><b>A.</b>   <b>Ribbon Lengths (inches)</b></p> <p><b>B.</b>   <b>Ribbon Lengths (inches)</b></p> <p><b>C.</b>   <b>Ribbon Lengths (inches)</b></p> <p><b>D.</b>   <b>Ribbon Lengths (inches)</b></p>	Ribbon Lengths (inches)	12	$14\frac{1}{2}$	12	15	$14\frac{1}{2}$	12	<p>Multiple Choice Response</p>	
Ribbon Lengths (inches)									
12									
$14\frac{1}{2}$									
12									
15									
$14\frac{1}{2}$									
12									

<p>Kelly has strips of ribbon with lengths as shown.</p> <table border="1" data-bbox="191 275 412 877"> <thead> <tr> <th>Ribbon Lengths (inches)</th> </tr> </thead> <tbody> <tr><td>12</td></tr> <tr><td><math>14\frac{1}{2}</math></td></tr> <tr><td>12</td></tr> <tr><td>13</td></tr> <tr><td><math>14\frac{1}{2}</math></td></tr> <tr><td><math>13\frac{1}{4}</math></td></tr> <tr><td>12</td></tr> </tbody> </table>  <p>Click on the graph to create a line plot that represents these data.</p>	Ribbon Lengths (inches)	12	$14\frac{1}{2}$	12	13	$14\frac{1}{2}$	$13\frac{1}{4}$	12	<p>Graphic Response – Hot Spot</p>	
Ribbon Lengths (inches)										
12										
$14\frac{1}{2}$										
12										
13										
$14\frac{1}{2}$										
$13\frac{1}{4}$										
12										
<p>A line plot with Kelly’s lengths of ribbons is shown.</p>  <p>What is the total length, in inches, of the longest and shortest pieces of ribbon?</p>	<p>Equation Response</p>									

<p>A line plot with Kelly's lengths of ribbons is shown.</p>  <p style="text-align: center;"><b>Ribbon Lengths (inches)</b></p> <p>What is the total length, in inches, for all pieces of ribbon?</p>	<p>Equation Response</p>	
<p>A line plot with Kelly's lengths of ribbons is shown. She adds another ribbon so that the difference between the longest and shortest piece of ribbon is <math>1\frac{1}{8}</math> inches.</p>  <p style="text-align: center;"><b>Ribbon Lengths (inches)</b></p> <p>What length of ribbon, in inches, could Kelly have added?</p>	<p>Equation Response</p>	
<p>A line plot with Kelly's lengths of ribbons is shown. She uses the shortest ribbon and buys another of the longest ribbon.</p>  <p style="text-align: center;"><b>Ribbon Lengths (inches)</b></p> <p>How much longer is the total length, in inches, of ribbon now?</p>	<p>Table Response</p>	

A line plot with Kelly's lengths of ribbons is shown. She adds two more ribbons so that the total length of ribbon that Kelly has is 200 inches.



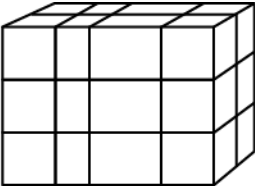
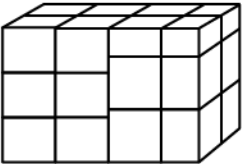
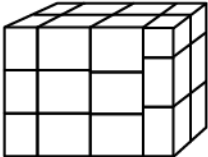
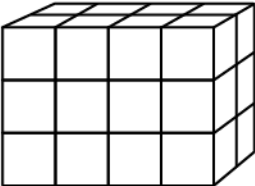
Ribbon Lengths (inches)

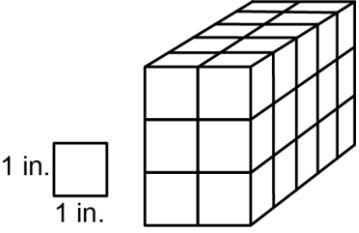

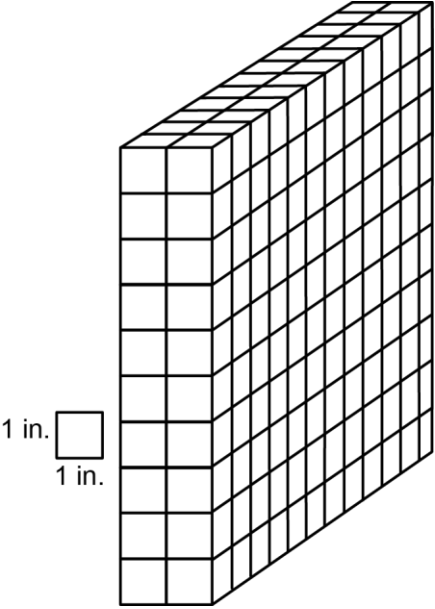

Complete the table to show two possible lengths of ribbon, in inches, Kelly could have added.

Table Response

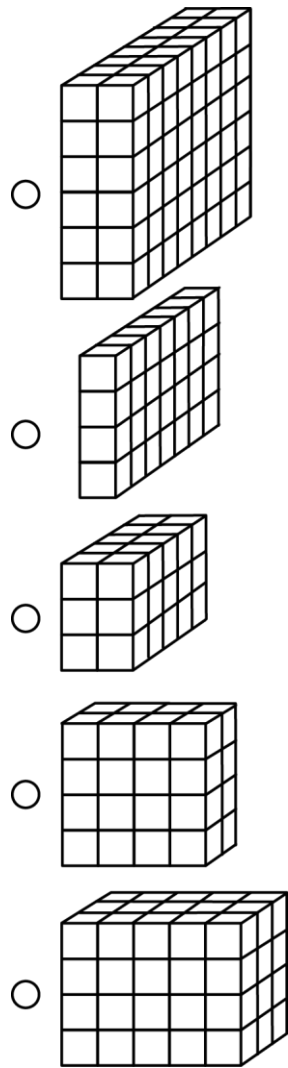


Content Standard	<p><b>MAFS.5.MD</b> <i>Measurement and Data</i></p> <p><b>MAFS.5.MD.3</b> <i>Geometric measurement: understand concepts of volume and relate volume to multiplication and division.</i></p> <p><b>MAFS.5.MD.3.3</b> Recognize volume as an attribute of solid figures and understand concepts of volume measurement.</p> <p><b>MAFS.5.MD.3.3a</b> A cube with side length 1 unit, called a “unit cube,” is said to have “one cubic unit” of volume, and can be used to measure volume.</p> <p><b>MAFS.5.MD.3.3b</b> A solid figure which can be packed without gaps or overlaps using <math>n</math> unit cubes is said to have a volume of <math>n</math> cubic units.</p> <p>Also Assessed:</p> <p><b>MAFS.5.MD.3.4</b> Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and improvised units.</p>
Assessment Limits	<p>Right rectangular prisms with whole-number side lengths. Graphics include unit cube. Labels can include cubic units (i.e. cubic centimeters, cubic feet, etc.) or exponential units (i.e., <math>\text{cm}^3</math>, <math>\text{ft}^3</math>, etc.).</p>
Calculator	No
Acceptable Response Mechanisms	<p>Equation Response Matching Item Response Multiple Choice Response Multi-Select Response</p>
Context	Allowable
Example	
Context	A rectangular prism(s) with unit cubes is shown.
Context easier	<p>Decrease dimensional values (<math>\leq 6</math>). One prism given.</p>
Context more difficult	<p>Increase dimensional values (<math>&gt; 6</math>). Increase number of prisms given (3 or more).</p>

Sample Item Stem	Response Mechanism	Notes, Comments
<p>Ellen is shopping for boxes. Which attribute should she use to determine the amount the box will hold?</p> <p>A. Area            B. Perimeter            C. Length            D. Volume</p>	<p>Multiple Choice Response</p>	
<p>For which solid object can the volume be found just by counting the number of cubes?</p> <p><b>A.</b> </p> <p><b>B.</b> </p> <p><b>C.</b> </p> <p><b>D.</b> </p>	<p>Multiple Choice Response</p>	

<p>A rectangular prism is shown.</p>  <p>1 in.  1 in.</p> <p>What is the volume of the prism in cubic inches?</p>	<p>Equation Response</p>	
<p>A rectangular prism is shown.</p>  <p>1 in.  1 in.</p> <p>What is the volume of the prism in cubic centimeters?</p>	<p>Equation Response</p>	

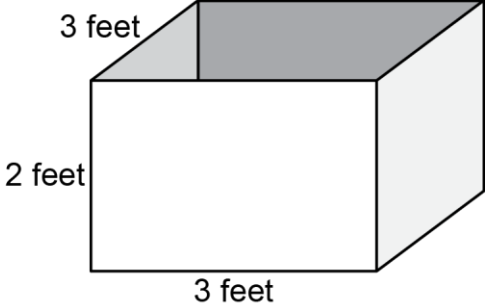
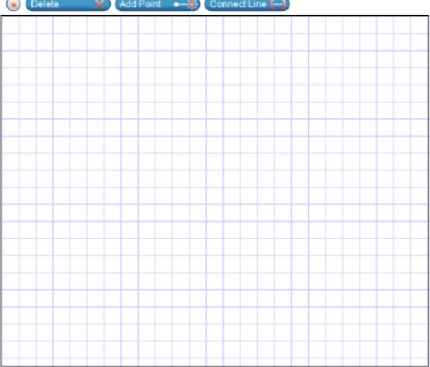
Several rectangular prisms are shown.



Which prisms have a volume between 20 and 40 cubic units?

Multi-Select Response

Content Standard	<p><b>MAFS.5.MD: Measurement and Data</b></p> <p><b>MAFS.5.MD.3 Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.</b></p> <p><b>MAFS.5.MD.3.5</b> Relate volume to the operations of multiplication and addition and solve real world and mathematical problems involving volume.</p> <p><b>MAFS.5.MD.3.5a</b> Find the volume of a right rectangular prism with whole-number side lengths by packing it with unit cubes, and show that the volume is the same as would be found by multiplying the edge lengths, equivalently by multiplying the height by the area of the base. Represent threefold whole-number products as volumes, e.g., to represent the associative property of multiplication.</p> <p><b>MAFS.5.MD.3.5b</b> Apply the formulas <math>V = l \times w \times h</math> and <math>V = b \times h</math> for rectangular prisms to find volumes of right rectangular prisms with whole-number edge lengths in the context of solving real world and mathematical problems.</p> <p><b>MAFS.5.MD.3.5c</b> Recognize volume as additive. Find volumes of solid figures composed of two non-overlapping right rectangular prisms by adding the volumes of the non-overlapping parts, applying this technique to solve real world problems.</p>
Assessment Limits	<p>Whole number side lengths. Right rectangular prisms. No more than two non-overlapping prisms – non-overlapping means that two prisms may share a face, but they do not share the same volume.</p>
Calculator	No
Acceptable Response Mechanisms	<p>Equation Response Graphic Response – Drawing/Graphing Matching Item Response Multiple Choice Response Multi-Select Response</p>
Context	Allowable
Example	
Context	<p>Volumes between 50 and 100 square units. Volumes greater than 100 square units where at least one of the side lengths is a multiple of 10.</p>
Context easier	<p>Volumes under 50 square units. Volumes greater than 50 where at least one side length is 10.</p>
Context more difficult	<p>Volumes greater than 100, where no side length is a multiple of 10. The student is presented with multiple prisms to evaluate (i.e., multi-select items where each option is a prism).</p>

Sample Item Stem	Response Mechanism	Notes, Comments
<p>A shipping box in the shape of a rectangular prism has the dimensions shown.</p>  <p>What is the volume of the box in cubic feet?</p>	Equation Response	
<p>Select all the shipping boxes that are shaped like rectangular prisms that have a volume of 384 cubic feet (ft).</p> <ul style="list-style-type: none"> <li><input type="radio"/> 6 ft x 8 ft x 8 ft</li> <li><input type="radio"/> 4 ft x 12 ft x 24 ft</li> <li><input type="radio"/> 4 ft x 6 ft x 16 ft</li> <li><input type="radio"/> 4 ft x 8 ft x 12 ft</li> <li><input type="radio"/> 3 ft x 10 ft x 20 ft</li> </ul>	Multi-Select Response	
<p>A shipping box in the shape of a rectangular prism has a volume of 48 cubic feet, a length of 4 feet, and a width of 3 feet.</p> <p>What is the height, in feet, of the box?</p>	Equation Response	
<p>A shipping box in the shape of a rectangular prism has a height of 6 feet (ft) and a volume of <math>96 \text{ ft}^3</math>. Use the Connect Line tool to draw a possible base for the box.</p> 	Graphic Response – Drawing/Graphing	

Content Standard	<p><b>MAFS.5.G Geometry</b></p> <p><b>MAFS.5.G.1</b> Graph points on the coordinate plane to solve real-world and mathematical problems.</p> <p><b>MAFS.5.G.1.1</b> Use a pair of perpendicular number lines, called axes, to define a coordinate system, with the intersection of the lines (the origin) arranged to coincide with the 0 on each line and a given point in the plane located by using an ordered pair of numbers, called its coordinates. Understand that the first number indicates how far to travel from the origin in the direction of one axis, and the second number indicates how far to travel in the direction of the second axis, with the convention that the names of the two axes and the coordinates correspond (e.g., x-axis and x-coordinate, y-axis and y-coordinate).</p>	
Assessment Limits	<p>Whole numbers.          Use only points located in the first quadrant of the coordinate plane.          Plotting points given the ordered pair is aligned to MAFS.5.G.2.</p>	
Calculator	No	
Acceptable Response Mechanisms	<p>Graphic Response – Drawing/Graphing          Multiple Choice Response          Multi-Select Response</p>	
Context	No context	
<b>Example</b>		
Context	Give coordinates of one point and direction to another point.	
Context easier	Same coordinate values for both $x$ and $y$ .	
Context more difficult	Different coordinate values for both $x$ and $y$ .	
Sample Item Stem	Response Mechanism	Notes, Comments
<p>Point <math>M</math> is 3 units away from the origin in the direction of the <math>x</math>-axis, and 3 units away in the direction of the <math>y</math>-axis.</p> <p>What could be the coordinates of point <math>M</math>?</p> <p>A. (0, 3)          B. (3, 3)          C. (3, 6)          D. (6, 6)</p>	Multiple Choice Response	

<p>Point <math>M</math> is 3 units away from the origin on the <math>x</math>-axis.</p> <p>What could be the coordinates of point <math>M</math>?</p> <ul style="list-style-type: none"> <li>A. (0, 3)</li> <li>B. (3, 0)</li> <li>C. (3, 3)</li> <li>D. (3, 6)</li> </ul>	<p>Multiple Choice Response</p>	
<p>Point <math>M</math> is 3 units away from the origin in the direction of the <math>x</math>-axis, and 5 units away in the direction of the <math>y</math>-axis.</p> <p>What could be the coordinates of point <math>M</math>?</p> <ul style="list-style-type: none"> <li>A. (3, 5)</li> <li>B. (5, 3)</li> <li>C. (3, 8)</li> <li>D. (5, 8)</li> </ul>	<p>Multiple Choice Response</p>	
<p>Point <math>T</math> is 6 units away from the origin on the <math>x</math>-axis.</p> <p>Select all coordinates that could represent point <math>T</math>.</p> <ul style="list-style-type: none"> <li><input type="radio"/> (0, 6)</li> <li><input type="radio"/> (6, 0)</li> <li><input type="radio"/> (-6, 6)</li> <li><input type="radio"/> (-6, 0)</li> <li><input type="radio"/> (0, -6)</li> </ul>	<p>Multi-Select Response</p>	
<p>A point is located as described.</p> <ul style="list-style-type: none"> <li>• 4 units away from the origin in the direction of the <math>x</math>-axis, and</li> <li>• 4 units away from the origin in the direction of the <math>y</math>-axis</li> </ul> <p>Use the Add Point tool to plot the point.</p>	<p>Graphic Response – Drawing/Graphing</p>	
<p>A point is 3 units away from the origin on the <math>y</math>-axis.</p> <p>Use the Add Point tool to plot the point.</p>	<p>Graphic Response – Drawing/Graphing</p>	

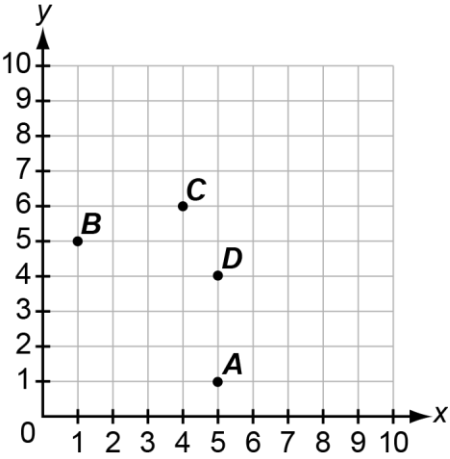


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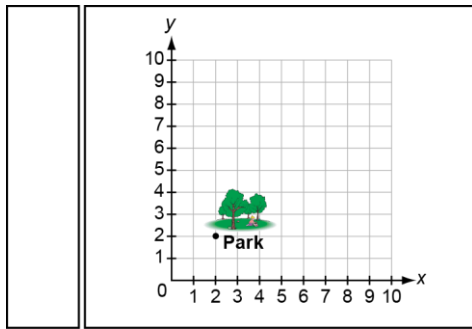
<p>A point is located as described.</p> <ul style="list-style-type: none"><li>• 3 units away from the origin in the direction of the <math>x</math>-axis, and</li><li>• 4 units away from the origin in the direction of the <math>y</math>-axis</li></ul> <p>Use the Add Point tool to plot the point.</p>	<p>Graphic Response – Drawing/Graphing</p>	
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Content Standard	<p><b>MAFS.5.G Geometry</b></p> <p><b>MAFS.5.G.1</b> Graph points on the coordinate plane to solve real-world and mathematical problems.</p> <p><b>MAFS.5.G.1.2</b> 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.</p>	
Assessment Limits	<p>Whole numbers. Use only points located in the first quadrant of the coordinate plane. Mathematical and real-world problems must have axes scaled to whole numbers (not letters).</p>	
Calculator	No	
Acceptable Response Mechanisms	<p>Graphic Response – Drag and Drop, Drawing/Graphing Multi-Select Response Multiple Choice Response Matching Item Response</p>	
Context	Allowable	
Example		
Context	<p>Give coordinates of one point and direction to another point. Generally includes some points that are on an axis.</p>	
Context easier	<p>Give actual coordinates or points plotted. Generally includes some points that have the same x-and y-coordinate.</p>	
Context more difficult	<p>Give only directions, no coordinates. Give distances from both axes (assuming that distances are different – if distances are the same, this should be medium difficulty). Generally includes some points that have different x-and y-coordinates.</p>	

Sample Item Stem	Response Mechanism	Notes, Comments
<p>Which point is located at (5, 1) on the coordinate grid?</p>  <p>A. Point A          B. Point B          C. Point C          D. Point D</p>	<p>Multiple Choice Response</p>	
<p>Use the Add Point tool to plot the point (3, 4).</p>	<p>Graphic Response – Drawing/Graphing</p>	
<p>Point A has the coordinates (3, 5). Point B is located 5 units above point A.</p> <p>Drag points A and B to show their locations in the coordinate plane.</p>	<p>Graphic Response – Drag and Drop</p>	
<p>Point A is located on the x-axis. Point B is located 5 units above point A.</p> <p>Drag points A and B to show their locations in the coordinate plane.</p>	<p>Graphic Response – Drag and Drop</p>	
<p>Point A is located 5 units below and 4 units to the left of point B.</p> <p>Drag points A and B to show their locations in the coordinate plane.</p>	<p>Graphic Response – Drag and Drop</p>	

The location of the park in Dan’s town is shown in the coordinate plane.

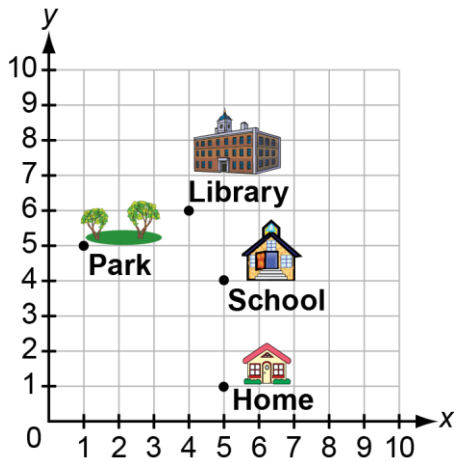


Dan left home, went 3 units up and 4 units right, and got to the park.

Use the Connect Line tool to plot a point that indicates the location of Dan’s house.

Graphic Response –  
Drawing/Graphing

Some locations in Dan’s town are shown in the coordinate plane.

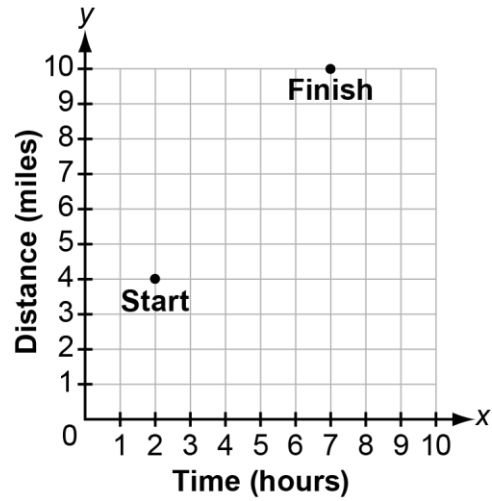


Dan moved from one location to another by traveling 1 unit left and 5 units up. Which ways could he have travelled?

- A. From home to the park
- B. From the park to the library
- C. From home to the library
- D. From school to the park

Multi-Select Response

Sonia's trip is shown in the coordinate plane.





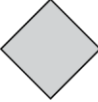
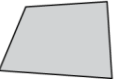
Select all the true statements.

- Sonia travelled 3 miles.
- Sonia travelled 5 miles.
- Sonia travelled 6 miles.
- Sonia's trip lasts 7 hours.
- Sonia's trip lasts 5 hours.

Multi-Select Response

Content Standard		<p><b>MAFS.5.G Geometry</b></p> <p><b>MAFS.5.G.2</b> Classify two-dimensional figures into categories based on their properties.</p> <p><b>MAFS.5.G.2.3</b> Understand that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category. <i>For example, all rectangles have four right angles and squares are rectangles, so all squares have four right angles.</i></p> <p>Also Assessed:</p> <p><b>MAFS.5.G.2.4</b> Classify and organize two-dimensional figures into Venn diagrams based on the attributes of the figures.</p>	
Assessment Limits		Focus should be on quadrilaterals, although other polygons can be included.	
Calculator		No	
Acceptable Response Mechanisms		Graphic Response – Drawing/Graphing, Hot Spot Matching Item Response Multi-Select Response Multiple Choice Response	
Context	No context		
Example			
<b>Note:</b> Because the scope of this standard is limited to a few shapes, parameters to change the difficulty of items are difficult to generalize across task demands.			
Context	Shapes that are nested in the hierarchy (e.g., rectangles and squares).		
Context easier	One label is missing/work with one category.		
Context more difficult	More than 2 labels missing/work with more than 2 categories. Shapes that are not nested in the hierarchy (e.g., rectangles and rhombuses). Consider more than one attribute.		
Sample Item Stem		Response Mechanism	Notes, Comments
Which could be the name of a parallelogram that has four equal length sides? <p>A. Rhombus B. Trapezoid C. Triangle D. Parallelogram</p>		Multiple Choice Response	

<p>Which could be the name of a parallelogram that has four equal sides and four right angles?</p> <ul style="list-style-type: none"><li>A. Kite</li><li>B. Trapezoid</li><li>C. Rectangle</li><li>D. Square</li></ul>	<p>Multiple Choice Response</p>	
<p>Select all the properties that both rectangles and parallelograms share.</p> <ul style="list-style-type: none"><li><input type="radio"/> 4 right angles</li><li><input type="radio"/> 4 sides of equal length</li><li><input type="radio"/> 2 pairs of parallel sides</li><li><input type="radio"/> 2 pairs of sides with equal length</li><li><input type="radio"/> 2 acute angles and 2 obtuse angles</li></ul>	<p>Multi-Select Response</p>	
<p>Kyle knows a formula for the area of a rectangle.</p> <p>For which other shape can he always use the same formula to find the area?</p> <ul style="list-style-type: none"><li>A. Parallelogram</li><li>B. Rhombus</li><li>C. Quadrilateral</li><li>D. Square</li></ul>	<p>Multiple Choice Response</p>	
<p>Which kinds of shapes are also all rectangles?</p> <ul style="list-style-type: none"><li>A. Parallelograms</li><li>B. Quadrilaterals</li><li>C. Rhombuses</li><li>D. Squares</li></ul>	<p>Multiple Choice Response</p>	

<p>Select all the shapes that are always also parallelograms.</p> <ul style="list-style-type: none"> <li><input type="radio"/> </li> <li><input type="radio"/> </li> <li><input type="radio"/> </li> <li><input type="radio"/> </li> </ul>	<p>Multi-Select Response</p>					
<p>Select all the names that apply to a rhombus.</p> <ul style="list-style-type: none"> <li><input type="radio"/> Parallelogram</li> <li><input type="radio"/> Square</li> <li><input type="radio"/> Rectangle</li> <li><input type="radio"/> Quadrilateral</li> <li><input type="radio"/> Trapezoid</li> </ul>	<p>Multi-Select Response</p>					
<p>Two descriptions are given.</p> <ul style="list-style-type: none"> <li>• If the shape is not possible, select “Not Possible.”</li> <li>• If the shape is possible, use the Connect Line tool to draw an example.</li> </ul> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30px; height: 20px;"></td> <td><input type="checkbox"/> Rhombus that is not a square</td> </tr> <tr> <td style="width: 30px; height: 20px;"></td> <td><input type="checkbox"/> Square that is a rectangle</td> </tr> </table> </div>		<input type="checkbox"/> Rhombus that is not a square		<input type="checkbox"/> Square that is a rectangle	<p>Graphic Response – Drawing/Graphing</p>	
	<input type="checkbox"/> Rhombus that is not a square					
	<input type="checkbox"/> Square that is a rectangle					