

DRAFT

# Grade 4 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.

Grade 4 Mathematics Item Specifications  
Florida Standards Assessments

Content Standard	<p><b>MAFS.4.OA Operations and Algebraic Thinking</b></p> <p><b>MAFS.4.OA.1</b> Use the four operations with whole numbers to solve problems.</p> <p><b>MAFS.4.OA.1.1</b> Interpret a multiplication equation as a comparison, e.g., interpret <math>35 = 5 \times 7</math> as a statement that 35 is 5 times as many as 7 and 7 times as many as 5. Represent verbal statements of multiplicative comparisons as multiplication equations.</p>	
Assessment Limits	<p>Whole numbers within 100. Item must either include a verbal description of an equation of a multiplication equation. Multiplication situation must be a comparison, e.g., three times as many.</p>	
Calculator	No	
Acceptable Response Mechanisms	<p>Equation Response Natural Language Response Multiple Choice Response Multi-Select Response Matching Item Response</p>	
Context	Allowable	
Example		
Context	<p>Items without a context using larger numbers (one double-digit factor). Items within a context using smaller numbers (single-digit factors).</p>	
Context easier	<p>Items without a context. Generally small numbers (single-digit factors).</p>	
Context more difficult	<p>Items within a context using larger numbers (one double-digit factor). Item requires student to identify multiple versions of the same equation/comparison (<math>12 \times 3 = 36</math>, <math>3 \times 12 = 26</math>).</p>	
Sample Item Stem	Response Mechanism	Notes, Comments
<p>Select the statement that represents <math>35 = 5 \times 7</math>.</p> <p>A. Pat collected 5 cars one year and 7 cars the next year.</p> <p>B. Pat collected 5 cars each year for 7 years.</p> <p>C. Pat had a collection of 35 cars and gave 7 of them away.</p> <p>D. Pat had a collection of 5 cars and increased the number of cars by 35.</p>	Multiple Choice Response	
<p>Pat has 8 times as many model cars as John. John has 2 model cars. Create a multiplication equation that represents the situation.</p>	Equation Response	

<p>Pat has 12 times as many model cars as John. John has 5 model cars. Select the expression that shows how many cars Pat has.</p> <ul style="list-style-type: none"><li><input type="radio"/> <math>5 \times 12</math></li><li><input type="radio"/> <math>5 + 12</math></li><li><input type="radio"/> <math>12 + 5</math></li><li><input type="radio"/> <math>12(5)</math></li><li><input type="radio"/> <math>12(12 + 5)</math></li></ul>	Multi-Select Response	
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Content Standard	<p><b>MAFS.4.OA Operations and Algebraic Thinking</b></p> <p><b>MAFS.4.OA.1</b> Use the four operations with whole numbers to solve problems.</p> <p><b>MAFS.4.OA.1.2</b> Multiply or divide to solve word problems involving multiplicative comparison, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem, distinguishing multiplicative comparison from additive comparison.</p>		
Assessment Limits	<p>Multiplication situation must be a comparison, e.g., three times as many. Operations limited to multiplication and division. Limit multiplication and division to 2-digit by 2-digit.</p>		
Calculator	No		
Acceptable Response Mechanisms	<p>Equation Response Multiple Choice Response</p>		
Context	Required		
Example			
Context	Division with two one-digit numbers.		
Context easier	Multiplication with at least one one-digit number.		
Context more difficult	Division with at least one two-digit numbers.		
Sample Item Stem	Response Mechanism	Notes, Comments	
Johnny has 10 marbles. Mark has 3 times as many marbles as Johnny. How many marbles does Mark have?	Equation Response		
Johnny has 30 marbles. Mark has $m$ marbles. If Johnny has 10 times as many marbles as Mark, write an equation that shows how many marbles Mark has.	Equation Response		

Content Standard	<p><b>MAFS.4.OA Operations and Algebraic Thinking</b></p> <p><b>MAFS.4.OA.1</b> Use the four operations with whole numbers to solve problems.</p> <p><b>MAFS.4.OA.1.3</b> Solve multistep word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.</p>	
Assessment Limits	<p>Whole numbers.          Multiplication of numbers of up to four digits by a one-digit number or of two numbers with two digits.          Quotients and remainders with up to four-digit dividends and one-digit divisors. Items may contain a maximum of 3 steps.          Problems involving remainders should require the student to interpret and use the remainder with respect to context.          Variables must be represented by a letter.</p>	
Calculator	No	
Acceptable Response Mechanisms	<p>Equation Response          Natural Language Response          Multiple Choice Response          Multi-Select Response</p>	
Context	Required	
Example		
Context	<p>Use some numbers that make the operations more difficult:</p> <ul style="list-style-type: none"> <li>• Addition – several carryings</li> <li>• Subtraction – several borrowings</li> <li>• Multiplication – use some easier factors (1, 2, 3, 5) and some more difficult factors (4, 6, 7, 8)</li> <li>• Division – either use zero as a digit in the quotient or use 4, 6, 7, 8 or 9 as the divisor</li> <li>• Partial information with a final value can be given, but the calculations should be easy to complete.</li> </ul>	

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Context easier	<p>Use numbers that make the four operations easier:</p> <ul style="list-style-type: none"> <li>• Addition – no carrying</li> <li>• Subtraction – no borrowing</li> <li>• Multiplication – use 1, 2, 3, 5 as the factors in each partial multiplication</li> <li>• Division – use 2, 3, and 5 for the divisor; no remainders</li> </ul> <p>All information is given in a straightforward manner.</p>	
Context more difficult	<p>Use numbers that make the four operations more difficult:</p> <ul style="list-style-type: none"> <li>• Addition – multiple carryings</li> <li>• Subtraction – multiple borrowings</li> <li>• Multiplication – use 4, 6, 7, 8 as factors and minimize 2, 3, 5 as factors in each partial multiplication</li> <li>• Division – have zero be a digit in the quotient and use 4, 6, 7, 8, 9 as the divisor; allow for remainders</li> </ul> <p>Partial information with a final value is given, and the student needs to work backwards to find a solution.</p>	
Sample Item Stem	Response Mechanism	Notes, Comments
Jack bought 2 umbrellas, each costing \$13. He bought 3 hats, each costing \$4. How much did Jack spend in all?	Equation Response	
Jack bought 2 umbrellas and 3 hats for \$18.00. Each umbrella costs the same amount. Each hat costs the same amount. The price of a hat is \$4.00. What is the cost of 1 umbrella?	Equation Response	
Jack bought 3 umbrellas and 4 hats. The umbrellas cost \$15 dollars each, and the hats cost \$5 each. Write an equation to show the total cost $c$ , in dollars, of the items Jack bought.	Equation Response	
<p>Jack has \$53, and each umbrella costs \$12. He writes the equation shown.</p> <p><math>53 \div 12 = 4 \text{ R } 5</math></p> <p>What does the number 5 represent in terms of Jack's money?</p>	Natural Language Response	
Jack wants to buy the same number of hats for 3 of his friends. He has \$57 dollars, and each hat costs \$5. What is the largest number of hats that Jack buys for each friend?	Equation Response	

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<p>Jack bought 2 umbrellas and 3 hats and spent between \$30 and \$50. Each umbrella costs the same amount. Each hat costs the same amount. The price of a hat is \$4.00. What is the least amount Jack could have spent on an umbrella? What is the most Jack could have spent on an umbrella?</p>	<p>Equation Response</p>	
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Content Standard	<p><b>MAFS.4.OA</b> <i>Operations and Algebraic Thinking</i></p> <p><b>MAFS.4.OA.1</b> <i>Use the four operations with whole numbers to solve problems.</i></p> <p><b>MAFS.4.OA.1a</b> Determine whether an equation is true or false by using comparative relational thinking. <i>For example, without adding 60 and 24, determine whether the equation <math>60 + 24 = 57 + 27</math> is true or false.</i></p>		
Assessment Limits			
Calculator	No		
Acceptable Response Mechanisms			
Context	Allowable		
Example			
Context			
Context easier			
Context more difficult			
Sample Item Stem		Response Mechanism	Notes, Comments

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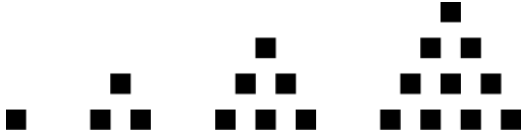
Content Standard	<p><b>MAFS.4.OA</b> <i>Operations and Algebraic Thinking</i></p> <p><b>MAFS.4.OA.1</b> <i>Use the four operations with whole numbers to solve problems.</i></p> <p><b>MAFS.4.OA.1b</b> Determine the unknown whole number in an equation relating four whole numbers using comparative relational thinking. <i>For example, solve <math>76 + 9 = n + 5</math> for <math>n</math> arguing that nine is four more than five, so the unknown number must be four greater than 76.</i></p>		
Assessment Limits			
Calculator	No		
Acceptable Response Mechanisms			
Context	Allowable		
Example			
Context			
Context easier			
Context more difficult			
Sample Item Stem	Response Mechanism	Notes, Comments	

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Content Standard	<p><b>MAFS.4.OA</b> <i>Operations and Algebraic Thinking</i></p> <p><b>MAFS.4.OA.2</b> <i>Gain familiarity with factors and multiples.</i></p> <p><b>MAFS.4.OA.2.4</b> Investigate factors and multiples.</p> <p><b>MAFS.4.OA.2.4a</b> Find all factor pairs and multiples in the range of 1—100.</p> <p><b>MAFS.4.OA.2.4b</b> Recognize that a whole number is a multiple of each of its factors.</p> <p><b>MAFS.4.OA.2.4c</b> Determine whether a given whole number in the range 1—100 is prime or composite.</p>	
Assessment Limits	<p>Whole numbers in the range 1—100. Vocabulary may include prime, composite, factor, or multiple.</p>	
Calculator	No	
Acceptable Response Mechanisms	<p>Equation Response Multi-Select Response Graphic Response – Drag-and-Drop, Hot Spot Matching Item Response Multiple Choice Response Table Response</p>	
Context	Allowable	
Example		
Context	<p>Use numbers with 3 or 4 factors (aside from 1 and the number itself). Use numbers between 17 and 50.</p>	
Context easier	<p>Use numbers with 2 or 3 factors (aside from 1 and the number itself). Use numbers less than 17.</p>	
Context more difficult	<p>Use numbers with more than 4 factors (aside from 1 and the number itself). Use numbers greater than 50.</p>	
Sample Item Stem	Response Mechanism	Notes, Comments
What are the factors of 10?	Equation Response	

<p>Select the multiples of 8 shown in the chart.</p> <table border="1" data-bbox="191 275 412 680"> <tr><td>×</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td></tr> <tr><td>1</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td></tr> <tr><td>2</td><td>2</td><td>4</td><td>6</td><td>8</td><td>10</td></tr> <tr><td>3</td><td>3</td><td>6</td><td>9</td><td>12</td><td>15</td></tr> <tr><td>4</td><td>4</td><td>8</td><td>12</td><td>16</td><td>20</td></tr> <tr><td>5</td><td>5</td><td>10</td><td>15</td><td>20</td><td>25</td></tr> <tr><td>6</td><td>6</td><td>12</td><td>18</td><td>24</td><td>30</td></tr> <tr><td>7</td><td>7</td><td>14</td><td>21</td><td>28</td><td>35</td></tr> <tr><td>8</td><td>8</td><td>16</td><td>24</td><td>32</td><td>40</td></tr> <tr><td>9</td><td>9</td><td>18</td><td>27</td><td>36</td><td>45</td></tr> <tr><td>10</td><td>10</td><td>20</td><td>30</td><td>40</td><td>50</td></tr> </table>	×	1	2	3	4	5	1	1	2	3	4	5	2	2	4	6	8	10	3	3	6	9	12	15	4	4	8	12	16	20	5	5	10	15	20	25	6	6	12	18	24	30	7	7	14	21	28	35	8	8	16	24	32	40	9	9	18	27	36	45	10	10	20	30	40	50	<p>Graphic Response – Hot Spot</p>	
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9	9	18	27	36	45																																																															
10	10	20	30	40	50																																																															
<p>Which factors do 36 and 42 have in common?</p>	<p>Multi-Select Response</p>																																																																			
<p>Determine whether each number is prime or composite.</p> <table border="1" data-bbox="191 890 597 1136"> <thead> <tr> <th></th> <th>Prime</th> <th>Composite</th> </tr> </thead> <tbody> <tr><td>16</td><td></td><td></td></tr> <tr><td>13</td><td></td><td></td></tr> <tr><td>12</td><td></td><td></td></tr> <tr><td>9</td><td></td><td></td></tr> <tr><td>7</td><td></td><td></td></tr> </tbody> </table>		Prime	Composite	16			13			12			9			7			<p>Matching Item Response</p>																																																	
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<p>Sarah is arranging the chairs for a recital. She wants to put the 16 chairs into a rectangular array. Complete the table to show three ways that Sarah can arrange the chairs.</p> <table border="1" data-bbox="191 1297 753 1604"> <thead> <tr> <th></th> <th>Number of Rows</th> <th>Number of Chairs in Each Row</th> </tr> </thead> <tbody> <tr><td>Arrangement 1</td><td></td><td></td></tr> <tr><td>Arrangement 2</td><td></td><td></td></tr> <tr><td>Arrangement 3</td><td></td><td></td></tr> </tbody> </table>		Number of Rows	Number of Chairs in Each Row	Arrangement 1			Arrangement 2			Arrangement 3			<p>Table Response</p>																																																							
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Arrangement 3																																																																				
<p>Write a number between 80 and 100 that has exactly 3 factors, one of which is 5.</p>	<p>Equation Response</p>																																																																			

Content Standard	<p><b>MAFS.4.OA Operations and Algebraic Thinking</b></p> <p><b>MAFS.4.OA.3 Generate and analyze patterns.</b></p> <p><b>MAFS.4.OA.3.5</b> Generate a number or shape pattern that follows a given rule. Identify apparent features of the pattern that were not explicit in the rule itself. <i>For example, given the rule “Add 3” and the starting number 1, generate terms in the resulting sequence and observe that the terms appear to alternate between odd and even numbers. Explain informally why the numbers will continue to alternate in this way.</i></p>		
Assessment Limits	<p>Whole numbers. Operations in patterns limited to addition, subtraction, multiplication, and division. Growing shape patterns.</p>		
Calculator	No		
Acceptable Response Mechanisms	<p>Equation Response Graphic Response – Drawing/Graphing, Drag and Drop Matching Item Response Multiple Choice Response Multi-Select Response Natural Language Response Table Response</p>		
Context	Allowable		
<b>Example</b>			
Context	<p>A pattern is shown. Intermediate initial terms (between 10 and 100). Intermediate rates of change (between 10 and 20 for addition/subtraction; between 5 and 10 for multiplication/division).</p>		
Context easier	<p>Addition and subtraction patterns. Smaller initial terms (less than 10). Smaller rates of change.</p>		
Context more difficult	<p>Multiplication and division patterns. Larger initial terms (greater than 100). Larger rates of change. Rules that use two operations. Shape patterns are generally more difficult than numeric patterns.</p>		
Sample Item Stem	Response Mechanism	Notes, Comments	
The first number in a pattern is 5. The pattern follows the rule “Add 3.”	Equation Response		
What is the next number in the pattern?			

<p>The first number in a pattern is 6. The pattern follows the rule “Divide by 2, and then add 8.” Complete the table to show the next three numbers in the pattern.</p> <table border="1" data-bbox="191 384 407 632"> <tr> <td>Numbers in the Pattern</td> </tr> <tr> <td>6</td> </tr> <tr> <td> </td> </tr> <tr> <td> </td> </tr> <tr> <td> </td> </tr> </table>	Numbers in the Pattern	6				<p>Table Response</p>	
Numbers in the Pattern							
6							
<p>A shape pattern is shown.</p>  <p>Describe how the number of total squares in each shape is related to the shape’s number.</p>	<p>Natural Language Response</p>						

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Content Standard	<p><b>MAFS.4.NBT</b> <i>Number and Operations in Base Ten</i></p> <p><b>MAFS.4.NBT.1</b> <i>Generalize place value understanding for multi-digit whole numbers.</i></p> <p><b>MAFS.4.NBT.1.1</b> Recognize that in a multi-digit whole number, a digit in one place represents ten times what it represents in the place to its right. <i>For example, recognize that <math>700 \div 70 = 10</math> by applying concepts of place value and division.</i></p>	
Assessment Limits	Whole numbers within 1,000,000.	
Calculator	No	
Acceptable Response Mechanisms	Equation Response Natural Language Response	
Context	No context	
Example		
Context	Limit to values under 100,000. Limit comparisons to within two place values.	
Context easier	Decrease value of power of ten. Limit values to numbers under 1,000. Limit comparisons to within one difference in place value.	
Context more difficult	Increase value of power of ten. Include numbers from 100,000 up to 1,000,000. Allow comparisons across multiple place values.	
Sample Item Stem	Response Mechanism	Notes, Comments
An expression is shown.  800 $\div$ 80  What is the value of the expression?	Equation Response	
How many times larger is the value 250,000 than 250?	Equation Response	
How many times greater is the value of the 3 in 300 than the value of the 3 in 30?	Equation Response	
How many times greater is the value of the 4 in 640,700 than the value of the 4 in 67,040?	Equation Response	

Content Standard	<p><b>MAFS.4.NBT</b> <i>Number and Operations in Base Ten</i></p> <p><b>MAFS.4.NBT.1</b> <i>Generalize place value understanding for multi-digit whole numbers.</i></p> <p><b>MAFS.4.NBT.1.2</b> Read and write multi-digit whole numbers using base-ten numerals, number names, and expanded form. Compare two multi-digit numbers 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	Whole numbers within 1,000,000.																
Calculator	No																
Acceptable Response Mechanisms	<p>Equation Response</p> <p>Graphic Response – Drag and Drop</p> <p>Matching Item Response</p> <p>Multiple Choice Response</p> <p>Multi-Select Response</p>																
Context	Allowable																
Example																	
Context	Limit to values under 100,000.																
Context easier	Limit values to numbers under 1,000.																
Context more difficult	<p>Include numbers from 100,000 up to 1,000,000.</p> <p>Zeros as placeholders increase the difficulty when reading/writing numbers in all three forms.</p>																
Sample Item Stem	Response Mechanism	Notes, Comments															
<p>Which phrase represents “253”?</p> <p>A. Two hundred three</p> <p>B. Two hundred fifty-three</p> <p>C. Twenty-five and three</p> <p>D. Two thousand and fifty-three</p>	Multiple Choice Response																
Write $6 \times 10,000 + 5 \times 1,000 + 2 \times 100 + 3 \times 1$ as a number.	Equation Response																
<p>Match the name of each number with its numeric form.</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td></td> <td style="text-align: center;">600,005</td> <td style="text-align: center;">600,050</td> <td style="text-align: center;">605,000</td> <td style="text-align: center;">650,000</td> </tr> <tr> <td><i>Six hundred five thousand</i></td> <td></td> <td></td> <td style="text-align: center;">x</td> <td></td> </tr> <tr> <td><i>Six hundred thousand fifty</i></td> <td></td> <td style="text-align: center;">x</td> <td></td> <td></td> </tr> </table>		600,005	600,050	605,000	650,000	<i>Six hundred five thousand</i>			x		<i>Six hundred thousand fifty</i>		x			Matching Item Response	Note that numbers are vertically oriented in this document for space reasons.
	600,005	600,050	605,000	650,000													
<i>Six hundred five thousand</i>			x														
<i>Six hundred thousand fifty</i>		x															



<p>Which statement(s) correctly compares two numbers?</p> <p>Select all the correct statements.</p> <ul style="list-style-type: none"><li><input type="radio"/> 259 &gt; 295</li><li><input type="radio"/> 295 &lt; 259</li><li><input type="radio"/> 259 &lt; 295</li><li><input type="radio"/> 295 &lt; 259</li><li><input type="radio"/> 259 = 295</li></ul>	Multi-Select Response	
<p>Select all the options with 54,625 written in expanded form.</p> <ul style="list-style-type: none"><li><input type="radio"/> 5 ten-thousands, 46 hundreds, 25 ones</li><li><input type="radio"/> 5 ten-thousands, 4 thousands, 62 hundreds, 5 ones</li><li><input type="radio"/> 50 thousands, 46 hundreds, 20 tens, 5 ones</li><li><input type="radio"/> 50 thousands, 40 hundreds, 60 tens, 25 ones</li><li><input type="radio"/> 54 thousands, 6 hundreds, 2 tens, 5 ones</li></ul>	Multi-Select Response	

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Content Standard	<p><b>MAFS.4.NBT</b> <i>Number and Operations in Base Ten</i></p> <p><b>MAFS.4.NBT.1</b> <i>Generalize place value understanding for multi-digit whole numbers.</i></p> <p><b>MAFS.4.NBT.1.3</b> Use place value understanding to round multi-digit whole numbers to any place.</p>																		
Assessment Limits	Greater than 1,000 and within 1,000,000.																		
Calculator	No																		
Acceptable Response Mechanisms	<p>Equation Response</p> <p>Matching Item Response</p> <p>Multi-Select Response</p> <p>Table Response</p>																		
Context	No context																		
Example																			
Context	Rounding to the nearest 1,000.																		
Context easier	Rounding numbers to the nearest 10 or 100.																		
Context more difficult	Rounding to the nearest 1,000,000.																		
Sample Item Stem	Response Mechanism	Notes, Comments																	
<p>Which numbers round to 4,100, when rounded to the nearest hundred?</p> <ul style="list-style-type: none"> <li>○ 4,008</li> <li>○ 4,140</li> <li>○ 4,060</li> <li>○ 4,109</li> <li>○ 4,049</li> </ul>	Multi-Select Response																		
<p>Complete the table to show how each old number was rounded to make the new number.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Original</th> <th>New</th> <th>Nearest 100</th> <th>Nearest 1,000</th> </tr> </thead> <tbody> <tr> <td>3,545</td> <td>3,500</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> <tr> <td>14,675</td> <td>15,000</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> <tr> <td>16,789</td> <td>16,800</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> </tbody> </table>	Original	New	Nearest 100	Nearest 1,000	3,545	3,500	<input type="checkbox"/>	<input type="checkbox"/>	14,675	15,000	<input type="checkbox"/>	<input type="checkbox"/>	16,789	16,800	<input type="checkbox"/>	<input type="checkbox"/>	Matching Item Response		
Original	New	Nearest 100	Nearest 1,000																
3,545	3,500	<input type="checkbox"/>	<input type="checkbox"/>																
14,675	15,000	<input type="checkbox"/>	<input type="checkbox"/>																
16,789	16,800	<input type="checkbox"/>	<input type="checkbox"/>																
<p>A. Round 590,340 to the nearest hundred thousand. Enter your answer in the first response box.</p> <p>B. Round 590,340 to the nearest ten thousand. Enter your answer in the second response box.</p>	Equation Response																		

<p>Jessica is thinking of a number that rounds to 1,300 for the nearest ten and for the nearest hundred. What number might she be thinking of?</p>	<p>Equation Response</p>										
<p>Original numbers are rounded to the nearest hundred and to the nearest thousand. The original numbers are missing from the table.</p> <table border="1" data-bbox="191 478 630 661"> <thead> <tr> <th>Original Number</th> <th>Rounded to Nearest Hundred</th> <th>Rounded to Nearest Thousand</th> </tr> </thead> <tbody> <tr> <td></td> <td>13,500</td> <td>14,000</td> </tr> <tr> <td></td> <td>1,700</td> <td>2,000</td> </tr> </tbody> </table> <p>Determine possible original numbers that would correctly complete the table.</p>	Original Number	Rounded to Nearest Hundred	Rounded to Nearest Thousand		13,500	14,000		1,700	2,000	<p>Table Response</p>	
Original Number	Rounded to Nearest Hundred	Rounded to Nearest Thousand									
	13,500	14,000									
	1,700	2,000									

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Content Standard	<b>MAFS.4.NBT</b> <i>Number and Operations in Base Ten</i>	
	<b>MAFS.4.NBT.2</b> <i>Use place value understanding and properties.</i>	
	<b>MAFS.4.NBT.2.4</b> Fluently add and subtract multi-digit whole numbers using the standard algorithm.	
Assessment Limits	Whole numbers greater than 1,000 and within 1,000,000.	
Calculator	No	
Acceptable Response Mechanisms	Equation Response Graphic Response – Drag and Drop	
Context	No context	
Example		
Context	Add/subtract two or more numbers where the student carries/borrows two non-consecutive digits. Use addends and subtrahends from 10,000 to 100,000.	
Context easier	Add/subtract two numbers where the student will not carry/borrow. Use addends and subtrahends from 1,000 to 10,000.	
Context more difficult	Add/subtract two or more numbers where the student carries/borrows two or more consecutive digits. Use addends and subtrahends from 100,000 to 1,000,000.	
Sample Item Stem	Response Mechanism	Notes, Comments
What is the sum of 42,436 and 21,352?	Equation Response	
An addition problem is shown.  $\begin{array}{r} 63,829 \\ 24,343 \\ + 1,424 \\ \hline \end{array}$ Calculate the sum.	Equation Response	
What is the difference of 31,678 and 28,995?	Equation Response	
Enter the missing digit to complete the subtraction statement.  $\begin{array}{r} 409,845 \\ - 1\square6,675 \\ \hline 213,170 \end{array}$	Equation Response	

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<p>Enter the missing digit to complete the addition statement.</p> $\begin{array}{r} 26, \square 54 \\ 18,899 \\ + \underline{12,351} \\ \hline 58,004 \end{array}$	Equation Response	
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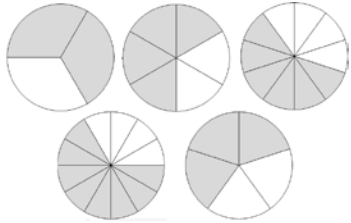
Content Standard	<b>MAFS.4.NBT</b> <i>Number and Operations in Base Ten</i>	
	<b>MAFS.4.NBT.2</b> <i>Use place value understanding and properties of operations to perform multi-digit arithmetic.</i>	
	<b>MAFS.4.NBT.2.5</b> Multiply a whole number of up to four digits by a one-digit whole number, and multiply two two-digit numbers, using strategies based on place value and the properties of operations. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.	
Assessment Limits	Multiply four digits by one digit, three digits by one digit, two digits by one digit, and two digits by two digits.	
Calculator	No	
Acceptable Response Mechanisms	Equation Response Multi-Select Response Natural Language Response	
Context	No context	
Example		
Context	Restrict multiplication to 3 or 4 digits by 1 digit. Include additional carrying.	
Context easier	Restrict multiplication to 2 or 3 digits by 1 digit. Use small digits that do not require additional carrying in problem solving.	
Context more difficult	Include multiplication of two digit by two digit numbers, with or without additional carrying.	
Sample Item Stem	Response Mechanism	Notes, Comments
Find the product of 220 and 4.	Equation Response	
Find the product of 2,830 and 3.	Equation Response	
Select all the expressions that have a product of 420.  <ul style="list-style-type: none"> <li>○ <math>35 \times 12</math></li> <li>○ <math>(3 \times 5) \times (10 \times 2)</math></li> <li>○ <math>(40 \times 10) \times (2 \times 4)</math></li> <li>○ <math>40 \times 20</math></li> <li>○ <math>14 \times 30</math></li> </ul>	Multi-Select Response	

Content Standard	<b>MAFS.4.NBT</b> <i>Number and Operations in Base Ten</i>	
	<b>MAFS.4.NBT.2</b> <i>Use place value understanding and properties of operations to perform multi-digit arithmetic.</i>	
	<b>MAFS.4.NBT.2.6</b> Find whole-number quotients and remainders with up to four-digit dividends and one-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.	
Assessment Limits	3-digit dividend and 1-digit divisor, and 4-digit dividend and 1-digit divisor.	
Calculator	No	
Acceptable Response Mechanisms	Equation Response Multi-Select Response	
Context	No context	
<b>Example</b>		
Context	Include division by non-skip counting numbers without a remainder. Include division by common skip counting numbers (multiples of 2 and 5) with a remainder.	
Context easier	Divisor includes common skip counting numbers (multiples of 2 and 5). Include division by skip counting numbers without a remainder.	
Context more difficult	Include 4-digit dividends. Include division by non-skip counting numbers with a remainder.	
<b>Sample Item Stem</b>		
What is 400 divided by 5?	Equation Response	
Select all the expressions that have a value of 25.  <ul style="list-style-type: none"> <li>○ <math>500 \div 5</math></li> <li>○ <math>600 \div 3</math></li> <li>○ <math>100 \div 4</math></li> <li>○ <math>150 \div 5</math></li> <li>○ <math>200 \div 8</math></li> </ul>	Multi-Select Response	
What is 402 divided by 8?	Equation Response	
What is 1,356 divided by 3?	Equation Response	

Content Standard	<p><b>MAFS.4.NF</b> Numbers and Operations – Fractions</p> <p><b>MAFS.4.NF.1</b> Extend understanding of fraction equivalence and ordering.</p> <p><b>MAFS.4.NF.1.1</b> Explain why a fraction <math>\frac{a}{b}</math> is equivalent to a fraction <math>\frac{(n \times a)}{(n \times b)}</math> by using visual fraction models, with attention to how the number and size of the parts differ even though the two fractions themselves are the same size. Use this principle to recognize and generate equivalent fractions.</p>
Assessment Limits	<p>Denominators limited to: 2, 3, 4, 5, 6, 8, 10, 12, 100.</p> <p>For denominators of 10 and 100, focus should not be on equivalence between these 2 denominators, since this is addressed specifically in standards MAFS.4.NF.5 – 7, but should be more on equivalence between fractions with denominators of 2, 4, and 5, and fractions with denominators of 10 and 100, e.g., <math>\frac{1}{2} = \frac{5}{10}</math>, <math>\frac{2}{5} = \frac{40}{100}</math>, etc.</p> <p>Refer to the same whole, including in models.</p> <p>Fraction models are limited to number lines, rectangles, circles, and squares. (The focus should not be on complex visual models.)</p> <p>Fractions <math>\frac{a}{b}</math> can be improper fractions and students should not be guided to put fractions in lowest terms or to simplify.</p> <p>Equivalent fractions also include fractions <math>\frac{1 \times a}{1 \times b}</math>.</p>
Calculator	No
Acceptable Response Mechanisms	<p>Equation Response</p> <p>Graphic Response – Drag and Drop, Hot Spot</p> <p>Multiple Choice Response</p> <p>Multi-Select Response</p> <p>Natural Language Response</p> <p>Matching Item Response</p>
Context	Allowable
Example	
Context	Include fractions and fractions represented by models to equivalent fractions with denominators of 8 or 12, and also may include fractions/models with denominator of 2, 3, 4, and/or 6.
Context easier	Limit fraction and fraction represented by models to equivalent fractions with denominators of 2, 3, 4, and 6.
Context more difficult	Include equivalent fractions or equivalent fractions represented by models with denominators of 5, 10, and/or 100, and also may include fractions/models with denominator of 2, 3, 4, 5, 8, and/or 12.



Sample Item Stem	Response Mechanism	Notes, Comments
<p>Kari modeled a fraction by shading parts of the circle as shown.</p> <p style="text-align: center;"><b>Kari's Fraction Model</b></p>  <p>Select sections to model a fraction equivalent to Kari's fraction.</p> 	<p>Graphic Response – Hot Spot</p>	
<p>Which fraction is equivalent to <math>\frac{2}{3}</math>?</p> <p>[Options are limited to fractions with denominators of 2, 3, 4, or 6.]</p>	<p>Multiple Choice Response</p>	
<p>Kari modeled a fraction by shading parts of the circle as shown.</p> <p style="text-align: center;"><b>Kari's Fraction Model</b></p>  <p>Select all models that have been shaded to represent fractions equivalent to Kari's fraction.</p> <p>[Five equal-sized models are options, with denominators limited to 2, 3, 4, 6, 8, or 12.]</p>	<p>Multi-Select Response</p>	

<p>Which fraction is equivalent to <math>\frac{2}{3}</math>?</p> <ul style="list-style-type: none"> <li><input type="radio"/> <math>\frac{4}{9}</math></li> <li><input type="radio"/> <math>\frac{4}{6}</math></li> <li><input type="radio"/> <math>\frac{6}{8}</math></li> <li><input type="radio"/> <math>\frac{8}{12}</math></li> <li><input type="radio"/> <math>\frac{3}{4}</math></li> </ul>	<p>Multi-Select Response</p>	
<p>Kari modeled a fraction by shading parts of the circle as shown.</p> <p style="text-align: center;"><b>Kari's Fraction Model</b></p>  <p>Select all the models that have been shaded to represent fractions equivalent to Kari's fraction.</p> 	<p>Graphic Response – Hot Spot</p>	
<p>Create two fractions that are equivalent to <math>\frac{2}{3}</math>.</p> <p>Enter one fraction in each response box.</p>	<p>Equation Response</p>	

<p>Kari has two fraction models, each divided into equal-sized sections. The models are shaded to represent the same fraction.</p> <p>Model A is divided into 8 sections, and 5 sections are shaded.</p> <p>Model B is divided into 12 sections.</p> <p>What do you know about the number of sections shaded in Model B? Explain your answer.</p>	Natural Language Response	
<p>Corey tried to find a fraction equivalent to <math>\frac{3}{5}</math>. His work is shown.</p> $\frac{3}{5} = \frac{3}{5} \times \frac{1}{2} = \frac{3}{10}$ <p>Which statement describes Corey's error?</p> <p>A. He incorrectly multiplied <math>\frac{3}{5}</math> and <math>\frac{1}{2}</math>.</p> <p>B. It is impossible to find a fraction equivalent to <math>\frac{3}{5}</math>.</p> <p>C. He should have divided by <math>\frac{1}{2}</math>.</p> <p>D. He did not multiply <math>\frac{3}{5}</math> by a fraction equal to 1.</p>	Multiple Choice Response	

Content Standard	<p><b>MAFS.4.NF</b> <i>Number and Operations – Fractions</i></p> <p><b>MAFS.4.NF.1</b> <i>Extend understanding of fraction equivalence and ordering.</i></p> <p><b>MAFS.4.NF.1.2</b> Compare two fractions with different numerators and different denominators, e.g., by creating common denominators or numerators, or by comparing to a benchmark fraction such as <math>\frac{1}{2}</math>. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with symbols <math>&gt;</math>, <math>=</math>, or <math>&lt;</math>, and justify the conclusions, e.g., by using a visual fraction model.</p>	
Assessment Limits	<p>Denominators limited to: 2, 3, 4, 5, 6, 8, 10, 12, 100.</p> <p>Benchmarks limited to: <math>0, \frac{1}{4}, \frac{1}{2}, \frac{3}{4}, 1</math>.</p> <p>Fractions <math>\frac{a}{b}</math> can be improper fractions and students should not be guided to put fractions in lowest terms or to simplify.</p> <p>Two fractions being compared should have both different numerator and different denominator.</p>	
Calculator	No	
Acceptable Response Mechanisms	<p>Equation Response</p> <p>Graphic Response – Drag and Drop, Drawing/Graphing, Hot Spot</p> <p>Multiple Choice Response</p> <p>Multi-Select Response</p> <p>Natural Language Response</p> <p>Matching Item Response</p>	
Context	Allowable	
Example		
Context	<p>Compare fractions or fractions represented by models with or without a situational context.</p> <ul style="list-style-type: none"> <li>• A fraction denominator does not have to be a multiple of the other, e.g., <math>\frac{2}{5}</math> and <math>\frac{2}{3}</math>.</li> <li>• Fractions less than 1</li> <li>• Both fractions can be non-unit fractions.</li> </ul>	
Context easier	<ul style="list-style-type: none"> <li>• Fractions less than 1</li> <li>• One of the fractions involved is a unit fraction.</li> <li>• One fraction denominator is a multiple of the other.</li> </ul>	
Context more difficult	<ul style="list-style-type: none"> <li>• One or both are improper fractions.</li> </ul>	
Sample Item Stem	Response Mechanism	Notes, Comments
<p>Select <math>&gt;</math>, <math>&lt;</math> or <math>=</math> to complete a true statement about each pair of fractions.</p> <p><math>\frac{3}{5}</math> <input type="checkbox"/> <math>\frac{5}{12}</math></p> <p><math>\frac{5}{6}</math> <input type="checkbox"/> <math>\frac{3}{8}</math></p> <p><math>\frac{1}{3}</math> <input type="checkbox"/> <math>\frac{3}{5}</math></p>	Matching Item Response	

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<p>Select &gt;, &lt; or = to complete a true statement about each pair of fractions.</p> <p><math>\frac{4}{3}</math> <input type="checkbox"/> <math>\frac{6}{5}</math></p> <p><math>\frac{3}{2}</math> <input type="checkbox"/> <math>\frac{8}{3}</math></p> <p><math>\frac{3}{2}</math> <input type="checkbox"/> <math>\frac{7}{4}</math></p>	<p>Matching Item Response</p>	
<p>Kari has two fraction models, each divided into equal-sized sections. The fraction represented by Model A is greater than the fraction represented by Model B.</p> <p>Model A is divided into 8 sections, and 2 sections are shaded.</p> <p>Model B is divided into 12 sections.</p> <p>What do you know about the number of sections shaded in Model B? Explain your answer.</p>	<p>Natural Language Response</p>	

Content Standard	<p><b>MAFS.4.NF</b> <i>Number and Operations - Fractions</i></p> <p><b>MAFS.4.NF.2</b> <i>Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers.</i></p> <p><b>MAFS.4.NF.2.3</b> Understand a fraction <math>\frac{a}{b}</math> with <math>a &gt; 1</math> as a sum of fractions <math>\frac{1}{b}</math>.</p> <p><b>MAFS.4.NF.2.3a</b> Understand addition and subtraction of fractions as joining and separating parts referring to the same whole.</p> <p><b>MAFS.4.NF.2.3b</b> Decompose a fraction into a sum of fractions with the same denominator in more than one way, recording each decomposition by an equation. Justify decompositions, e.g., by using a visual fraction model. <i>Examples:</i> <math>\frac{3}{8} = \frac{1}{8} + \frac{1}{8} + \frac{1}{8}</math>; <math>\frac{3}{8} = \frac{1}{8} + \frac{2}{8}</math>; <math>2\frac{1}{8} = 1 + 1 + \frac{1}{8} = \frac{8}{8} + \frac{8}{8} + \frac{1}{8}</math>.</p> <p><b>MAFS.4.NF.2.3c</b> Add and subtract mixed numbers with like denominators, e.g., by replacing each mixed number with an equivalent fraction, and/or by using properties of operations and the relationship between addition and subtraction.</p> <p><b>MAFS.4.NF.2.3d</b> Solve word problems involving addition and subtraction of fractions referring to the same whole and having like denominators, e.g., by using visual fraction models and equations to represent the problem.</p>
Assessment Limits	<p>Denominators limited to 2, 3, 4, 5, 6, 8, 10, 12, 100. Use mixed numbers and fractions with like denominators. Incorporate the concept of the same whole. Circle-based models, rectangular models, and number line models; do not overuse circle-based area food models (i.e., pizza).</p>
Calculator	No
Acceptable Response Mechanisms	<p>Equation Response Graphic Response – Drag and Drop, Drawing/Graphing, Hot Spot Multiple Choice Response Multi-Select Response Matching Item Response Natural Language Response</p>
Context	Allowable. Required for MAFS.4.NF.2.3d
Example	
Context	<p>Find the sum or difference of fractions with visual models or an equation including decomposition of fractions.</p> <ul style="list-style-type: none"> <li>• Unit fraction and non-unit fraction addends that sum to an improper fraction/factors in decomposition of fractions</li> <li>• Non-unit fraction addends that sum to a proper fraction/factors in decomposition of fractions</li> </ul>
Context easier	<ul style="list-style-type: none"> <li>• One or more unit fractions that sum to a proper fraction included in addends/factors in decomposition of fractions</li> </ul>

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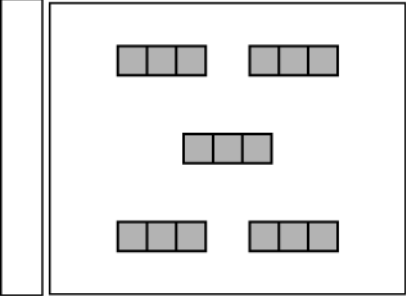
Context more difficult	<ul style="list-style-type: none"> <li>• Non-unit fraction addends that sum to an improper fraction/factors in decomposition of fractions</li> <li>• More than 1 fraction representation or decomposition of fraction representation</li> </ul>	
Sample Item Stem	Response Mechanism	Notes, Comments
<p>An expression is shown.</p> $\frac{1}{6} + \frac{1}{6}$ <p>What is the value of the expression?</p>	Equation Response	
<p>An expression is shown.</p> $\frac{9}{10} - \frac{4}{10}$ <p>What is the value of the expression?</p>	Equation Response	
<p>An expression is shown.</p> $\frac{2}{10} + \frac{9}{10}$ <p>What is the value of the expression?</p>	Equation Response	
<p>Sue had <math>\frac{7}{8}</math> of a cup of flour. She used <math>\frac{1}{8}</math> of a cup.</p> <p>How much flour, in cups, does Sue have left?</p>	Equation Response	
<p>Which sums show different ways to express <math>\frac{5}{8}</math>?</p> <ul style="list-style-type: none"> <li><input type="radio"/> <math>\frac{2}{8} + \frac{3}{8}</math></li> <li><input type="radio"/> <math>\frac{6}{8} - \frac{1}{8}</math></li> <li><input type="radio"/> <math>\frac{7}{8} - \frac{4}{8} + \frac{3}{8}</math></li> <li><input type="radio"/> <math>\frac{1}{8} + \frac{3}{8} + \frac{1}{8}</math></li> <li><input type="radio"/> <math>\frac{7}{8} - \frac{2}{8} - \frac{1}{8}</math></li> </ul>	Multi-Select Response	

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<p>What is the sum of <math>2\frac{2}{3}</math> and <math>1\frac{2}{3}</math>?</p> <p>A. Enter your answer as a mixed number.</p> <p>B. Enter your answer as a fraction.</p>	<p>Equation Response</p>	
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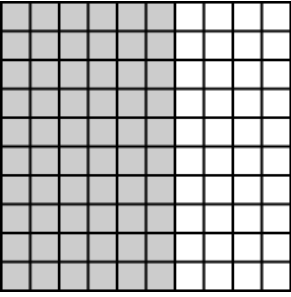


Content Standard	<p><b>MAFS.4.NF</b> <i>Number and Operations - Fractions</i></p> <p><b>MAFS.4.NF.2</b> <i>Build fractions from unit fractions by applying and extending previous understanding of operations on whole numbers.</i></p> <p><b>MAFS.4.NF.2.4</b> Apply and extend previous understandings of multiplication to multiply a fraction by a whole number.</p> <p><b>MAFS.4.NF.2.4a</b> Understand a fraction <math>\frac{a}{b}</math> as a multiple of <math>\frac{1}{b}</math>. For example, use a visual fraction model to represent <math>\frac{5}{4}</math> as the product <math>5 \times \left(\frac{1}{4}\right)</math>, recording the conclusion by the equation <math>\frac{5}{4} = 5 \times \left(\frac{1}{4}\right)</math>.</p> <p><b>MAFS.4.NF.2.4b</b> Understand a multiple of <math>\frac{a}{b}</math> as a multiple of <math>\frac{1}{b}</math>, and use this understanding to multiply a fraction by a whole number. For example, use a visual fraction model to express <math>3 \times \left(\frac{2}{5}\right)</math> as <math>6 \times \left(\frac{1}{5}\right)</math>, recognizing this product as <math>\frac{6}{5}</math>. (In general, <math>n \times \left(\frac{a}{b}\right) = \frac{(n \times a)}{b}</math>.)</p> <p><b>MAFS.4.NF.2.4c</b> Solve word problems involving multiplication of a fraction by a whole number, e.g., by using visual fraction models and equations to represent the problem. For example, if each person at a party will eat <math>\frac{3}{8}</math> of a pound of roast beef, and there will be 5 people at the party, how many pounds of roast beef will be needed? Between what two whole numbers does your answer lie?</p>	
Assessment Limits	Fractions will only be multiplied by a whole number. Limit denominators to 2, 3, 4, 5, 6, 8, 10, 12, 100.	
Calculator	None	
Acceptable Response Mechanisms	Equation Response Graphic Response – Drag and Drop, Drawing/Graphing, Hot Spot Multiple Choice Response Multi-Select Response	
Context	Allowable	
Example		
Context	Any mathematical problem or situational context that involves multiplying a fraction by a whole number. Multiplying a fraction by a one-digit whole number with products limited to improper fractions. Multiplying a fraction by a two-digit whole number with products limited to proper fractions.	
Context easier	Multiplying a fraction by a one-digit whole number with products limited to proper fractions.	
Context more difficult	Multiplying a fraction by a two-digit whole number with products limited to improper fractions.	

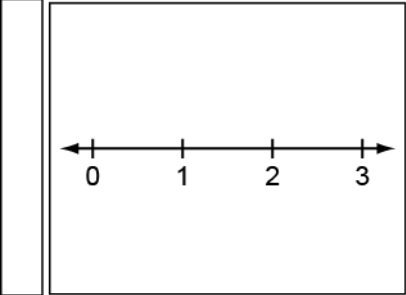
Sample Item Stem	Response Mechanism	Notes, Comments
<p>An equation is shown.</p> $3 \times \square = \frac{3}{4}$ <p>What is the missing number?</p>	Equation Response	
<p>An expression is shown.</p> $\frac{2}{3} \times 5$ <p>What is the value of the expression?</p>	Equation Response	
<p>An equation is shown.</p> $11 \times \square = \frac{55}{10}$ <p>What is the missing number?</p>	Equation Response	
<p>An expression is shown.</p> $\frac{1}{3} \times 5$ <p>Click on sections of the rectangles to model the expression.</p> 	Graphic Response – Hot Spot	
<p>Seth uses a bowl to fill a container with soil. The bowl holds <math>\frac{3}{4}</math> cup of soil.</p> <p>How many cups of soil does the container hold if it takes 13 full bowls of soil to fill it?</p>	Equation Response	

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Content Standard		<p><b>MAFS.4.NF</b> <i>Number and Operations - Fractions</i></p> <p><b>MAFS.4.NF.3</b> <i>Understand decimal notation for fractions, and compare decimal fractions.</i></p> <p><b>MAFS.4.NF.3.5</b> Express a fraction with denominator 10 as an equivalent fraction with denominator 100, and use this technique to add two fractions with respective denominators 10 and 100. <i>For example, express <math>\frac{3}{10}</math> as <math>\frac{30}{100}</math>, and add <math>\frac{3}{10} + \frac{4}{100} = \frac{34}{100}</math>.</i></p>	
Assessment Limits		<p>Denominators must be either 10 or 100.          Decimal notation is not assessed in this standard.          Common denominator and equivalent fractions are acceptable vocabulary words.</p>	
Calculator		No	
Acceptable Response Mechanisms		<p>Equation Response          Multiple Choice Response          Multi-Select Response          Matching Item Response</p>	
Context		Allowable	
Example			
Context	<p>Generally, moderately sized numbers in the numerators (between 3 and 7, between 30 and 70).          The final sum may be an improper fraction – use this criterion sparingly for a medium difficulty item.</p>		
Context easier	<p>Generally, smaller numbers in the numerators (<math>\leq 3</math>, <math>\leq 30</math>).          The numerator of the fraction with 100 in the denominator is a multiple of 10.</p>		
Context more difficult	<p>Generally, larger numbers in the numerators (<math>\geq 7</math>, <math>\geq 70</math>).          One of the addends may be an improper fraction – use this criterion sparingly for hard items.</p>		
Sample Item Stem		Response Mechanism	Notes, Comments
Create a fraction with a denominator of 100 that is equivalent to $\frac{2}{10}$ .		Equation Response	
Which fraction is equivalent to $\frac{3}{10}$ ?		Multiple Choice Response	

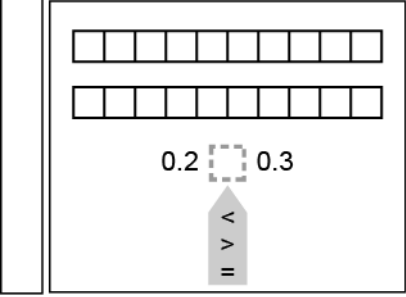
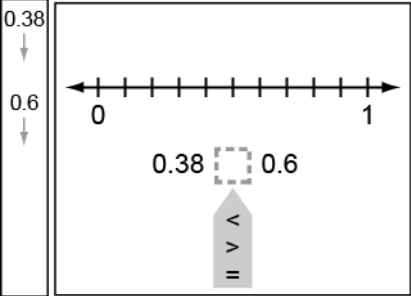
<p>A fraction model is shown.</p>  <p>The fraction represented by this model can be written in the form of <math>\frac{?}{10}</math>.</p> <p>What is the missing number?</p>	<p>Equation Response</p>	
<p>An equation is shown.</p> $\frac{8}{10} + \square = \frac{97}{100}$ <p>What is the missing number?</p>	<p>Equation Response</p>	

Content Standard	<p><b>MAFS.4.NF</b> <i>Number and Operations - Fractions</i></p> <p><b>MAFS.4.NF.3</b> <i>Understand decimal notation for fractions, and compare decimal fractions.</i></p> <p><b>MAFS.4.NF.3.6</b> Use decimal notation for fractions with denominators 10 or 100. For example, rewrite 0.62 as <math>\frac{62}{100}</math>; describe a length as 0.62 meters; locate 0.62 on a number line diagram.</p>	
Assessment Limits	Denominators of 10 and 100. Decimal notation to tenths and hundredths.	
Calculator	No	
Acceptable Response Mechanisms	Equation Response Multiple Choice Response Graphic Response – Drag and Drop, Drawing/Graphing, Hot Spot Matching Item Response Multi-Select Response	
Context	No context	
Example		
Context	Any mathematical problem or situational context that involves converting a fraction with a denominator of 100 to a decimal.	
Context easier	Any mathematical problem or situational context that involves converting a fraction with a denominator or 10 to a decimal.	
Context more difficult	Any mathematical problem or situational context that involves converting a mixed number with a denominator of 10 or 100 to a decimal.	
Sample Item Stem	Response Mechanism	Notes, Comments
A value is shown. $\frac{3}{10}$ What is this value in decimal form?	Equation Response	
A value is shown. $\frac{54}{100}$ What is this value in decimal form?	Equation Response	

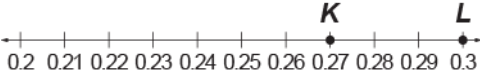
<p>Two values are shown.</p> <p>0.25 0.83</p> <p>Use the Add Point tool to correctly plot these values on the number line.</p> 	<p>Graphic Response – Drawing/Graphing</p>	
<p>A value is shown.</p> <p><math>5\frac{20}{100}</math></p> <p>What is this value in decimal form?</p>	<p>Equation Response</p>	
<p>Select all the fractions that are equivalent to 0.8.</p> <ul style="list-style-type: none"> <li><input type="radio"/> <math>\frac{8}{10}</math></li> <li><input type="radio"/> <math>\frac{80}{10}</math></li> <li><input type="radio"/> <math>\frac{8}{100}</math></li> <li><input type="radio"/> <math>\frac{80}{100}</math></li> <li><input type="radio"/> <math>\frac{10}{8}</math></li> <li><input type="radio"/> <math>\frac{100}{8}</math></li> </ul>	<p>Multi-Select Response</p>	

Grade 4 Mathematics Item Specifications  
Florida Standards Assessments

Content Standard	<p><b>MAFS.4.NF</b> <i>Number and Operations - Fractions</i></p> <p><b>MAFS.4.NF.3</b> <i>Understand decimal notation for fractions, and compare decimal fractions.</i></p> <p><b>MAFS.4.NF.3.7</b> Compare two decimals to hundredths by reasoning about their size. Recognize that comparisons are valid only when the two decimals refer to the same whole. Record the results of comparisons with the symbols <math>&gt;</math>, <math>=</math>, or <math>&lt;</math>, and justify the conclusions, e.g., by using a visual model.</p>	
Assessment Limits	<p>Decimals reference the same whole value. Decimals limited to tenths and hundredths. Decimals should not be limited to values less than 1. Use mathematical symbols appropriately to compare values represented by models and not to compare models, e.g., <math>0.62 &lt; 0.89</math> instead of <math>[\text{model}] &lt; [\text{model}]</math>.</p>	
Calculator	No	
Acceptable Response Mechanisms	<p>Equation Response Graphic Response – Drag and Drop, Drawing/Graphing, Hot Spot Multiple Choice Response Multi-Select Response Table Response Natural Language Response Matching Item Response</p>	
Context	Allowable	
Example		
Context	<p>Compare two decimals with or without a situational context such as measurement/length.</p> <ul style="list-style-type: none"> <li>• At least one decimal to the hundredths place, with both less than one</li> <li>• Both decimals to the tenths place, with at least one greater than 1</li> </ul>	
Context easier	Both decimal numbers to the tenths place, with both values less than 1.	
Context more difficult	At least one decimal number to the hundredths place, with at least one greater than 1.	

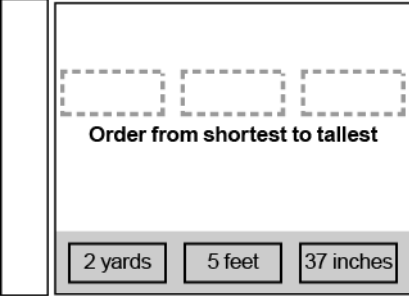
Sample Item Stem	Response Mechanism	Notes, Comments
<p>Each model shown represents 1 whole.</p>  <p>Click to shade sections in the models to represent 0.2 and 0.3.</p> <p>Then, select the correct comparison symbol.</p>	<p>Graphic Response – Hot Spot</p>	
<p>A number line is shown.</p>  <p>A. Drag each number to its correct location on the number line.</p> <p>B. Select the correct comparison symbol.</p>	<p>Graphic Response- Hot Spot</p>	
<p>Mr. Shelby bought a new plant. The plant grew 2.6 centimeters in the first week and 3.4 centimeters the second week. Select all the true comparisons of the plant growth for the two weeks.</p> <ul style="list-style-type: none"> <li><input type="radio"/> 2.6 &gt; 3.42</li> <li><input type="radio"/> 3.42 &gt; 2.6</li> <li><input type="radio"/> 2.6 &lt; 3.42</li> <li><input type="radio"/> 3.42 &lt; 2.6</li> <li><input type="radio"/> 2.6 = 3.42</li> </ul>	<p>Multi-Select Response</p>	



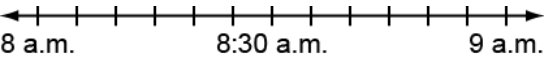
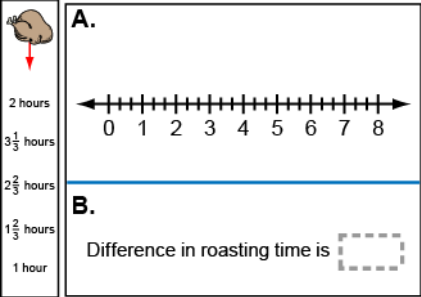
<p>Zach and Karla each have seeds they will plant in a class garden. Zach’s flower seeds weigh 1.5 grams. Karla’s seeds weigh 1.46 grams.</p> <p>Select the correct symbol for each comparison.</p> <table border="1" data-bbox="191 489 472 615"> <tr> <td></td> <td>&lt;</td> <td>&gt;</td> <td>=</td> </tr> <tr> <td>1.5 □ 1.46</td> <td></td> <td></td> <td></td> </tr> <tr> <td>1.46 □ 1.5</td> <td></td> <td></td> <td></td> </tr> </table>		<	>	=	1.5 □ 1.46				1.46 □ 1.5				<p>Matching Item Response</p>					
	<	>	=															
1.5 □ 1.46																		
1.46 □ 1.5																		
<p>The locations of points <i>K</i> and <i>L</i> on the number line represent decimal numbers.</p>  <p>Explain why the value of point <i>L</i> is greater than the value of point <i>K</i>.</p>	<p>Natural Language Response</p>																	
<p>Complete the table to show a possible missing digit for each comparison.</p> <table border="1" data-bbox="191 1050 532 1188"> <thead> <tr> <th>Comparison</th> <th>Missing Digit</th> </tr> </thead> <tbody> <tr> <td>2.7 &lt; 2.□</td> <td></td> </tr> <tr> <td>0.23 &gt; 0.□</td> <td></td> </tr> </tbody> </table>	Comparison	Missing Digit	2.7 < 2.□		0.23 > 0.□		<p>Table Response</p>											
Comparison	Missing Digit																	
2.7 < 2.□																		
0.23 > 0.□																		
<p>Complete the table to show whether each number in the table is less than, equal to, or greater than 2.8.</p> <table border="1" data-bbox="191 1367 508 1518"> <thead> <tr> <th></th> <th>&lt; 2.8</th> <th>= 2.8</th> <th>&gt; 2.8</th> </tr> </thead> <tbody> <tr> <td>0.99</td> <td></td> <td></td> <td></td> </tr> <tr> <td>2.80</td> <td></td> <td></td> <td></td> </tr> <tr> <td>3.1</td> <td></td> <td></td> <td></td> </tr> </tbody> </table>		< 2.8	= 2.8	> 2.8	0.99				2.80				3.1				<p>Table Response</p>	
	< 2.8	= 2.8	> 2.8															
0.99																		
2.80																		
3.1																		
<p>Allison wrote down a decimal number that is greater than 0.58 but less than 0.62.</p> <p>What is one number Allison could have written down?</p>	<p>Equation Response</p>																	

Content Standard	<p><b>MAFS.4.MD Measurement and Data</b></p> <p><b>MAFS.4.MD.1</b> Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.</p> <p><b>MAFS.4.MD.1.1</b> Know relative sizes of measurement units within one system of units including km, m, cm; kg, g; lb, oz.; l, ml; hr, min, sec. Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit. Record measurement equivalents in a two-column table. <i>For example, know that 1 ft is 12 times as long as 1 in. Express the length of a 4 ft snake as 48 in. Generate a conversion table for feet and inches listing the number pairs (1, 12), (2, 24), (3, 36), ...</i></p>	
Assessment Limits	<p>Measurement units are within a single system.</p> <p>Measurement conversions are from larger units to smaller units.</p> <p>Multiplication is limited to 4-digit numbers by 1-digit numbers and two 2-digit numbers (MAFS.4.NBT.B.5).</p> <p>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</p> <p>Graphic Response – Drag and Drop</p> <p>Matching Response</p> <p>Multiple Choice Response</p> <p>Multi-Select Response</p> <p>Table Response</p>	
Context	Allowable	
Example		
Context	Use the dimensions and mass of containers to solve problems (can include non-adjacent units that are separated by 1 other unit. For example, yard to inches). Student selects two measures.	
Context easier	<p>One measurement is given.</p> <p>Limit multiplication to 1- and 2-digit numbers.</p> <p>Limit conversions to adjacent units (i.e., feet to inches).</p> <p>Student selects one measure.</p>	
Context more difficult	<p>No measurements given.</p> <p>Increase the number of digits in multiplication to include 3-digit numbers.</p> <p>Conversions of non-adjacent units that are separated by two or more (i.e., gallons to cups).</p> <p>Student selects three measures.</p>	

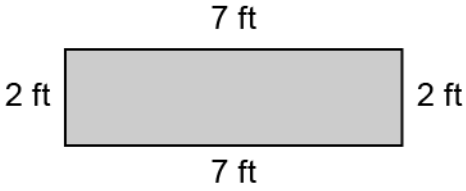
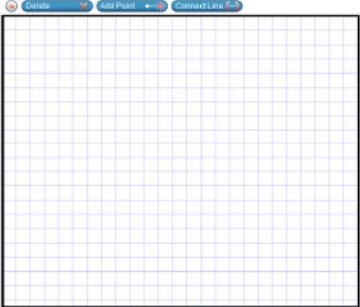
Grade 4 Mathematics Item Specifications  
Florida Standards Assessments

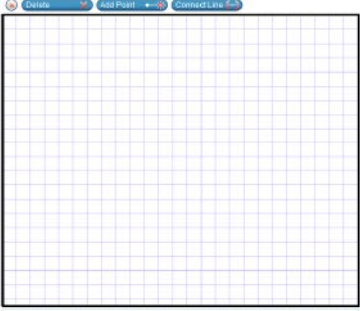
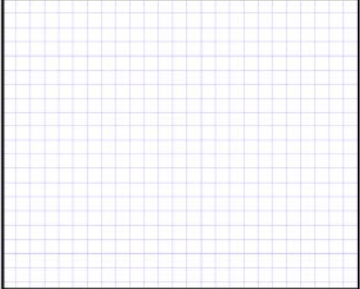
Sample Item Stem	Response Mechanism	Notes, Comments									
<p>Select all the objects that are close to an inch long.</p> <ul style="list-style-type: none"> <li><input type="radio"/> A textbook</li> <li><input type="radio"/> A paperclip</li> <li><input type="radio"/> A new pencil</li> <li><input type="radio"/> A 25-cent coin</li> <li><input type="radio"/> A telephone</li> </ul>	Multi-Select Response										
<p>Select all the measurements that are close to a yard.</p> <ul style="list-style-type: none"> <li><input type="radio"/> The length of a student’s desk</li> <li><input type="radio"/> The height of a classroom</li> <li><input type="radio"/> The width of a classroom door</li> <li><input type="radio"/> The length of a movie ticket</li> <li><input type="radio"/> The height of a building</li> </ul>	Multi-Select Response										
<p>A table is shown.</p> <table border="1" data-bbox="191 877 544 989"> <thead> <tr> <th></th> <th>Inches</th> <th>Feet</th> </tr> </thead> <tbody> <tr> <td>Container 1</td> <td>24</td> <td></td> </tr> <tr> <td>Container 2</td> <td></td> <td>3</td> </tr> </tbody> </table> <p>Complete the table to show the missing dimensions.</p>		Inches	Feet	Container 1	24		Container 2		3	Table Response	
	Inches	Feet									
Container 1	24										
Container 2		3									
<p>The heights of three boxes are shown. Drag one measurement into each box to order the boxes from shortest to tallest.</p> 	Graphic Response – Drag and Drop										

Content Standard		<b>MAFS.4.MD Measurement and Data</b>	
		<b>MAFS.4.MD.1</b> Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.	
		<b>MAFS.4.MD.1.2</b> Use the four operations to solve word problems involving distances, intervals of time, and money, including problems involving simple fractions or decimals. Represent fractional quantities of distance and intervals of time using linear models (Computational fluency with fractions and decimals is not the goal for students at this grade level.)	
Assessment Limits		Measurement conversions are from larger units to smaller units. Calculations are limited to simple fractions or decimals. Operations include addition, subtraction, multiplication, and division.	
Calculator		No	
Acceptable Response Mechanisms		Equation Response Graphic Response – Drawing/Graphing, Hot Spot	
Context	Required		
Example			
Context	Involves multiple operations. Involves fractions or decimals.		
Context easier	Involves one operation. Involves whole numbers.		
Context more difficult	Involves conversion of units.		
Sample Item Stem		Response Mechanism	Notes, Comments
Gretchen is baking pies. She needs 2 cups of flour for each pie. She has 8 cups of flour. She uses all 8 cups of flour.  How many pies can Gretchen bake?		Equation Response	
Gretchen is baking pies. She needs $\frac{1}{4}$ cup of butter for each pie. One stick of butter is $\frac{1}{2}$ cup.  How many sticks of butter does Gretchen need to make 4 pies?		Equation Response	

<p>Gretchen is baking a pie. She needs <math>\frac{3}{4}</math> cup of sugar.</p> <p>She notices that her measuring devices are only marked in ounces, not cups.</p> <p>How many ounces of sugar will Gretchen need?</p>	<p>Equation Response</p>	
<p>Gretchen needs to bake 3 pies. Each pie takes 12 minutes to bake. She needs to let the oven re-heat for 4 minutes between each pie. She begins baking at 8:05 a.m. Drag pies onto the number line to show when each pie is finished baking.</p> 	<p>Graphic Response – Drag and Drop</p>	
<p>A chef is roasting two turkeys. A turkey must roast for <math>\frac{1}{3}</math> of an hour for each pound. One turkey weighs 8 pounds and the other turkey weighs 14 pounds.</p> <p>A. Drag each turkey to the number line to correctly show how long each will take to roast.</p> <p>B. Select the difference in the roasting times.</p> 	<p>Graphic Response – Drag and Drop</p>	

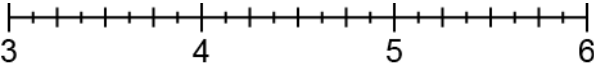
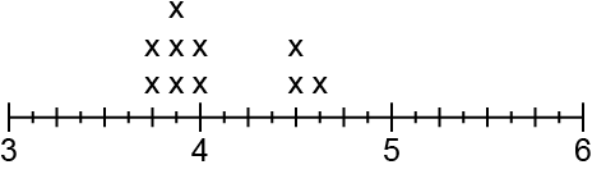
Content Standard	<p><b>MAFS.4.MD Measurement and Data</b></p> <p><b>MAFS.4.MD.1</b> Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.</p> <p><b>MAFS.4.MD.1.3</b> Apply the area and perimeter formulas for rectangles in real world and mathematical problems. <i>For example, find the width of a rectangular room given the area of the flooring and the length, by viewing the area formula as a multiplication equation with an unknown factor.</i></p>	
Assessment Limits	<p>Figures are limited to rectangles.          Fractions are limited to like denominators.          Products of factor pairs are limited to the range 1–100.          Division is limited to 2-digit by 1-digit, or 2-digit by 2-digit, where one number is multiple of 10.          Addition and subtraction within 1,000.          When constructing rectangles, the minimum grid size is 20 pixels, and in the context of a situation, one grid must be labeled with the appropriate dimension. That dimension should be “1 _____,” as items at this standard should not assess scale.</p>	
Calculator	No	
Acceptable Response Mechanisms	Equation Response Graphic Response – Drawing/Graphing Multi-Select Response	
Context	Allowable	
Example		
Context	Both length and width are provided in stem or as options. For area, dimensions are 1-digit by 2-digit. For perimeter, dimensions are 2-digit by 3-digit.	
Context easier	All four dimensions are provided in stem or options as art. For area, dimensions are 1-digit by 2-digit. For perimeter, dimensions are 2-digit by 2-digit or less.	
Context more difficult	Generally, unless restricted by the task demand, problem includes at least one unknown dimension. For area, dimensions are 2-digit by 2-digit. For perimeter, dimensions are 3-digit by 3-digit or less.	

Sample Item Stem	Response Mechanism	Notes, Comments
<p>A rectangular rug, with dimensions given in feet (ft), is shown.</p> <div style="text-align: center;">  </div> <p>What is the area of the rug in square feet?</p>	Equation Response	
<p>A store owner needs a rug with an area of at least 420 square feet.</p> <p>Select all the sizes of rugs the store owner could choose.</p> <ul style="list-style-type: none"> <li><input type="radio"/> 40 feet x 20 feet</li> <li><input type="radio"/> 60 feet x 7 feet</li> <li><input type="radio"/> 70 feet x 6 feet</li> <li><input type="radio"/> 4 feet x 20 feet</li> <li><input type="radio"/> 20 feet x 4 feet</li> </ul>	Multi-Select Response	
<p>The perimeter of a rectangular rug is 20 feet.</p> <p>Use the Connect Line tool to draw a rectangle that shows one possible size of the rug.</p> <div style="text-align: center;">  </div>	Graphic Response – Drawing/Graphing	
<p>A rectangular school gym has a length of 120 feet and a perimeter of 520 feet.</p> <p>What is the width, in feet, of the school gym?</p>	Equation Response	

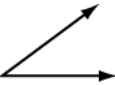



<p>A store owner wants to buy a new rectangular rug. The rug must be between 55 and 65 square feet and the side length must be less than 10 feet long.</p> <p>Use the Connect Line tool to draw a rectangle that could represent the new rug.</p> 	<p>Graphic Response – Drawing/Graphing</p>	
<p>A store owner wants to buy a new rectangular rug. The rug must be between 97 and 107 square feet. The rug must be less than 10 feet long.</p> <p>Use the Connect Line tool to draw a rectangle that could represent the new rug.</p> 	<p>Graphic Response – Drawing/Graphing</p>	






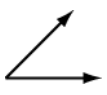
Content Standard	<p><b>MAFS.4.MD Measurement and Data</b></p> <p><b>MAFS.4.MD.2</b> Represent and interpret data.</p> <p><b>MAFS.4.MD.2.4</b> Make a line plot to display a data set of measurements in fractions of a unit <math>\left(\frac{1}{2}, \frac{1}{4}, \frac{1}{8}\right)</math>. Solve problems involving addition and subtraction of fractions by using information presented in line plots. <i>For example, from a line plot find and interpret the difference in length between the longest and shortest specimens in an insect collection.</i></p>	
Assessment Limits	<p>Measurement units are limited to halves, quarters, and eighths.          Addition and subtraction of fractions is limited to fractions with the same denominators.          Multiplication and division is limited to 2-digit by 1-digit, or 2-digit by 2-digit, where one number is a multiple of 10.          Addition and subtraction within 1,000.</p>	
Calculator	No	
Acceptable Response Mechanisms	Equation Response Graphic Response – Hot Spot	
Context	Allowed	
Example		
Context	For construction, data is in eighths, with wholes, halves, and quarters optional. For problem solving, data is in quarters, with wholes and halves optional.	
Context easier	For construction, data is in quarters, with wholes and halves optional. For problem solving, data is in halves, with wholes optional. Decrease the amount of data.	
Context more difficult	For problem solving, data is in eighths, with wholes, halves, and quarters optional. Increase the amount of data.	

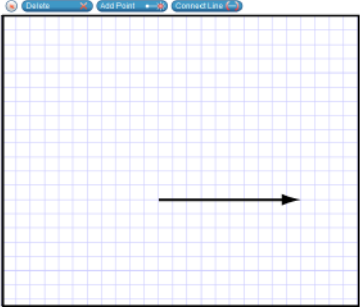

Sample Item Stem	Response Mechanism	Notes, Comments							
<p>Long jump measurements are given.</p> <table border="1" data-bbox="191 348 418 821"> <tr> <td>Long Jump Measurements (in feet)</td> </tr> <tr> <td><math>4\frac{1}{4}</math></td> </tr> <tr> <td><math>4\frac{1}{2}</math></td> </tr> <tr> <td>4</td> </tr> <tr> <td><math>4\frac{1}{4}</math></td> </tr> <tr> <td><math>3\frac{3}{4}</math></td> </tr> <tr> <td><math>3\frac{3}{4}</math></td> </tr> </table> <p>Click above the number line to create a correct line plot of the data.</p>  <p><b>Long Jump Measurements (in feet)</b></p>	Long Jump Measurements (in feet)	$4\frac{1}{4}$	$4\frac{1}{2}$	4	$4\frac{1}{4}$	$3\frac{3}{4}$	$3\frac{3}{4}$	<p>Graphic Response – Hot Spot</p>	
Long Jump Measurements (in feet)									
$4\frac{1}{4}$									
$4\frac{1}{2}$									
4									
$4\frac{1}{4}$									
$3\frac{3}{4}$									
$3\frac{3}{4}$									
<p>A line plot with long jump data is given.</p>  <p><b>Long Jump Measurements (in feet)</b></p> <p>Ben jumped <math>\frac{3}{8}</math> foot less than the farthest jump.          How far did Ben jump?</p>	<p>Equation Response</p>								

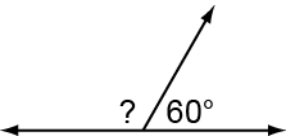
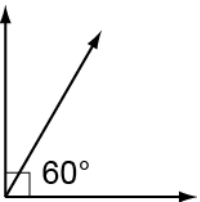
<p>Benny recorded the results for his top four long jump attempts. The total was 57 feet.</p> <p>Click above the number line to create a possible line plot for these data.</p> <div data-bbox="188 401 594 695" style="border: 1px solid black; padding: 5px;"> </div>	<p>Graphic Response – Hot Spot</p>	
<p>Benny recorded the results for his top four long jump attempts. The total was 57 feet. The first two jumps are shown on the number line.</p> <p>Click above the number line to show the possible lengths of Benny’s last two jumps.</p> <div data-bbox="188 1045 594 1339" style="border: 1px solid black; padding: 5px;"> </div>	<p>Graphic Response – Hot Spot</p>	

Content Standard	<p><b>MAFS.4.MD</b> <i>Measurement and Data</i></p> <p><b>MAFS.4.MD.3</b> <i>Geometric measurement: understand concepts of angle and measure angles.</i></p> <p><b>MAFS.4.MD.3.5</b> Recognize angles as geometric shapes that are formed wherever two rays share a common endpoint, and understand concepts of angle measurement.</p> <p><b>MAFS.4.MD.3.5a</b> An angle is measured with reference to a circle with its center at the common endpoint of the rays, by considering the fraction of the circular arc between the points where the two rays intersect the circle. An angle that turns through <math>\frac{1}{360}</math> of a circle is called a “one-degree angle,” and can be used to measure angles.</p> <p><b>MAFS.4.MD.3.5b</b> An angle that turns through <math>n</math> one-degree angles is said to have an angle measure of <math>n</math> degrees.</p>		
Assessment Limits	Whole number degree measures. Angles are less than or equal to $360^\circ$ .		
Calculator	No		
Acceptable Response Mechanisms	Graphic Response – Drawing/Graphing Multiple Choice Response Multi-Select Response Matching Item Response		
Context	Allowable		
<b>Example</b>			
Context	Identify angles (measures less than or equal to $180^\circ$ ).		
Context easier	Limit angles to benchmark angle measures of less than or equal to $180^\circ$ ( $45^\circ$ , $90^\circ$ , $135^\circ$ , $180^\circ$ ).		
Context more difficult	Angles include those between $180^\circ$ and $360^\circ$ .		
Sample Item Stem	Response Mechanism	Notes, Comments	
<p>Which is an angle?</p> <p>A. </p> <p>B. </p> <p>C. </p> <p>D. </p>	Multiple Choice Response		

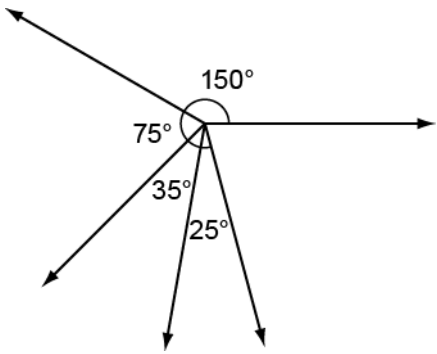
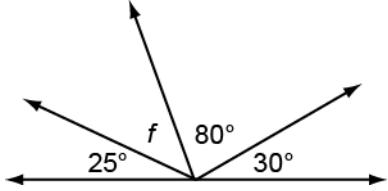
Select the category of measure for each angle.			Matching Item Response	
	<b>Less than 90°</b>	<b>Between 90° and 180°</b>		
				
				
				

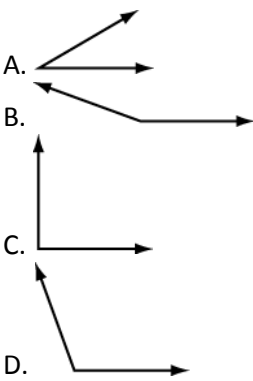
Content Standard	<b>MAFS.4.MD Measurement and Data</b>	
	<b>MAFS.4.MD.3 Geometric measurement: understand concepts of angle and measure angles.</b>	
	<b>MAFS.4.MD.3.6 Measure angles in whole-number degrees using a protractor. Sketch angles of specified measure.</b>	
Assessment Limits	Whole number degree measures between $0^\circ$ and $360^\circ$ . For identification, angles are less than $360^\circ$ . For construction, angles are less than $180^\circ$ .	
Calculator	No	
Acceptable Response Mechanisms	Equation Response Graphic Response – Drawing/Graphing	
Context	No context	
	Example	
Context	For measurement: angles with horizontal/vertical ray(s), and measure $120^\circ$ , $135^\circ$ , $150^\circ$ , or $180^\circ$ ; angles without a horizontal/vertical ray, and measure $30^\circ$ , $45^\circ$ , $60^\circ$ , or $90^\circ$ For construction: angle measures are multiples of 5 but not 10.	
Context easier	For measurement: limit angles to benchmark angle measures ( $30^\circ$ , $45^\circ$ , $60^\circ$ , $90^\circ$ ) with horizontal and/or vertical rays. For construction: angle measures are multiples of 10.	
Context more difficult	For measurement: angles without a horizontal/vertical ray, and measure $120^\circ$ , $135^\circ$ , $150^\circ$ , or $180^\circ$ ; any angle greater than $180^\circ$ . For construction: angle measures are integers that are not multiples of 5 or 10.	
	Sample Item Stem	Response Mechanism
	An angle is shown.  What is the measure of the angle?	Equation Response
		Notes, Comments

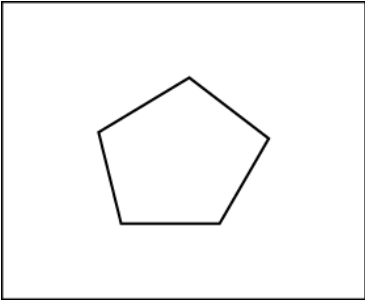






<p>One ray of angle T is shown.</p> <p>Use the Connect Line tool to draw another ray so that angle T measures <math>68^\circ</math>.</p> 	<p>Graphic Response – Drawing/Graphing</p>	
<p>An angle is shown.</p>  <p>What is the measure of the angle?</p>	<p>Equation Response</p>	

Content Standard		<b>MAFS.4.MD Measurement and Data</b>	
		<b>MAFS.4.MD.3 Geometric measurement: understand concepts of angle and measure angles.</b>	
		<b>MAFS.4.MD.3.7</b> Recognize angle measure as additive. When an angle is decomposed into non-overlapping parts, the angle measure of the whole is the sum of the angle measures of the parts. Solve addition and subtraction problems to find unknown angles on a diagram in real world and mathematical problems, e.g., by using an equation with a symbol for the unknown angle measure.	
Assessment Limits		Angle sums are less than or equal to $360^\circ$ .	
Calculator		No	
Acceptable Response Mechanisms		Equation Response Matching Item Response Multiple Choice Response Multi-Select Response	
Context		Allowable	
Example			
Context	Solve problems when an angle sum or angle measures are given. Angles composed of three smaller angles.		
Context easier	Limit to one angle composed of two smaller angles.		
Context more difficult	Increase number of angles (four or more). Angle sum determined from given parameters.		
Sample Item Stem		Response Mechanism	Notes, Comments
A diagram of $180^\circ$ is shown.  What is the measure of the unknown angle?		Equation Response	
A diagram is shown.  What is the sum of the angles?		Equation Response	

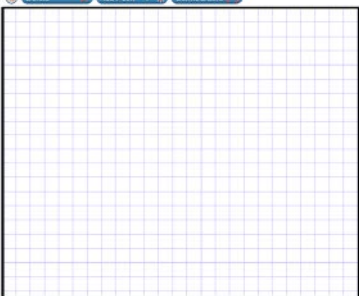


<p>Kyle is adding angles to create other angles.</p> <p>Select the angles Kyle can use to create a <math>128^\circ</math> angle.</p> <p>Select the angles that Kyle can use to create a <math>55^\circ</math> angle.</p> <table border="1" data-bbox="191 527 555 653"> <tr> <td></td> <td><math>64^\circ</math></td> <td><math>34^\circ</math></td> <td><math>30^\circ</math></td> <td><math>25^\circ</math></td> </tr> <tr> <td><math>128^\circ</math></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td><math>55^\circ</math></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>		$64^\circ$	$34^\circ$	$30^\circ$	$25^\circ$	$128^\circ$					$55^\circ$					<p>Matching Response</p>	
	$64^\circ$	$34^\circ$	$30^\circ$	$25^\circ$													
$128^\circ$																	
$55^\circ$																	
<p>A diagram is shown.</p>  <p>What is the angle sum?</p>	<p>Equation Response</p>																
<p>A diagram is shown.</p>  <p>A. Create an equation to show one way to find the measure of angle <math>f</math>.</p> <p>B. What is the measure of angle <math>f</math>?</p>	<p>Equation Response</p>																






Content Standard		<p><b>MAFS.4.G Geometry</b></p> <p><b>MAFS.4.G.1</b> Draw and identify lines and angles, and classify shapes by properties of their lines and angles.</p> <p><b>MAFS.4.G.1.1</b> Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures.</p>	
Assessment Limits		All objects (point, line, line segment, angles) and properties (right, acute, obtuse, perpendicular, parallel) noted in the standard, as individual objects, or within two-dimensional figures.	
Calculator		No	
Acceptable Response Mechanisms		Graphic Response – Drawing/Graphing, Hot Spot Matching Item Response Multi-Select Response Multiple Choice Response	
Context		Allowable	
Example			
Context		Draw a shape with exactly one acute angle. (basic objects considered in the context of more complex figure.)	
Context easier		Limit to one basic object as noted by the standard. Lines are shown horizontally/vertically. Angles are shown in traditional orientations (one arm is horizontal). Arms of all angles the same length.	
Context more difficult		Lines are shown in nontraditional orientations (not horizontal/vertical). Angles are shown in nontraditional orientations (no arm is horizontal).	
Sample Item Stem		Response Mechanism	Notes, Comments
<p>Several angles are shown.</p> <p>Which angle is acute?</p> 		Multiple Choice Response	






<p>A shape is shown.</p>  <p>Click to show all the obtuse angles in the shape.</p>	<p>Graphic Response – Hot Spot</p>																
<p>A set of lines is shown.</p> <p>Select all the attributes that apply to each set of lines.</p> <table border="1" data-bbox="191 861 670 1339"> <tr> <td></td> <td></td> <td></td> </tr> <tr> <td><b>Contains Parallel Line</b></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td><b>Contains Perpendicular Line</b></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td><b>Contains Acute Angle</b></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td><b>Contains Obtuse Angle</b></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> </table>				<b>Contains Parallel Line</b>	<input type="checkbox"/>	<input type="checkbox"/>	<b>Contains Perpendicular Line</b>	<input type="checkbox"/>	<input type="checkbox"/>	<b>Contains Acute Angle</b>	<input type="checkbox"/>	<input type="checkbox"/>	<b>Contains Obtuse Angle</b>	<input type="checkbox"/>	<input type="checkbox"/>	<p>Matching Item Response</p>	
																	
<b>Contains Parallel Line</b>	<input type="checkbox"/>	<input type="checkbox"/>															
<b>Contains Perpendicular Line</b>	<input type="checkbox"/>	<input type="checkbox"/>															
<b>Contains Acute Angle</b>	<input type="checkbox"/>	<input type="checkbox"/>															
<b>Contains Obtuse Angle</b>	<input type="checkbox"/>	<input type="checkbox"/>															
<p>A. Use the Connect Line tool to draw an acute angle.</p> <p>B. Use the Connect Line tool to draw an obtuse angle.</p>	<p>Graphic Response – Drawing/Graphing</p>																

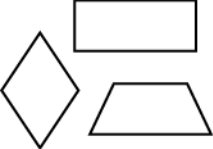

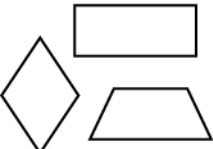
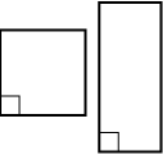
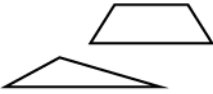
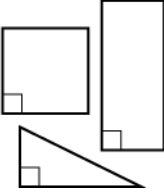
Grade 4 Mathematics Item Specifications  
Florida Standards Assessments

			
Content Standard	<p><b>MAFS.4.G Geometry</b></p> <p><b>MAFS 4.G.1</b> Draw and identify lines and angles, and classify shapes by properties of their lines and angles.</p> <p><b>MAFS.4.G.1.2</b> Classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines, or the presence or absence of angles of a specified size. Recognize right triangles as a category, and identify right triangles.</p>		
Assessment Limits	<p>Triangles: right triangles, acute triangles, obtuse triangles, scalene triangles, isosceles triangles, and equilateral triangles.</p> <p>Quadrilaterals: parallelograms, rectangles, squares, rhombi, trapezoids.</p> <p>Other polygons may be included where appropriate.</p>		
Calculator	No		
Acceptable Response Mechanisms	<p>Graphic Response – Drawing/Graphing</p> <p>Matching Item Response</p> <p>Multi-Select Response</p> <p>Multiple Choice Response</p> <p>Natural Language Response</p>		
Context	No Content		
Example			
Context	A set of figures (two attributes).		
Context easier	<p>Limit to one attribute.</p> <p>Only use shapes in traditional orientation (e.g., base of isosceles triangle is horizontal at the bottom).</p>		
Context more difficult	<p>More than two attributes.</p> <p>Include a variety of orientations.</p>		
Sample Item Stem	Response Mechanism	Notes, Comments	
<p>A set of triangles is shown.</p> <p>Select all the obtuse triangles.</p>	Multi-Select Response		

Grade 4 Mathematics Item Specifications  
Florida Standards Assessments







<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><li><input type="radio"/> </li></ul>		
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<p>A set of triangles is shown.</p> <p>Select all the right isosceles triangles.</p> <p><input type="radio"/> </p> <p><input type="radio"/> </p> <p><input type="radio"/> </p> <p><input type="radio"/> </p> <p><input type="radio"/> </p>	<p>Multi-Select Response</p>																	
<p>A set of shape names is given.</p> <p>Select all the shapes that always contain perpendicular lines.</p> <ul style="list-style-type: none"> <li><input type="radio"/> Right triangle</li> <li><input type="radio"/> Isosceles triangle</li> <li><input type="radio"/> Rectangle</li> <li><input type="radio"/> Obtuse triangle</li> <li><input type="radio"/> Rhombus</li> </ul>	<p>Multi-Select Response</p>																	
<p>Names of shapes with properties are shown.</p> <p>Select all the properties that belong to each shape.</p> <table border="1" data-bbox="191 1394 786 1675"> <thead> <tr> <th></th> <th>Has a right angle</th> <th>Has perpendicular lines</th> <th>Has parallel lines</th> </tr> </thead> <tbody> <tr> <td>Right Triangle</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Isosceles Triangle</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Rectangle</td> <td></td> <td></td> <td></td> </tr> </tbody> </table>		Has a right angle	Has perpendicular lines	Has parallel lines	Right Triangle				Isosceles Triangle				Rectangle				<p>Matching Item Response</p>	
	Has a right angle	Has perpendicular lines	Has parallel lines															
Right Triangle																		
Isosceles Triangle																		
Rectangle																		

<p>The shapes have been sorted into two groups.</p> <p><b>Group 1</b></p>  <p><b>Group 2</b></p>  <p>Explain what attribute was used to sort the shapes.</p>	<p>Natural Language Response</p>	
<p>The shapes have been sorted into two groups.</p> <p><b>Group 1</b></p>  <p><b>Group 2</b></p>  <p>Explain what two attributes were used to sort the shapes.</p>	<p>Natural Language Response</p>	
<p>The shapes have been sorted into two groups.</p> <p><b>Group 1</b></p>  <p><b>Group 2</b></p>  <p>Explain what two attributes were used to sort the shapes.</p>	<p>Natural Language Response</p>	

Content Standard	<p><b>MAFS.4.G</b> Geometry</p> <p><b>MAFS.4.G.1</b> Draw and identify lines and angles, and classify shapes by properties of their lines and angles.</p> <p><b>MAFS.4.G.1.3</b> Recognize a line of symmetry for a two-dimensional figure as a line across the figure such that the figure can be folded along the line into matching parts. Identify line-symmetric figures and draw lines of symmetry.</p>	
Assessment Limits	Items that require constructing lines of symmetry should specify the shape category with regards to the number of sides (quadrilateral, triangle, pentagon, etc.).	
Calculator	No	
Acceptable Response Mechanisms	<p>Equation Response</p> <p>Graphic Response – Drawing/Graphing</p> <p>Matching Item Response</p> <p>Multi-Select Response</p> <p>Multiple Choice Response</p>	
Context	Allowable	
Example		
Context	A figure is given (more than one line of symmetry, one of them is in nontraditional orientation).	
Context easier	<p>One line of symmetry (or zero).</p> <p>Lines of symmetry in figures are horizontal/vertical.</p> <p>Line of symmetry is perpendicular to the sides of the shape.</p>	
Context more difficult	<p>Number of lines of symmetry is a specific number greater than 1.</p> <p>Lines of symmetry in figures are not horizontal/vertical.</p> <p>Line of symmetry is not perpendicular to the sides of the shape.</p>	
Sample Item Stem	Response Mechanism	Notes, Comments
<p>Several figures are shown. Select all the figures that have a line of symmetry.</p> <ul style="list-style-type: none"> <li>○ A</li> <li>○ G</li> <li>○ H</li> <li>○ R</li> <li>○ Q</li> </ul>	Multi-Select Response	



<p>Several figures are shown.</p> <p>A. </p> <p>B. </p> <p>C. </p> <p>D. </p> <p>Which figure has a line of symmetry?</p>	<p>Multiple Choice Response</p>	
<p>A figure is shown.</p> <p></p> <p>How many lines of symmetry does the figure have?</p>	<p>Equation Response</p>	
<p>A figure is shown.</p> <p></p> <p>How many lines of symmetry does the figure have?</p>	<p>Equation Response</p>	