DRAFT

Grade 4 Mathematics Item Specifications

Florida
Standards Assessments

The draft Florida Standards Assessments (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.

Item types describe the characteristics of the question.

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

- **Context - Allowable** refers to items that may but are not required to have context.
- **Context - No context** refers to items that should not have context.
- **Context - Required** refers to items that must have context.

Item Descriptions:

The Florida Standards Assessments (FSA) are composed of test items that include traditional multiple-choice items and other item types that may be scanned and scored electronically.

Currently, there are six types of items that may appear on paper-based assessments for FSA Mathematics.

Any of the item types may be combined into a single item with multiple parts called a multi-interaction item. For paper-based assessments, the student will interact with the same item type within a single item.

For samples of each of the item types described below, see the FSA Practice Tests.

Paper-Based Item Types – Mathematics

1. **Multiple Choice –** The student is directed to select the one correct response from among four options.
2. **Multiselect –** The student is directed to select all of the correct answers from among a number of options. These items are different from Multiple Choice items, which prompt the student to select only one correct answer.
3. **Editing Task Choice –** The student fills in a bubble to indicate the correct number, word, or phrase that should replace a blank or a highlighted number, word, or phrase.
4. **Selectable Hot Text –** Excerpted sentences from the text are presented in this item type. The student fills in bubbles to indicate which sentences are correct.
5. **Equation Editor** – The student fills in bubbles indicating numbers and mathematical symbols to create a response. Students respond in response grids in which they write their answer in the boxes at the top of the grid, then fill in the corresponding bubble underneath each box.

   Matching Item – This item type presents options in columns and rows. The student is directed to fill in a bubble that matches a correct option from a column with a correct option from a row.

Mathematical Practices:

The Mathematical Practices are a part of each course description for Grades 3-8, Algebra 1, and Geometry. These practices are an important part of the curriculum. The Mathematical Practices will be assessed throughout.

MAFS.K12.MP.1.1:	**Make sense of problems and persevere in solving them.** Mathematically proficient students start by explaining to themselves the meaning of a problem and looking for entry points to its solution. They analyze givens, constraints, relationships, and goals. They make conjectures about the form and meaning of the solution and plan a solution pathway rather than simply jumping into a solution attempt. They consider analogous problems, and try special cases and simpler forms of the original problem in order to gain insight into its solution. They monitor and evaluate their progress and change course if necessary. Older students might, depending on the context of the problem, transform algebraic expressions or change the viewing window on their graphing calculator to get the information they need. Mathematically proficient students can explain correspondences between equations, verbal descriptions, tables, and graphs or draw diagrams of important features and relationships, graph data, and search for regularity or trends. Younger students might rely on using concrete objects or pictures to help conceptualize and solve a problem. Mathematically proficient students check their answers to problems using a different method, and they continually ask themselves, “Does this make sense?” They can understand the approaches of others to solving complex problems and identify correspondences between different approaches.
MAFS.K12.MP.2.1:	**Reason abstractly and quantitatively**. Mathematically proficient students make sense of quantities and their relationships in problem situations. They bring two complementary abilities to bear on problems involving quantitative relationships: the ability to decontextualize—to abstract a given situation and represent it symbolically and manipulate the representing symbols as if they have a life of their own, without necessarily attending to their referents—and the ability to contextualize, to pause as needed during the manipulation process in order to probe into the referents for the symbols involved. Quantitative reasoning entails habits of creating a coherent representation of the problem at hand; considering the units involved; attending to the meaning of quantities, not just how to compute them; and knowing and flexibly using different properties of operations and objects.

MAFS.K12.MP.3.1:	**Construct viable arguments and critique the reasoning of others.** Mathematically proficient students understand and use stated assumptions, definitions, and previously established results in constructing arguments. They make conjectures and build a logical progression of statements to explore the truth of their conjectures. They are able to analyze situations by breaking them into cases, and can recognize and use counterexamples. They justify their conclusions, communicate them to others, and respond to the arguments of others. They reason inductively about data, making plausible arguments that take into account the context from which the data arose. Mathematically proficient students are also able to compare the effectiveness of two plausible arguments, distinguish correct logic or reasoning from that which is flawed, and—if there is a flaw in an argument—explain what it is. Elementary students can construct arguments using concrete referents such as objects, drawings, diagrams, and actions. Such arguments can make sense and be correct, even though they are not generalized or made formal until later grades. Later, students learn to determine domains to which an argument applies. Students at all grades can listen or read the arguments of others, decide whether they make sense, and ask useful questions to clarify or improve the arguments.
MAFS.K12.MP.4.1:	**Model with mathematics.** Mathematically proficient students can apply the mathematics they know to solve problems arising in everyday life, society, and the workplace. In early grades, this might be as simple as writing an addition equation to describe a situation. In middle grades, a student might apply proportional reasoning to plan a school event or analyze a problem in the community. By high school, a student might use geometry to solve a design problem or use a function to describe how one quantity of interest depends on another. Mathematically proficient students who can apply what they know are comfortable making assumptions and approximations to simplify a complicated situation, realizing that these may need revision later. They are able to identify important quantities in a practical situation and map their relationships using such tools as diagrams, two-way tables, graphs, flowcharts and formulas. They can analyze those relationships mathematically to draw conclusions. They routinely interpret their mathematical results in the context of the situation and reflect on whether the results make sense, possibly improving the model if it has not served its purpose.

MAFS.K12.MP.5.1:	**Use appropriate tools strategically.** Mathematically proficient students consider the available tools when solving a mathematical problem. These tools might include pencil and paper, concrete models, a ruler, a protractor, a calculator, a spreadsheet, a computer algebra system, a statistical package, or dynamic geometry software. Proficient students are sufficiently familiar with tools appropriate for their grade or course to make sound decisions about when each of these tools might be helpful, recognizing both the insight to be gained and their limitations. For example, mathematically proficient high school students analyze graphs of functions and solutions generated using a graphing calculator. They detect possible errors by strategically using estimation and other mathematical knowledge. When making mathematical models, they know that technology can enable them to visualize the results of varying assumptions, explore consequences, and compare predictions with data. Mathematically proficient students at various grade levels are able to identify relevant external mathematical resources, such as digital content located on a website, and use them to pose or solve problems. They are able to use technological tools to explore and deepen their understanding of concepts.
MAFS.K12.MP.6.1:	**Attend to precision.** Mathematically proficient students try to communicate precisely to others. They try to use clear definitions in discussion with others and in their own reasoning. They state the meaning of the symbols they choose, including using the equal sign consistently and appropriately. They are careful about specifying units of measure, and labeling axes to clarify the correspondence with quantities in a problem. They calculate accurately and efficiently, express numerical answers with a degree of precision appropriate for the problem context. In the elementary grades, students give carefully formulated explanations to each other. By the time they reach high school they have learned to examine claims and make explicit use of definitions.

MAFS.K12.MP.7.1:	**Look for and make use of structure.** Mathematically proficient students look closely to discern a pattern or structure. Young students, for example, might notice that three and seven more is the same amount as seven and three more, or they may sort a collection of shapes according to how many sides the shapes have. Later, students will see 7 × 8 equals the well remembered 7 × 5 + 7 × 3, in preparation for learning about the distributive property. In the expression $x^2 + 9x + 14$, older students can see the 14 as 2 × 7 and the 9 as 2 + 7. They recognize the significance of an existing line in a geometric figure and can use the strategy of drawing an auxiliary line for solving problems. They also can step back for an overview and shift perspective. They can see complicated things, such as some algebraic expressions, as single objects or as being composed of several objects. For example, they can see $5 – 3(x – y)^2$ as 5 minus a positive number times a square and use that to realize that its value cannot be more than 5 for any real numbers x and y.
MAFS.K12.MP.8.1:	**Look for and express regularity in repeated reasoning.** Mathematically proficient students notice if calculations are repeated, and look both for general methods and for shortcuts. Upper elementary students might notice when dividing 25 by 11 that they are repeating the same calculations over and over again, and conclude they have a repeating decimal. By paying attention to the calculation of slope as they repeatedly check whether points are on the line through (1, 2) with slope 3, middle school students might abstract the equation $(y – 2)/(x – 1) = 3$. Noticing the regularity in the way terms cancel when expanding $(x – 1)(x + 1)$, $(x – 1)(x^2 + x + 1)$, and $(x – 1)(x^3 + x^2 + x + 1)$ might lead them to the general formula for the sum of a geometric series. As they work to solve a problem, mathematically proficient students maintain oversight of the process, while attending to the details. They continually evaluate the reasonableness of their intermediate results.

Reference Sheets:

- Reference sheets will be available as online references (in a pop-up window). A paper version will be available for paper-based tests.
- Reference sheets with conversions will be provided for FSA Mathematics assessments in Grades 4–8 and EOC Mathematics assessments.
- There is no reference sheet for Grade 3.
- For Grades 4, 6, 7, and Geometry, some formulas will be provided on the reference sheet.
- For Grade 5 and Algebra 1, some formulas may be included with the test item if needed to meet the intent of the standard being assessed.
- For Grade 8, no formulas will be provided; however, conversions will be available on a reference sheet.

Grade	**Conversions**	**Some Formulas**
3	No	No
4	On Reference Sheet	On Reference Sheet
5	On Reference Sheet	With Item
6	On Reference Sheet	On Reference Sheet
7	On Reference Sheet	On Reference Sheet
8	On Reference Sheet	No
Algebra 1	On Reference Sheet	With Item
Geometry	On Reference Sheet	On Reference Sheet

Content Standard	***MAFS.4.OA*** *Operations and Algebraic Thinking* ***MAFS.4.OA.1*** *Use the four operations with whole numbers to solve problems.* **MAFS.4.OA.1.1** Interpret a multiplication equation as a comparison, e.g., interpret 35 = 5 × 7 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.
Assessment Limits	Items may not require students to solve for unknown factors that exceed 10 x 10 multiplication facts. Item must include a verbal description of an equation or a multiplication equation. Multiplication situations must be a comparison (e.g., times as many).
Calculator	No
Context	Allowable
Sample Item	Item Type
Reggie has 12 times as many model cars as Jackson. Jackson has 5 model cars. Select all the equations that show how many cars Reggie has. A. 5 x 12 = ? B. 5 + 12 = ? C. 12 – 5 = ? D. 12 ÷ 5 = ?	Multiple Choice
See Appendix A for the Practice Test item aligned to this standard.	

Content Standard	***MAFS.4.OA*** *Operations and Algebraic Thinking* ***MAFS.4.OA.1*** *Use the four operations with whole numbers to solve problems.* **MAFS.4.OA.1.2** 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.
Assessment Limits	Multiplication situation must be a comparison (e.g., times as many). Limit multiplication and division to 2-digit by 1-digit or a multiple of 10 by a 1-digit.
Calculator	No
Context	Required
See Appendix A for the Practice Test item aligned to this standard.	

Content Standard	***MAFS.4.OA*** *Operations and Algebraic Thinking* ***MAFS.4.OA.1*** *Use the four operations with whole numbers to solve problems.* **MAFS.4.OA.1.3** 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.
Assessment Limits	Items requiring precise or exact solutions are limited to: • addition and subtraction within 1,000. • multiplication of 2-digit by 1-digit or a multiple of 10 by a 1-digit. • division of 2-digit by 1-digit. Items may contain a maximum of 3 steps. Items involving remainders must require the student to interpret and/or use the remainder with respect to the context. Variables must be represented by a letter, and variables must be defined or described in the context.
Calculator	No
Context	Required

Sample Item	Item Type
Jack bought 2 umbrellas. Each umbrella costs \$13. He bought 3 hats, each costing \$4. How much did Jack spend in all?	Equation Editor
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 greatest number of hats that Jack can buy for each friend?	Equation Editor
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. A. What is the least amount Jack could have spent on an umbrella? B. What is the greatest amount Jack could have spent on an umbrella?	Equation Editor
See Appendix A for the Practice Test item aligned to this standard.	

Content Standard	***MAFS.4.OA*** *Operations and Algebraic Thinking* ***MAFS.4.OA.1*** *Use the four operations with whole numbers to solve problems.* **MAFS.4.OA.1b** Determine the unknown whole number in an equation relating four whole numbers using comparative relational thinking. *For example, solve 76 + 9 = n + 5 for n arguing that nine is four more than five, so the unknown number must be four greater than 76.* Also Assesses: **MAFS.4.OA.1a** Determine whether an equation is true or false by using comparative relational thinking. *For example, without adding 60 and 24, determine whether the equation 60 + 24 = 57 + 27 is true or false.*
Assessment Limits	Whole number equations are limited to: • addition and subtraction within 1,000. • multiplication of 2-digit by 1-digit or a multiple of 10 by a 1-digit. • division of 2-digit by 1-digit. Variables represented by a letter are allowable.
Calculator	No
Context	Allowable
Sample Item	Item Type
Select all the true equations. A. 72 – 29 = 70 – 31 B. 72 – 29 = 67 – 24 C. 72 – 29 = 70 – 30 D. 72 – 29 = 74 – 31 E. 72 – 29 = 62 – 39	Multiselect
What is the missing number in the equation shown? 102 – 25 = ☐ – 38	Equation Editor
See Appendix A for the Practice Test item aligned to this standard.	

Content Standard	***MAFS.4.OA** Operations and Algebraic Thinking* ***MAFS.4.OA.2** Gain familiarity with factors and multiples.* **MAFS.4.OA.2.4** Investigate factors and multiples. **MAFS.4.OA.2.4a** Find all factor pairs for a whole number in the range of 1—100. **MAFS.4.OA.2.4b** Recognize that a whole number is a multiple of each of its factors. Determine whether a given whole number in the range 1–100 is a multiple of a given one-digit number. **MAFS.4.OA.2.4c** Determine whether a given whole number in the range 1—100 is prime or composite.
Assessment Limits	Items may only contain whole numbers between 1—100. Vocabulary may include prime, composite, factor, or multiple.
Calculator	No
Context	Allowable

Sample Item	Item Type
What are all the factors of 10? A. 1, 10 B. 2, 5 C. 1, 5, 10 D. 1, 2, 5, 10	Multiple Choice
Which factors do 36 and 42 have in common? A. 1 B. 2 C. 3 D. 4 E. 6 F. 7	Multiselect
See Appendix A for the Practice Test item aligned to a standard in this group.	

Content Standard	***MAFS.4.OA*** *Operations and Algebraic Thinking* ***MAFS.4.OA.3*** *Generate and analyze patterns.* **MAFS.4.OA.3.5** 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. *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.*	
Assessment Limits	Items may only contain whole numbers from 0 to 1,000. Operations in rules are limited to addition, subtraction, multiplication, and division. Items may not contain a rule that exceeds two procedural operations. Division rules may not require fractional responses. Rules may not be provided algebraically (e.g., $x + 5$). Items must provide the rule.	
Calculator	No	
Context	Allowable	
Sample Item		Item Type
The first number in a pattern is 5. The pattern follows the rule "Add 3." What is the next number in the pattern?		Equation Editor
See Appendix A for the Practice Test item aligned to this standard.		

Content Standard	***MAFS.4.NBT*** *Number and Operations in Base Ten* ***MAFS.4.NBT.1*** *Generalize place value understanding for multi-digit whole numbers.* **MAFS.4.NBT.1.1** 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. *For example, recognize that 700 ÷ 70 = 10 by applying concepts of place value and division*.
Assessment Limits	Items may contain whole numbers within 1,000,000. Items may not compare digits across more than 1 place value.
Calculator	No
Context	No context

Sample Item	Item Type
How many times greater is the value of the 4 in 640,700 than the value of the 4 in 64,070?	Equation Editor
See Appendix A for the Practice Test item aligned to this standard.	

<table>
<tr><td>Content Standard</td><td colspan="2"><i>MAFS.4.NBT</i> <i>Number and Operations in Base Ten</i>
<i>MAFS.4.NBT.1</i> <i>Generalize place value understanding for multi-digit whole numbers.</i>
MAFS.4.NBT.1.2 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 >, =, and < symbols to record the results of comparisons.</td></tr>
<tr><td>Assessment Limit</td><td colspan="2">Given values and item solutions may only be whole numbers between 1 and 1,000,000.
Items may compare two multi-digit numbers written in any form.</td></tr>
<tr><td>Calculator</td><td colspan="2">No</td></tr>
<tr><td>Context</td><td colspan="2">Allowable</td></tr>
<tr><td colspan="2">Sample Item</td><td>Item Type</td></tr>
<tr><td colspan="2">What is <i>6 x 10,000 + 5 x 1,000 + 2 x 100 + 3 x 1</i> written in standard form?</td><td>Equation Editor</td></tr>
<tr><td colspan="2">Fill in the circles to match the name of each number with its numeric form.
<table>
<tr><th></th><th>600,005</th><th>600,050</th><th>605,000</th><th>650,000</th></tr>
<tr><td><i>Six hundred five thousand</i></td><td>Ⓐ</td><td>Ⓑ</td><td>Ⓒ</td><td>Ⓓ</td></tr>
<tr><td><i>Six hundred thousand fifty</i></td><td>Ⓔ</td><td>Ⓕ</td><td>Ⓖ</td><td>Ⓗ</td></tr>
</table></td><td>Matching Item</td></tr>
<tr><td colspan="2">Select all the options with 54,625 written in expanded form.
A. 5 ten-thousands, 46 hundreds, 25 ones
B. 5 ten-thousands, 4 thousands, 62 hundreds, 5 ones
C. 50 thousands, 46 hundreds, 20 tens, 5 ones
D. 50 thousands, 40 hundreds, 60 tens, 25 ones
E. 54 thousands, 6 hundreds, 2 tens, 5 ones</td><td>Multiselect</td></tr>
<tr><td colspan="3">See Appendix A for the Practice Test item aligned to this standard.</td></tr>
</table>

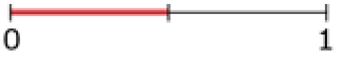
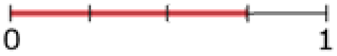
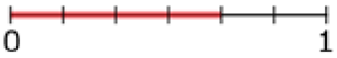
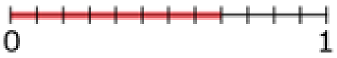
Content Standard	***MAFS.4.NBT*** *Number and Operations in Base Ten* ***MAFS.4.NBT.1*** *Generalize place value understanding for multi-digit whole numbers.* **MAFS.4.NBT.1.3** Use place value understanding to round multi-digit whole numbers to any place.
Assessment Limit	Given values and item solutions may only be whole numbers between 1,000 and 1,000,000.
Calculator	No
Context	Allowable

<table>
<tr><th>Sample Item</th><th>Item Type</th></tr>
<tr><td>Which numbers round to 4,100 when rounded to the nearest hundred?
A. 4,008
B. 4,140
C. 4,060
D. 4,109
E. 4,049</td><td>Multiselect</td></tr>
<tr><td>Fill in the circles to complete the table to show how each original number was rounded to make the new number.
<table>
<tr><th>Original</th><th>New</th><th>Nearest 100</th><th>Nearest 1,000</th></tr>
<tr><td>3,545</td><td>3,500</td><td>Ⓐ</td><td>Ⓑ</td></tr>
<tr><td>14,675</td><td>15,000</td><td>Ⓒ</td><td>Ⓓ</td></tr>
<tr><td>16,789</td><td>16,800</td><td>Ⓔ</td><td>Ⓕ</td></tr>
</table></td><td>Matching Item</td></tr>
<tr><td>A. Round 590,340 to the nearest hundred thousand.
B. Round 590,340 to the nearest ten thousand.</td><td>Equation Editor</td></tr>
<tr><td colspan="2">See Appendix A for the Practice Test item aligned to this standard.</td></tr>
</table>

Content Standard	***MAFS.4.NBT*** *Number and Operations in Base Ten* ***MAFS 4.NBT.2*** *Use place value understanding and properties.* **MAFS.4.NBT.2.4** Fluently add and subtract multi-digit whole numbers using the standard algorithm.
Assessment Limits	Items may only contain whole number factors and solutions greater than 1,000 and within 1,000,000. Addition expressions may contain up to three addends.
Calculator	No
Context	No context
Sample Item	Item Type
An addition problem is shown. 63,829 24,343 + 1,424 Calculate the sum.	Equation Editor
What is the difference of 31,678 and 28,995?	Equation Editor
Enter the missing digit to complete the subtraction statement. 40 9,845 − 1☐6,675 2 1 3,170	Equation Editor
See Appendix A for the Practice Test item aligned to this standard.	

Content Standard	***MAFS.4.NBT*** *Number and Operations in Base Ten* ***MAFS.4.NBT.2*** *Use place value understanding and properties of operations to perform multi-digit arithmetic.* **MAFS.4.NBT.2.5** 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 Limit	Items may require multiplying: four digits by one digit, three digits by one digit, two digits by one digit, or two digits by two digits.
Calculator	No
Context	No context
Sample Item	Item Type
Select all the expressions that have a product of 420. A. 35 x 12 B. (3 x 5) x (10 x 2) C. (40 x 10) x (2 x 4) D. 40 x 20 E. 14 x 30	Multiselect
See Appendix A for the Practice Test item aligned to this standard.	

Content Standard	***MAFS.4.NBT*** *Number and Operations in Base Ten* ***MAFS.4.NBT.2*** *Use place value understanding and properties of operations to perform multi-digit arithmetic.* **MAFS.4.NBT.2.6** 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 Limit	Items may not require finding a quotient within the factor pairs of 10 x 10.
Calculator	No
Context	No context
Sample Item	Item Type
What is 1,356 divided by 3?	Equation Editor
See Appendix A for the Practice Test item aligned to this standard.	

Content Standard	***MAFS.4.NF*** *Numbers and Operations – Fractions* ***MAFS.4.NF.1*** *Extend understanding of fraction equivalence and ordering.* **MAFS.4.NF.1.1** Explain why a fraction $\frac{a}{b}$ is equivalent to a fraction $\frac{(n\times a)}{(n\times b)}$ 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.	
Assessment Limits	Denominators of given fractions are limited to: 2, 3, 4, 5, 6, 8, 10, 12, 100. For items with denominators of 10 and 100, focus may not be on equivalence between these 2 denominators, since this is addressed specifically in standards MAFS.4.NF.5 – 7, but should focus on equivalence between fractions with denominators of 2, 4, and 5, and fractions with denominators of 10 and 100, e.g., $\frac{1}{2}=\frac{5}{10}$, $\frac{2}{5}=\frac{40}{100}$, etc. Fractions must refer to the same whole, including in models. Fraction models are limited to number lines, rectangles, squares, and circles. Fractions $\frac{a}{b}$ can be fractions greater than 1 and students may not be guided to put fractions in lowest terms or to simplify. Equivalent fractions also include fractions $\frac{1\times a}{1\times b}$.	
Calculator	No	
Context	Allowable	
Sample Item		Item Type
Select all the models that have been shaded to represent fractions equivalent to $\frac{2}{3}$. A.  B.  C.  D.  E.  F. 		Multiselect

Sample Item	Item Type
Corey tried to find a fraction equivalent to $\frac{3}{5}$. His work is shown. $\frac{3}{5} = \frac{3}{5} \times \frac{1}{2} = \frac{3}{10}$ Which statement describes Corey's error? A. It is impossible to find a fraction equivalent to $\frac{3}{5}$. B. He did not multiply $\frac{3}{5}$ by a fraction equal to 1. C. He incorrectly multiplied $\frac{3}{5}$ and $\frac{1}{2}$. D. He should have divided by $\frac{1}{2}$.	Multiple Choice
See Appendix A for the Practice Test item aligned to this standard.	

Content Standard	***MAFS.4.NF*** *Number and Operations – Fractions* ***MAFS.4.NF.1*** *Extend understanding of fraction equivalence and ordering.* **MAFS.4.NF.1.2** 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 $\frac{1}{2}$. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with symbols >, =, or <, and justify the conclusions, e.g., by using a visual fraction model.
Assessment Limits	Denominators of given fractions are limited to: 2, 3, 4, 5, 6, 8, 10, 12, 100. Fractions $\frac{a}{b}$ may be fractions greater than 1 and students may not be guided to put fractions in lowest terms or to simplify. Two fractions being compared must have both different numerators and different denominators.
Calculator	No
Context	Allowable
See Appendix A for the Practice Test item aligned to this standard.	

Content Standard	***MAFS.4.NF** Number and Operations - Fractions* ***MAFS.4.NF.2** Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers.* **MAFS.4.NF.2.3** Understand a fraction $\frac{a}{b}$ with $a > 1$ as a sum of fractions $\frac{1}{b}$. **MAFS.4.NF.2.3a** Understand addition and subtraction of fractions as joining and separating parts referring to the same whole. **MAFS.4.NF.2.3b** 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. *Examples:* $\frac{3}{8}=\frac{1}{8}+\frac{1}{8}+\frac{1}{8}$; $\frac{3}{8}=\frac{1}{8}+\frac{2}{8}$; $2\frac{1}{8}=1+1+\frac{1}{8}=\frac{8}{8}+\frac{8}{8}+\frac{1}{8}$. **MAFS.4.NF.2.3c** 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. **MAFS.4.NF.2.3d** 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.
Assessment Limits	Denominators of given fractions are limited to: 2, 3, 4, 5, 6, 8, 10, 12, 100. Mixed numbers and fractions must contain like denominators. Items must reference the same whole. Visual fraction models are limited to circular models, rectangular models, and number line models.
Calculator	No
Context	Allowable. Required for MAFS.4.NF.2.3d

Sample Item	Item Type
What is the value of $\frac{9}{10}-\frac{4}{10}$?	Equation Editor

Sample Item	Item Type
What is the value of the following expression? $\frac{2}{10}+\frac{9}{10}$ A. $\frac{11}{20}$ B. $\frac{11}{10}$ C. $\frac{18}{10}$ D. $\frac{18}{100}$	Multiple Choice
Sue had $\frac{7}{8}$ of a cup of flour. She used $\frac{1}{8}$ of a cup. How much flour, in cups, does Sue have left?	Equation Editor
What is the sum of $2\frac{2}{3}$ and $1\frac{2}{3}$?	Equation Editor
See Appendix A for the Practice Test item aligned to a standard in this group.	

Content Standard	***MAFS.4.NF*** *Number and Operations - Fractions* ***MAFS.4.NF.2*** *Build fractions from unit fractions by applying and extending previous understanding of operations on whole numbers.* **MAFS.4.NF.2.4** Apply and extend previous understandings of multiplication to multiply a fraction by a whole number. **MAFS.4.NF.2.4a** Understand a fraction $\frac{a}{b}$ as a multiple of $\frac{1}{b}$. *For example, use a visual fraction model to represent* $\frac{5}{4}$ *as the product* $5 \times \left(\frac{1}{4}\right)$*, recording the conclusion by the equation* $\frac{5}{4} = 5 \times \left(\frac{1}{4}\right)$*.* **MAFS.4.NF.2.4b** Understand a multiple of $\frac{a}{b}$ as a multiple of $\frac{1}{b}$, and use this understanding to multiply a fraction by a whole number. *For example, use a visual fraction model to express* $3 \times \left(\frac{2}{5}\right)$ *as* $6 \times \left(\frac{1}{5}\right)$*, recognizing this product as* $\frac{6}{5}$*. (In general,* $n \times \left(\frac{a}{b}\right) = \frac{(n \times a)}{b}$*.* **MAFS.4.NF.2.4c** 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* $\frac{3}{8}$ *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?*
Assessment Limits	Fractions may only be multiplied by a whole number. Denominators of given fractions are limited to: 2, 3, 4, 5, 6, 8, 10, 12, 100.
Calculator	None
Context	Allowable
See Appendix A for the Practice Test item aligned to a standard in this group.	

Content Standard	***MAFS.4.NF*** *Number and Operations - Fractions* ***MAFS.4.NF.3*** *Understand decimal notation for fractions, and compare decimal fractions.* **MAFS.4.NF.3.5** 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. *For example, express* $\frac{3}{10}$ *as* $\frac{30}{100}$*, and add* $\frac{3}{10}+\frac{4}{100}=\frac{34}{100}$.
Assessment Limits	Denominators must be either 10 or 100. Decimal notation may not be assessed at this standard.
Calculator	No
Context	Allowable

Sample Item	Item Type
Create a fraction with a denominator of 100 that is equivalent to $\frac{2}{10}$.	Equation Editor
Which fraction is equivalent to $\frac{3}{10}$? A. $\frac{6}{13}$ B. $\frac{9}{30}$ C. $\frac{10}{3}$ D. $\frac{30}{10}$	Multiple Choice
An equation is shown. $\frac{8}{10} + \square = \frac{97}{100}$ What is the missing fraction?	Equation Editor
See Appendix A for the Practice Test item aligned to this standard.	

Content Standard	***MAFS.4.NF*** *Number and Operations - Fractions* ***MAFS.4.NF.3*** *Understand decimal notation for fractions, and compare decimal fractions.* **MAFS.4.NF.3.6** Use decimal notation for fractions with denominators 10 or 100. *For example, rewrite 0.62 as* $\frac{62}{100}$ *; describe a length as 0.62 meters; locate 0.62 on a number line diagram*.
Assessment Limits	Denominators are limited to 10 and 100. Decimal notation is limited to tenths and hundredths. Items may contain decimals or fractions greater than 1 and/or mixed numbers.
Calculator	No
Context	No context
Sample Item	Item Type
Select all the fractions that are equivalent to 0.8. A. $\frac{8}{10}$ B. $\frac{80}{10}$ C. $\frac{8}{100}$ D. $\frac{80}{100}$ E. $\frac{10}{8}$ F. $\frac{100}{8}$	Multiselect
See Appendix A for the Practice Test item aligned to this standard.	

Content Standard	***MAFS.4.NF*** *Number and Operations – Fractions* ***MAFS.4.NF.3*** *Understand decimal notation for fractions, and compare decimal fractions.* **MAFS.4.NF.3.7** 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 >, =, or <, and justify the conclusions, e.g., by using a visual model.
Assessment Limits	Decimals may reference the same whole entity. Decimals are limited to tenths and hundredths. Decimals may be greater than 1. Items may not require a comparison of visual models in isolation.
Calculator	No
Context	Allowable

<table>
<tr><th>Sample Item</th><th>Item Type</th></tr>
<tr><td>Mr. Shelby bought a new plant. The plant grew 2.6 centimeters in the first week and 3.42 centimeters the second week.

Select all the true comparisons of the plant growth for the two weeks.

A. 2.6 > 3.42
B. 3.42 > 2.6
C. 2.6 < 3.42
D. 3.42 < 2.6
E. 2.6 = 3.42</td><td>Multiselect</td></tr>
<tr><td>Zach and Karla each have seeds they will plant in a class garden. Zach’s seeds weigh 1.5 grams. Karla’s seeds weigh 1.46 grams.

Fill in the circles to select the correct symbol for each comparison.

<table>
<tr><th></th><th><</th><th>></th><th>=</th></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></td><td>Matching Item</td></tr>
<tr><td>Allison wrote down a decimal number that is greater than 0.58 but less than 0.62.

What is one number Allison could have written down?</td><td>Equation Editor</td></tr>
<tr><td colspan="2">See Appendix A for the Practice Test item aligned to this standard.</td></tr>
</table>

Content Standard	***MAFS.4.MD*** *Measurement and Data* ***MAFS.4.MD.1*** *Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.* **MAFS.4.MD.1.1** 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. *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), ...*
Assessment Limits	Measurements may only be whole numbers. For non-metric conversions, multiplication is limited to 2-digit numbers by 1-digit numbers or a multiple of 10 by a 1-digit number. Allowable 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.
Calculator	No
Context	Allowable

Sample Item	Item Type
Select all the measurements that are about 1 yard long. A. The length of a student's desk B. The height of a classroom C. The width of a classroom door D. The length of a movie ticket E. The height of a building	Multiselect

See Appendix A for the Practice Test item aligned to this standard.

Content Standard	***MAFS.4.MD*** *Measurement and Data* ***MAFS.4.MD.1*** *Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.* **MAFS.4.MD.1.2** 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 may include addition, subtraction, multiplication, and division. Item contexts are not limited to distances, intervals of time, and money.
Calculator	No
Context	Required
Sample Item	Item Type
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 Editor
See Appendix A for the Practice Test item aligned to this standard.	

Content Standard	***MAFS.4.MD*** *Measurement and Data* ***MAFS.4.MD.1*** *Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.* **MAFS.4.MD.1.3** Apply the area and perimeter formulas for rectangles in real world and mathematical problems. *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*.
Assessment Limits	Figures are limited to rectangles or composite figures composed of rectangles. Fractions are limited to like denominators. Limit multiplication and division to 2-digit by 1-digit or a multiple of 10 by 1-digit. Quotients may only be whole numbers. Limit addition and subtraction to solutions within 1,000. When constructing rectangles, one grid must be labeled with the appropriate dimension. That dimension must be "1 ____," as items at this standard may not assess scale.
Calculator	No
Context	Allowable
See Appendix A for the Practice Test item aligned to this standard.	

Content Standard	***MAFS.4.MD*** *Measurement and Data* ***MAFS.4.MD.2*** *Represent and interpret data.* **MAFS.4.MD.2.4** Make a line plot to display a data set of measurements in fractions of a unit $\left(\frac{1}{2}, \frac{1}{4}, \frac{1}{8}\right)$. Solve problems involving addition and subtraction of fractions by using information presented in line plots. *For example, from a line plot find and interpret the difference in length between the longest and shortest specimens in an insect collection*.
Assessment Limits	Measurement units are limited to halves, quarters, and eighths. Addition and subtraction of fractions is limited to fractions with like denominators. Limit addition and subtraction to solutions within 1,000.
Calculator	No
Context	Allowable
See Appendix A for the Practice Test item aligned to this standard.	

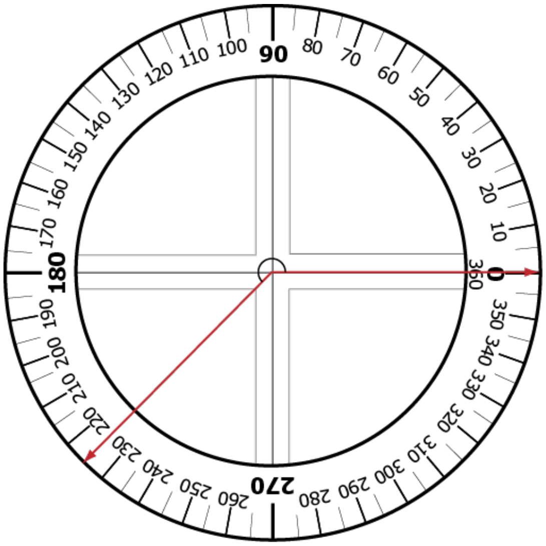
Content Standard	***MAFS.4.MD*** *Measurement and Data* ***MAFS.4.MD.3*** *Geometric measurement: understand concepts of angle and measure angles.* **MAFS.4.MD.3.5** Recognize angles as geometric shapes that are formed wherever two rays share a common endpoint, and understand concepts of angle measurement. **MAFS.4.MD.3.5a** 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 1/360 of a circle is called a “one-degree angle,” and can be used to measure angles. **MAFS.4.MD.3.5b** An angle that turns through *n* one-degree angles is said to have an angle measure of *n* degrees. Also Assesses: **MAFS.4.MD.3.6** Measure angles in whole-number degrees using a protractor. Sketch angles of specified measure.
Assessment Limits	Items may contain whole number degree measures within 0° and 360°. For identification, angles are less than 360°. For construction, angles are less than 180°. Items may not require estimating the exact measures of angles.
Calculator	No
Context	Allowable for 4.MD.3.5; no context for 4.MD.3.6.

Sample Item	Item Type
Fill in the circles to select the category of measure for each angle.	Matching Item

	Less than 90°	Between 90° and 180°
	Ⓐ	Ⓑ
	Ⓒ	Ⓓ
	Ⓔ	Ⓕ

<table>
<tr><th>Sample Item</th><th>Item Type</th></tr>
<tr><td>

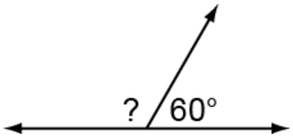
An angle is shown.



What is the measure, in degrees, of the angle?

</td><td>Equation Editor</td></tr>
<tr><td colspan="2">See Appendix A for the Practice Test items aligned to these standards.</td></tr>
</table>

Content Standard	***MAFS.4.MD*** *Measurement and Data* ***MAFS.4.MD.3*** *Geometric measurement: understand concepts of angle and measure angles.* **MAFS.4.MD.3.7** 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 Limit	Whole number degree measures, sums, and differences may only be within 0° and 360°.
Calculator	No
Context	Allowable

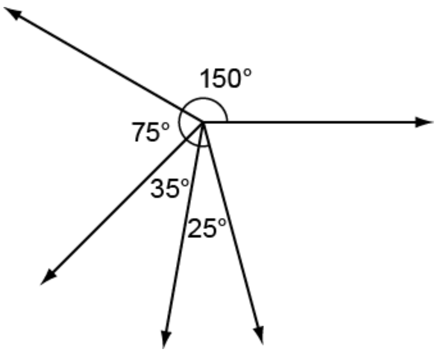
<table>
<tr><th>Sample Item</th><th>Item Type</th></tr>
<tr><td>What is the measure of the unknown angle?


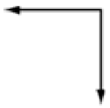
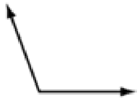
A. 40°
B. 100°
C. 120°
D. 180°</td><td>Multiple Choice</td></tr>
<tr><td>Kyle is adding angles to create other angles.

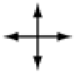
Fill in the circles to select the angles Kyle can use to create a 128° angle.

Fill in the circles to select the angles that Kyle can use to create a 55° angle.

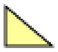
<table>
<tr><th></th><th>64°</th><th>34°</th><th>30°</th><th>25°</th></tr>
<tr><td>128°</td><td>Ⓐ</td><td>Ⓑ</td><td>Ⓒ</td><td>Ⓓ</td></tr>
<tr><td>55°</td><td>Ⓔ</td><td>Ⓕ</td><td>Ⓖ</td><td>Ⓗ</td></tr>
</table>
</td><td>Matching Item</td></tr>
</table>

<table>
<tr><th>Sample Item</th><th>Item Type</th></tr>
<tr><td>A diagram is shown.

What is the sum of all the angles that are labeled?</td><td>Equation Editor</td></tr>
<tr><td colspan="2">See Appendix A for the Practice Test item aligned to this standard.</td></tr>
</table>

Content Standard	***MAFS.4.G*** *Geometry* ***MAFS.4.G.1*** *Draw and identify lines and angles, and classify shapes by properties of their lines and angles.* **MAFS.4.G.1.1** Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures.
Assessment Limits	Items may not require students to name a given figure. Items may not require knowledge or use of ordered pairs or a defined coordinate grid system. Items may require students to draw a figure based on multiple attributes (e.g., an acute triangle), with the exception of right triangles. Items that include trapezoids must consider both the inclusive and exclusive definitions. Items may not use the term "kite" but may include the figure.
Calculator	No
Context	Allowable
Sample Item	Item Type
Which angle is acute?  A.  B.  C.  D.	Multiple Choice

<table>
<tr><th>Sample Item</th><th>Item Type</th></tr>
<tr><td>Fill in the circles to select all the attributes that apply to each set of lines.
<table>
<tr><td></td><td></td><td></td></tr>
<tr><td>Contains Parallel Line</td><td>Ⓐ</td><td>Ⓑ</td></tr>
<tr><td>Contains Perpendicular Line</td><td>Ⓒ</td><td>Ⓓ</td></tr>
<tr><td>Contains Acute Angle</td><td>Ⓔ</td><td>Ⓕ</td></tr>
<tr><td>Contains Obtuse Angle</td><td>Ⓖ</td><td>Ⓗ</td></tr>
</table></td><td>Matching Item</td></tr>
<tr><td colspan="2">See Appendix A for the Practice Test item aligned to this standard.</td></tr>
</table>

Content Standard	***MAFS.4.G*** *Geometry* ***MAFS 4.G.1*** *Draw and identify lines and angles, and classify shapes by properties of their lines and angles.* **MAFS.4.G.1.2** 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.
Assessment Limits	Triangles: equilateral, equiangular, isosceles, scalene, acute, right, obtuse. Quadrilaterals: parallelograms, rectangles, squares, rhombi, trapezoids. Other polygons may be included where appropriate. Items that include trapezoids must consider both the inclusive and exclusive definitions. Items may not use the term "kite" but may include the figure.
Calculator	No
Context	No context

Sample Item	Item Type
Select all the obtuse triangles. A.  B.  C.  D.  E. 	Multiselect
Which figure is an acute triangle? A.  B.  C.  D. 	Multiple Choice

<table>
<tr><th>Sample Item</th><th>Item Type</th></tr>
<tr><td>Fill in the circles to select all the properties that always belong to each shape.
<table>
<tr><th></th><th>Has a right angle</th><th>Has perpendicular lines</th><th>Has parallel lines</th></tr>
<tr><td>Right Triangle</td><td>Ⓐ</td><td>Ⓑ</td><td>Ⓒ</td></tr>
<tr><td>Rhombus</td><td>Ⓓ</td><td>Ⓔ</td><td>Ⓕ</td></tr>
<tr><td>Rectangle</td><td>Ⓖ</td><td>Ⓗ</td><td>Ⓘ</td></tr>
</table>
</td><td>Matching Item</td></tr>
<tr><td colspan="2">See Appendix A for the Practice Test item aligned to this standard.</td></tr>
</table>

Content Standard	***MAFS.4.G*** Geometry ***MAFS.4.G.1*** Draw and identify lines and angles, and classify shapes by properties of their lines and angles. **MAFS.4.G.1.3** 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.
Assessment Limit	Items that require constructing lines of symmetry must specify the shape category with regard to the number of sides (quadrilateral, triangle, pentagon, etc.). Items that include trapezoids must consider both the inclusive and exclusive definitions. Items may not use the term "kite" but may include the figure.
Calculator	No
Context	Allowable

Sample Item	Item Type
Select all the figures that have at least one line of symmetry. A.  B.  C.  D.  E. 	Multiselect
How many lines of symmetry does the following figure have? 	Equation Editor
A figure is shown.  How many lines of symmetry does the figure have?	Equation Editor
See Appendix A for the Practice Test item aligned to this standard.	

Appendix A

The chart below contains information about the standard alignment for the items in the Grade 4 Mathematics FSA Computer-Based Practice Test at http://fsassessments.org/students-and-families/practice-tests.

Content Standard	Item Type	Paper-Based Practice Test Item Number
MAFS.4.OA.1.1	Multiple Choice	23
MAFS.4.OA.1.2	Equation Editor	15
MAFS.4.OA.1.3	Equation Editor	2
MAFS.4.OA.1.A	Multiple Choice	14
MAFS.4.OA.2.4c	Matching Item	3
MAFS.4.OA.3.5	Editing Task Choice	22
MAFS.4.NBT.1.1	Multiple Choice	1
MAFS.4.NBT.1.2	Multiselect	11
MAFS.4.NBT.1.3	Equation Editor	8
MAFS.4.NBT.2.4	Multiple Choice	21
MAFS.4.NBT.2.5	Multi-Interaction: Equation Editor and Equation Editor	6
MAFS.4.NBT.2.6	Multiselect	27
MAFS.4.NF.1.1	Multiselect	4
MAFS.4.NF.1.2	Matching Item	28
MAFS.4.NF.2.3b	Multiselect	18
MAFS.4.NF.2.4c	Equation Editor	10
MAFS.4.NF.3.5	Equation Editor	26
MAFS.4.NF.3.6	Equation Editor	13
MAFS.4.NF.3.7	Multiple Choice	17
MAFS.4.MD.1.1	Equation Editor	19
MAFS.4.MD.1.2	Multiple Choice	7
MAFS.4.MD.1.3	Equation Editor	12
MAFS.4.MD.2.4	Equation Editor	24
MAFS.4.MD.3.5a	Multiple Choice	29
MAFS.4.MD.3.6	Multiple Choice	9
MAFS.4.MD.3.7	Equation Editor	20
MAFS.4.G.1.1	Multiple Choice	5
MAFS.4.G.1.2	Multiselect	25
MAFS.4.G.1.3	Multiple Choice	16

Appendix B: Revisions

Page(s)	**Revision**	**Date**
3	Revisions for paper-based testing (PBT) grades.	September 2018
9-42	Sample items not compatible with paper-based testing (PBT) removed.	September 2018
9	Sample item revised.	September 2018
11	Sample item revised.	September 2018
14	Assessment limit revised.	September 2018
16	Assessment limit and sample item revised.	September 2018
25	Sample item revised.	September 2018
43	Appendix A updated to show Fall 2018 Practice Test information.	September 2018

Grade 4 FSA Mathematics Reference Sheet

Customary Conversions

1 foot = 12 inches
1 yard = 3 feet
1 mile = 5,280 feet
1 mile = 1,760 yards

1 cup = 8 fluid ounces
1 pint = 2 cups
1 quart = 2 pints
1 gallon = 4 quarts

1 pound = 16 ounces
1 ton = 2,000 pounds

Metric Conversions

1 meter = 100 centimeters
1 meter = 1000 millimeters
1 kilometer = 1000 meters

1 liter = 1000 milliliters

1 gram = 1000 milligrams
1 kilogram = 1000 grams

Time Conversions

1 minute = 60 seconds
1 hour = 60 minutes
1 day = 24 hours
1 year = 365 days
1 year = 52 weeks

Formulas

$A = lw$

$P = 2l + 2w$