Alabama Item Specifications

Grade 4 Mathematics

Alabama Comprehensive Assessment Program

The draft Alabama Comprehensive Assessment Program (ACAP) item specifications are based upon the development of summative assessments that measure the Alabama Course of Study Standards. The item specifications define the purpose of the ACAP and provide important information regarding the content to be measured. The item specifications serve to provide a road map designed to guide Alabama educators in the development of items and subsequent review of items that best measure the Course of Study Standards for a given grade and content area. Each content-area and grade-level item specification aligned to the given domain, cluster, and standard includes the following key information regarding each domain:

- Evidence statements
- Assessment limits/Content constraints
- Recommended depth-of-knowledge (DOK) or cognitive levels
- Calculator usage
- Item types for measuring a given standard
- Information regarding whether context is allowable
- Sample stem information

Definitions

Course of Study Standards: The Course of Study Standards are a set of content curriculum statements that define what students should know and be able to do at a given grade level. The goal is to prepare students for future opportunities and options in the workplace and for everyday life. Through the implementation of the Alabama Course of Study for Mathematics, students will be well equipped for the workforce upon graduation or ready to pursue higher levels of education in Alabama's colleges and universities.

Domain: A domain is a group of related clusters and content standards. Sometimes standards from different domains may be closely related.

Cluster: A cluster is a group of related content standards. Because mathematics is a connected subject, standards from different clusters may sometimes be closely related.

Standard: The standard defines what students should understand (know) and be able to do at the conclusion of a course or grade. The standard text in the item specification is preceded by a standard identifier (e.g., 4.OA.1) to indicate the student grade level as fourth (4), the domain as Operations and Algebraic Thinking (OA), and the standard number as one (1).

Evidence Statements: Evidence statements are closely aligned to the standard and do not deviate from the requirements of the standard. Standards that are substantial in content do provide for a better opportunity to "unpack the standard," which is the case for many of the Alabama Course of Study Standards. The evidence statements serve that purpose.

Assessment Limits/Content Constraints: Assessment limits and/or content constraints define the range of content knowledge and the degree of difficulty allowable when items are written to measure a given standard.

Depth of Knowledge (DOK): Depth of knowledge involves the cognitive complexity or the nature of thinking regarding a given item. Most recently Webb's depth-of-knowledge levels are used in the development of items for cognitive demand. Therefore, when developing items for depth of knowledge, the item should be as demanding cognitively as what the actual standard expects. Webb's depth of knowledge includes four levels, from the lowest (basic recall) to the highest (extended thinking.) The mathematics ACAP assessment items are written to one of three cognitive levels of complexity:

- Level 1: Recall
- Level 2: Application of a Skill/Concept
- Level 3: Strategic Thinking

Item Types: The ACAP summative assessments are composed of various item types. These item types are described in the following section.

Context: Context provides information regarding the types of stimulus materials that can be used in the items. If a context is allowable, it means that the item may have context. If context is required, then the item measuring the given standard must have context. If no context is noted, then the items measuring the given standard should not have context.

Sample Stem Information: This statement explains what students are expected to do when they respond to a given item.

Item Types

The Alabama Comprehensive Assessment Program (ACAP) summative assessments are composed of various item types. These item types are described below.

Multiple-Choice (MC) Items: MC items have four answer choices, including three distractors and one correct answer. Distractors for mathematics represent common misconceptions, incorrect logic, incorrect application of an algorithm, computational errors, etc. A correct response to an MC item is worth one score point in the mathematics ACAP.

Multiple-Select (MS) Items: MS items are similar in structure to MC items. MC items have a stem and four answer options, one of which is correct. However, unlike an MC item, and MS item has more than four options and more than one correct answer. In other words, there are multiple responses required for a given item. For mathematics, there are two types of MS configurations. One has five answer options of which two are correct, and the other has six answer options of which two or three are correct. Directions for the number of options to select are provided with each item. A correct response to an MS item is worth one score point in the mathematics ACAP.

Short-Answer (SA) Items: SA items are constructed-response items that require a keyed response from the student. As such, they often require a brief series of objective, concise answers of just a few characters entered into a small response space (no extemporaneous test or explanatory work is required). In the mathematics ACAP, this item type is autoscored using scoring guidelines for the correct answer. A correct response to an SA item is worth one score point in the mathematics ACAP.

Technology-Enhanced (TE) Items: TE items share the same functional structure as traditional paper- and-pencil test items; however, the expansive features and functions of a computer-based medium allow for the incorporation of technical enhancements into traditional elements of a test item, such as the stem, the stimulus (if any), the response area, or a combination of all three. These items require the use of one or more tools. A correct response to a TE item is worth one score point in the mathematics ACAP. Grade 4 mathematics TE items include the following types:

- **Angle Draw Input:** These TE items provide a student with a given ray, and then the student completes the angle by drawing a second ray.
- **Drag-and Drop-Input**: These TE items provide a student with draggable entities that can be configured to be used once or multiple times.
- **Drop-Down List Input:** These TE items allow a student to select elements in drop-down lists that can be embedded within text or tables.
- **Hot Spot:** These TE items allow for one image to replace another image when a given hot spot is selected.
- **Line Plot Input:** These TE items provide another way for a student to graphically represent data when the structure is provided. Certain labeling on the line plot can be done by the student.
- **Matching:** These TE items allow for the use of text or graphics as the matching objects. The student selects one object and then selects a second object to connect them.
- **Matching Table:** These TE items include a table with multiple rows and columns, and the student makes matches between the given elements in the rows and columns. The table can be customized to allow for only a single selection in a row and/or column or for multiple selections within each.
- **Number Line Input:** These TE items allow a student to create a number line graph that might involve plotting points only or points and lines. Both closed and open points are available, as well as line segments and rays.

Math Reference Sheets

An online reference sheet is available as a pop-up window in certain grades.

Grade	Conversions	Formulas
2	No	No
3	No	No
4	Yes	Yes
5	Yes	Yes
6	Yes	Yes
7	Yes	Yes
8	Yes	Yes

Standards for Mathematical Practices

The Standards for Mathematical Practice are based on important "processes and proficiencies" that have longstanding importance in mathematics education. The first of these are the National Council of Teachers of Mathematics (NCTM) process standards of problem solving, reasoning and proof, communication, representation, and connections. The second are the strands of mathematical proficiency specified in the National Research Council's report *Adding It Up: Helping Children Learn Mathematics*. These proficiencies include adaptive reasoning, strategic competence, conceptual understanding (comprehension of mathematical concepts, operations, and relations), procedural fluency (skill in carrying out procedures flexibly, accurately, efficiently, and appropriately), and productive disposition (habitual inclination to see mathematics as sensible, useful, and worthwhile, coupled with a belief in diligence and one's own efficacy). Because these practices are an important part of the curriculum, they will be assessed throughout the mathematics ACAP. The eight Standards for Mathematical Practice are listed below, but more detail is provided in the Alabama Course of Study for Mathematics.

- Make sense of problems and persevere in solving them.
- Reason abstractly and quantitatively.
- Construct viable arguments and critique the reasoning of others.
- Model with mathematics.
- Use appropriate tools strategically.
- Attend to precision.
- Look for and make use of structure.
- Look for and express regularity in repeated reasoning.

Domain	OA: Operations and Algebraic Thinking
Cluster	Use the four operations with whole numbers to solve problems.
Standard	4.OA.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. [4-OA1]
Evidence Statements	The student will interpret a multiplication equation as a comparison and represent verbal statements of multiplicative comparisons as multiplication equations.
Assessment Limits / Content Constraints	Tasks have “thin context” or no context.
DOK(s)	1, 2, or 3
Calculator	NO – a calculator will not be available for items
Item Type(s)	MC, MS, SA, TE
Context	Allowable
Sample Stem Information (as applicable)	Given a multiplication equation, identify a verbal statement that represents the equation. Given a verbal statement, identify a multiplication equation that represents the verbal statement.

Domain	OA: Operations and Algebraic Thinking
Cluster	Use the four operations with whole numbers to solve problems.
Standard	4.OA.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. (See Appendix A, Table 2.) [4-OA2]
Evidence Statements	The student will multiply or divide to solve word problems involving multiplicative comparison.
Assessment Limits / Content Constraints	
DOK(s)	1, 2, or 3
Calculator	NO – a calculator will not be available for items
Item Type(s)	MC, MS, SA, TE
Context	Allowable
Sample Stem Information (as applicable)	Given a context involving multiplication or division, solve the problem. Given a context involving multiplication or division, identify an equation that can be used to solve the problem.

Domain	OA: Operations and Algebraic Thinking
Cluster	Use the four operations with whole numbers to solve problems.
Standard	4.OA.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. [4-OA3]
Evidence Statements	The student will 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. The student will use equations with a symbol or letter standing for the unknown quantity to represent these problems and will use mental computation and estimation strategies including rounding to assess the reasonableness of answers.
Assessment Limits / Content Constraints	Assessing the reasonableness of an answer could be assessed here. Tasks could involve interpreting remainders. Multistep problems must have at least 3 steps.
DOK(s)	1, 2, or 3
Calculator	NO – a calculator will not be available for items
Item Type(s)	MC, MS, SA, TE
Context	Allowable
Sample Stem Information (as applicable)	Given a context requiring multiple steps, solve the problem. Given a context involving estimation, identify the best estimate for the solution.

Domain	OA: Operations and Algebraic Thinking
Cluster	Gain familiarity with factors and multiples.
Standard	4.OA.4: Find all factor pairs for a whole number in the range 1-100. 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. Determine whether a given whole number in the range 1-100 is prime or composite. [4-OA4]
Evidence Statements	The student will find all factor pairs for a whole number in the range 1–100 and recognize that a whole number is a multiple of each of its factors. The student will determine whether a given whole number in the range 1–100 is a multiple of a given one-digit number and whether a given whole number in the range 1–100 is prime or composite.
Assessment Limits / Content Constraints	
DOK(s)	1, 2, or 3
Calculator	NO – a calculator will not be available for items
Item Type(s)	MC, MS, SA, TE
Context	Allowable
Sample Stem Information (as applicable)	Choose all factors or factor pairs of a given number. Choose a prime or composite number from a list. Identify multiples of a given number.

Domain	OA: Operations and Algebraic Thinking
Cluster	Generate and analyze patterns.
Standard	4.OA.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. [4-OA5] 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.
Evidence Statements	The student will generate a number or shape pattern that follows a given rule and identify apparent features of the pattern that were not explicit in the rule itself. The student will explain informally why the pattern will continue to develop in this way.
Assessment Limits / Content Constraints	Tasks do not require students to determine a rule; the rule is given.
DOK(s)	1, 2, or 3
Calculator	NO – a calculator will not be available for items
Item Type(s)	MC, MS, SA, TE
Context	Allowable
Sample Stem Information (as applicable)	Given a pattern, identify a missing number or shape in the pattern. Given a rule, identify a pattern that fits the rule. Given a rule or pattern, identify a feature of the pattern.

Domain	NBT: Number and Operations in Base Ten
Cluster	Generalize place value understanding for multi-digit whole numbers.
Standard	4.NBT.6: 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. [4-NBT1] Example: Recognize that 700 ÷ 70 = 10 by applying concepts of place value and division.
Evidence Statements	The student will 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.
Assessment Limits / Content Constraints	Grade 4 expectations in this domain are limited to whole numbers less than or equal to 1,000,000.
DOK(s)	1, 2, or 3
Calculator	NO – a calculator will not be available for items
Item Type(s)	MC, MS, SA, TE
Context	Allowable
Sample Stem Information (as applicable)	Given a multidigit whole number, compare the values of digits in the numbers.

Domain	NBT: Number and Operations in Base Ten
Cluster	Generalize place value understanding for multi-digit whole numbers.
Standard	4.NBT.7: 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. [4-NBT2]
Evidence Statements	The student will use base-ten numerals, number names, and expanded form to read and write multi-digit whole numbers. The student will compare two multi-digit numbers based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons.
Assessment Limits / Content Constraints	Grade 4 expectations in this domain are limited to whole numbers less than or equal to 1,000,000. Tasks assess conceptual understanding (e.g., by including a mixture of expanded form, number names, and base-ten numerals within items). The vocabulary of the item should match the vocabulary of the standard (e.g., base-ten numerals, number names, and expanded form).
DOK(s)	1, 2, or 3
Calculator	NO – a calculator will not be available for items
Item Type(s)	MC, MS, SA, TE
Context	Allowable
Sample Stem Information (as applicable)	Given a number in one form (numeral, words, expanded form), identify the number in a different form. Given numerical comparisons as answer options, identify the correct comparison. Given two numbers, identify the correct reasoning for how the numbers should be compared.

Domain	NBT: Number and Operations in Base Ten
Cluster	Generalize place value understanding for multi-digit whole numbers.
Standard	4.NBT.8: Use place value understanding to round multi-digit whole numbers to any place. [4-NBT3]
Evidence Statements	The student will use place value understanding to round multi-digit whole numbers to any place.
Assessment Limits / Content Constraints	Grade 4 expectations in this domain are limited to whole numbers less than or equal to 1,000,000.
DOK(s)	1, 2, or 3
Calculator	NO – a calculator will not be available for items
Item Type(s)	MC, MS, SA, TE
Context	Allowable
Sample Stem Information (as applicable)	Round a given number to a specified place value. Given a number which was rounded to a specified place value, identify a number that rounds to the given number.

Domain	NBT: Number and Operations in Base Ten
Cluster	Use place value understanding and properties of operations to perform multi-digit arithmetic.
Standard	4.NBT.9: Fluently add and subtract multi-digit whole numbers using the standard algorithm. [4-NBT4]
Evidence Statements	The student will fluently add and subtract multi-digit whole numbers using the standard algorithm.
Assessment Limits / Content Constraints	Grade 4 expectations in this domain are limited to whole numbers less than or equal to 1,000,000; for purposes of assessment, both of the given numbers should have 4 digits. The given addends are such as to require an efficient/standard algorithm (e.g., 7263 + 4875). Addends in the task do not suggest any obvious ad hoc or mental strategy (as would be present in a case such as 16,999 + 3,501). The given subtrahend and minuend are such as to require an efficient/standard algorithm (e.g., 7263 – 4875 or 7406 – 4637). The subtrahend and minuend do not suggest any obvious ad hoc or mental strategy (as would be present in a case such as 7300 – 6301). Tasks do not have a context. Tasks are not timed.
DOK(s)	1
Calculator	NO – a calculator will not be available for items
Item Type(s)	MC, MS, SA, TE
Context	Not Allowable
Sample Stem Information (as applicable)	Given two whole numbers, determine the sum or difference.

Domain	NBT: Number and Operations in Base Ten
Cluster	Use place value understanding and properties of operations to perform multi-digit arithmetic.
Standard	4.NBT.10: 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. [4-NBT5]
Evidence Statements	The student will use strategies based on place value and the properties of operations to multiply a whole number of up to four digits by a one-digit whole number and multiply two two-digit numbers. The student will illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.
Assessment Limits / Content Constraints	Tasks do not have a context.
DOK(s)	1, 2, or 3
Calculator	NO – a calculator will not be available for items
Item Type(s)	MC, MS, SA, TE
Context	Not Allowable
Sample Stem Information (as applicable)	Given two whole numbers, calculate the product.

Domain	NBT: Number and Operations in Base Ten
Cluster	Use place value understanding and properties of operations to perform multi-digit arithmetic.
Standard	4.NBT.11: 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. [4-NBT6]
Evidence Statements	The student will use strategies based on place value, the properties of operations, and/or the relationship between multiplication and division to find whole-number quotients and remainders with up to four-digit dividends and one-digit divisors. The student will illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.
Assessment Limits / Content Constraints	Tasks do not have a context.
DOK(s)	1, 2, or 3
Calculator	NO – a calculator will not be available for items
Item Type(s)	MC, MS, SA, TE
Context	Not Allowable
Sample Stem Information (as applicable)	Given two numbers, calculate the quotient and/or remainder.

Domain	NF: Number and Operations - Fractions
Cluster	Extend understanding of fraction equivalence and ordering.
Standard	4.NF.12: Explain why a fraction a/b is equivalent to a fraction $(n \times a)/(n \times b)$ 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. [4-NF1]
Evidence Statements	The student will explain why a fraction a/b is equivalent to a fraction $(n \times a)/(n \times b)$ by using visual fraction models. The student will use this principle to recognize and generate equivalent fractions.
Assessment Limits / Content Constraints	Tasks are limited to denominators 2, 3, 4, 5, 6, 8, 10, 12, and 100. Tasks may include fractions that equal whole numbers. Whole numbers are limited to 0 through 5.
DOK(s)	1, 2, or 3
Calculator	NO – a calculator will not be available for items
Item Type(s)	MC, MS, SA, TE
Context	Allowable
Sample Stem Information (as applicable)	Given a fraction, identify an equivalent fraction. Given a fraction model, identify the number of parts of another fraction model that must be shaded to represent an equivalent fraction.

Domain	NF: Number and Operations - Fractions
Cluster	Extend understanding of fraction equivalence and ordering.
Standard	4.NF.13: 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 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. [4-NF2]
Evidence Statements	The student will compare two fractions with different numerators and different denominators and recognize that comparisons are valid only when the two fractions refer to the same whole. The student will record the results of comparisons with the symbols >, =, or < and justify the conclusions.
Assessment Limits / Content Constraints	Only the answer is required. Tasks require the student to choose the comparison strategy autonomously. Tasks are limited to denominators 2, 3, 4, 5, 6, 8, 10, 12, and 100. Tasks may include fractions that equal whole numbers. Whole numbers are limited to 0 through 5.
DOK(s)	1, 2, or 3
Calculator	NO – a calculator will not be available for items
Item Type(s)	MC, MS, SA, TE
Context	Allowable
Sample Stem Information (as applicable)	Given comparisons as answer options, choose the correct comparison. Given a fraction, identify a fraction that is greater than (or less than) the given fraction.

Domain	NF: Number and Operations - Fractions
Cluster	Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers.
Standard	4.NF.14a: Understand a fraction *a*/*b* with *a* > 1 as a sum of fractions. [4-NF3] a. Understand addition and subtraction of fractions as joining and separating parts referring to the same whole. [4-NF3a]
Evidence Statements	The student will understand addition and subtraction of fractions as joining and separating parts referring to the same whole.
Assessment Limits / Content Constraints	Tasks are limited to denominators 2, 3, 4, 5, 6, 8, 10, 12, and 100.
DOK(s)	1, 2, or 3
Calculator	NO – a calculator will not be available for items
Item Type(s)	MC, MS, SA, TE
Context	Allowable
Sample Stem Information (as applicable)	Given a fraction, identify a decomposition of the fraction using the same denominator. Given a decomposition of a fraction, identify the fraction. Given two fractions (can include mixed numbers) with like denominators, add or subtract the fractions.

Domain	NF: Number and Operations - Fractions
Cluster	Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers.
Standard	4.NF.14b: Understand a fraction *a*/*b* with *a* > 1 as a sum of fractions. [4-NF3] 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. [4-NF3b] Examples: 3/8 = 1/8 + 1/8 + 1/8; 3/8 = 1/8 + 2/8; 2 1/8 = 1 + 1 + 1/8 = 8/8 + 8/8 + 1/8.
Evidence Statements	The student will decompose a fraction into a sum of fractions with the same denominator in more than one way and record each decomposition by an equation.
Assessment Limits / Content Constraints	Only the answer is required. Tasks are limited to denominators 2, 3, 4, 5, 6, 8, 10, 12, and 100. Tasks may include fractions that equal whole numbers. Whole numbers are limited to 0 through 5.
DOK(s)	1, 2, or 3
Calculator	NO – a calculator will not be available for items
Item Type(s)	MC, MS, SA, TE
Context	Allowable
Sample Stem Information (as applicable)	Given a fraction, identify a decomposition of the fraction using the same denominator. Given a decomposition of a fraction, identify the fraction. Given two fractions (can include mixed numbers) with like denominators, add or subtract the fractions.

Domain	NF: Number and Operations - Fractions
Cluster	Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers.
Standard	4.NF.14c: Understand a fraction *a*/*b* with *a* > 1 as a sum of fractions. [4-NF3] c. 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. [4-NF3c]
Evidence Statements	The student will add and subtract mixed numbers with like denominators.
Assessment Limits / Content Constraints	Tasks do not have a context. Denominators are limited to grade 3 possibilities (2, 3, 4, 6, 8) so as to keep computational difficulty lower.
DOK(s)	1, 2, or 3
Calculator	NO – a calculator will not be available for items
Item Type(s)	MC, MS, SA, TE
Context	Not Allowable
Sample Stem Information (as applicable)	Given a fraction, identify a decomposition of the fraction using the same denominator. Given a decomposition of a fraction, identify the fraction. Given two fractions (can include mixed numbers) with like denominators, add or subtract the fractions.

Domain	NF: Number and Operations - Fractions
Cluster	Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers.
Standard	4.NF.14d: Understand a fraction *a*/*b* with *a* > 1 as a sum of fractions 1/*b*. [4-NF3] d. 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. [4-NF3d]
Evidence Statements	The student will solve word problems involving addition and subtraction of fractions referring to the same whole and having like denominators.
Assessment Limits / Content Constraints	Tasks are limited to denominators 2, 3, 4, 5, 6, 8, 10, 12, and 100. Prompts do not provide drawings or visual fraction models; students may at their discretion draw visual fraction models as a strategy.
DOK(s)	1, 2, or 3
Calculator	NO – a calculator will not be available for items
Item Type(s)	MC, MS, SA, TE
Context	Allowable
Sample Stem Information (as applicable)	Given a fraction, identify a decomposition of the fraction using the same denominator. Given a decomposition of a fraction, identify the fraction. Given two fractions (can include mixed numbers) with like denominators, add or subtract the fractions.

Domain	NF: Number and Operations - Fractions
Cluster	Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers.
Standard	4.NF.15a: Apply and extend previous understandings of multiplication to multiply a fraction by a whole number. [4-NF4] a. Understand a fraction *a*/*b* as a multiple of 1/*b*. [4-NF4a] Example: Use a visual fraction model to represent 5/4 as the product 5 × (1/4), recording the conclusion by the equation 5/4 = 5 × (1/4)
Evidence Statements	The student will understand a fraction *a*/*b* as a multiple of 1/*b*.
Assessment Limits / Content Constraints	Tasks are limited to denominators 2, 3, 4, 5, 6, 8, 10, 12, and 100.
DOK(s)	1, 2, or 3
Calculator	NO – a calculator will not be available for items
Item Type(s)	MC, MS, SA, TE
Context	Allowable
Sample Stem Information (as applicable)	Given a fraction and a whole number, find their product. Given a non-unit fraction, identify an equivalent expression in which a unit fraction is multiplied by a whole number.

Domain	NF: Number and Operations - Fractions
Cluster	Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers.
Standard	4.NF.15b: Apply and extend previous understandings of multiplication to multiply a fraction by a whole number. [4-NF4] b. Understand a multiple of *a*/*b* as a multiple of 1/*b*, and use this understanding to multiply a fraction by a whole number. [4-NF4b] Example: Use a visual fraction model to express 3 × (2/5) as 6 × (1/5), recognizing this product as 6/5. (In general, *n* × (*a*/*b*) = (*n* × *a*)/*b*.)
Evidence Statements	The student will understand a multiple of *a*/*b* as a multiple of 1/*b* and use this understanding to multiply a fraction by a whole number.
Assessment Limits / Content Constraints	Tasks do not have a context. Prompts do not provide visual fraction models; students may at their discretion draw visual fraction models as a strategy. Results may equal fractions greater than 1 (including fractions equal to whole numbers limited to 0 through 5). Tasks are limited to denominators 2, 3, 4, 5, 6, 8, 10, 12, and 100.
DOK(s)	1, 2, or 3
Calculator	NO – a calculator will not be available for items
Item Type(s)	MC, MS, SA, TE
Context	Not Allowable
Sample Stem Information (as applicable)	Given a fraction and a whole number, find their product. Given a non-unit fraction, identify an equivalent expression in which a unit fraction is multiplied by a whole number.

Domain	NF: Number and Operations - Fractions
Cluster	Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers.
Standard	4.NF.15c: Apply and extend previous understandings of multiplication to multiply a fraction by a whole number. [4-NF4] c. 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. [4-NF4c] Example: If each person at a party will eat 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 which two whole numbers does your answer lie?
Evidence Statements	The student will solve word problems involving multiplication of a fraction by a whole number.
Assessment Limits / Content Constraints	Prompts do not provide visual fraction models; students may at their discretion draw visual fraction models as a strategy. Situations are limited to those in which the product is unknown (situations do not include unknown factors). Situations involve a whole number of fractional quantities—not a fraction of a whole-number quantity. Results may equal fractions greater than 1 (including fractions equal to whole numbers limited to 0 through 5). Tasks are limited to denominators 2, 3, 4, 5, 6, 8, 10, 12, and 100.
DOK(s)	1, 2, or 3
Calculator	NO – a calculator will not be available for items
Item Type(s)	MC, MS, SA, TE
Context	Allowable
Sample Stem Information (as applicable)	Given a word problem involving multiplication of a fraction and a whole number, find their product. Given a word problem involving a non-unit fraction, identify an equivalent expression in which a unit fraction is multiplied by a whole number.

Domain	NF: Number and Operations - Fractions
Cluster	Understand decimal notation for fractions, and compare decimal fractions.
Standard	4.NF.16: 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. (Students who can generate equivalent fractions can develop strategies for adding fractions with unlike denominators in general. But addition and subtraction with unlike denominators in general is not a requirement at this grade.) [4-NF5] Example: Express 3/10 as 30/100, and add 3/10 + 4/100 = 34/100.
Evidence Statements	The student will 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.
Assessment Limits / Content Constraints	Tasks do not have a context.
DOK(s)	1, 2, or 3
Calculator	NO – a calculator will not be available for items
Item Type(s)	MC, MS, SA, TE
Context	Not Allowable
Sample Stem Information (as applicable)	Given a fraction with a denominator of 10, identify an equivalent fraction with a denominator of 100. Given a fraction with a denominator of 10 and a fraction with a denominator of 100, identify the sum of the fractions.

Domain	NF: Number and Operations - Fractions
Cluster	Understand decimal notation for fractions, and compare decimal fractions.
Standard	4.NF.17: Use decimal notation for fractions with denominators 10 or 100. [4-NF6] Example: Rewrite 0.62 as 62/100; describe a length as 0.62 meters; locate 0.62 on a number line diagram.
Evidence Statements	The student will use decimal notation for fractions with denominators 10 or 100.
Assessment Limits / Content Constraints	
DOK(s)	1, 2, or 3
Calculator	NO – a calculator will not be available for items
Item Type(s)	MC, MS, SA, TE
Context	Allowable
Sample Stem Information (as applicable)	Given a fraction with a denominator of 10 or 100, identify an equivalent decimal. Given a decimal to the tenths or hundredths, identify an equivalent fraction. Given a fraction or decimal to the hundredths, locate the number on a number line.

Domain	NF: Number and Operations - Fractions
Cluster	Understand decimal notation for fractions, and compare decimal fractions.
Standard	4.NF.18: 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. [4-NF7]
Evidence Statements	The student will compare two decimals to the hundredths by reasoning about their size and will recognize that comparisons are valid only when the two decimals refer to the same whole. The student will record the results of comparisons with the symbols >, =, or < and justify the conclusions (e.g., by using a visual model).
Assessment Limits / Content Constraints	Tasks have “thin context” or no context. Prompts do not provide visual fraction models; students may at their discretion draw visual fraction models as a strategy.
DOK(s)	1, 2, or 3
Calculator	NO – a calculator will not be available for items
Item Type(s)	MC, MS, SA, TE
Context	Allowable
Sample Stem Information (as applicable)	Given a decimal to the hundredths, identify a decimal that is greater than (or less than) the given decimal. Given a list of decimals to the hundredths, identify a correct comparison of decimals in the list or identify the decimal with the greatest (or least) value in the list.

Domain	MD: Measurement and Data
Cluster	Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.
Standard	4.MD.19: Know relative sizes of measurement units within one system of units, including km, m, cm; kg, g; lb, oz; l, ml; and 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. [4-MD1] Examples: 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), ...
Evidence Statements	The student will know relative sizes of measurement units within one system of units, including km, m, cm; kg, g; lb, oz; L, mL; hr, min, sec. The student will express measurements in a larger unit in terms of a smaller unit (within a single system of measurement). The student will record measurement equivalents in a two-column table.
Assessment Limits / Content Constraints	
DOK(s)	1, 2, or 3
Calculator	NO – a calculator will not be available for items
Item Type(s)	MC, MS, SA, TE
Context	Allowable
Sample Stem Information (as applicable)	Given a measurement in one unit, identify an equivalent measurement using a different unit. Given a table of measurement equivalents with a missing value, identify the missing value.

Domain	MD: Measurement and Data
Cluster	Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.
Standard	4.MD.20: Use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money, including problems involving simple fractions or decimals, and problems that require expressing measurements given in a larger unit in terms of a smaller unit. Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale. [4-MD2]
Evidence Statements	The student will use the four operations to solve word problems involving distances and represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale.
Assessment Limits / Content Constraints	Situations involve whole-number measurements and require expressing measurements given in a larger unit in terms of a smaller unit. Situations involve two measurements given in the same units, one a whole-number measurement and the other a non-whole-number measurement (given as a fraction). Tasks may present number line diagrams featuring a measurement scale. Tasks may include measuring distances to the nearest cm or mm. Units of mass are limited to grams and kilograms. Tasks will not include division of fractions.
DOK(s)	1, 2, or 3
Calculator	NO – a calculator will not be available for items
Item Type(s)	MC, MS, SA, TE
Context	Allowable
Sample Stem Information (as applicable)	Solve multistep problems involving units of measurement.

Domain	MD: Measurement and Data
Cluster	Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.
Standard	4.MD.21: Apply the area and perimeter formulas for rectangles in real-world and mathematical problems. [4-MD3] 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.
Evidence Statements	The student will apply the area and perimeter formulas for rectangles in real-world and mathematical problems.
Assessment Limits / Content Constraints	
DOK(s)	1, 2, or 3
Calculator	NO – a calculator will not be available for items
Item Type(s)	MC, MS, SA, TE
Context	Allowable
Sample Stem Information (as applicable)	Given the length and width of a rectangle in a real-world or mathematical problem, find the area or perimeter of the rectangle. Given the area or perimeter of a rectangle and the length of one side in a real-world or mathematical problem, find the length of the other side.

Domain	MD: Measurement and Data
Cluster	Represent and interpret data.
Standard	4.MD.22: Make a line plot to display a data set of measurements in fractions of a unit (1/2 ,1/4, 1/8). Solve problems involving addition and subtraction of fractions by using information presented in line plots. [4-MD4] Example: From a line plot find and interpret the difference in length between the longest and shortest specimens in an insect collection.
Evidence Statements	The student will make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8) and solve problems involving addition and subtraction of fractions with common denominators by using information presented in line plots.
Assessment Limits / Content Constraints	Tasks may include mixed numbers. Fractions equivalent to whole numbers are limited to 0 through 5.
DOK(s)	1, 2, or 3
Calculator	NO – a calculator will not be available for items
Item Type(s)	MC, MS, SA, TE
Context	Allowable
Sample Stem Information (as applicable)	Given a data set, identify a line plot that represents the data. Given a line plot, find the total of the data represented. Given a line plot, find the difference between the largest and smallest values represented. Given a line plot, identify the most common value of the data set.

Domain	MD: Measurement and Data
Cluster	Geometric measurement: understand concepts of angle and measure angles.
Standard	4.MD.23a: Recognize angles as geometric shapes that are formed wherever two rays share a common endpoint, and understand concepts of angle measurement. [4-MD5] a. 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. [4-MD5a]
Evidence Statements	The student will understand that 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. The student will understand that an angle that turns through 1/360 of a circle is called a "one-degree angle" and can be used to measure angles.
Assessment Limits / Content Constraints	
DOK(s)	1, 2, or 3
Calculator	NO – a calculator will not be available for items
Item Type(s)	MC, MS, SA, TE
Context	Allowable
Sample Stem Information (as applicable)	Given an angle measure (in words or in a graphic), identify the number of one-degree angles it turns through. Given an angle as *n*/360 of a circle, identify the angle as *n* degrees.

Domain	MD: Measurement and Data
Cluster	Geometric measurement: understand concepts of angle and measure angles.
Standard	4.MD.23b: Recognize angles as geometric shapes that are formed wherever two rays share a common endpoint, and understand concepts of angle measurement. [4-MD5] b. An angle that turns through *n* one-degree angles is said to have an angle measure of *n* degrees. [4-MD5b]
Evidence Statements	The student will understand that an angle that turns through *n* one-degree angles is said to have an angle measure of *n* degrees.
Assessment Limits / Content Constraints	
DOK(s)	1, 2, or 3
Calculator	NO – a calculator will not be available for items
Item Type(s)	MC, MS, SA, TE
Context	Allowable
Sample Stem Information (as applicable)	Given an angle measure (in words or in a graphic), identify the number of one-degree angles it turns through. Given an angle as *n*/360 of a circle, identify the angle as *n* degrees.

Domain	MD: Measurement and Data
Cluster	Geometric measurement: understand concepts of angle and measure angles.
Standard	4.MD.24: Measure angles in whole-number degrees using a protractor. Sketch angles of specified measure. [4-MD6]
Evidence Statements	The student will use a protractor to measure angles in whole-number degrees and will sketch angles of specified measure.
Assessment Limits / Content Constraints	
DOK(s)	1, 2, or 3
Calculator	NO – a calculator will not be available for items
Item Type(s)	MC, MS, SA, TE
Context	Allowable
Sample Stem Information (as applicable)	Given an angle, identify the measure of the angle. Given an angle measure, choose an angle with that measure.

Domain	MD: Measurement and Data
Cluster	Geometric measurement: understand concepts of angle and measure angles.
Standard	4.MD.25: Recognize angle measure as additive. When an angle is decomposed into nonoverlapping 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 or mathematical problems, e.g., by using an equation with a symbol for the unknown angle measure. [4-MD7]
Evidence Statements	The student will recognize that angle measure is additive and that when an angle is decomposed into nonoverlapping parts, the angle measure of the whole is the sum of the angle measures of the parts. The student will 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 or letter for the unknown angle measure).
Assessment Limits / Content Constraints	
DOK(s)	1, 2, or 3
Calculator	NO – a calculator will not be available for items
Item Type(s)	MC, MS, SA, TE
Context	Allowable
Sample Stem Information (as applicable)	Given the measures of two adjacent angles, find the measure of the larger angle they form. Given the measure of an angle formed by two smaller angles and the measure of one of the smaller angles, find the measure of the second smaller angle.

Domain	G: Geometry
Cluster	Draw and identify lines and angles, and classify shapes by properties of their lines and angles.
Standard	4.G.26: Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures. [4-G1]
Evidence Statements	The student will draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. The student will identify these in two-dimensional figures.
Assessment Limits / Content Constraints	
DOK(s)	1, 2, or 3
Calculator	NO – a calculator will not be available for items
Item Type(s)	MC, MS, SA, TE
Context	Allowable
Sample Stem Information (as applicable)	Given a characteristic (acute angle, parallel lines, etc.), identify a shape that has the characteristic. Given a series of shapes, identify a true statement about the series. Given a figure, identify the term that describes a specific part of the figure.

Domain	G: Geometry
Cluster	Draw and identify lines and angles, and classify shapes by properties of their lines and angles.
Standard	4.G.27: 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. [4-G2]
Evidence Statements	The student will classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines or on the presence or absence of angles of a specified size. The student will recognize right triangles as a category and identify right triangles.
Assessment Limits / Content Constraints	A trapezoid is defined as “A quadrilateral with at least one pair of parallel sides.” Tasks may include terminology: equilateral, isosceles, scalene, acute, right, and obtuse.
DOK(s)	1, 2, or 3
Calculator	NO – a calculator will not be available for items
Item Type(s)	MC, MS, SA, TE
Context	Allowable
Sample Stem Information (as applicable)	Identify a shape that has parallel and/or perpendicular sides. This could include identification of a specific number of parallel or perpendicular sides.

Domain	G: Geometry
Cluster	Draw and identify lines and angles, and classify shapes by properties of their lines and angles.
Standard	4.G.28: 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. [4-G3]
Evidence Statements	The student will 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. The student will identify line-symmetric figures and draw lines of symmetry.
Assessment Limits / Content Constraints	
DOK(s)	1, 2, or 3
Calculator	NO – a calculator will not be available for items
Item Type(s)	MC, MS, SA, TE
Context	Allowable
Sample Stem Information (as applicable)	Given a shape, identify a line of symmetry. Given a shape, identify the number of lines of symmetry. Given several shapes, identify which shape has a line of symmetry. Given several shapes, identify which shape has a line of symmetry drawn correctly.