

CLAIM 1: CONCEPTS AND PROCEDURES

TARGET GUIDE



GRADE
4

★ PRIORITY CLUSTER

★ TARGET A	Use the four operations with whole numbers to solve problems.	4.OA.1 – 4.OA.3
TARGET B	Gain familiarity with factors and multiples.	4.OA.4
TARGET C	Generate and analyze patterns.	4.OA.5
★ TARGET D	Generalize place value understanding for multi-digit whole numbers.	4.NBT.1 – 4.NBT.3
★ TARGET E	Use place value understanding and properties of operations to perform multi-digit arithmetic.	4.NBT.4 – 4.NBT.6
★ TARGET F	Extend understanding of fraction equivalence and ordering.	4.NF.1 4.NF.2
★ TARGET G	Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers.	4.NF.3 4.NF.4
★ TARGET H	Understand decimal notation for fractions, and compare decimal fractions.	4.NF.5 – 4.NF.7
TARGET I	Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.	4.MD.1 – 4.MD.3
TARGET J	Represent and interpret data.	4.MD.4
TARGET K	Geometric measurement: understand concepts of angle and measure angles.	4.MD.5 – 4.MD.7
TARGET L	Draw and identify lines and angles, and classify shapes by properties of their lines and angles.	4.G.1 – 4.G.3

SMARTER BALANCED ASSESSMENT VOCABULARY

GRADE 4

acute	length	quadrilateral
add	less than	quotient
angle	line	
area	line of symmetry	ray
	line plot	remainder
centimeter(s)	line segment	right
composite	liter(s) (L)	right triangle
data set	mass	sides
decimal	meter(s)	square units
denominator	milliliter(s)	subtract
difference	millions	sum
digit(s)	model	
divide	multiple	ten thousands
		tens
equal	nearest hundred	thousands
equal to	nearest hundred thousand	times as many
equation	nearest ten	times as much
equivalent	nearest ten thousand	triangle
expression	nearest thousand	
	number line	unit fractions
factor	numerator	
factor pair		vertex
fraction(s)	obtuse	volume
	octagon	
gram(s) (g)	one-degree angle	whole number
greater than	ones	
hexagon	parallel	
hundreds	partial product	
hundred thousands	partial quotient	
	product	
intersect	pentagon	
interval	perimeter	
	perpendicular	
kilogram(s) (kg)	point	
kilometer(s)	polygon	
	prime	
	product	
	protractor	

Grade 4 Smarter Balanced Assessment Item Specifications Fact Sheet

Claim 1 - Target A: Use the four operations with whole numbers to solve problems.

Content Domain: Operations and Algebraic Thinking

Claim 1 Priority Cluster

Standards Assessed in Target A:

4.OA.1: Interpret a multiplication equation as a comparison, e.g., interpret $35 = 5 \times 7$ 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.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.

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.

Achievement Level Descriptors

Level 1	Students should be able to use the four operations (add, subtract, multiply, and divide) to solve one-step problems involving equal groups and arrays.
Level 2	Students should be able to use the four operations to solve one-step problems involving an unknown number. They should be able to realize that it is appropriate to multiply or divide in order to solve familiar multiplicative comparison problems.
Level 3	Students should be able to use the four operations (add, subtract, multiply, and divide) to solve one-step problems involving equal groups and arrays, including problems where the remainder must be interpreted. They should be able to find an unknown number and represent problems using equations with a symbol representing the unknown quantity.
Level 4	Students should be able to assess the reasonableness of answers using mental computation and estimation strategies, including rounding.

Construct-Relevant Vocabulary

equation, difference, product, quotient, remainder, sum, times as many, times as much

Allowable Stimulus Materials

Multiplication equations, verbal statements of multiplicative comparison, contextual problems involving multiplicative comparison, one-step contextual word problems, measurements limited to: kilometers (km), meters (m), centimeters (cm), kilograms (kg), grams (g), pounds (lb), ounces (oz), liters (L), milliliters (mL), hours (hr), minutes (min), seconds (s), money (whole number \$ or ¢ only), yards (yd), feet (ft), inches (in), gallons (gal), quarts (qt), pints (pt), cups

Grade 4 Smarter Balanced Assessment Item Specifications Fact Sheet

Claim 1 - Target B: Gain familiarity with factors and multiples.

Content Domain: Operations and Algebraic Thinking

Claim 1 Priority Cluster

Standards Assessed in Target B:

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.

Achievement Level Descriptors

Level 1	Students should be able to recognize that a whole number is a multiple of each of its factors.
Level 2	Students should be able to find factor pairs for whole numbers in the range of 1–100 that are multiples of 2 or 5 and determine whether a given whole number in the range of 1–100 is a multiple of a given one-digit number.
Level 3	Students should be able to find all factor pairs for whole numbers in the range of 1–100 and determine whether a given whole number in the range of 1–100 is prime or composite.
Level 4	No Descriptor.

Construct-Relevant Vocabulary

composite, factor, factor pair, multiple, prime, whole number

Allowable Stimulus Materials

whole numbers from 1 to 100, tables, lists, sets, 100s chart

Grade 4 Smarter Balanced Assessment Item Specifications Fact Sheet

Claim 1 - Target C: Generate and analyze patterns.
Content Domain: Operations and Algebraic Thinking
Claim 1 Priority Cluster

Standards Assessed in Target C:

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. *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.*

Achievement Level Descriptors

Level 1	Students should be able to extend a number or shape pattern that follows a given rule.
Level 2	Students should be able to generate a number or shape pattern that follows a given rule.
Level 3	Students should be able to analyze a pattern for apparent features that are not explicit in the rule itself.
Level 4	No Descriptor.

Construct-Relevant Vocabulary

pattern

Allowable Stimulus Materials

whole number patterns using all four operations, fraction patterns using addition and subtraction with like denominators (limited to denominators of 2, 3, 4, 5, 6, 8, 10, 12 and 100), shape patterns with two-dimensional figures or pictures of objects

Limitations on numbers in number patterns:

- Multiplication should never exceed 4-digit by 1-digit or 2-digit by 2-digit.
- Multiplication should never involve decimals, but may involve multiplying a whole number by a fraction.
- Division should never exceed 4-digit by 1-digit.
- Division should never involve fractions or decimals.

Grade 4 Smarter Balanced Assessment Item Specifications Fact Sheet

Claim 1 - Target D: Generalize place value understanding for multi-digit whole numbers.

Content Domain: Numbers and Operations in Base 10

Claim 1 Priority Cluster

Standards Assessed in Target D:

4.NBT.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 $700 \div 70 = 10$ by applying concepts of place value and division.*

4.NBT.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.

4.NBT.3: Use place value understanding to round multi-digit whole numbers to any place.

Achievement Level Descriptors

Level 1	Students should be able to read and write multi-digit whole numbers less than or equal to 1000 using base-ten numerals, number names, and expanded form; compare multi-digit numbers up to 1000 using $<$, $>$, and $=$; and round multi-digit whole numbers up to 1000 to any place.
Level 2	Students should look for and use repeated reasoning to generalize place value understanding to be able to read and write multi-digit whole numbers less than or equal to 100,000 using base-ten numerals, number names, and expanded form; compare multi-digit numbers up to 100,000 using $<$, $>$, and $=$; and round multi-digit whole numbers up to 100,000 to any place.
Level 3	Students should look for and use repeated reasoning to generalize place value understanding to be able to read and write multi-digit whole numbers less than or equal to 1,000,000 using base-ten numerals, number names, and expanded form; compare multi-digit numbers up to 1,000,000 using $<$, $>$, and $=$; round multi-digit whole numbers up to 1,000,000 to any place; and 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.
Level 4	No Descriptor.

Construct-Relevant Vocabulary

hundreds, hundred thousands, millions, nearest hundred, nearest hundred thousand, nearest ten, nearest ten thousand, nearest thousand, ones, tens, thousands, ten thousands

Allowable Stimulus Materials

- Multi-digit whole numbers less than or equal to 1,000,000 in any of these forms:
 - Numeric form (e.g., 427)
 - Expanded form (e.g., $400 + 20 + 7$)
 - “Expanded word” form (e.g., 4 hundreds + 2 tens + 7 ones)
- Comparisons using $<$, $>$, or $=$
- Numbers that include a 0 in one or more place values

Grade 4 Smarter Balanced Assessment Item Specifications Fact Sheet

Claim 1 - Target E: Use place value understanding and properties of operations to perform multi-digit arithmetic.

Content Domain: Numbers and Operations in Base 10

Claim 1 Priority Cluster

Standards Assessed in Target E:

4.NBT.4: Fluently add and subtract multi-digit whole numbers using the standard algorithm.

4.NBT.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.

4.NBT.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.

Achievement Level Descriptors

Level 1	Students should be able to add and subtract one- and two-digit whole numbers using strategies based on place value; multiply two one-digit whole numbers based on place value and properties of operations; and find whole-number quotients with no remainders with up to two-digit dividends and one-digit divisors using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division.
Level 2	Students should be able to use place value understanding to add and subtract two- and three-digit whole numbers using a standard algorithm; multiply whole numbers up to and including four digits by one digit based on place value and properties of operations; find whole-number quotients and remainders with up to two-digit dividends and one-digit divisors using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division; and illustrate multiplication and division by using equations, arrays, and/or area models.
Level 3	Students should be able to fluently add and subtract multi-digit whole numbers using the standard algorithm; multiply whole numbers including two digits by two digits based on place value and properties of operations; find whole-number quotients and remainders with up to four-digit dividends and one-digit divisors using strategies based on place value understanding, the properties of operations, and/or the relationship between multiplication and division; and explain multiplication and division using equations, arrays, and/or area models.
Level 4	No Descriptor.

Construct-Relevant Vocabulary

difference, equal, equation, expression, multiple, partial product, partial quotient, product, quotient remainder, sum

Allowable Stimulus Materials

Non-contextual problems in the four operations, equations, expressions, problems solved or partially solved reflecting different solution strategies

Grade 4 Smarter Balanced Assessment Item Specifications Fact Sheet

Claim 1 - Target F: Extend understanding of fraction equivalence and ordering.

Content Domain: Numbers and Operations - Fractions

Claim 1 Priority Cluster

Standards Assessed in Target F:

4.NF.1: 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.NF.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 $1/2$. 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.

Achievement Level Descriptors

Level 1	Students should be able to recognize that fraction comparisons are valid only when the two fractions are referring to the same whole.
Level 2	Students should be able to compare two fractions with different numerators and different denominators using $<$, $>$, and $=$ by comparing to a benchmark fraction such as $1/2$ and recognize equivalent fractions using visual models.
Level 3	Students should be able to extend understanding to compare two fractions with different numerators and different denominators using $<$, $>$, and $=$ by creating common denominators or numerators and recognize and generate equivalent fractions using visual models.
Level 4	Students should be able to extend understanding to compare two fractions with different numerators and different denominators using $<$, $>$, and $=$ and justify the conclusions using a visual fraction model.

Construct-Relevant Vocabulary

denominator, digits, divide, equal to, equivalent, fraction, greater than, less than, numerator

Allowable Stimulus Materials

$<$, $>$, and $=$ symbols, number lines, parts of whole visual models, parts of set visual models, tables

Grade 4 Smarter Balanced Assessment Item Specifications Fact Sheet

Claim 1 - Target G: Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers.

Content Domain: Numbers and Operations - Fractions

Claim 1 Priority Cluster

Standards Assessed in Target G:

4.NF.3: Understand a fraction a/b with $a > 1$ as a sum of fractions $1/b$.

- a. Understand addition and subtraction of fractions as joining and separating parts referring to the same whole.
- 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.
- 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.
- 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.NF.4: Apply and extend previous understandings of multiplication to multiply a fraction by a whole number.

- a. Understand a fraction a/b as a multiple of $1/b$. For example, use a visual fraction model to represent $5/4$ as the product $5 \times (1/4)$, recording the conclusion by the equation $5/4 = 5 \times (1/4)$.
- 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.
- 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. For 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 what two whole numbers does your answer lie?

Achievement Level Descriptors

Level 1	Students should be able to understand that a fraction a/b with $a > 1$ is the sum of its unit fractional parts by extending previous understandings of addition on whole numbers. They should be able to identify fractions using visual models.
Level 2	Students should be able to understand that a fraction a/b is a multiple of $1/b$ by extending previous understanding of multiplication on whole numbers; solve one-step problems involving addition and subtraction of fractions referring to the same whole with like denominators; and use visual fraction models and/or equations to represent the problem.
Level 3	Students should be able to identify and generate equivalent forms of a fraction including mixed numbers with like denominators and solve one-step problems involving multiplication of a fraction by a whole number.
Level 4	No Descriptor.

Construct-Relevant Vocabulary

equal, equation, expression, fraction, model, numerator, product

Allowable Stimulus Materials

number lines, parts of whole visual models, parts of set visual models, equations, expressions

Grade 4 Smarter Balanced Assessment Item Specifications Fact Sheet

Claim 1 - Target H: Understand decimal notation for fractions, and compare decimal fractions.

Content Domain: Numbers and Operations - Fractions

Claim 1 Priority Cluster

Standards Assessed in Target H:

4.NF.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 $3/10$ as $30/100$, and add $3/10 + 4/100 = 34/100$.*

4.NF.6: Use decimal notation for fractions with denominators 10 or 100. *For example, rewrite 0.62 as $62/100$; describe a length as 0.62 meters; locate 0.62 on a number line diagram.*

4.NF.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.

Achievement Level Descriptors

Level 1	No Descriptor.
Level 2	Students should be able to express a fraction with denominator 10 as an equivalent fraction with denominator 100 and express those fractions as decimals.
Level 3	Students should be able to add two fractions with respective denominators 10 and 100 by first converting to two fractions with like denominators; compare two decimals to the hundredths using $>$, $<$, $=$, or on a number line; and compare decimals by reasoning about their size.
Level 4	Students should be able to compare two decimals to the hundredths using $<$, $>$, and $=$ and justify the conclusions by using visual models.

Construct-Relevant Vocabulary

centimeters, decimal, denominator, equal, equation, equivalent, expression, fraction, grams, kilograms, kilometers, length, liters, mass, meters, milliliters, number line, volume

Allowable Stimulus Materials

$<$, $>$, and $=$ symbols, fractions, decimals to the hundredths, decimal models, number lines, fraction addition problems

Grade 4 Smarter Balanced Assessment Item Specifications Fact Sheet

Claim 1 - Target I: Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.

Content Domain: Measurement and Data

Claim 1 Priority Cluster

Standards Assessed in Target I:

4.MD.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), ...*

4.MD.2: 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.MD.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.*

Achievement Level Descriptors

Level 1	Students should be able to know relative sizes of measurement units within one system of units, including in, ft, yd; km, m, cm; kg, g; lb., oz.; L, mL; and hr, min, sec.
Level 2	Students should be able to express measurements in a larger unit in terms of a smaller unit within a single system of measurement, record measurement equivalents in a two-column table, and apply the perimeter formula to rectangles in mathematical problems.
Level 3	Students should be able to use the four operations to solve 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; and apply the area formula to rectangles in mathematical problems.
Level 4	Students should be able to apply the perimeter and area formulas to rectangles in word problems.

Construct-Relevant Vocabulary

area, equivalent, interval, mass, perimeter, square units, volume

Allowable Stimulus Materials

Number lines featuring measurement scales, diagrams, tables, graphics of rectangles, equations, whole numbers, decimals (to the hundredths), fractions (limited to denominators 2, 3, 4, 5, 6, 8, 10, 12, and 100), measurements (in units of km, m, cm; kg, g; lb, oz; L, mL; hr, min, sec)

Grade 4 Smarter Balanced Assessment Item Specifications Fact Sheet

Claim 1 - Target J: Represent and interpret data.

Content Domain: Measurement and Data

Claim 1 Priority Cluster

Standards Assessed in Target J:

4.MD.4: Make a line plot to display a data set of measurements in fractions of a unit ($\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{8}$). 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.*

Achievement Level Descriptors

Level 1	Students should be able to identify data from a given line plot using whole numbers.
Level 2	Students should be able to use data from a given line plot using fractions $\frac{1}{2}$, $\frac{1}{4}$, and $\frac{1}{8}$ to solve one-step problems.
Level 3	Students should be able to create a line plot to represent a data set using fractions $\frac{1}{2}$, $\frac{1}{4}$, and $\frac{1}{8}$, and interpret data from a line plot to solve problems involving addition and subtraction of fractions with like denominators.
Level 4	No Descriptor.

Construct-Relevant Vocabulary

add, data set, denominator, difference, fractions, interval, line plot, numerator, subtract, sum, unit fractions

Allowable Stimulus Materials

line plots, tables, fractions of a unit ($\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{8}$)

Grade 4 Smarter Balanced Assessment Item Specifications Fact Sheet

Claim 1 - Target K: Geometric measurement: understand concepts of angle and measure angles.

Content Domain: Measurement and Data

Claim 1 Priority Cluster

Standards Assessed in Target K:

4.MD.5: Recognize angles as geometric shapes that are formed wherever two rays share a common endpoint, and understand concepts of angle measurement:

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 $\frac{1}{360}$ of a circle is called a “one-degree angle,” and can be used to measure angles.

b. An angle that turns through n one-degree angles is said to have an angle measure of n degrees.

4.MD.6: Measure angles in whole-number degrees using a protractor. Sketch angles of specified measure.

4.MD.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.

Achievement Level Descriptors

Level 1	No Descriptor.
Level 2	Students should be able to recognize whole number degrees on a protractor and measure angles in whole-number degrees using a protractor.
Level 3	Students should be able to construct angles in whole-number degrees using a protractor, use understanding of angle concepts to decompose a larger angle with two or more smaller angles that have the same sum as the original, and determine an unknown angle measure in a diagram.
Level 4	Students should be able to solve addition and subtraction problems to find unknown angles on a diagram in problems by using an equation with a symbol for the unknown angle measure.

Construct-Relevant Vocabulary

angle, intersect, one-degree angle, protractor, ray, vertex

Allowable Stimulus Materials

Graphics of angles, turns, and rotations; protractors