

Grade Four Content Standards Overview

Critical Areas for COHERENCE in Grade Four

Operations and Algebraic Thinking (4.OA)

- A. Use the four operations with whole numbers to solve problems.
[OA.1](#) [OA.2](#) [OA.3](#)
- B. Gain familiarity with factors and multiples.
[OA.4](#)
- C. Generate and analyze patterns.
[OA.5](#)

Number and Operations in Base Ten (4.NBT)

- A. Generalize place value understanding for multi-digit whole numbers.
[NBT.1](#) [NBT.2](#) [NBT.3](#)
- B. Use place value understanding and properties of operations to perform multi-digit arithmetic.
[NBT.4](#) [NBT.5](#) [NBT.6](#)

Number and Operations—Fractions (4.NF)

- A. Extend understanding of fraction **equivalence** and ordering.
[NF.1](#) [NF.2](#)
- B. Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers.
[NF.3](#) [NF.4](#)
- C. Understand **decimal notation** for fractions, and compare decimal fractions.
[NF.5](#) [NF.6](#) [NF.7](#)

Measurement and Data (4.MD)

- A. Solve problems involving measurement and conversions of measurements from larger units to smaller units.
[MD.1](#) [MD.2](#) [MD.3](#)
- B. Represent and interpret data.
[MD.4](#)

Geometry (4.G)

- A. Draw and identify lines and angles, and classify shapes by properties of their lines and angles.
[G.1](#) [G.2](#) [G.3](#)

Standards for Mathematical Practices

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

Click on the box to open specific details related to Grade Four!

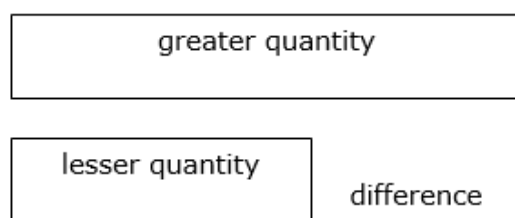
Operations and Algebraic Thinking 4.OA

(Counting and Cardinality and Operations and Algebraic Thinking Progression K-5 Pg. 29-31)

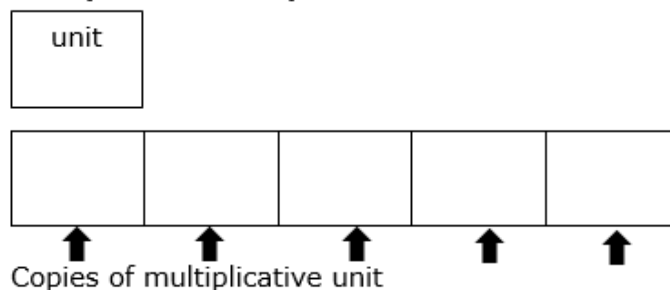
Use the four operations with whole numbers to solve problems.

- 4.OA.1. Interpret a multiplication equation as a comparison, (*e.g. interpret $35 = 5 \cdot 7$ 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.1)**
- 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.2)**

Additive Comparison



Multiplicative Comparison



- 4.OA.3. Solve multi-step word problem 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 situation equations and/or solution equations with a letter or symbol standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding. **(4.OA.3)**

For Example:

A clown had 20 balloons. He sold some and has 12 left. Each balloon costs \$2. How much money did he make?

Situation Equation: $20 - n = 12$

$$n \times \$2 = \square$$

Solution Equation: $20 - 12 = n$

$$n \times \$2 = \square$$

Gain familiarity with factors and multiples.

- 4.OA.4. Find all factor pairs for a whole number in the range 1 to 100. Recognize that a whole number is a multiple of each of its factors. Determine whether a given whole number in the range 1 to 100 is a multiple of a given one-digit number. Determine whether a given whole number in the range 1 to 100 is prime or composite. **(4.OA.4)**

Generate and analyze patterns.

- 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. **(4.OA.5)**

Number and Operations in Base Ten 4.NBT

[\(Numbers & Operations Base 10 Progression K-5 Pg. 13-17\)](#)

Generalize place value understanding for multi-digit whole numbers.

(Limited to whole numbers less than or equal to 1,000,000.)

- 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.1)**
- 4.NBT.2. Read and write multi-digit whole numbers using base-ten **numerals**, number names, expanded form, and **unit form**. Compare two multi-digit numbers based on meanings of the digits in each place, using $>$, $<$, $=$, and \neq symbols to record the results of comparisons. *(Note: Students should demonstrate understanding and application of place value decomposition. For example, 127 can be 1 hundred, 2 tens, 7 ones or 12 tens, 7 ones Refer to [2.NBT.1](#))* **(4.NBT.2)**
- 4.NBT.3. Use place value understanding to round multi-digit whole numbers to any place. **(4.NBT.3)**

Use place value understanding and properties of operations to perform multi-digit arithmetic.

- 4.NBT.4. Fluently ([efficiently, accurately, and flexibly](#)) add and subtract multi-digit whole numbers using an efficient algorithm (including, but not limited to: traditional, partial-sums, etc.), based on place value understanding and the properties of operations. **(4.NBT.4)**
- 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.5)**
- 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. **(4.NBT.6)**

Number and Operations—Fractions 4.NF

Extend understanding of fraction **equivalence** and ordering.

(Limited to fractions with denominators 2, 3, 4, 5, 6, 8, 10, 12, 100.)

([Number and Operations – Fractions Progression Pg. 3](#))

- 4.NF.1. Explain why a fraction $\frac{a}{b}$ is equivalent to a fraction $\frac{(n \cdot a)}{(n \cdot b)}$ 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.1)**
([Number and Operations—Fractions Progression 3–5 Pg. 6](#))
- 4.NF.2. Compare two fractions with different numerators and different denominators, (e.g. by creating common numerators or denominators, 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 relational symbols $>$, $<$, $=$, or \neq , and justify the conclusions, (e.g. by using visual fraction models.). **(4.NF.2)**

Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers.

(Limited to fractions with denominators 2, 3, 4, 5, 6, 8, 10, 12, 100.)

- 4.NF.3. Understand a fraction $\frac{a}{b}$ with $a > 1$ as a sum of fractions $\frac{1}{b}$.
- 4.NF.3a. Understand addition and subtraction of fractions as joining and separating parts referring to the same whole. **(4.NF.3a)**
- 4.NF.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. **(4.NF.3b)**
Examples: $\frac{3}{8} = \frac{1}{8} + \frac{1}{8} + \frac{1}{8}$; $\frac{3}{8} = \frac{1}{8} + \frac{2}{8}$; $2\frac{1}{8} = 1 + 1 + \frac{1}{8} = \frac{8}{8} + \frac{8}{8} + \frac{1}{8}$
- 4.NF.3c. Add and subtract mixed numbers with like denominators, e.g. by replacing each mixed number with an equivalent fraction (simplest form is not an expectation), and/or by using properties of operations and the relationship between addition and subtraction. **(4.NF.3c)**
- 4.NF.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. **(4.NF.3d)**
- 4.NF.4. Apply and extend previous understandings of multiplication (refer to [2.OA.3](#), [2.OA.4](#), [3.OA.1](#), [3.NF.1](#), [3.NF.2](#)) to multiply a fraction by a whole number.
- 4.NF.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 5 copies of $\frac{1}{4}$, recording the conclusion by the equation $\frac{5}{4} = 5 \cdot \frac{1}{4}$ **(4.NF.4a)**
- 4.NF.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 $3 \cdot \frac{2}{5}$ as $6 \cdot \frac{1}{5}$, recognizing this product as $\frac{6}{5}$. (In general, $n \cdot \frac{a}{b} = \frac{n \cdot a}{b}$.) **(4.NF.4b)**

- 4.NF.4c. Solve word problems involving multiplication of a fraction by a whole number, ([See Table 2](#)) (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? (4.NF.4c)

Understand decimal notation for fractions, and compare decimal fractions.

(Students are expected to learn to add decimals by converting them to fractions with the same denominator, in preparation for general fraction addition in grade 5.)

- 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 $\frac{3}{10}$ as $\frac{30}{100}$ and add $\frac{3}{10} + \frac{4}{100} = \frac{34}{100}$. (4.NF.5)
- 4.NF.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. (4.NF.6)
- 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 relational symbols $>$, $<$, $=$, or \neq , and justify the conclusions, (e.g. by using a visual model.). (4.NF.7)

Measurement and Data 4.MD

Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.

- 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.1)
([Measurement and Data \(measurement part\) Progression K–5 Pg. 20](#))
- 4.MD.2. Use the four operations to solve word problems ([See Table 1](#) and [Table 2](#)) 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.2)
- 4.MD.3. Apply the area and perimeter formulas for rectangles in real world and mathematical problems explaining and justifying the appropriate unit of measure. 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. (4.MD.3)

Represent and interpret data.

- 4.MD.4. Make a data display (line plot, bar graph, pictograph) to show a 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 the data display. For example, from a line plot find and interpret the difference in length between the longest and shortest specimens in an insect collection. (4.MD.4)

Geometry 4.G

([Geometry Progression K-6 Pg. 15-16](#))

Draw and identify lines and angles, and classify shapes by properties of their lines and angles.

- 4.G.1. Draw points, lines, line segments, rays, angles (right, acute, obtuse, straight, reflex), and perpendicular and parallel lines. Identify these in two-dimensional figures. **(4.G.1)**
- 4.G.2. Classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines, or the presence or absence of angles (right, acute, obtuse, straight, reflex). Recognize and categorize triangles based on angles (right, acute, obtuse, and equiangular) and/or sides (scalene, isosceles, and equilateral). **(4.G.2)**
- 4.G.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. **(4.G.3)**