

Grade 4 - Mathematics

Standard 1: Number Sense

Students understand the place value of whole numbers and decimals to two decimal places and how whole numbers and decimals relate to simple fractions.

4.1.1

Read and write whole numbers up to 1,000,000.

4.1.2

Identify and write whole numbers up to 1,000,000, given a place-value model.

4.1.3

Round whole numbers up to 10,000 to the nearest ten, hundred, and thousand.

4.1.4

Order and compare whole numbers using symbols for “less than” ($<$), “equal to” ($=$), and “greater than” ($>$).

4.1.5

Rename and rewrite whole numbers as fractions.

4.1.6

Name and write mixed numbers, using objects or pictures.

4.1.7

Name and write mixed numbers as improper fractions, using objects or pictures.

4.1.8

Write tenths and hundredths in decimal and fraction notations. Know the fraction and decimal equivalents for halves and fourths (e.g., $\frac{1}{2} = 0.5 = 0.50$, $\frac{7}{4} = 1\frac{3}{4} = 1.75$).

4.1.9

Round two-place decimals to tenths or to the nearest whole number.

Standard 2: Computation

Students solve problems involving addition, subtraction, multiplication, and division of whole numbers and understand the relationships among these operations. They extend their use and understanding of whole numbers to the addition and subtraction of simple fractions and decimals.

4.2.1

Understand and use standard algorithms for addition and subtraction.

4.2.2

Represent as multiplication any situation involving repeated addition.

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4.2.3

Represent as division any situation involving the sharing of objects or the number of groups of shared objects.

4.2.4

Demonstrate mastery of the multiplication tables for numbers between 1 and 10 and of the corresponding division facts.

4.2.5

Use a standard algorithm to multiply numbers up to 100 by numbers up to 10, using relevant properties of the number system.

4.2.6

Use a standard algorithm to divide numbers up to 100 by numbers up to 10 without remainders, using relevant properties of the number system.

4.2.7

Understand the special properties of 0 and 1 in multiplication and division.

4.2.8

Add and subtract simple fractions with different denominators, using objects or pictures.

4.2.9

Add and subtract decimals (to hundredths), using objects or pictures.

4.2.10

Use a standard algorithm to add and subtract decimals (to hundredths).

4.2.11

Know and use strategies for estimating results of any whole-number computations.

4.2.12

Use mental arithmetic to add or subtract numbers rounded to hundreds or thousands.

Standard 3: Algebra and Functions

Students use and interpret variables, mathematical symbols, and properties to write and simplify numerical expressions and sentences. They understand relationships among the operations of addition, subtraction, multiplication, and division.

4.3.1

Use letters, boxes, or other symbols to represent any number in simple expressions, equations, or inequalities (i.e., demonstrate an understanding of and the use of the concept of a variable).

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4.3.2

Use and interpret formulas to answer questions about quantities and their relationships.

4.3.3

Understand that multiplication and division are performed before addition and subtraction in expressions without parentheses.

4.3.4

Understand that an equation such as $y = 3x + 5$ is a rule for finding a second number when a first number is given.

4.3.5

Continue number patterns using multiplication and division.

4.3.6

Recognize and apply the relationships between addition and multiplication, between subtraction and division, and the inverse relationship between multiplication and division to solve problems.

4.3.7

Relate problem situations to number sentences involving multiplication and division.

4.3.8

Plot and label whole numbers on a number line up to 100. Estimate positions on the number line.

Standard 4: Geometry

Students show an understanding of plane and solid geometric objects and use this knowledge to show relationships and solve problems.

4.4.1

Identify, describe, and draw rays, right angles, acute angles, obtuse angles, and straight angles using appropriate mathematical tools and technology.

4.4.2

Identify, describe, and draw parallel, perpendicular, and oblique lines using appropriate mathematical tools and technology.

4.4.3

Identify, describe, and draw parallelograms, rhombuses, and trapezoids, using appropriate mathematical tools and technology.

4.4.4

Identify congruent quadrilaterals and give reasons for congruence using sides, angles, parallels, and perpendiculars.

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4.4.5

Identify and draw lines of symmetry in polygons.

4.4.6

Construct cubes and prisms and describe their attributes.

Standard 5: Measurement

Students understand perimeter and area, as well as measuring volume, capacity, time, and money.

4.5.1

Measure length to the nearest quarter-inch, eighth-inch, and millimeter.

4.5.2

Subtract units of length that may require renaming of feet to inches or meters to centimeters.

4.5.3

Know and use formulas for finding the perimeters of rectangles and squares.

4.5.4

Know and use formulas for finding the areas of rectangles and squares.

4.5.5

Estimate and calculate the area of rectangular shapes using appropriate units, such as square centimeter (cm^2), square meter (m^2), square inch (in^2), or square yard (yd^2).

4.5.6

Understand that rectangles with the same area can have different perimeters and that rectangles with the same perimeter can have different areas.

4.5.7

Find areas of shapes by dividing them into basic shapes such as rectangles.

4.5.8

Use volume and capacity as different ways of measuring the space inside a shape.

4.5.9

Add time intervals involving hours and minutes.

4.5.10

Determine the amount of change from a purchase.

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Standard 6: Data Analysis and Probability

Students organize, represent, and interpret numerical and categorical data and clearly communicate their findings. They show outcomes for simple probability situations.

4.6.1

Represent data on a number line and in tables, including frequency tables.

4.6.2

Interpret data graphs to answer questions about a situation.

4.6.3

Summarize and display the results of probability experiments in a clear and organized way.

Standard 7: Problem Solving

Students make decisions about how to approach problems and communicate their ideas.

4.7.1

Analyze problems by identifying relationships, telling relevant from irrelevant information, sequencing and prioritizing information, and observing patterns.

4.7.2

Decide when and how to break a problem into simpler parts.

4.7.3

Apply strategies and results from simpler problems to solve more complex problems.

4.7.4

Use a variety of methods, such as words, numbers, symbols, charts, graphs, tables, diagrams, tools, and models to solve problems, justify arguments, and make conjectures.

4.7.5

Express solutions clearly and logically by using the appropriate mathematical terms and notation. Support solutions with evidence in both verbal and symbolic work.

4.7.6

Recognize the relative advantages of exact and approximate solutions to problems and give answers to a specified degree of accuracy.

4.7.7

Know and use appropriate methods for estimating results of whole-number computations.

4.7.8

Make precise calculations and check the validity of the results in the context of the problem.

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4.7.9

Decide whether a solution is reasonable in the context of the original situation.

4.7.10

Note the method of finding the solution and show a conceptual understanding of the method by solving similar problems.