

Math Standards

Fourth Grade

Course Abilities

1 . Develop abilities in math.

- A. Higher thinking (analyze, evaluate, classify, predict, decide, estimate, generalize, solve, relate, interpret, simplify).
- B. Communications (present, persuade, collaborate, explain, recommend).
- C. Goal setting/attainment (brainstorm, envision, research, plan, organize, persist).
- D. The quality process (plan, draft, analyze, and revise when producing products).

2 . Be able to apply math knowledge and skills to a variety of purposes.

- A. Be able to solve one- and two-step problems using the four-step problem-solving method with time, money, and measurement in standard and metric units (determine problem, select operations, estimate, solve and label solution) and check for common sense.
- B. Be able to conduct research (locate, observe/gather, present).
- C. Be able to solve one-step problems using graphs, charts, tables, calculators and computers (safely, effectively efficiently, accurately).
- D. Possess technical skills:
 - read/write/present: instructions, table, chart, thank you letter, letter of request, letter of response, proposal, lab report, research report, summary
 - technology: word processing, database, Internet, AV production

Course Content

1. Be able to demonstrate mastery of multiplication and division.

- A. Be able to demonstrate fluency with multiplication and division facts.
- B. Be able to use an understanding of place value to multiply a number by 10, 100 and 1000.
- C. Be able to multiply multi-digit numbers, using standard algorithms.
- D. Be able to Estimate products and quotients of multi-digit whole numbers to assess the reasonableness of results.
For example: 53×38 is between 50×30 and 60×40 , or between 1500 and 2400, and $411/73$ is between 5 and 6..
- E. Be able to solve multi-step, real-world and mathematical problems with multi-digit whole numbers, using various strategies.
- F. Be able to use strategies and algorithms to divide multi-digit whole numbers by one- or two-digit numbers.

2 . Be able to represent and compare fractions.

- A. Be able to represent equivalent fractions using fraction models.
- B. Be able to locate, order, and compare whole numbers and fractions, including mixed numbers and improper fractions on a number line.
For example: Locate $\frac{5}{3}$ and $1\frac{3}{4}$ on a number line and give a comparison statement about these two fractions, such as " $\frac{5}{3}$ is less than $1\frac{3}{4}$."
- C. Be able to add and subtract fractions with like denominators.

3 . Be able to represent and compare decimals.

- A. Be able to read and write decimals with words and symbols; use place value to describe decimals in terms of thousands, hundreds, tens, ones, tenths, hundredths, and thousandths.

For example: Writing 362.45 is a shorter way of writing the sum:

3 hundreds + 6 tens + 2 ones + 4 tenths + 5 hundredths,
which can also be written as:
three hundred sixty-two and forty-five hundredths.

- B. Be able to compare and order decimals and whole numbers using place value, a number line and other models.
- C. Be able to read and write tenths and hundredths in decimal and fraction notations using words and symbols; know the fraction and decimal equivalents for halves and fourths.

For example: $\frac{1}{2} = 0.5 = 0.50$ and $\frac{7}{4} = 1\frac{3}{4} = 1.75$, which can also be written as one and three-fourths or one and seventy-five hundredths.

D. Be able to round decimals to the nearest tenth.

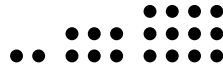
For example: The number 0.36 rounded to the nearest tenth is 0.4.

4 . Be able to understand and apply basic Algebraic skills.

A. Be able to create and use input-output rules involving addition, subtraction, multiplication and division to solve problems in various contexts. Record the inputs and outputs in a chart or table.

For example: If the rule is "multiply by 3 and add 4," record the outputs for given inputs in a table.

Another example: A student is given these three arrangements of dots:



Identify a pattern that is consistent with these figures, create an input-output rule that describes the pattern, and use the rule to find the number of dots in the 10th figure.

B. Be able to interpret number sentences involving multiplication, division, and unknowns.

For example: The number sentence $a \times b = 60$ can be represented by the situation in which chairs are being arranged in equal rows and the total number of chairs is 60.

C. Be able to use multiplication, division and unknowns to represent a given problem situation using a number sentence. Use number sense, properties of multiplication, and the relationship between multiplication and division to find values for the unknowns that make the number sentences true.

For example: If \$84 is to be shared equally among a group of children, the amount of money each child receives can be determined using the number sentence $84 \div n = d$.

Another example: Find values of the unknowns that make each number sentence true:

$$12 \times m = 36$$
$$s = 256 \div t$$

5 . Be able to name, describe, classify, and sketch polygons.

A. Be able to describe, classify and sketch triangles, including equilateral, right, obtuse and acute triangles. Recognize triangles in various contexts.

B. Be able to describe, classify and draw quadrilaterals, including squares, rectangles, trapezoids, rhombuses, parallelograms and kites. Recognize quadrilaterals in various contexts.

6 . Be able to understand angle and area as measurable attributes of objects.

A. Be able to measure angles with a protractor or angle ruler.

B. Be able to compare angles according to size. Classify angles as acute, right and obtuse.

For example: Compare different hockey sticks according to the angle between the blade and the shaft.

C. Be able to understand that the area of a two-dimensional figure can be found by counting the total number of same size square units that cover a shape without gaps or overlaps. Justify why length and width are multiplied to find the area of a rectangle by breaking the rectangle into one unit by one unit squares and viewing these as grouped into rows and columns.

For example: How many copies of a square sheet of paper are needed to cover the classroom door? Measure the length and width of the door to the nearest inch and compute the area of the door.

D. Be able to find the areas of geometric figures and objects which can be divided into rectangular shapes. Use square units to label area measurements.

7 . Be able to understand points, lines, and their relationships.

A. Be able to identify rays, points, and line segments.

B. Be able to identify parallel, perpendicular, and intersecting lines.

8 . Be able to use translations, reflections and rotations to establish congruency and understand symmetries.

- A. Be able to apply translations (slides) to figures.
- B. Be able to apply reflections (flips) to figures by reflecting over vertical or horizontal lines and relate reflections to lines of symmetry.
- C. Be able to apply rotations (turns) of 90° clockwise or counterclockwise.
- D. Be able to recognize that translations, reflections and rotations preserve congruency and use them to show that two figures are congruent.

9 . Be able to collect, organize, display and interpret data.

- A. Be able to use and produce tables, bar graphs, timelines and Venn diagrams to display data sets. The data may include fractions or decimals. Understand that spreadsheet tables and graphs can be used to display data.

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