

Grade Level Expectations for the Sunshine State Standards

Mathematics Fifth Grade



FLORIDA DEPARTMENT OF EDUCATION

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**Sunshine State Standards
Grade Level Expectations
Mathematics
Fifth Grade**

The fifth grade student:

Number Sense, Concepts, and Operations

- reads, writes, and identifies whole numbers, fractions, mixed numbers, and decimals through thousandths.
- reads, writes, and identifies common percents including 10%, 20%, 25%, 30%, 40%, 50%, 60%, 70%, 75% , 80%, 90%, and 100%.
- compares and orders whole numbers, commonly used fractions, percents, and decimals to thousandths using concrete materials, number lines, drawings, numerals, and symbols ($>$, $<$, $=$).
- translates problem situations into diagrams, models, and numerals using whole numbers, fractions, mixed numbers, decimals, and percents.
- knows that numbers in different forms are equivalent or nonequivalent, using whole numbers, decimals, fractions, mixed numbers, and percents.
- knows that place value relates to powers of 10.
- expresses numbers to millions or more in expanded form using powers of ten, with or without exponential notation.
- explains the similarities and differences between the decimal (base 10) number system and other number systems that do or do not use place value.
- explains and demonstrates the multiplication of common fractions using concrete materials, drawings, story problems, symbols, and algorithms.
- explains and demonstrates the multiplication of decimals to hundredths using concrete materials, drawings, story problems, symbols, and algorithms.
- predicts the relative size of solutions in the following:
 - addition, subtraction, multiplication, and division of whole numbers
 - addition, subtraction, and multiplication of fractions, decimals, and mixed numbers, with particular attention given to fraction and decimal multiplication (for example, when two numbers less than one are multiplied, the result is a number less than either factor)
- explains and demonstrates the inverse nature of multiplication and division, with particular attention to multiplication by a fraction (for example, multiplying by $\frac{1}{4}$ yields the same result as dividing by 4).
- explains and demonstrates the commutative, associative, and distributive properties of multiplication.
- uses problem-solving strategies to determine the operation(s) needed to solve one- and two-step problems involving addition, subtraction, multiplication, and division of whole numbers, and addition, subtraction, and multiplication of decimals and fractions.

**Sunshine State Standards
Grade Level Expectations
Mathematics
Fifth Grade**

- solves real-world problems involving addition, subtraction, multiplication, and division of whole numbers, and addition, subtraction, and multiplication of decimals, fractions, and mixed numbers using an appropriate method (for example, mental math, pencil and paper, calculator).
- chooses, describes, and explains estimation strategies used to determine the reasonableness of solutions to real-world problems.
- estimates quantities of objects to 1000 or more and justifies and explains the reasoning for the estimate (for example, using benchmark numbers, unitizing).
- finds factors of numbers to 100 to determine if they are prime or composite.
- expresses a whole number as a product of its prime factors.
- determines the greatest common factor or the least common multiple of two numbers up to 100 or more.
- multiplies by powers of 10 (100, 1,000, and 10,000) demonstrating patterns.
- identifies and applies rules of divisibility for 2, 3, 4, 5, 6, 9, and 10.
- uses models to identify perfect squares to 144.

Measurement

- knows measurement concepts and uses oral and written language to communicate them.
- knows varied units of time that include centuries and seconds and uses schedules, calendars, and elapsed time to solve real-world problems.
- classifies angle measures as acute, obtuse, right, or straight.
- investigates measures of circumference using concrete materials (for example, uses string or measuring tape to measure the circumference of cans or bottles).
- solves real-world problems involving measurement of the following:
 - length (for example, eighth-inch, kilometer, mile)
 - weight or mass (for example, milligram, ton)
 - temperature (comparing temperature changes within the same scale using either a Fahrenheit or a Celsius thermometer)
 - angles (acute, obtuse, straight)
- solves real-world problems involving perimeter, area, capacity, and volume, using concrete, graphic or pictorial models and extends conceptual experiences into patterns to develop formulas for determining perimeter, area, and volume.
- finds the length or height of “hard-to-reach” objects by using the measure of a portion of the objects (for example, find the height of a room or building by finding the height of one block or floor and multiplying by the number of blocks or floors).
- uses customary and metric units to compare length, weight or mass, and capacity or volume.

**Sunshine State Standards
Grade Level Expectations
Mathematics
Fifth Grade**

- uses multiplication and division to convert units of measure within the customary or metric system.
- knows an appropriate unit of measure (standard or nonstandard) to measure length, weight, and capacity.
- knows how to determine whether an accurate or estimated measurement is needed for a solution.
- solves real-world problems involving estimated measurements, including the following:
 - length to nearest quarter-inch, centimeter
 - weight to nearest ounce, gram
 - time to nearest one-minute interval
 - temperature to nearest five-degree interval
 - money to nearest \$1.00.
- knows how to estimate the area and perimeter of regular and irregular polygons and how to estimate the volume of a rectangular prism.
- selects an appropriate measurement unit for labeling the solution to real-world problems.
- selects and uses the appropriate tool for situational measures (for example, measuring sticks, scales and balances, thermometer, measuring cups, gauges, protractors).

Geometry and Spatial Sense

- uses appropriate geometric vocabulary to describe properties and attributes of two- and three-dimensional figures (for example, obtuse and acute angles, radius, equilateral, scalene, and isosceles triangles.).
- draws and classifies two-dimensional figures having ten or more sides and three-dimensional figures (cubes, rectangular prisms, pyramids).
- knows the characteristics of and relationships among points, lines, line segments, rays, and planes.
- uses manipulatives to solve problems requiring spatial visualization.
- knows symmetry, congruency, and reflections in geometric figures.
- knows how to justify that two figures are similar or congruent.
- knows the effect of a flip, slide or turn (90° , 180° , 270°) on a geometric figure.
- explores tessellations.
- compares the concepts of area, perimeter, and volume using concrete materials (for example, geoboards, grid paper) and real-world situations (for example, tiling a floor, bordering a room, packing a box).
- applies the concepts of area, perimeter, and volume to solve real-world and mathematical problems using student-developed formulas.

**Sunshine State Standards
Grade Level Expectations
Mathematics
Fifth Grade**

- knows how area and perimeter are affected when geometric figures are combined, rearranged, enlarged, or reduced (for example, What happens to the area of a square when the sides are doubled?).
- identifies, locates, and plots ordered pairs of whole numbers on a graph or on the first quadrant of a coordinate system.

Algebraic Thinking

- describes, extends, creates, predicts, and generalizes numerical and geometric patterns using a variety of models (for example, lists, tables, graphs, charts, diagrams, calendar math).
- poses and solves problems by identifying a predictable visual or numerical pattern such as:

Day	1	2	3	4	...	n
Number of Calls	4	7	10	?		?
- explains and expresses numerical relationships and pattern generalizations, using algebraic symbols (for example, in the problem above, the number of calls on the n th day can be expressed as $3n+1$).
- knows mathematical relationships in patterns (for example, Fibonacci numbers: 1, 1, 2, 3, 5, 8,...).
- analyzes and generalizes number patterns and states the rule for relationships (for example, 1, 4, 9, 16, ...; the rule: +3, +5, +7, ...; or “squares of the whole numbers”).
- applies the appropriate rule to complete a table or a chart, such as:

IN	1	2	3	9
OUT	1	4	9	?
- solves problems involving simple equations or inequalities using concrete or pictorial models, symbolic expressions, or written phrases.
- uses a variable to represent a given verbal expression (for example, 5 more than a number is $n + 5$).
- translates equations into verbal and written problem situations.

Data Analysis and Probability

- knows which types of graphs are appropriate for different kinds of data (for example, bar, line, or circle graphs).
- interprets and compares information from different types of graphs including graphs from content-area materials and periodicals.
- generates questions, collects responses, and displays data on a graph.
- creates an appropriate graph to display data, including titles, labels, scales, and intervals.

**Sunshine State Standards
Grade Level Expectations
Mathematics
Fifth Grade**

- interprets and completes circle graphs using common fractions or percents.
- analyzes and explains orally or in writing the implications of graphed data.
- uses a stem-and-leaf plot from a set of data to identify the range, median, mean, and mode.
- uses range and measures of central tendency in real-world situations.
- uses a calculator to determine the range and mean of a set of data.
- uses computer applications (including spreadsheets) to record, display, examine, and evaluate data and to construct labeled graphs.
- determines the number of possible combinations of given items and displays them in an organized way.
- represents all possible outcomes for a simple probability situation or event using models such as , organized lists, charts, or tree diagrams.
- calculates the probability of a particular event occurring from a set of all possible outcomes.
- identifies and records the possible outcomes of an experiment using concrete materials (for example, spinners, marbles, number cubes).
- conducts experiments to test predictions.
- designs a survey to collect data.
- as a class project, discusses ways to choose a sample representative of a large group such as a sample representative of the entire school
- applies statistical data to predict trends and to make and justify generalizations.



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