

**MATHEMATICS
CONTENT
STANDARDS
FOR CHRISTIAN
UNIFIED SCHOOLS
OF SAN DIEGO**

**Sixth Grade
Parent Handbook**



Standards for Mathematics

Number Sense

1.0 Comparing and Ordering Numbers

By the end of sixth grade, your child will:

- 1.1 Compare and order positive and negative fractions, decimals, and mixed numbers and place them on a number line.
- 1.2 Interpret and use ratios in different contexts (e.g., batting averages, miles per hour) to show the relative sizes of two quantities, using appropriate notations (a/b, a to b, a:b).
- 1.3 Use proportions to solve problems (e.g., determining the value on N if $\frac{4}{7} = \frac{N}{21}$, finding the length of a side of a polygon similar to a known polygon). Use cross-multiplication of both sides of an equation by a multiplicative inverse.
- 1.4 Calculate given percentages of quantities and solve problems involving discounts at sales, interest earned, and tips.

2.0 Calculating

By the end of sixth grade, your child will:

- 2.1 Solve problems involving addition, subtracting, multiplication, and division of positive fractions and explain why a particular operation was used for a given situation.
- 2.2 Explain the meaning of multiplication and division of positive fractions and perform the calculations (e.g., $\frac{5}{8} \div \frac{15}{16} = \frac{5}{8} \times \frac{16}{15} = \frac{2}{3}$).
- 2.3 Solve addition, subtraction, multiplication, and division problems, including those arising in concrete situations that use positive and negative integers and combinations of these operations.
- 2.4 Determine the least common multiple and the greatest common divisor of whole numbers; use them to solve problems with fractions (e.g., to find a common denominator to add two fractions or to find the reduced form for a fraction).
- 2.5 Identify/find percent of a whole, group, set, or number.
- 2.6 Write percents as fractions and decimals
- 2.7 Calculate sales tax and find the total price of a given discounted item.

Algebra and Functions

1.0 Simple Expressions

By the end of sixth grade, your child will:

- 1.1 Write and solve one-step linear equations with one variable.

- 1.2 Write and evaluate an algebraic expression for a given situation.
- 1.3 Apply algebraic order of operations and the commutative, associative, and distributive properties to evaluate expressions; and justify each step in the process.
- 1.4 Solve problems manually by using the correct order of operations.
- 1.5 Solve problems involving linear functions with integer values; write the equation; and graph the resulting ordered pairs of integers on a grid.

2.0 Rates and Proportions

By the end of sixth grade, your child will:

- 2.1 Convert one unit of measurement to another (e.g., from feet to miles, from centimeters to inches).
- 2.2 Demonstrate an understanding that rate is a measure of one quantity per unit value of another quantity.
- 2.3 Solve problems involving rates, average speed, distance, and time.
- 2.4 Solve proportions using cross products.
- 2.5 Solve percent problems using ratios.
- 2.6 Use ratios to determine actual counts of given items.

3.0 Patterns

By the end of sixth grade, your child will:

- 3.1 Use variables in expressions describing geometric quantities (e.g., $P = 2W + 2L$, $A = \frac{1}{2}bh$, $C = \pi d$ – the formulas for the perimeter of a rectangle, the area of a triangle, and the circumference of a circle, respectively).
- 3.2 Express in symbolic form simple relationships arising from geometry.

Measurement and Geometry

1.0 Area and Volume

By the end of sixth grade, your child will:

- 1.1 Understand the concept of a constant such as π ; knowing the formulas for the circumference and area of a circle
- 1.2 Know the common estimates of pi (3.14; $\frac{22}{7}$) and use these values to estimate and calculate the circumference and area of a circle; compare with actual measurements.
- 1.3 Know and use the formulas for the volume of triangular prisms and cylinders (area of base x height); compare these formulas and explain the similarity between them and the formula for the volume of a rectangular solid.
- 1.4 Derive and use the formula for the area of a triangle and of a parallelogram by comparing it with the formula for the area of a rectangle (e.g., two of the same triangles make a parallelogram with twice the area;

a parallelogram is compared with a rectangle of the same area by cutting and pasting a right triangle on the parallelogram).

- 1.5 Find the area of complex shapes by dividing them into smaller shapes.

2.0 Geometry

By the end of sixth grade, your child will:

- 2.1 Identify angles as vertical, adjacent, complementary, or supplementary and provide descriptions of these terms.
- 2.2 Use the properties of complementary and supplementary angles and the sum of the angles of a triangle to solve problems involving an unknown angle.
- 2.3 Draw quadrilaterals and triangles from given information about them (e.g., a quadrilateral having equal sides but no right angles, a right isosceles triangle).
- 2.4 Graph shapes on a coordinate plane using a line of symmetry
- 2.5 Bisect angles and lines using a compass and a straightedge.

Statistics, Data Analysis, and Probability

1.0 Data

By the end of sixth grade, your child will:

- 1.1 Compute the range, mean, median, and mode of data sets.
- 1.2 Understand how additional data added to data sets may affect these computations of measures of central tendency.
- 1.3 Understand how the inclusion or exclusion of outliers affects measures of central tendency.
- 1.4 Know why a specific measure of central tendency (mean, median, mode) provides the most useful information in a given context.
- 1.5 Identify the mode(s) for sets of categorical data and the mode(s), median, and any apparent outlier for numerical data sets.

2.0 Limitations

By the end of sixth grade, your child will:

- 2.1 Compare different samples of a population with the data from the entire population and identify a situation in which it makes sense to use a sample.
- 2.2 Identify different ways of selecting a sample (e.g., convenience sampling, response to a survey, random sampling) and which method makes a sample more representative of a population.
- 2.3 Analyze data displays and explain why the way in which the question was asked might have influenced the results obtained and why the way in which the results were displayed might have influenced the conclusions reached.

- 2.4 Identify data that represent sampling errors and explain why the sample (and the display) might be biased.
- 2.5 Identify claims based on statistical data and, in simple cases, evaluating the validity of claims.

3.0 Probabilities

By the end of sixth grade, your child will:

- 3.1 Represent possible outcomes for events in an organized way.
- 3.2 Use data to estimate the probability of future events (e.g., batting averages or number of accidents per mile driven).
- 3.3 Represent probabilities as ratios, proportions, decimals between 0 and 12, and percentages between 0 and 100 and verify the probabilities computed are reasonable.
- 3.4 Understand the difference between independent and dependent events.

Mathematical Reasoning

1.0 Making Decisions About a Problem

By the end of sixth grade, your child will:

- 1.1 Analyze problems by identifying relationships, distinguishing relevant from irrelevant information, and observing patterns.
- 1.2 Formulate and justify mathematical conjectures based on a general description of the mathematical question or problem posed.
- 1.3 Determine when and how to break a problem into smaller parts.

2.0 Solving Problems and Justify Reasoning

By the end of sixth grade, your child will:

- 2.1 Use estimation to verify the reasonableness of results.
- 2.2 Apply strategies and results from simpler problems to more complex problems.
- 2.3 Estimate unknown quantities graphically and solve them using logical reasoning and arithmetic and algebraic techniques.
- 2.4 Use a variety of methods, such as words, numbers, symbols, charts, graphs, tables, diagrams, and models, to explain mathematical reasoning.
- 2.5 Express the solution clearly and logically by using the appropriate mathematical notation and terms and clear language; support solutions to problems and give answers to a specified degree of accuracy.
- 2.6 Indicate relative advantages of exact and approximate solutions to problems and give answers to a specified degree of accuracy.
- 2.7 Make precise calculations and check the validity of the results from the context of the problem.

3.0 Make Connections

By the end of sixth grade, your child will:

- 3.1 Evaluate the reasonableness of the solution in the context of the original situation.
- 3.2 Note the method of deriving the solution and demonstrate a conceptual understanding of the derivation by solving similar problems.
- 3.3 Develop generalizations of the results obtained and the strategies used and apply them in new circumstances.
- 3.4 Recognize God as the creator of Earth and founder of mathematic principles.
- 3.5 Recognize the attributes of God evident in mathematics (e.g., orderly, unchanging, absolute)