

SAUSALITO MARIN CITY SCHOOL DISTRICT

Mathematics Standards - GRADE 5

By the end of fifth grade, students increase their facility with the four basic arithmetic operations applied to positive and negative numbers, fractions and decimals. They know and use common measuring units to determine length and area; they know and use formulas to determine the volume of simple geometric figures. Students know the concept of angle measurement and use a protractor and compass in solving problems. They use grids, tables, graphs, and charts to record and analyze data.

NUMBER SENSE

1. Students compute with very large and very small numbers, positive and negative numbers, decimals and fractions and understand the relationship between decimals, fractions and percents. They understand the relative magnitudes of numbers.

1.1. estimate, round, and manipulate very large (e.g., millions) and very small (e.g., thousandths) numbers

+1.2. interpret percents as part of a hundred; find decimal and percent equivalents for common

fractions; explain why they represent the same value; and compute a given percent of a whole number

1.3. understand and compute positive integer powers of non-negative integers; compute examples as repeated multiplication

+1.4. determine the prime factors of all numbers through 50 and write numbers as the product of their prime factors using exponents to show multiples of a factor (e.g., $24 = 2 \times 2 \times 2 \times 3 = 2^3 \times 3$)

+1.5. identify and represent positive and negative integers, decimals, fractions and mixed numbers on a number line

1.6. write and solve real world problems involving addition and subtraction of fractions

2. Students perform calculations and solve problems involving addition, subtraction and simple multiplication and division of fractions and decimals.

+2.1. add, subtract, multiply and divide with decimals and negative numbers and verify the reasonableness of the results

+2.2. are proficient with division, including division with positive decimals and long division with multiple digit divisors

+2.3. solve simple problems including ones arising in concrete situations involving the addition and subtraction of fractions and mixed

numbers (like and unlike denominators of 20 or less) and express answers in simplest form

2.4. understand the concept of multiplication and division of fractions

2.5. compute and perform simple multiplication and division of fractions and apply these procedures to solving problems

2.6. use a variety of strategies (e.g., estimation, rounding, mental math, paper and pencil) to solve computation problems

(1) explain thinking orally and in writing

(2) show two ways to solve a given problem

ALGEBRA AND FUNCTIONS

1. Students use variables in simple expressions, compute the value of the expression for specific values of the variable, and plot and interpret the results.

1.1. use information taken from a graph or equation to answer questions about a problem situation

+1.2. use a letter to represent an unknown number; write and evaluate simple algebraic expressions in one variable by substitution

1.3. know and use the distributive property in equations and expressions with variables

+1.4. identify and graph ordered pairs in the four quadrants of the coordinate plane

+1.5. solve problems involving linear functions with integer values, write the equation, and graph the resulting ordered pairs of integers on a grid

MEASUREMENT AND GEOMETRY

1. Students understand and compute volumes and areas of simple objects.

+1.1. derive and use the formula for the area of right triangles and of parallelograms by comparing with the area of rectangles (i.e., two of the same triangles make a rectangle with twice the area; a parallelogram is compared to a rectangle with the same area found by cutting and pasting a right triangle on the parallelogram)

+1.2. construct cube and rectangular boxes from two-dimensional patterns and use this to compute the surface area for these objects

+1.3. understand the concept of volume and use the appropriate units in common measuring systems (cubic centimeter, cubic meter, cubic inches, cubic yard) to compute the volume of

rectangular solids

1.4. differentiate between and use appropriate units of measures for two- and three-dimensional objects (perimeter, area and volume)

2. Students identify, describe, draw and classify properties of, and relationships between, plane and solid geometric figures.

+2.1. measure, identify and draw angles, perpendicular and parallel lines, rectangles and triangles, using appropriate tools (e.g., straight edge, ruler, compass, protractor and drawing software)

+2.2. know that the sum of the angles of any triangle is 180 and the sum of the angles of any quadrilateral is 360 and use this information to solve problems

2.3. visualize and draw two-dimensional views of three-dimensional objects made from rectangular solids

STATISTICS, DATA ANALYSIS and PROBABILITY

1. Students display, analyze, compare and interpret different data sets, including data sets that are not the same size.

1.1. know the concepts of mean, median, and mode; compute and compare them in simple examples and notice that they can differ

1.2. organize and display single-variable data in appropriate graphs and representations (e.g., histogram, circle graphs) and explain which types of graphs are appropriate for different kinds of data sets

1.3. use fractions and percentages to compare data sets of different size

+1.4. identify ordered pairs of data from a graph and interpret the meaning of the data in terms of the situation depicted by the graph

+1.5. know how to write ordered pairs correctly (e.g., (x, y))

MATHEMATICAL REASONING

1. Students make decisions about how to approach problems.

1.1. analyze problems by identifying relationships, discriminating relevant from irrelevant information, sequencing and prioritizing and observing patterns

1.2. determine when and how to break a problem into simpler parts

2. Students use strategies, skills and concepts in finding solutions.

2.1. use estimation to verify the reasonableness of calculated results

2.2. apply strategies and results from simpler problems to more complex problems

2.3. use a variety of methods such as words, numbers, symbols, charts, graphs, tables, diagrams and models to explain mathematical reasoning

2.4. express the solution clearly and logically using appropriate mathematical notation and terms and clear language, and support solutions with evidence, in both verbal and symbolic work

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

2.6. make precise calculations and check the validity of the results from the context of the problem

3. Students move beyond a particular problem by generalizing to other situations.

3.1. evaluate the reasonableness of the solution in the context of the original situation

3.2. note method of deriving the solution and demonstrate conceptual understanding of the derivation by solving similar problems

3.3. develop generalizations of the results obtained and extend them to other circumstances