

**The South Pasadena Math Content Standards
K-5**

Kindergarten.....	2
1.0 Number Sense.....	2
2.0 Algebraic Functions.....	2
3.0 Measurement and Geometry.....	3
4.0 Statistics, Data, Analysis, and Probability.....	3
5.0 Mathematical Reasoning.....	3
Grade 1.....	5
1.0 Number Sense.....	5
2.0 Algebraic Functions.....	6
3.0 Measurement and Geometry.....	6
4.0 Statistics, Data, Analysis, and Probability.....	7
5.0 Mathematical Reasoning.....	7
Grade 2.....	8
1.0 Number Sense.....	8
2.0 Algebraic Functions.....	9
3.0 Measurement and Geometry.....	9
4.0 Statistics, Data, Analysis, and Probability.....	10
5.0 Mathematical Reasoning.....	10
Grade 3.....	12
1.0 Number Sense.....	12
2.0 Algebraic Functions.....	13
3.0 Measurement and Geometry.....	13
4.0 Statistics, Data, Analysis, and Probability.....	14
5.0 Mathematical Reasoning.....	15
Grade 4.....	17
1.0 Number Sense.....	17
2.0 Algebraic Functions.....	18
3.0 Measurement and Geometry.....	19
4.0 Statistics, Data, Analysis, and Probability.....	20
5.0 Mathematical Reasoning.....	20
Grade 5.....	22
1.0 Number Sense.....	22
2.0 Algebraic Functions.....	23
3.0 Measurement and Geometry.....	23
4.0 Statistics, Data, Analysis, and Probability.....	24
5.0 Mathematical Reasoning.....	25

The South Pasadena Math Content Standards

Kindergarten

1.0 Number Sense

1.1 Students understand the relationship between numbers and quantities, i.e., that a set of objects has the same number of objects in different situations, regardless of its position or arrangement.

1.1.1 Count, recognize, represent, name, and order numbers (through 30) using objects.

1.1.2 Compare two or more sets (up to 10 objects in each group), and identify which set is equal to, more than, or less than the other.

1.1.3 Know that the larger numbers describe sets with more objects in them than smaller numbers.

1.2 Students understand and describe simple addition and subtraction situations.

1.2.1 Model and solve simple addition and subtraction problem situations (for two numbers each less than 10), using concrete objects, drawings, and counting.

1.3 Students understand fractions as parts of a whole.

1.3.1 Recognize fractions of a whole and parts of a group.

1.4 Students understand money and its values.

1.4.1 Identify a specific coin (penny, nickel, dime, quarter, and dollar) and can determine its value.

1.5 Students use estimation strategies in computation and problem solving that involve numbers that use the ones and tens places.

1.5.1 Recognize when an estimate is reasonable.

2.0 Algebraic Functions

2.1 Students identify, describe, and extend simple patterns.

2.1.1 Identify, sort, and classify objects by attribute and identify objects that do not belong to a particular grouping (e.g., all these balls are green, those are red).

2.1.2 Identify, describe, and extend simple patterns involving shape, size, or color, or two or more of those attributes.

3.0 Measurement and Geometry

3.1 Students understand that there are properties such as length, weight, capacity, and time and that comparisons can be made by using these properties.

3.1.1 Compare the length, weight, and capacity of objects by making direct comparisons or using reference objects (e.g., shorter/longer/taller, lighter/heavier, which holds more?).

3.1.2 Measure length, mass, and/or volume using standard and non-standard measuring tools.

3.1.3 Identify the time (to the nearest hour).

3.1.4 Demonstrate understanding of concepts of time (e.g., morning, afternoon, evening, day, days of the week, yesterday, tomorrow, week, year) including tools that measure time (e.g., clock, calendar).

3.2 Students identify common geometric objects in their environment and describe their features.

3.2.1 Identify, describe, and compare common plane geometric objects (e.g., circle, triangle, square, rectangle).

3.2.2 Identify, describe, and compare common solid objects (e.g., cube, sphere, and cone).

4.0 Statistics, Data, Analysis, and Probability

4.1 Students collect information about objects and events in their environment.

4.1.1 Pose information questions, collect data, and record the results using objects, pictures, and picture graphs.

5.0 Mathematical Reasoning

5.1 Students make decisions about how to set up a problem.

5.1.1 Decide about the approach, materials, and strategies to use.

5.1.2 Use tools and strategies such as manipulative or sketches to model problems.

5.2 Students solve problems in reasonable ways and justify reasoning.

5.2.1 Explain the reasoning used with concrete objects and pictorial representations.

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

5.2.3 Predict outcomes and make reasonable estimates.

The South Pasadena Math Content Standards

Grade 1

1.0 Number Sense

1.1 Students understand and use numbers up to 100.

1.1.1 Count, read, and write whole numbers to 100.

1.1.2 Represent equivalent forms of the same number through the use of physical models, diagrams, and number expressions (to 20).

1.1.3 Compare and order whole numbers to 100 using the symbols for less than, equal to, or greater than ($<$, $=$, $>$).

1.1.4 Count and group objects into ones and tens (e.g., 3 groups of ten and 4 more is 34 or $30 + 4$).

1.2 Students demonstrate the meaning of addition and subtraction and use these operations to solve problems.

1.2.1 Know the addition facts (sums to 20) and the corresponding subtraction facts, and commit them to memory.

1.2.2 Use the inverse relationship between addition and subtraction to solve problems.

1.2.3 Identify one more than, one less than, ten more than, ten less than a given number.

1.2.4 Count by 2s, 5s, and 10s with numbers to 100.

1.2.5 Show the meaning of addition (putting together, increasing) and subtraction (taking away, comparing, finding the difference).

1.2.6 Solve addition and subtraction problems with one- and two-digit numbers (e.g. $5 + 58 = \underline{\quad}$).

1.2.7 Find the sum of three one-digit numbers.

1.3 Students understand fractions as parts of a whole.

1.3.1 Recognize, name, and compare fractions of a whole and parts of a group.

1.4 Students understand money and its values.

1.4.1 identify and know the value of coins and show different combinations of coins that equal the same value.

1.5 Students use estimation strategies in computation and problem solving that involve numbers that use the ones, tens, and hundreds places.

5.1.1 Make reasonable estimates when comparing larger or smaller numbers.

2.0 Algebraic Functions

2.1 Students create and solve problems using words, symbols, drawings, and objects.

2.1.1 Create problem situations that could lead to number sentences involving addition and subtraction.

2.1.2 Write and solve number sentences from problem situations that express relationships involving addition and subtraction.

2.1.3 Use and understand the meaning of the symbols $+$, $-$, $=$.

2.2 Students sort objects, and create, complete, and describe patterns involving numbers, shape, size, rhythm, or color.

2.2.1 Recognize, describe, extend and explain how to get to the next term in linear patterns (e.g., 4, 8, 12, ...; the number of ears on 1, 2, 3, 4, ... horses).

2.2.2 Create and solve problems involving simple number patterns.

3.0 Measurement and Geometry

3.1 Students use direct comparison and non-standard units to describe the measurement of objects.

3.1.1 Measure and compare the length, weight, and volume of two or more objects using direct comparison or a non-standard unit.

3.1.2 Tell time to the nearest half-hour and compare time related to events (e.g., before/after, shorter/longer).

3.1.3 Demonstrate an understanding of larger amounts of time (e.g. date, days of the week, days in the month, and months in the year).

3.1.4 Tell the temperature to the nearest degree in Celsius and Fahrenheit scales.

3.2 Students identify common geometric figures, classify them by common attributes, and describe their relative position/or their location in space.

3.2.1 Construct, identify, describe, and compare familiar plane objects (e.g., points, line segments, triangles, rectangles, squares, and circles).

3.2.2 Construct solid objects and classify them by their faces, edges, and vertices. Explain which attributes are being used for classification.

3.2.3 Give and follow directions about location.

3.2.4 Describe and arrange objects in space in terms of proximity, position, and direction (e.g., near, far, below, above, up, down, behind, in front of, next to, left/right).

4.0 Statistics, Data, Analysis, and Probability

4.1 Students collect, organize, represent, and compare categorical data on simple graphs and charts.

4.1.1 Sort objects and data by common attributes and describe the groups formed using categorical labels.

4.1.2 Represent and compare data (e.g., largest, smallest, often, least often), using pictures, bar graphs, tally charts, and picture graphs, and explain how the data was organized and represented.

5.0 Mathematical Reasoning

5.1 Students make decisions about how to set up a problem.

5.1.1 Decide about the approach, materials, and strategies to use.

5.1.2 Use tools and strategies such as manipulatives or drawing sketches to model problems.

5.2 Students solve problems and justify their reasoning.

5.2.1 Explain the reasoning used and justify the procedures selected with concrete objects and pictorial representations.

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

5.2.3 Predict outcomes and make reasonable estimates.

5.3 Students note connections between one problem and another.

The South Pasadena Math Content Standards

Grade 2

1.0 Number Sense

1.1 Students understand the relationship among numbers, quantities, and place value in whole numbers up to 1000.

1.1.1 Count, read, and write whole numbers to 1,000, including skip counting.

1.1.2 Order and compare whole numbers up to 1,000 using the symbols $<$, $=$, $>$.

1.1.3 Use words, models, and expanded form to represent number (to 1,000) and identify the place value for each digit.

1.2 Students estimate, calculate, and solve problems involving addition and subtraction of two-and three-digit numbers.

1.2.1 Find the sum or difference of two whole numbers up to three digits long (using place value concepts mentally and with paper/pencil).

1.2.2 Understand and use the inverse relationship between addition and subtraction (e.g., an opposite number for $8 + 6 = 14$ is $14 - 6 = 8$) to solve problems and check solutions.

1.3 Students model and solve simple problems involving multiplication and division.

1.3.1 Use repeated addition, arrays, counting by multiples, finding area to do multiplication.

1.3.2 Use repeated subtraction, equal sharing, and forming equal groups to do division with remainders.

1.3.2 Know the multiplication tables of 2s, 5s, and 10s (to "times 10") and commit to memory.

1.4 Students understand fractions and decimals and can refer to parts of a set and parts of a whole.

1.4.1 Recognize, name, and compare unit fractions up to $1/12$.

1.4.2 Recognize fractions of a whole and parts of a group (e.g., $1/4$ th of a pie, $2/3$ rds of 15 balls).

1.4.3 Know that when all fractional parts are included, such as four-fourths, the result is equal to the whole and to one.

1.5 Students model and solve problems by representing, adding, and subtracting amounts of money.

1.5.1 Solve problems using combinations of coins and bills.

1.5.2 Know and use the decimal notation and the dollar and cents symbols for money.

1.6 Students use estimation strategies in computation and problem solving that involve numbers that use the ones, tens, hundreds, and thousands places.

1.6.1 Recognize when an estimate is reasonable.

2.0 Algebraic Functions

2.1 Students create and solve problems involving addition and subtraction.

2.1.1 Create and relate problem situations and number sentences involving addition, subtraction, multiplication, and division.

2.1.2 Create and solve addition subtraction, multiplication, and division problems using data from simple charts, pictures, graphs, and number sentences.

2.1.3 Use the commutative and associative rules to simplify.

2.2 Students demonstrate an understanding of patterns and how they grow, and describe them in general ways.

2.2.1 Recognize, describe, extend, and explain how to get to next term in linear patterns (e.g., 4, 8, 12,...; or the number of ears on 1 horse, 2 horses, 3 horses, 4 horses,...).

2.2.2 Create and solve problems involving simple geometric patterns.

3.0 Measurement and Geometry

3.1 Students understand that measurement is accomplished by identifying a unit of measure, repeating that unit and comparing it to the item to be measured.

3.1.1 Measure the length of objects by repeating a non-standard or standard unit.

3.1.2 Use different units to measure the same object and predict whether the measure will be greater or smaller when a different unit is used.

3.1.3 Measure the length of an object to the nearest inch and/or centimeter.

3.1.4 Tell time to the nearest quarter hour and know time relationships (e.g., minutes in an hour, days in a month, weeks in a year).

3.1.5 Determine the duration of time intervals in hours (e.g., 11:00 a.m. to 4:00 p.m.).

3.1.6 Tell temperature to the nearest degree in Celsius and Fahrenheit scales.

3.2 Students identify and describe the elements that compose common figures in the plane and common objects in space.

3.2.1 Construct, describe, and classify plane geometric shapes (e.g., points, line segments, circle, triangle, square, and rectangle) according to the number and shape of the sides and angles.

3.2.2 Construct and describe solid geometric shapes (e.g., sphere, pyramid, cube, and rectangular prism) and classify them according to the number and shape of faces, edges, and vertices.

3.2.3 Put shapes together and take them apart to form other shapes (e.g., two congruent right triangles can form a rectangle).

4.0 Statistics, Data, Analysis, and Probability

4.1 Students collect, record, organize, display, and interpret numerical data on bar graphs and other representations.

4.1.1 Collect and record numerical data in systematic ways, keeping track of what/who has been counted.

4.1.2 Represent the same data set in more than one way (e.g., charts with tallies, and bar graphs).

4.1.3 Identify features of data sets (range, median, and mode).

4.1.4 Ask and answer simple questions related to data representations.

5.0 Mathematical Reasoning

5.1 Students make decisions about how to set up a problem.

5.1.1 Decide about the approach, materials, and strategies to use.

5.1.2 Use tools and strategies such as manipulatives or drawing sketches to model problems.

5.2 Students solve problems and justify their reasoning.

5.2.1 Defend the reasoning used and justify the procedures selected with concrete objects and pictorial representations.

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

5.2.3 Predict outcomes and make reasonable estimates.

5.3 Students note connections between one problem and another.

5.3.1 Develop generalizations of the results obtained and extend them to other concepts, including other school subjects and the real world.

The South Pasadena Math Content Standards

Grade 3

1.0 Number Sense

1.1 Students understand place value of whole numbers up to 10,000.

1.1.1 Count, read, and write whole numbers to 10,000 including skip counting.

1.1.2 Compare and order whole numbers up to 10,000.

1.1.3 Identify the place value for each digit in numbers to 10,000.

1.1.4 Use words, models, benchmark numbers, and expanded form to represent numbers (up to 10,000).

1.1.5 Round off numbers to 10,000 to the nearest ten, hundred, and thousand.

1.2 Students estimate, calculate, and solve problems involving addition, subtraction, multiplication, and division.

1.2.1 Find the sum or difference of two whole numbers between 0 and 10,000.

1.2.2 Memorize to automaticity the multiplication table for numbers between 1 and 10.

1.2.3 Use the inverse relationship of multiplication and division to compute and check results.

1.2.4 Solve simple problems involving multiplication of multi-digit numbers by one-digit numbers.

1.2.5 Solve division problems in which a multi-digit number is evenly divided by a one-digit number.

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

1.2.7 Determine the unit cost when given the total cost and number of units.

1.2.8 Solve problems which combine two or more of the skills above.

1.3 Students understand the relationship between whole numbers, simple fractions, and decimals.

1.3.1 Compare fractions represented by drawings or concrete materials to show the meaning of the numerator and denominator, to compare fractions, and to show equivalency (e.g., $\frac{1}{2}$ of a pizza is

= to $\frac{2}{4}$ of another pizza that is the same size; show that $\frac{3}{8}$ is more than $\frac{1}{8}$).

1.3.2 Add and subtract simple fractions in equations and in context.

1.3.3 Solve problems involving addition, subtraction, multiplication, and division of money amounts in decimal notation and multiply and divide money amounts in decimal notation using whole number multipliers and divisors.

1.3.4 Know and understand that fractions and decimals values are two different representations of the same concept.

2.0 Algebraic Functions

2.1 Students select appropriate symbols, operations and properties to represent, describe, simplify, and solve simple number relationships.

2.1.1 Represent relationships of quantities in the form of mathematical expressions, equations, or inequalities.

2.1.2 Solve problems involving numeric equations or inequalities.

2.1.3 Select appropriate operational and relational symbols to make an expression true (e.g., $4 _ 3 = 12$, what operation symbol goes in the blank?).

2.1.4 Recognize and use the commutative and associative properties of multiplication (e.g., if $5 * 7 = 35$, what is $7 * 5$?) and properties of 0 and 1 to solve computations and check results.

2.1.5 Express simple unit conversions in symbolic form (e.g., # of inches = # of feet * 12).

2.2 Students represent and interpret numerical and geometric patterns and simple functional relationships.

2.2.1 Recognize, describe, and extend a numeric pattern by its rules (e.g., the number of legs on a given number of horses can be calculated by counting by 4s or by multiplying the number of horses by 4).

2.2.2 Recognize, describe, and extend geometric patterns.

2.2.3 Solve simple problems involving a functional relationship between two quantities (e.g., find the total cost of multiple items given the per unit cost).

3.0 Measurement and Geometry

3.1 Students choose and use appropriate units and measurement tools to estimate and measure objects.

3.1.1 Choose appropriate units (metric and U.S. customary) and tools, and estimate and measure length, liquid volume, and weight/mass.

3.1.2 Estimate and determine the area and volume of solid figures by covering them with squares or counting the number of cubes that would fill them.

3.1.3 Estimate and find the perimeter and area of a polygonal shape with integer sides.

3.1.4 Tell time to the nearest minute, including converting hours/minutes.

3.1.5 Carry out simple unit conversions within a system of measurement (e.g., centimeters and meters, hours and minutes).

3.1.6 Relate temperatures to appropriate activities.

3.2 Students describe and compare the attributes of plane and solid geometric figures and use their understanding to show relationships and solve problems.

3.2.1 Identify, name, describe, and classify two-dimensional shapes (including points, line segments, rays, angles, vertices, right angles, perpendicular, parallel and intersecting lines, pentagons, and beyond).

3.2.2 Identify and describe the attributes of triangles (e.g., two equal sides for the isosceles triangle, three equal sides for the equilateral triangle, and right triangle).

3.2.3 Identify and describe the attributes of quadrilaterals (e.g., parallel sides for the parallelogram, right angles for the rectangle, equal sides and right angles for the square).

3.2.4 Identify right angles in geometric figures and objects in the environment, and determine whether other angles are greater or less than a right angle.

3.2.4 Visualize, identify, name, describe, and classify common three-dimensional geometric objects (e.g., cube, rectangular solid, sphere, prism, pyramid, cone, and cylinder).

3.2.6 Combine and take apart common three-dimensional objects to construct new three-dimensional objects.

4.0 Statistics, Data, Analysis, and Probability

4.1 Students collect, record, organize, display, and interpret data.

4.1.1 Collect, record, and represent numerical data in more than one way.

4.1.2 Identify features of data sets (range, maximum, mean, median, mode, etc.).

4.1.3 Draw conclusions from data.

4.2 Students collect data and conduct simple probability experiments by determining the number of possible outcomes, and make simple predictions.

4.2.1 Identify whether common events are certain, likely, unlikely, or improbable.

4.2.2 Record the possible outcomes for a simple event (e.g., tossing a coin) and systematically keep track of the outcomes when the event is repeated many times.

4.3.3 Summarize and display the results of probability experiments in a clear and organized way (e.g., use a bar graph or line plot).

4.4.4 Use the results of probability experiments to predict future events (e.g., use a line plot to predict the temperature forecast for the next day), recognizing that the predictions include a degree of uncertainty.

5.0 Mathematical Reasoning

5.1 Students make decisions about how to approach problems.

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

5.1.2 Determine when and how to break a problem into simpler parts.

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

5.2.1 Express the solution clearly and logically using appropriate mathematical notation, terms and clear language, and support solutions with evidence, in both verbal and written work.

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

5.2.3 Predict outcomes and use estimation to verify the reasonableness of calculated results.

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

5.2.5 Use a variety of methods such as words, numbers, symbols,

charts, graphs, tables, diagrams, and models to explain mathematical reasoning.

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

5.3 Students move beyond a particular problem to other situations by making generalizations, summary statements, and posing new, related questions and comments.

5.3.1 Evaluate the reasonableness of the solution in the context of the original situation.

5.3.2 Note method of deriving the solution and demonstrate conceptual understanding of the derivation by solving similar problems.

The South Pasadena Math Content Standards

Grade 4

1.0 Number Sense

1.1 Students understand place value of whole numbers and decimals to two decimal places, how these relate to simple fractions, and use concepts of negative numbers.

1.1.1 Read and write whole numbers in the millions.

1.1.2 Order and compare whole numbers and decimals to two decimal places.

1.1.3 Identify the relative position of fractions, mixed numbers, and decimals to two decimal places on the number line.

1.1.4 Decide when a rounded solution is called for, and explain why this is the case.

1.1.5 Write the fraction representation by a drawing of parts of a figure; represent a given fraction using drawings.

1.1.6 Use concepts of negative numbers (e.g., on a number line, in counting, in temperature, "owing").

1.1.7 Interpret different meanings for fractions including parts of a whole, parts of a set, indicated division of whole numbers, and quantities (and measures) between whole numbers on a number line; and relate to simple decimals on a number line.

1.1.8 Write tenths and hundredths in decimal and fraction notation and know fraction/decimal equivalents for halves and fourths (e.g., $1/2=0.5$ or $.50$ $7/4 = 1 \frac{3}{4} = 1.75$).

1.2 Students extend their use and understanding of whole numbers to addition and subtraction of simple decimals.

1.2.1 Estimate and compute the sum or difference of whole numbers and positive decimals to two places.

1.2.2 Round two place decimals to one place decimals or the nearest whole number, and use rounding to judge the reasonableness of the answer.

1.2.3 Demonstrate understanding of, and the ability to use standard algorithms for addition and subtraction of multi-digit numbers.

1.2.4 Demonstrate understanding of, and ability to use standard algorithms for multiplying a multi-digit number by a two digit number and long division for dividing a multi-digit number by a one digit number; use relationships between them to simplify computations and to check results.

1.2.5 Solve problems involving multiplication of multi-digit numbers by two-digit numbers.

1.2.6 Solve problems involving division of multi-digit numbers by one-digit numbers.

1.3 Students know how to factor small whole numbers.

1.3.1 Understand that many whole numbers decompose in different ways (e.g., $12 = 4 * 3 = 2 * 6 = 2 * 2 * 3$).

1.3.2 Know that numbers such as 2, 3, 5, 7, 11 do not have any factors except 1 and themselves, and that such numbers are called prime numbers.

2.0 Algebraic Functions

2.1 Students use and interpret variables, mathematics symbols, and properties to write and simplify expressions and sentences.

2.1.1 Use letters, boxes, or other symbols to stand for any number in simple expressions or equations (e.g., demonstrate understanding and use of a concept of a variable).

2.1.2 Interpret and evaluate mathematical expressions that use parentheses.

2.1.3 Use parentheses to indicate which operation to perform first when writing expressions containing more than two terms and different operations.

2.2 Students know how to manipulate equations.

2.2.1 Know and understand that with an equation such as $y=3x + 5$, given one number, the second number can be determined.

2.2.2 Know and understand that equals added to equals are equal.

2.2.3 Know and understand that equals multiplied by equals are equal.

2.3 Students use two-dimensional coordinate grids to represent points, graph lines, and simple figures.

2.3.1 Identify and graph ordered pairs in the four quadrants of the coordinate plane.

2.3.2 Draw the points corresponding to linear relationships on graph paper (e.g., draw the first ten points for the equation $y = 3x$ and connect them using a straight line).

2.4 Students use two-dimensional coordinate grids to represent points, graph lines, and simple figures.

2.4.1 Identify and graph ordered pairs in the four quadrants of the coordinate plane.

2.4.2 Draw the points corresponding to linear relationships on graph paper (e.g., draw the first ten points for the equation $y = 3x$ and connect them using a straight line).

2.4.3 Understand that the length of a horizontal line segment equals the difference of the x-coordinates.

2.4.4 Understand that the length of a vertical line segment equals the difference of the y-coordinates.

3.0 Measurement and Geometry

3.1 Students understand perimeter and area.

3.1.1 Measure the area of rectangular shapes, using appropriate units square centimeter, square meter, square kilometer, square inches, square yards, and square miles.

3.1.2 Recognize that the rectangles having the same area can have different perimeters.

3.1.3 Understand that the same number can be the perimeter of different rectangles, each having a different area.

3.1.4 Use and interpret formulas (e.g., area = length times width) to answer questions about quantities and their relationships.

3.1.5 Understand and use formulas to solve problems involving perimeters and areas of rectangles and squares. Use these formulas to find the areas of more complex figures by dividing them into parts with these basic shapes.

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

3.2.1 Identify lines that are parallel and perpendicular.

3.2.2 Identify the radius and diameter of a circle.

3.2.3 Identify congruent figures.

3.2.4 Identify figures that have bilateral and rotational symmetry.

3.2.5 Know the definitions of right angle, acute angle, and obtuse angle. Understand that 90, 180, 270, and 360 degrees are associated with $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$ and full turns.

3.2.6 Know the definitions of different triangles (e.g., equilateral, isosceles, scalene) and identify their features.

3.2.7 Know the definitions of different quadrilaterals (e.g., rhombus, square, rectangle, parallelogram, trapezoid).

3.2.8 Visualize, describe, and represent geometric solids (e.g., prisms, pyramids, etc.) in terms of the number and shape of faces, edges, vertices; interpret two-dimensional representations of three-dimensional objects; and draw patterns (of faces) for a solid that when folded will make a model of the solid.

4.0 Statistics, Data, Analysis, and Probability

4.1 Students organize, represent, and interpret numerical and categorical data, and clearly communicate their findings.

4.1.1 Identify the mode(s) for sets of categorical data, and the mode(s), median, mean, range, and any apparent outliers for the numerical data sets.

4.1.2 Formulate survey questions, systematically collect and represent data.

4.1.3 Interpret one-and two-variable data graphs to answer questions about a situation.

4.2 Students make predictions for simple probability situations.

4.2.1 Represent all possible outcomes for simple probability situations in an organized way (e.g., tables, grids, tree diagrams).

4.2.2 Express outcomes of experimental probability situations verbally and numerically (e.g., 3 out of 4 or $3/4$).

5.0 Mathematical Reasoning

5.1 Students make decisions about how to approach problems.

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

5.1.2 Determine when and how to break a problem into simpler parts.

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

5.2.1 Use estimation to verify the reasonableness of calculated results.

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

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

5.2.4 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.

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

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

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

5.3.1 Evaluate the reasonableness of the solution in the context of the original situation.

5.3.2 Note method of deriving the solution and demonstrate conceptual understanding of the derivation by solving similar problems.

5.3.3 Develop generalizations of the results obtained and extend them to other circumstances.

The South Pasadena Math Content Standards

Grade 5

1.0 Number Sense

1.1 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.

1.1.1 Estimate, round and manipulate very large (e.g., millions) and very small (e.g. thousandths) numbers.

1.1.2 Identify and represent positive and negative integers, decimals, fractions, and mixed numbers on a number line.

1.1.3 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.

1.2 Students use calculators and solve problems involving addition, subtraction, and simple multiplication and division of fractions and decimals.

1.2.1 Add, subtract, multiply, and divide with decimals and negative numbers and verify the reasonableness of the results.

1.2.2 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.

1.2.3 Are proficient with division, including division with positive decimals and long division with multiple digit divisors.

1.2.4 Understand the concept of multiplication and division of fractions.

1.2.5 Compute and perform simple multiplication and division of fractions and apply these procedures to solving problems.

1.3 Students know how to factor whole numbers and use exponents.

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

1.3.2 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., $24 = 2*2*2*3 = 2^3*3$).

2.0 Algebraic Functions

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

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

2.1.2 Know and use the distributive property in equations and expressions with variables.

2.1.3 Evaluate and simplify equations including those requiring an understanding of order of operation.

2.2 Students know how to manipulate equations.

2.2.1 Know and understand that with an equation such as $y=3x + 5$, given one number, the second number can be determined.

2.2.2 Know and understand that anything added, subtracted, multiplied, or divided to one side of the equation, must be added, subtracted, multiplied, or divided by the other side of the equation.

2.3 Students use two-dimensional coordinate grids to represent points, graph lines, and simple figures.

2.3.1 Identify and graph ordered pairs in the four quadrants of the coordinate plane.

2.3.2 Identify ordered pairs of data from a graph and interpret the meaning of the data in terms of the situation depicted by the graph.

2.3.3 Solve problems involving linear functions with integer values, write the equation, and graph the resulting ordered pair of integers on a grid.

2.3.4 Use information taken from a graph or equation to answer questions about a problem situation.

2.3.5 Solve simple problems involving rates, average speed, distance, and time.

3.0 Measurement and Geometry

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

3.1.1 Understand the concept of volume and use the appropriate units in common measuring systems (cubic centimeter, cubic meter, cubic inches, cubic yards) to compute the volume of rectangular solids.

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

3.1.3 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).

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

3.2.1 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).

3.2.2 Identify the radius, diameter, and chords of a circle.

3.2.3 Derive the common estimates of π (3.14 or $22/7$) by using a ratio of the actual measurements between the circumference and diameter of a circle.

3.2.4 Identify congruent figures.

3.2.5 Understand the properties of complementary and supplementary angles and of angles of a triangle.

3.2.6 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.

3.2.7 Visualize and draw two-dimensional views of three-dimensional objects made from rectangular solids.

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

4.0 Statistics, Data, Analysis, and Probability

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

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

4.1.2 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.

4.1.3 Identify different ways of selecting a sample (e.g., convenience sampling, those who respond to a survey, random sampling) and which makes a sample more representative for a population.

4.1.4 Use fractions and percentages to compare data sets of different size.

4.2 Students determine theoretical and experimental probabilities and use these to make predictions about events.

4.2.1 Represent all possible outcomes for compound events in an organized way (e.g. tables, grids, tree diagrams) and express the theoretical probability of each outcome.

5.0 Mathematical Reasoning

5.1 Students make decisions about how to approach problems.

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

5.1.2 Determine when and how to break a problem into simpler parts.

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

5.2.1 Use estimation to verify the reasonableness of calculated results.

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

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

5.2.4 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.

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

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

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

5.3.1 Evaluate the reasonableness of the solution in the context of the original situation.

5.3.2 Note method of deriving the solution and demonstrate conceptual understanding of the derivation by solving similar problems.

5.3.3 Develop generalizations of the results obtained and extend them to other circumstances.

1.0