Shepherd of the Hills Christian School
Math Scope and Sequence

*denotes year concept is taught
X denotes concept is reviewed or implemented in current concepts

Students will be able to:	K	1	2	3	4	5	6	7	8
Count, read and write whole numbers to 100.	*	X	X	X	X	X	X	X	X
Demonstrate understanding of place value in whole numbers; recognize the use of 0 in place value.	*	X	X	X	X	X	X	X	X
Use ordinal numbers to count objects in order (first through tenth).	*	X	X	X	X	X	X	X	X
Group objects and use patterns to count them by ones, twos, fives, and tens.	*	X	X	X	X	X	X	X	X
Express understanding of the plus, minus, and equal symbols.	*	X	X	X	X	X	X	X	X
Explain the meaning of addition in several ways (e.g., putting together, increasing) and the meaning of subtraction in several ways (e.g., taking away, finding the difference).	*	X	X	X	X	X	X	X	X
Express the concept of one-half as compared to a whole, using numbers and a group of objects.	*	X	X	X	X	X	X	X	X
Describe repeating patterns of numbers, sizes, shapes, rhythms, or colors observed in groups or objects or data.	*	X	X	X	X	X	X	X	X
Predict the next element in a simple repeating pattern (of numbers, sizes, shapes, rhythms, or colors).	*	X	X	X	X	X	X	X	X
Label a repeating pattern according to similar attributes (e.g., AABA; XO, XOO, XOOO).	*	X	X	X	X	X	X	X	X
Derive a number sentence from a problem situation, expressing a relationship involving addition or subtraction; explain the reasoning behind choosing the procedure selected.	*	X	X	X	X	X	X	X	X
Compare the length and weight of two or more objects by using a nonstandard unit (such as bigger, thinner, greater, etc.). Discuss why fixed fixed units of measurement are useful.	*	X	X	X	X	X	X	X	X
Use vocabulary terms to order a time sequence, such as yesterday, today, and tomorrow; spring, summer, fall winter; morning, noon, and night.	*	X	X	X	X	X	X	X	X
Identify, describe, and compare triangles, rectangles, squares, and circles.	*	X	X	X	X	X	X	X	X
Recognize, geometric shapes in the classroom and other environments.	*	X	X	X	X	X	X	X	X
Use calendars to identify the date, week, month, and year.	*	X	X	X	X	X	X	X	X
Identify and know the value of coins, and show different combinations of coins that equal the same thing.	*	X	X	X	X	X	X	X	X

Describe objects by proximity, position, and direction, using terms such as near, far, below, above, up, down, behind, in front, next to, left, and right.	*	X	X	X	X	X	X	X	X
Sort objects and data by commonalities and classify them into categories; reclassify the objects or numbers in a set according to a different set of criteria or characteristics.	*	X	X	X	X	X	X	X	X
Collect data about the students and their surroundings on charts, using tally marks to record the data.	*	X	X	X	X	X	X	X	X
Compare data (e.g. largest, smallest, most, least often) and represent the data using picture graphs or bar graphs.	*	X	X	X	X	X	X	X	X
Draw conclusions by interpreting data from a simple picture or bar graph.	*	X	X	X	X	X	X	X	X
Compare whole numbers ranging from 1 to 100 using the symbols for less than, equal to, or greater than.		*	X	X	X	X	X	X	X
Identify 1 more, 1 less, 10 more, 10 less than a given number.		*	X	X	X	X	X	X	X
Recognize and memorize the addition facts with sums up to 20, as well as the corresponding subtraction facts; use pictures, models, and groupings to demonstrate these facts.		*	X	X	X	X	X	X	X
Recognize the logical connection between addition and subtraction (an inverse relationship), and make decisions about how to use this relationship in problem-solving situations.		*	X	X	X	X	X	X	X
Recognize equivalent forms of the same number through the use of physical models and manipulatives, diagrams and drawings, or number sentences (e.g., 3 + 3 = 4 + 2).		*	X	X	X	X	X	X	X
Solve addition and subtraction number sentences with one- and two-digit numbers; use this process in solving mathematical and real-world problems.		*	X	X	X	X	X	X	X
Find the sum of three one-digit numbers.		*	X	X	X	X	X	X	X
Make estimates when comparing larger and smaller numbers in addition or subtraction; then, check to verify whether or not the estimates were reasonable.		*	X	X	X	X	X	X	X
Count backward from 30.		*	X	X	X	X	X	X	X
Identify odd and even numbers from 1 to12.		*	X	X	X	X	X	X	X
Identify an element that does not belong in a simple pattern.		*	X	X	X	X	X	X	X
Tell time to the nearest half hour (before and after) and relate time by comparisons (shorter, longer, using analog and digital clocks.		*	X	X	X	X	X	X	X
Combine, pennies, nickels and dimes to equal one dollar.		*	X	X	X	X	X	X	X
Distinguish between two-dimensional and three-dimensional shapes.		*	X	X	X	X	X	X	X
Explore the symmetries of objects and shapes.		*	X	X	X	X	X	X	X

Begin to develop a spatial sense by giving and following directions about the location of objects.		*	X	X	X	X	X	X	X
Use words, models, pictures, and groups of objects to represent numbers.			*	X	X	X	X	X	X
Identify numbers as combinations of tens and ones.			*	X	X	X	X	X	X
Recognize the purpose of zero as a placeholder, and describe what happens when zero is added or subtracted from a number.			*	X	X	X	X	X	X
Use the symbols <, =,> to compare ad order whole numbers to 1,000; use other qualitative terms (bigger, taller, slower, same as) to make comparisons (using formal, as well as mathematical language)			*	X	X	X	X	X	X
Read number words and ordinal numbers through 100.			*	X	X	X	X	X	X
Round one and two digit numbers to the nearest 10.			*	X	X	X	X	X	X
Demonstrate fluency in knowing addition and subtraction facts through 20; add and subtract multiples of 10.			*	X	X	X	X	X	X
Use mental math to find the sum or difference of two two- digit numbers that do not require regrouping.			*	X	X	X	X	X	X
Solve addition problems (with and without regrouping) and subtraction problems (without regrouping) using up to three digit numbers.			*	X	X	X	X	X	X
Demonstrate understanding of the relationship of odd and even numbers in addition and subtraction (e.g. two odd numbers equals and even number)			*	X	X	X	X	X	X
Begin to study division through the use of repeated subtraction and forming equal groups from a single set.			*	X	X	X	X	X	X
Recognize that fractions such as 3/3 and 7/7, where all fractional parts are included, are equal to one or one whole.			*	X	X	X	X	X	X
Represent numbers in equivalent ways.			*	X	X	X	X	X	X
Begin to use symbols within a number sentence to indicate unknown quantities.			*	X	X	X	X	X	X
Relate problem situations to corresponding addition or subtraction number sentences; make decisions about and explain the strategies to be used.			*	X	X	X	X	X	X
Evaluate the reasonableness of a solution by considering appropriate estimates and by considering the context of the original problem.			*	X	X	X	X	X	X
Improve in problem-solving by prioritizing pertinent information and disregarding irrelevant information.			*	X	X	X	X	X	X
Recognize that adding numbers in any order results in the same sum; recognize that adding numbers grouped in any order results in the same sum; explore why these rules do not apply to subtraction.			*	X	X	X	X	X	X

Identify and extend linear numerical patterns; use patterns to solve problems.			*	X	X	X	X	X	X
Identify a nonstandard unit of measure and iterate that unit to measure the length of an object. Then use a standard unit of measure and compare the results.			*	X	X	X	X	X	X
Measure an object to the nearest inch, foot, yard, centimeter, and meter.			*	X	X	X	X	X	X
Use different standard units of measurement when making estimates, recognize if the estimate is reasonable, and use the appropriate tool to check on the validity of the estimate.			*	X	X	X	X	X	X
Demonstrate the relationship of various measure of time.			*	X	X	X	X	X	X
Tell time to the nearest quarter and half hour, using analog and digital clocks, distinguish between a.m. and p.m.			*	X	X	X	X	X	X
Recognize and use the dollar and cent symbols and the proper placement of the decimal point to indicate amounts of money.			*	X	X	X	X	X	X
Use addition and subtraction to solve problems involving combinations of coins and bills.			*	X	X	X	X	X	X
Describe and classify common geometric two- and three-dimensional objects using characteristics such as number and shape of faces, edges, and angles, and identifying these shapes within the classroom environment.			*	X	X	X	X	X	X
Identify two-dimensional shapes that are congruent or similar.			*	X	X	X	X	X	X
Create symmetrical patterns, shapes, and designs.			*	X	X	X	X	X	X
Collect and record data in systematic, categorical way; interpret the data on a graph or chart by asking and answering simple questions.			*	X	X	X	X	X	X
Use the data on a graph or chart to demonstrate a conclusion in the form of an addition or subtraction number sentence; explain the reasoning used in making the conclusion.			*	X	X	X	X	X	X
Make comparative verbal and numerical descriptions of the range of data on a chart or graph.			*	X	X	X	X	X	X
Determine the mode in a series of charted or graphed items; represent data in more than one way			*	X	X	X	X	X	X
Recognize patterns in graphed data; identify inappropriate or false conclusions about a set of data; and, on the basis of the data, predict if something is more or less likely to occur.			*	X	X	X	X	X	X
Compare, order, read, and write numbers to 10,000.				*	X	X	X	X	X
Identify the place value for each digit in numbers to 10,000; use expanded notation to represent this.				*	X	X	X	X	X
Round off numbers to the nearest tens, hundreds, and thousands.				*	X	X	X	X	X
Use addition and subtraction with numbers up to 10,000.				*	X	X	X	X	X
Memorize multiplication tables for numbers 1-10.				*	X	X	X	X	X

Explore the unique properties of 0 and 1 in multiplication and division.				*	X	X	X	X	X
Solve simple problems involving multi-digit numbers multiplied or divided by a one-digit number.				*	X	X	X	X	X
Verbalize how the remainder in a division expression could impact a real-life situation.				*	X	X	X	X	X
Represent fractions and mixed numbers with numerals, concrete materials, drawings, and words.				*	X	X	X	X	X
Locate whole and fractional numbers on a number line.				*	X	X	X	X	X
Use drawings and concrete materials to compare fractions, determining equivalency or if greater or less than.				*	X	X	X	X	X
Demonstrate that fractions and decimals are different ways to represent the same concept.				*	X	X	X	X	X
Add and subtract numbers using simple fractions or decimals.				*	X	X	X	X	X
Choose appropriate operational symbols to make an expression true.				*	X	X	X	X	X
Solve problems and demonstrate relationships of numerical quantities using expressions, equations, or inequalities, working with and without a calculator.				*	X	X	X	X	X
Apply strategies and results from simpler problems to solve more complex problems.				*	X	X	X	X	X
Recognize that the commutative and associative properties, as used with addition, also can be used with multiplication; explore why these properties do not work with subtraction and division.				*	X	X	X	X	X
Recognize and extend a linear pattern after determining its pattern or rule; recognize that unlike addition, multiplication may involve different units.				*	X	X	X	X	X
Develop and use strategies for making reasonable estimates.				*	X	X	X	X	X
Determine and use the appropriate tools and units to measure length, liquid volume and weight.				*	X	X	X	X	X
Read thermometers and compare temperatures in both Fahrenheit and Celsius				*	X	X	X	X	X
Carry out simple unit conversion within a measurement system.				*	X	X	X	X	X
Count money and make change using coins and bills up to $10.				*	X	X	X	X	X
Identify and draw points, lines, and segments.				*	X	X	X	X	X
Make a physical model to show different angles; identify angles are right, acute, obtuse, and straight angles.				*	X	X	X	X	X
Classify and describe polygons using exact vocabulary.				*	X	X	X	X	X
Determine the perimeter of simple geometric shapes.				*	X	X	X	X	X
Explore the area and volume of solid figures through several means, such as by covering them with equal-size squares or counting the number of cubes needed to fill them.				*	X	X	X	X	X

Identify and classify common three-dimensional geometric objects and find examples in the classroom environment; recognize the shapes from a different perspective.				*	X	X	X	X	X
Explore symmetry using a mirror; find the line of symmetry of non-geometrical shapes, such as in some of the letters in the alphabet.				*	X	X	X	X	X
Find and name locations on a labeled grid or coordinate system.				*	X	X	X	X	X
Construct and interpret graphs with intervals larger than one.				*	X	X	X	X	X
Use fractions to interpret information on a timeline.				*	X	X	X	X	X
Identify the range and mode of graphed data.				*	X	X	X	X	X
Use probability experiments to predict future events as likely, unlikely, or impossible.				*	X	X	X	X	X
Design a survey or investigation to collect information regarding a given question; choose suitable procedures; display information gathered; and explain and justify the process used to draw conclusions.				*	X	X	X	X	X
Read and write numbers in the millions and use extended notation to explain the place value.					*	X	X	X	X
Determine when to round off numbers and explain the reasoning behind the decision; round off numbers to the nearest ten, hundred, thousand, ten thousand, and hundred thousand.					*	X	X	X	X
Explore the concept of negative numbers on a number line, in counting, in temperature, and in finances.					*	X	X	X	X
Apply an understanding and ability to use algorithms for adding and subtracting multi-digit numbers to solve problems.					*	X	X	X	X
Apply an understanding and ability to use algorithms for multiplying multi-digit numbers by two-digit numbers to solve problems.					*	X	X	X	X
Apply an understanding and ability to use algorithms for dividing multi-digit numbers by a one digit number to solve problems.					*	X	X	X	X
Know multiplication facts through 12 times 12 and develop use of strategies and patterns to help retention of these facts; use various models, including sets and arrays to represent multiplication facts; estimate products and quotients beyond the basic facts.					*	X	X	X	X
Use left-to-right multiplication and the distributive property to find an exact answer using mental math, without using paper, pencil or calculator.					*	X	X	X	X
Explore the numbers 2,3,5,7, and 11 as prime numbers that do not have any factors except 1 and themselves.					*	X	X	X	X
Be able to explain fractions verbally and through models or drawings as parts of a whole, parts of a set, a division of whole numbers by whole numbers, and demonstrating fractional equivalency.					*	X	X	X	X

Order and compare numbers that include decimals to two decimal places using the symbols <,=,>; write and compare fractions of tenths and hundredths to their decimal equivalents.					*	X	X	X	X
Rename and rewrite whole numbers as fractions; analyze improper fractions and mixed numbers; represent fractions and decimals on a number line.					*	X	X	X	X
Use letters, boxes, or other symbols to stand for any number in simple expressions, equalities, or inequalities.					*	X	X	X	X
Recognize that an equation such as y=x+3 can be used for finding a second number when a first number is given; demonstrate understanding of the concepts of a variable.					*	X	X	X	X
Understand and use parentheses to show which operation to perform first in an equation.					*	X	X	X	X
Manipulate equations based on an understanding that equals added to equals are equal, and equals multiplied by equals are equal.					*	X	X	X	X
Determine when to break a problem into simpler parts; apply strategies from a simpler problem to a more complex problem.					*	X	X	X	X
Analyze and solve problem situations by determining relationships, excluding irrelevant and identifying missing information, prioritizing and sequencing pertinent information, and observing patterns.					*	X	X	X	X
Express clearly, logically, verbally, and symbolically the procedures and operations used to solve a problem or draw a conclusion; recognize when a strategy does not work, and then try a new approach.					*	X	X	X	X
Use estimation, the context of a problem, and technological tools to check the reasonableness and the validity of results obtained. Determine if it is better to overestimate or underestimate in a given situation.					*	X	X	X	X
Use formulas to solve problems involving perimeters or rectangular shapes; know how perimeters relate to areas and volume.					*	X	X	X	X
Measure the area of rectangular shapes using the appropriate units.					*	X	X	X	X
Recognize volume and capacity as ways of describing the space inside a shape.					*	X	X	X	X
Use logical reasoning to make sense of monetary transactions, solving problems involving counting money and making change.					*	X	X	X	X
Make simple unit conversion within a measurement system.					*	X	X	X	X
Use formal geometric terms to identify parallel, intersecting, and perpendicular lines.					*	X	X	X	X

Identify the attributes of different triangles based on side lengths or on angle measures; use the appropriate tools and technology to draw examples of make models of them.					*	X	X	X	X
Identify attributes of different quadrilaterals, such as rhombus, square, rectangle, parallelogram, and trapezoid; use the appropriate tools and technology to draw examples of make models of them.					*	X	X	X	X
Identify attributes of a circle, its radius, and its diameter; determine what distinguishes a circle from an oval shape.					*	X	X	X	X
Compare figures for congruency, similarity, or symmetry.					*	X	X	X	X
Demonstrate that angles of 90, 180, 270, and 360 Degrees relate respectively to ¼, ½, ¾, and full rotations.					*	X	X	X	X
Verbalize, visualize, and make models for solid two-and three-dimensional geometric objects; describe shapes and solids in terms of vertices, edges, and faces.					*	X	X	X	X
Identify translations, reflections, and rotations around the center point of a polygon using concrete models.					*	X	X	X	X
Determine survey questions, collect data, and record this on a number line, graph, table and/or chart.					*	X	X	X	X
Identify the range, mode, and median for a set of data, and know what each statistic does and does not indicate about the data; use the statistics and data to make comparisons, draw a conclusion, or make a prediction of probability.					*	X	X	X	X
Locate the points corresponding to a numerical expression on graph paper and connect the points with a straight line; use this graph to determine the next probable point.					*	X	X	X	X
Describe the relationship between two sets of related data such as ordered pairs in a table or chart; specify locations and plot order pairs on a graph, map or globe.					*	X	X	X	X
Use Venn diagrams to sort and describe data.					*	X	X	X	X
Predict events according to the probability of likelihood of occurrence, using terms such as impossible, unlikely, equal, likely, and certain.					*	X	X	X	X
Convert numbers-as-figures to numbers-as-words and vice versa						*	X	X	X
Identify decimals, fractions, mixed numbers, and positive and negative integers on a number line; explore real-life situations where the use of these types of numbers is significant and necessary.						*	X	X	X
Use very large numbers, very small numbers, and decimals in addition, subtraction, multiplication, and division with and without a calculator.						*	X	X	X
Add, subtract, multiply, and divide with negative numbers.						*	X	X	X

Demonstrate proficiency with division, including long division with two digit divisors; explain the significance of a remainder in a real-life problem.						*	X	X	X
Recognize different interpretations of fractions as parts of a whole, parts of a set, and division of whole numbers by whole numbers.						*	X	X	X
Recognize percent as part-to-whole and part of a hundred; compute a given percent of a whole number; compare fractions, decimals, and percentages that are equivalent.						*	X	X	X
Investigate and justify why fractions need common denominators to be added or subtracted; explore the purpose of using equivalent forms in order to add and subtract fractions with unlike denominators.						*	X	X	X
Solve problems from real-life situations that involve fractions and mixed numbers in the operations of addition, subtraction, and multiplication, and express results in the simplest form; draw or construct models to verify conclusions						*	X	X	X
Identify and describe numbers according to their characteristics, including place value, prime or composite numbers, odd or even numbers and square numbers.						*	X	X	X
Identify and describe situations with constant or varying rates of change.						*	X	X	X
Recognize that change is often predictable when consistent patterns emerge; use algebraic expressions to describe the relationship in repeating, growing, and shrinking patterns.						*	X	X	X
Using a letter to represent an unknown number, write a simple algebraic expression with one variable, and evaluate by substitution.						*	X	X	X
Use commutative, associative, distributive, and inverse properties to simplify, perform, and check computations; apply these efficiently and accurately						*	X	X	X
Distinguish between situations when an estimate is appropriate and when an exact answer is needed.						*	X	X	X
Express problems and solutions using the proper and formal mathematical language and notation, supporting conclusions verbally and symbolically.						*	X	X	X
Use the appropriate tools, instruments, and technologies for taking various types of measurements.						*	X	X	X
Investigate formulas for the perimeter and area of a triangle and of a parallelogram, and compare these to the formulas for finding the perimeter and area of a rectangle.						*	X	X	X
Explain the differences among linear units, square units, and cubic units.						*	X	X	X

Identify and use the appropriate units of measure to find the perimeter, area, or volume of two- and three-dimensional objects; identify real-life situations where this knowledge is applicable.						*	X	X	X
Make conversions with measurement systems.						*	X	X	X
Compare temperatures in Celsius and Fahrenheit, recognizing the freezing and boiling point of water in each.						*	X	X	X
Add and subtract money in decimal notation.						*	X	X	X
Explore scale in drawings, models, and maps and relate scale to the measurement of real objects.						*	X	X	X
Solve problems involving elapsed time						*	X	X	X
Identify and draw angles, perpendicular and parallel lines, and various types of quadrilaterals and triangles using appropriate tools, such as ruler, compass, and protractor.						*	X	X	X
Determine relationships among the radius, diameter, center, and circumference of a circle.						*	X	X	X
Classify polygons as regular or irregular; continue to develop appropriate, formal vocabulary in all areas of geometry.						*	X	X	X
Solve problems by using the knowledge that the sum of the angles of any triangle is 180 degrees and the sum of the angles of a quadrilateral is 360 degrees.						*	X	X	X
Visualize and draw two-dimensional views of three-dimensional objects; construct a three-dimensional object from a two-dimensional representation.						*	X	X	X
Identify shapes that have reflectional symmetry and rotational symmetry.						*	X	X	X
Use concepts of position, direction, and orientation to describe objects in the classroom environment and beyond; explore what happens to the size, shape, and position of an object after sliding, flipping, turning, enlarging, or reducing it.						*	X	X	X
Answer questions about a real-life problem situation using information take from a graph						*	X	X	X
Use ordered pairs of numbers to locate and name points on a coordinate grid						*	X	X	X
Use tables of related number pairs to make line graphs						*	X	X	X
Know the measure of range, mean, median, and mode; and compare examples to show what each does and does not indicate and how they may differ.						*	X	X	X
Apply the use of fractions and percentages when comparing sets of data.						*	X	X	X
Determine whether or not a given graph matches a given set of data.						*	X	X	X

Identify the probability of events within a simple experiment and associate the ratio with the likelihood of the outcome; demonstrate knowledge that probability can take any value between 0 and 1						*	X	X	X
Make predictions and perform a simple experiment; compare what should happen with what did happen; modify initial conclusions where necessary; discuss the relationship of science and math.						*	X	X	X
Read and interpret increasingly complex displays of data, such as double bar graphs, frequency tables, and circle graphs displaying percentages.						*	X	X	X
Display the same set of data with different representations.						*	X	X	X
Determine which type of graph is most appropriate for a particular set of data, and explain and justify this choice.						*	X	X	X
After recording and interpreting data, develop generalizations of the results obtained and apply these in other circumstances.						*	X	X	X
Critically evaluate data by examining its sources, manner of collection, and presentation, as well as the conclusions drawn; relate the need to scrutinize data for possible inaccuracies, misinterpretations, or bias.						*	X	X	X
Become more proficient in doing math mentally, manually, and with appropriate use of technology.							*	X	X
Use the four mathematical operations of addition, subtraction, multiplication, and division in symbolic and real-life problem situations that involve positive and negative integers and combinations of these operations; explain and justify the choice of procedures and results.							*	X	X
Solve problems and explain the meaning of addition, subtraction, multiplication, and division of fractions and decimals and supporting the results with models.							*	X	X
Locate and compare integers, fractions, decimals, and mixed numbers on a number line, and order and compare these using <,=, >							*	X	X
Convert between representations of numbers as fractions, decimals, and percents							*	X	X
Determine percentages of quantities and solve real-world problems involving tips, taxes, sale discounts, and interest earned.							*	X	X
Use ratios in various contexts to show the relative sizes of two quantities; use appropriate notation							*	X	X
Use ratios to make predictions in proportional situations; construct models and solve real-life problems using ratios.							*	X	X
Recognize the least common multiple and the greatest common divisor of whole numbers; use this information to find a common							*	X	X

denominator to add two fractions or to find the reduced form of a fraction.									
Decompose and recompose whole numbers using factors and exponents; explain "squared" as being the same as the "second power" and "cubed" as the "third power"							*	X	X
Write and analyze algebraic expressions using up to three variables and replacing the variables with given values.							*	X	X
Use parentheses to group numbers and indicate which operation to perform first when writing expressions with more than two terms and different operations.							*	X	X
Translate a problem, describe verbally or depicted in tables or graphs, into mathematical language; solve the problem mathematically, and then interpret that result in the original context.							*	X	X
Identify relationships, distinguish relevant from irrelevant information, identify missing information, sequence and prioritize information, and observe patters as you solve problems.							*	X	X
Express mathematical procedures and solutions clearly and logically, using the appropriate mathematical notation and language; use a variety of means such as words, numbers, symbols, charts, graphs, diagrams, and models to explain mathematical decisions and reasoning.							*	X	X
Apply mathematics to solving everyday problems with other mathematical topics and with other curriculum subject areas.							*	X	X
Use a problem-solving model that involves understanding the problem, making a plan, carrying out the plan, evaluating the solution for reasonableness, and explaining the procedures used and interpretation of results.							*	X	X
Convert from one unit of measurement to another within customary U.S. system and within the metric system; use a formula to convert temperatures between Celsius and Fahrenheit.							*	X	X
Solve problems involving rate, such as average speed, distance, and time; differentiate between rates and ratios.							*	X	X
Know and use the formula for finding the circumference and area of a circle.							*	X	X
Determine which measurement relates best to the context of a problem situation.							*	X	X
Use variables in algebraic expressions to describe geometric formulas							*	X	X
Identify measures of time, weight, and distance as fractions, mixed numbers and decimals; use this information to solve real-life mathematical situations.							*	X	X

Describe, name, and draw vertical, adjacent, complementary, or supplementary angles.							*	X	X
Solve problems involving an unknown angle by using the properties of complementary and supplementary angles.							*	X	X
Use multiple classification criteria to describe triangles.							*	X	X
Identify and define relationships between lines.							*	X	X
Predict positions and orientations of two-dimensional shapes after transformations such as reflections, rotations, translations, and dilations; construct three-dimensional objects and sketch two-dimensional representations of each side; identify symmetry in three-dimensional shapes.							*	X	X
Draw two-dimensional shapes that are similar, though not congruent; use appropriate tools for measuring and constructing the shapes.							*	X	X
Compare the same data in different types of representations and determine which representation relates best to the context of the data.							*	X	X
Compute measures of central tendency and determine which provides the most useful information with regard to a specific question or given context.							*	X	X
Explain how additional data added to a set of data may affect the mean, median, and mode. Understand how the inclusion or exclusion of outliers affects measures of central tendency.							*	X	X
Compare samples of population with the data from the entire population; determine situations where it is reasonable to simply take a sample.							*	X	X
Identify ways of selecting a sample and what makes one sample more representative of the population.							*	X	X
Evaluate the validity of claims based on statistical data. Determine whether the manner in which a question is asked or the type of question it is may have influenced the results, or if the way the results were presented may have influenced the interpretation of results. Identify sampling errors and bias in the manner of presentation of results.							*	X	X
Represent data in an organized way, make logical inferences, and use the information to estimate the probability of future events or outcomes; understand that probability cannot determine an individual outcome, but can be used to predict the frequency of an outcome.							*	X	X
State probabilities as ratios, proportions, decimals between 0 and 1, and percentages between 0 and 100; know that if P is the probability of an event occurring, then 1-P is the probability of it not occurring.							*	X	X

Write, compare, and solve problems using large numbers in scientific notation.								*	X
Explore integers, rational numbers, and common irrational numbers; order and compare these numbers; and place them on a number line.								*	X
Explain the meaning of adding, subtracting, multiplying and dividing integers. Use integers to solve real-life problems. Develop and use strategies to estimate and judge the reasonableness of results.								*	X
Explain, expand and compute whole number powers of whole numbers. Explore the inverse relationship between squaring positive integers and taking the square root of the result. Determine without a calculator the two integers between which the square root of a number lies.								*	X
Multiply and divide expressions involving exponents with a common base.								*	X
Find the prime factorization of whole numbers, and represent using exponents when applicable. Use the concepts of greatest common factor, least common multiple, prime factorization, and relatively prime numbers to solve problems.								*	X
Represent and solve problem situations that can be modeled by and solved using the concepts of absolute value, exponents, and square roots.								*	X
Explore differences between rational and irrational numbers. Convert terminating decimals into fractions in reduced form.								*	X
Use order of operations and properties to simplify numerical expressions involving integers, fractions, and decimals.								*	X
Interpret, model, and use percents greater than 100 and less than 1 to solve problems.								*	X
Develop and analyze algorithms for computing percents. Calculate the percentage increase and decrease of a given quantity.								*	X
Compute simple fractions, decimals and powers using mental arithmetic. Convert among fractions, decimals and percents. Use the appropriate form of a rational number when problem solving. Use estimation to decide if answers are reasonable.								*	X
Use division to find unit rates and ratios in proportional relationships such as speed, density, price, recipes, and student-teacher ratio.								*	X
Calculate discounts, markups, interest rates, taxes, tips and commissions in real-life scenario problem solving.								*	X
Represent and analyze patterns, rules, and functions with words, tables, graphs, and simple variable expressions. Write an expression, a formula, an equation, or an inequality that								*	X

represents a verbal description using variables and appropriate operations.									
Recognize a variety of uses for variables.								*	X
Use formulas in problem-solving situations.								*	X
Use properties of rational numbers and order of operations to evaluate numerical expressions and simplify algebraic expressions.								*	X
Solve an equation or formula including two variables for a given variable. Evaluate expressions and formulas by substituting integers.								*	X
Use correct algebraic terminology.								*	X
Define slope as a vertical change per unit of horizontal change. Recognize that a straight line has a constant slope or rate of change.								*	X
Identify and describe situations with constant or varying rates of change.								*	X
Determine the slope of a line from it's graph.								*	X
Draw the graph of a line given an equation, two points on the line, or one point and the slope of the line.								*	X
Examine the characteristics of functions in tables, graphs, and equations. Identify whether a function is linear or nonlinear.								*	X
Use graphing, with or without technology, to estimate solutions, and check the estimates with analytic approaches.								*	X
Represent inequalities on a number line or a coordinate plane.								*	X
Use inductive reasoning to make and test conjecture.								*	X
Analyze problems by identifying relationships, determining relevant from irrelevant information, identifying missing information, sequencing and prioritizing information, and observing patterns. Determine whether an exact or approximate solution is appropriate.								*	X
Know, use and translate calculator notation conventions to mathematical notation. Explain why the use of a calculator does not replace the need for mental computation.								*	X
Use appropriate tools to record measurements to a desired accuracy.								*	X
Compare and convert lengths, areas, volumes, weights, capacities, times, and temperatures within measurement systems.								*	X
Analyze problem situations involving measurement concepts, select appropriate strategies, and use an organized approach to solve increasingly complex problems.								*	X
Use and explore formulas to determine the perimeter and area of basic two-dimensional shapes and the surface area and volume of basic three-dimensional shapes.								*	X

Decide whether a solution is reasonable in the context of the original problem.								*	X
Describe and express relationships between parts and attributes of similar and congruent figures using proportional reasoning. Determine and use scale factors for similar figures to solve problems.								*	X
Compare and contrast two-dimensional figures or three-dimensional objects by their characteristics								*	X
Identify parallel and intersecting lines and pairs of angles formed by parallel lines cut by a transversal, and determine their measure. Recognize complementary and supplementary angles.								*	X
Use triangle sum relationships to solve problems.								*	X
Explore necessary conditions for triangle congruence.								*	X
Use coordinate graphs to plot simple shapes, find lengths and areas related to shapes, and find images under translations, rotations and reflections.								*	X
Explore transformations of two-dimensional figures using a variety of methods. Recognize that some transformations preserve the length of segments, and that figures resulting from slides, turns and flips are congruent to the original figures.								*	X
Identify the line and rotation symmetries of two-dimensional figures to solve problems.								*	X
Analyze, interpret, and display data in appropriate bar, line, or circle graphs; stem-and leaf plots; scatter plots, or box-and-whisker plots. Justify the choice of display.								*	X
Analyze a set of data by using and comparing combinations of measures of center and measures of spread, and describe how they may be affected by additional data, particularly outliers.								*	X
Make predictions based upon statistical data.								*	X
Analyze data displays, including ways they can be misleading. Construct opposing arguments based on analysis of the same data, using different graphical representations.								*	X
Analyze ways in which the wording of questions or selection of data samples can influence survey results. Identify methods for selecting a sample that are representative of the population. Distinguish between random and biased samples, and identify possible sources of bias in sampling.								*	X
Identify misuses of statistical data in articles, advertisements, and other media.								*	X
Find the number of possible permutations of a group of objects using a tree diagram								*	X
Express probabilities as percentages, fractions, proportions and decimals.								*	X

Given that p is the probability of an event occurring, determine the probability of the event not occurring								*	X
Recognize that the probability of either one or the other of two disjointed events occurring is the sum of the two individual probabilities.								*	X
Compute probabilities of compound events using such methods as organized lists, tree diagrams, and area models.								*	X
Make predictions based on theoretical probabilities, design and conduct an experiment, compare actual results to predicted results, and explain differences.								*	X
Read, write, compare, and solve problems using large and small numbers in scientific notation.									*
Recognize natural numbers, whole numbers, integers, rational numbers, and irrational numbers and their relation to the set of real numbers.									*
Describe the effects of multiplication and division on integers.									*
Evaluate negative integer exponents. Interpret positive integer powers as repeated multiplication and negative integer powers as repeated division or multiplication by the multiplicative inverse.									*
Apply order of operations to simplify expressions and perform computations involving integers, exponents and radicals.									*
Explain and use the inverse and identity properties and use inverse relationships in problem-solving situations.									*
Determine when an estimate is sufficient and when an exact answer is necessary in problem situations.									*
Compare and order rational numbers and percents. Know that every rational number other than zero produces and irrational number.									*
Estimate, compute, and solve problems involving rational numbers, including ratio, proportion, and percent. Evaluate the reasonableness of solutions.									*
Find the square foot of perfect squares. Place non-perfect squares on an integer number line. Use, explain and simplify fractional exponents.									*
Solve problems by computing simple and compound interest.									*
Use mental techniques to compute with common fractions, decimals, powers, and percents.									*
Describe a relationship using a variety of representations.									*
Generalize patters and sequences represented graphically or numerically using words, a formula for the nth term, or recursive notation. Compare and contrast the various forms.									*
Use physical models to add and subtract monomials and polynomials and to multiply a polynomial by a monomial.									*

Demonstrate an understanding of rate as a measure of one quantity with respect to another quantity.									*
Describe the relationship between the graph of a line and its equation. Explain the meaning of slope as a constant rate of change. Interpret the y-intercept in real-world problems.									*
Identify and graph linear functions, and identify lines with positive, negative, parallel and perpendicular slopes.									*
Find the slope of a linear function given the equations, and write the equation of a line given the slope and any point of the line.									*
Write, simplify, and evaluate algebraic expressions and equation. Use symbolic algebra, graphs and tables to represent situations and solve problems. Extend the use of covariants where y depends upon x.									*
Determine the domain of independent variables and the range of dependent variables defined by a graph, a set of ordered pairs, or a symbolic equation. Determine if the relation is a function.									*
Use graphing to estimate solutions and check their estimates with analytic approaches.									*
Apply basic factoring techniques to polynomials, including finding a common factor for all terms in a polynomial, recognizing the difference of two squares, and recognizing perfect squares or binomials.									*
Represent simple quadratic functions using verbal descriptions, tables, graphs, and formulas, and translate among these representations. Solve quadratic equations by factoring, the quadratic formula, or completing the square. Know that the roots are the x-intercepts.									*
Simply fractions with polynomials in the numerator and denominator by factoring both and reducing them to the lowest terms.									*
Analyze non-routine problems by identifying relationships, modeling, guessings, illustrating, telling relevant from irrelevant information, identifying missing information, sequencing and prioritizing information and observing patterns.									*
Appropriately use examples and counterexamples to make and test conjectures, justify solutions, and explain results.									*
Compare and order the relative size of U.S. customary units and metric units.									*
Convert units from one measurement system to another through proportional relationships and formulas. Identify equivalent area and volume measurements within a system of measurement.									*
Derive formulas for surface area and volume, and justify them using geometric models and common materials.									*

Use formulas, models, and graphs to solve and determine the reasonableness of the results for problems involving scale factors, area, and volume.									*
Make indirect measurements, including heights and distances, using proportions.									*
Find the sum of the interior angles of regular convex polygons with and without measuring the angles with a protractor.									*
Use conventional formulas to find surface area and volume of basic three-dimensional shapes.									*
Estimate and compute the area of irregular two-dimensional shapes and the volume of irregular three-dimensional objects by breaking them down into more basic geometric objects.									*
Identify and describe basic properties of geometric shapes: altitudes, diagonals, angle and perpendicular bisectors, central angles, radii, diameters and chords.									*
Perform simple constructions such as bisectors of segments and angles, copies or segments and angles, and perpendicular segments.									*
Recognize the angles formed and the relationship between the angles when two lines intersect and when parallel lines are cut by a transversal.									*
Use the Pythagorean theorem and its converse to solve problems in two and three dimensions.									*
Use proportions to solve problems involving similar figures.									*
Represent and analyze shapes using coordinate geometry.									*
Draw the results of translations, reflections, rotations, and dilations of objects in the coordinate plane, and determine characteristics of objects that remain fixed.									*
Determine the number of rotational symmetries of regular polygons.									*
Construct, develop, and communicate logical arguments about geometric figures and patterns.									*
Formulate questions, design studies, and collect data about a characteristic. Identify different methods of selecting samples, analyzing the strengths and weaknesses of each method and the possible bias in a sample or display.									*
Analyze, interpret, and display single and two variable data in appropriate bar, line, and circle graphs; stem-and plots; and box-and whisker plots. Compare different representations of the same data, and evaluate how well each representation show important aspects of the data.									*
Find, use and interpret measures of center, outlier, and spread, including range and interquartile range.									*

Make conjectures about the results of experiments.									*
Represent two-variable data with a scatter plot on the coordinate plane, and describe how the data points are distributed. If the pattern appears to be linear, draw a line that appears to best fit the data, and write the equations of that line.									*
Identify a hypothesis and conclusion in logical deduction.									*
Use counterexamples to show that an assertion is false, and recognize that a single counterexample is sufficient to refute an assertion.									*
Identify claims based on statistical data and, in simple cases, evaluate the reasonableness of the claim. Convert between odds and probabilities. Understand and recognize equally likely events.									*
Explain and use appropriate terminology to describe complementary and mutually exclusive events and determine their probabilities.									*
Explain the difference between inductive and deductive reasoning, and identify and provide examples of each. Make and test conjectures using inductive reasoning									*