Cape Elizabeth School Department
K – 12 Math Curriculum Priority Goals

May, 2010

K-4 Math Priority Learning Goals

	Kindergarten	Grade 1	Grade 2	Grade 3	Grade 4
Priority/Mastery Knowledge and Skills					
NUMBER SENSE **•Whole Numbers**	Students will: • Count to 100 by ones • Count to 30 by fives • Count to 100 by tens • Count to 20 by twos • Count backwards from 15 to 0 • Count by ones starting with any number 0 - 50 • Read numbers 0 - 30 • Write numbers 0 - 30 • Identify and form groups with numbers 0 – 10 • Create stories using the numbers 0 - 10	Students will: • Count by ones, twos, fives, and tens from any number 0 – 100 to 100 and back • Count collections of objects accurately and reliably • Estimate the number of objects in a collection • Read, write, and model with manipulatives numbers up to 1000 • Use manipulatives to identify and model odd and even numbers • Add and subtract, using a variety of methods, one and two digit numbers to give sums and differences from 0 - 100 • Compare and order numbers up to 1000 • Demonstrate proficiency with addition and subtraction facts through 10 • Use a variety of methods to solve problems involving addition and subtraction of single digit numbers • Estimate answers to basic facts problems to check for "reasonableness" • Apply the Commutative Property of Addition to basic addition problems • Apply the Additive Identity Property to basic addition problems	Students will: • Count by twos, fives, tens, and hundreds past 1000 • Identify each digits place value in two, three, four, and five digit numbers • Demonstrate proficiency with complements of ten • Demonstrate proficiency with addition and subtraction facts through 20 • Add and subtract two digit numbers • Estimate answers to basic facts problems to check for "reasonableness" • Find equivalent names for numbers (tallies, arrays, numerical expressions)	Students will: • Read and write numbers up to one million • Identify place value of digits in numbers through one million • Apply place-value concepts in four digit numbers • Find equivalent names for numbers using addition, subt., multiplication, and division • Compare and order numbers to one million • Demonstrate automaticity with addition and subtraction facts through 20 • Use basic facts to compute fact extensions • Add and subtract multi-digit numbers • Estimate answers to addition and subtraction problems to check for "reasonableness" • Solve addition and subtraction number stories • Demonstrate automaticity with multiplication using the factors 0 – 5 and 10 • Use a variety of strategies to compute multiplication facts through 10 * 10	Students will: • Give equivalent names for numbers • Compare large numbers • Read and write numbers up to one billion • Identify place value of digits in numbers through one billion • Compare and order numbers to one billion • Solve addition and subtraction facts • Solve basic multiplication facts • Add and subtract multi-digit numbers • Estimate sums, differences, and products • Multiply by two-digit numbers • Divide multi-digit numbers by single digit numbers

NUMBER SENSE **•Rational Numbers**	No rational number goals for Kindergarten	Students will: • Use manipulatives and drawings to model halves, thirds, and fourths as equal parts of a region or collection; describe the model	Students will: • Read and write money amounts using decimal notation • Shade a specific fractional part of a region and name the part	No rational number goals for Grade 3	Students will: • Identify whole for fractions • Give equivalencies between fractions(hundredths denom.), decimals, and percents • Identify fractional parts of a collection of objects • Identify fractional parts of a region • Read, write, and order decimal numbers through thousandths • Identify place-value of digits in decimal numbers through thousandths • Read, write, and order fractions
NUMBER SENSE **•Real Numbers**	No real number goals for Kindergarten	No real number goals for Grade 1	No real number goals for Grade 2	No real number goals for Grade 3	No real number goals for Grade 4
DATA **•Measurement**	Students will: • Recognize and name the US coins; penny, nickel, dime, quarter, and dollar bill • Tell the time to the nearest hour using an analog clock	Students will: • Know and compare the value of pennies, nickels, dimes, quarters, and dollar bills • Make equal exchanges between different coins and dollar bills • Estimate and compare length and width of objects using non-standard tools and techniques • Measure length and weight of objects using standard tools and techniques • Identify a thermometer as a tool used to measure temperature • Read temperatures on Fahrenheit and Celsius thermometers to the nearest ten degrees • Use a calendar to identify days, weeks, months, and dates • Tell the time to the nearest half and quarter hour using an analog clock	Students will: • Show given amounts of money using standard US coins • Use equivalent coins to show amounts of money in different ways • Measure lengths to the nearest inch and centimeter • Read temperatures on Fahrenheit and Celsius thermometers to the nearest degree • Read and show the time to the nearest five minute interval on an analog clock	Students will: • Estimate length using Metric and US Customary units • Measure lengths to the nearest half-inch and half centimeter • Tell the time to the nearest minute using an analog clock • Tell and write time using digital notation	Students will: • Measure length to the nearest quarter inch and half centimeter

DATA **•Data Analysis**	Students will: • Create a simple graph and share observations	Students will: • Collect and organize data • Create tally charts, tables, bar graphs, and line plots using data • Use graphs to answer simple questions and draw conclusions • Determine the maximum and minimum of a set of data	Students will: • Create bar graphs to show data • Compare quantities using a bar graph • Find the minimum, maximum, mode, and median of a data set	Students will: • Use data to create charts, tables, bar graphs, and line plots • Interpret graphs to ask and answer simple questions	Students will: • Collect and organize data and use data to create charts, tables and graphs • Use maximum, minimum, range, and mode to describe a set of data
DATA **•Probability**	No Probability goals for Kindergarten	Students will: • Describe the probability of events using the terms certain, likely, unlikely, and impossible	No Probability goals for Grade 2	No Probability goals for Grade 3	Students will: • Predict the outcome of probability experiments
GEOMETRY **• Geometric Figures**	Students will: • Recognize and name geometric shapes: circle, square, triangle, rectangle, sphere, and cube	Students will: • Identify and describe plane and solid figures including circles, triangles, squares, rectangles, spheres, cylinders, rectangular prisms, cones, and cubes • Identify shapes having lines of symmetry • Complete line-symmetric shapes and designs	Students will: • Draw line segments • Identify two dimensional shapes • Identify three dimensional shapes	Students will: • Identify and draw intersecting and parallel line segments and lines, rays, and right angles • Classify three dimensional solids • Create two dimensional symmetrical shapes • Locate lines of symmetry	Students will: • Name and draw intersecting and parallel line segments, lines, and rays • Name and draw angles • Name and draw polygons
GEOMETRY **•Geometric Measurement**	No Geometric Measurement goals for Kindergarten	No Geometric Measurement goals for Grade 1	No Geometric Measurement goals for Grade 2	No Geometric Measurement goals for Grade 3	No Geometric Measurement goals for Grade 4
GEOMETRY **•Transformation**	No Transformation goals for Kindergarten	No Transformation goals for Grade 1	No Transformation goals for Grade 2	No Transformation goals for Grade 3	No Transformation goals for Grade 4

ALGEBRA **•Symbols and Expressions**	Students will: • See and utilize patterns • Sort objects using various attributes	Students will: • Extend, describe, and create numeric, visual, and concrete patterns • Solve problems involving function machines, "What's my Rule?" tables, and Frames-and-Arrows diagrams • Read, write, and explain expressions and number sentences using appropriate symbols	Students will: • Complete "Frame and Arrow" problems with one rule • Complete "What's My Rule" problems • Use less-than, greater-than, and equal symbols to compare numbers	Students will: • Determine operations and values in "Frame and Arrow" problems • Determine operations and values in "What's My Rule" problems • Use addition, subtraction, multiplication, division, less-than, greater-than, and equal symbols to represent and analyze numerical relationships	Students will: • Determine whether number sentences are true or false • Write number sentences to model number stories • Use parenthesis to make number sentences true
ALGEBRA **•Equations and Inequalities**	No Equations and Inequalities goals for Kindergarten	Students will: • Solve equations involving addition and subtraction	No Equations and Inequalities goals for Grade 2	No Equations and Inequalities goals for Grade 3	No Equations and Inequalities goals for Grade 4
ALGEBRA **•Functions and Relations**	No Functions and Relations goals for Kindergarten	No Functions and Relations goals for Grade 1	No Functions and Relations goals for Grade 2	No Functions and Relations goals for Grade 3	No Functions and Relations goals for Grade 4

5-8 Math Priority Learning Goals

	Grade 5	Grade 6	Rational Math	Transition Math, Part 1
Priority/Mastery Knowledge and Skills				
NUMBER SENSE **• Whole Numbers**	Students will: • Read and write whole numbers to one hundred billion • Use expanded notation to represent whole numbers • Multiply and divide whole numbers and interpret remainders	Students will: • Identify prime and composite numbers • Interpret and use exponential notation as repeated multiplication • Find the least common multiple and greatest common factor of two numbers • Use order of operations to evaluate three and four term numerical expressions	Students will: • Use knowledge of prime and composite numbers to factor numbers • Use "Fact Families" to show that inverse operations can be used to check answers • Follow conventions of order of operations using whole numbers	Students will: • Translate numbers back and forth from written words into numerals • Use a calculator to perform arithmetic operations and solve problems • Use and interpret numbers written in exponential notation • Identify numbers written in scientific notation • Use scientific notation to denote large numbers • Identify and apply the **Multiplication Property of Equality** • Identify and apply the **Properties of Addition** (Additive Identity, Commutative, Associative) • Use Order of Operations to evaluate whole number expressions • Solve problems involving inequalities
NUMBER SENSE **• Rational Numbers**	Students will: • Read and write decimal numbers to the thousandths place • Multiply and divide decimal numbers by a whole number and interpret decimal remainders • Solve problems involving addition and subtraction of decimal number to the thousandths place • Solve problems involving addition and subtraction of fractions with like denominators • Place positive and negative numbers on a number line and determine the distance between them	Students will: • Compare and order fractions • Add and subtract fractions with unlike denominators • Compare and order decimals • Add and subtract decimals • Multiply and divide decimals by 10, 100, and 1000 • Convert between fractions, decimals, and percents • Find a given whole percent of a number • Compare and order integers • Add and subtract integers	Students will: • Compare and order integers on a number line • Add, subtract, multiply and divide fractions • Solve problems involving money, including computing sales tax, percent reductions and total cost • Express relative quantities as fractions, decimals, and percentages	Students will: • Add, subtract, multiply and divide decimal numbers • Add, subtract, multiply and divide fractions • Add, subtract, multiply and divide positive and negative numbers • Compare and order rational numbers using correct symbols of inequality • Round decimal numbers • Use a calculator to perform arithmetic operations and solve problems involving rational numbers • Convert between fractions, mixed numbers, decimals and percents • Find percents of quantities in various given situations • Use scientific notation to denote numbers less than one using negative exponents • Explain the concept of **absolute value**, and calculate it for any given rat. number • Use the **Addition of Opposites Prop.** to convert subtraction to addition

NUMBER SENSE • **Real Numbers**	No real number goals for Grade 5	No real number goals for Grade 6	No real number goals for Rational Math	No real number goals for Transition Math, Part 1
DATA • **Measurement**	No measurement goals for Grade 5	Students will: • Choose appropriate units for measuring • Convert units within systems	Students will: • Measure and draw lines using traditional "ruler" units and metric units • Determine elapsed time involving whole hours, whole days, and whole years • Compute simple conversions among units of time (seconds, minutes, hours)	Students will: • Measure and draw lines using U.S. standard units to one eighth of an inch • Measure and draw lines using metric units to one millimeter • Name and use customary measures of length in U.S. standard units • Convert units of length within the U.S. standard system • Name and use customary measures of length in the metric system • Convert units of length within the metric system • Name and use customary measures of mass and volume in the U.S. standard system • Name and use customary measures of mass and volume in the metric system • Convert common relationships between U.S. standard units and metric units given a conversion factor
DATA • **Data Analysis**	Students will: • Find and use median, mode, and range for a set of data • Students will understand elapsed time and temperature • Read, construct, and interpret line graphs	Students will: • Determine the range, mean, median, and mode given a set of data • Construct bar, line, and circle graphs • Interpret bar, line, and circle graphs	Students will: • Solve problems using tables • Interpret bar, line, and circle graphs • Organize data to create simple bar or line graphs • Determine the range, mean, median, and mode given a set of data	No Data Analysis goals for Transition Math, Part 1
DATA • **Probability**	No probability goals for Grade 5	Students will: • Determine probability as a ratio	Students will: • Recognize events as certain, likely, unlikely, or impossible • Determine the probability for a simple experiment using one or more coins	Students will: • Calculate and predict probabilities and relative frequencies given situations with known numbers of outcomes • Describe given events in various degrees of likelihood, as a fraction, and as a percentage

GEOMETRY • **Geometric Figures**	Students will: • Identify, describe and classify solid figures • Identify acute, obtuse, and straight angles	Students will: • Identify lines, line segments, and rays using appropriate symbols	Students will: • Identify acute, obtuse, and straight angles • Identify intersecting, parallel, and perpendicular lines • Identify the parts of a circle	Students will: • Identify and describe several common polygons by their number of sides • Apply the definitions of **parallelogram, rectangle, rhombus, and square,** to determine the properties of each quadrilateral • Identify the center, radius, diameter and sector of a circle
GEOMETRY • **Geometric Measurement**	Students will: • Find the area of of triangles and quadrilaterals	Students will: • Calculate the area and perimeter of squares, rectangles, and triangles • Measure and draw angles to a certain degree using a protractor • Use "given formulas" to calculate circumference and area of circles	Students will: • Convert between inches and feet • Calculate the area and perimeter of squares, rectangles • Solve simple problems involving measurement of length	Students will: • Measure and draw angles to a certain degree using a protractor • Calculate the areas of square rectangles • Calculate the volume of a cube • Know and apply relationships among angles formed by **intersecting lines** • Determine the measure of angles in figures containing **linear pairs, vertical angles, and perpendicular lines** • Find measures of angles formed in figures containing parallel lines and transversals • Use the **Triangle Sum Property** to find measures of angles
GEOMETRY • **Transformations**	No Transformation goals for Grade 5	Students will: • Determine congruency or similarity of shapes • Use proportions with similar shapes to determine a missing side length • Use reflections, rotations, and translations to determine congruency	No Transformation goals for Rational Math	No Transformation goals for Transition Math, Part 1

ALGEBRA • **Symbols and Expressions**	Students will: • Create and evaluate simple expressions	Students will: • Create and give a rule for a numerical pattern • Generalize patterns (input, output tables) • Convert word phrases to algebraic expressions • Evaluate two-variable expressions with values given for each variable	Students will: • Convert word phrases to algebraic expressions • Complete an arithmetic pattern by filling in missing numbers and creating a rule • Use order of operations to solve simple algebraic expressions and that involve grouping symbols	Students will: • Give instances of a pattern and write a "rule" for a pattern using variables • Translate a written word expression into an algebraic or numerical expression • Evaluate algebraic expressions given the value of the variable • Use order of operations to solve simple algebraic expressions and formulas that involve grouping symbols • Identify and apply the **Properties of Addition** to simplify algebraic expressions
ALGEBRA • **Equations and Inequalities**	No Equations and Inequalities goals for Grade 5	No Equations and Inequalities goals for Grade 6	Students will: • Solve basic facts addition and subtraction open sentences • Solve simple open sentences with missing factors	Students will: • Solve open sentences • Identify and apply the **Addition Property of Equality** to solve algebraic equations • Use the **Addition of Opposites Property** to convert subtraction to addition when solving algebraic equations • Solve equations of the form **x + a = b** • Solve equations of the form **x - a = b** • Solve equations of the form **a - x = b**
ALGEBRA •**Functions and Relations**	No Functions and Relations goals for Grade 5	No Functions and Relations goals for Grade 6	No Functions and Relations goals for Rational Math	No Functions and Relations goals for Transition Math, Part 1

5-8 Math Priority Learning Goals (Draft)

	Transition Math, Part 2	Transition Math, Full year	Algebra	Geometry
Priority/Mastery Knowledge and Skills				
NUMBER SENSE **•Whole Numbers**	Students will: • Use and apply the Algebraic Definition of Division with both fractions and variables	Students will: • Translate numbers back and forth from written words into numerals • Use a calculator to perform arithmetic operations and solve problems • Use and interpret numbers written in exponential notation • Identify numbers written in scientific notation • Use scientific notation to denote large numbers • Identify and apply the **Multiplication Property of Equality** • Identify and apply the **Properties of Addition** (Additive Identity, Commutative, Associative) • Use Order of Operations to evaluate whole number expressions • Solve problems involving inequalities • Use and apply the Algebraic Definition of Division with both fractions and variables	See **Algebra Course** under HS Priority Learning Goals	See **Geometry Course** under HS Priority Learning Goals
NUMBER SENSE **•Rational Numbers**	Students will: • Identify numbers as rational, irrational, or real	Students will: • Add, subtract, multiply and divide decimal numbers • Add, subtract, multiply and divide fractions • Add, subtract, multiply and divide positive and negative numbers • Compare and order rational numbers using correct symbols of inequality • Round decimal numbers • Use a calculator to perform arithmetic operations and solve problems involving rational numbers • Convert between fractions,mixed numbers, decimals and percents • Find percents of quantities in various given situations • Use scientific notation to denote numbers less than one using negative exponents • Explain the concept of **absolute value,** and calculate it for any rational number	See **Algebra Course** under HS Priority Learning Goals	See **Geometry Course** under HS Priority Learning Goals

		• Use the **Addition of Opposites Property** to convert subtraction to addition • Identify numbers as rational, irrational, or real		
NUMBER SENSE **•Real Number**	No Real Number goals for Transition Math, Part 2	No Real Number goals for Transition Math, Full Year	See **Algebra Course** under HS Priority Learning Goals	See **Geometry Course** under HS Priority Learning Goals
DATA **•Measurement**	No Measurement goals for Transition Math, Part 2	Student's will: • Measure and draw lines using U.S. standard units to one eighth of an inch • Measure and draw lines using metric units to one millimeter • Name and use customary measures of length in U.S. standard units • Convert units of length within the U.S. standard system • Name and use customary measures of length in the metric system • Convert units of length within the metric system • Name and use customary measures of mass and volume in the U.S. standard system • Name and use customary measures of mass and volume in the metric system • Convert common relationships between U.S. standard units and metric units given a conversion factor	See **Algebra Course** under HS Priority Learning Goals	See **Geometry Course** under HS Priority Learning Goals
DATA **• Data Analysis**	Student's will: • Interpret information on coordinate graphs • Display information on coordinate graphs • Plot and name points on a coordinate graph • Graph equations for lines of the form $x + y = k$ or $x - y = k$ • Graph equations of the form $y = ax + b$ • Graph solutions to equations of the form $ax + b = cx + d$	Student's will: • Interpret information on coordinate graphs • Display information on coordinate graphs • Plot and name points on a coordinate graph • Graph equations for lines of the form $x + y = k$ or $x - y = k$ • Graph equations of the form $y = ax + b$ • Graph solutions to equations of the form $ax + b = cx + d$	See **Algebra Course** under HS Priority Learning Goals	See **Geometry Course** under HS Priority Learning Goals

DATA • **Probability**	No Probability goals for Transition Math, Part 2	Student's will: • Calculate and predict probabilities and relative frequencies given situations with known numbers of outcomes • Describe given events in various degrees of likelihood, as a fraction, and as a percentage	See **Algebra Course** under HS Priority Learning Goals	See **Geometry Course** under HS Priority Learning Goals
GEOMETRY • **Geometric Figures**	Student's will: • Identify similar figures and name corresponding parts • Show how square roots and geometric figures are related	Student's will: • Identify and describe severa common polygons by their number of sides • Apply the definitions of **parallelogram, rectangle, rhombus, and square,** to determine the properties of each quadrilateral • Identify the center, radius, diameter and sector of a circle • Identify similar figures and name corresponding parts • Show how square roots and geometric figures are related	See **Algebra Course** under HS Priority Learning Goals	See **Geometry Course** under HS Priority Learning Goals
GEOMETRY •**Geometric Measurement**	Student's will: • Calculate the volume of a rectangular solid • Calculate the surface area of a rectangular solid • Find the area of a trapezoid • Use the Pythagorean Theorem to find the length of the third side of a right triangle • Calculate the circumference of a circle given its radius or diameter (using the formula) • Calculate the area of a circle or sector given its radius or diameter (using the formula) • Calculate the area of cylinders and prisms (using the formula) • Calculate the volume of cylinders and prisms (using the formula) • Calculate the surface area and volume of a sphere, given its radius or diameter (using the formula)	Student's will: • Measure and draw angles to a certain degree using a protractor • Calculate the areas of squares rectangles • Calculate the volume of a cube • Know and apply relationships among angles formed by **intersecting lines** • Determine the measure of angles in figures containing **linear pairs, vertical angles, and perpendicular lines** • Find measures of angles formed in figures containing parallel lines and transversals • Use the **Triangle Sum Property** to find measures of angles • Calculate the volume of a rectangular solid • Caiculate the surface area of a rectangular solid • Find the area of a trapezoid • Use the Pythagorean Theorem to find the length of the third side of a right triangle	See **Algebra Course** under HS Priority Learning Goals	See **Geometry Course** under HS Priority Learning Goals

		Geo. Measurement (cont.) Student's will: • Calculate the circumference of a circle given its radius or diameter (using the formula) • Calculate the area of a circle or sector given its radius or diameter (using the formula) • Calculate the area of cylinders and prisms (using the formula) • Calculate the volume of cylinders and prisms (using the formula) • Calculate the surface area and volume of a sphere, given its radius or diameter (using the formula)		
GEOMETRY **•Transformations**	Student's will: • Apply the relationships between geo. figures and their translated images • Interpret translations on a coordinate graph • Draw the reflection image of a figure over a line • Interpret reflections on a coordinate graph • Apply the Size Change Model for Multiplication to real situations involving expansions, contractions, and reflections	Student's will: • Apply the relationships between geo. figures and their translated images • Interpret translations on a coordinate graph • Draw the reflection image of a figure over a line • Interpret reflections on a coordinate graph • Apply the Size Change Model for Multiplication to real situations involving expansions, contractions, and reflections	See **Algebra Course** under HS Priority Learning Goals	See **Geometry Course** under HS Priority Learning Goals
ALGEBRA **•Symbols and Expressions**	No Symbols and Expressions goals for Trans Math, Part 2	Student's will: • Give instances of a pattern andwrite a "rule" for a pattern using variables • Translate a written word expression into an algebraic or numerical expression • Evaluate algebraic expressions given the value of the variable • Use order of operations to solve simple algebraic expressions and formulas that involve grouping symbols • Identify and apply the **Properties of Addition** to simplify algebraic expressions	See **Algebra Course** under HS Priority Learning Goals	See **Geometry Course** under HS Priority Learning Goals

ALGEBRA **•Equations and Inequalities**	Student's will: • Solve and check equations of the form Ax = B • Solve and check equations of the form Ax + B = C • Solve and check equations of the form Ax + B = C when A is a negative number • Solve equations of the form ax + b = cx + d • Recognize and apply the **Multiplication Property of Equality** • Recognize and apply the **Means-Extremes Property** to solve proportions that involve variables • Apply the **Distributive Property of Multiplication over Addition and Subtraction** to simplify expressions	Student's will: • Solve open sentences • Identify and apply the **Addition Property of Equality** to solve algebraic equations • Use the **Addition of Opposites Property** to convert subtraction to addition when solving algebraic equations • Solve equations of the form **x + a = b** • Solve equations of the form **x - a = b** • Solve equations of the form **a - x = b** • Solve and check equations of the form Ax = B • Solve and check equations of the form Ax + B = C • Solve and check equations of the form Ax + B = C when A is a negative number • Solve equations of the form ax + b = cx + d • Recognize and apply the **Multiplication Property of Equality** • Recognize and apply the **Means-Extremes Property** to solve proportions that involve variables • Apply the **Distributive Property of Multiplication over Addition and Subtraction** to simplify expressions	See **Algebra Course** under HS Priority Learning Goals	See **Geometry Course** under HS Priority Learning Goals
ALGEBRA **•Functions and Relations**	No Functions and Relations goals for Transition Math, Part 2	No Functions and Relations goals for Trans Math, Full year	See **Algebra Course** under HS Priority Learning Goals	See **Geometry Course** under HS Priority Learning Goals

HS Math Priority Learning Goals

Algebra	Geometry	Adv. Algebra	Functions, Stats. Trig.
Priority/Mastery Knowledge and Skills	**Priority/Mastery Knowledge and Skills**	**Priority/Mastery Knowledge and Skills**	**Priority/Mastery Knowledge and Skills**
Using Algebra to Describe Students will: • Evaluate numerical and algebraic expressions • Use variables to describe patterns in instances or tables. • Evaluate expressions using absolute value. • Calculate the range and mean absolute deviation. • Identify and apply the associative, commutative, and transitive properties. • Create expressions to model real-world situations. • Calculate and interpret the spread of a distribution using mean absolute deviation. • Create a scatterplot from a table or expression. • Use graphs to determine whether expressions seem to be equivalent • Use graphs to find values, create tables, and select appropriate windows. **Using Algebra to Explain** Students will: • Use the Distributive Property to expand and combine like terms. • Use the Opposites of Opposites Property, the Opposite of a Sum Property, and the Opposite of a Difference Property to simplify expressions. • Apply and recognize the following multiplication properties: Multiplicative Identity Property, Multiplicative Inverse Property, Multiplication Property of Zero, Multiplication Property of Equality, and the Zero Product Property. • Apply and recognize the following addition properties: Additive Identity Property, Additive Inverse Property, and Addition Property of Equality.	**Points and Lines** Students will: • Apply the Distance Postulate properties of betweenness **Angles and Lines** Students will: • Find the measures of central angles and the degree measures of arcs. • Give justifications for conclusions involving angles and lines. • Apply angle and arc measures in real situations. **Proofs using Congruence** Students will: • Identify and determine measures of parts of congruent figures. • Make and justify conclusions about congruent figures. **Triangle Congruence** Students will: • Write proofs that triangles are congruent. • Apply the triangle congruence and CPCF theorems to prove that segments or angles are congruent.	**Functions** Students will: • Solve and check linear equations. • Write a recursive definition for a sequence. • Determine the domain and range of a function defined by a table, a list of ordered pairs, or a simple equation. • Determine the domain, range, and values of a function from its graph. **Variation and Graphs** Students will: • Solve variation problems. • Find slopes (rates of change). • Recognize variation situations. • Fit an appropriate model to data. • Graph variation equations. **Linear Functions** Students will: • Evaluate or find explicit and recursive formulas for arithmetic sequences. • Fit lines to data. • Graph or interpret graphs of linear equations.	**Exploring Data** Students will: • Compare measures of center and compare measures of spread • Use samples to make inferences about populations **Functions and Models** Students will: • Identify the independent variables, domain, and range of a function. • Identify properties of regression lines and the correlation coefficient. • Use scatterplots to draw conclusions about models for data. **Transformations of Graphs and Data** Students will: • Recognize and graph parent functions. **Circular Functions** Students will: • Find lengths of circular arcs and areas of sectors. • Find sines, cosines, and tangents of angles. • Solve Problems involving lengths of arcs of areas of sectors.

Using Algebra to Explain (cont.)

Students will:

- Use and apply the Distributive Property to perform calculations in your head.
- Use algebra to explain how number puzzles work.
- Apply the Distributive Property to real-world situations.
- Use a spreadsheet or table to test the equivalence of expressions.
- Use technology to test for equivalence of expressions.

Linear Equations and Inequalities

Students will:

- Solve and check linear equations of the form $ax + b = c$.
- Solve and check linear inequalities of the form $ax + b < c$.
- Apply the Addition and Multiplication Properties of Equality and Inequality.
- Use linear equations and inequalities of the form $ax + b = c$ and $ax + b < c$ to solve real-world problems.
- Solve problems involving equations of the form $y = ax + b$ using tables or graphs.
- Graph all the solutions of a linear inequality.

Perimeters and Areas

Students will:

- Describe or apply a method for determining the area of an irregularly shaped region.
- Calculate areas of squares, rectangles, parallelograms, trapezoids, and triangles given relevant length of sides, and vice versa.
- Apply the Pythagorean Theorem to calculate lengths and areas in right triangles and other figures.
- Calculate lengths and measures of arcs, the circumference, and the area of a circle given measures of relevant lengths and angles, and vice versa.
- Apply the Pythagorean Theorem and perimeter formulas for parallelograms, kites, and equilateral polygons to real-world situations.
- Apply formulas for the area and circumference of a circle to real-world situations.
- Determine the areas of polygons on a coordinate plane.

Surface Areas and Volumes

Students will:

- Calculate lateral areas, surface areas, and volumes of cylinders and prisms from appropriate lengths, and vice versa.
- Calculate lateral areas, surface areas, and volumes of pyramids and cones from appropriate lengths, and vice versa.
- Calculate the surface area and volume of a sphere from appropriate lengths, and vice versa.
- Determine what happens to the surface area and volume of a figure when its dimensions are multiplied by some number(s).
- Apply formulas for lateral and surface area to real situations.
- Apply formulas for volume to real situations

Systems

Students will:

- Solve 2 x 2 and 3 x 3 systems using the Linear Combination Method or substitution.
- Use matrices to solve systems of two or three linear equations.
- Recognize properties of systems of equations.
- Recognize properties of systems of inequalities.
- Use systems of two or three linear equations to solve real-world problems.
- Use linear programming to solve real-world problems.
- Solve and graph linear inequalities in one variable.
- Estimate solutions to systems by graphing.
- Solve systems of inequalities by graphing.

Quadratic Functions

Students will:

- Expand squares of binomials.
- Solve quadratic equations.
- Apply the definition of absolute value and the Absolute Value-Square Root Theorem.
- Use the discriminant of a quadratic equation to determine the nature of the solutions to the equation.
- Graph quadratic functions or absolute value functions and interpret them.
- Use the discriminant of a quadratic equation to determine the number of x-intercepts of the graph.

Trigonometric Functions

Students will:

- Find sines, cosines, and tangents of angles.
- Evaluate inverse trigonometric functions.
- Use Trigonometry to find lengths, angles, or areas.
- Solve problems using trigonometric ratios in right triangles.

Root, Power, and Logarithm Functions

Students will:

- Evaluate $b^{m/n}$ for $b > 0$
- Evaluate logarithms.
- Describe properties of rational power, *n*th root, and logarithm functions.
- Solve problems arising from exponential or logarithmic models.
- Graph *n*th root, rational power, and logarithm functions.

Probability and Simulation

Students will:

- State and use properties of probabilities.
- Determine whether events are mutually exclusive, independent, or complementary.
- Calculate probabilities in real situations.

Sequences, Series, and Combinations

Students will:

- Find the terms of sequences from explicit or recursive formulas.
- Find explicit or recursive formulas for the *n*th term of an arithmetic or geometric sequence.

More Linear Equations and Inequalities

Students will:

- Solve and check equations of the form $ax + b = cx + d$.
- Solve and check compound inequalities of the form $ax + b < cx + d$.
- Solve percent problems.
- Solve absolute value equations and inequalities involving linear expressions.
- Apply and recognize Addition and Multiplication Properties of Equality and Inequality when solving linear sentences.
- Recognize when sentences have no solution or every real number as a solution.
- Use linear equations and inequalities of the form $ax + b = cx + d$ or $ax + b < cx + d$ to solve real-world problems.
- Use tables and graphs to solve real-world problems involving linear situations.
- Solve real-world problems involving percents.
- Use graphs to solve problems involving linear equations.
- Use graphs to model sentences that have no solution or every real number as a solution.

Division and Proportions in Algebra

Students will:

- Solve proportions.
- Use the language of proportions and the Means-Extreme Property.
- Use rates in real situations.
- Convert units and use reciprocal rates in real situations.
- Use ratios to compare two quantities.
- Calculate relative frequencies and probabilities in situations with a finite number of equally likely outcomes.
- Find probabilities involving geometric regions.• Solve problems involving proportions in real situations.

Indirect and Coordinate Proofs

Students will:

- Determine the length and the coordinates of the midpoint of a segment in the coordinate plane.
- Plot points, find distances between them, and find coordinates of midpoints in 3-dimensional space.
- Apply the Distance and Box Diagonal Formulas in real situations.

Similarity

Students will:

- Use proportions to find missing parts in similar figures.
- Recognize and apply properties of size transformations.
- Use the Fundamental Theorem of Similarity to find lengths, perimeters, areas, and volumes in similar figures.

Similar Triangles and Trigonometry

Students will:

- Calculate lengths using the Right Triangle Altitude Theorem.
- Determine sines, cosines, and tangents of angles and use the SAS Triangle Area Formula.
- Estimate or determine exact values of the trigonometry ratios.
- Know the definitions of sine, cosine, and tangent.
- Use sines, cosines, and tangents to determine unknown lengths in real situations.

Further Work with Circles

Students will:

- Calculate measures of inscribed angles from measures of intercepted arcs, and vice versa.

Powers

Students will:

- Evaluate b^n when $b > 0$ and n is a rational number.
- Simplify expressions or solve equations using properties of exponents.
- Describe geometric sequences explicitly and recursively.
- Recognize properties of the nth powers and nth roots.
- Graph nth power functions.

Inverses and Radicals

Students will:

- Evaluate radicals.
- Apply properties of radicals and nth root functions.
- Solve real-world problems which can be modeled by equations with radicals.

Exponential and Logarithmic Functions

Students will:

- Use logarithms to solve exponential equations.
- Solve logarithmic equations.
- Apply logarithmic scales (pH, decibel), models, and formulas.
- Graph exponential functions.

Trigonometry

Students will:

- Find exact values of trigonometric functions of multiples of 30° or 45° or their radian equivalents.
- Determine the measure of an angle given its sine, cosine, or tangent.
- Solve real-world problems using the trigonometry of right triangles.

Polynomial Functions

Students will:

- Calculate or approximate zeros and relative extrema of polynomial functions.
- Divide polynomials.
- Factor polynomials and solve polynomial equations using technology
- Apply the Remainder Theorem, Factor Theorem, and Factor-Solution-Intercept Equivalence Theorem.

Binomial and Normal Distributions

Students will:

- Calculate the mean and standard deviation of a binomial probability distribution.
- Apply confidence intervals to real-world problems.

Division and Prop. in Algebra (cont.)

Students will:

- Interpret the meaning of percentile for benchmarks of 10^{th}, 25^{th}, 50^{th}, 75^{th}, and 90^{th} percentiles.
- Find lengths and ratios of similitude in similar figures.

Slopes and Lines

Students will:

- Find the slope of the line through two given points.
- Find an equation for a line given either its slope and any point or two points on it.
- Write an equation for a line in standard form or slope-intercept form, and using either form, find its slope and y-intercept.
- Use the definition and properties of slope.
- Calculate rates of change from real data and describe their real-world meanings.
- Use equations for lines to describe real situations.
- Given data whose graph is approximately linear, find a linear equation to fit the graph and make predictions about data values.
- Graph a line given its equation, or given a point and its slope.
- Graph linear inequalities.

Using Algebra to Describe Patterns of Change Students will: • Evaluate functions. • Calculate function values in spread sheets. • Use the language of functions. • Calculate compound interest. • Solve problems involving exponential growth and decay. • Determine whether a situation is constant increase, constant decrease, exponential growth, exponential decay, or nonconstant change. • Compare linear increase with exponential growth. • Graph exponential relationships. • Graph functions **Powers and Roots** Students will: • Simplify products, quotients, and powers of powers. • Evaluate negative integer powers of real numbers. • Rewrite powers of products and quotients. • Simplify square roots. • Evaluate cube roots. • Identify properties of powers that justify a simplification, from the following list: Zero Exponent Property; Negative Exponent Property; Power of a Product Property; Power of a Quotient Property, Product of Powers Property; Quotient of Powers Property; Power of a Power Property. • Represent squares, cubes, square roots, and cube roots geometrically. • Calculate distances on the x-y coordinate plane.			

Quadratic Equations and Functions Students will: • Solve quadratic equations of the form $ax^2 = b$. • Solve quadratic equations using the Quadratic Formula. • Use quadratic equations to solve problems about paths of projectiles. • Solve other real-world problems involving quadratic functions. • Graph equations of the form $y = ax^2$ and interpret these graphs. • Graph equations of the form $y = ax^2 + bx + c$. **Linear Systems** Students will: • Solve systems using substitution. • Solve systems by addition and multiplication. • Use systems of linear equations to solve real-world problems. • Find solutions to systems of equations by graphing.			