

MIDDLE SCHOOL

MATH

SCOPE AND SEQUENCE

SIXTH MATH

SEVENTH MATH

EIGHTH MATH

EIGHTH ALGEBRA I

Mathematics, Grade 6

First Six Weeks :: The student is expected to...

- write prime factorizations using exponents;[1.D]
- use multiplication and division of whole numbers to solve problems including situations involving equivalent ratios and rates;[2.C]
- use order of operations to simplify whole number expressions (without exponents) in problem solving situations.[2.E]
- use tables and symbols to represent and describe proportional and other relationships such as those involving conversions, arithmetic sequences (with a constant rate of change), perimeter and area[4.A]
- use a problem-solving model that incorporates understanding the problem, making a plan, carrying out the plan, and evaluating the solution for reasonableness;[11.B]
- make conjectures from patterns or sets of examples and nonexamples[13.A]

Second Six Weeks :: The student is expected to...

- use integers to represent real-life situations;[1.C]
- use tables of data to generate formulas representing relationships involving perimeter, area, volume of a rectangular prism, etc.[4.B]
- select and use appropriate units, tools, or formulas to measure and to solve problems involving length (including perimeter), area, time, temperature, volume, and weight;[8.B]
- select and use an appropriate representation for presenting and displaying different graphical representations of the same data including line plot, line graph, bar graph, and stem and leaf plot;[10.A]
- identify mean (using concrete objects and pictorial models), median, mode, and range of a set of data;[10.B]
- solve problems by collecting, organizing, displaying, and interpreting data.[10.D]
- select or develop an appropriate problem-solving strategy from a variety of different types, including drawing a picture, looking for a pattern, systematic guessing and checking, acting it out, making a table, working a simpler problem, or working backwards to solve a problem[11.C]
- select tools such as real objects, manipulatives, paper/pencil, and technology or techniques such as mental math, estimation, and number sense to solve problems.[11.D]
- evaluate the effectiveness of different representations to communicate ideas.[12.B]

Third Six Weeks :: The student is expected to...

- compare and order non-negative rational numbers;[1.A]
- generate equivalent forms of rational numbers including whole numbers, fractions, and decimals;[1.B]
- identify factors of a positive integer, common factors, and the greatest common factor of a set of positive integers[1.E]
- identify multiples of a positive integer and common multiples and the least common multiple of a set of positive integers.[1.F]
- use addition and subtraction to solve problems involving fractions and decimals;[2.B]
- estimate and round to approximate reasonable results and to solve problems where exact answers are not required[2.D]
- The student is expected to locate and name points on a coordinate plane using ordered pairs of non-negative rational numbers.[7.A]
- identify and apply mathematics to everyday experiences, to activities in and outside of school, with other disciplines, and with other mathematical topics;[11.A]
- communicate mathematical ideas using language, efficient tools, appropriate units, and graphical, numerical, physical, or algebraic mathematical models[12.A]

Fourth Six Weeks :: The student is expected to...

- model addition and subtraction situations involving fractions with objects, pictures, words, and numbers;[2.A]
- use ratios to describe proportional situations;[3.A]
- represent ratios and percents with concrete models, fractions, and decimals[3.B]
- use ratios to make predictions in proportional situations.[3.C]
- construct sample spaces using lists and tree diagrams[9.A]
- find the probabilities of a simple event and its complement and describe the relationship between the two.[9.B]
- sketch circle graphs to display data[10.C]
- validate his/her conclusions using mathematical properties and relationships.[13.B]

Mathematics, Grade 6

Fifth Six Weeks :: The student is expected to...

- The student is expected to formulate equations from problem situations described by linear relationships.[5.A]
- use angle measurements to classify angles as acute, obtuse, or right;[6.A]
- identify relationships involving angles in triangles and quadrilaterals[6.B]
- describe the relationship between radius, diameter, and circumference of a circle.[6.C]
- estimate measurements (including circumference) and evaluate reasonableness of results;[8.A]
- measure angles[8.C]
- convert measures within the same measurement system (customary and metric) based on relationships between units.[8.D]

Mathematics, Grade 7

First Six Weeks :: The student is expected to...

- simplify numerical expressions involving order of operations and exponents;[2.E]
- select and use appropriate operations to solve problems and justify the selections[2.F]

Second Six Weeks :: The student is expected to...

- represent squares and square roots using geometric models.[1.C]
- represent multiplication and division situations involving fractions and decimals with models, including concrete objects, pictures, words, and numbers;[2.A]
- use addition, subtraction, multiplication, and division to solve problems involving fractions and decimals;[2.B]
- use words and symbols to describe the relationship between the terms in an arithmetic sequence (with a constant rate of change) and their positions in the sequence.[4.C]
- formulate problem situations when given a simple equation and formulate an equation when given a problem situation.[5.B]

Third Six Weeks :: The student is expected to...

- compare and order integers and positive rational numbers;[1.A]
- convert between fractions, decimals, whole numbers, and percents mentally, on paper, or with a calculator[1.B]
- use division to find unit rates and ratios in proportional relationships such as speed, density, price, recipes, and student-teacher ratio;[2.D]
- estimate and find solutions to application problems involving percent[3.A]
- estimate and find solutions to application problems involving proportional relationships such as similarity, scaling, unit costs, and related measurement units.[3.B]
- use concrete and pictorial models to solve equations and use symbols to record the actions[5.A]
- use critical attributes to define similarity.[6.D]

Fourth Six Weeks :: The student is expected to...

- use models, such as concrete objects, pictorial models, and number lines, to add, subtract, multiply, and divide integers and connect the actions to algorithms;[2.C]
- use angle measurements to classify pairs of angles as complementary or supplementary;[6.A]
- use properties to classify triangles and quadrilaterals;[6.B]
- use properties to classify three-dimensional figures, including pyramids, cones, prisms, and cylinders[6.C]
- locate and name points on a coordinate plane using ordered pairs of integers[7.A]
- graph reflections across the horizontal or vertical axis and graph translations on a coordinate plane.[7.B]
- sketch three-dimensional figures when given the top, side, and front views;[8.A]
- make a net (two-dimensional model) of the surface area of a three-dimensional figure[8.B]

Fifth Six Weeks :: The student is expected to...

- generate formulas involving unit conversions, perimeter, area, circumference, volume, and scaling;[4.A]
- graph data to demonstrate relationships in familiar concepts such as conversions, perimeter, area, circumference, volume, and scaling[4.B]
- use geometric concepts and properties to solve problems in fields such as art and architecture.[8.C]
- estimate measurements and solve application problems involving length (including perimeter and circumference) and area of polygons and other shapes;[9.A]
- connect models for volume of prisms (triangular and rectangular) and cylinders to formulas of prisms (triangular and rectangular) and cylinders[9.B]
- estimate measurements and solve application problems involving volume of prisms (rectangular and triangular) and cylinders.[9.C]
- construct sample spaces for simple or composite experiments[10.A]
- find the probability of independent events.[10.B]
- select and use an appropriate representation for presenting and displaying relationships among collected data, including line plot, line graph, bar graph, stem and leaf plot, circle graph, and Venn diagrams, and justify the selection[11.A]
- make inferences and convincing arguments based on an analysis of given or collected data.[11.B]
- describe a set of data using mean, median, mode, and range[12.A]
- choose among mean, median, mode, or range to describe a set of data and justify the choice for a particular situation.[12.B]

Mathematics, Grade 7

- identify and apply mathematics to everyday experiences, to activities in and outside of school, with other disciplines, and with other mathematical topics.[13.A]
- use a problem-solving model that incorporates understanding the problem, making a plan, carrying out the plan, and evaluating the solution for reasonableness.[13.B]
- select or develop an appropriate problem-solving strategy from a variety of different types, including drawing a picture, looking for a pattern, systematic guessing and checking, acting it out, making a table, working a simpler problem, or working backwards to solve a problem[13.C]
- select tools such as real objects, manipulatives, paper/pencil, and technology or techniques such as mental math, estimation, and number sense to solve problems.[13.D]
- communicate mathematical ideas using language, efficient tools, appropriate units, and graphical, numerical, physical, or algebraic mathematical models[14.A]
- evaluate the effectiveness of different representations to communicate ideas.[14.B]
- make conjectures from patterns or sets of examples and nonexamples[15.A]
- validate his/her conclusions using mathematical properties and relationships.[15.B]

Mathematics, Grade 8

First Six Weeks :: The student is expected to...

- compare and order rational numbers in various forms including integers, percents, and positive and negative fractions and decimals.[1.A]
- approximate (mentally and with calculators) the value of irrational numbers as they arise from problem situations (such as $\sqrt{2}$, $\sqrt{3}$)[1.C]
- express numbers in scientific notation, including negative exponents, in appropriate problem situations.[1.D]

Second Six Weeks :: The student is expected to...

- use the Pythagorean Theorem to solve real-life problems[9.A]

Third Six Weeks :: The student is expected to...

- select and use appropriate forms of rational numbers to solve real-life problems including those involving proportional relationships.[1.B]
- select appropriate operations to solve problems involving rational numbers and justify the selections.[2.A]
- use appropriate operations to solve problems involving rational numbers in problem situations.[2.B]
- evaluate a solution for reasonableness[2.C]
- graph dilations, reflections, and translations on a coordinate plane.[6.B]
- use pictures or models to demonstrate the Pythagorean Theorem[7.C]
- locate and name points on a coordinate plane using ordered pairs of rational numbers.[7.D]

Fourth Six Weeks :: The student is expected to...

- use multiplication by a constant factor (unit rate) to represent proportional relationships.[2.D]
- compare and contrast proportional and non-proportional linear relationships[3.A]
- estimate and find solutions to application problems involving percents and other proportional relationships such as similarity and rates.[3.B]
- find and evaluate an algebraic expression to determine any term in an arithmetic sequence (with a constant rate of change).[5.B]
- generate similar figures using dilations including enlargements and reductions[6.A]
- draw three-dimensional figures from different perspectives[7.A]
- use geometric concepts and properties to solve problems in fields such as art and architecture[7.B]
- find lateral and total surface area of prisms, pyramids, and cylinders using concrete models and nets (two-dimensional models);[8.A]
- connect models of prisms, cylinders, pyramids, spheres, and cones to formulas for volume of these objects[8.B]
- estimate measurements and use formulas to solve application problems involving lateral and total surface area and volume.[8.C]
- describe the resulting effects on perimeter and area when dimensions of a shape are changed proportionally [10.A]

Fifth Six Weeks :: The student is expected to...

- The student is expected to generate a different representation of data given another representation of data (such as a table, graph, equation, or verbal description).[4.A]
- predict, find, and justify solutions to application problems using appropriate tables, graphs, and algebraic equations[5.A]
- use proportional relationships in similar two-dimensional figures or similar three-dimensional figures to find missing measurements.[9.B]
- describe the resulting effect on volume when dimensions of a solid are changed proportionally.[10.B]
- find the probabilities of dependent and independent events:[11.A]
- use theoretical probabilities and experimental results to make predictions and decisions[11.B]
- select and use different models to simulate an event.[11.C]
- select the appropriate measure of central tendency or range to describe a set of data and justify the choice for a particular situation:[12.A]
- draw conclusions and make predictions by analyzing trends in scatterplots[12.B]
- select and use an appropriate representation for presenting and displaying relationships among collected data, including line plots, line graphs, stem and leaf plots, circle graphs, bar graphs, box and whisker plots, histograms, and Venn diagrams, with and without the use of technology.[12.C]
- evaluate methods of sampling to determine validity of an inference made from a set of data[13.A]

- recognize misuses of graphical or numerical information and evaluate predictions and conclusions based on data analysis.[13.B]
- make conjectures from patterns or sets of examples and nonexamples[16.A]

Sixth Six Weeks :: The student is expected to...

- identify and apply mathematics to everyday experiences, to activities in and outside of school, with other disciplines, and with other mathematical topics.[14.A]
- use a problem-solving model that incorporates understanding the problem, making a plan, carrying out the plan, and evaluating the solution for reasonableness.[14.B]
- select or develop an appropriate problem-solving strategy from a variety of different types, including drawing a picture, looking for a pattern, systematic guessing and checking, acting it out, making a table, working a simpler problem, or working backwards to solve a problem[14.C]
- select tools such as real objects, manipulatives, paper/pencil, and technology or techniques such as mental math, estimation, and number sense to solve problems.[14.D]
- communicate mathematical ideas using language, efficient tools, appropriate units, and graphical, numerical, physical, or algebraic mathematical models[15.A]
- evaluate the effectiveness of different representations to communicate ideas.[15.B]
- validate his/her conclusions using mathematical properties and relationships.[16.B]

Algebra I

First Six Weeks :: The student is expected to...

- describe independent and dependent quantities in functional relationships:[1.A]
- use symbols to represent unknowns and variables[3.A]

Second Six Weeks :: The student is expected to...

- gather and record data and use data sets to determine functional relationships between quantities:[1.B]
- describe functional relationships for given problem situations and write equations or inequalities to answer questions arising from the situations:[1.C]
- connect equation notation with function notation, such as $y = x + 1$ and $f(x) = x + 1$. [4.C]

Third Six Weeks :: The student is expected to...

- represent relationships among quantities using concrete models, tables, graphs, diagrams, verbal descriptions, equations, and inequalities[1.D]
- interpret and make decisions, predictions, and critical judgments from functional relationships.[1.E]
- look for patterns and represent generalizations algebraically.[3.B]
- find specific function values, simplify polynomial expressions, transform and solve equations, and factor as necessary in problem situations:[4.A]
- use the commutative, associative, and distributive properties to simplify algebraic expressions[4.B]

Fourth Six Weeks :: The student is expected to...

- identify and sketch the general forms of linear ($y = x$) and quadratic ($y = x^2$) parent functions:[2.A]
- identify mathematical domains and ranges and determine reasonable domain and range values for given situations, both continuous and discrete:[2.B]
- interpret situations in terms of given graphs or creates situations that fit given graphs[2.C]
- collect and organize data, make and interpret scatterplots (including recognizing positive, negative, or no correlation for data approximating linear situations), and model, predict, and make decisions and critical judgments in problem situations.[2.D]
- determine whether or not given situations can be represented by linear functions:[5.A]
- determine the domain and range for linear functions in given situations[5.B]
- interpret and determine the reasonableness of solutions to systems of linear equations.[8.C]
- determine the domain and range for quadratic functions in given situations:[9.A]
- investigate, describe, and predict the effects of changes in a on the graph of $y = ax^2 + c$:[9.B]
- investigate, describe, and predict the effects of changes in c on the graph of $y = ax^2 + c$:[9.C]
- analyze graphs of quadratic functions and draw conclusions.[9.D]
- solve quadratic equations using concrete models, tables, graphs, and algebraic methods[10.A]

Fifth Six Weeks :: The student is expected to...

- use, translate, and make connections among algebraic, tabular, graphical, or verbal descriptions of linear functions.[5.C]
- develop the concept of slope as rate of change and determine slopes from graphs, tables, and algebraic representations:[6.A]
- interpret the meaning of slope and intercepts in situations using data, symbolic representations, or graphs:[6.B]
- investigate, describe, and predict the effects of changes in m and b on the graph of $y = mx + b$:[6.C]
- graph and write equations of lines given characteristics such as two points, a point and a slope, or a slope and y intercept:[6.D]
- determine the intercepts of the graphs of linear functions and zeros of linear functions from graphs, tables, and algebraic representations:[6.E]
- interpret and predict the effects of changing slope and y -intercept in applied situations[6.F]
- relate direct variation to linear functions and solve problems involving proportional change.[6.G]
- analyze situations involving linear functions and formulate linear equations or inequalities to solve problems; [7.A]
- investigate methods for solving linear equations and inequalities using concrete models, graphs, and the properties of equality, select a method, and solve the equations and inequalities[7.B]
- interpret and determine the reasonableness of solutions to linear equations and inequalities.[7.C]
- analyze situations and formulate systems of linear equations in two unknowns to solve problems:[8.A]
- solve systems of linear equations using concrete models, graphs, tables, and algebraic methods[8.B]

Algebra I

Sixth Six Weeks :: The student is expected to...

- make connections among the solutions (roots) of quadratic equations, the zeros of their related functions, and the horizontal intercepts (x-intercepts) of the graph of the function.[10.B]
- use patterns to generate the laws of exponents and apply them in problem-solving situations;[11.A]
- analyze data and represent situations involving inverse variation using concrete models, tables, graphs, or algebraic methods[11.B]
- analyze data and represent situations involving exponential growth and decay using concrete models, tables, graphs, or algebraic methods.[11.C]