

Diocese of Bridgeport
Curriculum Map

Course: Algebra 1

Grade Level: 8/9

Content	Skills	Suggested Assessments	Connecticut Content Standards
Variables and the order of operations	<ul style="list-style-type: none"> Understand the use of variables in algebra. Understand and use the order of operations in algebraic expressions. Evaluate an algebraic expression. Understand the use of parentheses (grouping symbols) in algebraic expressions. Solve an equation or inequality with and without grouping symbols. 	<ul style="list-style-type: none"> Use a calculator to evaluate an algebraic expression. Have students estimate answers before finding a solution. Use a calculator to solve a problem with grouping symbols. Use a calculator to verify answers. 	<ul style="list-style-type: none"> The number system extends from natural numbers to include integers, rational numbers, and real numbers. Properties of number systems are used to develop strategies for computation and estimation and judging the reasonableness of results.
Verbal and algebraic models	<ul style="list-style-type: none"> Translate variables into a mathematical sentence. Translate verbal sentences into equations or inequalities. Write an equation as an algebraic model. Be able to interpret graphs as visual models. 	<ul style="list-style-type: none"> Match a verbal phrase or sentence with its corresponding algebraic equation. Have students set up equations with variables for common instances. Have students design graphs for sample data. 	<ul style="list-style-type: none"> Properties of number systems are used to develop strategies for computation and estimation and judging the reasonableness of results. Tables, graphs, and equations can be used to analyze linear functions as well as non-linear functions, for which the rate of change is not constant.
Real numbers	<ul style="list-style-type: none"> Graph real numbers on the real number line. Find the absolute value of a number. Know the properties of addition, subtraction, multiplication, and division of real numbers. Be able to express division as multiplication using reciprocals. Simplify quotients. Use the Distributive Property. Combine like terms in an expression. Use rates and ratios. Use parentheses in grouping to change the order of operation. 	<ul style="list-style-type: none"> Use a number line to understand negative numbers. Use a calculator to perform calculations with negative numbers. Have students use a matrix for organizing data. Assign problems allowing students to see ratios as rates. Use a calculator to see the order of operations. 	<ul style="list-style-type: none"> The number system extends from natural numbers to include integers, rational numbers, and real numbers. Properties of number systems are used to develop strategies for computation and estimation and judging the reasonableness of results.

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Solve linear equations	<ul style="list-style-type: none"> • Solve a linear equation using one transformation. • Use reciprocals to solve equations. • Solve a linear equation using two or more transformations. • Solve Linear equations with variables on both sides. • Solve linear equations involving decimals. • Solve linear equations having denominators. • Recognize and apply the properties of equality. 	<ul style="list-style-type: none"> • Have students use a fulcrum model to understand examples in solving equations. • Use a calculator to test the properties of equality. • Have students use algebraic models to turn real life situations into linear equations. • Have students solve formulas for a specified variable. • Assign problems to explore data with a scatter plot. 	<ul style="list-style-type: none"> • Real world problems may be analyzed using statistical techniques. • Functions are used in a variety of situations including to model data, to make predictions, and to find the rate of change.
Graphing linear equations	<ul style="list-style-type: none"> • Understand the Cartesian Coordinate System. • Graph a linear equation by making a table of values, or plotting two points, or by solving an equation for y. • Understand the use of intercepts in graphing. • Graph a line given a slope and an ordered pair. • Find the slope of a line by using two points or the equation of a line. • Identify the three forms of a linear equation. 	<ul style="list-style-type: none"> • Correctly graph a number on a number line. • Correctly graph an ordered pair on the Cartesian coordinate system. • Use the table function of a calculator to find ordered pairs. • Use scatter plots to see the equation of a line. • Use a graphing calculator to verify the graph of a linear equation. 	<ul style="list-style-type: none"> • Proportional reasoning can be used to make predictions and describe relationships between variables. • Technology can be used to interpret large sets of numbers. • Tables, graphs, and equations can be used to analyze linear functions as well as non-linear functions, for which the rate of change is not constant.
Absolute value equations	<ul style="list-style-type: none"> • Define absolute value and identify the two cases of absolute value. • Graph an absolute value equation on the real number line. • Solve an equation containing absolute value. 	<ul style="list-style-type: none"> • Model a real-life situation to an absolute value problem. • Shade graphs involving absolute value equations. • Use a graphing calculator to graph an equation containing absolute value. 	<ul style="list-style-type: none"> • Functions are used in a variety of situations including to model data, to make predictions, and to find the rate of change.

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Writing linear equations	<ul style="list-style-type: none"> Given a slope and the y intercept, write the equation of a line. Given an equation in standard or general form, transfer the equation to slope intercept form. Given the equation of a line, identify the slope and y intercept. Write the equation of a line in a specified form given a slope and an ordered pair or two points. Write the equation of a parallel or perpendicular line given an equation and an ordered pair. 	<ul style="list-style-type: none"> Use a calculator to explore the equation of a line. Give graphs of points to fit an equation to the data. Have students determine if lines are parallel or perpendicular. Give exercises to show how slopes related to rates of change. Solve word problems by modeling data into the equation of a line. 	<ul style="list-style-type: none"> Proportional reasoning can be used to make predictions and describe relationships between variables. Functions are used in a variety of situations including to model data, to make predictions, and to find the rate of change.
Solving linear inequalities	<ul style="list-style-type: none"> Solve an inequality in one variable using a simple transformation. Solve a linear inequality in two variables, with grouping symbols, by using two or more transformations. Solve a compound inequality. 	<ul style="list-style-type: none"> Have students compose linear inequalities as models. Graph an inequality using a graphing calculator. 	<ul style="list-style-type: none"> Functions are used in a variety of situations including to model data, to make predictions, and to find the rate of change.
Graphing linear inequalities	<ul style="list-style-type: none"> Define the difference between an inequality and an equation. Graph an inequality by changing the inequality sign to an equal sign and correctly shading it by testing a point on the graph. Graph a compound inequality by separating it into two simple inequalities and graphing both equations and find the area that is true for both equations. 	<ul style="list-style-type: none"> Solve an assigned set of problems. Using a graphing calculator compare the graph of an expression containing an inequality sign and an equal sign. Shade the correct side of a graph containing an inequality sign. Solve an inequality by graphing. 	<ul style="list-style-type: none"> Functions are used in a variety of situations including to model data, to make predictions, and to find the rate of change.
Absolute value and inequalities	<ul style="list-style-type: none"> Solve absolute value inequalities. Graph an inequality in two variables on the Cartesian coordinate system. 	<ul style="list-style-type: none"> Solve real-life word problems involving absolute value. 	<ul style="list-style-type: none"> Properties of number systems are used to develop strategies for computation and estimation and judging the reasonableness of results.
Solving linear systems of equations and inequalities	<ul style="list-style-type: none"> Solve a system of equations by graphing, substitution, and linear combination. Identify when a system has one solution, infinite number of solutions or no solution. and is consistent and independent. Identify when a system has no solution and is inconsistent. Solve a system of linear inequalities. 	<ul style="list-style-type: none"> Have students model real-life data into a system of equations. Assign a variety of systems of equations to apply the three methods of finding a solution. Explore how linear programming using linear systems can be used to solve real problems. 	<ul style="list-style-type: none"> Functions are used in a variety of situations including to model data, to make predictions, and to find the rate of change. Properties of number systems are used to develop strategies for computation and estimation and judging the reasonableness of results.

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Powers and exponents	<ul style="list-style-type: none"> • Use the properties of exponents in multiplication and division and power expansion. • Correctly apply exponents to simplify a problem and evaluate expressions with variables. • Understand the use of negative and zero exponents. • Simplify expressions with exponents. • Use scientific notation in calculations. 	<ul style="list-style-type: none"> • Use a calculator to verify the rules used to manage expressions having powers and exponents. • Rewrite an expression having a negative exponent as an expression with positive exponents. • Use the rules of exponents to solve problems involving compound interest and exponential growth and decay. 	<ul style="list-style-type: none"> • Properties of numbers systems are used to develop strategies for computation and estimation and judging the reasonableness of results.
Radicals	<ul style="list-style-type: none"> • Use the distance formula to find the distance between two points. • Use the midpoint formula to find the halfway point between to points. • Find square roots. • Simplify a radical. • Write a radical as an exponent. • Solve an equation containing radicals. 	<ul style="list-style-type: none"> • Use a number line to understand midpoint and distance formula. • Approximate a square root without a calculator. • Use scientific notion to solve problems involving distance, mass, and velocity. 	<ul style="list-style-type: none"> • A wide variety of functions can be used to model real world situations.
Quadratic equations	<ul style="list-style-type: none"> • Solve quadratic equations by finding square roots. • Use the quadratic formula to solve an equation. • Use the discriminate to explore the nature of the solutions of a quadratic equation. 	<ul style="list-style-type: none"> • Use the discriminate to check for the existence of a solution to avoid long difficult calculations. • Write a program for a graphing calculator to solve a quadratic equation. • Solve problems in economics, engineering and physics using quadratic inequalities. 	<ul style="list-style-type: none"> • Functions are used in a variety of situations including to model data, to make predictions, and to find the rate of change.
Polynomials and factoring	<ul style="list-style-type: none"> • Add and subtract polynomials. • Identify the degree of a polynomial. • Write a polynomial in descending order. • Classify a polynomial by the number of terms. • Multiply different type of polynomials. • Understand the relationship between factoring and distribution. • Factor a trinomial. • Factor a perfect square. • Use factoring and completing the square to solve a quadratic equation. 	<ul style="list-style-type: none"> • Have students determine the best method for solving a quadratic equation. • Find the vertex of a quadratic by completing the square. • Use a graphing calculator to graph a quadratic and analyze it's properties. • Assign some real-life problems dealing with factoring. 	<ul style="list-style-type: none"> • Properties of number systems are used to develop strategies for computation and estimation and judging the reasonableness of results. • Functions are used in a variety of situations including to model data, to make predictions, and to find the rate of change.

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Proportions and rational equations	<ul style="list-style-type: none"> • Solve a proportion. • Solve a percent problem. • Understand the concepts of direct and inverse variation. • Use multiplication and common denominators to simplify a rational expression. • Use long division to divide a polynomial. • Solve a rational equation. 	<ul style="list-style-type: none"> • Solve word problems using percents that refer to shopping, sports, science, business, and statistics. • Give probability problems using rational expressions and percentages. • Use the concept of direct and inverse variation to solve word problems involving electrical current, business, and time required to complete a job. 	<ul style="list-style-type: none"> • Principles of probability may be applied in a variety of situations. • Properties of number systems are used to develop strategies for computation and estimation and judging the reasonableness of results.
Functions and relations	<ul style="list-style-type: none"> • Identify the differences between functions and relations. • Evaluate a function. • Use a function to model data. • Solve linear functions. • Solve quadratic functions by completing the square, the quadratic equation or factoring. 	<ul style="list-style-type: none"> • Assign problems modeling functions to real-life situations. • Give mathematical expressions to determine which are relations and which are functions. • Use a graphing calculator to graph different types of functions. • Match exponential and quadratic graphs with the appropriate equation. 	<ul style="list-style-type: none"> • Tables, graphs, and equations can be used to analyze linear functions as well as non-linear functions, for which the rate of change is not constant. • Functions are used in a variety of situations including to model data, to make predictions, and to find the rate of change.