Adopted: September 2017

Bloomingdale School District
Mathematics Department
Grade 8 Curriculum

Grade 8 Curriculum Profile

Overview of the course

Connected Mathematics is a complete mathematics curriculum that helps students develop an understanding of important concepts, skills, procedures, and ways of thinking and reasoning in number, geometry, measurement, algebra, probability and statistics. Students learn to link mathematics with other subject areas, to recognize similarities between programs, and to bridge the gap between elementary and secondary math. The eighth grade program consists of eight units, each focusing on an important mathematical concept. This course provides students with the tools necessary for success on the Algebra 1 PARCC and for entrance into Geometry.

Subject Areas Covered

A. Thinking with Mathematical Models
   1. Linear models and equations
   2. Inverse variation models and equations
   3. Variability of numerical and categorical data

B. Looking for Pythagoras
   1. Pythagorean Theorem and Converse
   2. Square and Cube Roots
   3. Irrational and Real Numbers
   4. Equation of a Circle

C. Growing, Growing, Growing
   1. Representing exponential growth with tables, graphs, equations
   2. Rules for Exponents
   3. Scientific Notation
   4. Exponential Growth and Decay

D. Frogs, Fleas and Painted Cubes (Algebra 1 Only)
   1. Representing quadratic functions
   2. Factoring quadratic expressions
   3. Patterns of change
   4. Effect of parameters

E. Say It With Symbols
   1. Equivalent expressions
   2. Solving linear and quadratic equations
   3. Identify and represent linear
   4. Exponential and quadratic functions

F. Butterflies, Pinwheels and Wallpaper
   1. Symmetry and Transformations
   2. Congruence
   3. Similarity
   4. Coordinate Proof

G. It's In The System
   1. Solving linear systems graphically and algebraically
   2. Systems of functions and inequalities
   3. Solving systems of linear inequalities

H. Function Junction (Algebra 1 Only)
   1. Function notation
   2. Inverses
   3. Arithmetic/geometric sequences
   4. Transformations on functions
   5. Completing the square
   6. Quadratic formula
   7. Polynomial expressions/functions/equations.

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I. Methodology

a. To facilitate learning a consistent three-step process is provided: 1) Launch 2) Explore 3) Summarize
b. Question and answer sessions to encourage student curiosity, confirm understanding and reinforce instruction
c. Presentation of solutions, using the whiteboard to discuss and correct classwork and homework
d. Regular homework and classwork assignments
e. Note-taking
f. Presentation of concepts through real-world projects

II. Instructional Objectives

a. To improve the student's ability to use the principles of Pre-Algebra in problem solving.
b. To instruct students in the use of proper mathematical thinking and reason effectively.
c. To equip students with the tools necessary for success in an Algebra program
d. To instruct students in the practical applications of rational numbers.
e. To make students aware of the importance of mathematics in their everyday life.

III. Text and Other Course Materials

a. Connected Math 3, Grade 7. Lappan, Fey, Fitzgerald, Friel and Phillips. Pearson Prentice Hall.
b. Scientific or graphing calculators
c. Appropriate manipulatives
d. Whiteboard and markers; Smartboard technology
e. Copied and supplementary materials

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Essential Questions	Enduring Understandings	Domain	Cluster	Standard	Learning Targets	Assessment Formative and Summative	Inter-disciplinary Connections	21st Century Connections
Unit 1 – Transformations Pacing - 23 days						**Common unit test, mathematical reflections, quizzes**		

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What situations can be analyzed using transformations and symmetries?	Shape and area can be conserved during mathematical transformations.	Geometry SMP 3 – Construct viable arguments and critique the reasoning of others	Understand congruence and similarity using physical models, transparencies, or geometry software.	8.G.1 - Verify experimentally the properties of rotations, reflections and translations.	Recognize symmetry in design; determine the design element that has been reflected, rotated, or translated to produce a design with symmetry.	How would you explain to someone what it means for a figure to have reflection symmetry, rotation symmetry, translation symmetry?		9.1.8.A.1 - Develop strategies to reinforce positive attitudes and productive behaviors that impact critical thinking and problem-solving skills.
How can we best represent and verify geometric/ algebraic relationships?	Coordinate geometry can be used to represent and verify geometric/ algebraic relationships.	Geometry SMP 2 – Reason abstractly and quantitatively SMP 3 – Construct viable arguments and critique the reasoning of others	Understand congruence and similarity using physical models, transparencies, or geometry software.	8.G.1 - Verify experimentally the properties of rotations, reflections and translations. 8.G.3 - Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.	Describe rigid motions in words and with coordinate rules.	What is the image of a point (x,y) under each transformation: a reflection in the y-axis, a reflection in the x-axis, a reflection in the line y=x, a 90° counterclockwise rotation about the origin, a 180o counterclockwise rotation about the origin, a 270° counterclockwise rotation about the origin, a 360° counterclockwise		9.1.8.B.1 - Use multiple points of view to create alternative solutions.

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						rotation about the origin, a translation that slides (1,2) onto (3, -2), a translation 6 units to the left followed by a translation 2 units down, a 90° counterclockwise rotation about the origin followed by a reflection in the y-axis.		
How can spatial relationships be described by careful use of geometric language?	Geometric properties can be used to construct geometric figures.	Geometry SMP 2 – Reason abstractly and quantitatively SMP 3 – Construct viable arguments and critique the reasoning of others	Understand congruence and similarity using physical models, transparencies, or geometry software.	8.G.1 - Verify experimentally the properties of rotations, reflections and translations. 8.G.1.a – Lines are transformed to lines and line segments to line segment of the same length 8.G.1.b – Angles are transformed to angles of the same measure 8.G.1.c – Parallel lines are transformed to parallel lines 8.G.2 - Understand that a two-	Relate rigid motions to the concept of symmetry and congruence of figures.	What does it mean to say that two geometric figures are congruent? How can you use symmetry transformations to show that two figures are congruent?		9.1.8.A.1 - Develop strategies to reinforce positive attitudes and productive behaviors that impact critical thinking and problem-solving skills.

Essential Questions	**Enduring Understandings**	**Domain**	**Cluster**	**Standard**	**Learning Targets**	**Assessment Formative and Summative**	**Inter-disciplinary Connections**	**21st Century Connections**
				dimensional figure is congruent to another if the second can be obtained from the first by a sequence of rotations, reflections, and translations; given two congruent figures, describe a sequence that exhibits the congruence between them.				
How can spatial relationships be described by careful use of geometric language?	Geometric properties can be used to construct geometric figures.	Geometry SMP 2 – Reason abstractly and quantitatively SMP 3 – Construct viable arguments and critique the reasoning of others	Understand congruence and similarity using physical models, transparencies, or geometry software.	8.G.3 - Describe the effect of dilations, translations, rotations, and reflections on two- dimensional figures using coordinates.	Describe the effects of translations, rotations, reflections, and dilations on two-dimensional figures using coordinates.	Identify figures on a graph as enlargements or reductions and give the scale factor.		9.1.8.A.1 - Develop strategies to reinforce positive attitudes and productive behaviors that impact critical thinking and problem-solving skills.

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How can spatial relationships be described by careful use of geometric language?	Geometric properties can be used to construct geometric figures.	Geometry	Understand congruence and similarity using physical models, transparencies, or geometry software.	8.G.4 - Understand that a two-dimensional figure is similar to another if the second can be obtained from the first by a sequence of rotations, reflections, translations, and dilations; given two similar two dimensional figures, describe a sequence that exhibits the similarity between them. reflections, translations, and dilations; given two similar two dimensional figures, describe a sequence that exhibits the similarity between them.	Describe the sequence of translations, rotations, reflections, or dilations that exhibits the similarity of two similar figures.	Describe a sequence of transformations that proves figure A is similar to figure B.		9.1.8.A.1 - Develop strategies to reinforce positive attitudes and productive behaviors that impact critical thinking and problem-solving skills.

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Essential Questions	Enduring Understandings	Domain	Cluster	Standard	Learning Targets	Assessment Formative and Summative	Inter-disciplinary Connections	21st Century Connections
Unit 2 - Geometry Topics Pacing - 12 days						**Common unit test, mathematical reflections, quizzes**		
How can measurements be used to solve problems?	Measurements can be used to describe, compare, and make sense of phenomena.	Geometry SMP 2 – Reason abstractly and quantitatively SMP 5 – Use appropriate tools strategically	Understand congruence and similarity using physical models, transparencies, or geometry software.	8.G.5 - Use informal arguments to establish facts about angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles.	Using facts about angle sum and exterior angle of triangles, the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles, find the measurements of angles.	How would you explain the relationships of the angles created when parallel lines are cut by a transversal? Include the relationships of the similar triangles created.	W.8.1 - Write arguments to support claims with clear reasons and relevant evidence.	9.1.8.A.1 - Develop strategies to reinforce positive attitudes and productive behaviors that impact critical thinking and problem-solving skills.
How can measurements be used to solve problems?	Measurements can be used to describe, compare, and make sense of phenomena.	Geometry SMP 1 – Make sense of problems and persevere to solve them SMP 2 – Reason abstractly and	Solve real world and mathematical problems involving volume of cylinders, cones, and spheres.	8.G.9 - Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.	Calculate the volumes of cones, cylinders, and spheres, and use them to solve problems.	Explain how to use the formulas to calculate volumes of cones, cylinders, and spheres.	W.8.1 - Write arguments to support claims with clear reasons and relevant evidence.	

		quantitatively.						

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Unit 3 - Thinking with Mathematical Models Pacing - 28 days						**Common unit test, mathematical reflections, quizzes.**		
How can change be best represented mathematically? How can patterns, relations, and functions be used as tools to best describe and help explain real-life situations.	The symbolic language of algebra is used to communicate and generalize the patterns in mathematics. Algebraic representation can be used to generalize patterns and relationships.	Functions SMP 2 – Reason abstractly and quantitatively SMP 7 – Look for and make use of structure	Define, evaluate, and compare functions. Use functions to model relationships between quantities.	8.F.2 – Compare properties (e.g., rate of change, intercepts, domain and range) of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). For example, given a linear function represented by a table of values and a linear function represented by an algebraic expression, determine which function has the greater rate of change.	Recognize linear and nonlinear patterns from verbal descriptions, tables, and graphs and describe those patterns using words and equations.	How can you decide from a table or graph whether a relationship is linear?		9.1.8.A.1 - Develop strategies to reinforce positive attitudes and productive behaviors that impact critical thinking and problem-solving skills.

				8.F.4 - Construct a function to model a linear relationship between two quantities.				

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				Determine the rate of change and initial value of the function from a description of a relationship or from two (x, y) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values.				
How are patterns of change related to the behavior of functions? What makes an algebraic algorithm both effective and efficient?	Patterns and relationships can be represented graphically, numerically, symbolically, or verbally. Algebraic and numeric procedures are interconnected and build on one	Expressions and Equations Functions SMP 5 – Use appropriate tools strategically SMP 6 – Attend to	Analyze and solve linear equations and pairs of simultaneous linear equations. Define, evaluate, and compare functions. Investigate patterns of association of	8.EE.7 - Solve linear equations in one variable. 8.F.3 - Interpret the equation y = mx + b as defining a linear function, whose graph is a straight line; give examples of functions that are not linear. 8.F.5 - Describe qualitatively the functional	Solve linear equations.	How would you find the equation for linear relationship from each of these: a verbal description, a table of values, a graph?		9.1.8.A.2 - Implement problem-solving strategies to solve a problem in school or the community.

	another to produce a coherent whole.	precision Statistics and Probability	bivariate data.	relationship between two quantities by analyzing a graph				

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				(e.g., where the function is increasing or decreasing, linear or nonlinear). Sketch a graph that exhibits the qualitative features of a function that has been described verbally 8.SP.3 - Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept. 8.F.3 - Interpret the equation y = mx + b as defining a linear function, whose graph is a straight line; give examples of functions that are not linear.				

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How are patterns of change related to the behavior of functions?	Patterns and relationships can be represented graphically, numerically, symbolically, or verbally.	Functions SMP 5 – Use appropriate tools strategically SMP 6 – Attend to precision	Define, evaluate and compare functions.		Use linear and inverse equations to solve problems and make predictions.	Suppose the relationship between variables x and y is an inverse variation: how do the values of y change as values of x increase; describe the pattern in the graph of (x,y) values; describe the		9.1.8.A.4 - Design and implement a project management plan using one or more problem-solving strategies.

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						equation that relates the values of x and y. How is an inverse relationship similar to a linear relationship? How is it different?		
How can we use mathematical models to describe physical relationships?	Mathematical models can be used to describe and quantify physical relationships.	Expressions and Equations SMP 7 – Look for and make use of structure SMP 8 – Look for and express regularity in repeated reasoning	Understand the connections between proportional relationships, lines, and linear equations.	8.EE.5 - Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways. 8.EE.6 - Use similar triangles to explain why the slope m is the same between any two distinct points on a non-vertical line in the coordinate plane; derive the equation y = mx for a line through the origin and the equation y = mx + b for a line	Understand that a function is a rule that assigns a unique output to each input, and that a graph of a function is a set of ordered pairs consisting of each input and corresponding output.	Determine if a table or graph represents a function and how do you know.	W.8.1 - Write arguments to support claims with clear reasons and relevant evidence.	9.1.8.A.1 - Develop strategies to reinforce positive attitudes and productive behaviors that impact critical thinking and problem-solving skills.

				intercepting the vertical axis at b.				

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			Analyze and solve linear equations and pairs of simultaneous linear equations.	8.EE.7.a - Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions. Show which of these possibilities is the case by successively transforming the given equation into simpler forms, until an equivalent equation of the form x = a, a = a, or a = b results (where a and b are different numbers).				
		Functions	Define, evaluate, and compare functions.	8.F.1 - Understand that a function is a rule that assigns to each input exactly one output. The graph of a function is the set of ordered pairs consisting of an input and the corresponding output				

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				8.F.2 – Compare properties (e.g., rate of change, intercepts, domain and range) of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). For example, given a linear function represented by a table of values and a linear function represented by an algebraic expression, determine which function has the greater rate of change.				

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Unit 4 - Looking for Pythagoras Pacing - 18 days						**Common unit test, mathematical reflections, quizzes.**		
How can measurements be used to solve problems?	Measurements can be used to describe, compare, and make sense of phenomena.	Expressions and Equations SMP 1 – Make sense of problems and persevere to solve them SMP 8 – Look for and express	Work with radicals and integer exponents.	8.EE.2 - Use square root and cube root symbols to represent solutions to equations of the form $x^2 = p$ and $x^3 = p$, where p is a positive rational number. Evaluate square roots of small perfect squares and cube roots of small	Understand square roots as lengths of sides of squares.	Describe how you would find the length of a line segment connecting two points on a grid. Be sure to consider horizontal, vertical, and titled segments. Explain what it means to find the square root of a number.		9.1.8.A.2 - Implement problem-solving strategies to solve a problem in school or the community.

		regularity in repeated reasoning		perfect cubes. Know that √2 is irrational.				

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How do we decide when to use an exact answer and when to use an estimate?	Context is critical when using estimation.	Geometry SMP 1 – Make sense of problems and persevere to solve them SMP 4 – Model with mathematics SMP 5 – Use appropriate tools strategically	Understand and apply the Pythagorean Theorem.	- Explain a proof of the Pythagorean Theorem and its converse. - Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real world and mathematical problems in two and three dimensions. 8.G.8 - Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.	Understand the Pythagorean Theorem and how it relates the areas of the squares on the sides of a right triangle.	Given the lengths of two sides of a right triangle, find the length of the third side. Use the Pythagorean Theorem to find the distance between two points on a grid without measuring. How can you determine whether a triangle is a right triangle if you know the lengths of its sides?		9.1.8.B.1 - Use multiple points of view to create alternative solutions.

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How do mathematical ideas interconnect and build on one another to produce a coherent whole	Numeric fluency includes both the understanding of and the ability to appropriately use numbers.	The Number System SMP 1 – Make sense of problems and persevere to solve them SMP 6 – Attend to precision SMP 7 – Look for and make use of structure Geometry	Know that there are numbers that are not rational, and approximate them by rational numbers. Understand and apply the Pythagorean Theorem.	8.NS.1 - Know that numbers that are not rational are called irrational. Understand informally that every number has a decimal expansion; for rational numbers show that the decimal expansion repeats eventually, and convert a decimal expansion which repeats eventually into a rational number. 8.NS.2 - Use rational approximations of irrational numbers to compare the size of irrational numbers, locate them approximately on a number line diagram, and estimate the value of expressions (e.g., π2).8.G.7 - Apply the Pythagorean Theorem to determine unknown sides determine unknown side lengths in right triangles in real world and mathematical problems in two and three dimensions.	Understand irrational numbers as non-terminating, non-repeating decimals.	Given a number, tell if it is rational or irrational and why. Define rational and irrational numbers.		9.1.8.B.1 - Use multiple points of view to create alternative solutions.

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Mid-Year Assessment Pacing: 1 Day								
Unit 5 - Exponential Functions Pacing - 34 Days						**Common unit test, mathematical reflections, quizzes.**		
How can we use mathematical models to describe physical relationships? How can we use physical models to clarify mathematical relationships?	Mathematical models can be used to describe and quantify physical relationships. Physical models can be used to clarify mathematical relationships.	Functions SMP 6 – Attend to precision SMP 7 – Look for and make use of structure	Define, evaluate, and compare functions.	8.F.2 – Compare properties (e.g., rate of change, intercepts, domain and range) of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). For example, given a linear function represented by a table of values and a linear function represented by an algebraic expression, determine which function has the greater rate of change.	Build and analyze an exponential model.	Describe an exponential growth pattern, include key properties such as growth factors. How are exponential growth patterns similar to and different from linear growth patterns?		9.1.8.B.1 - Use multiple points of view to create alternative solutions.

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			Use functions to model relationships between quantities.	8.F.5 - Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear). Sketch a graph that exhibits the qualitative features of a function that has been described verbally.				

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How are patterns of change related to the behavior of functions?	Patterns and relationships can be represented graphically, numerically, symbolically, or verbally.	Functions SMP 6 – Attend to precision SMP 7 – Look for and make use of structure	Use functions to model relationships between quantities.	8.F.5 - Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear). Sketch a graph that exhibits the qualitative features of a function that has been described verbally.	Make sense of the symbols in the equation y=a(b)x.	Explain how you can use a table, a graph, and an equation to find the y-intercept and growth factor for an exponential relationship. Explain how you can use the y-intercept and growth factor to write an equation of an exponential relationship. In the equation y=a(bx), explain what the values for a and b represent in the exponential relationship. How is a represented in a graph of y=a(bx)? c. How is b represented in a graph of y=a(bx)?		9.1.8.A.2 - Implement problem-solving strategies to solve a problem in school or the community.

Essential Questions	**Enduring Understandings**	**Domain**	**Cluster**	**Standard**	**Learning Targets**	**Assessment Formative and Summative**	**Inter-disciplinary Connections**	**21st Century Connections**

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How can patterns, relations, and functions be used as tools to best describe and help explain real-life situations?	Algebraic representation can be used to generalize patterns and relationships.	Functions SMP 1 – Make sense of problems and persevere to solve them SMP 4 – Model with mathematics	Use functions to model relationships between quantities.	8.F.5 - Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear). Sketch a graph that exhibits the qualitative features of a function that has been described verbally.	Calculate growth based on growth rates.	Suppose you know the initial value for a population and the yearly growth rate. How can you determine the population several years from now? How is a growth rate related to the growth factor for the population? How can you determine the yearly growth rate? Suppose you know the equation that represents the exponential relationship between the population size p and the number of years n. How can you determine the doubling time for the population?		9.2.8.D.2 - Differentiate among various investment options.

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How can we use mathematical models to describe physical relationships? How can we use physical models to clarify mathematical relationships?	Mathematical concepts can be used to describe	Functions SMP 1 – Make sense of problems and persevere to solve them SMP 4 – Model with mathematics SMP 6 – Attend to precision SMP 7 – Look for and make use of structure	Use functions to model relationships between quantities.	8.F.5 - Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear). Sketch a graph that exhibits the qualitative features of a function that has been described verbally.	Recognize and describe situations that can be modeled by an exponential function.	How can you recognize an exponential decay pattern from a table of data and a graph? How can you tell that an equation represents exponential decay? How are exponential growth and decay relationships similar? How are they different? How are exponential decay and decreasing linear relationships similar? How are they different?		9.2.8.G.1 - Compare the impact of losses associated with different types of financial risk.

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	b e a n d q u a n t i f y p h y s i c a l r e l a t i o n s h i p s . P h						

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	y s i c a l n o d e l s c a n b e u s e d t o c l a r i f y n a t h e						

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	n a t i c a l r e l a t i o n s h i p s .								
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How do mathematical ideas interconnect and build on one another to produce a coherent whole? How do operations affect numbers?	One representation may sometimes be more helpful than another; and used together, multiple representations give a fuller understanding of a problem. Numeric fluency includes both the understanding of and the ability to appropriately use numbers. The magnitude of numbers affects the outcome of operations on them.	Expressions and Equations SMP 5 – Use appropriate tools strategically SMP 6 – Attend to precision SMP 7 – Look for and make use of structure		8.EE.1 - Know and apply the properties of integer exponents to generate equivalent numerical expressions. 8.EE.3 - Use numbers expressed in the form of a single digit times a whole-number power of 10 to estimate very large or very small quantities, and to express how many times as much one is than the other. 8.EE.4 - Perform operations with numbers expressed in scientific notation, including problems where both decimal and scientific notation are used. Use scientific notation and choose units of appropriate size for measurements of very large or very small quantities (e.g., use millimeters per year for seafloor spreading). Interpret scientific notation that has been generated by technology.	Multiply, divide, and simplify expressions with exponents	Apply the rules for operations with exponents. Include examples with positive and negative exponents as well as scientific notation.		9.1.8.B.1- Use multiple points of view to create alternative solutions.

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Unit 6 - Quadratic Functions Pacing - 22 days						**Common unit tests, mathematical reflections, quizzes**		
How can we use mathematical models to describe physical relationships?	Mathematical models can be used to describe and quantify physical relationships.	Functions SMP 1 – Make sense of problems and persevere to solve them	Use functions to model relationships between quantities.	8.F.5 - Describe qualitatively the functional relationship between two quantities by analyzing a graph	Analyze quadratic relationships by examining patterns of change in table, graph and symbolic representations.	Describe the characteristics of graphs and tables of quadratic functions you have observed so far. How do the		9.2.8.B.1 - Use multiple points of view to create alternative solutions.
How can we use physical models to clarify mathematical relationships? How are patterns of change related to the behavior of functions?	Physical models can be used to clarify mathematical relationships. Patterns and relationships can be represented graphically, numerically, symbolically, or verbally.	SMP 7 – Look for and make use of structure SMP 8 – Look for and express regularity in repeated reasoning		(e.g., where the function is increasing or decreasing, linear or nonlinear). Sketch a graph that exhibits the qualitative features of a function that has been described verbally.		patterns in a graph of a quadratic function appear in the table of values for the function? Describe two ways to find the maximum area for rectangles with a fixed perimeter. How are tables, graphs, and equations for quadratic functions different from those for linear and exponential functions?		

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How can we use mathematical models to describe physical relationships?	Mathematical models can be used to describe and quantify physical relationships.	Functions SMP 1 – Make sense of problems and persevere to solve them SMP 5 – Use appropriate tools strategically SMP 7 – Look for and make use of structure	Define, evaluate, and compare functions.	8.F.2 – Compare properties (e.g., rate of change, intercepts, domain and range) of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). For example, given a linear function represented by a table of values and a linear function represented by an algebraic expression, determine which function has the greater rate of change.	Attach contextual meaning to equations.	Show how the area of a rectangle can illustrate distributive property. Explain how you can use distributive property to write expressions in both factored and expanded form.		9.1.8.B.1 - Use multiple points of view to create alternative solutions.

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Unit 7 - Equivalent Expressions Pacing - 20 days						**Common unit tests, mathematical reflections, quizzes.**		
How do mathematical ideas interconnect and build on one another to produce a coherent whole?	One representation may sometimes be more helpful than another; and used together, multiple representations give a fuller understanding of a problem.	Expressions and Equations SMP 2 – Reason abstractly and quantitatively SMP 3 – Construct viable arguments and critique the reasoning of others	Analyze and solve linear equations and pairs of simultaneous linear equations.	8.EE.7.b - Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms	Write and interpret symbolic expressions and statements.	What does it mean to say that two expressions are equivalent? Explain how the distributive and commutative properties can be used to show that two or more expressions are equivalent.	W.8.2 - Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content	9.1.8.B.1- Use multiple points of view to create alternative solutions.
What makes an algebraic algorithm both effective and efficient?	Algebraic and numeric procedures are interconnected and build on one another to produce a coherent whole.	Expressions and Equations SMP 3 – Construct viable arguments and critique the reasoning of others	Analyze and solve linear equations and pairs of simultaneous linear equations.	8.EE.7 - Solve linear equations in one variable. 8.EE.7.a - Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions. Show which of these possibilities is the case by	Solve linear equations	Describe some general strategies for solving linear equations, including those with parentheses. Give examples that illustrate your strategies.	W.8.2.d - Use precise language and domain-specific vocabulary to inform about or explain the topic.	9.1.8.B.1 - Use multiple points of view to create alternative solutions.

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				successively transforming the given equation into simpler forms, until an equivalent equation of the form x=a, a=a, or a=b results (where a and b are different numbers). 8.EE.7.b - Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms				
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Unit 8 - Shapes of Algebra Pacing - 21 days						**Common unit test, mathematical reflections, quizzes**		
How are patterns of change related to the behavior of functions?	Patterns and relationships can be represented graphically, numerically, symbolically, or verbally.	Functions SMP 7 – Look for and make use of structure SMP 8 – Look for and express regularity in repeated reasoning Statistics and Probability	Define, evaluate, and compare function. Investigate patterns of association in bivariate data.	8.F.2 - Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables or by verbal descriptions). 8.F.3 - Interpret the equation y=mx+b as defining a linear function, whose graph is a straight line; give examples of functions that are not linear. 8.SP.3 - Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and y-intercept.	Graph linear functions in the form y=mx+b and ax+by=c.	What pattern will result from plotting all points (x,y) that satisfy an equation in slope intercept and standard form? Graph lines given equations.		9.1.8.B.1 - Use multiple points of view to create alternative solutions.

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How are patterns of change related to the behavior of functions?	Patterns and relationships can be represented graphically, numerically, symbolically, or verbally.	Expressions and Equations SMP 7 – Look for and make use of structure SMP 8 –	Analyze and solve linear equations and pairs of simultaneous linear equations.	8.EE.8 - Analyze and solve pairs of simultaneous linear equations. 8.EE.8.a - Understand that solutions to a	Write and solve systems of linear equations.	What is the goal of solving a system of linear equations such as: a. y = - 3x + 5 y = 4x - 8 b. 3x + y = 5 2x + 5y = -8		9.1.8.A.1 - Use multiple points of view to create alternative solutions.

		Look for and express regularity in repeated reasoning		systemof two linear equations in two variables correspond to points of intersection of their graphs, because points of intersection satisfy both equations simultaneously. 8.EE.8.b - Solve systems of two linear equations in two variables algebraically, and estimate solutions by graphing the equations. Solve simple cases by inspection. 8.EE.8.c - Solve real-world and mathematical problems leading to two linear equations in two variables.		Tell which solutions strategy would be most efficient for the system. y = 4x - 5 y = 1.5x + 8 x + 3y = 4 x - 5y = -8 c. 4x + 3y = 4 x - 5y = 7 d. 4x + 3y = 4 2x - 5y = 7 How can you check a possible solution of a systemof linear equations		

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How can the collection, organization, interpretation, and display of data be used to answer questions?	The message conveyed by the data depends on how the data is collected, represented, and summarized.	Statistics and Probability SMP 2 – Reason abstractly and quantitatively SMP 3 – Construct viable arguments and critique the reasoning of others SMP 4 – Model with mathematics	Investigate patterns of association in bivariate data.	8.SP.1 - Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities. Describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association. 8.SP.2 – Know that straight lines are widely used to model relationships between quantitative variables. For scatter plots that suggest a linear association, informally fit a straight line, and informally assess the model fit (e.g., line of best fit) by judging the closeness of the data points to the line.	Develop a linear equation to characterize a display of data on a scatter ploy.	What does it mean to say one variable is related to another variable? Write an equation based on a scatter plot. Use a scatter plot to predict information.	W.8.1.b - Support claim(s) with logical reasoning and relevant evidence, using accurate, credible sources and demonstrating an understanding of the topic or text.	9.1.8.E.4 - Compare and contrast ways governments regulate media advertising to protect children and adults in the United States and in other countries.

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How can experimental and theoretical probabilities be used to make predictions or draw conclusions?	The results of a statistical investigation can be used to support or refute an argument.	Statistics and Probability SMP 1 – Make sense of problems and persevere to solve them SMP 2 – Reason abstractly and quantitatively SMP 4 – Model with mathematics	Investigate patterns of association in bivariate data.	8.SP.4 - Understand that patterns of association can also be seen in bivariate categorical data by displaying frequencies and relative frequencies in a two-way table. Construct and interpret a two-way table summarizing data on two categorical variables collected from the same subjects. Use relative frequencies calculated for rows or columns to describe possible association between the two variables.	Construct and interpret two-way tables summarizing bivariate categorical data, including relative frequencies.	Make a two-way table using given data and describe what the relative frequencies tell you about the data.	W.8.1.b - Write arguments to support claims with clear reasons and relevant evidence.	9.1.8.E.4 - Compare and contrast ways governments regulate media advertising to protect children and adults in the United States and in other countries.

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End-of-Year Assessment Pacing: 1 Day						

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