Subject	**8th Grade Algebra 1 (Honors)**
Nine Week	**First 9 Weeks**
Standard	**Standards are not covered in their entirety during this 9 weeks. Standards will be repeated throughout the course.** **N-Q.A.1**: Use units as a way to understand problems and to guide the solution of multistep problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays. **N-Q.A.2**: Define appropriate quantities for the purpose of descriptive modeling. **N-Q.A.3**: Choose a level of accuracy appropriate to limitations on measurement when reporting quantities. **A-CED.A.1**: Create equations and inequalities in one variable and use them to solve problems. **A-CED.A.2**: Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales. **A-CED.A.3**: Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context **A-CED.A.4**: Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. **A-APR.A.1**: Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials. **A-REI.A.1**: Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method. **A-REI.B.3**: Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters. **A-REI.C.5**: Prove that, given a system of two equations in two variables, replacing one equation by the sum of that equation and a multiple of the other produces a system with the same solutions. **A-REI.D.10**: Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line). **A-REI.D.12**: Graph the solutions to a linear inequality in two variables as a half-plane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes.
Objectives	Students define appropriate quantities from a situation (a graphing story), choose and interpret the scale and the origin for the graph, and graph the piecewise linear function described in the video. They understand the relationship between physical measurements and their representation on a graph.

	Students represent graphically a nonlinear relationship between two quantities and interpret features of the graph. They understand the relationship between physical quantities via the graph. Students choose and interpret the scale on a graph to appropriately represent an exponential function. Students plot points representing the number of bacteria over time, given that bacteria grow by a constant factor over evenly spaced time intervals. Students develop the tools necessary to discern units for quantities in real-world situations and choose levels of accuracy appropriate to limitations on measurement. They refine their skills in interpreting the meaning of features appearing in graphs. Students interpret the meaning of the point of intersection of two graphs and use analytic tools to find its coordinates. Students use the structure of an expression to identify ways to rewrite it. Students use the distributive property to prove equivalency of expressions. Students use the commutative and associative properties to recognize structure within expressions and to prove equivalency of expressions. Students understand that the sum or difference of two polynomials produces another polynomial and relate polynomials to the system of integers; students add and subtract polynomials. Students understand that the product of two polynomials produces another polynomial; students multiply polynomials. Students understand that an equation is a statement of equality between two expressions. When values are substituted for the variables in an equation, the equation is either true or false. Students find values to assign to the variables in equations that make the equations true statements. Students understand that an equation with variables is often viewed as a question asking for the set of values one can assign to the variables of the equation to make the equation a true statement. They see the equation as a "filter" that sifts through all numbers in the domain of the variables, sorting those numbers into two disjoint sets: the solution set and the set of numbers for which the equation is false. Students understand the commutative, associate, and distributive properties as identities (i.e., equations whose solution sets are the set of all values in the domain of the variables). Students are introduced to the formal process of solving an equation: starting from the assumption that the original equation has a solution. Students explain each step as following from the properties of equality. Students identify equations that have the same solution set.

	Students learn if-then moves using the properties of equality to solve equations. Students also explore moves that may result in an equation having more solutions than the original equation Students learn if-then moves using the addition and multiplication properties of inequality to solve inequalities and graph the solution sets on the number line. Students describe the solution set of two equations (or inequalities) joined by either "and" or "or" and graph the solution set on the number line Students solve two inequalities joined by "and" or "or" and then graph the solution set on the number line. Students learn that equations of the form $(x - a)(x - b) = 0$ have the same solution set as two equations joined by "or": $x - a = 0$ or $x - bb = 0$. Students solve factored or easily factorable equations. Students interpret equations like $1\,xx = 3$ as two equations, $1\,xx = 3$ and $xx \neq 0$, joined by "and." Students find the solution set for this new system of equations. Students learn to think of some of the letters in a formula as constants in order to define a relationship between two or more quantities, where one is in terms of another, for example holding V in $V = I\mathrm{R}$ as constant and finding R in terms of I. Students recognize and identify solutions to two-variable equations. They represent the solution set graphically. They create two-variable equations to represent a situation. They understand that the graph of the line $a\mathrm{x} + b\mathrm{y} = c$ is a visual representation of the solution set to the equation $a\mathrm{x} + b\mathrm{y} = c$. Students recognize and identify solutions to two-variable inequalities. They represent the solution set graphically. They create two-variable inequalities to represent a situation. Students understand that a half-plane bounded by the line $\mathrm{ax} + b\mathrm{y} = c$ is a visual representation of the solution set to a linear inequality, such as $a\mathrm{x} + b\mathrm{y} < cc$. They interpret the inequality symbol correctly to determine which portion of the coordinate plane is shaded to represent the solution. Students identify solutions to simultaneous equations or inequalities; they solve systems of linear equations and inequalities either algebraically or graphically. Students create systems of equations that have the same solution set as a given system. Students understand that adding a multiple of one equation to another creates a new

	system of two linear equations with the same solution set as the original system. This property provides a justification for a method to solve a system of two linear equations algebraically. Students use systems of equations or inequalities to solve contextual problems and interpret solutions within a particular context. Students investigate a problem that can be solved by reasoning quantitatively and by creating equations in one variable. Students compare the numerical approach to the algebraic approach. Students learn the meaning and notation of recursive sequences in a modeling setting. Following the modeling cycle, students investigate the double and add 5 game in a simple case in order to understand the statement of the main problem. Students learn the meaning and notation of recursive sequences in a modeling setting. ♣ Students use recursive sequences to model and answer problems. ♣ Students create equations and inequalities to solve a modeling problem. ♣ Students represent constraints by equations and inequalities and interpret solutions as viable or non-viable options in a modeling context. Students create equations and inequalities in one variable and use them to solve problems. ♣ Students create equations in two or more variables to represent relationships between quantities and graph equations on coordinate axes with labels and scales. ♣ Students represent constraints by inequalities and interpret solutions as viable or non-viable options in a modeling context.
Topics	**N-Q.A.1, N-Q.A.2, N-Q.A.3, A-CED.A.2** • Graphs of Piecewise Linear Functions • Graphs of Quadratic Functions • Graphs of Exponential Functions • Analyzing Graphs-Water Usage During a Typical Day at School **A-SSE.A.2, A-APR.A.1** • Algebraic Expressions-The Distributive Property • Algebraic Expressions-The Commutative and Associative Properties • Adding and Subtracting Polynomials • Multiplying Polynomials **A-CED.A.3, A-CED.A.4, A-REI.A.1, A-REI.B.3, A-REI.C.5, A-REI.C.6, A-REI.D.10, A-REI.D.12** • True and False Equations • Solution Sets for Equations and Inequalities • Solving Equations • Solving Inequalities • Solution Sets of Two or More Equations • Solving and Graphing Inequalities • Special Types of Equations • Rearranging Formulas

	• Solutions to Equations/Inequalities in Two Variables • Simultaneous Equations • Applications of System of Equations/Inequalities **N-Q.A.1, A-SSE.A.1, A-CED.A.1, A-CED.A.2, A-REI.B.3** • Creating Equations to Solve Problems
Major Assignment/s	**All Assessments (Listed below in "Assessment(s)" Section** **Daily Problem Sets (Homework)** **Daily Exit Tickets** **Projects (Reminder: First 9 Weeks Only):** Sell That (Mathematical) Property Project Word Wall Algebra Vocabulary Cards The Cost of College Project** CSI Algebra 1 Unit 1 Packet** The Game of Life—Financial Literacy Project** Math History Research Paper (Past Mathematician)** **Projects are available as extra credit items for students who are more advanced/quick to complete regular assignments. Most of these projects come from the same creator (21st Century Math Projects. A STEM Teacher who creates amazing projects that can be used in STEM or the Math classrooms. Based on student need, additional projects may be added.
Instructional Materials	All Handouts courtesy of EngageNY Module 1 Student Materials located here: https://www.engageny.org/resource/algebra-i-module-1/file/110601 Videos Shown in Class: http://www.mrmeyer.com/graphingstories1/graphingstories2.mov http://www.mrmeyer.com/graphingstories1/graphingstories3.mov https://vimeo.com/105382325 http://www.mrmeyer.com/graphingstories1/graphingstories4.mov https://www.youtube.com/watch?v=gEwzDydciWc https://www.youtube.com/watch?v=X956EvmCevI&feature=youtu.be Random Number Generator http://www.mathgoodies.com/calculators/random_no_custom.html

Assessment(s)	**Diagnostic Test Part 1 and Part 2** **Mid Module 1 Quiz (Summative Assessment)** **Module 1 Assessment (Test)** **Common Formative Assessment 1** **In Class Assessments (i.e Bellwork or Exit Tickets)**
Field Trip/s	N/A