	ARTS IN MOTION CHARTER SCHOOL| 9th Grade Math 1 CURRICULUM MAP				
Projects	**Essential Questions**	**Enduring Understandings**	**Math Concepts**	**CCSS**	**Final Product**
Equations and Inequalities	• What do solutions for equations and inequalities mean? How can linear equations and inequalities represent real-world situations? • How can contextualizing and decontextualizing linear equations and inequalities deepen our understanding of the real world? • How can we manipulate one-variable linear equations and inequalities to solve for unknown quantities? • How can we justify if a given value or an ordered pair is a solution to an equation or inequality?	• Solutions are the value(s) that satisfy an equation, inequality, or system, and they can be represented in multiple ways. • Solving for unknown quantities often requires the mindful manipulation of expressions, equations and inequalities. • Both de-contextualizing (abstracting a given situation and represent it symbolically and manipulate the representing symbols as if they have a life of their own) and contextualizing (pausing as needed in order to probe into the referents for the symbols involved) can add meaning to problems and their solutions.	• Represent Graphically • Solving	• CCSS.MATH.CONTENT.HSA.REI.A.1 • CCSS.MATH.CONTENT.HSA.REI.B.3 • CCSS.MATH.CONTENT.HSA.REI.D.10 • CCSS.MATH.CONTENT.HSA.REI.D.11 • CCSS.MATH.CONTENT.HSA.REI.D.12 • CCSS.MATH.CONTENT.HSN.Q.A.1 • CCSS.MATH.CONTENT.HSN.Q.A.2 • CCSS.MATH.CONTENT.HSN.Q.A.3	• Performance Task
Patterns and Sequences	• How can patterns and real-world situations be represented with sequences and functions? • How can we use mathematical representations of real-world situations to make predictions about those situations? • What are the different ways that patterns and grow or shrink, and how can these be characterized?	• Patterns and real-world situations can be represented as sequences, which can be viewed in tables, in graphs, or with algebraic symbols. • Representing situations mathematically yields predictive power about those situations. • Arithmetic sequences change at a constant rate; geometric sequences change multiplicatively by a constant ratio. Each of these types of sequences has a general form when expressed symbolically and a general shape when viewed graphically.	• Sequences	• CCSS.MATH.CONTENT.HSF.BF.A.1 • CCSS.MATH.CONTENT.HSF.BF.A.2 • CCSS.MATH.CONTENT.HSF.IF.A.1 • CCSS.MATH.CONTENT.HSF.IF.A.2 • CCSS.MATH.CONTENT.HSF.IF.A.3 • CCSS.MATH.CONTENT.HSN.Q.A.1 • CCSS.MATH.CONTENT.HSN.Q.A.2 • CCSS.MATH.CONTENT.HSN.Q.A.3	• Performance Task

Features of Functions	• How can real-life situations be described and modeled mathematically? What are the benefits of doing this? • What are the ways functions can be represented? • In what ways are functions always the same and in what ways can they be different?	• Functions describe situations in which one quantity is determined by another. • The defining characteristic of a function is that the input value determines the output value or, equivalently, that the output value depends upon the input value. • To understand relationships between quantities, it is often helpful to describe the relationships qualitatively, paying attention to the general shape of the graph without concern for specific numerical values. • The input/output relationship in a function is a correspondence between two sets: the domain and the range	• Interpret Functions • Sequences • Understand Functions	• CCSS.MATH.CONTENT.HSF.BF.A.1 • CCSS.MATH.CONTENT.HSF.BF.A.2 • CCSS.MATH.CONTENT.HSF.IF.A.1 • CCSS.MATH.CONTENT.HSF.IF.A.2 • CCSS.MATH.CONTENT.HSF.IF.A.3 • CCSS.MATH.CONTENT.HSF.IF.B.4 • CCSS.MATH.CONTENT.HSF.IF.B.5 • CCSS.MATH.CONTENT.HSF.IF.B.6 • CCSS.MATH.CONTENT.HSN.Q.A.1 • CCSS.MATH.CONTENT.HSN.Q.A.2	• Performance Task
Event Planning	• How can mathematical models illustrate the business notions of revenue and cost, and how can these models be analyzed to predict profit or loss?	• Mathematical models can be developed both by individuals to help manage their finances and by businesses to help plan for something that will be financially feasible.	• Justifying / Constructing an Explanation • Modeling • Multimedia in Oral Presentation • Oral Presentation • Precision	• CCSS.MATH.CONTENT.HSA.CED.A.3 • CCSS.MATH.CONTENT.HSF.BF.A.1 • CCSS.MATH.CONTENT.HSF.BF.A.2 • CCSS.MATH.CONTENT.HSF.IF.B.4 • CCSS.MATH.CONTENT.HSF.IF.B.5 • CCSS.MATH.PRACTICE.MP4 • CCSS.MATH.PRACTICE.MP6	• Performance Task
Linear and Exponential Functions	• How can we use functions to represent change of one quantity in terms of another? • When is it appropriate to use exponential or linear functions to model a situation? • What are the similarities and differences between exponential and linear patterns?	• Functions, including the linear and exponential variety, can be represented and viewed in multiple ways, including graphs, tables and algebraic rules. • Linear and exponential characterize two common types of growth; each has distinct characteristics.	• Analyze Functions • Create Functions • Interpret Functions • Represent Graphically • Systems	• CCSS.ELA-LITERACY.CCRA.R.1 • CCSS.MATH.CONTENT.HSA.CED.A.1 • CCSS.MATH.CONTENT.HSA.CED.A.2 • CCSS.MATH.CONTENT.HSA.CED.A.3 • CCSS.MATH.CONTENT.HSA.CED.A.4 • CCSS.MATH.CONTENT.HSA.REI.C.5 • CCSS.MATH.CONTENT.HSA.REI.C.6 • CCSS.MATH.CONTENT.HSA.REI.C.7 • CCSS.MATH.CONTENT.HSA.REI.C.8 • CCSS.MATH.CONTENT.HSA.REI.C.9	• Performance Task
Geometry	• What does it mean to prove deductively? What information is necessary to prove figures congruent? • How can congruence be used to prove geometric conjectures?	• Two figures are congruent if one can be obtained from the other by rigid motion. In many cases, only three corresponding parts of triangles are needed to prove them congruent. • Congruent triangles allow us to prove many geometric conjectures, which in turn make more conjectures and proofs possible.	• Congruence • Geometric Proofs • Plane Transformations	• CCSS.MATH.CONTENT.HSG.CO.A.1 • CCSS.MATH.CONTENT.HSG.CO.A.2 • CCSS.MATH.CONTENT.HSG.CO.A.3 • CCSS.MATH.CONTENT.HSG.CO.A.4 • CCSS.MATH.CONTENT.HSG.CO.A.5 • CCSS.MATH.CONTENT.HSG.CO.B.6 • CCSS.MATH.CONTENT.HSG.CO.B.7 • CCSS.MATH.CONTENT.HSG.CO.B.8 • CCSS.MATH.CONTENT.HSG.GPE.B.4 • CCSS.MATH.CONTENT.HSG.GPE.B.5	• Performance Task

Descriptive Statistics	• Why is data collected and analyzed? What are different methods by which data can be displayed? • How do people use data to influence others? • How can predictions be made based on data? • What is strength of an association between two variables?	• Data are collected for a purpose and have meaning in a context. The way that data is collected, organized and displayed influences interpretation. • Measures of central tendency describe how the data cluster or group. Measures of dispersion describe how the data spread around the center of the data. Association between two variables considers both the direction and strength of the association. • The strength of an association between two variables reflects how accurately the value of one variable can be predicted based on the value of the other variable.	• Bivariate Data • Univariate Data	• CCSS.MATH.CONTENT.HSS.ID.A.1 • CCSS.MATH.CONTENT.HSS.ID.A.2 • CCSS.MATH.CONTENT.HSS.ID.A.3 • CCSS.MATH.CONTENT.HSS.ID.B.5 • CCSS.MATH.CONTENT.HSS.ID.B.6 • CCSS.MATH.CONTENT.HSS.ID.C.7 • CCSS.MATH.CONTENT.HSS.ID.C.8 • CCSS.MATH.CONTENT.HSS.ID.C.9	• Performance Task
Booming Populations	• How can we understand and predict patterns of population change in countries around the world, using visual models such as scatterplots, spreadsheets, and linear or exponential functions? • How do these mathematical models shed light on historical processes and events? • What is the utility of such models for making long-range predictions?	• Linear and exponential models behave in fundamentally different ways, but both can be used to model various situations in social, political or scientific contexts. • Each type of model has benefits and limitations. More importantly, these and other mathematical models can be used to approximate real-world data, and are useful for visualizing patterns, presenting basic information, and making predictions.	• Comparing/ Contrasting • Conventions • Hypothesizing • Interpreting Data/Info • Modeling	• CCSS.MATH.CONTENT.HSF.BF.A.1 • CCSS.MATH.CONTENT.HSF.BF.A.2 • CCSS.MATH.CONTENT.HSF.LE.A.1 • CCSS.MATH.CONTENT.HSF.LE.A.2 • CCSS.MATH.PRACTICE.MP1 • CCSS.MATH.PRACTICE.MP4	• Booming Populations Final Report

ARTS IN MOTION CHARTER SCHOOL| 9th Grade Math 1 UNIT PLAN	
Project	**Equations and Inequalities**
Suggested Time	● 4 Weeks
Essential Questions	● What do solutions for equations and inequalities mean? How can linear equations and inequalities represent real-world situations? ● How can contextualizing and decontextualizing linear equations and inequalities deepen our understanding of the real world? ● How can we manipulate one-variable linear equations and inequalities to solve for unknown quantities? ● How can we justify if a given value or an ordered pair is a solution to an equation or inequality?
Enduring Understandings	● Solutions are the value(s) that satisfy an equation, inequality, or system, and they can be represented in multiple ways. ● Solving for unknown quantities often requires the mindful manipulation of expressions, equations and inequalities. ● Both de-contextualizing (abstracting a given situation and represent it symbolically and manipulate the representing symbols as if they have a life of their own) and contextualizing (pausing as needed in order to probe into the referents for the symbols involved) can add meaning to problems and their solutions.
Math Concepts	● Represent Graphically ● Solving
Focus Areas	● One- Variable Equations and Inequalities
CCSS	● CCSS.MATH.CONTENT.HSA.REI.A.1 ● CCSS.MATH.CONTENT.HSA.REI.B.3 ● CCSS.MATH.CONTENT.HSA.REI.D.10 ● CCSS.MATH.CONTENT.HSA.REI.D.11 ● CCSS.MATH.CONTENT.HSA.REI.D.12 ● CCSS.MATH.CONTENT.HSN.Q.A.1 ● CCSS.MATH.CONTENT.HSN.Q.A.2 ● CCSS.MATH.CONTENT.HSN.Q.A.3
Checkpoints	● Meaning of Solution ● Justifying Solutions ● Writing Equations and Inequalities ● Simultaneous Equations ● Two-variable Inequalities

	• Simultaneous Inequalities
Final Product	• Performance Task

ARTS IN MOTION CHARTER SCHOOL| 9th Grade Math 1 LESSON PLAN					
Project	**Equations and Inequalities**	**Essential Questions**	• What do solutions for equations and inequalities mean? How can linear equations and inequalities represent real-world situations? • How can contextualizing and decontextualizing linear equations and inequalities deepen our understanding of the real world? • How can we manipulate one-variable linear equations and inequalities to solve for unknown quantities? • How can we justify if a given value or an ordered pair is a solution to an equation or inequality?	**Final Product**	• Performance Task

Checkpoint	• Meaning of Solution
Cognitive Skills	• Represent Graphically • Solving
Objective	• Determine if solutions are correct based on sorting equations and identities
Activities	• Checkpoint
Resources	• True & False Equations • Sorting Equations and Identities
Assessment	• Performance task assessment using cognitive skills (Teacher created)

Checkpoint - Meaning of solution

Determine whether the following number sentences are true or false.

1. $18 + 7 = \frac{50}{2}$ 2. $(123 + 54) \cdot 4 = 123 + (54 \cdot 4)$ 3. $5^2 + 12^2 = 13^2$

For each of the following, assign a value to the variable, □, to make the equation a true statement:

4. $\sqrt{(x+1)(x+2)} = \sqrt{20}$ 5. $(d+5)^2 = 36$

Generate the following:

6. An equation that is always true

7. An equation that is true when x = 1

8. An inequality that is true for all numbers greater than or equal to 5