	ARTS IN MOTION CHARTER SCHOOL| 8th Grade Math CURRICULUM MAP				
Projects	**Essential Questions**	**Enduring Understandings**	**Math Concepts**	**CCSS**	**Final Product**
Linear Equations	• What are the characteristics of a linear equation that has no solutions? • What are the characteristics of a linear equation that has an infinite number of solutions? • What are the characteristics of a linear equation that has one solution?	• Understand that linear equations have one, none, or an infinite number of solutions	• Solving	• CCSS.MATH.CONTENT.8.EE.C.7	• Performance Task: Linear Equations- When are Equations True?
Linear Relationships	• What are the characteristics of a linear equation that has no solutions? • What are the characteristics of a linear equation that has an infinite number of solutions? • What are the characteristics of a linear equation that has one solution?	• Understand that linear equations have one, none, or an infinite number of solutions	• Solving	• CCSS.MATH.CONTENT.8.EE.C.7	• Performance Task: When are Equations True?
Functions	• How does the defining characteristic of a function show up in a table, or in a graph? • How do the defining characteristics of a linear function show up in a verbal description, a table, or in a graph?	• A function is a rule that assigns to each input exactly one output. • The general form of a linear function is y = mx + b, where b represents the initial value and m represents the constant rate of increase.	• Functions • Linear Relationships	• CCSS.MATH.CONTENT.8.EE.B.5 • CCSS.MATH.CONTENT.8.F.A.1 • CCSS.MATH.CONTENT.8.F.A.2 • CCSS.MATH.CONTENT.8.F.A.3 • CCSS.MATH.CONTENT.8.F.B.4 • CCSS.MATH.CONTENT.8.F.B.5	• Performance Task: Milk Jug Race
Business Not As Usual	• How does math contribute to a	• Math helps people make good decisions. • Math is fundamental to planning a	• Informational/Explanatory Thesis	• CCSS.MATH.CONTENT.8.EE.B.5 • CCSS.MATH.CONTENT.8.F.B.4	• Performance Task: Create a

	decision to create and fund a business? ● What data, equations, and functions matter most when planning a business?	business.	● Interpreting Data/Info ● Oral Presentation ● Synthesizing Multiple Sources	● CCSS.MATH.CONTENT.8.F.B.5 ● CCSS.MATH.PRACTICE.MP4	Persuasive Business Plan

Measurement	• How does the representation of a cylinder as a parallel solid explain its volume as a product of the area of the cylinder's base and perpendicular height? • What is the ratio of the volume of a come to the volume of a cylinder with the same radius and perpendicular height? • What is the Pythagorean theorem and how can it help find distances along a diagonal? • What is the converse of the Pythagorean theorem and what can it help you find?	• Understand that most common solids fall into two large families of solids: those with regular cross-section and those without. • Understand that a cylinder represents a general class of geometric solid. That is, those geometric solids that are formed by two congruent bases that lie in parallel planes and are connected by line segments that are parallel and congruent. • Understand why the volume of a cylinder is the product of the area of its base and its perpendicular height. • Understand that a cone represents another general class of geometric solid. That is, those geometric solids that have one base and an apex, which can be any point not in the same plane as the base. The line segments that connect the base to the apex form the sides, usually called its lateral surface. For lack of a better term we can call these point solids. • Understand that the volume of a cone is the 1/3 times the product of the area of its base and its perpendicular height. • Know that volume of a sphere and understand how to use the volume of spheres, cylinders and cones to solve real world and mathematical problems. • Students understand that the Pythagorean theorem is about finding distances along a diagonal., or given a diagonal finding either of the horizontal or vertical distance	• Pythagorean Theorem and Volume	• CCSS.MATH.CONTENT.8.G.B.6 • CCSS.MATH.CONTENT.8.G.B.7 • CCSS.MATH.CONTENT.8.G.B.8 • CCSS.MATH.CONTENT.8.G.C.9	• Performance Task: Measurement Questions
Numerical Expressions	• Why do the rules of integer exponent work? • How can we use scientific notation to represent and compute with very large or very small numbers?	• Understand that repeated multiplication signifies exponentiation and that repeated addition signifies multiplication.	• Integer Exponents & Scientific Notation	• CCSS.MATH.CONTENT.8.EE.A.1 • CCSS.MATH.CONTENT.8.EE.A.2 • CCSS.MATH.CONTENT.8.EE.A.3 • CCSS.MATH.CONTENT.8.EE.A.4	• Performance Task: Numerical Expressions
Transformations	• How do rotations, reflections, and translations define congruent figures? • How do dilations, rotations, reflections, and translations define congruent figures? • Why do dilations,	• Rotations, reflections, and translations are transformations that preserve distance and angle measures. • A dilation is a transformation that multiplies distance measures by a common scale factor and preserves angle measures. • A two-dimensional figure is congruent to another if one can be obtained from the other by a sequence of rotations, reflections, and translations.	• Congruence & Similarity	• CCSS.MATH.CONTENT.8.EE.B.6 • CCSS.MATH.CONTENT.8.G.A.1 • CCSS.MATH.CONTENT.8.G.A.2 • CCSS.MATH.CONTENT.8.G.A.3 • CCSS.MATH.CONTENT.8.G.A.4	• Performance Task: Transformation Questions

	rotations, reflections, and translations preserve angle measures? ● Why do rotations, reflections, and translations preserve distance measures while dilations do not?	● A two-dimensional figure is similar to another if one can be obtained from the other by a sequence of rotations, reflections, translations, and dilations.Collapse			
Number System	● How do I convert a decimal expansion of a rational number to a fraction? ● How do I classify numbers as rational and irrational? ● How do I write approximations of irrational numbers and use these to compare numbers?	● Understand that the definition of a rational number is any number that can be written as the ratio of two integers. This ratio can be written using a fraction bar or it can be converted to a decimal by carrying out the division implied by the ratio. Decimal representations of rational numbers eventually repeat. ● Understand that the set of irrational numbers is the set of numbers whose decimal expansion does not repeat.	● Irrational Numbers	● CCSS.MATH.CONTENT.8.NS.A.1 ● CCSS.MATH.CONTENT.8.NS.A.2	● Performance Task: Exact Measurement
How Green is my School?	● How environmentally-friendly is my school? ● How does math inform an environmental analysis?	● Mathematical practices and modeling can lead to real-world change.	● Explanation of Evidence ● Interpreting Data/Info ● Multimedia in Oral Presentation ● Point of View/Purpose ● Precision	● CCSS.MATH.CONTENT.8.G.C.9 ● CCSS.MATH.CONTENT.8.SP.A.1 ● CCSS.MATH.CONTENT.8.SP.A.2 ● CCSS.MATH.CONTENT.8.SP.A.3 ● CCSS.MATH.CONTENT.8.SP.A.4	● Audio Report

ARTS IN MOTION CHARTER SCHOOL| 8th Grade Math UNIT PLAN	
Project	Linear Equations

Suggested Time	● 3 Weeks
Essential Questions	● What are the characteristics of a linear equation that has no solutions? ● What are the characteristics of a linear equation that has an infinite number of solutions? ● What are the characteristics of a linear equation that has one solution?
Enduring Understandings	● Understand that linear equations have one, none, or an infinite number of solutions
Math Concepts	● Solving
Focus Areas	● Solving Linear Equations
CCSS	● CCSS.MATH.CONTENT.8.EE.C.7
Checkpoints	● Solving
Final Product	● Performance Task: Linear Equations- When are Equations True?

ARTS IN MOTION CHARTER SCHOOL| 8th Grade Math LESSON PLAN					
Project	Linear Equations	**Essential Questions**	● What are the characteristics of a linear equation that has no solutions?	**Final Product**	● Performance Task: Linear Equations- When

			• What are the characteristics of a linear equation that has an infinite number of solutions? • What are the characteristics of a linear equation that has one solution?		are Equations True?

Checkpoint	• Solving
Math Concepts	• Solving
Objective	• Students will be able to solve a variety of LInear Equations
Activities	• The Sign of Solutions (See attached Sample) • Coupon Vs. Discount
Resources	• Classifications of Solutions (linked) • Solving a Linear Equation • Introduction to Linear Equations
Assessment	• Performance task assessment using cognitive skills (See attached Sample)

The Sign of Solutions

Without solving them, say whether these equations have a positive solution, a negative solution, a zero solution, or no solution.

a. $3x = 5$

b. $5z + 7 = 3$

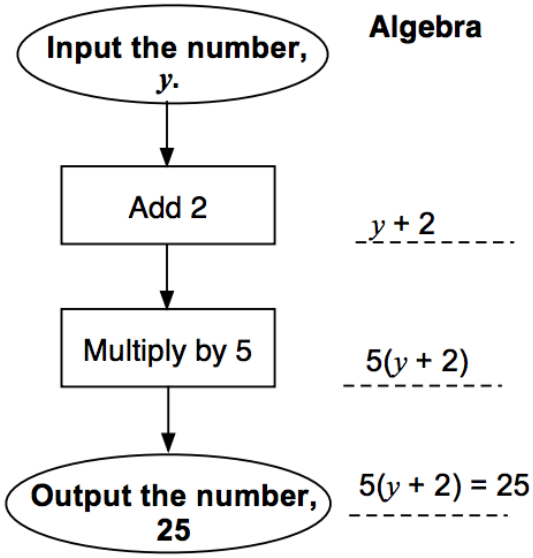
c. $7 - 5w = 3$

d. $4a = 9a$

e. $y = y + 1$

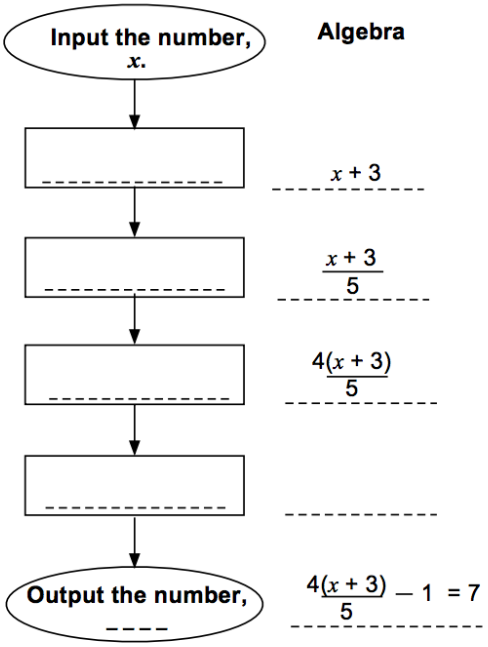
Checkpoint - Building and Solving Linear Equations

Here is an algebra machine. The **Algebra** column shows what happens to the unknown. Solve the equation. Show and explain all your steps.



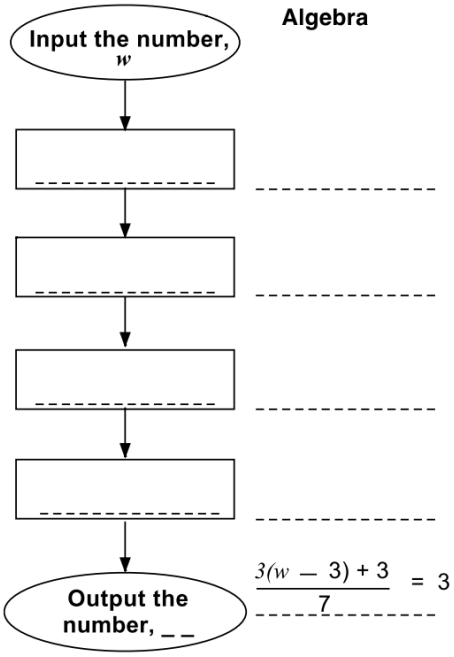
Use this space to solve the equation: 5(y + 2) = 25

Here is another algebra machine. Complete the machine instructions and the **Algebra** column. Solve your equation. Show and explain all your steps.



Use this space to solve the equation: $\frac{4(x+3)}{5} - 1 = 7$

Here is a third algebra machine. Complete the machine instructions and the **Algebra** column. Solve your equation. Show and explain all your steps.



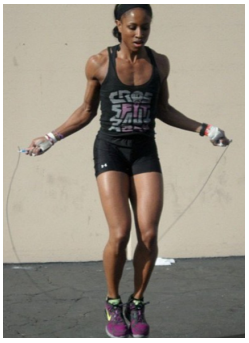
Use this space to solve the equation: $\frac{3(w-3)+3}{7} = 3$

Unit 1 Individual Performance Task: Jump-a-Thon

Name: _____Period: _____ Date: _____

Children, adults, and professional athletes jump rope for enjoyment and exercise. Jumping rope can also be a way to raise money for a cause. For example, schools can host "Jump-a-Thons" to raise money to support special events and activities.





To raise money during a Jump-a-Thon, students contact family and community members for two kinds of support: students ask for **donations**, and ask people to be **sponsors**.

- A **donation** is money given before the Jump-a-Thon. The amount **does not** depend on the number of minutes a person jumps rope during the Jump-a-Thon.
- **Sponsors** promise to pay a certain amount of money for **each** minute someone jumps rope during the event.

Byron, Clarissa, Janelle, and Mark, are participating as a team in their school's Jump-a-Thon.

Your task is to help students predict how much money they will raise during the Jump-a-Thon.

Table 1 shows the number of sponsors and donations each student has gathered for the Jump-a-Thon.

Table 1. Donations and Sponsors

		Sponsors	
Student	**Donations (in dollars)**	**Number of Sponsors**	**Amount to pay for each minute jumping rope**
Byron	$10.00	1	$0.40
Clarissa	$40.00	1	$0.10
Janelle	$0.00	5	$0.05
Mark	$0.00	12	$0.10

1. Complete the table to show how much money Byron raises for each number of minutes he jumps rope.

Number of Minutes	Total Amount Raised, in dollars
1	
2	
5	
30	

2. Clarissa wants to raise a total of $50.00.

   How many minutes does Clarissa need to jump rope during the Jump-a-Thon to reach her goal?

   _____ minutes

3. Janelle's goal is to raise $20 during the Jump-a-Thon.

   Janelle says she can use the equation $20 = 0.25□$ to determine the number of minutes she needs to jump rope during the Jump-a-Thon to reach her goal.

   Do you agree or disagree with Janelle's equation? Support your answer.

4. Byron is bragging to his homeroom about how good he is at jumping rope:
   "I'm going to jump for three times as long as Mark."

Meanwhile, Mark is bragging to the Junior Varsity Jump-rope Team:

> "I will raise $12 more dollars than Byron."

Clarissa says she can prove it is impossible for *both* students to achieve what they claim. Explain one way for Clarissa to use linear equations to prove it is impossible.