Unit #4: Equations

Content Area: **Mathematics**
Course(s): **English I**
Time Period: **March**
Length: **1**
Status: **Published**

Enduring Understandings

- Patterns and relationships can be represented graphically, numerically, symbolically, or verbally.
- Some systems of equations have no solutions (parallel lines) and others have infinite solutions (be the same line).
- The solution to a system of two linear equations in two variables is an ordered pair that satisfies both equations.
- Unit rates can be explained in graphical representation, algebraic equations, and in geometry through similar triangles.

Essential Questions

- How does the context of the problem affect the reasonableness of a solution?
- How is it determined if multiple solutions to an equation are valid?
- What makes a solution strategy both efficient and effective?
- Why can two equations be added together to get another true equation?
- Why is one variable dependent upon the other in relationships?

Standards/Indicators

MA.K-12.2	Reason abstractly and quantitatively.
MA.K-12.3	Construct viable arguments and critique the reasoning of others.
MA.8.EE	Expressions and Equations
MA.K-12.4	Model with mathematics.
MA.8.EE.B	Understand the connections between proportional relationships, lines, and linear equations.
MA.8.EE.C	Analyze and solve linear equations and pairs of simultaneous linear equations.
MA.8.EE.C.8	Analyze and solve pairs of simultaneous linear equations.

Lesson Titles

- Determine the equation of a line in multiple ways
- Exploring Patterns with Lines
- Finding the point of intersection
- Solving Linear Equations

- Solving Systems of Equations
- Special Linear Equations

21st Century Skills and Career Ready Practices

CAEP.9.2.8.B.1	Research careers within the 16 Career Clusters ® and determine attributes of career success.
CAEP.9.2.8.B.2	Develop a Personalized Student Learning Plan with the assistance of an adult mentor that includes information about career areas of interest, goals and an educational plan.
CAEP.9.2.8.B.3	Evaluate communication, collaboration, and leadership skills that can be developed through school, home, work, and extracurricular activities for use in a career.
CAEP.9.2.8.B.4	Evaluate how traditional and nontraditional careers have evolved regionally, nationally, and globally.
CAEP.9.2.8.B.5	Analyze labor market trends using state and federal labor market information and other resources available online.
CAEP.9.2.8.B.6	Demonstrate understanding of the necessary preparation and legal requirements to enter the workforce.
CAEP.9.2.8.B.7	Evaluate the impact of online activities and social media on employer decisions.

Inter-Disciplinary Connections

- Consumer Science
- LAL - Vocabulary

LA.L.8.4	Determine or clarify the meaning of unknown and multiple-meaning words or phrases based on grade 8 reading and content, choosing flexibly from a range of strategies.
PFL.9.1.8.A	Income and Careers
PFL.9.1.8.B	Money Management

Anticipatory Set

- Current Events
- Mathematics History
- Relate to prior knowledge
- Video clips

Instructional Strategies, Learning Activities, and Levels of Blooms/DOK

- SWBAT compare graphs, tables, and equations of proportional relationships.
- SWBAT construct a model for a linear function.
- SWBAT derive the equation

=mx+b for a line through the origin.

- SWBAT describe the qualities of a function using a graph (e.g., where the function is increasing or decreasing).
- SWBAT determine if a system has one solution, no solutions, or many solutions.
- SWBAT determine whether a relationship is linear.
- SWBAT estimate solutions by graphing equations
- SWBAT graph proportional relationships and interpret the unit rate as the slope.
- SWBAT identify and contextualize the rate of change and the initial value from tables, graphs, equations, or verbal descriptions.
- SWBAT interpret the solution to a system of equations in context.
- SWBAT sketch a graph when given a verbal description of a situation.
- SWBAT solve systems by graphing, substitution, or elimination (combination).
- SWBAT use similar triangles to explain why the slope is the same between any two distinct points on a non-vertical line in the coordinate plane

Modifications

ELL Modifications

Content specific:

vocabulary important for ELL students to understand include: Numerical expression, variable, algebraic expression, exponent, term, coefficient, constant, like terms, associative property, commutative property, identity property, distributive property, simplify, evaluate, inverse operation, solution, function, sequence, inequality

- Collaboration with ELL Teacher
- Frontload information in native language
- Graphic organizers
- Modification plan
- Strategy groups
- Teacher conferences
- Using videos, illustrations, pictures, and drawings to explain or clarification

IEP & 504 Modifications

- Break tests down in smaller increments
- Increase one-to-one time
- Modifications & accommodations as listed in the student's IEP

- Modified or reduced assignments
- Position student near helping peer or have quick access to teacher
- Prioritize tasks
- Provide guided notes and step-by-step instructions on solving equations
- Provide worked out examples on classwork and homework that students can use as a guide when working independently
- Reduce length of assignment for different mode of delivery
- Think in concrete terms and provide hands-on-tasks
- Use a balance to show how equations are solved
- Use algebra tiles to provide more hands on and visual representation of variables and expressions

G&T Modifications

- Evaluating algebraic expressions with more than one variable
- Finding function rules that are two step
- Simplifying algebraic expressions with multiple terms and variables
- Simplifying numerical expressions with more than 4 operations involved
- Writing algebraic expressions with more than one operation
- Writing and solving multi step equations
- Writing, solving, and graphing two step inequalities

Formative Assessment

- Exit Question - Finding Slope
- Exit Question - Slope Intercept Form
- Exit Tickets
- Graphic Organizer
- Group Work
- Guided Practice
- Hand Signals
- Independent Practice
- Observation
- Oral Questioning
- PARCC Questions - Linear Relationships
- Senteo
- Slope Puzzle - Matching Slope in various forms
- Think-Pair-Share
- Written Work

Summative Assessment

- Project - Line Design
- Marking Period Assessment
- Project - Stained Glass Window
- Project Based Assessment
- Quiz - Graphing Lines
- Quiz - Slope
- Quiz - Systems of Equations
- Quiz - Tables, Graphs, Equations
- Self-Assessment
- Test - Graphing Lines from multiple forms
- Test - Table, Graphs, Equations

Resources and Materials

- Connected Math - Moving Straight Ahead
- Glencoe Pre Algebra - Chapter 8
- Graph Paper
- PMI - Systems of Equations

Technology

- Calculator
- Chromebook
- desmos.com
- Equation of a Line from Table https://www.youtube.com/watch?v=swydB4hltzQ
- Equation of a Line https://www.youtube.com/watch?v=mmWf_oLTNSQ
- Graphing Calculator
- Graphing Using Slope and Y-Intercept https://www.youtube.com/watch?v=BzO8LQ2vcUM
- Smartboard
- You Tube "All I Do Is Solve" video

TECH.8.1.8	Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.
TECH.8.2.8	Technology Education, Engineering, Design, and Computational Thinking - Programming: All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.