Unit 1b- Analyze and Solve Linear Equations

Content Area: **Mathematics**
Course(s): **Math 8 Gen Ed**
Time Period: **Marking Period 1**
Length: **Wk 7-11 Envisions Mathematics Topic 2**
Status: **Published**

Essential Questions

- How can we analyze connections between linear equations and use them to solve problems?

Big Ideas

- Understand the connection between proportional relationships, lines, and linear equations.
- Analyze and solve linear equations and pairs of simultaneous linear equations.

Diversity Integration

Objective: Students will be able to use equations to figure out the factors that affect population growth.

Activity:

Students will explore the science of demography. They will explore how birth rate, death rate, emigration, and immigration affect population growth with a country of their heritage. Students will analyze how changes in these indicators affect resource sustainability and how resource availability affects population growth.

CSDT Technology Integration

8.1.8.DA.1: Organize and transform data collected using computational tools to make it usable for a specific purpose.

8.1.8.AP.2: Create clearly named variables that represent different data types and perform operations on their values

8.1.8.AP.5: Create procedures with parameters to organize code and make it easier to reuse

8.1.8.AP.7: Design programs, incorporating existing code, media, and libraries, and give attribution.

Activity: The Algebra College Slope Project encourages students to learn about college choices and decisions. Students have the opportunity to research colleges and universities, and select one based on possible majors they would be interested in, as well as a budget. Students then research possible high school jobs in an effort to earn money to use for college tuition. Students create electronic descriptions of their research, spreadsheets on the computer, and develop linear functions electronically

Career Education Integration

9.1.8.CR.1: Compare and contrast the role of philanthropy, volunteer service, and charities in community development and the quality of life in a variety of cultures

9.1.8.CR.2: Compare various ways to give back through strengths, passions, goals, and other personal factors.

9.1.8.CR.3: Relate the importance of consumer, business, and government responsibility to the economy and personal finance.

9.1.8.PB.2: Explain how different circumstances can affect one's personal budget

Connection: Students are expected to apply ratios and proportions to real world situations – this can be applied to a variety of career choices. Students can create equations based upon different labor market trends and career path decisions.

Enduring Understandings

8.EE.5[M] Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways. For example, compare a distance-time graph to a distance-time equation to determine which of two moving objects has greater speed.

8.EE.6[M] 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 intercepting the vertical axis at b.

8.EE.7a[M] 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).

8.EE.7b[M] Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.

Technology Connection

8.1.8.DA.1: Organize and transform data collected using computational tools to make it usable for a specific purpose

Mathematical Practices Focus

1. Make sense of problems and persevere in solving them. Lesson 1, 4, 5,
2. Reason abstractly and quantitatively. Lesson 1, 2, 3, 4, 6, 7, 9, and page 117
3. Construct viable arguments and critique the reasoning of others. Lesson 4, 5, 6, and page 117
4. Model with mathematics. Lesson 1, 2, 3, 4, 5, 7, 8, and page 117
6. Attend to precision. Lesson 8, 9
7. Look for and make use of structure. Lesson 1, 3, 4, 6, 7, 8, 9, and page 117
8. Look for and express regularity in repeated reasoning. Lesson 5, 7, 9