MP1a-Solving Equations and Inequalities

Content Area: **Math**
Course(s): **Algebra 1 Accelerated**
Time Period: **Marking Period 1**
Length: **Envision Math 8 Lessons 1.1 and 1.2 20 days**
Status: **Published**

Essential Questions

- What general strategies can you use to solve simple equations and inequalities?

Big Ideas

- Properties of equality
- Using inverse operations to solve equations containing variables
- Writing equations to represent situations
- Simplify equations before solving
- Solve equations and proportions

CRLLKS- Career Education

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.

9.2.8.B.4 Evaluate how traditional and nontraditional careers have evolved regionally, nationally, and globally.

9.2.8.B.5 Analyze labor market trends using state and federal labor market information and other resources available online.

9.2.8.B.6 Demonstrate understanding of the necessary preparation and legal requirements to enter the workforce.

Connection:
Students are expected to apply ration 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.

CSDT Technology Connection

8.2.8.ED.2 Identify the steps in the design process that could be used to solve a problem.

8.2.8.ED.5 Explain the need for optimization in a design process.

8.2.8.NT.1 Examine a malfunctioning tool, product, or system and propose solutions to the problem.

Diversity

Objective:

The activities in these projects use all five of the NCTM process standards. The context is a real-world connection in a problem-solving format. Analysis involves reasoning with multiple representations of data and communication of conclusions. Project I. What Is Poverty? The reality of poverty is introduced and students are asked to consider whether they could live below the poverty level. They are asked to create a budget and to relate their own life to that of a family below the poverty line. (Any math course 6-12) Project II. Who Are the Poor? Students are given two tables from the U.S. Census Bureau and asked to analyze this data, to create graphs, and summarize their conclusions. The tables give the poverty level in the 50 states and the District of Columbia, and demographic characteristics of people in poverty such as age, race, and education. (Discrete Mathematics, General Mathematics, Statistics)

Activity:

Project I. What Is Poverty? The reality of poverty is introduced and students are asked to consider whether they could live below the poverty level. They are asked to create a budget and to relate their own life to that of a family below the poverty line.

Project II. Who Are the Poor? Students are given two tables from the U.S. Census Bureau and asked to analyze this data, to create graphs, and summarize their conclusions. The tables give the poverty level in the 50 states and the District of Columbia, and demographic characteristics of people in poverty such as age, race, and education.

Enduring Understandings

The Number System

8.NS.A.1 Know that numbers that are not rational are called irrational. Understand informally that every number has a decimal expression; for rational numbers show that the decimal expansion repeats eventually and convert a decimal expansion which repeats eventually into a rational number.

8.NS.A.3 Understand that the sum or product of two rational numbers is rational; that the sum of a rational number and an irrational number is irrational; and that the product of a nonzero rational number and an

irrational number is irrational

Reasoning with Equations & Inequalities

A.REI.A1 [M] 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.

- Solving Equations by Adding or Subtracting
- Solving Equations by Multiplying or Dividing
- Solving Two-Step and Multi-Step Equations
- Solving Equations with Variables on Both Sides

Reasoning with Equations & Inequalities

A.REI.B3 [M] Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.

- Graphing and Writing Inequalities
- Solving Inequalities by Adding or Subtracting
- Solving Inequalities by Multiplying or Dividing
- Solving Two-Step and Multi-Step Inequalities
- Solving Inequalities with Variables on Both Sides
- Solving Compound Inequalities
- Solving Absolute-Value Inequalities

Quantities

N.Q.A1 Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.

- Rates, Ratios, and Proportions
- Applications of Proportions

N.Q.A2 Define appropriate quantities for the purpose of descriptive modeling.

N.Q.A3 Choose a level of accuracy appropriate to limitations on measurement when reporting qualities.

- Precision and Accuracy

Creating Equations

A.CED.A4 [M] Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. For example, rearrange Ohm's law V = IR to highlight resistance R.

- Solving for a Variable

A.CED.A1 [M] Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions.

- Solving Absolute-Value Equations

Mathematical Practices Focus

1. Make sense of problems and persevere in solving them. Pages 5, 11, 24 30, 43

2. Reason abstractly and quantitatively. Pages 2, 18

3. Construct viable arguments and critique the reasoning of others. Pages 5, 18, 24, 30

4. Model with mathematics. Pages 24, 36, 37, 43

5. Use appropriate tools strategically.

6. Attend to precision.

7. Look for and make use of structure. Pages 11, 30, 37, 43

8. Look for and express regularity in repeated reasoning. Pages 37