Instruction

Prerequisite Skills

This lesson requires the use of the following skills:

- applying the order of operations (5.OA.1)

- creating ratios (6.RP.2)

- translating verbal sentences into algebraic expressions (6.EE.2a)

- solving linear equations (8.EE.7b)

Introduction

Creating equations from context is important since most real-world scenarios do not involve the equations being given. An **equation** is a mathematical sentence that uses an equal sign (=) to show that two quantities are equal. A **quantity** is something that can be compared because it has a numerical value. In this lesson, contexts will be given and equations must be created from them and then used to solve the problems. Since these problems are all in context, units are essential because without them, the numbers have no meaning.

Key Concepts

- A **linear equation** is an equation in which the highest power of any variable is 1. This lesson focuses on solving linear equations that have just one variable and that can be written in the form $ax + b = c$, where a, b, and c are numbers and x is the variable. Often, the most difficult task in turning a context into an equation is determining what the variable is and how to represent it in an equation.

- A **variable** is a letter used to represent an unknown value or a value which changes. Once the equation is determined, solving for the variable follows the steps for isolating a variable that were learned previously.

- The **solution** is the value that makes the equation true.

- In some cases, the solution must be converted into different units. Multiplying by a unit rate or a ratio can do this.

- A **rate** is a ratio that compares different kinds of measurements. A **unit rate** is a ratio of two measurements, the second of which is 1, such as miles per (1) gallon.

- Use units that make sense, such as when reporting time; for example, if the time is less than 1 hour, report the time in minutes.

UNIT 2 • REASONING WITH LINEAR EQUATIONS AND INEQUALITIES
Lesson 1: Creating Linear Equations and Inequalities in One Variable

Instruction

- Make sure the units match when you begin the problem. For example, do not include a value that is measured in meters per second with a value that uses centimeters per second in the same equation. Convert one of these to match the other.

- Think about rounding and precision. The more significant digits you include, the more precise the number is.

- When using measurement in calculations, only report to the nearest decimal place of the least precise measurement.

Creating Equations from Context

1. Read the problem statement carefully.

2. Reread the scenario and make a list of the known quantities.

3. Read the statement again, identifying the unknown quantity or variable.

4. Create an equation from the known quantities and variable(s).

5. Solve the equation for the variable.

6. Interpret the solution of the equation in terms of the context of the problem and convert units if necessary.

Common Errors/Misconceptions

- attempting to solve the problem without first reading/understanding the problem statement

- incorrectly setting up the equation

- misidentifying the variable

- forgetting to convert to the correct units

- setting up the ratio inversely when converting units

- reporting too many or too few decimal places