ACC Solving Equations

Content Area: **Mathematics**
Course(s): **Algebra**
Time Period: **October**
Length: **10 Days**
Status: **Published**

Unit Summary

The underlying theme for this unit is "balance". We will use the properties of equality to solve linear equations in one variable. Students will solve multi-step equations that include quadratic terms, absolute value terms, and rational coefficients. They will also explore special situations where there is no solution or more than one solution to an equation. Equations will be created and used to model real world and complex situations that involve distance, work, and age.

Standards

MA.8.EE.A	Work with radicals and integer exponents.
MA.8.EE.A.2	Use square root and cube root symbols to represent solutions to equations of the form $x^2 = p$ and $x^3 = p$, where p is a positive rational number. Evaluate square roots of small perfect squares and cube roots of small perfect cubes. Know that √2 is irrational.
MA.8.EE.C	Analyze and solve linear equations and pairs of simultaneous linear equations.
MA.8.EE.C.7	Solve linear equations in one variable.
MA.8.EE.C.7a	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).
MA.8.EE.C.7b	Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.
MA.K-12.1	Make sense of problems and persevere in solving them.
MA.K-12.2	Reason abstractly and quantitatively.
MA.K-12.3	Construct viable arguments and critique the reasoning of others.
MA.K-12.6	Attend to precision.
MA.K-12.7	Look for and make use of structure.
MA.K-12.8	Look for and express regularity in repeated reasoning.
MA.A-CED.A	Create equations that describe numbers or relationships
MA.A-CED.A.1	Create equations and inequalities in one variable and use them to solve problems.
MA.A-CED.A.2	Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.
MA.A-CED.A.4	Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations.
MA.A-REI.A	Understand solving equations as a process of reasoning and explain the reasoning
MA.A-REI.A.1	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.
MA.A-REI.A.2	Solve simple rational and radical equations in one variable, and give examples showing

	how extraneous solutions may arise.
MA.A-REI.B	Solve equations and inequalities in one variable
MA.A-REI.B.3	Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.
TECH.8.1.8.A.CS1	Understand and use technology systems.
TECH.8.1.8.A.CS2	Select and use applications effectively and productively.
TECH.8.1.8.D.CS2	Demonstrate personal responsibility for lifelong learning.

Student Learning Objectives

- Students will learn to solve equations using the four basic operations (in one variable).
- Students will learn to solve multi-step equations involving the distributive property, fractions, rational numbers, and variables on both sides (in one variable).
- Students will learn to solve linear equations with one solution, infinitely many solutions, or no solutions (in one variable).
- Students will learn to apply and solve equations related to real-world situations (in one variable).
- Students will learn to solve quadratic equations by taking the square root (in one variable).
- Students will learn to solve absolute value equations.

Essential Questions

- What is the mathematical language of balance?
- How are equations used to find something you don't know from something you know?
- How are equations related to symmetry?

Enduring Understandings

- Students will understand that the process of solving an equation requires balance; any action taken on one side of an equation must be taken on the other.
- Students will understand that analogies can be quantified.

Application

- Students will be able to independently use their learning to solve a variety of equations in one variable.
- Students will be able to independently use their learning to model and solve a subset of real world problems.

Skills

Students will be skilled at:

- Applying the steps/rules for solving a variety of equations in one variable.