Unit Title: UNIT 4 – SOLVING OTHER KINDS OF EQUATIONS	**Teacher:** ROATE/ELIZALDE
Subject/Course: ALGEBRA ONE	**Grade:** 8

Desired Results

Essential Questions

01. Why are the concepts of balance/equality, identity, and inversion so critical to the solving of equations?
02. How do maneuvers useful for solving linear equations also prove useful when solving equations of other kinds?

Enduring Understandings

01. An equation is a balanced statement that can be manipulated algebraically through the performance of the same operation to both sides of the equation. The most useful operations to perform are those that invert operations already appearing in the equation. When an inverse operation is performed it is common for an identity element, one or zero, to be left behind that simplifies the form of the equation and further isolates the unknown.
02. The same algebraic moves that can be made to solve a linear equation can also be made to isolate a particular algebraic expression appearing in a given equation. For example, the moves you make to solve $5x + 9 = 49$ for x are the very same moves you make to isolate the expression $(x + 4)^3$ appearing in the equation $5(x + 4)^3 + 9 = 49$.

Knowledge

01. There are often two solutions to a quadratic equation.
02. There are often two solutions to an absolute value equation.
03. Commutative Rule of Addition and Multiplication
04. Associative Rule of Addition and Multiplication
05. Distributive Rule of Multiplication Over Addition/Subtraction
06. Additive and Multiplicative Inverses
07. Additive and Multiplicative Identity

Skills

01. Isolating an algebraic expression for a given equation.
02. Solving simple quadratic equations.
03. Solving simple cubic equations.
04. Solving simple radical (square root and cube root) equations.
05. Solving simple absolute value equations.
06. Solving simple exponential equations with base 2 and 3.
07. Translating word problems into equations.

Assessment Evidence

01. QUIZ: Solving Other Kinds of Equations (Friday, November 11)
02. TEST: Solving Other Kinds of Equations (Friday, November 18)

Core Problems

01. Solve $340 = 5(2x - 6)^2 + 20$ for x.

02. Solve $\frac{1}{2}(2 + 4x)^3 + 5 = 37$ for x.

03. Solve $2.5\sqrt{2 + x} - 3.2 = 19.3$ for x.

04. Solve $8.5\sqrt[3]{1 + x} + 2.7 = 53.7$ for x.

05. Solve $119 = 200 - 9|3x - 7|$ for x.

06. Solve $90 - 3^{x-2} = 9$ for x.

07. Solve $5(2x + 5)^2 - 4 = 12(2x + 5)^2 - 67$

08. A mass of 4 milligrams of bacteria is allowed to grow in a laboratory such that the mass of the bacteria doubles every six days. How much time must elapse for the mass of the bacteria to become 128 milligrams?

Learning Plan

Monday, October 31: Problem Set 1: Solving for Boxes Part I (1-24)
Tuesday, November 1: Problem Set 1: Solving for Boxes Part I (25-47 odd)
Wednesday, November 2: Problem Set 1: Solving for Boxes Part I (49, 51, 53, 55, 57, 59)
Thursday, November 3: Problem Set 1: Solving for Boxes Part I (24-48 even)
Friday, November 4: Problem Set 1: Solving for Boxes Part I (50, 52, 54, 56, 58, 60)

Monday, November 7: Problem Set 2: Solving for Boxes Part II (1-27 odd)
Tuesday, November 8: Problem Set 2: Solving for Boxes Part II (2-28 even)
Wednesday, November 9: Problem Set 2: Solving for Boxes Part II (29-37 odd)
Thursday, November 10: Problem Set 2: Solving for Boxes Part II (30-38 even)
Friday, November 11: QUIZ: Solving Other Kinds of Equations

Monday, November 14: Problem Set 3: Applications of Solving Other Kinds of Equations (1,3)
Tuesday, November 15: Problem Set 3: Applications of Solving Other Kinds of Equations (5,7)
Wednesday, November 16: Problem Set 3: Applications of Solving Other Kinds of Equations (9,11)
Thursday, November 17: *Flex Day / Review Day*
Friday, November 18: TEST: Solving Other Kinds of Equations

Notes