

Technology Integration Workshop 2016

Unit Title: Solving Equations**Grade Level: (example: 9, 10, 11, 12 or 7-8) 8th Grade****Subject Area: (example: Science, Physics; English, Short Stories) : Algebra****Duration/Length/Number of class periods: (example: 5 class periods) : 6 days 50 minute classes****Description:**

Students will solve linear equations by using different methods of solving.

Students need to move from relational thinking about equivalence to using algebraic properties to generate equivalent expressions. It is essential for students to be able to use the properties of algebra to manipulate numerical and mathematical expressions.

Established Goals (National, State, Local):

8.2.3.2 Justify steps in generating equivalent expressions by identifying the properties used, including the properties of algebra. Properties include the associative, commutative and distributive laws, and the order of operations, including grouping symbols.

What Enduring Understandings are desired?

Applying the associative, commutative, and distributive properties. Using the “Undo” method, “Balance” method, and “algebraic” method to solve equations. Solving multiple step linear equations, which include radicals, fractions, and decimals.

What Essential Questions will be considered?

What is the “Undoing” method? Why does the “Undoing” method work? How do I know which terms can be combined? How do I know where to begin when solving an equation? How do I justify the steps of solving a linear equation?

Students will know / be able to:

I can describe what mathematical operations are happening to the variable.

I can implement the steps of the “undoing” method.

I can explain why the “undoing” works.

I can define and combine like terms.

I can demonstrate equality (think of a balanced scale) when solving equations.

I can solve one step linear equations.
 I can solve two step linear equations.
 I can solve three or more step linear equations.

Description	Units must include at least one of each formative, summative, introductory activity and learning activity. Check the appropriate box; one per row.			Formative	Summative	Introductory Activity	Learning Activity	Student Technology Used	Teacher Technology Used	ISTE Standards
<u>Do Now</u> - Warm Up Intro or review order of operations and combining like terms	x			x					x	4a
<u>Undo Activity 1:</u> Students will create a math problem that their elbow partner will solve by using the Undo Chart. (Will repeat with a different elbow partner). Random Students will be called on to present their solutions on the Promethean board.			x			x	x			1b, 2b, 4b,5, 6
Undo Activity 2: Use <u>Corners</u> pages 20 to have student determine the <u>undo operation</u> to <u>different operations</u> .	x					x			x	1a
<u>Undo Small Group Worksheet:</u> Student will work in small groups to complete five problems. Students will turn these problems in for grading. Random Students will be called on to present their solutions on the Promethean board.			x			x	x			1a, 2b
Exit Ticket will be one problem from the small group set (teacher choice). Students will do this problem individually and turn in before exiting class.			x			x				1a
DO NOW - Warm Up - Students will be answering the question of “What is balancing or balance? and give an example.” One student in group will come to the Promethean Board and record their groups examples using CLR strategy - <u>Whip-Around</u> - slide 9	x					x	x		x	2b
Solving by balancing using manipulatives. Day 1 They are more intuitive for the students and help when we take the manipulatives away. Presentation in <u>Google Slides</u> - Students will create their own problem, once everyone in their group has created a problem each student will move one seat to the right. Students will repeat this until they have solved every problem in their group. If students need more practice have them repeat this group activity.	x		x				x		x	1b,c 2a,d 4a,c, d
Students will use paper manipulatives (if needed) to solve their <u>homework problems</u> .			x							
<u>DO NOW</u> - Warm up - Students will review previous day lesson	x					x	x		x	
Students will use Laptops individually to work on an <u>online program</u> solving equations using the balance method.	x						x	x		1c 5 & 6

Students will be using Laptops in groups to go through the Slides and practicing more balancing problems. Using CLR strategy - Pick-A-Stick (slide 2), I will call on students to choose another student in their group to come to the board to solve one problem, until all problems are completed.	x	x		x	x	x	2a,2d
Homework - Solving both by “undo” and balancing day 2		x		x			4a, d
Ups and Downs Activity word problems worksheet (problems were used for Kahoot game)		x		x			4a
Play Kahoot to determine equations from story problems. Students will respond to question by choosing the correct answer(s) on an electronic device while teacher projects questions on the board.	x			x	x		4c, 5b,c 6
Students will be using graphing calculators to solve linear equations. Students will be working in small groups.	x		x	x	x	x	1c, 3b,c, d
Show Me Activity Solve each of the equations algebraically, showing all steps. Then, check your answer with a graph and a table. For each, give the equations you enter into the calculator, sketch the graph and the table, and circle the point that shows the solution on both the graph and the table.		x		x	x	x	1c, 3d, 5b,c, d, 6
Socrative Quiz - Assessment of “undo”, “balance”, “algebraic” method and writing plus solving word problems.		x		x	x		5,6

Materials, tools and resources

- Laptops
- Graphing Calculators
- Colored Blocks
- Colored Disks
- Notebooks
- Pencil/Pen
- Promethean Board/Smart Board
- Internet

Unit Plan Author (name, school and optional email address or hyperlink to teacher’s web page) *Roxanne Terry, Olson Middle School, Minneapolis Public Schools*

Additional credit given to Minneapolis Public Schools, Kahoot, and *Culturally and Linguistically Responsive Teaching and Learning* by Sharroky Hollie.