UNIT 1 – SOLVING LINEAR EQUATIONS

Part A: Video Tutorial Section

Video 1 and 2:

https://www.youtube.com/watch?v=bAerID24QJ0 **(Solving Simple Equations)**

https://www.youtube.com/watch?v=9DxrF6Ttws4 **(More Examples of Solving Simple Equations)**

Video 3 and 4:

https://www.youtube.com/watch?v=9h6LDMNUTnA (S**olving Linear Multi-Step Equations**)

https://www.youtube.com/watch?v=63IkBH4kXzE **(More Examples of Linear Multi-Step Equations)**

Video 5 and 6:

https://www.youtube.com/watch?v=9h6LDMNUTnA (**Solving Multi-Step Equations with Fractions**)

https://www.youtube.com/watch?v=df3NPg5Zf6A **(More Examples of Solving Multi-Step Equations with Fractions**)

Video 7 and 8:

https://www.youtube.com/watch?v=GDit9RzzhzU **(Solving Equations with Variables on Both Sides**)

https://www.youtube.com/watch?v=f15zA0PhSek **More Examples of Solving Equations with Variables on Both Sides**)

Part B : Vocabulary, Hints and Explanations

absolute value equation	• an equation that contains an absolute value expression

Students have been solving basic linear equations since Sixth Grade.

1) Some students continue to confuse the variable x for a multiplication sign. Remind those students that x is the variable or the "mystery number".

2) Some students have been observed to struggle when they are asked to solve for a variable other than X. It may be helpful to change the variable to x in these equations.

Ex: b + 2 = 7

3) If a student struggles to recall how to solve a basic equation, remind that student of previously used language may be helpful.

Hints: Remind student that this type of equation was referred to as "railroad problems". It may help to have the student draw the "railroad lines" down from the equals sign and begin working to solve across that equals sign.

Instruct the student to "circle the variable" and work to "get everything away from the variable". Remind the student to balance the equation or "do the same to both sides".

4) Students also tend to struggle with multiple steps to solving an equation, especially when distribution is required.

Ex: 2(x-2) + 8 = 26

Hints: To help students with distribution you may find this helpful.

Mnemonic: Create a visual

1. Cup your hands to represent parenthesis. Say “Stand beside means”...
2. Cross your arms to create an X and say “multiply”. Kinesthetic learners should copy this movement to reinforce learning.
3. Remind the student that he needs to multiply each “piece” of the equation inside the parenthesis.

Many students will draw arrows to represent distribution.

Some students may use the box method for distribution. Also, some students benefit from seeing this method to visualize the process.

Ex: 2(x + 3) is represented in box form as

2 X + 3

	X	3
2	2X	6

4) As students begin to solve equations with variables on both sides of the equations

Ex: 7x + 3 = 4x + 9 or Ex: -2(4x + 1) = -8 x – 2

Hints: Remind student to again circle where the variable is in the equation. Explain that they need to “work the way that makes the most sense”. That means to combine those variables in a manner that results in a positive when possible. Once a student has successfully “slid” the variables to one side of the equation, the student may the solve the “railroad problem”.

Literal Equations:

An equation that has two or more variables is a literal equation. A student may struggle to solve for a letter versus a numerical solution.

Ex: d = rt Ex.: 1/3 x + y = 4 Ex: C= 5/9(F-32)

Hint: Remind the student to circle the variable for which he is solving the equation. Then solve for that variable in the same way he solved the "railroad problems".

d=rt Solve for r. The student circles the r. Divides both sides by t. The solution is d/t = r

For more complex equations such as C = 5/9(F – 32) - Solve in terms of F

The student needs to

1. Multiply both sides by 9/5

   9/5C = F-32

2. Add 32 to both sides

   9/5 C + 32 = F