**Unit 2 - Solving Equations**

Lesson 1: Solving Two-Step Equations.
Objective: Today we will solve two-step equations with rational coefficients.
Standard: 8.EE.7b

**Two-Step Equations**

To solve two step equations you will need to use the properties of equality.
This can also be referred to as using \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.



A \_\_\_\_\_\_\_\_\_\_ equation contains two operations. This means that there will be \_\_\_\_ steps needed to solve the equation.

**Examples: Solve the following equations.**

Lesson 2: Write and Solve Two-Step Equations.
Objective: Today we will write and solve two-step equations that represent real-world situations.
Standard: 8.EE.7b

**Writing Two-Step Equations**

Follow these three steps to write a two-step equation.



**Examples:**

1. Translate the sentence into an equation. Then solve.

Eight less than three times a number is .

 

1. You buy 3 books that each cost the same amount and a magazine, all for $55.99. You know that the magazine costs $1.99. How much does each book cost?

 

Lesson 3: Solving Equations by Combining Like Terms.
Objective: Today we will solve multi-step equations that involve combining like terms.
Standard: 8.EE.7b

**Combining Like Terms**

When you are combining like terms, you can only combine terms that have the same \_\_\_\_\_\_\_\_\_\_\_ with the same \_\_\_\_\_\_\_\_\_\_\_.

You will need to combine like terms before using inverse operations to solve an equation.

**Examples:**

Lesson 4: Combining Like Terms for Perimeter.
Objective: Today we will solve perimeter problems that involve combining like terms.
Standard: 8.EE.7b

**Combining Like Terms – Perimeter**

To find the perimeter of a figure you need to find the \_\_\_\_\_ of the sides.

You will then need to combine \_\_\_\_\_\_\_\_\_\_\_\_\_ and use \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to solve the equation.

**Example**:

1. In the figure ABCD below, the total length of the sides equals 92 inches. Find the value of .

Lesson 5: Solving Equations by Using the Distributive Property.
Objective: Today we will solve multi-step equations that involve the Distributive Property.
Standard: 8.EE.7b

**The Distributive Property**

When you are using the Distributive Property, you must make sure that you multiply the factor outside the parentheses with **all** terms inside the parentheses.

1. Use the Distributive Property
2. Combine any \_\_\_\_\_\_\_\_\_\_\_\_\_
3. Use \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Examples:**

1. 2.

Less on 6: Solving Equations with Variables on Each Side.
Objective: Today we will solve equations with variables on each side.
Standard: 8.EE.7b

**Variables on Each Side**

1. Use the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. Combine \_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. Use \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_to bring all variables to one side and all constants on the other side
4. Solve the equation

**Examples:**

1. Solve . 2. Solve .

Lesson 7: Solving Perimeter Problems by Solving Equations with Variables on Both Sides of the Equation.
Objective: Today we will solve perimeter problems involving variables on both sides of the equal sign.
Standard: 8.EE.7b

**Perimeter**

Perimeter is the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of any shape.

**Example:**

Write an equation to find the value of x so that the pair of polygons has the same perimeter.



Lesson 8: Determine the Number of Solutions.
Objective: Today we will determine the number of solutions for a given equation.
Standard: 8.EE.7a

What does the word solution mean? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

When solving an equation there are **THREE** possible types of solutions:

 \_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

We can figure out how many solutions an equation has by solving,
and even without solving!

You can determine the number of solutions by simplifying the equation.

**One Solution**
Examples

An equation has only one solution when: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**No Solutions**
Examples

An equation has no solutions when: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Infinite Solutions**
Examples

An equation has infinite solutions when:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Lesson 9: Variables on Both Sides of the Equation with Distributive Property
Objective: Today we will solve multi-step equations with the variable on both sides of the equal sign involving the distributive property.
Standard: 8EE.7b

**Multi-Step Equations – Distributive Property**

Step 1: Use the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
Step 2: Use \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_to get the variable on one side and the constants on the other side.
Step 3: Solve the resulting \_\_\_\_\_\_\_\_\_\_\_\_\_.

**Examples:**

Solve the equations.

Lesson 10: Variables on Both Sides of the Equation with Combining Like Terms
Objective: Today we will solve multi-step equations with the variable on both sides of the equal sign involving combining like terms.
Standard: 8EE.7b

**Multi-Step Equations – Combining Like Terms**

Step 1: Combine all \_\_\_\_\_\_\_\_\_\_\_\_\_\_.
Step 2: Use \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to get the variable on one side and the constants on the other side.
Step 3: Solve the resulting \_\_\_\_\_\_\_\_\_\_\_\_.

**Examples:**

Solve the equation.

Lesson 11: Variables on Both Sides of the Equation with Combining Like Terms and the Distributive Property
Objective: Today we will solve multi-step equations with the variable on both sides of the equal sign involving combining like terms and the distributive property.
Standard: 8EE.7b

**Multi-Step Equations**

Step 1: Use the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
Step 2: Combine all \_\_\_\_\_\_\_\_\_\_\_.
Step 3: Use \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to get the variable on one side and the constants on the other side.
Step 4: Solve the resulting \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**Examples:**

Lesson 12: Solve Fractional Equations.
Objective: Today we will solve fractional equations using a proportion.
Standard: 8.EE.7b

**Fractional Equations**

Step 1: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
Step 2: Solve the resulting equation.

**Examples**

Solve the equation.

Lesson 13: Solve Fractional Equations.
Objective: Today we will solve fractional equations by finding a common denominator.
Standard: 8.EE.7b

**Fractional Equations**

Step 1: Identify the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
Step 2: \_\_\_\_\_\_\_\_ every term by the common denominator.
Step 3: \_\_\_\_\_\_\_\_ each term to have an equation with no denominators.
Step 4: Solve the resulting equation.

**Examples:**

Solve the equation.

1. 2.

Lesson 14: Solving Real-World Problems Involving Equations with Variables on Each Side.
Objective: Today we will use equations with variables on each side to solve real-world problems.
Standard: 8.EE.7b

**Word Problems**

Follow these three steps to write an equation for a word problem:



**Example:**

1. Green’s Gym charges a one-time fee of $50 plus $30 per session for a personal trainer. A new fitness center charges a yearly fee of $250 plus $10 for each session with a trainer. For how many sessions is the cost of the two plans the same?

