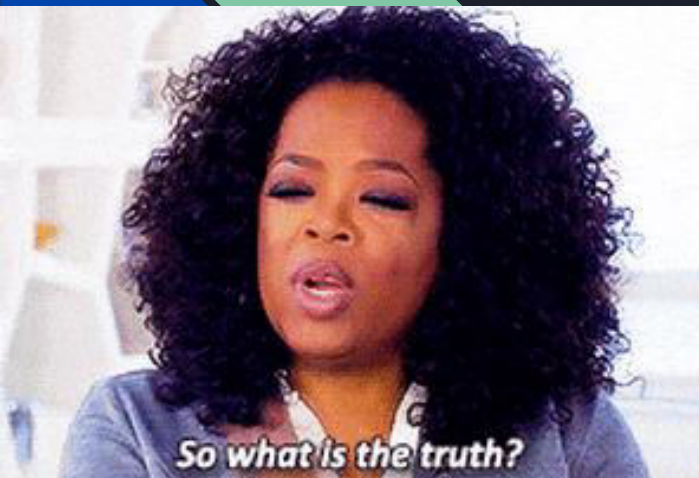




Truth and Equations



Lesson # 2

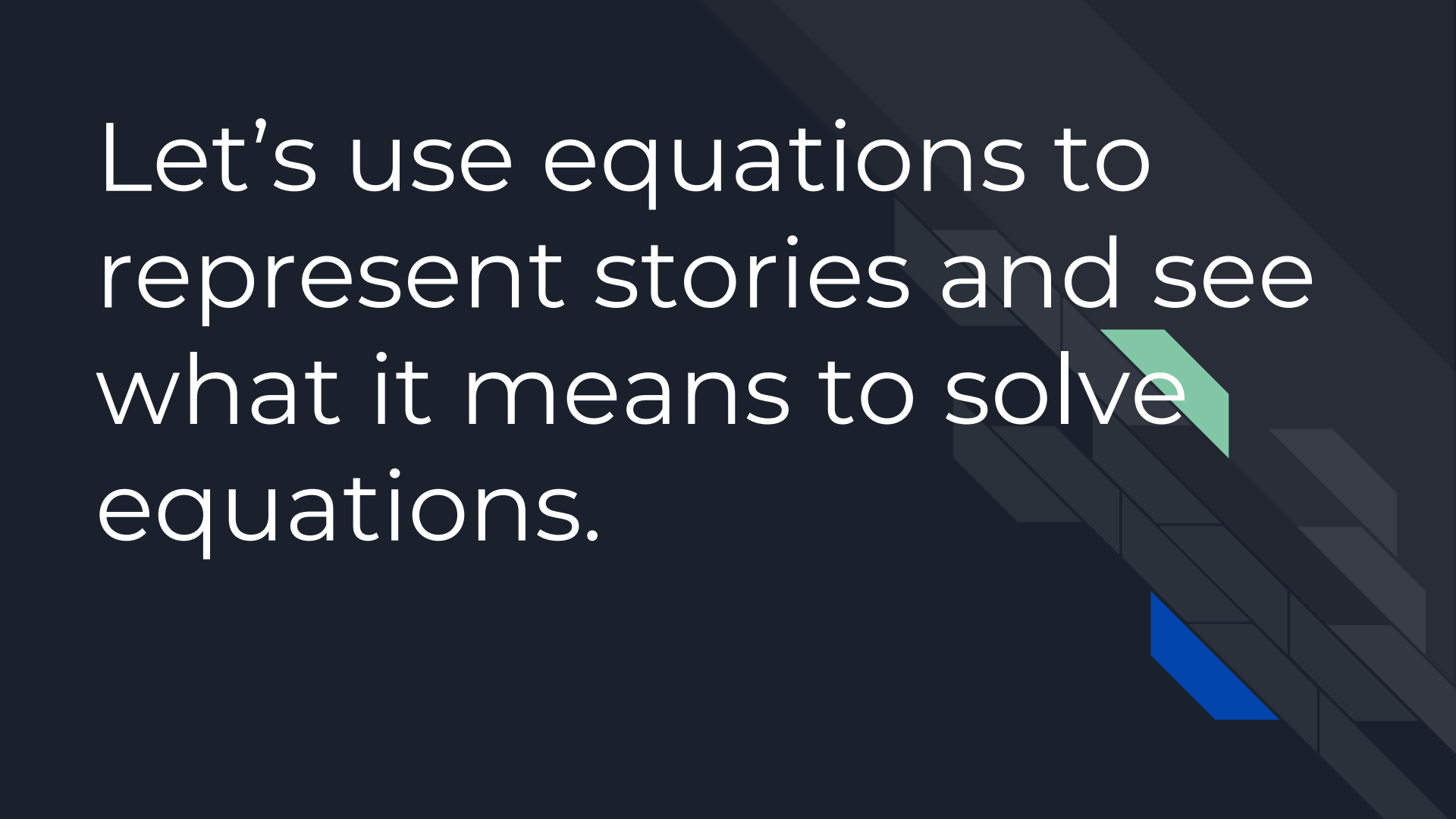


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Addressing

6.EE.B.5 Understand solving an equation or inequality as a process of answering a question: which values from a specified set, if any, make the equation or inequality true? Use substitution to determine whether a given number in a specified set makes an equation or inequality true.

Let's use equations to
represent stories and see
what it means to solve
equations.

The background features a series of overlapping, three-dimensional rectangular blocks in various shades of gray, creating a sense of depth. A single block is highlighted in a vibrant green, and another further down is highlighted in a bright blue. The overall aesthetic is modern and geometric.



Today's Goals

- ☐ I can match equations to real life situations they could represent.
- ☐ I can replace a variable in an equation with a number that makes the equation true, and know that this number is called a solution to the equation.



Students, write your response!



Three Letters

Warm Up 2.1





Work on the first part of the question and then pause.

1. The equation $a + b = c$ could be true or false.

a. If a is 3, b is 4, and c is 5, is the equation true or false?



Complete the rest of the task (2 min)

1. The equation $a + b = c$ could be true or false.
 - a. If a is 3, b is 4, and c is 5, is the equation true or false?
 - b. Find new values of a , b , and c that make the equation true.
 - c. Find new values of a , b , and c that make the equation false.
2. The equation $x \cdot y = z$ could be true or false.
 - a. If x is 3, y is 4, and z is 12, is the equation true or false?
 - b. Find new values of x , y , and z that make the equation true.
 - c. Find new values of x , y , and z that make the equation false.



Let's Talk About It

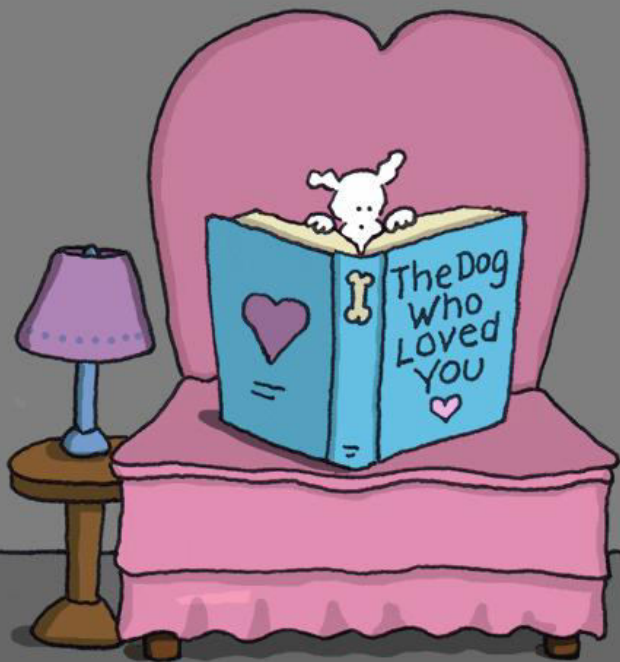
- What does it mean when an equation contains a letter?
- What makes an equation true? What makes an equation false?
- How can we determine whether an equation is true or false?



variable

A variable is a letter that represents a number. You can choose different numbers for the value of the variable.

For example, in the expression $10 - x$, the variable is x . If the value of x is 3, then $10 - x = 7$, because $10 - 3 = 7$. If the value of x is 6, then $10 - x = 4$, because $10 - 6 = 4$.



Storytime

Activity 2.2

- MLR7: Compare and Connect





coefficient

A coefficient is a number that is multiplied by a variable.

For example, in the expression $3x + 5$, the coefficient of x is 3. In the expression $y + 5$, the coefficient of y is 1, because $y = 1 \cdot y$.

- 
- Work quietly on the problems (5 min)

Here are three situations and six equations. Which equation best represents each situation? If you get stuck, draw a diagram.

1. After Elena ran 5 miles on Friday, she had run a total of 20 miles for the week. She ran x miles before Friday.
2. Andre's school has 20 clubs, which is five times as many as his cousin's school. His cousin's school has x clubs.
3. Jada volunteers at the animal shelter. She divided 5 cups of cat food equally to feed 20 cats. Each cat received x cups of food.

$$x + 5 = 20$$

$$x = 20 + 5$$

$$5x = 20$$

$$x + 20 = 5$$

$$5 \cdot 20 = x$$

$$20x = 5$$



Let's Talk About It

- All of the equations and situations had the same numbers. Describe how you decided which equations represented which situations.
- Did any of the words in the stories confuse or mislead you? How did you move past the confusion?
- Did you rule out any equations right from the start? Which ones? Why?

Using Structure to Find Solutions

Activity 2.3

- MLR2: Collect & Display
- Think Pair Share





Solution to an equation

A solution to an equation is a number that can be used in place of the variable to make the equation true.

For example, 7 is the solution to the equation $m + 1 = 8$, because it is true that $7 + 1 = 8$. The solution to $m + 1 = 8$ is not 9, because $9 + 1 \neq 8$.

- 
- Work quietly on the problems (5-7 min)
 - Share your responses with your partner (2-3 min)

Here are some equations that contain a **variable** and a list of values. Think about what each equation means and find a **solution** in the list of values. If you get stuck, draw a diagram. Be prepared to explain why your solution is correct.

1. $1000 - a = 400$

Values:

- $\frac{1}{8}$

- 1

2. $12.6 = b + 4.1$

- $\frac{3}{7}$

- 2

3. $8c = 8$

- $\frac{4}{7}$

- 8.5

4. $\frac{2}{3} \cdot d = \frac{10}{9}$

- $\frac{3}{5}$

- 9.5

5. $10e = 1$

- $\frac{5}{3}$

- 16.7

6. $10 = 0.5f$

- $\frac{7}{3}$

- 20

7. $0.99 = 1 - g$

- 0.01

- 400

8. $h + \frac{3}{7} = 1$

- 0.1

- 600

- 0.5

- 1400



Students, draw anywhere on this slide!

Are you ready for more?

One solution to the equation $a + b + c = 10$ is $a = 2, b = 5, c = 3$.

How many different whole-number solutions are there to the equation $a + b + c = 10$? Explain or show your reasoning.

Lesson Synthesis

What does it mean for an equation to be true? False?

What does the equal sign have to do with whether the equation is true or false?



Students, write your response!

Lesson Synthesis

Is an equation with a variable always true?

Lesson Synthesis

What do we call a number written next to a variable? What does it mean?

Lesson Synthesis

Why might it be helpful to eliminate symbols that show multiplication?

Lesson Synthesis

What do we call a number that can be used in place of the variable that makes the equation true?



Today's Goals

- ☐ I can match equations to real life situations they could represent.
- ☐ I can replace a variable in an equation with a number that makes the equation true, and know that this number is called a solution to the equation.



Students, drag the icons!





How Do You Know a Solution is a Solution?

Cool Down 2.4



Cool Down

Explain how you know that 88 is a solution to the equation $\frac{1}{8}x = 11$ by completing the sentences:

The word “solution” means . . .

88 is a solution to $\frac{1}{8}x = 11$ because . . .