NAME:_____ Math 7.1

Mr. Rogove Date:_____

**LEARNING OBJECTIVE:** We will hone our ability to create equations from written stories and situations. (G7M3L8)

## CONCEPT DEVELOPMENT:

**Equation**: An equation is a statement of equality between two expressions.
*Example*: $x + 4 = 7$

$x = 2$ $1 + 1 = 2$ $x^2 + 3x + 2 = 0$

$5 + 6 = 11$

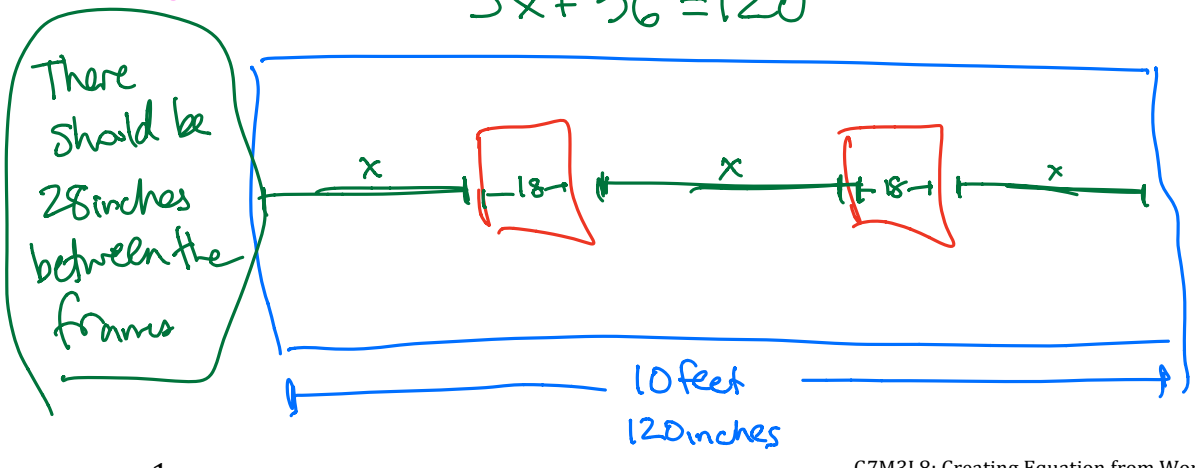
**Number Sentence**: A number sentence is a statement of equality (or inequality) between two numerical expressions. It can be true or false.
*Example*: $3 + 4 = 7$ (true)
$2 + 4 = 7$ (false)

**Solution**: A solution to an equation is a number that, when substituted for all instances of the variable in both expressions makes the equation a true number sentence.
*Example*: $x = 3$ is the solution to the equation $x + 4 = 7$ because it makes the equation a true number sentence. $x = 2$ is **NOT** a solution because it doesn't make the equation a true number sentence.

**Tips for Solving Word Problems:**
1. Read the problem carefully.
2. Would a picture or diagram of the situation help? - Array model - Tape diagrams - Picture.
3. Identify important information that is provided in the problem.
4. Identify what you are trying to figure out…this will usually be your variable.
5. When you create your equation, consider the two sides of your equation.

*Example*: You want to hang 2 picture frames on a wall, and you want it to look nice—with the same amount of space between the corner and the frames and between the frames themselves. If the wall is 10 feet long and the picture frames are 18 inches wide each, how much space should be between the frames? (Note: there are 12 inches in a foot)

$3x + 36 = 120$




$3x + 36 = 120$
$-36 \quad -36$
$\frac{3x}{3} = \frac{84}{3}$
$x = 28$ in.

NAME:_____ Math 7.1

Mr. Rogove Date:_____

## Guided Practice:

**Steps for Solving Word Problems**

1. Read the problem carefully. Identify the important information, including your unknown quantity (typically your variable).
2. Create an equation by placing two equivalent expressions on either side of the equal sign.
3. Follow if-then moves to isolate your variable—"solve for *x*."
4. Check your work by making sure your answer is a solution to the original equation.
5. Interpret your answer in context.

I'm thinking of a number. 3 less than 5 times my number is 27. What is my number.

equal sign!!

x = the mystery number.

$5x - 3 = 27$

$+3 \quad +3$

$\frac{5x}{5} = \frac{30}{5}$

$x = 6$

My number is 6

I've got a mystery number. 5 more than 8 times my number is 77. Identify the mystery number.

x = the mystery number

$8x + 5 = 77$

$-5 \quad -5$

$\frac{8x}{8} = \frac{72}{8}$

$x = 9$

3 consecutive numbers add up to 93. Find the three numbers.

x = the first number

x+1 = the second number

x+2 = the third number.

$x + (x+1) + (x+2) = 93$

$(x+x+x) + (1+2) = 93$

$3x + 3 = 93$

$-3 \quad -3$

$\frac{3x}{3} = \frac{90}{3}$

$x = 30$

The 3 numbers are 30, 31, & 32

Your mother has 4 children, each born 2 year apart. If the total of their ages is 44, how old is the oldest child?

- x = oldest child
- x-2 = 2nd oldest
- x-4 = 3rd oldest
- x-6 = youngest.

$x + (x-2) + (x-4) + (x-6) = 44$

$x + x + (-2) + x + (-4) + x + (-6) = 44$

$4x - 12 = 44$

$+12 \quad +12$

$\frac{4x}{4} = \frac{56}{4}$

$x = 14$

The oldest child is 14 years old

NAME:_____ Math 7.1

Mr. Rogove Date:_____

On a recent trip to Target, you spent $125 on 3 pairs of identical jeans and 4 tee shirts. If each tee shirt was $12.50, how much was each pair of jeans?

Let $j$ = price of jeans

$3j + (4 \cdot 12.50) = 125$

$3j + 50 = 125$

$-50 \quad -50$

$\frac{3j}{3} = \frac{75}{3}$

$j = 25$

Each pair of jeans costs $25.00

Your family just bought new furniture for your dining room. There a table and 6 chairs. The table itself was $350 and the total was $590 before tax. How much did each chair cost?

$c$ = cost for a chair.

$350 + 6c = 590$

$-350 \quad -350$

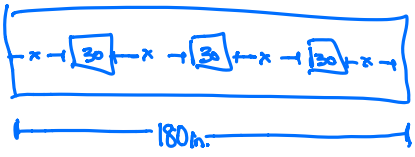
$\frac{6c}{6} = \frac{240}{6}$

$c = 40$

Each chair cost $40.

Your brother is going to college and you no longer have to share a bedroom. You want to hang 3 new posters on your wall. The wall is 15 feet wide, and each poster is 30 inches wide. You want the posters on the wall so that the distance from the edge of each poster to the nearest edge of the wall is the same as the distance between posters. What is that distance?

$x$ = the distance between posters




$(30 \cdot 3) + 4x = 180$

$90 + 4x = 180$

$-90 \quad -90$

$\frac{4x}{4} = \frac{90}{4}$

$x = 22.5$

The space between each poster is 22.5 inches

Mr. Rogove wants to put student work on the board in his classroom. Small Student posters are 12 inches wide. Mr. Rogove wants to hang 6 student posters in a row with the same distance between them (and the same distance between the nearest edge of the wall and the poster). If Mr. Rogove has 8 feet of space to work with, what is the distance between each poster?

$x$ = space between posters.

$7x + 72 = 96$

$-72 \quad -72$

$\frac{7x}{7} = \frac{24}{7}$

$x = 3\frac{3}{7}$

Distance between each poster is $3\frac{3}{7}$ inches

NAME:_____ Math 7.1

Mr. Rogove Date:_____

## Independent Practice:

| | |
|---|---|
| 4 pens and 7 mechanical pencils is $13.25. If the pencils cost $0.75 each, how much does each pen cost? | Cielo is selling knitwear again—this time, she is selling hats. Each hat costs her $2.00 to make (in terms of the yarn she has to buy to make the hat). She sells each hat for $7.50. The knitting needles cost her $9.00-and she needs to buy them before she can make any hats. How many hats does Cielo need to sell in order to make a profit of $46.00? |
| In the World's Strongest Man, contestants lift 5 huge stones to show off their strength. Each stone is 45 pounds heavier than the previous stone. If the total weight of the 5 stones is 1,950 pounds, how much does the heaviest stone weigh? | Sophia pays a $19.99 membership fee for an online music store. Songs cost $0.99. If she spends $118.00 total at the online store, how many songs did she purchase? |

NAME:_____ Math 7.1

Mr. Rogove Date:_____

## Activating Prior Knowledge:

We know how to solve equations using if-then moves…

| | |
|---|---|
| $3x + 3 = 45$<br>$-3 \quad -3$<br>$\frac{3x}{3} = \frac{42}{3}$<br>$x = 14$<br>$3(14) + 3 \stackrel{?}{=} 45$<br>$42 + 3 = 45$<br>$45 = 45$ ✓ | $3x + 8 = 14$<br>$x = 2$ |

## Closure:

Check whether the given value of $x$ is a solution to the equation.

$\frac{1}{3}(x + 4) = 20 \qquad x = 48$

## Teacher Notes:

Maps to lesson 7 of module 3

Illustrative Math-Guess My Number—might be homework??