

Solving Equations with One Variable

Solving Equations with One Variable

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Summary	Students work on a story about two children who each have a certain amount of money. The amount of one of the children is known but the other is not. After a sequence of transformations they end with the same amount of money. Students will be led to solve for the starting value by relating the equation to the events in the story. After that, they will be asked to solve another similar problem.
Goals	<ol style="list-style-type: none">1. To write equations that fits a given story.2. To solve equations with a single variable on only one side of the equals sign, relating the solution to the story context.
Materials	Overheads, Handouts
Keywords	Balancing Equations Contextualized Situations Full Class Discussion Function Representations Interpretation of Stories Linear Functions Production of Algebraic Expressions Production of Equations Representing Variables Solving Equations

Activity Plan:

1. Generating an equation from a story and then solving it [Whole Class: 30 minutes]

Show Overhead 1 (Page 1) and guide the students towards describing the amounts for each child by reflecting on the events in the story and writing an equation.

Once an equation is written, show Overhead 2 (Page 2) and guide the students towards solving the problem by performing the inversion of each operation corresponding to the events in the story. Make sure that, as each transformation is represented and implemented on the left side of the equation, an equivalent transformation will be represented and implemented on the right side. Indicate in the circles which operations are performed.

2. Solving another problem [Individual work and class discussion: 30 minutes]

Show overhead 3 (Page 3) and distribute handout 1 (Page 3). Ask the children to represent the problem. Ask a few children to show how they have written the equation.

Show overhead 4 (Page 4) and distribute handout 2 (Page 4). Ask the children to solve the equation, showing which operations they perform to reach a solution.

3. Discussing the solutions [Whole Class: 20 minutes]

Ask a few children to show how they solved the problem. Discuss their solutions.

If there is enough time, discuss the following equations and ask the children to suggest how to solve each of them:

$$\frac{1}{3}(x + 6) = 5$$

$$2(x - \frac{1}{3}) = 16$$

4. Homework (Page 5 & 6)

The homework is similar to the class work.

Overhead: Generating the Equation**(Page 1)**

Anna went to the arcade with some money. She spent \$8 in video games. Later she won a prize where they doubled her money.

The same day, Bobby went to the arcade with \$16. There, his mother gave him \$20 more. Afterwards, he spent half of all of his money playing video games.

Anna's Money

When she arrived at the arcade	
After she played video games	
After she won a prize	

Bobby's Money

When he arrived at the arcade	
After his mother gave him more money	
After he played video games	

At the end of the day, Anna and Bobby counted their money and discovered that they had the same amount of money.

Write a mathematical sentence showing that Anna and Bobby had the exact same amounts at the end of the day:

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Overhead: Solving the Equation**(Page 2)**

Anna went to the arcade with some money. She spent \$8 in video games. Later she won a prize where they doubled her money.

The same day, Bobby went to the arcade with \$16. There, his mother gave him \$20 more. Afterwards, he spent half of all of his money playing video games.

At the end of the day, Anna and Bobby counted their money and discovered that they had the same amount of money.

Here is the equation showing that Anna and Bobby had the exact same amounts at the end of the day:

$$2(n - 8) = 18$$

How much money did Anna have when she arrived at the arcade?

Or: How can you figure out what n is equal to?

Anna's amount at the end of the day

$$2(n - 8) = 18$$

Anna's amount before she doubled her money

↓ ○

$$\boxed{} = \boxed{}$$

Anna's amount before she spent 8 dollars

↓ ○

$$\boxed{} = \boxed{}$$

Anna had _____ dollars when she arrived at the arcade.

Overhead and Handout: Representing Another Problem (Page 3)

Name: _____ Date: _____

Yolanda went to the beach with some amount of money. She then spent \$10 on lunch. Later she tripled her remaining money by selling seashells.

The same day, Zach went to the beach with \$35. He found \$7 in the sand, and then spent half of all his money on ice cream.

Yolanda's Money

When she arrived at the beach	
After spent money on lunch	
After she sold seashells	

Zach's Money

When he arrived at the beach	
After he found money in the sand	
After he bought ice cream	

At the end of the day, Yolanda and Zach counted their money and discovered that they had the same amount of money.

Write a mathematical sentence showing that Yolanda and Zach had the exact same amounts at the end of the day:

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Overhead and Handout: Solving the Problem

(Page 4)

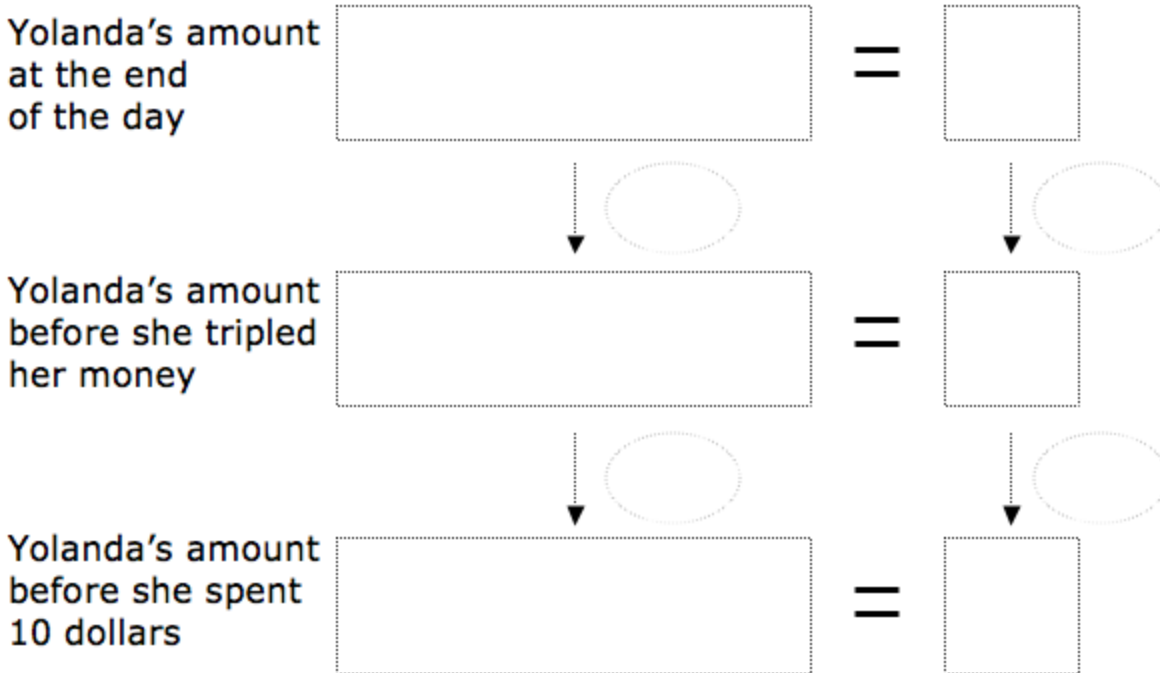
Name: _____ Date: _____

Yolanda went to the beach with some amount of money. She then spent \$10 on lunch. Later she tripled her remaining money by selling seashells.

The same day, Zach went to the beach with \$35. He found \$7 in the sand, and then spent half of all his money on ice cream.

How much money did Yolanda have when she arrived at the beach?

Or: How can you figure out what n is equal to?



Yolanda had _____ dollars when she arrived at the beach.

Name: _____ Date: _____

Carla went to the beach with some money. She spent 20 dollars in a souvenir shop and then tripled her remaining money by selling seashells.

The same day, Sharik went to the beach with 40 dollars. He found 14 dollars in the sand, and then spent half of all his money on ice cream.

Carla's Money

When she arrived at the beach	
After spent money on lunch	
After she sold seashells	

Sharik's Money

When he arrived at the beach	
After he found money in the sand	
After he bought ice cream	

At the end of the day, Carla and Sharik counted their money and discovered that they had the same amount of money.

Write a mathematical sentence showing that Carla and Sharik had the exact same amounts at the end of the day:

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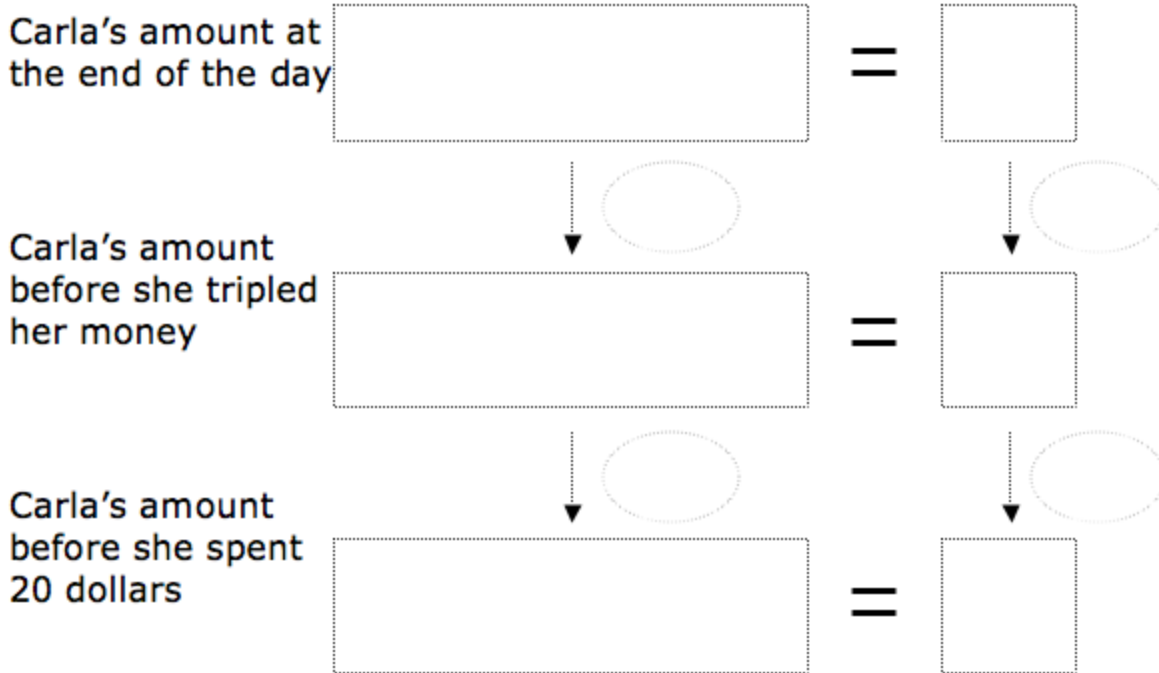
Name: _____ Date: _____

Carla went to the beach with some money. She spent 20 dollars in a souvenir shop and then tripled her remaining money by selling seashells.

The same day, Sharik went to the beach with 40 dollars. He found 14 dollars in the sand, and then spent half of all his money on ice cream.

How much money did Carla have when she arrived at the beach?

Or: How can you figure out what n is equal to?



Carla had _____ dollars when she arrived at the beach.