Arcade

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Summary	Students are told a story about two children, each of whom has a certain amount of money, but only one of whom has an amount known to us. After a series of events they happen to end up with the same amount of money.
Goals	1. To write algebraic expressions and number sentences for each child's amounts. 2. To write an equation that fits the story.
Materials	Overheads, Handouts
Keywords	Contextualized Situations Full Class Discussion Function Representations Interpretation of Stories Linear Functions Production of Algebraic Expressions Production of Equations Representing Variables Solving Equations

<u>Activity Plan:</u>

1. Writing an expression that fits a story [Individual work: 15 minutes]

>   Show Overhead 1 (Page 1) and distribute the corresponding Handout 1
>   (Page 1). Ask the children to represent on paper what happens in the
>   story. Collect the handouts.

2. Building an algebraic expression [Individual work and class discussion]

   (a) Individual work (15 minutes):

   Distribute Handout 2 (Page 2) and ask the children to represent the story
   on paper.

   (b) Class discussion on representations of Anna's and Bobby's amounts
   (15 minutes):

   - Collect the handouts. Choose a few examples of
     representations to discuss.

   - Explore comparisons between different notations.

   - How do you represent order of operations? Is there only one
     correct expression?

   - Which representations, even though different, faithfully
     represent the situations? Which ones fail to represent the
     situations? Why?

   (c) Class discussion on the supposition of equality (15 minutes):

   - Discuss whether the two children in the story can have the same
     amount of money. Could they have other amounts?

   - Through discussion, lead the children to adopt the mathematical
     notation for the equation using the equals sign.

   - Show and discuss a few equations that represent the equality in
     the problem: $(n\text{-}5) \times 2 = 20$; $(n\text{-}5) + (n\text{-}5) = 20$; $20 = (n\text{-}5) \times 2$; etc.

3. Building and solving an equation [Individual work and class discussion]

>   Distribute Handout 3 (Page 3) and allow the children approximately 15
>   minutes to work on the handout. The students will, once more,
>   represent the equation. They will also attempt to find out how much
>   money Anna had when she arrived at the arcade. Make sure they will
>   try to explain their answers in writing. This will be the basis for
>   preparation of the next lesson.

4. Homework (Page 4)

>   The homework will be similar to the classroom activity.

Overhead and Handout: The Story **(Page 1)**

Name: _____ Date: _____

One summer day Anna went to the arcade with some money. She first spent five dollars playing video games. Later that day she won a prize where they doubled her money.

The same day, Bobby went to the arcade with ten dollars. When he got there, his mother gave him thirty more dollars. Afterwards, he spent half of all of his money playing video games.

Represent Anna's money and Bobby's money at the arcade at the end of the day.

Name: _____ Date: _____

Anna went to the arcade with some amount of money. She then spent five dollars playing video games. After that, she won a prize where they doubled her money.

The same day, Bobby went to the arcade with ten dollars. When he got there, his mother gave him thirty more dollars. Afterwards, he spent half of all of his money playing video games.

Anna's Money

Express Anna's money when she arrived at the arcade	
Express Anna's money after playing video games	
Express Anna's money after she won a prize	

Bobby's Money

Express Bobby's money when he arrived at the arcade	
Express Bobby's money after his mother gave him more money	
Express Bobby's money after he played video games	

Suppose that Anna and Bobby had exactly the same amount of money at the end of the day. Write a mathematical sentence showing that they had the exact same amounts at the end of the day.

Name: _____ Date: _____

Anna went to the arcade with some amount of money. She then spent five dollars playing video games. After that, she won a prize where they double her money.

The same day, Bobby went to the arcade with ten dollars. When he got there, his mother gave him thirty more dollars. 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 did have the same amount.

Express Anna's money at the end of the day	
Express Bobby's money at the end of the day	
Write a mathematical sentence that shows Anna and Bobby having the same amount of money at the end of the day	

How much money did Anna have when she arrived at the arcade? Show how you computed your answer:

Name: _____ Date: _____

Yolanda went to the beach with some money. She spent ten dollars on lunch and then tripled her remaining money by selling seashells. The same day, Zach went to the beach with thirty-five dollars. He found seven dollars in the sand, and then spent half of all his money on ice cream.

On their way home, Yolanda and Zach discovered that they had the same amount of money.

Write expressions about Yolanda and Zach's money in the following tables:

Yolanda's money when she arrived at the beach	
Yolanda's money after she bought lunch	
Yolanda's money after selling seashells	

Zack's money when he arrived at the beach	
Zack's money after finding money in the sand	
Zack's money after he bought ice cream	

Write a mathematical sentence that shows Zack and Yolanda having the same amount of money on their way home.	

How much money did Yolanda have when she arrived at the beach? Show how you computed your answer: