

Equations in Groups

Equations in Groups

Click [here](#) to download lesson.

Summary	Students first discuss equality situations and how equal changes on both sides of the equality do not change the equality or the solution to the equation. In a second activity, A pair of students begins with a solved equation (e.g. $N = 4$) and passes the equation to their neighbor; the neighbor operates equally on each side of the equation and passes the equations to the following neighbor. They continue this process until the series of equations return to the first two students who, then, check whether the solution still holds. They also check the logic and correctness of their colleagues operations on the initial equation.
Goals	<ol style="list-style-type: none">1. Students produce equations from a solution (unsolving equations), thus substituting a solution into a presumed equivalent equation.2. They investigate the logic and correctness of the derivations.
Materials	Overheads, Handouts
Keywords	Balancing Equations Contextualized Situations Full Class Discussion Interpretation of Equations Production of Equations Small Group Work


Activity Plan:

1. Discussing changes on equalities (whole class discussion: 15 minutes).

Show Overhead on Page 1, implement each of the suggested transformations, and ask the students to decide on whether or not, at each step:

- (a) The two children in the story have equal amounts of money, and
- (b) The amount that may be unknown remains the same.

The suggested transformations are shown below:

Equation A		Equation B		
Carl's money	=	Samantha's money		Operation on each side of each equation
	=	\$20 \$1	$W = 21$	[none]
	=			Add 2
	=			Multiply by 3
	=			Subtract 6
	=			Divide by 3

Implement other transformations such as adding a wallet on each side or subtracting amounts from each side. Circle a wallet or a monetary unit in red to denote negative values.

2. Equations with the Same Solutions (group work: 30 minutes).

Distribute the Handout (Page 2) and ask the children to follow the instructions, modifying the equation but maintaining the equality and the solution to the equation.

3. Discussion on children's answers (whole class discussion: 30 minutes).


Choose a few of the children's productions and answers to discuss.

4. Homework: Equations with the Same Solutions (Page 3).

Children will be asked to produce equations that have or that do not have the same solution and to judge whether or not pairs of equations have the same solution.

Overhead: Change on Equalities

(Page 1)

Equation A			Equation B		Operation on each side of each equation
Carl's money	=	Samantha's money			
	=	<div style="display: flex; gap: 10px;"> <div style="border: 1px solid black; padding: 2px 5px;">\$20</div> <div style="border: 1px solid black; padding: 2px 5px;">\$1</div> </div>	$W = 21$		
	=				
	=				
	=				
	=				

Carl's

Samantha's



Handout: Equations with the Same Solutions (Page 2)

Name: _____ Date: _____

Begin by making a solution (equation), that is, fill in a value for k .

Step	Equation	Who wrote the equation?
1	$k =$	
2	$=$	
3	$=$	

Fill in a value for k . This is your solution.

Write another true equation based on equation 1

Write another true equation based on equation 2

Write your name here.

Does equation 3 have the same solution as equation 1? Yes or No? ____
How can you be sure of this?

If you answered 'yes' above, then describe how equations 2 and 3 were made.

If you answered 'No' above, explain what the students did that was wrong.

Name: _____ Date: _____

1. Write three different equations that have the same solution as:

$$N + 1 = 120$$

Explain why:

2. Write three different equations that DO NOT HAVE the same solution as:

$$N + 1 = 120$$

Explain why:

3. Decide whether or not the following two equations are equivalent (have the same solution):

$$\begin{aligned}8n &= 5n + 3 \\8n - 3 &= 5n + 3 - 3\end{aligned}$$

Explain:

4. Decide whether or not the following two equations are equivalent (have the same solution):

$$\begin{aligned}4n + 8 &= 2n + 16 \\3n + 8 &= 16\end{aligned}$$

Explain: