

Supporting Students' Algebraic Reasoning in the Early Grades

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1) Ways to Modify Tasks (Smith, 2012)

- Provide all students with access to a task by first making observations about a situation before moving on to more focused work.
- Engage students in investigation and conjecturing instead of just giving answers (e.g., What do you notice? Can you explain in your own words?)
- Require students to provide a mathematical argument, explanation, or proof. (e.g., Does it always work? How do you know?)

2) How would you algebrafy this task?

Solving Addition Problems		Name _____	Date _____
Examples			
$3 + 4 = 7$	$4 + 6 = 10$	$5 + 1 = 6$	
$4 + 3 = 7$	$6 + 4 = 10$	$1 + 5 = 6$	
You try!			
$7 + 2 =$	$12 + 4 =$	$0 + 10 =$	
$2 + 7 =$	$4 + 12 =$	$10 + 0 =$	

3) Exploring Fundamental Properties (Commutative Property of Addition)

$$38 + \underline{\quad} = \underline{\quad} + 38$$

How is this similar to or different from the way you teach this topic?

In what grade do you think this is appropriate?

How do you think the teacher finds and supports students' algebraic thinking?

4) Commutative Property of Addition task

Marcy's teacher asks her to solve "23 + 15." She adds the two numbers and gets 38. The teacher then asks her to solve "15 + 23." Marcy already knows the answer without adding.

- a) How do you think Marcy knew the answer without adding again?
- b) Write an equation using variables (letters) to represent the idea that you can add two numbers in any order and get the same result.
- c) Will Marcy's idea always work? Explain why.