Building Mathematical Thinkers: Mini-Activities

Is That True?

Objective: 3rd grade Algebra – Properties

Theoretical Foundation: This activity provides practice with representing numerical expressions with concrete materials, therefore reinforcing the meaning of each operation. It also provides a tangible way to explore the properties of operations. Please note that the actual terminology (ie commutative, identity, etc…) is not included in this activity because students need time to explore and discover these properties *before* being asked to focus on the vocabulary.

Estimated Time: 30 minutes

Materials: Color tiles or other items for making arrays, Copies of "*Is That True?*"

Description:
1. Distribute tiles or other material for making arrays and the *Is That True* sheets.
2. Present students with the first task: Create 3 x 4 with the materials on one side of your desk and 4 x 3 on the other side.
3. Direct students to sketch each collection of tiles in the appropriate place.
4. Draw students' attention to the equals sign between 3 x 4 and 4 x 3.
5. Ask students if it is true that they are equal. Be sure to ask how students know it is true.
6. Ask students what they can conclude about multiplication based on this true equation.
7. Continue by guiding students through the other 4 equations.

Differentiation Suggestions:
- Struggling students will benefit by completing more than one of each type of equation provided. For instance, after completing 3 x 4 = 4 x 3 have them try 5 x 2 = 2 x 5 and
7 x 3 = 3 x 7. In this way, it will make more sense to conclude that switching the order of factors results in the same product.
- Challenge advanced students and early finishers to create similar equations to test if their conclusions are always true.

Probing Questions:
- Is the equation true? How can you tell?
- Why is this one true, but not this one?
- What does this tell you about multiplication? About addition? About zero? About one?
- Would the equation still be true/false if…?

Assessment:
- How independently can students arrange the manipulatives to accurately demonstrate each number sentence?
- How independently and accurately can students use the manipulatives to draw conclusions about operations?
- How do students understand the *concepts* of the commutative and identity properties?

Name _____

Is That True?

Use your materials to show each side of the equation. Sketch your objects, then write whether the equation is true or false and tell what you can conclude.

Equation	*Sketch*	*True or False*	*What do can you conclude?*
$3 \times 4 = 4 \times 3$	=		_____ _____ _____
$3 \times 4 = 3 + 4$	=		_____ _____ _____
$3 + 4 = 4 + 3$	=		_____ _____ _____
$6 \times 0 = 6 + 0$	=		_____ _____ _____
$8 \times 1 = 8 + 0$	=		_____ _____ _____