

## Algebra Balance Activity

**Class:** Math 38

### **Course context:**

This activity is best as an introduction to solving equations.

*I usually do this activity before introducing variables. Right after chapter 1.*

### **Overview:**

Students will use an algebra balance to verify equal relationships and to find missing values.

### **Objectives:**

Specific mathematical concepts include: Adding and multiplying of whole numbers, equality as balance, problem solving, and solving linear equations

### **Timing:**

About 90 minutes

### **Groups:**

2-3 students per group are best, instructor or random choice.

### **Materials:**

10-15 Algebra Balances (Depending on number of students and group size.)

Handouts

*I usually have students fill out one handout per group. You may also choose to have each student fill out a handout. Reinforce that for this activity, the number in parentheses will be how many weights will be hung on a given peg.*

### **Before the Activity:**

The first page of the handout can be reviewed as a class. Encourage students to physically model the situations.

### **Activity:**

Part 1: Students practice modeling arithmetic operations on the scales to see if the given equations give true statements.

*Optional: you may want to discuss greater than and less than. This is not a direct outcome of this activity, but can be discussed.*

Part 2: Students model equations with an unknown value on one or both sides.

*Emphasize that the unknown number is the number of weights and if it appears more than once in an equation, it must be the same value. Try not to call the # by a variable name until after the assignment. Students are more comfortable talking about an unknown number than using a variable as the start.*

Part 3: Students model arithmetic equations that represent commutative and distributive properties.

*Some students may have seen these properties, but may not know their names. A fruitful discussion can arise from this. This is a good part to reference when discussing the properties later, as well.*

Part 4: Students model equations with one, none, or infinite number of solutions.

*Students may be confused at first, but encourage them to discuss with each other and with you why these equations are different.*

**Follow up discussion questions:**

*You may want to discuss these after the groups are done, or on a future date on which you bring one scale to model for the students. This might be done after discussing these techniques in solving equations by hand.*

What is different about the questions in Part 4 compared to those in Part 2?

How can we model adding to both sides?

How can we model multiplying to both sides?

How can we model subtracting to both sides?

How can we model dividing to both sides?