"Tackling Transformations"

I. Goal/Objective
   a. The goal of this staff development is to teach/show math teachers the effectiveness of using sorting circles as a manipulative when teaching mathematics.
   b. (Mississippi Math Curriculum Frameworks, 5th grade, 1-Numbers and Operations)-
   Analyze relationships among numbers and the four basic operations, compute fluently, and make reasonable estimates.

II. Math Concepts.
   a. Adding and subtracting integers

III. Materials.
   a. Two-color counters
   b. ELMO overhead device
   c. Transparency
   d. Vis-à-vis marker

IV. Management.
   a. Things to prepare ahead of time.
      i. Contact principal to set a date for staff development.
      ii. Have a subtraction and addition problem on transparency
      iii. Have six bags of sorting circles on the table for each participant.
   b. Participant groupings
      i. I will have four tables set up for four groups. Each group will represent a different color (red, yellow, green, and blue).
      ii. Place six color tiles of each of the four colors in a jar.
      iii. As participants enter the meeting room, ask them to choose a color tile from the jar without looking.
      iv. The color tile the participant chooses will determine the table/group they belong.
   c. Time frame.
      i. The approximate time for the entire activity is 30-45 minutes.

V. Procedure.
   a. Introduction.
      i. Using prior knowledge, ask teachers the following questions:
         1. "What is 6 + (-8)?"

2. What is 8 – (-3)?"
3. "How many of you have students that have had trouble adding and subtracting integers or whole numbers?"
   ii. Tell teachers they will be adding and subtracting integers with sorting circles.

b. Content Activities.
   i. Tell the teachers to take their sorting circles out of the bag.
   ii. Inform the teachers the red side will represent the negative and the yellow will be positive.
   iii. Display one red circle under the ELMO, and ask the teachers what it represents. They should respond negative one.
   iv. Display one yellow circle beside the red under the ELMO, and ask the teachers what it represents. They should respond positive one.
   v. Show the two circles on top of each other and explain that when the positive is paired with the negative, they yield a "zero pair."
   vi. Write 5+ -6. Count out five yellow circles. Then count out six red circles up under the yellow. Explain the "pairs" will cancel each other out. Count out the five pair and slide them off to the side. You will have one yellow left, and it's a positive one. Write 5+ -6=-1
   vii. Write 2+-5. Count out two yellow circles. Afterwards, count out five red circles. Pair the two yellow with two red and slide them to the side. Explain you are left with three red circles. Write 2+-5=-3.
   viii. Write the following problems on the transparency:
       a.) 7+ -3   b.) -8+2   c.)6- (-2)   d.)-6 –(-1)
   ix. Walk around monitoring and answering questions the teachers may have.

c. Closure
   i. Ask the teachers if they enjoyed working with sorting circles.
   ii. Ask the teachers if they think their students will enjoy using the sorting circles.
   iii. Ask teachers to share whether or not they will use sorting circles to teach a math concept in their classroom.
   iv. Ask the teachers to share another math concept were they could use sorting circles as a manipulative. If they are not sure, suggest and illustrate multiplication, division, and improper fractions.