SCAFFOLDING TASK: One Hundred Hungry Ants!

STANDARDS FOR MATHEMATICAL CONTENT

MCC.3.OA.1. Interpret products of whole numbers, e.g., interpret 5 × 7 as the total number of objects in 5 groups of 7 objects each. *For example, describe a context in which a total number of objects can be expressed as 5 × 7.*

STANDARDS FOR MATHEMATICAL PRACTICE

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

BACKGROUND KNOWLEDGE

(Information from Van de Walle and Lovin, Teaching Student-Centered Mathematics: Grades 3-5, page 167)

When multiplying whole numbers it is a good idea to establish the meaning of the factors. We would say that 4 x 5 means that we have 4 sets of 5. The first factor will tell how much of the second factor you have. This along with simple story problems is a good beginning to developing the concept of multiplication.

ESSENTIAL QUESTIONS

- What are the strategies for learning multiplication?
- How can we practice multiplication facts in a meaningful way that will help us remember them?
- How is the commutative property of multiplication evident in an array model?

MATERIALS

- Colored tiles or two-sided counters
- Linking cubes (100 for groups of 4)
- Something to help organize groups such as paper plates, cups, bowls, etc.
- *One Hundred Hungry Ants,* by Elinor J. Pinczes or similar story

GROUPING

Individual/Partners

TASK DESCRIPTION, DEVELOPMENT AND DISCUSSION

In this task students determine the factors by creating equal groups of counters/colored tiles.

Part I

Begin the lesson by reading *One Hundred Hungry Ants,* by Elinor J. Pinczes or similar story. Discuss the ways the ants reorganized themselves into equal groups. You can begin the discussion by asking the following question: When the ants were first interrupted, how did they arrange themselves? (you will want to draw the pattern on the board or have linking cubes available to demonstrate the first grouping) Write the multiplication sentence next to the model. Ask students to explain the factors. "Which number represents which part of the model?" At this point the discussion will develop around groups and how many are in the groups. Continue discussing and modeling the arrangements that the ants are put into each time they are interrupted. To emphasize the idea of equal groups, you may want to ask the students, "Why did the ants not organize into groups of 3 or 6?" Allow students time to struggle with this idea. Provide groups of 4 with 100 linking cubes and let them investigate this idea.

Part II

After students have had discussions about the ways that the ants have organized themselves, they will have an opportunity to organize ants of their own. Students will be given 20 counters and asked to arrange them in as many different equal groups as they can. Students should record their reasoning using pictures, words, and numbers.

QUESTIONS FOR FORMATIVE ASSESSMENT

- How many ways were you able to organize 20 ants?
- Can you think of another way to organize 20 ants?
- What does your number sentence look like?
- How can you explain your picture and number sentence in words?

DIFFERENTIATION

Extension

- Allow students to use different numbers of ants. (24, 36, 42). They should explain their reasoning using pictures, words, and numbers.

Intervention

- Allow students to work in small guided groups and reduce the number of ants to 12