CONSTRUCTING TASK: Sharing Pumpkin Seeds

STANDARDS OF MATNEMATICAL CONTENT

MCC.3.OA.2 Interpret whole-number quotients of whole numbers, e.g., interpret 56 ÷ 8 as the number of objects in each share when 56 objects are partitioned equally into 8 shares, or as a number of shares when 56 objects are partitioned into equal shares of 8 objects each.
MCC.3.OA.3 Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.

STANDARDS OF 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

This task provides students with an opportunity to develop and discuss strategies for dividing a two- or three-digit number by a one-digit number. Possible strategies students may use to solve this type of problem include, using base 10 blocks, using their knowledge of multiplication and inverse operations, or using repeated subtraction. Third grade is students' first exposure to larger number division and it is important to allow students time to make sense of this operation, so that students will continue to be successful with division in later grades.

ESSENTIAL QUESTIONS

- How can we divide larger numbers?
- What is the meaning of a remainder?
- Does a remainder mean the same thing in every division problem?

MATERIALS

- "Sharing Pumpkin Seeds" recording sheet
- Base 10 blocks or other materials for counting available for students who wish to use them

- *How Many Seeds in a Pumpkin?* by Margaret McNamara or similar book

GROUPING

Individual/Partner Task

TASK DESCRIPTION, DEVELOPMENT AND DISCUSSION

In this task, students will decide how to share pumpkin seeds fairly with a group of children.

Comments

This task can be paired with the following science standard: S3L1b. Identify features of green plants that allow them to live and thrive in different regions of Georgia.

There are many children's books about pumpkins and pumpkin seeds, any one of them could be used as an introduction to this task. One book that deals directly with the number of seeds in a pumpkin is *How Many Seeds in a Pumpkin?* by Margaret McNamara, Illustrated by G. Brian Karas.

Task Directions

Students will solve the two sharing problems on the "Sharing Pumpkin Seeds" recording sheet.

Problem 1

Ben and his 3 friends toasted 80 pumpkin seeds from their pumpkin. How many seeds will each child get if they share the pumpkin seeds fairly?

Clearly explain your thinking using words, numbers, and/or pictures.

Students may approach the problem 80 ÷4 in a variety of ways. Some students may build on their understanding of multiplication as the inverse of division to solve the problem.

Example 1

I know 4 x 2 = 8, so 4 x 20 = 80. If I add 4 groups of 20, I know there are a total of 80. Therefore, each child will get 20 pumpkin seeds.

Other students may build on their understanding of division as repeated subtraction.

Example 2

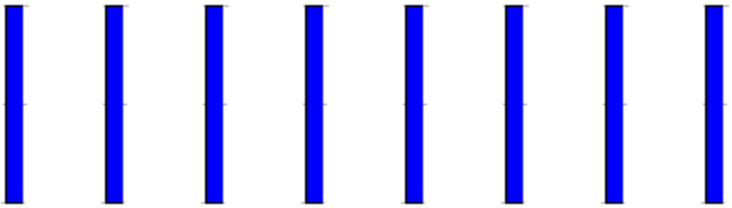
4 x 10 = 40 *80-40 = 40*
Each child got 10 pumpkin seeds.

4 x 10 = 40 *40– 40 = 0*
Each child got 10 more pumpkin seeds.

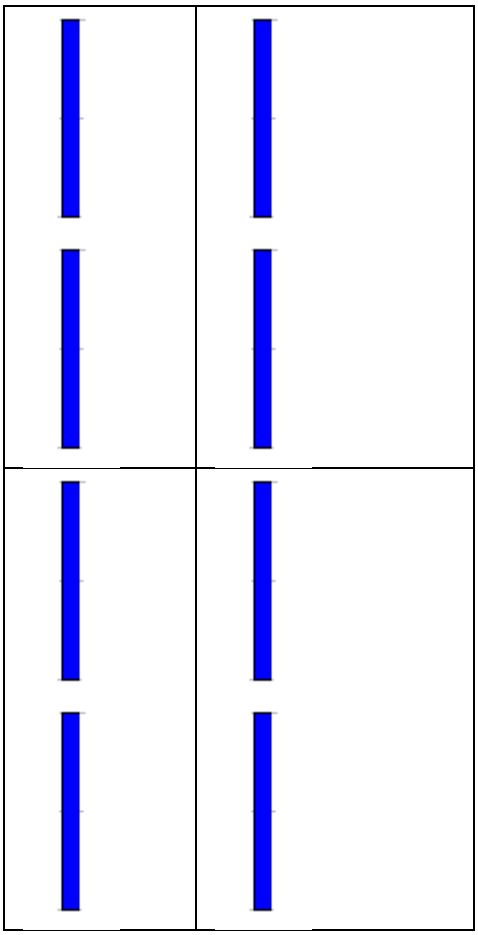
Each child received a total of 10 + 10 pumpkin seeds or 20 pumpkin seeds.

Some students may choose to use base 10 blocks to represent the division problem.

Example 3
First I took out blocks equal to 80.



Then I started sharing the ten strips among four groups.



Comments

After students have had plenty of time to develop an understanding of division using a method that makes sense to them, begin to talk with students about an efficient way to record the various strategies they now use.

FORMATIVE ASSESSMENT QUESTIONS

- What is your plan to solve this problem?
- How do you know your answer is correct?
- How does this help you answer the question in the problem?

DIFFERENTIATION

Extension

Have students to compare strategies used to solve each problem. Encourage them to look for similarities and differences in their approaches to the problem and to discuss the efficiency of each. Ask students to present their findings to the class.

Intervention

Before asking students to solve the problems on the "Sharing Pumpkin Seeds" recording sheet, be sure students have been able to solve similar problems with two-digit dividends.

TECHNOLOGY CONNECTION

http://mason.gmu.edu/~mmankus/whole/base10/asmdb10.htm#div A site for teachers and parents provides information on using base 10 blocks to solve division problems with an area model.

Name _____Date _____

Sharing Pumpkin Seeds

Ben and his 3 friends toasted 80 pumpkin seeds from their pumpkin. How many seeds will each child get if they share the pumpkin seeds fairly? Clearly explain your thinking using words, numbers, and/or pictures.

Sarah and her 5 friends toasted 96 pumpkin seeds from their pumpkin. How many seeds will each child get if they share the pumpkin seeds fairly? Clearly explain your thinking using words, numbers, and/or pictures.