

## In the Middle

Grade 4

Activity #418

Relevant Chapters in the *Digi-Block Comprehensive Teacher's Guide: Book III, 3-5:*  
Multiplying by One-Digit Numbers

### Overview

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Students predict one of the factors in a multiplication sentence and then use the blocks to check their answers.

### Objectives

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Thinking Skills: Students apply their understanding of multiplication to predicting one of the factors.

Mastery Skills: Students learn to relate one factor and the product in a multiplication sentence in order to determine the other factor.

### Materials

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Each small group of students needs:

- 1 place value mat
- 3 blocks-of-100 (Students can unpack to get the blocks they need.)
- 1 activity sheet per student

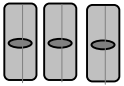

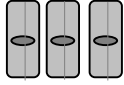

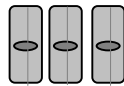

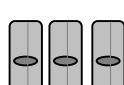

### Class Introduction

(10-15 minutes)

Pass out materials to small groups of 2-4 students. Present the following 2-digit X 1-digit multiplication sentence including the product:

$$\begin{array}{r} 32 \\ \times 4 \\ \hline 128 \end{array}$$

Have students model 4 groups of 32 with blocks on their place value mat.

Hundreds	Tens	Ones
		
		
		
		

Have students consider the following situation. What if they knew that:

- There are 32 blocks in each group.
- The product (total number of blocks) is 128.

Cover the 4 in the equation. Ask, How many groups of 32 are needed?

$$\begin{array}{r} 32 \\ \times \square \\ \hline 128 \end{array}$$

Have students explain their thinking. Students should be encouraged to articulate how they arrived at their answers. Strategies might include:

- Estimating/Predicting: i.e., they might know that they will need more than 1 group (1 group of 32 is 32) but less than 10 groups (10 groups of 32 is 320).
- Guessing and checking: i.e., putting a number of groups in the blank and testing with the blocks.
- Using the blocks by placing one group of 32 at a time until they reach 128:  $32 + 32 = 64$ ,  $64 + 32 = 96$ ,  $96 + 32 = 128$ ! So it's 4 groups.
- Starting with 128 blocks and removing 32 blocks at a time until there are no blocks remaining. This process is a division or repeated subtraction method.

Present a second multiplication problem with a missing factor:

$$\begin{array}{r} 63 \\ \times \square \\ \hline 252 \end{array}$$

Have students estimate/predict the number of groups. Then have students use the blocks to find the missing factor. Discuss strategies.

### Small Group Activity

(20 minutes)

Pass out the activity sheet. Have students work with their group to estimate/predict the number of groups and then use blocks to find the missing factors.

### Closure

(10 minutes)

Bring the class together. Have groups:

- Share one of their multiplication sentences.
- Determine the accuracy of their multiplication sentences.
- Discuss strategies for finding missing factors.

### Assessment

- Do students understand the difference between a factor and a product?
- Is the definition of factor and product modeled accurately on the place value mat?
- Are the students making reasonable predictions regarding the missing factor?
- Are the students choosing an appropriate method for determining the missing factor?
- Are the students appropriately comparing their predictions to their final answers determined from packing the blocks as much as possible?

### Extension

- Encourage students to write stories to accompany the multiplication sentences.
- Have students choose a second method to find a missing addend and compare results.
- Challenge students by putting the 1-digit factor and the product in a multiplication sentence and then asking them to determine the 2-digit factor (for example:  $5 \times \underline{\quad} = 225$ ). Students may choose to do this kind of missing factor problem as division by creating 5 equal groups out of 225 blocks.