

## Three Ways to See $48 \div 3$

Grade 4

Activity #424

Relevant Chapters in the *Digi-Block Comprehensive Teacher's Guide*:  
Book III: 4-1, Developing Two Meanings for Division, pages 103-106

### Overview

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Students solve story problems using repeated subtraction, array, and number line models of division. They make posters representing these different models for division.

### Objectives

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**Thinking Skills:** Students select materials to illustrate problems that can be modeled with division. They examine different models and conclude that the solution is the same regardless of the model.

**Mastery Skills:** Students learn to model, record, and solve 2-digit  $\div$  1-digit problems.

### Materials

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Each small group of 2-4 students needs:

- 1 piece of 12 x 18 (or larger) newsprint
- A supply of single blocks
- At least 16 small cups or 16 small holders (as needed)
- 1 number line (0-50)
- 1 array mat
- Activity Sheet #1
- Activity Sheet #2 ("Modeling Division Stories")

### Class Introduction

(30 minutes)

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Organize students in small groups. Provide each group with Activity Sheet #1 and the materials listed above.

Tell students to read through all 3 problems and think about how they can use their materials to model each problem.

- Explain that the problems tell 3 very different stories and encourage students to model each problem in a way that "shows" each story.
- Note: Students may find these problems very easy to solve. Emphasize that this lesson is not about finding the answer, but rather about making a model that most clearly represents the division situation in the story. This lesson will help them identify different types of division situations.

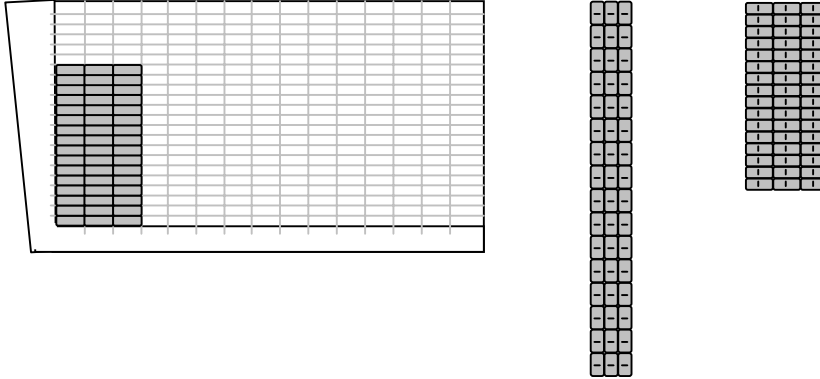
Have students reread each story problem, then have them arrange the blocks and other materials to model the situation. They should have 3 arrangements when they are finished, one for each problem.

Students will likely illustrate each problem differently.

- For problem A, they may arrange the 48 blocks in rows, with 3 blocks in each row, to represent the array of cars. They may do this on "flat" paper or they may

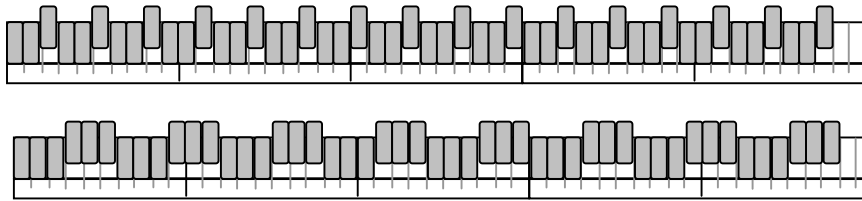
use the array mat, placing the blocks upright along the edges to show 16 rows of 3.

Array Models for 16 rows of 3



- For problem B, students may place 48 blocks in a line along their desk or on a number line. They may count out 3 blocks at a time to represent a leap of four blocks. They may mark each group of 3 or each 3<sup>rd</sup> block by offsetting blocks on the line, and repeat this six times. They may write or count: 3, 6, 9, 12, 15, 18, 21, 24, 27, 30, 33, 36, 39, 42, 45, 48. That makes 16 leaps of 3.

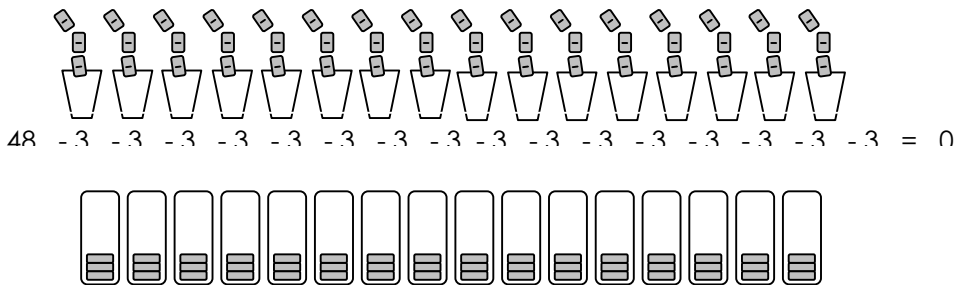
Number Line Models for 16 leaps of 3



- For problem C, students may set out cups or small holders. They may make fair shares of the 48 blocks by putting 3 blocks at a time into each cup or holder until all the blocks are distributed. They may write  $48 - 3 - 3 - 3 - 3 - 3 - 3 - 3 - 3 - 3 - 3 - 3 - 3 - 3 - 3 - 3 = 0$ . That makes 16 containers of 3.

Repeated Subtraction/Sharing Models for 16 containers of 3

Start with 48 blocks.  
Deal out 3 blocks  
at a time.



Have students create a poster by dividing their paper into thirds. Have them:

- Glue one problem in each section.
- Use the spaces to illustrate the model they used to solve each problem.
- Write a number sentence to show what they did.

Have students share their models and posters with the rest of the class.

- Have students compare their models and discuss how the different materials illustrate the different contexts.
- Have students discuss their preferences, yet note that all 3 models yield the same answer.
- Students should notice that even though the blocks are arranged differently, they can always “see”  $48 \div 3 = 16$ .

### Activity

(20 minutes)

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Distribute Activity Sheet #2, "Modeling Division Stories," to pairs of students. Provide additional materials as needed.

Have students take turns being the Modeler and the Recorder.

- The Modeler arranges the blocks to illustrate the problem.
- Both students find the answer.
- The Recorder illustrates the problem/solution and writes a number sentence that matches the problem.

### Closure

(10 minutes)

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As a whole class, share models and solutions for the problems on the activity sheet. Discuss number sentences and answers to each.

Write  $56 \div 8$  on the board. Have students write two different story problems that match the number sentence. Explain that the problems must suggest different models for representing them.

### Assessment

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As students work, observe and note the following. Do they:

- Model story problems according to their context?
- Understand that all models yield the same product?
- “See” the division fact within each different model?
- Illustrate and write appropriate number sentences for each story situation?
- Write different story situations given a division fact?

### Extension

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- Create a book of “ $56 \div 8$ ” (or another fact) by having students each contribute a different illustrated story problem. Encourage students to use a variety of contexts/models in their stories.