

# Pears in a Basket: Dividing with Whole Numbers

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<b>Strand:</b>	Computation and Estimation
<b>Topic:</b>	Estimating and dividing to find the quotient with one-digit divisors
<b>Primary SOL:</b>	4.4 The student will c) divide whole numbers, finding quotients with and without remainders.* * On the state assessment, items measuring this objective are assessed without the use of a calculator.
<b>Related SOL:</b>	4.4a

## Materials

- Base-10 materials
- Conquer Division activity sheet (attached)
- Demonstration tool (e.g., document camera, digital display) (optional)

## Vocabulary

*a little more than, between, closer to, divide, dividend, divisor, estimate, estimation, interpret, quotient, remainder*

## Student/Teacher Actions: What should students be doing? What should teachers be doing?

1. Present the following problem to the class: “Ann has a pear tree in her backyard. The tree produces beautiful pears each year, and Ann likes to share the pears with her three neighbors. So, Ann picked a basketful of pears, 57 in all! She decided not to keep any for herself this time but to use all the pears to make pear baskets for her neighbors, putting the same number of pears in each basket. How many pears did each person receive?”
2. First, ask students to estimate how many pears each neighbor will get. Ask a volunteer to share their estimate and their strategy. Ask whether anyone has another estimate, and then ask for his or her strategy. At this point, the purpose is to identify strategies and determine how students think about putting the pears into groups. Listen for the use of terms such as *groups, how many in a group, sharing, dividing, etc.*
  - a. Then, have students use pictures and/or base-10 materials to model the solution. Instruct students to write a number sentence they think represents their thinking with the models. Observe students as they use the manipulatives, and have them write or illustrate how their pictorial or concrete model helped find the solution and how they determined the solution.
  - b. Circulate around the room and identify students to share their strategy with the class. Some strategies students may use include using base-10 materials or sorting fair shares until none are left. If students use base-10 blocks, be sure to discuss the need for exchanging some of the rods for units. Did any student use the same idea with a pictorial representation instead of using base-10 material? Look for students who are able to write a number sentence for 57 divided by 3 and who can discuss the role of the 3 and the 57. Use think-pair-share, and ask

students to think about the following questions individually and then discuss them with their partner:

- “What did you use to represent the neighbors or the number of groups?”
- “What did you use to represent the pears or how many items were to be divided or shared?”
- “How many pears did each neighbor receive?”
- “Were there any leftover pears?”

As a class, discuss the idea of sharing as related to dividing and the different ways to show the operation of division symbolically.

- c. Ask whether anyone’s estimate resulted in there being any pears left over, and ask when there is a leftover, what it is called. Have students compare their estimates to the actual number of pears that each person received and note how close their estimates were.
3. Present another scenario to the students: “I have 69 markers. Each group of students needs eight markers to complete a project. How many groups of students can I have if each group gets eight markers?”
    - a. First, ask students to estimate the number of groups and write down their estimate. Allow them to work in pairs to do so. While monitoring these discussions, determine the estimation strategies students are using, specifically just rounding 69 to 70, using front-end estimation to get 60, or using 64 as a compatible number. Call on pairs that used different methods to explain their strategy. Call on students you identified, as well as some volunteers. Ask:
      - “How did you estimate with 69 markers?”
      - “What strategy did you use?”
      - “How did you get that answer?”
      - “Do you think your estimate is a little more than or a little less than the exact answer? Why?”
      - “Do you think there will be leftover markers, why?”
    - b. Following the discussion about estimates, ask:
      - “What is the problem asking us to find?”
      - “What is the total number of markers that I have?”
      - “How many markers will each group get?”
      - “Do I know how many student groups there are?”

Ask partners to solve the problem and to represent their thinking pictorially, and to write a number sentence. If any students are struggling with the concept of division, encourage them to use the base-10 material to represent their thinking.

- c. Determine which pairs you want to share their answer and representations with the class. Ask these pairs to explain their thinking and their answer. Push students to state that the answer to the question is that there are enough markers for eight groups to have eight markers each. However, there are five markers left over, but that is not enough for another whole group. If students do not share about the remainders, say: “There were 69 markers to start with.

Were you able to use all the markers?” Students should think about the original question and the answer to that question, which is eight groups. However, they also need to realize there are five leftovers, but they will not be used because there are not enough to add another group with eight markers.

- d. Revisit the two division problems, and through modeling connect the symbolic process for division to the pictorial representations the student created.
4. Students have now worked with both problem types for division: number of groups unknown, with the pears (measurement division), and size of groups unknown, with the markers (partitive division). Students do not need to know these terms, but they do need experience with both contextual situations. To start a conversation about the two types of problems, ask students to think about how the pears problem and the marker problem are similar and how they are different. Then provide students with the Conquer Division activity sheet. Base-10 blocks should still be available as an option for students to use. Students may work in pairs to solve the problems while the teacher circulates to make notes about each student’s understanding. You may decide to collect the students’ work to review as a formative assessment to make decisions about the following lessons, or you may choose to have students share in class.

### Assessment

- **Questions**
  - If Ann had decided to include herself in the sharing of the pears, would the number of pears each person receives increase or decrease? Use pictures and words to explain your thinking.
  - In the marker problem, how could the total number of markers be changed so that everyone got a fair share without any leftovers?
  - How would you describe division to a new student?
- **Journal/writing prompts**
  - Illustrate your solution in your journal to either the pears or the markers problems. Give a written explanation of your thinking.
  - Write a problem for a friend to solve. Include a solution to a problem.
  - Explain the relationship between multiplication and division.
- **Other Assessments**
  - Create a word problem given a specific division problem, such as  $93 \div 3$ .
  - Create two word problems where 7 is the divisor and 73 is the dividend, and where both problems interpret the remainder differently.

### Extensions and Connections

- You have five brownies to share with three friends so that each person, including yourself, have fair shares and no brownies are left over. How much of the brownies does each person get? Show your work with pictures and words. Write a number sentence for this problem.

- Present the following problem: “An NFL football team is traveling to an away game in vans. They have 87 players that need to travel. Each van only can hold six players. How many vans will the team need?” This problem allows students to explore interpreting the remainder when the quotient goes to the next higher number.

**Strategies for Differentiation**

- Provide “counters” and “baskets” (real or representational), in lieu of base-10 blocks for students to use when solving the contextual problems.
- Begin with smaller numbers with no remainders (e.g., 30) for students to calculate numbers with remainders.
- For ELL students, have pictures that represent the scenario of the problem. Provide cards that include picture and word in English and in the student’s native language.

**Note: The following pages are intended for classroom use for students as a visual aid to learning.**

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3. Write and solve your own division story problem with a divisor of 6 and a dividend of 84.

4. Use what you have learned about division to solve the following problem. Show your work.

$$136 \div 5$$