Lesson 3: Division as Equal Partitioning

Lesson Objective

- Students will solve problems that relate division to equal partitioning.

Instructional Materials

Material	Quantity	Description
Timer	1	
How Am I Doing? graph	1 per student	
Facts Practice graph	1 per student	
Colored pencils	1 per student	
24 objects	1 set	
Display Masters	1 each	• Preview: Key Ideas: Division as Equal Partitioning • Demonstrate: 24 Objects A • Demonstrate: 24 Objects B • Demonstrate: 24 Objects on a Number Line A • Demonstrate: 24 Objects on a Number Line B • Demonstrate: 24 Objects on a Number Line C • Demonstrate: Division on a Number Line • Demonstrate: 27 Objects A • Demonstrate: 27 Objects B • Demonstrate: 27 Objects on a Number Line A • Demonstrate: 27 Objects on a Number Line B • Demonstrate: 27 Objects on a Number Line C
Handouts	1 per student	• Timed Fact Practice 3 • Cumulative Review • Practice 1 • Practice 2 • Independent Practice
Answer Keys	1 each	• Timed Fact Practice 2 • Cumulative Review • Practice 1 • Practice 2 • Independent Practice

Timed Fact Practice

Distribute the Timed Fact Practice 3 handout of the chosen set of facts; multiplication, division, or mixed. Remember to use the same set of facts throughout the module.

Say: *When I say, "begin," you will have one minute to complete the 20 multiplication/division/mixed facts. Start with the first one, going across the rows. If you make a mistake, cross out the wrong answer and write the correct answer next to it. When I say, "stop" or the timer goes off, put your pencil down.*

Say: *Ready? Begin.*

After the timer goes off, display the Timed Fact Practice 3 Answer Key and have the students use a colored pencil or marker to check their work and write the number correct on the score line on the Facts Practice Graph.

Then have students graph the number correct. As the lessons proceed, connect the new point with the previous lesson's point.

Cumulative Review

Have students answer the questions on the Cumulative Review handout. Go over the answers. Correct misconceptions. Have students use a colored pencil to make corrections as needed. Collect student papers to determine who needs additional instruction.

Preview

This lesson will build on students' conceptual knowledge of partitioning to help them understand division as equal partitioning. Students will solve division problems pictorially and using a number line. Students will apply this knowledge to build their automaticity of division facts.

Display and introduce through a brief explanation the key ideas for this lesson:

- There are two ways to think about division: How many groups? or How many in each group?
- Division partitions a total into equal groups.

Use the Key Ideas: Division as Equal Partitioning DM display master as needed.

Engage Prior/Informal Knowledge

To open the lesson, present questions to activate students' background knowledge related to the content to be taught in this lesson. Ask questions such as:

- What is the relationship between multiplication and addition? (Multiplication can be thought of as repeated addition.)
- What does the equals sign represent (or mean)? (The equals sign means "equals" or "is equal to.")
- How can you show 15 on a number line? (3 jumps of 5, 5 jumps of 3, 15 jumps of 1)
- How can you show 3 x 5 on a number line? (3 jumps of 5)

Say: *We talked about repeated addition as one way to think about multiplication. Now we are going to learn a strategy for solving division problems.*

If students cannot correctly answer these questions, stop and explicitly teach the material.

Demonstrate

1. Divide a collection of objects into equal groups to determine how many groups there are.

Say: *Multiplication and division both deal with groups of objects. Multiplication combines groups to find the total number of objects. Division partitions groups to find the number of groups or how many objects are in each group. For both multiplication and division, the total number of objects is partitioned equally. The groups have the same number of objects.*

Display a collection of 24 objects. Use the 24 Objects A DM display master as needed.

Say: *There are 24 total objects to partition into groups of 6. How many groups are there?*

Say: *I can represent this as 24 ÷ 6. The 24 total objects are partitioned into groups where each has 6 objects.*

Divide the 24 objects into groups of 6. Use the 24 Objects B DM display master as needed.

Say: *There are 4 groups in all. When 24 objects are divided into equal groups of 6, there are 4 groups in all. 24 ÷ 6 = 4.*

2. Partition a number line into equal units to determine how many units are in the total.

Say: *I can also think of this problem using a number line. If I were drawing my own number line, I would start at 0 and stop at 24, the total number of objects.*

Display the 24 Objects on a Number Line A DM display master.

Say: *How many total objects? (24) I first find the total number of objects, 24, on the number line.*

Mark 24 on the number line. Use the 24 Objects on a Number Line B DM display master.

Draw attention to the distance from 0 to 24 on the number line.

Say: *I want to partition this distance, which represents the total number of objects, into groups of 6. I am going to count how many groups, or units of 6, are needed to have the same distance as 24.*

Display the 24 Objects on a Number Line C DM display master.

Count the number of units of 4 aloud.

Say: *There are 4 units of 6 in 24. Each group receives 6 objects. 24 ÷ 6 = 4.*

Repeat with additional examples such as 18 ÷ 3, 24 ÷ 8, and 16 ÷ 4. Use the Division on a Number Line DM display master as needed.

3. Divide a collection of objects into equal groups to determine how many groups there are.

Display a collection of 27 objects. Use the 27 Objects A DM display master as needed.

Say: *There are 27 total objects. Each group has 3 objects. How many groups are there?*

Say: *I can represent this as 27 ÷ 3. The 27 total objects are partitioned into groups where each has 3 objects.*

Divide the 27 objects into groups of 3 objects. Use the 27 Objects B DM display master as needed.

Say: *There are 9 groups. When 27 objects are divided into groups of 3, there are 9 groups. 27 ÷ 3 = 9.*

4. Partition a number line into equal units to determine how many units are in the total.

Say: *I can also think of this problem using a number line. If I were drawing my own number line, I would start at 0 and stop at the 27, the total number of objects.*

Display the 27 Objects on a Number Line A **DM** display master.

Say: *How many total objects? (27) I first find the total number of objects, 27, on the number line.*

Mark 27 on the number line. Use the 27 Objects on a Number Line B **DM** display master.

Draw attention to the distance from 0 to 27 on the number line.

Say: *I will solve this problem the same way I solved the previous problem. The answer represents something different, but is found the same way.*

Say: *I want to partition this distance, which represents the total number of objects, into groups that each have 3 objects. I am going to count how many units of 3 are needed to have the same distance as 27.*

Display the 27 Objects on a Number Line C **DM** display master.

Count the number of units of 3 aloud.

Say: *There are 9 units of 3 in 27. When 27 objects are divided into groups of 3, there are 9 groups. 27 ÷ 3 = 9.*

Repeat with additional examples as needed.

Practice

For each practice activity, provide detailed feedback to students, highlighting what was done correctly and what needs improvement. Provide opportunities for students to correct their errors. Collect student work to review and monitor student progress.

Activity 1: Help students complete the activity on the Practice 1 handout. Select a few students to verbalize their reasoning and each step in the process.

Activity 2: Have students work in pairs or small groups to complete the activity on the Practice 2 handout. Have students verbalize their reasoning and each step in the process to their partners.

Independent Practice

1. Have students work independently to complete the activity on the Independent Practice handout.

2. Go over the answers (students self-check and correct, using a colored pencil).

3. Have students record the number correct in the box and complete their How Am I Doing? graph.

4. Collect the papers to review and monitor student progress.

Closure

Review the key ideas. Have students provide examples from the lesson.

Have students discuss their answers to the following questions.

- What two questions can a division problem answer?

- How is division similar to or different from multiplication?
  Clear up any misconceptions. Students who have difficulty relating partitioning to division need additional instruction.