Lesson 9

Objective: Model decompositions of 8 using a story situation, arrays, and number bonds.

Suggested Lesson Structure

- Fluency Practice (12 minutes)
 Application Problem (5 minutes)
 Concept Development (25 minutes)
 Student Debrief (8 minutes)
 - Total Time (50 minutes)

Fluency Practice (12 minutes)

- Making 8 with Squares and Beans K.OA.3 (6 minutes)
- Hidden Numbers K.OA.3 (6 minutes)

Making 8 with Squares and Beans (6 minutes)

Materials: (S) 8 beans, 2 paper or foam squares

Note: This fluency activity extends students' familiarity with squares and the number 4 and applies it to the number 8. This activity also anticipates the use of arrays in today's lesson.

- T: Let's put one bean on each corner of our squares. Count each bean as you put it down.
- S: 1, 2, 3, 4, 5, 6, 7, 8.
- T: How many beans did you count?
- S: 8 beans!
- T: Let's count the corners of the squares. As you count each corner, move the bean a little off the corner, so you can remember which ones you already counted.
- S: 1, 2, 3, 4, 5, 6, 7, 8.
- T: Our job is to make 8. Move 7 beans on the corners of your squares. Leave the other one where it is. Count how many beans are on your corners. Wait for the signal to tell me. (Allow time to count; then, signal.)
- S: 7.
- T: How many beans are not on a corner?
- S: 1.

Continue with all of the number combinations, including 8 and 0.



Lesson 9:

Model decompositions of 8 using a story situation, arrays, and number bonds.



88



NOTES ON MULTIPLE MEANS OF REPRESENTATION:

Some students working above grade level may not need to count the corners again. They may know that there are 8 corners because they matched 1 bean to each corner. If this happens, ask students to explain how they knew there were 8 corners without counting.



Lesson 9:

Hidden Numbers (6 minutes)

Materials: (S) Hidden numbers mat (Lesson 2 Fluency Template 2) inserted into personal white board

Note: Finding embedded numbers continues the work of this module by developing part-whole thinking.

- T: Touch and count the fish on your mat. Raise your hand when you know how many. (Wait for all hands to go up, and then give the signal.) Ready?
- S: 10.
- T: Put Xs on 2 of the fish. Pretend they swam away!
- S: (Cross out 2 fish.)
- T: Circle a group of 7 from the fish who didn't swim away.
- T: How many fish are left?
- S: 1.
- T: Let's circle that 1. How many did you circle altogether?
- S: 8.

Repeat the process. This time, have 2 fish swim away again, but circle 5 fish, then another 3 fish, and ask how many are circled. Repeat with other combinations equal to 8 as time allows. Pause occasionally to allow students to explain efficient ways of locating the groups.

Application Problem (5 minutes)

Materials: (S) Two linking cube 5-sticks, 1 each of 2 colors

Take one of your 5-sticks. Add 1 more cube. How many cubes are in your stick now? (6.) Add 1 more cube. How many are in your stick now? (7.) Add another cube. Now, how many cubes are in your stick? (8.) Take your 8-stick apart. Work with your partner to make two rows of cubes out of your stick. Make sure you have the same number of cubes in each row. How many cubes are in each row? (4.) Yes, you took your 8 and made 2 rows of 4.

Now, take your cubes, and make a tiny row of 2. Make another tiny row of 2 underneath. Keep going until all of your cubes are used up. How many cubes are in each row? (2.) How many tiny rows do you have? (4.) You made your 8 into 4 rows of 2. You made your 8 into 2 columns. Talk to your partner about the ways you made your 8 look.

number bonds.

Note: Reviewing the array formations of 8 from Module 1 serves as an anticipatory set for the decomposition work with 8 in today's lesson.

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89

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Concept Development (25 minutes)

Materials: (S) Personal white board

- T: Draw a row of 8 crackers on your personal white board. (Demonstrate.) Let's pretend you want to share them between two friends. How many crackers should we give your first friend?
- S: (Example.) Let's give her 3.
- T: Okay, we will give her 3. Let's draw a line after the first three crackers to show the ones she will get. Draw the line on your board like this. (Demonstrate.)
- T: I'm going to put an empty number bond on the board. Who can help me fill in the numbers that would tell about your drawing?
- MP.2 S: There are 8 crackers, so put that in the whole. \rightarrow There are 3 for one friend and 5 for the other friend. \rightarrow Put 3 and 5 in the parts.
 - T: You took your 8 crackers and made groups of 3 and 5. Help me with the number sentence. (Write 8 = 3 + 5.)
 - S: 8 is the same as 3 and 5.
 - T: Could we share your crackers another way?
 - S: (Example.) I want to give them all away except 1 for me!
 - T: Draw another row of 8 crackers, and draw a line in the row to show that idea. (Demonstrate.) Let's make another number bond to show that story. (Guide students to assist in the creation of the new number bond.) This time, you took your 8 crackers and made groups of 7 and 1. Let's write the number sentence. (Write 8 = 7 + 1.)
 - S: 8 is the same as 7 and 1.
 - T: Does anyone have other ideas? Work with your partner to make other number bonds equal to eight.

Encourage students to draw and experiment with several different partners for 8, always following up with a number bond and a number sentence. Make sure that the number bonds are shown in a variety of configurations.

Problem Set (10 minutes)

Students should do their personal best to complete the Problem Set within the allotted time.



NOTES ON MULTIPLE MEANS OF REPRESENTATION:

If there are students working below grade level who are still confused about where to place the whole and the parts of decomposed numbers, have them practice the activity introduced in Lesson 1 of this module where students begin in a hoop representing the whole and have to walk along the path to arrive at different hoops representing the parts. Continue practicing until students understand the relationship represented between the whole and the parts in the number bond.





Model decompositions of 8 using a story situation, arrays, and number bonds.





Student Debrief (8 minutes)

Lesson Objective: Model decompositions of 8 using a story situation, arrays, and number bonds.

The Student Debrief is intended to invite reflection and active processing of the total lesson experience.

Invite students to review their solutions for the Problem Set. They should check work by comparing answers with a partner before going over answers as a class. Look for misconceptions or misunderstandings that can be addressed in the Student Debrief. Guide students in a conversation to debrief the Problem Set and process the lesson.

Any combination of the questions below may be used to lead the discussion.

 Look at the dots on the second page of the Problem Set.
 Compare with your neighbor where you drew your line to make two parts. Are they the same or different?

$$8 = 6 + 2.$$

$$8 = 5 + 3.$$

$$8 = 4 + 4.$$

$$8 = 3 + 5.$$

$$8 = 2 + 6.$$

$$8 = 1 + 7.$$

- Look at the dots again. Why do you think some are white and some are gray?
- How did the Application Problem connect to today's lesson?
- In our lesson, how did you decide which ways to divide the crackers?
- Did you notice any patterns?
- What are some of the partners you found to make 8?







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Draw some more dots to make 8 dots in all, and finish the number bond.







Draw 8 dots, some blue and the rest red. Fill in the number bond.



Red Dots





Lesson 9:

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Draw a line to make 2 groups of dots. Fill in the number bond.



Model decompositions of 8 using a story situation, arrays, and number bonds.

93

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Name

Complete the number bond to match the dot picture.



Draw a line to make 2 groups of dots. Fill in the number bond.



- Draw a number bond for 6. Fill in the number bond.
- Draw a number bond for 7. Fill in the number bond.



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