LESSON 7

Counting and Cardinality

Arranging Sets of Objects

In this lesson, children will learn that sets of objects with the same number of items can be arranged in different ways. A set of 8 items, for example, can be arranged in rows of 3 and 5 or 2 and 6. Children also will begin to understand simple addition and number families.

Objective

Explain how the same number of objects can be arranged in different ways.

Common Core State Standards

- **K.CC.4** Understand the relationship between numbers and quantities; connect counting to cardinality.
- **K.CC.4a** When counting objects, say the number names in the standard order, pairing each object with one and only one number name and each number name with one and only one object.
- **K.CC.4b** Understand that the last number name said tells the number of objects counted. The number of objects is the same regardless of their arrangement or the order in which they were counted.
- **K.CC.5** Count to answer "how many?" questions about as many as 20 things arranged in a line, a rectangular array, or a circle, or as many as 10 things in a scattered configuration; given a number from 1–20, count out that many objects. Compare numbers.

Try It! *Perform the Try It! activity on the next page.*

Talk About It

Discuss the Try It! activity.

- **Ask:** *Did you find two different ways to arrange your Three Bear Family® counters?* Have children look at one of the ten-frame arrangements. **Ask:** *How many counters do you have in the first row? In the second row?* Have children look at the second ten-frame arrangement and answer the same questions.
- Have children compare the two arrangements. **Say:** *You should have the same number of counters in both ten frames.*
- Make sure children understand that no matter how the 6 counters are arranged, there are still the same number. **Say:** *A number can be arranged in many ways.* (For example, 5 and 1, 3 and 3, and 4 and 2.)

Solve It

With children, reread the problem. On the Ten-Frame Worksheet (BLM 4), have children draw 3 chairs on one side and 3 chairs on the other side of the first ten frame and draw 4 chairs on one side and 2 chairs on the other side of the second ten frame. Have them count the number of chairs on each ten frame. Make sure that they understand that both ten frames have 6 colored chairs and show a set of 6 items.

More Ideas

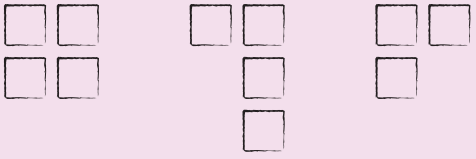
For other ways to teach about arranging sets of objects—

- Have groups of children use 1" Color Cubes to make four-cube towers. Then have children rearrange the cubes so the cubes are in a line or in a square. Point out that the different arrangements show the same number.
- Give each group a train of 9 green Snap Cubes® and an assortment of green and yellow cubes. Have children make a train of green and yellow cubes that also shows the number 9. Then have them line up the trains to reinforce the idea that the different arrangements are equal sets.

Formative Assessment

Have children try the following problem.

Circle the groups that show the same number.



Try It! 15 minutes | Pairs

Here is a problem demonstrating how to arrange sets of objects.

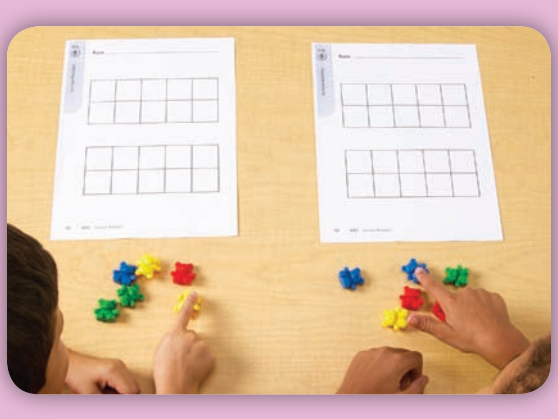
One of the tables in Anthony's classroom has 3 chairs on one side and 3 chairs on the other side. Another table has 2 chairs on one side and 4 on the other. How can Anthony figure out whether each table has the same number of chairs?

Introduce the problem. Then have children do the activity to solve the problem.

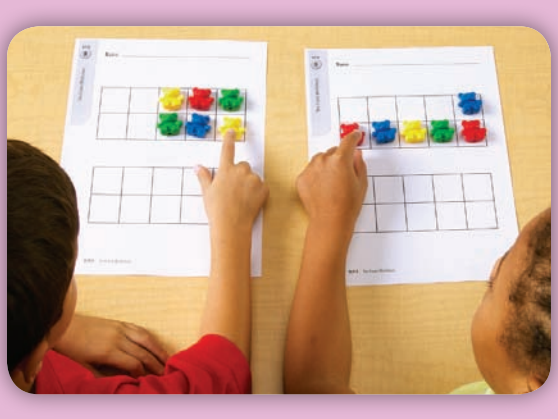
Arrange children in pairs, distribute Three Bear Family Counters, and give each child a Ten-Frame Worksheet (BLM 4).

Materials

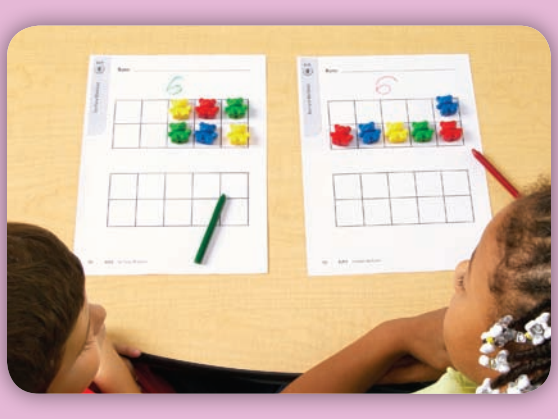
- Three Bear Family® Counters (6 per child)
- Ten-Frame Worksheet (BLM 4; 1 per child)



1. Have children count out 6 bears. Tell children that they will be showing the number 6 on their worksheets.



2. Invite children to place the bears on their worksheets. Each child should try to arrange the bears in a different way than their partner.



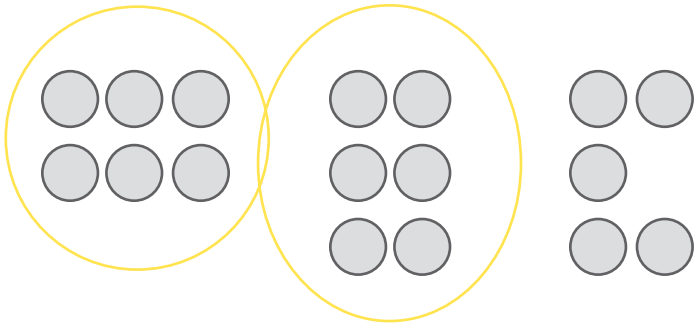
3. Ask children to write the number of bears (6) at the top of their worksheets. Have children count the bears to make sure everyone has the same number. Discuss the difference in how partners placed the bears (4 and 2, 3 and 3, or 5 and 1), but conclude that each still shows 6 bears. Repeat the activity with other numbers as time allows.

⚠ Look Out!

Children may believe that counters arranged in a different manner represent different numbers. Be sure to count the total in each set to show that the sets contain the same number of items, despite their difference in appearance. Have children act out the concept by asking a group of 6 children to sit at a table. With the class, count the children. Then rearrange the group of 6 and count again to compare.

Answer Key

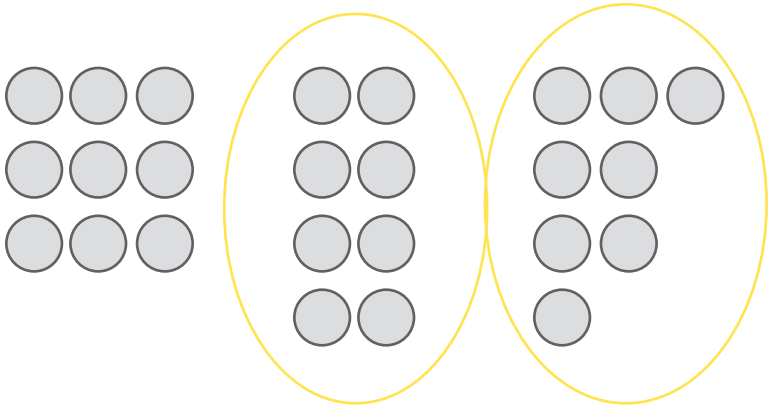
1.



Check children's work. (due to circling)

6 6 5

2.



9 8 8

Directions

1. Circle the groups that show the same number. Write the number of counters in each group. **2.** Circle the groups that show the same number. Write the number of counters in each group.

Answer Key

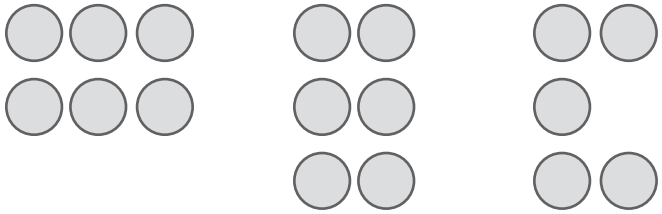
Check children's work.

Challenge

Draw 7 circles. Draw 7 circles again. This time find a different way to arrange your circles.

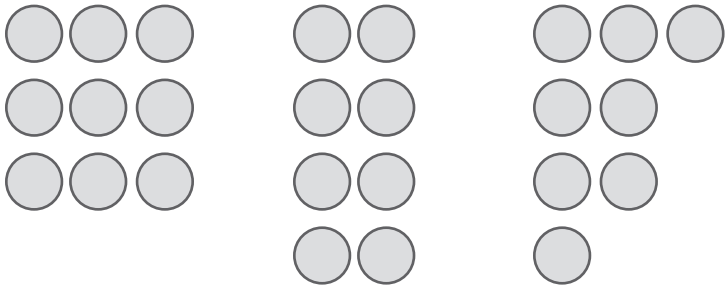
Name _____

1.



_____ _____ _____

2.



_____ _____ _____

Directions

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Challenge

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BLM 4

Ten-Frame Worksheet

Name _____