

Outside Inside

Grade 2

Lesson 204

Topic Overview

Students pack, explore, compare, and name blocks up to the block-of-1000. They also imagine and identify the inside of each size block by pretending to have x-ray vision.

Objectives

Thinking Skills: Students observe, compare, contrast, record, and articulate the features of various sized blocks. They identify the packing pattern and use this pattern to imagine what is inside each size block.

Mastery Skills: Students learn the features and names of the blocks. They also learn there is a definite pattern in the way the blocks pack to form larger blocks.

Materials

- 1000 single blocks to distribute evenly among student groups
- Small and medium holders
- 1 large holder for class demonstration
- 1 clear block-of-100 for demonstration (if available)
- 1 "Outside Inside" activity sheet for each student
- Chart paper to record student observations

Class Demonstration

(20 - 30 minutes)

Have students work in small groups to pack, explore, and articulate features of the blocks. Distribute "Outside Inside" activity sheets and 1000 single blocks (relatively equally) in containers among student groups. Ask students to:

- Describe the single block in their small group and record some of its features on their activity sheet.
- Record the size and appearance of the single block by drawing details on the outside view of the single block.

Have each student pack single blocks into a small holder until they can make a "larger block" by snapping on another holder as a cover. Help students to:

- Count and discover that exactly 10 single blocks must be packed in order for the holder to snap shut.
- Name the larger block, a "block-of-10."

Have students record the appearance of the block-of-10 by drawing details on the outside view of the block-of-10. Discuss the following questions:

- **What is the same about the single block and the block-of-10?**
(Same domino shape, oval indentation, and color)
- **What is different about the single block versus the block-of-10?**
(Different sizes - The block-of-10 is larger. In fact the block-of-10 is ten times larger in volume, but not in length or width. Most second grade students will not be able to go much beyond saying that the block-of-10 is larger.)
- **What is *inside* the bigger block?** (10 single blocks)

Tell students to imagine that they are superheroes with x-ray vision! Have them:

- Draw the inside or an "x-ray view" of the block-of 10. (They may need to look inside to check themselves.)
- Write words and numbers to label their illustrations as best they can.

Have students pack additional blocks-of-10 so that each group has at least ten blocks-of-10.

- Provide medium holders and have group members combine their blocks-of-10 to make an even larger block.
- Wait to name this larger block until students make some discoveries - see below.

Have students draw details for the outside view of this larger block on their activity sheets. Then have students make an x-ray picture of the inside.

- Most students will remark that, once again, there are 10 smaller blocks inside the larger block, "just like before!" They should also notice that it is again the same color and shape and that it has the oval shape in the center.
- Some will note that there are 10 singles inside each of the 10 blocks-of-10.
- Depending on students' levels, some may draw just one "layer" of blocks inside, and some may want the challenge of drawing the 10 singles *inside* the 10 tens *inside* the block of 100!
- Discuss these thoughts, and then name the bigger block, a **block-of-100**.
- Bring out in the discussion the important idea that 10 blocks make the next size block.
- Again, encourage students to write words or numbers to label their block pictures.

Ask, What will the next larger block look like on the outside? On the inside? Discuss predictions.

Have students combine blocks-of-100 to create a block-of-1000.

- They will recognize that once *again*, 10 blocks make the next size block. NOTE: Many second graders will have difficulty fully comprehending such a large quantity.

Student Activity and Closure

(4- 8 minutes)

- Give each group a single block, block-of-10, and block-of 100 to study. Have students refer to the blocks and their activity sheets. Give groups 2 - 4 minutes to discuss similarities of the blocks. Share and record groups' responses on chart paper.

- Give groups 2 - 4 additional minutes to discuss how the blocks are different. Share and record.
- Add to the list throughout the year as new discoveries are made.

Assessment

As students work, observe and note. Do they:

- Pack the blocks correctly?
- Recognize, illustrate, and explain how 10 blocks pack in holders to form a larger block?

Observe which students are beginning to "see" a block as a whole *and* as a whole composed of 10 smaller units.

- Can students visualize the "inside" view of the blocks-of-10 and blocks-of-100?

Extension

- Ask students to predict the name, outside features, and inside features of the next larger block (the block-of-10,000) and so on.
- Ask students to unpack the blocks and identify the unpacking pattern each time. When they get to the single block, ask if they can imagine unpacking the single block. **How many blocks do you think would pack inside the single block?** (10)