

UNIT

1

Full Digi-Block
Activity

A

The Pattern of Packing

OBJECTIVES:

- To discover relationships among the single blocks, blocks-of-10, blocks-of-100, and blocks-of-1000
- To observe, compare, record, and articulate the features of blocks of each size, to identify the pattern of the packing, and to use this pattern to imagine what is inside each size block

summary

materials



Digi-Block Overview

The purpose of this lesson is to emphasize the pattern of the packing, which sets the foundation for later understanding of base ten.

- Students explore the blocks' features and learn their names.
- They describe the 10:1 pattern in the way the blocks pack to form larger blocks.

For the whole class activity:

- 1 block-of-1000, completely unpacked with the holders separated according to size—small, medium, and large
- transparent block-of-100, optional

For each student:

- Outside and Inside* activity sheet
- green crayons or markers, optional



Everyday Math Connection

- Introduce the Digi-Blocks as you begin Unit 1. This lesson allows students to discover and articulate the structure of our base ten number system by building, or “packing,” each power of ten to model one, ten, and hundred. The Digi-Blocks provide a concrete representation of our ten-within-one number system.
- Later in the Unit (Lesson 1.6) students use money as a more abstract model for illustrating this relationship.



- Have students work in small groups to explore the features of the blocks. Distribute the *Outside-Inside* activity sheet and 1000 single blocks and small holders (relatively equally) in containers among student groups. Have students:
 - describe the single block.
 - record the size and appearance of the single block by tracing around it on their activity sheets.
- Have each student pack single blocks into a small holder until they can make a bigger block by snapping on another holder as a cover. Allow students time 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 tracing it on their activity sheets. Discuss the following questions:

What's the same about the single block and the block-of-10?

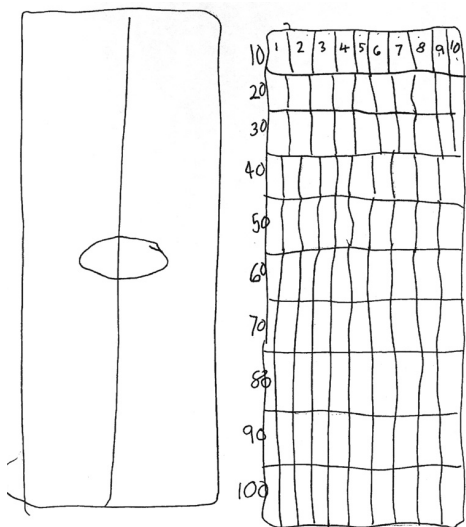
(same rectangular shape, oval indentation, color)

What's different about the single block versus the block-of-

10? *(different sizes - the block-of-10 is ten times bigger in size or volume, because there are 10 smaller ones inside.)*

What's inside the bigger block? *(ten single blocks)*

- Tell students to imagine they are superheroes with x-ray vision! Have them:
 - draw an "x-ray view" of the block-of 10. (They may need to look inside to check.)
 - write words and/or numbers to label their illustrations as best they can.
- Have students pack additional blocks-of-10 so that each group has at least 10 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 bigger block until students make some discoveries - see below.)
- Have students trace the outside view of this larger block on blank paper or on the backs of their activity sheets. Then have students make an x-ray picture of the inside.



Student's drawing of the inside of a block-of-100.

- 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 each student’s level, they may draw just one layer of blocks within, while others may rise to the challenge of drawing the 10 singles within the 10 tens within the block-of-100!
- Discuss these thoughts and then name the bigger block, a **block-of-100**.
- Emphasize the structure of the blocks: 10 blocks make the next size block.
- Again, encourage students to write words or numbers to label their block pictures.
(See figure of student drawing.)

- If you have a transparent block-of-100, show it to the class and allow students to compare it to their x-ray drawings.
- After each group has built several blocks-of-100, 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.



Closure

10 min

- Examine the block-of-1000 as a class.
 - Compare it to the smaller blocks to identify how it is alike/different from them.
 - Have students use their x-ray vision to tell about what’s inside the block-of-1000.
- Unpack it, layer by layer, as students tell how many smaller blocks (10) are inside each holder. When they get to the single block, ask if they can imagine unpacking the single blocks. Ask, **How many blocks do you think would pack inside the single block?**
(Students may want to sketch the tiny little blocks inside the single block on their activity sheets.)

Name _____

ACTIVITY SHEET

Outside and Inside
How does each block look on the outside?
Trace around each block and add the details you see.

Single Block – outside

How does each block look on the inside?
Use your x-ray eyes to help you draw the inside of each block!

Block-of-10 – outside **Block-of-10 – inside**

On a blank sheet or on the back of this paper, trace the outside of the next size block – the block-of-100! Then use your x-ray eyes and draw what’s inside. Look carefully!

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Assessment

As students work, observe and note, do they:

- ✓ Pack the blocks correctly?
- ✓ Recognize, illustrate, and explain the 10-in-1 relationships?
- ✓ Begin to see a block as a whole and as a whole composed of ten smaller units?
- ✓ Visualize the inside view of the blocks-of-10 and blocks-of-100?

Name _____

Outside and Inside

How does each block look on the outside?

Trace around each block and add the details you see.

Single Block – outside

How does each block look on the inside?

Use your x-ray eyes to help you draw the inside of each block!

Block-of-10 – outside

Block-of-10 – inside

On a blank sheet or on the back of this paper, trace the outside of the next size block – the block-of-100! Then use your x-ray eyes and draw what's inside. Look carefully!