Measuring the Blocks

Grade 3

Activity 310

Relevant Chapters in the *Digi-Block Comprehensive Teacher's Guide:*
    Book III, 1-1: Introducing the Blocks, pages 15 – 19

Overview

Students use estimation and measurement skills to find the measurements of various sized blocks and then predict the measurements for a block-of-1000.

Objectives

Thinking Skills:	Students make predictions and draw conclusions from information obtained. Students critique their process and results.
Mastery Skills:	Students measure length, width, and height of different sized blocks. Using this information, they estimate the size of the block-of-1000. They compare estimates to discuss reasonableness of answers.

Materials

Each group of students needs:
- 1 Single block
- 1 Block-of-10
- 1 Block-of-100
- 1 Ruler

- 1 Measuring tape or a longer ruler
- 1 "How Big Is It?" Activity Sheet
- Access to 1 Block-of-1000

Class Introduction   (10-15 minutes)

Give each group of students a single block, block-of-10 and a block-of-100.

Have each group arrange their 3 different-sized blocks in front of them, with each block standing vertically.

Lead a discussion of what the students notice about these blocks. Discussion points may include:
- Which block is the biggest?
- Which block is the smallest?
- Discuss the growth of the blocks.
- What can students say about the relationships of the blocks?

Ask students the name of next sized block (a block-of-1000). Ask students to imagine the size of the block-of-1000.

In their groups, challenge the students to measure the length (longest dimension), width (middle dimension), and depth/thickness (smallest dimension) of the smaller blocks. Upon completion, ask students to discuss how knowing these measurements will help them to estimate the size of a block-of-1000.

Activity   (25-30 minutes)

Provide each group with the necessary materials: a ruler and an activity sheet.

After each group finishes measuring the smaller blocks and has written down an estimated prediction, show them a packed block-of-1000. Record each group's estimate on newsprint or transparency. (Note: Do not expect exact results or estimations.)

Give each group a packed block-of-1000 and ask them to measure the length, width, and depth of this block.

(Note: The width and depth of a larger block are approximately equal to the length and width of the next smaller block (picture the way the smaller blocks are arranged inside). Overall, each dimension on the block is a litter more than 2 times what it was on the smaller block.)

Closure (10 minutes)

Discuss with students how close their estimates came to the actual measurements of the block-of-1000.
- What factors contributed to the different resulting measurements?
- Did each group have the same measurements for the block-of-100?
- What effect do the holders have on the resulting size of the block-of-1000?

Assessment

As students work, observe and note:
- Did students use a ruler or measuring tape correctly? Do they know where to begin and where to end on the ruler or tape?
- Did students use one measurement as a reference for another?
- Did students notice the repeating nature of the way the blocks pack into the next larger holder? Did any students pretend to pack the blocks-of-100 to help them estimate the measurements of the block-of-1000? (Note: This is a great strategy. Students should notice that the way blocks pack into a holder is always the same, no matter what the size.)
- Were students able to find the three dimensions?
- Do they notice that each dimension of a block is about 2 times bigger than each corresponding dimension of the next smaller block? If so, they are doing very well! (Note to Teachers: If the blocks were perfect and had holders of zero thickness, the blocks would grow by 2.15, the cube root of 10.)

Extension

- ❑ This same activity can be done estimating the size of a block-of-10,000. (Note: In Digi-Block Full Class Sets, the largest cardboard box that contains the Counters is a replica of a block-of-10,000. Wait to show this replica to students until after they have estimated the measurements. Have students measure the cardboard box to compare to their estimations.)

Measuring the Blocks

1. Find the measurements for a single block.

    Length_____

    Width _____

    Height _____

    Note: We will need to have a block standing up with arrows that point the length, width, and height.

2. Find the measurements for a block-of-10.

    Length _____

    Width _____

    Height _____

3. Before you begin finding the measurements for a block-of-100, discuss with your group what you found out about the relationship between the measurements for a single block and a block-of-10. Write down what you found out.

4. Find the measurements for a block-of-100.

    Length _____

    Width _____

    Height _____

5. How does what you discussed in #3 relate to what you found out in #4?

6. Estimate the measurements for a block-of-1000.

    Length _____

    Width _____

    Height _____

7. Find the actual measurements for a block-of-1000.

    Length _____

    Width _____

    Height _____

8. How close was your prediction?