How Big Is It?

Overview

Students use estimation and measurement skills to estimate the measurements of a block of ten thousand and beyond.

Objectives

Thinking Skills: Students draw conclusions from information obtained. They critique their process and results.

Mastery Skills: Students measure length and width and depth of a block of 100. Using this information, they estimate the size of the block-of-10,000. 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 measuring tape
- 1 yard or meter stick
- Large sheets of butcher block paper
- Newspaper (optional)
- 1 "How Big Is It?" Activity sheet

For demonstration, have available:
- 1 block-of-1000
- The cardboard box in which the Digi-Block classroom kit is packaged
  (Note: On the outside of the box there is a block-of-10,000 drawn)

Class Introduction   (20 - 25 minutes)

Give each group of students a single block, block-of-10 and a block- of- 100. Have each group place the blocks upright with the smallest rectangular face as the base and arrange the blocks from smallest to largest.

Lead a discussion of about these blocks. Discussion points:
- How many singles in block-of-10?
- How many singles in block-of-100?
- How many blocks-of-10 in block-of-100?
- Consider growth of the blocks.

Have students show you with their hands the approximate size of the block-of-1000. Bring out the block-of-1000 and have students compare it to the other sizes of blocks.

Ask the students what the next sized block is called (a block-of-10,000). Ask students to estimate the size of the block-of-10,000. Do they think it will be bigger than
- Their desks or tables?
- The door?
- The chalkboard?
- The room?

- The gym?

In their groups, challenge the students to determine a method that would enable them to closely estimate the size of a block-of-10,000.

Discuss the group's methods as a class. Instruct students to use their method or one they have heard from another group to estimate the size of a block-of-10,000.

Activity   (10 - 15 minutes)

Provide each group with the tape measure, yard or meter stick, and a large sheet of butcher block paper. Have students follow their plan to estimate the size of a block-of-10,000. Then have students draw the block-of-10,000 on their paper.

Each student in the group should record the process their group used and the resulting estimate in his or her Digi Discovery Page.

After each group finishes, show them the cardboard version of the block-of-10,000.

Ask volunteers from each group to come measure the length, width and depth of this block and to compare it to their drawings.

Closure   (5-10 minutes)

Discuss with students how close their estimates came to the measurements of the block-of-1000. Ask,
- What factors contributed to the different resulting measurements?
- Did each group have the same measurement for the block-of-10,000?
- What effect to the holders have on the resulting size of the block-of-10,000?
Since all the blocks pack in the same way, ask,
- Did any students use the block-of-1000 and pretend to pack it into the next larger holder?

Assessment

As students work, observe and note:
Do they-
- Have a "gut" sense of the relative size of numbers?
- Compare numbers with confidence?
- Justify their thinking with mathematical proof?
- Use materials (blocks, number line) to represent/support their ideas?
- Understand and communicate different strategies for comparing numbers?
- Rely on a more concrete, or abstract, method for determining differences?

Observe student's collaborative style. Look for leadership, inclusive gestures, clarifying questions and summarizers. Consider informing students that you will looking for one particular characteristic such as those students who work to include everyone. Before the end of class be certain to comment on your observations.

Extensions

- This same activity can be done predicting the size of a block-of-100,000. Students will need to tape together several sheets of butcher block paper, or have them use newspaper.
- Use the gym or the playground to predict the size of a block-of-1,000,000.
- Have students predict the name and size of the next smaller block (a block-of-0.1).