What A Handful! (Part 1)

Grade 2

Activity 208

Relevant chapters in the *Digi-Block Comprehensive Teacher Guides*:

Book II: Unit 2-4: Relating Single Blocks to Packed… , page 37-40

Book III: Unit 1-3: Predicting the Base Ten Representation, page 25

Topic Overview

Students construct, interpret, and represent a physical graph that shows how many blocks students typically grab in a handful.

Objectives

Thinking Skills: Students organize, interpret, and translate physical data to a paper/pencil representation. Students will devise and describe estimation strategies.

Mastery Skills: Students learn to construct a physical graph. They express observations in words and/or numbers. They name quantities between 10 and 20 by "seeing" tens and ones.

Materials

Each student, group of students, etc. needs:

- Tub of single Digi-Blocks
- 5"-6" paper plates – 1 per student, student's name on each
- Floor graphing mat*
- Holders, 20-40 small and 2-4 medium, depending on class size
- 4 x 10 Graph sheet

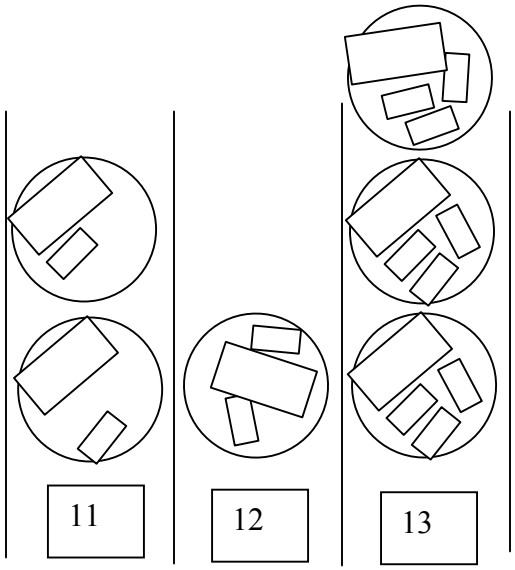
*Floor graphing mats are commercially available by major mathematics supply vendors. It is easy to make your own by drawing a 4 x 10 grid on bulletin board paper, making 6- or 7-inch squares. Depending on the range of data, the graph may need to be taller or wider.

Class Introduction (20 minutes)

- Show students the tubful of Digi-Blocks. Ask, **How many blocks do you think you can grab in a handful?** Have students:
  - Predict and share predictions
  - Take turns grabbing a handful of blocks and placing them on a paper plate.
  - Count the blocks by ones.
  - Predict what the blocks will look like when packed as much as possible
- Distribute holders and have students pack blocks-of-10 if possible. Name the number as tens and ones.

- Ask, **Is it easier to name the number of blocks when they are unpacked or packed? Why?** Discuss the base ten representation as a shortcut for counting quantities greater than 10. Depending on their level, most students will agree that it is easier to "see" 15 as 1 ten and 5 ones rather than 15 singles.

- Roll out the graphing mat. Ask, **How can we use this mat to organize our handfuls so we can see what numbers came up most often?** Students will likely suggest placing platefuls on the grid from smallest to largest, and placing equal-sized quantities above one another. Have pieces of paper available to label axes, and to give the graph a student-suggested title.



The more engaged students are in creating the graph **themselves**, the more meaningful it will be to them.

- Discuss the graph, asking questions, such as
  - **How many students grabbed 15 Digi-Blocks?**
  - **Who grabbed the largest/smallest handfuls?**
  - **How many more/fewer students grabbed # than #?**
  - **How many people grabbed more/fewer blocks than you?**
  - **If another second grader grabbed a handful, how many blocks would he or she likely grab? Why do you think so?**

Student Activity (15 minutes)

Distribute the Activity Sheet (4 x 10 graph grid) and have students:

- Record on paper the physical graph they made, including axis labels and title
- Reflect on earlier discussion in small groups or pairs
- Write at least three observations or conclusions they can make from interpreting the graph.

Closure (10 minutes)

Have students share their observations with classmates. Discuss the shape of the data. Check for understanding by having students make a statement about how their classmates' handfuls compare to their own.

Assessment

As students work, observe and note:
Do they-

- Recognize the connection between counting their handfuls as single blocks and naming the number as packed blocks?
- Observe packed handfuls of blocks and name the quantity without counting? For example, while interpreting the graph, can they readily recognize the platefuls of 12 blocks? 14 blocks?

Use students' graphs and written interpretations to further evaluate students' understanding

Extension

- Play "Digi-Block Flash" using the overhead projector and collections of blocks-of-10 and single blocks. This activity highlights the idea of grouping tens to make a quantity easy to "see" without counting by ones.
    - Turn the projector off. Place 13 single blocks on the projector screen. "Flash" the blocks for 2 seconds and then ask students to tell you how many blocks they saw. Note the range of numbers!
    - Place a block-of-10 and 3 singles on the overhead and repeat the 2-second "flash." Most students will agree on 13 blocks.
    - Discuss which representation is easier to read and why.
    - Repeat with several other examples, including larger numbers. If some students seem uncertain, have them unpack the blocks-of-10 and count by ones to ensure understanding.
- Make a graph using older students' or parents' handfuls. Compare graphs.