The Big Count

Grade 3

Lesson 307

Relevant chapter in the *Digi-Block Comprehensive Teacher's Guide:*
   Book III: Unit 1-4: Seeing Patterns in the Count, pages 26 - 29

Lesson Overview

Students use the Counter and 3-place paper strips to make a class number line from 0 to 1000. They identify patterns in the count and get a sense of where numbers are located as they navigate the number line.

Objectives

Thinking Skills: Students model the sequence of 3-place numbers. They identify and describe the repeating patterns of digits in the number code. Students use number sense to estimate and then to verify where 3-place numbers are located on a number line. Students relate the base ten view of number to the number line view.

Mastery Skills: Students use blocks on the Counter to model, name, and write numbers from 0 to 1000. They practice counting by tens and hundreds.

Materials

Part 1: Set up a class center supplied with:
  * One Counter
  * 1000 single blocks (and holders, enough to make a block-of-1000)

- Pencil
- Tape
- One can or paper towel tube and paper clips
- 50 number line strips (25 copies of the master, cut along dotted line)
- Timer

Part 2: Have crayons or markers available

Class Introduction   (5 – 10 minutes)

Present this center activity as an extension of the "Pattern of the Count" lesson in the Teacher's Guide. Explain to students that they will be working together in teams of three. Their task is to build numbers from 0 to 1000 on the Counter and to record the numbers on a number line.

Set up an area in the classroom for the Big Count. Provide materials listed above. Model the procedure for students:
- Designate roles: one student is the Packer, the second is the Dialer, and the third is the Recorder.
- The Packer places one single block at a time on the Counter. The Dialer sets the digits on the dials and reads the number. The Recorder writes the number on the number line strip.
- All three students check to make sure that the written numbers match the number of blocks in each place on the Counter.
- The Recorder tapes additional paper strips to the ongoing count as they are needed.
- Make sure the Recorder starts at the bottom of the number strip and works to the top. Each additional paper strip is taped to the top of the previous strip. The finished class number line will read from the bottom (0) to the top (1000).

Activity: Part One   (15-minute shifts)

Have small groups of students rotate through the center, doing 15-minute shifts. Adjust the time limit, as needed.
- The purpose of the timed shift is to encourage students to keep focused and to coordinate their effort. Remind students that the

activity is not a race; the shift is simply a way to ensure that all teams have equal time at the center.
- Depending on class schedules, this task may take up to a week to complete.

As groups are working, check to make sure they are:
- Using the Counter properly - adding a single block at a time and packing as needed.
- Setting and reading the dials accurately.
- Recording the numbers as they are read, starting at the bottom of the number line strip and working their way to the top.
- Taping additional number strips to the top of the previous strips.

After each team's turn, have students:
- Roll up the number line around a can or paper towel tube and secure it with paper clips so it is ready for the next group to continue the count.
- Leave the blocks on the Counter showing where they ended their count.

Unroll the number line after every team has had one shift. Read the number at the top. Have students predict how long the number line will be when it is complete. Have them explain their reasoning.
- The finished line will extend to almost 50 feet! Prearrange to use a hallway or gymnasium, if available, to continue the lesson.

Activity: Part Two   (30 minutes)

Unroll the number line and display it for all students to view. Students may want to walk up and down the line to get a close-up view of all the numbers. Have them sit along one side of the line for a group discussion. Orient the number line so students read it from bottom (0) to top (1000).
- Ask, *What patterns do you notice? How do the numbers change as they go from one to the next? Where do big changes occur? (99 to 100, 699 to 700). Why does this happen? What happened on the Counter?*
- As students describe the patterns they see, have them highlight them using crayons or markers.

- For example, use blue to loop the repeating pattern of 0 to 9 in the ones place. Use green to loop the sets of repeating zeroes, ones, twos, etc. in the tens place. Use a different color to loop the long chains of hundreds.
- Continue questioning students to foster clarification of their observations. Record their ideas on chart paper.

Space students out equally along the number line so they will have a range of numbers before them. Next, "navigate" the number line!

- Say, *Raise your hand if some numbers in front of you have zero hundreds, 1 hundred, 2 hundreds, . . . 9 hundreds.* Hands will rise along the line to show where each hundred falls.
- Color each hundred (100, 200, . . .900) yellow on the number line. Ask, *Who is sitting near 500? Raise your hand if the numbers in front of you are greater than 500, less than 500?* Discuss the middle location of 500. Say, *Raise your hand if the numbers in front of you are more than 100? 400? Less than 800? 600? Between 300 and 500?*
- Count by hundreds to 1000. Ask, *How many hundreds in 1000?* Show the ten hundreds on the number line and **show the ten hundreds in the block-of 1000**!
- Count by tens to 1000. Have students draw stripes or another identifying mark on the decades (10, 20, . . . 980, 990). Note the ten tens within each hundred. **Show the ten tens within each block-of 100**. Ask, **How many tens in 1000?** Identify the 100 tens on the number line and **show the hundred tens in the block-of-1000**!
- Ask, **Who is sitting near 150?** Have students predict which classmate is nearest the number. Students may use the yellow-colored hundreds as clues to help them. Repeat with different numbers and discuss strategies.
- Show 684 on the Counter. Ask, *How many hundreds on the Counter?* (6) Count by hundreds on the number line to 600. Ask, *How many blocks are in the tens place on the Counter?* (8) Count out 8 tens on the number line and locate 680. *How many blocks are in the ones place on the Counter?* (4) Count out 4 more ones, and locate 684. Ask students where the blocks would end if they unpacked all of the blocks and put one on each number on the number line, this is how far they would go. Use a smaller number to actually prove this!

Closure   (20 minutes)

As a whole class activity, have students write to an imaginary alien from another planet! Explain that the aliens do not count the way we do here on Earth, so the letter must explain how our counting system works. Have students reflect on their experiences with the Counter and number line to give them ideas of what to write.

Assessment

As students work, observe and note:

Do they-
- o Pack the Counter and set the dials correctly?
- o Record and read numbers correctly?
- o See patterns in the count?
- o Count by hundreds to 1000? By tens?
- o Identify a number's location along the number line with ease?
- o Understand the connection between the number of blocks on the Counter and the number on the number line?
- o Describe our counting system with understanding?

Extension

Play "Name My Number." Students use logical reasoning and number sense to ask yes-no questions about a secret number. Questions may begin with these stems only:

Is it more than _____?
Is it less than _____?
Is it between _____?
Is it _____?

For example, if the secret number is 346, a series of questions may be:
- ▪ Is it more than 500? (no)
- ▪ Is it less than 200 (no)
- ▪ Is it between 200 and 400? (yes) . . .and so on

Initially, students' questions will be random. Help them think about asking good questions. After each question is answered, discuss which numbers the new information eliminates and what the remaining possibilities are.

It may be a good idea to begin with a smaller range of numbers, such as 0 – 100, then 0 – 500. Fold or cut the student-made number line to these sizes, and as the game is played, use it to model the process of elimination. Eventually, a straight line with hash marks may be all students need to help them keep track of the clues in the game!