

Location, Location, Location!

Reporting Category Number and Number Sense

Topic Exploring whole numbers through the millions place

Primary SOL 4.1 The student will

- a) identify orally and in writing the place value for each digit in a whole number expressed through millions;
- b) compare two whole numbers expressed through millions, using symbols ($>$, $<$, or $=$); and
- c) round whole numbers expressed through millions to the nearest thousand, ten thousand, and hundred thousand.

Materials

- Index cards
- Periods Place-Value Chart (attached)
- Clothesline
- 12 spring-type clothespins
- Laminated register tape or strips of paper to make number lines

Vocabulary

periods, ones, tens, hundreds, thousands, ten thousands, hundred thousands, place value, value, digit, numeral, millions

Student/Teacher Actions (what students and teachers should be doing to facilitate learning)

Note: Before undertaking this activity, prepare index cards with a variety of hundred-millions numbers written on them—one card per student. Each hundred-millions number should be different. Also, prepare a set of 12 index cards with each of 10 cards having one numeral, 0–9, written very large on it, and each of two cards having a comma written very large on it.

1. Explain to students that when we understand place value, we also develop an understanding of really big numbers. Write the number 134,276,983 on the board, and ask students to write a description of the number, including a reference to the value of the number and to the importance of the *place* of each numeral. (This is to assess your students’ knowledge of place value and to focus their minds on each place.) Ask for volunteers to read what they have written. Tell students that you want them to understand the *place* and *value* of each digit in the number. Display the attached Periods Place-Value Chart. (If you redraw it, keep the columns the same width so that students do not confuse block size with value.) Write each digit in the number 134,276,983 in its proper place, and discuss how this tool can help with understanding large numbers.

Millions Period			Thousands Period			Ones Period		
Hundred-Millions	Ten-Millions	Millions	Hundred-Thousands	Ten-Thousands	Thousands	Hundreds	Tens	Ones
1	3	4	2	7	6	9	8	3

2. Distribute copies of the Period Place-Value Chart and index cards with various hundred-millions numbers written on them. Ask students to write each digit of their numbers under the correct heading in their charts. Have students exchange cards and repeat the activity; then, have them exchange again but with a different person and repeat. Each student will then have written three hundred-millions numbers in three place-value charts.
3. Repeat this activity with different sized numbers. Once students are comfortable using a place-value chart, have them compare two of the numbers on the charts, using the terms *greater than*, *less than*, or *equal to*, along with the corresponding symbols.
4. Have students practice rounding the same numbers from the activities above to the nearest thousand, ten thousand, and hundred thousand. Students may use laminated strips of paper to make a number line to determine answers. For example, if students are rounding 6,154,091 to the nearest ten thousand, they need to know which two ten thousands the number lies between on the number line. (6,150,000 and 6,160,000) Once this is determined, they will see that the number is closer to 6,150,000 than to 6,160,000. Then, using the knowledge they have acquired about this number, students can round it to the nearest thousand.

Assessment

- **Questions**
 - Do you see any patterns in the place-value system? If so, what are they?
 - Does the use of zeros in a number always affect the value of the number? Why, or why not?
- **Journal/Writing Prompts**
 - Write one of your hundred-millions numbers in word form, and describe in writing a situation in which a number that large would be used.
- **Other**
 - Observe student accuracy in putting numerals in the correct places as they write the numerals in their place-value charts or clip them on the clothesline (see Extensions below). Listen for accuracy as students describe their numbers and for correct vocabulary usage as students compare and contrast their numbers.
 - Observe student language and interaction in the clothesline activity (see below).
 - Ask students to order their numbers from least to greatest and greatest to least after they have compared their numbers.

Extensions and Connections (for all students)

- Extend the lesson with the following activity. Distribute the teacher-created set of 12 numeral cards (numerals 0–9, plus two commas) and 12 clothespins to 12 students. Give two other students a clothesline. Have these two students hold up the clothesline. Display the number 943,721,856 so that the other students in the class can see it but the students holding the cards cannot. Tell the students with the cards that they will clip their numerals or commas on the clothesline, one-by-one, to make the secret number as it is revealed by the remainder of the students, who will answer the following questions aloud.
 - What numeral is in the hundred thousands place? (7)
 - What numeral is in the thousands place? (1)
 - What numeral is in the hundreds place? (8)

- What is used to separate the hundreds place and the thousands place? (,)
- What numeral is in the hundred millions place? (9)
- What numeral is in the ten thousands place? (2)
- What numeral is in the ten millions place? (4)
- What numeral is in the millions place? (3)
- What is used to separate the hundred thousands and the millions place? (,)
- What numeral is in the ones place? (6)
- What numeral is in the tens place? (5)

Have the students read the number once it is displayed, and direct them to verify that all numerals have been placed in the right places—i.e., that their place values are correct.

- Repeat the activity with a different number. If time permits, give every student an opportunity to participate as a “clipper.”
- Ask students to look for and report back examples of large numbers on display in the community (e.g., street numbers on houses and businesses).

Strategies for Differentiation

- Have students enter large numbers into a calculator for display.
- Have students enter a large number into a voice-supported word processing program that translates the number into words.
- Have students use visual cues and/or mnemonic devices to help them remember place-value order.
- Have students write large numbers in a sand tray.
- Have students color-code the different periods of the number line.
- Have students work in groups to participate in a mock bank, using large-denomination play money.
- Have students work in pairs to check each other when writing and reading large numbers.

