



# Places, Everyone!

## Creative Strategies for Teaching Place-Value Concepts

Putting numbers in their places—that's what place value is all about! Help students better understand this challenging math topic with the following hands-on games and learning activities.

### This Must Be the Place!

#### Skill: Reviewing place value

Review basic place-value concepts and introduce new ones with this versatile, hands-on chart that students can make and keep. Provide each student with a 12" x 18" sheet of light-colored paper and a ruler. Also provide permanent markers for students to share. Then guide them through these steps:

1. With your sheet of paper lying horizontally, fold it in half and crease it. Then fold it in half and crease it again.
2. Open up your sheet. Using a permanent marker, draw lines along the three vertical creases.
3. Measure and draw a horizontal line one inch from the top edge of your sheet.
4. Beginning on the left side, label the four resulting boxes "billions," "millions," "thousands," and "ones."
5. Measure and draw another horizontal line one inch below the first one.
6. Beginning on the right side of your paper, measure and draw a vertical line  $1\frac{1}{2}$  inches from the edge. Extend this line from the first horizontal line down to the bottom edge of the paper.
7. Measure and draw another vertical line  $1\frac{1}{2}$  inches from the first one. Extend this line from the first horizontal line down to the bottom edge of the paper.
8. From left to right, label the three resulting small boxes "H" (hundreds), "T" (tens), and "O" (ones).
9. Continue measuring and drawing vertical lines ( $1\frac{1}{2}$  inches apart) across the paper so that the thousands, millions, and billions sections are exactly like the ones section.
10. Label the three column headings ("H," "T," and "O") in each section.

Next, provide each student with a small (about 4" x 6") piece of construction paper in a color that contrasts with his chart. Have each student cut this sheet into small markers (about one square centimeter each). Share with students that our numeration system is based on groups, or multiples, of ten—thus it's a *decimal system*. Our numeration system is also known as a *place-value system*. In a place-value system, every digit in a numeral has two different values: the value of the *digit* and the *place value* of the *digit*. Students' charts show just some of the place values in our numeration system.

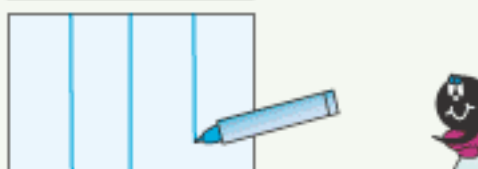
Then have students use their place-value charts and markers with the teacher-directed lessons on page 4.

by Irving P. Crump

Step 1



Step 2



Steps 3 & 4



Step 5



Step 6



Steps 7 & 8



Steps 9 & 10



# Introductory Activities

## Number Families

### Skills: Building vocabulary, basic skills

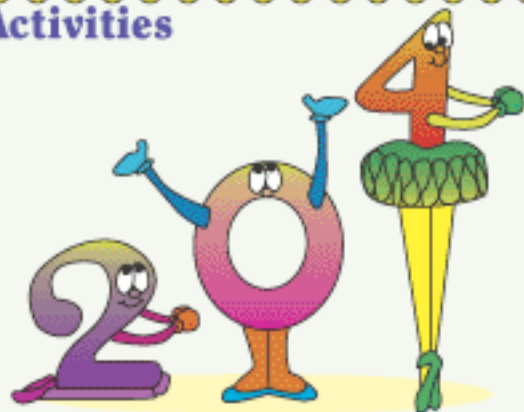
Write the numeral 123,456,789,246 on a chalkboard or transparency. Tell students to note that the digits are grouped in threes. Each group is called a *period*. (Students may wish to use the word *family* instead.) The periods are named—reading from left to right: *billions*, *millions*, *thousands*, and *ones*. Also have students observe that within each group the names are the same: *hundreds*, *tens*, and *ones*. Thus the *place value* of any digit is ones, tens, or hundreds followed by the group name. Ask students if the ones family is named when reading a numeral (*no*). Help students see that to read a numeral, it's necessary to consider the values of the digits and the positions they occupy.



## Breaking Down Big Numerals

### Skill: Simplifying large numerals

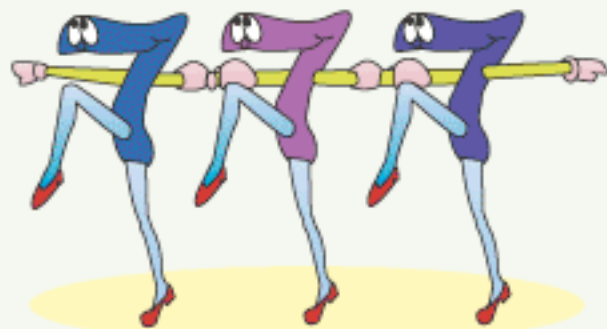
Cover all of the digits in the numeral written on the board (123,456,789,246) except for the 123 group. Ask a volunteer to read that group of digits (*one hundred twenty-three*). Next, cover all of the digits except the 456 group and ask a volunteer to read that group of digits (*four hundred fifty-six*). Repeat this procedure with the last two groups of digits. Guide students to see that in reading (or writing) a large numeral, it's helpful to break it down into its periods and read each period as a simple, three-digit numeral. Also help students see that the commas represent pauses when reading a numeral, just as they do in reading text. Whenever a student comes to a comma in reading or writing a large numeral, he knows to pause and say or write a period name. Ask volunteers to reread each group of three digits—this time adding the period name after each one.



## In First Place

### Skill: Naming the first place value

Beginning from the right, have each student place one marker in each of the first eight columns of his chart. Ask a volunteer to read the numeral that is formed (*11 million, 111 thousand, 111*). Next, have students clear their charts and place four markers in each of the first six columns. Ask a volunteer to read the numeral that is formed (*444 thousand, 444*). Have students observe that the first digit in a numeral represents the largest place value, and that it determines how to begin reading or writing the numeral. Continue with various other examples, extending all the way to the hundred billions place.



## A Place for Nothing

### Skill: Recognizing zeros as placeholders

Have each student place six markers in the one millions place, five in the hundred thousands place, three in the one thousands place, one in the hundreds place, and seven in the ones place. Then ask the class, "How many digits will this numeral have when you write it?" (*seven*) Ask a volunteer to write the numeral on the board (*6,503,107*). Remind students that the value of the first digit's place (*millions*) determines how large the numeral will be and that any empty place to the right of that digit must have a zero placeholder. Continue with other similar examples. Have students write their resulting numerals on paper.