

# PREPARATORY MATH SKILLS LAB

Lab **P<sup>M</sup>S10**

## MATH ACTIVITY

### Writing Decimal Numbers or Power-of-ten Numbers in Scientific Notation

## MATH SKILLS LAB OBJECTIVE

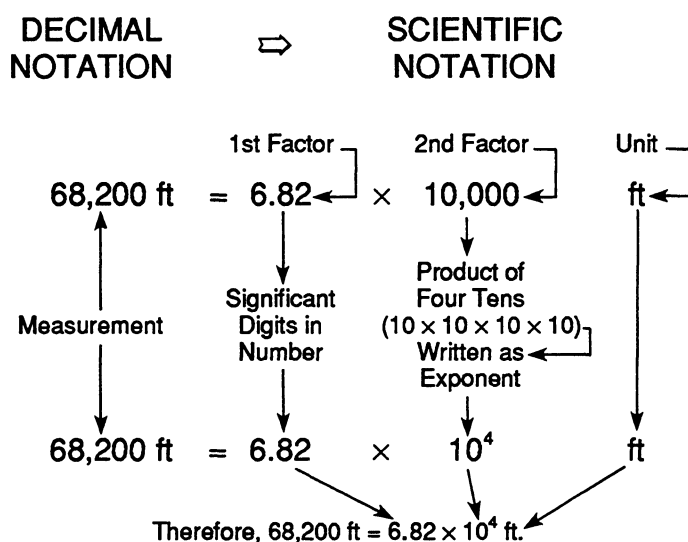
When you complete this activity, you should be able to convert power-of-ten or decimal numbers to scientific notation.

## MATERIALS

For this activity, you'll need a pencil and paper.

When converting decimal numbers to power-of-ten numbers, or *vice versa*, do not round off or drop significant digits. This would indicate a change in accuracy and the conversion should not affect accuracy. While not a fixed rule, the first factor often is represented as a number

between 1 and 10. This type of expression is a special power-of-ten notation called "**scientific notation**." Scientific notation is simply a numeral written as a number between 1 and 10, multiplied by the number 10 that is raised to an appropriate power. See Figure 1.



**Fig. 1** Expressing a number in scientific notation.

TABLE 1: CONVERSION OF DECIMAL NUMBERS TO POWER-OF-TEN (COLUMN B)  
AND SCIENTIFIC NOTATION (COLUMN C)

Column A		Column B		Column C
375,000	=	$375 \times 10^3$	=	$3.75 \times 10^5$
81,000	=	$81 \times 10^3$	=	$8.1 \times 10^4$
623,000,000	=	$623 \times 10^6$	=	$6.23 \times 10^8$
0.0715	=	$715 \times 10^{-4}$	=	$7.15 \times 10^{-2}$
0.000000133	=	$133 \times 10^{-9}$	=	$1.33 \times 10^{-7}$

The following numbers in Column C from Table 1 are each written in **scientific notation** as shown below:

$$\begin{aligned}
 &3.75 \times 10^5 \\
 &8.1 \times 10^4 \\
 &6.23 \times 10^8 \\
 &7.15 \times 10^{-2} \\
 &1.33 \times 10^{-7}
 \end{aligned}$$

Note that in each example, the first factor contains all the significant digits, and is a number between one and ten.

### PRACTICE EXERCISES

**Problem 1:** Convert the power-of-ten numbers in Column A to numbers in scientific notation. Place answer in Column B. The answer to the first number is given. (Some may already be in scientific notation, so be alert.)

Column A	Column B
$326 \times 10^3$	$3.26 \times 10^5$
$41.98 \times 10^4$	_____
$2.12 \times 10^{-4}$	_____
$6.1 \times 10^5$	_____
$3.06 \times 10^2$	_____
$1.2 \times 10^{-3}$	_____
$0.81 \times 10^5$	_____

**Problem 2:** Convert the decimal numbers in Column A to scientific notation. Place answers in Column B. The answer to the first number is given.

Column A	Column B
125,000	$1.25 \times 10^5$
32,100	_____
1,521	_____
1,921,000	_____
0.0000192	_____
0.11050	_____
0.0567	_____
22	_____