

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.

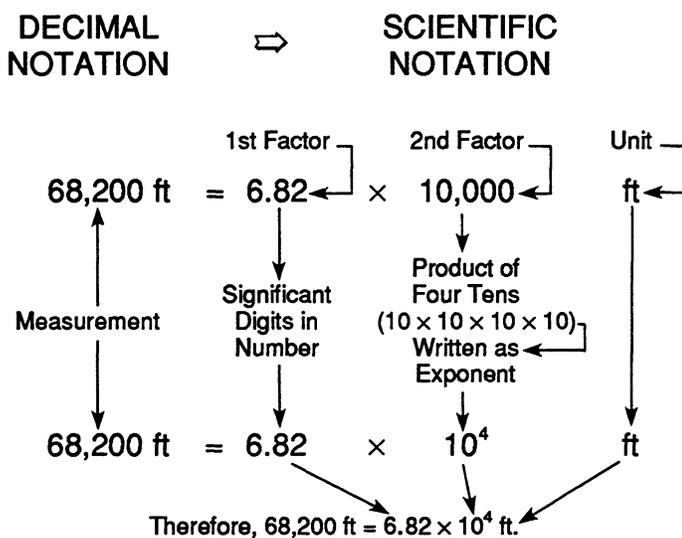


Fig. 1 Expressing a number in scientific notation.

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	=	375×10^3	=	3.75×10^5
81,000	=	81×10^3	=	8.1×10^4
623,000,000	=	623×10^6	=	6.23×10^8
0.0715	=	715×10^{-4}	=	7.15×10^{-2}
0.000000133	=	133×10^{-9}	=	1.33×10^{-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
326×10^3	3.26×10^5
41.98×10^4	_____
2.12×10^{-4}	_____
6.1×10^5	_____
3.06×10^2	_____
1.2×10^{-3}	_____
0.81×10^5	_____

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	1.25×10^5
32,100	_____
1,521	_____
1,921,000	_____
0.0000192	_____
0.11050	_____
0.0567	_____
22	_____