8.4 Use Scientific Notation

TEKS a.1; 8.1.D

Before You used properties of exponents.

Now You will read and write numbers in scientific notation.

Why? So you can compare lengths of insects, as in Ex. 51.

Key Vocabulary
- **scientific notation**

Numbers such as 1,000,000, 153,000, and 0.0009 are written in *standard form*. Another way to write a number is to use *scientific notation*.

KEY CONCEPT *For Your Notebook*

Scientific Notation

A number is written in **scientific notation** when it is of the form $c \times 10^n$ where $1 \leq c < 10$ and n is an integer.

Number	Standard form	Scientific notation
Two million	2,000,000	2×10^6
Five thousandths	0.005	5×10^{-3}

EXAMPLE 1 Write numbers in scientific notation

a. $42{,}590{,}000 = 4.259 \times 10^7$ — Move decimal point 7 places to the left. Exponent is 7.

b. $0.0000574 = 5.74 \times 10^{-5}$ — Move decimal point 5 places to the right. Exponent is -5.

EXAMPLE 2 Write numbers in standard form

a. $2.0075 \times 10^6 = 2{,}007{,}500$ — Exponent is 6. Move decimal point 6 places to the right.

b. $1.685 \times 10^{-4} = 0.0001685$ — Exponent is -4. Move decimal point 4 places to the left.

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READING
A positive number in scientific notation is greater than 1 if the exponent is positive. A positive number in scientific notation is between 0 and 1 if the exponent is negative.

GUIDED PRACTICE for Examples 1 and 2

1. Write the number 539,000 in scientific notation. Then write the number 4.5×10^{-4} in standard form.