1 EXAMPLE **Is each number written in scientific notation? If not, explain.**

a. 0.46×10^4 No; 0.46 is less that 1.

b. 3.25×10^{-2} yes

c. 13.2×10^6 No; 13.2 is greater than 10.

2 EXAMPLE **Write each number in scientific notation.**

a. 234,000,000

$234{,}000{,}000 = 2.34 \times 10^8$

Move the decimal point 8 places to the left and use 8 as an exponent. Drop the zeros after the 4.

b. 0.000063

$0.000063 = 6.3 \times 10^{-5}$

Move the decimal point 5 places to the right and use −5 as an exponent. Drop the zeros before the 6.

3 EXAMPLE **Write each number in standard notation.**

a. elephant's mass: 8.8×10^4 kg

$8.8 \times 10^4 = 8.8000.$

A positive exponent indicates a number greater than 10. Move the decimal point 4 places to the right.

$= 88{,}000$

b. ant's mass: 7.3×10^{-5} kg

$7.3 \times 10^{-5} = 0.00007.3$

A negative exponent indicates a number between 0 and 1. Move the decimal point 5 places to the left.

$= 0.000073$

4 EXAMPLE List the planets in order from least to greatest distance from the sun.

Planet	Distance from the Sun
Jupiter	4.84×10^8 mi
Earth	9.3×10^7 mi
Neptune	4.5×10^9 mi
Mercury	3.8×10^7 mi

Order the powers of 10. Arrange the decimals with the same power of 10 in order.

3.8×10^7	9.3×10^7	4.84×10^8	4.5×10^9
Mercury	Earth	Jupiter	Neptune

From least to greatest distance from the sun, the order of the planets is Mercury, Earth, Jupiter, and Neptune.

5 EXAMPLE Order 0.0063×10^5, 6.03×10^4, 6103, and 63.1×10^3 from least to greatest.

Write each number in scientific notation.

0.0063×10^5	6.03×10^4	6103	63.1×10^3
↓	↓	↓	↓
6.3×10^2	6.03×10^4	6.103×10^3	6.31×10^4

Order the powers of 10. Arrange the decimals with the same power of 10 in order.

6.3×10^2 6.103×10^3 6.03×10^4 6.31×10^4

Write the original numbers in order.

0.0063×10^5 6103 6.03×10^4 63.1×10^3

6 EXAMPLE **Simplify. Write each answer using scientific notation.**

a. $6(8 \times 10^{-4}) = (6 \cdot 8) \times 10^{-4}$ Use the Associative Property of Multiplication.

$= 48 \times 10^{-4}$ Simplify inside the parentheses.

$= 4.8 \times 10^{-3}$ Write the product in scientific notation.

b. $0.3(1.3 \times 10^{3}) = (0.3 \cdot 1.3) \times 10^{3}$ Use the Associative Property of Multiplication.

$= 0.39 \times 10^{3}$ Simplify inside the parentheses.

$= 3.9 \times 10^{2}$ Write the product in scientific notation.