10.5

Reading Scientific Notation

- Identify numbers written in scientific notation.
- Write numbers in standard form.
- Compare numbers in scientific notation.
- Write large and small numbers in scientific notation.
- Perform operations with numbers written in scientific notation.
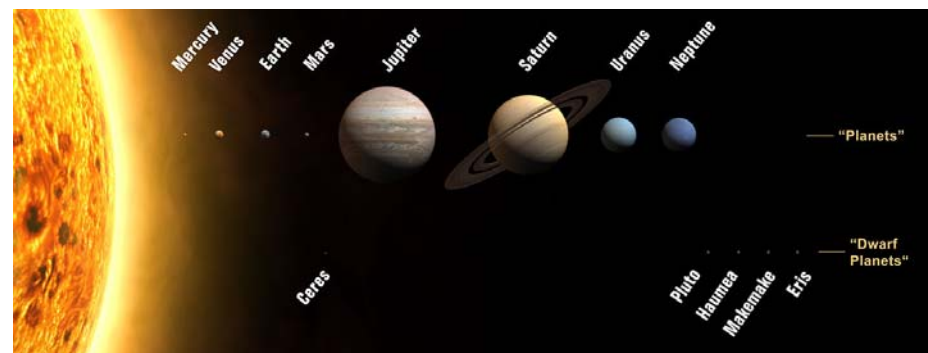
Evaluate the expression.

1. 10^3 **2.** 10^{-4} **3.** 10^5

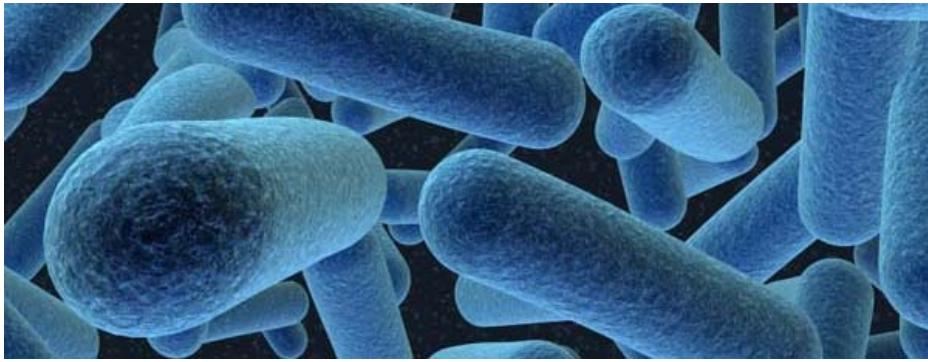**4.** 10^{-2} **5.** 10^{10} **6.** 10^{-5}

Distance from Earth to the Sun

150,000,000 km

Size of Bacterium

0.0000625 cm

Scientific Notation

This is way of writing very big or small numbers in an easier way.

$$150 \quad = 1.5 \times 100 \quad = 1.5 \times 10^2$$

$$1,500 \quad = 1.5 \times 1000 \quad = 1.5 \times 10^3$$

$$15,000 \quad = 1.5 \times 10000 \quad = 1.5 \times 10^4$$

Scientific Notation

A number is expressed in scientific notation when it is in the form

$a \times 10^n$

where **a** is between 1 and 10 and **n** is an integer

Tell whether the number is written in scientific notation. Explain.

a. 5.9×10^{-6}

b. 0.9×10^8

Scientific Notation

This is way of writing very big or small numbers in an easier way.

$$150,000,000$$

Scientific Notation

This is way of writing very big or small numbers in an easier way.

$$0.0000625$$

Standard Form

Write the following in standard form:

1) 2.5×10^3

2) 3.94×10^{-4}

3) 6.47×10^6

4) 7.83×10^{-7}

5) 2.5×10^2

6)   a. Write 3.22×10^{-4} in standard form.

       b. Write 7.9×10^5 in standard form.

7) An object with a lesser density than water will float. An object with a greater density than water will sink. Use each given density (in kilograms per cubic meter) to explain what happens when you place a brick and an apple in water.

Water: 1.0×10^3 Brick: 1.84×10^3 Apple: 6.41×10^2

8)

A dog has 100 female fleas. How much blood do the fleas consume per day?

A female flea consumes about 1.4×10^{-5} liter of blood per day.

Scientific Notation

Write the following in scientific notation:

Big Number – Positive Exponent

Small Decimal – Negative Exponent

9) $64,830,000,000,000$

10) 0.00000000089

11) $118,000,000,000,000$

12) 0.000000000000025

13) 67

14) A large corporation purchased a video-sharing website for $1,650,000,000. Write this number in scientific notation.

15) The 2004 Indonesian earthquake slowed the rotation of Earth, making the length of a day 0.00000268 second shorter. Write this number in scientific notation.

16)

An album has sold 8,780,000 copies. How many more copies does it need to sell to receive the award?

Ⓐ 1.22×10^{-7} Ⓑ 1.22×10^{-6}

Ⓒ 1.22×10^{8} Ⓓ 1.22×10^{7}

An album receives an award when it sells 10,000,000 copies.

17) The table shows when the last three geologic eras began. Order the eras from earliest to most recent.

Era	Began
Paleozoic	5.42×10^{8} years ago
Cenozoic	6.55×10^{7} years ago
Mesozoic	2.51×10^{8} years ago