

8.EE.3 USE NUMBERS EXPRESSED IN THE FORM OF A SINGLE DIGIT TIMES AN INTEGER POWER OF 10 TO ESTIMATE VERY LARGE OR VERY SMALL QUANTITIES, AND TO EXPRESS HOW MANY TIMES AS MUCH ONE IS THAN THE OTHER.

Which is 23,578,000 written in scientific notation?

- A. 2.3578×10^6
- B. 23.578×10^6
- C. 2.3578×10^7
- D. 23.578×10^7

During a presentation at the Battelle Planetarium, Magdalena learned that the average distance between the Earth and the sun is approximately 9.3×10^7 miles. What is the average distance between Earth and the sun in standard form?

- A. 93,000 miles
- B. 930,000 miles
- C. 9,300,000 miles
- D. 93,000,000 miles

Loretta calculated the distance she drove from home to her grandmother's house as 5.11×10^5 miles. The distance from Loretta's home to her aunt's house is 5.3×10^7 miles. Which sentence is correct?

- A. Loretta lives closer to her grandmother than to her aunt.
- B. Loretta lives closer to her aunt than to her grandmother.
- C. Loretta lives farther away from her grandmother than from her aunt.
- D. Loretta lives the same distance from her aunt and from her grandmother.

A micrometer is equal to 1.0×10^{-6} meters. Which of the following would best be measured in micrometers?

- A. the distance between two planets
- B. the height of a coffee table
- C. the length of a pencil
- D. the width of a strand of hair

A neighborhood playground has an area of 3,025 square feet. Which is this area expressed in scientific notation?

- A. $3.025 \times 10^3 \text{ ft}^2$
- B. $3.025 \times 10^4 \text{ ft}^2$
- C. $30.25 \times 10^2 \text{ ft}^2$
- D. $302.5 \times 10 \text{ ft}^2$

The diameter of Earth is about 1.274×10^4 kilometers, and the diameter of the Great Red Spot, a giant storm in Jupiter's atmosphere, is about 3.218×10^4 kilometers. Which object has a larger diameter, and by how much?

- A. Earth, by about $2 \times 10 \text{ km}$
- B. Earth, by about $3.218 \times 10^4 \text{ km}$
- C. the Great Red Spot, by about 2 km
- D. the Great Red Spot, by about $2 \times 10^4 \text{ km}$

Fill in the blanks below with numbers to correctly write each number in scientific notation.

$$3 \times 10^{\underline{3}} = 3,000$$

$$0.000004 = \underline{4.0} \times 10^{\underline{-6}}$$

$$\underline{4.0} \times 10^6 = 4,000,000$$

$$0.006 = \underline{6.0} \times 10^{\underline{-3}}$$

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Write $.063 \times 10^{-6}$ in scientific notation.

- A) 6.3×10^{-4}
- B) 6.3×10^{-8}
- C) 63,000
- D) .000000063

Alyssa estimated that there are five hundred twenty billion grains of sand on a beach. How is this number written in scientific notation?

- A) 5.2×10^9
- B) 5.2×10^{10}
- C) 5.2×10^{11}
- D) 5.2×10^{12}

A water tower holds 2,340,000 gallons of water. Express this number in correct scientific notation.

- A) 2.34×10^{-6}
- B) 23.4×10^5
- C) 2.34×10^6
- D) 2.34×10^7

China has a population of approximately 1.3×10^9 people. The United States has a population of approximately 3×10^8 people. How many more people live in China than in the United States?

- A) 10^7 people
- B) 10^8 people
- C) 10^9 people
- D) 10^{10} people

The word microns is an abbreviated term for micrometer, or $\frac{1}{1,000,000}$ of one meter.

Part A

Write an expression in scientific notation that is equivalent to $\frac{1}{1,000,000}$. Show your work.

$$10^{-6} \text{ or } 1.0 \times 10^{-6}$$

Part B

Find the area, in square microns, of a rectangular object with a width of 6,000 microns and a length of 2,000,000 microns. Show your work and write your final answer in scientific notation.

$$6.0 \times 10^3 \times 2.0 \times 10^6 = 12 \times 10^9 = 1.2 \times 10^{10}$$