

LESSON

2

Scientific Notation

Review It!

When you use scientific notation, remember these words:

scientific notation a way of writing very large or very small numbers as the product of a number ≥ 1 and < 10 and a power of 10
power of 10 a number having 10 as a base

standard notation a way of writing a number without using an exponent

4.3×10^{-2} is in scientific notation.
 ↑ power of 10

0.043 is in standard notation.

Rule: When you convert a number from scientific notation to standard notation, multiply or divide by a power of 10. If the exponent is positive, move the decimal point right to multiply. If the exponent is negative, move the decimal point left to divide.

Write 2.6×10^3 in standard notation.

Step 1 Find the decimal point in the first number.

2.6×10^3

The decimal point is between _____ and _____

Step 2 Move the decimal point to multiply.

The exponent is 3, so move the decimal point _____ places.

The exponent is positive, so move the decimal point to the _____

2,600

So, 2.6×10^3 written in standard form is _____.

REMEMBER The first number is always 1 or between 1 and 10.

Try It!

Write each number in standard notation.

1. 9.3×10^{-3} 2. 4.8×10^4 3. 1.7×10^{-2} 4. 6.4×10^5

.0093 48000 .017 640000

5. 7.1×10^3 6. 8.6×10^{-2} 7. 7.3×10^2 8. 5.9×10^4

7100 .086 730 59000

Ask Yourself

1.

Move the decimal point left how many places?

1, or 3?

Write each number in scientific notation.

9. 23,900 10. 615,000 11. 9,800 12. 2,300,000

2.39×10^4 6.15×10^5 9.8×10^3 2.3×10^6

13. 0.0029 14. 0.000015 15. 0.00000664 16. 0.00035

2.9×10^{-3} 1.5×10^{-5} 6.64×10^{-6} 3.5×10^{-4}

9.

What is the first factor?
2.39, or 23.9?

Solve.

17. The circumference of the Earth is about 24,900 miles at the equator. What is 24,900 written in scientific notation?

2.49×10^4

18. A part of a cell is 0.00021 cm long. What is 0.00021 written in scientific notation?

2.1×10^{-4}

17.

What will the exponent be? positive, or negative?

On Your Own!

Circle the best answer for each question.

- What is 9,500,000,000 in scientific notation?
 - 95×10^9
 - 9.5×10^9
 - 9.5×10^8
 - 9.5×10^{-9}
- What is 0.000061 in scientific notation?
 - 61×10^6
 - 6.1×10^5
 - 6.1×10^{-5}
 - 6.1×10^{-6}
- What is 3.2×10^3 in standard notation?
 - 320
 - 3,200
 - 32,000
 - 320,000
- What is 1.3×10^{-7} in standard notation?
 - 0.00013
 - 0.000013
 - 0.0000013
 - 0.00000013
- What is 416,000,000 in scientific notation?
 - 4.16×10^8
 - 41.6×10^7
 - 4.16×10^6
 - 4.16×10^5
- What is 9.7×10^{-3} in standard notation?
 - 0.000097
 - 0.00097
 - 0.0097
 - 0.097
- Suppose part of a cell is 0.000024 cm wide. What is 0.000024 in scientific notation?
 - 2.4×10^{-6}
 - 2.4×10^{-5}
 - 24×10^{-6}
 - 2.4×10^{-4}
- The Earth travels at a speed of 108,000 km per hour. What is 108,000 in scientific notation?
 - 1.08×10^5
 - 10.8×10^4
 - 1.08×10^3
 - 1.08×10^2

- Saturn is an average distance of 1.4335×10^9 km from the sun. What is 1.4335×10^9 in standard notation?

1,433,500,000

- A cell is about 0.0000021 cm wide. What is 0.0000021 in scientific notation?

2.1×10^{-7}

Math Words

Fill in the blanks.

- When you convert a number from scientific notation to standard notation, move the decimal point to the right if the exponent is positive, and to the left if the exponent is negative.
- The first part of a number written in scientific notation is greater than or equal to 1 and less than 10.
- The number 0.00082 is in standard (decimal) notation.