

1 Math Support**Using Scientific Notation**

Scientific notation allows you to express a very large number, like 1,567,000,000, as a decimal and a power of 10.

$$1,567,000,000 = 1.567 \times 10^9$$

Scientific notation also allows you to express very small numbers, like 0.0000000000736 as a decimal and a power of 10.

$$0.0000000000736 = 7.36 \times 10^{-11}$$

SAMPLE PROBLEM

Express 45,270,000,000,000 using scientific notation.

Set up: Figure out where you must place a decimal to make a number between 1 and 10. In this case, you would place the decimal between the 4 and the 5 to make the number 4.527.

Count: Count the number of digits between the new decimal and the old decimal. Here, there are 13 digits between the decimals. This is the power of 10 you will use. Now you have

$$4.527 \times 10^{13}$$

Check: Check the sign on the power of 10. If the number you are expressing is a decimal less than one, the power should be negative. If the number you are expressing is greater than one, as this one is, the power is positive.

Answer:

$$4.527 \times 10^{13}$$

EXERCISES

Solve each problem. Remember to show all your work.

1. Express 234,000,000 using scientific notation.

Set up: _____

Count: _____

Check: _____

Answer: _____

2. Express 0.000000258 using scientific notation.

Set up: _____

Count: _____

Check: _____

Answer: _____

Name _____

Period _____

Date _____

CHAPTER | ATOMIC STRUCTURE AND THE PERIODIC TABLE

1 Math Practice

Using Scientific Notation

Answer each question. Remember to show all your work.

1. Write 0.00000000394 using scientific notation.

2. Write 4,580,000 using scientific notation.

3. Write 2.378×10^7 using normal decimal format.

4. Write 1.25×10^{-11} using normal decimal format.

5. Write 30,002,000,000 using scientific notation.

6. Write 0.0000004001 using scientific notation.

7. What is the sum of 3.45×10^{11} and 2.35×10^{11} ?

8. Write 12,293,442,101 using scientific notation. Round to the nearest million.

9. Round 1.546×10^7 to the nearest hundred thousand. Write your answer using scientific notation.

Use your knowledge of scientific notation to answer the questions below. Remember to show all your work.

10. Tom took four measurements and wrote them using scientific notation.

2.32×10^{13} , 1.11×10^{-7} , 9.04×10^5 , 4.45×10^8

Write these in order from least to greatest.

11. Last year, Company A made a profit of \$12.7 million. Write the amount Company A made using scientific notation.

12. There are 292,087,000 people living in the United States. Write this number to the nearest million using scientific notation.

