

Section 2.2 Scientific Notation and Dimensional Analysis

In your textbook, read about scientific notation.

1. Circle the figures that are written in scientific notation.

1.61×10^2

$1.61 \times 10 \times 10$

1.61×100

161 km

$1.62762 \times 10^{-27} \text{ kg}$

$9.10939 \times 10^{-31} \text{ kg}$

2.8×10^{-8}

$1,380,000$

2. Change the following data into scientific notation.

a. 5,000,000 km _____

c. 0.000421 g _____

b. 8,394,000,000 s _____

d. 0.03 cm _____

In your textbook, read about dimensional analysis.

Answer the following questions.

3. What is a conversion factor?

4. What is dimensional analysis?

Complete the following dimensional analysis problems.

5. Convert 50 kilograms into grams.

$50 \text{ _____} \times 1000 \text{ _____} / 1 \text{ _____} = 50,000 \text{ _____}$

6. Convert 5 meters into centimeters.

$5 \text{ _____} \times 100 \text{ _____} / 1 \text{ _____} = 500 \text{ _____}$

7. Convert 5 liters into kiloliters.

$5 \text{ _____} \times 1 \text{ _____} / 1000 \text{ _____} = 0.0005 \text{ _____}$

8. Convert 5 centimeters into meters.

$5 \text{ _____} \times 1 \text{ _____} / 100 \text{ _____} = 0.05 \text{ _____}$

9. Convert 55 kilometers per hour into meters per second. Use the conversion factor 1 km = 1000 m.

$55 \text{ _____} / \text{_____} \times 1000 \text{ _____} / 1 \text{ _____} \times 1 \text{ _____} / 60 \text{ _____}$

$\times 1 \text{ _____} / 60 \text{ _____} = 15 \text{ _____}$

Section 2.3 *continued*

In your textbook, read about significant figures.

Use each of the terms below just once to complete the statements.

counting numbers	estimated	non-zero	zeros
scientific notation	significant figures	placeholders	

7. The digits that are reported in an answer are called _____.
8. The numeral 9.66 has three significant figures, two known figures and one _____ figure.
9. _____ numbers are always significant.
10. All final _____ to the right of the decimal place are significant.
11. Zeros that act as _____ are not significant.
12. _____ have an infinite number of significant figures.
13. When you convert to _____, you remove the placeholder zeros.

In your textbook, read about rounding off numbers.

14. Round the following to four significant figures.
 - a. 12.555 km _____
 - b. 1.0009 _____
 - c. 99.999 _____
 - d. 23.342999 _____
15. Round 12.783 456 to the requested number of significant figures.
 - a. 2 significant figures _____
 - b. 5 significant figures _____
 - c. 6 significant figures _____
 - d. 7 significant figures _____
16. Round 120.752416 to the requested number of significant figures.
 - a. 3 significant figures _____
 - b. 4 significant figures _____
 - c. 5 significant figures _____
 - d. 7 significant figures _____
17. Complete the following calculations. Round off the answers to the correct number of significant figures.
 - a. $51.2 \text{ kg} + 64.44 \text{ kg}$ _____
 - b. $6.435 \text{ cm} - 2.18 \text{ cm}$ _____
 - c. $16 \text{ m} \times 2.82 \text{ m} \times 0.05 \text{ m}$ _____
 - d. $3.46 \text{ m}/1.82 \text{ s}$ _____