

ACTIVITY!

Inquire & Investigate



SCIENTIFIC METHOD

The scientific method is the method scientists use to ask questions and find answer. Keep a science journal to record your methods and observations during all the activities in this book. You can use a scientific method worksheet to keep your ideas and observations organized.

Question: What are we trying to find out? What problem are we trying to solve?

Research: What do other people think?

Hypothesis: What do we think the answer will be?

Equipment: What supplies are we using?

Method: What procedure are we following?

Results: What happened and why?

CONVERTING UNITS

Chemistry uses many types of measurements. Some of the most common include distance, mass, time, temperature, volume, density, pressure, amount, concentration, energy, velocity, molarity, viscosity, and electric charge. Each of these can be measured in different ways. For example, mass can be measured in pounds, ounces, grams, and kilograms. Because of these differences, chemists must know how to convert measured quantities into SI.

The factor-label method allows you to easily convert units from one type of unit to another. All you need is a conversion factor! A conversion factor is a number that lets you convert one set of units to another. For example, let's convert a dog's weight of 25 pounds to kilograms.

- To solve this problem, set up the following equation:

$$25 \text{ pounds} \times \text{—————} =$$

- Next, write the unit that you already know below the line:

$$25 \text{ pounds} \times \frac{\text{—————}}{\text{pounds}} =$$

- Then, write the unit that you are converting to above the line:

$$25 \text{ pounds} \times \frac{\text{kilograms}}{\text{pounds}} =$$

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- **Now this is where you need to know the conversion factor.** There are 2.21 pounds in 1 kilogram. Add this to the equation:

$$25 \text{ pounds} \times \frac{1 \text{ kilogram}}{2.21 \text{ pounds}} =$$

- **Solve the equation.** The pounds cancel each other out, leaving kilogram as the unit.

$$25 \cancel{\text{ pounds}} \times \frac{1 \text{ kilogram}}{2.21 \cancel{\text{ pounds}}} = 25 \times \frac{1}{2.21} = 11.3 \text{ kilograms}$$

- **Knowing how to convert unit measurements is a skill that chemists rely on every day.** Now it's your turn to practice your conversion skills! Use the factor-label method to solve the following problems. You can use this method to solve many different types of word problems. Remember, you may need to perform multi-step conversions to find the answers!

- Find the number of seconds in the month of October.
- Convert 170 pounds to kilograms. There are 2.21 pounds in one kilogram.
- The Empire State building is 1,454 feet tall. How tall is it in meters?
- How many cookies can you buy if you have \$23 and they cost \$3 per dozen?
- A painter is painting a fence that measures 400 meters long and 2 meters high. Paint costs \$17 per gallon. If a gallon of paint covers 50 square meters, how much paint will the painter need? How much will it cost to paint the fence?



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VOCAB LAB



Write down what you think each word means:

chemistry, matter, molecules, periodic table, mass, and atoms.

Compare your definitions with those of your friends or classmates. Did you all come up with the same meanings? Turn to the text and glossary if you need help.

CONVERSION FACTORS

You can find conversion factors here to help you convert any measurement into the metric system.



 metric conversion factors