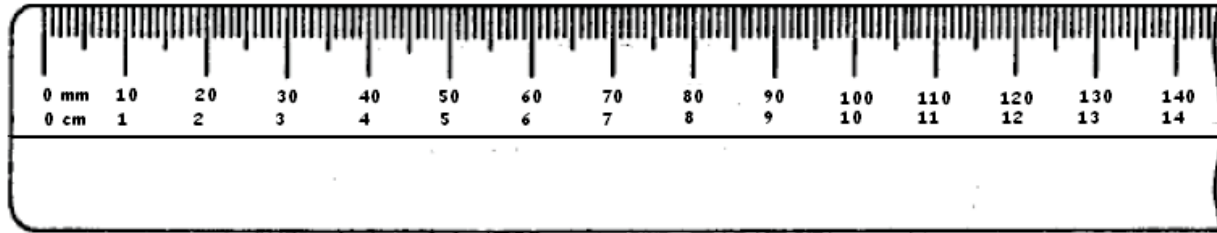


Metric System & Dimensional Analysis



Use the diagram above and your knowledge from previous science activities, to answer the questions below.

- 1 cm = _____ millimeters (mm)
- 1 m = _____ centimeters (cm)
- How many millimeters (mm) are in one meter (m)? Show all of your work.
- _____ m = 5 cm = _____ mm
- 1.5 m = _____ cm = _____ mm
- _____ m = _____ cm = 310 mm
- You measure the diameter of a quarter to be 18 mm. How many centimeters is this? Show all of your work.
- You measure the width of your notebook to be 32 cm. How many millimeters is this? How many meters? Show all of your work.

A solid knowledge of the metric system and its prefixes will help you to convert any measurement to other units following a few simple rules.

Conversion Rules:

1. Write down the given information and put it over 1.
2. Set up a conversion factor such that the information in the numerator and denominator equal each other.
3. Cancel the units.
4. Multiply the numerators.
5. Multiply the denominators.
6. Divide your final answer and include the new units.

Example:

A dog walks 457 meters away from home. If there are 1000 meters in a kilometer, how many kilometers away from home did the dog wander?

$$\left(\frac{457 \cancel{\text{meters}}}{1}\right) \left(\frac{1 \text{ kilometer}}{1000 \cancel{\text{meters}}}\right) = \left(\frac{457 \text{ kilometers}}{1000}\right) = 0.457 \text{ kilometers (km)}$$

Remember:

kilo = thousands
mega = millions
centi = hundredth
milli = thousandth
micro = millionth

Useful Conversions:

1 inch = 2.54 cm
1 kilogram = 2.2 lbs
1 liter = 0.26 gallons
1 meter = 3.3 feet
1 mile = 5280 feet

Complete the following problems. Show all work and include units.

1. A marathon is 26.2 miles. How many feet does a runner have to run in order to complete the race?
2. The world's heaviest cat was Himmy who lived in Cairns, Queensland weighing in at an amazing 21.3 kg. What is Himmy's weight in pounds?
3. The average mid-size American car has a gas tank that can hold 13 gallons of gas. In Mexico gas is sold by the liter. If you filled your car up in Mexico, how many liters of gas would you need to purchase in order for your tank to be full?
4. If you are in Canada and the speedometer of the car you are driving reads 100 km/hr and you happen to know that there are 1.6 kilometers in a mile, what is your speed in mi/hr?
5. The fastest moving insect is the large tropical cockroach. It scurries at speeds of up to 2.3 feet per second. How many miles can this cockroach travel in 1 hour?
6. A baby is 120 days old. How old is the baby in minutes? In seconds?
7. * You measure the distance from the C-building to the Library as 102 feet. How many centimeters is this? (*Hint: Do two separate conversion factors or use two at the same time.*)
8. * How many milliliters (mL) are in one megaliter (ML)?