

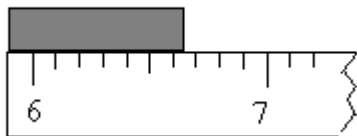
Chemistry Pre-Test

Some math functions are very important to chemists, and all scientists. This pretest will help gauge your readiness for the math that will need to be completed throughout the chemistry course. You may use a calculator as needed.

Solve the following density problems labeling your answers with the correct units.

$$\text{Density} = \text{mass} / \text{volume} \quad \text{or} \quad d = m / v$$

1. What is the density of a copper block if it has a mass of 43.5 grams and a volume of 4.85 cm³?
2. What's the volume of a sheet of aluminum if it has a mass of 10.2 grams? (density of aluminum = 2.699 grams/mL)
3. How would you record the following length, ignoring units?



4. Convert the following numbers into the indicated units.
 - a. 15 meters = _____ mm
 - b. 1.7 cm = _____ m
 - c. 1,000,000 mg = _____ kg
 - d. 45 m² = _____ cm²
5. We measure masses in (liters, seconds, meters, centimeters, grams, pascals). Circle one!
6. Reduce the following fraction: $\frac{\text{apple} \times \text{orange}^3 \times \text{banana}}{\text{apple}^2 \times \text{lemon} \times \text{orange}}$

7. Given: 75.0 g Sn
 Molar mass of Sn = 118.69 g/mol
 1 mol Sn = 2 mol HF (mole ratio)

Unknown: mol HF

Use the molar mass of Sn to convert the grams of Sn to moles. Then use the mole ratio to convert from mol Sn to mol HF. This will be done in a single two-step calculation. Use the following “template” to assist you:

When we plug it all in it looks like this. Solve.

$$75.0 \text{ g Sn} \times \frac{1 \text{ mol Sn}}{118.69 \text{ g Sn}} \times \frac{2 \text{ mol HF}}{1 \text{ mol Sn}} =$$

8. A liter of chloroform has a mass of 1490 grams. Convert this mass to kilograms.

Unit Conversions	
1 kg	1000 g

9. If a space shuttle can travel at 17,000 miles per hour, how many meters per second does it travel?

Unit Conversions	
1 mile	1.609 km
1 minute	60 sec
1 hour	60 minutes
1 km	1000 m

10. Express the following numbers in proper scientific notation. Don't forget a unit in your answer!

465 hg =

50,100.0 mL =

0.000002 nm =

336,000,000,000 ug =

789.95 dL =

0.066510 dam =

11. Express each of the following in standard notation. Don't forget a unit in your answer!

$$2.44 \times 10^2 \text{ m} =$$

$$3.7 \times 10^4 \text{ cL} =$$

$$3.21 \times 10^{-4} \text{ dag} =$$

$$1.7 \times 10^{12} \text{ uL} =$$

$$1.99 \times 10^{-3} \text{ hm} =$$

$$7.68 \times 10^{-8} \text{ kg} =$$

12. Perform each of the following operations using scientific notation.

$$(2.3 \times 10^3 \text{ g}) \times (4.0 \times 10^5 \text{ g}) =$$

$$\frac{7.41 \times 10^6 \text{ cm}^2}{5.63 \times 10^4 \text{ cm}}$$

$$\frac{8.44 \times 10^{-2} \text{ dg}^3}{4.1 \times 10^{-4} \text{ dg}}$$