What you should have learned in the MEASUREMENT section of regents chemistry…

Temperature scales: Centigrade (AKA Celsius), Kelvin, and Fahrenheit. Centigrade is metric but 0°C is normal cold for us, and a zero in a formula wrecks the math, so we avoid it in formulas. Kelvin always works, but it has "weird" temperatures of 273 K and 373 K for water's phase changes. Never say the "F" word in chem.

To covert from C to K, or K to C, use K = C + 273 formula. That's on the reference table T.
Density is a constant, which can be used to discern unknowns in lab, or at least to say this substance can't be the unknown, the density is too far off.

Density has units of grams/centimeter cubed (g/cm^3), or grams/milliliter (g/mL). mL^3 is ALWAYS WRONG.

You should be able to solve for DENSITY, or MASS, or VOLUME. It helps a lot to start with a formula like this:

$$\frac{\text{Density}}{1} = \frac{\text{Mass}}{\text{volume}}$$

Significant figures are always important, and you must learn the rules and remember them. The rules are measurement PACK.

Scientific notation changes really big measurements into more manageable notation.
It does the same for super small measurements too.
To multiply: multiply the coefficients, add the exponents.
To divide: divide the coefficient, subtract the exponents.
To add: first adjust the exponents to the same value, then add the coefficients.
To subtract: first adjust the exponents to the same value, then subtract the coefficients.
In our class, the "RULE" is make sure the coefficient is at least 1, but less than 10. If your answer is outside of this range, you must adjust both the coefficient by moving the decimal, and adjusting the exponent (up or down) depending on how you adjusted the coefficient. One goes up, the other down, always.

We try to measure perfectly, but there are limits to how well we can measure. Our tools can "only go so far" and we can't fool ourselves that they might be better than they are. If your tool measures to the nearest whole number of units (degrees centigrade, or milliliters) you must estimate to the nearest tenth of a unit. Not more, and not less.

Our mistake is called our "error" but we choose to measure how far off we are with the PERCENT ERROR formula (on Table T). That gives us a proportional boo-boo, that must be positive or negative. No sign is wrong. A positive % Error indicates we measured more than the actual value. A negative % Error means your measured value is less than the accepted value. The formula is in the reference table. Significant figures count here too. Actual values have unlimited SF and will not impact our percent error answers, but your measured values will.

BASIC UNITS	FACTOR	MEANS	MASS	LENGTH	VOLUME
KILO-	10^3	1000 x bigger than basic unit	1 kilogram = 1000 grams	1 Km = 1000 meters	
CENTI-	10^{-2}	one hundredth of basic unit	1 gram = 100 centigrams	1 m = 100 cm	100 cL = 1 L
MILLI-	10^{-3}	one thousandth of basic unit	1 g = 1000 milligrams	1 m = 1000 mm	1000 mL = 1 L
MICRO	10^{-6}	one millionth of basic unit	1 g = 1,000,000 micrograms	1 m = 1,000,000 micrometers	
NANO-	10^{-9}	one billionth of basic unit	1 g = 1,000,000,000,000 nanograms	1 m = 1,000,000,000,000 nm	

There are many basic units in Table D. You can modify them with the metric prefixes in Table C. The only prefix that is bigger than a basic unit is the kilo– prefix.

A kilo is a 10^3 or a thousand times the size of a base unit. All the other prefixes are negative exponents, or decimals of the basic units.

Dimensional Analysis is really unit conversion math, when you start with a measurement and then convert the units over and over until you get the units you want. All conversion factors must equal one, and the way that happens is that you use equalities, like 1000 mL = 1 liter.

Because they are equal to each other, in a fraction they equal one (with units). Without units this won't work.

$$\frac{1000\text{ mL}}{1\text{ liter}} = 1 = \frac{1\text{ liter}}{1000\text{ mL}}$$

Logically if the numerator equals the denominator, the fraction = 1. Any equality makes two different conversion factors, you just need to pick the one you need to cancel the units you want to change.

1	Quantitative measures	Must have numbers and units, like 1.0 g/mL or 214 pounds
2	Qualitative measures	Use only words, like, the solution is clear, or the metal is warm
3	Accurate measures	Are measurements that are close to the actual values, close to correct
4	Precise measures	Are multiple measurements that are close together, which might be accurate or not.
5	Coefficient	Front part of a scientific notation expression, which must be at least 1, but less than 10
6	Exponent	The back part of scientific notation. 2.45×10^4 grams the coefficient is 2.45 the exponent is 10^4 the unit is grams
7	Kelvin	The absolute temperature scale. Zero Kelvin is literally absolute zero. Water's phase changes occur at 273 Kelvin and 373 Kelvin.
8	Absolute zero	0 Kelvin is not possible to reach, it's a theoretical temperature.
9	Centigrade	AKA Celsius, temperature scale with water's phase changes at 0°C and 100°C.
10	Fahrenheit	An odd scale that has water's phase changes at 32°F and 212°F. Avoid this; we will NOT do conversions from the F scale in our class.
11	Density	A relationship of mass divided by volume. It is constant for all substances.
12	Graphing	When the title of the graph is Mass as a function of Volume, mass is on the the Y axis (up and down), volume is the X axis (left to right).