

Safety First

I can...

- Follow safe laboratory practices
- Identify lab equipment

What Can We Measure About Chemicals?

How Do We Communicate About Chemicals?

I can...

- Find the mass of any atom (in grams) on a periodic table.
- Determine the molar mass/gram formula mass for compounds and molecules.
- Give examples of atoms, molecules, elements, and compounds.
- State the # and kind of atoms in formulas using parentheses [ex., Ca(NO₃)₂ ≈ CaN₂O₆]
- List the seven diatomic elements.

How Are Measurements Different from Regular Numbers?

I can...

- Recognize the difference between accuracy (how close measurements are to a “true” value) and precision (how close measurements are to each other).
- Measure length, mass, and volume with the correct precision.
- Round off long numbers to a specified decimal place.
- Write very large or very small numbers in scientific notation.
- Analyze class data to indicate precision significant figures.
- Define significant figures as all those of which you are certain plus one more that involves judgment of the observer.

How Can I Show That My Calculations Are Correct?

I can...

- Write equalities as conversions factors. [ex.,]
$$\frac{1 \text{ mile}}{5280 \text{ feet}}$$
- Use “dimensional analysis” (train tracks) to set up problems that convert one unit to another.
- Calculate answers from a dimensional analysis set up.
- List the six metric prefixes (nano-, micro-, centi-, milli-, and kilo-) as conversion factors for Liters (volume), meters (length), and grams (mass).
- Enter numbers written in scientific notation into a scientific calculator.

What is Matter?

I can...

- Define matter
- Classify a substance as a solid, liquid, and gas
- Identify a phase change and classify as endothermic or exothermic
- Identify properties of matter as physical or chemical
- Distinguish between physical and chemical changes
- Determine whether a property is extensive or intensive
- Distinguish between a homogenous and heterogeneous mixture
- Distinguish between elements and compounds
- Distinguish between elements as monoatomic and diatomic
- Distinguish between a pure substance and a mixture

Why Is Density A Useful Property of Matter?

I can...

- Define density.
- Calculate density from measurement data.
- Show calculations with enough detail so errors can be recognized.
- Make a simple data table with labels, units, and straight lines.
- Explain that since density does not depend on the size of the sample, it is more useful for identifying substances than mass or volume.

How Do We Symbolize A Chemical Reaction?

I can...

- define and give examples of “reactants,” “products,” and “coefficients”
- explain that chemical equations are balanced because the number and kind of atoms do not change during a chemical reaction, they are merely rearranged. Mass is conserved.
- classify a reaction as synthesis/addition, decomposition, single replacement, double replacement, or combustion.

What Is Stoichiometry?

I can...

- use the coefficients in a balanced reaction as a conversion factor for calculations.
- calculate the mass or number of particles of any substance in a chemical reaction given the mass or number of particles of any other substance in the chemical reaction.