

UNIT 2 Objective List

Atomic Structure

- Students will be able to describe, in writing, the law of conservation of mass.
- Students will be able to rewrite the five statements in Dalton's Atomic Theory.
- Students will be able to mark (with an asterisk) which statements are no longer true for Dalton's Atomic Theory.
- Students will be able to explain, in writing, the significance of the discovery of the electron by J.J. Thompson using the Cathode Ray Tube.
- Students will be able to explain, in writing, the significance of the discovery of the nucleus by Ernest Rutherford using the Gold Foil Experiment.
- Given a picture of an atom, student will be able to label the electrons, protons, neutrons, and nucleus.
- Students will be able to list the charge of the three main subatomic particles of the atom.
- Given an elements isotope, students will be able to determine (write) the number of neutrons, protons and electrons in an atom.
- Given a elements isotope, students will be able to label the atomic number, mass number and symbol for an atom.
- Students will be able to describe (written) the size of an nucleus compared to the atom.
- Given a partially filled in chart (With the following headings: Element Name, Protons, Neutrons, Electrons, Atomic Number, and Mass Number) and a Periodic Table of Elements, the students will be able to fill in the remaining unfilled slots with 100% accuracy.
- Given a Periodic Table of Elements, the students will be able to identify (label) the Alkali metals, Alkaline Earth metals, Transition Metals, Inner Transition Metals, Halogens, and Noble Gases.
- Given the symbol or element, the students will be able to write the number of protons and electrons for the atom.
- Students will be able to compare and contrast (verbally and written) the atomic number, mass number, and atomic mass.

Nuclear Chemsitry

- Students will be able to define nuclide and nucleon.
- Students will be able to explain (written) how nuclear forces hold the neutron and protons together in the nucleus.

- Given the graph called, “The Band of Stability”, students will be able to interpret the relationship between the neutron to proton ratio in the nucleus.
- Students will be able to define nuclear reaction.
- Students will be able to define transmutation.
- Given an incomplete transmutation nuclear reaction, students will be able to determine the missing product or reactant in the transmutation nuclear reaction.
- Students will be able to define nuclear radiation and radioactive decay.
- Students will be able to recall the nuclide formula (verbally and written) for the three types of radioactive particles (alpha, beta, gamma).
- Students will be able to define half-life.
- Given the half-life and beginning mass of a radioactive substance, the students will be able to calculate the remaining amount of the radioactive material.
- Given the time and the change in mass of the radioactive material, the student will be able to calculate the half-life of the radioactive substance.
- Given the initial mass, the final mass, and the half-life, the student will be able to calculate the amount of time for radioactive decay to the final mass.
- Given a transmutation reaction, the student will be able write a balanced nuclear equation written in nuclide form.
- Students will be able to list the materials that can block the three most common radioactive particles (alpha, beta, and gamma) can penetrate.