LEARNING OBJECTIVES

Big Idea: Changes in matter involve the rearrangement and/or reorganization of atoms and/or the transfer of electrons.

Objectives:

The student will be able to...

☐ translate among macroscopic observations of change, chemical equations, and particle views.

☐ translate an observed chemical change into a balanced chemical equation and justify the choice of equation type (molecular, ionic, or net ionic) in terms of utility for the given circumstances.

☐ use stoichiometric calculations to predict the results of performing reaction in the laboratory and/or to analyze deviations from the expected results.

☐ relate quantities (measured mass of substances, volume of solutions, or volumes and pressures of gases) to identify stoichiometric relationships for a reaction, including situations involving limiting reactants and situations in which the reaction has gone to completion.

☐ design a plan in order to collect data on the synthesis or decomposition of a compound to confirm the conservation of matter and the law of definite proportions.

☐ use data from synthesis or decomposition of a compound to confirm the conservation of matter and the law of definite proportions.

☐ *identify compounds as Brønsted-Lowry acids, bases, and/or conjugate acid-base pairs, using proton-transfer reactions to justify the identification.

☐ identify redox reactions and justify the identification in terms of electron transfer.

☐ design and/or interpret the results of an experiment involving a redox titration.

☐ evaluate the classification of a process as a physical change, chemical change, or ambiguous change based on both macroscopic observations and the distinction between rearrangement of covalent interactions and noncovalent interactions.

☐ interpret observations regarding macroscopic energy changes associated with a reaction process to generate a relevant symbolic and/or graphical representation of the energy changes.

☐ make qualitative or quantitative predictions about galvanic or electrolytic reactions based on half-cell reactions and potentials and/or Faraday’s laws.

☐ analyze data regarding galvanic or electrolytic cells to identify properties of the underlying redox reactions.

*These learning objectives overlap with learning objectives in Big Idea 6, and will be evaluated in both units.