Chemistry

Unit: What Is Chemistry?

MA Curriculum Frameworks (2016): N/A

Mastery Objective(s): (Students will be able to…)

- Explain what chemistry is and what is studied in different branches of chemistry.

Success Criteria:

- Explanation describes what is studied in each of the branches of study described in this section.

Tier 2 Vocabulary: matter

Language Objectives:

- Understand and correctly use terms relating to each branch of chemistry.

Notes:

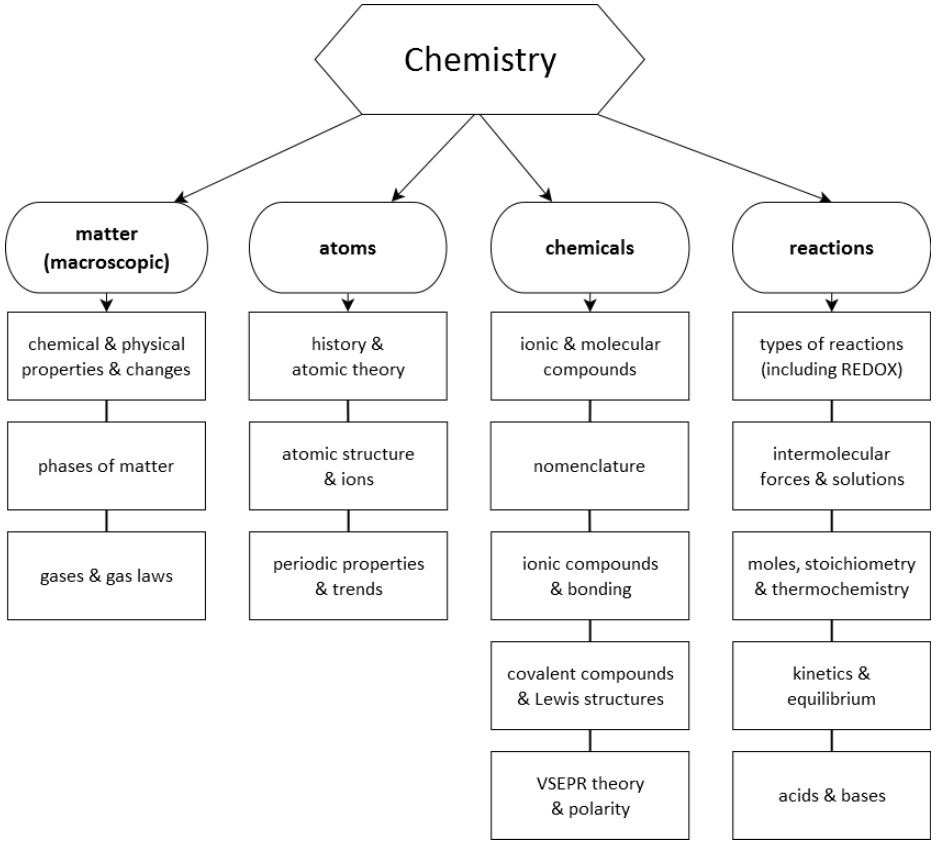
matter: the "stuff" that everything is made of. Matter is anything that has mass and takes up space (has volume).

chemistry: the study of matter, its properties, how it behaves, how it's put together, and how it can be changed or rearranged .

chemical: a specific substance (regardless of size or shape) that has a specific arrangement of the atoms that it's made of, and has specific properties because of that arrangement.

Use this space for summary and/or additional notes:

The major units we will study this year include:



- **macroscopic properties of matter**
  - solids & liquids
  - gases
  - when a change is or is not caused by a chemical reaction
- **atoms**
  - what they're made of (protons, neutrons & electrons)
  - what properties they have (periodic table and periodic properties)
- **chemicals**
  - how atoms combine
  - how the names tell us what's they're made of
  - the shapes of the molecules or crystals (bonding and molecular geometry)
  - how the shapes affect the properties they have
  - dissolving in water (solutions) and forces between molecules

Use this space for summary and/or additional notes:

- **chemical reactions**
  - different ways atoms can rearrange (chemical reactions & equations)
  - calculating how much of the reactants you use and products you make (stoichiometry)
  - heat produced (or consumed) by chemical reactions
  - how fast chemicals react (kinetics)
  - how much chemicals react (equilibrium)
  - acids & bases

Branches of Chemistry

The study of chemistry is divided into different branches, including:

organic chemistry: the study of chemicals and reactions involving molecules that contain carbon and hydrogen.

inorganic chemistry: the study of chemicals and reactions involving molecules that do not contain both carbon and hydrogen.

biochemistry: the study of chemicals that play important roles in biological processes, such as amino acids, lipids, and sugars.

physical chemistry: the study of energy changes in chemistry. Some sub-fields include thermodynamics (the study of heat energy), statistical mechanics (the study of molecular collisions and momentum), and quantum mechanics (the study of discrete energy changes at the sub-atomic level).

analytical chemistry: quantitative aspects of chemistry, such as determining what a chemical is made of, how much of it reacts under certain conditions, *etc.*

green chemistry: the study of making decisions about how chemicals are made or used in order to reduce the impact on the environment.

Use this space for summary and/or additional notes: