



G-E-T High School Curriculum
Align, Explore, Empower
2019-2020 Scope and Sequence
Chemistry

Unit 1 - Measurement

(Length of Unit - 2 weeks)

- Know the metric system and its values from Kilo- to milli-
- Convert between the English and Metric systems
- Use algebra to manipulate equations such as $D=M/V$ and $q=Mc\Delta T$ and create and understand a line graph with a slope.

In this unit, students will ...

Use the metric system and algebra to manipulate the basic chemistry of matter and heat to determine a variety of variables and unknowns.

Standards for Chemistry Unit 1-Measurement

HS-PS1-1 : Use the periodic table as a model to predict the relative properties of elements based on the patterns of electrons in the outermost energy level of atoms.

Unit 2 - Periodic Table

(Length of Unit - 3 weeks)

- Describe how science has changed chemistry from the time of Mendeleev and how the periodic table has changed over time.
- Be able to use the periodic table to analyze the trends in the table including size, ionization energy and reactivity

In this unit, students will ...

Understand that all matter in the universe has a common origin of atoms, which have structure and can be systematically arranged on the periodic table.

Standards for Chemistry Unit 2-Periodic Table

HS-PS1-1 : Use the periodic table as a model to predict the relative properties of elements based on the patterns of electrons in the outermost energy level of atoms.

Unit 3 - Atomic Theory

(Length of Unit - 3 weeks)

- Know how light is produced by an atom
- Be able to state the electron configuration for elements through barium.
- Know what subatomic particles are found in each element and where they are found.

In this unit, students will ...

Understand the relationship between energy changes in the atom specific to the movement of electrons.

Standards for Chemistry Unit 3-Atomic Theory

HS-PS1-1 : Use the periodic table as a model to predict the relative properties of elements based on the patterns of electrons in the outermost energy level of atoms.

HS-PS1-3 : Plan and conduct an investigation to gather evidence to compare the structure of substances at the bulk scale to infer the strength of electrical forces between particles.

HS-PS1-8 : Develop models to illustrate the changes in the composition of the nucleus of the atom and the energy released during the processes of fission, fusion, and radioactive decay.

HS-PS4-1 : Use mathematical representations to support a claim regarding relationships among the frequency, wavelength, and speed of waves traveling in various media.

HS-PS4-3 : Evaluate the claims, evidence, and reasoning behind the idea that electromagnetic radiation can be described either by a wave model or a particle model, and that for some situations one model is more useful than the other.

Unit 4 - Bonding and Naming

(Length of Unit - 4 weeks)

- Understand the difference between ionic and covalent bonds.
- Find which type(s) of bonds in a compounds
- Given the formula or the name, be able to find the other.
- Draw and build chemical models and find molecular interactions. Including hydrogen and metallic bonding and dipole-dipole interactions.

In this unit, students will ...

Understand chemical bonding and the relationship of the type of bonding to the chemical and physical properties of substances.

Standards for Chemistry Unit 4-Bonding and Naming

HS-PS1-2 : Construct and revise an explanation for the outcome of a simple chemical reaction based on the outermost electron states of atoms, trends in the periodic table, and knowledge of the patterns of chemical properties.

HS-PS3-5 : Develop and use a model of two objects interacting through electric or magnetic fields to illustrate the forces between objects and the changes in energy of the objects due to the interaction.

Unit 5 - Reactions

(Length of Unit - 3 weeks)

- Write a balanced reaction and identify the ratio between each of the reactants and products.
- Predict the products given the reactants of the 5 types of reactions.

In this unit, students will ...

Write a balanced chemical equation for the 5 basic types of chemical reactions.

Standards for Chemistry Unit 5-Reactions

HS-PS1-2 : Construct and revise an explanation for the outcome of a simple chemical reaction based on the outermost electron states of atoms, trends in the periodic table, and knowledge of the patterns of chemical properties.

HS-PS1-7 : Use mathematical representations to support the claim that atoms, and therefore mass, are conserved during a chemical reaction.

Unit 6 - Stoichiometry

(Length of Unit - 3 weeks)

- Find the limiting reactant of any 2 part chemical reaction.
- Predict the theoretical amount, mass or moles, for every product and reactant in a chemical reaction.
- Use the % yield to relate actual and theoretical amounts in a chemical reaction.

In this unit, students will ...

Understand that in chemical reactions matter and energy change forms, but the amounts of matter and energy do not change.

Standards for Chemistry Unit 6-Stoichiometry

HS-PS1-4 : Develop a model to illustrate that the release or absorption of energy from a chemical reaction system depends upon the changes in total bond energy.

HS-PS1-5 : Apply scientific principles and evidence to provide an explanation about the effects of changing the temperature or concentration of the reacting particles on the rate at which a reaction occurs.

HS-PS1-7 : Use mathematical representations to support the claim that atoms, and therefore mass, are conserved during a chemical reaction.

Unit 0 - (Science Skills)

(Length of Unit - Entire Course)

- Plan a scientifically sound investigation
- Collect and analyze data using technology
- Practice lab safety
- Measure accurately
- Use all equipment appropriately

In this unit, students will ...

Demonstrate appropriate laboratory skills by using materials and equipment effectively to design and conduct a scientifically valid experiment.

Standards for Lab and Science Skills

Most NGSS Standards

*****Instructor reserves the right to change the order of the units depending on the time of year the course is taken, and change the length of the unit depending on the needs of students.*****