

Curriculum Map: Honors Chemistry

Course: HONORS CHEMISTRY Sub-topic: Chemistry

Grade(s): 11

Course

Description: Chemistry is the study of matter and how it interacts with its environment. We will be learning about the different properties/compositions of matter and the interactions it undergoes. A variety of laboratory experiments will be performed to further the understanding of the concepts discussed during classroom instruction. The topics to be covered include: physical/chemical changes, atomic structure/theory, the periodic table, chemical reactions/equations, stoichiometry, chemical bonds, and more!

Unit: Unit 0 - Lab Safety

Timeline: Week 36

Topic: Handling Accidents

Topic: Safety Equipment Operation

Topic: Clean-Up Protocol

Topic: Lab Rules

Unit: Unit 1 - Matter and Measurement

Timeline: Week 37

STANDARDS: STANDARDS

STATE: Pennsylvania State Anchors (2010)

S3.C.1 (Advanced)	Structure, Properties, and Interaction of Matter and Energy	
S3.C.1.1 (Advanced)	Describe the observable physical properties of matter.	
S3.C.1.1.1 (Advanced)	Describe matter in terms of its observable properties (e.g., weight, mass, shape, size, color, texture, state).	
S3.C.1.1.2 (Advanced)	Classify matter using observable physical properties (e.g., weight, mass, shape, size, color, texture, state).	
S3.C.1.1.3 (Advanced)	Classify a substance as a solid, liquid, or gas.	
S3.C.1.1.4 (Advanced)	Recognize and identify how water goes through phase changes (i.e., evaporation, condensation, freezing, and melting).	
S3.C.1.1.5 (Advanced)	Describe how the properties of matter can be changed (e.g., heating, cooling, physical weathering).	
S4.C.1 (Advanced)	Structure, Properties, and Interaction of Matter and Energy	
S4.C.1.1 (Advanced)	Describe observable physical properties of matter.	
S4.C.1.1.1 (Advanced)	Use physical properties [e.g., mass, shape, size, volume, color, texture, magnetism, state (i.e., solid, liquid, and gas), conductivity (i.e., electrical and heat)] to describe matter.	
S5.C.1.1 (Advanced)	Describe the observable physical properties of matter.	
S5.C.1.1.1 (Advanced)	Identify characteristic properties of matter that are independent of mass and volume.	
S5.C.1.1.2 (Advanced)	Differentiate between volume and mass.	
S5.C.1.2 (Advanced)	Describe that matter can undergo chemical and physical changes.	
S5.C.1.2.1 (Advanced)	Describe how water changes from one state to another.	
S5.C.1.2.2 (Advanced)	Identify differences between chemical and physical changes of matter.	
S5.C.3.1.1 (Advanced)	Differentiate between the mass and weight of an object.	
S6.C.1.1 (Advanced)	Explain that matter has observable physical properties.	
S6.C.1.1.1 (Advanced)	Describe how characteristic physical properties of matter can be used to distinguish one substance from another (e.g., boiling point, freezing/melting points).	
S6.C.1.1.2 (Advanced)	Explain that materials are characterized by having a specific amount of mass in each unit of volume (density).	
S6.C.1.2 (Advanced)	Describe that matter can undergo chemical and physical changes.	

Topic: What is Chemistry?

Topic: The Scientific Method

Topic: Matter Classification

Topic: States of Matter and State Changes

Topic: Chemical and Physical Changes

Topic: Intensive and Extensive Properties

Topic: Separation Techniques

Topic: Density

Topic: SI Units

Topic: Accuracy and Precision

Topic: Percent Error

Topic: Significant Figures

Topic: Dimensional Analysis

Unit: Unit 2 - Atomic Structure

Timeline: Week 39

STANDARDS: STANDARDS

STATE: [Pennsylvania State Anchors \(2010\)](#)

[S7.C.1.1.2](#)
(Advanced)

Recognize that the atom is the basic building block for all matter.

[S11.C.1.1.1](#)
(Advanced)

Explain that matter is made of particles called atoms and that atoms are composed of even smaller particles (e.g., protons, neutrons, electrons).

Topic: Atomic Theory

Topic: Isotopes and Relative Abundance

Topic: Chemical Formulas

Topic: Nomenclature (Ionic, Acid, and Molecular Compounds)

Unit: Unit 3 - Periodic Properties of Elements

Timeline: Week 41

STANDARDS: STANDARDS

STATE: [Pennsylvania State Anchors \(2010\)](#)

[S11.C.1.1.4](#)
(Advanced)

Explain how the relationships of chemical properties of elements are represented in the repeating patterns within the periodic table.

Topic: The Periodic Table

Topic: Periodic Trends

Topic: Reactivity

Topic: Coulombic Attraction

Unit: Unit 4 - Chemical Reactions

Timeline: Week 43

STANDARDS: STANDARDSSTATE: Pennsylvania State Anchors (2010)

S7.C.1.2.1 (Advanced)	Identify the reactants and products of simple chemical reactions (e.g., photosynthesis, cellular respiration).	
S8.C.1.1.3 (Advanced)	Identify and describe reactants and products of simple chemical reactions.	
S11.C.1.1.6 (Advanced)	Describe factors that influence the frequency of collisions during chemical reactions that might affect the reaction rates (e.g., surface area, concentration, catalyst, temperature).	
S11.C.2.1.2 (Advanced)	Describe energy changes in chemical reactions.	

Topic: Chemical Equations**Topic: Types of Reactions****Topic: Formula Weight and Molar Mass****Topic: Percent Composition****Topic: The Mole Concept****Topic: Empirical Formula Calculations****Topic: Stoichiometry****Topic: Limiting Reactants and Percent Yield****Unit: Unit 5 - Aqueous Solutions**

Timeline: Week 45

Topic: Properties of Solutions**Topic: Dissolving Process****Topic: Solubility****Topic: Conductivity****Topic: Net Ionic Equations****Topic: Intro to Acids and Bases****Topic: Molarity****Topic: Dilution****Topic: Absorbance****Topic: Solution Stoichiometry****Unit: Unit 6 - Electronic Behavior**

Timeline: Week 47

STANDARDS: STANDARDSSTATE: Pennsylvania State Anchors (2010)

S11.C.2.1.1 (Advanced)	Compare or analyze waves in the electromagnetic spectrum (e.g., ultraviolet, infrared, visible light, Xrays, microwaves) as well as their properties, energy levels, and motion.	
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Topic: Atomic Emission Spectra**Topic: Bohr/Schrodinger Model****Topic: Electron Configurations****Topic: Quantum Numbers**

Topic: Photoelectron Spectroscopy

Unit: Unit 7 - Chemical Bonding

Timeline: Week 50

STANDARDS: STANDARDS

STATE: Pennsylvania State Anchors (2010)

[S11.C.1.1.3](#)

(Advanced)

Explain the formation of compounds (ionic and covalent) and their resulting properties using bonding theories.

Topic: Types of Bonds

Topic: Bond Energy

Topic: Resonance Structures

Topic: Lewis Structures

Topic: Bonding Theories

Topic: Formal Charge

Topic: Polarity

Topic: Chromatography

Topic: Hybridization

Unit: Unit 8 - Gases

Timeline: Week 1

STANDARDS: STANDARDS

STATE: Pennsylvania State Anchors (2010)

[S11.C.1.1.5](#)

(Advanced)

Predict the behavior of gases through the application of laws (e.g., Boyle's law, Charles' law, or ideal gas law).

Topic: Kinetic Molecular Theory

Topic: Pressure Conversions

Topic: Standard Temperature and Pressure

Topic: Dalton's Law of Partial Pressures

Topic: The Ideal Gas Law

Topic: Ideal vs. Real Gases

Topic: Avogadro's Law

Topic: Gas Stoichiometry

Topic: Boyle's Law

Topic: Charles' Law

Topic: Gas Density

Topic: Gay-Lussac's Law