Unit I: Chemistry

Content Area: **Science**
Course(s):
Time Period:
Length: **20 weeks**
Status: **Published**

State Mandated Topics Addressed in this Unit

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N/A	N/A

Unit Summary

As matter changes from one state to another, the distances and the forces between the particles change, and the amount of thermal energy in the matter changes. An atom is the smallest unit of an element and is made mostly of empty space. It contains a tiny nucleus surrounded by an electron cloud. Elements can join together by sharing, transferring, or pooling electrons to make chemical compounds. Atoms are neither created nor destroyed in chemical reactions. Energy can be released when chemical bonds form or absorbed when chemical bonds are broken.

Enduring Understanding

As matter changes from one state to another, the distances and the forces between the particles change, and the amount of thermal energy in the matter changes. An atom is the smallest unit of an element and is made mostly of empty space. It contains a tiny nucleus surrounded by an electron cloud. Elements can join together by sharing, transferring, or pooling electrons to make chemical compounds. Atoms are neither created nor destroyed in chemical reactions. Energy can be released when chemical bonds form or absorbed when chemical bonds are broken.

Learning Objectives

- How can bonding determine the properties of a substance?
- How is matter conserved in a chemical reaction?
- How is matter described?
- How is the periodic table organized?
- What determines the properties of a solution?
- Why does a substance change states?

Essential Skills

- Describe how atomic theory developed.
- Describe how energy changes when matter changes.
- Describe how metals are classified in the periodic table.
- Describe the modern model of the atom.
- Describe the motion of particles in a gas.
- Describe the motion of particles in a liquid.
- Describe the motion of particles in a solid.
- Describe the properties of a mixture.
- Describe the properties of acids.
- Describe the properties of bases.
- Describe the units used to measure mass and volume.
- Describe what happens in a neutralization reaction.
- Describe what makes up matter.
- Explain how changes in matter can be described.
- Explain how mass is conserved during a chemical reaction.
- Explain how Mendeleev discovered the pattern that led to the periodic table.
- Explain how pressure and temperature of a gas are related.
- Explain how pressure and volume of a gas are related.
- Explain how the periodic table is useful.
- Explain how to determine the density of a material.
- Explain how volume and temperature of a gas are related.
- Explain what a chemical change is.
- Explain what a physical change is.
- Explain what determines an element's chemistry.
- Explain what happens to a substance during changes between liquid and gas.
- Explain what happens to a substance during changes between solid and gas.
- Explain what happens to a substance during changes between solid and liquid.
- Identify the data about elements found in the periodic table.
- Identify the information included in a chemical equation.
- Identify the properties used to describe matter.
- Identify the types of ions acids and bases formed in water.
- Identify three categories of chemical reactions.
- Identify ways to tell that a chemical reaction has occurred.
- Summarize the properties of metals.

Standards

SCI.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.
SCI.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.
SCI.HS-PS1-7	Use mathematical representations to support the claim that atoms, and therefore mass, are conserved during a chemical reaction.
SCI.HS-PS2-6	Communicate scientific and technical information about why the molecular-level structure is important in the functioning of designed materials.
SCI.HS-PS3-3	Design, build, and refine a device that works within given constraints to convert one form of energy into another form of energy.

Instructional Tasks/Activities

- Daily “Do Now” questions as well as Exit questions
- Foldables – organization of material (scientific method & features of living things)
- Inquiry based activity based on the structure of the atom.
- PowerPoint presentation of material Group discussion
- Quizzes
- Tests
- Think, pair, share (read assigned section of text individually, discuss with a partner, present material in pairs to class – use PowerPoint as a reference)
- Worksheets

Assessment Procedure

- Introduction to Matter
    - Describing Matter
    - Classifying Matter
    - Measuring Matter
    - Changes in Matter
- Solids, Liquids Gasses
    - States of Matter
    - Changes of state
    - Gas behavior
- Elements and the Periodic Table
    - Introduction to Atoms

        - Organizing the Elements
        - Metals
        - Nonmetals and Metalloids
    - Atoms and Bonding
        - Atoms, bonding, and the periodic table
        - Ionic Bonds
        - Covalent Bonds
    - Chemical Reactions
        - Observing Chemical Change
        - Describing Chemical Reactions
        - Controlling Chemical Reactions
    - Acids, Bases, and Solutions
        - Understanding Solutions
        - Concentration and Solubility
        - Describing Acids and Bases

- Acids, Bases, and Solutions
- Atoms and Bonding
- Atoms, bonding, and the periodic table
- Changes in Matter
- Changes of state
- Chemical Reactions
- Classifying Matter
- Classroom Total Participation Technique
- Classwork
- Concentration and Solubility
- Controlling Chemical Reactions
- Covalent Bonds
- DBQ
- Describing Acids and Bases
- Describing Chemical Reactions
- Describing Matter
- Elements and the Periodic Table

- Essay
- Exit Ticket/Entrance Ticket/Do Now
- Gas behavior
- Introduction to Atoms
- Introduction to Matter
- Ionic Bonds
- Journal / Student Reflection
- Kahoot
- Measuring Matter
- Metals
- Nonmetals and Metalloids
- Observing Chemical Change
- Organizing the Elements
- Other named in lesson
- Peer Review
- Performance
- Problem Correction
- Project
- Quiz
- Rubric
- Solids, Liquids Gasses
- States of Matter
- Teacher Collected Data
- Test
- Understanding Solutions
- Worksheet

Recommended Technology Activities

- Appropriate Content Specific Online Resource
- Appropriate Content Specific Online Resource
- Copy/Paste Content Specific Link Here
- Copy/Paste Content Specific Link Here
- Copy/Paste Content Specific Link Here
- Gimkit
- GoGuardian
- Google Classroom
- Google Docs
- Google Slides

- Google Slides
- Kahoot
- MagicSchool AI
- Other- Specified in Lesson
- Quiziz
- Screencastify

Accommodations & Modifications & Differentiation

Accommodations and Modifications should be used to meet individual needs. Their IEP and 504 plans should be used in addition to the following suggestions.

Gifted and Talented

- Compare & Contrast
- Conferencing
- Debates
- Jigsaw
- Peer Partner Learning
- Problem Solving
- Structured Controversy
- Think, Pair, Share
- Tutorial Groups

Instruction/Materials

- alter format of materials (type/highlight, etc.)
- color code materials
- eliminate answers
- extended time
- extended time
- large print
- modified quiz
- modified test
- Modify Assignments as Needed
- Modify/Repeat/Model directions
- necessary assignments only
- Other (specify in plans)

- other- named in lesson
- provide assistance and cues for transitions
- provide daily assignment list
- read class materials orally
- reduce work load
- shorten assignments
- study guide/outline
- utilize multi-sensory modes to reinforce instruction

Environment

- alter physical room environment
- assign peer tutors/work buddies/note takers
- assign preferential seating
- individualized instruction/small group
- modify student schedule (Describe)
- other- please specify in plans
- provide desktop list/formula

Honors Modifications

Resources

- https://www.brainpop.com
- www.discoveryeducation.com
- https://phet.colorado.edu
- www.pbslearningmedia.org

- https://www.khanacademy.org/science/physics