Unit 5: Ionic and Molecular Compounds and Nomenclature

Content Area: **Template**
Course(s):
Time Period:
Length:
Status: **Published**

State Mandated Topics Addressed in this Unit

State Mandated Topics Addressed in this Unit	
N/A	N/A

Unit 5: Ionic and Molecular Compounds and Nomenclature

Essential Questions

- How do electrons affect the shape of a molecule?
- How do ionic compounds form?
- How does metallic bonding affect the properties of metals?
- How does the charge of an atom change if it gains or loses an electron?
- How does the periodic table help you determine the names and formulas of ions and compounds?
- How is the bonding of molecular compounds different from ionic compounds?
- Other than gaining or losing electrons, how do atoms attain noble gas configuration?
- What factors affect molecular properties?
- What is an ion?
- What is the difference between an ionic and a molecular compound?

Objectives

- Apply the rules of naming for ionic compounds
- Assign the correct prefix for naming molecular compounds
- Calculate electronegativity differences for molecular compounds
- Describe how cations and anions form
- Describe how polyatomic ions differ from monatomic ions
- Describe how resonance structures are used
- Describe the relationship between atomic and molecular orbits

- Describe three properties of ionic compounds
- Determine the number of valence electrons for an element using the periodic table
- Evaluate whether the molecule is polar or non-polar
- Explain how to determine the charges of monatomic ions
- Explain the electrical charge of an ionic compound
- Explain the importance of metal alloys
- Explain the result of electron sharing in a covalent bond
- Identify exceptions to the octet rule
- Identify the information a molecular compound provides
- Identify the trend whether an element is losing or gaining electrons
- Model the valence electrons of a metal atom
- Predict VSEPR shapes from given molecules
- Put into action naming ionic compounds with polyatomic ions and transition metals
- Relate the strength of bonds between ionic and covalent bonds

Standards

9-12.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.
9-12.HS-PS2-6	Communicate scientific and technical information about why the molecular-level structure is important in the functioning of designed materials.
9-12.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.
9-12.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.

Instructional Tasks/Activities

- 3d Molecules Virtual Lab
- Common assessment chapter test
- Common assessment quiz
- Constructed response
- Covalent Bonding Virtual Lab
- Covalent compound naming convention sheet
- Covalent compounds article and question
- Crystal Growth Lab
- Do now’s and/or exit slips
- Graphic organizers or models
- Guided practice
- Homework

- Individual, small, and large group work
- Ionic Bonding Virtual Lab
- Ionic Nomenclature
- Ionic vs Covalent Lab
- Kahoot/gimkit Review
- Laboratory investigations within small groups
- Lewis structures exceptions to the octet rule
- Lewis structures intro
- Lewis structures multi bonds
- Lewis Structures Practice
- Lewis structures practice
- Matching activity/game
- Midterm
- Midterm review day 1 Atomic Origins
- Midterm review day 2 models of the atom
- Midterm review day 3 periodic table, trends, bonds
- Midterm review day 4 Review game and time to work on review sheets
- Molecules in 3d
- Octet Rule Intro to Ionic
- Polar and Non Polar Activity
- Review Activity
- Test on Covalent Bonds

Assessment Procedure

- Classroom Total Participation Technique
- Classwork
- DBQ
- Essay
- Exit Ticket/Entrance Ticket/Do Now
- Flashcards and/or drill and practice
- Inquiry based activities with reflective discussion
- Journal / Student Reflection
- Kahoot
- Laboratory groups
- Lecture with note taking or guided notes
- Online models and simulators
- Other named in lesson
- Peer Review

- Performance
- Power point presentation
- Problem Correction
- Project
- Quiz
- Rubric
- Teacher Collected Data
- Test
- Whole and small group discussions
- Worksheet

Recommended Technology Activities

- Appropriate Content Specific Online Resource
- Chromebook
- 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 Forms
- 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

- Resource 1
- Resource 2
- Resource 3
- Resource 4
- Resource 5