

Unit 6 - What is my name and shape?

Content Area: **Science**
Course(s): **Chemistry CP**
Time Period: **January**
Length: **6 weeks**
Status: **Published**

Transfer Skills

Chemicals species will combine in small whole number ratios to form compounds. Students will learn to name and write formulas for ionic and covalent compounds. The arrangement of atoms in a molecule determine the shapes of substances. Students will learn the different shapes of molecules (bent, trigonal planar, trigonal pyramid, tetrahedral, and linear) and how those shapes help determine properties of the substances.

Enduring Understandings

A compound is a substance composed of two or more elements chemically combines in a fixed proportion.

A chemical compound can be represented by a specific formula and assigned a name based in the IUPAC system.

Models of molecules help scientists understand properties.

An atom's electron configuration determines who it interacts with and the shape the compound will have.

Essential Questions

How does the Periodic Table help you determine the names and formulas of ions and compounds?

Where does the name of a compound come from?

How do electrons affect the shape of the molecule?

How does the degree of polarity between two different atoms affect the bonding and shape of a molecule?

How does the VSEPR theory explain the shape of a molecule?

Content

Binary, diatomic, Greek method, molecule, compound, bent, trigonal planar, trigonal pyramid, tetrahedral, linear

Skills

Write and name the binary compounds and use the Greek system to name molecular compounds.

Name binary compounds using polyatomic ions.

Name binary compounds using transition metals.

Determine the effect that multiple bonds have on the molecular geometry of a molecule and ion.

Predict the shape of molecules and polarity using the VSEPR theory.

Resources

Standards

SCI.9-12.5.1.12.A.1	Refine interrelationships among concepts and patterns of evidence found in different central scientific explanations.
SCI.9-12.5.1.12.A.2	Develop and use mathematical, physical, and computational tools to build evidence-based models and to pose theories.
SCI.9-12.5.1.12.A.3	Use scientific principles and theories to build and refine standards for data collection, posing controls, and presenting evidence.
SCI.9-12.5.1.12.B.1	Design investigations, collect evidence, analyze data, and evaluate evidence to determine measures of central tendencies, causal/correlational relationships, and anomalous data.
SCI.9-12.5.1.12.B.2	Build, refine, and represent evidence-based models using mathematical, physical, and computational tools.
SCI.9-12.5.1.12.B.3	Revise predictions and explanations using evidence, and connect explanations/arguments to established scientific knowledge, models, and theories.
SCI.9-12.5.2.12.A.c	In the Periodic Table, elements are arranged according to the number of protons (the atomic number). This organization illustrates commonality and patterns of physical and chemical properties among the elements.
SCI.9-12.5.2.12.A.d	In a neutral atom, the positively charged nucleus is surrounded by the same number of negatively charged electrons. Atoms of an element whose nuclei have different numbers of neutrons are called isotopes.
SCI.9-12.5.2.12.A.e	Solids, liquids, and gases may dissolve to form solutions. When combining a solute and solvent to prepare a solution, exceeding a particular concentration of solute will lead to precipitation of the solute from the solution. Dynamic equilibrium occurs in saturated solutions. Concentration of solutions can be calculated in terms of molarity, molality, and percent by mass.
SCI.9-12.5.2.12.B	Substances can undergo physical or chemical changes to form new substances. Each

change involves energy.

SCI.9-12.5.2.12.B.1

Model how the outermost electrons determine the reactivity of elements and the nature of the chemical bonds they tend to form.

SCI.9-12.5.2.12.B.a

An atom's electron configuration, particularly of the outermost electrons, determines how the atom interacts with other atoms. Chemical bonds are the interactions between atoms that hold them together in molecules or between oppositely charged ions.

SCI.9-12.5.2.12.B.b

A large number of important reactions involve the transfer of either electrons or hydrogen ions between reacting ions, molecules, or atoms. In other chemical reactions, atoms interact with one another by sharing electrons to create a bond.