In Fascinating Chemistry, you will learn the four ways that atoms bond to each other to create molecules, and how each bond helps determine the properties of the resulting molecule. You will learn how these special molecular properties explain our everyday world from water freezing to nuclear energy to food to metals to weather, and more.

Lesson 1: The Solar System

- The planets
- The seasons

Lesson 2: The Atom

- Electrons
- The nucleus
- Neutrons

Lesson 3: The Periodic Table

- Elements
- Atomic size
- Molecules

Lesson 4: Chemical Bonds

- Covalent bonds
- Ionic
- Polar covalent bonds
- Metallic bonds
- Why atoms bond
- Bond strength

Lesson 5: The Basis of Atomic Bonding

- Ionic bonding
- Covalent bonding

Lesson 6: States of Matter

- Predicting states of matter from bond type
- Crystals
- Gases
- Liquids
- Metals
- The intermolecular bond

Lesson 7: The Metallic Bond

- Structure
- Alloys
- Properties

Lesson 8: Transition Metals

- Scandiuum to zinc
- Yttrium to cadmium
- Gold

Fascinating Chemistry is a program developed by Fascinating Education. Other curricula currently available include Fascinating Biology and Fascinating Physics. Other curricula coming soon are Fascinating Trigonometry and Fascinating Anatomy & Physiology.
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Lesson 9: The Unequal Sharing Polar Covalent Bond

- Unshared Electrons
- Summary of Intramolecular Bonds
- Pauling's Bond Energy Chart
- Properties of the Polar Covalent Bond
- Intermolecular Bond
- Hydrogen Bonding
- Ice Crystal Bonding
- Latent Heat of Fusion
- Surface Tension

Lesson 10: Heat

- Temperature vs. heat
- Molecular movement
- Physiology of temperature sensation
- Heat conduction through metals
- Heat conduction through gases

Lesson 11: Evaporation and Steam

- Specific heat capacity
- Heat of vaporization
- Boiling point
- Barometer
- Air pressure

Lesson 12: Water Density

- Density of water vs. ice
- Density of salt water vs. fresh water
- Frozen lakes
- Density of the ocean
- Compressibility of water
- Water pressure

Lesson 13: Properties of Non-Polar Covalent Molecules

- Intermolecular bond between covalent molecules
- van der Waals forces
- Hydrogen bonding
- Soaps
- Surface tension

Lesson 14: The Mole

- Comparing equal numbers of molecules
- Lower the freezing point
- Weighted average
- Converting grams to moles
- Converting moles to molecules
- Converting moles to grams
- Percentage weight
- Empirical formula vs. actual formula

Lesson 15: Gases

- Coulomb's Law
- Kinetic energy
- Ideal Gas Law
- Electrolysis
- Concentration vs. density
- Standard temperature and pressure (STP)
- Partial pressure of gas

Lesson 16: Solutions

- Molarity
- Molality
- Mixtures
- Freezing point depression
- Colligative property
- Phase diagram
- Boiling point elevation
- Acids and bases
- Types of acids
- Neutralization of acids and bases
- Calculating pH

Lesson 17: Chemical Reactions

- Activation energy
- Catalysts
- Balancing equations
- Stoichiometry
- Coefficients
- Equilibrium state
- LeChatelier's principle
- Phase diagram
- Equlibrium constant
- Solubility product constant

Lesson 18: Orbitals

- Subshells
- Slots within subshells
- Energy levels within slots
- Probability clouds
- Aufbau Principle
- Hund's Rule
- Pauli Exclusion Principle
- Ionization energy
- Lewis Diagrams
- Hybrid bonds
- VSEPR (Valence Shell Electron Pair Repulsion)
- Molecular shapes

Lesson 19: Electrochemistry

- Oxidation State
- Redox
- Voltage Cells
- Reduction Potential
- Calculating Potentials
- Voltage
- Current
- Car Battery
- Electroplating
- Aluminum Oxide
- Iron Rust
- Fuel Cells

Lesson 20: Polymers

- Formaldehyde, Phenol, and Bakelite
- Ethylene and Polyethylene
- Strengthening Polyethylene
- Natural Polymers
- Nylon
- Rubber

Lesson 21: The Nucleus

- Solar energy
- The Strong Force
- Neutrons
- Making helium
- Making heavy elements
- Binding energy
- The Sun's fuel

Final Problems