

# Interactive Physics and Chemistry (IPC) - Colville High School

## Unit - Boat on a Building

**HS-ESS2-3 Earth's Internal Mechanisms:** Develop a model to illustrate how Earth's internal processes operate through the cycling of matter and energy to result in surface geologic phenomena.

**HS-PS3-4 - Plan and conduct an investigation** to provide evidence that the transfer of thermal energy when two components of different temperatures are combined within a closed system results in a more uniform energy distribution among the components in the system (second law of thermodynamics).

-PS3-B Conservation of Energy and Energy Transfer

-PS3-D Energy in Chemical Processes

**HS-PS2-1 - Newton's Laws:** Analyze data to support the claim that Newton's second law of motion describes the mathematical relationship among the net force on the object, its mass, and its acceleration.

**HS-PS3-2 - Modeling Energy and Motion:** Develop and use models to illustrate that energy at the macroscopic scale can be accounted for as a combination of energy of associated particles and the relative positions of particles.

## Unit - Disappearing Body

**HS-PS1-1 - Atomic Structure and Periodic Table:** Develop a model of the atom to describe its structure and calculate its charge and mass and 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.

**HS-PS1-2 - Chemical Reactions:** 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 chemical properties.

**HS-PS1-7 - Conservation of Mass:** Use mathematical representations to support the claim that atoms, and therefore mass, are conserved during a chemical reaction.

**HS-LS4-4 - Construct an explanation** based on evidence for how natural selection leads to adaptation of populations.

## Unit - Biolite

**HS - ETS 1-3 - Evaluating Real-World Problems:** Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics, as well as possible social, cultural, and environmental impacts.

**HS - PS1-7 - Conservation of Mass:** Use mathematical representations to support the claim that atoms, and therefore mass, are conserved during a chemical reaction.

**HS - PS3-1 - Conservation of Energy:** Create a model to calculate the change in the energy of one component of a system when the change in energy of the other component(s) and energy flows (in and out of the system) are known.

**HS - PS1-4 - Develop a model** to illustrate that the release or absorption of energy from a chemical reaction system depends upon the changes in total bond energy.

**HS - PS3-2 - Develop and use models** to illustrate that energy at the macroscopic scale can be accounted for as a combination of energy associated with the motion of particles (objects) and energy associated with the relative positions of particles (objects).

**HS - PS1-6 - Refine the design** of a chemical system by specifying a change in conditions that would increase the amounts of products at equilibrium.

**HS - PS3-3** - Design, build and/or refine a device that works within given constraints to convert one form of energy into another form of energy.

## Unit - Snapchat

**HS - PS4-1 - Wave Properties:** Use mathematical representations to support a claim regarding relationships among the frequency, wavelength, and speed of waves traveling in various media.

**HS - PS4-5 - Digital Transmission of Information:** Communicate technical information about how some technological devices use the principles of wave behavior and wave interactions with matter to transmit and capture information and energy.

**HS - PS4-3 - Evaluate the claims, evidence, and reasoning** behind the idea that electromagnetic radiation can be described by either a wave model or a particle model, and that for some situations one model is more useful than the other.

**HS - PS4-2 - Evaluate questions about the advantages of using a digital transmission** and storage of information.

## Unit - Sequoia (Photosynthesis)

**HS - LS1-5 - Matter and Energy in Organisms:** Use a model to illustrate how photosynthesis transforms light energy into stored chemical energy.

**HS - PS1-7 - Chemical Reactions:** Use mathematical representations to support the claim that atoms, and therefore mass, are conserved during a chemical reaction.

**HS - PS1-4 - Develop a model** to illustrate that the release or absorption of energy from a chemical reaction system depends upon the changes in total bond energy.

## Unit - Nucleosynthesis / Colliding Galaxies

**HS - PS1-8 - Develop models** to illustrate the changes in the composition of the nucleus of the atom and the energy released during the processes of fission, fusion and radioactive decay.

**HS - PS2-4 - Use mathematical representations of Newton's Law** of Gravitation and Coulomb's Law to describe and predict the gravitational and electrostatic forces between objects.

**HS - PS3-5 - Develop and use a model of two objects interacting** through electric or magnetic fields to illustrate the forces between objects and the changes in energy of the objects due to the interaction.

**HS - ESS1-1 - Develop a model based on evidence to illustrate the life span** and the role of nuclear fusion in the sun's core to release energy in the form of radiation.

**HS - ESS1-3 - Communicate scientific ideas about the way stars**, over their life cycle, produce elements.