



## Unit 5 Energy

### High School Chemistry

#### Unit Length and Description:

9 Instructional Weeks

Students will create computational models to calculate the change in the energy of one component in a system when the change in energy of the other component(s) and energy flows in and out of the system are known. They will also conduct investigations 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 of a system (2<sup>nd</sup> Law of Thermodynamics). Students will also design, build, and refine a device (ex: hot and/or cold packs and batteries) that works within given constraints (ex: renewable energy forms) to convert one form of energy into another form of energy.

#### Science Standards:

- HS-PS1-5** Apply scientific principles and evidence to provide an explanation about the effects of changing the temperature or concentration of the reacting particles on the rate at which a reaction occurs.
- HS-PS1-6** Refine the design of a chemical system by specifying a change in conditions that would produce increased amounts of products at equilibrium.

#### Enduring Understandings- Unit Anchor Phenomenon:

Heat from Earth's natural geologic processes can be used to make electricity.

#### Essential Questions- Reflective Summaries:

- Calculate the change in the energy of one component in a system when the change in energy of the other component(s) and energy flows in and out of the system are known.
- Design an experiment to verify that objects of different temperatures, when placed together, move towards a more uniform temperature distribution.
- Refine the design of a simple system that converts energy from one form to another.