Unit 3
Energy

High School
Physics

Unit Length and Description:

9 Instructional Weeks

Students will create models to calculate the change in one component in a system when the change in energy of the other components and energy flows in and out of the system are known. They will also develop models to illustrate that energy at the macroscopic scale can be accounted for as a combination of energy associated with the motions and relative position of particles and/or objects. Then students will design and refine a device that works within given constraints to convert one form of energy into another form of energy. Students will conclude by planning and conducting an investigation to provide evidence that the transfer of thermal energy when two components of different temperature are combined within a closed system results in a more uniform energy distribution among the components in the system.

Science Standards:

HS-PS3-1	Create a computational model to calculate the change in the energy of one component in a system when the change in energy of the other components and energy flows in and out of the system are known.
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 and/or objects and energy associated with the relative positions of particles and/or objects.
HS-PS3-3	Design, build, and refine a device that works within given constraints to convert one form of energy into another form of energy.
HS-PS3-4	Plan and conduct an investigation to provide evidence that the transfer of thermal energy when two components of different temperature are combined within a closed system results in a more uniform energy distribution among the components in the system.

Enduring Understandings- Unit Anchor Phenomenon:	**Essential Questions- Reflective Summaries:**
Wind turbines convert wind energy to electrical energy.	• How can computational models be used to calculate the change in the energy of one component in a system when the change in energy of the other components are known? • How can computational models be used to calculate the change in the energy of one component in a system when the energy flows in and out of the system are known? • Use and/or apply models to illustrate that energy at the macroscopic scale can be accounted for as a

	combination of energy associated with the motion of particles and/or objects. • Use and/or apply models to illustrate that energy at the macroscopic scale can be accounted for as a combination of energy associated with the energy associated with the relative positions of particles and/or objects. • Describe and refine a device that works within given constraints to convert one form of energy into another form of energy. • Predict and/or describe the outcomes when the transfer of thermal energy of two components of different temperatures are combined within a closed system.