Curriculum Overview

Unit Goal

Students will understand how electrical energy is produced and why it is important to conserve energy in their homes. Students will be able to identify sources of "standby" power that will enable them to be more efficient consumers. They will also educate their family as well as others about the benefits of saving "standby" power.

Unit Question: How can we conserve stand-by power in our homes?

Lesson Objectives

The student will be able to:

- Define standby power.
- Demonstrate safety when using electricity.
- Define energy and understand that it comes in many forms, including electrical energy.
- Understand that atoms cannot be broken down by natural processes and are made of neutrons, protons, and electrons, each with their own specific charge.
- Understand that electrical energy is the energy of moving electrons.
- Explain the difference between an insulator and a conductor.
- Explain how energy usage is measured in watts.
- Calculate basic kilowatt-hours use for a given appliance.
- Label the major parts of a generator and understand how a turbine spins.
- Compare renewable with nonrenewable energy.
- Describe the major methods of energy production, including coal, natural gas, nuclear, water, wind, and solar.
- Compare the risks and benefits of different energy production methods.
- Identify devices in his/her home that use electrical energy.
- Explain how to determine if a device likely uses standby power.
- State the percentage of standby power in an average home.
- Calculate the total standby power used by a device over time.
- Understand the cost of standby power in devices.
- Use a metering device to measure the amount of energy used by various devices in the home.
- Define carbon footprint.
- Define global climate change.
- Explain how the greenhouse effect warms our planet.
- Identify evidences for global climate change.
- Understand possible causes of global climate change.
- Identify possible future affects of global climate change.
- Read charts and graphs related to data collected by students
- Analyze basic standby power data for basic trends
- Calculate kilowatt-hours (kWh) spent on standby power, daily, yearly, in the home, country, etc.
- Generate realistic methods for conserving power in his or her daily life.
- Identify methods for conserving standby power.
- Use a monitoring device to monitor energy use for specific appliances.
- Analyze time vs power use graphs for trends.
- Calculate average standby power use for a specific appliance.
- Produce a blog, video (skit, song, report, etc), or poster informing others about standby power consumption. (OPTIONAL EXTENSION ACTIVITY)
- Explore careers related to energy conservation.
- Explore careers related to Science, Technology, Engineering and Mathematics (STEM).