

PLTW Gateway

Energy and the Environment | Unit Outline

Clean water, clean air, a sustainable world! Students use tools such as the engineering design process, an engineering notebook, and alternative energy modeling to invent and innovate.

Learn how creative thinking and problem solving can change your world!

In the Energy and the Environment Unit (EE), students are challenged to think big and look toward the future as they explore sustainable solutions to our energy needs and investigate the impact of energy on our lives and the world. They design and model alternative energy sources and evaluate options for reducing energy consumption.

EE Lesson Summary

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| Lesson 1 | Investigating Energy |
| Lesson 2 | Sustainable Energy |
| Lesson 3 | Making an Impact |

Lesson 1: Investigating Energy

The use and production of energy is important in everyone's life. It is also important to consider ways to reduce our impact on the environment when using energy to heat our buildings, to power modes of transportation, or to operate electrical appliances. The development of alternative energy systems is a recent innovation where energy is generated from inexhaustible energy sources like wind, solar, geothermal, and hydropower, and renewable energy sources like biomass. These systems have the advantage of generating power with virtually zero carbon emissions. In this lesson students will explore the challenge we face to economically harness, store, and deliver these sources of energy.

Lesson 2: Sustainable Energy

Many events across the globe over the last several years have reinforced the need to restructure both our use of energy and the source of our energy on a global basis. Stop and consider the effects on energy that these events have caused: population growth, economic growth in China and India, conflicts in the Middle East, global climate change, and natural disasters. We must implement innovative solutions to promote energy security and alternatives to fossil fuels. While meeting the increasing demand for energy, we also need to consider minimizing the environmental impact. In this unit students will present an alternative solution for a global energy problem.

Lesson 3: Making an Impact

Energy saved is energy gained for another day. Saving energy will cut down on pollution and help our fossil fuels last longer, hopefully until renewable energy sources become more practical. Finding a way to do more with less is a benefit to everyone. Students can actively participate in energy conservation through a variety of measures including turning off lights when they leave a room, turning up the thermostat a few degrees on very hot days, turning down the thermostat on cold days, closing windows and doors during temperature extremes, reducing water usage, and ensuring that plug-in chargers are unplugged when not in use. Students need to realize that each and every one of us does make a difference. The solution to energy problems will be solved by individuals. We are the ones who need to practice using resources wisely, pass beneficial laws, and quit polluting. In this unit students will learn to realize that individually they can impact energy usage trends.