

PLTW Gateway

Magic of Electrons | Unit Outline

How do electricity and electronics affect my life?

Students use tools such as the engineering design process, an engineering notebook, computer simulations, and circuit design prototyping materials to invent and innovate.

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

Through hands-on projects, students explore electricity, the behavior and parts of atoms, and sensing devices in the Magic of Electrons (ME) unit. They learn knowledge and skills in basic circuitry design and examine the impact of electricity on the world around them.

ME Lesson Summary

Lesson 1	What Is Electricity?
Lesson 2	Electronics
Lesson 3	Digital Electronics

Lesson 1: What Is Electricity

This lesson is an introduction to basic electricity. It is assumed that students have no prior exposure to the concepts addressed. The power provided through electricity is a part of their everyday lives, but they may or may not have considered where it comes from, why it works, or how it is produced and transmitted. Few students could imagine life without it. They might consider something like a camping trip to be life without electricity. Upon further investigation, though, they would discover the role of electricity in preparing for the trip and in the materials they might pack.

Lesson 2: Electronics

This lesson is an overview and introduction to basic electronics and circuits with a focus on some of the most basic devices and their functions. Students will be introduced to electrical circuit diagrams and asked to create them. In this lesson students will observe how the electron flow merges with technology through electronic circuits. Almost any device that uses electricity can be broken down into basic electronic circuits and the electronic devices in those circuits.

Lesson 3: Digital Electronics

This lesson introduces students to the digital world of cell phones, computers, MP3 devices, and many other modern conveniences that rely on binary numbers, the 0s and 1s of the digital realm, to function. This is an exciting field for students to consider because it is ever-changing. An understanding of the components and their functions opens the door for limitless creative ideas to design improved devices that can entertain or save lives.