Unit 4: Electronics

Content Area: **Technology**
Course(s):
Time Period: **October**
Length: **4 weeks**
Status: **Published**

Enduring Understandings

- All electrical circuits must be comprised of a power source, a load and a path for electricity to flow.
- Electricity can be generated from multiple sources.
- Current is the rate of flow of electrons.
- Renewable resources are easily replenished by the environment; non-renewable resources are not.

Essential Questions

- When was electricity discovered?
- How did it develop over time?
- What were the positive and negative impacts relating to the development of electricity?
- How can electricity be generated?
- How does it get to our houses and buildings?
- What is current?
- What is an open versus a short circuit?
- How is electricity measured?

Content

Skills

- Students will be able to create and explain a simple circuit.
- Students will be able to define and demonstrate current.
- Students will be able to solder electrical components.

Suggested Activities:

- Diorama Simple Circuit - potato battery
- Electric Car Squishy circuits
- LED Cards- Paper Circuits
- Sewn Circuits
- LED Light Up Sign

Resources

1. PC or Laptops with internet access, able to run Adobe Illustrator (or similar program) and the various 3D printer software platforms.

2. Laser Printer allows for printing capabilities from classroom computers.

3. TinkerCAD (or other equivalent solid modeling program). TinkerCAD is a free, web-based 3D modelling application which allows users to create objects utilizing constructive solid geometry applications.

4. 3D Printers allow students to realize their designs by producing physical objects from their three-dimensional digital models.

5. Adobe Illustrator & Photoshop are industry recognized graphic art software programs. Adobe presently offers a creative cloud suite for education.

6. Vacuum forming machine is a simplified version of thermoforming. In this process, a sheet of plastic is heated then stretched over a preformed mold. The plastic is then shaped into the shape of the mold. This machine allows for exciting project based learning opportunities in the Manufacturing and Production unit.

7. Drill press and bandsaw are presently located in the Technology Workshop, the machines are fixed and utilized only with teacher supervision and proper safety testing accomplished.

8. Consumable Materials such as bass and balsa wood, foam, hot glue, project kits, aluminum foil, wax paper, balloons, fishing line, cups and other materials are needed to support project based learning. Suggested projects include building a model architectural structure, room or facility, bridge, tower, aircraft and more.

9. Personal protection equipment such as safety goggles and gloves are required when students are at risk of injuring themselves while creating projects or utilizing tools and/or machinery.

10. Hand Tools various hand tools such as easy cutters, coping saws, craft knives, hot glue guns and hot wire cutting machine will be utilized within the classroom. Safety precautions and training will be taken and provided at all times.

Standards

TECH.8.2.8.A.2	Examine a system, consider how each part relates to other parts, and discuss a part to redesign to improve the system.
TECH.8.2.8.B.1	Evaluate the history and impact of sustainability on the development of a designed product or system over time and present results to peers.
TECH.8.2.8.B.2	Identify the desired and undesired consequences from the use of a product or system.
TECH.8.2.8.B.3	Research and analyze the ethical issues of a product or system on the environment and report findings for review by peers and /or experts.
TECH.8.2.8.B.4	Research examples of how humans can devise technologies to reduce the negative consequences of other technologies and present your findings.
TECH.8.2.8.C.3	Evaluate the function, value, and aesthetics of a technological product or system, from the perspective of the user and the producer.
TECH.8.2.8.C.8	Develop a proposal for a chosen solution that include models (physical, graphical or mathematical) to communicate the solution to peers.