Unit 6: Manufacturing & Production

Content Area: **Technology**
Course(s):
Time Period: **November**
Length: **3 weeks**
Status: **Published**

Enduring Understandings

- Safety standards and procedures must be followed to reduce the risk of injury.
- Raw materials are found in nature.
- Products are developed through technological systems.
- A generalized manufacturing and production system can be categorized as three parts: the input, process and output.
- Technology has four categories of impacts on our lives: social, economical and environmental.
- Industrial engineers create manufacturing and production systems.
- This career spreads to many industrial sectors, including business, computer science and information technology.

Essential Questions

- Why is following safety procedures paramount in any work environment?
- How do earlier manufacturing and production methods compare with today's methods?
- How have they evolved with time?
- Who designs and creates these systems?
- How are trade and manufacturing interrelated?
- How do methods of manufacturing and projected quantities differ?

Content

Skills

- Students will be able to describe a manufacturing and production system.
- Students will be able to describe and provide examples to four impact categories of technology on our lives.

Suggested Activities:

- Chocolate Bar
- Manufacturing Button Production
- Shark Tank

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.