Unit 3: Career Paths and Possibilities (Engineers & Architects)

Content Area: **Technology**
Course(s):
Time Period: **September**
Length: **2 weeks**
Status: **Published**

Enduring Understandings

- Engineers and architects roles and responsibilities differ in our society.
- There are many different branches of study within architecture and engineering.
- Engineers and architects design objective is to translate human needs and wants into functional products and systems.

Essential Questions

- How do engineers and architects jobs differ?
- What are the various branches within engineering and architecture?
- What types of things do they design?
- What is the relationship between engineers and architects?
- What characteristics make good engineers and architects?
- What is usability engineering?
- How do and why do engineers and architects consider the user in their designs?

Content

Skills

- Students will be able to explain the roles and responsibilities of engineers and architects.
- Students will be able to explain various branches within engineering and architecture and associate various design tasks and plans with these specialized branches.

Suggested Activities:

- Product usability evaluation.
- Sharktank invention convention.
- New product research, investigation and presentation. (example: solar roof shingles)

Resources

Resources:

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

2. 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.

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

4. Engineers scales allow students to measure items graphically depicted within technical drawings and physical objects according to a set scale.

5. AutoCAD is a computer-aided design (CAD) and drafting program used for producing 2-D and 3-D technical drawings.. AutoCAD is considered an industry standard and was developed and marketed by Autodesk Inc. A free version is available for education.

6. Autodesk Design Academy https://academy.autodesk.com/ , supports educators by providing free, authentic project based learning guides and supporting videos.

7. Monmouth County Executive Airport locally positioned in Wall Township, New Jersey, is a potential location for an authentic learning experience through a field trip, supporting the Exploring Flight unit.

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, 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.8.1.8.A.2	Create a document (e.g., newsletter, reports, personalized learning plan, business letters or flyers) using one or more digital applications to be critiqued by professionals for usability.
TECH.8.2.8.B.5	Identify new technologies resulting from the demands, values, and interests of individuals, businesses, industries and societies.
TECH.8.2.8.C.1	Explain how different teams/groups can contribute to the overall design of a product.