Unit 3: From Pencil to Prototyping - Digital Modeling and Prototyping

Content Area: **Technology**

Course(s):

Time Period: November
Length: 8-9 Blocks
Status: Published

Enduring Understandings

- 1. A 3D model is created using 3D Software designed from multiple angles on an X, Y, and Z axis. In both (2-D) parallel projection and (3-D) Perspective.
- 2. 2D Drawings can be directly translated to 3D Design using 2D CAD software in combination with 3D Design Software.
- 3. Prototypes are not only physical, but can be digital as well.
- 4. A digital prototype is an excellent way to quickly evaluate the 3-D experience of the space and identify any changes the designer would like to make
- 5. A digital model can be applied using multiple modern output channels and tools to help communicate the overall design.

Essential Questions

- 1. How can an AutoCAD drawing be used as the basis for a 3D Model?
- 2. What are the advantages of a digital model and a 3D Printed Model when presenting to a client?
- 3. What are the disadvantages of a digital model and a 3D Printed Model when presenting to a client?
- 4. What types of design advantages does a 3D Printed model show you?

Content

Surface, Push/Pull Tool, Orbit, Pan, Parallel Project, Perspective View, Section Plane, Point, Measure Tool, Pilament, PLA Plastic, Move/Duplicate Tool

Skills

1. Students will be able to translate their 2D Drawings into 3D Models

- 2. Students will be able to modify their design in 3D and update their 2D Drawing to match.
- 3. Students will be able to generate a 3D Printable file and print their design.
- 4. Students will be able to present their design concepts using multiple types of media
- 5. Students will be able to read a technical design document and develop a 3D model based on technical specifications

Resources

AutoCAD (Lastest Version) and Sketchup (Latest Version)

Standards

- 8.2.12.D.1 Design and create a prototype to solve a real world problem using a design process, identify constraints addressed during the creation of the prototype, identify trade-offs made, and present the solution for peer review.
- 8.2.12.D.5 Explain how material processing impacts the quality of engineered and fabricated products.
- 8.2.12.D.3 Determine and use the appropriate resources (e.g., CNC (Computer Numerical Control) equipment, 3D printers, CAD software) in the design, development and creation of a technological product or system.
- 8.1.12.A.1 Create a personal digital portfolio which reflects personal and academic interests, achievements, and career aspirations by using a variety of digital tools and resources.
- CTE 9.3.12.AC-DES.6 Apply the techniques and skills of modern drafting, design, engineering and construction to projects.
- CTE 9.3.12.AC.1 Use vocabulary, symbols and formulas common to architecture and construction.
- CTE 9.3.12.AC.6 Read, interpret and use technical drawings, documents and specifications to plan a project.