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.