



3D Printing & CAD

6th-8th Grade, Week of: June 6th, 2024

What We Did on...Monday:

Intro to CAD

- Campers got an introduction to computer-aided design and the different softwares that can be used.

3D Coordinate Geometry Activity

- Campers learned how to graph in 3 dimensions and made their own physical coordinate grids!

Learning the Fusion UI

- The campers learned how to navigate in the Fusion 360 CAD software, as well as the different workspaces that are available.

Learning to Draw - Orthographic

- Campers learned how to portray 3D objects as 2D sketches in orthographic drawings.



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What We Did on...Tuesday:

Fusion Sketch Tools

- Campers learned how to make the basic 2D geometry needed to drive the 3D designs made in CAD.

Learning to Sketch Pt. 2 - Isometric

- Today the campers learned about hidden lines, center lines, and how to draw with isometric graphing paper. They also learned to use a protractor and varying types of dimensions.

Fusion Dimensions, Constraints

- The campers learned how to restrict 2D designs so that they can be created more easily and predictably.

Makeshift Motor

- Campers learned the basics of electricity and how motors work. They then built their own makeshift motors made from just a few common items!



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What We Did on...Wednesday:

Intro to 3D Printing

- The campers learned about all of the different types of 3D printers at the Fab Lab. They then got to see some open-air printers up close, and all of their different components.

Fusion Solid Tools

- The campers learned about solid tools on Fusion360 through designing their own coffee mug.

3D Printing Demonstration

- Campers are taken through the process starting from making a Fusion CAD design to printing it on one of our MakerBots!

Learning Corel

- Campers learned another software, Corel Draw, which can be used to create 2D designs and graphics from scratch.

T-Shirt Design

- Using their newfound Corel skills, the campers made vectorized designs that will go on their camp t-shirts!



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What We Did on...Thursday:

Construction Planes / Digital Drawings

- Campers learned about construction planes, axes, and points through independent exploration. They also created digital drawings based off of their edited object.

CAD Project - Planning

- Campers began planning and drawing out the designs that they will be able to have 3D printed.

Problem Solving Prompt

- The Campers designed their own solution to a real-life problem solving prompt. "Photographers often use their camera tripod handles to hang their headphones, but they always fall off! What mechanism can you make to attach to the handle and hold the headphones?"

CAD Project - Designing

- Based on the drawings they made earlier, the campers made their designs in CAD that will be 3D printed.



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What We Did on...Friday:

MakerBox Creation on Corel

- Campers created designs on Corel to form 3-dimensional boxes out of 2D wooden laser cutouts.

CAD and 3D Printing Trivia Blooket!

- The campers had fun playing a Blooket game on all of the different information they've learned in this camp!

Fusion Static Stress Analysis

- Campers learned how to conduct static stress analysis, a procedure often used in the industry to simulate model strengths. The campers used this feature to examine the strength of different materials and shapes.

MakerBox Assembly

- After having the designs cut out, campers assembled and decorated their makeshift wooden boxes!

Using CAD in the Future

- Onshape is a browser-based CAD software with a free basic plan. Although it has a few differences from Fusion, the majority of the tools are the same.
- Most high school engineering classes provide access to a free educational account to CAD softwares such as Fusion360 or SOLIDWORKS