UBC Geering Up Engineering Outreach
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Digital Manufacturing (10-12)

Hello! This document includes a brief outline of our Digital Manufacturing workshop, as well as relevant BC ADST curriculum connections. In this workshop, students will gain hands-on engineering experience by designing their own CAD models and be exposed to the design process engineers use when creating new parts and products.

BC Curriculum Ties (In addition to satisfying multiple core competencies)	BC Applied Design, Skills, and Technologies Curriculum Links 10-12:
	
	Drafting 10-12:
	• *Content:*
	  ○ *simple drafting design projects*
	  ○ *geometric construction to create drawings and images*
	  ○ *drawing management and problem-solving using computer-assisted design (CAD) software*
	  ○ *use of scale and proportion when outputting to 3D models*
	
	BC ADST: Engineering 10-12:
	• *Content:*
	  ○ *history of manufacturing and production*
	  ○ *product development and manufacturing processes*
	  ○ *manufacturing to meet the needs of the end user*
	  ○ *measurement techniques in engineering projects*
	• *Applied Design:*
	  ○ *Prototyping - Visualize and construct prototypes, making changes to tools, materials, and procedures as needed*
	  ○ *Create design, incorporating feedback from self, others, and results from testing of the prototype*

Grade Levels	10-12

Time	1~1.5 Hours
Goals of the Workshop	1. Understand the basics of an advanced CAD modelling software, namely sketches and extrusions 2. Build a simple object using a CAD program 3. Understand the applications of CAD programs for prototyping and aiding in the design process, including some of the technologies available to manufacture a sketch

Activity Descriptions

Design 101- Sketching

Objective: To learn about designing, sketching, and drawing in 3D
Participants will:

- Learn about angles, orthographic projections and isometric views
- Draw objects from various perspectives

Onshape CAD Modelling

Objective: To learn and use the Onshape CAD software to design an accessibility innovation
Participants will:

- Get a tutorial on Onshape and learn the basics of CAD drawing
- Learn how to make a 2D sketch and extrude it to make it 3D
- Use what they have learned to design, create, and improve an invention that could aid in accessibility issues

We can't wait to connect with your school & expose your students to the STEM field with our exciting, hands-on STEM activities!