

# Designing Parts in CAD

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Thank you to the University of Victoria for hosting the FTC Workshop series!



# Why Should I Design my Own Parts?

- Freedom
  - Tetrix and other kits give lots of freedom but only come in standard rectangular sizes
- Other materials
  - 3D Printing
  - Laser Cutting
  - CNC Machining
- It's what engineers actually do

# The Design Process

- Brainstorm ideas
- Draw sketches of the most feasible ones
- Consider how they would be manufactured
- Simple is usually better
- Start designing the CAD

# CAD Design Tips

Use a CAD model or drawing from the manufacturer when possible

Consider screw access

Consider wires that may connect

Avoid sharp corners - particularly for wood

# 3D Printing Tips

Have a flat surface for the part to start printing from

Holes will print a bit smaller than you dimension

Outer edges will be slightly larger

Wall thickness of  $<2\text{mm}$  will likely break

Fillets help support walls

# Laser Cutting Tips

The beam has a thickness - parts will not be slip fit if dimensioned to be the same size

The beam thickness is more for thicker materials

Limited plastic options