



CPSC 1091 – Engineering Design and Drafting

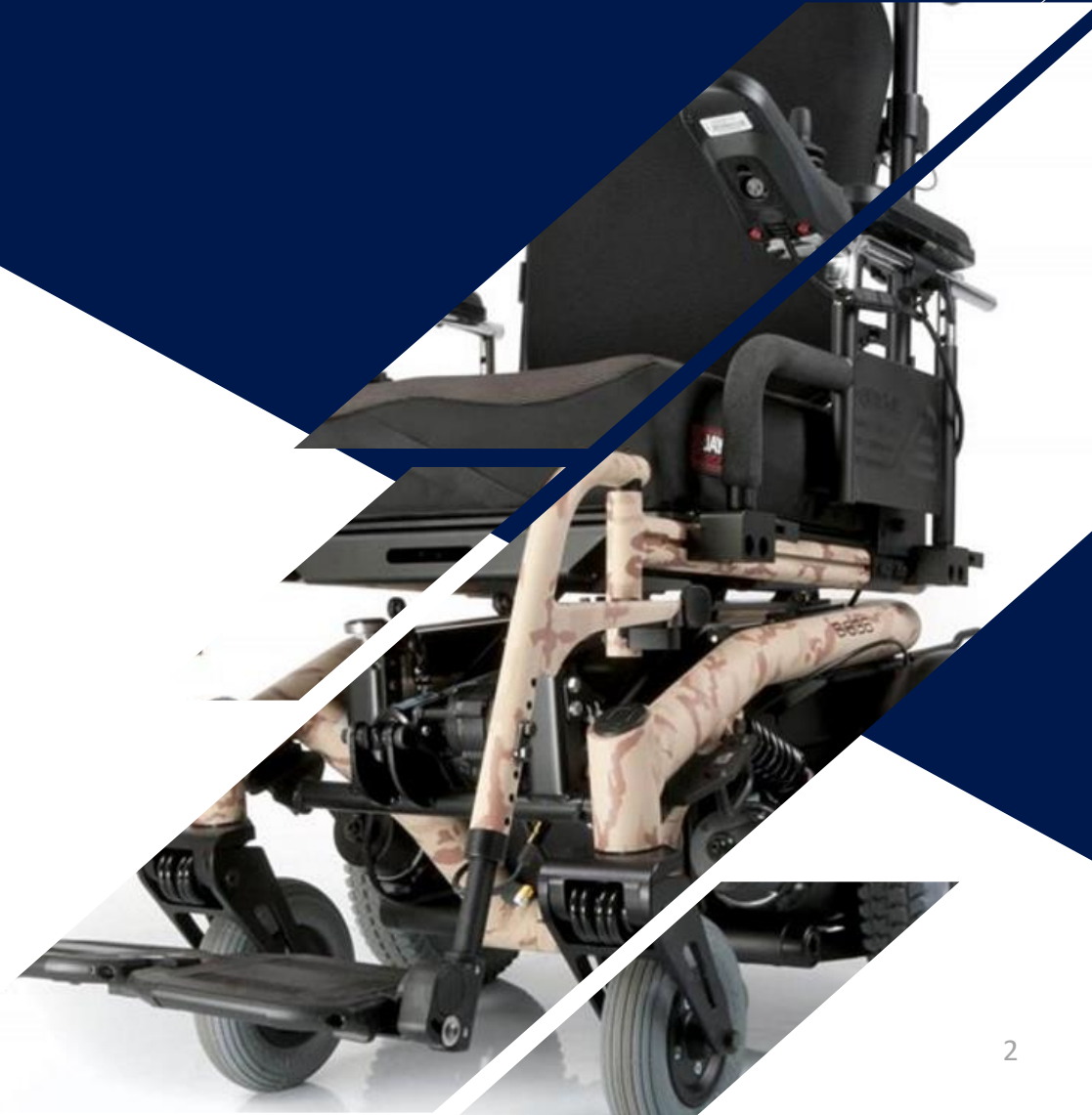
Final Presentation

Presented by Adin, Grant, Hamza,
Iddo and Tyson

Requirements

Wheelchair Collapsible Cup Holder

- Needs to be designed for left-handed use
- Needs to be usable from different angles
- Need to holds various cup sizes
- Needs to be collapsible (when not in use)
- Need to allow passage through doorways



Detailed Objectives

Wheelchair Collapsible Cup Holder

- Accessibility
 - Should be able to move to various locations parallel and in operable reach of the left-hand.
- Expandability
 - Should be able to hold cup sizes ranging from diameters of 7 cm to 9 cm
- Stability
 - Should be able to hold the drink at angles of inclination/declination up to 40 degrees.
- Collapsibility
 - Should be able to collapse to 25% of protrusion



Constraints

Wheelchair Collapsible Cup Holder

- Constraints imposed by client follow:
 1. Must not restrict functionality of the Quickie S-656 wheelchair - notably the Dual post Height Adjustable Flip Back Armrest
- Constraints imposed by regulations follow:
 2. Must not exceed total width (including the width of the wheelchair) of 810 mm.



Primary Functions

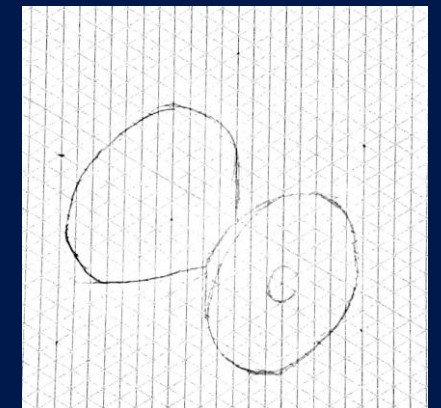
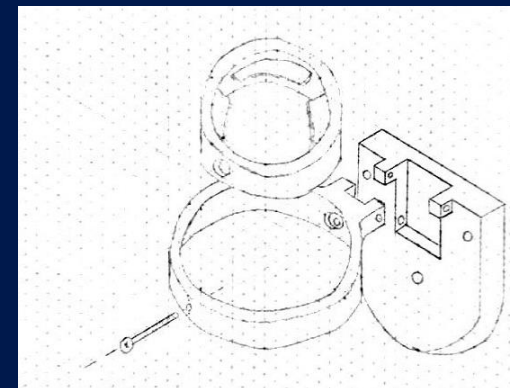
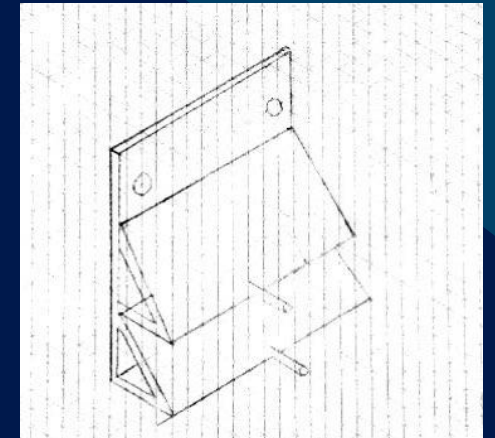
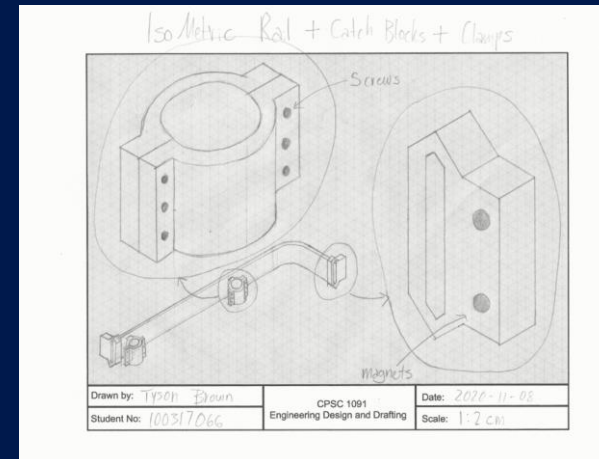
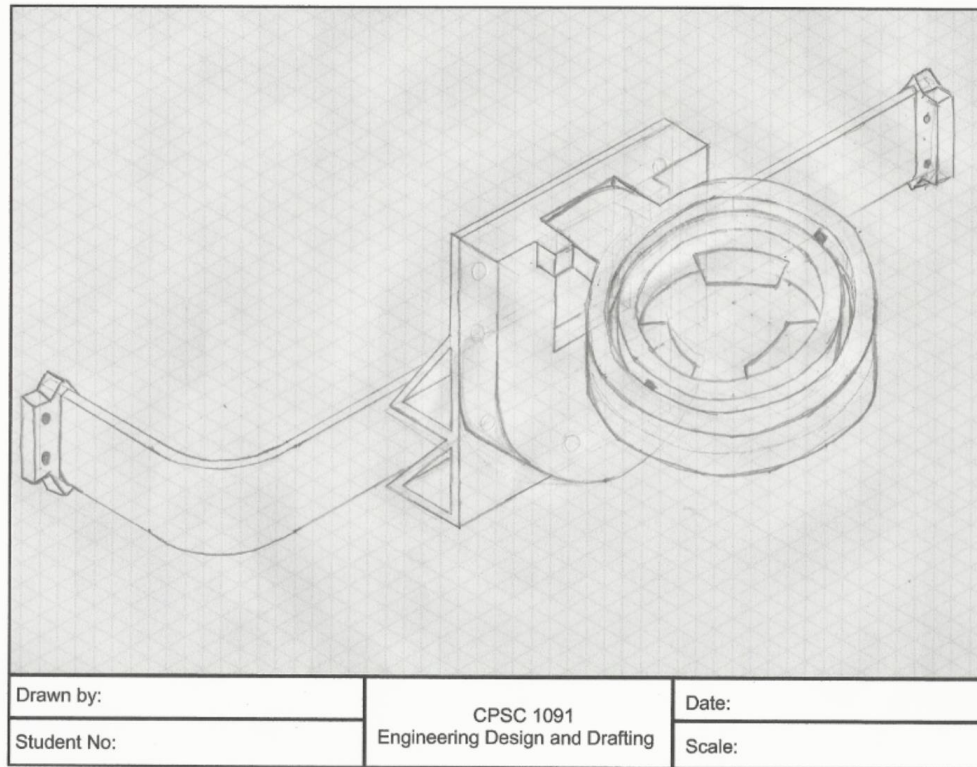
Wheelchair Collapsible Cup Holder

- Holds drink in place
- Holds cups of different sizes
- Moves the cup to different places



Proposed Design: Initial Designs

Wheelchair Collapsible Cup Holder



Objective Comparison

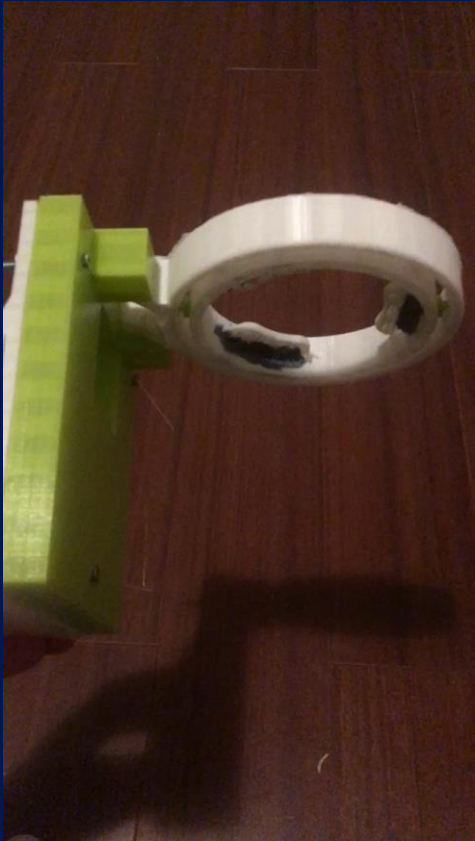
Wheelchair Collapsible Cup Holder

Accessibility	Expandability	Stability	Collapsibility
✓	✓	✓	✓



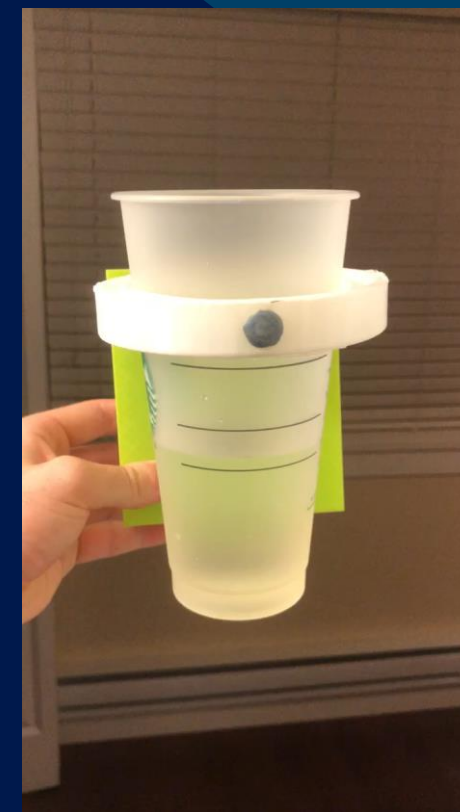
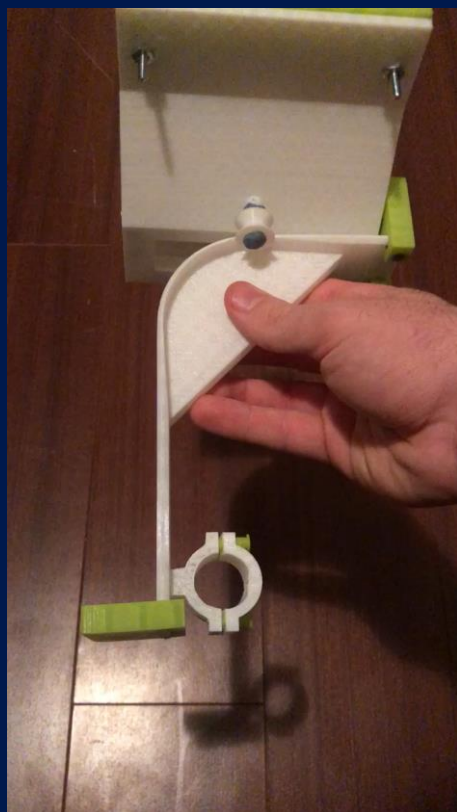
Prototyping and Testing

Wheelchair Collapsible Cup Holder



Prototyping and Testing

Wheelchair Collapsible Cup Holder



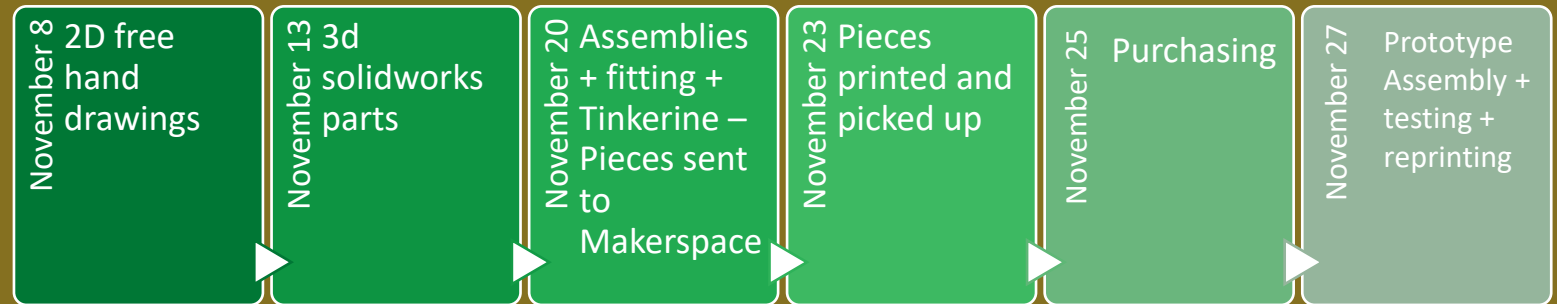
Prototyping and Testing

Wheelchair Collapsible Cup Holder

Faults in first prototype:

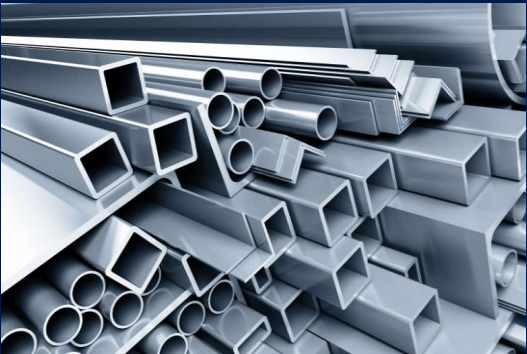
- a. Design flaw – support does not fit
- b. Flap on inner ring – break
- c. PLA printed bolts – not sturdy enough

Prototyping Timeline



Economics

Wheelchair Collapsible Cup Holder



Raw Materials: 93.82 USD



Manufacturing: 179.06 USD

Total: 272.88 USD

Life Cycle

Wheelchair Collapsible Cup Holder

1. Raw Material Extraction
2. Manufacturing
3. Machining
4. Transportation
5. End of Life





Thank you

