

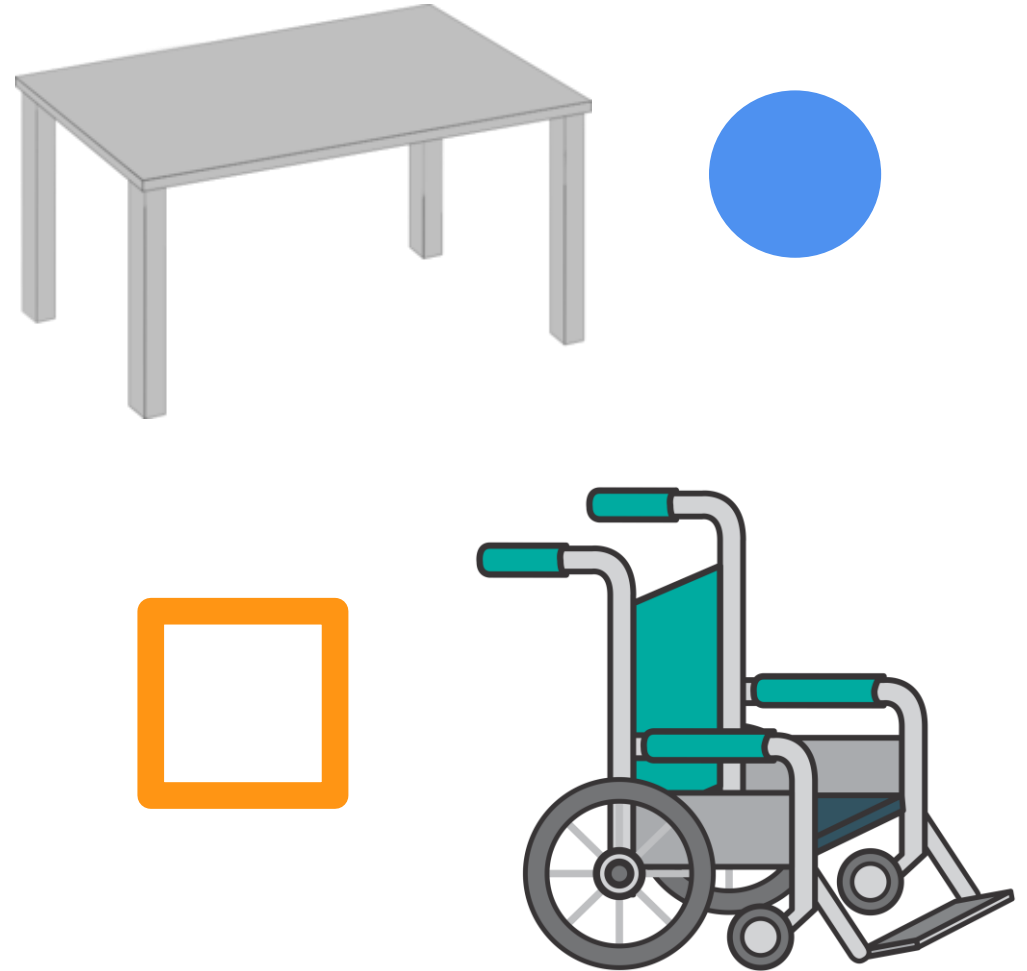
Adjustable Play Table

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Our Challenge

- Client has a genetic disorder: no muscle support in her legs
- Requires a table that can fit around her wheelchair and accommodate a variety of activities
- Current options on the market are limited; they accommodate some but not all the client's desires, and are usually out of budget





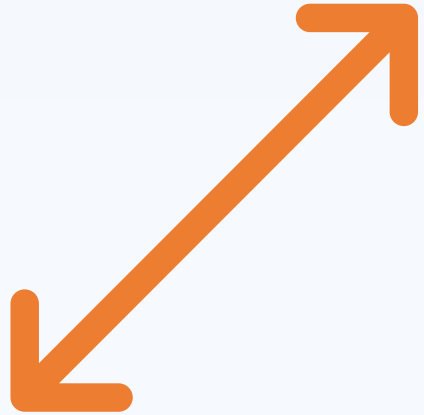
Problem Statement

"Design an adjustable, versatile, and cost-efficient table for children with disabilities, specifically those with hindered motor skills, that can accommodate everyday tasks and be compatible with a wheelchair."

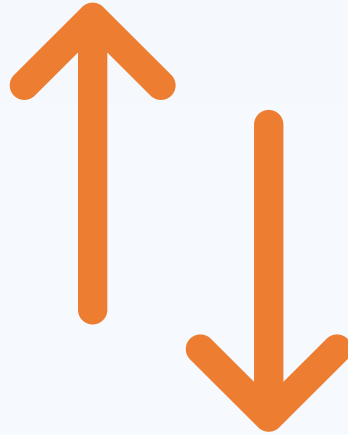
A person is seated in a wheelchair, positioned in the center-right of the frame. The wheelchair is a standard manual model with a red seat and silver frame. The person's hands are resting on the large rear wheel. The background is a brightly lit hospital hallway, with numerous circular ceiling lights that are out of focus, creating a bokeh effect. The overall image has a dark, semi-transparent overlay. In the bottom-left corner, there is a decorative graphic consisting of several short, curved teal lines. In the bottom-right corner, there is a small white number '4'.

Client Needs

Adjustability



Adjustable
from **1ft to
4ft** and angle



Adjustable in
increments
of around **2"**



Easily
Adjustable
(ideally by
user)

Safety

- Client wants it to support **100lbs**
 - Prevent falling over when pushed



- Table must be strong and durable - Long lifespan
- No sharp edges or any **hazards**

Portability

- Needs **wheels** to easily move around the house
- Other **surfaces** i.e. outside, more places the better
- Pack into **car** to go to grandma's house
 - Disassemble?

Ease Of Use And Maintenance

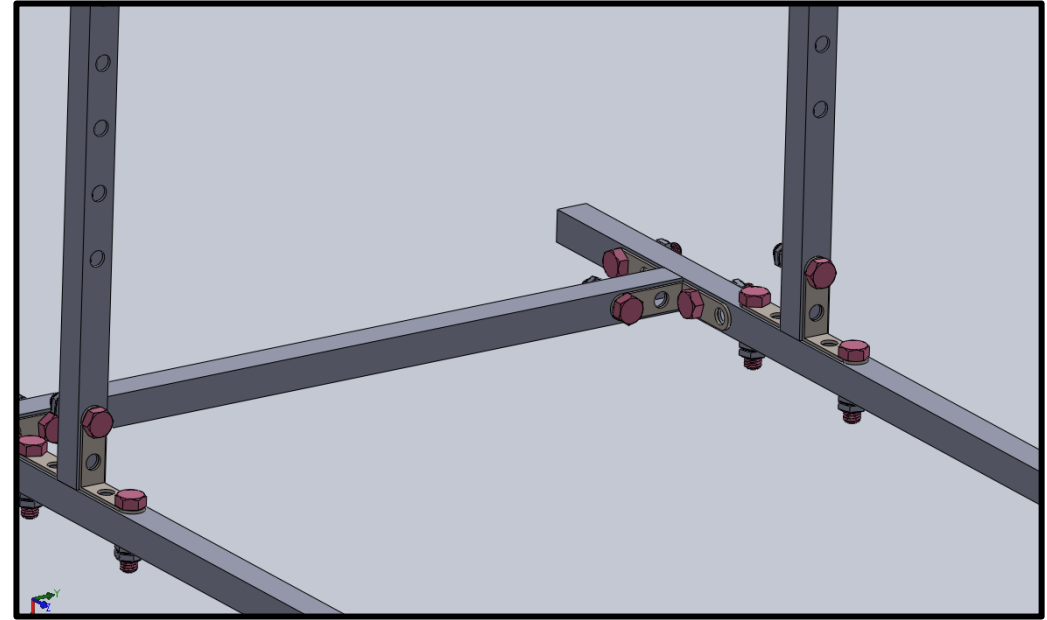
- **Easy** adjustable mechanism
- **Simple** controls
- Client can adjust independently
- Easily **cleaned**
 - Tabletop - From painting or eating
 - Wheels





Global Design

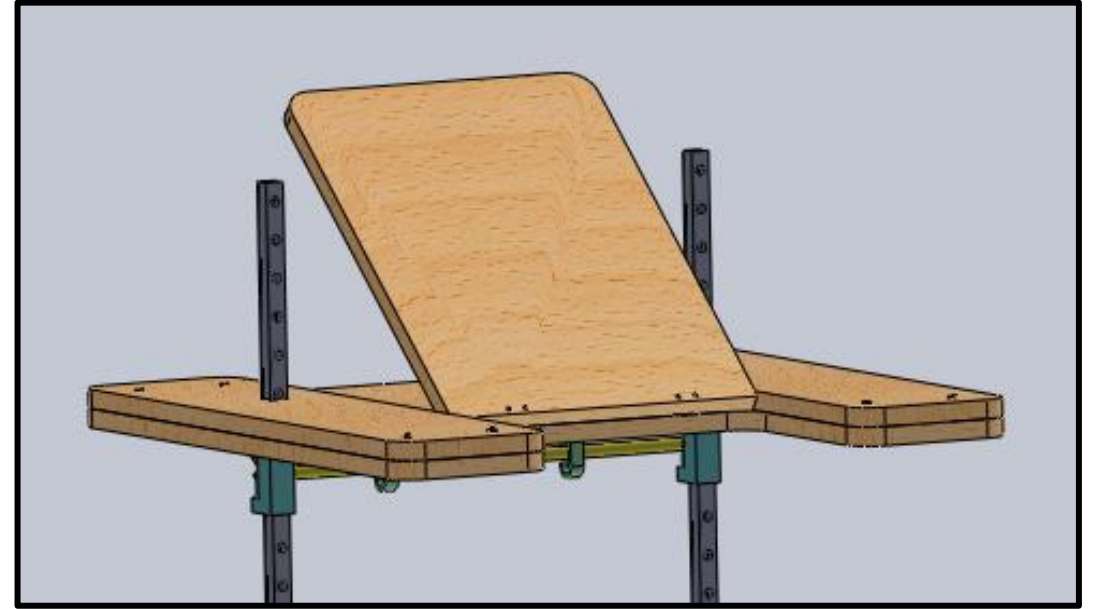
Legs + Frame



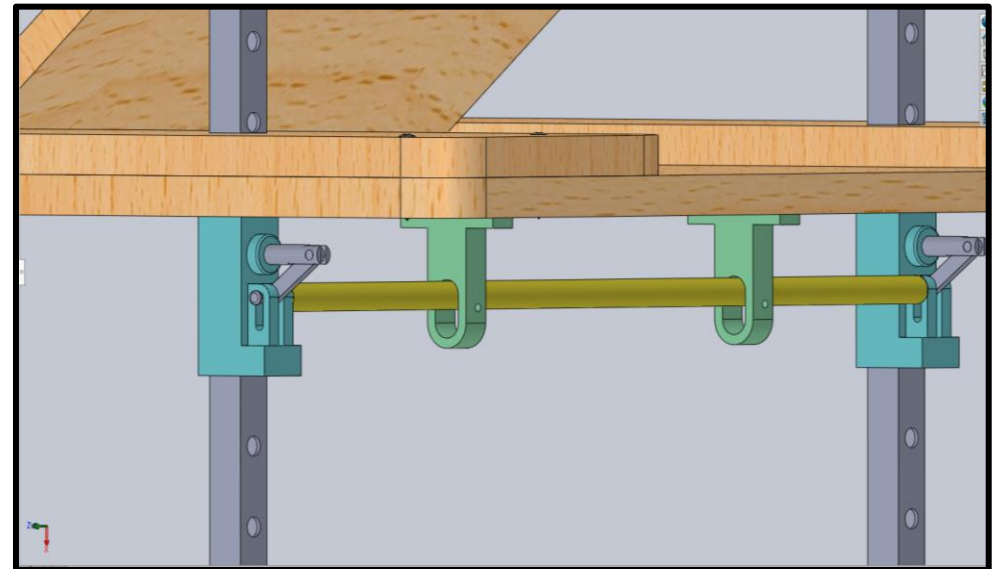
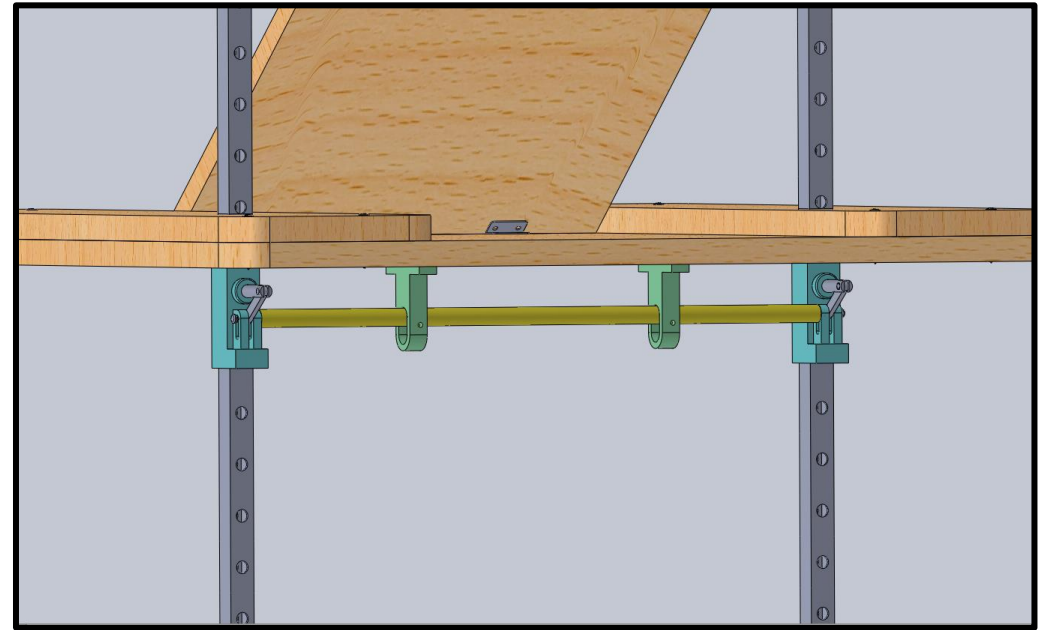
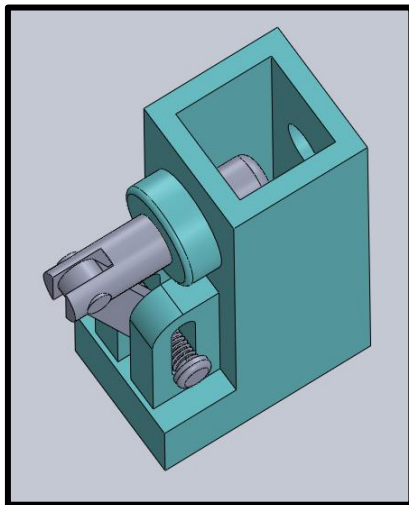
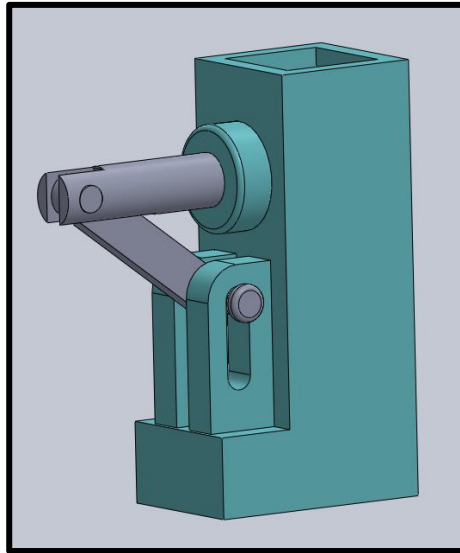
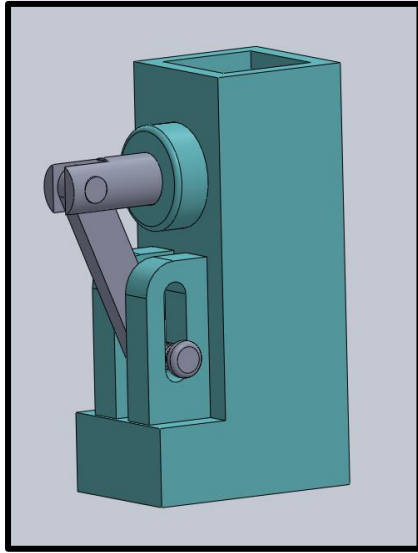
- H-Shaped Frame -
Connecting Rod positioned back
- Double nuted brackets
- 0.5 inch diameter holes, 2 inches apart

Tabletop

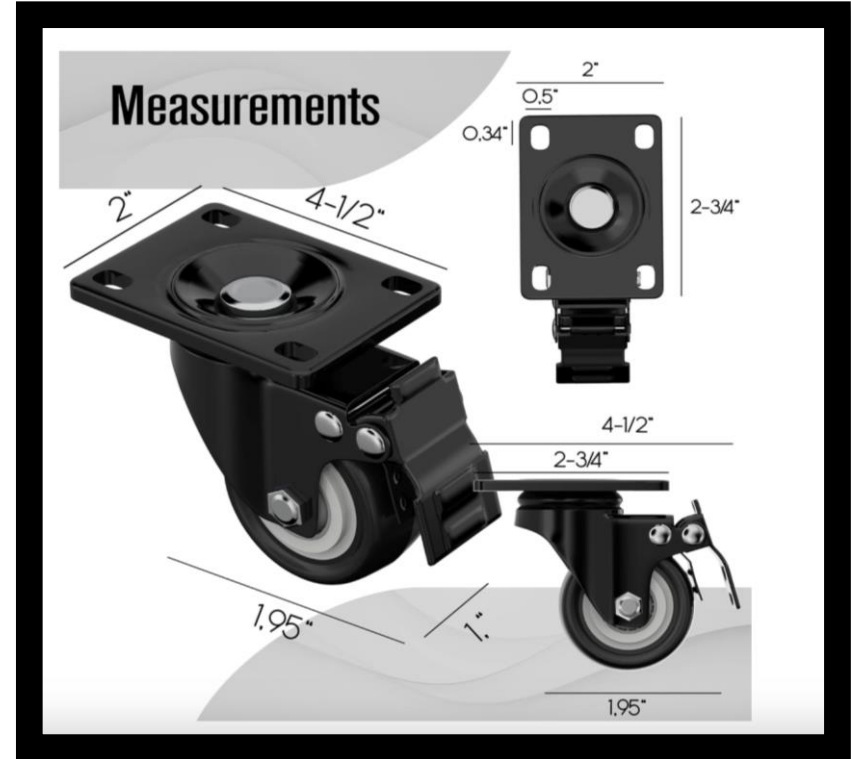
- Door hinges to adjust angle
- Supported with separate wooden plank
- Similar to a drawing tablet
- Can sit flush



Adjustability



Wheels



BOM

Price (\$CAD)	Part Name	Part Usage Description	Quantity
\$24.08	Caster Wheels	Wheels of the table, so they can move & also lock	1 Package x 4 wheels
\$32.58	Plywood	Tabletop	1
\$32.28	Aluminum Square Tubing	Legs of the Table	2
\$2.73/foot	Aluminum rods	Used for lever mechanism	One 3 feet
\$29.95	Filament - PLA	Lever mechanism, caps	N/A
Total Cost: \$127.08 (\$143.60 Including Taxes)			
Total Cost (With Free Materials): \$98.08 (\$110.83 Including Taxes)			

Project Plan

- Heavy course loads necessitate efficient time management.

- Allocate a minimum of 4 hours per week as a group.

- Dedicate 2-3 extra hours during lighter course load periods.

- Implementation phase allows around a month, allowing flexibility.

- Project divided into body and tabletop components.

- Each component takes a minimum of 2 weeks or 30 hours.

- Project plan organized in Wrike with deliverable development plans.

- Commitment to close project plan tracking for timely final prototype delivery.

Client Feedback



- Satisfaction with the initial design idea.



- No concerns about the adjustment mechanism.



- Adding soft covers or caps on the two metal bars to enhance safety.



- Emphasized primary use indoors and outdoors, highlighting the importance of compactness and portability.



- Need for a compact design, even if it takes more time to disassemble.

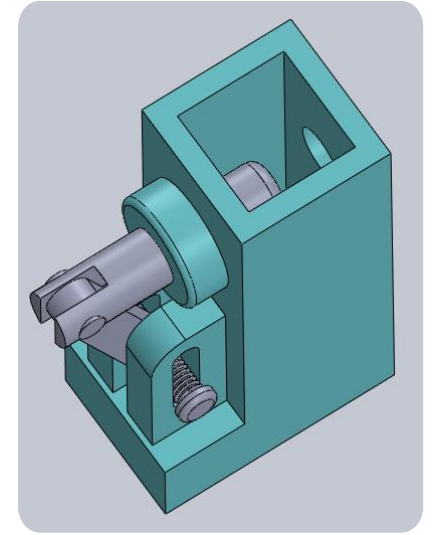
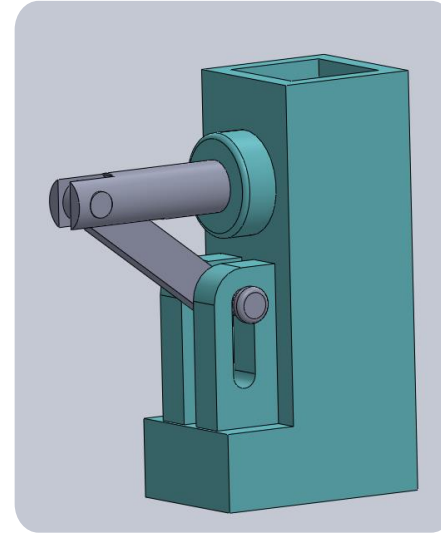
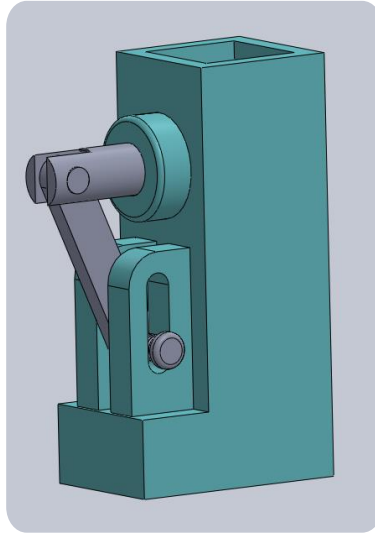


- Suggested the ability to take the top off for enhanced compactness.

A person is seated in a wheelchair, positioned in a brightly lit hospital hallway. The person's hands are resting on the large rear wheels of the wheelchair. The background is filled with rows of hospital beds, each with white linens, receding into the distance. The overall scene is dimly lit, with a dark overlay that makes the white text stand out. In the bottom left corner, there is a decorative graphic consisting of several short, curved cyan lines. The word "Prototypes" is centered in a large, white, sans-serif font.

Prototypes

Prototype A: Pin/Slider



See for yourself!

What we learned from prototype

- Factor in more time to make parts
- Aim for greater precision
- Give more room for fits
- 3D printing will work for some parts
- Consider tolerances



Info for Next Meeting

- General thoughts?
- Table sizing enough?
- Portability issues? Can be disassembled
- Safety Issues?
- Any updates?



Thank you for
your
attention!

