Adjustable Play Table

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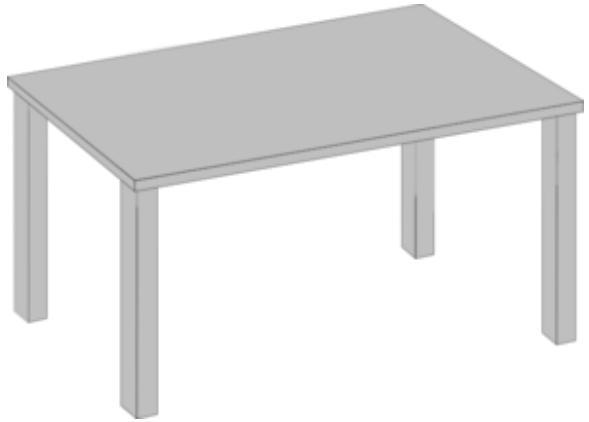
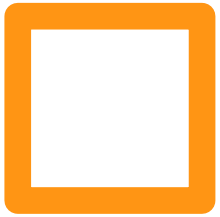
Our Challenge

- 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



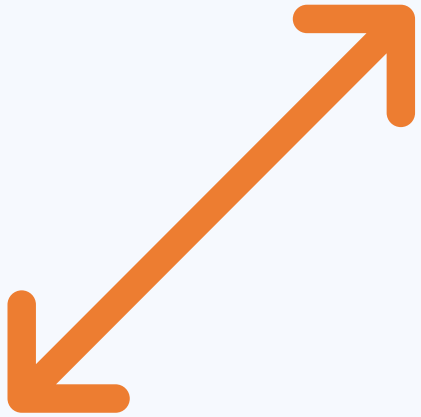


Problem Statement

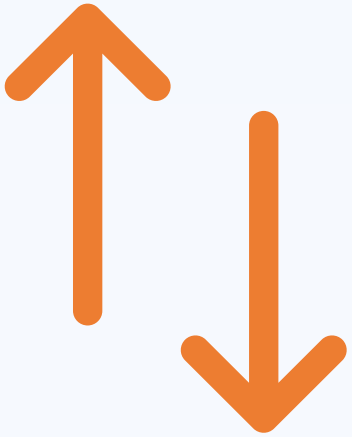
"Design an adjustable, versatile, and cost-efficient table for children with disabilities, specifically those with hindered motor skills, that can accommodate everyday tasks and be compatible with a wheelchair."

Client Needs

Adjustability



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

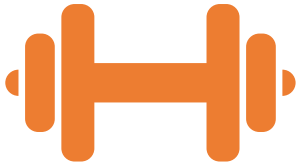


Adjustable in **increments** of around **2"**

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

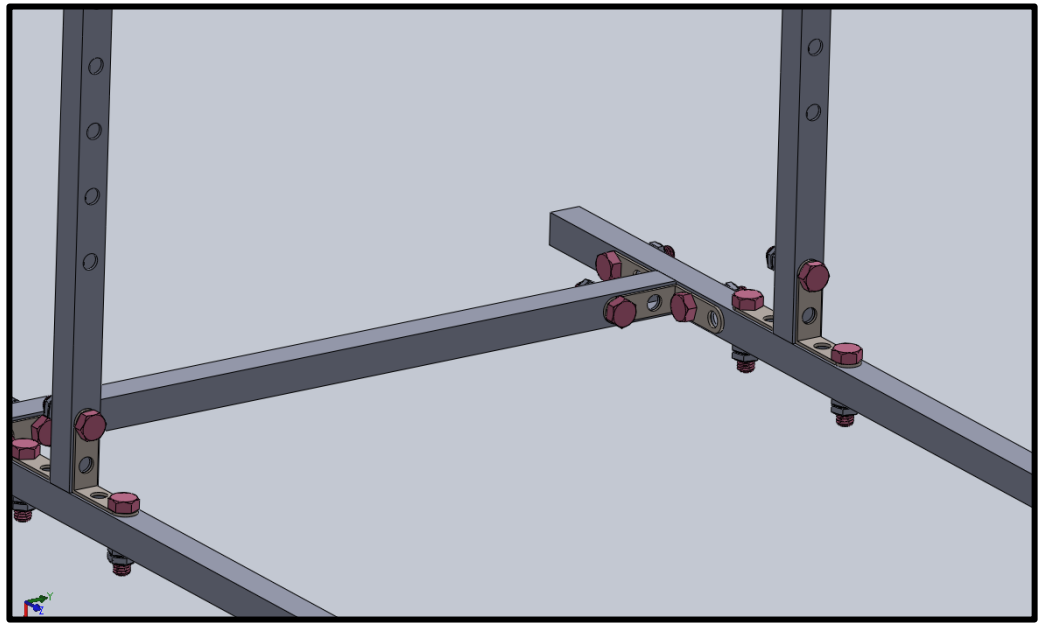
- Needs **wheels** to easily move around the house
- Other **surfaces** i.e. outside, more places the better
- Pack into **car** to go to grandma's house
  - Disassemble?

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

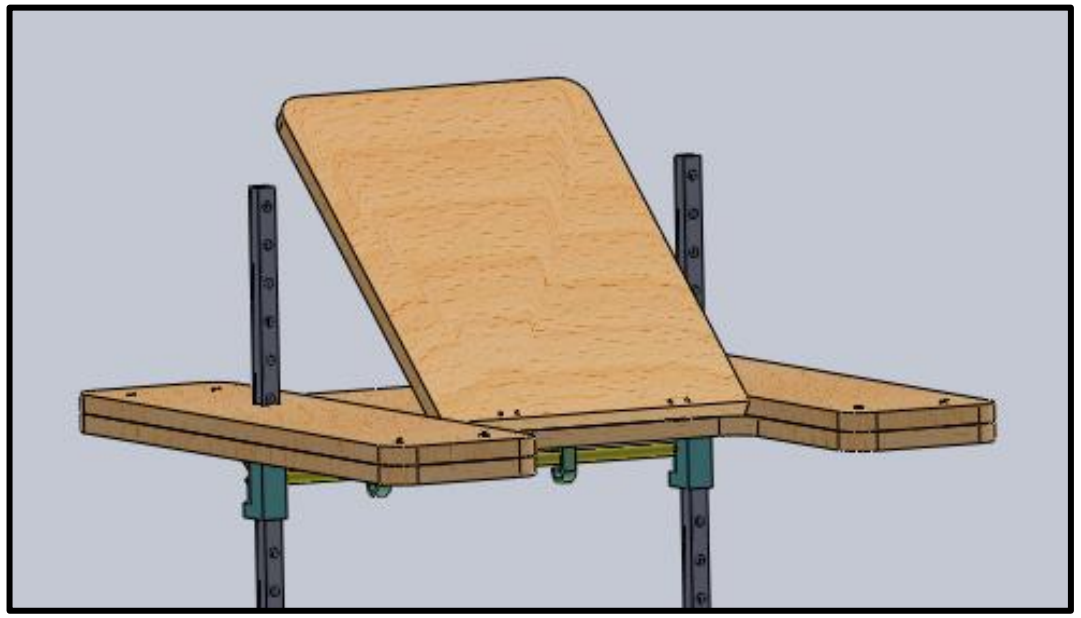


- H-Shaped Frame – Connecting Rod positioned back
- Double nutted brackets

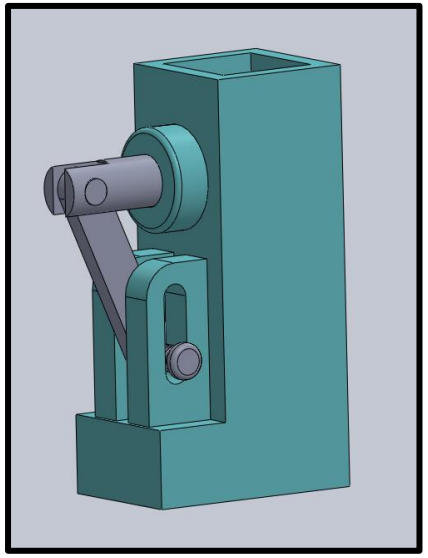
- 0.5 inch diameter holes, 2 inches apart

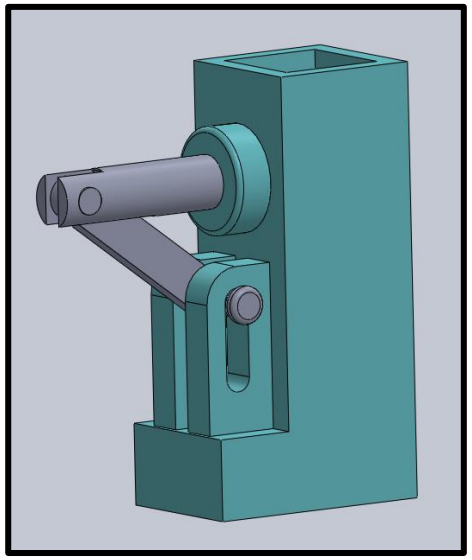
Tabletop

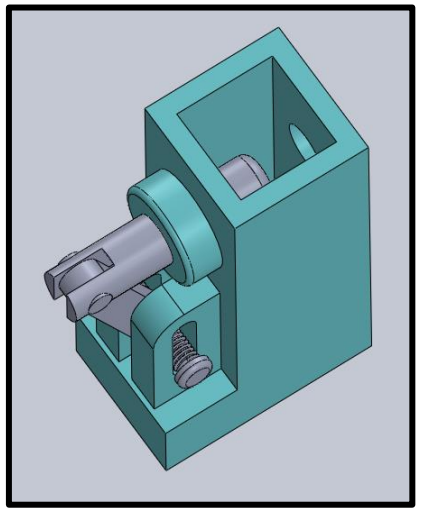
- Door hinges to adjust angle
- Supported with separate wooden plank
- Similar to a drawing tablet
- Can sit flush

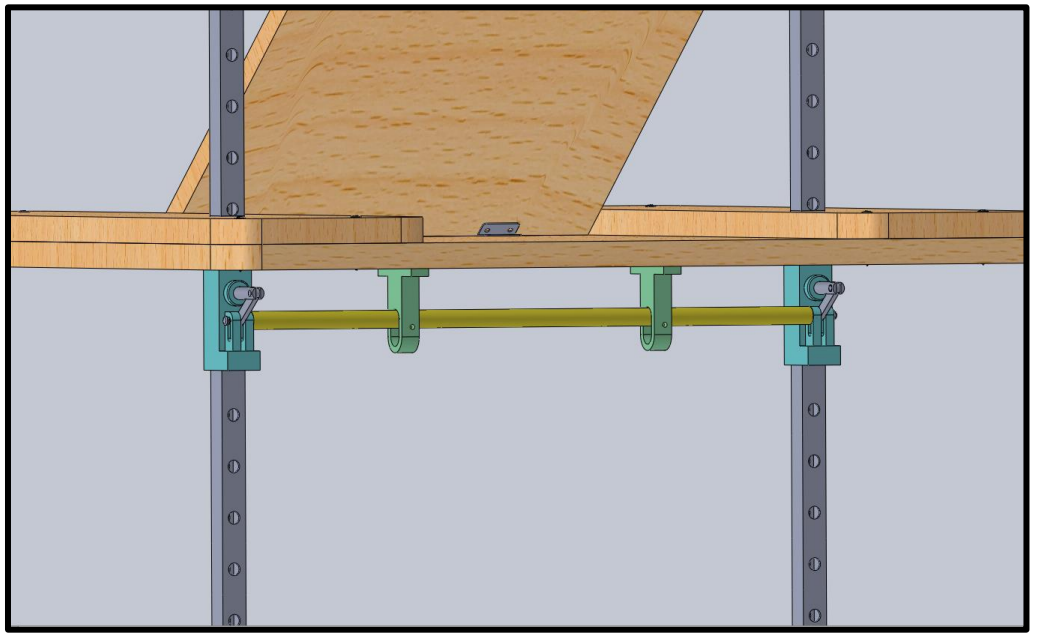


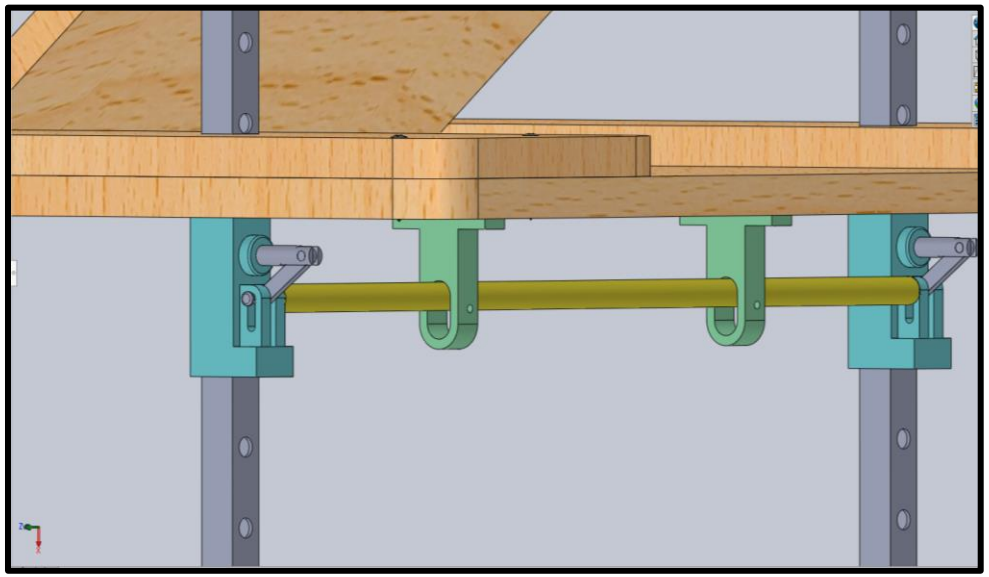
Adjustability



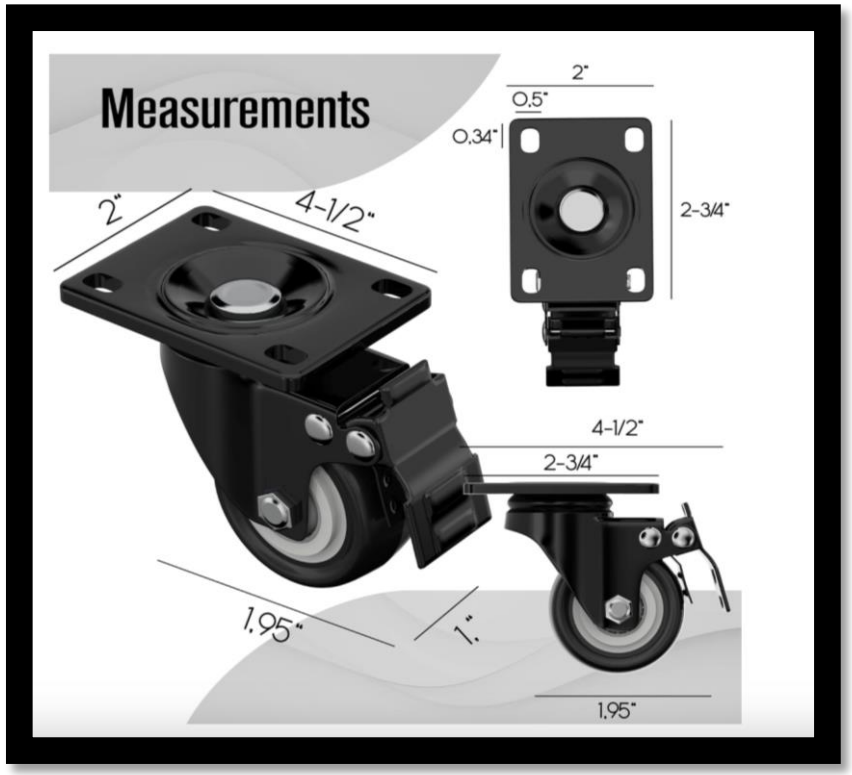








Wheels



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

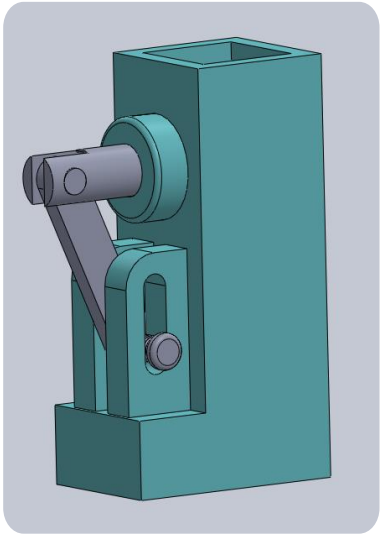
- Heavy course loads necessitate efficient time management.
- Allocate a minimum of 4 hours per week as a group.
- Dedicate 2-3 extra hours during lighter course load periods.
- Implementation phase allows around a month, allowing flexibility.
- Project divided into body and tabletop components.
- Each 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.

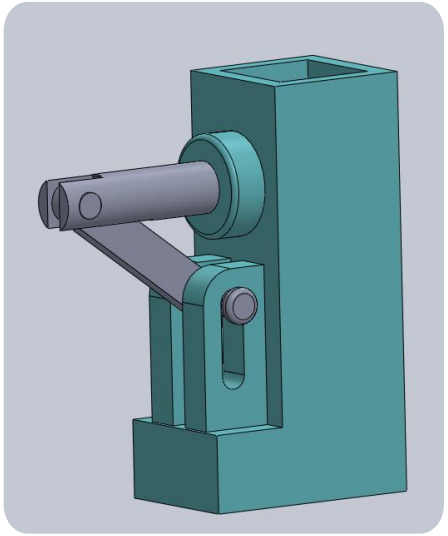
Client Feedback

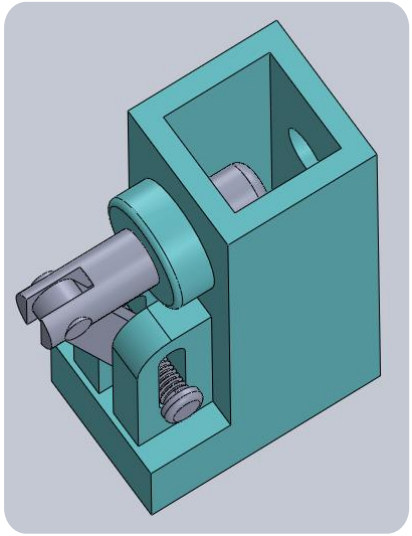
- Satisfaction with the initial design idea.
- No concerns about the adjustment mechanism.
- Adding soft covers or caps on the two metal bars to enhance safety.
- Emphasized primary use indoors and outdoors, highlighting the importance of compactness and portability.
- Need for a compact design, even if it takes more time to disassemble.
- Suggested the ability to take the top off for enhanced compactness.

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!