

ME110 GROUP 15

METAMORPHIC DESIGNS



MEET THE TEAM

Founders of Metamorphic Designs



Jack



Aaron



Antonio



Meta



Cyrus



Sophya

METAMORPHIC DESIGNS MISSION STATEMENT

*“Metamorphic Designs is looking to create a functional prototype for a table with the capacity to become **both a coffee table and full-sized dining table**, primarily targeting college students and city-dwelling consumers living in small apartments; emphasizing **ease of transport, ease of use, style, and affordability**”*

01

BUSINESS OPPORTUNITY



MARKET RESEARCH



8x

Number of times the average American under 40 will move

Source: FiveThirtyEight.com



292 sq ft

Approximate size of average living space per capita in cities

Source: RentCafe.com

6% annual growth

Expected growth of global small space furniture market

Source: Future Market Insights

COMPETITIVE LANDSCAPE

01

cosimates



- Confusing assembly instructions
- Low for a dining table

Source: Amazon.com

02

VINGLI



- Fragile, flimsy, cheap feeling materials
- No full dining table functionality

Source: Amazon.com

03

Expand Furniture



- \$1995 retail price (ON SALE)
- Minimal coffee table functionality

Source: expandfurniture.com



01 USABILITY

Ease of use, Ability to expand/contract easily once built.

02 COST

Should be as affordable, if not cheaper, than competitors.

03 STYLE

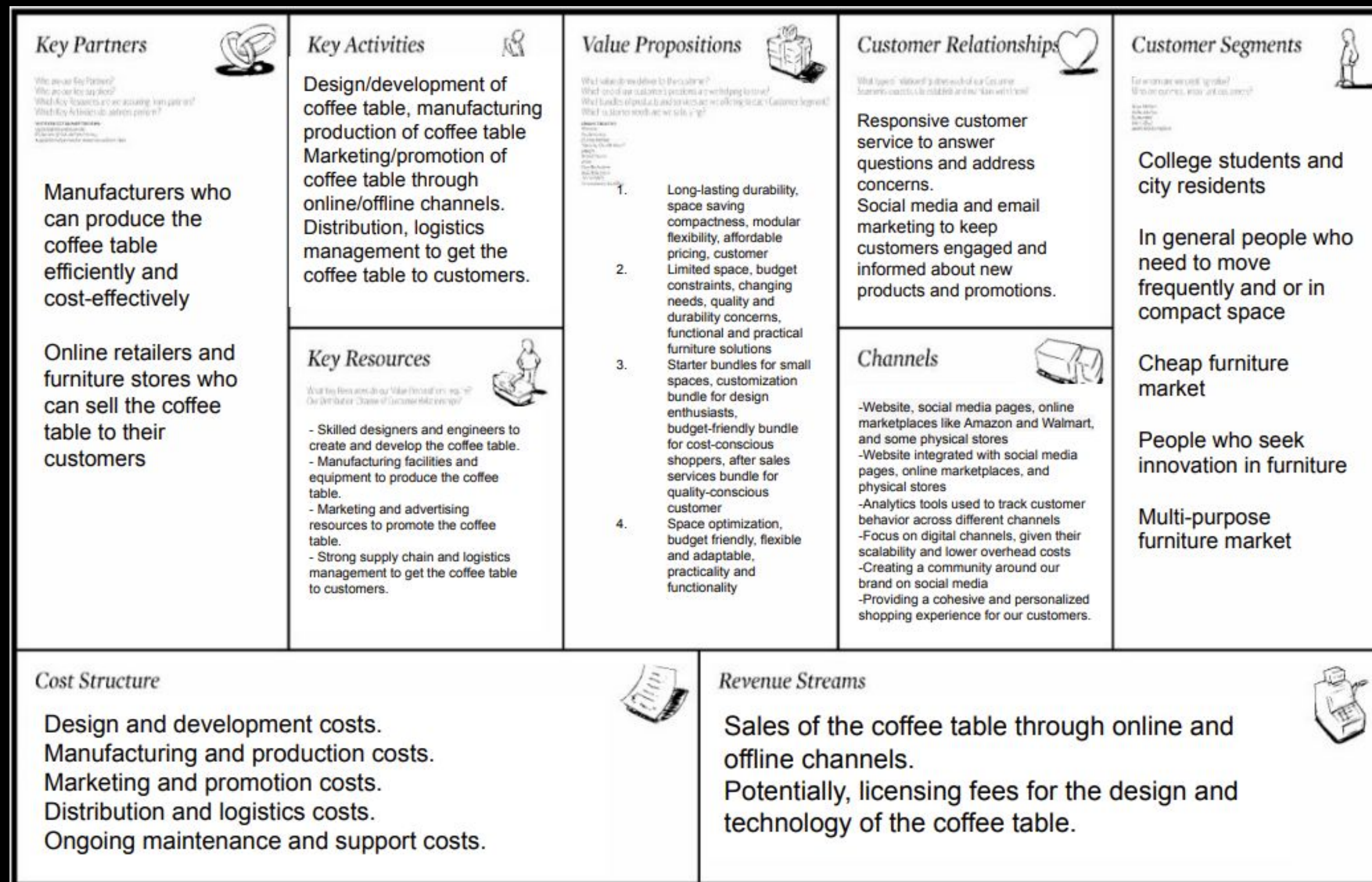
Desirable visual appearance,
Quality Materials

04 EASE OF ASSEMBLY

In-home assembly possible
quickly with common hand tools..

05 TRANSPORTABILITY

Should be able to be transported
during moving easier than
competitors.



BUSINESS MODEL CANVAS

PRODUCT SPECIFICATIONS



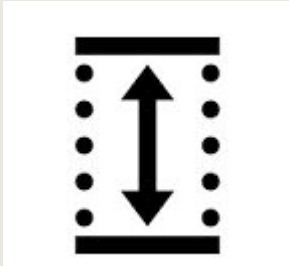
WEIGHT

40-50 LBS



DIMENSIONS

15 X 36 X 24 INCHES



FULL EXPANDED HEIGHT

28 - 30 INCHES



COST TO CONSUMER

\$100-200 USD



MAX LOAD

200-250 LBS



TRANSITION TIME

< 5 MINUTES



MATERIALS

Wood composite, aluminum fittings



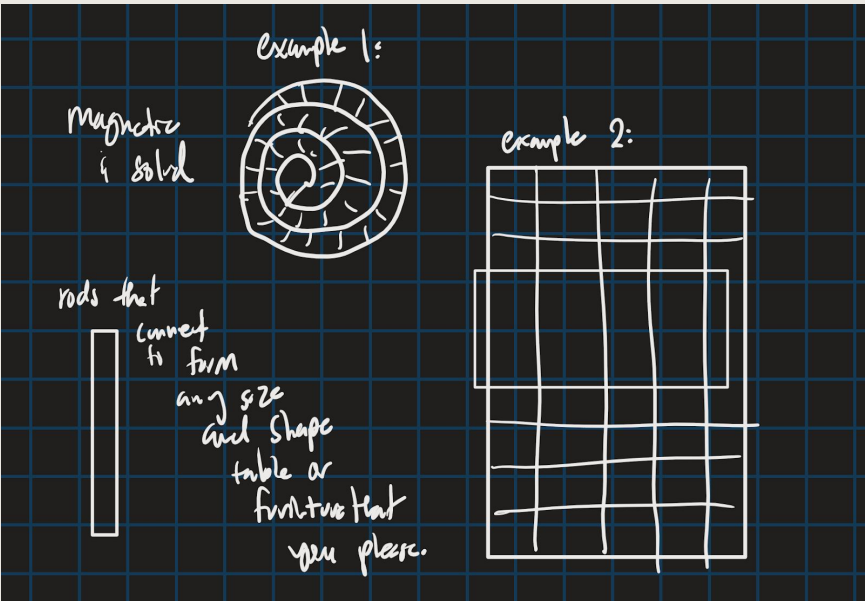
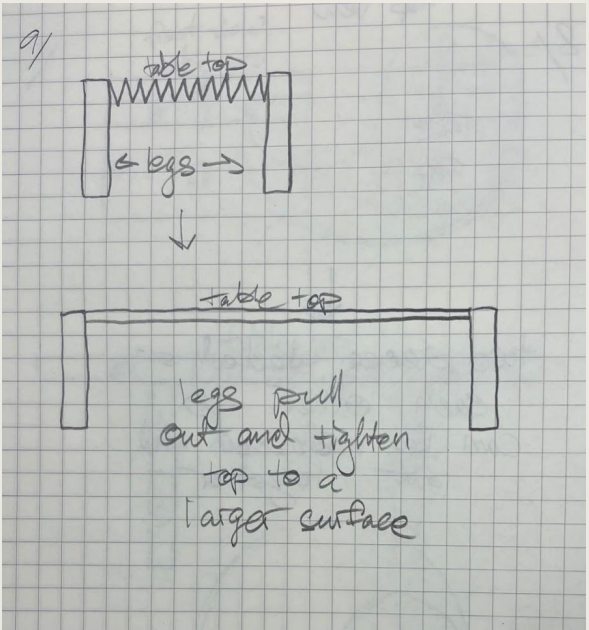
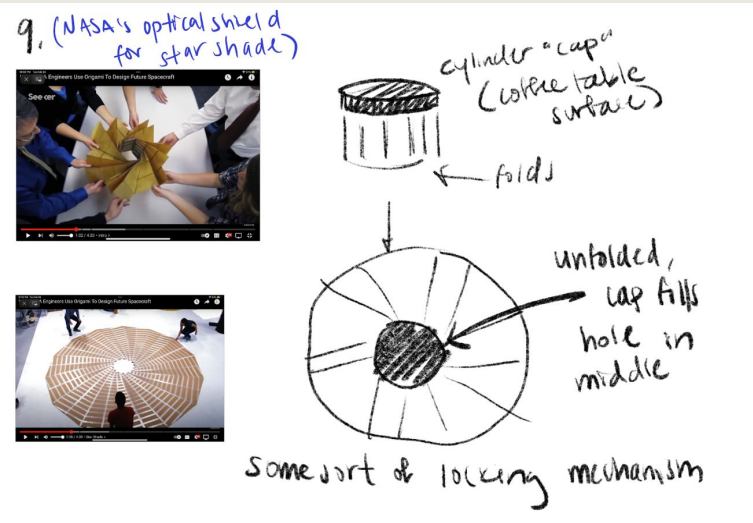
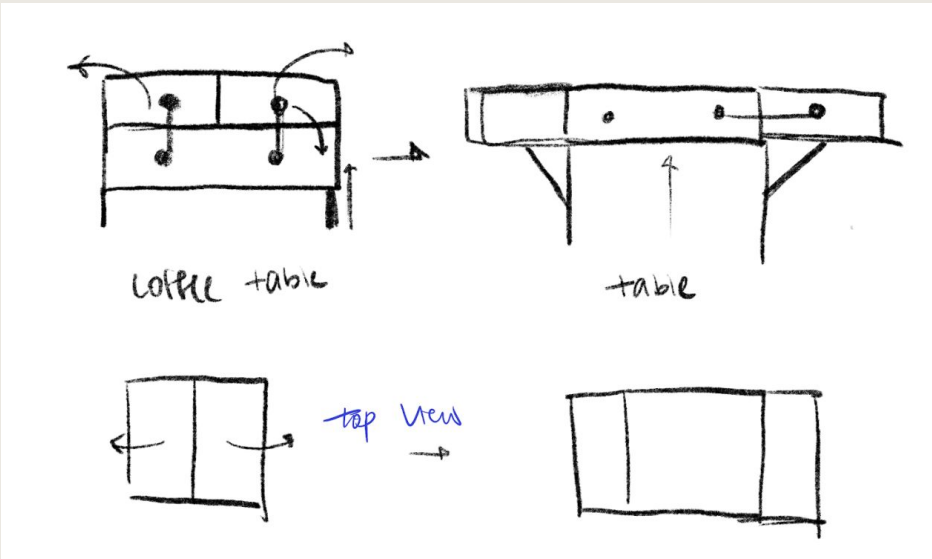
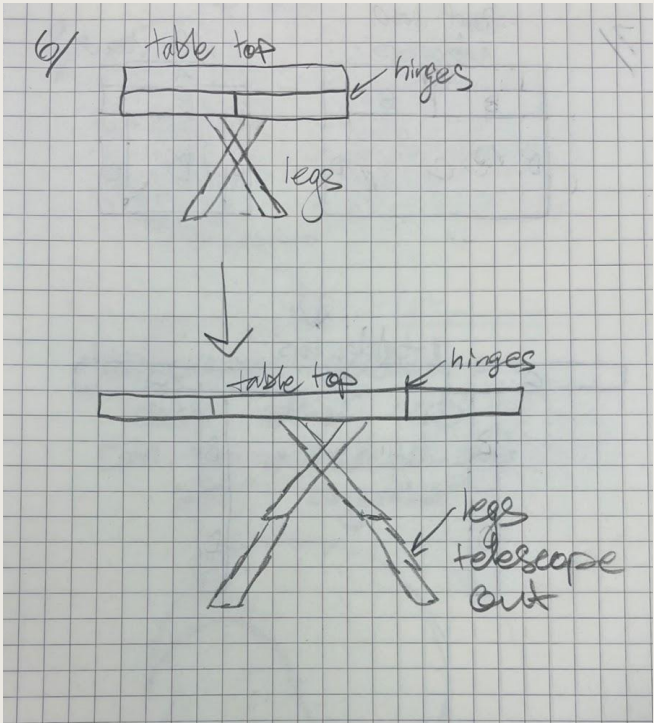
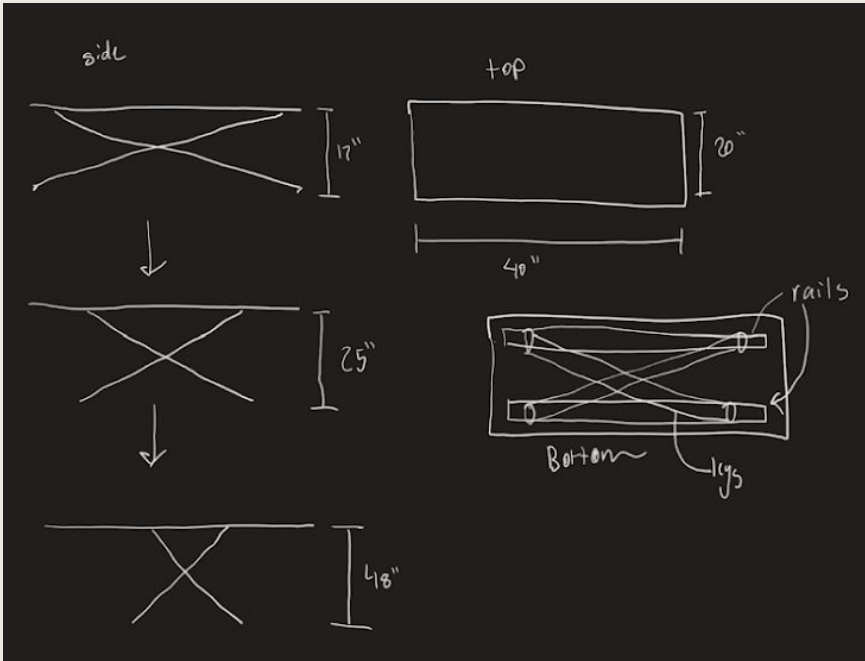
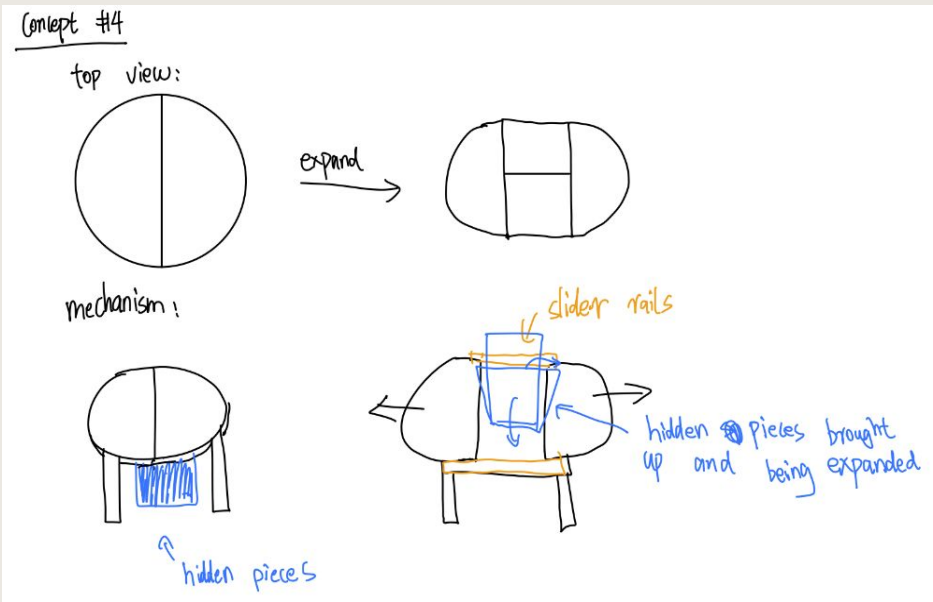
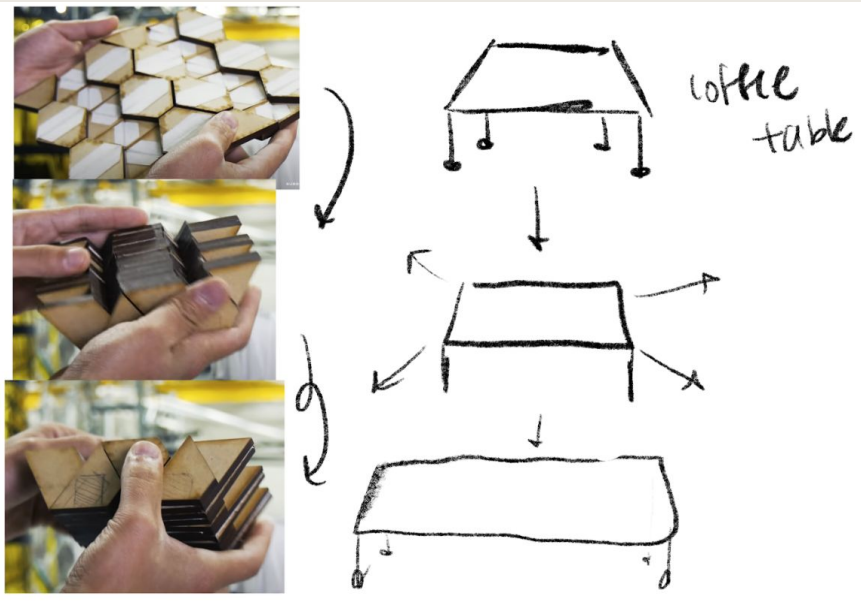
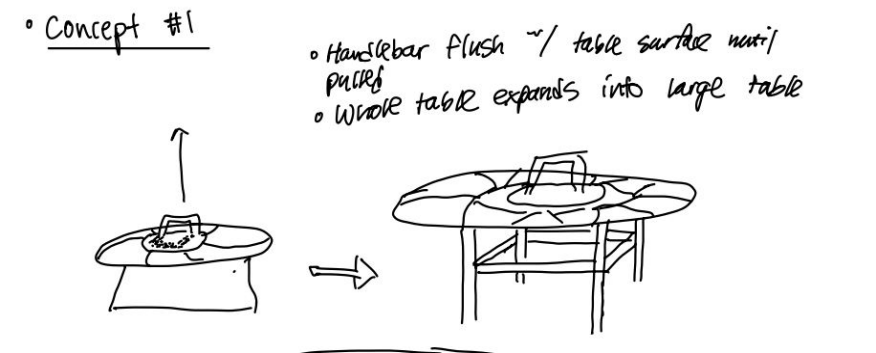
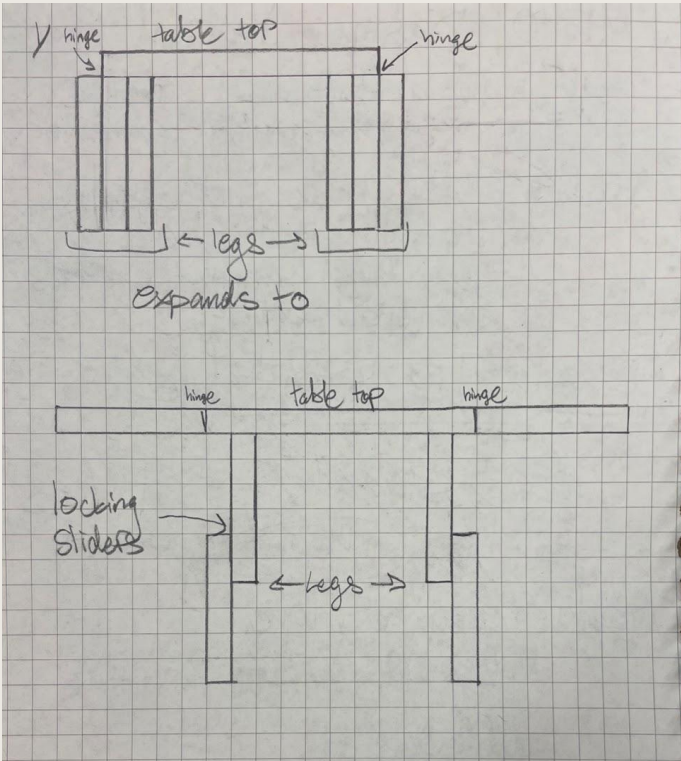
ASSEMBLY TIME

< 1 HOUR

02 CONCEPT SELECTION



BRAINSTORMING PHASE



IDENTIFYING CRITERIA

FOR USE IN
SCORING
CONCEPTS IN
SELECTION
PROCESS

USABILITY - 26%

AESTHETICS - 15%

MANUFACTURABILITY - 22%

EASE OF ASSEMBLY - 13%

SPACE EFFICIENCY - 16%

TRANSPORTABILITY - 8%

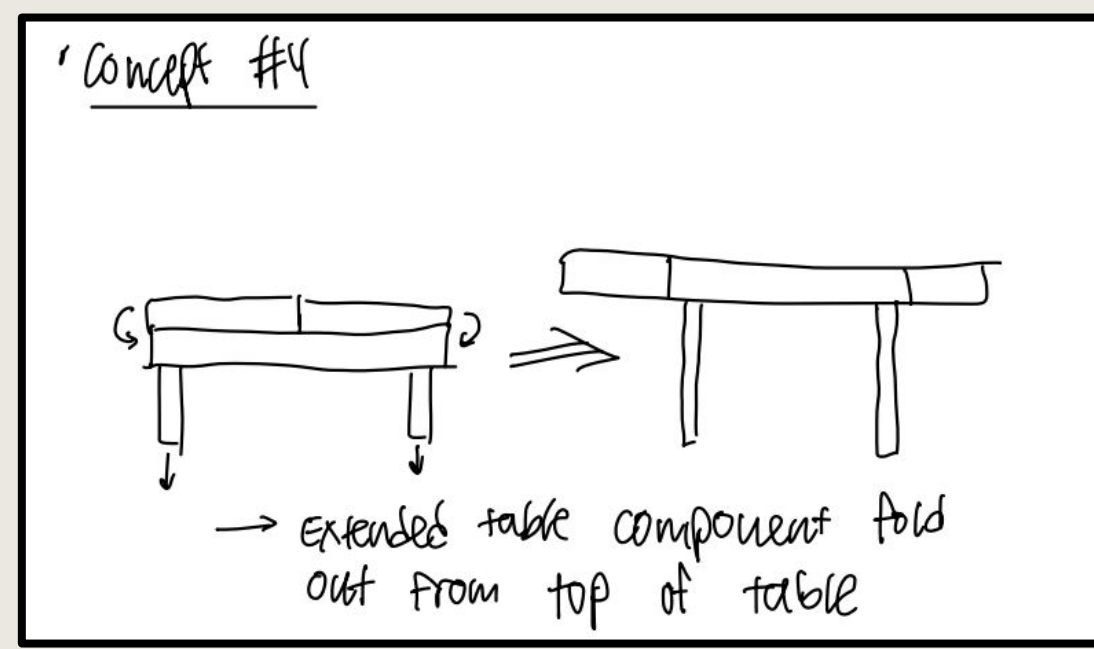
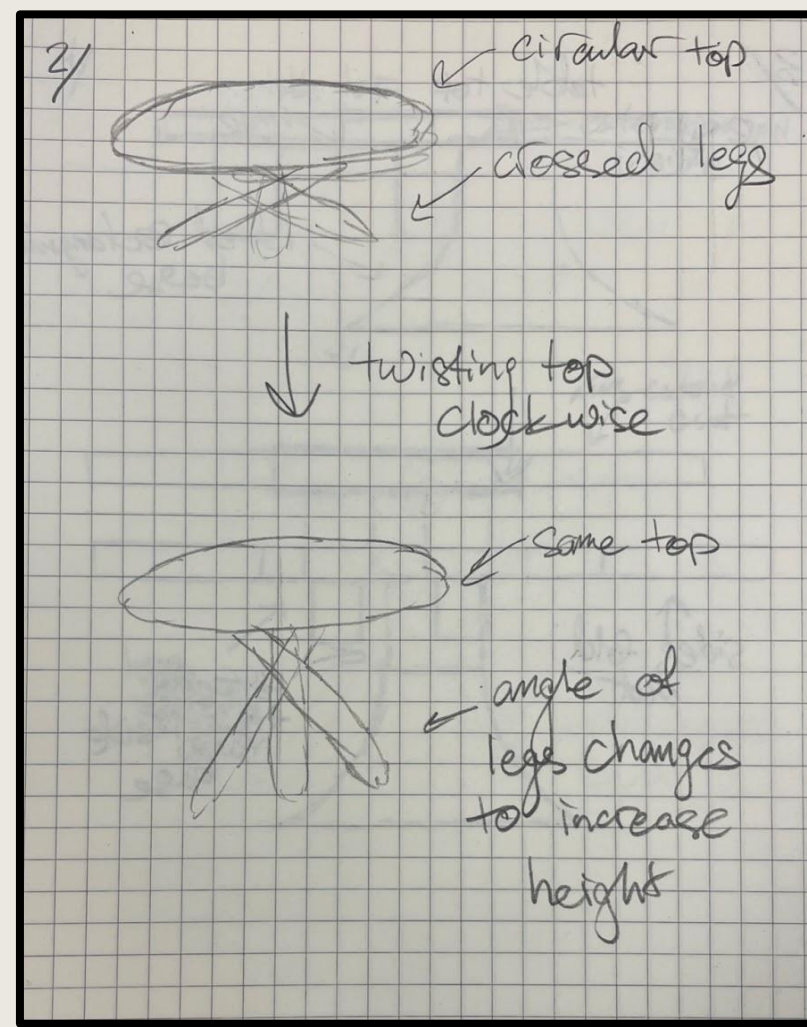
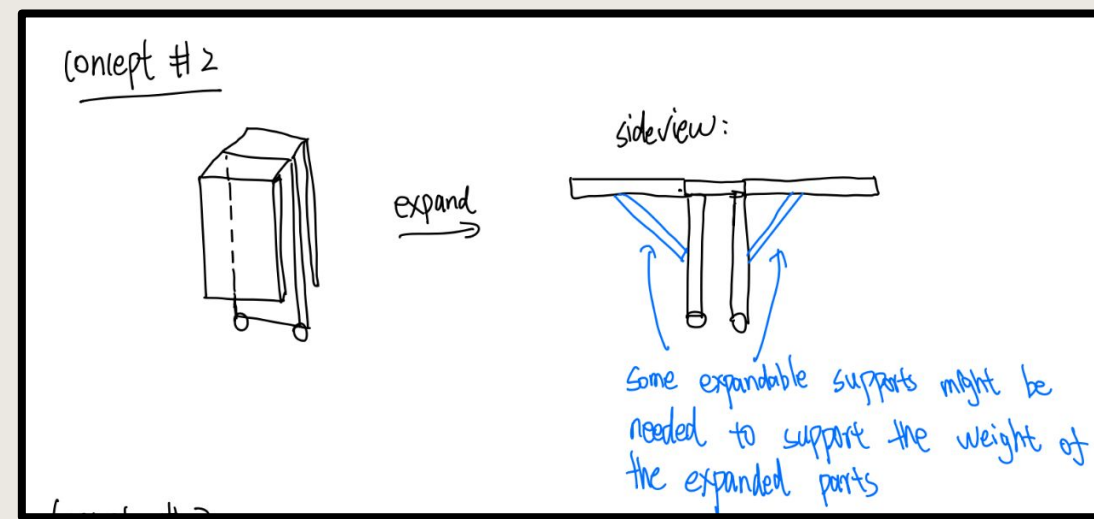
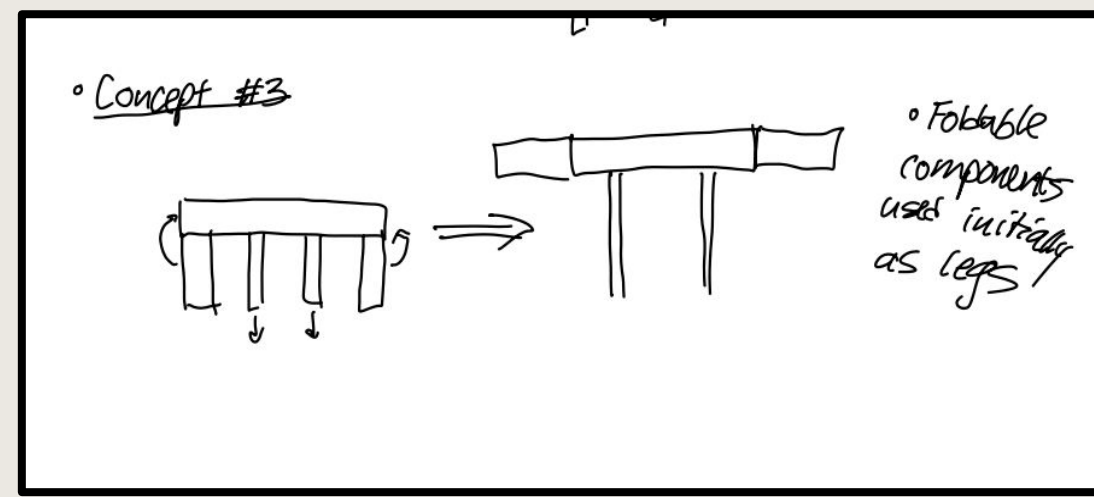
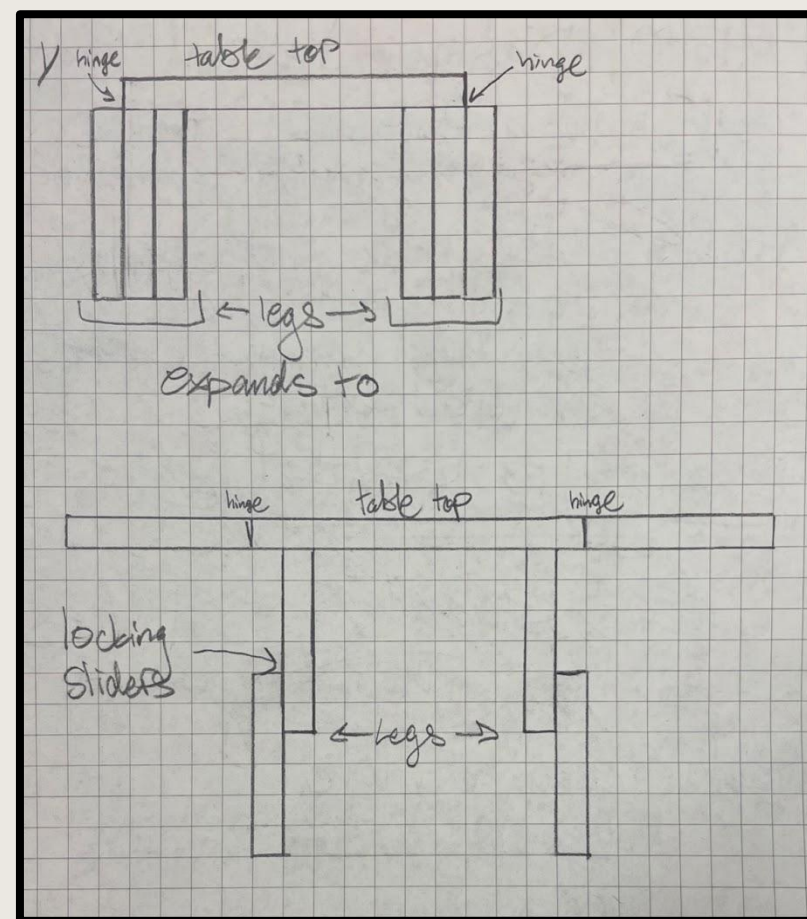
Ideas	Manufacturability (Aaron, Sophya, Antonio, Jack, Meta, Cyrus)						Usability (Aaron, Sophya, Antonio, Jack, Meta, Cyrus)						Space Efficiency/ Compact (Aaron, Sophya, Antonio, Jack, Meta, Cyrus)						Transportability (Aaron, Sophya, Antonio, Jack, Meta, Cyrus)						Aesthetic (Aaron, Sophya, Antonio, Jack, Meta, Cyrus)						Assembly (Aaron, Sophya, Antonio, Jack, Meta, Cyrus)						TOTAL SCORE		
Weight (%)	0.22	0.22	0.22	0.22	0.22	0.22	0.26	0.26	0.26	0.26	0.26	0.26	0.16	0.16	0.16	0.16	0.16	0.16	0.08	0.08	0.08	0.08	0.08	0.08	0.15	0.15	0.15	0.15	0.15	0.15	0.13	0.13	0.13	0.13	0.13	0.13			
AS1	1	1	1	1	1	1	1	1	1	1	1	0	0	-1	1	-1	-1	-1	-1	-1	-1	0	0	0	0	0	0	0	1	-1	-1	0	0	1	0	0	1	2.01	
AS2	1	0	0	0	0	-1	1	0	1	0	0	1	1	1	1	1	1	1	-1	0	0	-1	-1	-1	0	0	0	0	0	-1	0	0	-1	1	-1	-1	0	1.01	
AS3	1	1	-1	0	-1	0	0	1	0	0	1	1	1	1	1	1	-1	1	-1		0	-1	-1	-1	1	1	1	0	0	0	1	-1	-1	0	-1	-1	0	1.18	
AS4	0	0	0	0	-1	-1	1	-1	1	-1	-1	0	1	1	1	1	-1	1	-1	0	-1	0	-1	0	1	1	1	0	1	1	1	0	-1	0	-1	-1	0.19		
AS5	1	1	1	0	1	1	1	1	1	0	-1	0	0	1	1	0	0	-1	1		-1	0	0	-1	0	1	0	0	0	0	0	1	1	-1	1	0	0	2.11	
AH1	-1	1	0	0	1	1	1	0	0	1	1	0	0	0	0	1	1	0	0	1	-1	1	1	-1	1	0	0	0	1	0	0	1	1	1	1	1	0	2.57	
AH2	0	0	-1	-1	-1	-1	1	-1	1	0	1	0	0	0	1	1	0	1	0	0	-1	0	-1	0	1	0	1	1	1	1	1	-1	-1	-1	0	-1	-1	0.06	
AH3	1	1	1	1	1	1	1	0	1	1	1	1	1	-1	1	1	1	1	0	-1	-1	0	0	0	0	1	1	0	1	1	-1	0	1	1	1	1	0	4.07	
AH4	1	-1	0	-1	1	0	1	0	1	0	1	1	1	-1	1	1	0	1	0	0	-1	0	1	0	0	0	0	0	0	1	-1	1	-1	0	0	0	0	1.52	
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MZ1	-1	-1	0	1	1	1	0	0	1	1	1	1	1	0	1	1	1	0	0	0	-1	-1	1	1	1	0	1	1	1	1	-1	0	-1	1	0	0	1	2.48	
MZ2	-1	0	-1	0	1	0	1	-1	1	1	1	1	1	0	0	1	0	-1	1	0	-1	0	1	1	1	-1	1	1	0	1	1	1	0	0	0	1	0	1.85	
MZ3	0	-1	-1	-1	1	-1	0	-1	-1	-1	0	1	1	-1	1	1	1	0	1	-1	0	1	1	1	1	0	1	0	1	1	1	1	1	-1	0	0	0	0.27	
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SM1	0	1	1	-1	-1	0	0	1	1	1	0	1	1	1	1	1	0	1	0	1	0	1	0	1	0	1	0	0	0	-1	-1	0	1	1	0	-1	0	2.06	
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JZ1	1	1	1	1	1	1	1	-1	0	1	1	0	1	0	1	1	0	0	0	-1	-1	1	1	1	-1	1	1	0	1	1	0	0	0	0	1	1	0	3.1	
JZ2	0	0	1	0	0	0	1	1	1	1	1	1	0	0	0	1	-1	-1	0	0	0	1	1	1	1	1	1	0	1	1	1	-1	1	1	0	0	2.72		
JZ3	1	1	1	1	1	1	1	-1	-1	0	0	0	1	-1	1	1	1	1	0	1	-1	1	1	1	1	-1	0	0	0	1	-1	0	0	-1	0	0	1	1.94	
JZ4	0	0	0	-1	-1	-1	0	0	0	1	-1	0	0	1	0	0	-1	0	0	1	0	0	0	-1	0	0	0	0	0	0	0	1	-1	1	0	0	-1	0	-0.64
JZ5	1	-1	0	0	1	1	1	-1	1	0	1	-1	-1	0	1	0	-1	0	1	0	0	0	0	0	0	1	1	1	1	1	1	1	0	1	0	1	0	1.91	
CX1	1	1	1	0	1	1	1	-1	1	0	1	1	0	-1	0	0	0	-1	0	0	-1	0	0	0	0	0	0	0	0	0	-1	1	0	1	1	0	1	1.85	

DECISION MATRIX

SCORES OF (-1) (0) (1) GIVEN TO EACH CONCEPT BY ALL MEMBERS FOR EACH CRITERIA

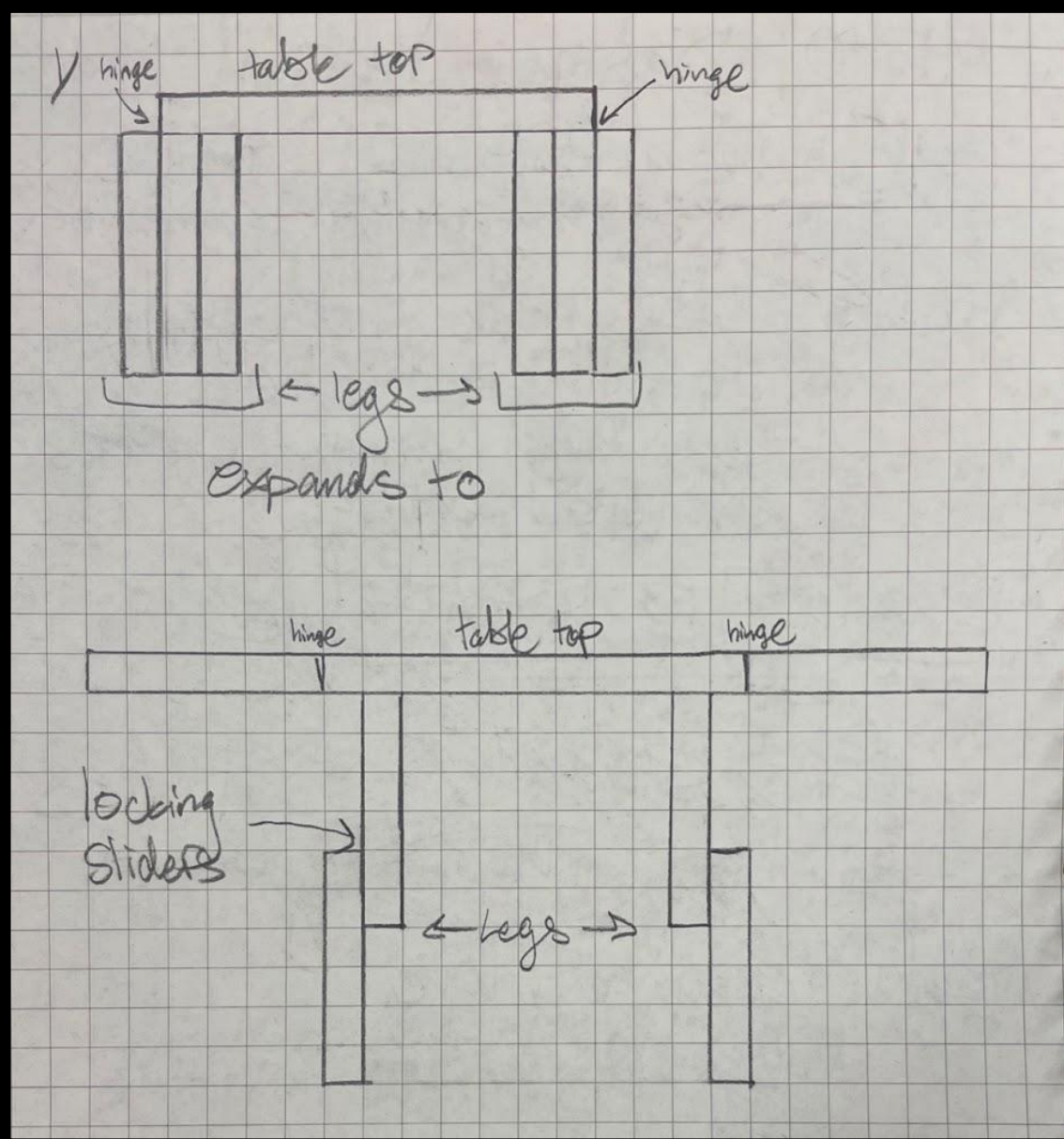
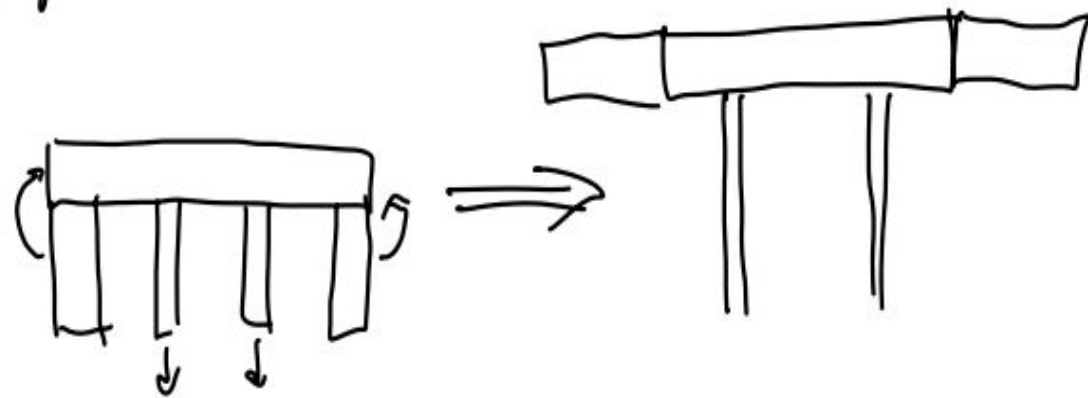
TOP CONCEPTS

Gathered from the five top scoring concepts on decision matrix



FINAL CONCEPT SELECTION

° Concept #3



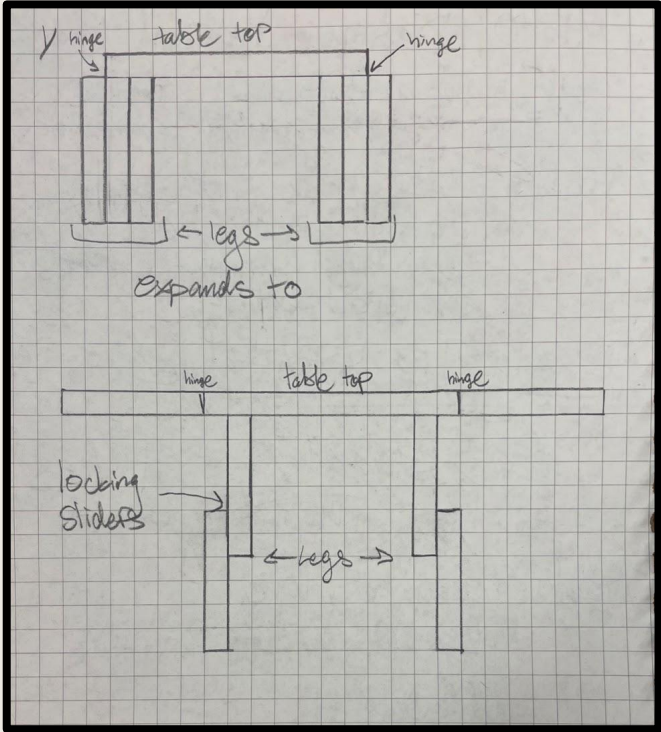
03

FINAL CONCEPT DEVELOPMENT



CAD MODELING

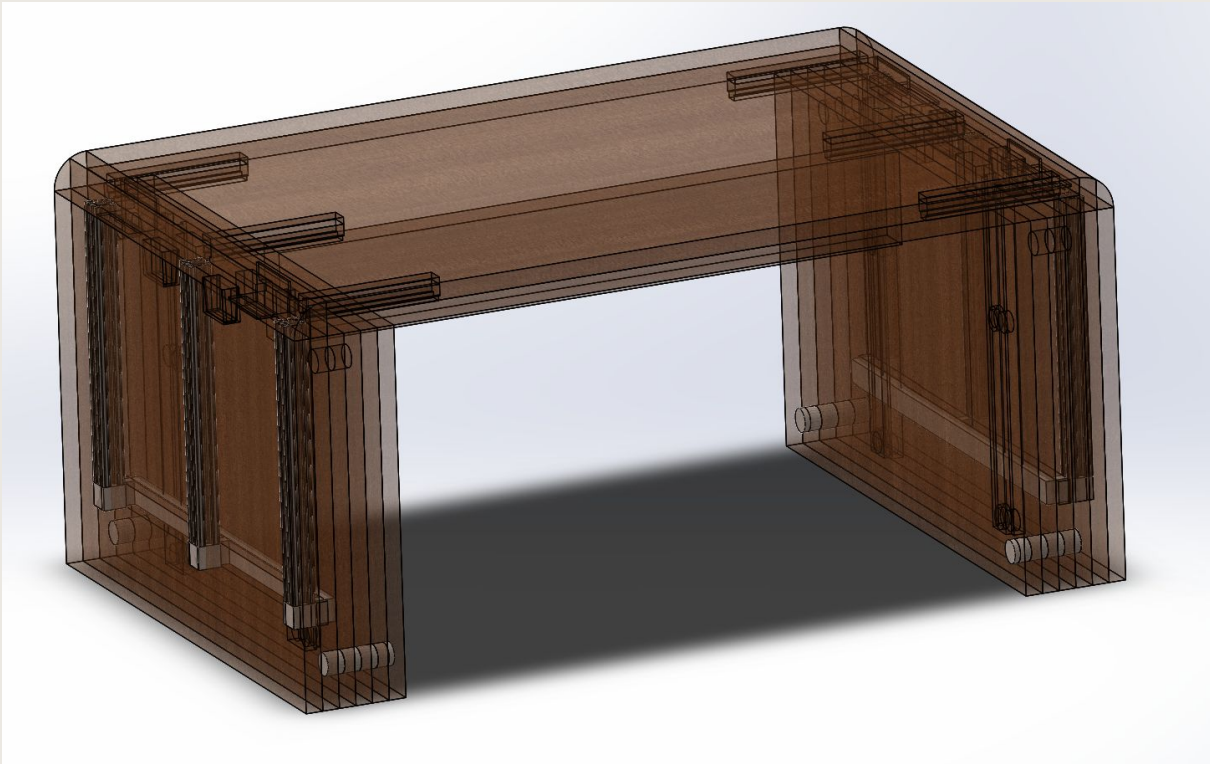
REFERENCE SKETCH



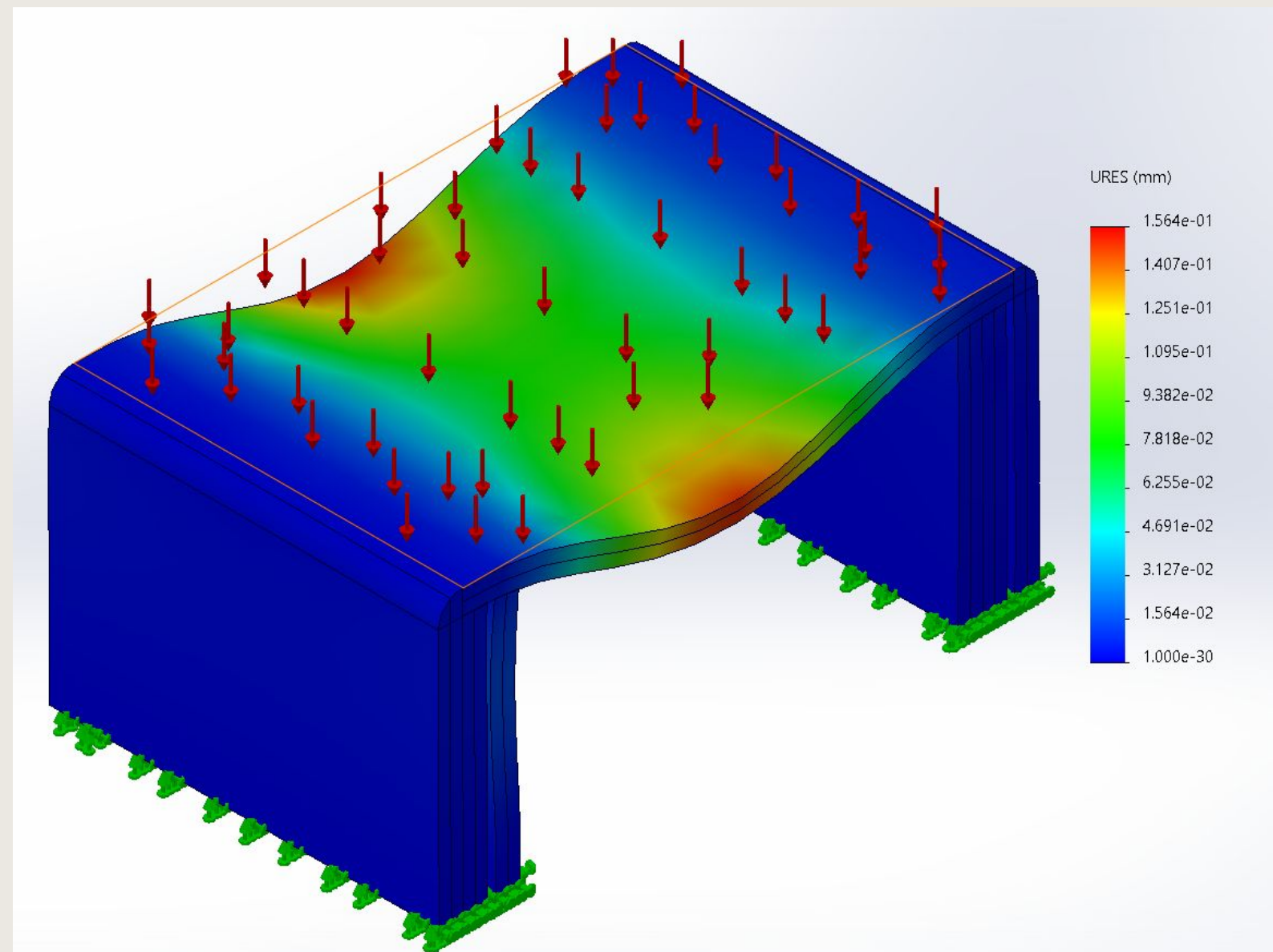
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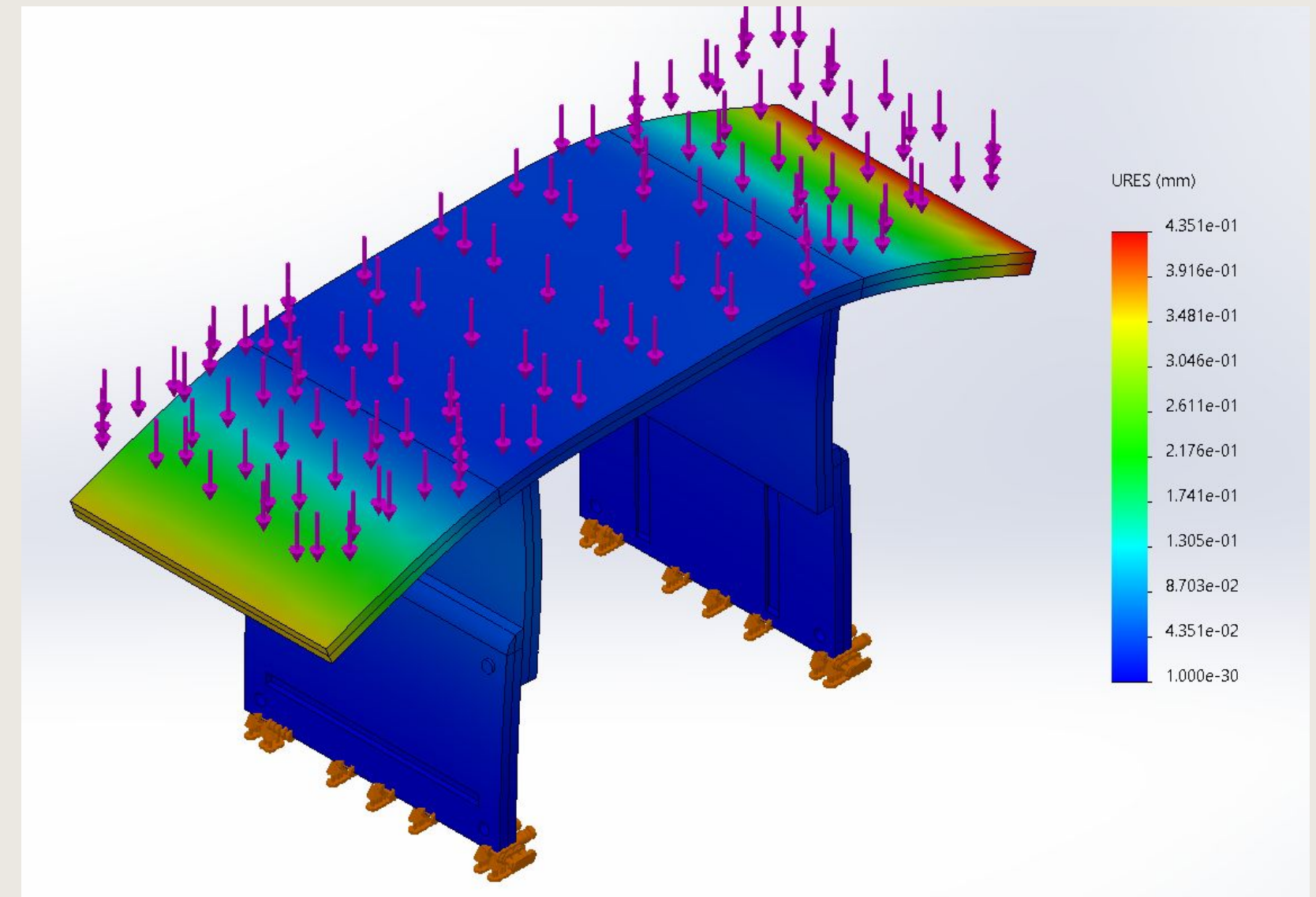
EXPANDED



FEA ANALYSIS



APPLIED PRESSURE : 2 PSI
MAX DISPLACEMENT : 0.155 MM



APPLIED FORCE: 500 LBS TOTAL
MAX DISPLACEMENT: 0.435 MM

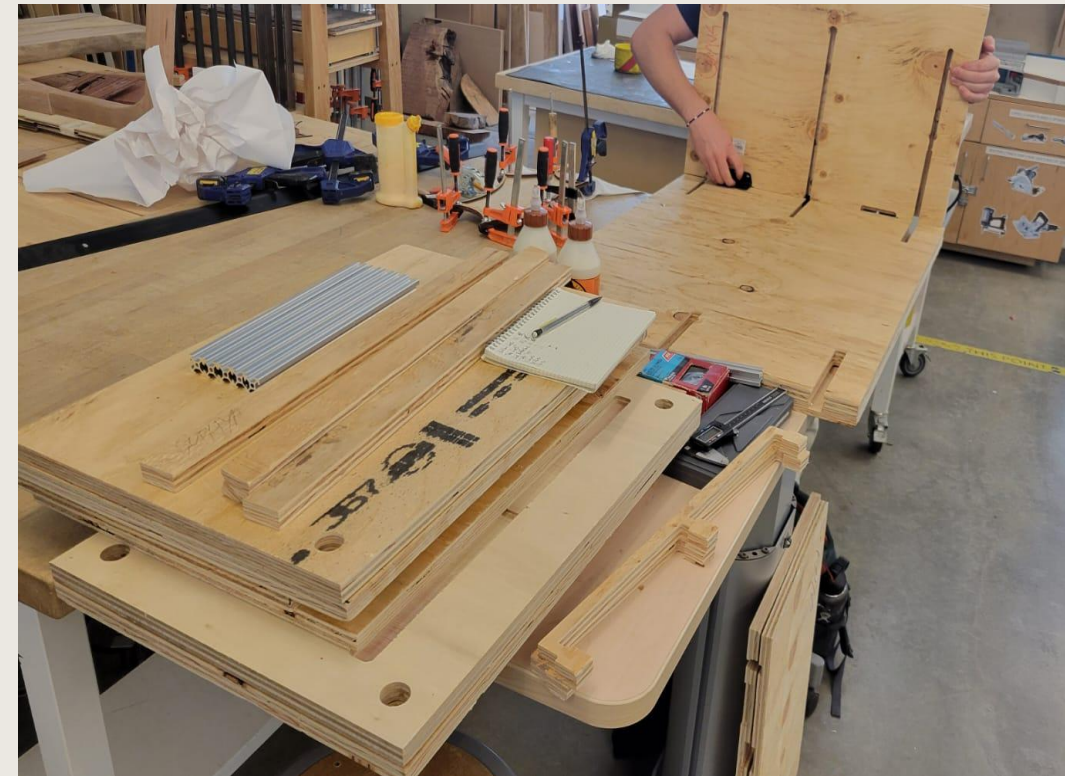
PROTOTYPES

PRELIMINARY PRODUCT PROTOTYPE



DEMONSTRATION PROTOTYPE

PROGRESS AS OF 05/03/23



REFERENCES

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<https://expandfurniture.com/product/box-coffee-to-dining-table/>

THANK YOU FOR YOUR TIME!

WE WILL NOW ANSWER ANY QUESTIONS

