



Furniture designed to evoke joy.

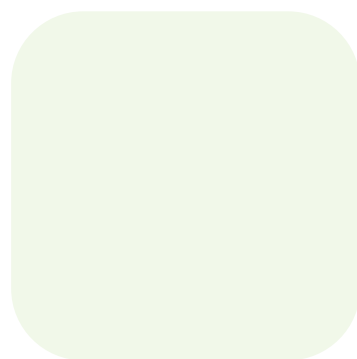
RESEARCH PACKET

A capstone project by Elaine Mansure
IND 4110, Professor Cameron Van Dyke



BACKGROUND

INITIAL THOUGHTS + RESEARCH



RESEARCH

I initially found two articles that provoked further research and thought.

08. Airbnb



Anyone is free to work in the open spaces dotted around Airbnb's design office

Most of the design team at [Airbnb](#) is based in this vibrant studio in San Francisco. "We work in what are essentially neighbourhoods built around large 'project rooms' that are modular spaces with displays, whiteboards, pinboards

Creative Bloq's "20 super-cool design offices to stir the senses"

This article focuses on the power of workspace design to affect creativity and morale among workers, listing examples of office spaces that are designed with this in mind. Reading this made me think more about designing in a way that could promote joy and playfulness for adults.

BIG THINK

SMART SKILLS – NOVEMBER 17, 2021

Being playful is a biological imperative, even for adults

The power of play: our forgotten lifehack.



From BigThink

The importance of play for overall wellbeing is the central theme of this piece. The article's focus on how play can appear different as an adult than earlier in life made me wonder: how can I incorporate play into my capstone project?

RESEARCH

I began to search for inspiring products and pieces.



Lee ye Chan's **Goyo** uses sound reverberation to create a tranquil space. While I didn't think that this piece fit with my design vision, I was inspired by the idea of using furniture to illicit an emotional response.



The **ZERO.GRAVITY** chair by **AN.ONYMOUS** allows for play within an office space. I appreciated the goal of subverting traditional "adult spaces" that was expressed through this piece.



Apiwat Chitapanya nods to the relationship between humans and pets in **My Best Friend**. I was inspired by the playfulness that and movement that was implied in the pieces.



The **Spun Chair** by **Heatherwick Studio** allows for users to tilt and spin on an axis without falling over. I was interested in this piece's function-forward playful approach that still exists as a beautiful object.

RESEARCH

I began to search for inspiring products and pieces.



Samer Alameen's **Eret** is inspired by the children's construction toy Meccano. I was attracted to the use of formal childhood associations to create a piece intended for adults.



The **Monster Mouth Lamp** by Scarily Bright both illuminates a room and holds small objects. I was inspired by the lively features and forms of these lamps also serving a function.



Clap Studio designs a life-inspired bench through their **Worm Bench**. I appreciated that this piece is immediately reminiscent of a bug, even through using traditional materials and color schemes.



The **Rabbit Chair** by Stefano Giavannoni offers a variety of seating positions and a playfully reminiscent design. I loved how this piece could be easily understood, while still being derivative and not overly literal.

RESEARCH

The pieces that inspired me most.



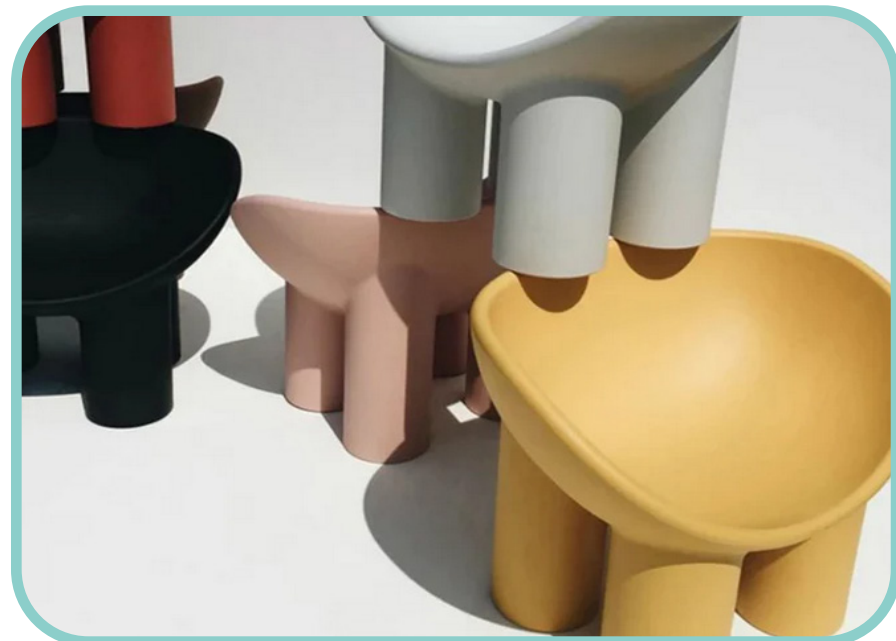
KISU by **Eero Aarnio** is a decorative piece immediately reminiscent of a cat, yet is derivative and refined. It reminds me of a toy from childhood, but is intended for adult spaces.



Blowing Chair by **Seungjin Yang** uses beautifully accurate materiality to create an immediate reaction. The effective use of form + material is wonderfully playful.



This **Ceiling Lamp** by **Entler Studios** seems to portray life, but in a non-literal way. I love the color choice and organic forms.



The **Roly Poly Chair** by **Driade** does not seem to be inspired by any specific life form, but feels alive. I am attracted to its simplicity, and the fact that it is designed for adults.



Play by **WOO Furniture** is inspired by a wooden toy that the designer owned as a child. I appreciate the relationship that this piece has to childhood, and its refined forms.



Tangle Table by **Oki Sato** uses beautiful and simple lines to create such a life-like interaction. I am inspired by minimalist approach to creating interest.

FROM THIS INSPIRATION, I DETERMINED FEATURES OF THE GENERAL PRODUCT SPACE I WANTED MY PIECE TO OCCUPY:

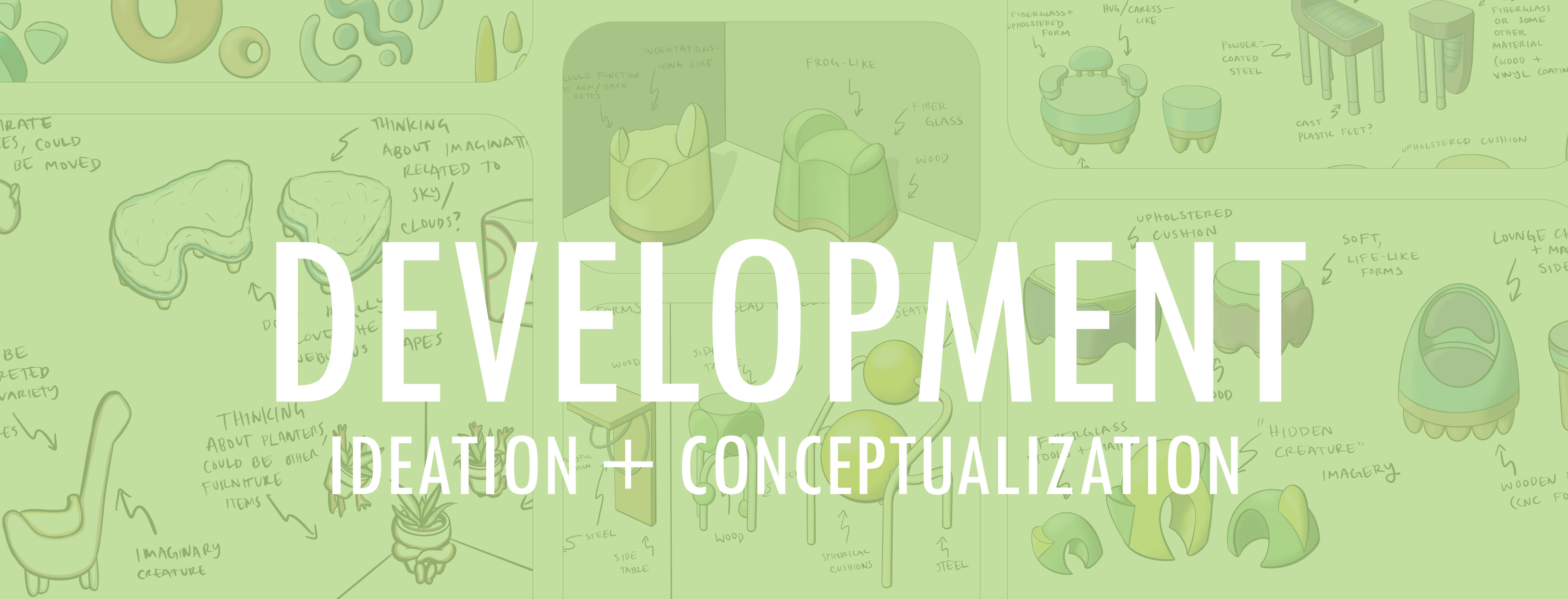
- Utilizing relatively simple forms
- Featuring lively colors
- Nodding to childhood, but not too direct/literal
- Ultimately: evoke joy!

MY PROBLEM STATEMENT:

How might I design home furniture that encourages adults to experience joy through evoking memories of childhood?

DEVELOPMENT

IDEATION + CONCEPTUALIZATION

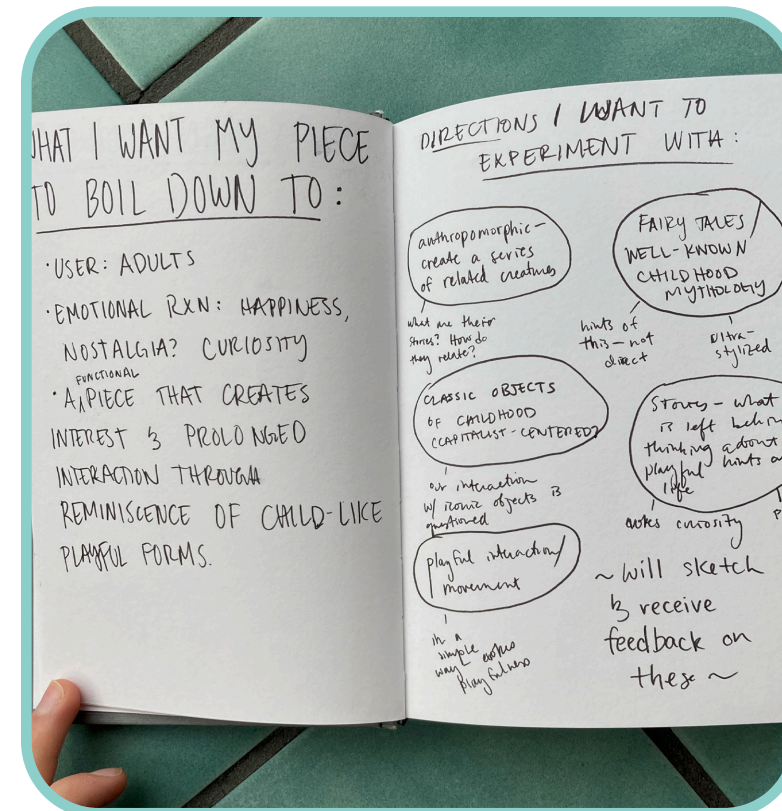


INITIAL IDEATION

brainstorming and conceptualizing my product space



Initially, I took notes on thoughts that I had from a variety of design-related input. I knew that I wanted to lean into the idea of "childhood reminiscence," but I wanted inspiration for how to do that successfully.



I created a list of main points or criteria that I wanted my project to achieve, as well as several themes that I thought could act as beneficial starting points.

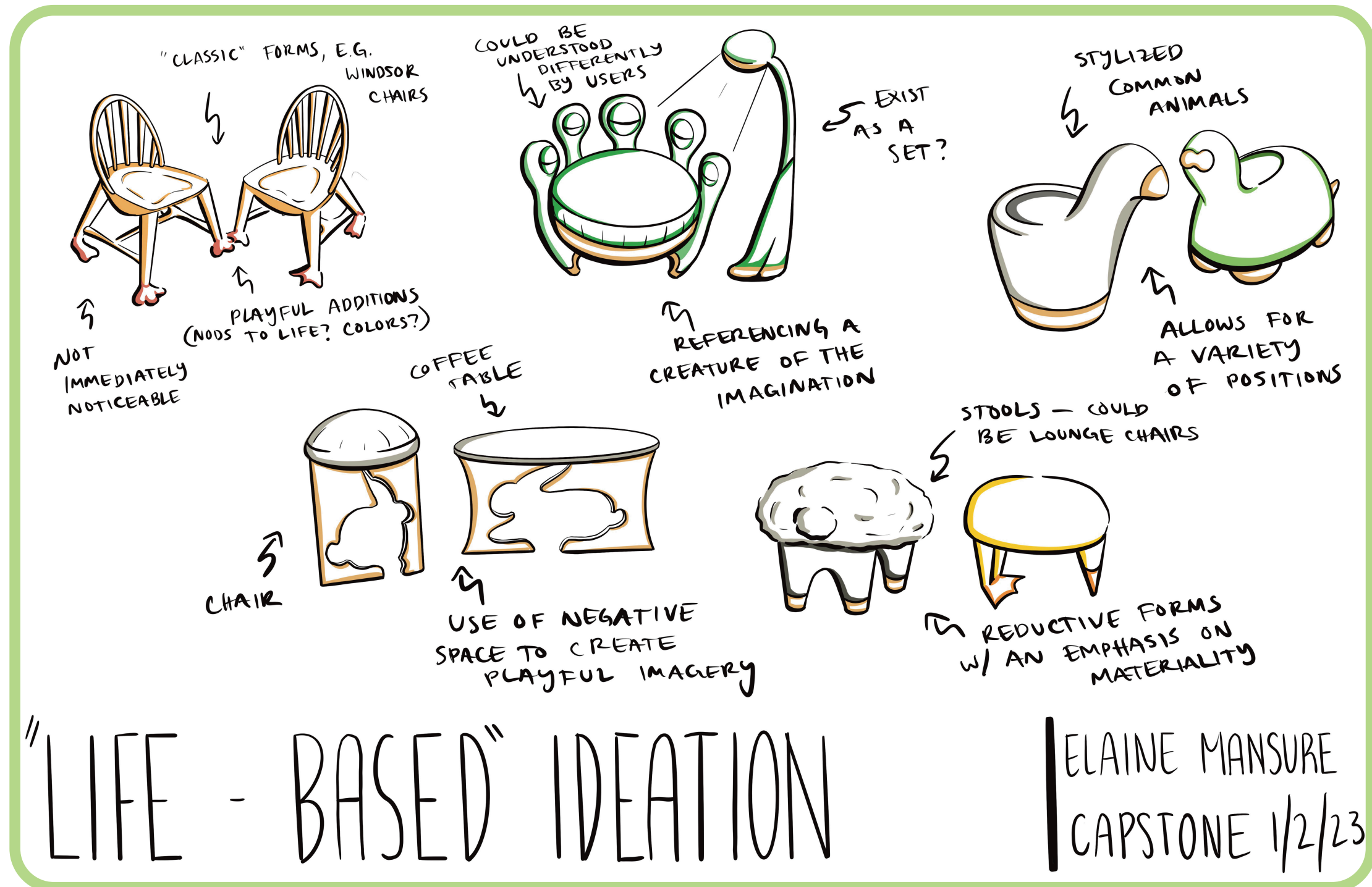


I created a mind map related to associations that I have with childhood and adulthood. Thinking about each concept as simultaneously unique and codependent was valuable.



I sketched objects that I associated with childhood and adulthood, thinking about how I could potentially merge these two spaces.

IDEATION PHASE 1



I began my ideation based around several distinct themes. "Life-based" ideation approached the idea of using anthropomorphism to design furniture. Many of the products that I approached in research used anthropomorphism to create a playful piece.

IDEATION PHASE 1

HINTS OF LIFE - FOOTSTEPS

INLAY?

NOT IMMEDIATELY NOTICED

"PERPETUAL"/NEVER-MOVING SHADOW - HARD MATERIAL

BASE - "FAKE" SHADOW WITH PLAYFUL CREATURE

STOOL

I WOULD WANT TO INCORPORATE MORE FUNCTION INTO THE "LINE"/BEE'S PATH

CREATING "MYTHICAL HOMES"/NESTS

ENCOURAGE USER TO WANT TO EXPLORE

USE OF LINES TO SHOW MOVEMENT OF A CREATURE (E.G. - A BEE)

THINKING ABOUT HUNDERTWASSER'S ETHOS

IDEA OF CREATING "EVIDENCE OF LIFE" - E.G. BURROWS

CURIOSITY/WONDER

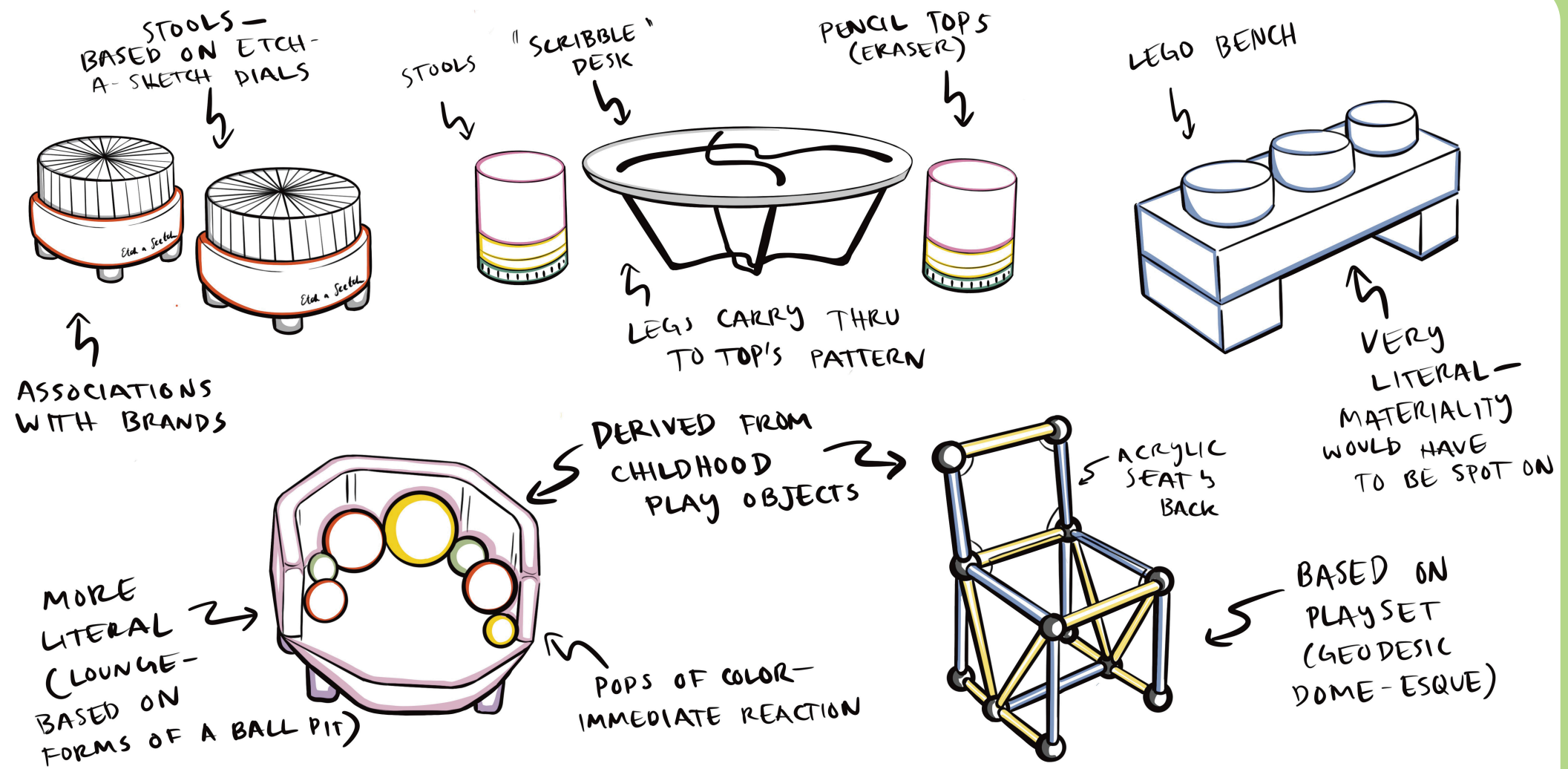
SIMPLE FORM FOR FURNITURE

"HINTS OF PLAY" IDEATION

ELAINE MANSURE
CAPSTONE 1/3/23

I started to think about the concept of other forms of life interacting with the furniture that I designed. This page began to conceptualize how traces of life could potentially be incorporated into a piece.

IDEATION PHASE 1

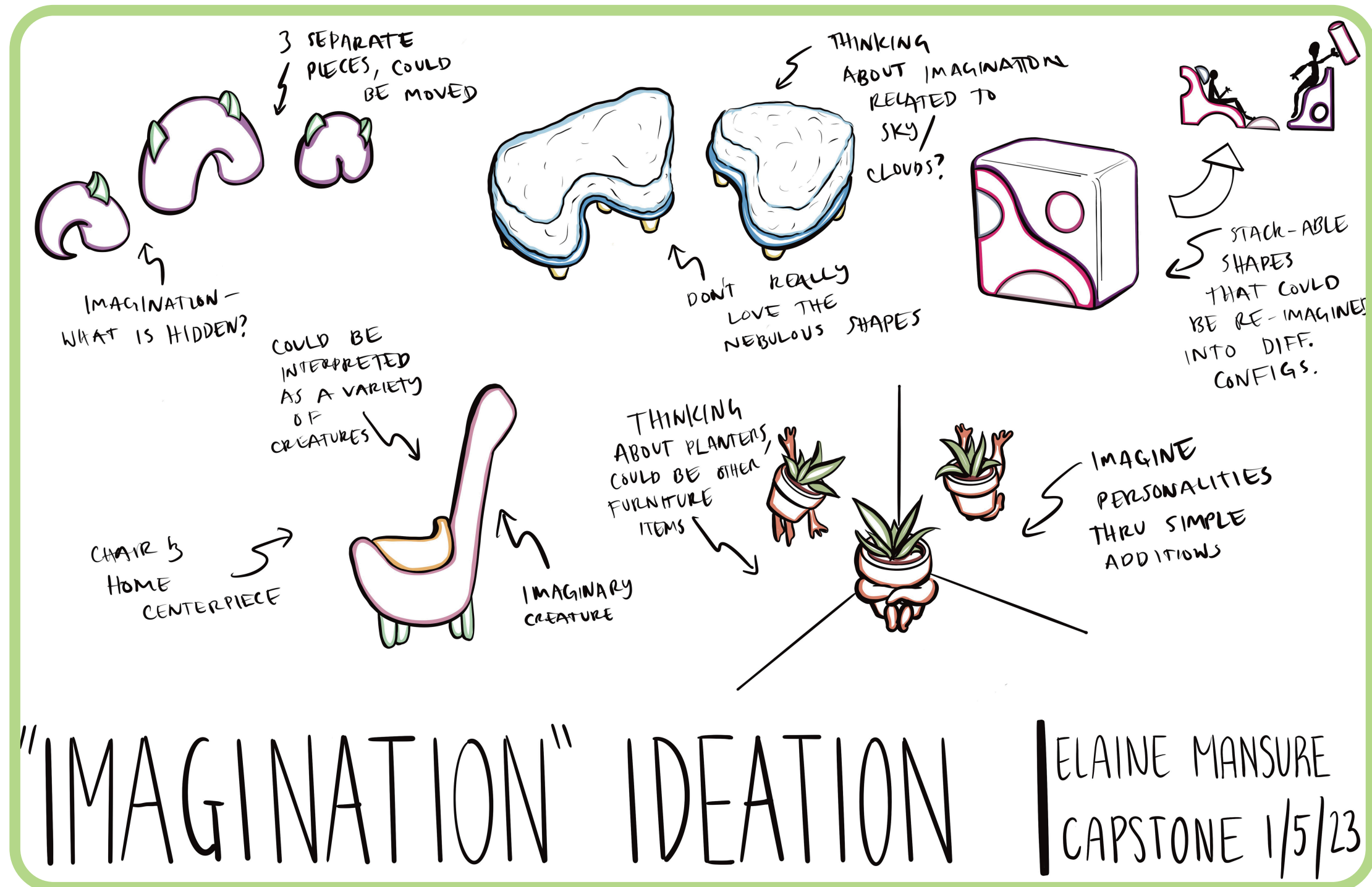


"ICONIC OBJECTS" IDEATION

ELAINE MANSURE
CAPSTONE 1/4/23

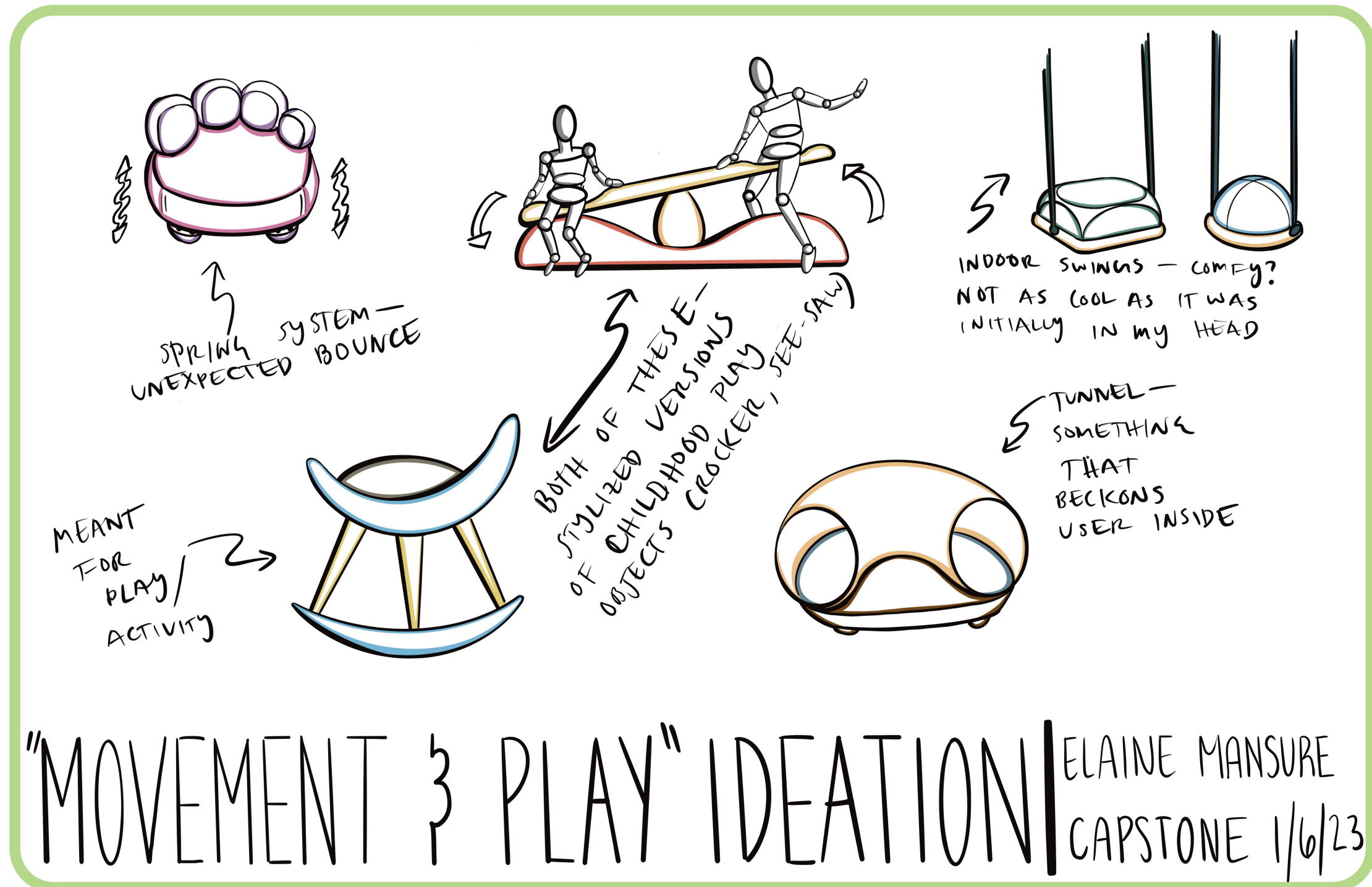
Some of the pieces that I found most compelling in my research used objects from childhood to create an association. I began to brainstorm objects of my childhood that I thought could be incorporated in a successful way. The main challenge that I had with this concept was to avoid kitsch or trite portrayals.

IDEATION PHASE 1



In a similar way to "Life-Based" ideation, "Imagination" ideation approached furniture through an anthropomorphic lens. However, these pieces were not intended to nod to any existing creature, but rather, allow the viewer to make their own conclusions about the piece.

IDEATION PHASE 1



This page of concepts was the most functionally-driven space that I explored. I wanted to think about whether altering the function (to allow the adult user to interact in a playful manner) could allow for a strong emotional reaction or a connection to childhood.

IDEATION PHASE 2

GOALS

- EVOKE A POSITIVE, HAPPY REACTION
- REMINISCENCE OF CHILDHOOD
- SOFTENED FORMS
- ADULT USERS

EVOKE LIFE, NOT TOO LITERAL

SERIES OF PIECES, FORMALLY RELATED

LEGS LIGHT UP

SIDE TABLE

PLANTER

SEATING OBJECTS THAT EVOKE IMAGINATION

CAN BE UTILIZED IN A VARIETY OF WAYS

FIBERGLASS, WOOD BASE

LIKEN TO MATERIALITY OF PLAYGROUND ITEMS

ACRYLIC BASE

CAST CORNER PIECES?

SIDE TABLE

THINKING ABOUT MATERIALITY OF A ROCKING HORSE

COULD FIT MOST ADULTS

TIGHTLY UPHOLSTERED

IMAGINATIVE SEATING

COULD BE REMINISCENT OF A VARIETY OF CREATURES

SIMPLE BENT-LAMINATE FORMS

LAYER COLORFUL VENEER

GREEN PLY

WOODEN FORMS WITH COLORFUL ACCENTS

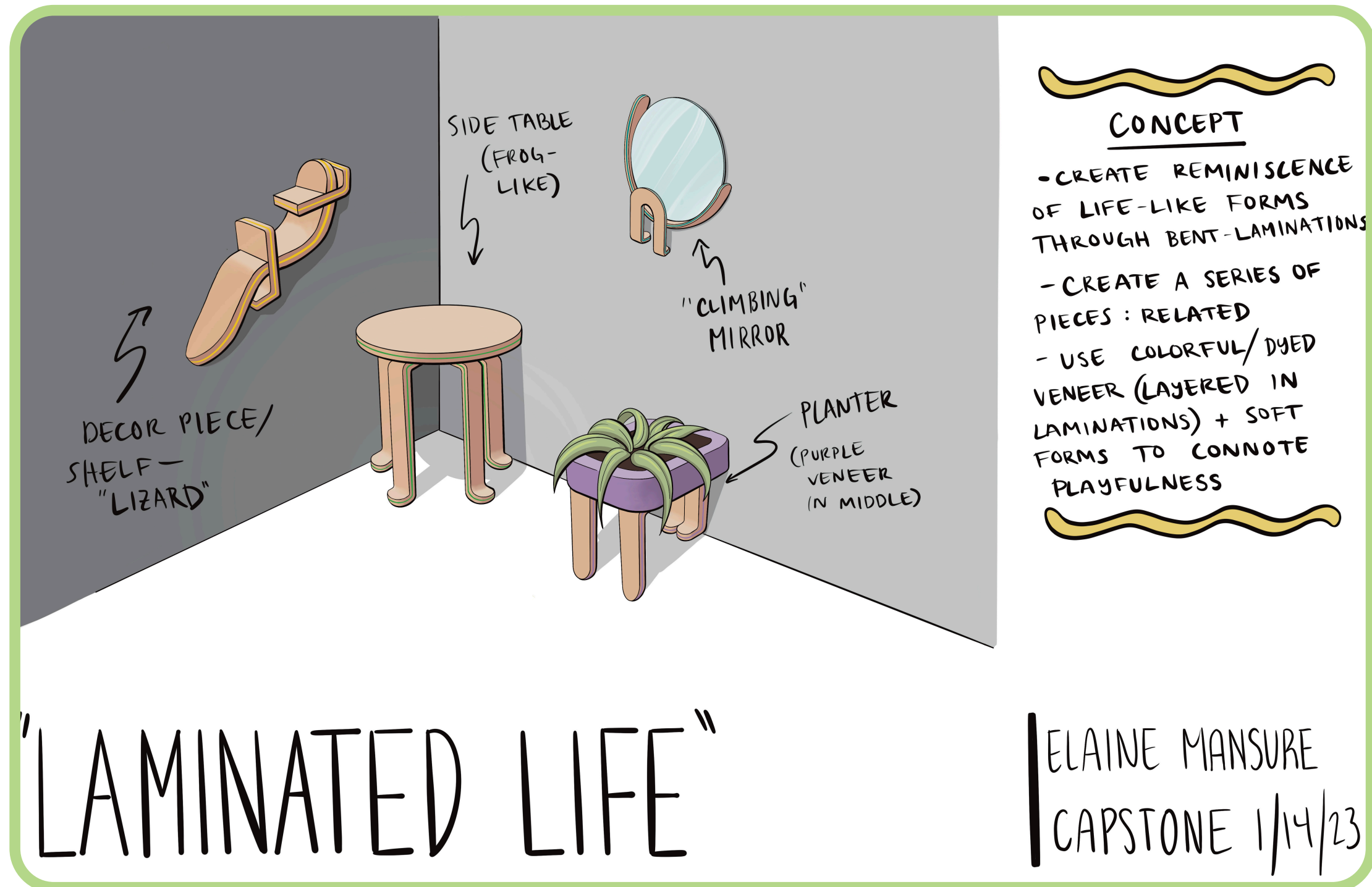
PLAYFUL, LIVELY

REFINED IDEATION

ELAINE MANSURE
CAPSTONE 1/10/23

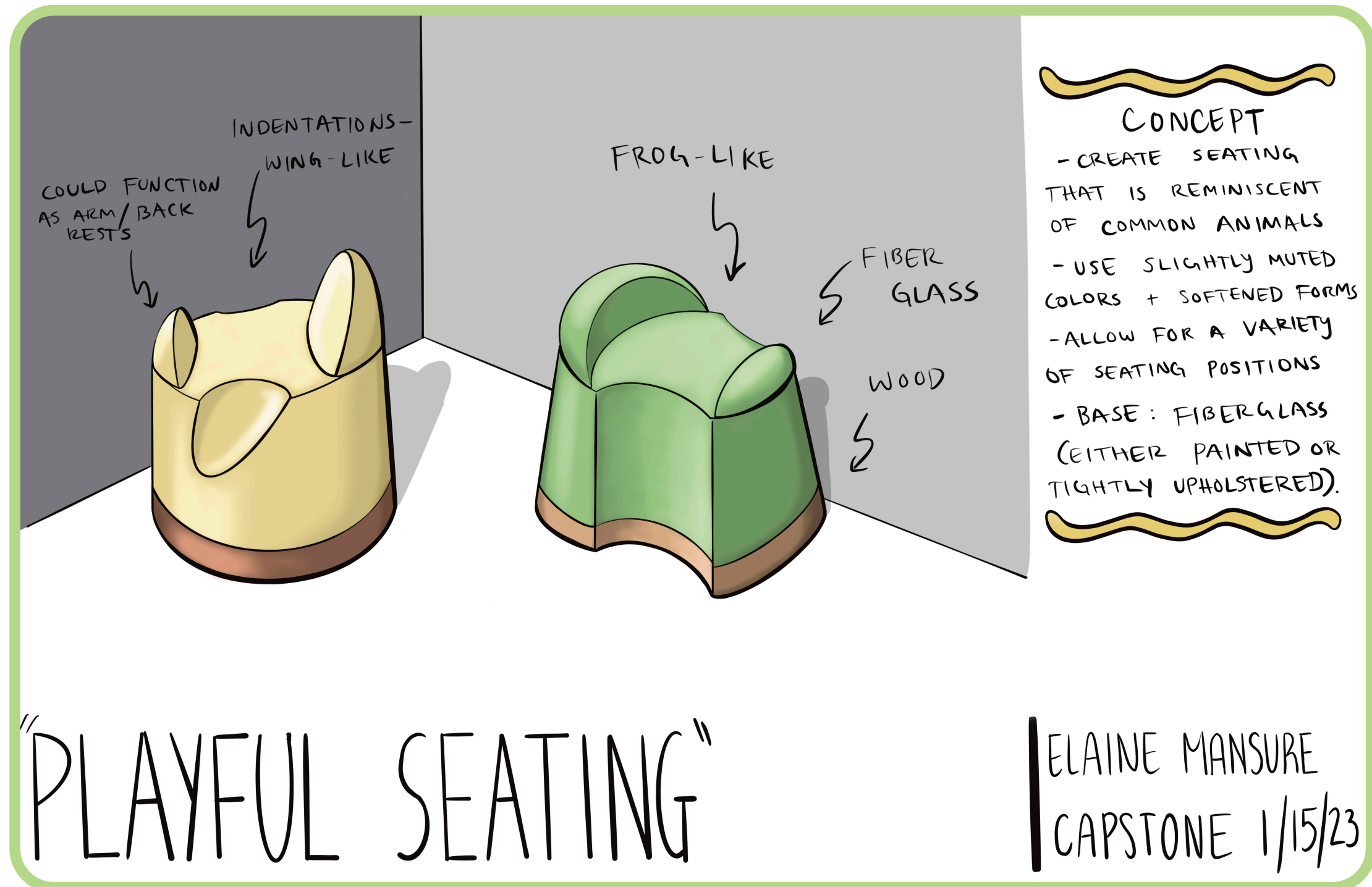
After exploring five different directions, I chose seven previous concepts to develop further. Some concepts were directly based on past ideas, while others were more conceptually-based. I thought through these concepts with more of a realistic (fabrication-based) mindset.

IDEATION PHASE 3



I thought through three of the previous seven concepts, focusing on construction methods and viability. I liked the idea of creating bent wood pieces featuring layers of colorful veneer. I thought that the marriage of a process often used in commercial furniture with a playful element could be interesting.

IDEATION PHASE 3



This concept centered around vaguely anthropomorphic forms that could fit within a house as both a seating piece and a sculpture/decoration when not in use. I aimed to abstract existing animals through this design.

IDEATION PHASE 3

CAN FUNCTION AS SEATING OR WHATEVER USER WANTS

INSPIRATION - LOCH NESS MONSTER / HIDDEN CREATURE

TWO TONES - REMOVABLE SPIKES?

CONCEPT

- EVOKE IMAGINATION THROUGH IMPLYING HIDDEN FORMS
- LIFE-LIKE & FUN, BUT NOT A LITERAL REPRESENTATION
- FIBERGLASS, ORGANIC FORMS
- SEATING / STOOL / DECORATION OBJECTS

"IMAGINATIVE FORMS"

ELAINE MANSURE
CAPSTONE 1/16/23

The idea of the “unseen” guided this concept. I wanted to create a series of pieces that could exist together or apart, and require the viewer to construct meaning through imagination. I was formally inspired by a loch ness monster or a dragon.

IDEATION PHASE 4

INSPIRED BY A BEAD MAZE

SPHERICAL CUSHIONS

INSPIRED BY WOODEN BALL & CUP TOY, STYLIZED

CUSHION, SUSPENDED

FIBERGLASS BASE, NEUTRAL COLOR

INSPIRED BY STACKED TOYS

FIBERGLASS?

CHAIRS/STOOLS/OTTOMANS

POWDER COATED TUBE-STEEL

THICK CUSHIONS

LIFE-LIKE, NOT LITERAL

THICK CUSHION

FUN FORMS, NOT BASED ON A PARTICULAR FORM

WOODEN, REPEATED FORMS

WOOD BASE & LEGS

GOALS

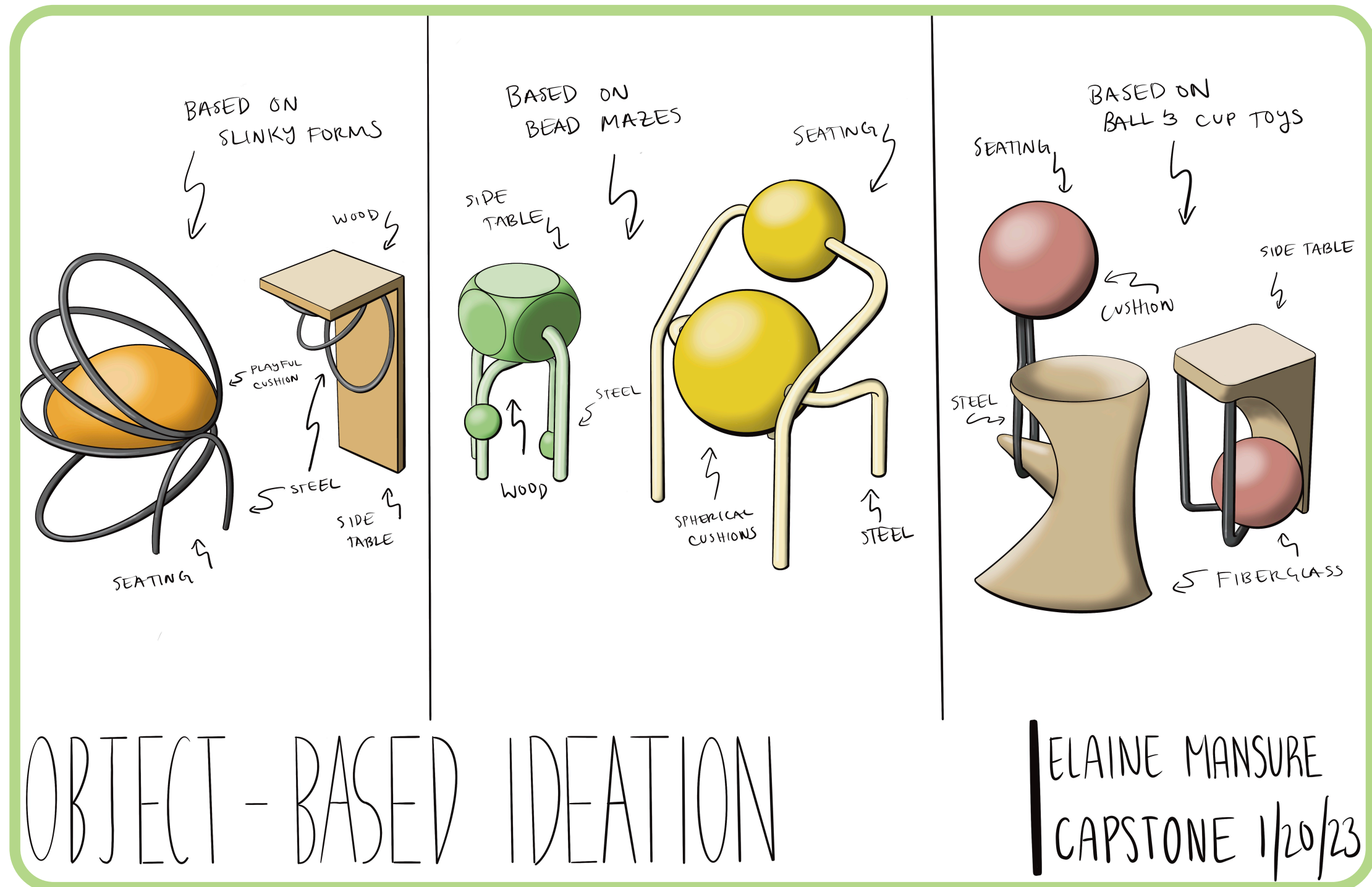
- FOCUS ON PRODUCTS FROM CHILDHOOD + SIMPLE FORMS
- CREATE REMINISCENCE THAT IS SOMEWHAT ABSTRACTED

MORE SIMPLE FORMS

ELAINE MANSURE
CAPSTONE 1/18/23

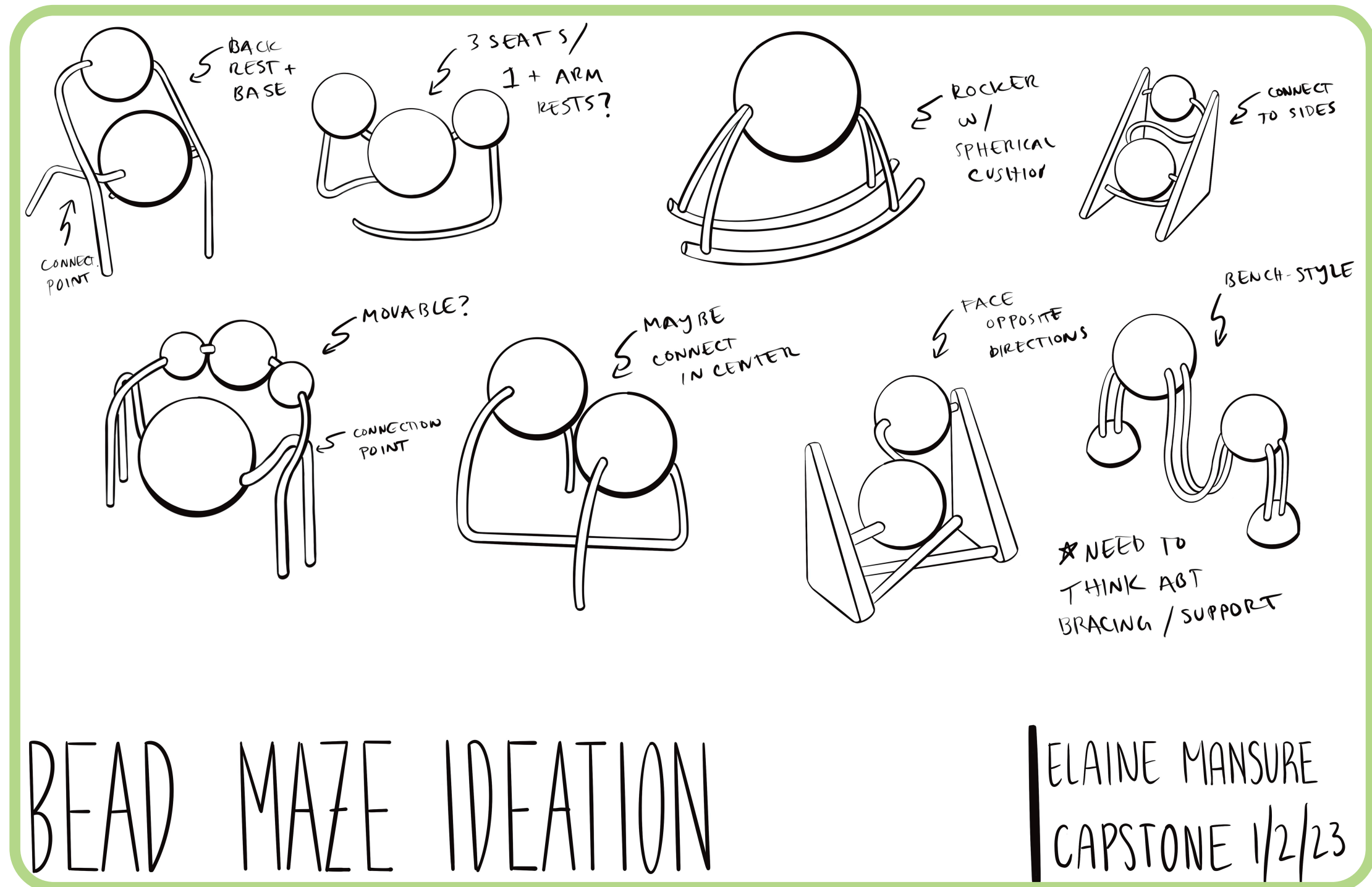
After receiving feedback from peers on the previous concepts, I was encouraged to simplify my forms. I began to think more about toys from childhood that I could draw inspiration from. I also attempted to approach anthropomorphism through more simple means.

IDEATION PHASE 4



As a part of creating more simple forms, I looked at the visual language of childhood toys: the slinky (left), bead maze (middle), and kendama toy (right). I received positive feedback particularly related to the middle concept, so I chose to explore that direction more intently.

IDEATION PHASE 4



The idea of the “bead maze” in the previous page of ideations was well-received by peers, and I thought that it might have the potential to be explored in a variety of ways. For this concept, I thought through concepts involving a variety of “ball orientations.”

IDEATION PHASE 5

CONCEPT

- CREATE A LOUNGE CHAIR + SIDE TABLE (COORDINATED)
- UTILIZE ANTHROPOMORPHIC & FRIENDLY FORMS
- THINK ABOUT MANUFACTURABILITY

DIRECTION 2.2 - FIBERGLASS 2

ELAINE MANSURE
CAPSTONE 1/25/23

CONCEPT

- CREATING ORGANIC, FUN FORMS THAT CONNOTE LIFE
- UTILIZE ANTHROPOMORPHISM - NOT TOO DIRECT OR EASY TO UNDERSTAND
- FIBERGLASS AS A MEDIUM

DIRECTION 2.1 - FIBERGLASS 1

ELAINE MANSURE
CAPSTONE 1/25/23

After receiving peer feedback on “Phase 4” ideations, I was encouraged to narrow my scope down to two directions. I pursued direction 1 (left), ideating around the idea of the “bead maze” toy, as well as direction 2 (top left and right), which focused on anthropomorphism as a means of connecting to childhood. Peer feedback encouraged me to pursue direction 2, focusing on the topmost concept on direction 2.2 (top left image). This concept inspired my final direction.

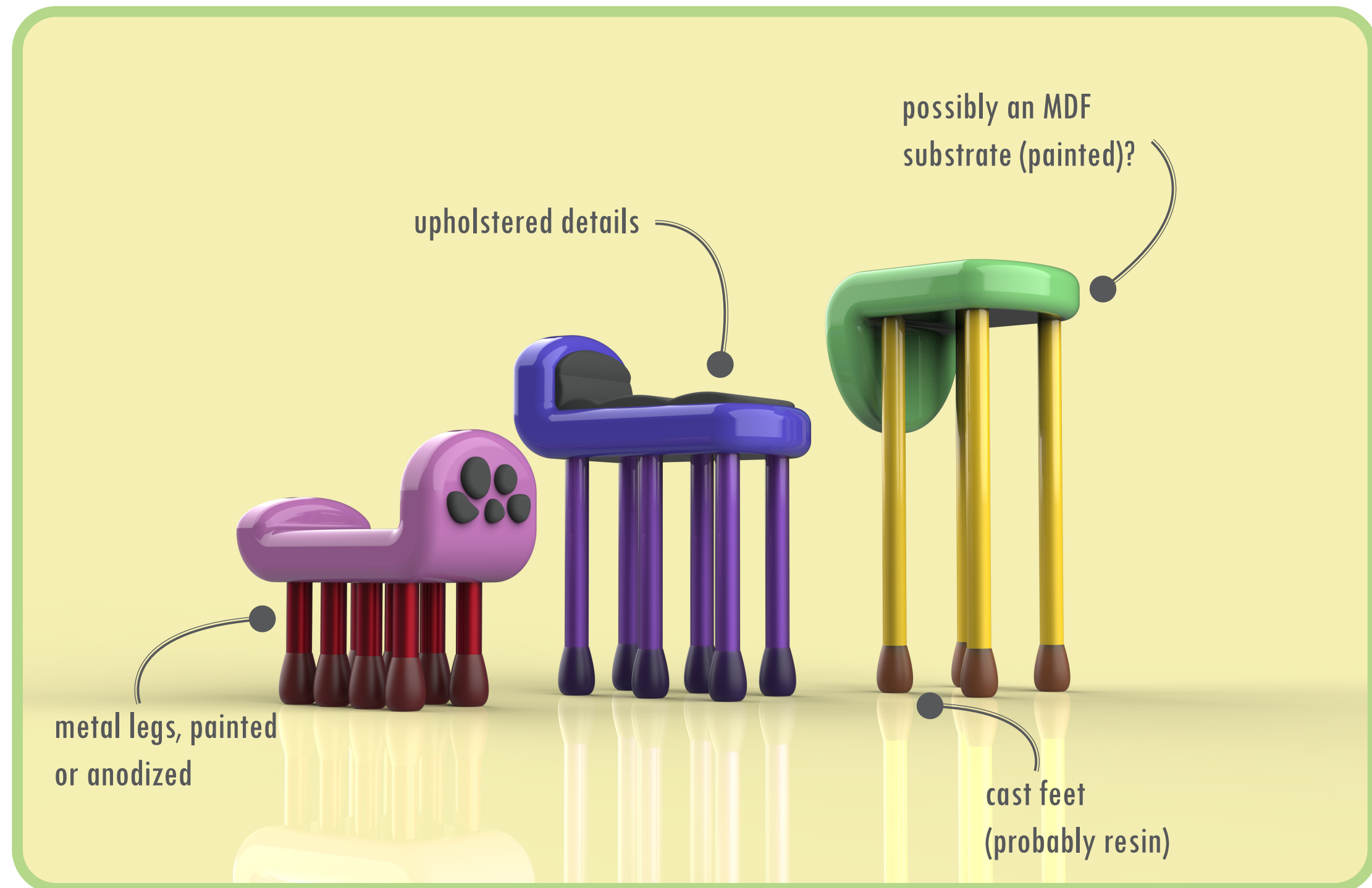
CONCEPT

- INSPIRED BY BEAD MAZE TOY (MONTESSORI-TYPE)
- SIMPLE FORMS (LINE WORK + SPHERES)
- MATERIALS - TUBE STEEL (POWDER-COATED), UPHOLSTERED SPHERES (SUBSTRATE - WOOD/FOAM/FIBERGLASS?)

DIRECTION 1: BEAD MAZE

ELAINE MANSURE
CAPSTONE 1/25/23

FINAL DIRECTION



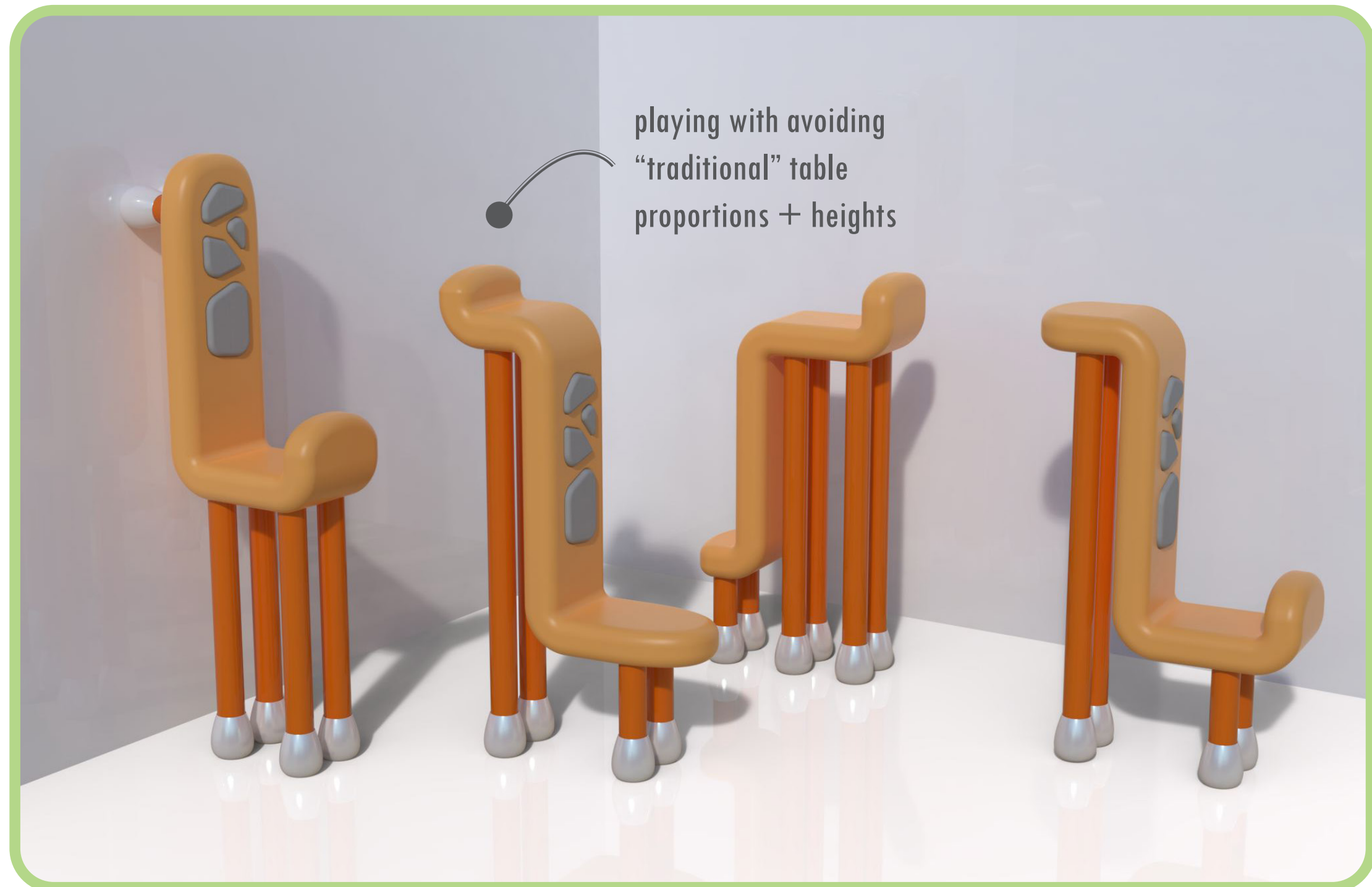
I presented this concept as my final general direction. I planned to create a series of three pieces inspired by life, featuring metal legs, cast resin feet, and seemingly “bent” primary components with subordinate details. I wanted each piece to be derivative of life, but not too literal.

FINAL DIRECTION DEVELOPMENT 1



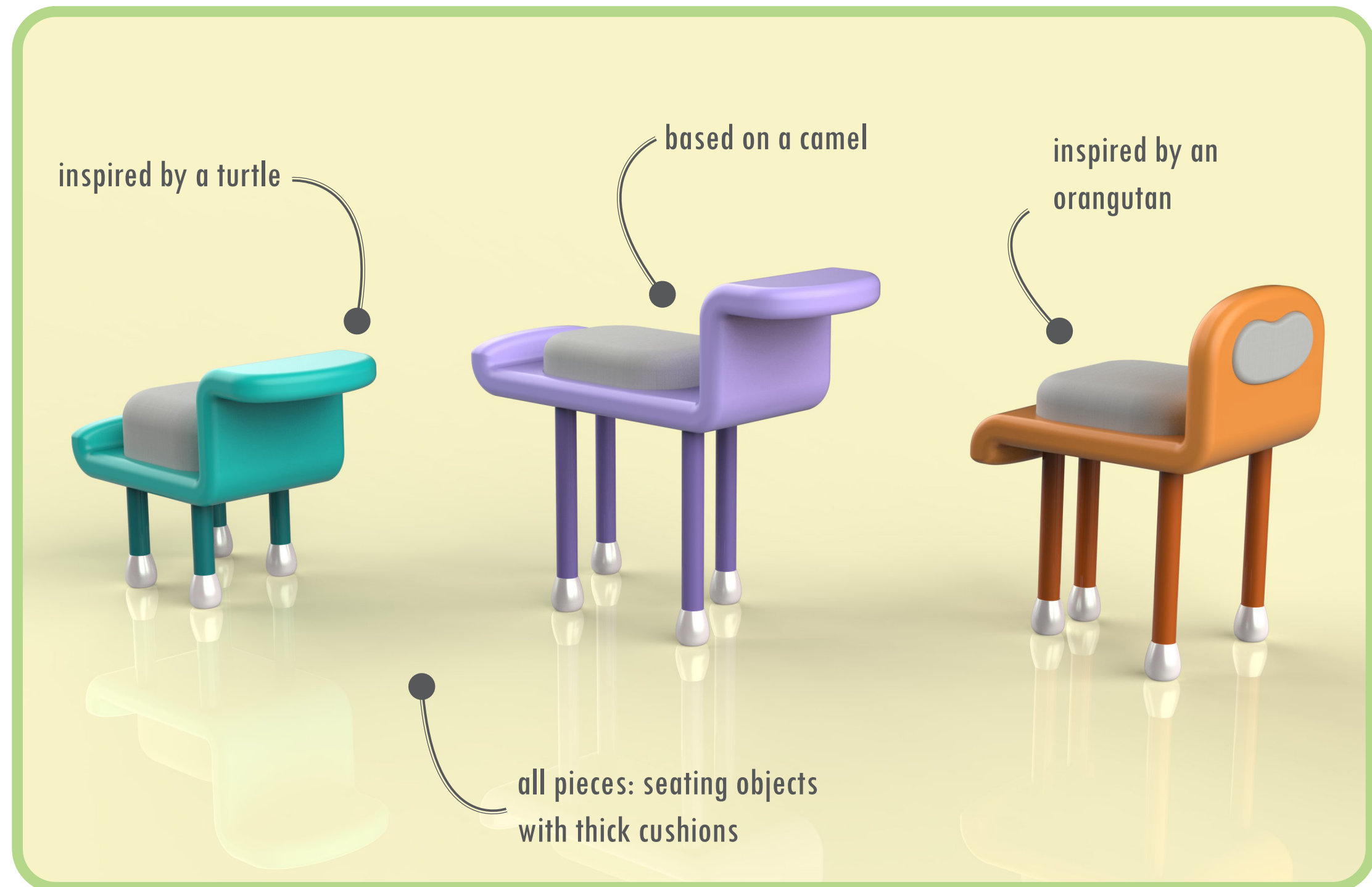
After presenting my final direction, I was encouraged to play with the proportions, scale, and colors of each of the pieces. I refined my concepts to be slightly more muted in color, while also lengthening and shortening various dimensions.

FINAL DIRECTION DEVELOPMENT 2



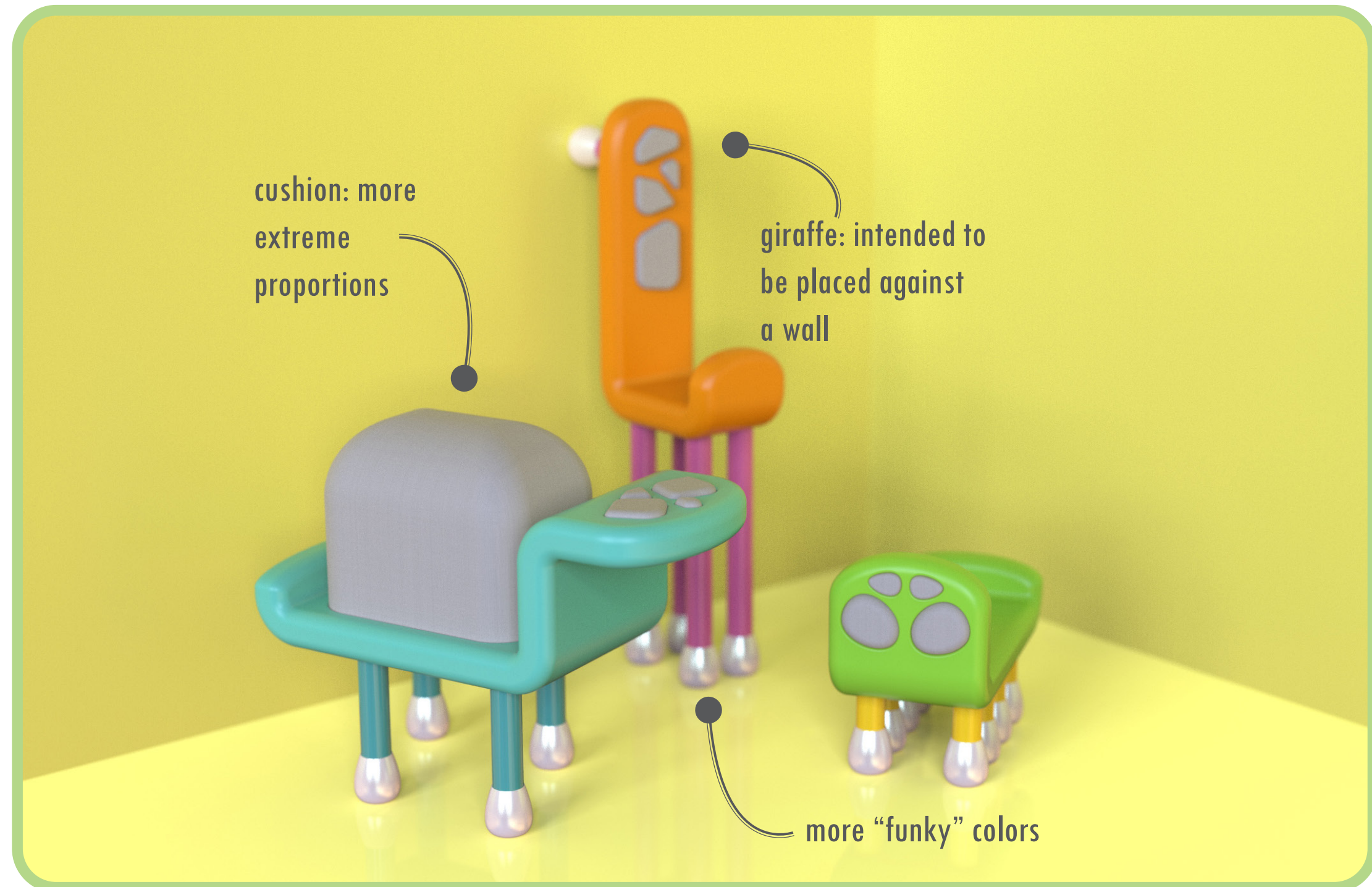
After I began to fabricate my first piece (the green step stool), I was encouraged to ideate on other options for the table and chair. Inspired by a giraffe, I created these related concepts. The leftmost concept was met with the most support from my peers.

FINAL DIRECTION DEVELOPMENT 3



I created three seating object options, inspired by a variety of animals. After presenting these to my peers, I was encouraged to further lengthen and exaggerate certain proportions to create a more immediate reminiscence. I chose to pursue the leftmost concept (turtle).

FINAL DIRECTION DEVELOPMENT 4



After refining the forms of both the chair and table objects, I had reached my final formal direction. However, I had not yet determined the materiality for the detail pieces, the fabrication method for the ultra-thick cushion, or the exact color schemes that I was planning to use.

FINAL DIRECTION - MATERIAL CONSIDERATIONS



Thick felt (CNC milled)



Upholstered foam



Cast resin

Alongside presenting my final direction to my peers, I asked for feedback on materiality decisions for the detail pieces. I was discouraged from pursuing either the felt or upholstered foam option, with concerns that they could appear crafty or unrefined. Peers suggested that I research casting a softer material, such as a rubber or foam. After researching this option and the associated costs, I chose to cast the detail pieces with resin that I already bought for the feet.

FINAL CONCEPT

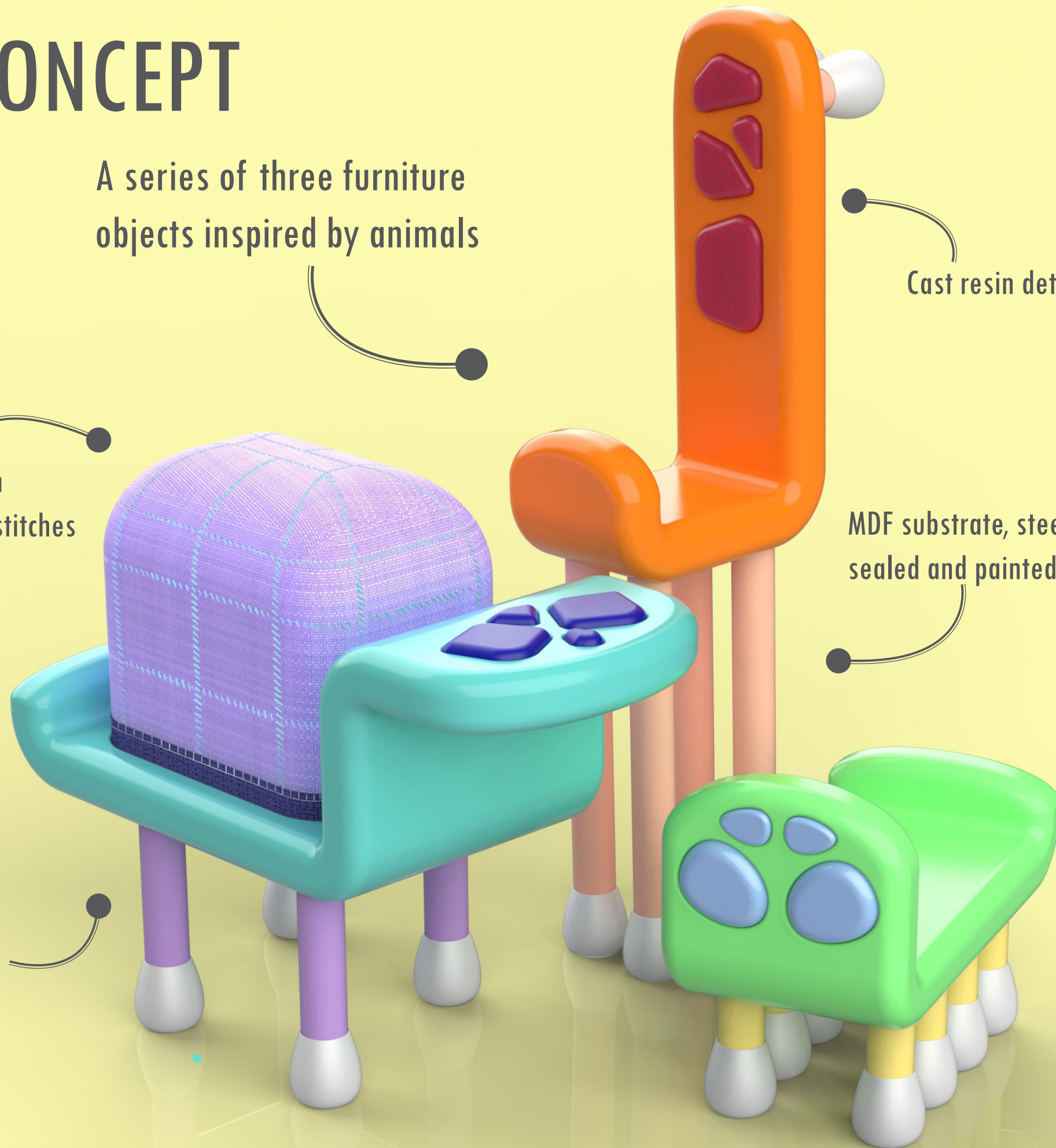
A series of three furniture objects inspired by animals

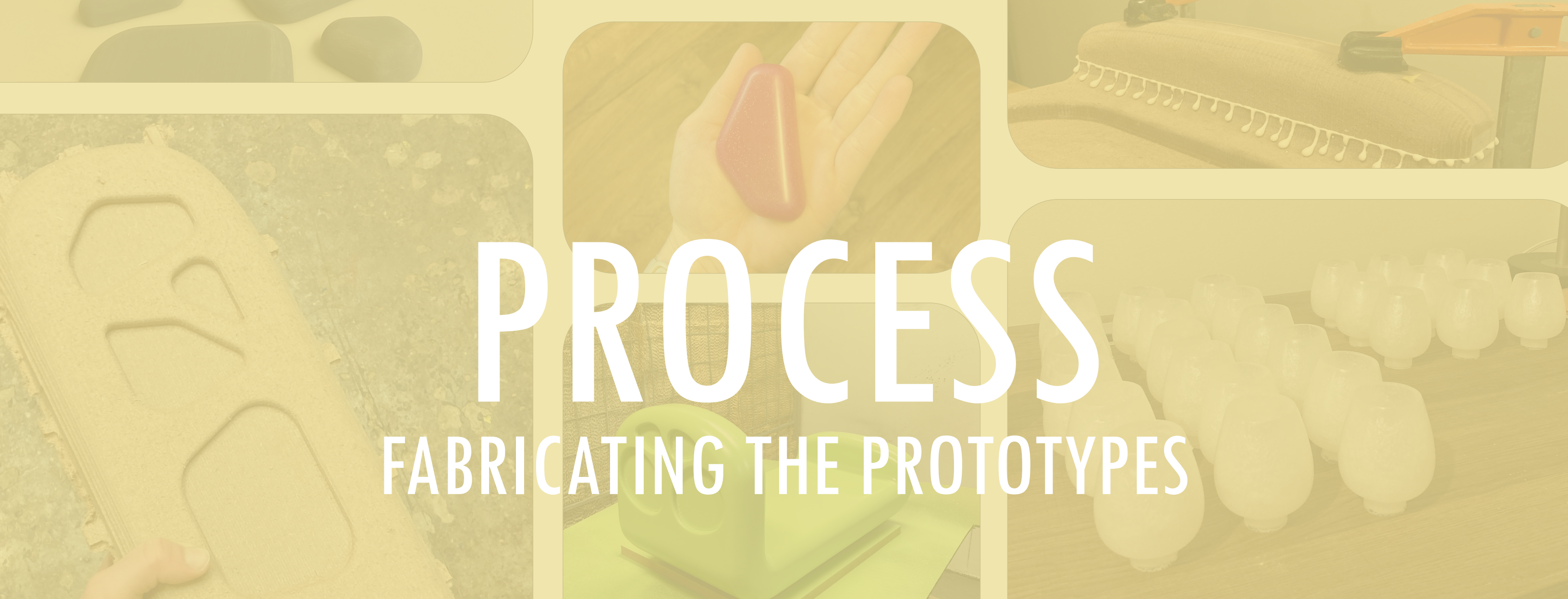
Cushion with contrasting stitches

Cast resin feet

Cast resin details

MDF substrate, steel legs - sealed and painted





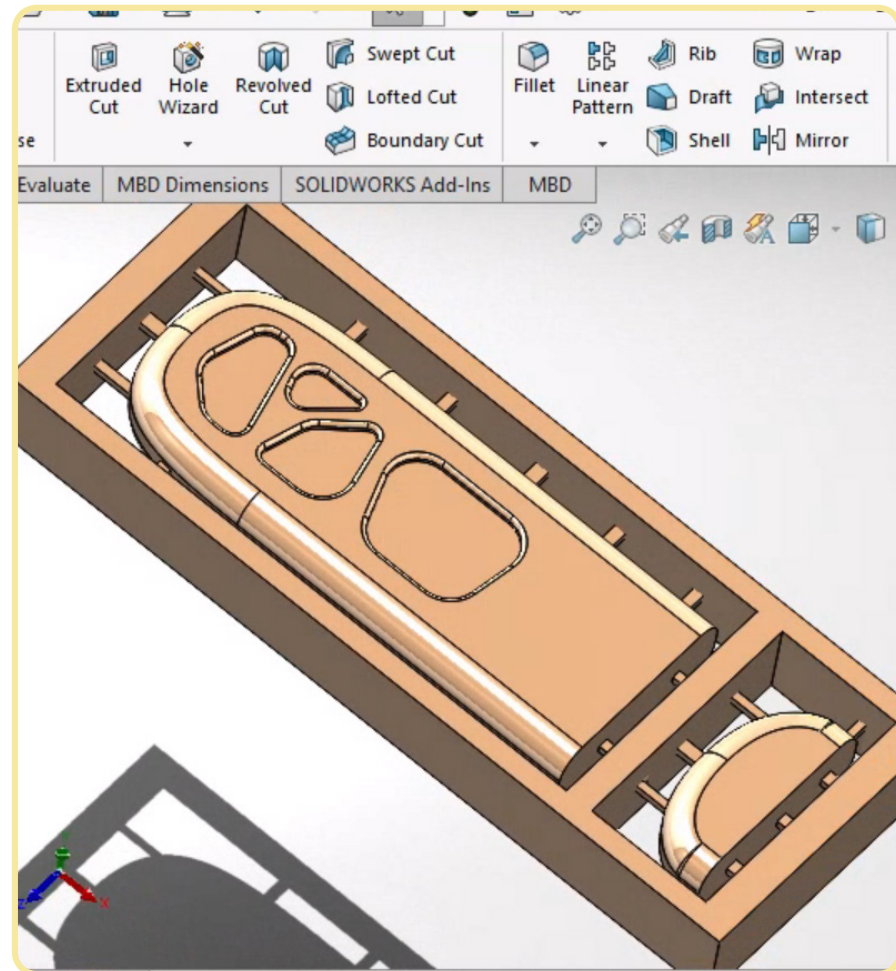
PROCESS

FABRICATING THE PROTOTYPES



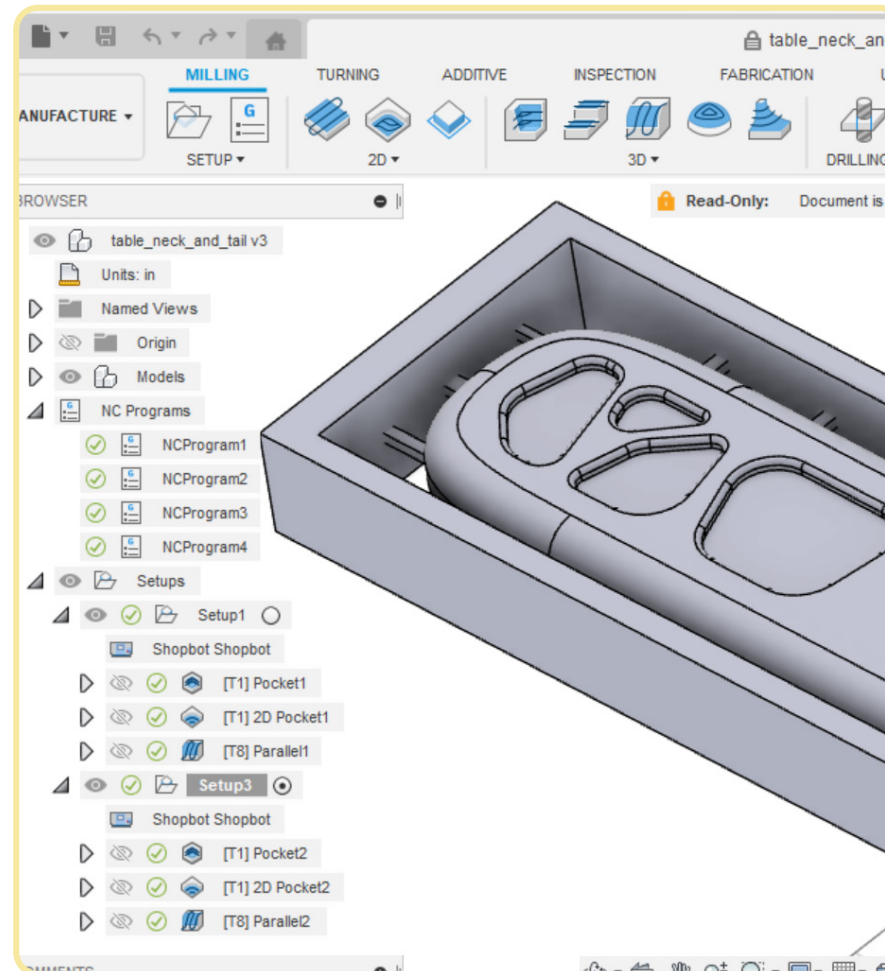
CADD + CAM

preparing for fabrication



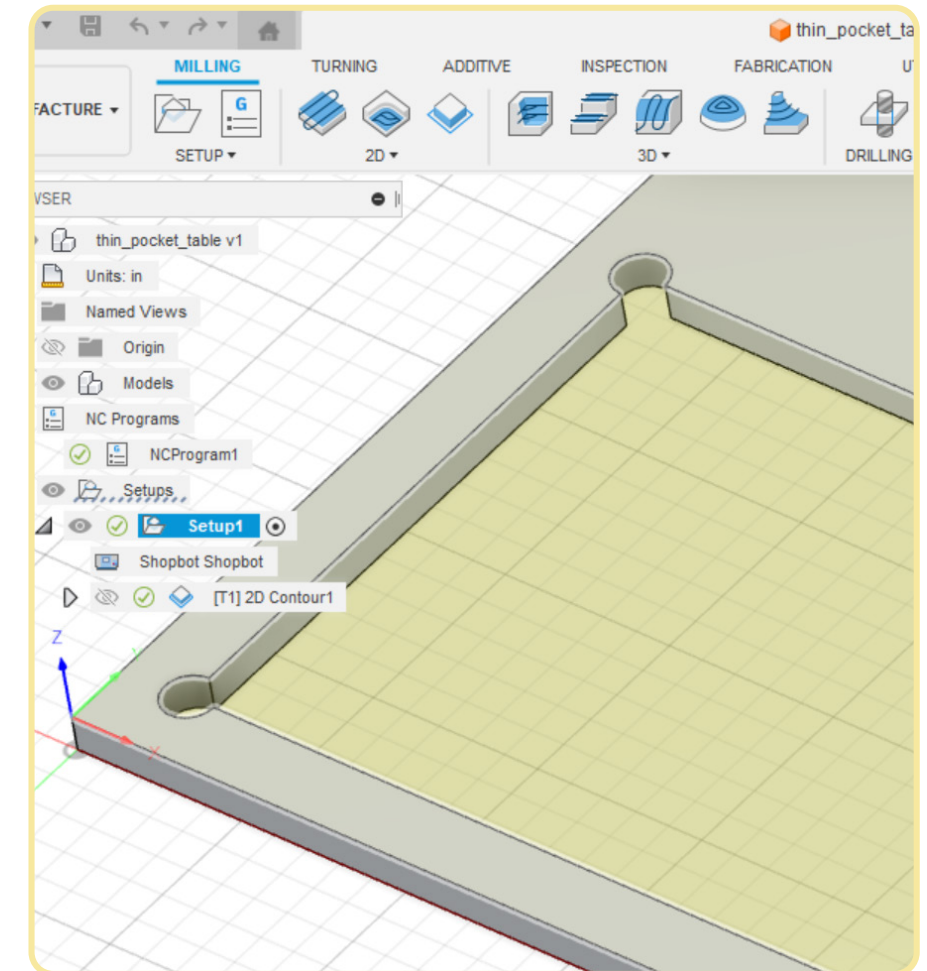
Step 1: Modeling on Solidworks

After modeling each piece fully in Solidworks, I separated the pieces into components that could be CNC milled. I created models that nested each piece within a pre-measured stock (including adding tabs). All cuts were flip cuts; the accuracy of measurements was imperative as a result.



Step 2: CAM for CNC

Each piece that was modeled in Solidworks was then post-processed in Fusion 360. Each cut was a 3D flip cut, requiring two set-ups, two tool changes, and typically six cutting modes (roughing, milling flat surfaces, and finishing).



Step 3: Pocket Jig

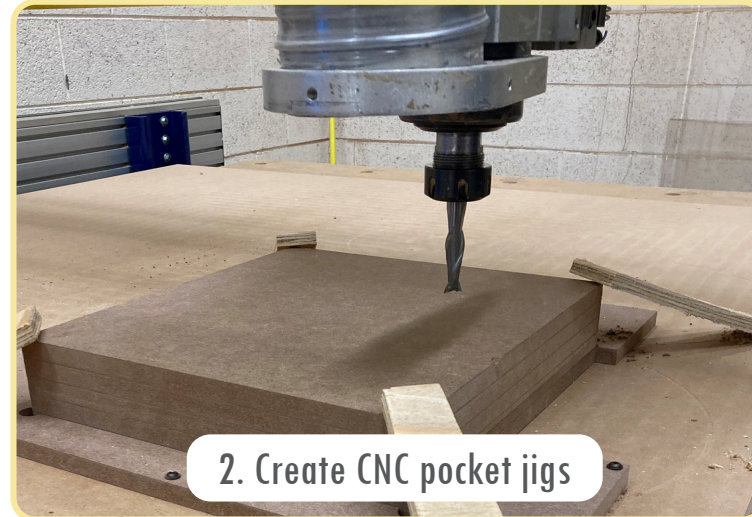
Each cut required a pocket jig in place on the CNC mill. I modeled each jig based on the dimensions of already-cut stock, as to allow for a successful reference when doing a series of flip cuts.

MAIN COMPONENTS

fabrication methods



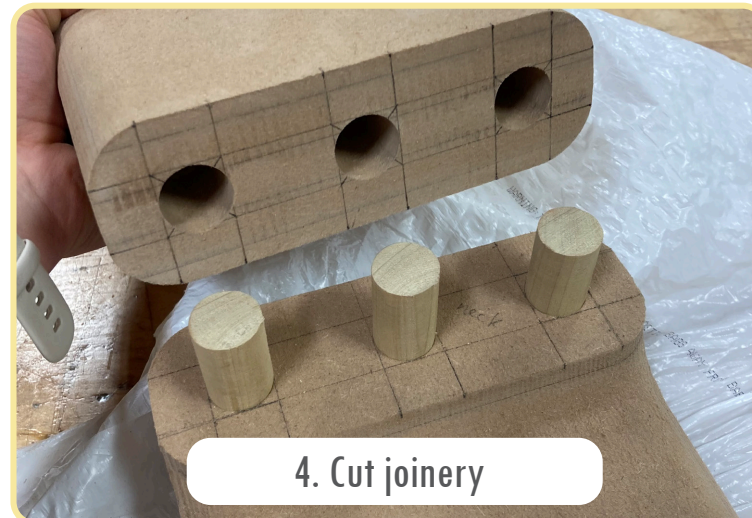
1. MDF glue-up



2. Create CNC pocket jigs



3. CNC mill pieces



4. Cut joinery



5. Glue up pieces



6. Prime pieces



7. Finish pieces

I reached an efficient workflow for creating the main component pieces. However, several processes were improved upon throughout the course of fabrication. These will be discussed on the next slide.

MAIN COMPONENTS

learning moments



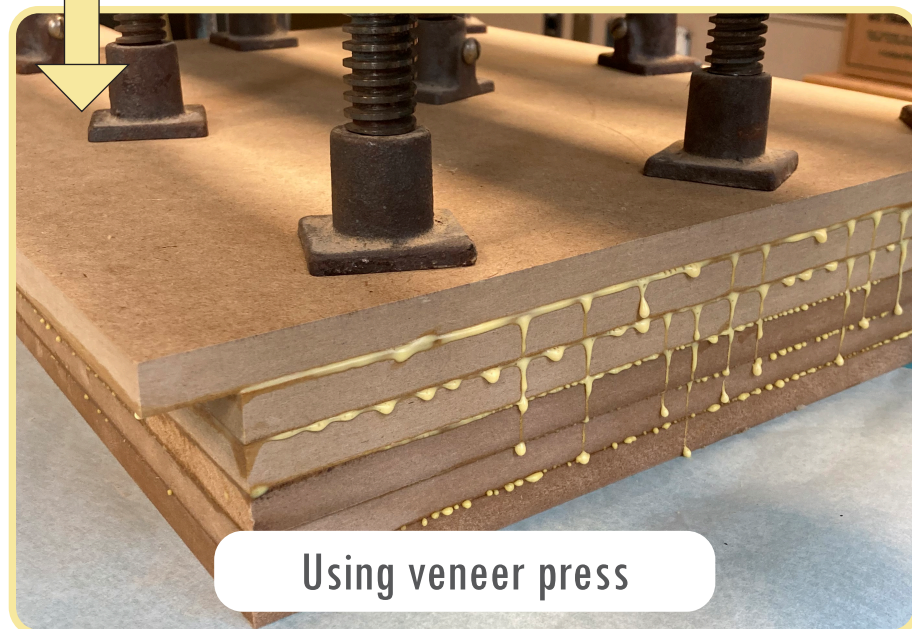
using clamps



using automotive putty



tenons in CADD model



Using veneer press



using polyurethane



floating tenons

For the MDF glue-up, I realized that I could create the large pieces of stock much more efficiently and independently if I used a veneer press rather than clamps.

After using automotive putty as the sealer for my first piece, I learned that using a primer that could soak into the MDF (i.e. polyurethane) before spraying primer would create a much stronger outer layer.

My initial piece included tenons in the CNC cut. However, I wanted to be able to cut deeper joinery and use a more sturdy material, so I opted for a dowel system on pieces 2 and 3.

MATERIAL RESEARCH + COLOR OPTIONS

detail components

Mold Star™ Series
Easy to Use Silicone Mold Rubber

List Products

	Hardness	Pot Life	Cure Time	Color
Mold Star™ 15 SLOW	15 A	50 mins	4 hrs	Green
Mold Star™ 16 FAST	16 A	6 mins	30 mins	Blue-Green
Mold Star™ 30	30 A	45 mins	6 hrs	Blue
Mold Star™ 14T	14 A	3 mins	9 mins	Translucent
Mold Star™ 19T	19 A	3 mins	12 mins	Translucent
Mold Star™ 20T	20 A	6 mins	30 mins	Translucent
Mold Star™ 31T	30 A	5 mins	23 mins	Translucent

I read through many product specifications to find the silicone rubber and casting resin that would best suit my needs. I chose SmoothOn's MoldStar 20T for my mold, as it cures quickly and withstands tearing well (both valuable to me, as I made 3 molds that were reused). The resin I chose was slow-setting (allowing bubbles to pop during curing) and UV-resistant (preventing yellowing over time).



To choose the colors of my detail pieces, I brought a variety of mica powders (to be mixed with resin) to class for feedback. It was helpful to have others help me choose accent colors that would complement, but not distract, the other components of the piece.

DETAIL PIECES + FEET

fabrication methods



1. Create positive forms



2. Create silicone mold



3. Cast resin pieces



To create the resin pieces, I 3D printed each piece with a resin printer, and sanded the pieces to 600 grit. I created silicone molds of the pieces, using a 2-part mold for the feet and a 1-part mold for the detail pieces. I cast resin in the molds, mixing in mica powder as a colorant.

DETAIL PIECES + FEET

learning moments



failed first mold



initial finish



successful 2-part mold



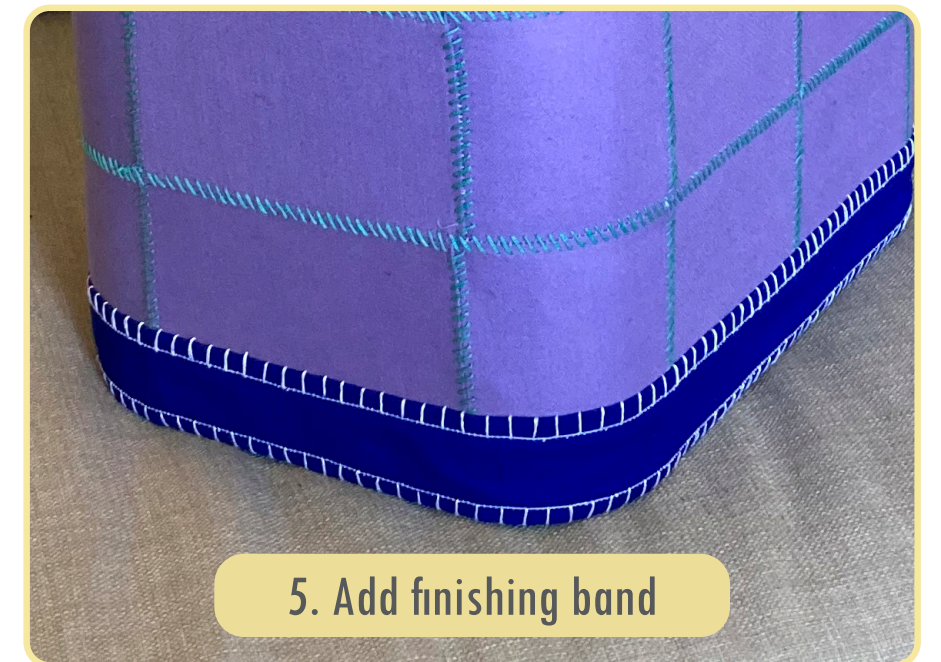
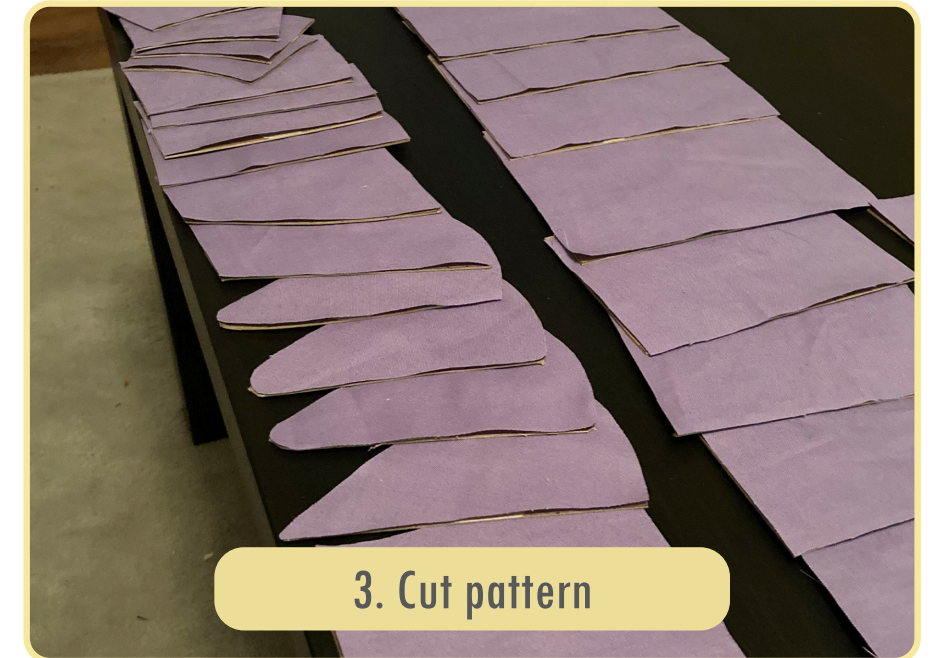
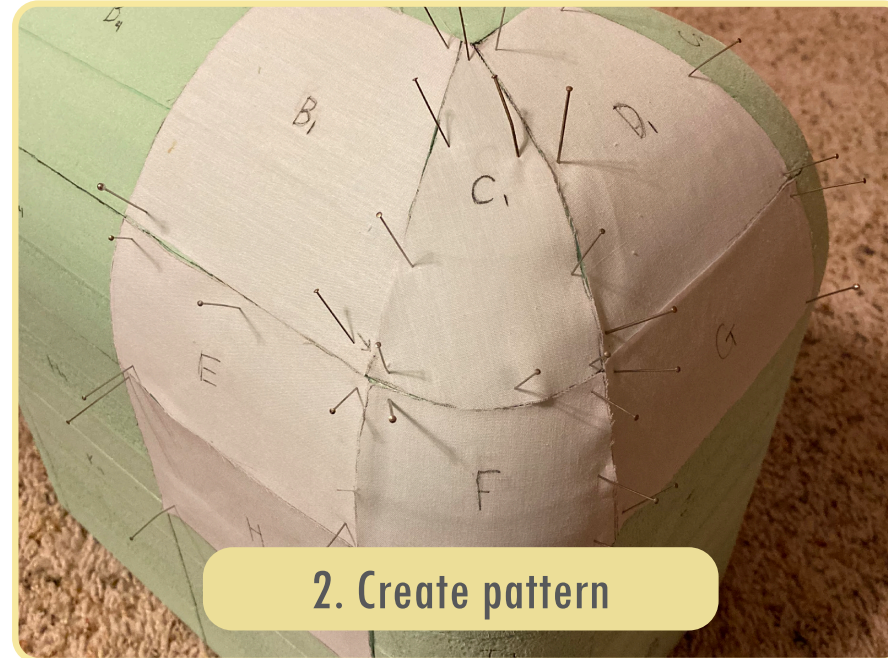
wet-sanded

I initially thought that I could achieve a successful 1-part mold for the feet pieces by cutting a slit in the silicone. Unfortunately, it was impossible to remove the piece without tearing the mold. I re-thought through the mold-making process and added a seam along the top of the foot, allowing for easy de-molding.

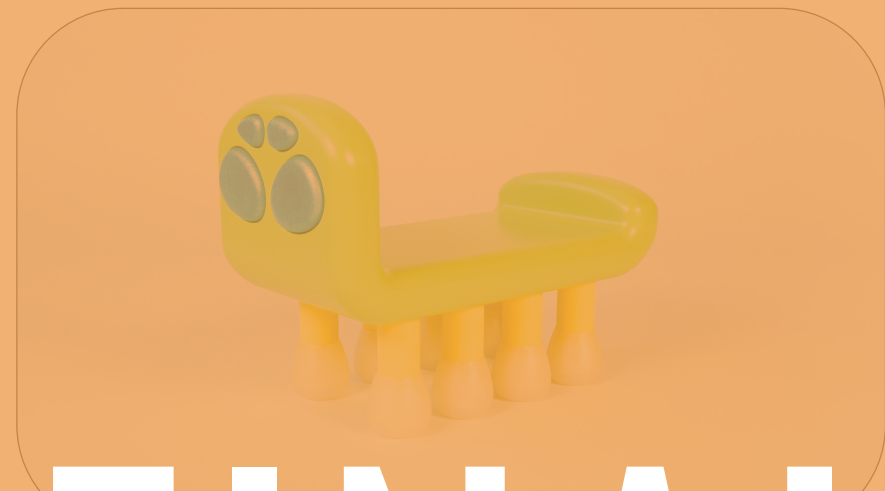
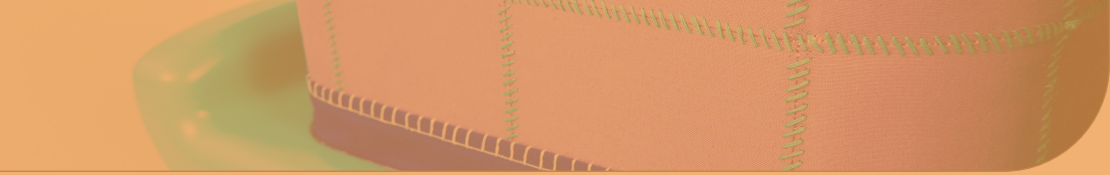
I had hoped that the detail pieces would de-mold with a satin finish. However, I was not happy with the slight abnormalities in the face due to brushing mold-release in the mold, so I wet-sanded the pieces to a 2000 grit finish.

CUSHION

fabrication methods



In order to create such a tall, domed cushion, I thought through several options, including using a stretchy fabric over a hard foam. I decided, however, to use a non-stretchy fabric with a soft upholstery foam that could fill the form. In order to mimick a turtle shell pattern, I created a fabric pattern with many tiles and contrasting stitching.





Furniture designed to evoke joy.

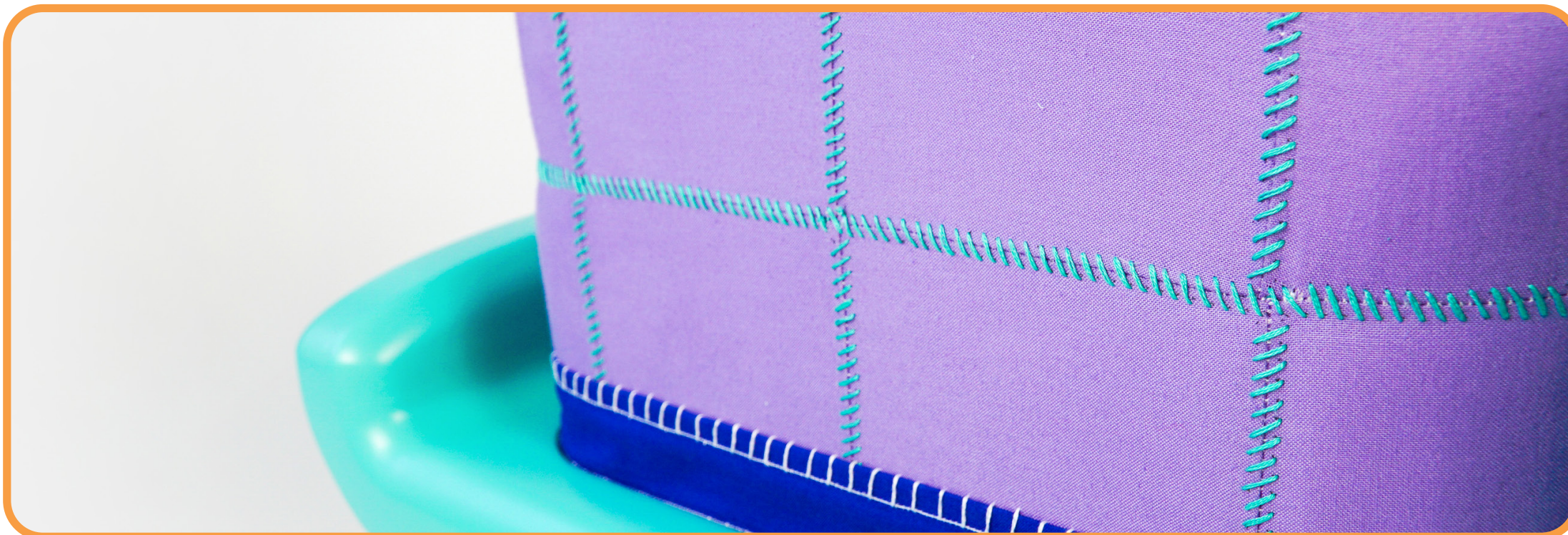




- colorful components

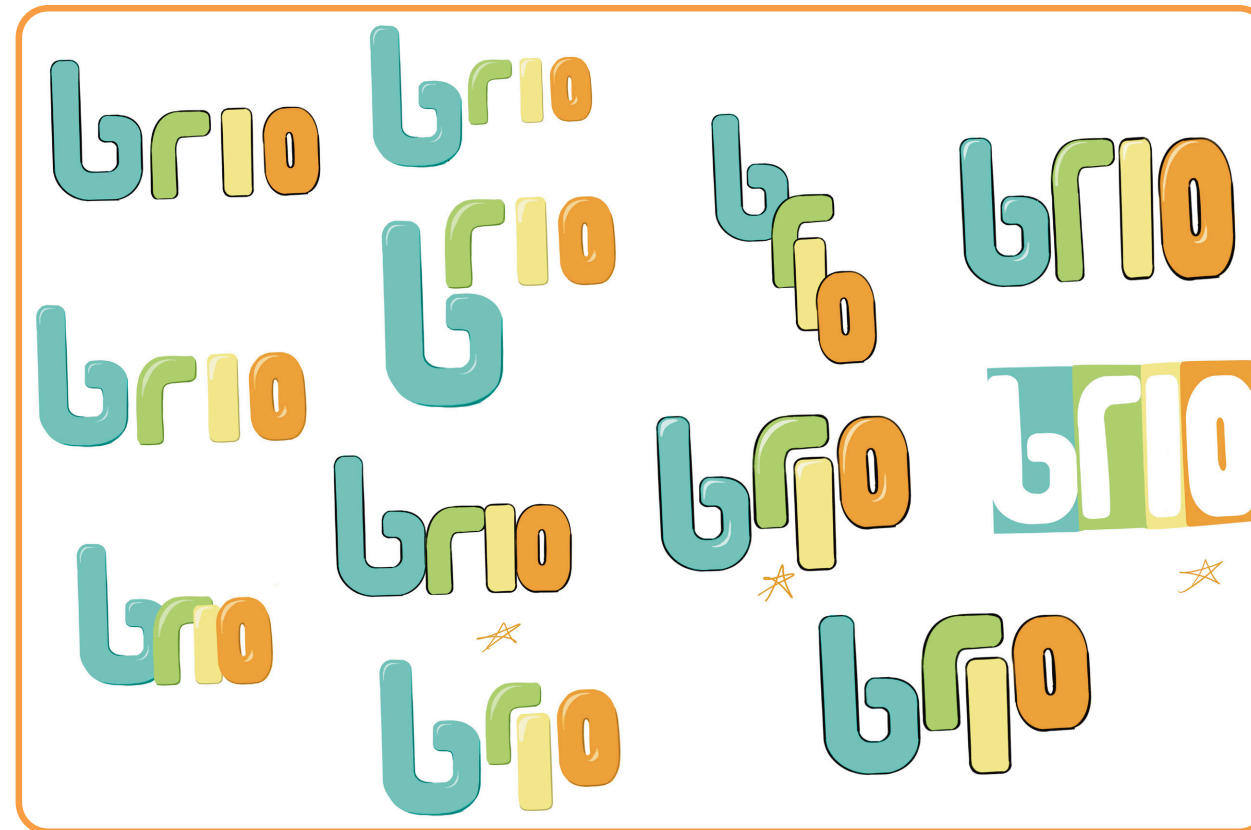
- soft details

- playful forms



NAMING + BRANDING

creating an intentional and cohesive brand



In order to decide the name of the series, I brainstormed words related to life, happiness/joy, and animals. I decided on the name Brio, which means vivacity or verve, as I a) liked the way that it sounded and looked on paper, b) thought the meaning of the word reflected the ethos of the brand, and c) had the synonyms zing, zest, and zeal, which I thought made great coordinated names for the individual pieces.

PHOTOGRAPHY

inspiration research



In styling photographs, I researched inspiration from playful furniture objects and fashion photography. The images that I was most attracted to primarily had a simple seamless background, allowing the colorful object to pop. However, I was also interested in images that didn't take themselves too seriously, using unrealistic backgrounds or props.

PHOTOGRAPHY

experimentation with style



Inspired by colorful fashion photography, I decided to place each of my pieces in otherworldly settings, focusing on a lack of realism. I wanted to give each of my pieces a bit more personality through these images.





**BRIO (noun): enthusiastic vigor:
vivacity, verve**

*Brio as a brand - highlighting the value of
playfulness, life, and joy in everyday life.*



Zing
a seating object



Zeal
a table object



Zest
a stepstool

TOTAL HOURS + COSTS

attaching monetary value to the project

TOTAL HOURS SPENT ON PROJECT:

602.75 HOURS

251.5 hours creating finished prototype
99.75 hours working on presentation materials,
including logo, website, posters
91.75 hours ideation
69.5 hours CADD/CAM work
44.75 hours research
19 hours planning and book-keeping
12.5 hours meeting with mentors and peers
12.5 hours buying materials
1.5 hours transporting pieces

TOTAL COST OF MATERIALS:

\$1267.15



thank you!