

Amy McGrath Project

Mia Playmates - Macadamia Wooden Toys

Product & Branding Design



CONTENT

DESIGN INSPIRATION	PAGE 02
RESEARCH	PAGE 02
CONCEPTS	PAGE 02
MATERIAL EXPLORATION	PAGE 02
PROTOTYPES	PAGE 02
BRANDING	PAGE 02
PRODUCTION	PAGE 02
SUMMARY	PAGE 02

Additional Informtaion

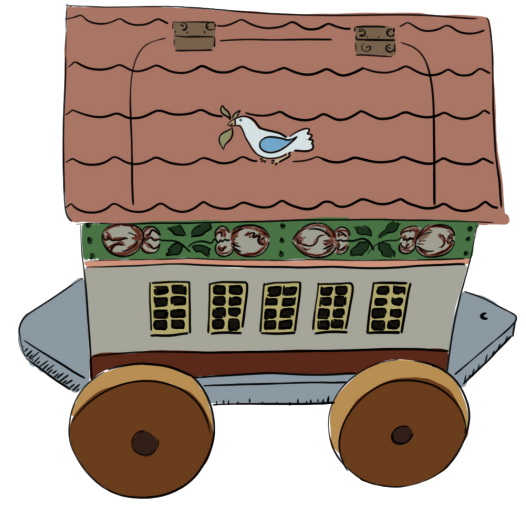
TOOLS USED
Adobe Photoshop
Adobe Illistrator
Fusion 360
CNC Route

COLABERATIVE DESIGNERS
Marc Harrison
Forrest Gillham

WORKSHOP TECHICIAN
Brad Nunn

Acknowledgment

In the spirit of reconciliation, all my work acknowledges the Traditional Custodians of Country throughout Australia and their connections to land, sea and community. We pay our respect to their Elders past and present and extend that respect to all Aboriginal and Torres Strait Islander peoples today.



DESIGN INSPIRATION

When I think of timber, memories flood in of a cherished childhood toy: a simple wooden farm. The squeak of its wheels, the scent of hand-painted pieces, and the weight in my hands evoke a sense of innocence.

Having stood the test of time, this toy is now gracing the playrooms of my nephew's generation. Reflecting on its durability and sentimental value, I'm reminded of the importance of the endurance in toy designs.



RESEARCH

As the toy set my nephew plays with will be shared amongst the grandchildren, it won't remain at his home indefinitely to pass down to his own children in the future. Because of this, I decided to dedicate five weeks to crafting a wooden toy set for his birthday.

When considering which animals to include in his set, I took special inspiration from a movie that his mother and I cherished during our own childhoods, link the set to his mother too. I'm referring to the timeless classics, 'The Land Before Time.'

Choosing to recreate the six main characters; Little Neck, Cera, Ducky, Petrie, Spike and of course, Chomper.

While this sets theme does nod to his mother's childhood, it wasn't the sole reason I chose dinosaurs.

Dinosaurs, are gender neutral and highly educational for children in multiple ways.

Dinosaurs allows scientific learning by encouraging children to exploring differences among dinosaurs they learn about biology, behaviors, and classification.

They also help with historical context as we can use dinosaurs to explain historical timelines to children in a relatable manner.

Introducing dinosaur terminology enhances language development by introducing words such as 'carnivore' and 'herbivore' in an easy-to-understand manner, expanding a child's vocabulary.

Dinosaurs, are also prominent in literature, film, and art, which can providing common ground for children to connect with their peers and fostering social development.

Which of course leads children to engage in creative play together.

By choosing dinosaurs as the theme for the set, I am providing your nephew with not only a fun and engaging toy but also a valuable educational tool that stimulates curiosity, learning, and creativity for him and other children who may engage with the set.

The Land Before Time (1988) Universal Pictures



CONCEPTS

Thanks to Marc’s insightful suggestion and understanding of macadamia wood, I avoided using the wood in a manner unsuitable for my intended design.

Subsequently, collaborating with another designer enabled us to brainstorm an iteration that effectively accommodated the material’s limitations while still achieving our desired outcome.

With this research, I refined the set’s design and transitioned to Fusion360 to create the CNC files for prototyping.

Upon reviewing food-safe woods, I recommended using maple as the core material. However, my sister requested using red cedar to include partner’s heritage, and my nephew’s father.

I did caution that intial research suggest red cedar might not be suitable as a core wood, as it’s could be toxic when ingested. However, I advised them I would order the wood and utilize it if possible

Starting Sketches

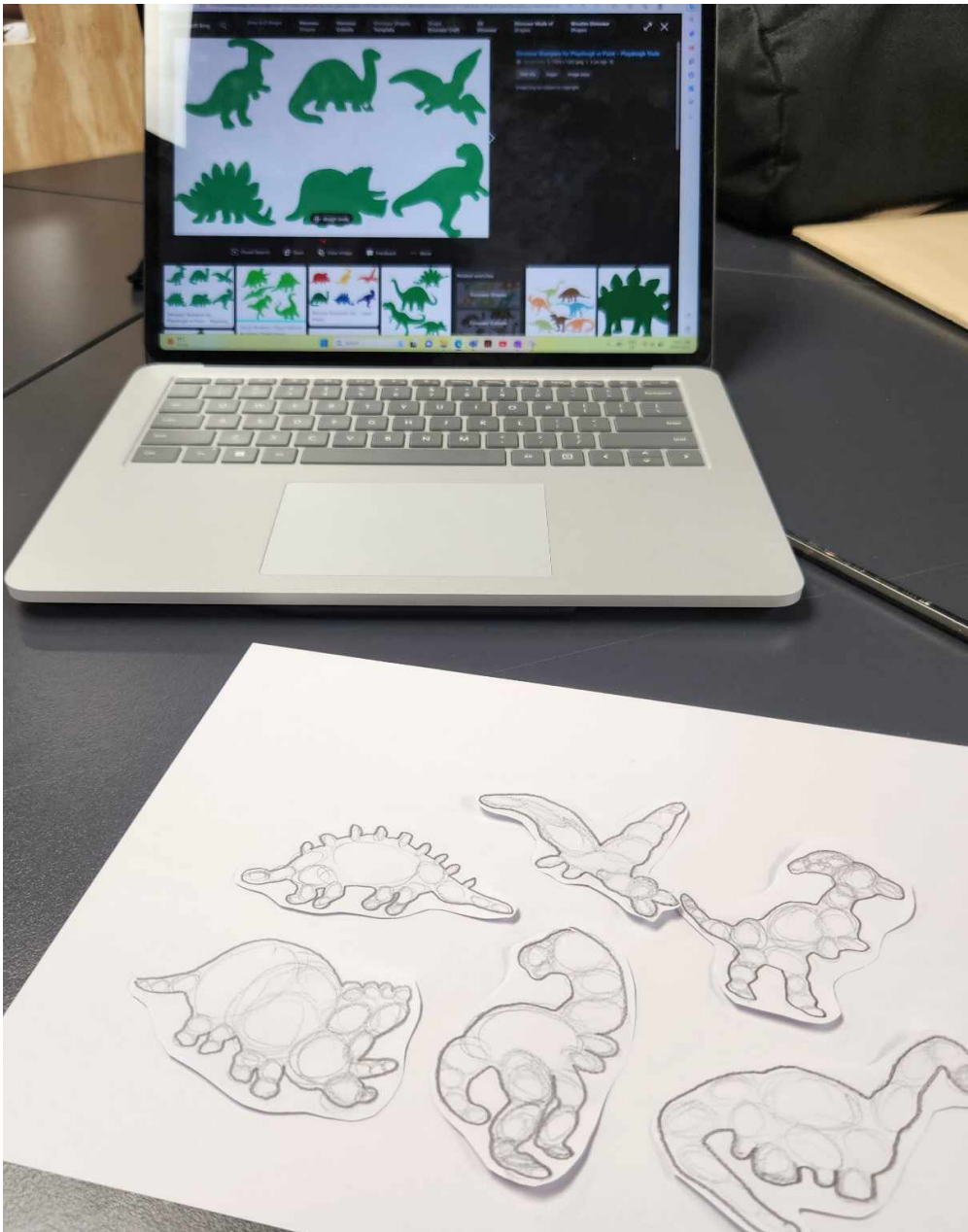
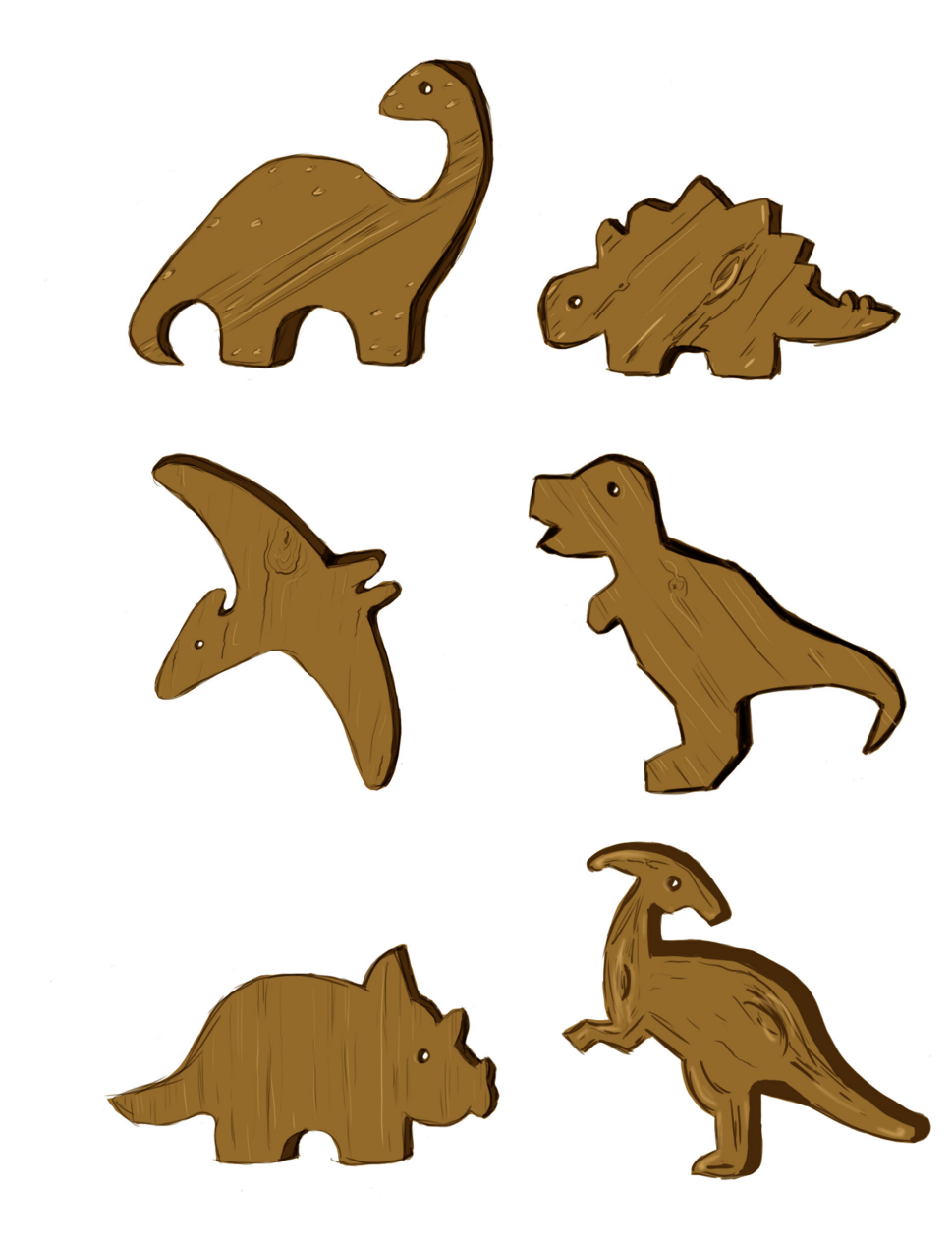


Illustration Vectors



MATERIAL EXPLORATION

Macadamia nuts, known also by it's Indigenous name, the Bauple nuts, have been present throughout my upbringing in Maryborough, a region where the tree is native to.

Although familiar with the nuts, I had never encountered anyone utilizing the timber until recently, when I became aware of a small movement of artists incorporating it into their works.

Upon discovering this, I was compelled to engage with the material, not only to deepen the heritage connection within the set for my nephew but also to explore its unique qualities firsthand.

Having grown up in Maryborough, where macadamia nuts, also known as Bauple nuts, were a common sight.

I was surprised to learn of artists incorporating the timber into their work only recently. Intrigued by this discovery, I felt compelled to explore it further.

Not only did I see an opportunity to infuse the dinosaur set for my nephew with a local touch, but I also wanted to experiment with the unique properties of the wood.

The designer and owner of Husque, previously researched macadamia timber and graciously guided me through his findings, suggesting ways I could incorporate the wood into my own design.

Marc explained that despite the macadamia tree being widely farmed and its wood classified as a hardwood and related to Silky Oak, it is often disregarded as 'rubbish' commercially for various reasons.

SPLITTING

Macadamia wood absorbs additional water through its pores, which run straight to the heart of the tree. This is how the nuts develop, this also results in stunning medullary rays in the timber. However, this unique feature comes at a cost. The high moisture content in the wood causes it to split during the drying process.



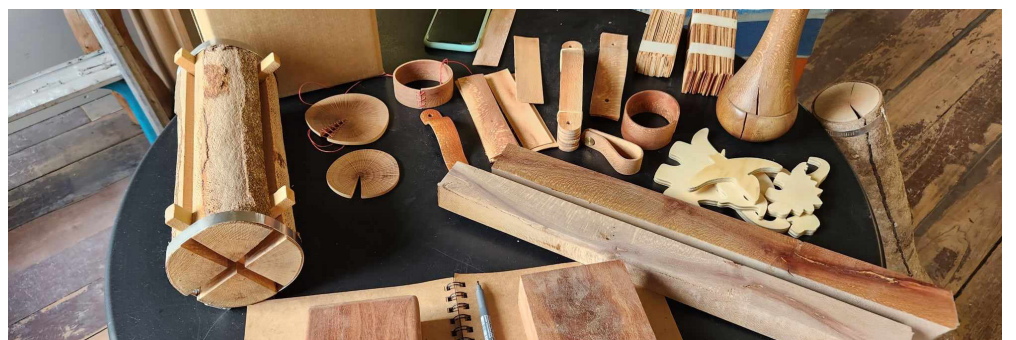
FUNGUS AND MOLD

Another downside of increased water retention is the susceptibility to fungal and mold growth within the timber if not properly maintained, which is less than ideal for products.



NO COMMERCIAL DISTRIBUTION

As the tree isn't cultivated primarily for its timber, there are no commercial distributors readily available. Additionally, the irregular and smaller shape of the wood makes it unsuitable for standard timber milling machines, limiting people's ability to utilize this native timber.



After discussing the material, we delved into my plans for the toy set. I expressed my desire to create sturdy toys that could withstand generations of play.

However, Marc cautioned that while this was a lovely idea, using only macadamia nut wood might not be the best fit due to its tendency to splinter, as we had previously discussed.

Considering that I need to keep the thickness to achieve the outcome, Marc suggested an alternative approach.

Instead of using solid macadamia wood throughout, he proposed using veneers of the timber, with a more stable core wood, effectively avoiding the risk of splintering while still achieving the desired aesthetic.

Marc kindly provided me with three pieces of pine wood core, each 20mm thick, along with macadamia nut wood veneers so I could prototype this idea.

PROTOTYPES

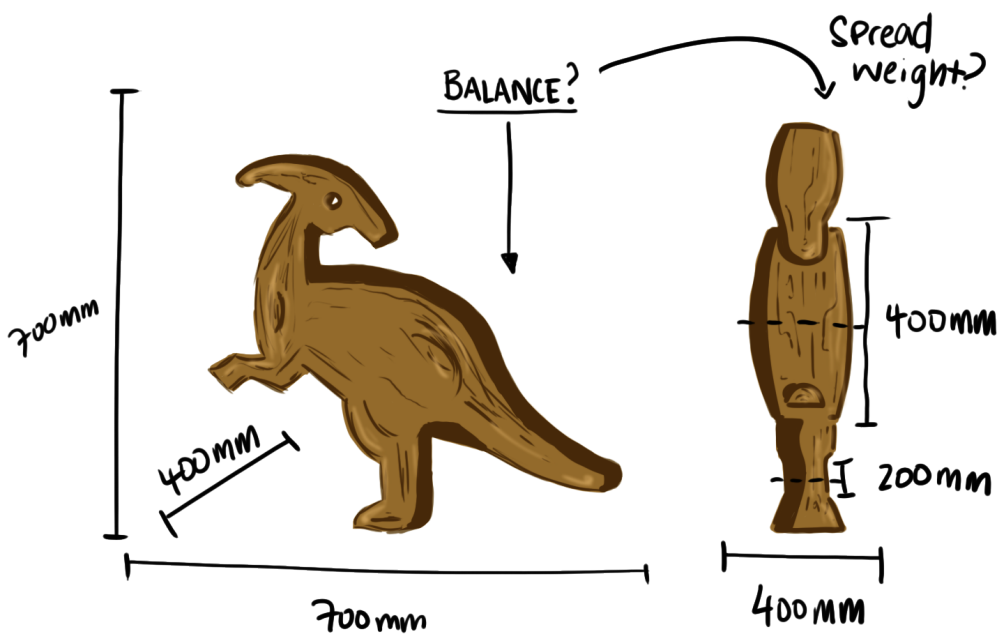
Thanks to Marc’s insightful suggestion and understanding of macadamia wood, I avoided using the wood in a manner unsuitable for my intended design.

Subsequently, collaborating with another designer enabled us to brainstorm an iteration that effectively accommodated the material’s limitations while still achieving our desired outcome.

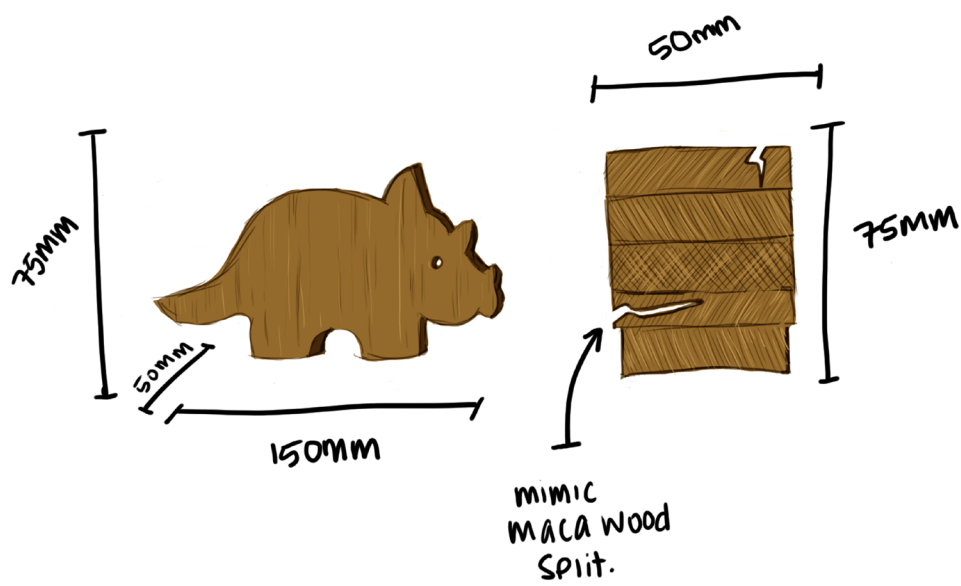
With this research, I refined the set’s design and transitioned to Fusion360 to create the CNC files for prototyping.

Upon reviewing food-safe woods, I recommended using maple as the core material. However, my sister requested using red cedar to include partner’s heritage, and my nephew’s father.

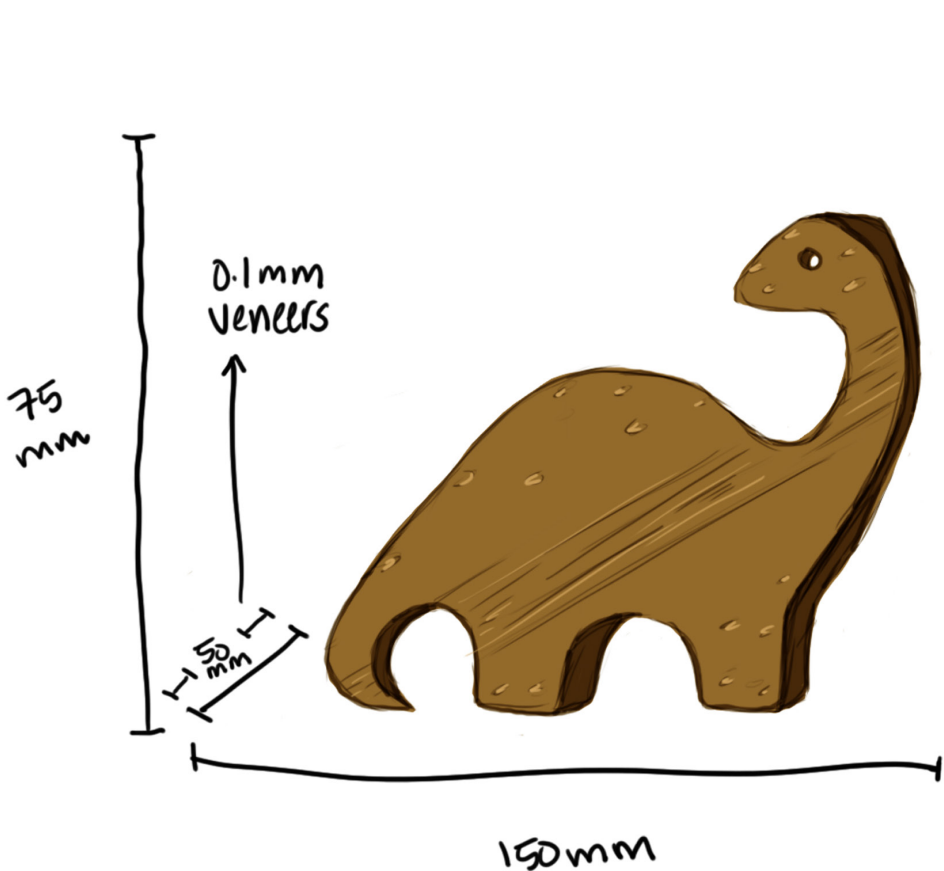
I did caution that intial research suggest red cedar might not be suitable as a core wood, as it’s could be toxic when ingested. However, I advised them I would order the wood and utilize it if possible



Initial Illustrations Dimensions



Second Illustrations Dimensions: Full Macadamia Wood



Third Illustrations Dimensions: Core wood with Veneers



PROTOTYPES

I personally find physical prototypes invaluable. They aid me in manipulating the design in virtual space, so whenever possible, I opt for prototypes, even if they're rudimentary.

For the first iteration of this set, I had Brad use the CNC to 4mm plywood with a 2mm drill bit.

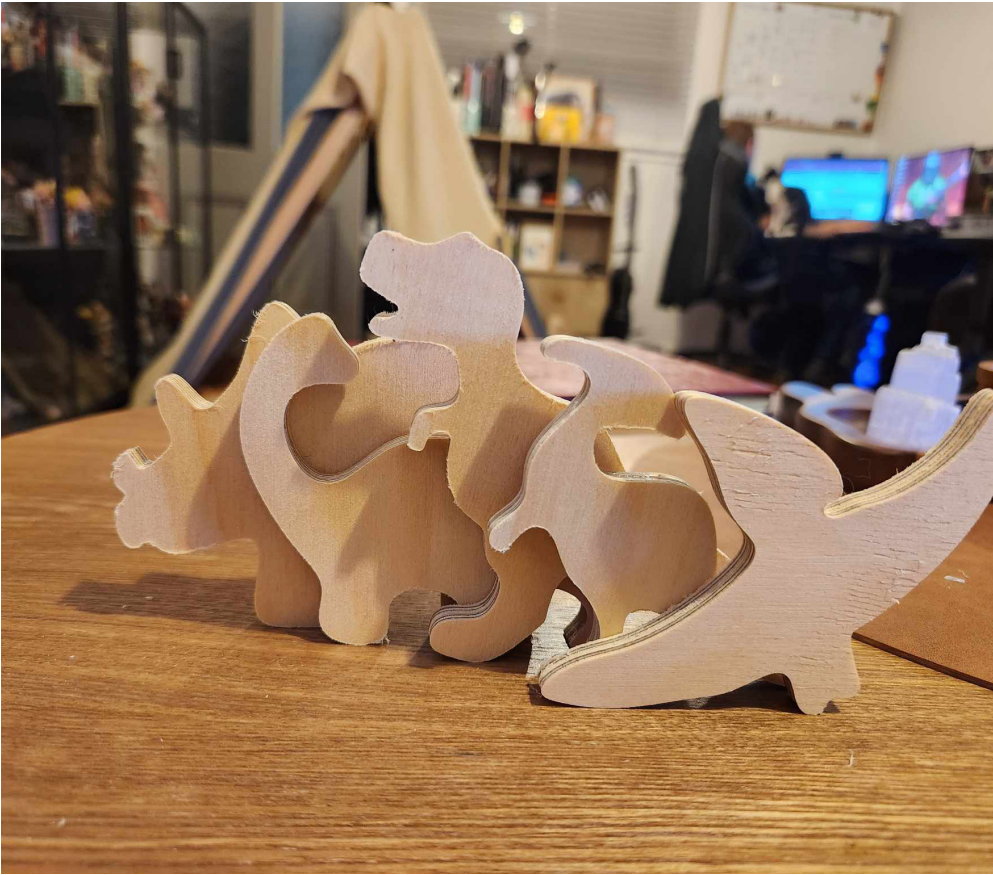
This proved beneficial, as it quickly revealed that the sizing on my long neck file wasn't correct.

Another valuable insight gained from these rough prototypes was provided by Forrest, another designer who assisted on this set.

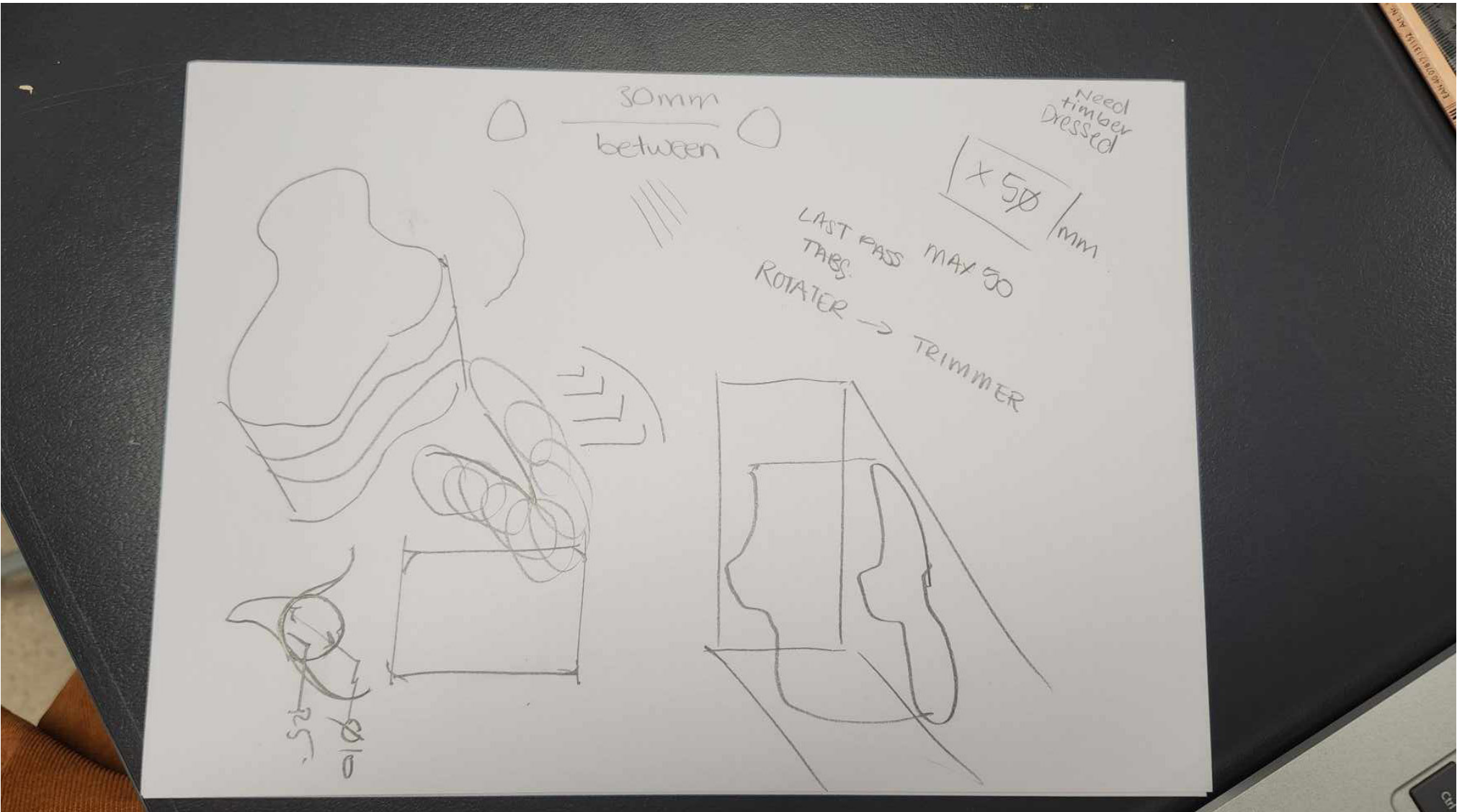
Forrest advised that while the 2mm drill bit successfully cut through the 4mm plywood, a minimum drill bit size of 10mm would be necessary to cut through the larger core wood.

This means that I will need to increase any diameters in the designs and simplify the overall styles.

PROTOTYPE ONE - 4MM PLYWOOD



PROTOTYPE ONE - FORREST'S SKETCHES



PROTOTYPES

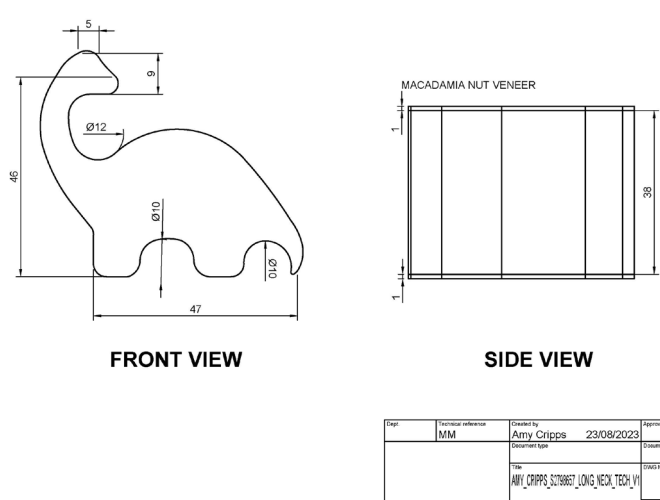
For my second prototype, I chose to resize the long neck and have it cut from the pine core and macadamia veneers provided by Marc, I opted not to create the full set due to having only a few veneers available.

The CNC cut through the timber easily. However, Brad advised that I include a buffer around the final designs as the drill bit dug into the CNC bed which we want to avoid wherever possible.

We also noticed a burn mark on the piece, which Forrest remarked could be due to the CNC potential hitting the bed or not moving fast enough.

However, once I sanded the piece, the burn mark was easy to remove. I also concluded that with the buffer around the designs, this issue may not occur.

Since this set is for children, I decided to apply food-safe wax to the final product to add a soft finish while ensuring safety for little ones.



BRANDING

Though this set is for my nephew, for fun and practice, I made the decision to create a brand the set, dubbing ‘Mia Playmates’.

The name ‘Mia’ was selected to draw attention to the ‘macadamia veneers, but also because the name, Mia, itself means ‘beloved’ which feels very suitable.

The term ‘Playmates’ was chosen as the descriptor for the toy brand. Playmates, exudes a timeless quality that aligns with my intention for these toys to be cherished across generations, while also leaving room for potential diversification in the future.

The smaller circle in the ‘l’ symbolizes the macadamia nut.

While we’re not marketing this as a macadamia ‘nut’ product, drawing the connection to the consumer’s attention, may increase interest and create a fimailar connection with the timber.

The larger circle, in the ‘l’ while not immediately apparent, represents the timber.

The shape is softened to mirror the splitting that naturally occurs in macadamia timber.

It serves as a symbol that beautiful wood isn’t without its imperfections, but rather, it possesses characteristics that can be creatively navigated to craft beautiful, functional products



BRANDING CONCEPTS & INTERATIONS



PRODUCTION

With the successful use of macadamia veneers on the CNC Router during the second prototype, I felt confident moving forward with the final set.

As I had set 5 week limit for the project, I wasn't able to obtain red cedar or maple in the size needed in time. So I used a soft pine core which I knew would work due to the prototyping.

Brad's assistance in operating the CNC machine was invaluable, and although I didn't personally press all the buttons, I enjoyed the challenge of learning how the machine worked.

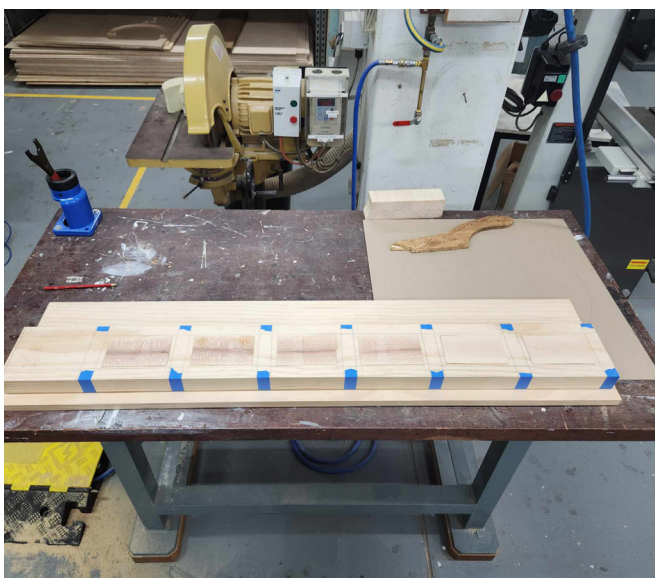
After setting up the timber on the CNC machine and ensuring the accuracy of all files, we conducted a test cut on a non-veneer piece to verify the sizing with the 10mm head. Given the approximate cost of \$3 for each 1mm thick veneer, there was little room for error. With the successful test, we proceeded with the full piece.

While the CNC machine adeptly handled the adjusted shapes, I didn't plan for the strength of the shop vacuum. Which resulting in the loss of one T-Rex to the vacuum bag and damage to the triceratops head due to loss of suction. Despite these challenges, I completed the day with a full set.

For subsequent cuts, I would want to resized the dinosaurs to utilize more of the veneer rather than attempting to get two out of one piece. The attempt to save costs wasn't worth the risk of losing and needing to recut multiple pieces.

In the future, I want to explore other wood cores. While I liked pine, and had planned maple, experimenting with silky oak, which belongs to the same tree family as macadamia, would be an exciting endeavor.

PRODUCTION PROCESS



SUMMARY

I am delighted with the outcome of these little playmates. Not only did I have the opportunity to collaborate with other designers, but I also gained a deeper understanding of a tree that has been a part of my life for as long as I can remember, albeit from a new design perspective.

Working in a wood shop for the first time was a fulfilling experience, and I thoroughly enjoyed the process of communicating with the tech team to bring this design to life. It became evident to me that this timber isn't just salvageable; it's well-suited for product creation.

Finally, I am genuinely thrilled to gift my nephew a set of uniquely Australian playmates that cannot simply be found in stores. By embracing his mother's love for Montessori with a plain timber design that showcases the depth and unique qualities of the wood, I am confident that this set will provide him, and any future siblings, with years and generations of playtime enjoyment.

