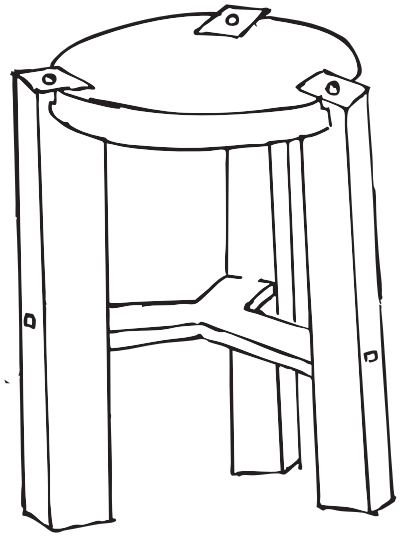
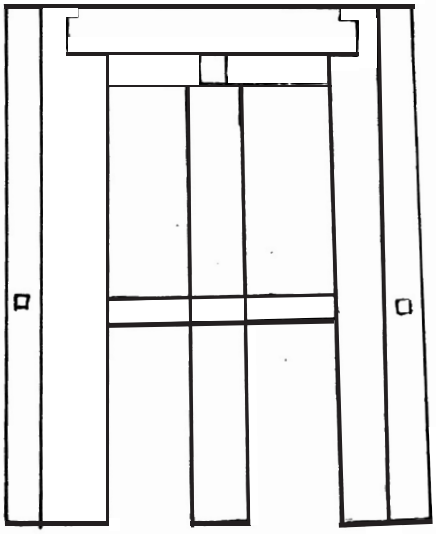
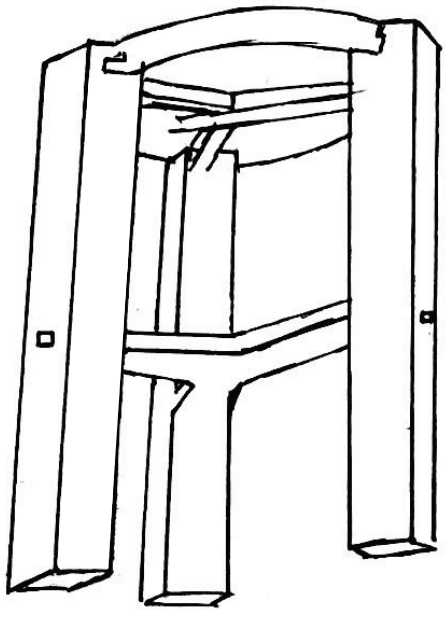
ReClaim

make & made







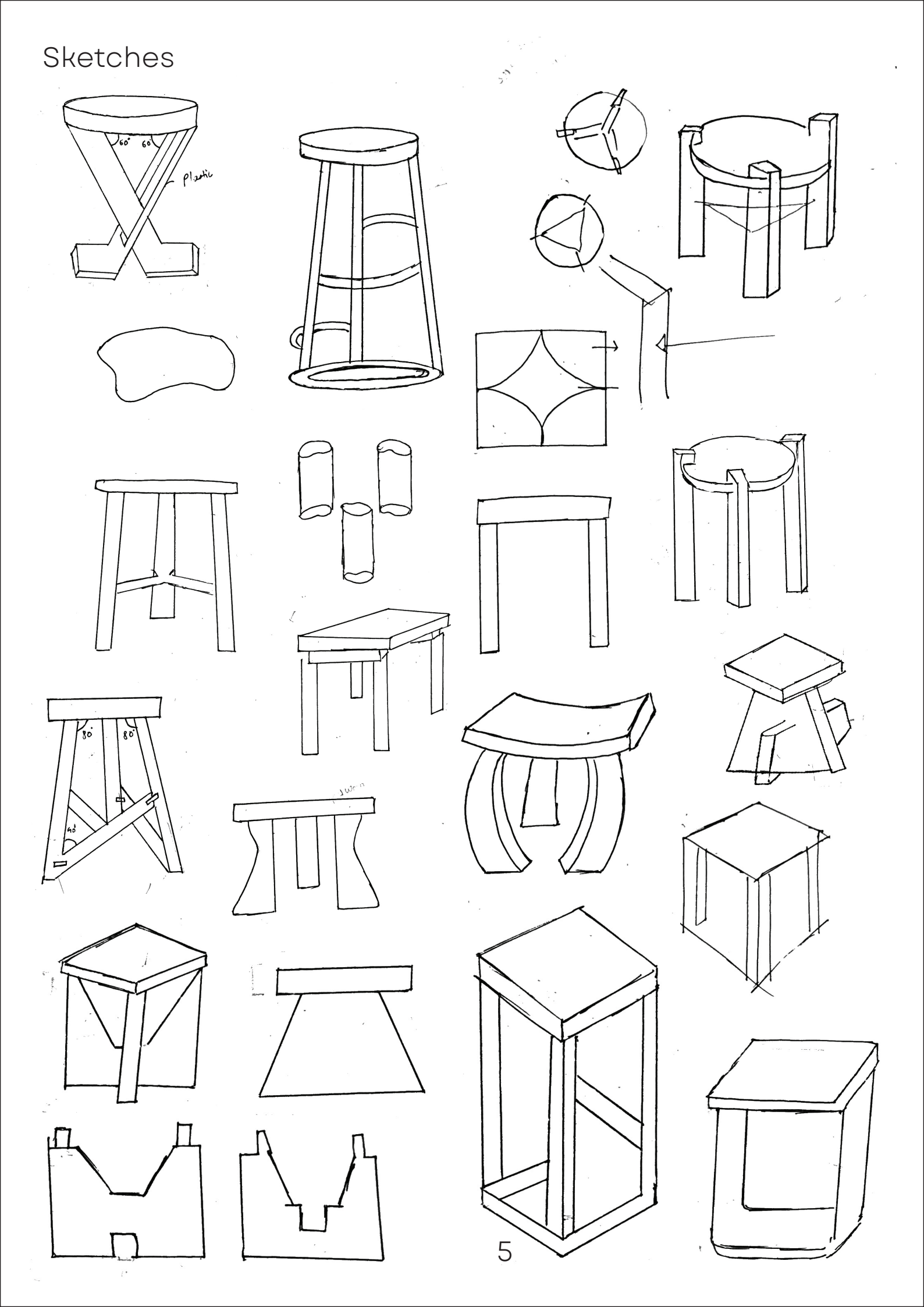
TRISHA SARAOGI

IDEATION

PRODUCTION

CONTENT:

Sketches



Macquettes

After completing initial sketches, five designs were selected to create exact 1:5 scale maquettes to help us visualize how each design would look once scaled up and made into an actual stool. My final stool design was selected by our lecturers . I built the maquette entirely out of white board to represent the final design's details and dimensions accurately. From sketches to maquettes to the final stool, many adjustments and improvements were made, enhancing the design's stability, look, and functionality.

Refinement Points

Feedback: To make the stool stable and prevent the legs from wobbling, we add a structure in the middle that connects all three legs, making it structurally sound.

Refinement points: Add a central support to reinforce stability and create a solid foundation for the stool, ensuring all legs remain secure and wobble-free.

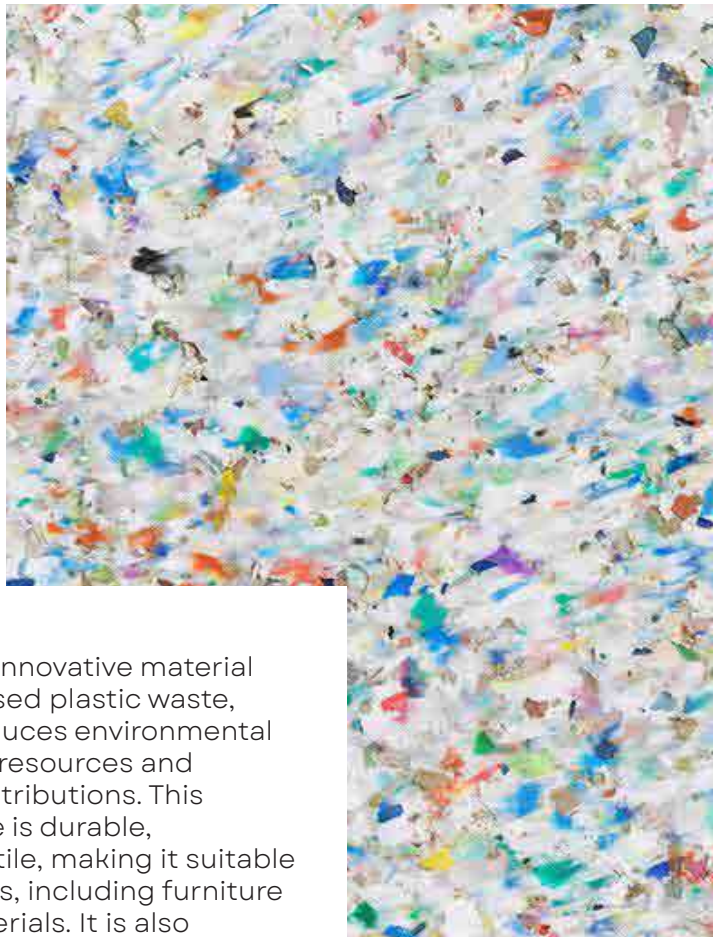
Feedback: The stool design shows promise, but the exposed ends of the legs extending above the seat could create discomfort for users.

Refinement Point: To improve comfort, ensure that the top ends of the legs are leveled and flush with the seat surface. This adjustment will create a smoother seating experience, eliminating any protruding parts that may be uncomfortable.

Feedback: The current design lacks adequate support for the leg joints, making them vulnerable to breaking under the seat's weight, especially with the heavy plastic.

Refinement Point: To enhance durability, add a reinforced support directly beneath the seat. This will distribute weight more evenly and prevent stress on the leg joints, reducing the risk of breakage during manufacturing and use.

UNDERSTANDING THE MATERIAL: (PLASTIC)



Recycled plastic is an innovative material created from repurposed plastic waste, which significantly reduces environmental impact by conserving resources and minimizing landfill contributions. This sustainable alternative is durable, lightweight, and versatile, making it suitable for various applications, including furniture and construction materials. It is also resistant to moisture, UV rays, and decay, ensuring longevity.

For my project, I sourced recycled plastic from Plastify, a Singapore-based company that specializes in transforming plastic waste into high-quality, sustainable materials. Committed to promoting a circular economy, Plastify reduces the overall environmental footprint while providing eco-friendly alternatives for designers and manufacturers. By incorporating recycled plastic into my stool design, I aimed to blend functionality with sustainability, reflecting a conscious choice to support environmentally responsible

UNDERSTANDING THE MATERIAL: (WOOD)

Wood is a versatile and renewable natural material derived from trees, primarily composed of cellulose fibers, hemicellulose, and lignin. Its unique properties–such as strength, durability, and aesthetic appeal–make it a preferred choice for a wide range of applications, including construction, furniture, flooring, and decorative items. Among the many types of wood, pine wood stands out as a popular softwood known for its light color, straight grain, and ease of workability.

Pine wood is not only lightweight and affordable but also adapts well to various finishes, making it an ideal material for furniture making and crafting projects. It often features natural knots and resin pockets, adding character to its appearance. Additionally, pine's inherent resins contribute to its resistance to decay, enhancing its longevity. This combination of properties makes pine wood particularly suitable for items like stools, where stability and visual appeal are essential. Overall, pine wood's balance of practicality and beauty continues to make it a favored choice in woodworking and design.

METHOD & PROCESS

PROOF OF CONCEPT

As part of the development process, we were tasked with creating a proof of concept for each joinery technique used in the stool. This step was essential to validate the functionality and strength of our chosen innovative joinery methods. By testing these connections, we ensured that each joint performs as intended, contributing to the overall stability and structural integrity of the stool. The proof of concept demonstrates that our design is not only aesthetically pleasing but also structurally sound and reliable for practical use.

01

In my first proof of concept, I demonstrated the joinery method for attaching the stool leg to the seat. I created a 1 cm deep depression in the plastic seat surface, into which the leg fits securely. The leg has a 6 cm breadth, and I cut a 4.5 cm by 2 cm slot in it, leaving a 1 cm thick section on top that slots perfectly into the depression in the seat. To further enhance stability and strength, I inserted a 9 mm diameter, 6 cm long dowel through the joint. This additional support reinforces the connection, making it more durable and preventing any wobble or potential detachment under weight

02

In the second proof of concept, I illustrated the joinery for the central support connecting to the legs. I opted for a mortise and tenon joint to provide additional strength and stability. The central support piece has a shape resembling a peace sign, with each arm of the 'sign' measuring 1.5 cm in breadth, 1 cm in thickness, and extending 6 cm in length. These ends fit into mortises cut into the legs, passing through the legs and visible on the opposite side. This design ensures that the support integrates securely with the legs, enhancing the stool's overall structural integrity.

FINAL STOOL

The final stool design is a thoughtful blend of sustainable materials, innovative joinery techniques, and a commitment to reducing environmental impact. We had to create the stool using 70% wood and 30% plastic. Crafted with a minimalist yet functional approach, the stool's legs are made from pine wood offcuts sourced directly from the college workshop, making use of available resources to minimize waste. The seat and central support structure are constructed from recycled plastic, supplied by Plastify, lending both durability and a modern aesthetic. This choice of materials highlights a key motive behind the project: to explore sustainable design practices by repurposing existing materials rather than relying on new resources.
To enhance stability and structural integrity, a wooden support is incorporated directly beneath the seat, reinforced by a wooden dowel that secures the joinery without additional adhesives or metal fasteners. By thoughtfully combining reclaimed and recycled materials, this stool not only achieves aesthetic appeal and durability but also embodies an environmentally responsible design philosophy. designers to consider eco-friendly alternatives in furniture-making.

For the final stool, I created it in four main parts: the main seat, the three legs, the central support, and an additional support beneath the seat. Starting with the seat, it began as a square piece of recycled plastic, which I trimmed and sanded into a perfect circle using a wood belt sander. To ensure smooth, even surfaces on both sides, I used a hand sander to flatten each side carefully. The original thickness of the plastic was 36mm, but I needed to reduce it to 30mm. For this, I set up a router by screwing it onto a wooden plank and clamping the plastic between two wooden pieces. This setup allowed me to precisely remove 5mm of material, with the final 1mm reduction done by hand-sanding and smoothing the surface for a clean, even finish.

Next, I needed to create 10mm-deep depressions on the plastic seat to allow the legs to fit seamlessly. Each depression measured 45x45mm and was placed on three sides of the seat. These slots allowed the legs to slide in perfectly, ensuring a stable, flush connection between the seat and legs, contributing to the overall structural integrity of the stool.

For the legs, I sourced pine wood from the workshop, with each piece initially measuring 60mm x 60mm. I cut three pieces to a length of 425mm each, ensuring uniformity. Then, I reduced one side by 25mm, shaping each leg to a final dimension of 45mm x 60mm. This adjustment allowed for a balanced fit with the seat and support structure. The precise resizing of each leg helped create a seamless connection with the other components, preparing them for the final assembly.

Starting 10mm from the top of each leg, I cut a 20mm-long slot with a width of 45mm, leaving an extra 15mm of wood extending outward. Below this slot, I created another, smaller slot measuring 15mm x 10mm x 25mm, positioned at the center. This smaller slot was made using a tenoner square hole mortising machine and was designed to fit the additional support positioned underneath the seat, enhancing the stability and overall integrity of the stool structure.

After preparing the legs, I moved on to creating a mortise and tenon joint for the central support. At 23cm along the length of each leg, I made a mortise with dimensions of 15mm x 10mm x 60mm. This allowed the central support piece to fit securely into the legs, ensuring a tight and stable connection that would contribute to the stool's structural integrity.

After shaping and joinery, I sanded each component to ensure a smooth, precise fit. Starting with 80-grit sandpaper to remove rough edges on the legs, mortises, and slots, I gradually progressed to 360-grit for a fine finish. This careful sanding ensured all parts fit together seamlessly, enhancing both the stool's stability and final appearance

For the central part, I used a 10mm thick plastic slab to create the necessary components for the tenon joint. Utilizing a 2D drawing, I carefully cut the exact pieces needed to form the tenon. After cutting, I sanded the pieces thoroughly to ensure a precise fit within the mortise created in the wooden legs. This attention to detail ensured a snug and secure connection, enhancing the overall structural integrity of the stool.

To create the additional support, I followed a similar approach, this time using 12mm thick plywood. I cut the pieces to a dimension of 105mm x 15mm x 12mm, ensuring they fit perfectly with the overall design. After cutting, I also sanded these components thoroughly to guarantee a smooth connection with the rest of the stool, reinforcing the structure and providing added stability.

Material:

- Legs: Pine wood (offcuts from college workshop)
- Seat and Central Support: Recycled plastic (from Plastify)
- Support and Dowel: Wood

Dimensions:

- Length: 280.0 mm
- Breadth: 300.0 mm
- Height: 425.0 mm

Joinery Used:

- Mortise and Tenon joint for central support to legs
- Slot and dowel connection between legs and seat.

Additional Support:

- Wooden support positioned beneath the seat for added stability

Finish:

- Smooth edges and flush surfaces for comfort and durability

The dowel used was wooden, and the hole was created using a handheld drill for precision.

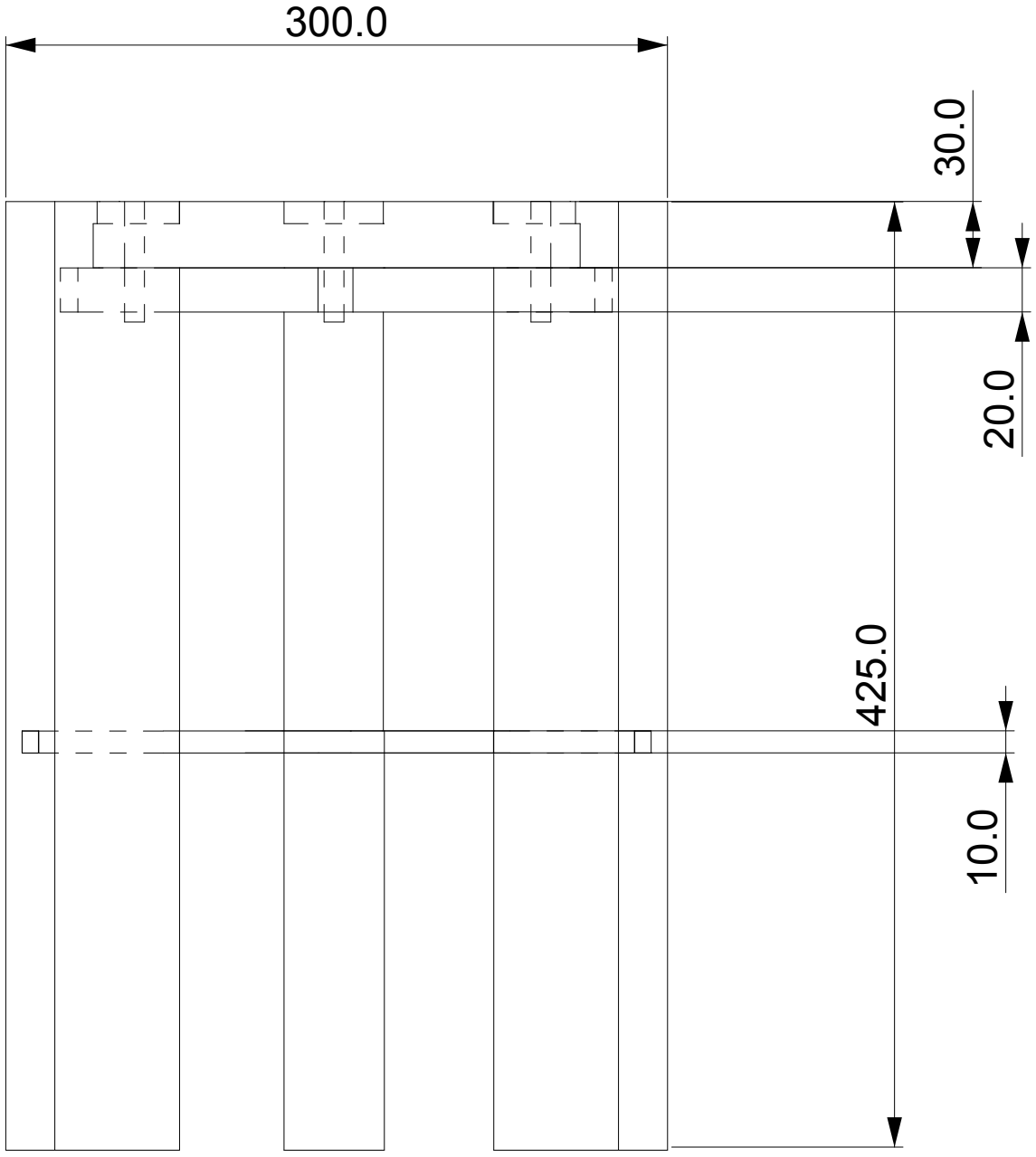
Dimensions:

Diameter: 9mm
Length: 60mm

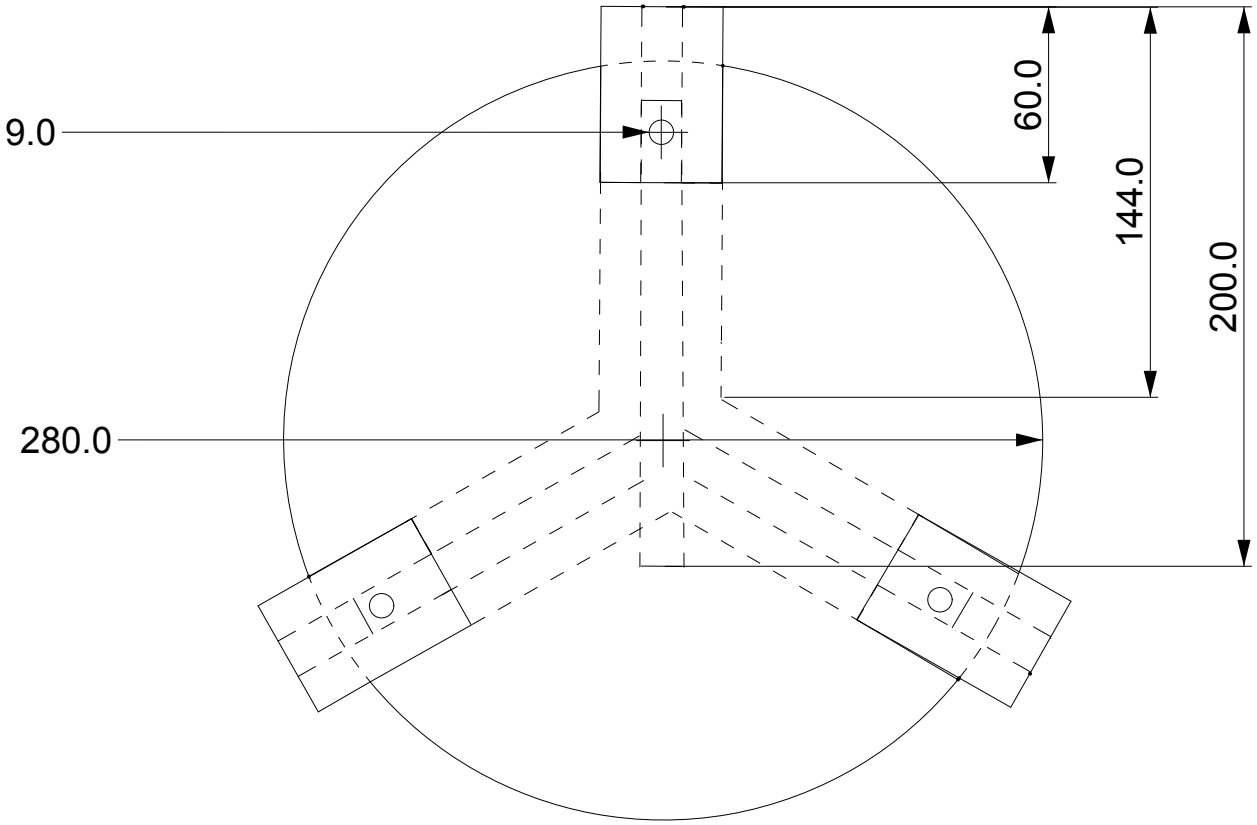
Joining the parts required careful handling due to the nature of the stool's components. I used epoxy glue to bond everything together. First, I inserted one leg into the seat, applying glue to the joints of that leg before inserting both supports. Next, I attached the other leg by first inserting it one-third of the way into the seat, then carefully guiding the support into its respective holes. At this stage, all parts were positioned inside their holes but not fully secured. I gradually pushed each component in to ensure a tight fit. I employed the same technique for the third leg and then left the entire assembly to dry overnight.

The next step was to create a 9mm diameter hole, 60mm long, in the center of each leg, extending deep into the seat and slightly beyond the surface of the plastic. I inserted a 9mm dowel into this hole and glued it in place to ensure that the legs would remain securely attached and not come loose. After this, I focused on filling in the holes and gaps I noticed on the surface of the seat. I used super glue and epoxy glue to address these imperfections. Once the filler dried, I sanded the area with lower grit sandpaper to level it out, then gradually increased the grit for a smoother finish. This process was repeated three times to achieve a flawlessly smooth surface, free from any holes or bumps, resulting in a polished final look.

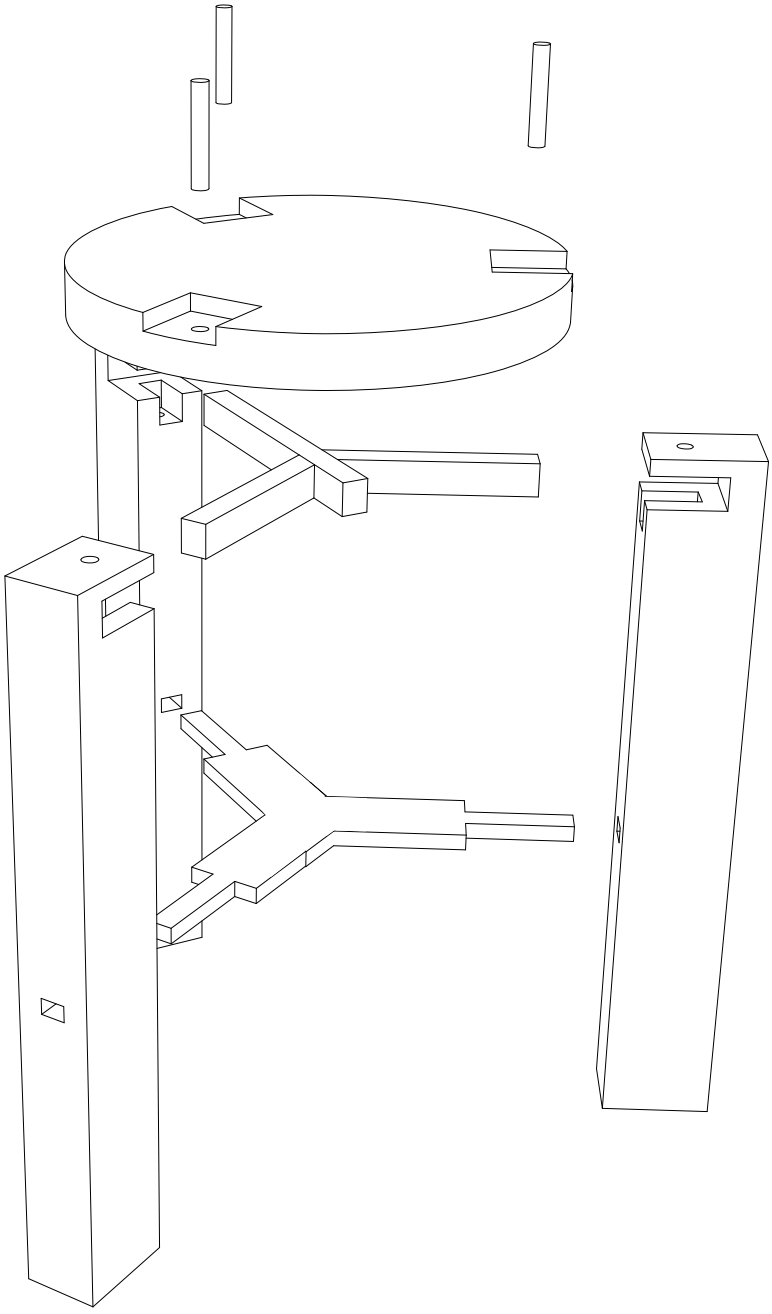
Technical Drawings

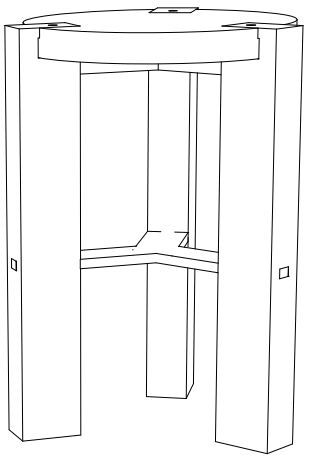


Technical Drawings



Assembly Drawing





School of Spatial & Product Design