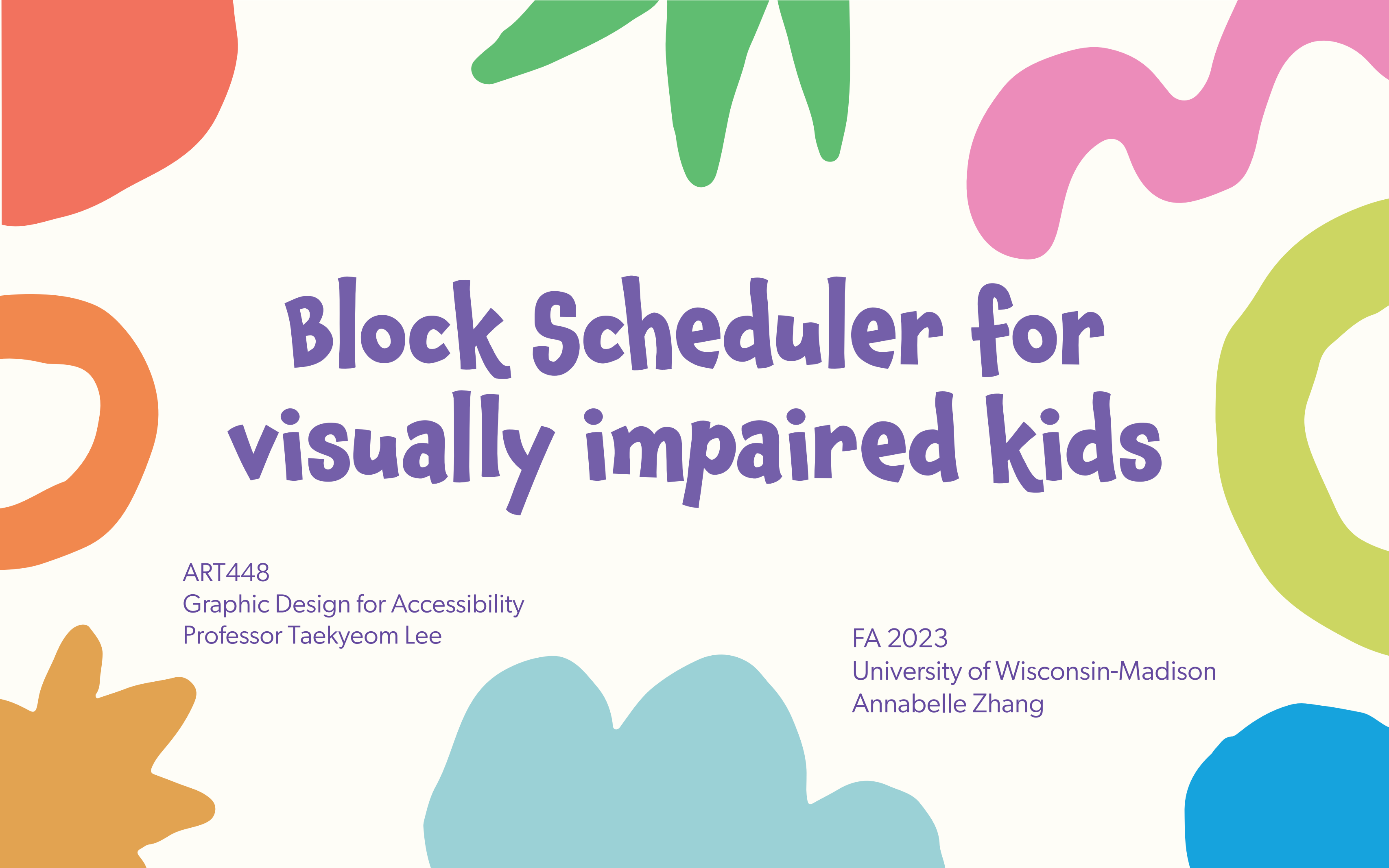




Block Scheduler for visually impaired kids

ART448
Graphic Design for Accessibility
Professor Taekyeom Lee

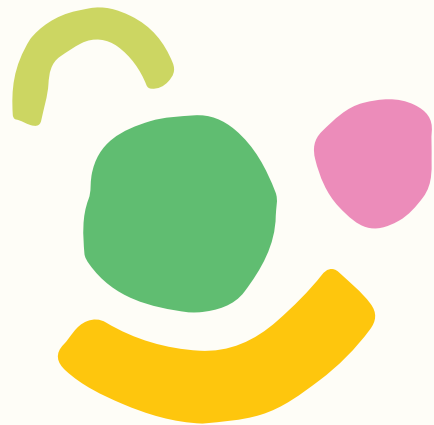
FA 2023
University of Wisconsin-Madison
Annabelle Zhang



We tell time by different events that happen throughout the day...



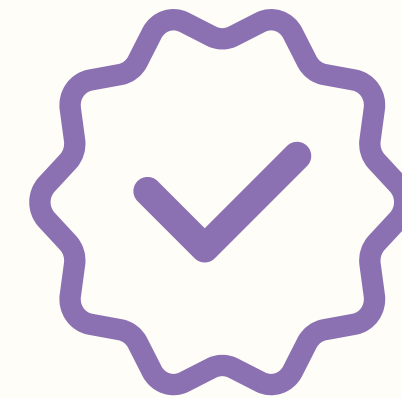
...but concepts like class schedules and time intervals can be a bit complex when first introduced to elementary school kids.



Design Idea & Brainstorming



A design that supports visually impaired kids to feel the time moving through the day is important.



It encourages independence, provides agency, and helps the kid to develop time management skills for their success.

Daily schedules and planners for kids in the market rely predominantly on visual design elements.

The approach offers limited options for distinguishing between tasks without relying on sight, making these tools less accessible for visually impaired children.

Design Idea & Brainstorming



Backstory

Morgan is a 7-year-old kid who is returning to elementary school and taking their next big step in life. They were born with an autoimmune disorder and their visions have started to get more glary and less clear. As a result, they had to leave school for a year and is learning to adjust with their new eye condition. They want to lead a normal childhood without letting their disability affect them.



Context

Morgan is having difficulties adjusting to handling school and learning to use visual aids in life are too many things to juggle all at once. They lose their stuff around the house and realize they do not memorize stuff as well as before. They slowly starting to feel demotivated in doing anything. Morgan needs something in their life to make the day-to-day activities more exciting. They want to take control of their life and a scheduler might be something they need, but a paper one is not that fun and effective due to their blurry visions.

Emotions

Morgan is scared to perform day-to-day activities in their home because everything feels different. They also have the fear of being mocked by other kids for slower reading speed, and using visual aids. This has in turn affected Morgan’s self-confidence in life and the desire to social with their friends.

Motivations

Morgan is motivated to use a scheduler to feel independent of their time. They want something that gives a new spark to start a day. They also hope the scheduler can also be a fun bonding activity with their parents. And maybe they can bring it to school to show it to other classmates and play it together with legos.

Scenario

Morgan's parents buy them a set of 3D-printed block scheduler that works with basic Lego sets. Morgan has something new to do for their day tomorrow. They start assembling the blocks on the base and their schedule is all done and organized. They bring the scheduler and show it to their teacher the next day. Their teacher praises them and asks the class to join and learn how to better support them in school. They go home, make plans with their parents again, and feel excited for the next day.

User Persona

Backstory

Carter is a doctor in their 30s with their first child Morgan. Knowing that their child was suffering from an immune disorder greatly sorrowed them. They want their child to lead a normal and healthy childhood and they will do everything for their kid to achieve it.

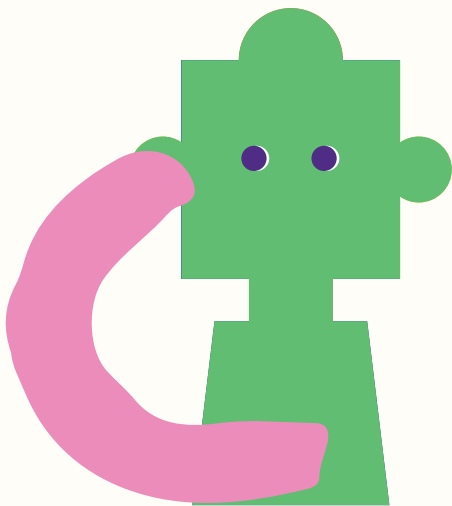
Context

Carter had started to notice a drop in Morgan's motivation at home whether it be putting the dishes away or completing the homework. Carter is struggling to engage with their child and the eye condition is affecting their bond as well as Morgan's confidence. Morgan has started to ignore their studies and lose interest in doing the things they liked before such as gardening, which is a deep concern for Carter.

Emotions

Carter feels deeply frustrated about Morgan's health condition. The lack of communication between them and Morgan is making them worried and doubting their parenting style. They are eager to provide the best for their kid, but it takes trial and error to find something suitable to cheer Morgan up for school and life.

Carter



Motivations

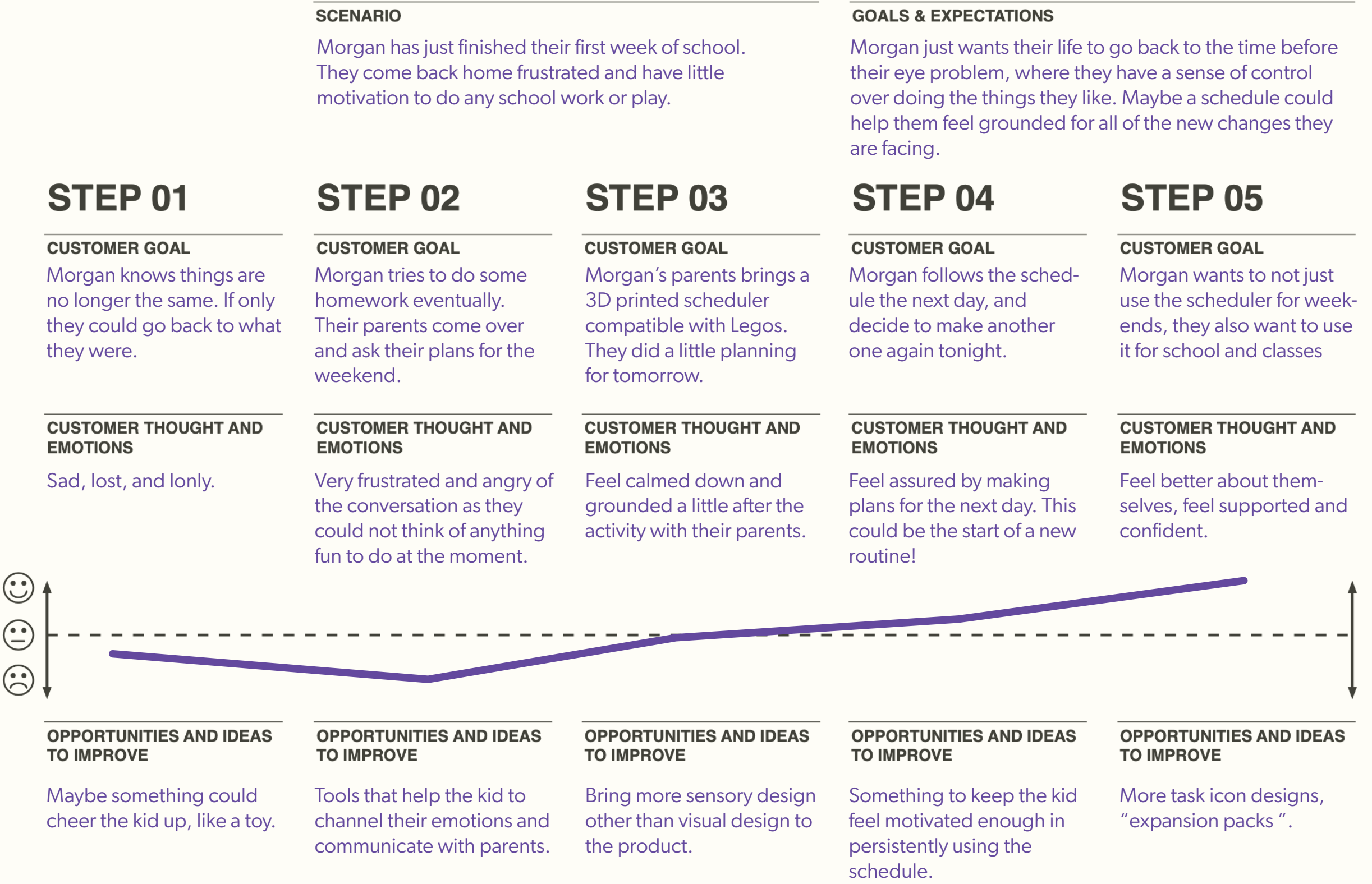
Carter wants Morgan to develop a sense of responsibility and time without being harsh and forcing a time schedule on Morgan. From the child development classes they took, they learned that tactile and sensory experiences are essential for development and they want something that can fulfill both purposes. Carter wants to support Morgan in their journey to the new changes in life.

Scenario

Carter sees the 3D-printed block scheduler and buys it for Morgan. They unbox it together, and Carter sees how Morgan becomes excited about using it. After spending some time together, they put up a simple schedule and placed it on Morgan's desk. The next day Morgan comes back from school, and tells Carter how their teacher and classmates also become interested in the schedule. Morgan also tells Carter how they want to use the schedule every day and feel excited for the upcoming semester. Carter feels they have made a step forward to give Morgan back their confidence and agency in life.

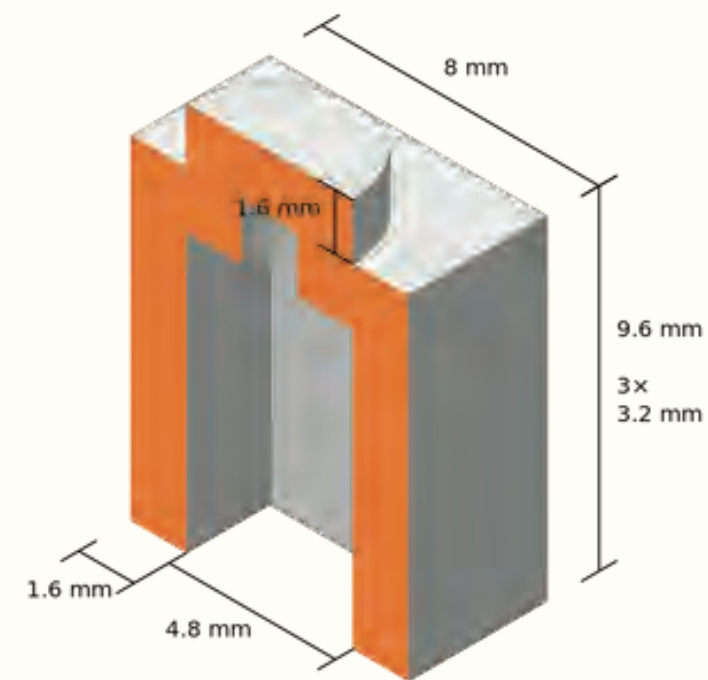
User Persona

User Journey Map

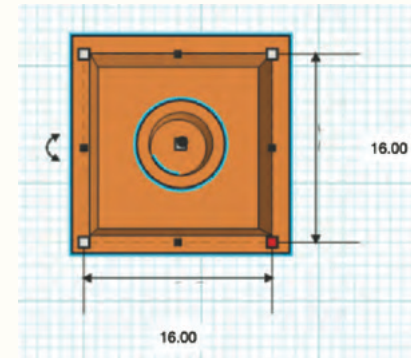




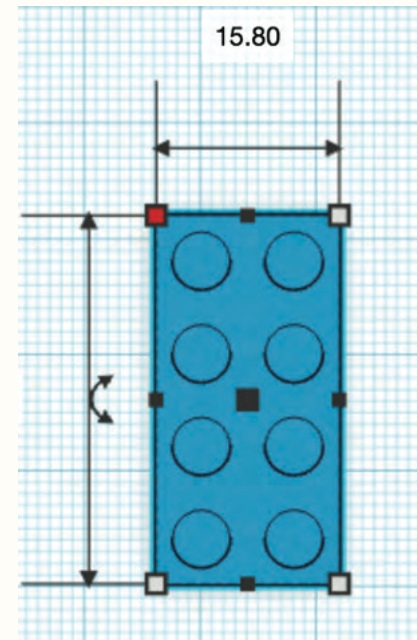
Moodboard: Energetic, Vibrant, Interactive



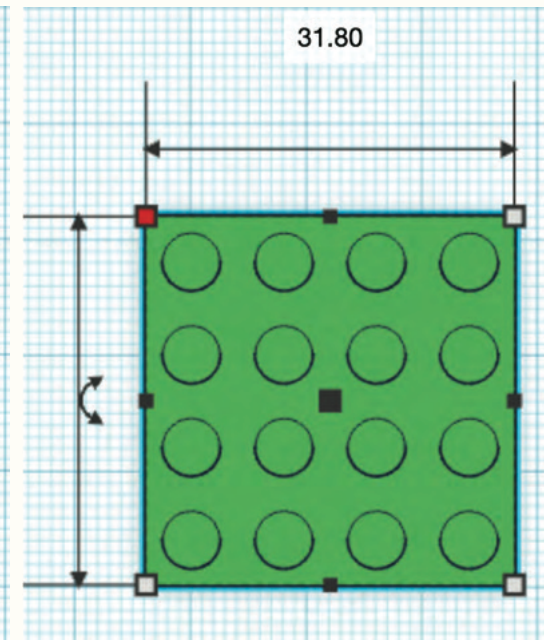
Unit: mm



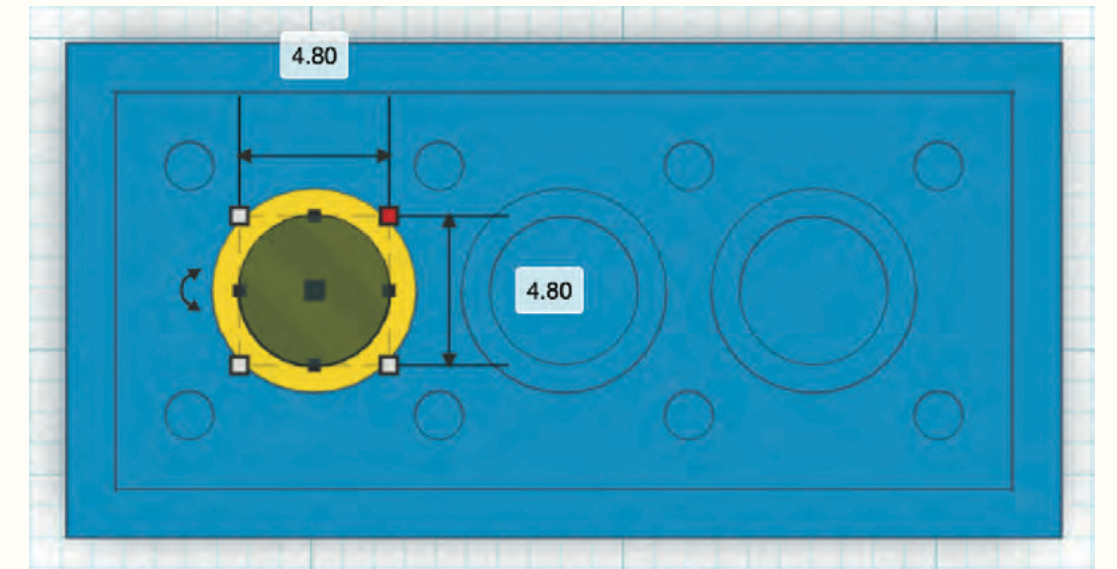
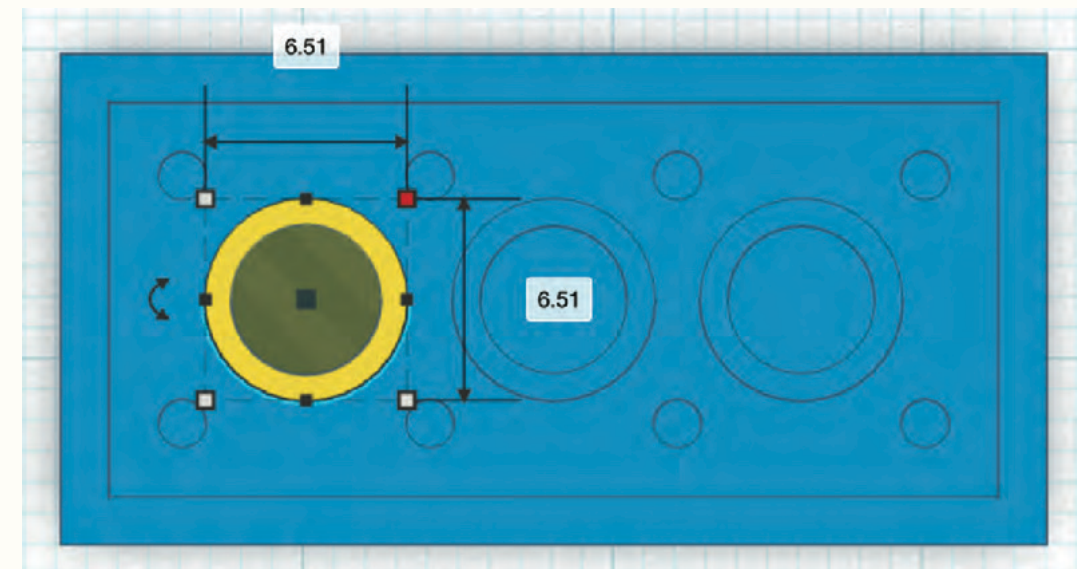
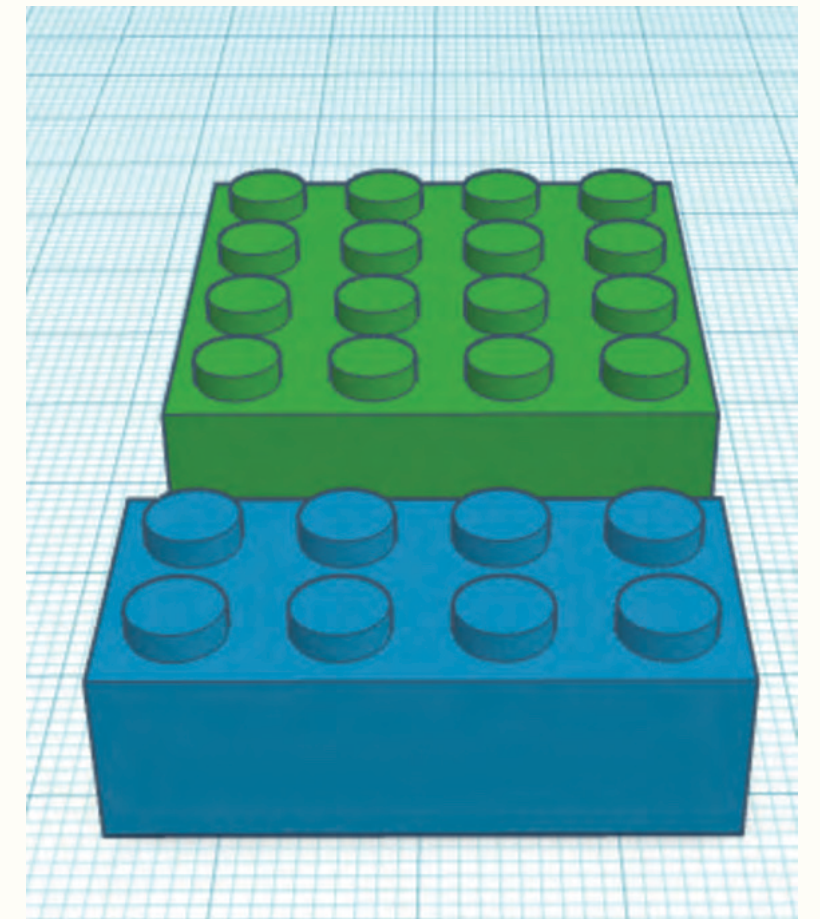
2 x 2 Block



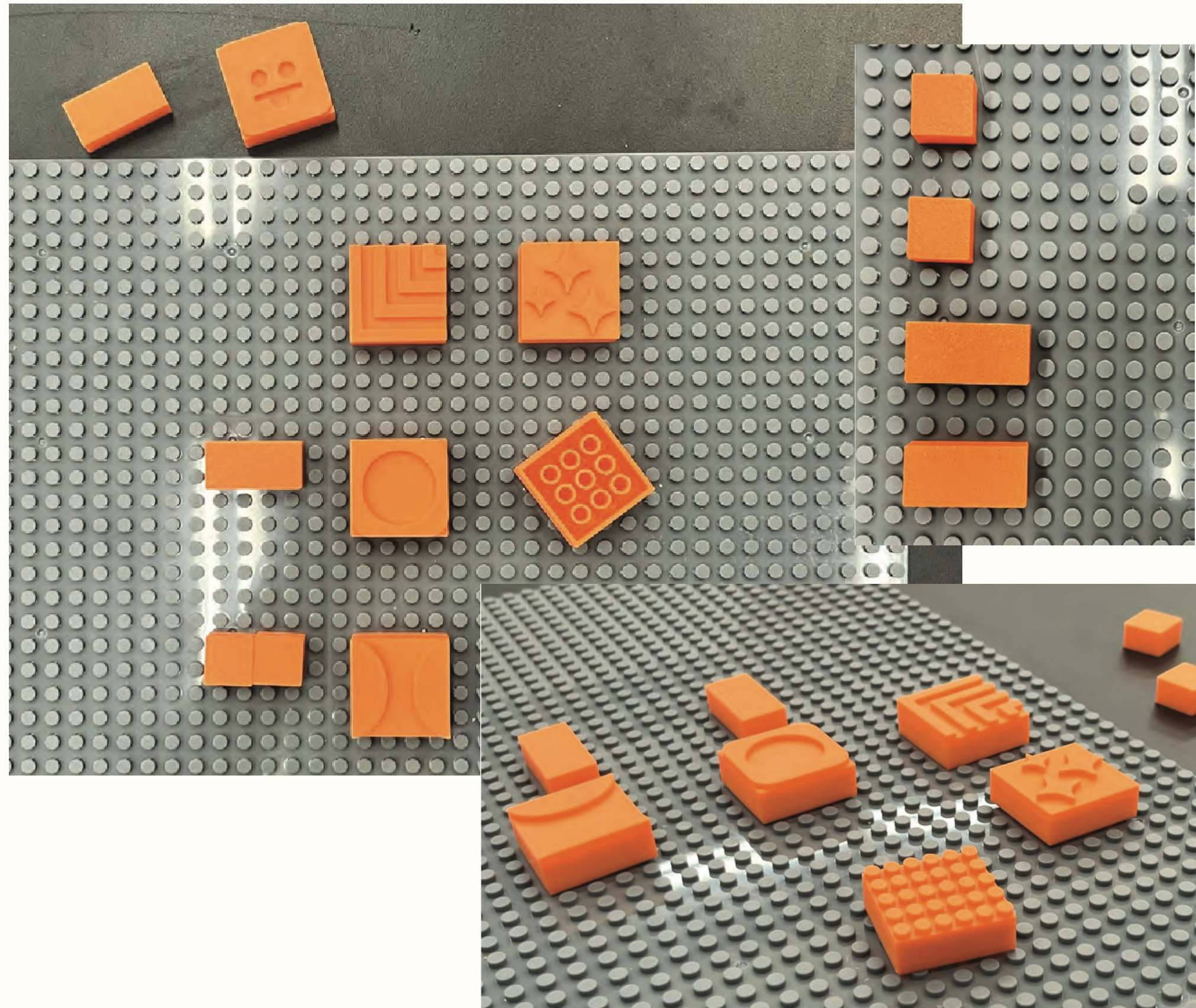
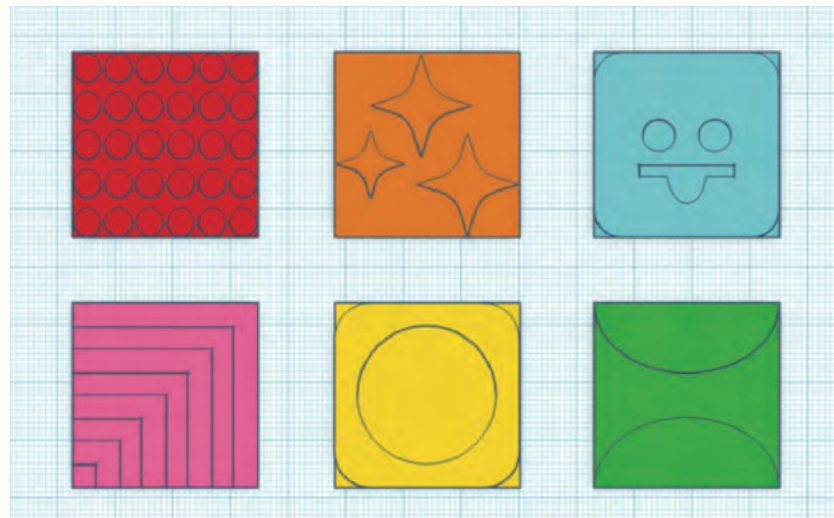
2 x 4 Block



4 x 4 Block



Lego Blocks in 3D (Tinkercad)

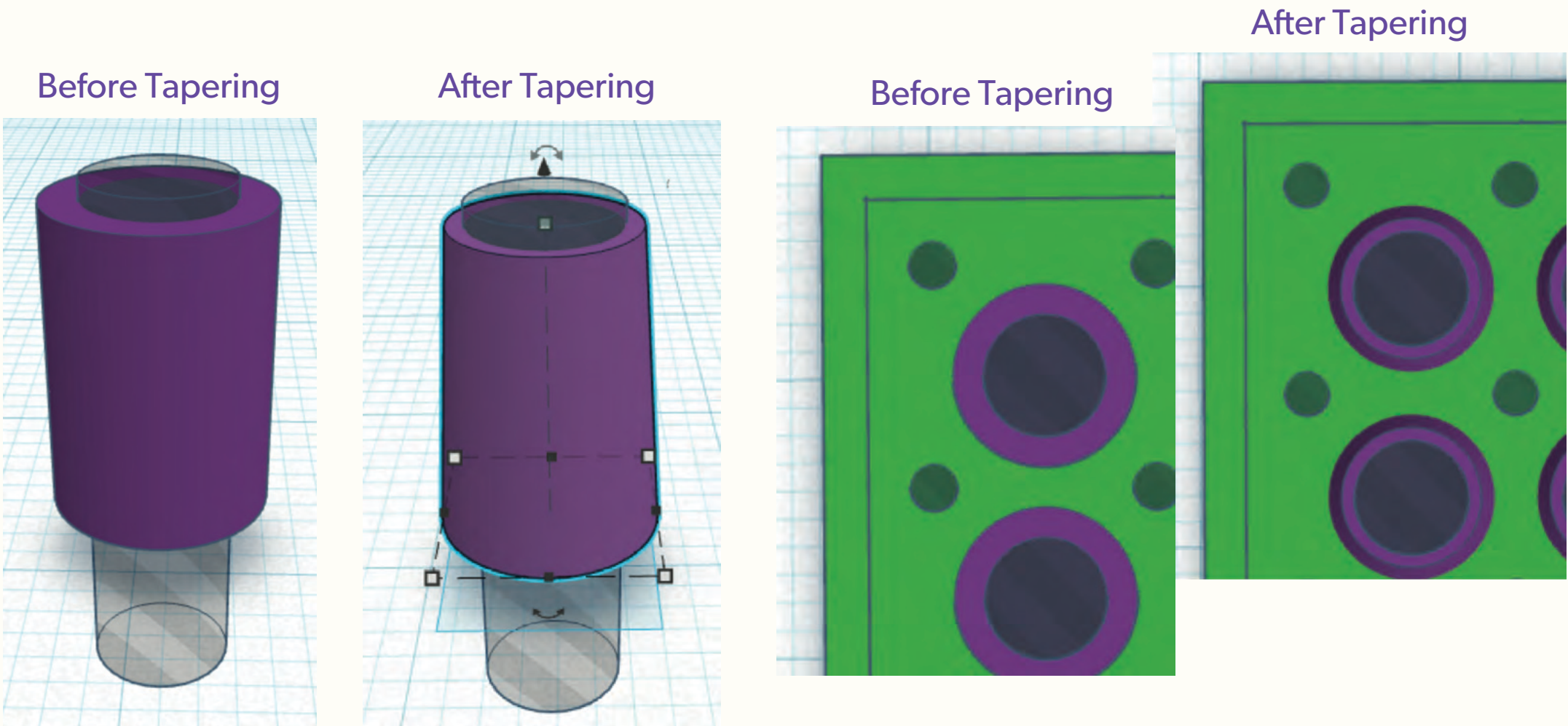


Print Testing Blocks

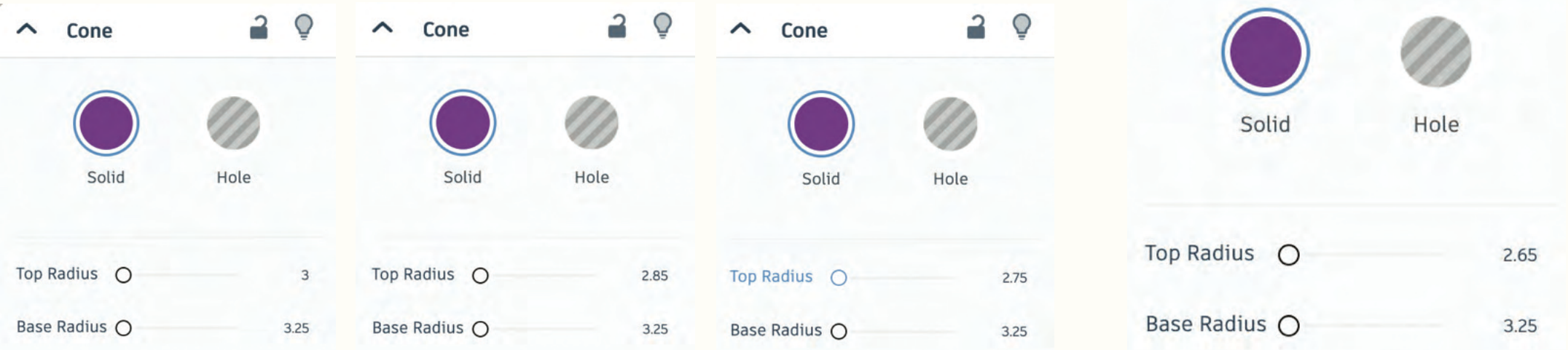
In the first test print, the blocks fit too tight on the Lego base plate, which makes it hard the a 7-year-old kid to grip and move them freely.

Professor Lee suggested tapering the blocks to loosen up the block.

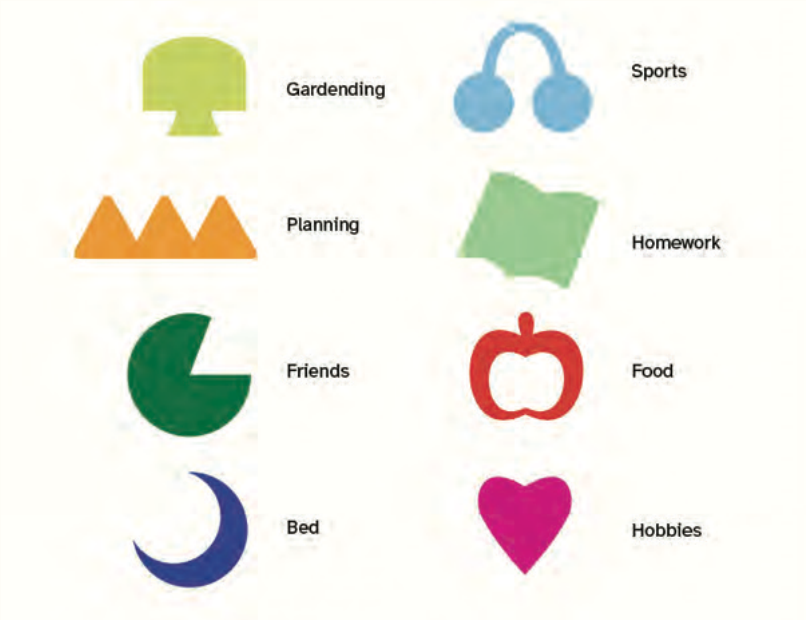
Tapering the Blocks



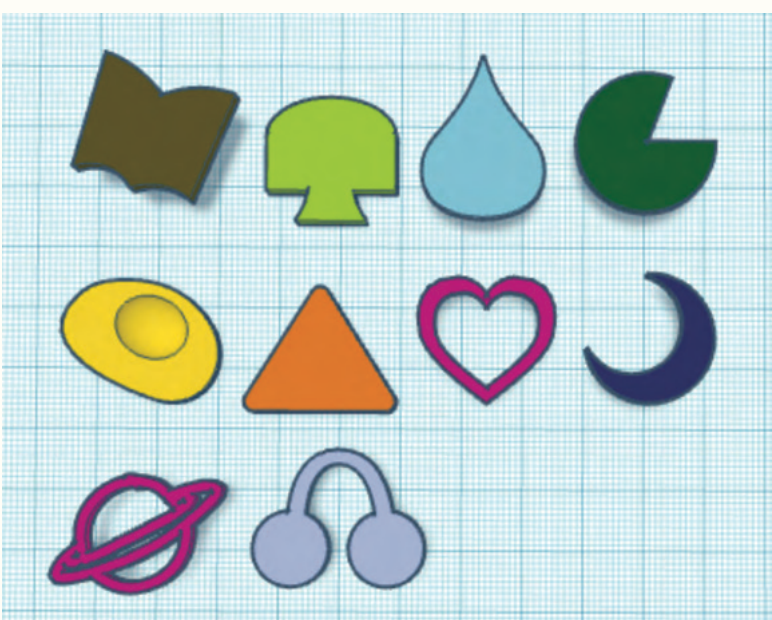
4 different radius was used for multiple test print, each smaller than the other



Sketch



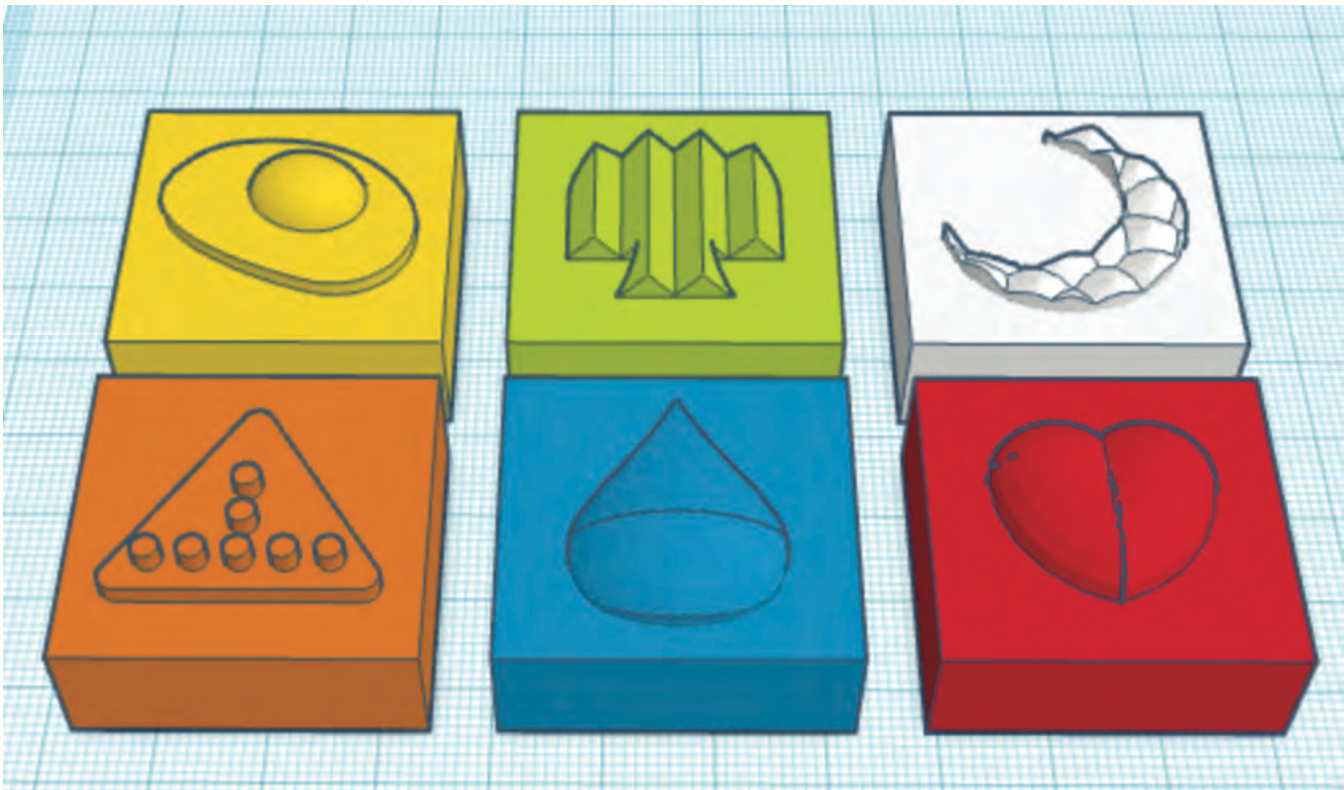
Turning 3D



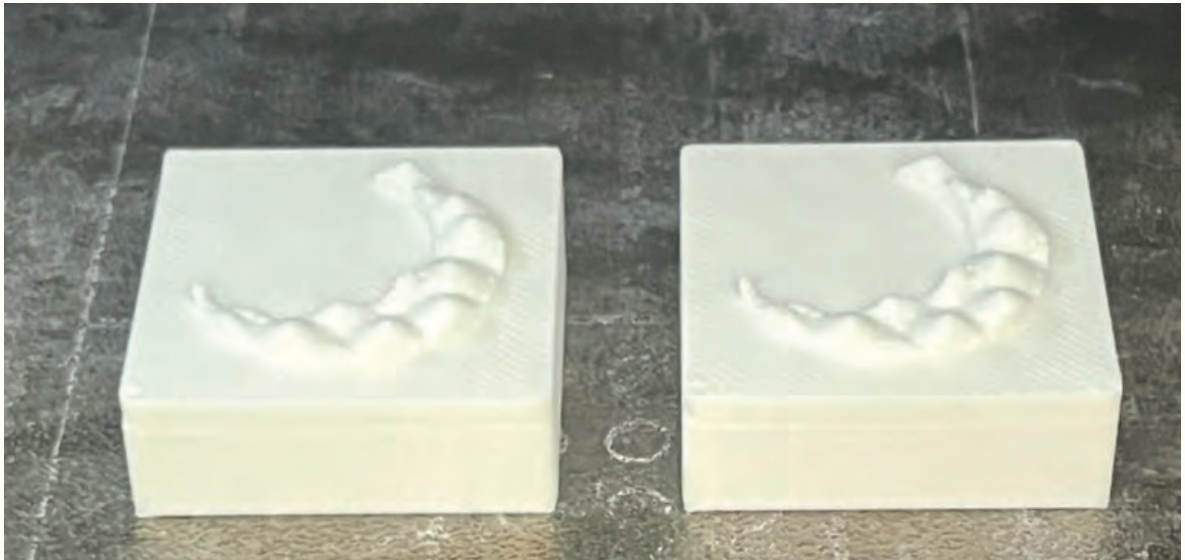
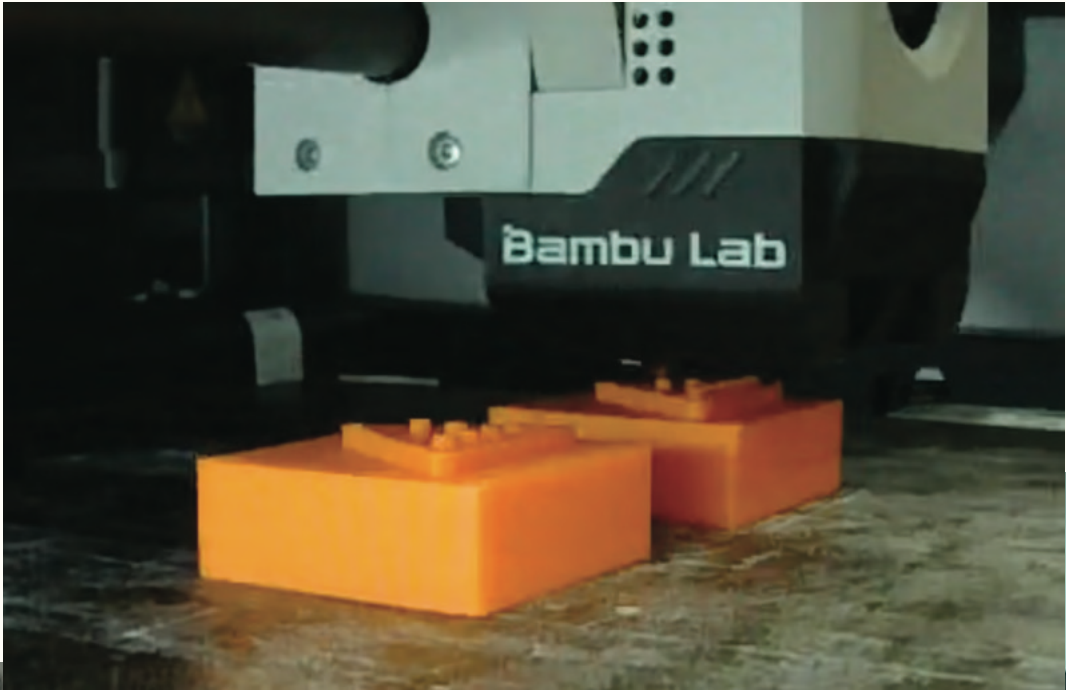
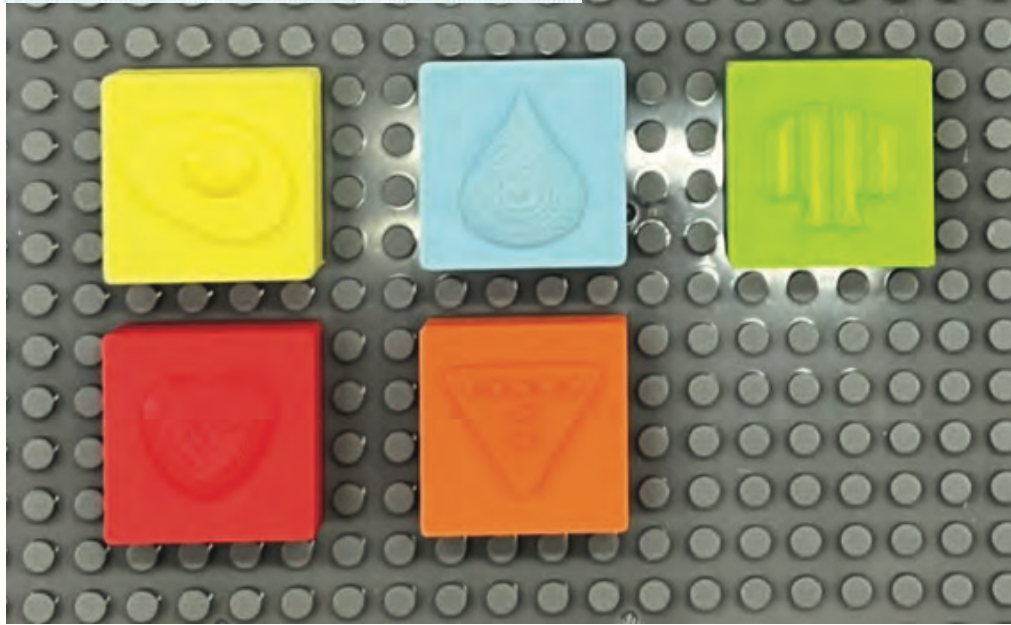
Adding texture to each icon, combine 4x4 block



Ideation

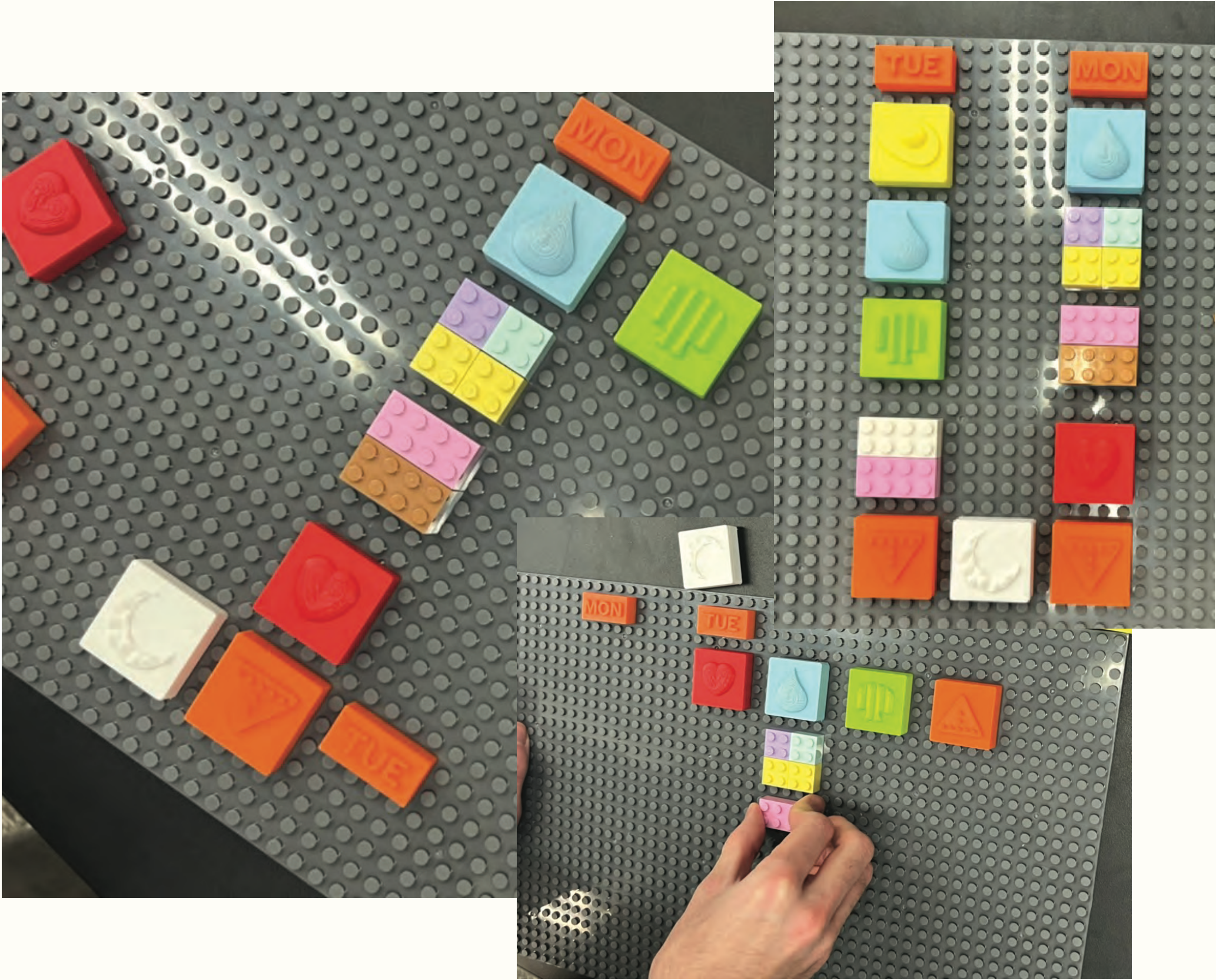
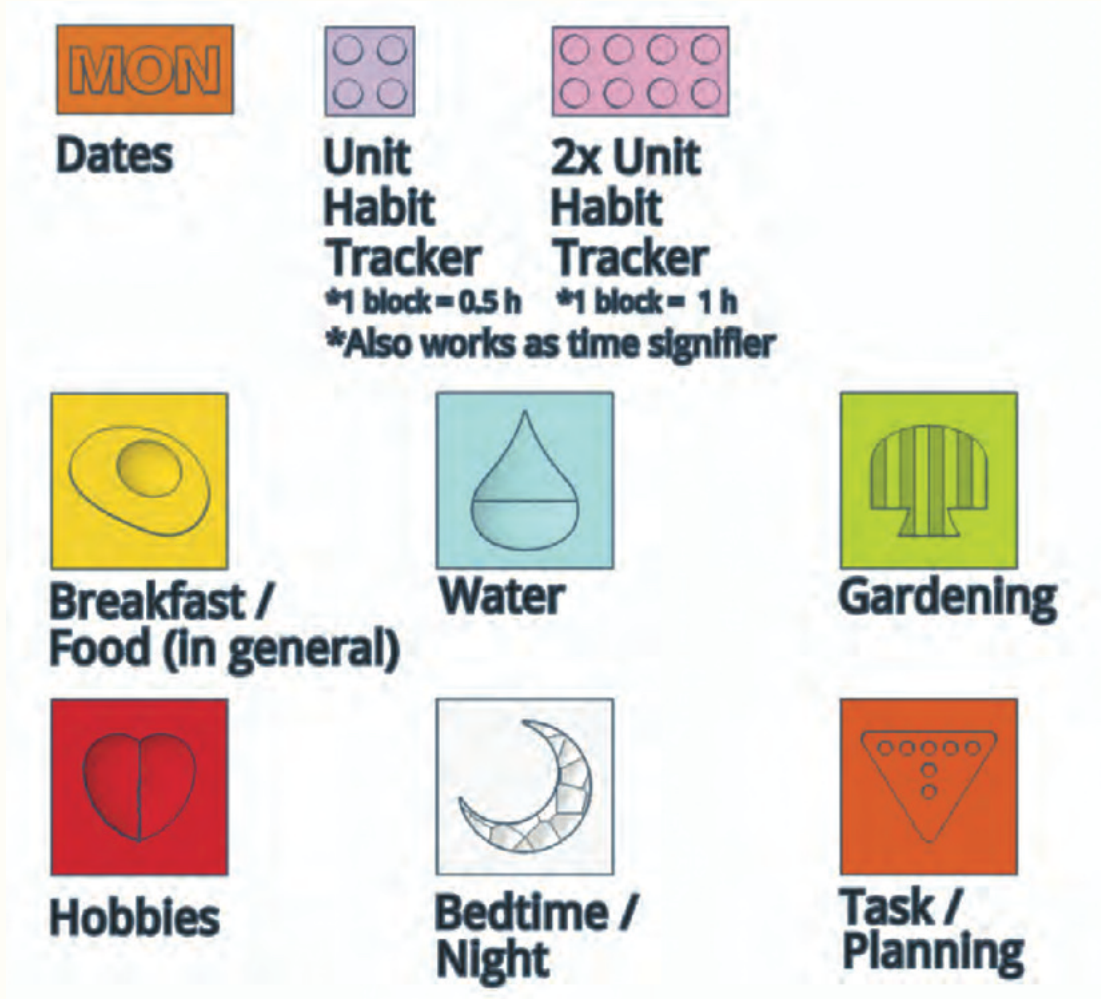


The Icons

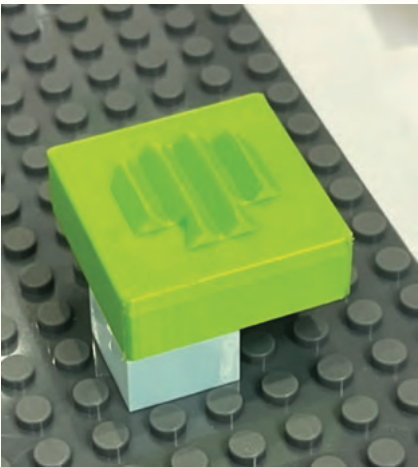


3D printing using
Bambu Lab X1 Carbon
0.4 nozzle

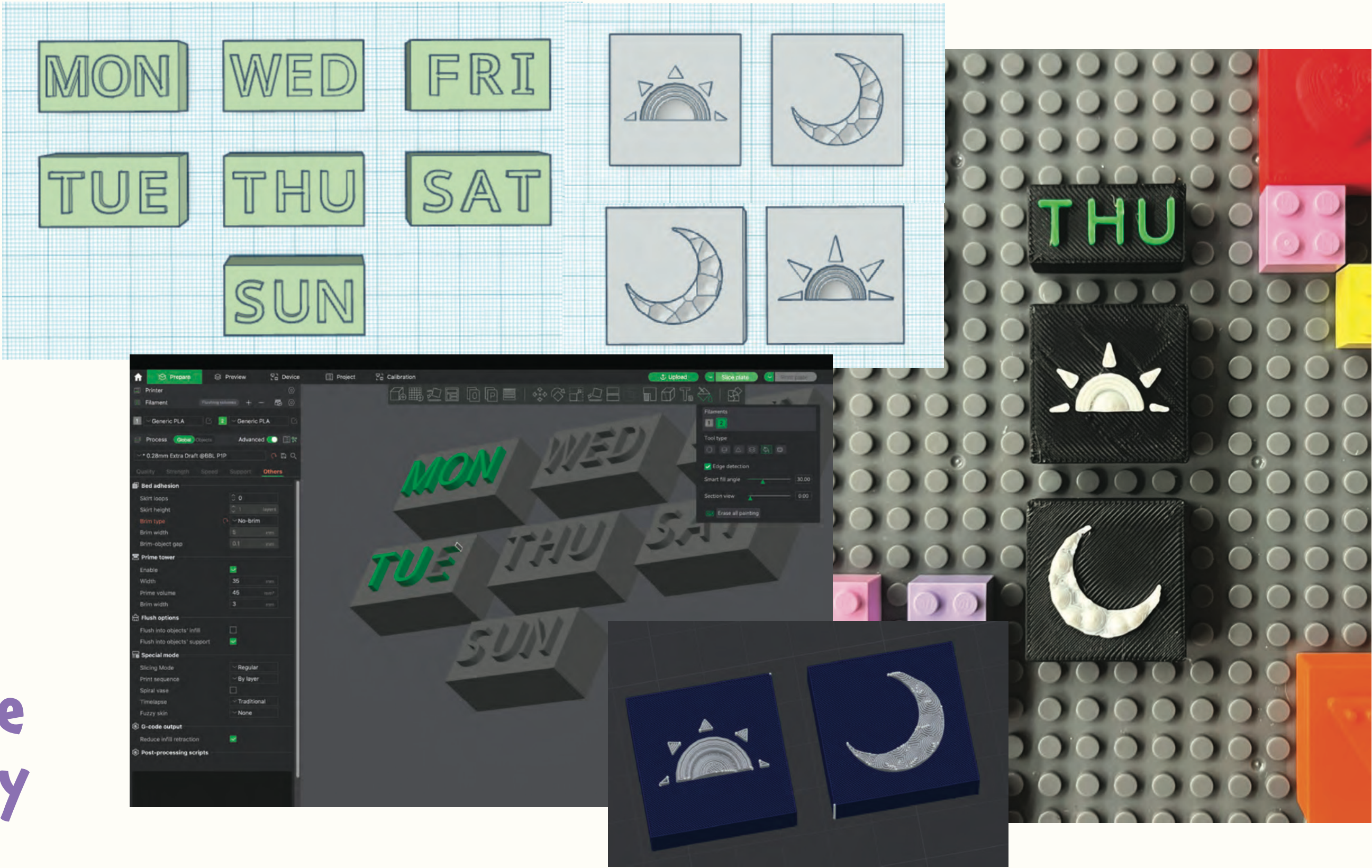
The Icons



The Prototype



User Testing



Adding Time and Weekday Icons

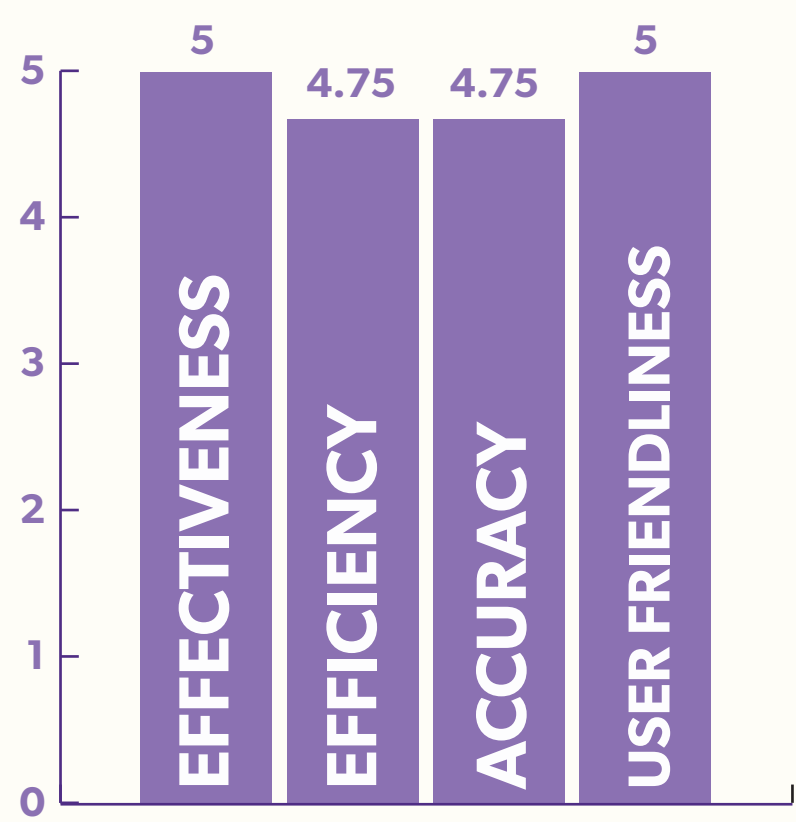


Habit traker,
each 2x2 block
added symbols
1 more day.

Add a note
to the kid



Assemble!



A total of 10 users participated in the usability test. Above is a graph depicting the average feedback score across four categories.

Userbility Test

Does the product work effectively? What worked and what did not work?

Worked!

Some of the comments:

- ☆ The color palette is fun.
- ☆ The blocks have distinctive textures that can be easily set apart.
- ☆ The system is very engaging for kids even beyond visual impairments.
- ☆ Very customizable design, could easily see this incorporating more icons and expanding.

Need More Work...

Some of the comments:

- ☆ I wish there were more icon blocks.
- ☆ Some of the icons are a little confusing. Like the hobby icon could be mistaken for health care.
- ☆ Not the most efficient scheduler you'll have. You need time to build it.

Reflection

PROJECT 05

Block Scheduler for visually impaired kids

What did you learn from the assignment, and how it influences your design practice?

Through this assignment, I've grown more comfortable with the design process. I have particularly felt more confident in creating user personas and journey maps, understanding their importance in guiding design decisions. A key lesson I've embraced is the importance of flexibility. It's better to tweak designs as things go, rather than getting fixed on perfectionism and getting stuck in one place. Prototyping is important, but so is getting user feedback. I also learned a good design could also be measured by its adaptability to new changes. It would be better to leave a space for future adjustments and new features.

Where did your ideas come from and how did they evolve?

The idea comes from my childhood experience. I always found traditional paper schedulers with their rigid time slots a bit boring. I wanted to create something that wasn't just a forced exercise in time management for kids. My design aimed to provide sensory information for the visually impaired while ensuring the process was engaging enough for the kid to form a habit. This idea has now evolved into a simple starter pack for a 3D schedule. Looking ahead, I'm thinking of incorporating a braille system using 2x3 Lego blocks, which also have six dots that align perfectly with braille characters, to provide more complex information on the schedules.

SECTION 03

Feedback and Analysis: Reflection

What went well with this assignment, and what did not go well?

There were definitely highs and lows in this project. The user testing part went really well, as I gathered feedback not just from classmates but also from the Winter Design Festival. I felt incredibly lucky to have had insightful input from someone in my persona's age group. It was also nice to see children engaging with and enjoying the design. However, there were also setbacks. I regret not creating more icons and more diverse activities for the scheduler. Then again, designing for distinct textures and colors is a tricky task that requires semesters of dedication. The 3D printing process was more time-consuming than I expected, especially for the tapering part. Crafting at least 15 test blocks to achieve the balance of secure attachment and easy removal for kids was quite a process.

What would you do differently if you could do this assignment again?

If I had the opportunity to redo this assignment, I would focus more on data gathering. I would love to send out questionnaires to collect a wide range of activities that children enjoy, which would aid in generating more icon ideas. Another addition I might consider is integrating some sort of tech features, like allowing the kid to scan their schedules and convert them into audio reminders. Most importantly, if more time were given, I would love to have in-depth testing on various textures suitable for different age groups. I noticed during user testing that tactile sensitivity varies significantly across ages, which could influence the design's effectiveness and appeal.

Thank you!

**Block Scheduler for
visually impaired kids**