Senior Capstone Project

asik

PROCESS BOOK

GLORIA CHRISANTY
Arizona State University

2021 - 2022



My story begins half a world away in **JAKARTA, INDONESIA.**

I discovered design at a liminal point in my life. I am learning that dualities of the world and the human condition must be accepted to be understood. Design is my duality. It is the intersection of my many passions in life: art/art history, design, STEM, and education.

Design has connected me to the best parts of myself and the world. I believe in the power of storytelling and that Earth, and every being on this planet, has a story worthy of being shared. Design helps us tell our stories and those stories connect us.

My Indonesian heritage and my story are embedded in my approach and understanding of design. To understand my designs is to understand me.

I am Gloria Indah Chrisanty.

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PHASE 1

Includes the project introduction academic and market research, and identification of user



An open letter to Indonesia.

Designing for remote education learning for under-resourced communities.

In immigrating to America, I've been privileged to the resources here that were not available to me when I lived in Indonesia. I've learned the importance of taking advantage of the opportunities that life here has offered, but I understand not everyone has access to the same opportunities that I've had.

I began relearning my native language in hopes to get reacquainted with my roots, but in taking classes in Bahasa Indonesian here at ASU, I've also learned more about the community and culture that I've left behind. In dealing with my own struggles here, I've realized I have a tool that allows me to work through them and that is design. People deal with their struggles in different ways, but if more people are able to access the tools and resources that empowers them to work through their challenges in positive and/or productive ways, then not only can that individual benefit, but entire communities can benefit too.

Indonesia is recognized as a "third-world" country because of social, political, and economic factors. However, I argue that this classification diminishes their potential not only as a country, but within individual communities as well. From my own personal experience and my Indonesian teacher, I've gained great insight to what life is like in Indonesia and it has inspired me to design something to give back to the community that helped shape me.

I recognize the privilege my position as a (now) American citizen and (almost) graduated college student holds over the communities I am designing for. It is difficult to admit the power dynamic that play into designing for communities that one might feel connected to but not apart of, but in doing so I hope to show the authenticity of my intent for this project.

Trauma changes people, entire communities, countries. Especially after so many lives have been lost to the ongoing pandemic, it is often difficult to find hope that things will change and get better. I'm writing to say that although my designs can change the course of people's lives, let alone an entire country, I hope to use my design as a symbol of hope to those who feel disempowered by their challenges. I hope to inspire the next generation of Indonesian children to dream big and give them access to tools and opportunities that weren't available to them before, no matter where they're from/live.

There are no simple solutions to bringing entire communities out of impoverishment or a lack of resources, but as someone who has the tools and resources to try, I will try. It's easy to say to not take opportunities for granted, but as a designer I believe it is equally as important to try and give back as much as take.

I chose to work on this project as my senior thesis as a thank you to the community I have to allow me to get this far in my journey. Indonesia will always be my home, no matter how far I go.

With love always,
Gloria Indah Chrisanty

PROJECT SCOPE

The Age of Technology

Technology has significantly impacted the way we live our lives as a society. It is now common for individuals to have multiple technological devices that allow us to stay connected to our work, school, and social media. However, not everyone has the same access to these tools and resources. Many communities in various parts of the world today don't have the luxury of being connected to the internet. How do these communities continue to stay informed, entertained, and connected?



Countries who have access to the technology that allows them to continue learning, stay connected, and be productive are typically those ahead in education and economy. So why not mobilize more countries to be able to do the same?



The Era of Remote Learning

The COVID-19 pandemic has also emphasized this technological disparity and access of resources. However, even if the technology is provided, those who live in remote areas still typically don't have access to good, stable internet.

So how do we approach the issue of providing resources that can even out the socioeconomic playing field for remote communities?

To find solutions to such large, complex issues are a huge undertaking that perhaps can't be solved in a lifetime, let alone with a single product. However, in each attempt to do so we will take the steps toward our answers.

RESEARCH SCOPE

1. Address trauma from disparity of educational and technological resources and opportunities

As discussed previously, the rampant advancements in technology in which those advancements are only accessible to specific communities and cultures, leads to the widening of educational and technological disparity between communities with and without access. Technology has been the key to the distribution and accessibility of knowledge. Though we can argue that not all knowledge distributed amongst people all over the world is representative to all cultures and perspectives, it is in accessibility that technology holds the greater power. Without technology's ability to distribute knowledge, those without access or opportunity to those resources are at a disadvantage in acquiring the information needed to improve their understanding of the world and themselves.

2. Provide accessible therapeutic design processes and methods without exercising "saviorism"

In designing for trauma-informed spaces and what it means to design for trauma-sensitive populations, I learned that the co-designing of the context matters. This means that rather than someone external deciding what is best for the product/space's success, teamwork is needed to identify and design solutions to the needs of the user. Although I am unable to work together with the target users at this point of my project, I plan to communicate my ideas to the intended community when I am able on my study abroad trip to Bali, Indonesia this summer (June-August 2022). Bali is not a remote area, but I hope to gain more insight from those who have experience living in remote areas. It is important for me to recognize that this type of research will need extensive qualitative, ethnographic research, thus I plan to record all my findings via interviews, if I am able.

3. Offer art and design education in remote areas through "continuous play"

The method of "continuous play" was adopted from Lego's goal to allow children to learn and create through play. The idea was to take the foundations of existing Lego products and extending its use to educational purposes. Lego has its own program called FIRST, which stands for "For Inspiration and Recognition of Science and Technology" allows for kids all over the world to engage in the design, creation and competition of robots. The FIRST program teaches kids not only encourages kids to pursue interests in STEM through robot building, but it also teaches them collaboration, presentation skills, and the importance of community service, all skills that prepare them for their future careers and personal development.

Through encouraging the art of "continuous play" I hope to instill the importance of creativity in their learning. Creativity is often repressed with time and age, but in instilling the mindset to always create and learn through the interaction of the world around them I hope to empower them to hold on to it and apply it to their everyday lives and perspectives.

RESEARCH QUESTIONS

To address the full scope of the project, I began with asking several questions to hone in on understanding the specific needs of the target users and the context the product will be used in.

In what ways can design and the design process be utilized to address and work through personal or community trauma?

- What does trauma-informed creative spaces for children look like?
- How do children's environments affect their well-being and creativity?
- How can children be empowered to create and express themselves without the need for external intervention of other cultures?
- Is it possible to offer resources and opportunities to marginalized communities without upholding the savior complex?

RESEARCH STATEMENT

Design an educational tool to encourage children's creativity through art and design by introducing interactive technology to empower them to address systemic and generational trauma from disparity of resources and opportunities

MARKET RESEARCH

Product Competitors



T: Aakash tablet, India; Millbug Vuya tablet, South Africa
B: XO 3.0 tablet, One Laptop Per Child Initiative

[ARTICLE] "How Solar-Powered Tablets Can Push Remote Learning Into New Horizons"
eLearning Industry, 2018 update, Link

[ARTICLE] "XO 3.0 tablet computer features solar panel and hand crank charging"
Eco-Business, 2012, Link

MARKET RESEARCH ANALYSIS

From the market research I conducted, the solar powered tablets created in South Africa and India failed due their poor usability and physical and technological limitations. Due to their inevitable downfall, very little information about them exists and I am unable to gather further information about whether any attempts to revive them exists.

However, One Laptop Per Child's initiative to provide tablets to kids seem to have slightly better success. Although multiple companies have written about their issues as well, the initiative is still active. There is also limited information on their design and technical specifications, but their tablets are probably the biggest competitor to my design.

MY DESIGN APPROACH

After conducting my interview with my Indonesian teacher, I decided to specify the purpose of my gameboy/tablet design to be for art and design-specific learning. By specifying its intended use, I hope to differentiate my product from my competitors and avoid their failed fates.

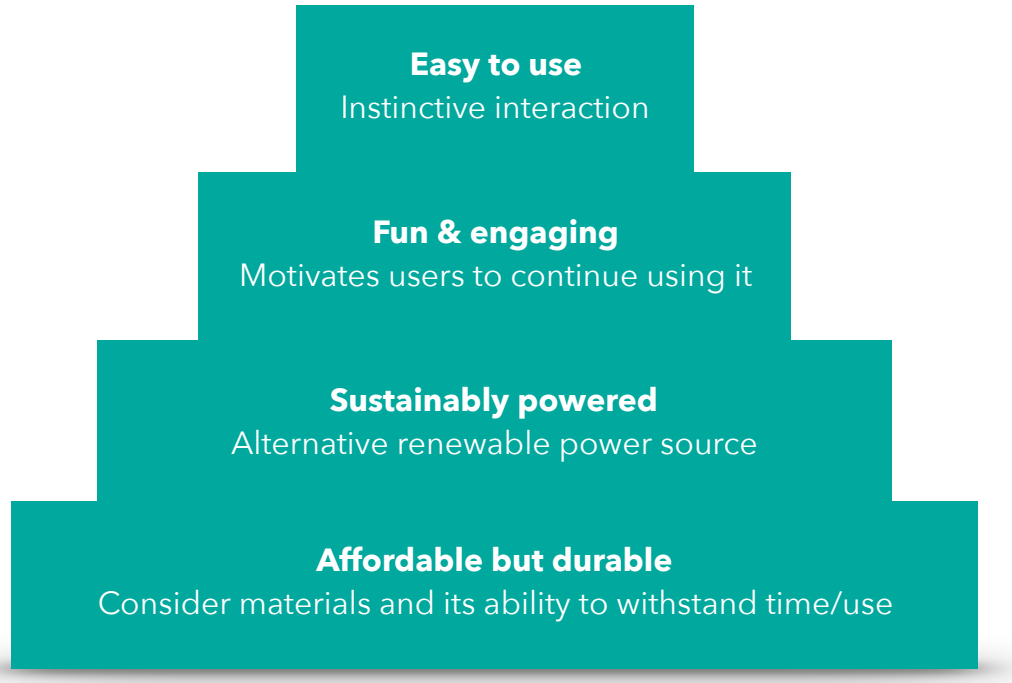
USER INTERVIEWS

To gain a better understanding of what schools and education is like in Indonesia, I interviewed my Indonesian teacher at ASU. She is a student teacher here at ASU, but she is a full-time teacher back in Indonesia. I voice-recorded our conversation, which was supposed to be 20-minutes long, but we ended up conversing for over an hour. Since I am unable to include all her insights, I will be summarizing the important ones below:

- The school she taught at, which was in a remote village in Sumatra, has a community computer lab with multiple computers, but only one or two of them work.
- They have poor connection to Wi-Fi and no staff who are able to fix technical or software issues.
- They use the computers for testing, but are limited to softwares for teaching and learning. Tests are often on Google surveys.
- Students have to be supervised using the computers and have limited time frames to use them.
- Computers are kept in the only air-conditioned room in the school, but there is history of flooding and power outages in the area.

Based on the insights I gained from my teacher and information learned in my Indonesian classes, I was able to create user personas representing the product's target users.

USER NEEDS HIERARCHY



TARGET USERS

Primary – Children

- Learning remotely
- Engaging with content outside of classroom
- Learning through play

Secondary – Teachers

- Assigning learning content
- Ability to teach remotely



Dewi / 5 yrs (primary)

Just started kindergarten

Lives far from school; only lives with mom who works in the next village, different from her school

Only able to attend a few days a week when uncle can take her to school, the other days she goes with her mom

Loves to play outside with neighborhood kids, draw, and sing/dance but don't have outlet to do her interests



Mba Fitri / 36 yrs (secondary)

Dewi's school teacher, lives in a different village from Dewi so she has to commute everyday

Has been teaching for 10 years

Currently teaching all kids from kindergarten through 2nd grade

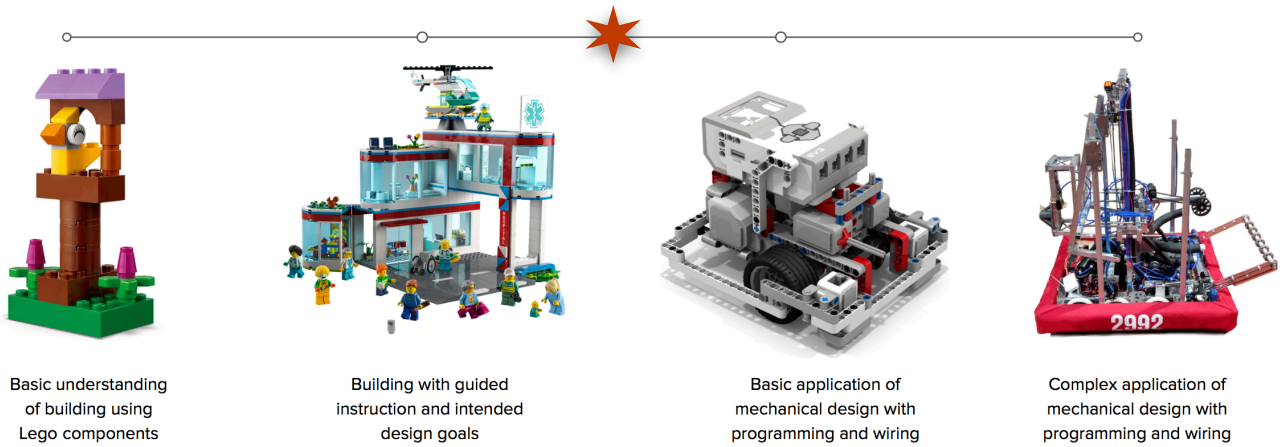
Has two children of her own that uses tablets for school

DESIGN INSPIRATION

I took inspiration from the Lego branding framework [source]. I was inspired by their vision to "learn through play." I used this to develop my product by incorporating the use of "continuous play," as discussed previously.

Belief	**Children are our role models**			
Mission	**Inspire and develop the builders of tomorrow**			
Vision	**A global force for Learning-through-Play**			
Idea	**System-in-Play**			
Values	**Imagination • Fun • Creativity • Caring • Learning • Quality**			
Promises	**Play Promise** Joy of building, Pride of creation	**People Promise** Succeed together	**Partner Promise** Mutual value creation	**Planet Promise** Positive impact
Spirit	**Only the best is good enough**			

Existing Lego Products and Technology



Basic understanding of building using Lego components

Building with guided instruction and intended design goals

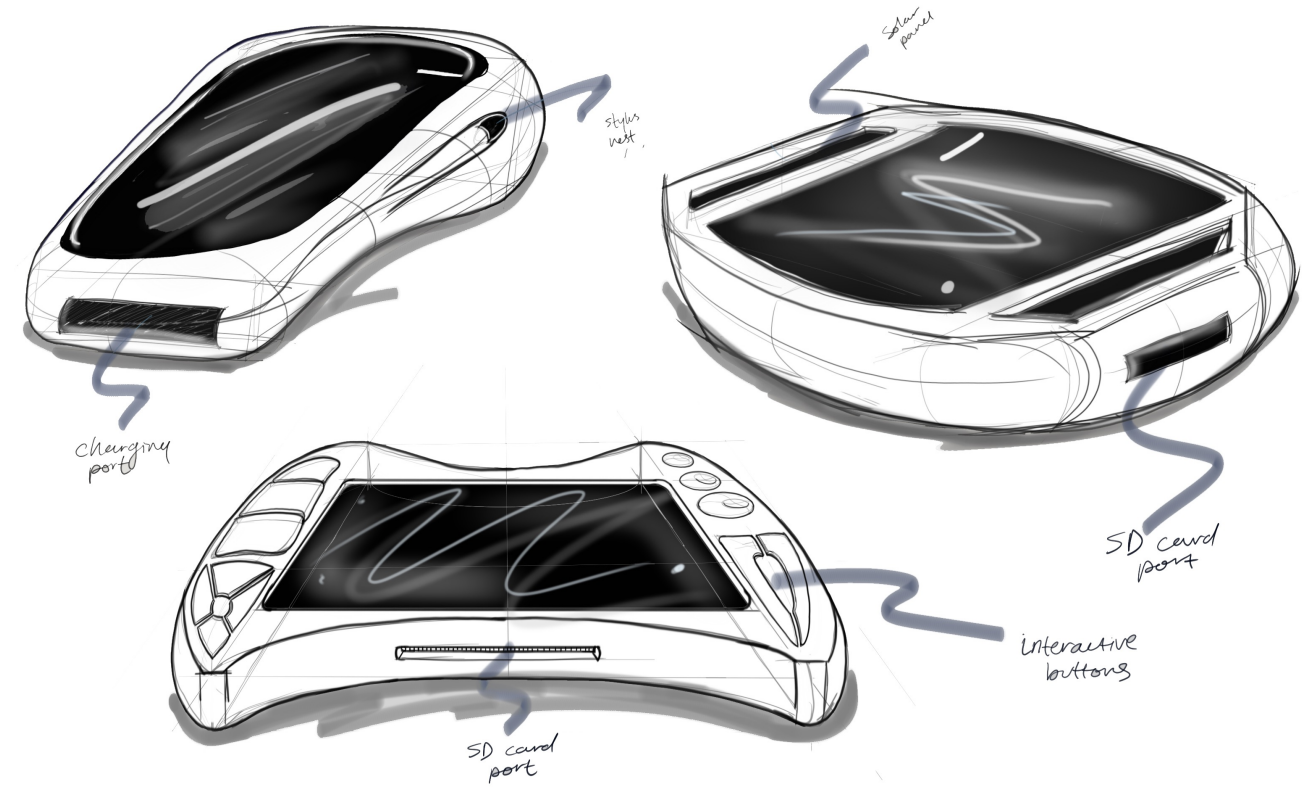
Basic application of mechanical design with programming and wiring

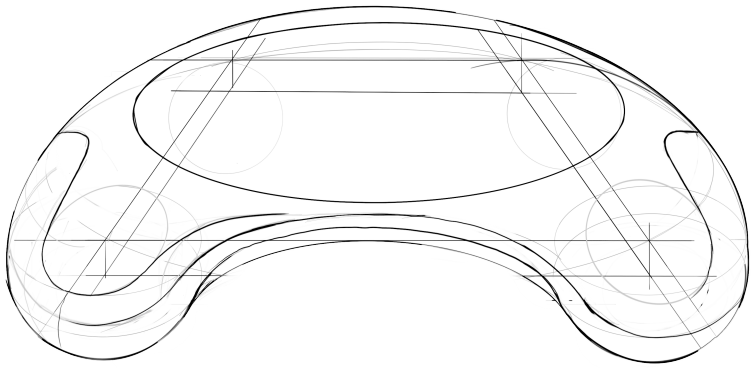
Complex application of mechanical design with programming and wiring

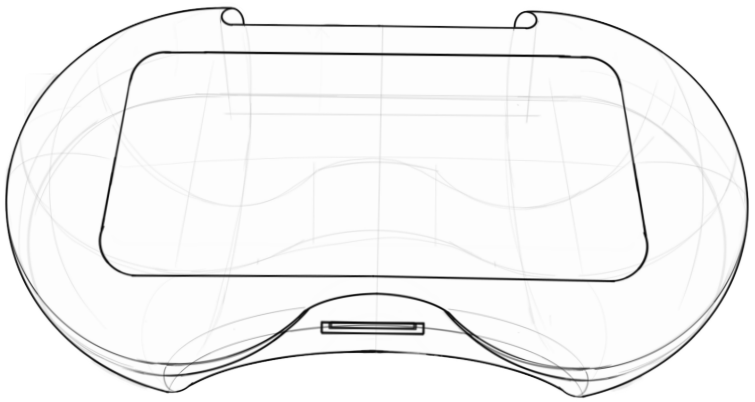
ASIK would fall between the guided designs and basic application of Lego products. Children would still be building and interacting with Lego pieces, but the integration of components like sensors and programs would still be assisted according to the design of the tablet and use of its softwares, which will be discussed later on.

PHASE 2

Includes brainstorming and ideation, product component research, materials and manufacturing







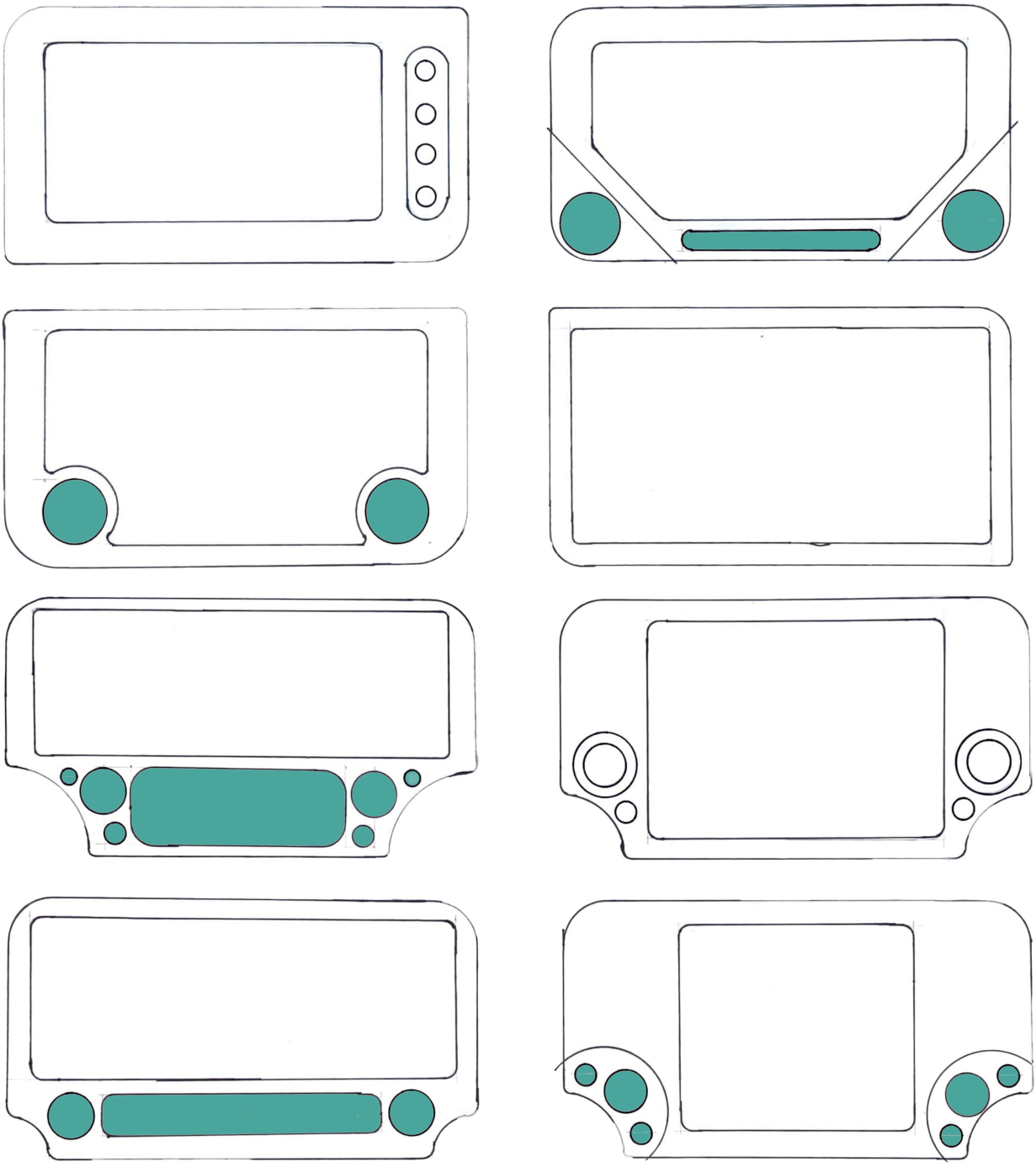
INITIAL BRAINSTORM

I first explored different variations of tablets and gameboy-like designs. I thought about how to maximize the screen space and ways to interact with the screen: buttons or stylus.

I was inspired by gameboys and the PlayStation controllers for my initial designs because these forms are familiar to potential users, thus making it more intuitive to use and interact with from the start.

Other features I considered incorporating into the design includes the solar panels, SD card slot and headphone jack.

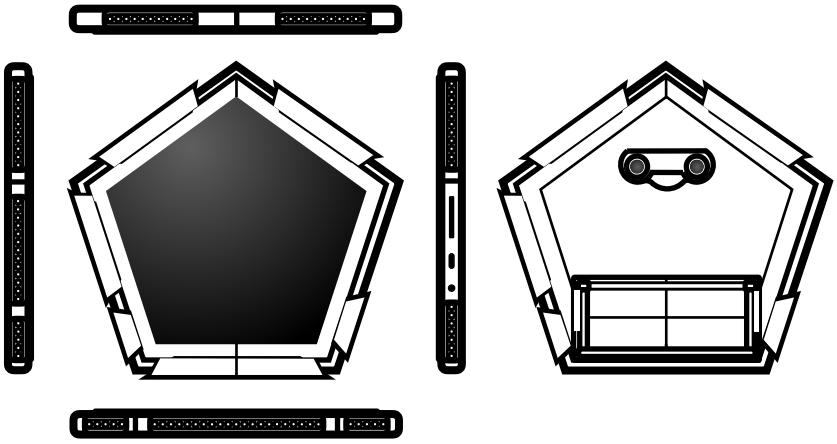
CONCEPT
IDEATION

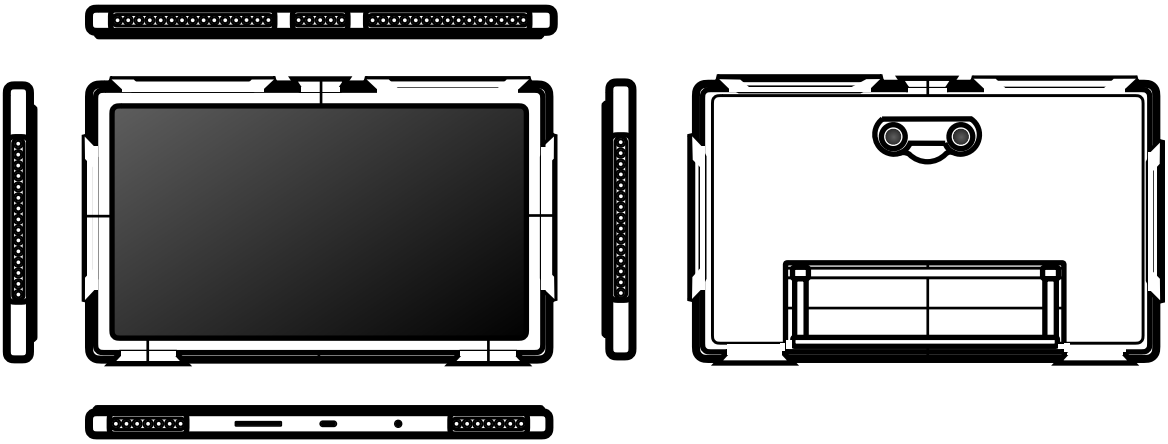


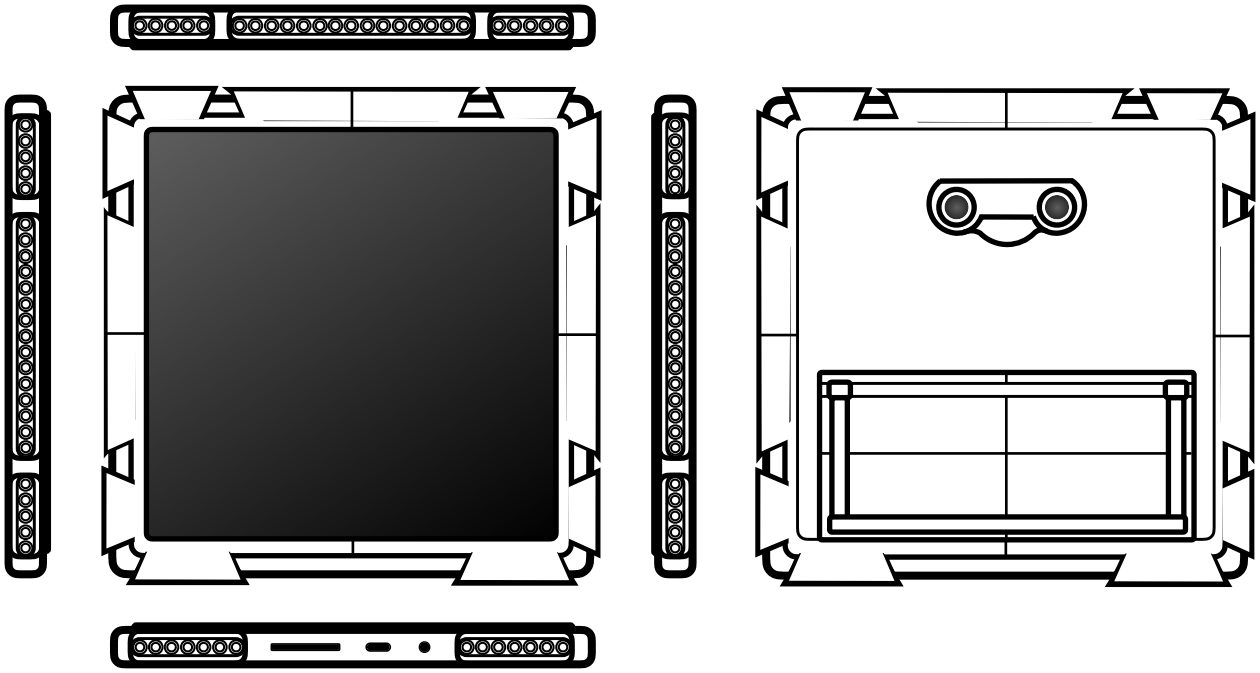
Here are more form and control button explorations I did. I considered button placements, sizes, and functions while also deciding whether a touchbar was necessary for additional touchscreen capabilities without interrupting main screen functions of the programs.

CONCEPT IDEATION

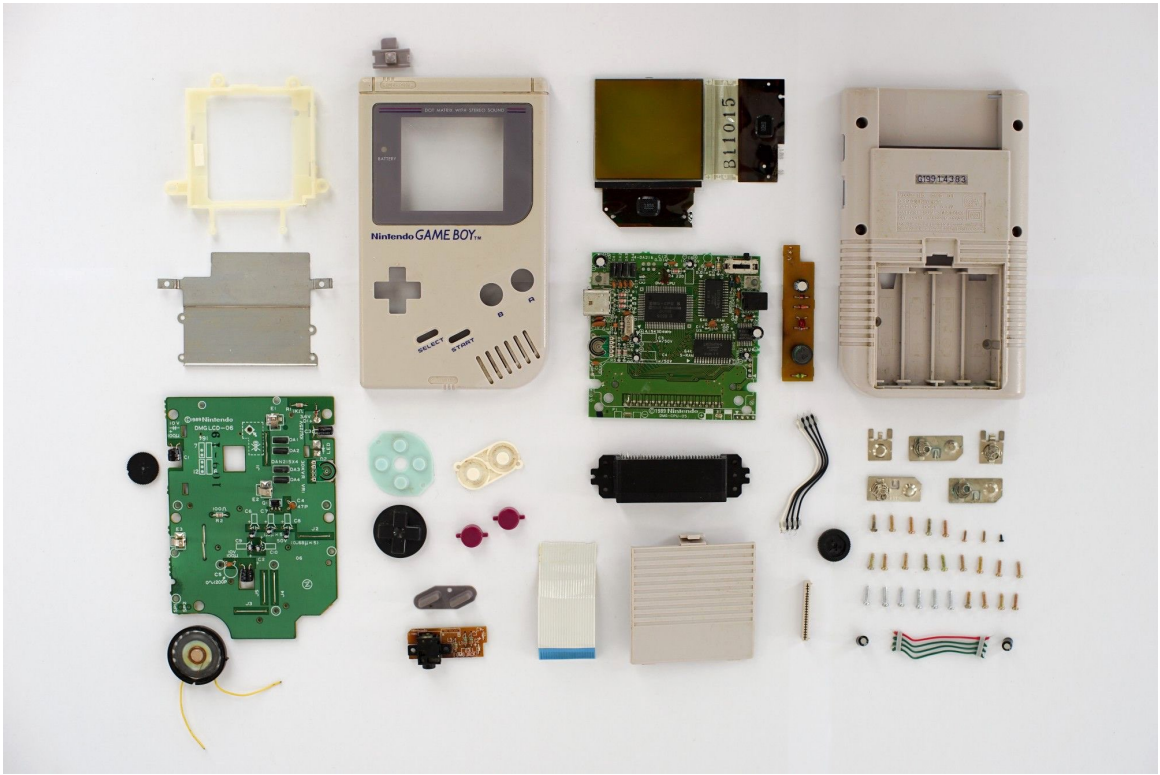
These are the tablet form explorations once I decided to integrate Lego technology into their design and use.







PRODUCT COMPONENTS



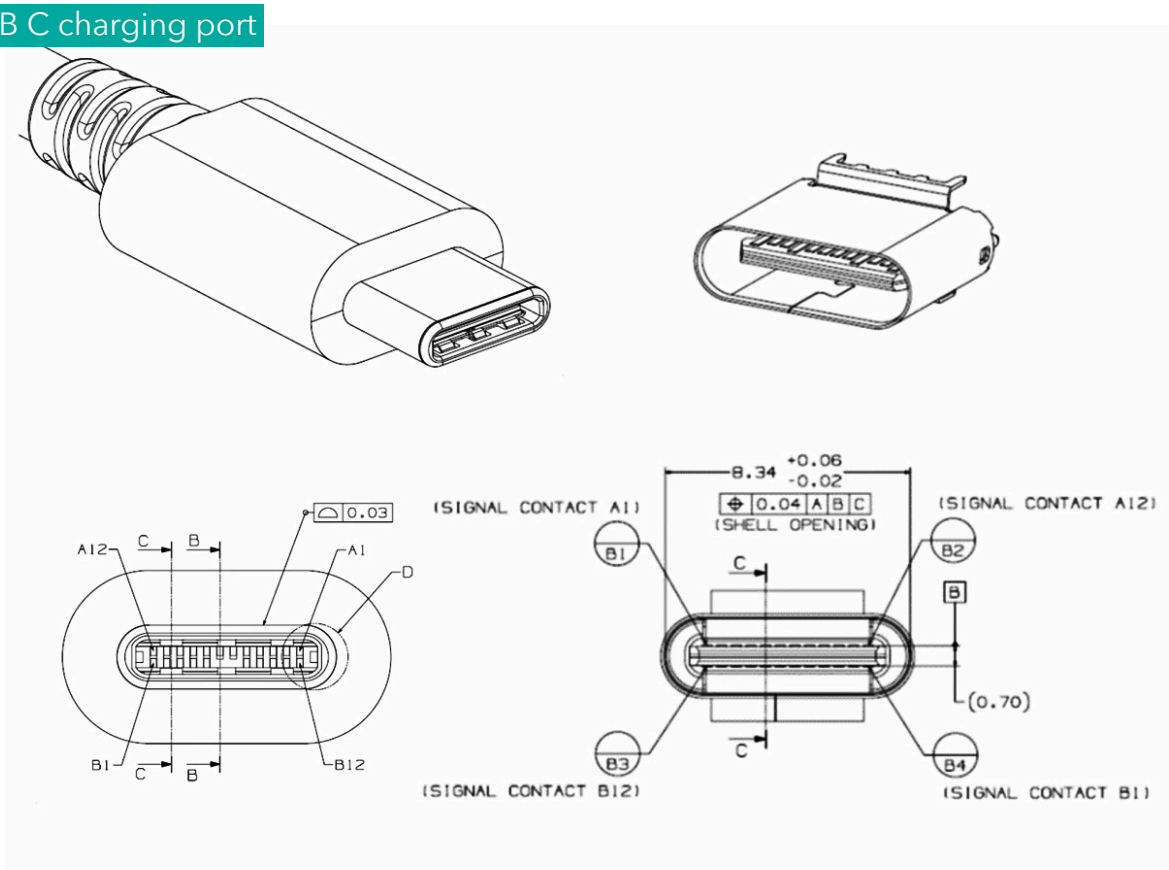
To understand what components go into the design of gameboys and tablets, I researched product breakdowns of them to see all the components required for each type of technology.



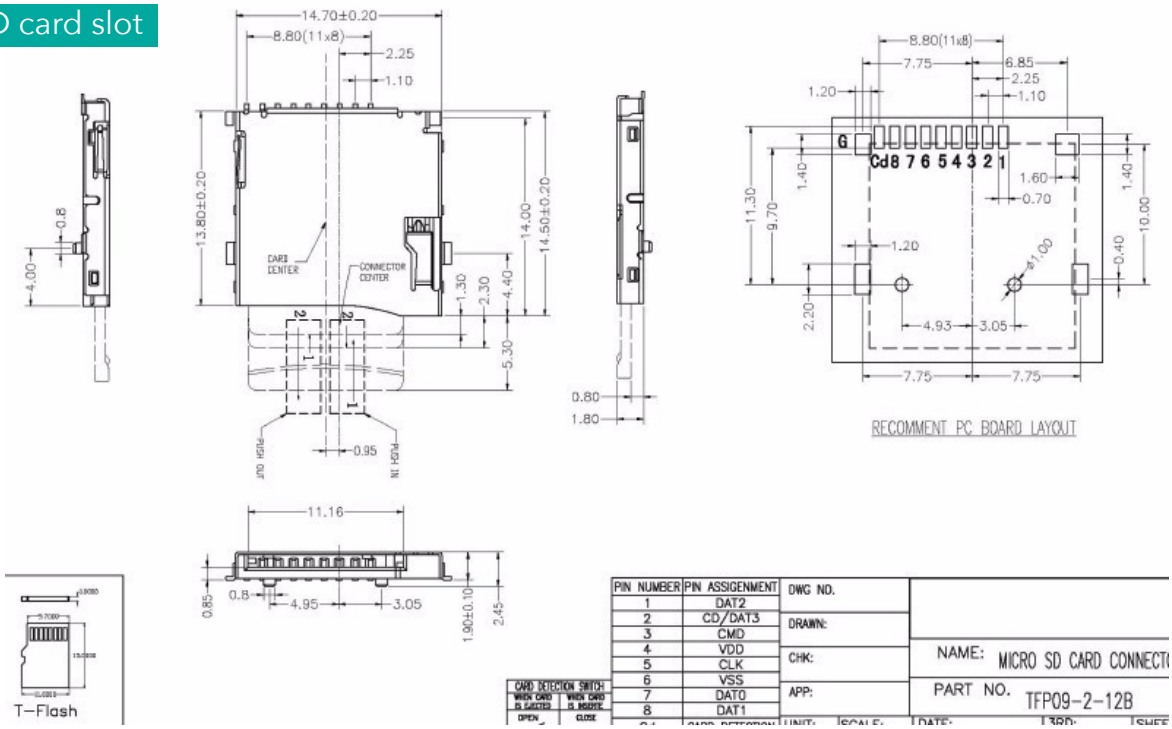
PRODUCT COMPONENTS

I also studied the dimensions of necessary components like the USB-C charging ports and SD card slots.

USB C charging port



SD card slot



PRODUCT COMPONENTS

Solar panel

Aluminum frame

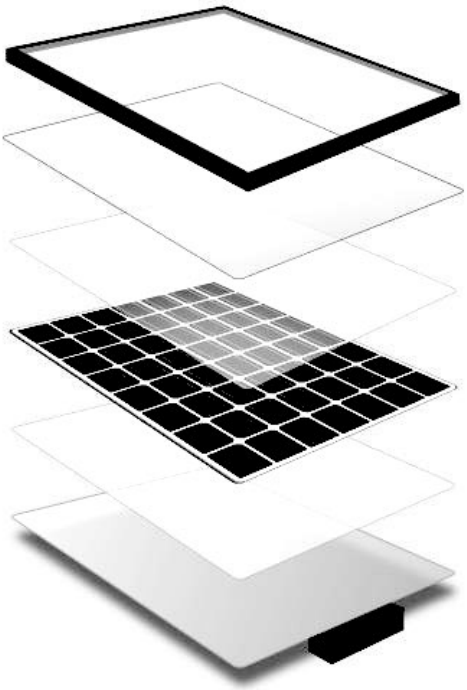
Tempered glass

Encapsulant EVA*
Ethyl vinyl acetate

Solar cells
Copper, silicon, silver

Back sheet
Steel

Junction box

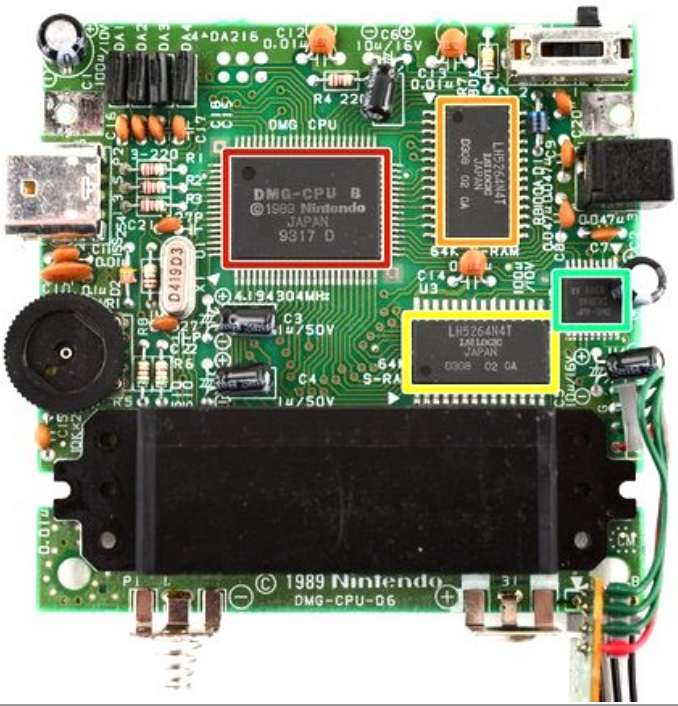


***EVA vs POE**
POE (PolyOlefin) is an alternative encapsulant slowly on the rise for solar panel manufacturing.
Source

Lithium iron battery pack



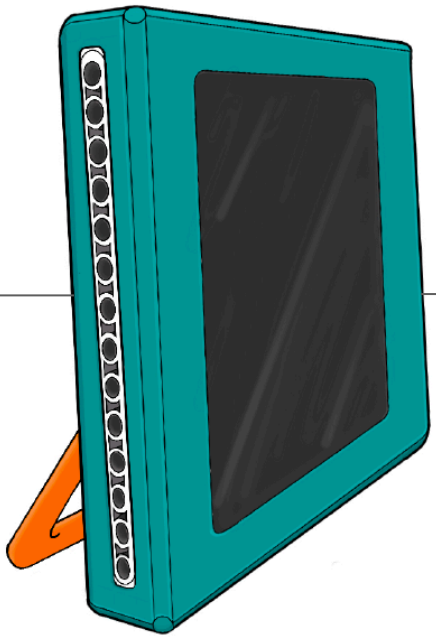
Nintendo gameboy breadboard



PHASE 3

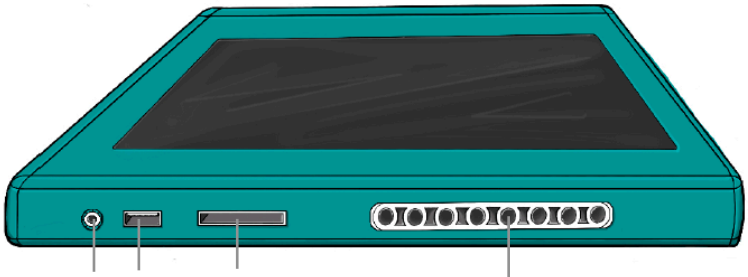
Includes final design, product branding and packing

FINAL DESIGN





Right view



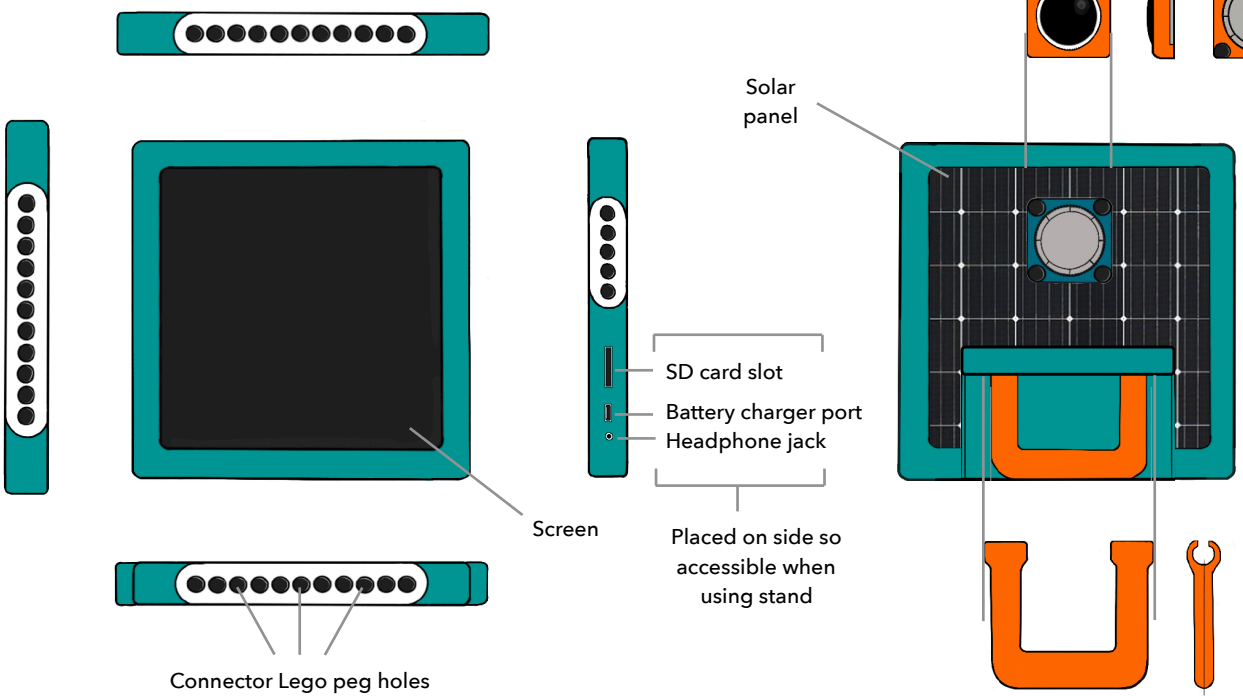
Accessible when standing up or laying down

Connector peg holes

Modular camera attached by connector pins



Solar panel



SD card slot

Battery charger port

Headphone jack

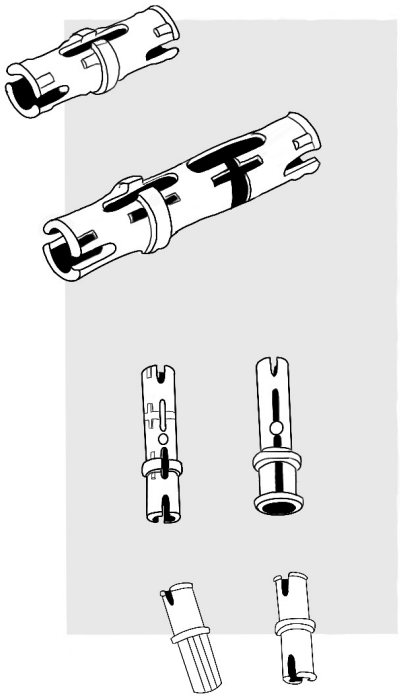
Placed on side so accessible when using stand

Screen

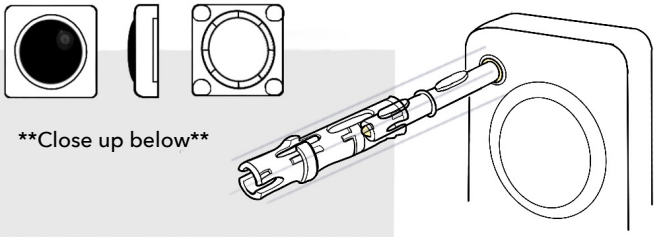
Connector Lego peg holes

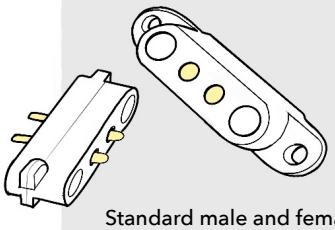
Modular stand swings out

FINAL DESIGN

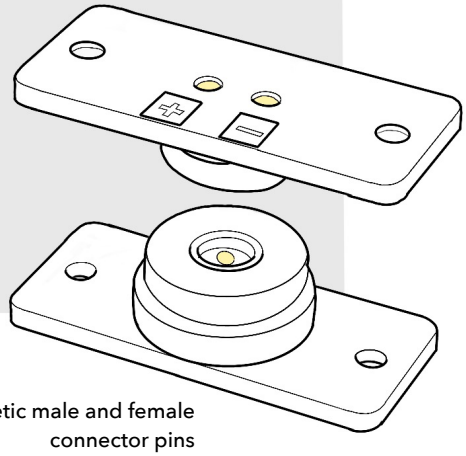


Existing Lego pegs comes in two sizes and various ends

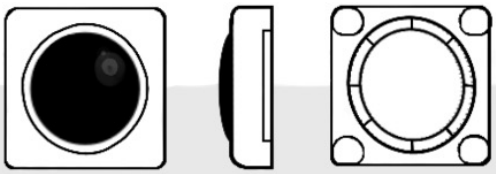




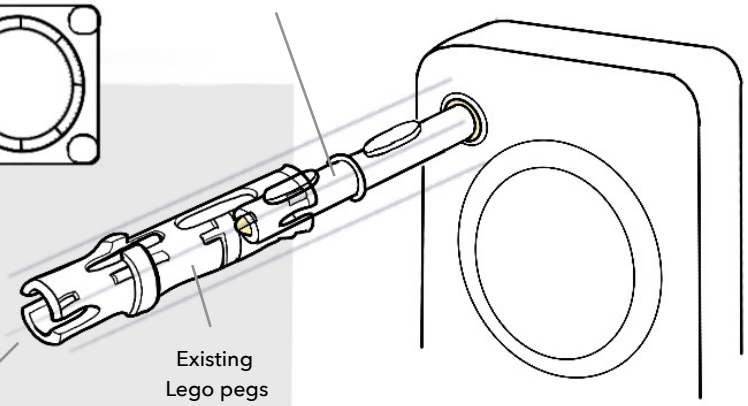
Standard male and female connector pins



Magnetic male and female connector pins



Double-ended male, magnet connector pins integrated with existing Lego peg





Connector pins can be used for other modular sensors and attachments

USING ASIK

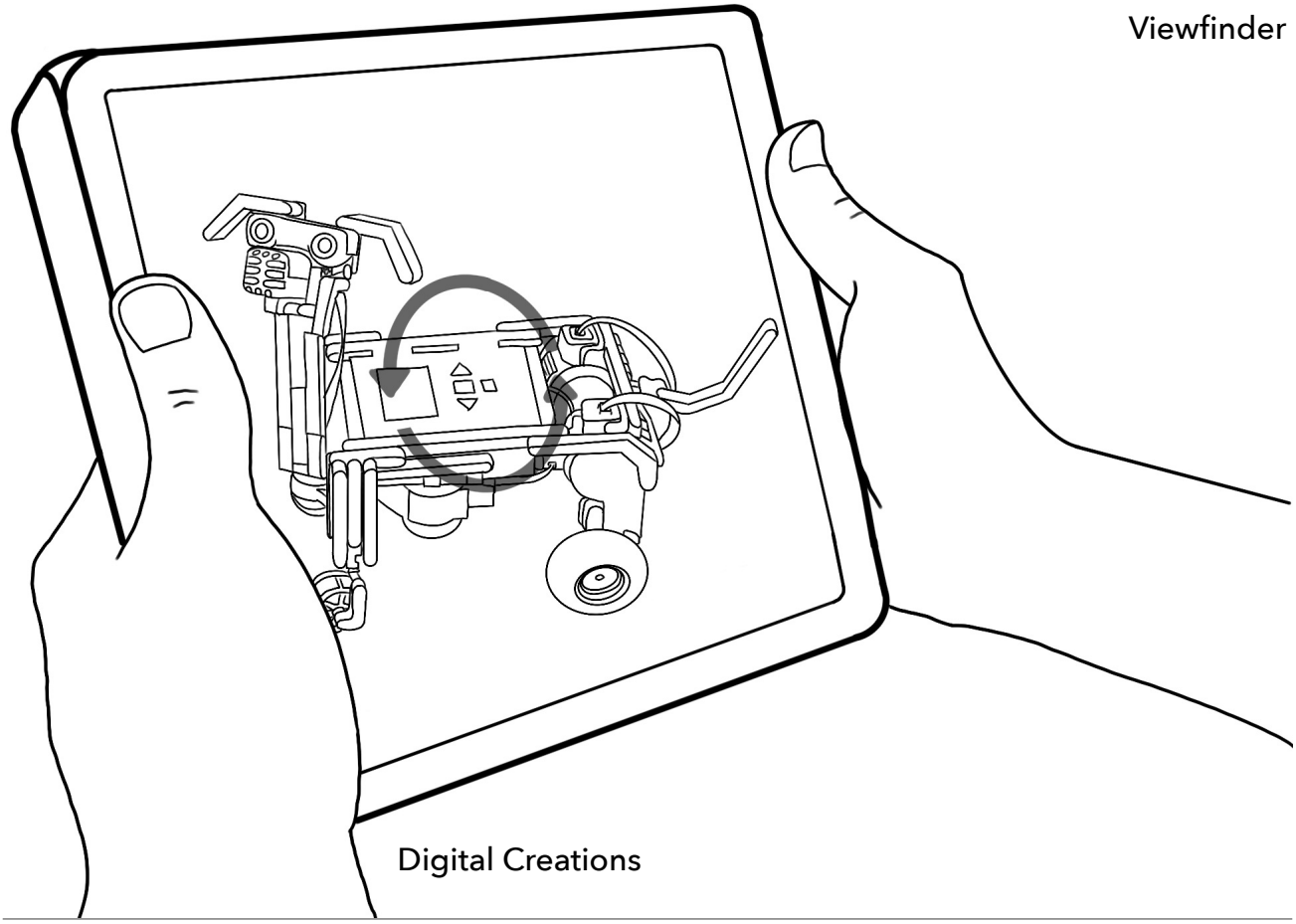
Featured Softwares

Viewfinder (right)
Software that allows users to use their cameras to learn more about their environment. Information stored on SD card.

***MyLegoWorld* Digital Creations (below)**
Software that scans, digitize, and upload creations into MyLegoWorld server where children can interact with their creations digitally.



Viewfinder



Digital Creations

USING ASIK

Viewfinder



Select and adjust settings for intended use



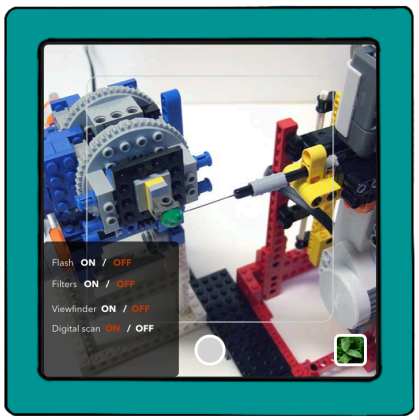
Hold down on image to load information



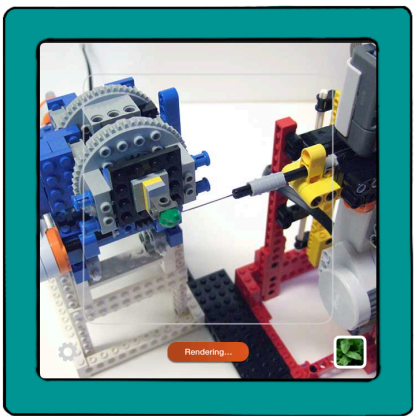
Information appears on pop-up widget

Information that appears in the pop-up widget is stored in an application within the SD card that can then be downloaded onto the tablet. Updates on information can be secured through updates of the application itself.

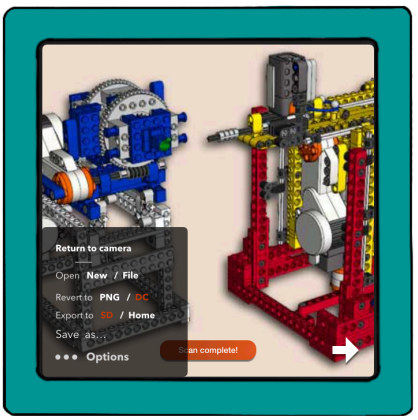
MyLegoWorld Digital Creations



Select and adjust settings for intended use



Capture screen to scan and render creation(s)



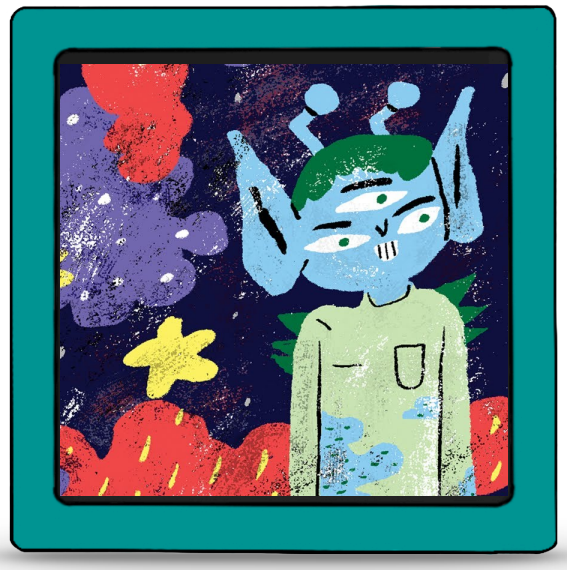
Creation is ready to upload to *MyLegoWorld*

Once children create their Lego masterpiece, orthographic photos are taken so that the application can use unique identification codes to reference each piece use and create a digital 3D model of their creation. The creation is then able to be rendered and uploaded and saved into the MyLegoWorld space.

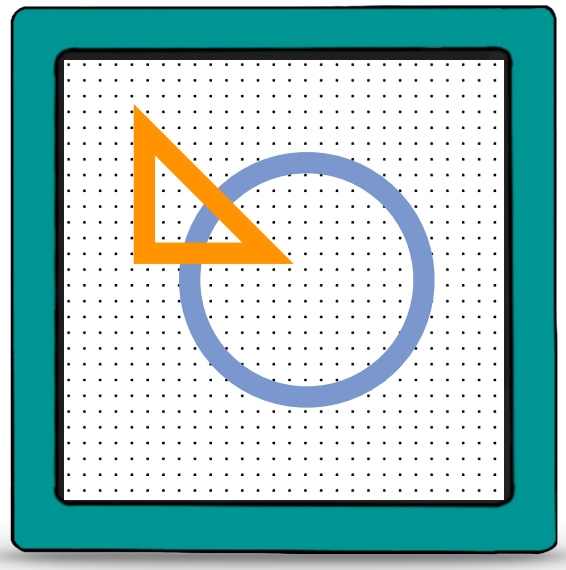
USING ASIK

Traditional Applications

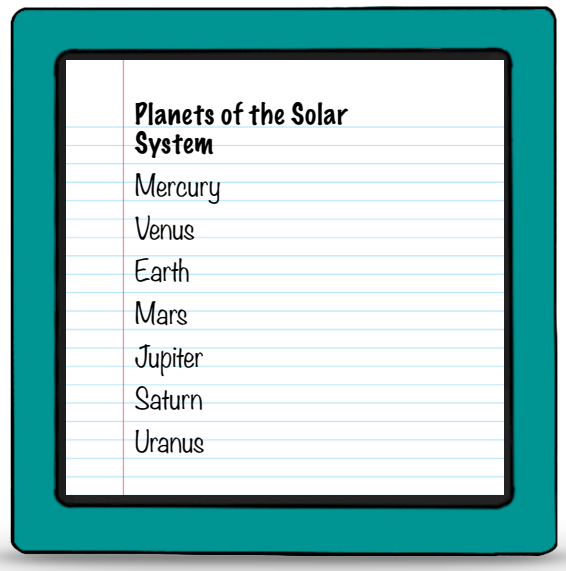
Besides the two main featured softwares, the tablet can be used for traditional education functions like take notes, ideate, and learn/study.



Drawing pad to draw/ideate!



Dotted paper for alternative drawing/writing!



Line paper to take notes!

USING ASIK





Children can connect their tablets to collaborate on assignments and creations via bluetooth. They can enter their own Lego worlds or their friends to share their creations or engage in fun games/activities!



When not using their tablets and no power supply nearby, children can simply lay their tablets face down to charge via the solar panel on the back of the tablet.

The tablets can be used anywhere their learning takes them!



PRODUCT BRANDING

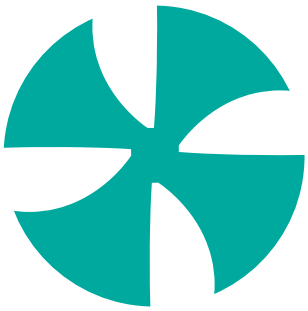
The Origin of asik

From the Indonesian word *asyik*, meaning being engrossed in something fun. The adjective perfectly captures the product's intent to engage young students in fun, imaginative activities that teach them about art and design.

Logo inspiration

The pinwheel is a symbol of youth and playfulness. Kids can learn to make their own pinwheels as a beginner arts and craft project, thus also making it a symbol of early creativity and simple joys.





Typography

Poiret One Regular

asik

asik asik asik

Color Palette

#00A99D
CMYK 78,9,46,0

#000000
CMYK 75,68,67,90

#FFFFFF
CMYK 0,0,0,0

#CC4F29
CMYK 14,83,99,4

I chose these colors because they are gender neutral, but still very youthful and playful. The blue-green is soothing, but the burnt orange represents the fiery passion kids demonstrate. I hope for these colors to continuously interest and engage children in their creative spirits.

PRODUCT BRANDING

Each tablet will come with a kit of Legos, sensors, camera, and special connector pegs.



Silakan membuat. = "Please create." *Silakan* is a polite way to invite someone to do something, often times in ways like "Please, take a seat" or "Please eat". In this case it's an invitation for children to continuously create.



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