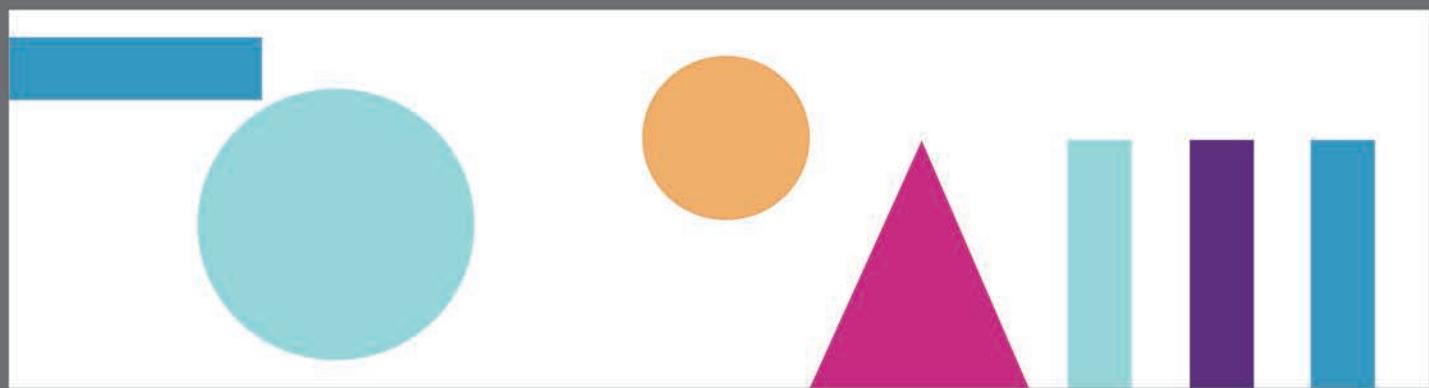


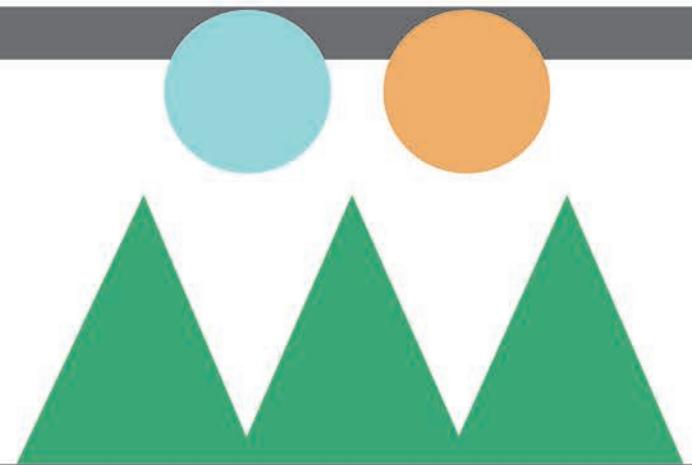
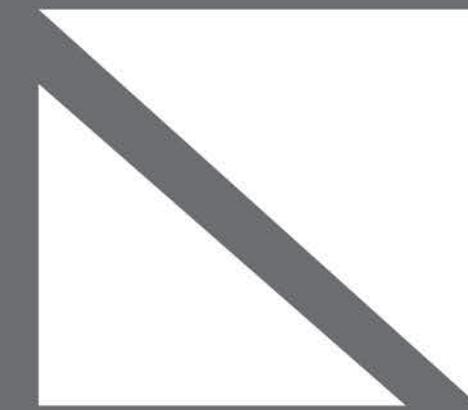
Winter 2020
Xavier Wang



Process

Project studio MDes-6520-1
Explorations in Ecology and New Materials:
Collaboration with Children in Design

Instructor: Angela Henderson



Journal

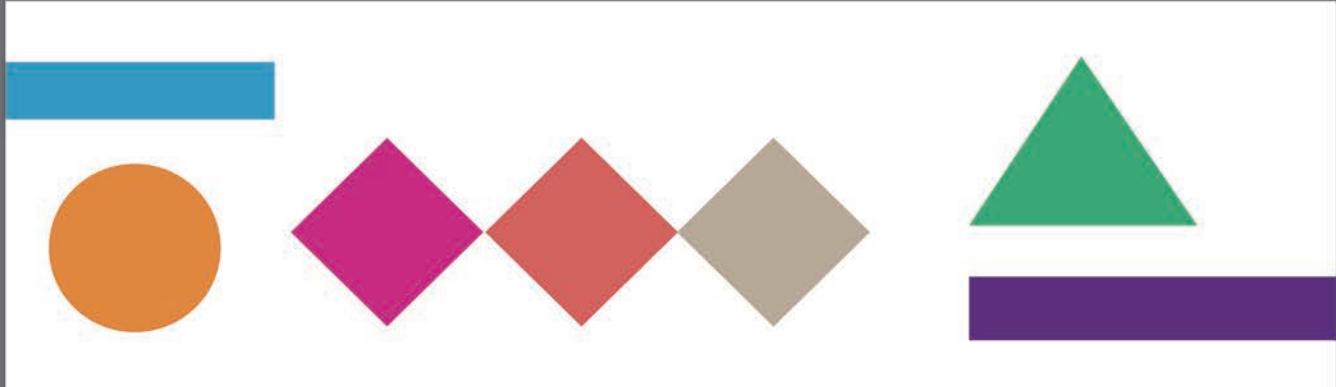


Table of Contents

Co-design with students of Halifax grammar school

Intro P02	Reflexive writing 7 P03	Reference P38
First project P04	First visit P04 Reflexive writing 2 P05 Second visit P06	Appendix A P39 Link of Writing P39
Material Palette P08		Appendix B P40
Design Application P12	Material Experience P13 Sketch of ideas P15 Ideas development P16 Prototype P17	
Second Project P18	Third visit P18 Fourth visit P22 Reflexive Writing 5 P25	
Final Design P26	Familiar with materials P26 Familiar with Casting Processes P27 Idea development P28 Prototype / Testing P31 3D model demo P32 Final product simulation P34	

Reference: MIT City Design & Development Group, Spring '17

Intro

Reflexive Writing 7
11 Apr.

...Co-Design is a well-established approach to creative practice, especially in the public sector, it's often used as an umbrella term for participatory, co-creation and open design processes. In fact following Sanders' position (Elizabeth Sanders & Stappers, 2008) we would argue that co-design is a subset of a wider notion of co-creation. CoDesign has its roots in participatory design developing in Scandinavia in the 1970s and in the seminal 'Design Participation' conference held by the Design Research Society in the UK in 1971 (E Sanders & Stappers, 2008).'

- Cruickshank, Leon and Coupe, Gemma and Hennessy, Dee (2013) *Beyond the castle:public space co-design, a case study and guidelines for designers.* Swedish Design Research Journal, 2. pp. 48-57. ISSN 2000-7574

'...The authors also believe that the project emphasizes flexibility and is also very risky because they really value openness. Also, some designers mentioned by the author think that it is difficult for them to put the role as 'responsible expert' in the co-design process, and then put forward 8 basic project guidelines. I think each one is a practical direction worth learning, especially 5. *Let everyone be creative in their own way* and 6. *Challenging assumptions explore and challenge assumptions*, these two points are what we have always wanted to really accomplish in our project(hopefully). I think what this article and this project really taught me is that we need to actively reflect on the process and direction of the project. Through these reflections and responses, the co-designed participants have the best chance contribute to the project, and gain at the same time.'

- From Reflexive Writing 7



The co-design project involved in this article is a large public green space in the UK, where 2500 people participated! 700 of them contributed their creativity! The main thing I want to talk about is the fifth event, Interactive Co-Design Exhibition. As a co-design practice, the exhibition method of this interactive exhibition has many similarities with my personal understanding of co-design. First, it contains elements such as divergent thinking, prototyping, etc. Then designers and participants are immersed in the ideas that have been generated, and an interactive 'scaffolding for experiencing' is constructed, which allows participants to use their previous insights to convey ideas.

What amazes me the most is that the participants spent more than forty minutes on average to make suggestions and ideas. Some of them had conversations with volunteers at the exhibition, but more often they did not. I can see in the reading that some participants collaborate with 'experts', while other participants are independently co-designing. The two collaboration models I saw here also appear in the case of our group and children's co-design project. The author of the article commented that the scope and complexity of the ideas proposed by the participants are worth noting. I agree with this. At the same time, I think that because the project background involved in the article has a wider range of stakeholders, it is not necessary to communicate with each individual and record the feedback of each individual. But I think that when we practice co-designing a project, if we can observe and record the individual feedback more closely during the creative stage, it will be of great help to the entire project, and it is of direct significance. For example, observe and record participants' feedback on different vocabulary or project details, including body language, subtext, and sense of subconsciousness. This allows us to analyze a certain/deeper level of participant feedback, rather than just staying in purely physical feedback. While focusing on psychological feedback, adjust or change some of the project's presets, which is very worthy of consideration by project participants and stakeholders; it is also more time-consuming and requires close interaction. So I also mentioned this the interactive mode is not suitable for projects with a large number of participants at the same time. This is more suitable for small projects and large projects that are carried out multiple times.

In addition, the author also mentioned the advantages and challenges of the project in the practice of their large-scale joint design project. The project provides a way for a wide range of experienced and professional people to input ideas into the design process. But this requires flexibility and strong support, because flexibility here allows different forms of creative investment, not just the designer as a trained person to provide solutions. There is also a need to flexibly combine the value and contribution created by a wide range of participants in the project process. It also needs to constantly and actively adjust the project's presets and processes, which is similar to our previous project process. The authors also believe that the project emphasizes flexibility and is also very risky because they really value openness. Also, some designers mentioned by the author think that it is difficult for them to put the role as 'responsible expert' in the co-design process, and then put forward 8 basic project guidelines. I think each one is a practical direction worth learning, especially 5. *Let everyone be creative in their own way* and 6. *Challenging assumptions explore and challenge assumptions*, these two points are what we have always wanted to really accomplish in our project(hopefully). I think what this article and this project really taught me is that we need to actively reflect on the process and direction of the project. Through these reflections and responses, the co-designed participants have the best chance contribute to the project, and gain at the same time.

First project

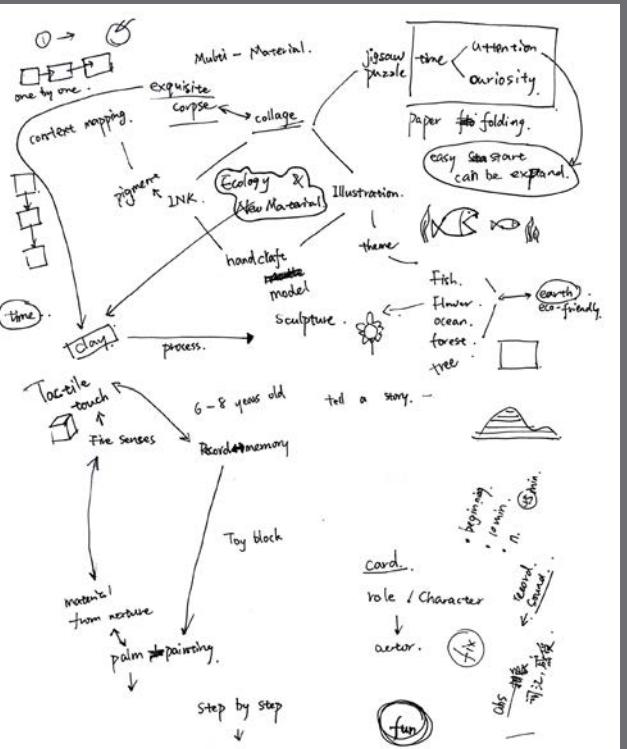
► First visit with the children



▲ Children play with the algae clay for the first time



▼ Some of the finished works of the in-class session



▲ Brainstorming about activities before meeting children



▲ Testing the materials before meeting the children.

The first thing that came to my mind was that before meeting these children for the first time, my team members and I had studied the relevant co-design with child methodology and some case studies. Member of my group also have experience with children of similar ages and teaching. Nevertheless, our plans for the first use of clay materials and children's interactive plans are far from expected.

Ideally, we advocate the use of the concept of exquisite corpse to group children in pairs. Each child first creates a part of an object with a given and non-given theme, and then exchanges it. Here we expect to see two groups of children accomplishing and solving differently the same goal. These include their use of clay, modeling methods, surface treatments, emotional expressions, attitudes towards us, interaction, and communication. It is expected that in the presence of a control group, we will obtain different creative solution directions and methods that we want to achieve. But different from expectations, we found that two groups of four children in three groups of six children could not survive this kind of related co-operation. They would destroy previous works and re-create, although we repeatedly emphasized that complete the work on a previous basis. This article in 'Co-design lessons with children' is very similar to the challenges in the classroom and team dynamics described by the author.

In addition, our group also learned from the experience in the article and set the focus of the activity on the material itself. There is no mention of meaning, semiotics, or other extensible content. The other group is two girls who seem to have a good relationship. When they are doing this activity, they imitate the previous works in a similar way to their producers and make similar works. At this stage, we adjust our interaction mode in a timely manner. Under the premise of personal interest, we break the previous group and adjust students of similar interests together. Let us understand them while we understand them.

In the next event we envision, we will bring more materials and items for them to use, in the hope that after learning about the characteristics of algae clay, we will find more ideas in the process of mixing with more materials and innovative ways with in-situ ideation context.

► Second visit with the children



Provide children with the same specific size white foam boards



Some of the finished works of the in-class session

Material Palette



Material Palette
of Children





Material Palette
of focus group



Design Application



Reflexive Writing 2
3 Mar.

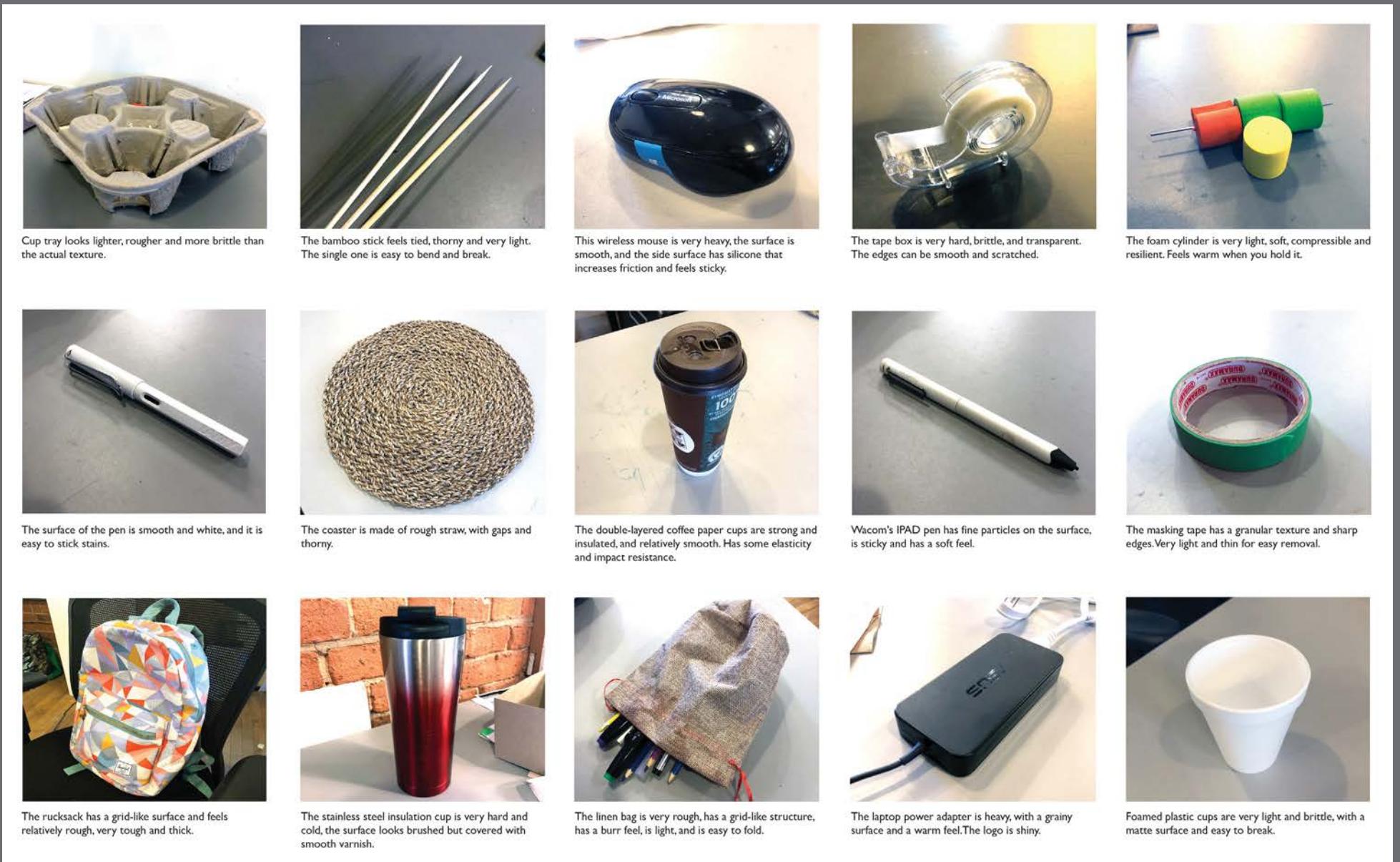
My first project was a complex of complex consciousness full of feelings and entanglements. It was also an intersection of contradictions. It's hard to say that I'm not because of the physical properties of this algae-clay composite material, but it's more from the meaning it carries and the sympathy that resonates with me, as well as symbolic and semiotic. To me this material is so new and difficult to hide historical traces; clay, pottery and porcelain have always been accompanied by human civilization, and it is one of the oldest inventions of mankind. It has been unearthed items close to 30,000 BC among them, the statue has living utensils, jugs, containers, measuring tools, etc. The clay mixed with seaweed is something I have never seen or imagined. It is completely new.

In the process of understanding the material, I noticed some interesting characteristics of the material itself, such as the unique odour, different textures according to the proportion of moisture and filling materials, different degrees of extension, and surface traces after drying, which will completely dry naturally. The breaking strength of the material, the different weights when fully air-dried and wet, etc. Then the content was photographed and typeset, and vocabulary annotations were made based on physical and psychological feelings. In the process, some possible solutions have been produced. After that, the children's, myself's, and my follow groups have summarized different samples and made different prototypes. This is also the same way the materials in the classroom are designed for reading.

In the design project itself, after I recorded the different material properties. I am attracted by the visual-texture / texture, olfactory-unique taste, touch-wet and sticky and dry matte surface. I combine my historical understanding of clay materials with different physical and psychological feelings; then I add (Sounds and Images) that I read and I myself receive more than 70% of the current human information from the visual. Understand, I want to integrate the five senses as much as possible in the first project. I quote the original "Listen to one of the earliest surviving recordings—for example the plea on behalf of the survivors of the battle of Balaclava made by Florence Nightingale, 30 July 1890. Nightingale describes the words, 'When I am no longer even a memory, just a name, I hope my voice may perpetuate the great work of my life. God bless my dear old comrades of Balaclava and bring them safe to shore.' From this a series of wax cylinders were made and sold on the open market to raise money for the veterans. In recent years, the Wellcome Institute has restored its surviving cylinder and transcribed what was originally recorded into an MP3 file downloadable on its website. Through 120 years, and through a series of mechanical, electronic and computational processes, you can hear Nightingale's voice, you can hear the sounds she made on that occasion in July 1890.", the above description of sound recordings, and the four eras of the history of sound recordings I investigated myself, the Acoustic era; the Electrical era; the Magnetic era; the Digital era. Combining the algae clay with some of the historical and modern sense, and combining my own characteristics mentioned above, the idea of developing a recording disc made of algae clay was created. I think that this kind of multi-sensory mobilized objects can make people become attached and generate memory nodes, so that they are not staying on an object itself, but more like a memory that recalls the past at the same time, and records the current feelings, making Connection point for future possibilities.

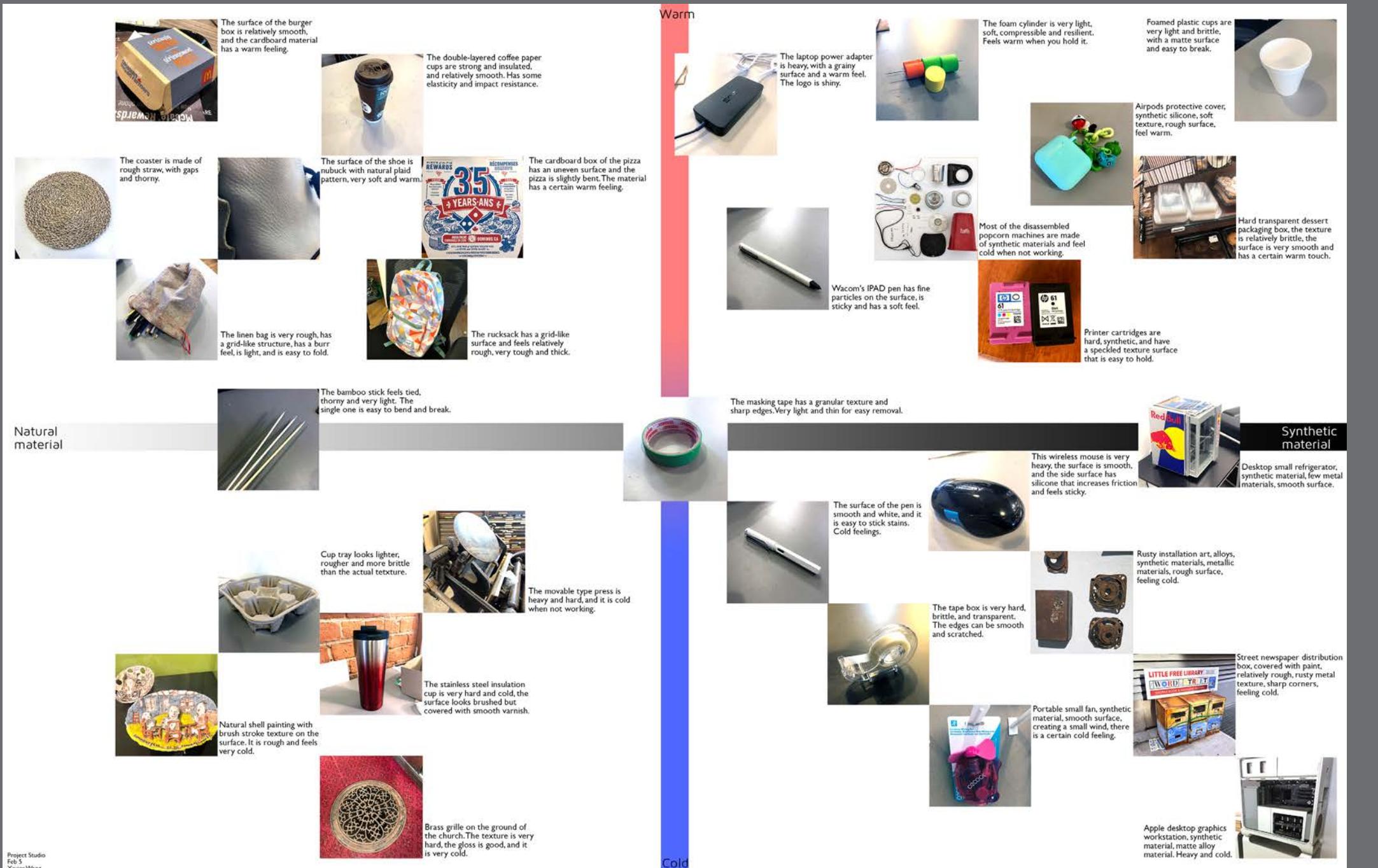


Material Experience 1



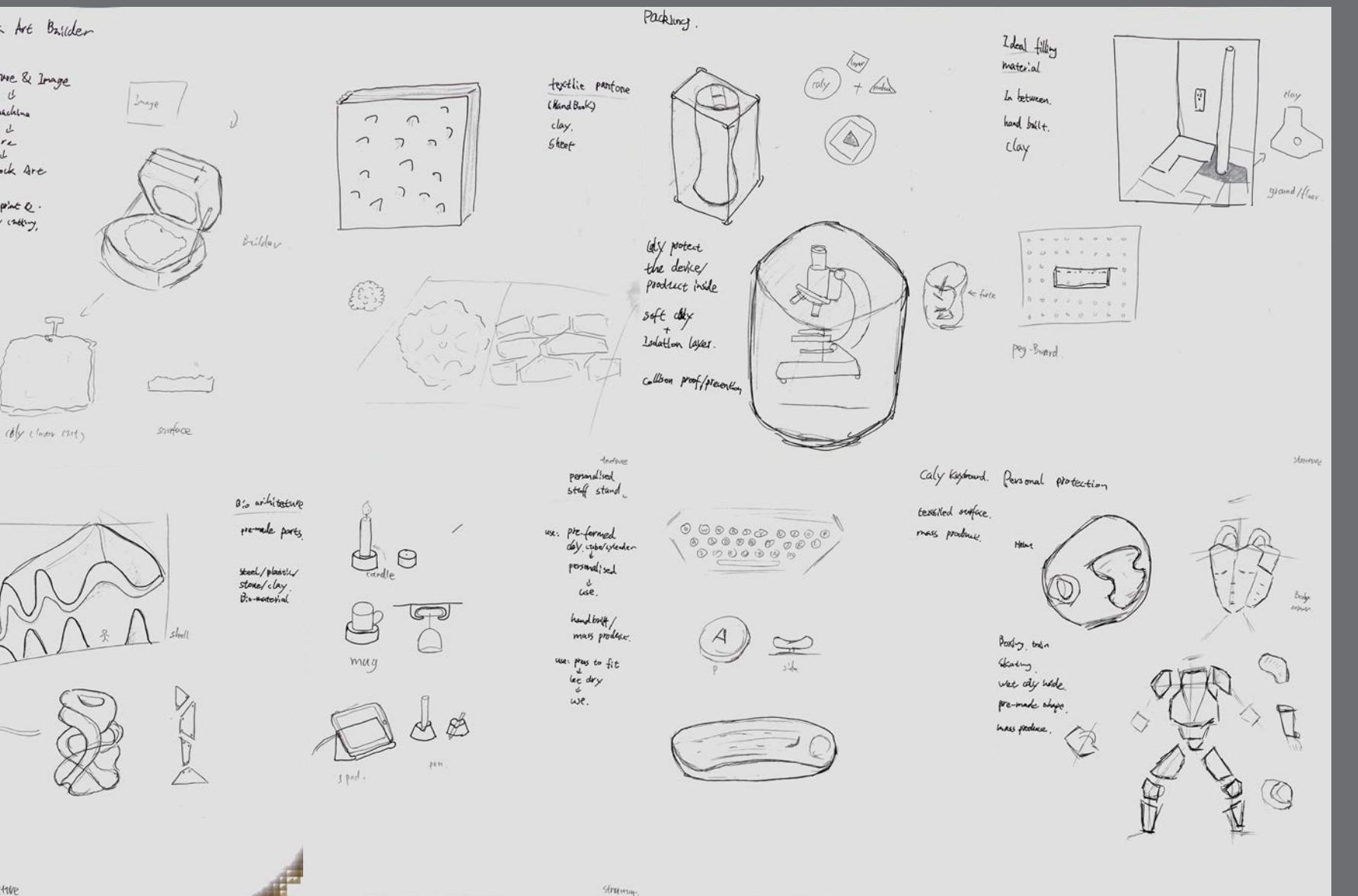
Try to analyze the characteristics of the item, familiar with the theory of material driven design

Material Experience 2



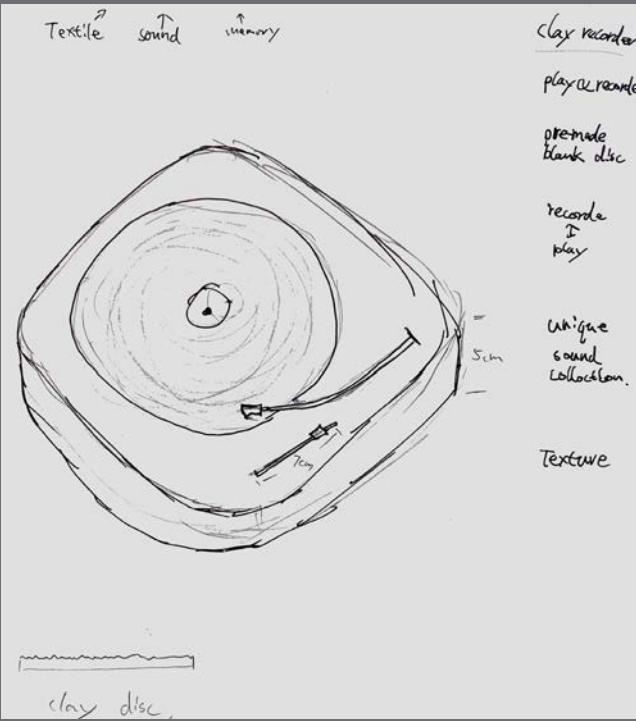
Deeper analysis of the characteristics of items,
Both emotional and physical

Sketch of ideas

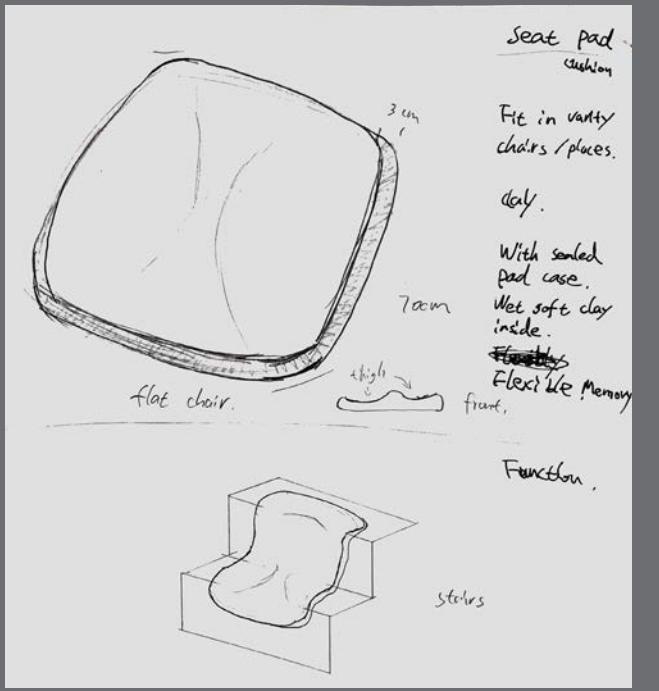


Using the physical properties and characteristics of algae clay, it is soft and sticky when wet; the surface is rough when dry, easy to break and hard. Different moisture content will greatly affect its scope of application, similar to clay.

Ideas development



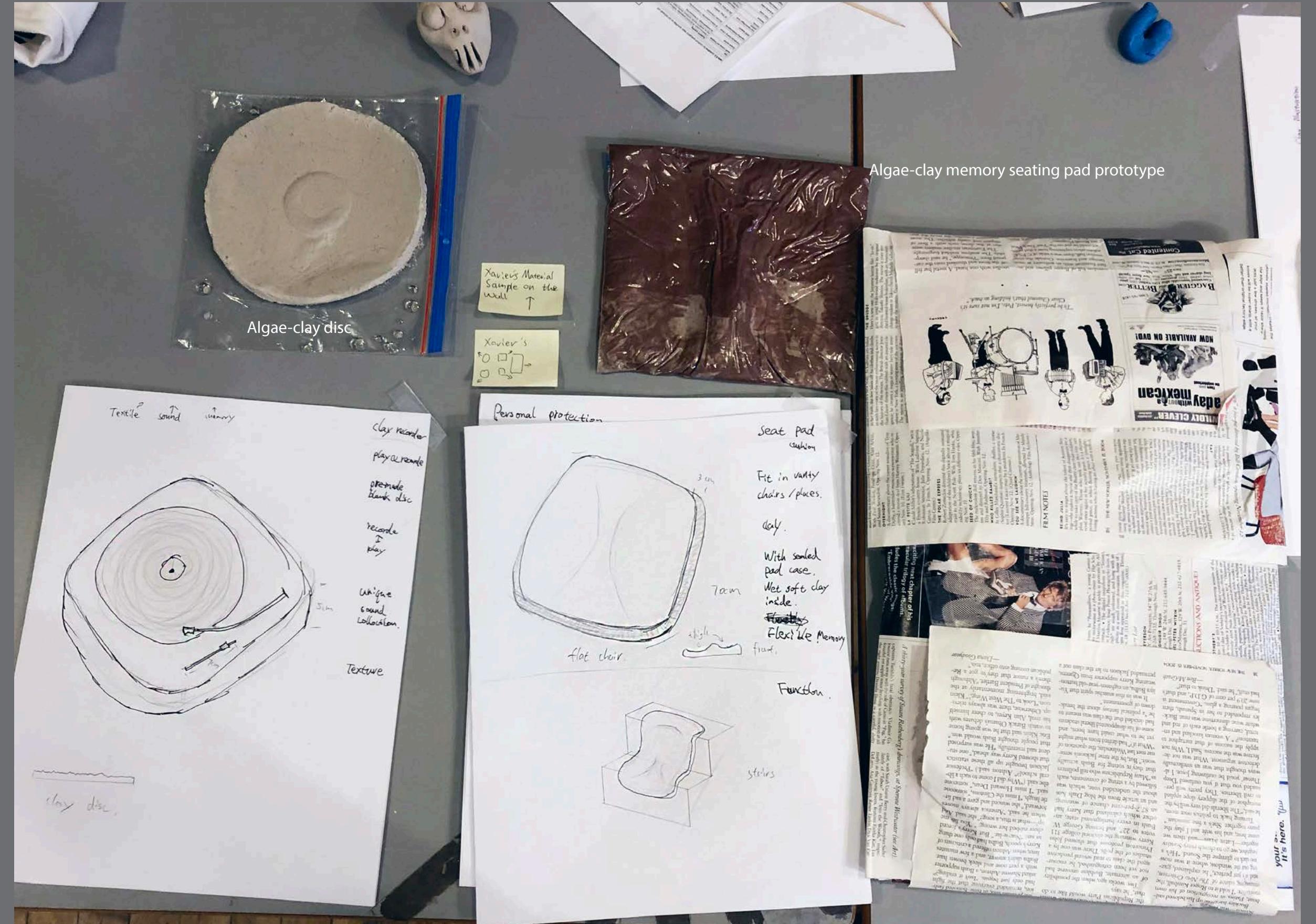
Algae-clay disc



Keywords: Sensory, Memory-Making, Time-oriented -Reflexive Writing 2

Algae-clay memory seating pad

Prototype - Algae clay/paper



Algae-clay memory seating pad prototype

Second Project

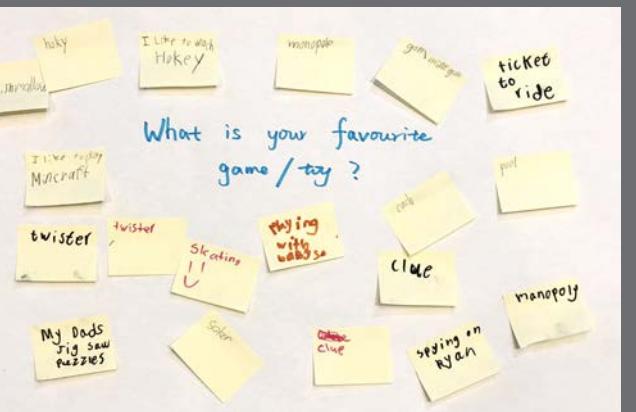
► Third visit with the children

First activity: Q & A
key words on sticky notes

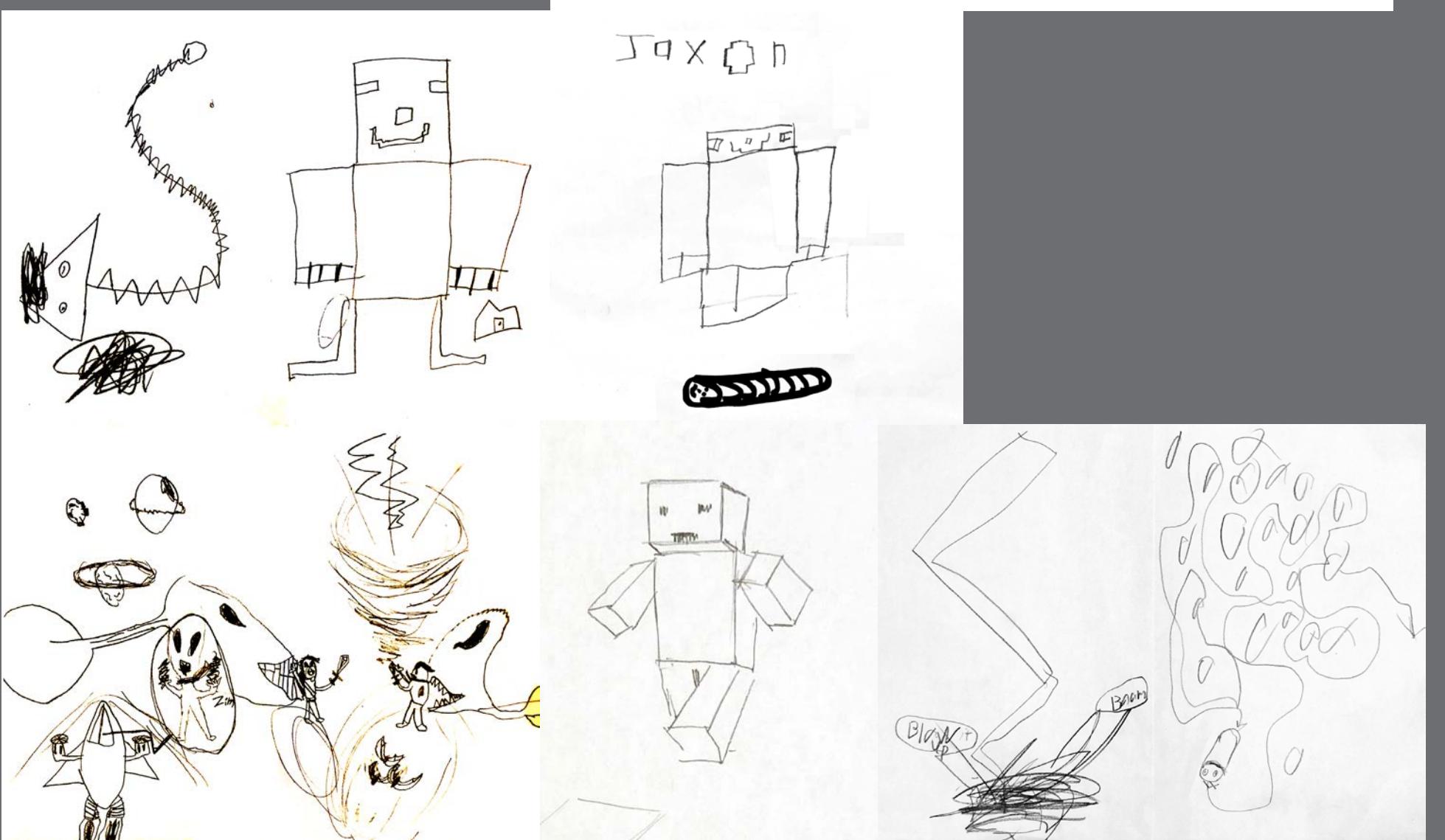


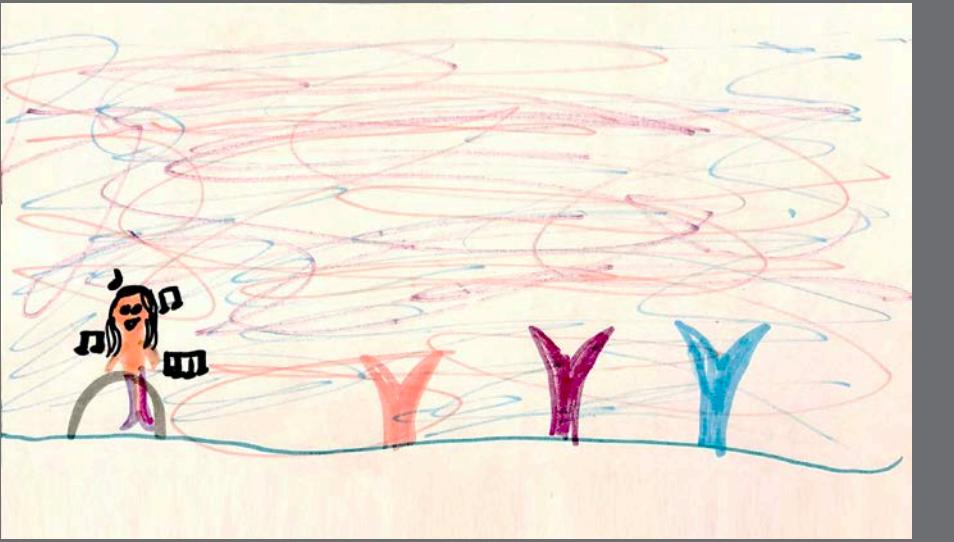
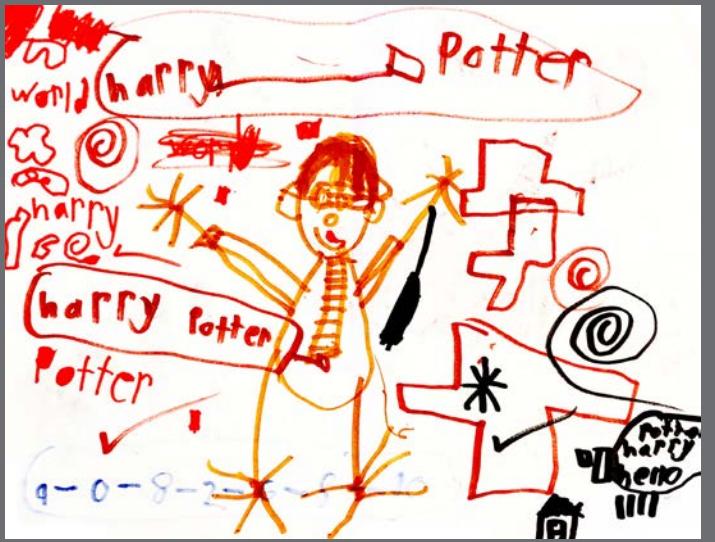
This stage is to determine the direction and tone for each subsequent event and meeting. Here are keywords about personal preferences and concerns, as well as feedback.

- Q1: What would you like to do when you're free?
Q2: What is your favourite game/toy?
Q3: Why?

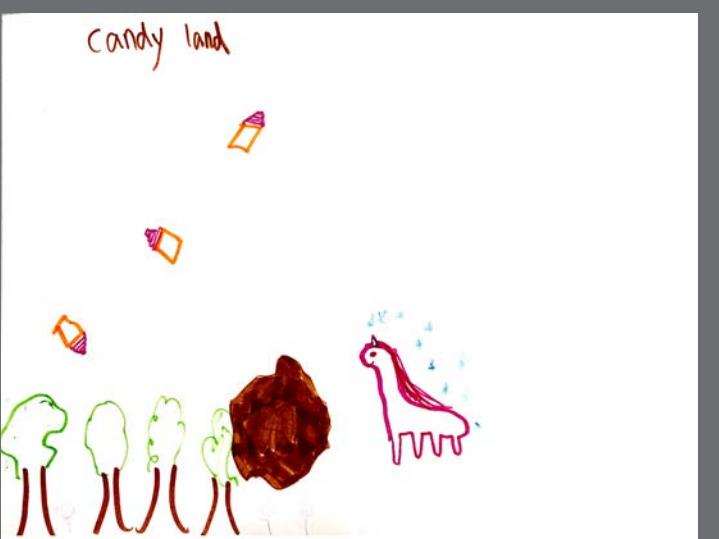
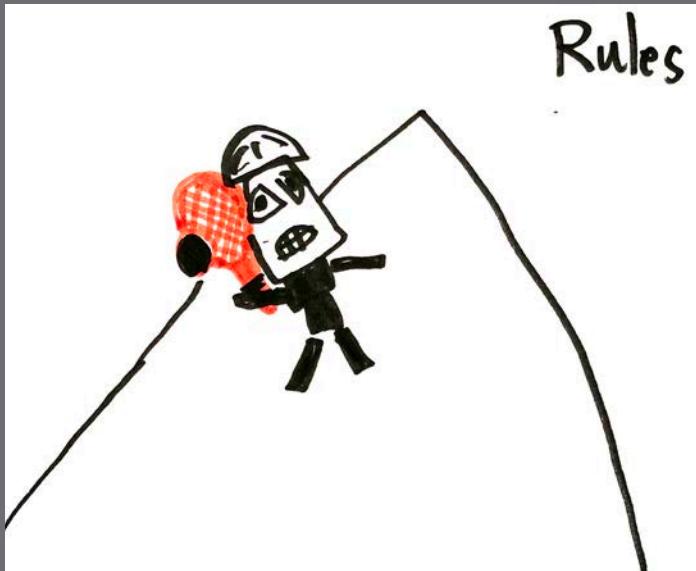


2nd activity: Draw the
favourite character



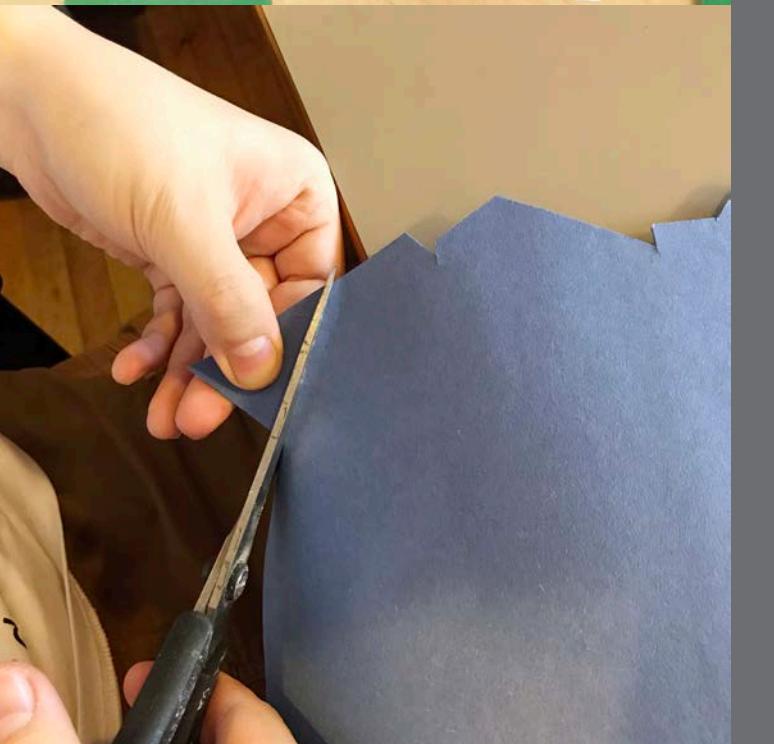
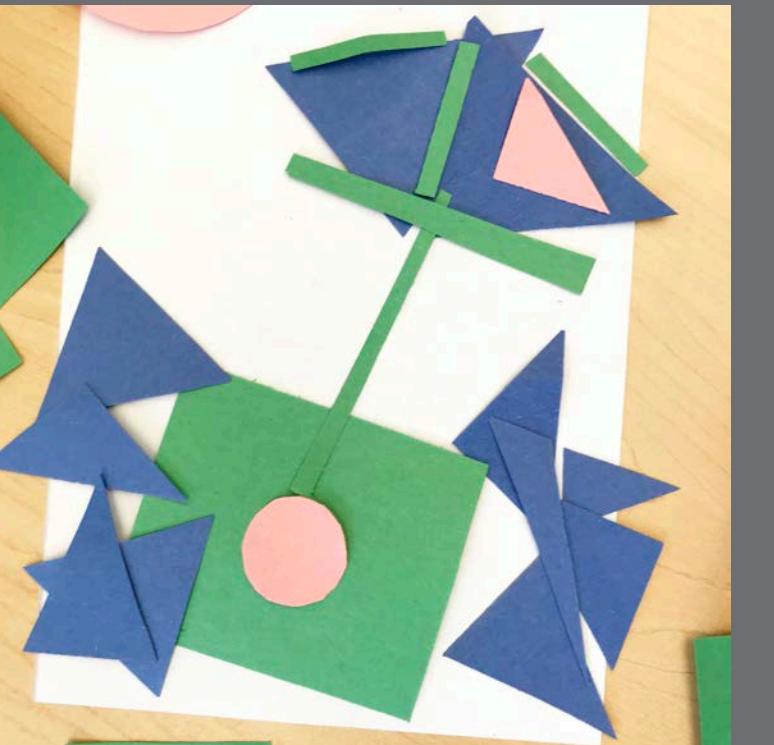
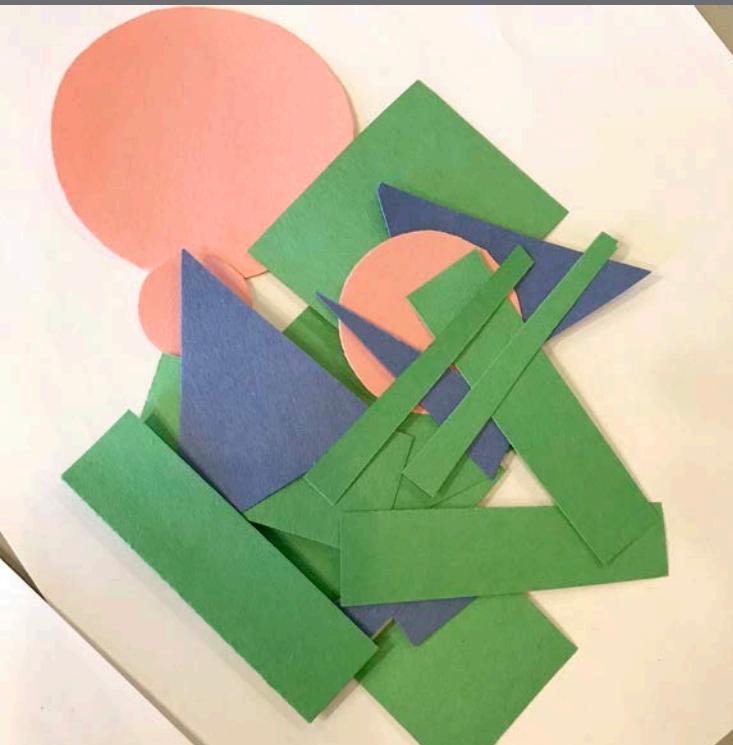


2nd activity: Draw the
favourite character



Here are all the children's works of the third meeting. We summarize the paintings and keywords. We also asked about children's preference for creative methods and media. We believe that the next two activities can still focus on the same theme, adjust the creative method, and establish the foundation for the final use of casting materials. We believe that co-designing with toys and games as the center, in the design process, it is effective to produce as many works as possible. While participating, we can not only reflect the creativity, but also experience the ease and joy when participating.

► Fourth visit with the children



Material preparation

Before meeting children, we prepared materials for activities. These geometric shapes have three different sizes, and each large one is 1.5 times the size of the smaller one. We prepared a set of the same quantity for each child, and also provided a white bottom plate of the same size as the bottom medium for creation. As before, we want to explore how different creations can be made when using similar materials within a certain range.



Co-design characters
in-class



I think that in the two projects, the focus of our group and the overall control of the project are not exactly the same, and the insertion direction of the project is not the same, so the challenges we face have also changed.

I think there are communication issues first. In project 1, our communication mainly included listening to children's introduction to their previous project progress, and explanation of certain technical issues and project progress directions and restrictions during the use of clay to make. The problem of communication in the second project focuses on how our designers, as project participants and organizers, can allow children to receive and adapt and change the design ideas we provide; participating in each stage of the project, from methods to carried out. Due to the increased requirements for communication in Project Two, because there are many abstract concepts and specific implementation plans involved. We use more accessible media, not just the language itself. Here are the keywords that we identified with the children, the paintings we created together, and the collages we made together. Here, not only one individual produced them separately, but also the works of two people together. In different kinds of communication and interaction, we can better adapt and use this co-designing environment. Because in the process of these projects we will strive to achieve good interaction, let us integrate into a cooperative atmosphere, rather than the teaching and learning mode. Of course, I would like to mention the second challenge: identity conversion. They asked for permission; the feedback and actions of the children at the beginning of the first project were like my teacher said, 'We were introduced to them by their teacher, so they will also treat us as their teacher to a certain extent'. Most children are not very active in communicating with us; some children are afraid to express their opinions, etc. I feel that these are obstacles and obstacles to progress, whether it be me or a child. Every time we provide co-design materials and solutions, we fully consider the elimination of the so-called 'privileged category' and 'genius design'. Equality and anti-patriarchy are the directions we realize in the process and direction of the project.

In addition, after we jointly overcome the gradual problems in the follow-up, the progress of our project is relatively smooth. At the beginning of the two projects, our expected goals will be adjusted and replaced after each meeting. This is something I did not expect. I think it's mainly because of the difference between tacit knowledge and children and how we use them. In the process of co-design, I consider three groups of children; designers; teachers to provide components of different knowledge. The children provided the basics and some potential design knowledge they had. The teacher provided the overall framework and guidance from the process knowledge and design knowledge, and the designer filled the space, and all the participants were involved in some stages of the entire process. I think it is reasonable to make a preliminary proposal, actively update the direction of the project, and adapt to the progress of the project. These are some of the factors that make the project successful.

Final Design

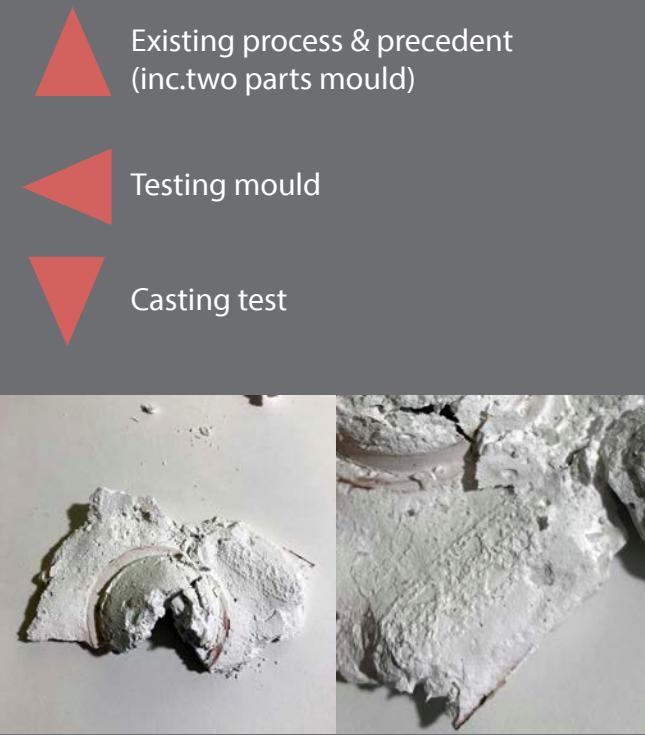
► Familiar with materials



Casting material
From completely mixed to semi-solid to completely solidified.



Casting material
Preparation



► Familiar with Casting Processes

Guides

Types of Casting Processes

Share: [in](#) [f](#) [t](#) [e-mail](#)

Casting manufacturing is a process in which liquefied material, such as molten metal, is poured into the cavity of a specially designed mold and allowed to harden. After solidification, the workpiece is removed from the die to undergo various finishing treatments or for use as a final product. Casting methods are typically used to create intricate solid shapes, and cast products are found in a wide range of applications, including automotive components, aerospace parts, electronics, mechanical devices, and construction supplies.

Different Types of Casting and the Casting Process

Although casting is one of the oldest known manufacturing techniques, modern advances in casting technology have led to a broad array of specialized casting methods. Hot forming processes, such as die casting, investment casting, plaster casting, and sand casting, each provide their own unique fabrication benefits. Comparing both the advantages and disadvantages of the common types of casting processes can help in selecting the method best-suited for a given production run.

Sand Casting

Sand casting typically relies on [silica](#)-based materials, such as synthetic or naturally-bonded sand. Casting sand generally consists of finely ground, spherical grains that can be tightly packed together into a smooth molding surface. The casting is designed to reduce the potential for tearing, cracking, or other flaws by allowing a moderate degree of flexibility and shrinkage during the cooling phase of the process. The sand can also be strengthened with the addition of clay, which helps the particles bond more closely. Many automotive products, such as engine blocks and housings, are manufactured through sand casting.

► Existing process & precedent
(inc.two parts mould)

► Testing mould

► Casting test

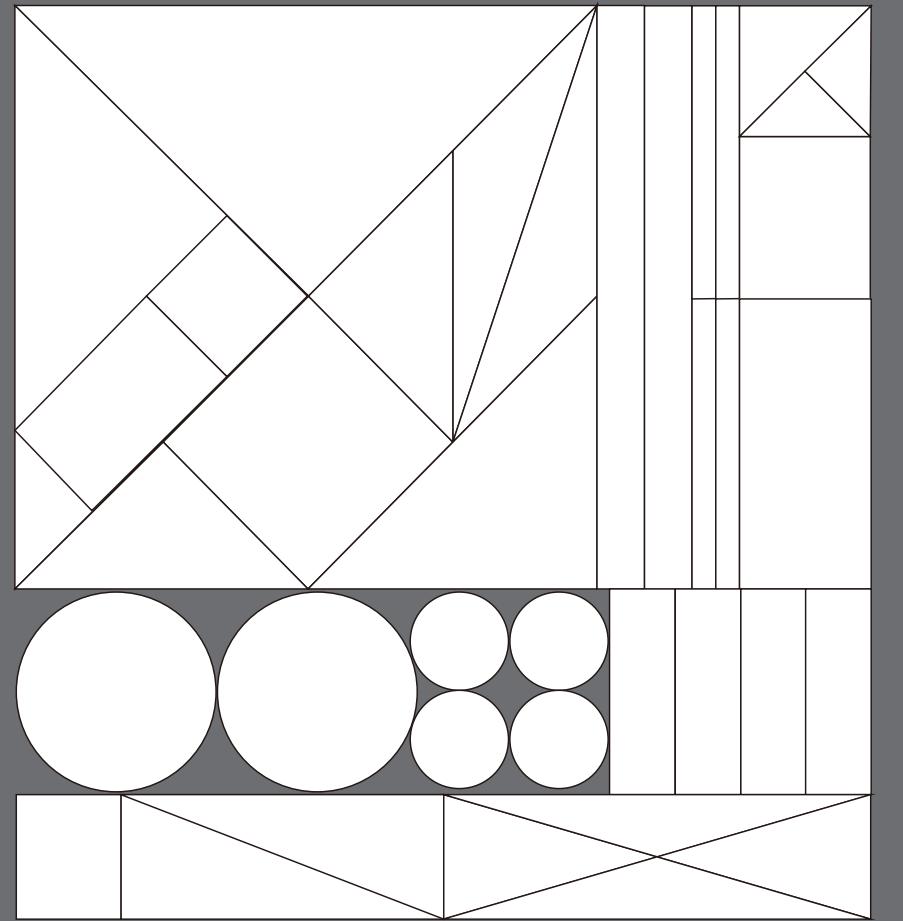
The surface texture, shrinkage, and separability were tested.



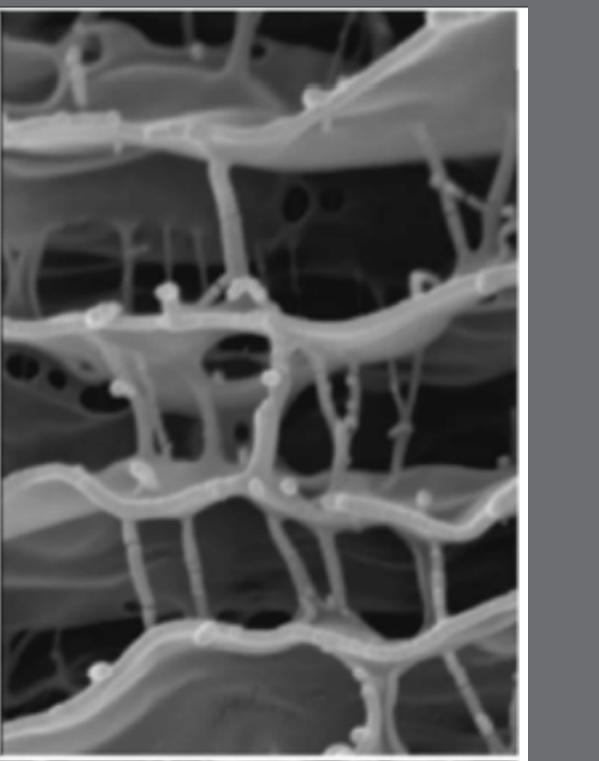
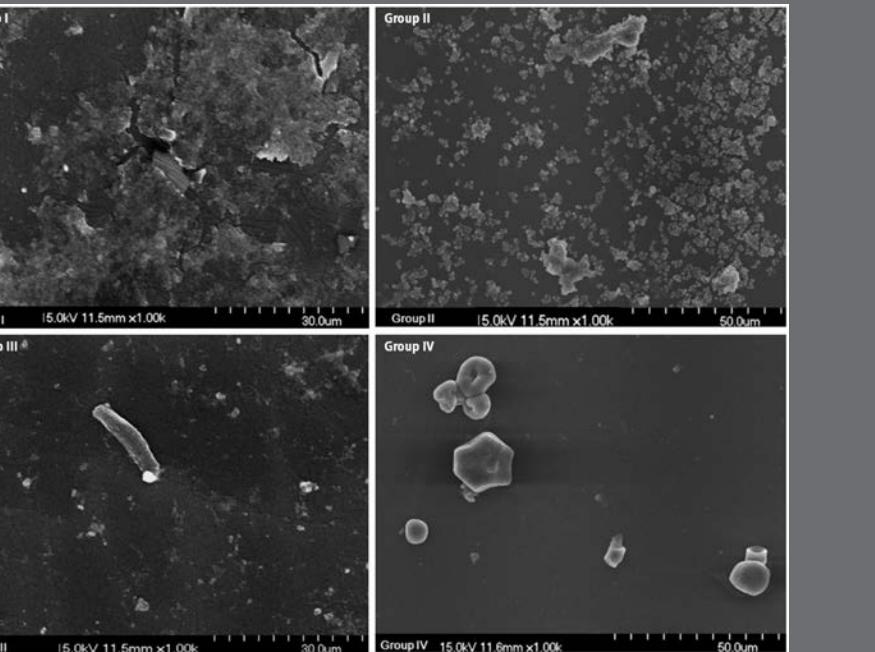
Idea development



The initial concept



When looking at the microscope pictures, our team felt that the structure of different organic substances in the picture and the way they are stacked are an inspiration for our creation and the origin of our geometric figure concept. The initial concept, after evaluation, we think that it contains too many graphics, we try to use more basic geometric shapes to meet the needs of creation and entertainment through different sizes.

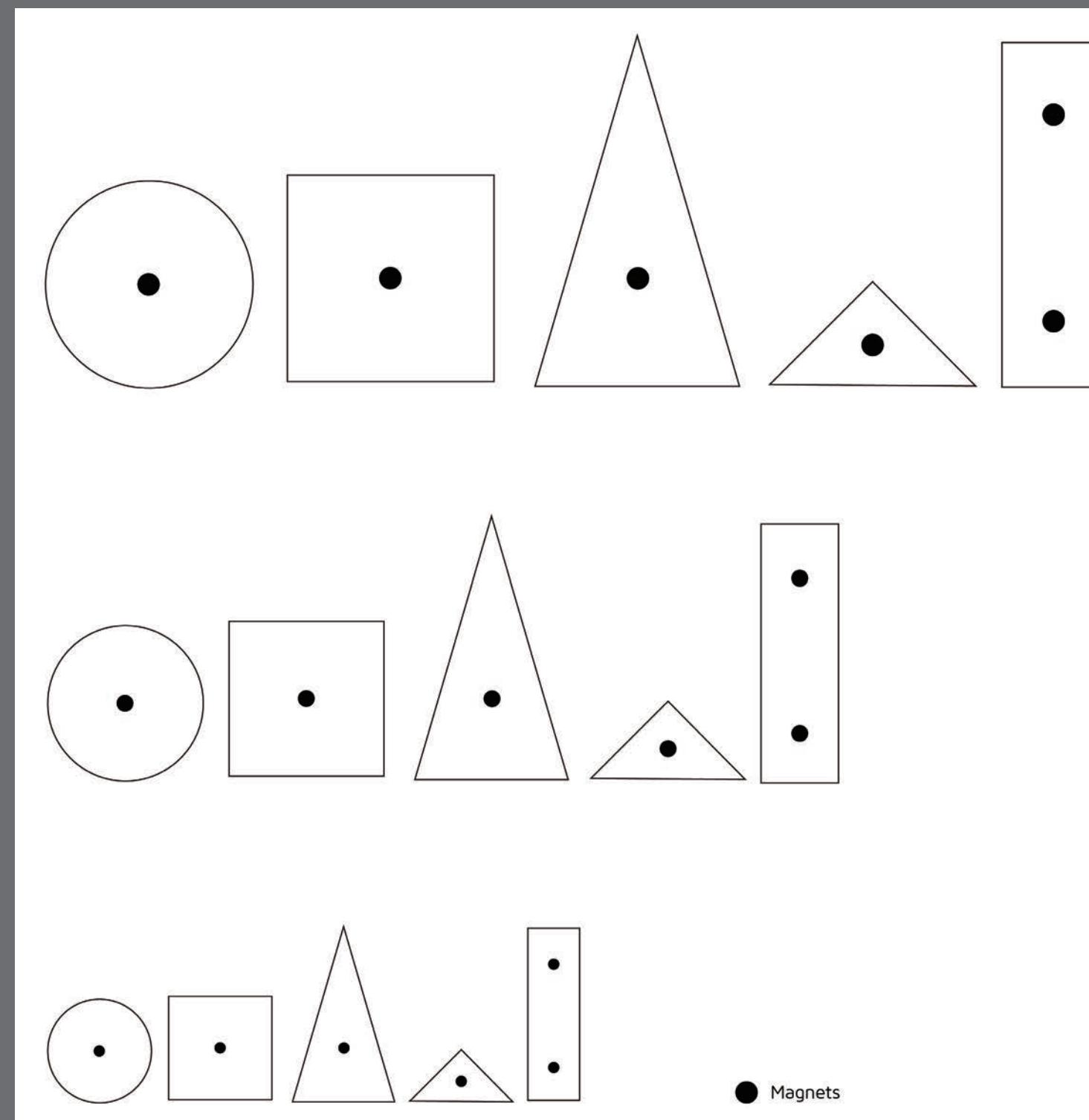


Azotobacter vinelandii
microscopic image

Agar
microscopic image



The final concept
A set of three sizes.

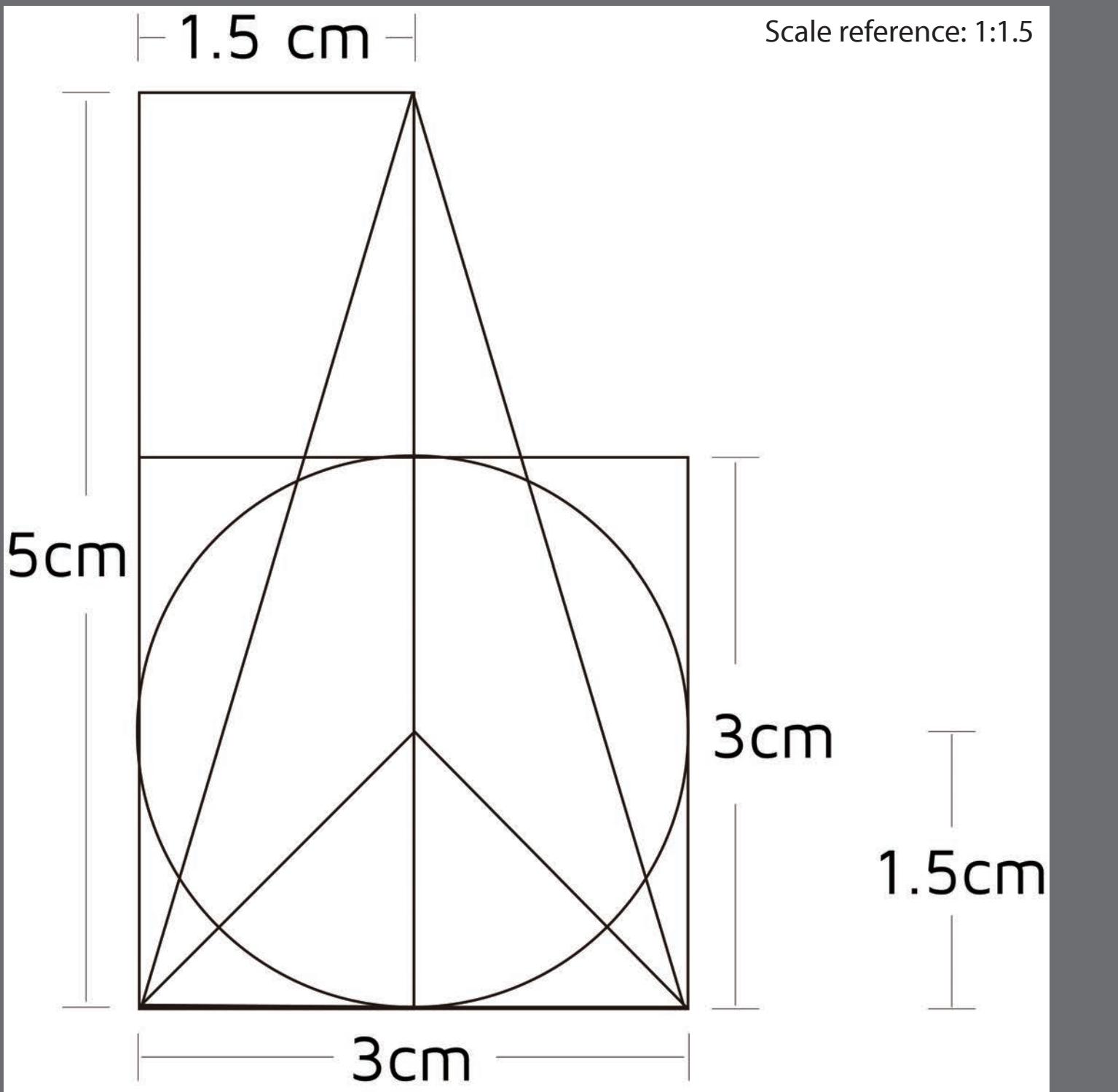


Each set of toys has a number of different basic geometries, circles, squares, rectangles, triangles. Inside each of these individual pieces of geometry are small magnets that attach it to the metal plate provided. It is convenient to put different shapes and graphics in a specific size to constitute any object or image imagined by the user. This is also in the joint design of the early stage and the child. We have to provide paper and small objects of a specific size, the same concept. The whole process is equivalent to using the basic geometry to form the final product through a puzzle-like pattern. In the project design process, considering the characteristics of the casting material, we reserve a relatively not smooth surface for each of these small geometries for personal customization and personalization, which can include engraving; coloring; sticky and so on. At the same time, the edges of each small object are clear but not sharp, providing safe use. Provide different levels of entertainment experience and creative possibilities for the entire gaming experience. The ideal material can be injection molded plastic or CNC-cut wood.

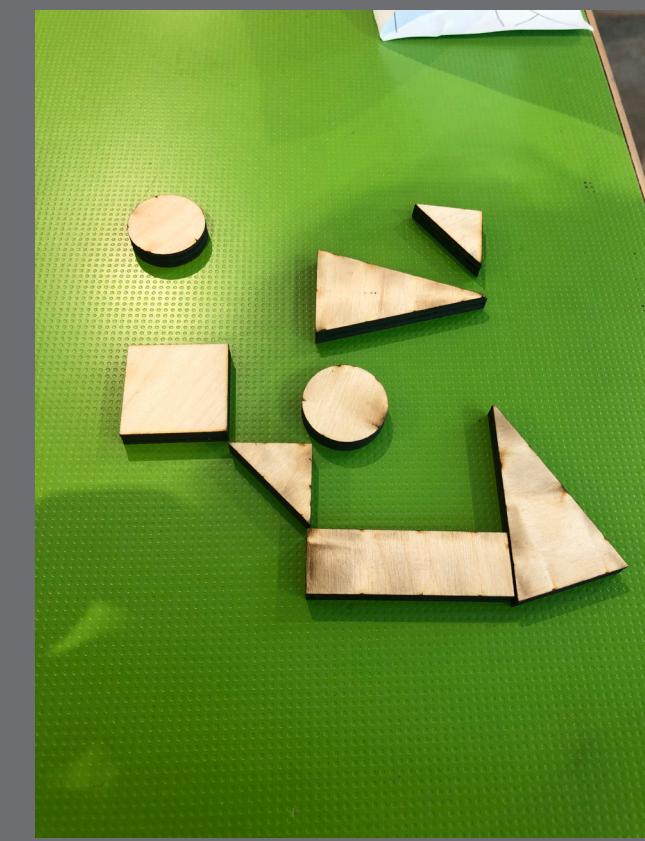
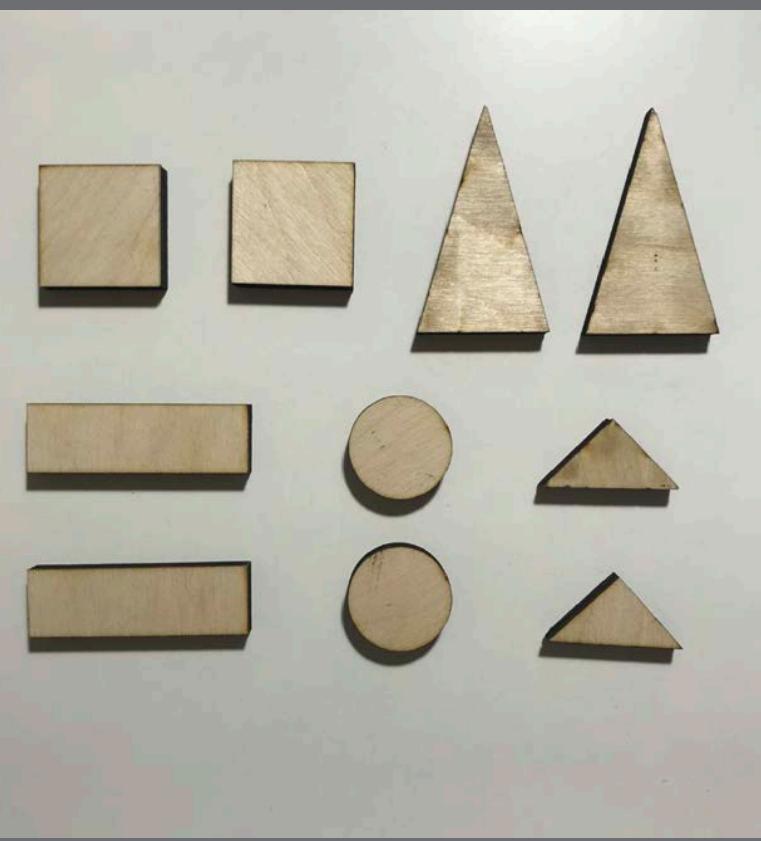
The ideal magnet is one for each part when the mold clamping. But we can also add gel magnet to the injection molding material. In this way, the distribution of each component can be ensured during the hardening process, and gravity will also guide the distribution structure of the gel magnet.

► Prototype / Testing

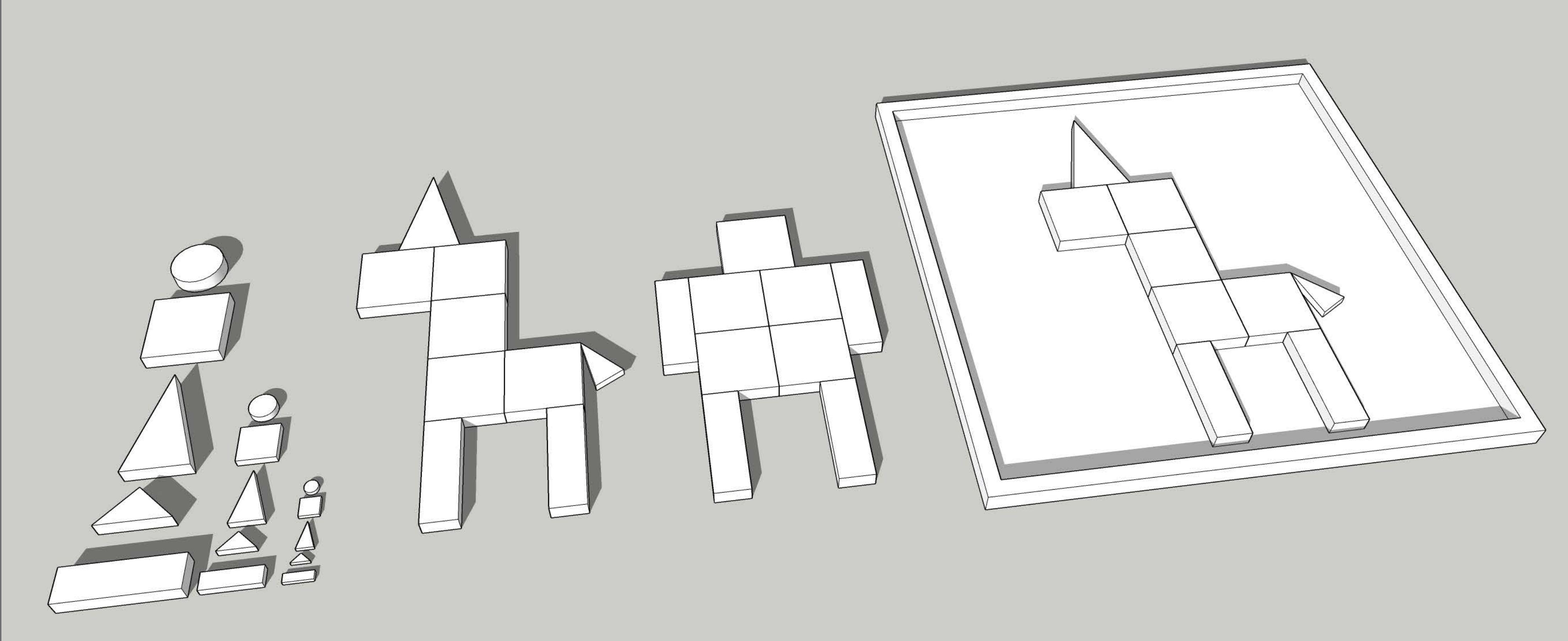
▼ Dimensions / scale reference



◀ Using wood planks of appropriate thickness, a batch of samples were made by laser cutting. We want to use this as a prototype; we need smooth the sharp edges, so that it has certain rounded corners, so as not to be scratched. Then make mould and provide children with creations by mass injection molding. Although it is not actually used by children because of the course arrangement, and there is no magnet inside the laser-cut board. But this prototype already has the possibility of practical use, because we can meet all the features required by the project when injection molding.



3D model demo



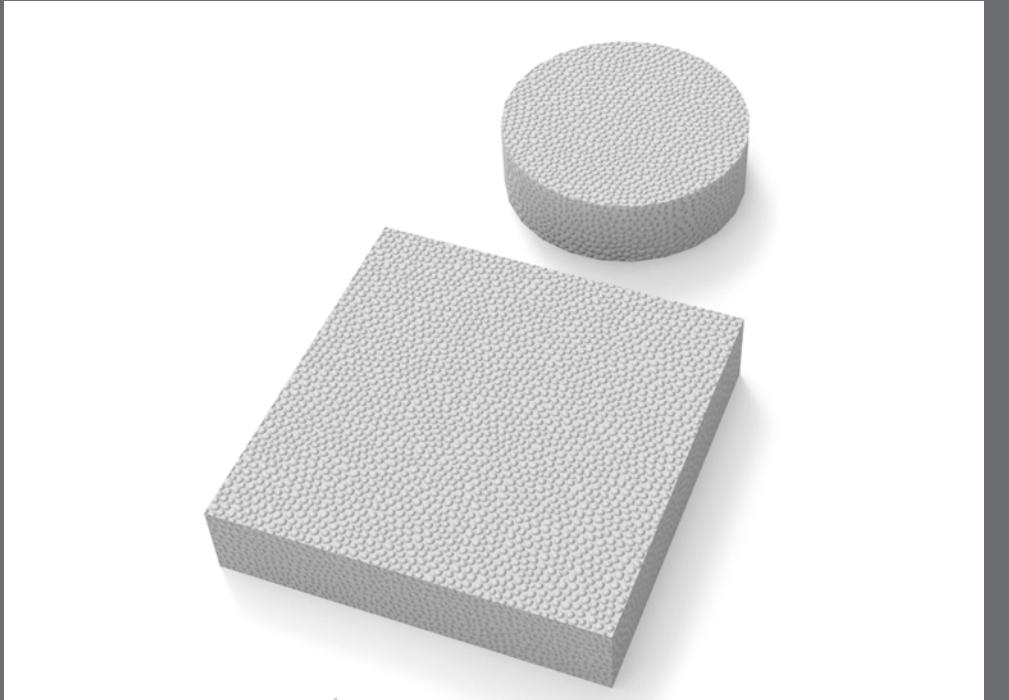
► One ste of the toy

► Form different characters / roles

► Magnetically attracted to the board



3D model - Final product simulation



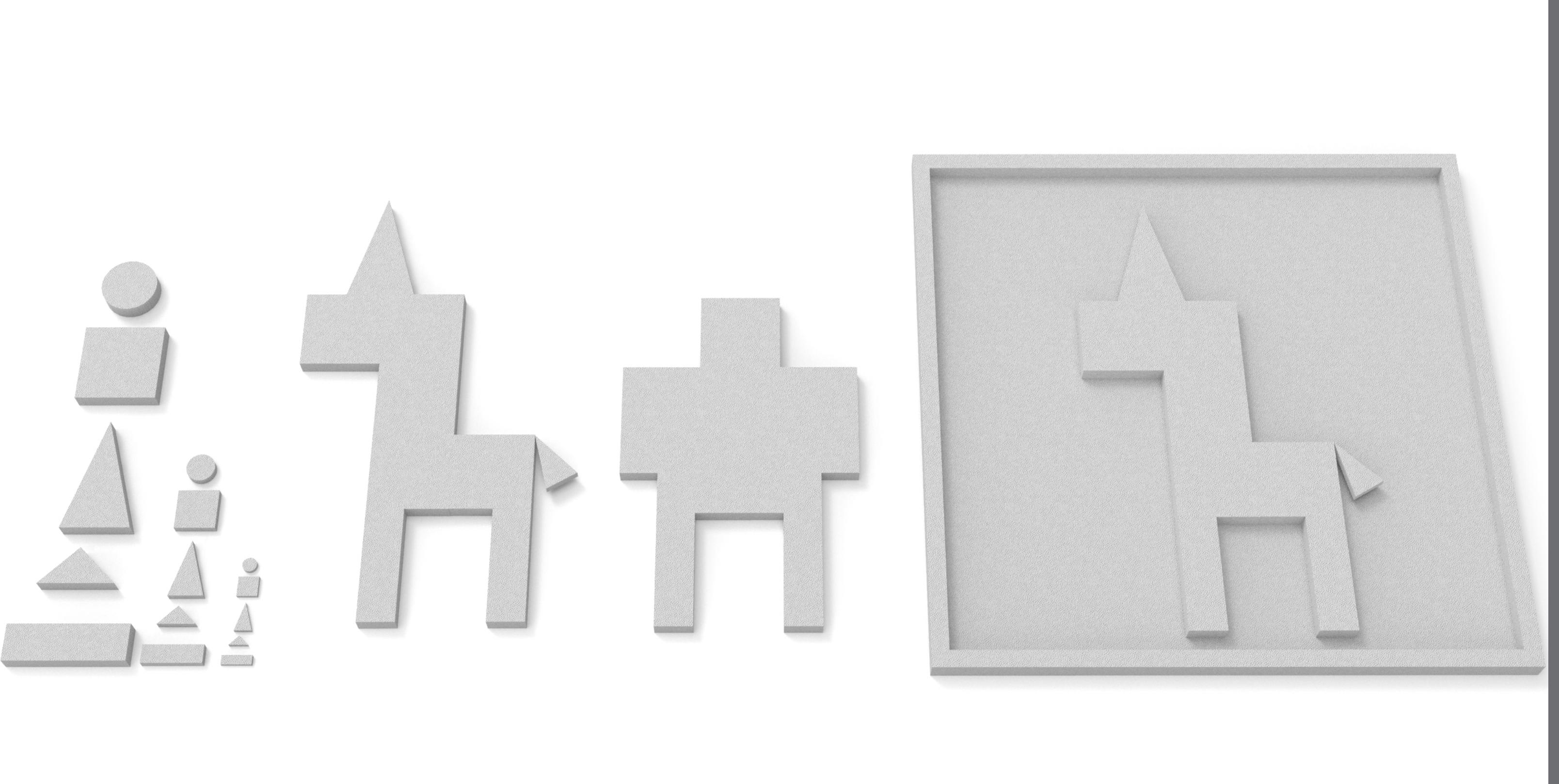
Details of the surface



Rendered mode



Our project 2 has preset magnets in each geometric part, and we have specifically studied how to use magnets safely and effectively for this purpose. We want to provide geometric puzzles that can be operated on both sides, so we will not use the method of installing magnets by Screw / Bolt and Pin Retainer. We want to use Over-Molding or a "2-shot mold". This process involves 2 separate molds. The first mold creates a part with a cavity for the magnet. The magnet is then inserted into the first part. The assembly is then placed into the 2nd mold where the 2nd half of the plastic is injected, covering the magnet and fusing with the first half of the plastic. Compared with another available Ultrasonic Welding solution, this method is more likely to be implemented by ourselves without the need for additional ultrasonic mechanical equipment.





3D model - Final product simulation

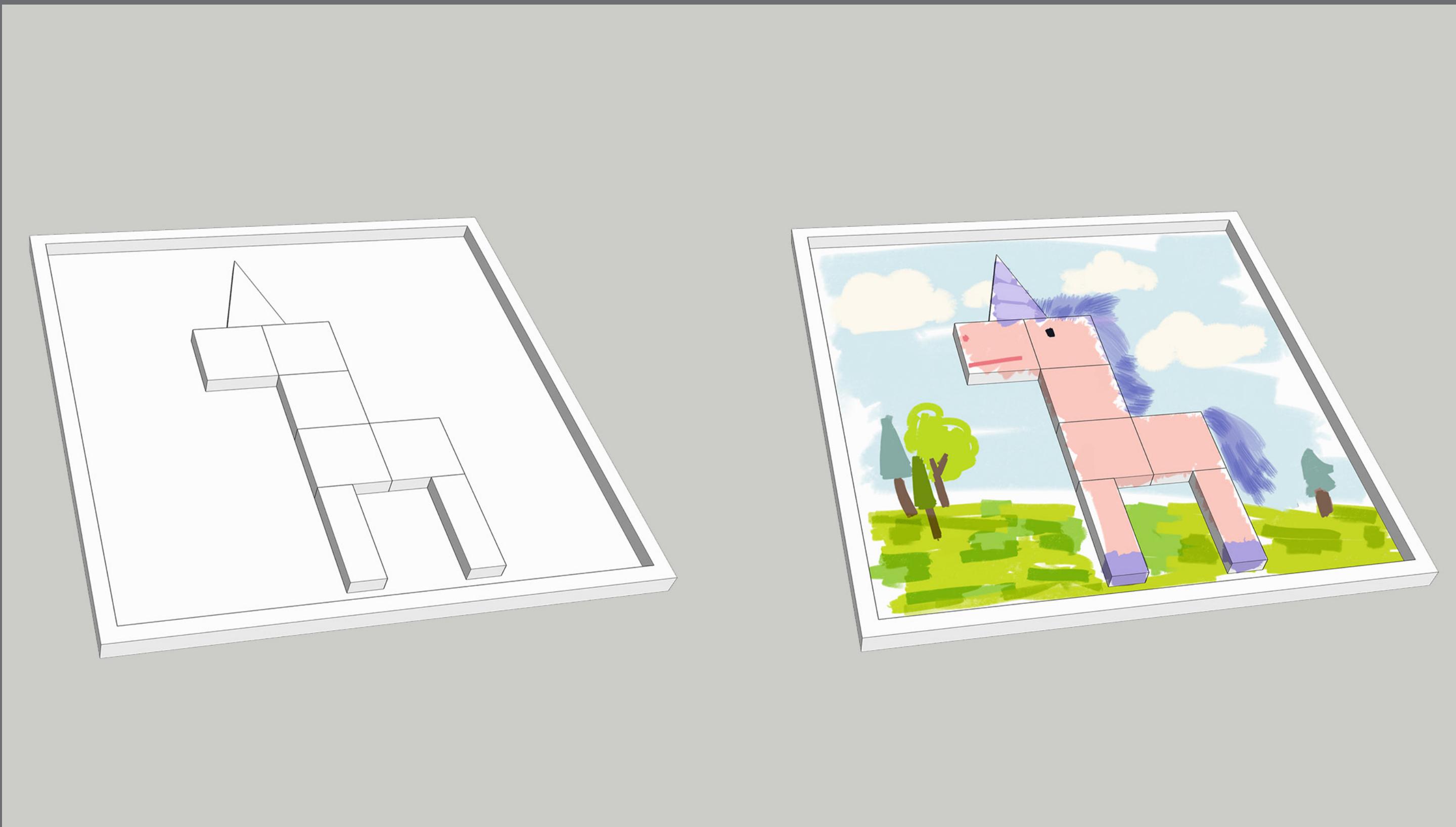


Image composed of geometric figures



Personalized work

...In project two, our design is mainly a personalized geometric shape puzzle toy. The initial concept was mainly because we preset the injection model and the materials provided, which allowed us to quickly provide each member of our group with the opportunity to participate in the production of the final product. Because it can be turned over, we can produce many same geometric models of different sizes for children to create. We saw in the early activities of co-designing for children that although children often do not distinguish between abstract and figurative concepts, they are actually very good abstract experts! Often use a single line or a certain word; a circle represents what they depict. On this basis, we believe that providing geometric puzzles of different sizes, as well as different colours and carving tools, can produce very creative and relatively short production time, and the final work effect is very good. We believe that the characteristics of the material itself provide the possibility of innovation, and the geometric form provides the basis for simple mass production. Our project 2 has preset magnets in each geometric part, and we have specifically studied how to use magnets safely and effectively for this purpose. We want to provide geometric puzzles that can be operated on both sides, so we will not use the method of installing magnets by Screw / Bolt and Pin Retainer. We want to use Over-Molding or a "2-shot mold". This process involves 2 separate molds. The first mold creates a part with a cavity for the magnet. The magnet is then inserted into the first part. The assembly is then placed into the 2nd mold where the 2nd half of the plastic is injected, covering the magnet and fusing with the first half of the plastic. Compared with another available Ultrasonic Welding solution, this method is more likely to be implemented by ourselves without the need for additional ultrasonic mechanical equipment.

-Part of Reflexive Writing 6

Reference

- Amazing magnets CO. *Injectionmolding*. Retrieved from: <https://www.amazingmagnets.com/t-injectionmolding.aspx#insertmolding>
- Bringhurst, R. (2012). *The elements of typographic style* (4th ed. (version 4.2).. ed.). Seattle, WA ; Vancouver, BC: Hartley & Marks.
- Ceschin,F(2014) How the Design of Socio-technical Experiments Can Enable Radical Changes for Sustainability, *IJDesign*, Vol 8, No 3, Retrieved from:<http://www.ijdesign.org/index.php/IJDesign/article/view/1308/650>
- Cruickshank, Leon and Coupe, Gemma and Hennesy, Dee (2013) Beyond the castle:public space co-design, a case study and guidelines for designers. *Swedish Design Research Journal*, 2. pp. 48-57. ISSN 2000-7574
- Fitton, D., Read, J., & Horton, M. (2013). The challenge of working with teens as participants in interaction design. *CHI '13 Extended Abstracts on Human Factors in Computing Systems*, 2013, 205-210.
- Helal A. 2010. Molding & Casting. Retrieved from: <http://fab.cba.mit.edu/classes/863.10/people/ahmed.helal/Week%208/Casting.html>
- HENNEPIN AVENUE CULTURAL CORRIDOR (2013), Retrieved from:<http://mspmag.com/arts-and-culture/hennepin-avenue-the-street-we-love-to-hate/>
- IDEO Org, Design kit, Retrieved from: <https://www.designkit.org/methods/20, & 40 & 2>.
- Martin, M.G.F. (2012). Sounds and images.(Florence Nightingale,). *The British Journal of Aesthetics*, 52(4), 331-351.
- MIDTOWN DETROIT, INC. (2011)SUGAR HILL ARTS DISTRICT Retrieved from: <https://www.artplaceamerica.org/funded-projects/sugar-hill-arts-district.& https://www.arts.gov/exploring-our-town/sugar-hill-arts-district>
- National Wildlife Federation, MICA, Retrieved from:<http://www.micasocialdesign.com/studios#Practice-based%20Studios>
- Pierandrei, F., & Marengoni, E. (2017). Design Culture in school. Experiences of design workshops with children. *The Design Journal: Design for Next: Proceedings of the 12th European Academy of Design Conference, Sapienza University of Rome, 12-14 April 2017, Edited by Loredana Di Lucchio, Lorenzo Imbesi, Paul Atkinson, ISBN 978-1-138-09023-1, 20(Sup1), S915-S926*. DOI: 10.1080/14606925.2017.1353036
- Vaajakallio,K, Mattelmäki,T., Lee,J.(2010). Co-design lessons with children. Retrieved from <https://interactions.acm.org/archive/view/july-august-2010/co-design-lessons-with-children1>. DOI: <http://doi.acm.org/10.1145/1806491.1806498>

Appendix A

▶ Link of Writing

- Case Study: https://nscad-my.sharepoint.com/:w/g/personal/ahenderson_nscad_ca/EbTINN6YXu9BjUuPVdXya5EBgiGFPMcTNAGS9yGWFrdp_g?e=s1lwDz
- Reflexive Writing 1: https://nscad-my.sharepoint.com/:w/g/personal/ahenderson_nscad_ca/EcJPOgtpno9FoBKmwCgxGMoB7-YWQf8tS74KjxqUzPxEqQ?e=orYk5
- Reflexive Writing 2: https://nscad-my.sharepoint.com/:w/g/personal/ahenderson_nscad_ca/EYyPbKeUZIJAw8Qkw4dA6QB_f5sle6XkEVVYT4BA5eYPg?e=mXE8k5
- Reflexive Writing 3: https://nscad-my.sharepoint.com/:w/g/personal/ahenderson_nscad_ca/EY8EWS-y4uNMgyATu5lVNH4Bn5VsZue0af-P6rPIP1o4fg?e=nhBEvE
- Reflexive Writing 4: https://nscad-my.sharepoint.com/:w/g/personal/ahenderson_nscad_ca/EQshYt6fr5IDhwI NYvoVNscB-plN4guAc65VXamdcKZUbw?e=hr2j30
- Reflexive Writing 5: https://nscad-my.sharepoint.com/:w/g/personal/ahenderson_nscad_ca/Eb15m9AV3_5Pp3keRG3YlyMBXC73p56e0Ferw-5Zswn1_Q?e=dHiOJI
- Reflexive Writing 6: https://nscad-my.sharepoint.com/:w/g/personal/ahenderson_nscad_ca/EaJlJWKaDtNKhvyHDqkXAUMBYD8k6jB56swBJj14-oGhew?e=hkvBic
- Reflexive Writing 7: https://nscad-my.sharepoint.com/:w/g/personal/ahenderson_nscad_ca/EXmwENNT2YhOu_ZV83pXA-wBwmkFUHd9ANN3ZYMLtZDaLQ?e=lXkV75

Appendix B

② empower children. communicate in an way more accessible.
 2.2 ① kid as a user & tester, adult draw, passive role
 ② see the child as the protagonist, protagonist
 ③ not only towards a product participant, but to enhance the insight, skills & reflective thinking capabilities
 ④ discover & learn world, without being a target of instruction
 ⑤ co-researcher.

3. ① creative and challenging each other's point of view
 ② cognitive development into consideration, & adopt methods
 3.1. ① if a designer introduced by a teacher, kid may view them as one
 ② co-design methods need to be adapted to the child's expressive needs
 3.2 ① cognitive ergonomics
 ② they can see new and creative opportunities, not related to the mere purpose of an object or idea
 3.3 ① feel ownership from beginning
 4. ① observe & capture their exploratory activity patterns.
 4. ② qualitative → contextual inquiry.
 4. ③ concrete operational stage!

23 Jan [Studio] Ecology & New Material
 Pattern language → Visual exploration → Microscope material
 & CNC, Laser cutting, 3D print
 3 object can be 1 physical 2 thermal. Kid need materials
 Here design, application & process.
 Different poetic
 ① different way/strategy build the model → Ecology
 ② different/potential use for the material → Ecology
 Assignment ① reading. "Material led design"
 Sensorial/contrast
 ② 15 Image MDP designs. print it.

30 Jan [Studio]
 "new material" → solo plastic
 32% water → semi-plastic
 take glazing well
 reading: "understanding", "interpreting", "envisioning", "designing"
 Pro actively "ecofriendly" design material.
 context
 characteristic
 image & description
 3D printing

Jan 21. [Design Theory] ① Action plan as research.
 4. Darnell's Cooperative Inquiry Research.
 ② Collaboration & Participatory
 built by each other & participate &
 5. Rise to the level, not in the way of understanding to work with child,
 in the process work with children, ② With weekly brief/design on the frame
 Mask Approach:
 ① Stage one: observation & interviews.
 ② Stage two: reflection & dialogue.
 ③
 ④ Observe the reflection & emphasis, what they ask then what's important, reflective questions.
 6.1 Four different overlapping child:
 ① developing child, ② tribal child, ③ adult child, ④ social child.
 Nourish & strengthen these abilities → participate.
 Adults

6.2 ① Epistemology ② Values ③ Outcomes ④ Stakeholders
 Communication / shared goal → key to the project

28 Jan. [Design Research] co-design.
 P. "Thing" & things.
 ② Socio-material structures Socio-material assembly
 different needs co-exist.
 P2 Co-design:
 - collaborate & collective resonance
 "reflective"
 ③ Q question can be related to "responsive writing" & stage
 & always use "literature" & "reference" "bibliography" in the tool,
 "case study" in design.
 ④ Feb [Design Theory] Library & source of references
 Literature reviewed.
 ① search databases & search engines
 ② List the key words of topic
 ③ filter (data range, methodologies)
 ④ Evaluate and synthesize findings, take notes on Adaption, methods, experts, conflicting ideas?
 ⑤ Periodicals: ① Magazines ② Professional Trade Publications
 ③ Peer-reviewed Publications, scholarly/academic
 ④ Bibliographies ⑤ Footnotes/endnotes ⑥ Authors' references, etc.
 (as images are mind, prefer for our academic culture
 peer review → be critical ⑦ check bibliographies ⑧ Abstracts see also
 "Design Award" →

FIN

Workshop: materialsexperimentalab.com
 Growing design.
 Main concept: transform our current economy into an eco-friendly and sustainable system.
 Process: understanding the material: use of material that are grown from living organisms, such as fungi, bacteria and algae.
 ② Creating materials expertise vision: ③ potential for product design, higher sustainability and inventing novel aesthetic(s).
 ③ Manifesting material/experience patterns.
 ④ Product concept: material palette samples: elastic to rigid, water-absorbing to water-repellent, porous to compact.

13 Feb [Project studio]
 Building-integrated Microalgae Photobioreactor.
 Biodesign, Material Nanotechnology-assisted
 "Biopolymers".
 Alginate soft matter, ionomer gel
 Aerogel.
 Bacteria Gx-incellular Polymer.
 Engineered living material → living clay
 installation/ apple to apple/ objects/ glazing/ packaging/ large-scale
 clay / motor water filter/ perfume (incense) 3D printing, as tall as coffee cup.

Highlights of reading material