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Toly

Design to Enhance
Parent-child Relationship

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Industrial Design
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December 24, 2013

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Acknowledgments

First of all, I want to thank my parents: thank you for supporting my study in the US. You are always my most powerful support.

Special acknowledgement and thank you to my thesis committee advisor, Professor Stan Rickel, without whose encouragement, I would not have been confident enough to deal with the challenge. And thank you for pointing out a correct direction every time I felt lost.

To Amos Scully, thank you for exploring the problems and solutions regarding children, being patient with my endless questions, encouraging me to think about the problem from different perspectives. Your time is greatly appreciated.

Sandra Turner, thank you for meeting with me and giving me your valuable opinion; your suggestions about my defense and exhibition were also valuable to me. And thank you for helping me find a friendly family to take pictures for the final model.

Alan Reddig, thank you for always helping me figure out on the last class in the last quarter.

Last but not least, thank you to Bridget Carey, Andy Carey, Martin Carey, Jane Carey and Tessa Carey, for your natural performance in front of the camera, and the photos of your beautiful house that make my design much more convincing.

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Why Design for Kids?

I was born into a middle-class family: my parents were not rich, but still did their best to give me a good environment to grow up in. Ordinarily, parents in China hope their children have a bright future. I think it's the same for all parents around the world.

I learned drawing as a 5 year old, and since that time drawing classes occupied most weekends of my childhood. I liked drawing, and my parents supported my hobby without question. I won a lot of awards in middle school. And after I graduated from high school, I needed to consider a major in college and I said "Why not design?" In my mind, design is the extension of my drawing life. So I am here at RIT, learning industrial design.

The reason I want to talk about my childhood is I believe people's childhoods greatly impact their development in the future, both physically or psychologically. Therefore, I pay a lot of attention to children's products. I think it's very important to design for kids, because they may change due to the product you give them. They are like a clean white paper—they will become any color according to what you draw on them. Although the change may be very subtle, it might impact their entire life. In other words, we are designing the country's next generation.



The author drawing in 1993

Current Parenting Situation

There are many successful children's products on the market, like those created by Fisher Price, Hasbro and Munchkin. The products they design provide parents with smart solutions to make everyday parenting easier.

Brica, the company I did an internship with, is a leading travel accessories brand for babies. One of their most famous products is "Baby In-Sight Magical Firefly Auto Mirror." Users can choose the entertainment mode during driving, and the baby will be attracted by shape as patterns of light dance behind the mirror. Parents love this product because their kids stay quiet and focus on the amazing mirror instead of bothering them during travel.

I really like this product. It makes parents' driving easier, with no need to worry about a baby's crying. However, in other circumstances, many parents still need to use a different interesting product to occupy the baby's whole attention. By doing this, parents are free to do what they need to.

Nowadays, more and more kids grow up with electronic products. They can play games on a computer, watch video on the internet, play Wii in front of a TV. To my surprise, even little babies know how to play "Fruit Slice" on an iPad. I cannot help but think about a question: "What will the next generation be without basic fatherly and motherly love in childhood? Are they going to be robots who can only communicate with machines?"

As far as I'm concerned, kids need more than an electronic product. The time parents spend with them is valuable, and they need to keep an eye on their growth, because every little thing might influence their entire life.

Abstract

Toly is both a tool and a toy for children and parents. It is composed of two products: a cleaning bubble launcher and an adjustable mop. The form is inspired by sea creatures – specifically a hermit crab and an octopus – which enables Toly to combine role play and household chores. It makes kids love cleaning and provides an opportunity for parents to interact with kids while they are doing necessary housework.

Problem Statement

In 2010, a British survey revealed that 30 percent of adults admit that they find playing with their kids to be boring. Half of the surveyed parents also said work commitments make it difficult to find time to play with their children.



“Most parents today are under considerable pressure to balance their working lives against their parental responsibilities, and often the easiest thing for parents to forgo is ‘quality time’ with their children. To make up for this, guilty parents will spend more money on their children to ensure that their children feel loved.”

Donna Dawson, Child Psychologist

Research

Exploratory Play : 0–2.5 years

Very young children explore objects and environments: touching, mouthing, tossing, banging, squeezing. Sensory play appears in children’s early attempts to feed themselves. As they get older, materials like playdough, clay, and paint add to sensory-play experiences.



Socio-dramatic Play: 3–6 years

Pretend play with peers: children take on social roles and invent increasingly complex narrative scripts, which they enact with friends in small groups.



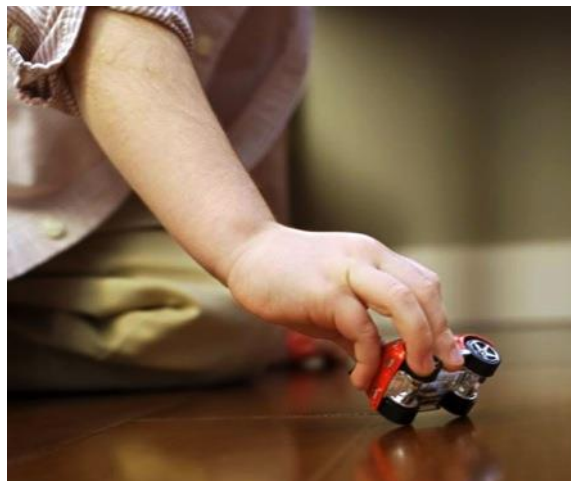
Construction Play: 3–8 years

Children begin to build and construct with commercial toys (Lego, Tinkertoys, blocks), with found and recycled materials (cardboard boxes, plastic tubing) and with a variety of modelling media (clay, playdough, plasticine).



Dramatic Play: 3–8 years

They invent scripts and play many roles simultaneously. Toys or props (e.g., dolls, cars, action figures) usually support this kind of play. As children get older, they create entire worlds in solitary pretense, often with large collections of small objects or miniature figures.



Physical Play: 3–8 years

Sensorimotor play begins as young infants discover they can make objects move, like kicking the figures on a crib mobile or crawling after a rolling ball. Physical play in the preschool years often involves rough-and-tumble play, a unique form of social play most popular with little boys.



Game with Rules: 5 years and up

Children begin to play formal games in social groups. These games have fixed, predetermined rules; e.g., card games, board games, soccer, and hockey.



Game with Invented Rules

5-8 years

Children begin to invent their own games and/or modify the rules of traditional playground games in their self-organized playgroups (e.g., tag, hide-and-see, red rover, hopscotch).



The statement above is quoted from Jane Hewes' "Let the Children Play." The author analyzed different kinds of play that kids will naturally get involved in. From the following chart we can see that except the exploratory play, most of them are developed for children over 3 years old.

Therefore I decided to choose children from 3 years old to preschool age as my target group.



Questionnaire

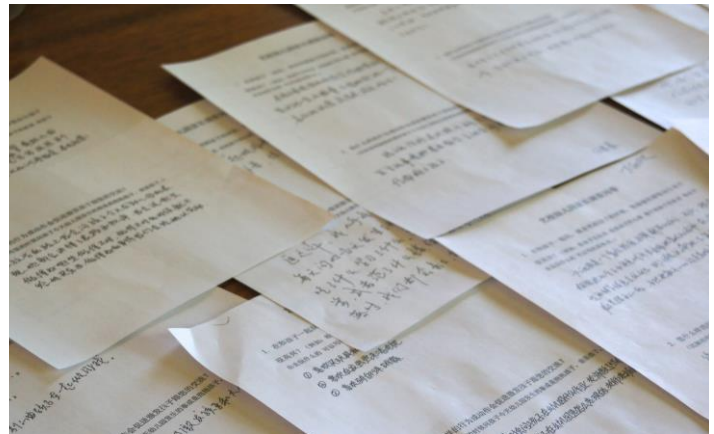
I gave two questionnaires in Chinese kindergartens. In the early questionnaire, I asked parents if they enjoyed playing with kids. To my surprise, the answers were all “Yes, I love to play with my baby!” The 100% identical responses made me doubt about the reliability of the outcome.

When I asked a mother if she really liked playing with her child, she hesitated for a while and said it made her feel ashamed that she hated to play with her child. Although the play is boring for her, she thought once you give birth to a baby, you have the responsibility to spend time with the child. The process is thus more of a responsibility than an interest to her.

I decided to change the way of asking in the later version. I instead asked about the activities the parents are always involved in with their children.

The result reveals the following activities:

- Reading bedtime stories
- Role playing
- Playing with toys
- Having meals together
- Bathing the children
- Teaching and learning
- Doing housework
- Playing games like hide and seek
- Making the kids “spiffy”

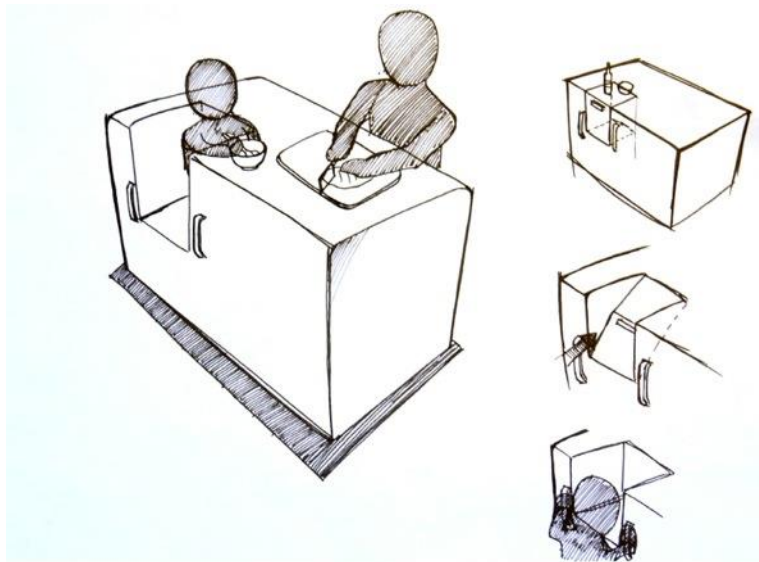


The activities above might provide good opportunities for parents to interact with their children.

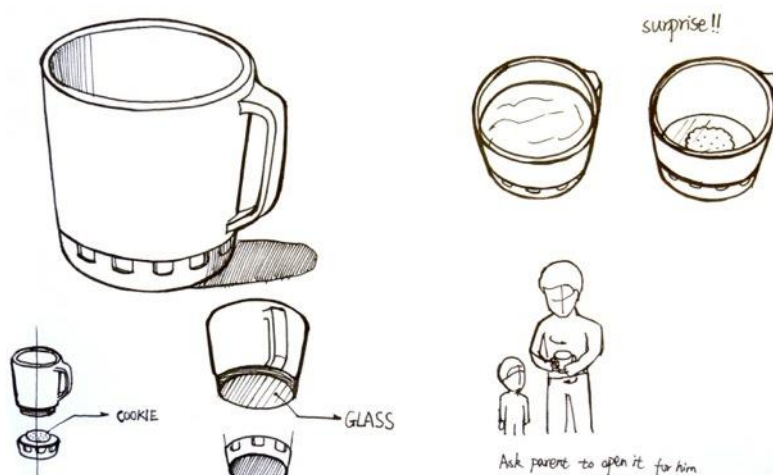
Early Ideation

Based on the conclusions from the questionnaire, I came up with some concepts. These include ideas about kitchens, dinner time, taking medicine, and housework.

This is an idea that lets kids be involved in the preparation of meals. During research I found that kids are happy to help adults. They feel excited to be helpful. This cabinet provides a higher surface for kids to stand on, so that they can work on the same surface with their parents.



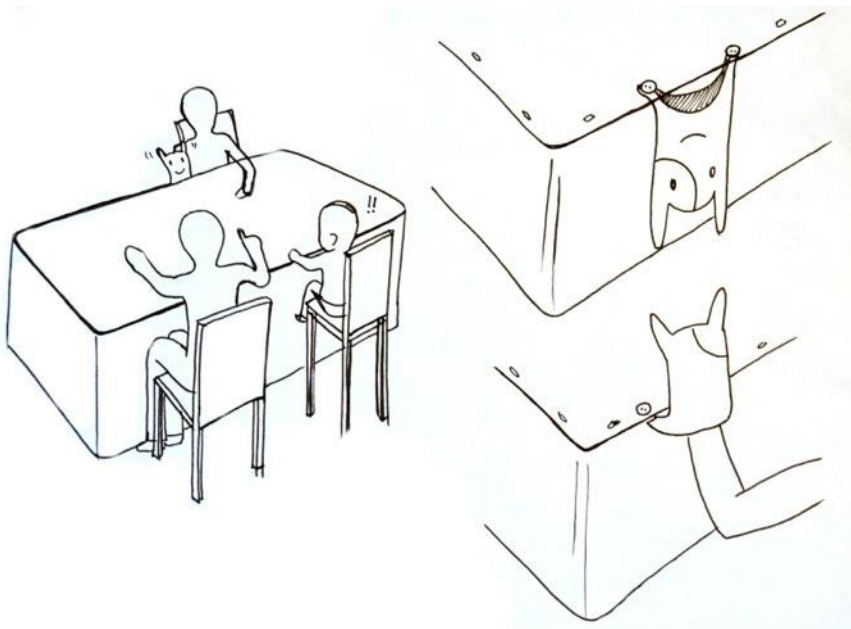
This is a cup for cajoling kids into drinking medicine. Kids don't like medicine, but are more willing if you tell them there is a surprise after they drink the whole medicine. The cookie is locked at the bottom. However, kids may not be able to open it, so they need their parents' help, which creates parent-child interaction.

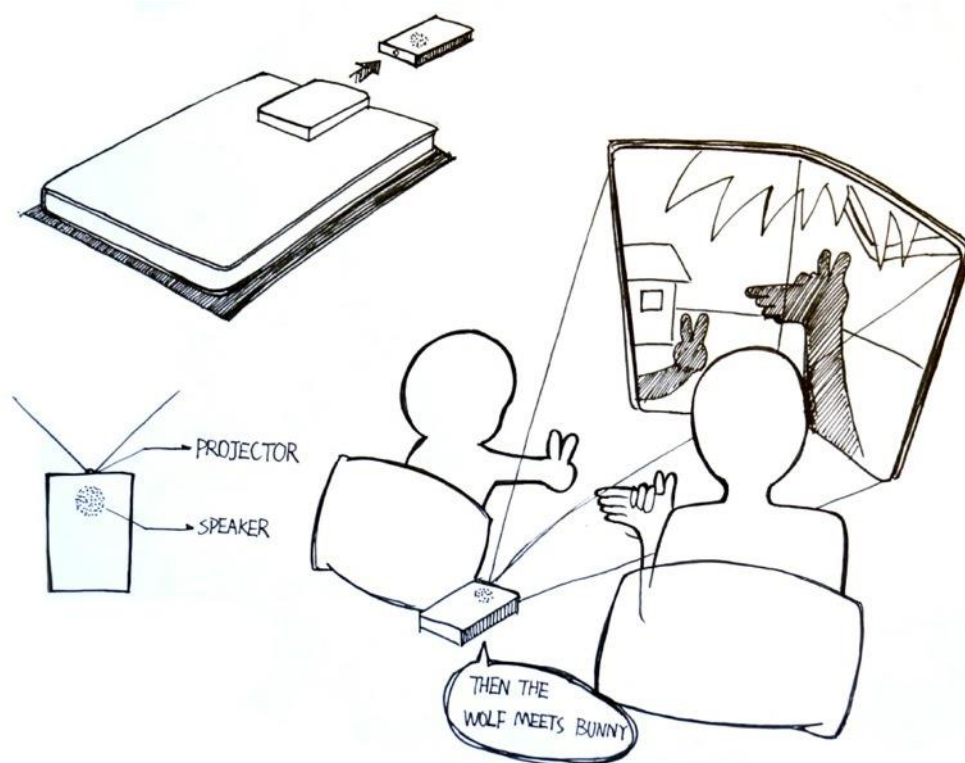


This is a double-sided ladder that enables parents and kids to stand on each side. They can work together to paint a wall or organize a bookshelf.



Young kids are easily distracted during meals. The hand puppet on the table helps parents to draw kids' attention; they can play a role and cajole kids to eat. The hand puppet also has the potential to be utilized as a bag for tableware when needed.





US health experts believe that engaging kids in basic conversation could be up to six times more effective than reading to them.

However, according to my survey, a bedtime story is a regular activity for parents. I hope to create an activity that engages the kids in more than a bedtime story, but one that leads them talk with their parents. For this concept, illustrated above, it is a projector that can project the scene of the story on a “book,” on which/where a speaker will tell the story, and parents and kids can act out the story using hand shadows. This “performance” enables parents to have fun with kids. What’s more, even if the baby cannot form words, their responses to the conversation help develop their language skills.

Research on Existing Products

Looking at existing products, you can find many toys branded by famous companies, such as Fisher Price and Hasbro. They produce Barbies, Transformers—toys that always provide characters for kids' role play and that are very popular.

Some companies like Munchkin, boon, Summer and Brica produce different kinds of baby gear, for feeding, travelling, nursery use and so on. These products pay more attention to function than to play. They all help parents to complete an activity.



However, there are some products that combine “play” and “function.” Here are some examples:

The cute dancing shoes are a very famous design. As I remember, when I was a kid, I used to stand on my father's feet and hold his hands to walk. It's a great opportunity for parents and kids to experience physical touch. During the game, they can feel closer. But when I got older, we didn't play this anymore. One reason is my weight, the other one might be that we both felt bored by it.

The shopping bag design is more in consideration of the safety issue. But shopping is not a frequent activity for children. I think this design therefore has limited impact on kids.



Some furniture on the market can involve parents in physical play with their kids. This is a breakthrough as usually both mothers and fathers engage in physical play with

babies only during the first two years. Beyond age 2, only fathers play highly charged bouncing, lifting, and wrestling games with children, typically with their sons.

The example below give kids a way to sit on their parent's shoulder while the parent can remain engaged in their own activities. It makes parents and children closer and doesn't use too much time. But as can be seen in the photo, the father is not involved in a game at all. This kind of furniture just bonds parent and child together physically, but doesn't provide a real opportunity for them to interact.



Some designers try to entertain kids with fancy tools, such as the following dining accessories, so that they will take an interest in meals. The kids tableware is for children who still need some cajoling during meals. Kids can learn how to use spoon, fork, and knife while having fun.

The kitchen tools in the image on the right, which are specially designed for children age 4 to 7, have a simple mission, to encourage children to understand more about food and its preparation, preparing them to healthier lifestyles in the future.

But the products are all for kids, and parents are not necessary involved.

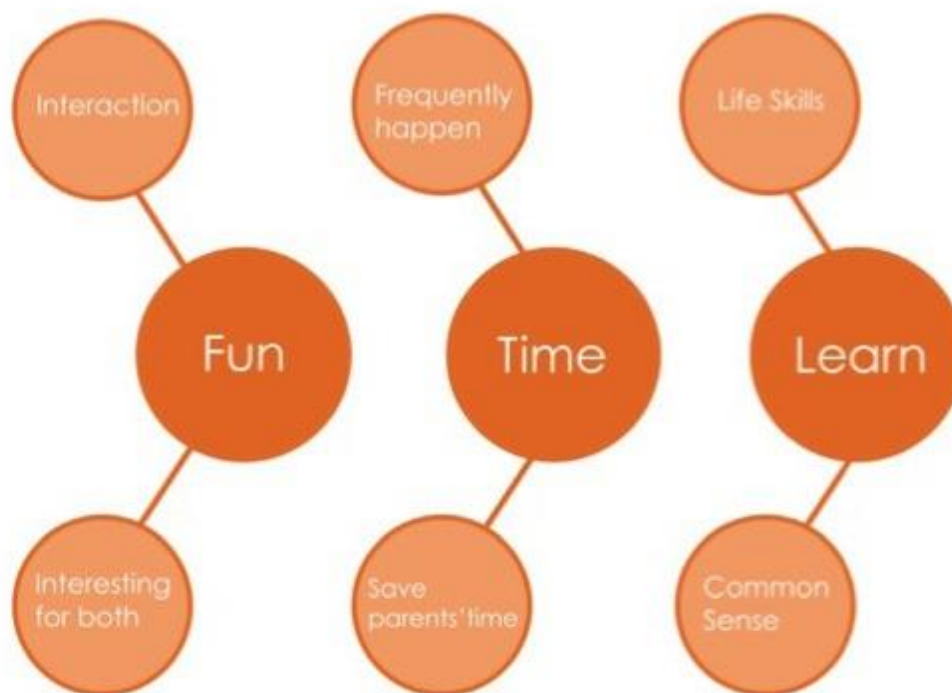


My Goal

Why housework?

My design should be interesting for both parents and children, and provide an opportunity for them to interact. The activity should be one that happens frequently, but won't need parents to exert too much time to do this. In addition, children can learn something from the activity, and will enjoy the personal attention and feeling of importance parents are giving them.

Based on this goal, I decided to choose housework as the activity.



Benefit of engaging children in housework

Children as young as two years old can help parents with such activities as dusting, watering the grass, picking up something and putting it in a box, and filling the dog's drinking bowl. By involving kids in housework, parents can instill the value of being tidy and organized. Children can learn to be good helpers when parents feel overwhelmed by so much work. What's more, with these products, housework will not be boring "work," but a time of laughter and talking for parents and kids. After the work is completed, everyone will feel good.

Research

For Cleaning Tools

The reason why I looked to cleaning activity is that cleaning is a frequent if not daily occurrence in many homes, and easy for kids to complete, compared to getting groceries, gardening, cooking and so on. Considering the height of kids, floor cleaning is a good place to start. I made a list of different cleaning activities and tried to find an appropriate one for kids.

Dusting Supplies

Although dust is sometimes hard to notice, dusting is an important job because it is related to breathing and allergy issues. Many people prefer to use their vacuum cleaner to dust since all the particles get sucked into the vacuum cleaner. Common cleaning supplies and their potential applications for this project include:

- Microfiber cloths (the cloth form has the potential to be a hand puppet)
- Lambswool duster and electrostatic dusters (successful at getting into small and irregular spaces, and the length of the pole can help kids to clean higher surfaces)
- Vacuum cleaner (high efficiency but it might be difficult for kids to handle)



Floors

When a family has kids, floor cleaning is frequently a concern. Kids love to sit, crawl or roll on the ground but floors bear most of the dirt that comes into our homes. With naughty children at home, things are more easily spilled on floors as well. There are some floor cleaning tools that are easy for kids to use:

- Broom (the length of the pole enables kids to reach corners)
- Dustpan (develops the sense of collecting things)
- Mop and mop bucket (kids can play with the water and spin the mop)



Organizing

Although children's rooms are small, kids are usually not able to stay organized by themselves. Parents have to be involved in the process. Professional organizer Julie Morgenstern recommends that parents view their role as an organizational consultant to their kids. Some tools to help with organization include:

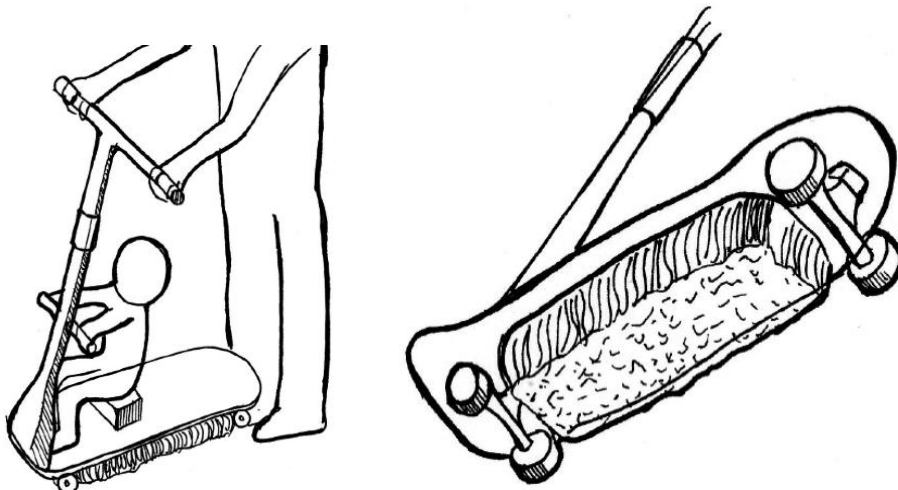
- Colorful labels (help kids develop the sense of color)
- Storage containers (have potential to be devices for throwing games)



Ideas

For Cleaning Tools

Skateboard mop



This is an idea that combines a skateboard and a mop. A child sits on the skateboard, while an adult controls the direction. There is a mop attached to the bottom. The mop will clean the floor while adults are pushing the “skateboard.”

Advantage

- According to the research I did, floor cleaning is common housework that tends to occur every week
- The mop is hidden under the board, so users will not see it

Disadvantage

- For some spots that are hard to get rid of, if parents try to clean them, the movement (going back and forward) may lead to kids, who would be sitting on the board, feeling uncomfortable
- The wheels will potentially harm the floor



Puppet Dust Cloth



It's a very simple design. Parents need to cut two holes in the cloth, so fingers can come through; fingernails can be the "eyes" of the puppet.

Advantages

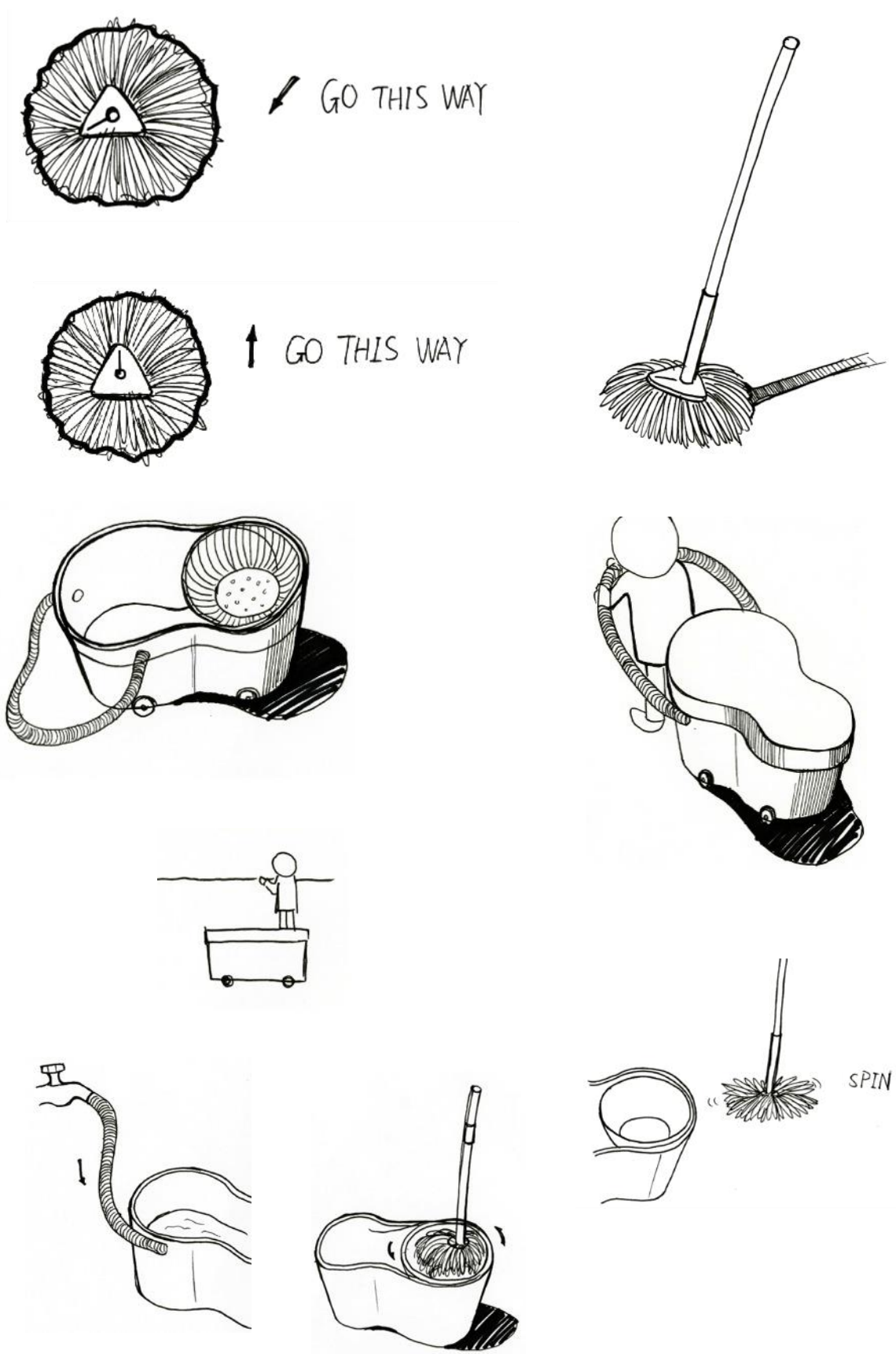
- Simple design, no need for other purchases
- Role play brings interaction

Disadvantage

- The fingers may touch the cleaning chemical, which is harmful to the skin



Spin mop and Bucket



The rotating mop bucket and spin mop are popular now. The special mechanism in the bucket lets the mop spin to dry. So I came up with an idea about the mop: with a simple mark, maybe an arrow or dot, it can tell you a direction when it stop, so you follow the direction to clean.

Advantages

- Simple design, no need for other purchases
- Kids can stand on the bucket to reach something on a high surface when the bucket is not in use

Disadvantages

- The weight of water might be heavy for kids to carry
- The game of “follow the arrow” can only engage one person, so there is no parent-child interaction

Summary

- The best way to make cleaning fun is to make it entertaining
- As a form of positive interaction, parents and children can engage in role play during the process
- Users must be careful with any chemicals. Children should not be allowed to touch the liquid

Market Research



Problems

- Color is not attractive enough for kids
- Mechanism is too complex so not child-friendly
- Operated by only one person

Solutions

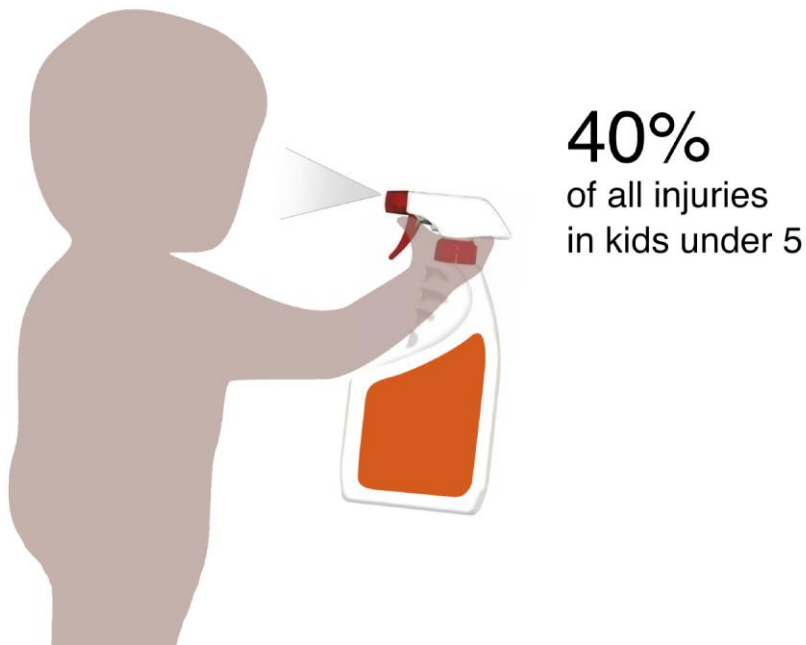
- Use bright color
- Use an electronic product
- Use two products working together

Further Research

Potential Danger of Spray Bottle

Based on the 17-year study of Household Cleaning Product-Related Injuries Treated in US Emergency Departments, spray bottles consistently accounted for about 40% of all injuries in children under 5-year-old kids.

It most often happens when kids point the nozzle toward their face and press the trigger by accident.



Solution: Bubbles

Bubbles are good replacements for spray. The advantages include:

- They are visible, so you can see where they go
- They are slow, so you can dodge them
- Children like bubbles, so they are willing to be involved in the work

Bubble bottle mock-up



Design Process

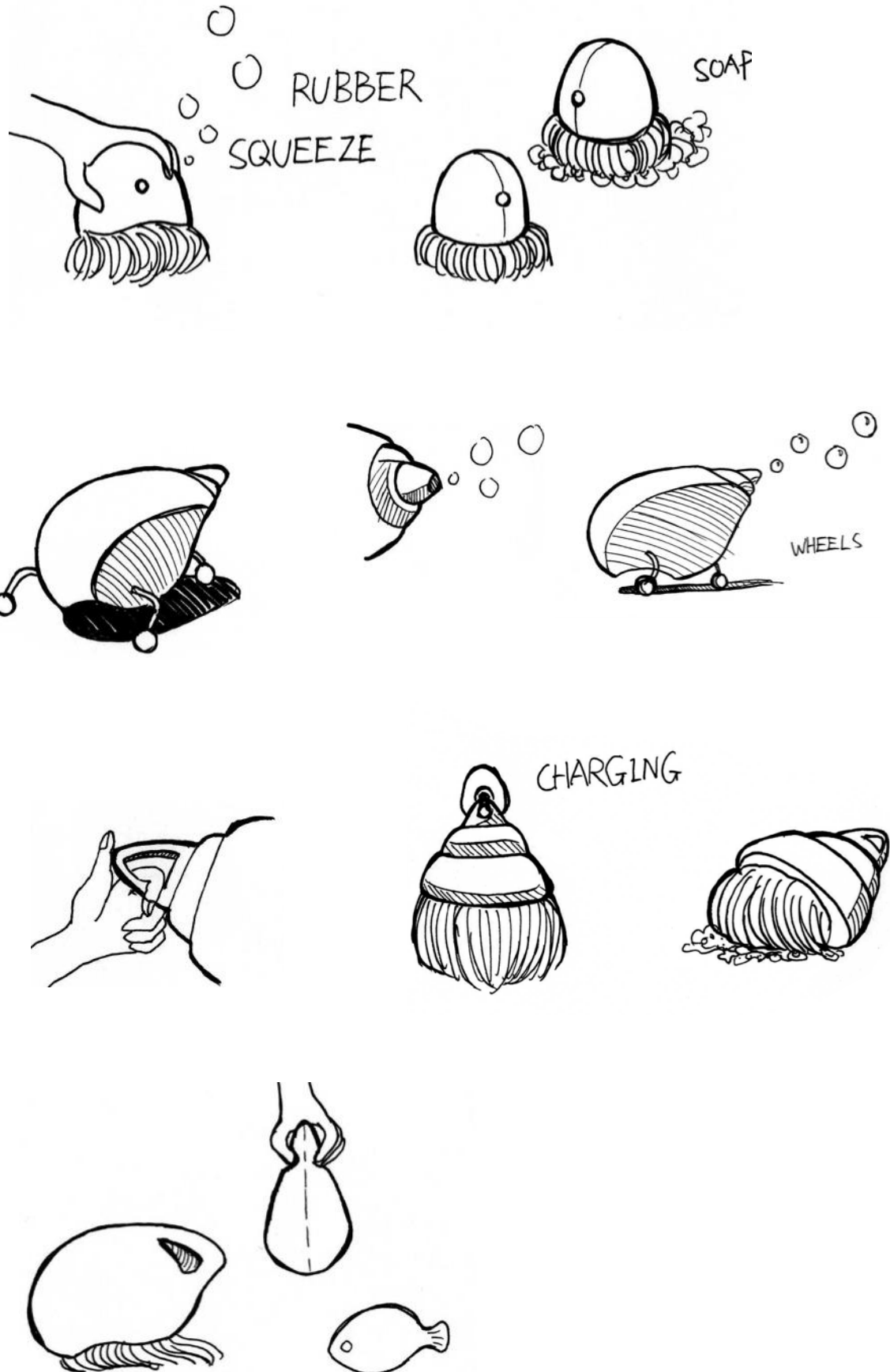
Inspiration

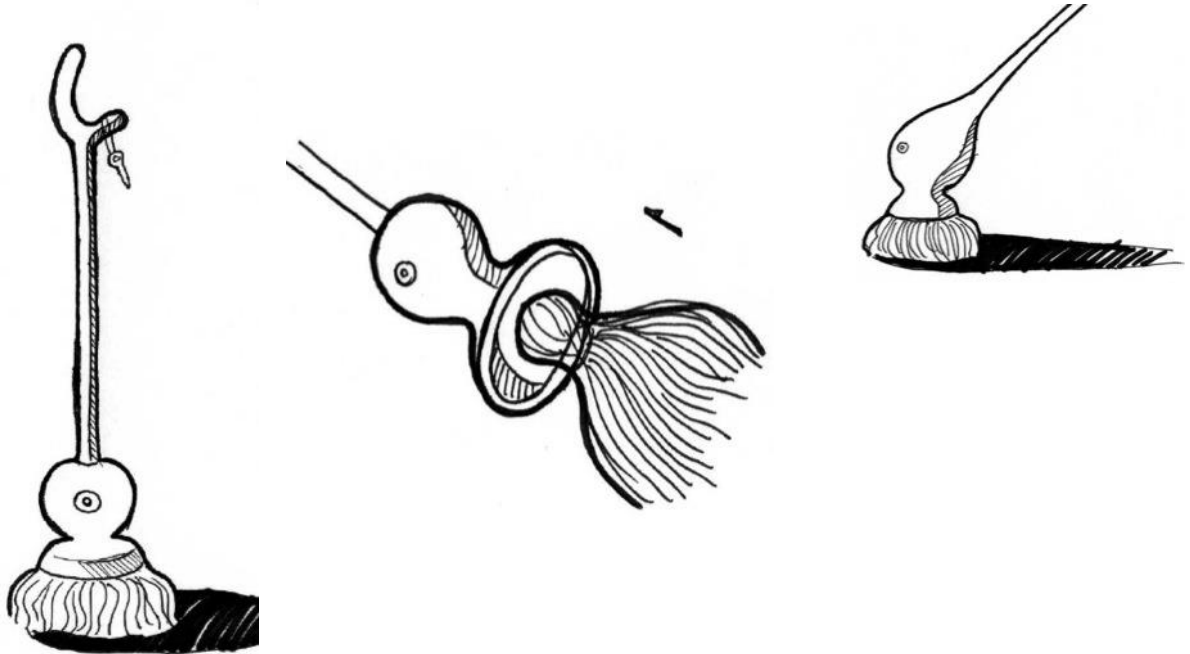
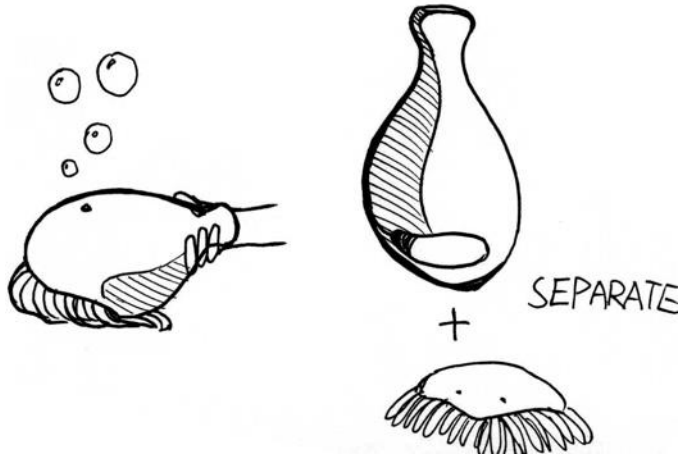
In order to add a role-play feature to the product, I got inspiration from sea creatures. Because the ocean reminds people of cleanliness and purity, this has subtle and interesting commonalities with cleaning work. What's more, the sea creature can infuse the product with elegance and organic form.

Finally, I chose a hermit crab and an octopus as my muses for the bubble launcher and mop.

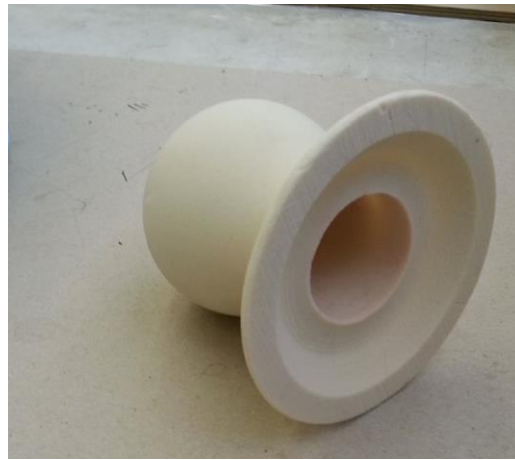


Sketch





Mock-up



The mock-up is made of yellow foam. I explored the best dimensions and ergonomic form for hand to grip. At the beginning, the “shell” shape had no groove because of aesthetic concerns, then I realized it might be challenging for kids to hold. Therefore, I created a groove at the end by sanding it. The octopus shape is made by lathe; it also took several sessions of lathe working to get the final size I liked.

Then I took the yellow foam model to a neighbourhood and observed how a 4-year-old girl played with the mock-up.

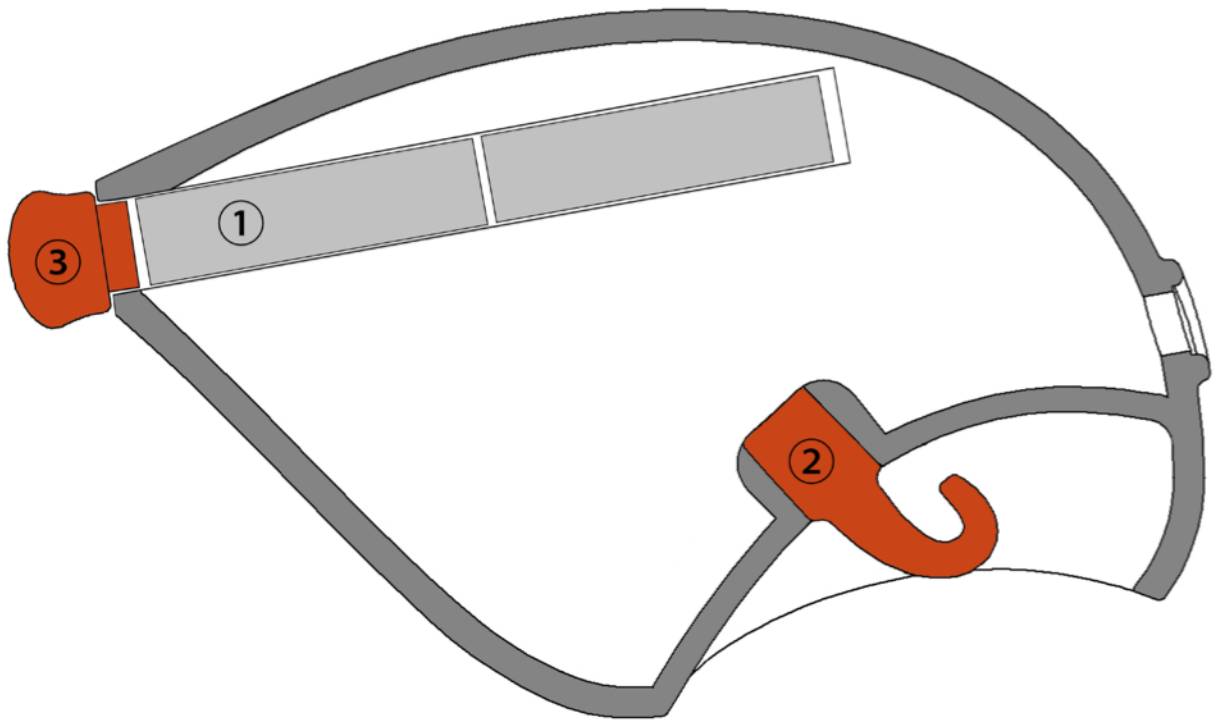
During the testing, I realized that even with the groove it was still hard for kids to catch the bottle, so I made two changes:

1. Made the “hermit crab shell” smaller but still able to contain liquid soap and the necessary mechanism.
2. Added a part at the end of the “shell” for an easier grip. This part could be a door for the battery.

Rendering



Mechanism



1. Two AAA batteries
2. Plug & Hook
The elastomer helps seal the liquid by friction.
It is also a hook for the cloth "crab" beneath it

3. Button
A quarter turn to left:
Unlock the batteries

Middle Position:
Lock the batteries

A quarter turn to right:
Turn on the bubble launcher

Final Model





Features

Hermit Crab Bubble: there is a detachable “crab” cloth hanging on the hook during use. By designing this, I also want to convey a concept to kids that the hermit crab doesn’t own its shell, but can walk out of that shell and find a new house. The detachable design is also a consideration for easy cleaning.

Octopus Adjustable Mop: the arm can be extended to fit an adult.

Scenario

3-year-old girl used the Octopus Adjustable Mop to clean the floor.



9-year-old boy used the Hermit Crab Bubble Launcher to create bubbles and cleaned them with the “crab.”



The child used the Hermit Crab Bubble Launcher to produce bubbles, and the parent used a mop to clean them. They can reverse their roles so it is like the two sea creatures are playing together.



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