fitit

Dream it, Build it, Play it

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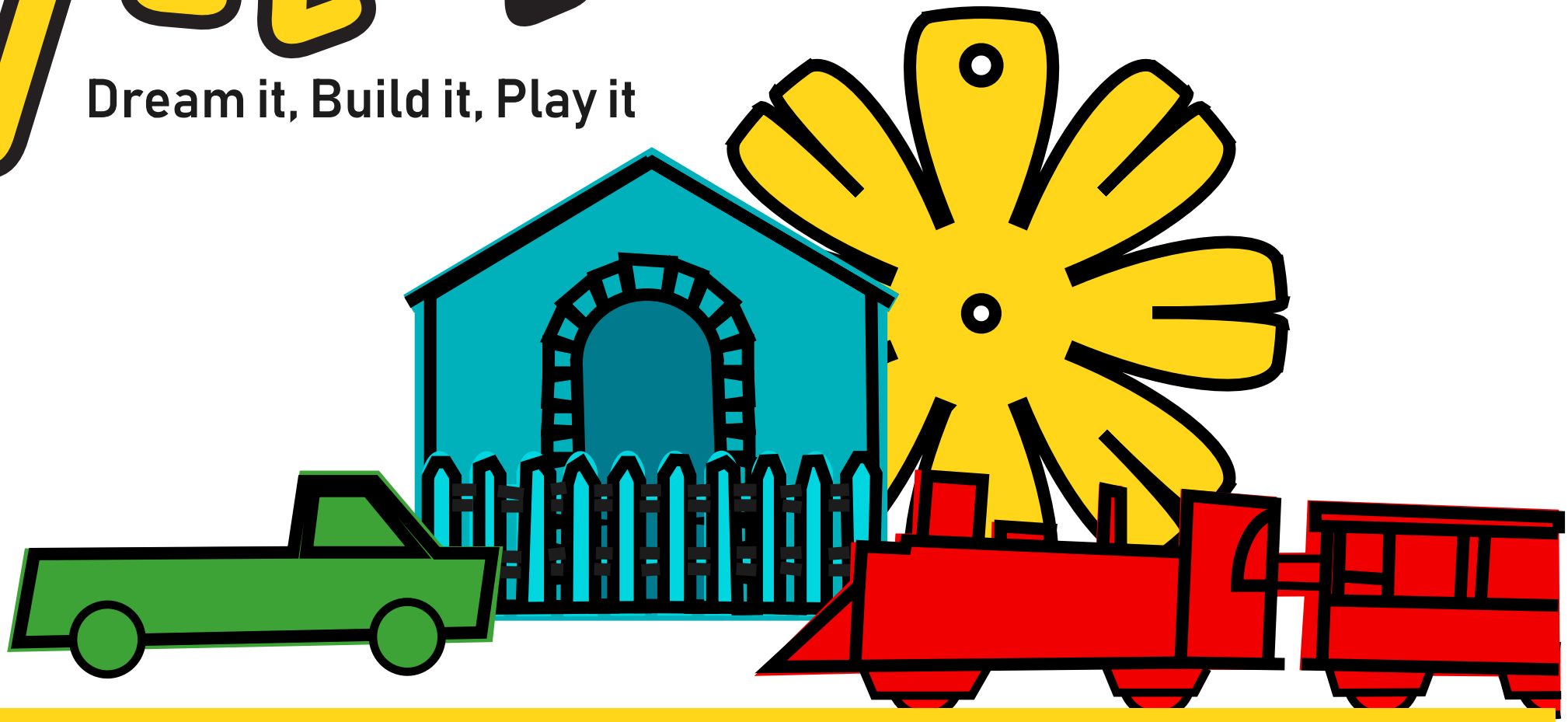

University, Department and Educational Program: Eindhoven University of Technology, Bachelor College Major Industrial Design
DPB100 Project 1 Design,Smart to touch,2018/2019 semester B

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Introduction

FitIt is a toy that enables children to build whatever they desire out of cardboard with a sustainable product. It does so by making use of 'fitters', round wooden discs in which pieces of cardboard can be pressed together to make all kinds of shapes and structures. The power of cardboard for our product is that it is a cheap, accessible and sustainable material.

This product is an outcome of us, four students of Industrial Design at the TU/e, working on our first half-year project.

Our project theme was called Smart to Touch. This theme revolved around the idea of finding inspiration from experimenting with a certain material and its properties and trying to develop a product from there.

Project goal

The goal of our project is to create a sustainable product that stimulates children to express their creativity by building their own toys with accessible materials, since playing this way can give a lot of benefits to children[1]. We want to accomplish this by producing building kits with which children can build premade structures with the help of instruction booklet. This serves as an introduction and explanation to our product and spark their own creativity. As an extension to these building kits, electrical components are to be provided separately to introduce children to the concept of working with electronics at a young age, and to keep our product interesting to a wider target group. By setting up a website where children can share their projects and see those of others, further stimulating each other's creativity.

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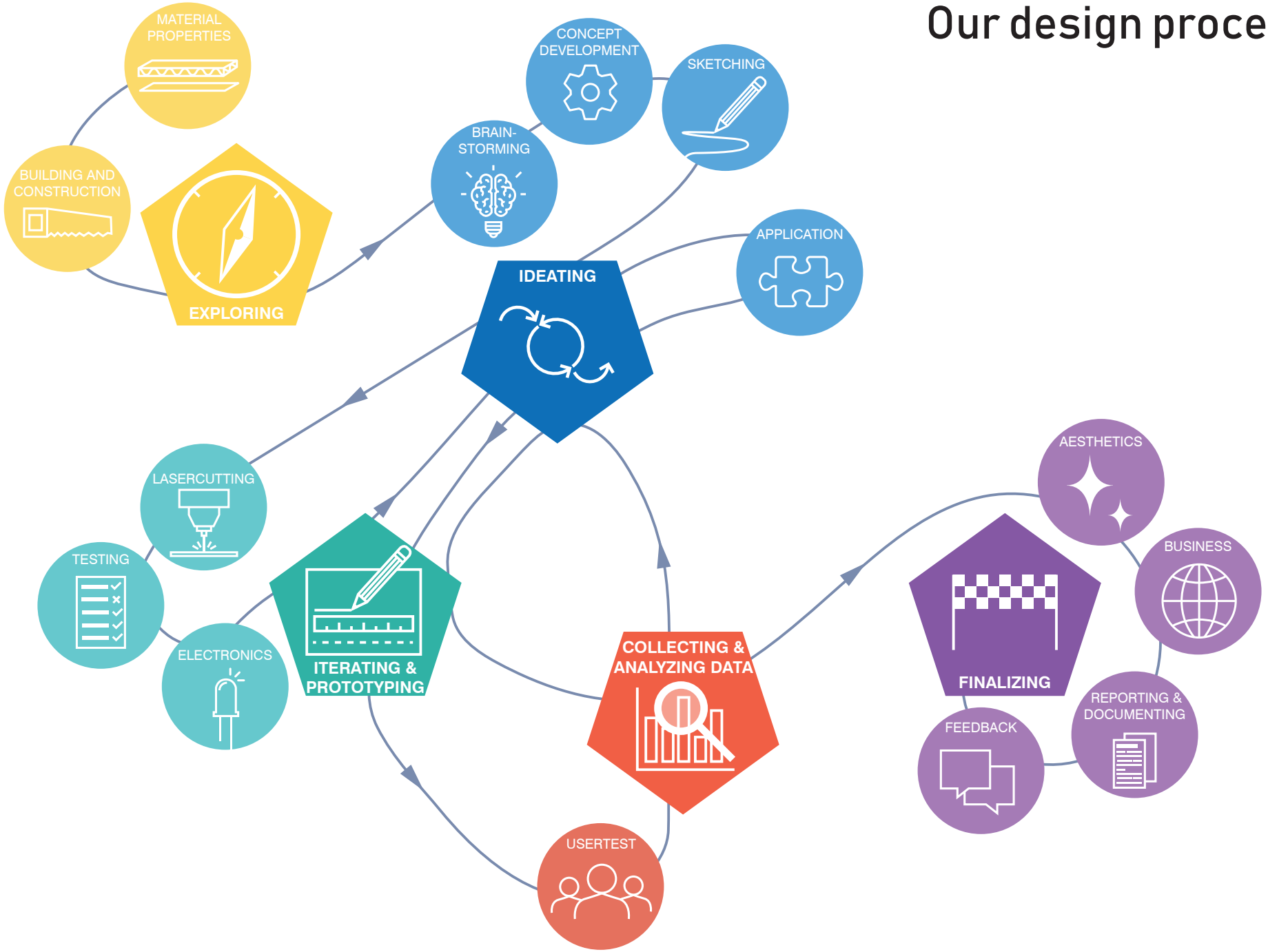
As industrial design students we aim to develop ourselves during this project in the following competencies;
1. Creativity and Aesthetics
By making a house style and brand for our design in order to stimulate attractiveness and a clean communication of the concept.
2. Math Data and Computing
By programming a mockup of our website ourselves.
3. Business and Entrepreneurship
By making a business model and talking to experts.
4. User and Society
By usertesting with our target group to create a user-centered product.
5. Technology and Realization
By making the electronics ourselves and as easy as possible for children to use.

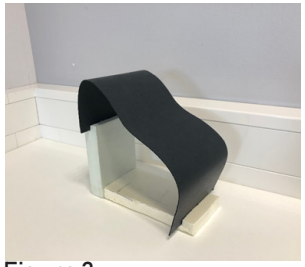
Our design process



Exploring


Figure 1


Figure 2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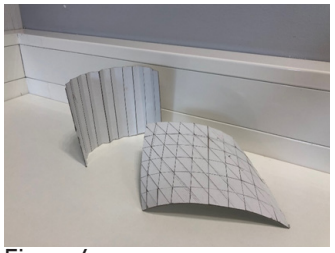
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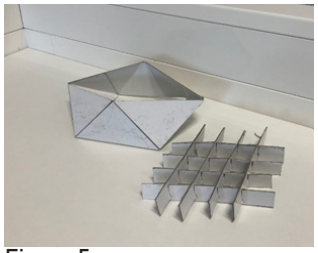
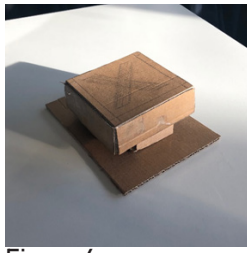


Figure 5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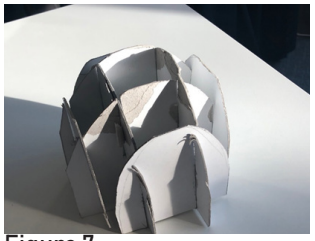
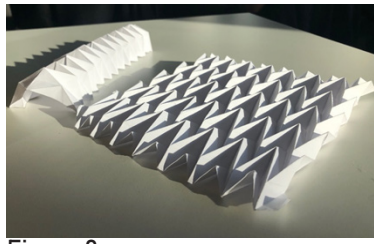


Figure 7


Figure 8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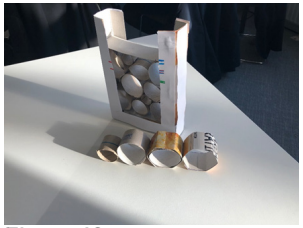
Figure 10


Figure 11

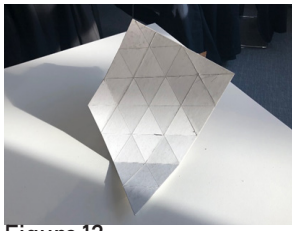
Figure 12

Exploration

Within the theme Smart to Touch we started our design process with a material. The material we chose to do explorations with was cardboard. We chose cardboard because it is: accessible, light, cheap, isolating, easy to shape, biodegradable, can be recycled and can be very strong when used in the right way. We all made things from cardboard within 3 categories;

- 1. Packaging

Paper is biodegradable so we thought it could be a sustainable alternative for packaging. We found out that paper on its own isn't ideal for packaging because it lets air through. We packaged some sort of plastic hay we found in paper to see what it would feel like reference. We found out that it behaved a lot like a pillow but with a very unusual outer texture. We found the bounce effect really interesting so we further explored that property(figure 2).

- 2. Physical sense

Cardboard is generally seen as a stiff material that does not bend easily. We tried a few methods to change this. We placed a thinner piece of cardboard into foam to get a chair that deforms when you sit on it and bounces back to its original shape when you do not reference.We made a button out of cardboard with a looped piece of cardboard inside of it to act as a spring. We also tried out a few different cutting and folding lines patterns to see how we could deform cardboard (figure 4).

- 3. Foldability

By interlocking pieces of cardboard in a diamond pattern, we created a something that can withstand a strong force and is foldable(figure 3). This inspired us to think about foldable structures of furniture. We also experimented with weight applied to different shapes of paper to see which shape could take on the most weight (figure 10). Additionally, we looked at a form that could only let a shape through in one direction (figure 11).

Ideating

After around two to three weeks of exploring with cardboard, we ended up with a wide range of explorations. Because of this, we found it hard to combine our explorations into one concrete idea. Additionally, using the material and its properties as inspiration to come up with an idea was something all of us had not ever done before. As a result, we tried coming up with different product ideas with each exploration individually.

Our paper packaging explorations were pretty quickly put aside since we could not really think of anything with this to further develop in. With explorations based on folding structures, our mind quickly went to using this to make furniture or portable structures out of. We also experimented with foldable cardboard and pleated paper. We thought about making interesting types of fabric with this because of the different properties they had from more conventional fabrics. The cardboard button we made, in combination with the pleaded pieces of paper, made us think of using paper and cardboard towards creating interesting types of interactions and haptic experiences with products.

Wrapping up the ideation process, we tried coming up with ideas, not from the
perspective of our explorations this time, but from a more conceptual perspective instead. The concepts we wanted to ideate around were: interactions and haptics, furniture, structures, and lastly toys. Though the last category might not seem to be based on any explorations we made, the category ended up on our list because of the relative ease with which we could make different objects out of our chosen material. We figured that this property of our material could be put to use in making toys with which children could easily create a variety of objects to play with. When we realized all four of us were quite interested in using the building properties of cardboard towards developing toys, we quickly decided to focus our project on this.

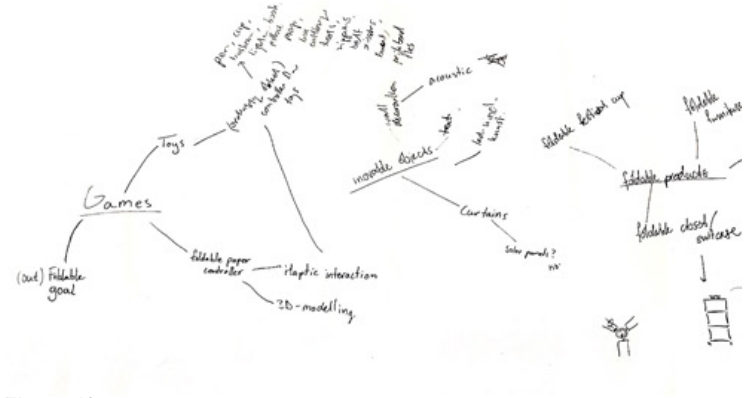

Figure 13

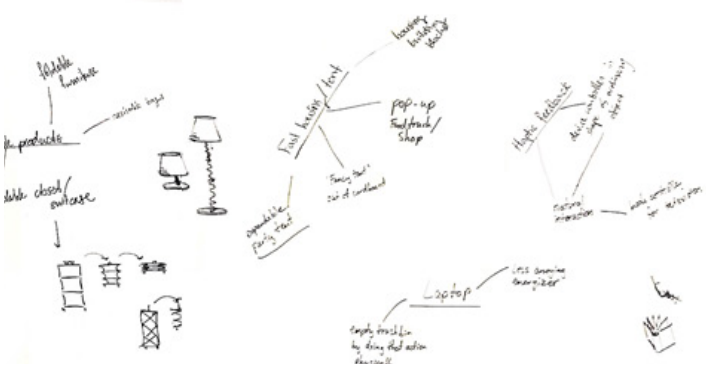

Figure 14

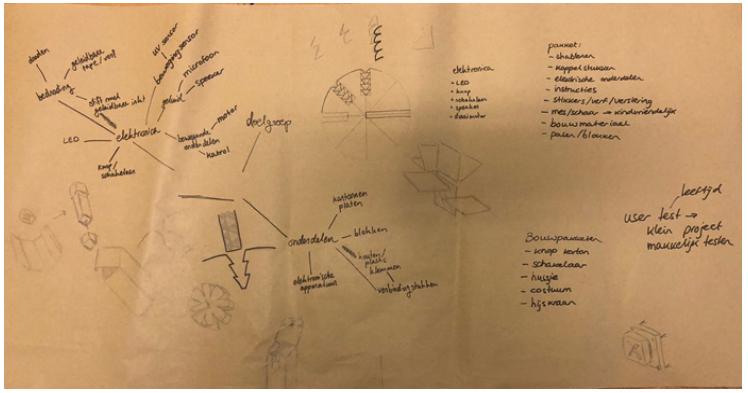

Figure 15

Iterating and prototyping

Fitters

After ideation, we agreed we wanted to make a toy for children that stimulates them to be more creative. Cardboard is a good material to use for a toy since it is really accessible and easy to use for children. The first problem we needed to tackle was; how to easily connect and assemble loose pieces of cardboard?

We thought of 2 things;
- Beams and blocks with velcro on it:

We designed beams and blocks where you could build a frame with for what you wanted to build (figure 16). The space between these beams could then be filled with cardboard plates that also had velcro on them. The velcro wasn't very sturdy when making big structures and also is not a very durable material. It would also be a lot of work to put velcro on all the blocks.

- Fitters:

We looked into clothespin or K'Nex like reference connection pieces that cardboard could be stuck into by it being pressed tight. Taking inspiration from the K'Nex pieces, we decided that round pieces in which cardboard can be pressed would give the most angles and dimensions to build with. By making round wooden discs with small grooves in them that slowly become tighter as they move inwards, the cardboard can be squeezed into a groove and then stays tight. Reference

While making a small car with the fitters we thought it would be fun to be able to make wheels from our fitters. That is why we decided to make small holes in the fitters to use as axis for wheels. Two additional holes were added on the side, letting the fitters to be used as hinges as well. The holes are so small that it does not decrease the structure strength of the fitters(figure 18).


figure 16


Figure 17: Fitter version 3

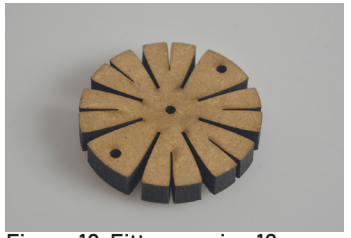
Figure 18: Fitter version 10


Figure 19: Fitter version 4


Figure 20: FItter version 1


Figure 21: Fitter version 5

We made the difference in width between the beginning and the end of the grooves pretty large to enable cardboard plates of different thicknesses to fit in. We chose to lasercut the fitters out of MDF because it is a very strong and cheap material. We also 3D-printed a fitter out of plastic, but this material had a too smooth surface, making it so that the cardboard could not stick in the disk as well as the wooden disks. We made the wooden disks, which we ended up calling 'fitters' at this point, have a diameter of six centimetres. This size makes it small enough for children to handle but big enough that it could not become a choking hazard. It also makes the fitter big enough to have a lot of grooves without losing strength.

With the fitters we had at this moment, the thoughts and ideas got more focussed on applications with them, like building kits, making users learn how to play with FitIt. We decided on building a few of the same building kits, so we could user test them. With this test we could know if the fitters functioned well and were fun to use and if the building kits served the purpose we wanted it to have.

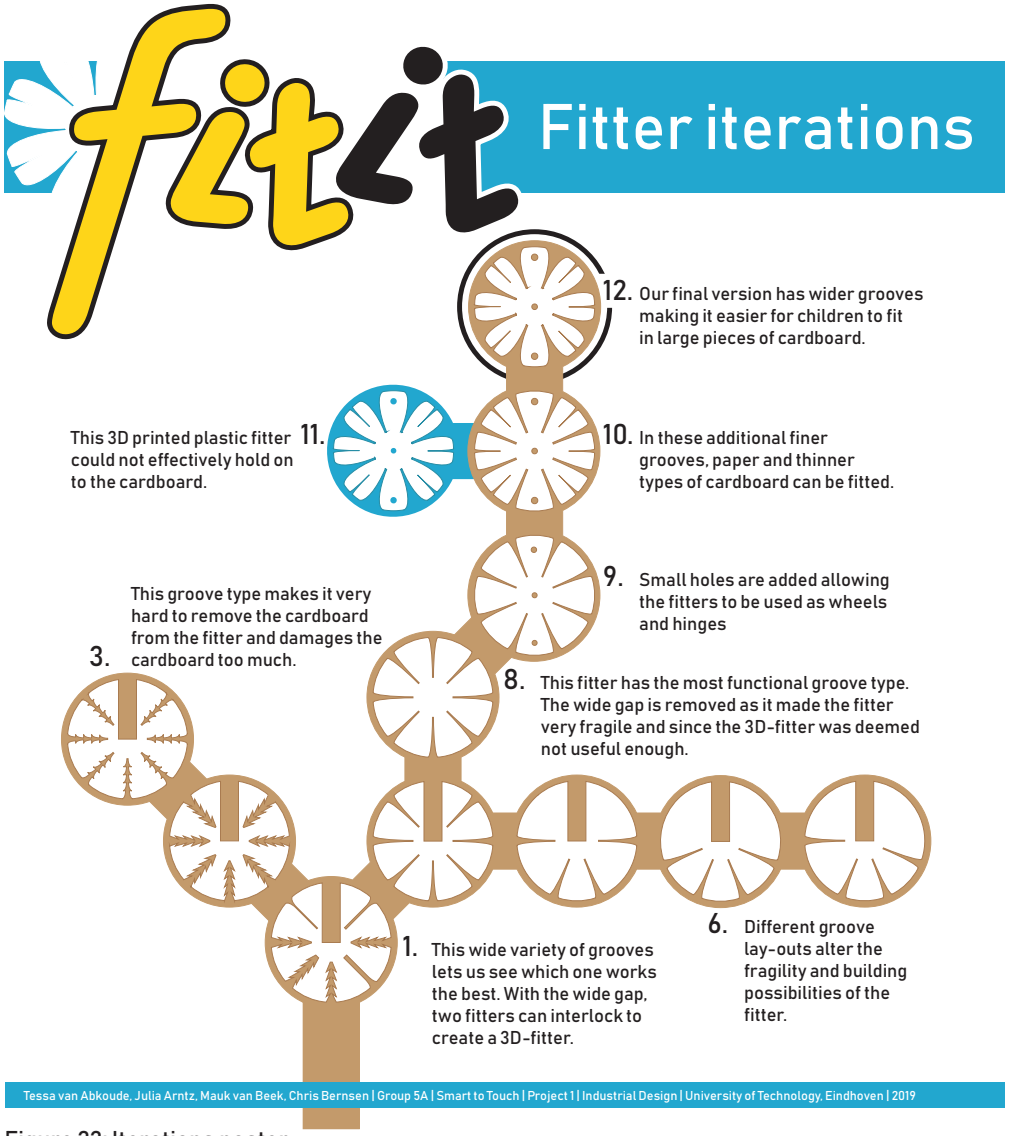

Figure 22: Iterations poster

Electronics

The idea of including some electronics to our project was something we were interested by from the start. However, we mostly wanted to focus on developing our fitters and the building kits before we added electronics. In the exploration phase we made a big button out of cardboard that gave a satisfying feeling when pressed (figure 22). We took the concept and aesthetic of the button make large and easy to use electronic components. After thinking about which kinds of electronic components we wanted to make, we started making a light, a sound buzzer, a button and a power supply (figure 23).

We wanted the electronics to be able to attach to the cardboard to make the creations more interactive. To join the electronic components and make a circuit. At first, we thought of doing this with a marker containing a conductive ink. We stepped away from this idea because it could become too expensive and too unreliable. We wanted to use aluminum foil as a cable because it is something everyone has lying around the house and it conducts electricity well. We made a small circuit with a buzzer, a battery and aluminium foil as cable to test if the foil would work as cable. And it did. This was a good step forward because it was hard to get cables that were cheap, easy to get, easy to get the right size of and also easy to use. We also needed to connect the strips to the electronics in a certain way. For this we considered clothespins, velcro and magnets. We ended up using magnets because they were the most user friendly(figure 24). After some more considering we bought aluminum tape to try out but it ended up not conducting electricity because of a plastic coating.

Figure 23

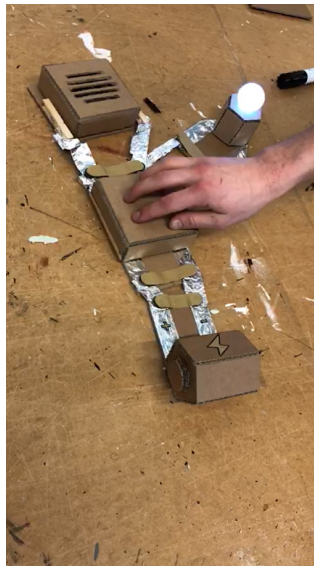

Figure 24

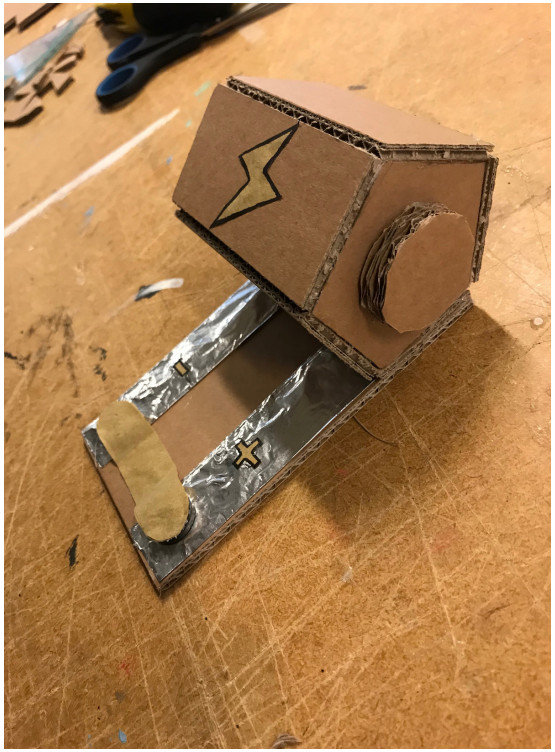

Figure 25

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Midterm demo day

To prepare for midterm demo day, we made two building kits, one of a house and one of a car. We also showed the prototypes of the electronics and a mockup of a website for children to share their projects.
The demo day went well, but we hardly got any useful or critical feedback. We did struggle a bit with not getting a lot of feedback, but we knew where our product still had to be improved, so we continued developing our product afterwards.


Figure 26


Figure 27


Figure 28

Electronics

In the second quartile we have worked on improving the aesthetics and physical properties of the electrical components. We ended up using MDF instead of cardboard, because we wanted these components to be more durable than if they were made out of cardboard. MDF is still fairly sustainable, as it is made out of compressed pieces of wood. At last we made some changes to their appearance to make them look more like an end product instead of a prototype (figure 15). We also improved the way the electronics can be connected. We used copper tape because it is more convenient to use and conducts electricity very well reference. We have folded over the edges so that even two pieces of tape are glued over each other at an angle. As a result, the sides of the tape were conductive and there was an adhesive layer in the middle of the strip reference, making the tape easy for children to apply.

After this we have again made improvements to the electronics. We changed the size and ringing of the connection points so that they are easier to connect. Finally, we have also added color to the electronics so that the components look more attractive for children to play with.

Figure 29

Figure 30

Figure 31

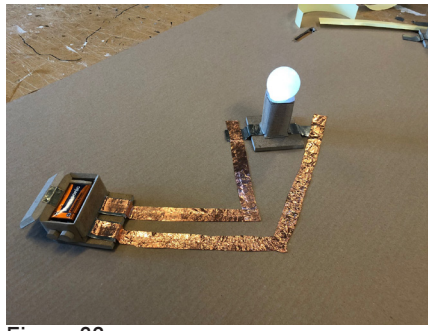

Figure 32

Figure 34

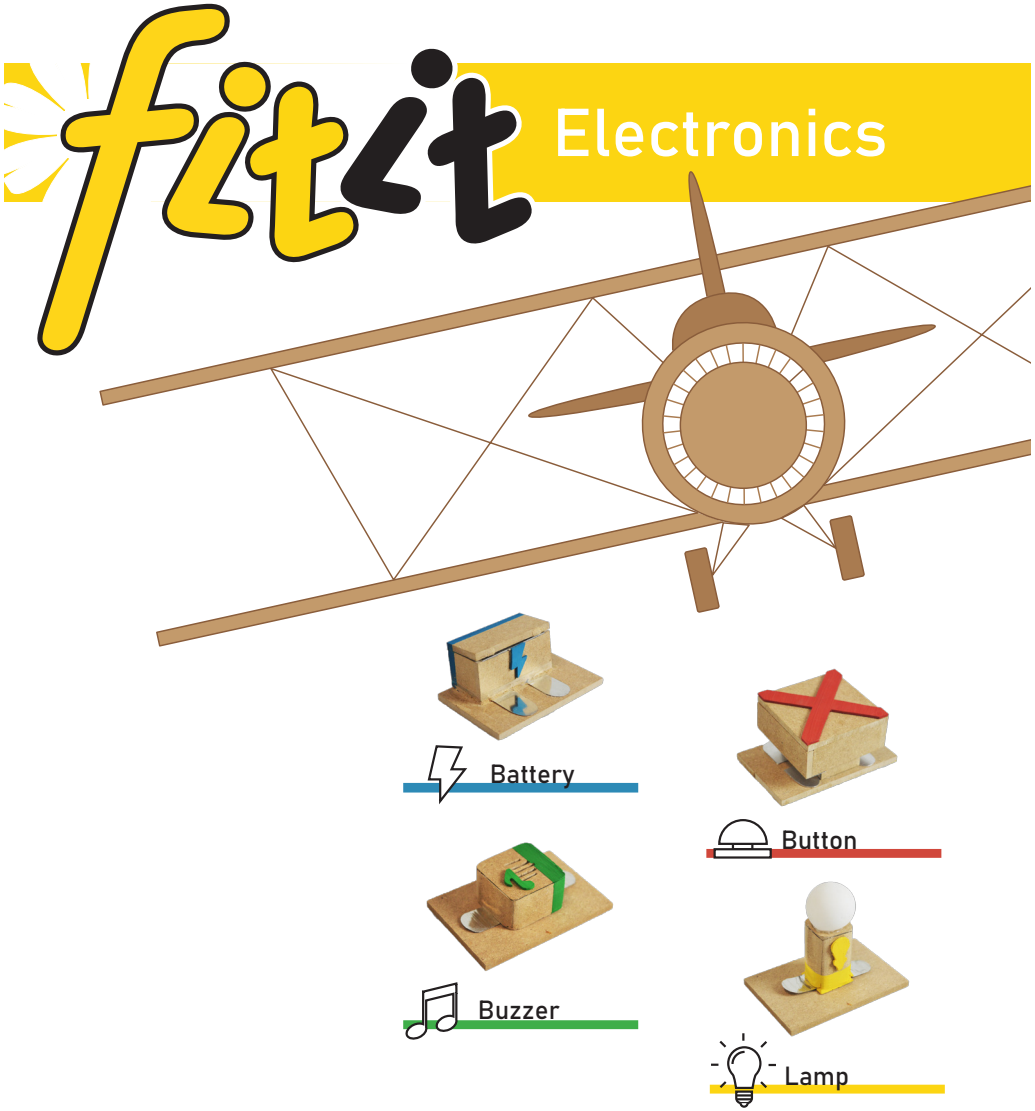

Figure 34: Electronics poster

Collecting and Analyzing Data

While developing the electronics, we wanted to further develop our fitters by conducting user tests and seeing experiencing first hand how usable our fitters are.

User testing

First user test

Before we could begin with a user test, we needed to have enough building kits made that were fully complete. Each kit consisted of a box with outlines drawn on it from which the children could cut out a car, an instruction booklet (Appendix, figure 54), seven fitters of version 10, and two skewers. We also bought markers with which the children could decorate the car.

After finishing these preparations, we conducted our first user test at a daycare in Son en Breugel. In addition to the car kit, we brought loose pieces of cardboard of various sizes for the kids to further build with. We wanted to see if:
1. The kids could apply enough force to properly fit the cardboard in the fitters,
2. The kids were able to follow the instructions, cut out the car and build it themselves,
3. The kids enjoyed playing with our product.
4. The kids would be motivated to decorate the car with the supplied


Figure 35


Figure 36


Figure 37


Figure 38


Figure 39

The whole user test was video-recorded and we were present during the user test to make note of everything we saw. The user test was conducted with seven children aged six through eight. They worked in groups of two. We noticed that the kids seemed interested in our product. After shortly explaining what they had to do and how the fitters could be used, they started opening up the box and tried following the instructions. Almost every child had difficulty with cutting the cardboard with scissors. With some of our help they eventually managed to get the right shape out of the box. Understanding how the car needed to be folded was for some a problem and for others not, while understanding where the fitters and skewers needed to be placed was something more children had problems with. All in all, building the car took longer than expected but eventually all building kits were made. While most kids directly took off to play outside, there were two girls that worked together really well and started decorating the car. Two out of the four cars were left at the daycare since some kids mentioned wanting to play with it more. We did not have enough time and kids to play with the other pieces of cardboard.

From this test we stated the following things as points for improvement:
1. The booklet was too difficult for the children to understand. They did not understand the schematic drawings in particular.
2. The children had trouble getting the cardboard in the fitter because their motor skills were not as developed as assumed.
3. Children had too much difficulty in cutting out the car out of the box.
4. Children have short attention spans so individual tasks should not take too long.
5. The skewers were to sharp and dangerous for the children to play with.
Things that were already good:
7. The children were immediately interested and enthusiastic.
8. They wanted to finish it even if it brought up frustration
9. Some were motivated to decorate it with the supplied markers.

Second user test

After processing all points for improvement of the first user test, we made a new building kit of a train. This kit consisted of four pre-cut plates with the outline of the train, a booklet (see Appendix, figure 55) with more detailed instructions, four times seven fitters of our newer version 12 (figure 22) and four times sticks with a rounded head for the wheel construction and connecting part of the train. On the backside of the instruction booklet, we placed a short questionnaire for the children about their experience using our product.

The second user test was again done in a daycare, but another one then used before. We had two groups of children: one group with four children of the ages eight to ten worked with the train kit and the other group with seven children of the ages five to seven had loose pieces of cardboard of various sizes and fitters to play with. The most important thing for us to test with the train kit was whether the improvements we made were good enough and if any other problems would arise. With the younger group we wanted to find out if our product motivated the children to get creative with cardboard.

From the test with the train kit we observed that:
1. The children could apply enough force and had the motor skills to use the fitters.
2. They quickly picked up how to work with the fitters.
3. They like building but also decorating their creation afterwards.
4. The booklet was understandable and the children were able to build the train themselves.
5. The children responded mostly positive about our product in the questionnaire (see Appendix, figure 57, 58, 59 and 60).
With the younger group we observed that:
7. They had a hard time with using the fitters on their own in the beginning. 8. After we gave them some demonstrations on how they could be used, they started working on their own.
9. They were inspiring each other to build different things.
10. They started playing with their creations after building with it.

From our meeting with the daycare supervisors it became clear that the product had to be cheap in order for daycares to buy it. We also found out that the kits were definitely not finished. The booklets needed improvement, the packaging was totally not finished and a business plan was needed.

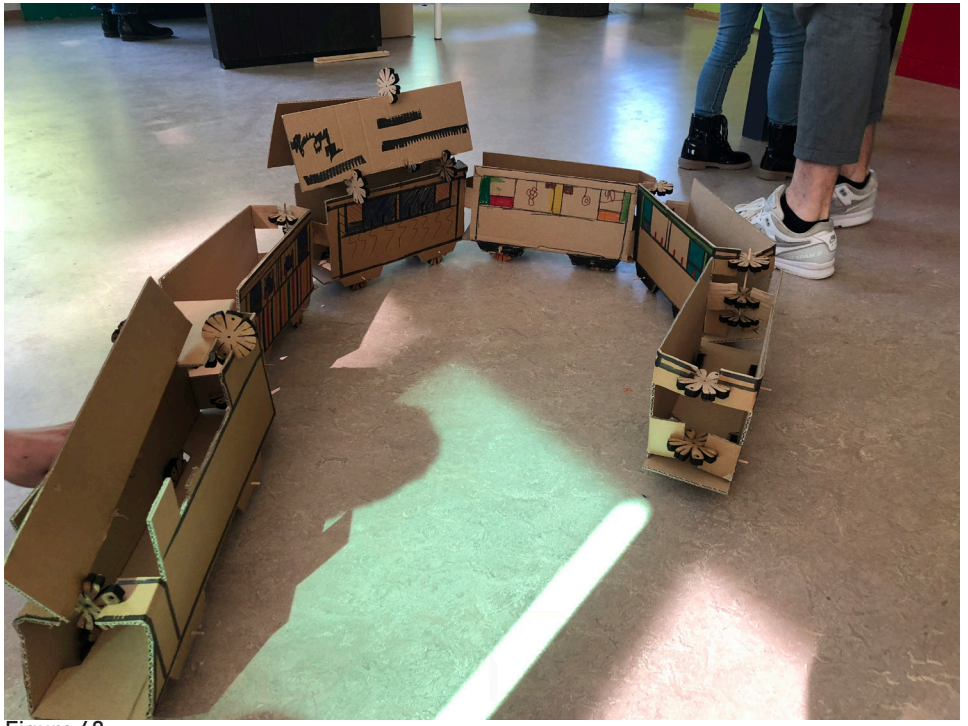

Figure 40

Figure 41

Figure 42

Finalizing

After finishing this second user test, we were content with the state of our fitters for now and building kits, so we started working on finalizing our project. We finished the booklet (Appendix, figure 55), made packaging for the train building kit reference and a business plan.
We also started preparing for demo day, which consisted of thinking about how we wanted to present our product, writing a pitch and making interactive posters.

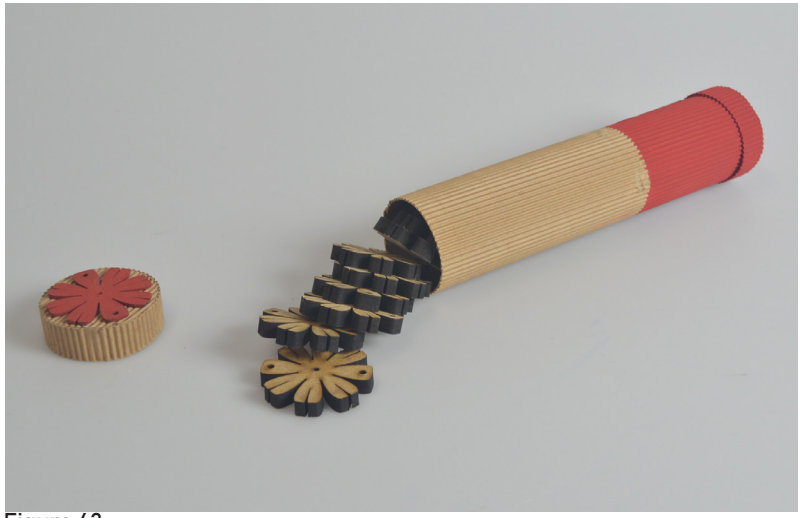

Figure 43

Figure 44

Figure 45

Final demo day

During demo day we got a lot of very positive feedback. Most people showed excitement about the concept of our product and of the product itself. A lot of people showed interest by asking questions which we answered for them.

Regarding feedback about our product, someone said that there are parents that do not want their children to use digital devices and that because of that, we should look into ways of stimulating the children's creativity without having them to visit a website. Though we believe that our product is sufficiently usable without the website, we should look into ways of stimulating a child's creativity like our website intends to do, without having them to use a digital device.

A second point of feedback was that, though we did want to focus more on educating children about electronics at a young age, we did not deliver the tools with which children could actually get do this with our product. Educating children about electronics is still something we think our product could be very useful for and definitely something we should spend more time on developing in the future.

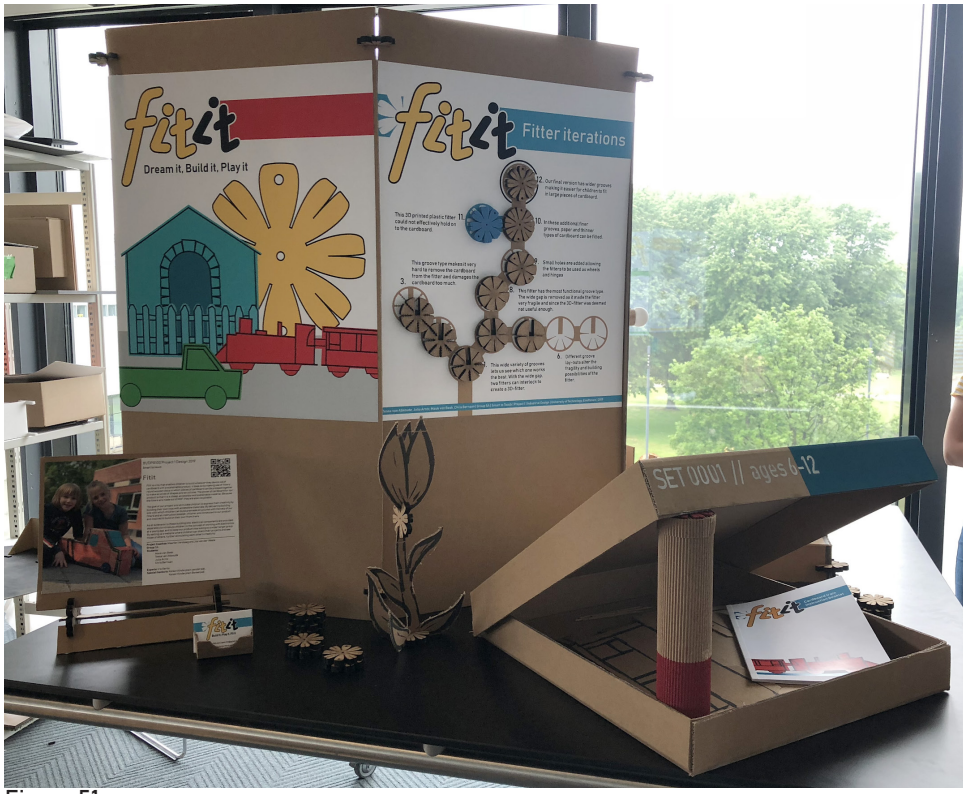

Figure 51


Figure 46


Figure 47


Figure 48

Figure 49

Figure 50

Figure 52

Figure 53

Business plan

As a startup named FitIt, run by 4 students, we want to start the company off on a small scale. You can imagine the small scale like us 4 going to toy shops and daycares ourselves and pitching/testing our product. With this the word will spread and some sales will come through. After we have evidence that the product will sell, the bigger scale will come in the picture. Distributors will be contacted and partnered up with after showing the sale evidence. The distributors will help with getting our products to a bigger audience.
For this we first need to complete some steps before the business plan comes in. These steps in chronological order are:
1. Claiming the rights on the product from the university.
2. Finalizing the product to make it market ready.
3. Finalizing the website (primarily making a functional web shop)
4. Buying a domain name for our website
5. Getting a KVK number.
6. Getting a European quality mark.
7. Considering possible investors.
8. Contacting transport and production companies.
9. Streamlining the production and transport process with the involved companies.
10. Contacting toy distributors.
11. Selecting a market strategies and applying this.

When these steps are completed, the company can get kicked off. The company is solely focused on the sales of the FitIt products, with aims on expanding the product line within the FitIt concept. The plan is to deliver packages of 20 fitters or 50 fitters, building kits of a car, a train and a house, extension kits like a battery, a lamp, a buzzer, a button, a motor and a switch, and a free to use community on the website.

Business model

Starting a company made FitIt.

Building kits: Car, Train, House
Starter kits: 20 fitters, 50 fitters

Extension kits: Battery, Lamp, Buzzer, Motor, Button, Switch
Webshop and online sharing platform

Key Partners

Small scale:
1. The Technical university of Eindhoven is a key partner because they own the rights to our concept at the moment.
2. Production companies are needed to be selected and partnered up with to establish a streamlined production.

Big scale:
3. A distributor is next to the web shop a key partner to expand the market.

4.Transport companies are of course key partners to get the products where they need to go in order to sell them.

Key activities

1. Providing a well working and clear web shop
2. Make sure we get supplied by the producers
3. Making the kit ready with the supplied products
3. Creating a delivery inventory to deliver the products in a small amount of time
4. Accounting of all inventory and orders
5. Delivery of the sold products via an external company.

Key resources

1.A well-structured patent to make sure the concept will not be imitated
2. Entrepreneurship

Value propositions

1. FitIt is a gender neutral toy for kits and is fun for both girls and boys.
2. Built from sustainable materials and involves users in direct repurposingof cardboard.
3. Stimulates children to use their creativity, technical thinking and spatial awareness in the building process.
4. Projects can be done in a group of children which helps their social skills.
5. The website provides a place to share projects.
6. The supply can match the demand because of fast and flexible production.
7. Building instructions are easy to understand for children because they consist of pictures and text.

Customer relations

Online community on our free to use website.
Next to the online community, all of the relationships will be transaction driven.

Channels

1.Online web shop
2. Toy shops
3. Toy distributors

Customer segments

1. Private consumers mostly parents of children at the age of 4-12.
2. Daycares because it can be a way of reaching a lot of children at one place. It offers also a way for children to work together and inspire each other in projects.
3. For schools the same applies. It can be a way of reaching a lot of children at one place. It offers also a way for children to work together and inspire each other in projects.

Cost structure

1. Materials
2. Production: Laser cutting, printing and packaging
4. Website maintenance and updating
3. Transport: toy stores and private customers (Distributor on big scale)
5. Operating expenses
6. Developing new products and kits
(7.Distributor, on large scale)

Income streams

1. Sales from the online webshop
2. Sales from the distributor
3. Sales from toy stores

Overall result

At the end of this semester, we presented our final product consisting of our finalized fitters; three building kits: a train, a car and a house, of which the train kit was fully developed with packaging and instruction manual; four electronic components: a battery, a lamp, a button and a buzzer; and finally a website with a mockup of a sharing platform and a webshop. We also looked into the business side of this product by setting up a business plan.

We, as a group, believe we all had a great contribution to this project. Because we made everything of this project with the four of us being present together, we cannot make a distinction between what was made by who.

Conclusion

This design process was one that was very interesting and new to us since we had to start designing from a material choice and not from a concept or problem statement, like we have done before. We noticed that this approach to designing worked well for us and we found enough inspiration from it to develop a solid product.

At the start of this project, the weekly tutor sessions motivated us to consistently work on the project, set weekly goals and come up with new deliverables each week. At a point where our product concept became more clear, we found ourselves reaching a tipping point where, instead of being driven by the tutor sessions, we became intrinsically motivated by the project itself.

This was, among other things, a result of how we as a group communicated clearly, were both motivated and motivating, were very critical on each other and made good use of each others' complementing skill sets.

As stated in the project goal: "The goal of our project is to create a sustainable product that stimulates children to express their creativity by building their own toys with accessible materials." We can say that we are satisfied with the outcome of our project in relation to our project goal. Especially regarding the fact that we were able to present a complete product line consisting of a base product, extensions, packaging and a website.

Future

Currently, we are heavily considering to elevate this project into a startup. We have already made a roadmap of steps we need to take to start a business from this project and how the business would work. We all would love for this to work and run the company ourselves. To keep expanding we would create new building kits and put more time into developing the electrical devices.

Before this all can happen, we still find we need to finalize our fitters. Currently the fitters are easy to press onto cardboard but do tend to sometimes lose grip after some time. We are working on finding a solution for the fitters giving off charcoal and possibly for providing more grip. We are now spraying the fitters with hairspray so they do not give off charcoal but this is not ideal concerning the toxicity of this product. We would need to spend time finding a substitute for this.

Though there is still a lot to be done, we are motivated to put in the work and we see a bright ahead of us and FitIt.

Reflections

Tessa van Abkoude

During project 1 we were given the task to design something within the theme ‘smart to touch’. Before starting this course I wrote down a list of things I want to get out of project 1(see points 1,2,3). Eventually I would like to have a successful ‘market ready’ product at the end of this course.
1. Being able to go through a broad design process
During the courses; from idea to design(FITD) and user centred design(UCD), I felt like we needed to go really fast through the design process and did not have time to make a lot of iterations. With this course I wanted to have a broad design process by making explorations, prototypes and doing literature research, user testing and ideation techniques. I think a lot in general. While designing, I tend to think about different perspectives and approaches before I make a decision. This results in me giving unexpected or totally different ideas during a brainstorm session. This is because I am scared to block out directions before I have even explored them. This resulted in us being able to explain why we made the project the way it is now. Furthermore, I found it refreshing to start the design process with a material since this is completely different than the problem solving approach.
2. Implement the user research techniques I learned during UCD
Before project 1 I had only done questionnaires and interviews while there are many more user testing methods to consider and I was eager to try out with the knowledge learned from UCD. I had some sort of love-hate relation with user testing. Although the input of user tests were really valuable, I didn’t like conducting them. This changed during this project. Testing children was actually quite fun and gave new energy to keep working hard on project 1. It was nice to finally put the techniques learned during UCD into practice. On top of that, FitIt would look completely different if we hadn’t done a user test.
3. Being able to work with a really vague design case
Something that is vague requires; structure and planning. During FITD and UCD there were a lot of deadlines in between. So I was curious about how I would operate when there weren’t a lot of assessments in between and strict guidelines. So far I handle this pretty well. Every week we worked hard as a group and got the things done we wanted to get done that week. We put in a lot of effort and are satisfied, proud even, with the end result. No harsh graded deadlines didn’t slow me down as a designer and I think that is a nice thing to discover.

I am confident in sharing my opinion and beliefs about this project and discuss it with the group. We often have discussions about a design decision since we all have a different vision on design in our group. It is good to stay critical about your product and after talking it through we are eventually all on the same page and come to a stronger design.
The target group of our project is now children aged (4-12). I have always had an interest for children, I work with a lot of children at my job as a tutor(‘studiebegeleider’ in dutch) at a high school and I baby-sit often. Being around children gives me joy so being able to design something for that age group drives me a lot in this project. Teaching children something at my job and seeing the appreciation they give you after that is priceless for me. That is why I find it so important that this project also stimulates learning and can really benefit a child.

Second quartile of project 1 I talked more during coaching sessions but I still do not take initiative when it comes to presenting. During demoday I noticed I do like talking to people about our project in more of a conversation form rather than a pitch. Presenting still is something I am uncomfortable with so I need to practice this. In the future I want to practice this by talking a lot during coaching sessions and explaining my designs to other students or family members.
During this project I could have learned more about business. I did not work on the business model so next year I am taking the USE-learning line; New Product Development and Marketing. On top of that team FitIt is thinking about becoming a startup and this would also help me develop myself on the business side of design.

What I am going to take with me from project 1 during my future design projects;
-Tell my opinion about something and start a discussion in a group
-Presenting does not have to be scary
-Lasercutting and woodworking skills --> fast prototyping
-Start reading scientific papers earlier to back up your story/assumptions
-User testing can be fun!
-Make founded design choice
-Illustrator and Indesign skills

Julia Arntz

At the start of project 1 I did not know exactly what my identity and vision were. And also the application of the expertise areas was still very broad and vague for me. Project one helped me to discover what I do and what I do not like when it comes to design which brings me a bit closer to developing a strong vision and identity.

For example, I found out that I really enjoy doing practical projects with a lot of hands-on work. This hands on approach is something that defines me as a designer and fits in my professional identity. For the past six months I have spent a lot of time in Vertigo making steps in our design for FitIt. Because I have worked a lot with MDF, I know from many devices in Vertigo how and why I can use them best for woodworking. This is very useful for me as a designer since I now have the skills to make rapid and quality prototypes.

Within the different design phases Explorations, Ideation and Iterating, prototypes need to meet different qualities and demands. A crappy prototype can still inspire for a better alternative. The most important thing for me is that prototypes succeed in communicating my idea to the user. By making a lot of prototypes I have become better at knowing when a prototype should meet a certain level of quality.

Since FitIt needed a website I started programming in HTML and CSS. This went really well and fast so I learned about myself that I'm good at programming. As a result, I also decided to program my portfolio myself. This took me a lot of time and I occasionally doubted to start using a web design site. I am very happy that I did not do this because I noticed that I was getting faster and better at programming. Nevertheless it remains difficult for me to combine my software programming skills with hardware. To communicate almost every electric design needs a sort of an interface. What makes a good interface and whether an interface should be embodied or not is something that interests me a lot. In the fourth quartile I followed the course Tangible and Embodied Interaction were we discussed a lot of theory behind this and I noticed that this interests me. But to make a working interface you require enough knowledge over both soft- and hardware skills. For me this is one of the most important things that I want to learn in the future.
Tessa and Chris have worked a lot with InDesign and Illustrator a lot in the past period and have become quick and good at this. As a result, it was often easier for them to do these tasks instead of picking it up or trying it out for myself. Afterwards I regret that I have not invested in this, this has been a missed opportunity for me. I want to work more on this in the coming period. I can learn some skills by watching tutorial movies on YouTube this summer and next year I want to go to the workshops at Lucid.

in this project I took on the role of a doer. I quickly picked up various tasks and held the action in our project group. I made sure that we did not stay on a certain subject for too long and that my group kept making progress. We are all different types of designers and often have a different view on things. This makes our team strong because we manage to combine the various views on things. Although we are so different, there is good communication and we learned from each other. It also helps that we are all about the same motivated to set up a good product for the project. In previous projects I have sometimes had difficulty encouraging people to become involved in a project. I am pleased that this is going so smoothly in this project despite our differences. Normally I quickly have a leading role within a team but this time it is not. I think we are all equal and do about the same amount. I find this very relaxed because in previous projects I always had to go after others so that they would do something for the project. I therefore want to keep doing this in future assignments. I think I the best way to achieve this by focusing on good communication in the team.
All in all I really enjoyed this project, my team and my tutors. This project has shown me that I am in the right study for me. What I am mainly going to take with me from project 1 during my future design projects;
- working together in a group and communicate much
- Laser cutting and woodworking skills
- Website programming skills
- If I want to learn something I have to do it myself and not choose the easiest way

Mauk van Beek

Smart to touch, the example of the iPhone box that opened so smoothly really attracted me. I thought it was interesting how probably a lot of thought is put into such a short and small but important experience. It makes it feel very premium. Within this experience, there is put a lot of thought in what material they have chosen and how it is assembled. It has to be perfect to work. These aspects really attracted me.

The ideation part was quick and professional in my eyes. We added well upon each other's ideas and gave the time for others to explain their ideas. I think we were all equal in what and how we added to ideating our idea.
We were quick with starting to prototype our idea which I really liked. Because of this we have iterated a lot within the project. Multiple different angles on the idea were ideated and multiple different iteration per angle were created. I think I helped a lot on starting to make physical prototypes. I am not afraid to just go and build something, which from what I have heard helped the others to also get motivated to physically prototype. What I did pick up whilst prototyping, is that I am not such a perfectionist if it comes to aesthetics, which means that my prototypes sometimes look like a low-fidelity prototype whilst they easily can be more beautiful and more finished looking, so they look like a high-fidelity prototype. This is not necessarily a problem, but I need to watch out that when it needs to be good looking, I do make it good looking instead of just practically working and ugly. I am overall very pleased with the others work as well as my work during prototyping.

The midterm demo day went very well for our group. We all took our turns and filled in on each other. Everyone liked the project and gave positive feedback. This is of course good to hear, but we do not need to cut our self some slack and take It easy after hearing this much of positive feedback; do not get lazy.

My role in the group was overall being practical I think. I went a lot to shops to buy products and materials. I also just build and soldered a lot. Next to this I think my practical vision of what will work and what not, helped to prevent us to put a lot of time in projects that will not work or not be viable. I am very much a realist, so that part spoke a lot in terms of what should and should not be done as well as keeping the priorities right and keeping focus. I would definitely not say I am the 'boss' of the group, but I sometimes do push on making a decision (for example who does what this week or are we going for this or this approach) and keep people from completely derailing from what we were doing. I do have noticed that this has changed over the course of the project. I have become more a listener when it comes to making bigger decisions unless some one asks me or I think I really need to say something about it. If it is something that I do not really care about I try to keep out of the discussion unless again some one asks me. I have learned that that saves me time and frustration. Sometimes I was so convinced of my own idea that I could not see that other ideas were better, but I have learned to listen more and leave more choices to others.

What I could have done better is I think giving more thought of other ideas earlier. I was a bit stubborn in pursuing my own idea, because I thought it was better or could be fused with the other idea. I did come to terms with others ideas maybe being better, but this could have been earlier. I also can still improve in not being 5 minutes late about half of the time. I have learned to work with a lot of machines in the Vertigo workshop and leaving more decisions and discussions to others, which helps save time and frustrations. I have also learned more about the value of a mixed team with also not just friends you have known for a long time.

Chris Bernsen

The theme I chose for Project 1 was called Smart to Touch, which stimulated us to start the designing process by exploring the properties of a certain material and coming up with a product concept from there.
The way this project and its theme were set up reminded me a lot of my first Industrial Design (FITD) course, From Idea to Design. The design case of Smart to Touch felt as vague as the FITD design case felt to me at the time, I was put in a group with two out of the three other group members and the design process was guided by project coaches our group met with every week.
Though the similarities, I experienced this course very differently than the FITD course, and it has shown me the growth I have been able to make during this first year studying.

Even though I had gained some design experience beforehand while designing a medical examination chair during my end-profile project in high school, I felt very unknowledgeable and inexperienced on how to tackle a design case. During this project, I felt very differently about it. Especially the design experience I had gained during other design courses like FITD, Socio-cultural Sensitivity (SCS) and User-Centred Design (UCD) made me feel more confident about my design capabilities entering this project. An example of where this level of experience and confidence expressed itself was through our iteration and prototyping process being done a lot more systematically, testing and reconsidering every aspect of our product as time went on. This resulted in developing a product that I stand behind a lot more than things I have worked on beforehand.

Not only experience but also the knowledge gained from these courses strongly defined the development of our product. Learning about how to approach user research for example during UCD helped us a lot with getting the information we needed during our two user tests. It felt very satisfying to me being able to apply knowledge I had gained just one course earlier to our project. The focus in Industrial Design on learning mostly through experience in contrast to learning from lectures, books and exams has been something that I had a lot of trouble with accepting this year, though. There have been days where I worked from nine am to six pm and did not feel like I had learned anything that day. Times like these left me feeling unsatisfied about my study choice and it even made me consider leaving this study.

Reflecting on the people I worked with during this project, I can see that the four of us are all very driven by design. Hardly any work was done by individual group members since we tried to meet with as many group members as possible while working on the project. I really liked this approach of working together. It motivated me every week to consistently work on this project, it made everyone involved in all parts of the project and all four of us had a similar workload. Because we all had our own unique set of skills, we constantly inspired and learned from each other. I, for example, learned a lot about working with Adobe Illustrator from another group member, enabling me to put my own stamp on the aesthetics of the product.

Concluding this project, there is hardly anything I would have done differently were I to do it all over again. I do find it unfortunate that I did not get to spend a lot of time working on the Math, Data and Computing and Technology and Realization. Our end product by nature does not have a lot to do with these two expertise areas, but I also did not spend a lot of time including them into our project. The code behind our website did of course fall under Math, Data and Computing, but I did really include myself with this part of the project. All in all, though, I feel very proud of my group and myself about what we have been able to put down this semester and I am driven to continue working on this project outside of this study in the future with my group members.

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Appenix

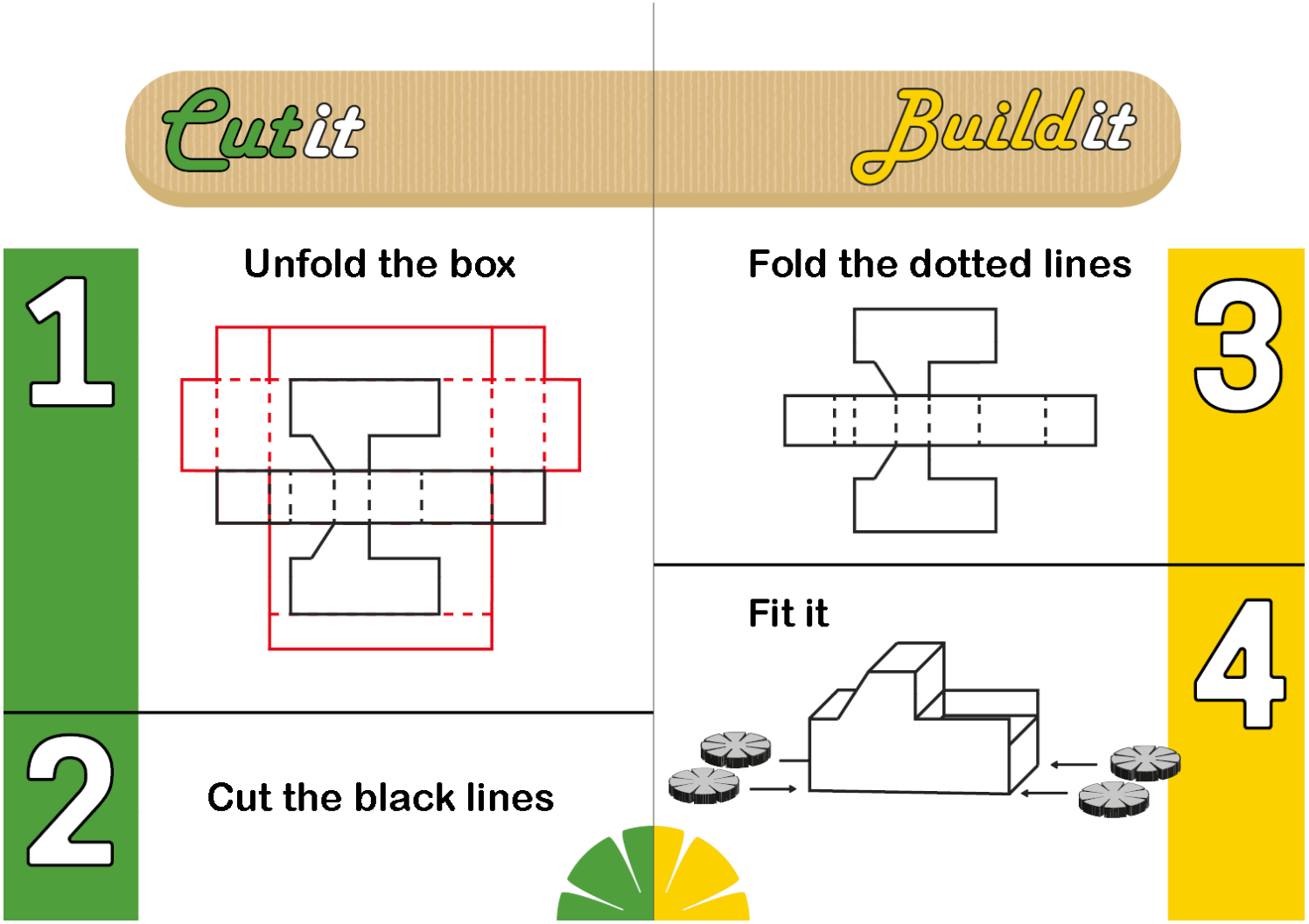


Figure 54

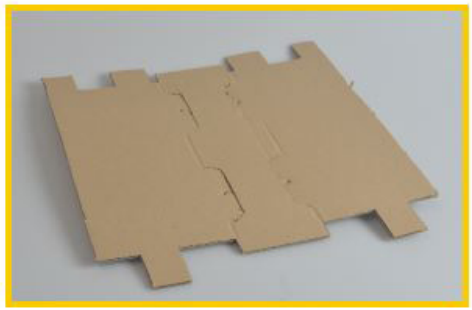
1. Leg het karton plat op tafel

2. Vouw de linkerhelft van het karton

Figure 55

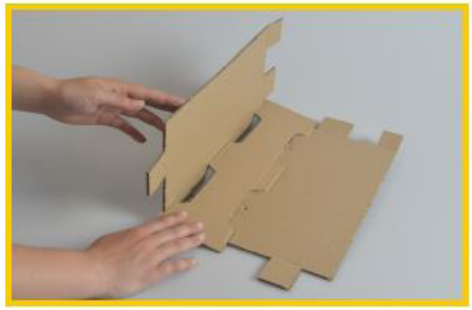
Build it

Place the wagon plate flat on a table



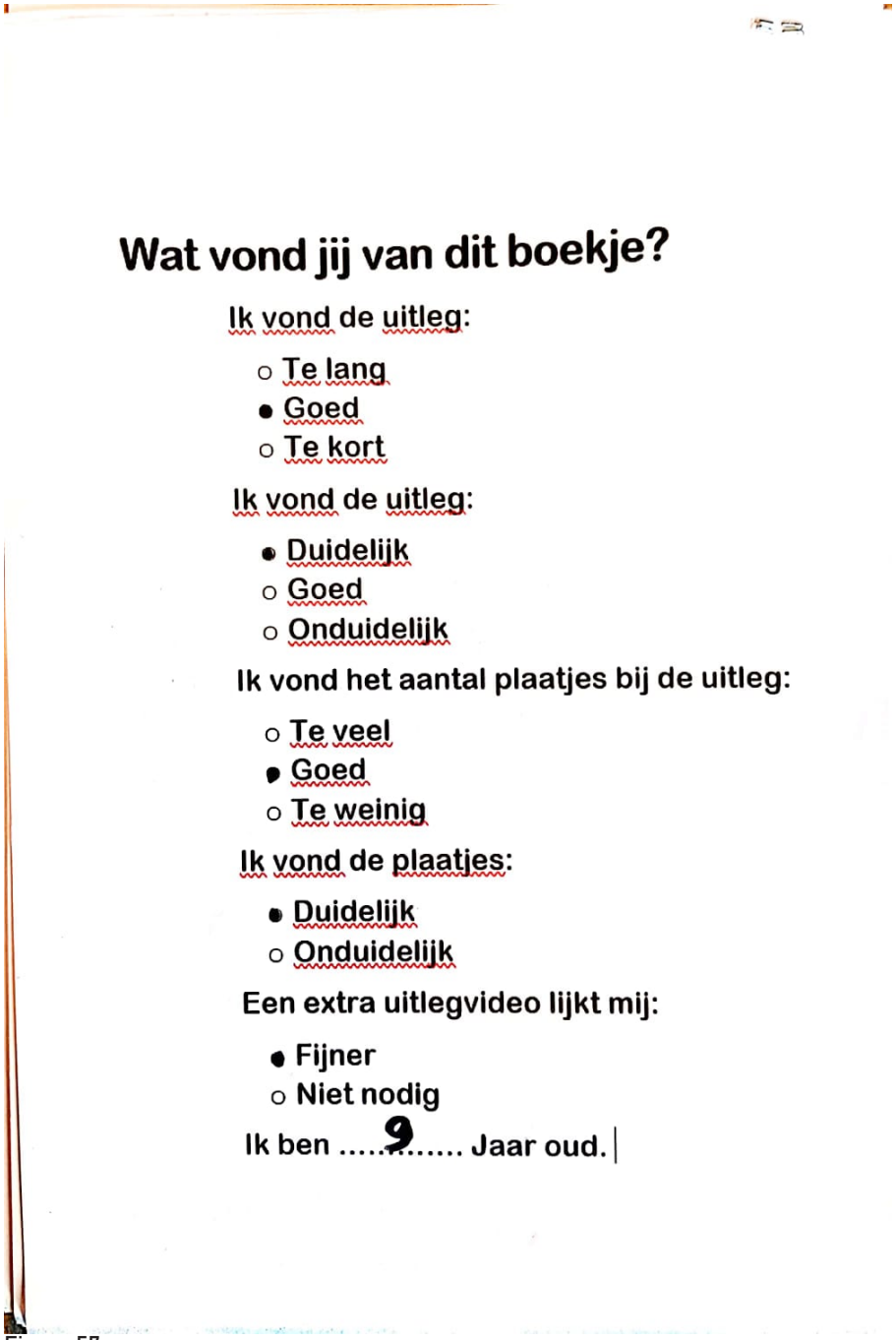
1

Fold the left side of the plate



2

Figure 56



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- ● Duidelijk
- ○ Onduidelijk

Een extra uitlegvideo lijkt mij:

- ● Fijner
- ○ Niet nodig

Ik ben .....9..... Jaar oud.

Figure 57

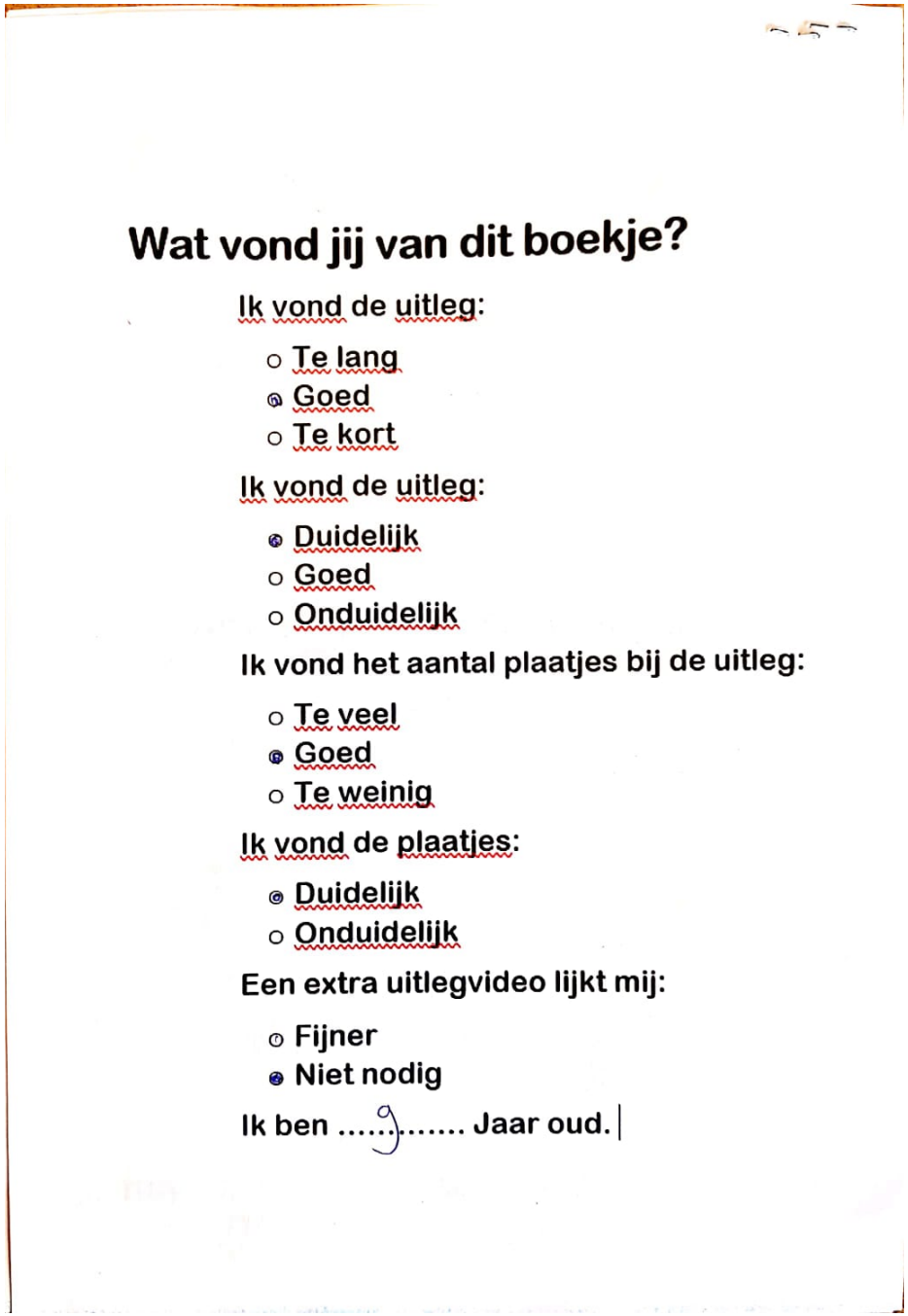

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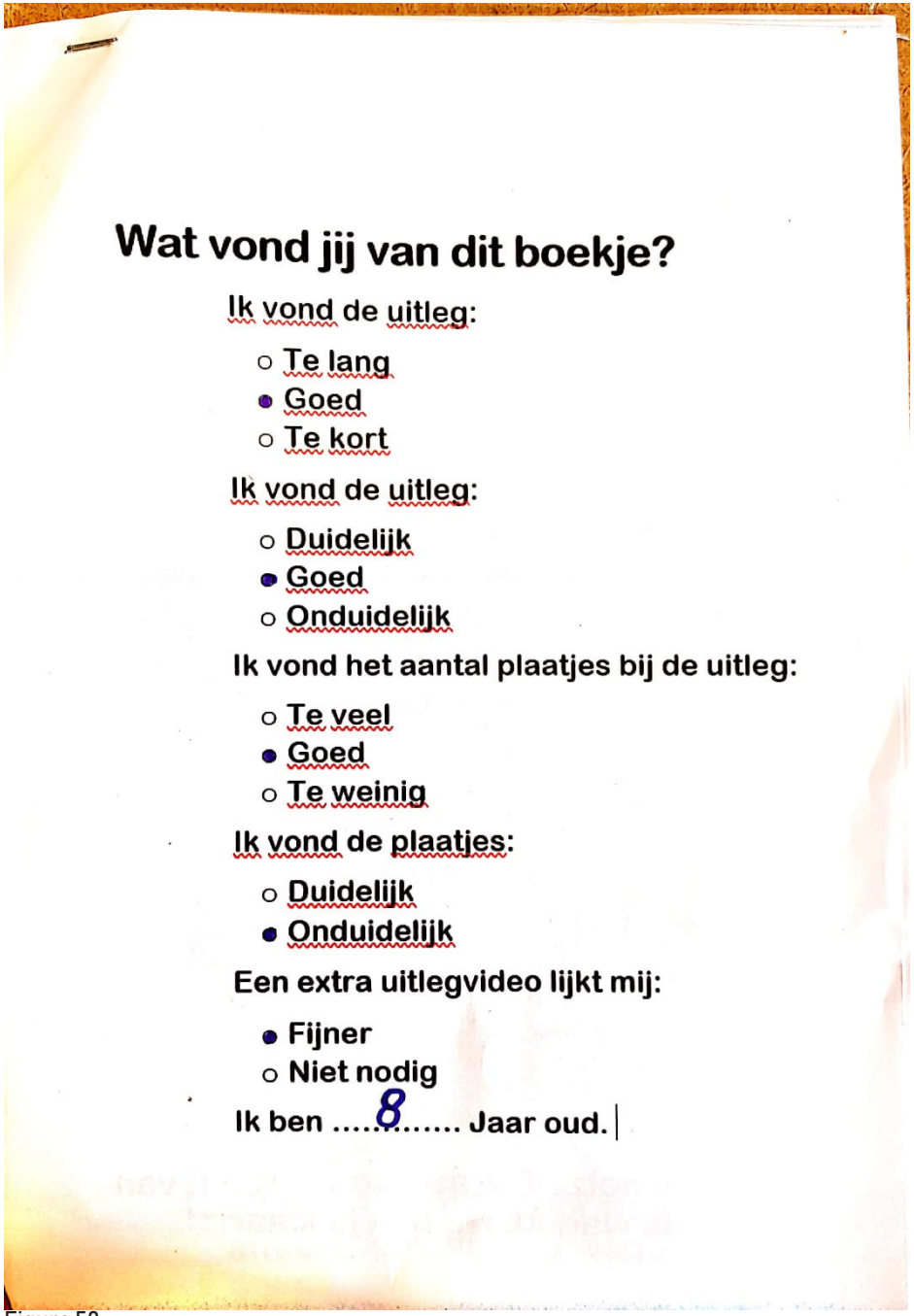
Figure 58



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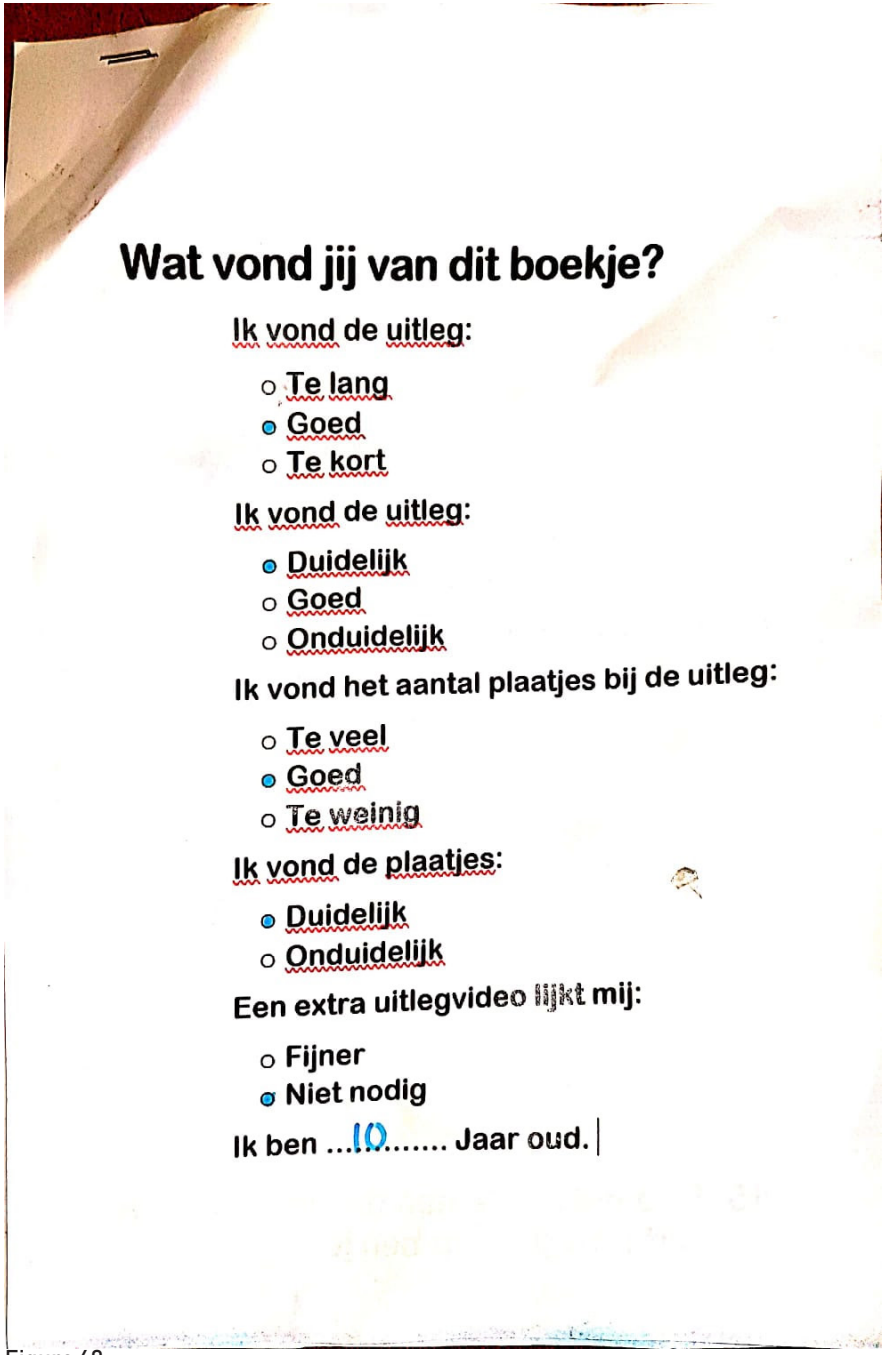
Ik ben ..8..... Jaar oud.

Figure 59



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- ○ Goed
- ○ Onduidelijk

Ik vond het aantal plaatjes bij de uitleg:

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- ● Goed
- ○ Te weinig

Ik vond de plaatjes:

- ● Duidelijk
- ○ Onduidelijk

Een extra uitlegvideo lijkt mij:

- ○ Fijner
- ● Niet nodig

Ik ben ...10..... Jaar oud.

Figure 60

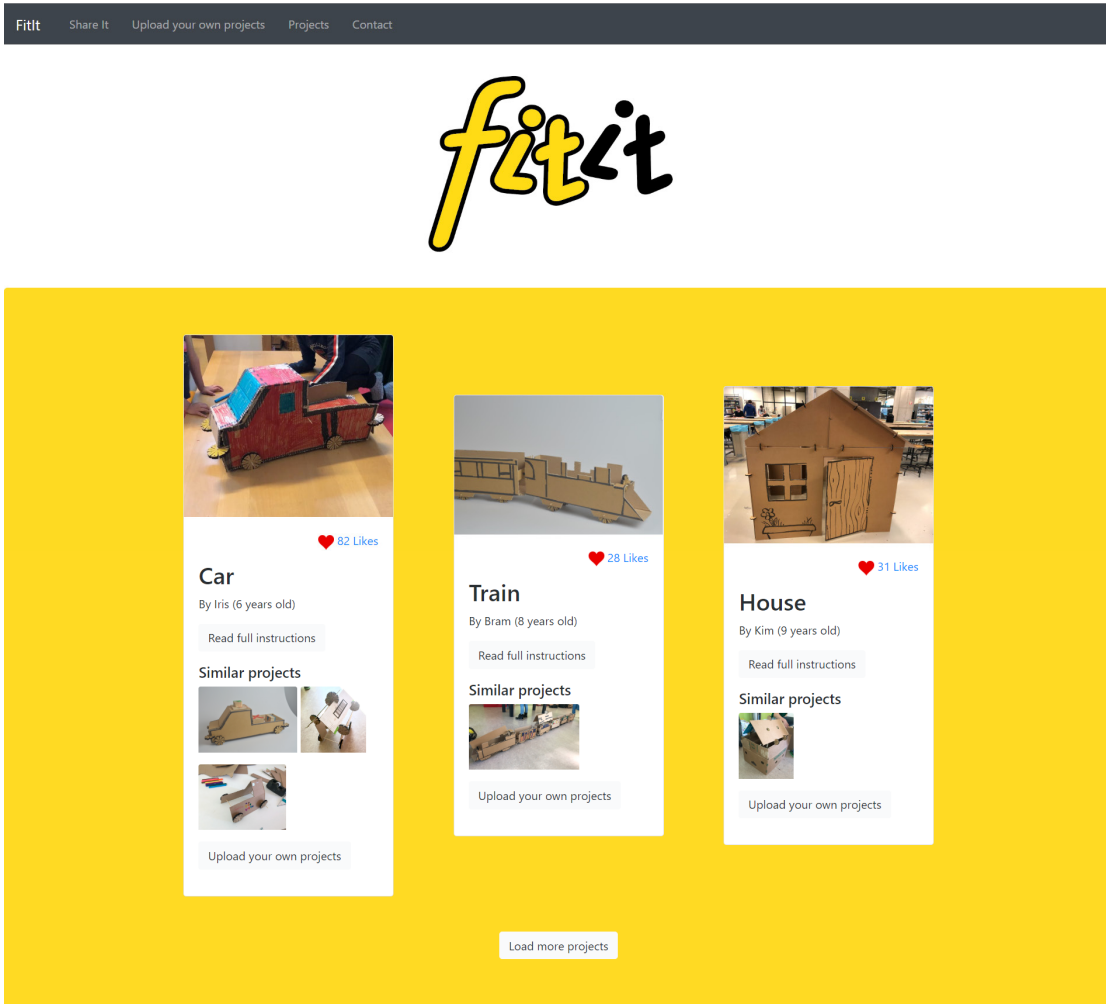

Figure 58: Front page of website

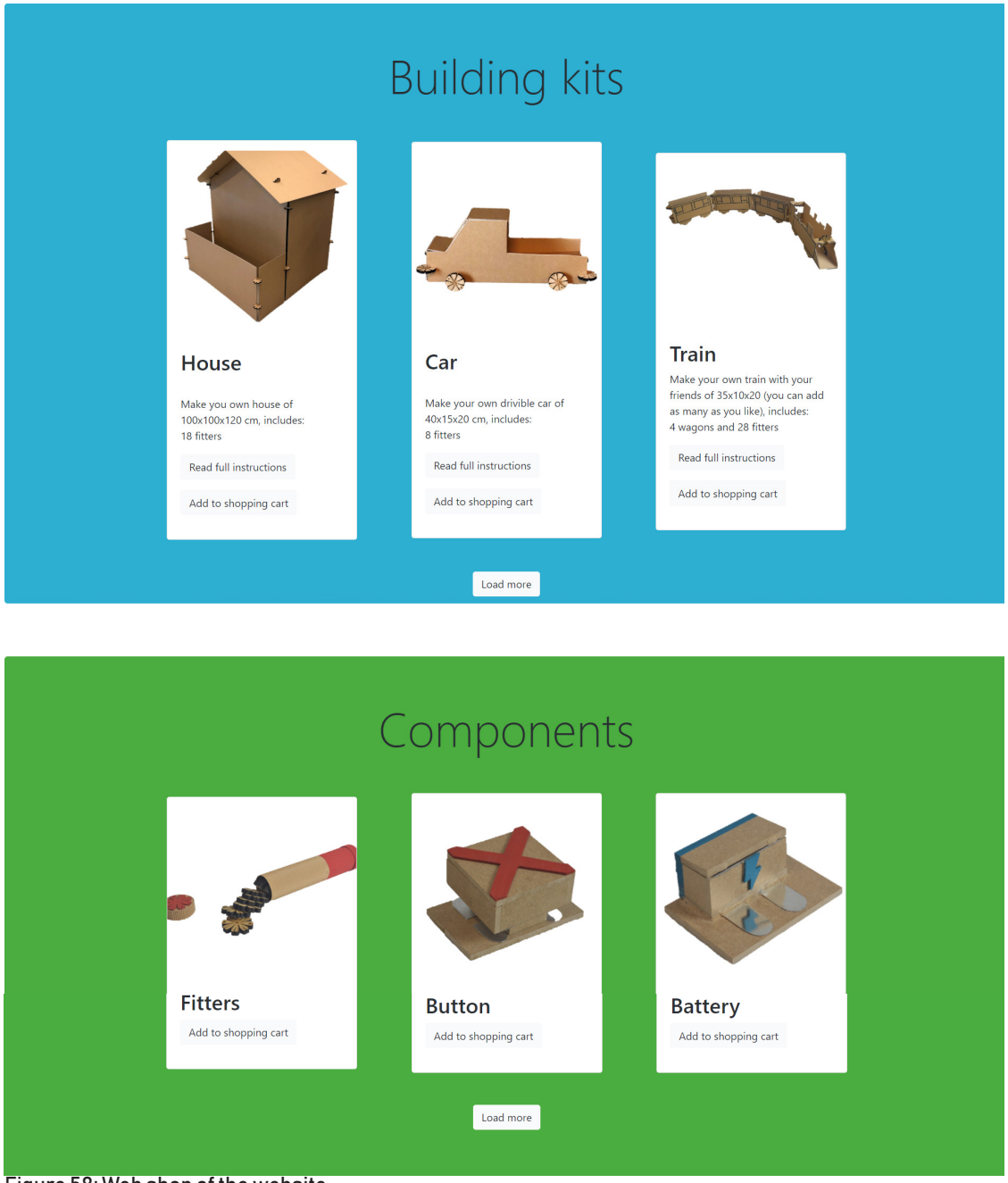

Figure 58: Web shop of the website