

READY. SET. GLOW.



Eindhoven University of Technology,
Bachelor College Major Industrial Design
DPB100 - Project 1 Design
Turn up the Light
2016/2017, Semester B
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INDEX

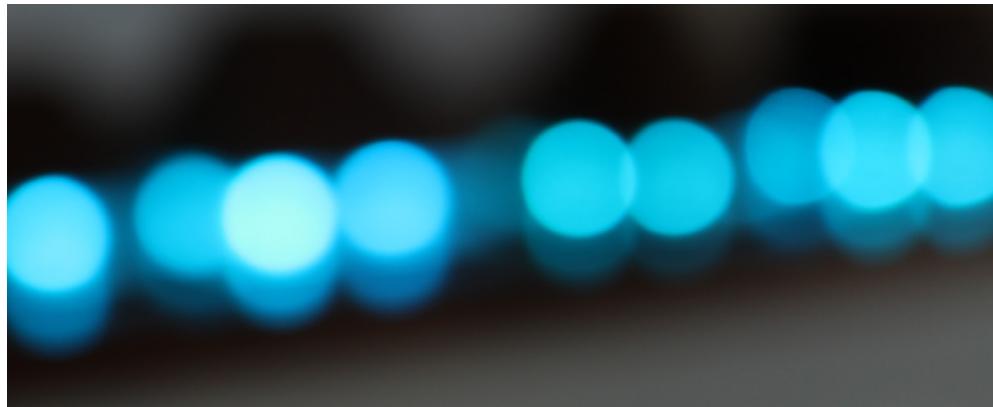
	Page number
Introduction	3
Project goal	4
Background information	5
Process	6
Iterations	9
Overall results	11
Conclusions	14
References	15
Individual reflections	16
Appendix	20
Contribution	31



INTRODUCTION

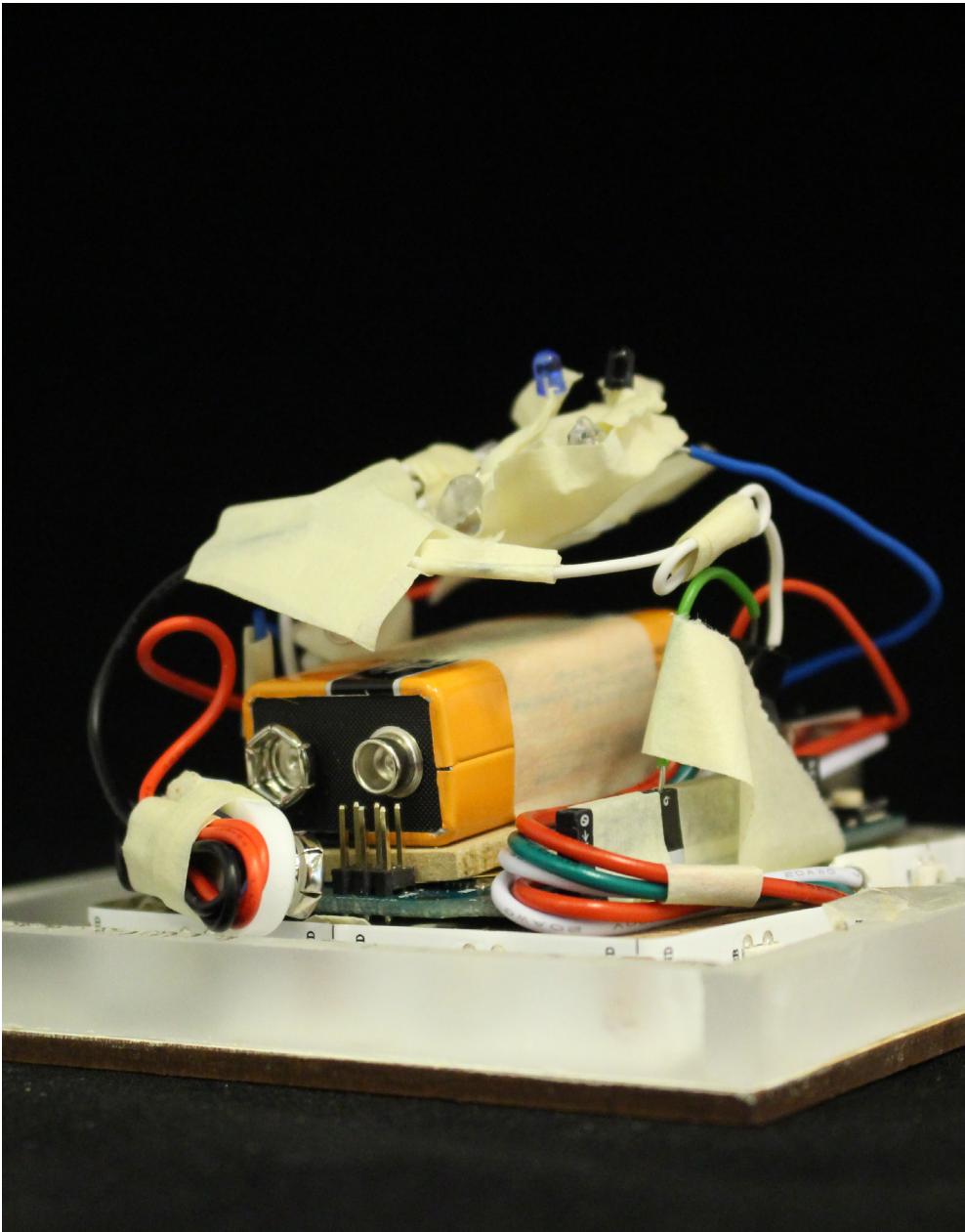
The main project topic was light. After various brainstorming sessions, focus was put on helping people who have trouble structuring their morning routine. This mostly concerns people with for example ADD or ADHD. The idea was to try to find a way to help these people structure using light. For the midterm demoday, the prototype consisted of a combination of an alarm clock which gave nice sounds in combination with some hemispheres which were placed at important location of the routine. These would change color once the user touched them, and thus, guiding him through what he/she has done yet, and what should still be done. After the demo-day, the focus shifted from the waking up itself to the actual guidance part of the concept. Different shapes were made to place at different key points in a routine. These shapes have a logical order and guide the user through. When a user touches the top of the shape, the way the light behaves changes, after a certain time of a static light, the light will have a movement in the direction the user is supposed to be going after.

This report focuses on our project goal, contains relevant background information, looks at our design process and iterations and in the end, it shows the final result and drawn conclusions.



PROJECT GOAL

Our project focusses on people with AD(H)D who lack structure in their morning ritual. The design aims at providing more structure in this morning ritual, which will create a more relaxed feeling of starting your day and a ritual that will become more efficient. The users will be guided through a fixed route through the house and thus a fixed morning ritual will be generated. A selection of four different locations was made, each with its own tasks that need to be carried out. To make sure our design will be effective, the target groups' senses will be triggered: tactile, visual and audio.



BACKGROUND INFORMATION

For our design we focus on people with AD(H)D. ADHD and ADD are chronic conditions characterized by inattention (such as distractibility, forgetfulness, or disorganization), impulsivity, and hyperactivity. Hyperactivity is mainly the case when suffering from ADHD. (Webster, 2012)

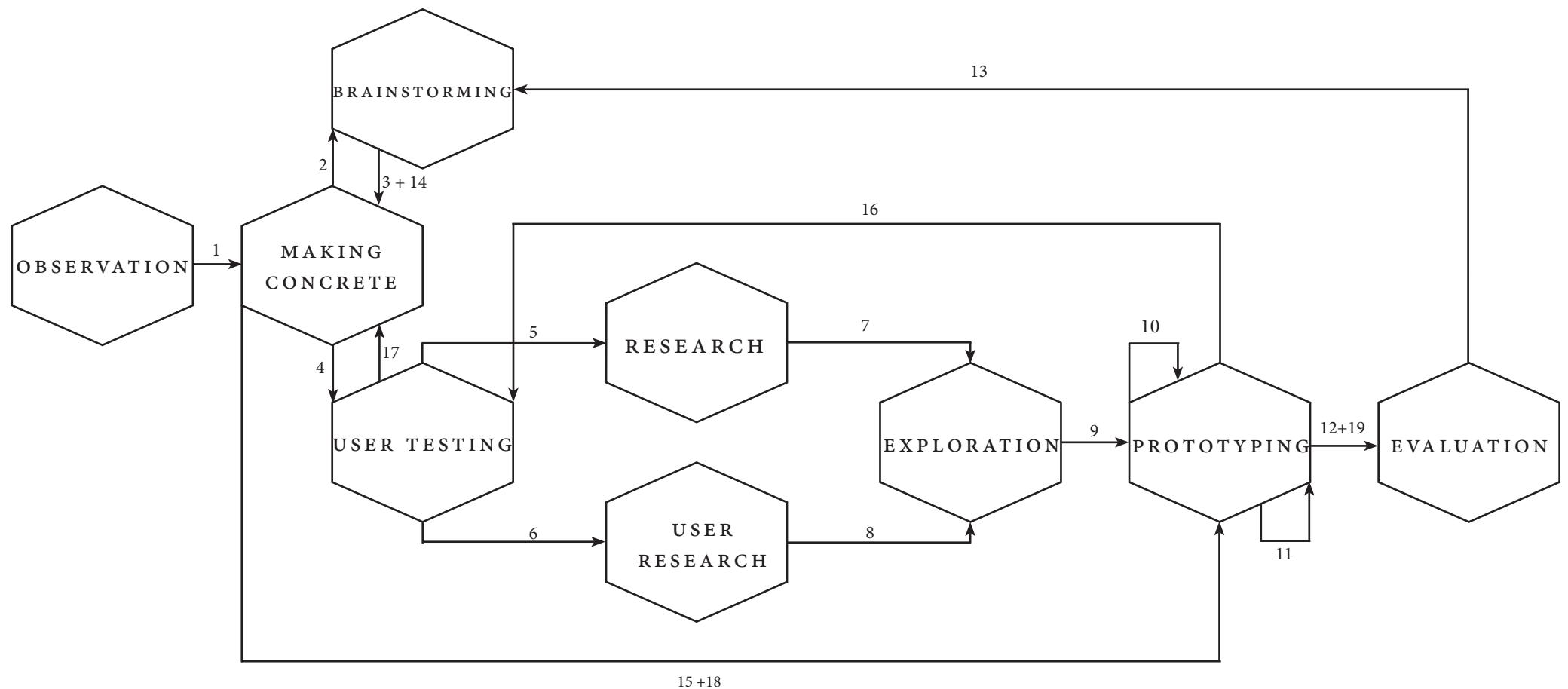
As stated in the research paper "Attention Deficit Disorders and Sleep/Arousal Disturbance" by Brown and McMullen, JR., falling asleep, awakening and/or maintaining adequate daytime alertness is a chronic struggle for people with Attention Deficit Disorders. (Brown, 2001) Before the first demo-day we tended to also focus on falling asleep and awakening and gaining more structure in the evening routine as well. However, we limited our focus on just the morning routine. The paper states a very important point; namely, that many persons with Attention Deficit Disorders note (as Isabel experiences similarly) that they often have much difficulty in doing a routine or un-stimulating task. Another research paper "Impact of attention-deficit/hyperactivity disorder on the patient and family: results from a European survey" analyzed parents' perceptions on how their children with AD(H)D vs children without AD(H)D coped with their morning routine and they conclu-

ded that 41% vs 12% experience their morning routine as a greater challenge. (Coghill, 2008)

We found out that there is already something comparable designed, but not on the market yet. (Luria, 2015) The product is called TangiPlan and provides a tangible object for every task in a morning routine of a person with AD(H)D. The sites states the following: "The TangiPlan System that includes multiple tangible objects and an android tablet application. Each object represents a task that needs to be executed by the child during his or her morning routine." However, having an object for every task would create an even more unclear overview on what to do or what not to do. Having one object per room would make it even clearer. Also, our prototype is automatically activated when starting the morning routine, and does not have to be planned every night since that burdens the user with another responsibility to plan the next morning's routine. Furthermore, our design offers a more abstract and integrated way to structure the morning routine. Linking an object to every task, though, would provide useful insight in the specific tasks that have been skipped.



PROCESS



In order to create a comprehensible overview of the design process of the past 20 weeks, the graphic picture above was created. The numbers correspond with the steps in the process and can also be found in the explanatory text starting on the next page. The same steps are used on the process pictures.





Process

1 : Observation

During the first phase of this project, an introduction to the topic “light” was given. The first exercise was to look at lighting in various public spaces.



2 : Making concrete

After exploring the different spaces to implement a lighting system, the results and ideas needed to turn into something a bit more comprehensible. In order to do this, the first version of the design thesis was written. The design thesis can be found in the appendix.



3 : Brainstorming

With the design thesis as basic starting point, brainstorming sessions were held to come up with ideas. Through sketching, mindmapping and talking about the various possibilities, a list of ideas was generated. One of the ideas was selected to work out a bit further.



4 : User testing

To get feedback on the selected idea, a list of interview questions was written and interviews were held. The main point that could be taken away from this was using multiple senses in the design: combining sound, scent, light, and touch in the best way possible.

5 : Research

Before working out the idea further, two research steps were taken: general research and user research. In this step of the research, the general research, papers were looked up to support the idea.



6 : User research

During the user research, the results from the previously held interviews were used to create personas.

7/8 : Exploration

After doing research and getting more feedback from the project coaches, the first idea was changed completely. With the midterm demo day only a week away, the next step was exploring our options and moving on to prototyping.

9/10/11: Prototyping

To get an idea of how the marble track (see pictures in iterations) would have to be made, the first (low-fidelity) version was created using cardboard and tape. After that, the prototype was translated to a somewhat more high fidelity build. Additional prototypes were made and used in the demonstrator video and on the demo day.

12: Evaluation

The demo day was a great way to evaluate the idea and functionality. Points of feedback were written down to take into account during the next steps of the design process.

13: Brainstorming

One of the main points of feedback of the demo day was that the project could be brought back to a bit more of an abstract form. With this in mind, all physical shapes used before were left behind. New mindmaps helped get an impression of the factors important to include in the design.

14: Making concrete

The results of the brainstorming session were put together to be able to comprehend the importance of the various factors in the next phases.

15: Prototyping

With so many changes to the design, it was time to create some low-fidelity prototypes again. The focus was put on shapes and structure, for which foam mockups were made.

16: User testing

To get a clear view on what shapes and structures would be best to use, a user test was written up and tests were held. Two main results from these tests were the order of the shapes and the structures that could be linked to each other, combined with locations.

17: Making concrete

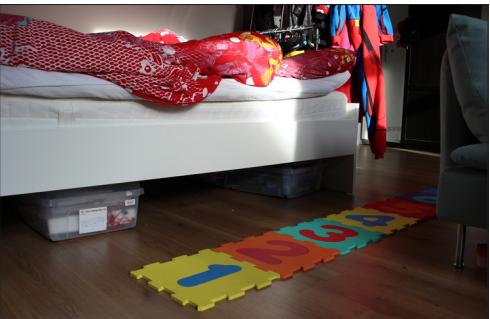
With the results from the user tests as input, there were still a lot of decisions left to be made. One thing that didn't vary too much during the different tests was the order the shapes should be placed in. This input was used in the final designs. With a more concrete idea of what the final prototypes would look like, the focus was put on prototyping again.

18: Prototyping

Unlike with the previous iterations, these prototypes required quite a bit of planning. To be able to give a similar look to the different shapes, laser cutting was chosen as the best way to create the shapes. With the lasercutting files waiting to be cut, the electronics to build the system were purchased and the code was written. The prototypes were made in two stages: the basic shapes and the electronics. Once all layers had been glued together and the components soldered together, the basic shapes and the electronics were put together.

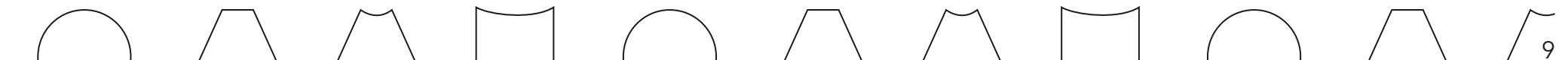


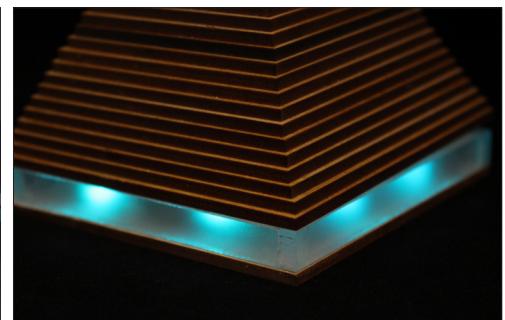
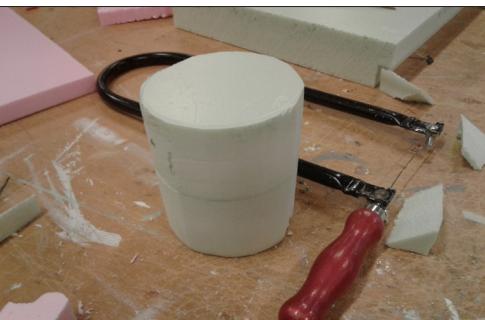
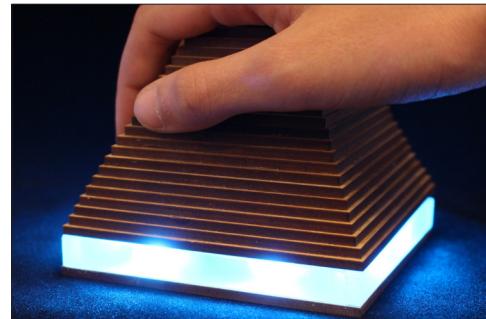
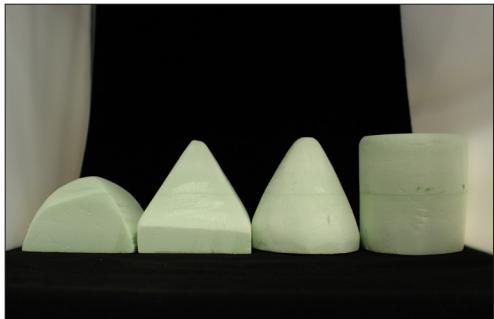
ITERATIONS



The first brainstorming sessions lead to the idea of using soft foam tiles that would light up to guide a way through the morning ritual. The soft structure of the tiles combined with the lights was an exploration in combining senses.

A week before the demoday, the idea of the tiles was dropped and a more abstract form was explored. Starting with a marble track lit up by a rolling ball of light, the route was continued by placing hemispheres at the various check points. In this iteration, the focus wasn't put on the electronics yet.





Before moving on to the final prototypes, a penultimate iteration was made to experiment with different shapes and structures. In this version, shapes and structures weren't combined yet.

For the final prototypes, the combination between aesthetics and electronics was tried to be combined in the most optimal way possible. To create a coherent look throughout the different shapes, layers of lasercut mdf were used to build up the lamps. A layer of sandblasted perspex was put underneath the wooden base to slightly fade the light of the LED strip. The sensor included in the top of the shape makes it possible for the program to be activated when the base shape is touched.



OVERALL RESULTS

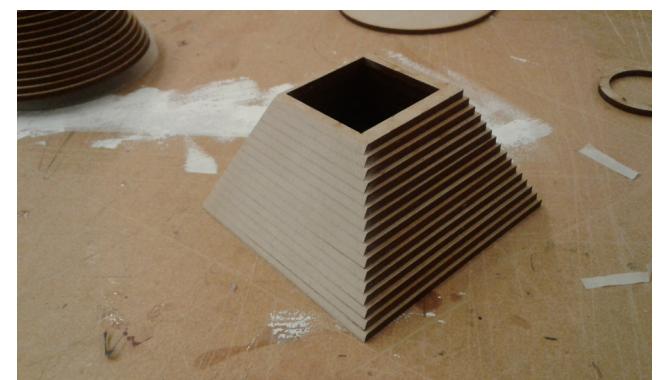
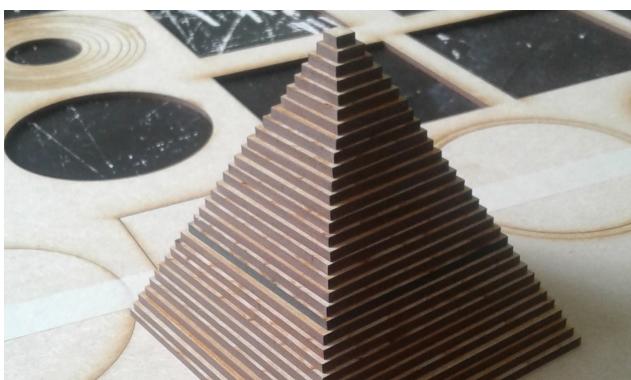
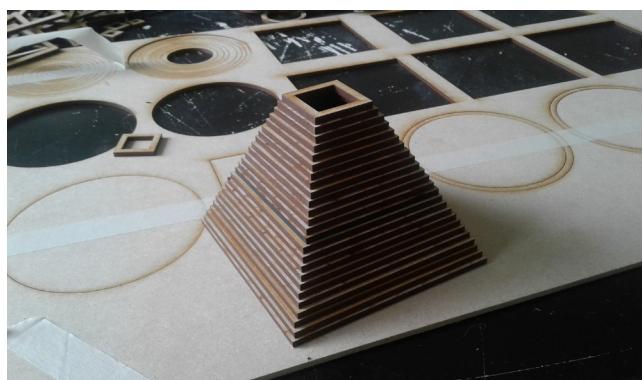
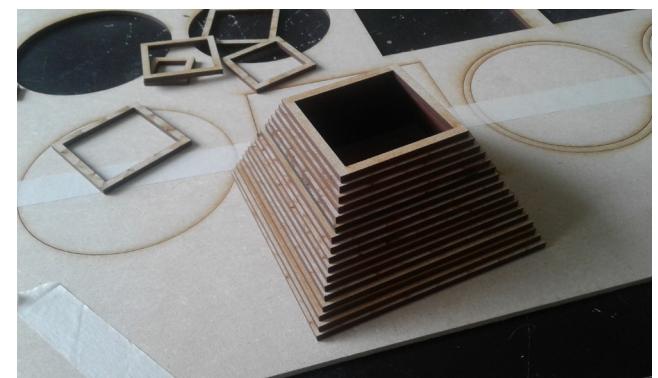
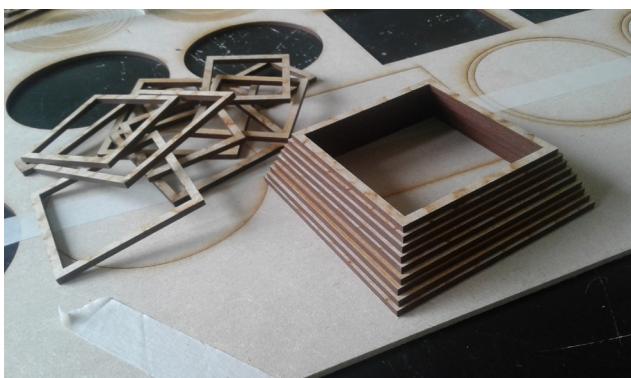
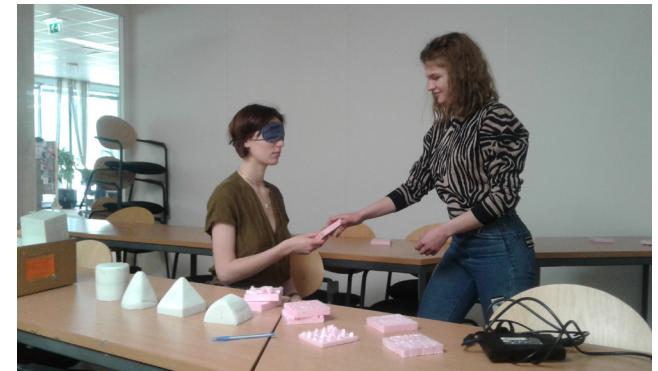
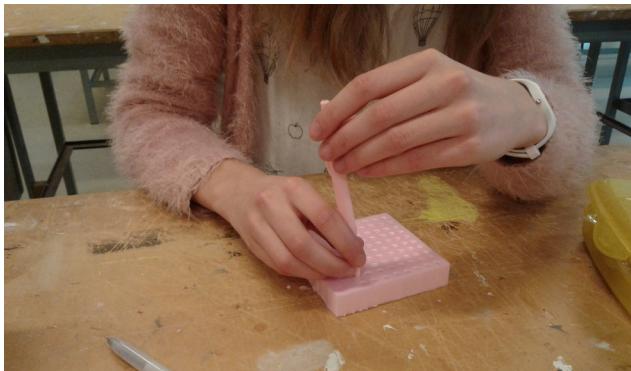
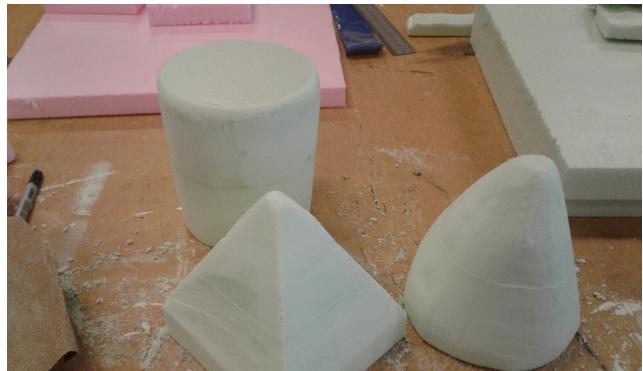
Concept

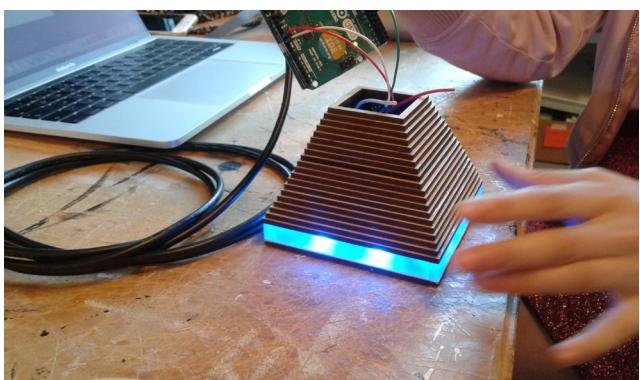
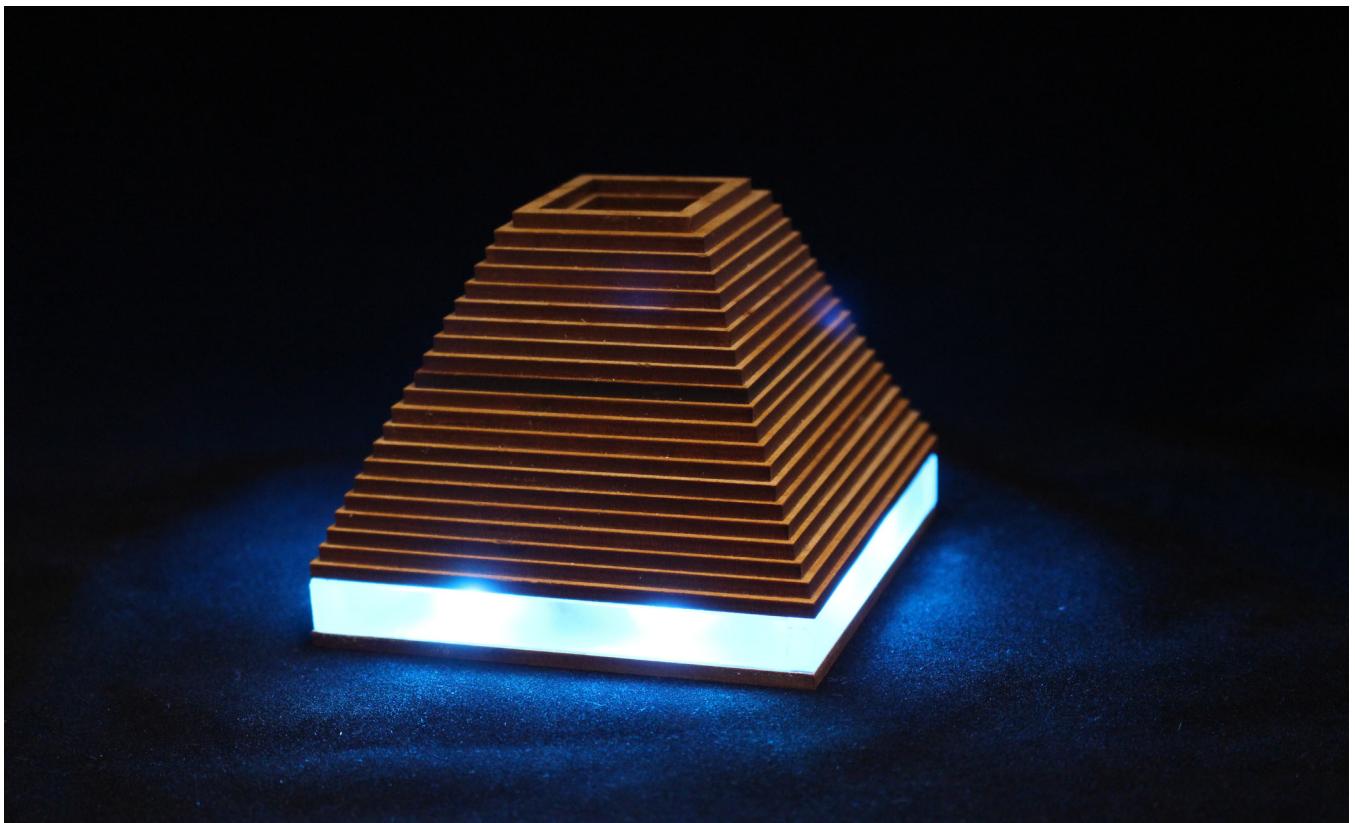
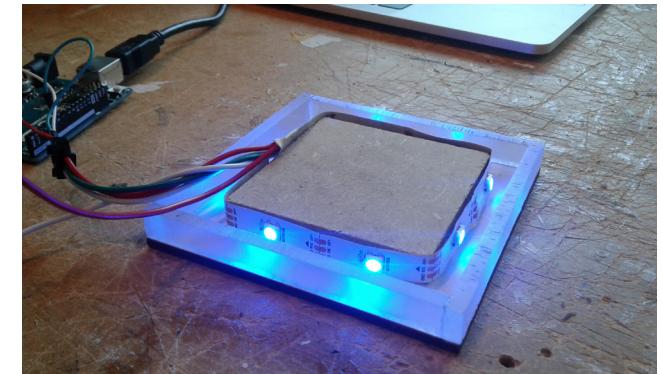
The design targets people with AD(H)D who struggle with structuring their morning routine. A morning routine consist of activities in different rooms. Our design consists of four different objects who each represent a different room. In each room you will need to do one or several activities. After touching the object in one room the object will light up the whole duration of the activity and will create wave light to the next room. So the objects guide the user during the activity and they guide him/her from one to another room. After repeatedly using this product, so on the long term, people will not need our product anymore and do it automatically. You can re-use the product when structuring a morning routine in a different environment.

Prototype

It had been decided to let multiple primary shapes represent each a different room. A user test was done to decide which shape was linked to which room. At first a user test was conducted to decide the structure and the order of the objects. The 16 different structures were made and we let people match these structures blindfolded when possible. Four structures were matched by multiple users, and these four structured were planned to become part of our prototype. First a lasercutter was user to cut the different layers of the triangular and cone shapes which generated a non-smooth, multi-layered, ribbled surface on the triangular objects. We decided to go for this structure and lasercutted the round objects (cylinder and hafl cylinder on its side) as well in such way that they would get the same surface. The cone and the triangle was adjusted in such way that they felt more comfortable to grab, by "imploding" the triangular top. For further visuals on the construction of the prototype, see the next pages.







CONCLUSIONS

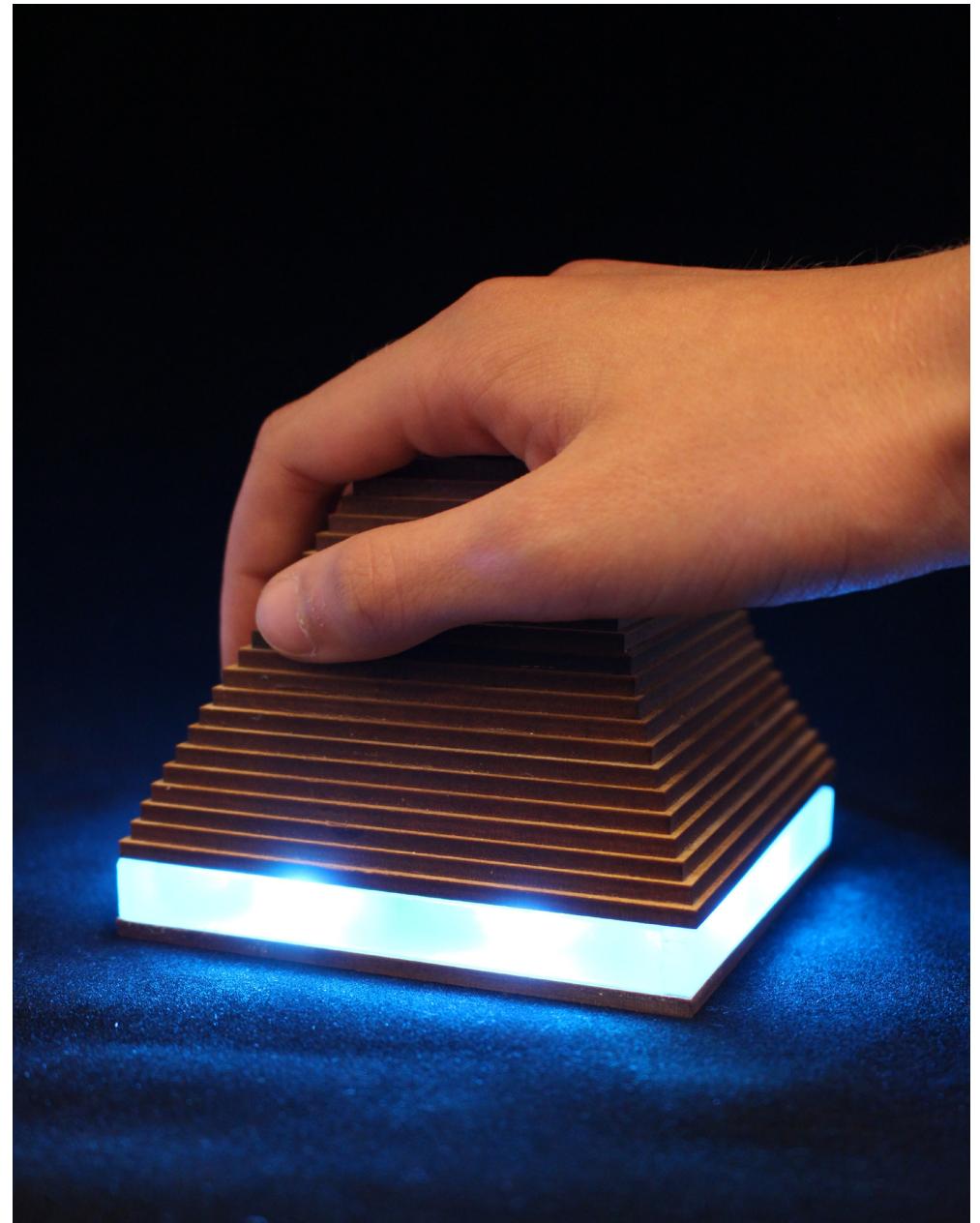
When looking at the final result, we can all agree that the outcome is something to be proud of and happy with. Even though the project didn't go as smoothly as possible throughout the semester, the end result is what we wanted to achieve. When looking at the final prototypes, they actually look and feel like an end result, where aesthetics and electronics came together in the way we had envisioned in the beginning of the project.

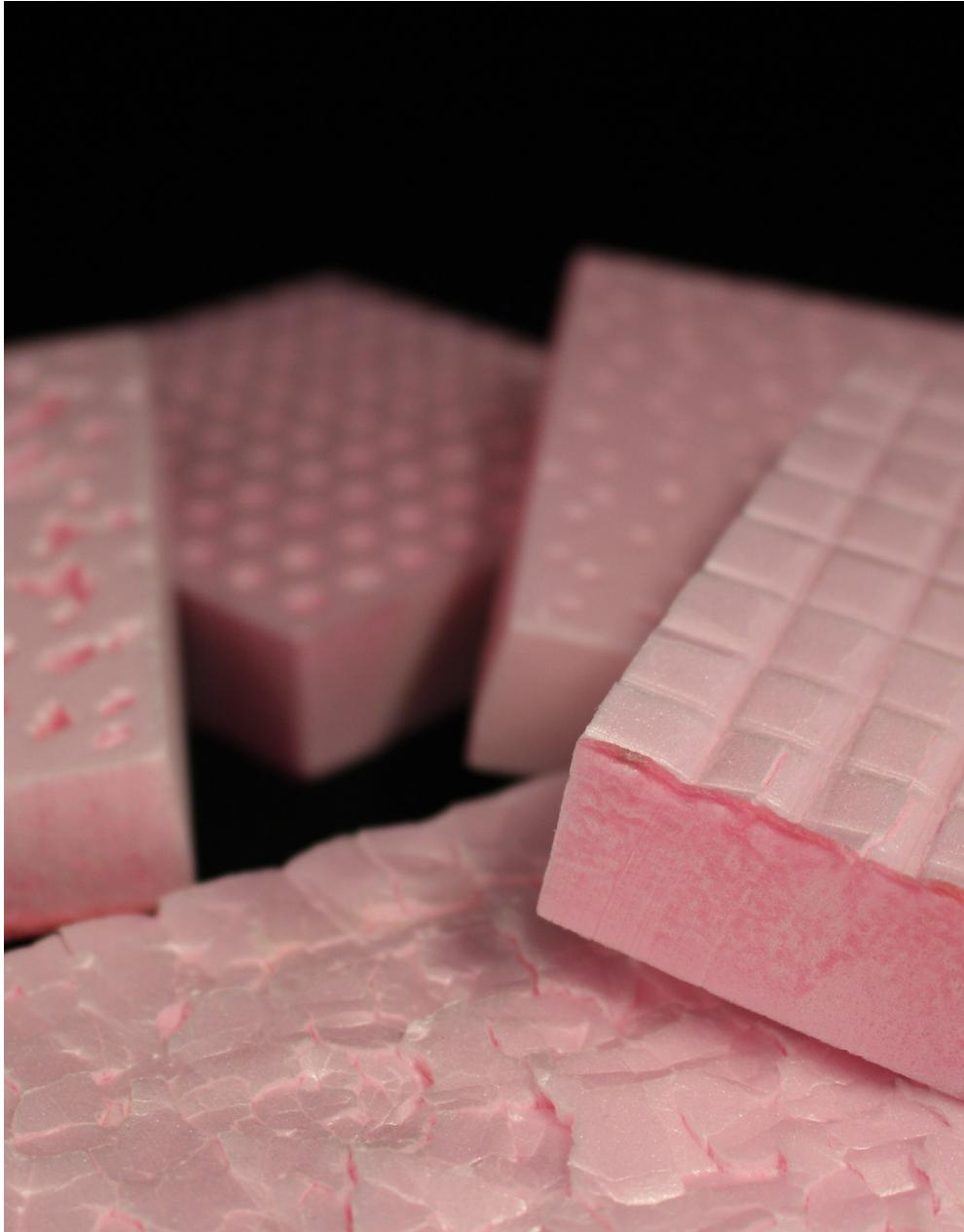
Of course, there's always room for improvement. One thing that could be looked at would be the code. Right now, all objects run the same code and are activated based on sensors. Linking the shapes together could give it a bit more depth. Another option, for example, would be to have the shapes behave differently based on their placements.

When thinking about mass producing, several aspects would need to be changed. The way the electronics are incorporated in the shape can be done much more efficiently and the basic shape could be produced a different way than stacking 30 layers of laser cut mdf for every shape.

After the demo day, a few other useful points of feedback can be used to write some recommendations. One thing that could be improved is the moment the shape gets activated. Right now, the leds switch from their breathing pattern to a bright blue colour. When the light is at its lowest at the moment of the switch, it's quite clear, but at the other moments in the breathing sequence the change is barely noticeable. Having a clearer indication, for example letting the leds blink in a totally different colour once, would already be an improvement.

Another important point we heard at the demo day was the possibility of implementing sound in our design. This was something that had been considered before as well, but for this design the focus was put on light as output. Including sound would be a good idea, because both light and sound (and sound even more) is very effective when it comes to peripheral interaction. It can very easily attract the user's attention.





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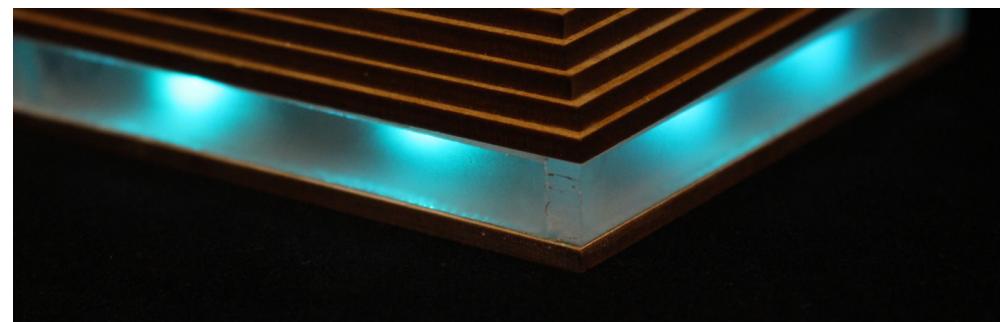
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INDIVIDUAL REFLECTIONS (1)

Reflection Lisa Laugs

This reflection focuses on project 1. Subjects that are covered during project 1 are for example brainstorming, conceptualization, realization and evaluation. The end deliverables are a working interactive prototype, visuals such as a poster and business cards, a video and this report.

General learning experience

When I started this project, I already had some experience in completing the design cycle (through other courses or electives), but I had never worked on a single project for a full semester.

Looking back at our design and research process, I think there are some points of improvement. Firstly, in the beginning we got sort of stuck with our first idea (the tile path). I learned that it's important to keep an open mind, look beyond your initial design and explore varied possibilities. Luckily we managed to divert from the tile concept and we transformed it into a more abstract form. Secondly, I think we could have involved our users more throughout the entire design cycle. Right now, we only did some user testing at a very early stage of prototyping, to see and evaluate what structures and shapes are preferred. In the future, I would also like to do some user testing after the final prototype is finished. In this way, the user will experience the full experience as we intended it. Through this type of user testing we can get very useful feedback and solve flaws that might still be present.

Regarding our research process, I think we found some very useful papers to support our assumptions.

Group process and individual contribution

I'm very satisfied with my group! We needed some time getting used to each other and although we all have different personalities, we had a good group collaboration. I felt like there was a real "team spirit" and we were all motivated to work for great end deliverables.

Most of the design process was a group effort, especially in the beginning. As the time passed, we started dividing tasks more.

Tasks that I have executed are for example creating the storyboards (see appendix) and for the mid-term demo day, as well as the final demo day, I took care of the visuals: I was responsible for the poster and business cards (see appendix). For our final prototype, I prepared the Illustrator files for laser cutting and I did the programming. Of course I also helped with prototyping in general, like creating the structures in foam, cutting mdf, soldering the electronics and sandblasting.

Before this semester, I set myself goals concerning my personal development. These goals included visuals, photography, meeting skills, and business. When it comes to visuals I have achieved my goal. I took care of the posters and business cards and even did the printing and cutting. Furthermore, I paid attention to the aesthetics of the prototype and I was responsible for the layout of this report (on which I spent a lot of time). Together with Emily, I worked on photography. Although Emily was the one who was actually in control of the camera, I helped with creating the composition, light setting and edited the photos afterwards. Regarding our meeting skills, a clear positive development can be seen during the semester. We started assigning minute makers and we set a specific goal and desired outcome before the meeting began. Lastly, looking at business, there wasn't a lot of opportunity to improve this competency in this project unfortunately. However, I was able to develop myself by looking at informative videos and filling in a business canvas for our concept (see appendix).

My role within our design team was keeping the focus. As soon as we tended to deviate from the subject, I helped keeping us on track. Also, often I was the one who was the minute maker and took notes.

Overall, I really enjoyed working on our project. Besides that I learned a lot, I also met great new people. I'm looking forward to applying my freshly gained knowledge, in other projects in the future!



INDIVIDUAL REFLECTIONS (2)

Reflection Emily van Leemput

For the first design project in B1.2, I chose a project in the theme “Turn up the lights”. During the first few weeks, brainstorming sessions lead to the concept of structuring the morning routine of people with ADD or ADHD. The various iterations all focussed on this concept, though the main change between the different iterations was the level of abstraction. Our first iteration was already really specific in both visual and technological aspect. For me, one of the hardest parts of the design process was actually letting go of this first idea.

Continuing on with new, improved iterations did however enable me to focus more on my main goal for this project: combining aesthetics and electronics to create a working prototype that looked pleasing as well. Throughout the project, I mainly focussed on the visual aspects, both in the prototypes as in the visual demonstrators. For the midterm and final demo day I created a demonstrator video explaining the project. Editing demonstrator videos is something I had a bit of experience with after the course “From Idea to Design”, where I also edited the video. Another visual I worked on for the final demo day was the graphic showing the process visualisation. The most challenging part was finding a way to add a lot of information in a clear overview, which I think worked out pretty good.

Apart from the visuals I focussed on, I also worked on the electronical part of the prototypes by soldering and making sure all four shapes actually functioned. Not all electronics worked properly after the first connections had been soldered, so I focussed on resoldering to get everything to work. For me, this stage of the project was mostly about helping out at the points where it was necessary: taking a look at the code, getting started with the business cards, resoldering connections, and documenting everything by taking pictures.

Throughout the project, I kept an eye on the planning, making sure that after the midterm demo day a week division was created to ensure that everything would be finished before the final demo day. Even though one of the weeks in our planning seemed to have disappeared, the extra time I planned to finalise everything was enough to make up for this. By working on the planning I was also able to keep an overview of who was doing what and how tasks should be divided to make sure the division was as optimal as possible, thinking about personal goals and workload at certain moments.



INDIVIDUAL REFLECTIONS (3)

Reflection Isabel Leus

The topic of my project in B1.2 was light. After a lot of brainstorming we were interested in helping people who have trouble structuring their morning routine, going to bed and waking up with the use of light. This target group consists of for example people with AD(H)D. During the first quartile (so before the midterm demoday) our first prototype was a combination of hemispheres placed at different locations which you will follow during your routine and an alarm clock which generated because of the use of the shape a nice rhythm of wake-up sounds. After the demo-day, we decided to focus on the target group's morning routine. We made four different shapes that can be placed in the different rooms that you will need to be during your morning routine.

This project felt/feels quite personal, since I have ADD and experience this problem myself every morning. The project gave me lots of energy since I was practically the user, so I knew the problem and could give lots of input. It was also very nice to speak with other people who also experience lack in their morning routine because of ADD or ADHD and also hear from them that they would like to have our design since they experience the same chaos every morning.

In our group we had four completely different personalities, who all needed to find their way into the project. However, I really liked working together on the project since especially in the end everyone was motivated to put time into the project and we could have a laugh with each other many times.

In quartile 3 I experienced that I got a lot of energy from brainstorming and making the first initiations for the project. As I already said earlier this project is very personal and strongly motivated me to make life more relaxed and more structured in the morning for this targetgroup. Since I experience the problem myself it gave me lots of material to discuss during the brainstorm

sessions. At the end of quartile 3 I redefined my goals for the rest of the year and I decided that I wanted to gain more insight on programming and wanted to program the final prototype of the project. Furthermore, I wanted to get over my blockade for usertesting and do the ustertests.

In quartile 4 we focused on what who wrote in their goals for the rest of the project. The rest of the group wanted to focus more on the visuals since they set that as a goal. The usertesting made me help to feel more comfortable asking people for a favor without them getting a return. I now tested with people from the faculty, but in the future I also want to get comfortable with people who do not know how making and giving a user test feels. For approximately one week I made a mistake by deciding that since I did not write a goal on visuals, that I should focus more on my own goals and thought that helping the rest during prototyping the visuals would be of less use, since there were already three people working on it and I specified two different goals for the rest of the project. When prototyping I got stuck in a to-difficult-thinking and worked for hours on the programming of the light pattern without going anywhere. When I discussed this my groupmates came up with something completely different and solved the problem quite quickly. At that point it bothered me that in that week I did not help them a lot with making the prototypes, however I did solder the electronics, but they also had to fix my programming. So I learned that dividing the tasks is okay, but do not get to caught up in your tasks since it will feel like failing when asking help instead of working together.

I think that for a first year project we already show a very concrete prototype which already has a rich interaction. However, since it is such a personal problem I would have liked to do this project in a later state of my bachelor when we have more skills and to so be able to bring the design to a higher level. But for the skills and knowledge we had I think we can be very proud of the results we gained during the project.



INDIVIDUAL REFLECTIONS (4)

Reflection Milan de Meij

For my first design project, I chose light as a topic. Before this project, I had some clear goals which I wanted to achieve, I wanted to get better at planning, and I wanted to become more active in groups. At the start of the project, I didn't really participate as much as I should have. Those first two weeks, were a little bit of a rough start, after which I eventually found my motivation to participate more in meetings and bring up my own ideas. Throughout the project I got more and more interested in what we were doing and had more input as well. Something which also really helped me was that at the start of the project, Emily decided to make a big group planning, with all 10 weeks of the first of the two quartiles. After which I took this planning home and stuck to my bedroom door, to keep adding things to it. A second thing which we did was that from the beginning we structured everything we made and make designated maps for every week we had, which created a clear overview of what we have done.

Another thing I wanted to focus on this project was prototyping. I wanted to create something which looked nice and functioned well. Most of my groupmates had put focus on this as well, which made it fairly hard to claim it. However, when we started working on the prototype I think we were all equally involved in it, which makes it so that I think we can all look back at that and be happy with what we've done. I mainly focused on the mechanics behind our prototype, for example, cutting the proximity sensor open in order to be able to implement it into our product without it being too obvious its present. Throughout the project I came up with quite a lot of ideas that I think benefited our final product much. I didn't want to put focus on the coding this project, but after Isabel couldn't manage to get the code working, me and Lisa decided to take a look into that and we eventually got a working code, after which we designed the circuit that was required for the prototypes to work. In conclusion, after a rough start, in which I didn't participate enough, I pic-

ked up the pace and got very involved in the project. I realized I wasn't a good groupmate and therefore tried to get more involved, but I also asked for a lot of feedback. By which I mean that I asked my groupmates if they thought I was active enough in the group. They said that at the start I had lacked in my participation, but that they were happy to have me as a groupmate at the end. I feel like I accomplished all the goals I had at the start of the project, which makes me feel very good. I really enjoyed working with both Emily, Lisa and Isabel and I think they're all very good teammates I wouldn't mind working again with.

For the future, this project has learned me a lot. I now have a lot more skills in prototyping, even though it's far from perfect. I hope I will be able to focus on aesthetics even more in the future, so I can keep improving on the areas I find important as a designer.



APPENDIX

Design thesis
part 1

Wake-up walk

Group: 5

Members: Isabel Leus, Milan de Meij, Lisa Laugs, Emily van Leemput

Design Thesis (Version I, 8-3-2017)

1. What will you design?

We are planning to design system that will help you not only wake up in a nice way, but that will also help you structure your sleeping schedule and morning ritual. Right now we're thinking of an alarm that you can deactivate by getting out of bed and after that completing a certain chain of events that can help its user wake up. This restricts the user from going back to bed and therefore help him or her wake up in a nice way.

2. What is its nature?

We want to implement the mechanics that turn of the alarm clock into tiles on the floor that will feel nice to your feet and also makes sure it doesn't feel cold. We're planning on implementing lights into this tile to make the actions and feedback more clear for people. There's multiple ways you can make the user feel like it's being guided by lights right now, by for example projecting foot prints which are leading the way. The tiles can be connected to form a path throughout your house. The lights on this path will not only follow you but also guide you through your morning/evening ritual.



Picture 1

3. Who is it for?

People who experience trouble structuring their sleep ritual (evening schedule / morning schedule), for example people with AD(H)D or Autism. Those are the persons that would have an advantage for this right now.

4. Why is it needed?

A lot of people suffer from sleep issues (going to bed / waking up). Most of them will be able to benefit from a product like this. It helps them get up in the morning and go to bed in time, therefore creating more structure in their life.

5. What are the benefits of it?

It brings structure to your sleeping and morning rituals.

6. Why is it interesting?

It reduces stress in the morning and makes it possible to start your day more organised.

7. How will you proceed?

Look into costs, work out the idea by sketching, look into realisation.

8. What are the constraints?

Possible high costs, is it feasible?





Picture 1



Picture 2



Picture 3



Picture 4

Reference

Picture 1:

<https://nl.aliexpress.com/item/10pcs-Children-s-soft-developing-crawling-rugs-baby-play-puzzle-number-letter-cartoon-eva-foam-mat/32614723132.html?spm=2114.48010308.4.134.YTnkz5>

Picture 2:

<http://www.ikea.com/nl/nl/catalog/products/20190198/>

Picture 3:

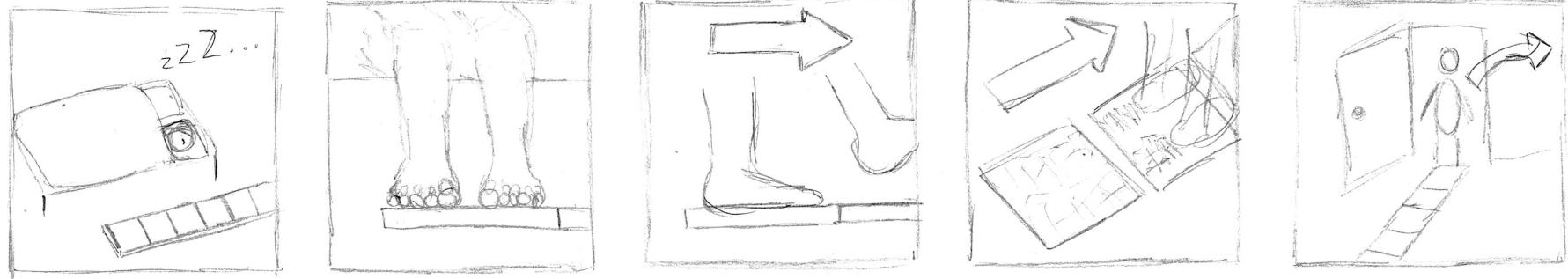
<http://newatlas.com/rug-alarm-clock-ruggie/41272/>

Picture 4:

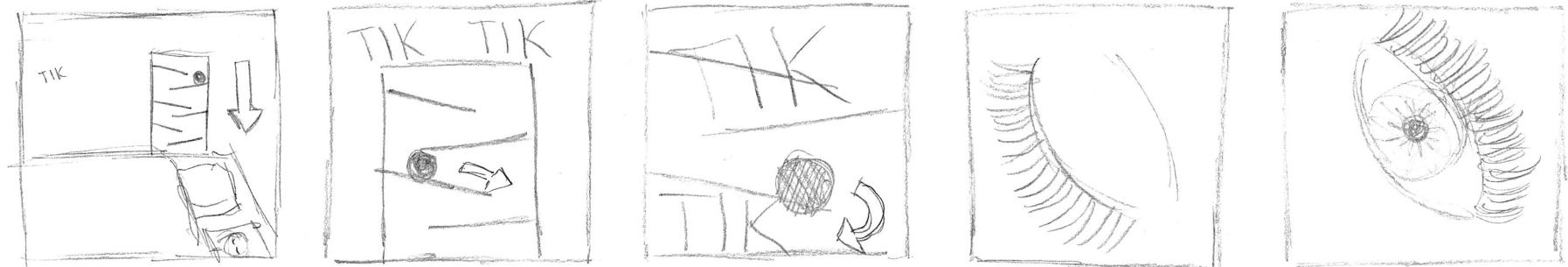
http://www.halloweenforum.com/attachments/halloween-props/105190d1322491805-animation-ghostly-footprints-project-anyone-have-how-create-one-87638d1316448348-ghostly-footprints-hauntedmansionfootsteps_referencephoto.jpg



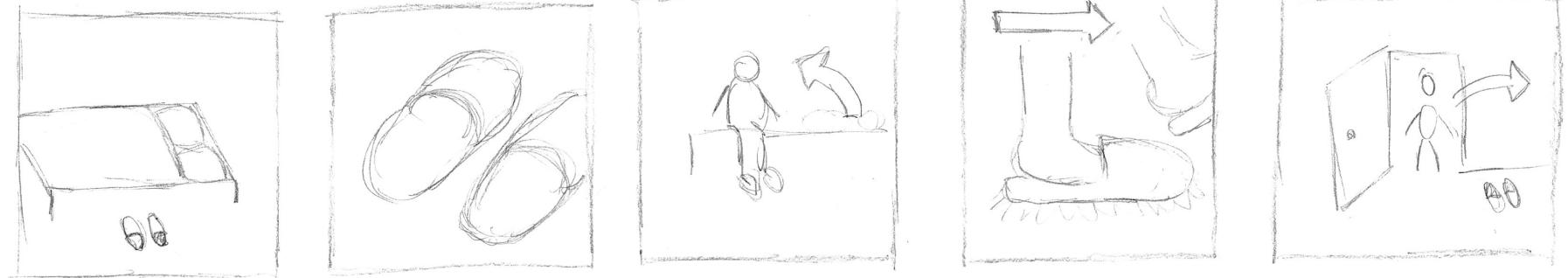
TILES



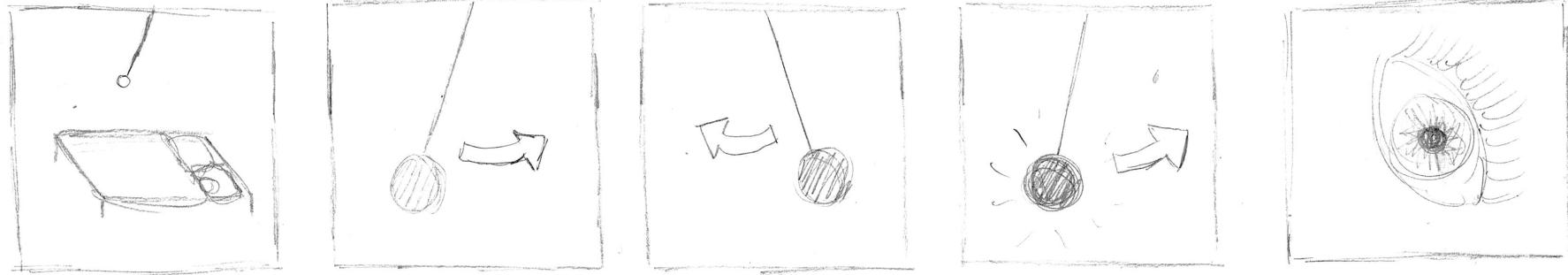
MARBLE TRACK



SLIPPERS



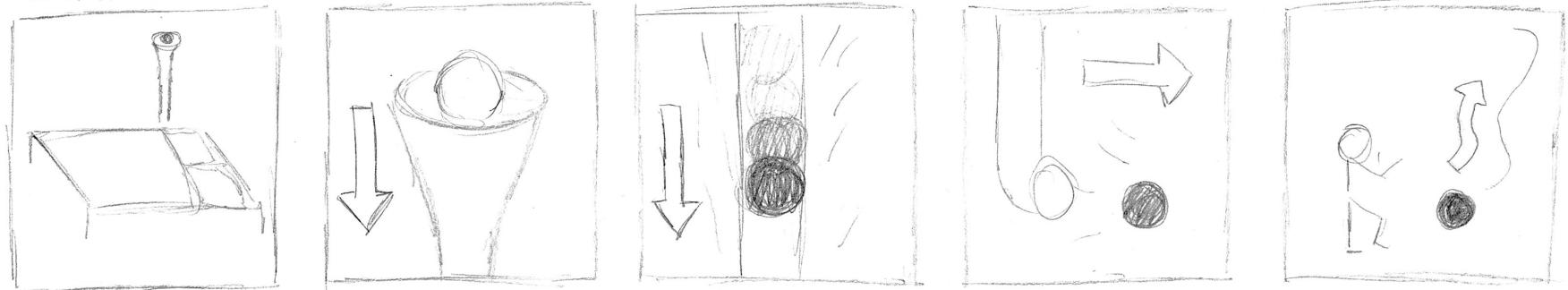
PENDULUM



APP.



LAMP





B1 / DPB100 Project 1 Design
Turn up the Lights



SCAN FOR
EXPLANATORY FILES

READY. SET. GLOW

In our project we focus on people who suffer from having a bad sleep schedule and struggle with structuring their lives in general. Our specific target group is people with ADD, ADHD and autism. It's a system that not only helps the user wake up, but also sufficiently helps with structuring their lives by creating a certain routine. The system is divided in two different parts. It all starts with the alarm clock. 5 minutes before you'll set your initial alarm, the ball starts rolling down the device. Everytime it hits the wall it makes a ticking sound, which makes the user wake up more gradually. After the user has gotten up, he has to complete a chain of events. These are marked by the hemispheres. The user can lay their hand on these to mark that step in their routine as completed.

Project Coaches: Yaliang Chuang, Meerthe Heuvelings

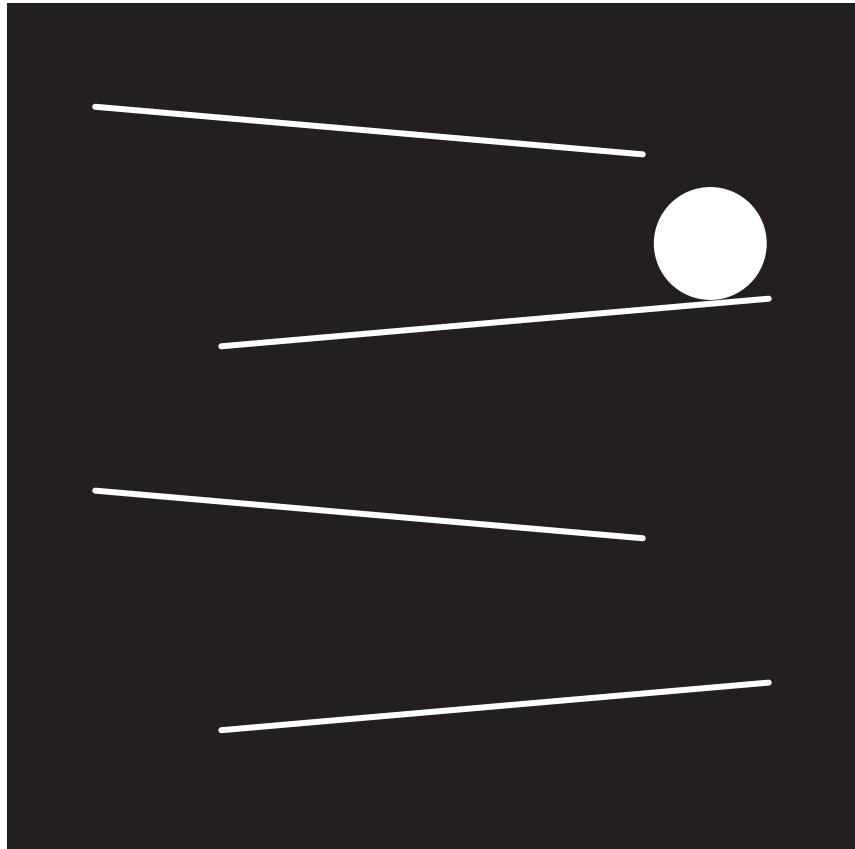
Students:

Lisa Laugs
Emily van Leemput
Isabel Leus
Milan de Meij

Teacher Coaches:

Lenneke Kuijer
Loe Feijs
Mathias Funk
Carl Megens





Arduino code
part 1

```
#include <Adafruit_NeoPixel.h>
#ifndef __AVR__
#include <avr/power.h>
#endif

// Which pin on the Arduino is connected to the NeoPixels?
// On a Trinket or Gemma we suggest changing this to 1
#define PIN          6

// How many NeoPixels are attached to the Arduino?
#define NUMPIXELS    8

Adafruit_NeoPixel pixels = Adafruit_NeoPixel(NUMPIXELS, PIN, NEO_GRB + NEO_KHZ800);

int delayval = 200; // delay for half a second
int t = 0;
int brightnessOn = 100;
int brightnessOff = 0;
int colorR = 0;
int colorG = 255;
int colorB = 255;
int staticTime = 5000;

void setup() {
  Serial.begin(9600);
  pixels.begin();
  pixels.show(); // Initialize all pixels to 'off'
}

void loop() {
  // read the input on analog pin 0:
  int sensorValue = analogRead(A0);
  // print out the value you read:
  Serial.println(sensorValue);
  delay(1); // delay in between reads for stability

  if(sensorValue > 600) {
    breathAll();
  }
  else {
    Static();
  }
}

void Static() {
  pixels.setPixelColor(0, colorR, colorG, colorB);
  pixels.setPixelColor(1, colorR, colorG, colorB);
  pixels.setPixelColor(2, colorR, colorG, colorB);
  pixels.setPixelColor(3, colorR, colorG, colorB);
  pixels.setPixelColor(4, colorR, colorG, colorB);
  pixels.setPixelColor(5, colorR, colorG, colorB);
  pixels.setPixelColor(6, colorR, colorG, colorB);
  pixels.setPixelColor(7, colorR, colorG, colorB);
  pixels.show();
  delay(staticTime);
  for (int k = 0; k < 11; k++) {
    Wave();
  }
}

void breathAll() {
  for (int i; i < 225; i++) {
    for(int j=0; j<pixels.numPixels(); j++) {
      int sensorValue = analogRead(A0);
      if (sensorValue < 600) {
        Static();
      } else {
        pixels.setBrightness(150);
        pixels.setPixelColor(j, pixels.Color(0,i+15,i));
      }
    }
    pixels.show();
    delay(10);
  }
  for (int i = 225; i > 0; i--) {
    for(int j=0; j<pixels.numPixels(); j++) {
      int sensorValue = analogRead(A0);
      if (sensorValue < 600) {
        Static();
      } else {
        pixels.setBrightness(150);
        pixels.setPixelColor(j, pixels.Color(0,i+15,i));
      }
    }
    pixels.show();
    delay(10);
  }
}

```



Arduino code
part 2

```
void Wave() {
    delay(500);
    pixels.setBrightness(brightnessOn);
    pixels.show();

    if(t==0) {
        pixels.setBrightness(brightnessOn);
        pixels.setPixelColor(0, colorR, colorG, colorB);
        pixels.setPixelColor(7, colorR, colorG, colorB);
        pixels.show(); // This sends the updated pixel color to the hardware.
        delay(delayval); // Delay for a period of time (in milliseconds).
        pixels.setBrightness(brightnessOff);
        pixels.show(); // This sends the updated pixel color to the hardware.
        t++;
    }

    if(t==1) {
        pixels.setBrightness(brightnessOn);
        pixels.setPixelColor(0, colorR, colorG, colorB);
        pixels.setPixelColor(7, colorR, colorG, colorB);
        pixels.setPixelColor(1, colorR, colorG, colorB);
        pixels.setPixelColor(6, colorR, colorG, colorB);
        pixels.show(); // This sends the updated pixel color to the hardware.
        delay(delayval); // Delay for a period of time (in milliseconds).
        pixels.setBrightness(brightnessOff);
        pixels.show(); // This sends the updated pixel color to the hardware.
        t++;
    }

    if(t==2) {
        pixels.setBrightness(brightnessOn);
        pixels.setPixelColor(1, colorR, colorG, colorB);
        pixels.setPixelColor(6, colorR, colorG, colorB);
        pixels.show(); // This sends the updated pixel color to the hardware.
        delay(delayval); // Delay for a period of time (in milliseconds).
        pixels.setBrightness(brightnessOff);
        pixels.show(); // This sends the updated pixel color to the hardware.
        t++;
    }

    if(t==3) {
        pixels.setBrightness(brightnessOn);
        pixels.setPixelColor(2, colorR, colorG, colorB);
        pixels.setPixelColor(5, colorR, colorG, colorB);
        pixels.show(); // This sends the updated pixel color to the hardware.
        delay(delayval); // Delay for a period of time (in milliseconds).
        pixels.setBrightness(brightnessOff);
        pixels.show(); // This sends the updated pixel color to the hardware.
        t++;
    }

    if(t==4) {
        pixels.setBrightness(brightnessOn);
        pixels.setPixelColor(2, colorR, colorG, colorB);
        pixels.setPixelColor(5, colorR, colorG, colorB);
        pixels.show(); // This sends the updated pixel color to the hardware.
        delay(delayval); // Delay for a period of time (in milliseconds).
        pixels.setBrightness(brightnessOff);
        pixels.show(); // This sends the updated pixel color to the hardware.
        t++;
    }

    if(t==5) {
        pixels.setBrightness(brightnessOn);
        pixels.setPixelColor(2, colorR, colorG, colorB);
        pixels.setPixelColor(5, colorR, colorG, colorB);
        pixels.setPixelColor(3, colorR, colorG, colorB);
        pixels.setPixelColor(4, colorR, colorG, colorB);
        pixels.show(); // This sends the updated pixel color to the hardware.
        delay(delayval); // Delay for a period of time (in milliseconds).
        pixels.setBrightness(brightnessOff);
        pixels.show(); // This sends the updated pixel color to the hardware.
        t=0;
    }

    if(t==6) {
        pixels.setBrightness(brightnessOn);
        pixels.setPixelColor(3, colorR, colorG, colorB);
        pixels.setPixelColor(4, colorR, colorG, colorB);
        pixels.show(); // This sends the updated pixel color to the hardware.
        delay(delayval); // Delay for a period of time (in milliseconds).
        pixels.setBrightness(brightnessOff);
        pixels.show(); // This sends the updated pixel color to the hardware.
        t=0;
    }
}
```





B1 / DPB100 Project 1 Design
Turn up the Lights

READY. SET. GLOW.

Ready. Set. Glow. is a system that helps users to wake up and structure their morning routine. Its target group is people with ADD, ADHD and autism who often experience problems in their waking up ritual. Our product offers a solution by creating a fixed routine. The system consists of four shapes which need to be placed in different locations in the house. Each shape will light up one after another and through a directional light pattern, it will guide you across your room. The shapes contain sensory output; tactile: the structure on the surface, and visual: the lights embedded in the bottom part. This overall system will guide the user through its morning routine in a structured and pleasant way. Ready. Set. Glow. lets you begin your day with a positive mindset!

Project Coaches: Yaliang Chuang, Meerthe Heuvelings

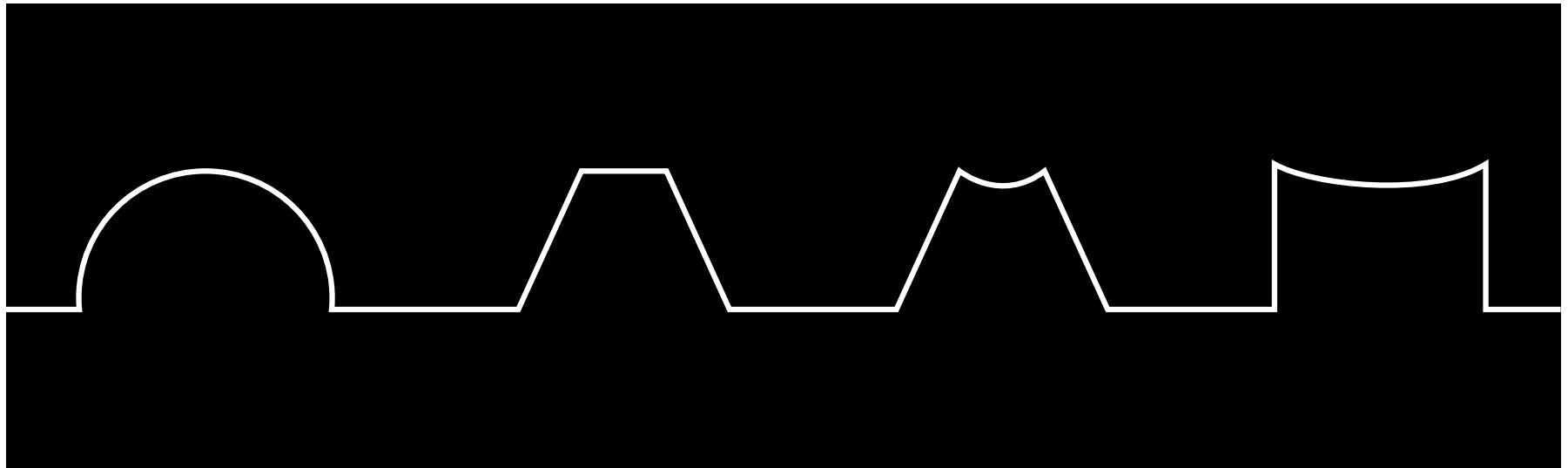
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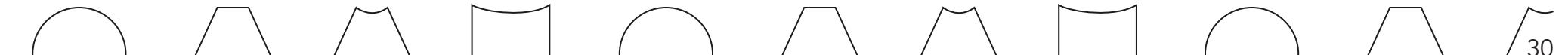
READY. SET. GLOW.

Turn up the Lights Group 5 • readysetglow@outlook.com
Lisa Laugs • Emily van Leemput • Isabel Leus • Milan de Meij



Business canvas

Key Partners		Key Activities		Value Proposition		Customer Relationships		Customer Segments	
e.g. Philips, health center specialized for AD(H)D and autism		produce products		in the morning routine: create structure more organized less stressful save time		engaged with customers understanding social media		people with ADD, ADHD and autism	
		promote product							
		Key Resources		technical and building skills marketing skills		Channels		through website flyers at health centers which are specialized in AD(H)D, and autism	
Cost Structure					Revenue Streams				
						through selling the product			
		invest in improvement of product invest in website, advertisement, etc.							



CONTRIBUTION

Main responsibility in the report

Lay out	Lisa Laugs
Cover	Lisa Laugs
Index	Lisa Laugs
Introduction	Milan de Meij
Project goal	Isabel Leus
Background information	Isabel Leus
Process	Emily van Leemput
Iterations	Emily van Leemput
Overall results	Isabel Leus
Conclusions	Milan de Meij
References	Lisa Laugs
Appendix	Milan de Meij and Lisa Laugs
Media	Emily van Leemput
Final check	Lisa Laugs

