Design Portfolio

Katie Nock

Contents

For more projects please check out my website: https://katienock.com/

Sink or Sail

Educational toy design for children

Project Brief

Design a product to help children engage with design processes

Project Principles

- Explore the role of play within the design process to increase creativity and experimentation
- Input from children should be involved in as many stages of the project as possible

Project Outcome

3D Printed Model

Methodology

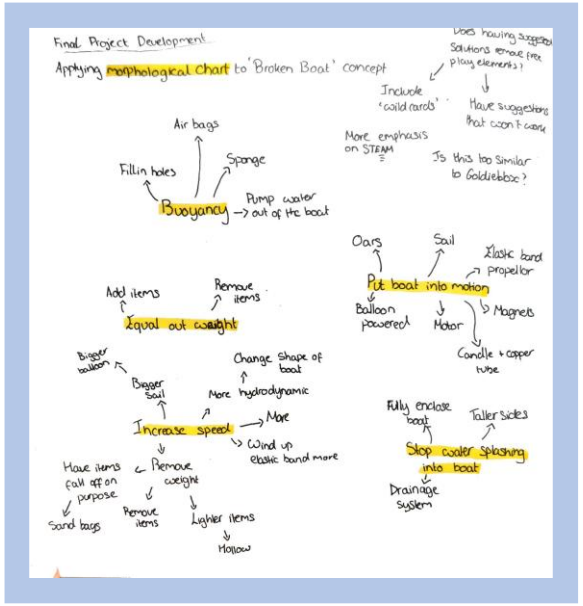
Primary Research

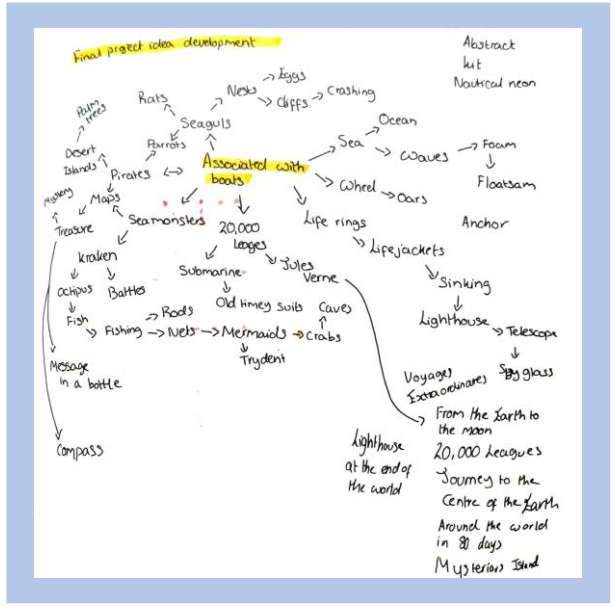
- Expert interviews:
  - Interview Primary school teaching staff to learn more about how design is taught and what children struggle with.
- School visit

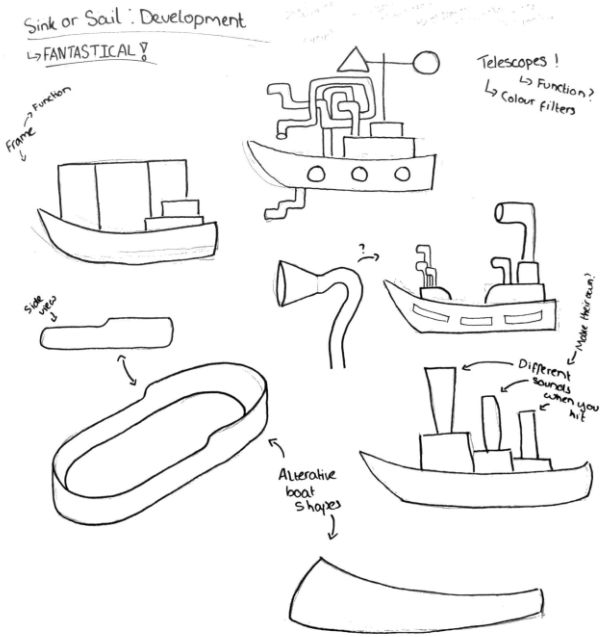
Secondary Research

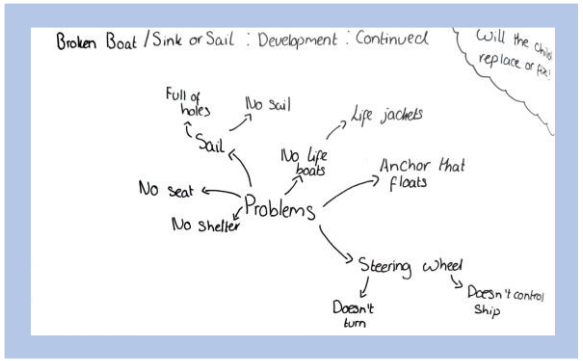
- Existing product research
  - Identify market gaps
  - What does and doesn't work in practical settings
- Books, academic papers and videos

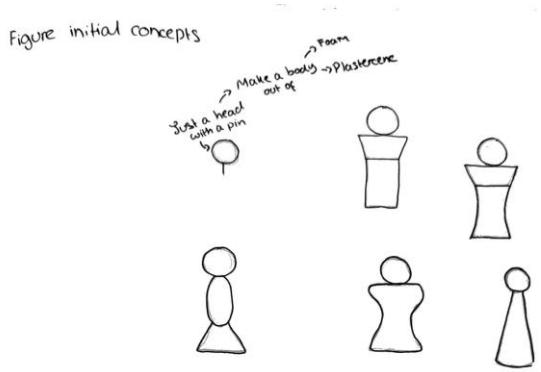
Initial Concepts

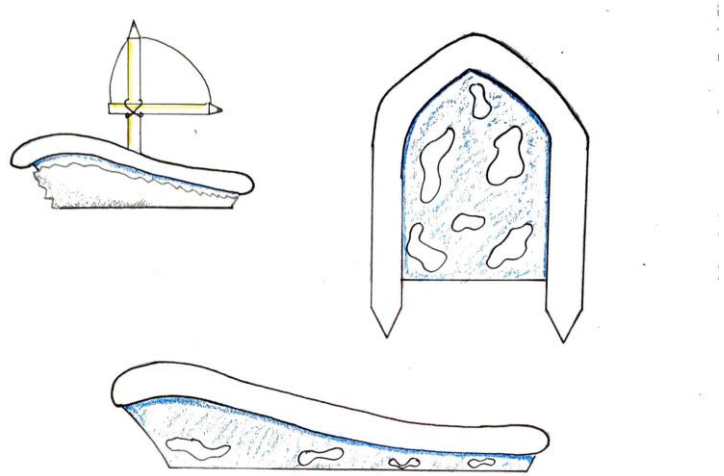




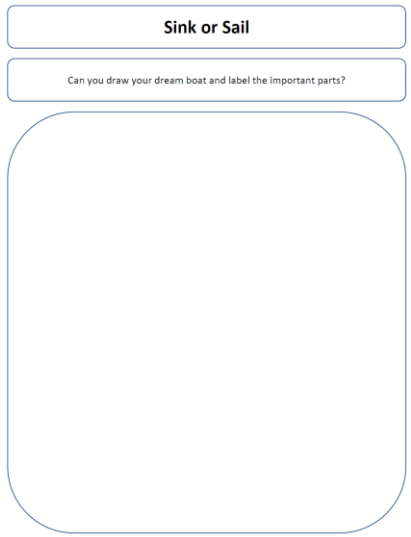


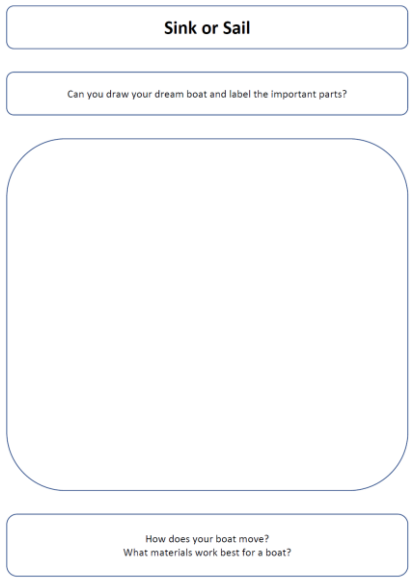


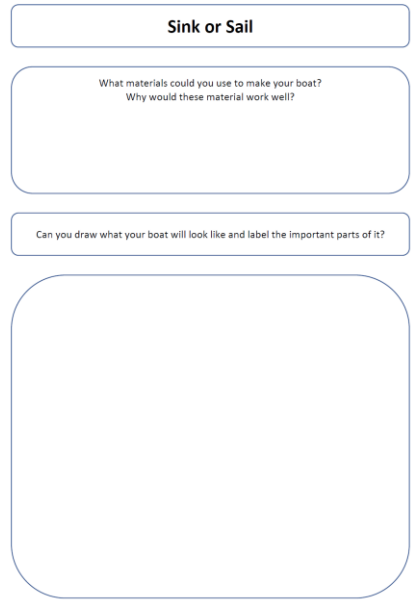


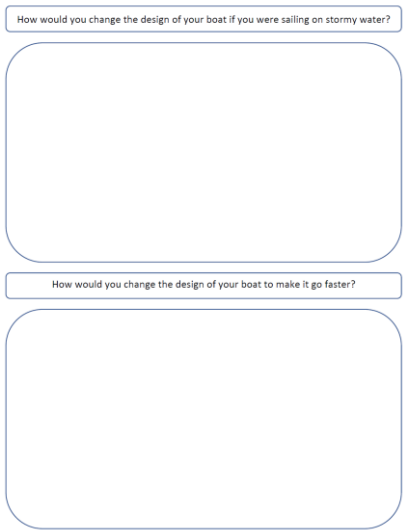


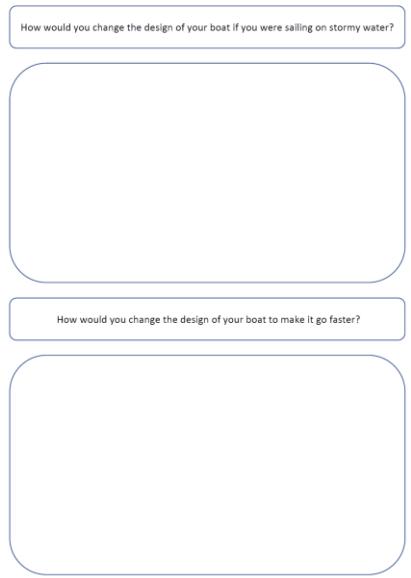
Research- Primary School Visit





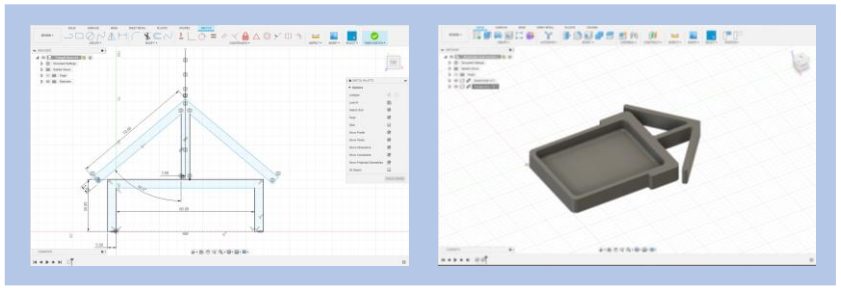


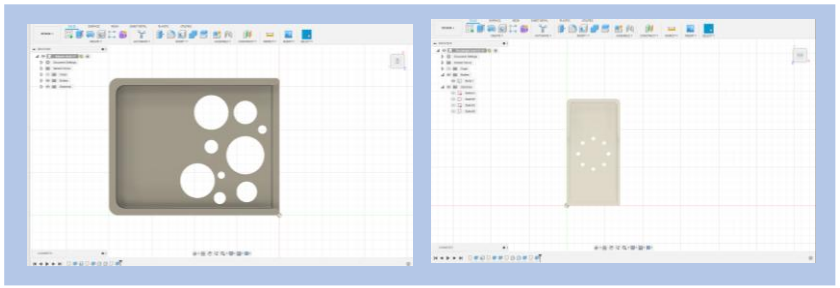


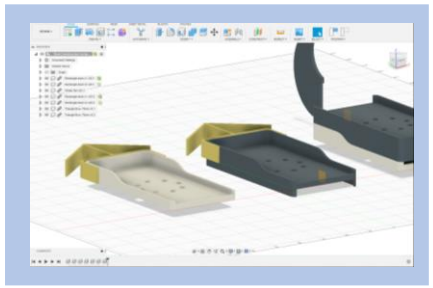


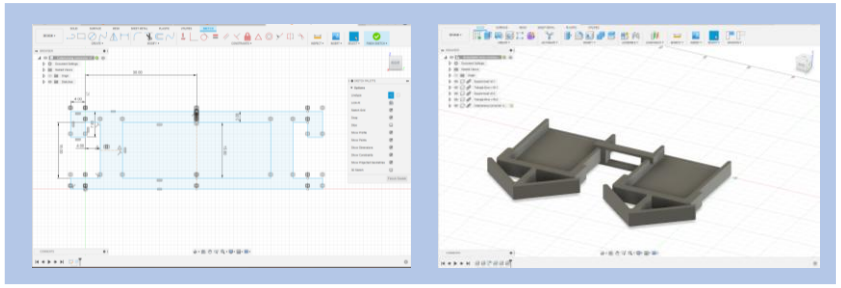
School visit worksheets:

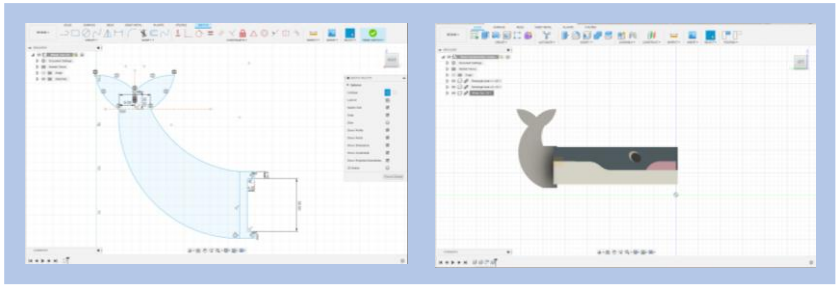
- Get feedback directly from children
- Different levels of worksheet complexity for different ages
- How do children approach open ended creative tasks?

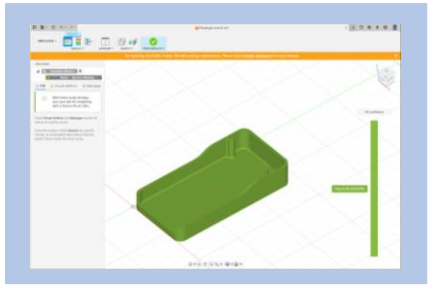


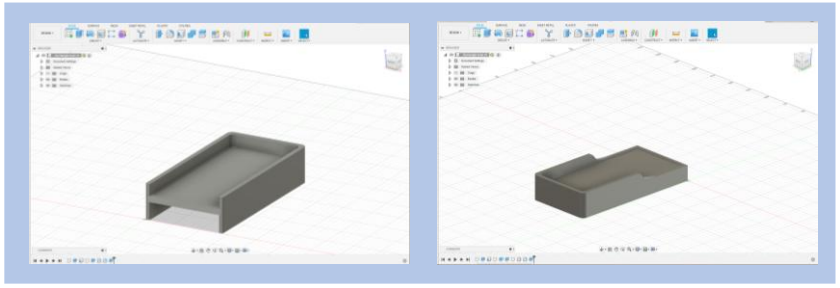


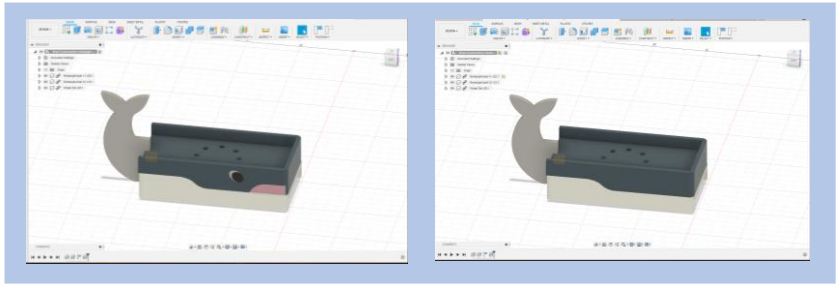


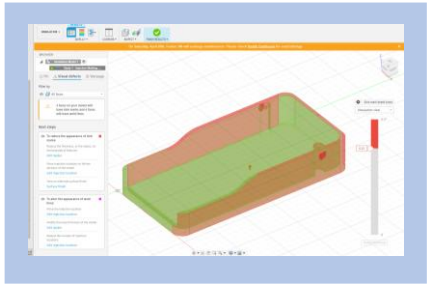


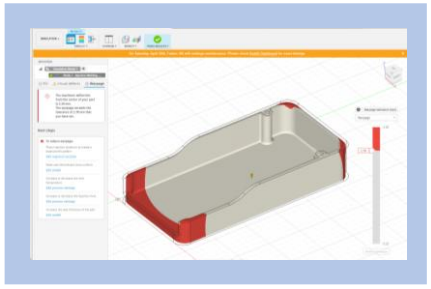












Refining the design using Fusion 360

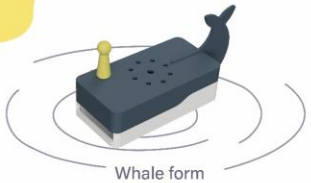
At multiple stages of the modelling process I used Fusion 360's simulation tools to check if the design was suitable for injection moulding.

Sink or Sail

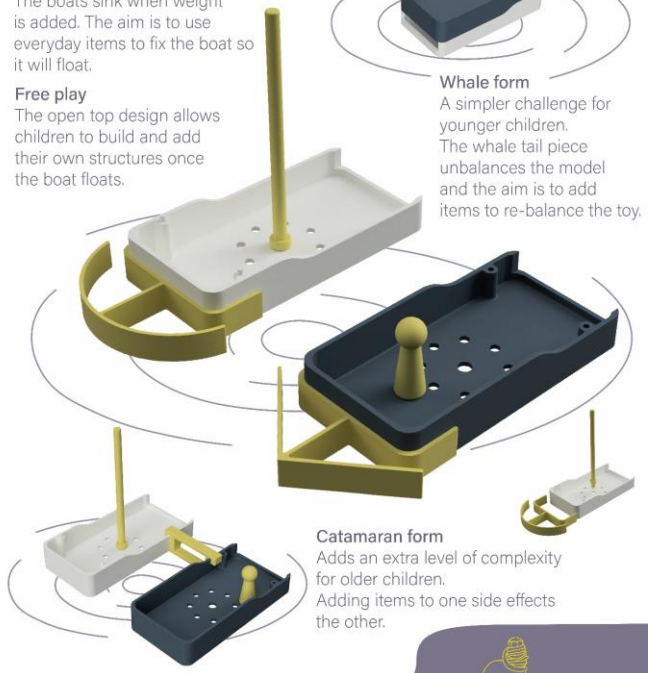
An educational toy for developing design thinking skills

Creating a space to design
The boats sink when weight is added. The aim is to use everyday items to fix the boat so it will float.

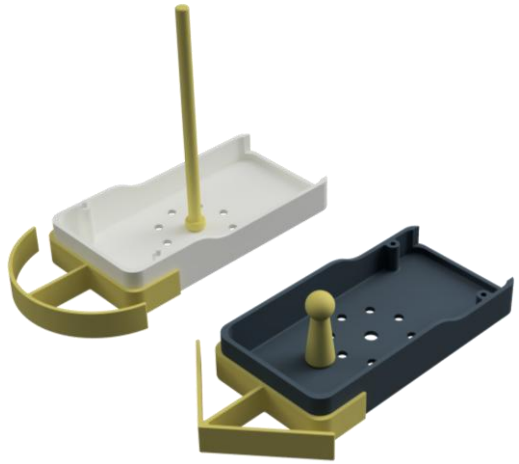
Free play
The open top design allows children to build and add their own structures once the boat floats.

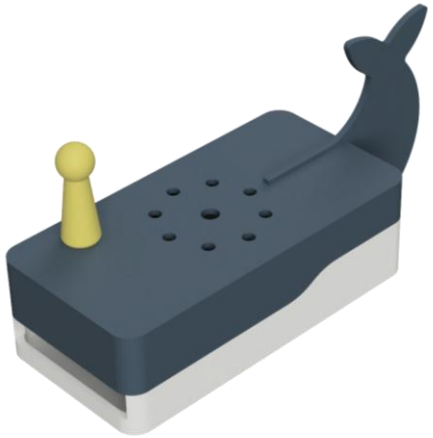


Whale form
A simpler challenge for younger children.
The whale tail piece unbalances the model and the aim is to add items to re-balance the toy.



Catamaran form
Adds an extra level of complexity for older children.
Adding items to one side effects the other.





Pop-up Boardgame Cafe

Designing for social interactions

Project Title

Creating community spaces for young people: How public space design can involve young people in communities

Secondary Research

- Existing product research
  - Identify market gaps
  - What does and doesn’t work in practical settings
- Literature review
  - Figures and Statistics
  - Theoretical knowledge
  - Covers wide area of information

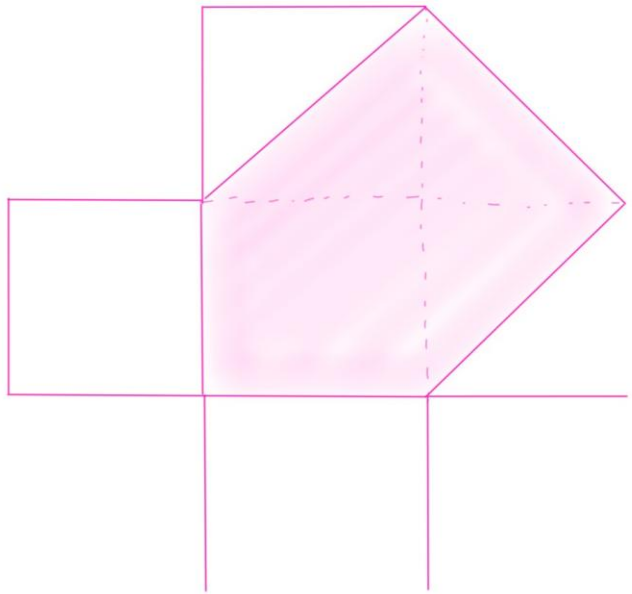
Primary Research

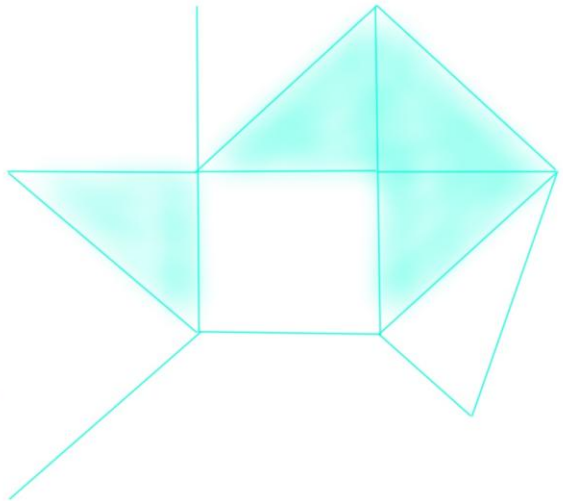
- Covert Observations
  - Visit locations to observe how people interact with them
  - Determine what are key features that should be included in the design
- Online Questionnaire
  - Gather young people's current opinions on public spaces and how they already use them.
  - Use information to select type of space that should be designed

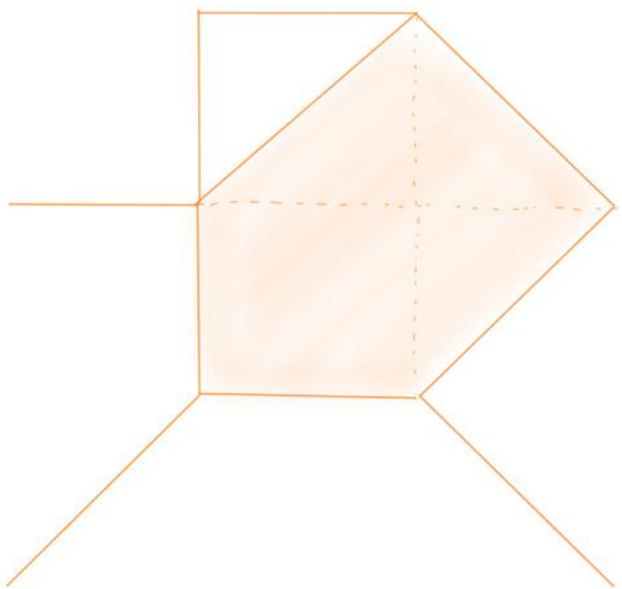
Project Outcome

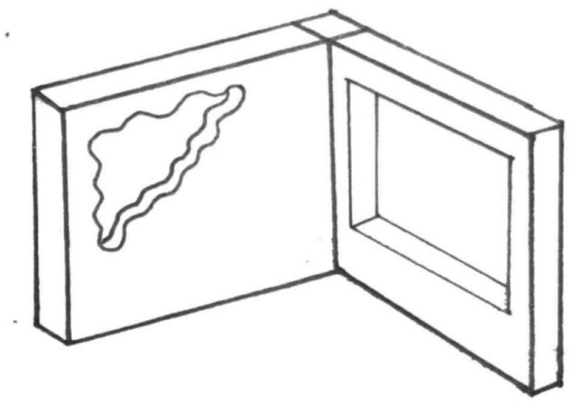
CAD render and Dissertation

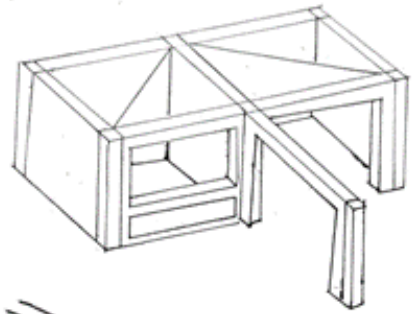
Sketches

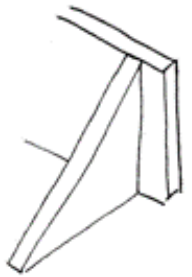


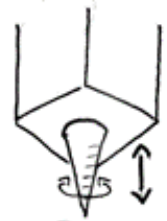


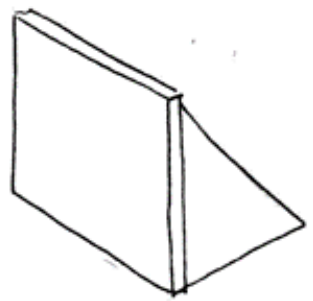






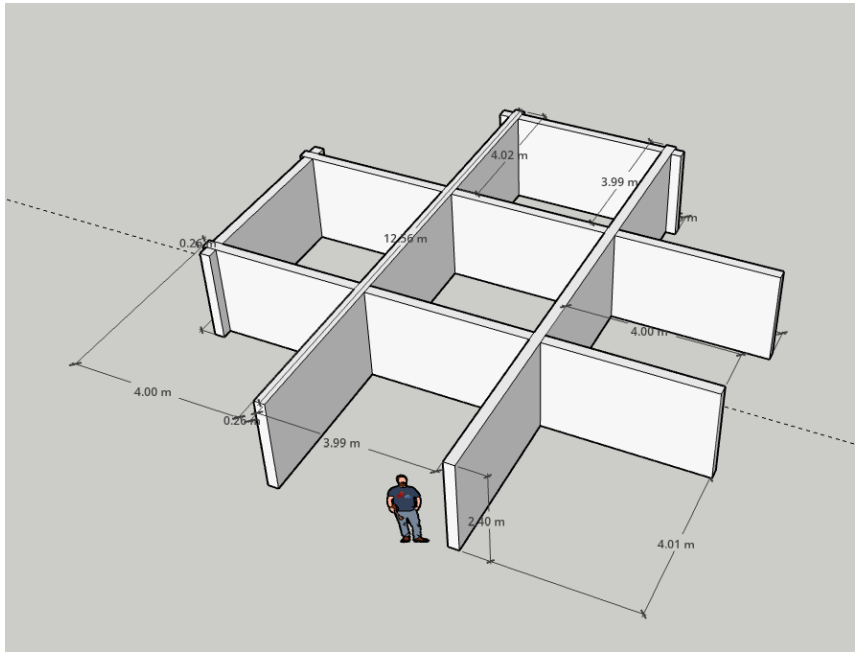


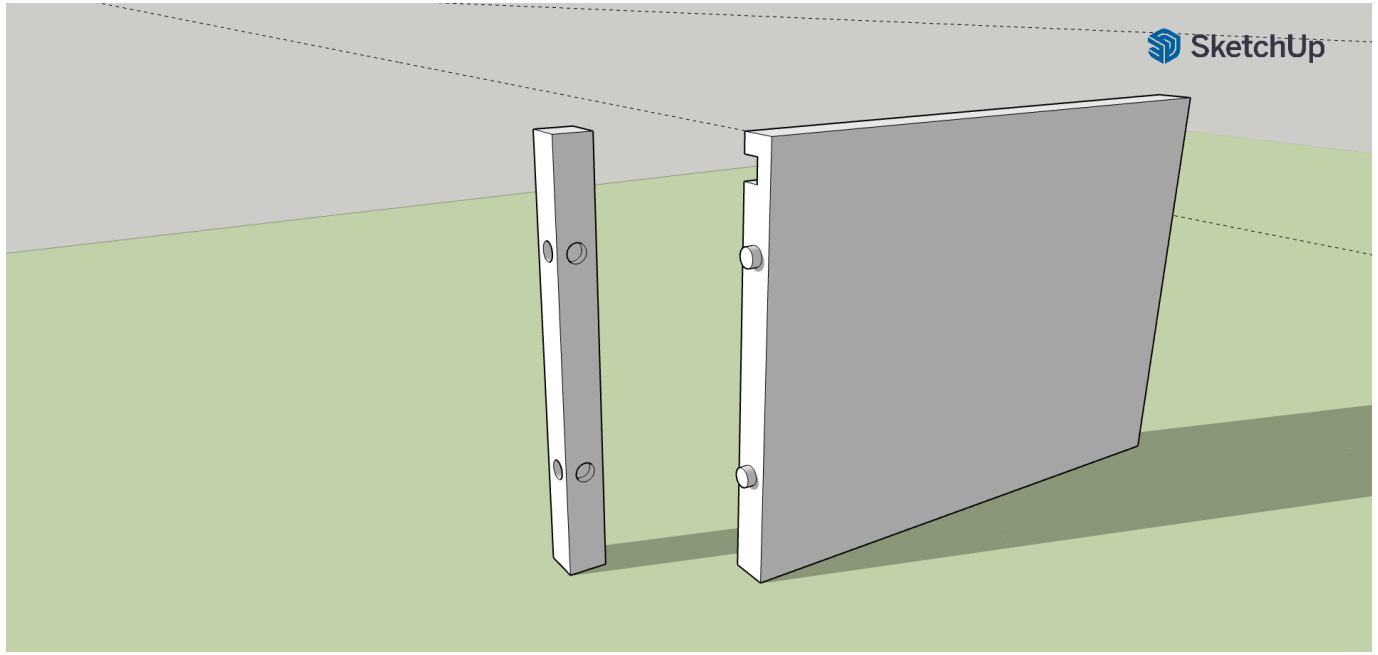


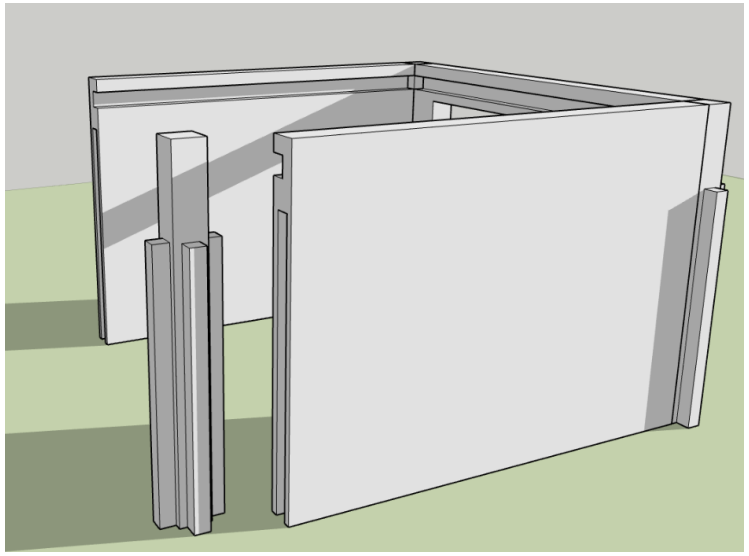


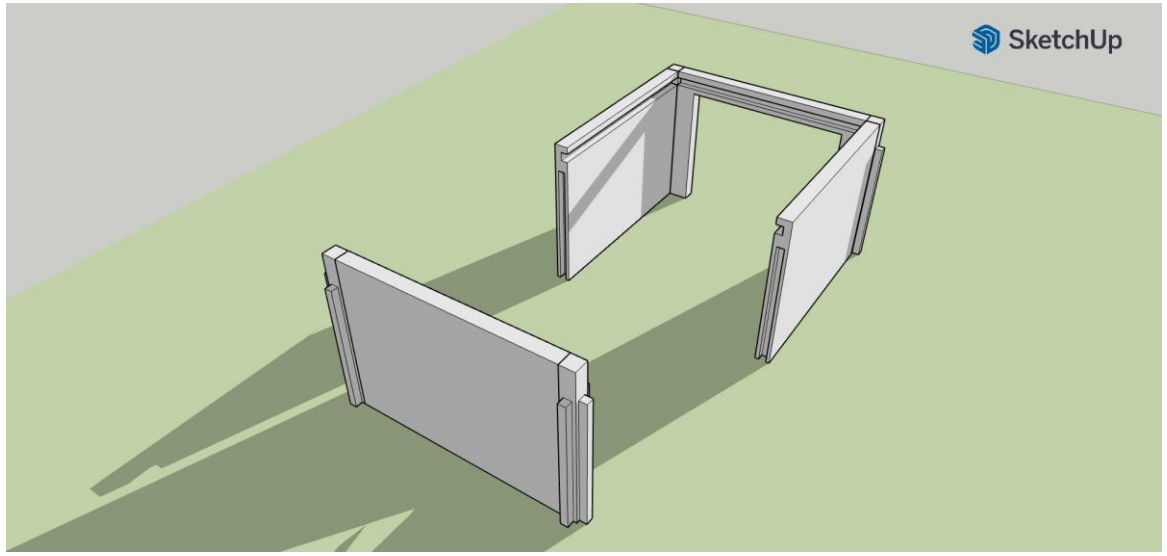
Shown here are a selection for sketches from throughout the project.

CAD Modelling





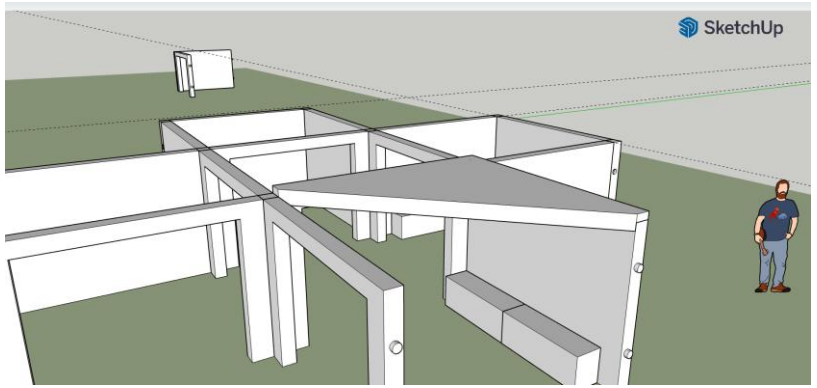


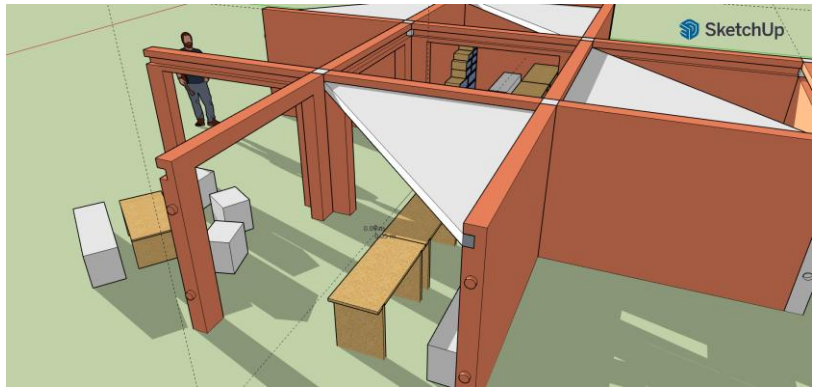


I used SketchUp to model different ways to connect the walls together.

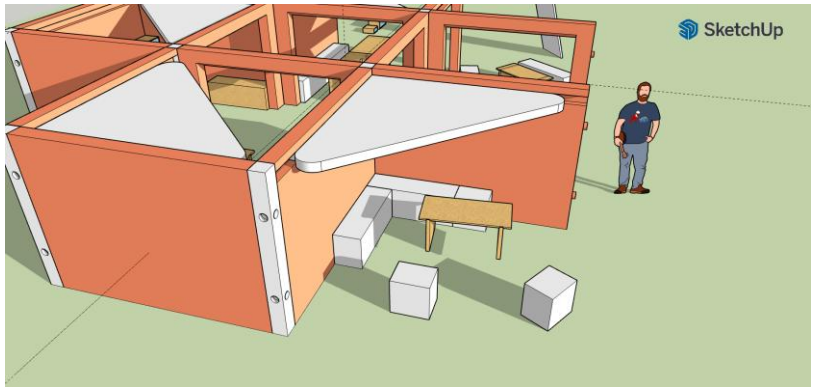
CAD Modelling

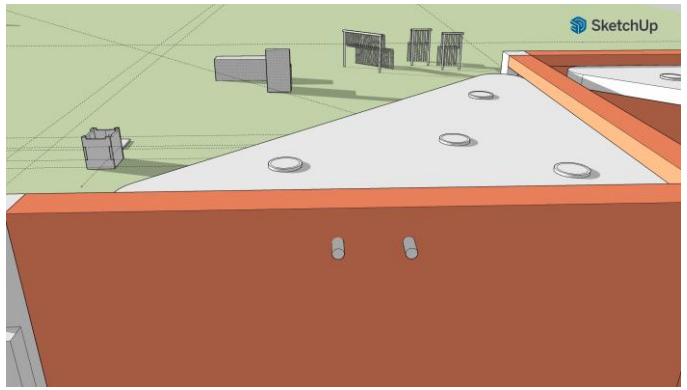
The cafe is intended to be used outside so a roof is necessary. A triangular half roof was chosen as it would provide rain protection whilst still feeling open as the individual sections could feel too enclosed and dark if the top is fully covered.

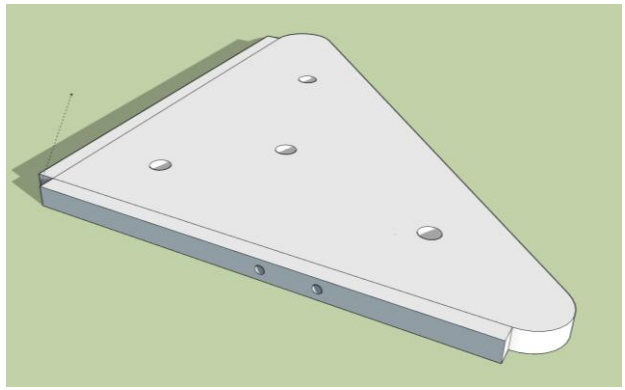


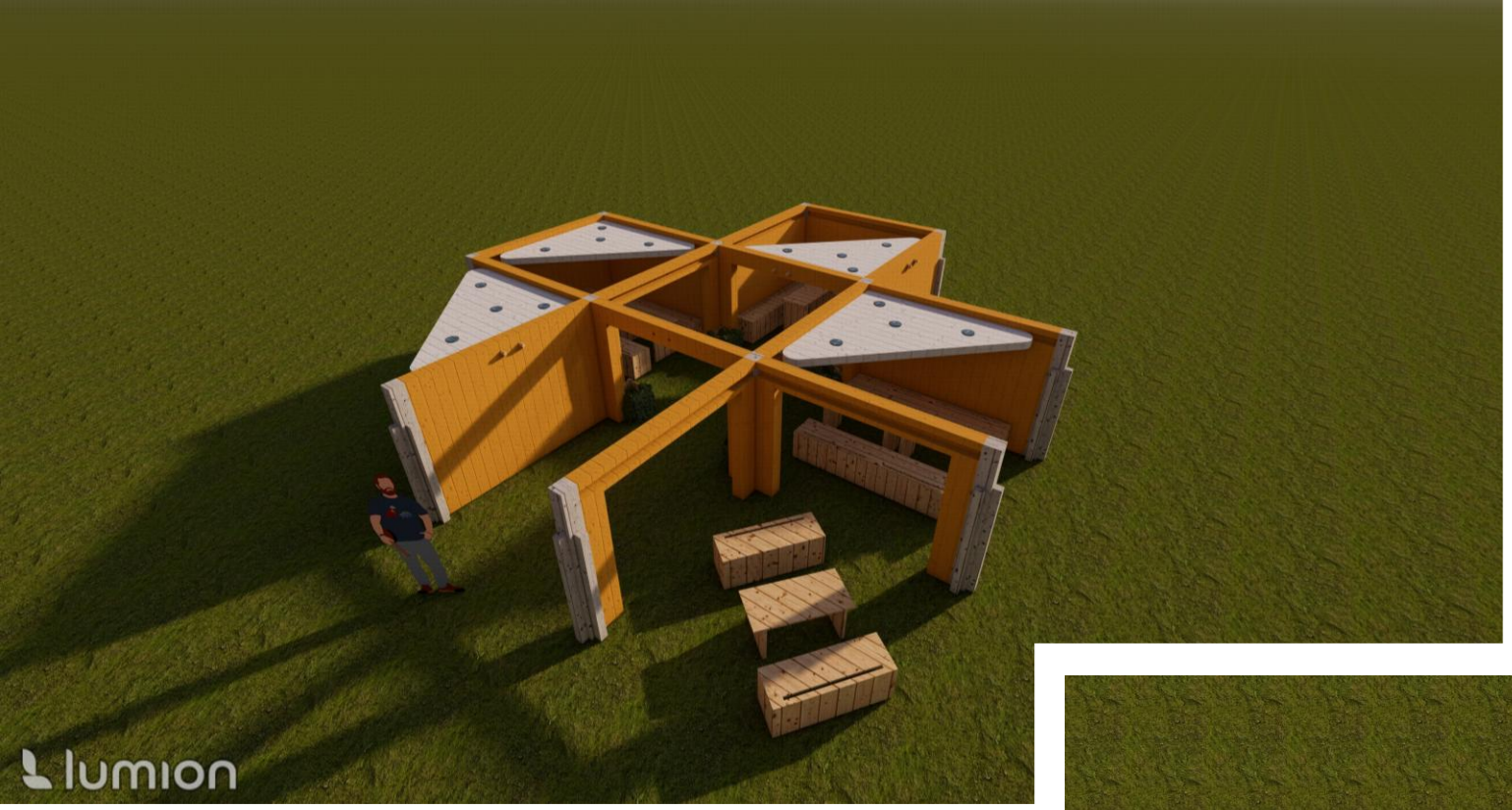


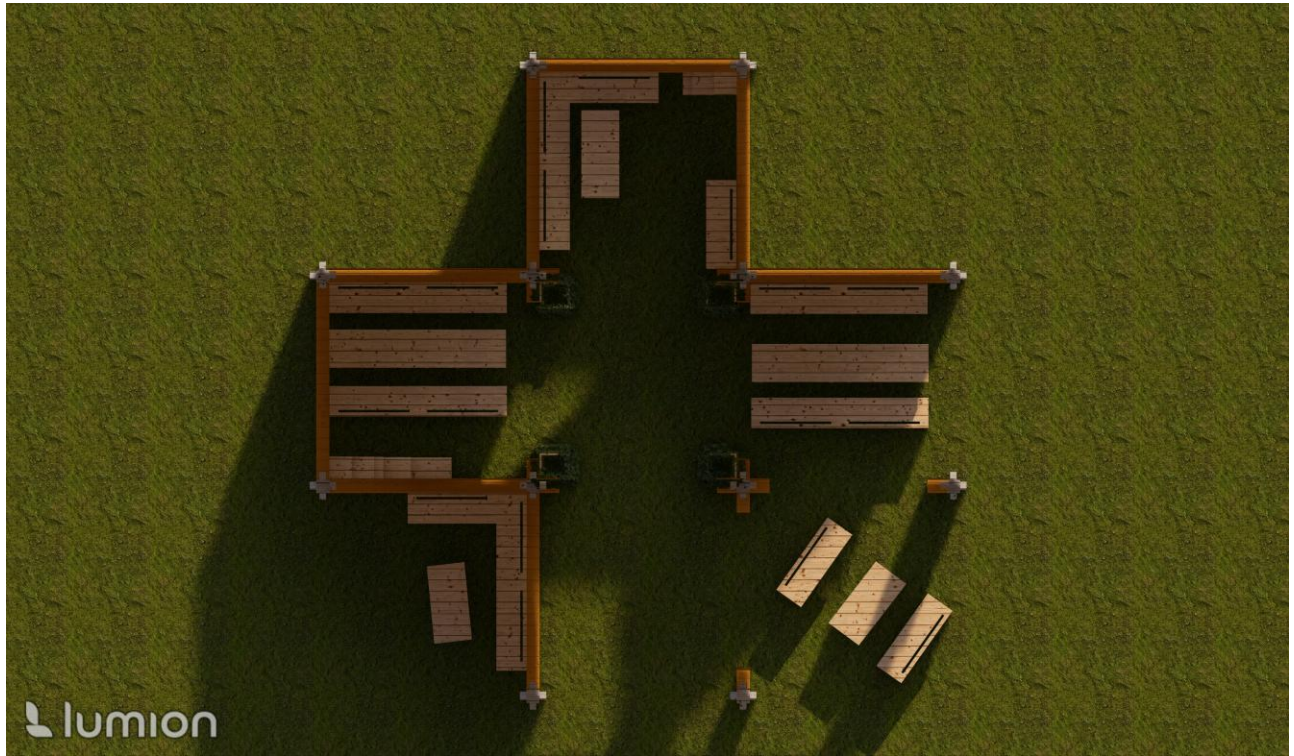
These models show the development of how the roof could attach safely to the walls.











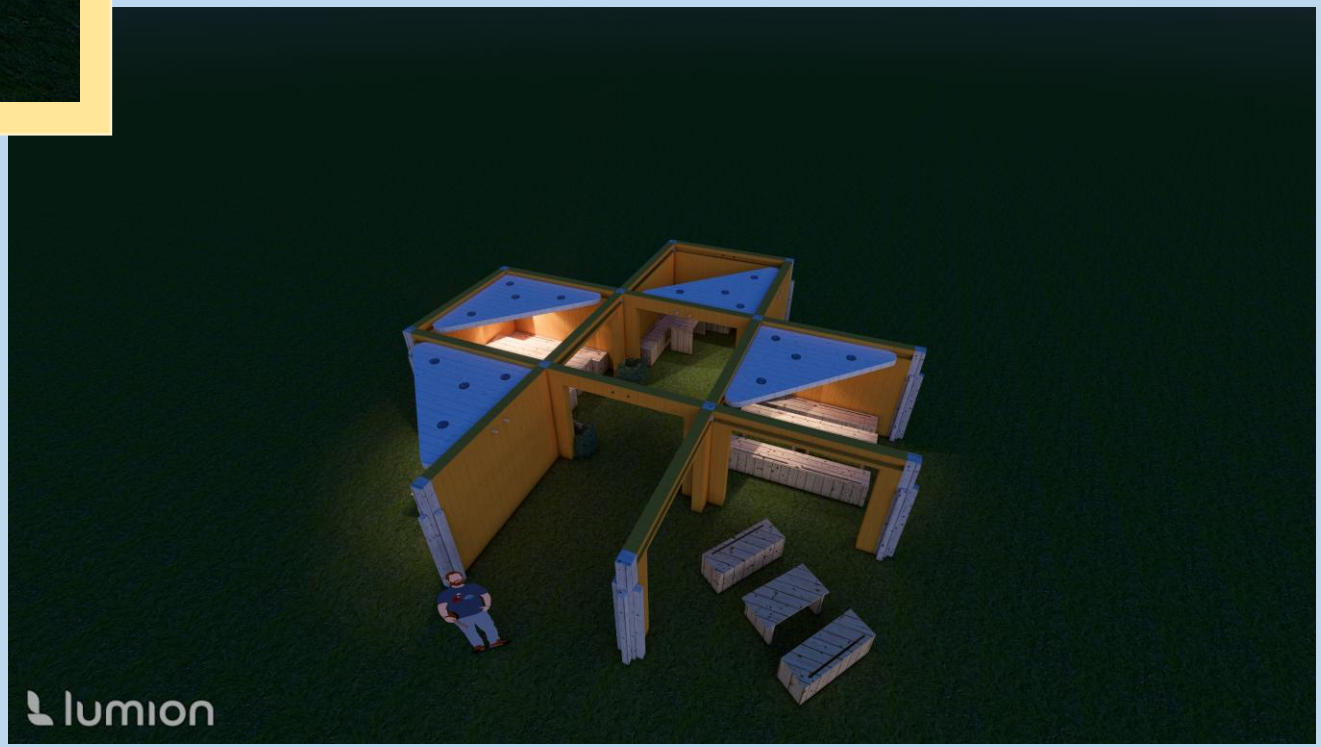
- A pop-up boardgame café that can be constructed in any **vacant area**.
- Used by a local council to turn empty land into a **community space** or rented out to organizations that want to attract more young people.
- Organizations that might benefit from this are: universities, outside markets, parks, shopping centres and festivals.

- The structure and furniture inside can be collapsed into panels so they it can easily be moved between locations.
- The tables, benches, planters and lockers can be arranged as needed to suit the space.

- Lockers are used to store the boardgames and protect them from the weather.
- The front panel of the locker is transparent so that people can see the boardgames inside.
- Central room left open in main design to allow for easier movement between sections.

- The walls can be set up in different configurations to suit the size of the space or the needs of the event
- The walls are connected to each other via four way support posts they slot into.
- Suitable for either inside or outside use
- Includes half roofs to provide shelter from the weather and solar panel powered lights so that the space can be used in the dark.

- Spikes are attached to the bottom of the support posts that can be anchored into the ground to provide support against the wind.
- They can be twisted up inside of the posts to shorten the spike or move it out of the way when the café is inside
- When inside the café relies on the layout of the walls to stay stable and upright.



Rocket Racers

STEM boardgame

Created as part of my Extended Project Qualification, the aim of this project was to learn more about game design and to further develop design skills such as 3D printing, physical modelling and using CAD software. This was also my first time conducting primary research directly with the target audience.

The initial brief I chose was to design a STEM based game for Primary school aged children.

Existing Products

Existing toys and games were researched to find gaps in the market and identify what works and does not work in practise.

Toys researched in this section include:

GoldieBloxs
Lego
Tinker Crate

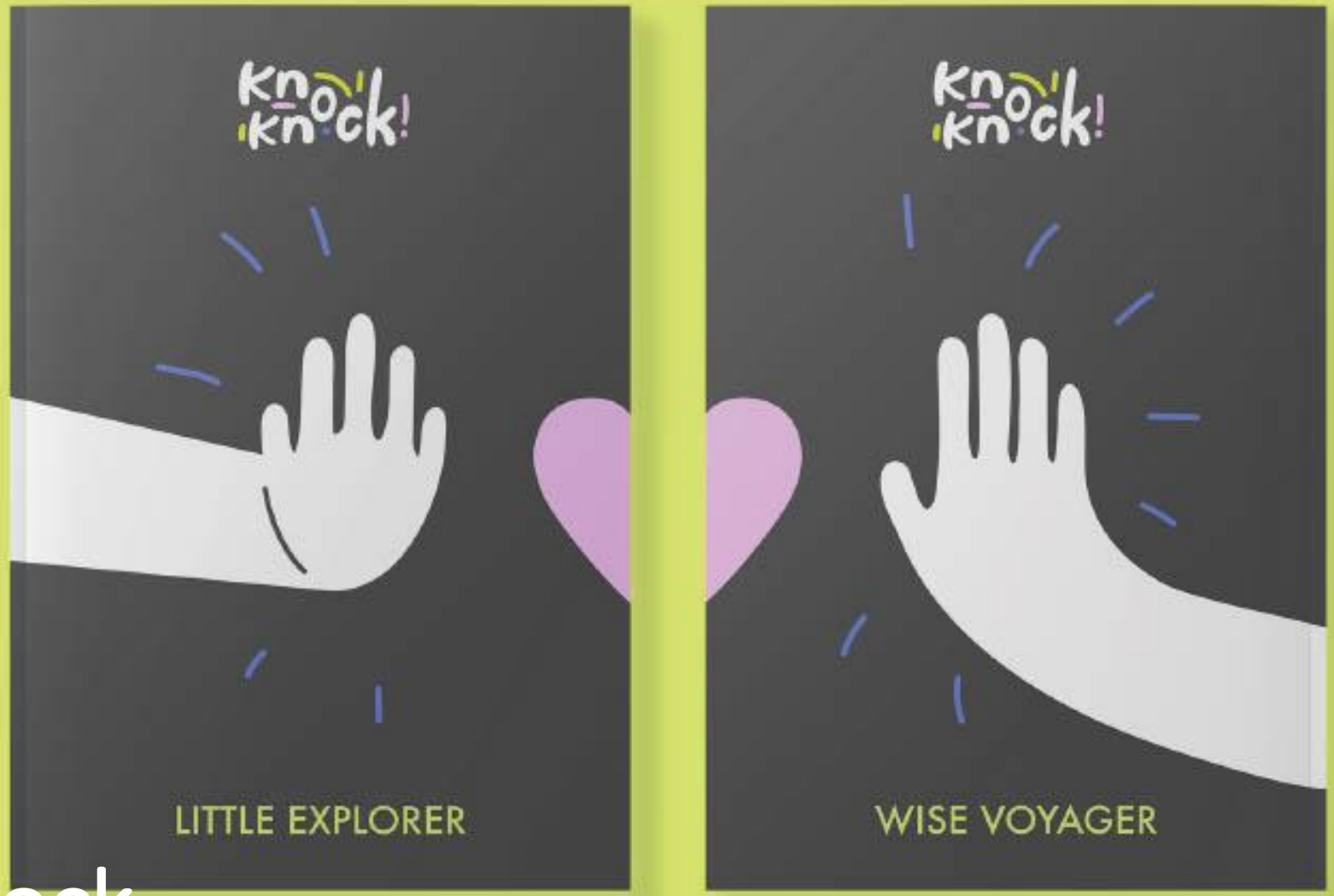
National Curriculum

- The National Curriculum was used to identify what topics are taught to children at which age.
- By lining the game's subject matter up with the curriculum it ensures that the information is age appropriate and the game could be used by teachers as a teaching aid
- This research only looked at topics that fell under Science and Maths to keep it relevant to the project (STEM)
- Initially research was done into most Primary school years (Year 1-6)
- Eventually the age range of 10-11 years old (Year 6) was chosen as the target audience as that age group would allow the educational element of the game to have more depth and the game could pull from any of the topics covered in previous years as well.

← Research Plans ↑

A space themed game where the players roll a dice to move around the board and collect components by correctly answering space themed questions. The winner is the first person to collect all the components and launch their plastic rocket.

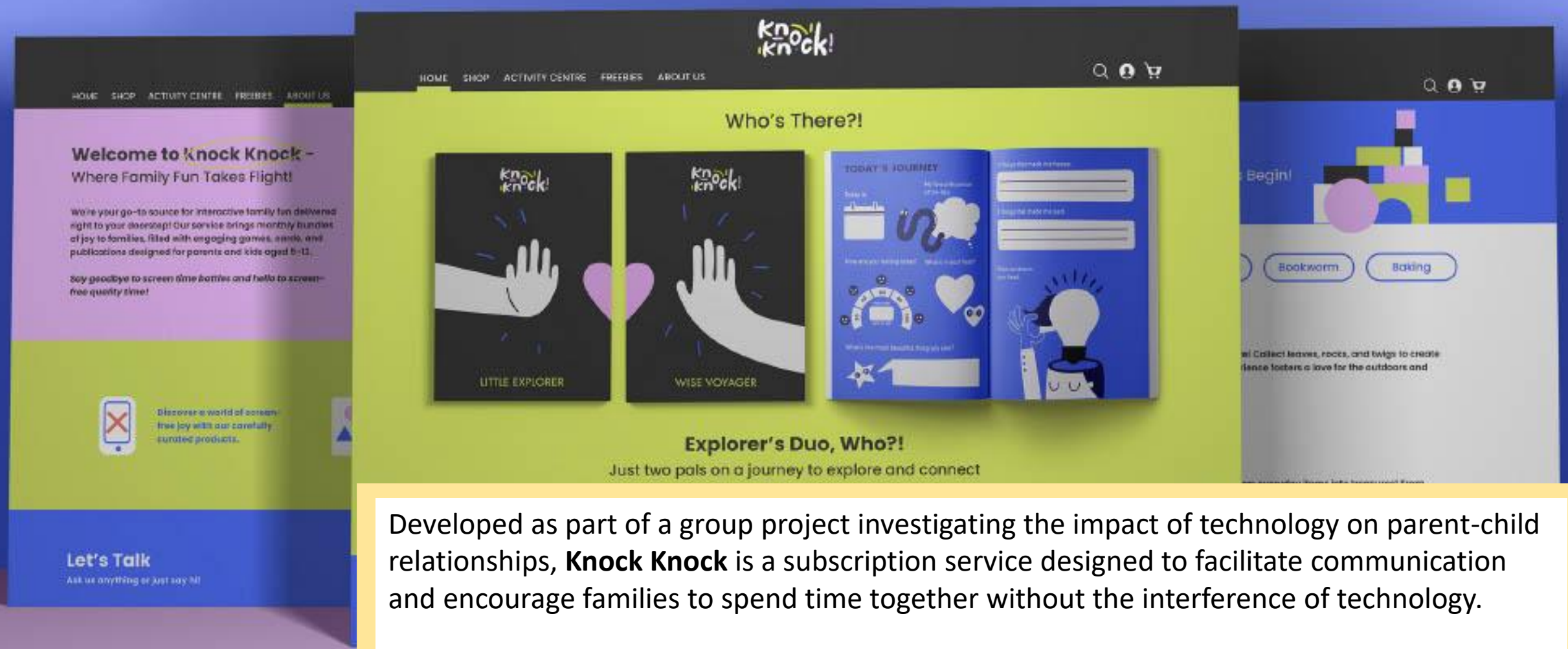
To evaluate whether the project was successful I organised a school visit for the children to test and give feedback on the game.



Knock Knock

A group project on improving parent-child relationships outside of technology

Explore Knock Knock

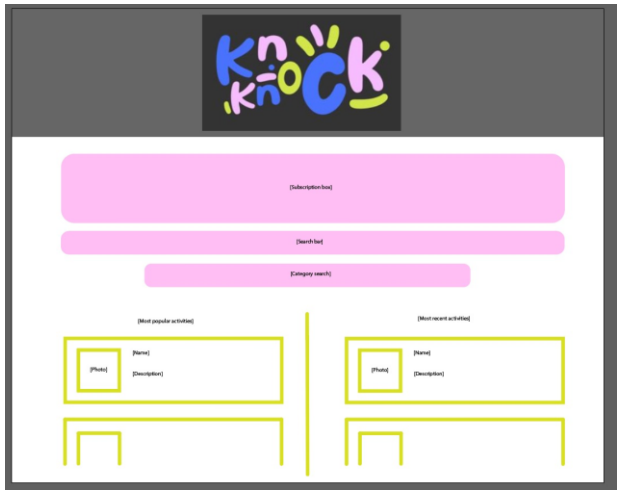


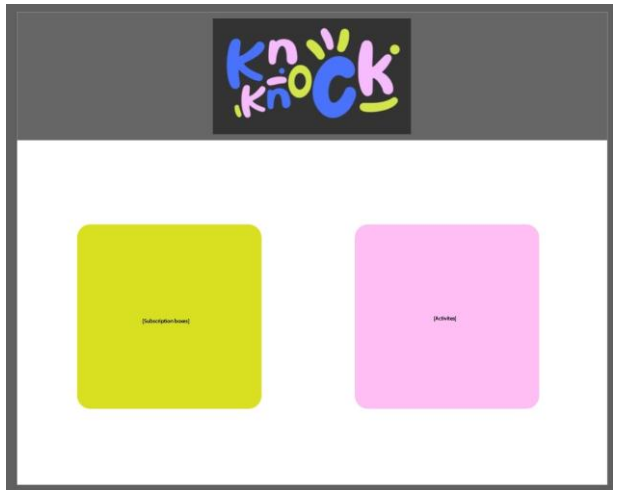
Developed as part of a group project investigating the impact of technology on parent-child relationships, **Knock Knock** is a subscription service designed to facilitate communication and encourage families to spend time together without the interference of technology.

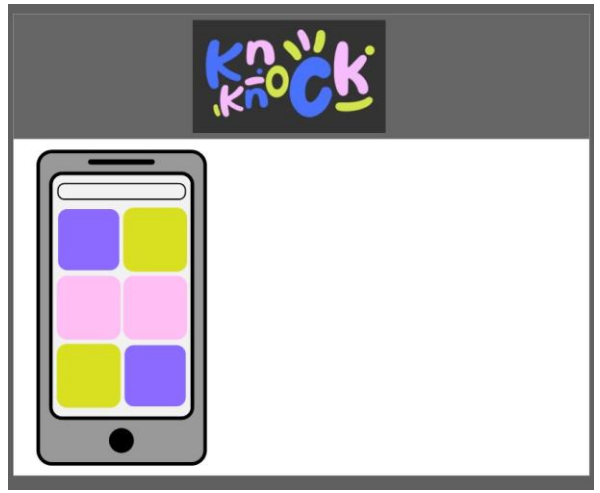
The brand comprises of three elements: a kit, worksheets and website.

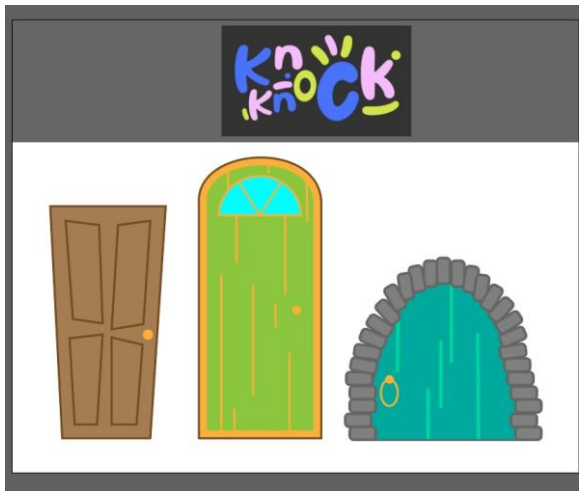
Graphics and low-fidelity UI models

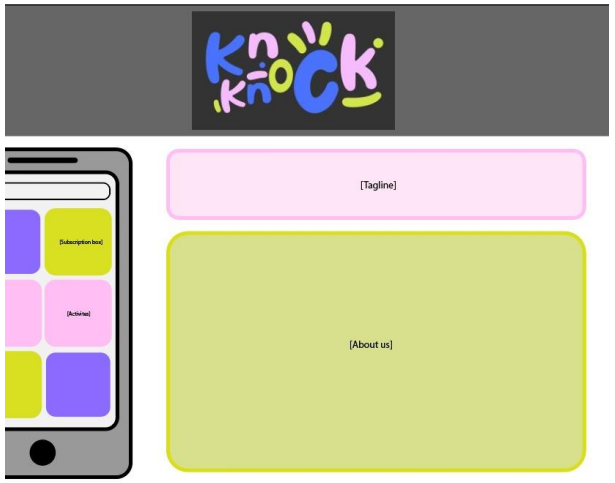
Knock
Knock
Knock



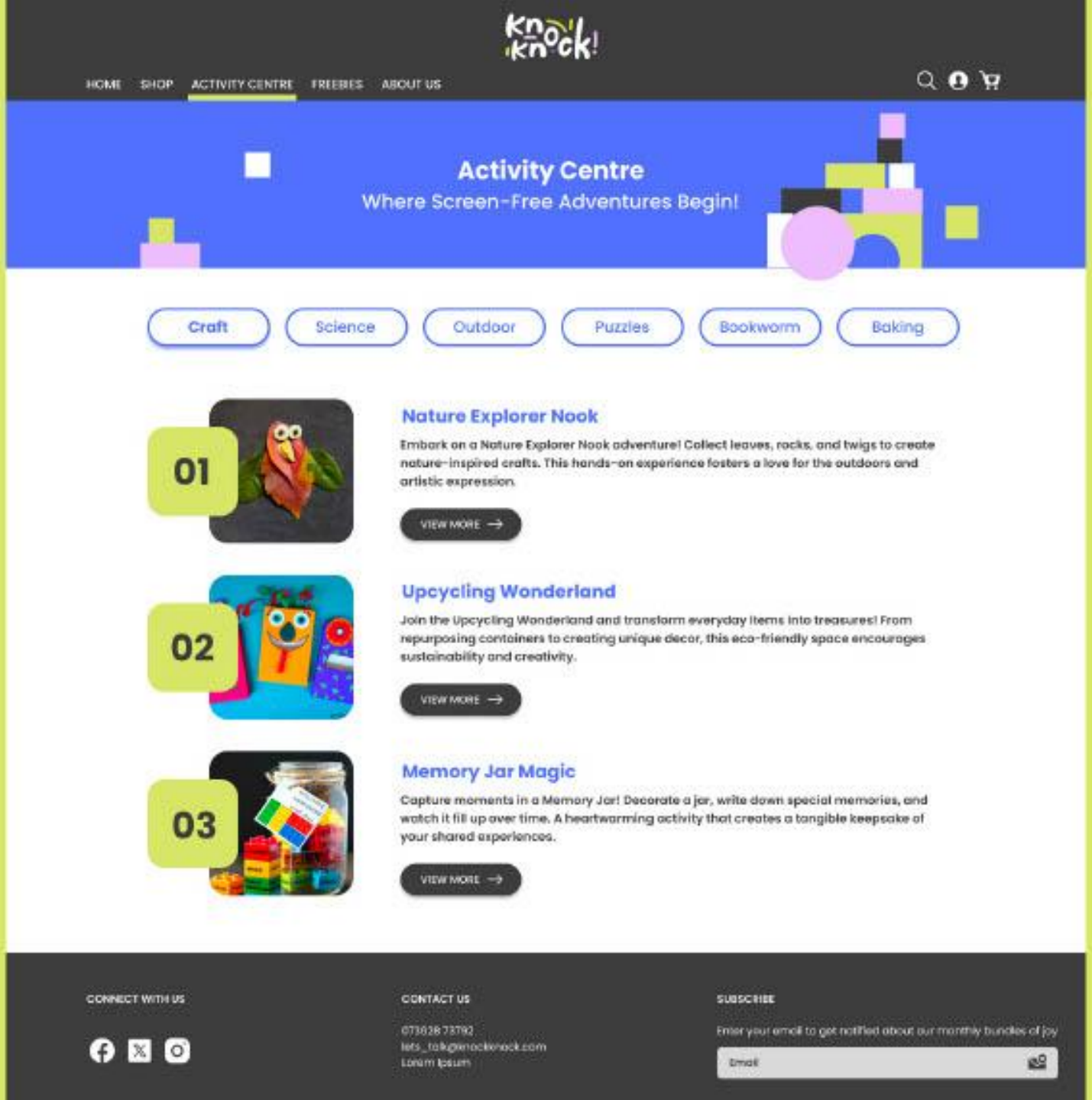








My roles within this project included primary/secondary research and concept development.
Shown on this page are my initial website layout proposals and graphics created with Illustrator.



The Website

This acts as an access point for all the other elements of the service. Through the website you can sign up to have the kit delivered, print off worksheets and access a free database of activities you can complete together.

The Kit

A monthly activity kit designed for children aged 5-12 to complete with their parents to promote communication, creative thinking, cogitative development and most importantly- having fun!

The Booklet

Each kit comes with two booklet filled with even more activities, stickers and games. One for the parent and one for the child.


If you could give this place a nickname it would be


How to create your own place...
Let's connect with your family by creating your own place. Start with the items and cut papers from what you've got at your home (newspaper, magazines, colored paper, etc.) as an object and put them into the map that come in this set of pot.
The Map!
Tools
Scissors
Glue
Papers
There're 4 spot for you on the map to create a place which is spot A, B, C, and D. You can share each spot with family members to have fun with.
Feel free to decorate and create any style of the place that you would love to. Hope this place can connect you all even more!


Create your own place

Hand-held vacuum

Conveying brand values through shape and form

Brief: Design a hand held vacuum cleaner based on a UK cleaning brand.
Aims: to improve my modelling skills and to better understand how branding can be used in the physical form of products.

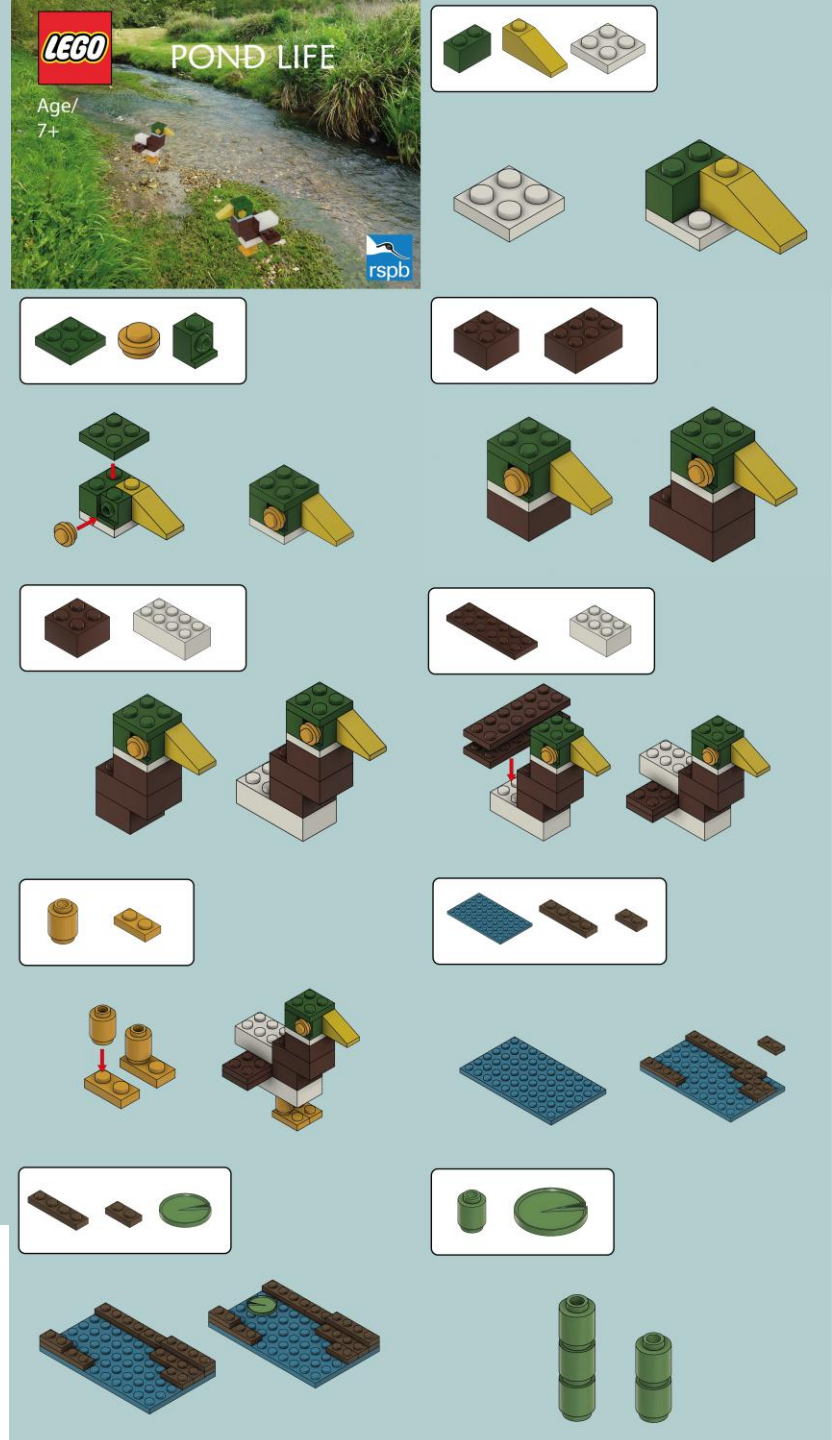
I chose Method as my cleaning brand, their bottles all use lots of smooth organic shapes and longer silhouettes. To reflect this I designed the vacuum so that it can stand in its end to imitate the bottles outlines. This also makes the vacuum almost sculpture like so it could be stored in a visible location rather than hiding it in a cupboard.

LEGO Duck- CAD Practice

I completed this project during my first year of university, the aim was to further develop my CAD skills on Fusion 360 by designing and making a new LEGO kit. All of the pieces are correctly sized and slot together.

The second component involved creating an instruction booklet which accurately replicates LEGOs iconic design so that we could practise using Photoshop and Illustrator.

As part of the project I also designed a Lilypad LEGO brick/attachment.



LEGO instruction booklet created using Photoshop and Fusion 360

The Milk Monster

Children’s packaging design

Milk Monster

Milk cartons for children

Research
- Pre-existing designs
- Bottle sizes
- Recycling
- Individually packaged items
- Design for Transportation
- Customer requirements

Pre-existing designs

I decided to base the size of the individual cartons on how much liquid they need to hold. I determined the volume by looking at similar existing products and looking at the recommended milk consumption for the relivant age group of children.

(NHS) Toddlers should drink: 350ml per day
Dairy food products count towards this

My bottles approximate size:
200m

250ml 150ml 250ml

Bottle Sizes

Best outcome: product entirely made from one material with no need for separating materials
If this is no possible how can material be sorted?

How are different plastics separated?
Different types of plastic can be sorted by grinding them up as passing them through a water bath where some plastics will sink and other will float depending on their density.

How are metal and plastic separated?
Many of the bottle designs that already exist have an aluminium foil seal to keep the product fresh. Plastics and metals can be separated by grinding the product up and passing it through a series of magnets that will collect any magnetic materials e.g. aluminium.

Recycling

Why do people buy indivdually portioned products?
- Convenience
- Portability
- Only need small quantity
- Speed

Individually packaged items

What materials are currently used?
HDPE and PET

What material am I using?
Why?
HDPE
- Can be blow moulded
- Resistant to liquids
- No chemical leaking
- Recyclable
- Safe for food contact

Materials

How is milk currently transported?
Need for quick transport so that the product remains fresh
Via refridgerated truck/lorry
Must be kept cold whilst being trandported
Does the packaging need to be designed for this?

Limit wasted space
Uniform or tessellating packaging allows more product to be transported in the same space as it removes gaps that are too small to put anything in.

Design for Transportation

How do people store their milk?
Fridge-shelf on the inside of the door
Long life milk doesn't need fridge.

What could people use milk for?
Tea/Coffee
Drink by itself
Baking/cooking

What sizes do people buy milk in?
1 pint
2 pint
4 pint
6pint

How much milk does the average person consume?
3/4 of a cup per day*

Do people recycle their empty milk cartons?

Customer Requirements

*eatthis.com

The Brief: Design a new Milk carton with considerations for sustainability.

Awarded 'Highly Commended' at the IOM3 Starpack Packaging Awards 2022.

Milk Monster

Milk cartons for children

Original tooth shape

The idea originated from the phrase 'Milk teeth' and the shape of a toothbrush holder I own. The shapes tessellate which allows more to fit into an area with no leftover space. The initial design also plays on the fact that calcium (found in milk) is good for your teeth. This educational link could lend itself to a product for children with a learning element.

Multiple Portions

The shape of the abstract tooth naturally has four sections which I thought could lend quite well to a single product that is made from four separate containers/portions. This product would be designed for people who want to drink milk the go or for packed lunches.

One portion

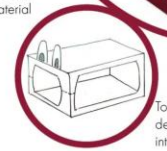
Rather than having one tooth shape be four portions, I decided to have one tooth shape be one portion. Doing this allows the teeth shapes to be smaller and really takes advantage of their tessellating shape. If I'd kept it as the four portion version then once you remove one portion it would lose one of its supports meaning it may be difficult to stand it up and slot it in with the other, complete 'teeth'.

Seals and lids

At this stage I considered several means of opening the cartons. The main two options were a aluminium foil seal and separate straw or a built in retractable straw. The built in version was only really viable if it was made from the same material as the rest of the carton, so that the materials could be easily separated to recycle them. I could not find a suitable material that was flexible enough to be used for the straw as well as meet the requirements for the carton, so I went with the separate staw concept.

Multipack

Although each 'tooth' is now one I still wanted to keep the multi-pack element as people are more likely to want to buy enough cartons to last a period of time rather than just one. As the product is designed mainly for children I wanted to incorperate an element of fun into the multipack. This design is arranged so that the 'teeth cartons' look like they are the monster's teeth. The cut outs on the side panels mean that less material needed, saving costs.



The box is held closed by two taps on the front panel which are sealed down with glue. To open the box just rip them off and then the 'mouth' can be opened to allow easy access.

Spots have been embossed onto the box to break up the empty sides .

Final

To improve on the previous design, I combined the eyes into one panel and given a more curved design. I've also designed them so that they fold out of the back of the box so that the net can be cut as one piece. They can be folded back into the back of the box whilst they are being transported so they don't get in the way. There is an image of a mouth on the back so that when the eyes are folded back they make a face.

https://katienock.com/

For more projects please check out my website portfolio