

Process Book

Final Year Individual Project Buddi & Bilingual Book

Andrew Dunne

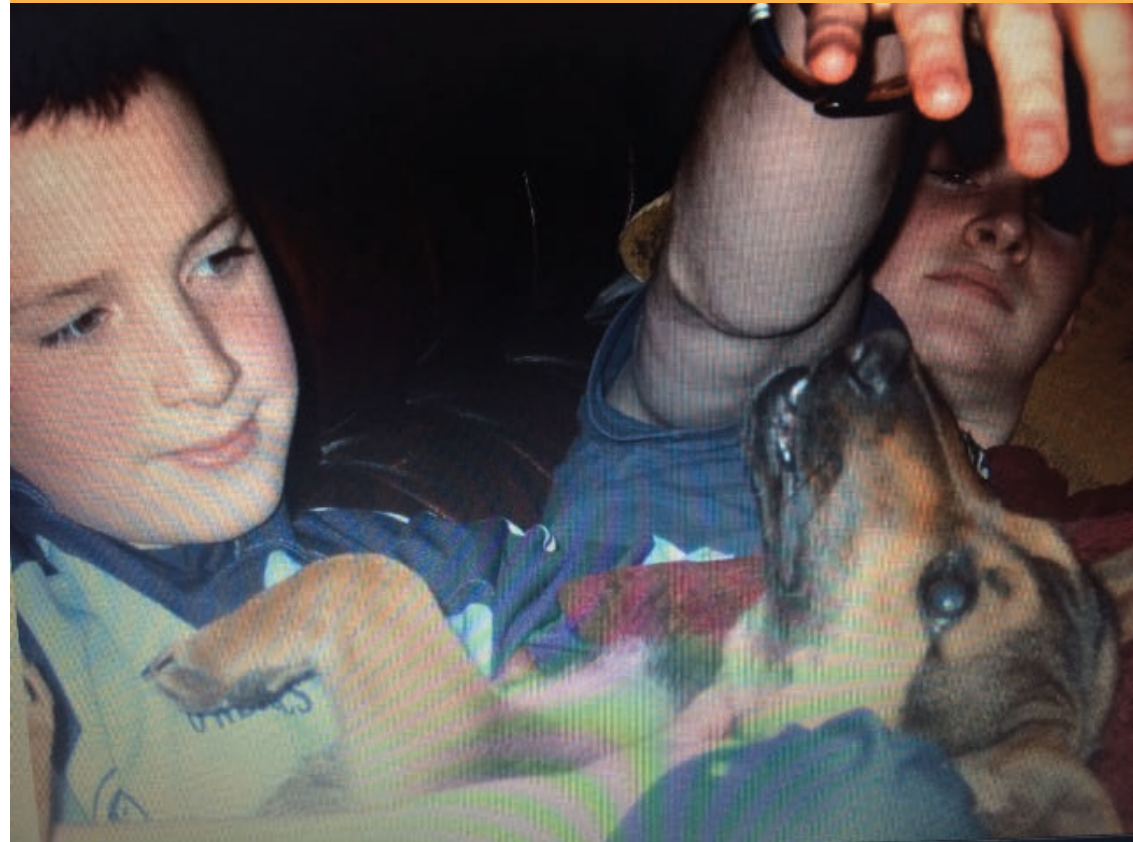
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BSc Product Design (Marketing & Innovation)



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The Designer

As a student of Product Design (Marketing & Innovation), I've learned to harness my creative, artistic, and problem-solving skills. I've gained valuable experience and knowledge throughout my university degree and have had the opportunity to work with several start-up companies.

As a product designer, I focus on empathy-based design, user interaction and user experience. This allows me to better understand and relate to individuals in difficult and challenging circumstances.



The Vision

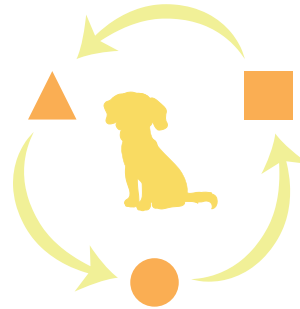
My mission is to inspire early learners to develop the essential building blocks of a language in the comfort of their home through immersive and engaging technology.

Language development is a critical part of a child's overall development. It supports the child's ability to communicate, and express and understand feelings. It also supports thinking, problem-solving, and developing and maintaining relationships. The capability for children to speak two languages carries a plethora of benefits including; increased brain power, improved educational development, increased awareness of other cultures, health benefits and provides more job opportunities later in life.

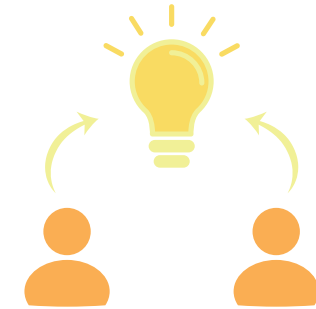
The figures from Ireland's Census 2016 show that 1.7% of the population speak Irish daily. Padraig Pearse once declared, "a country without a language is a country without a soul". I want to help preserve the Irish language.



Buddi is a soft plush, artificial intelligence device that will immerse the child in conversation, culture, music and play using gamified lessons and assisted speech.

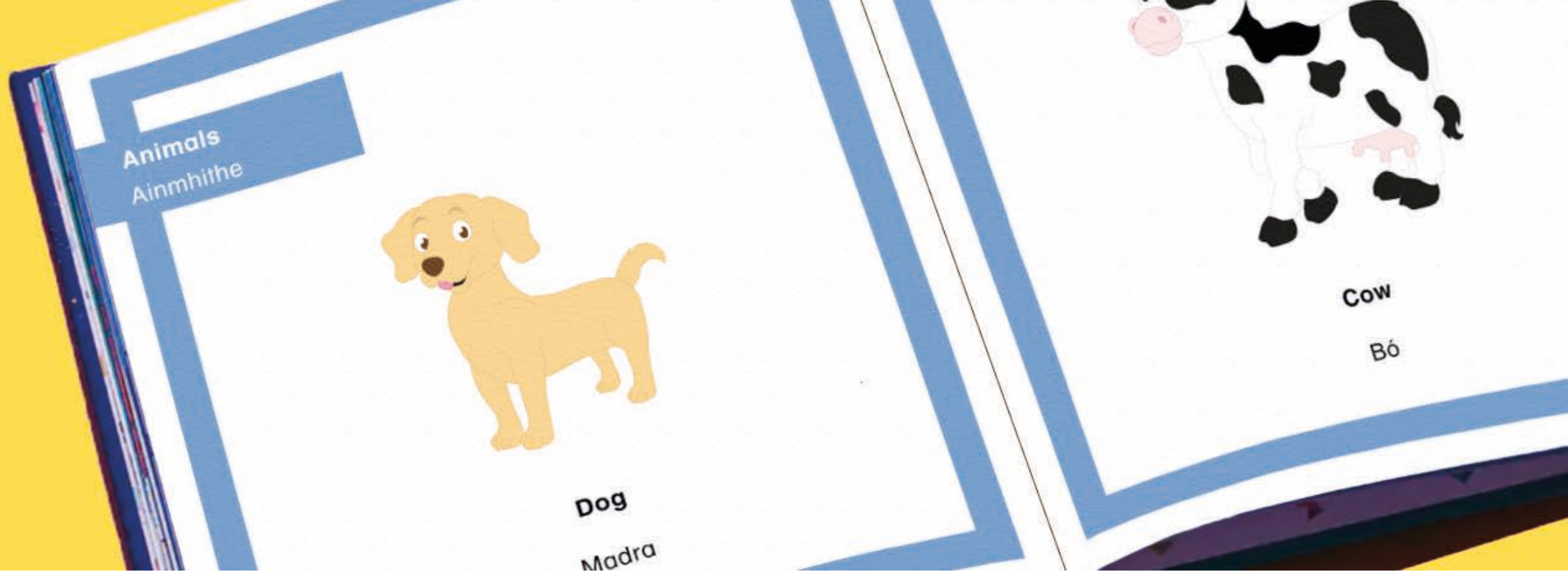


Children can outgrow educational toys after a number of months, the innovative technology ensures that Buddi adapts and grows with the child's language development.

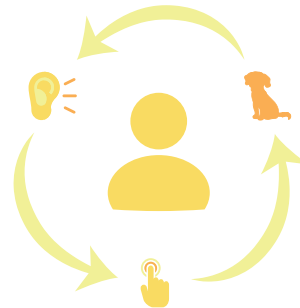


The device acts as a mediator between the child and parent, allowing single language parents to be the teacher and student, for a shared learning experience.





The physical book is not dead, it's about to be reborn with the use of conductive ink, to use the book, simply touch one of the “conductive points” with your finger.



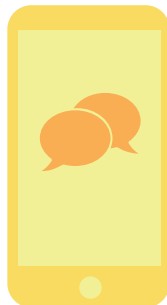
Each book is connected to Buddi and when a “conductive point” is touched, Buddi will speak the corresponding word, sentence, sound effect or music.



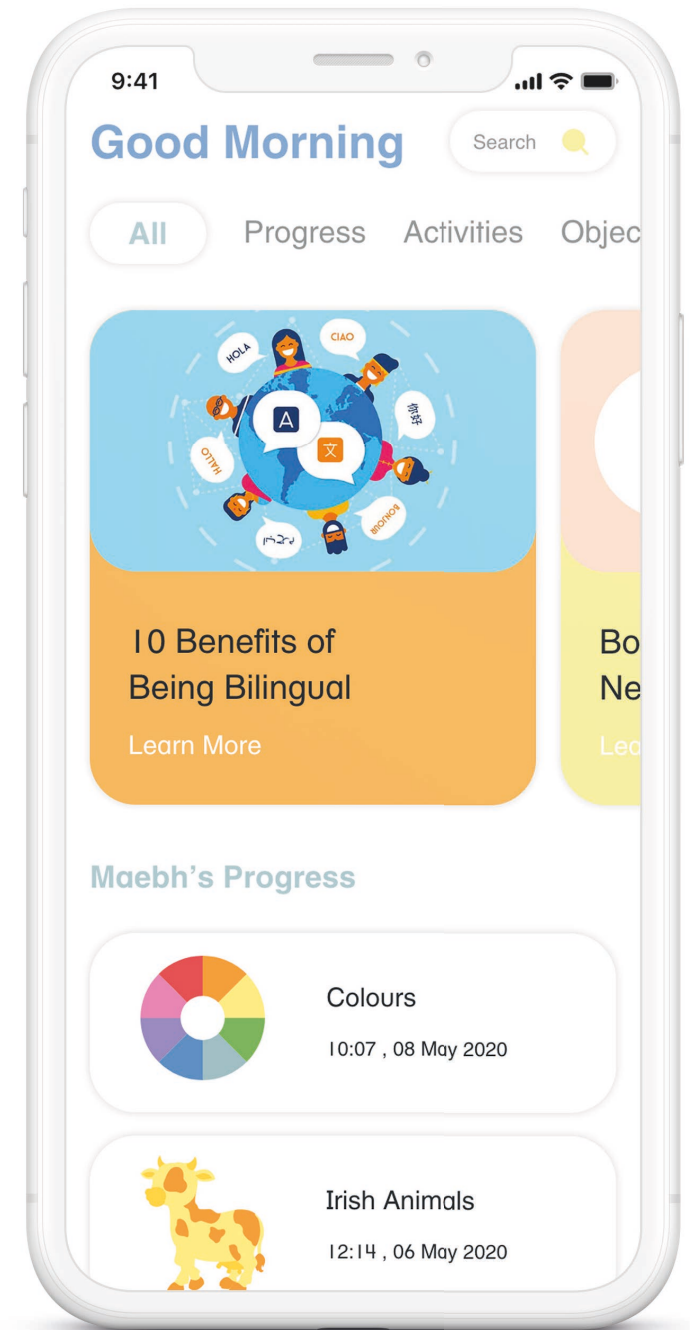
We eliminate the need for a screen, recent studies have shown that early electronic screen exposure can result in autism like symptoms in children.



The app uses push notifications to inform parents of their child's progress, daily activities, learning objectives and lesson reminders.



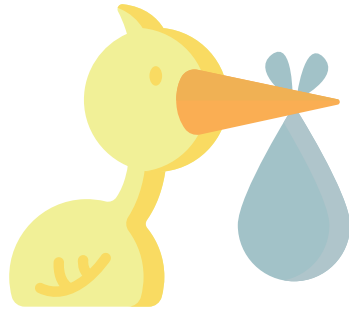
Through the use of daily gamified lessons, the app doubles as a language-learning platform providing an engaging experience for parents.





Well done!
An-mu-mu

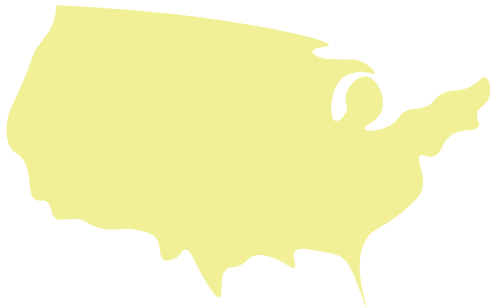
The Market



There have been 319,521 births in 2014 – 2019 (Central Statistics Office).



In Ireland, revenue in the Toys for Toddlers & Kids segment amounts to €78m in 2019. This has increased by 17.57% since 2012 (Statista).



In the United States, revenue in the Toys for Toddlers & Kids segment amounts to €5,488m in 2019 (Statista).



In India, revenue in the Toys for Toddlers & Kids segment amounts to €5,616m in 2019 (Statista).



In China, revenue in the Toys for Toddlers & Kids segment amounts to €10,261m in 2019 (Statista).

The Research

Online Surveys: The purpose of the first survey was to better understand and identify the general public's attitude towards language. The second survey was to get a better understanding of the language development of a child and parents' attitude towards technology.

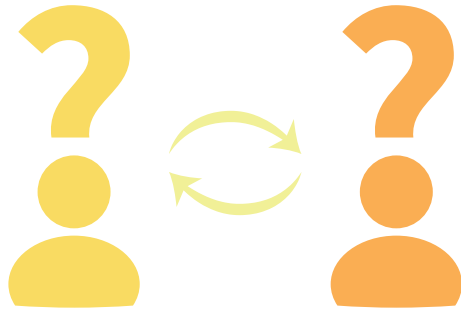
Interviews: Initially, I organised eight semi structured interviews with parents. Subsequently, I organised four ethnographic interviews with three professionals of early childhood development.

Observational: To observe and study the actions, interactions and reactions of a child for three different scenarios; comparing the child's reaction to two different toys, the child's first interaction with a tablet and the child's first interaction with artificial intelligence.

Discrete Observational: To observe and study the actions, interactions and reactions of parents and their child over a twelve-week period.



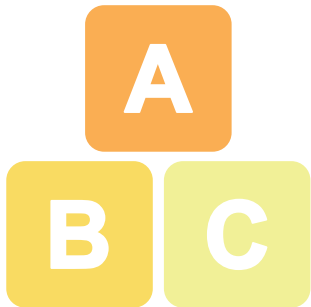
The Problem



Parents with only one language must rely on education outside of their homes for their child to develop a second language.



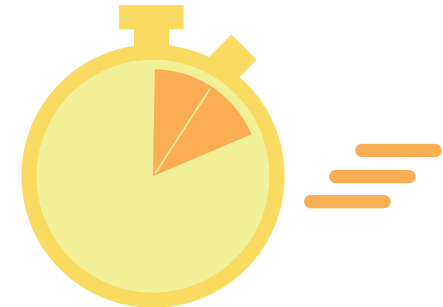
Lack of affordable, age appropriate and engaging language development experiences for children.



Children grow and develop at different rates; they can outgrow certain educational toys after a number of months.



Increased electronic screen exposure is resulting in autism like symptoms in children



Parents find it challenging to keep track of their child's progress.

The Customer



Name: Jennifer Murray

Age: 36

Work: Nurse

Status: Married

Family: 2 kids (2 years and 4 years)

Location: Celbridge, Co. Kildare

Household Income: €65,000

"Learning about other cultures is important for children and helps them understand the world around them."

Interests



Jennifer and her husband have a great educational background. She knows the importance of educating children from a young age. Has a great understanding of other cultures from traveling the world with her husband. Jennifer would like to pass this knowledge onto her children, as well as a sense of patriotism. Not tech savvy and can be reluctant to bring new technology into the household. This reluctance is due to privacy and safety concerns. Has a great love of music and would like to instill this in her children.

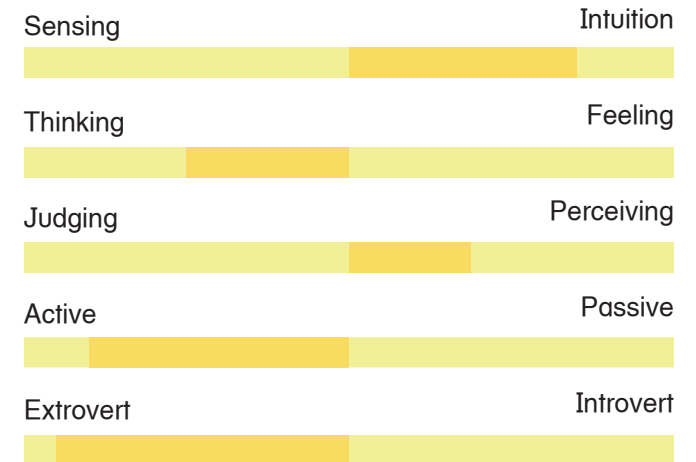
Goals:

- High aspirations for her children
- Wants children to be bilingual
- Help children learn about other cultures

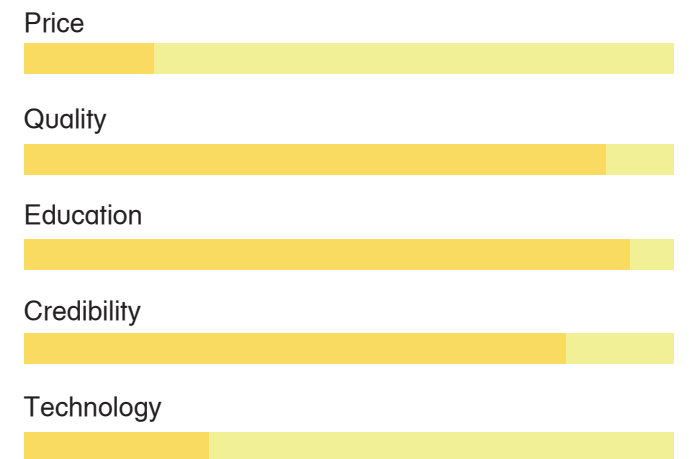
Frustrations:

- Single language parents
- Children on waiting list for Gaelscoil
- Not tech savvy

Personality:

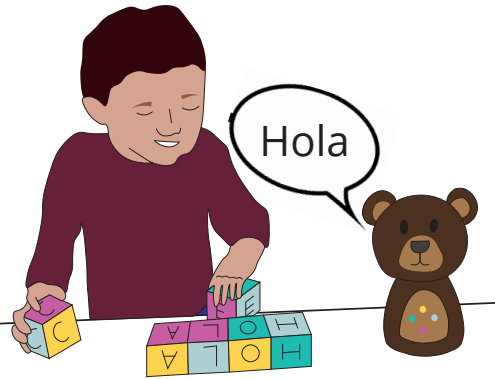
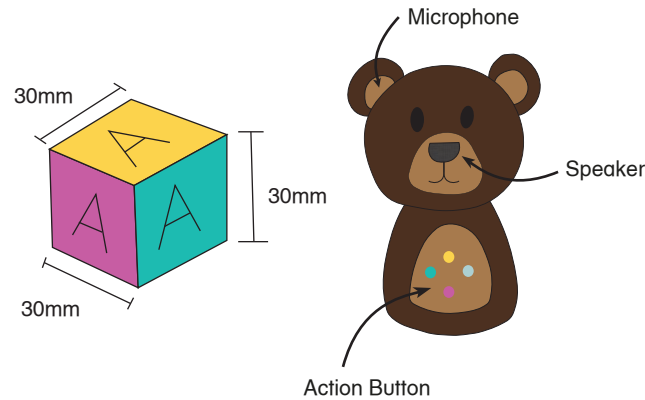


Motivations:



The Concepts

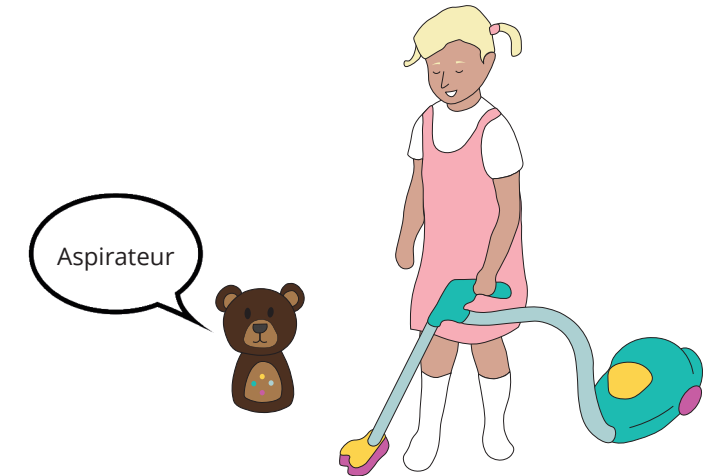
Individual ABC and 123 plastic blocks can be joined together in sequence to create various child friendly words and numbers that will be spoken aloud by the device in both the native language and chosen language.



This play by learning feature allows the child to be creative and develop their vocabulary on their own, while having fun.

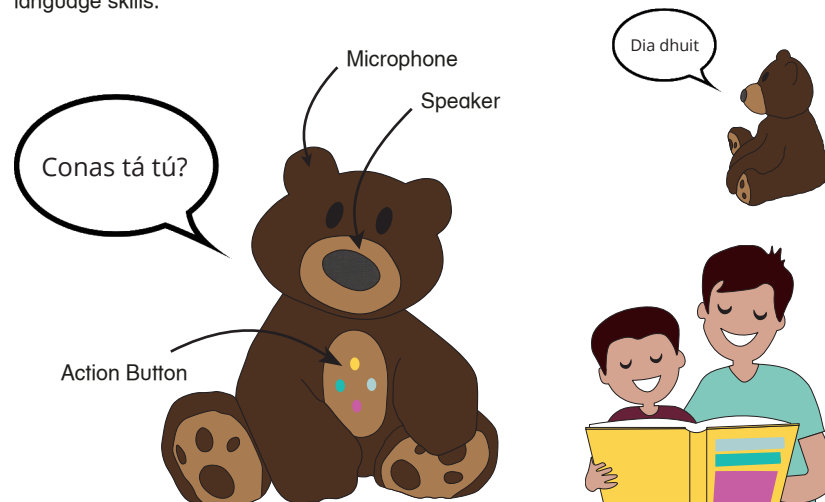
The device is made from plastic and is 143 millimetres tall and 96 millimetres in diameter at its widest point. The ABC and 123 blocks are 30 millimetres by 30 millimetres by 30 millimetres

Sold with or separately to the device are a variety of play by learning toys. When being used the device will speak aloud the object, phrases and sentences that relate to the object, in both the native language and chosen language.



AI can provide a fun, interactive and immersive experience for a child to learn a second language with no screen time. As discovered from my user investigation, children can interact with AI easily with a variety of different commands.

The child can freely talk, ask, play, sing and dance with the soft toy. The soft toy will speak to the child in their native language and the chosen language, conjunctively developing both language skills.



Bilingual books develop a connection between the child and the main character of the book. When the child has built a connection with the character, the child is given an artificial intelligence soft toy of the character.

This imaginative play allows the child to be fully immersed in real world scenarios, which has been proven to help the development of early childhood language.





The Experiment

I created a prototype of the product by inserting a Google Home into a plush soft toy of the child's favourite character and created a bilingual storybook, using English and Spanish. I then used the prototype in an experiment to study the child's (two years old) actions, reactions and interactions with the prototype.

There was huge excitement and interest when the child was introduced to the prototype and book. When music was played the child began to dance and interest in the product increased again. There was enormous excitement and interest when the prototype began to speak and the child began to hug the prototype.

The book was too advanced for a two year old. When the prototype began speaking Spanish, it was just noise to the child, the prototype and book are disconnected in the eyes of the child.

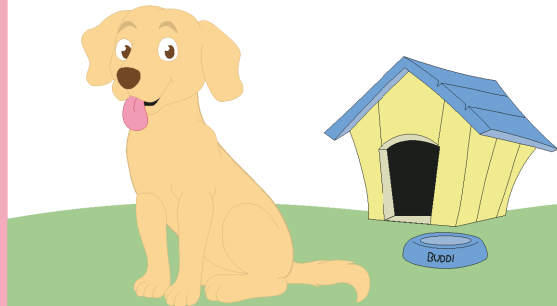
The Prototype

Having discovered the disconnect in the eyes of the child between the device and book, I decided to re-evaluate my project. Using a sensory design approach, journey maps, assumption mapping and storyboards, I redesigned the project changing the way in which the child, book and device interact with one another. A modern twist on traditional books, using conductive ink purchased from Bare Conductive, I transformed the book into an innovative, interactive and engaging experience.

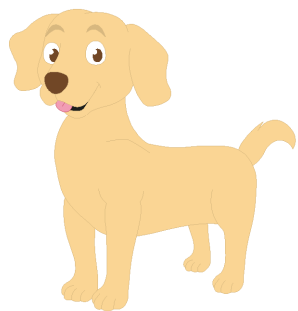
To create my working prototype, I first had to create a character to base the learning experience around. Once I had designed and illustrated Buddi, along with some other characters, I created a hand crafted working prototype of the book.

Unfortunately, due to COVID-19 and the subsequent lockdown I was unable to test my prototype. However I was able to validate the concept by recording a child's engagement and language development over a three week period by using a video of the working prototype.

Hello, my name is Buddi.
Would you like to learn Irish with me?



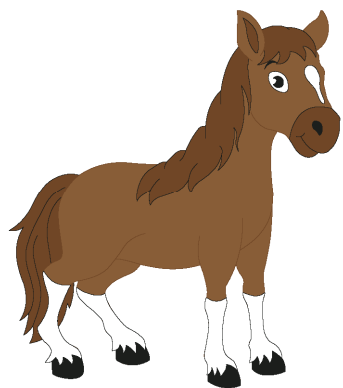
Animals
Ainmhithe



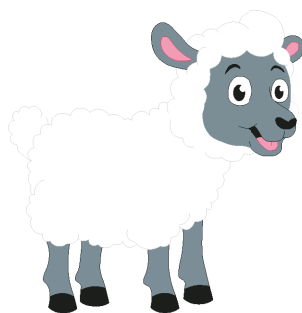
Dog
Madra



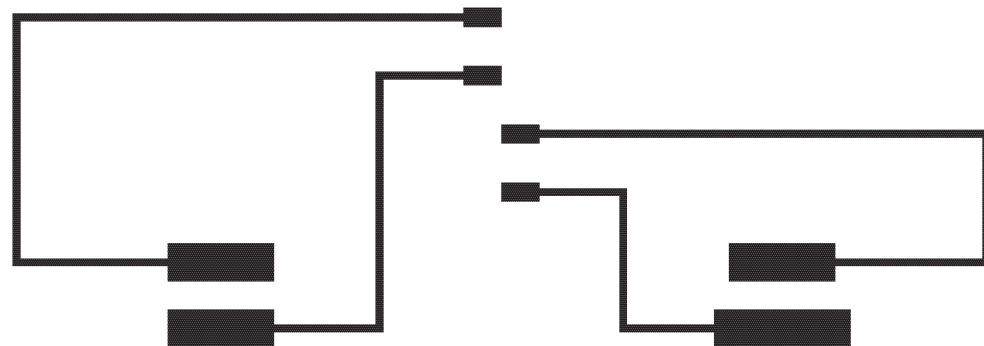
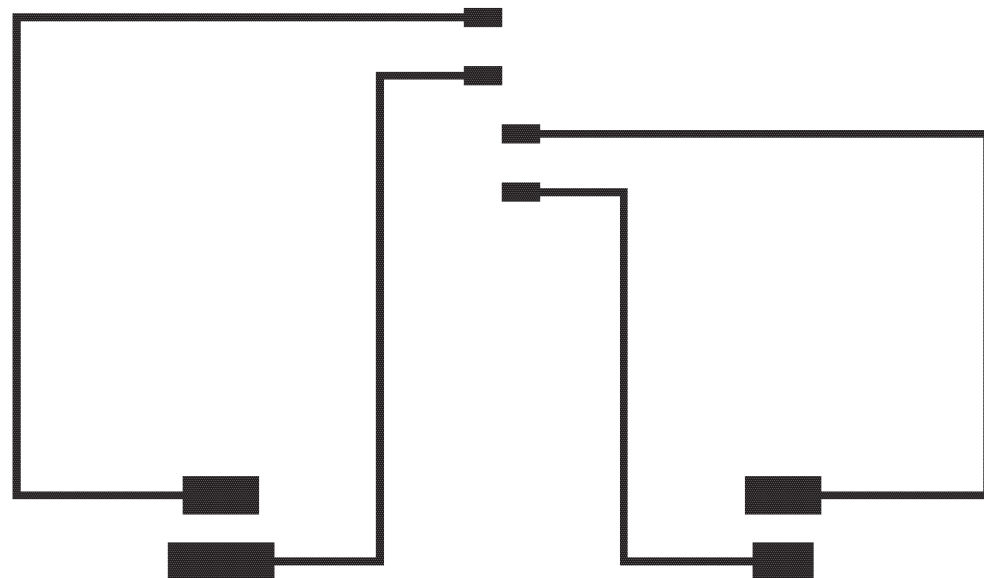
Cow
Bó

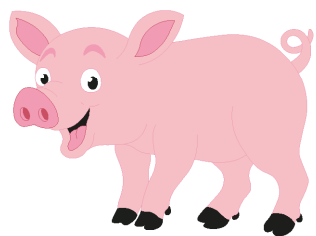


Horse
Capall



Sheep
Caoirigh

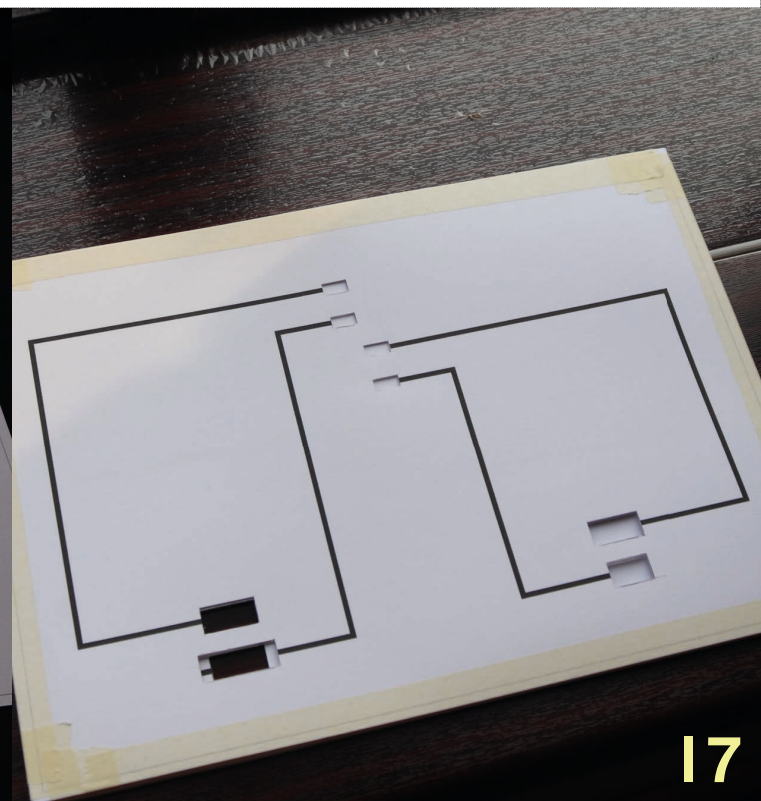
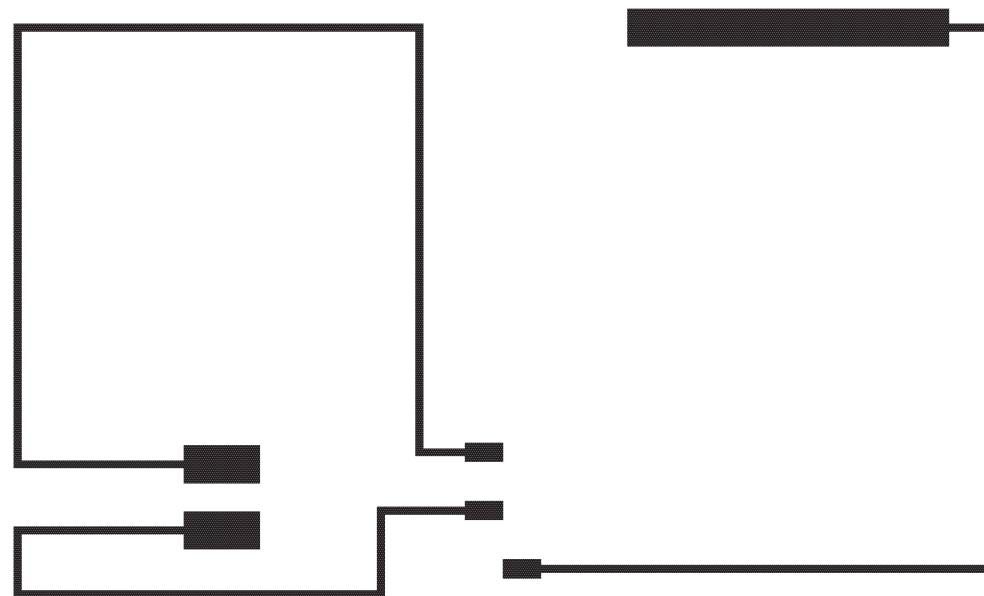


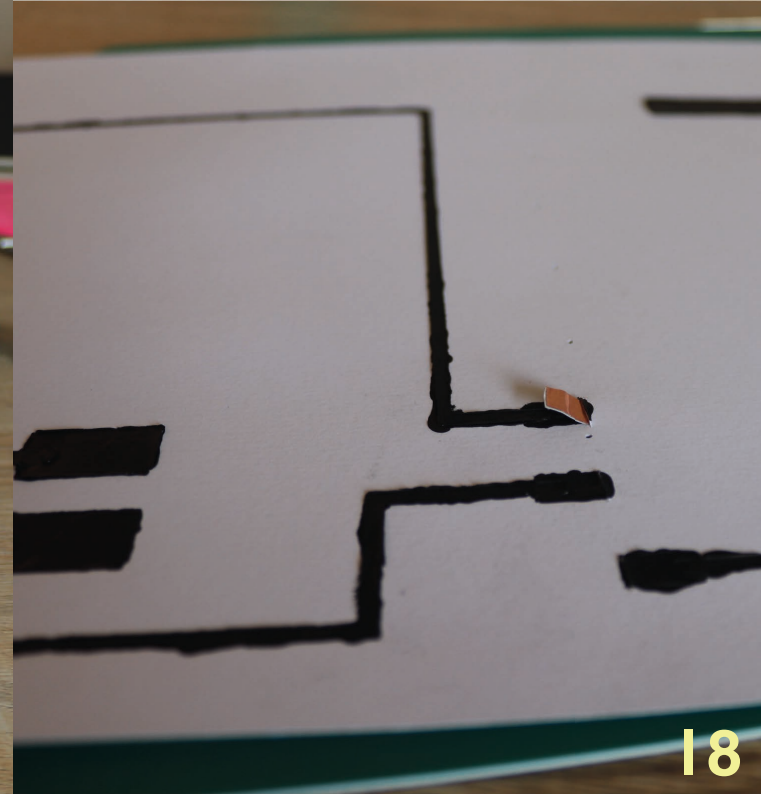
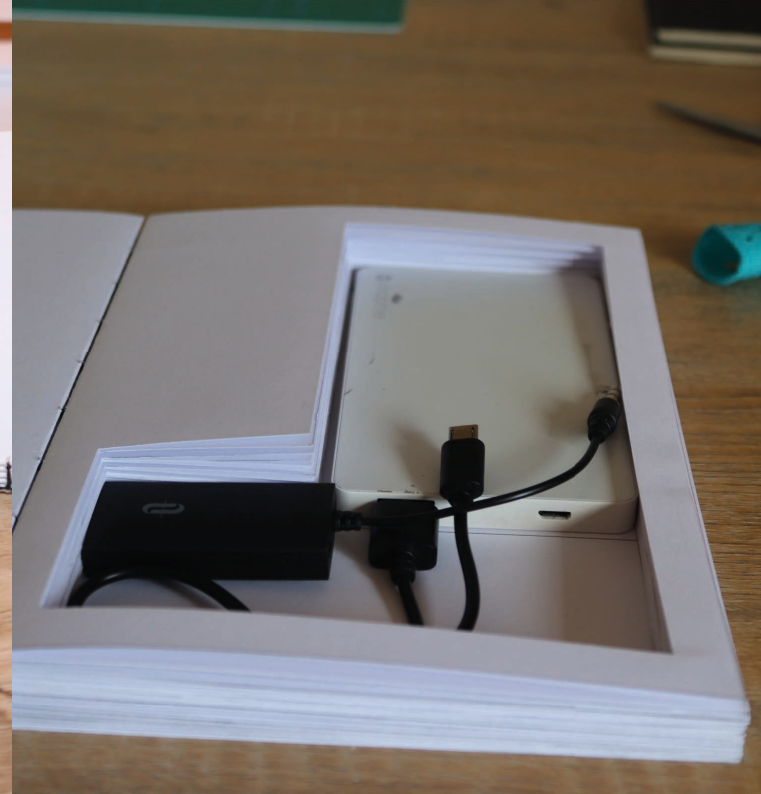
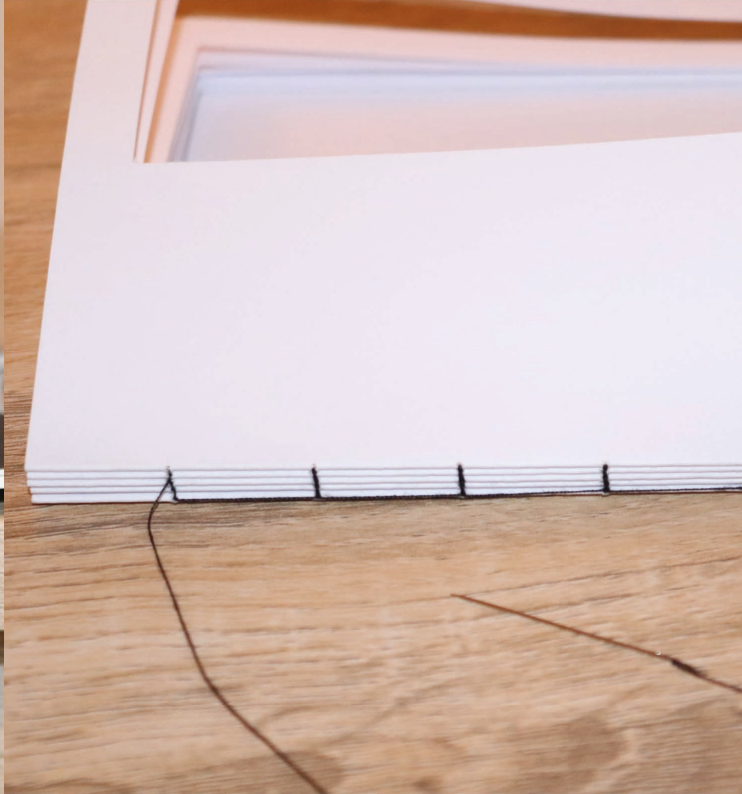


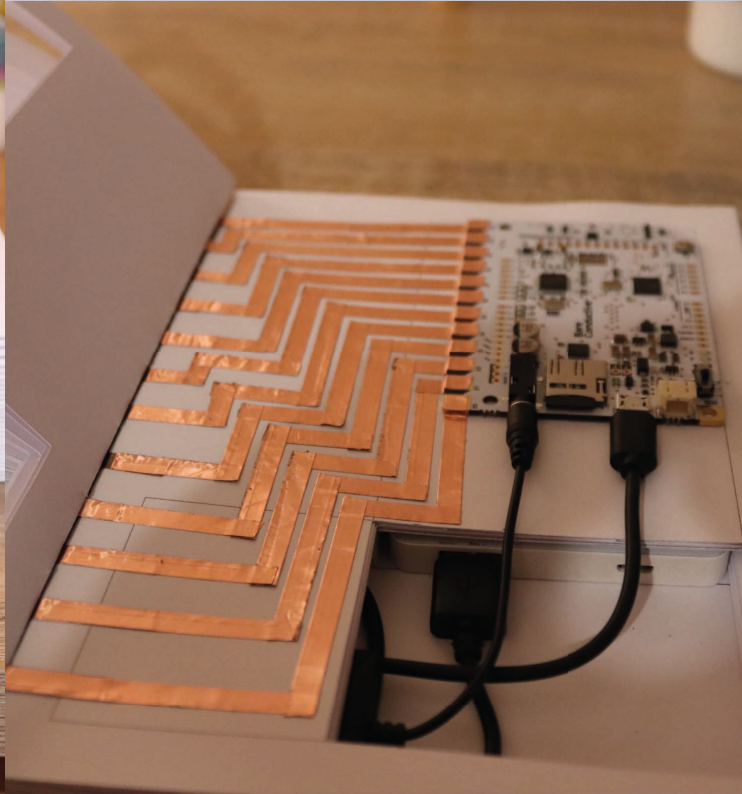
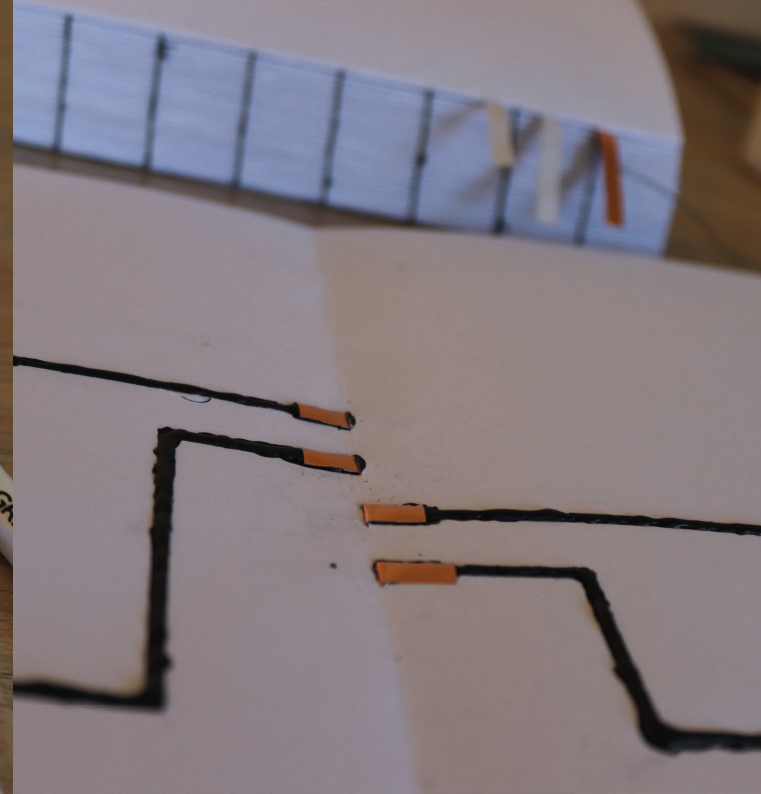
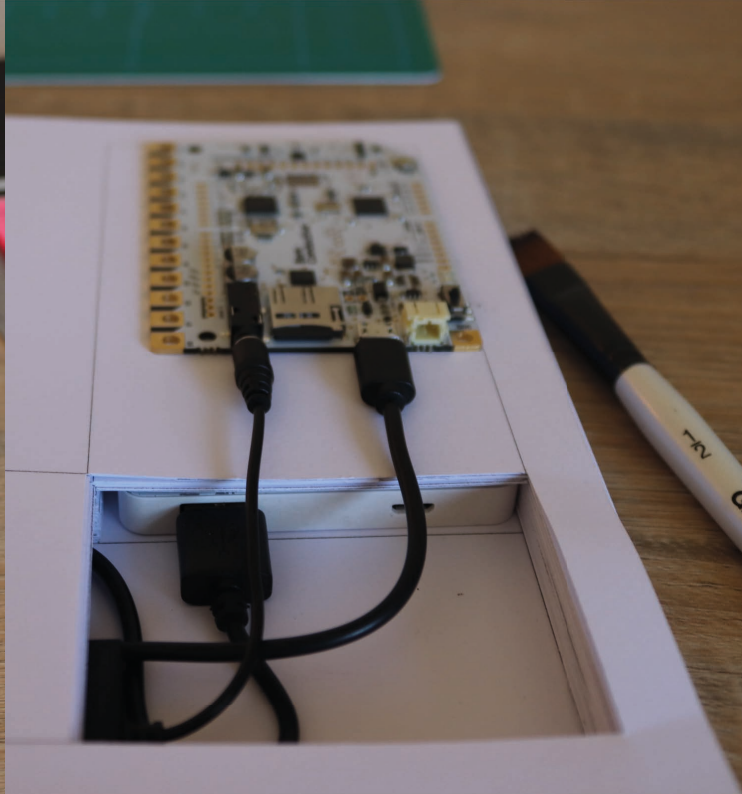
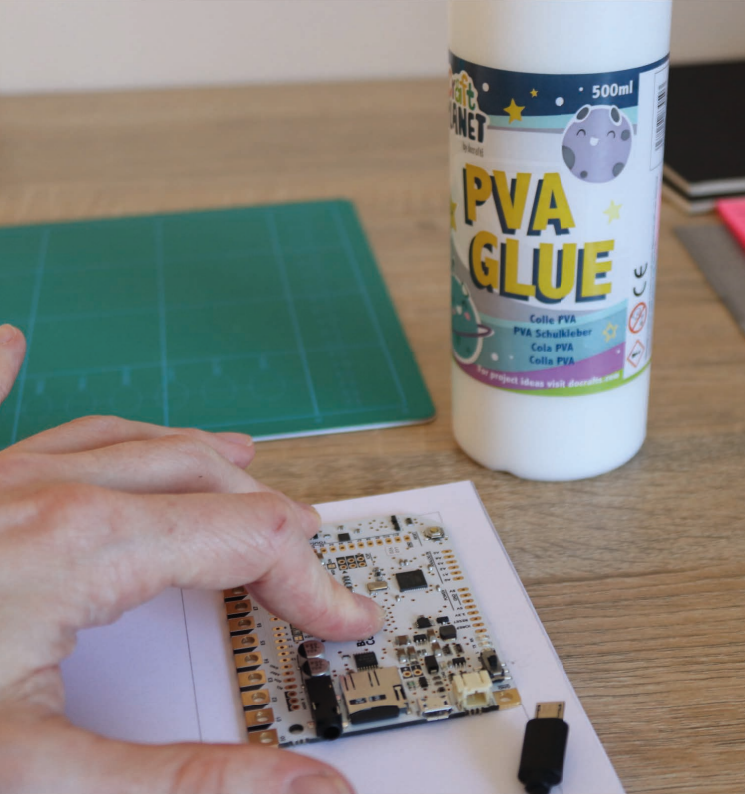
Pig

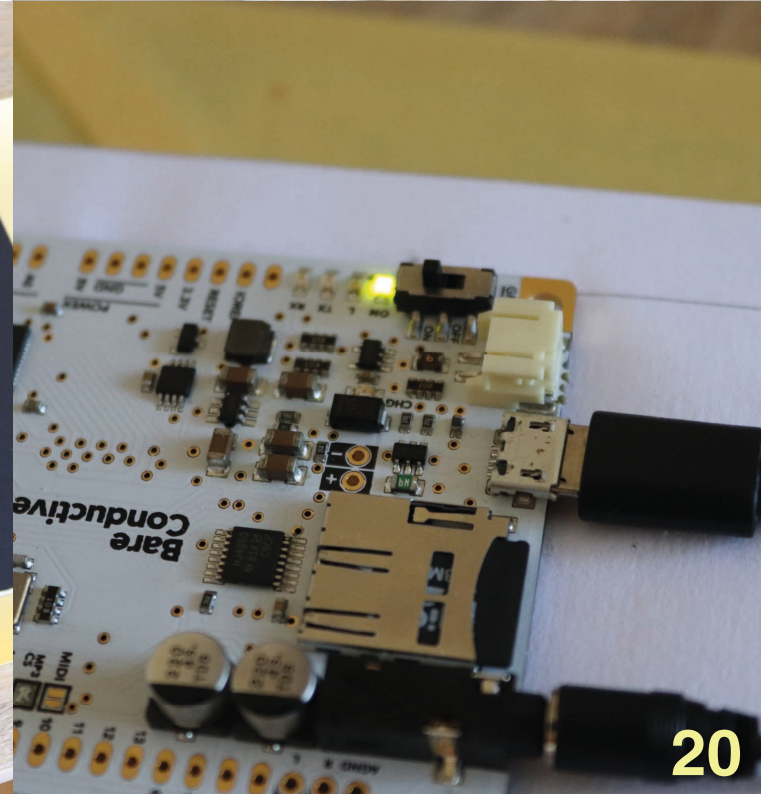
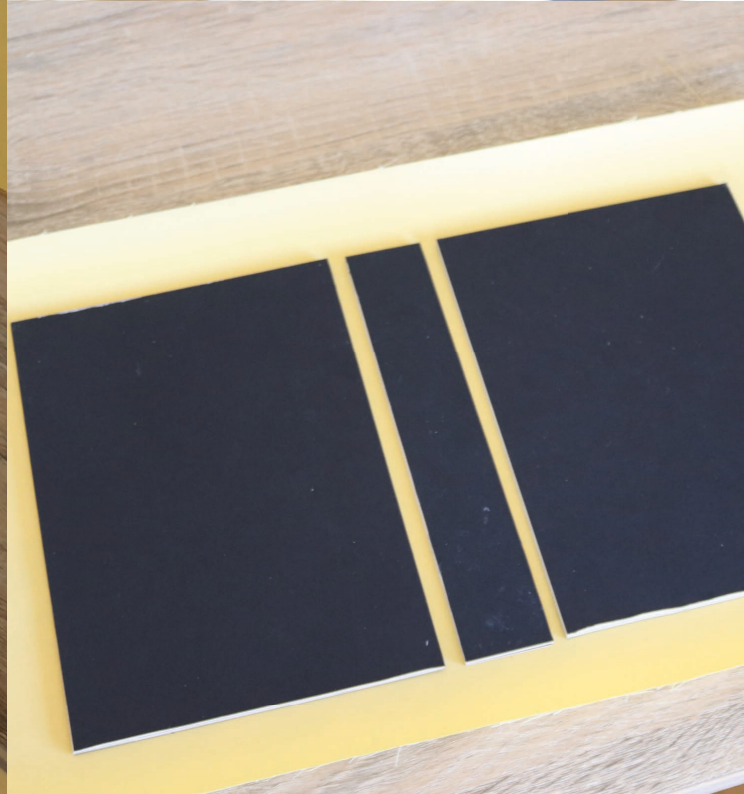
Muc

Well done altogether!

















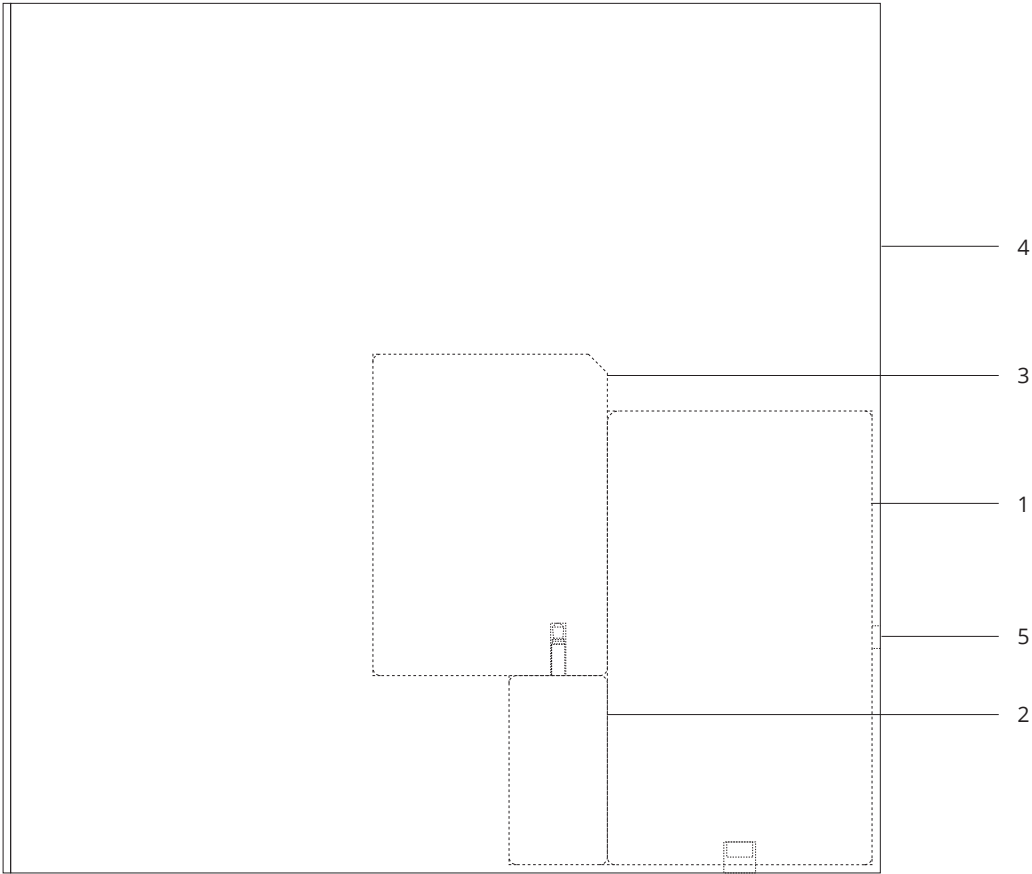
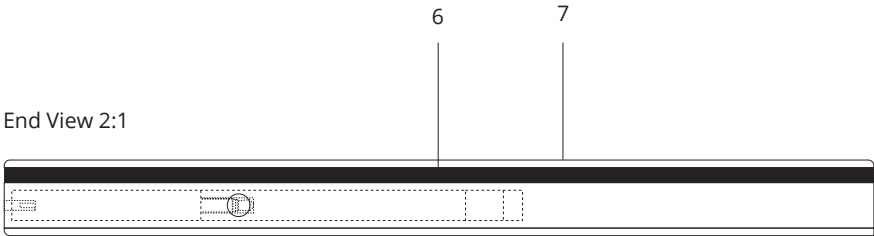


The Drawings

Elevation 2:1

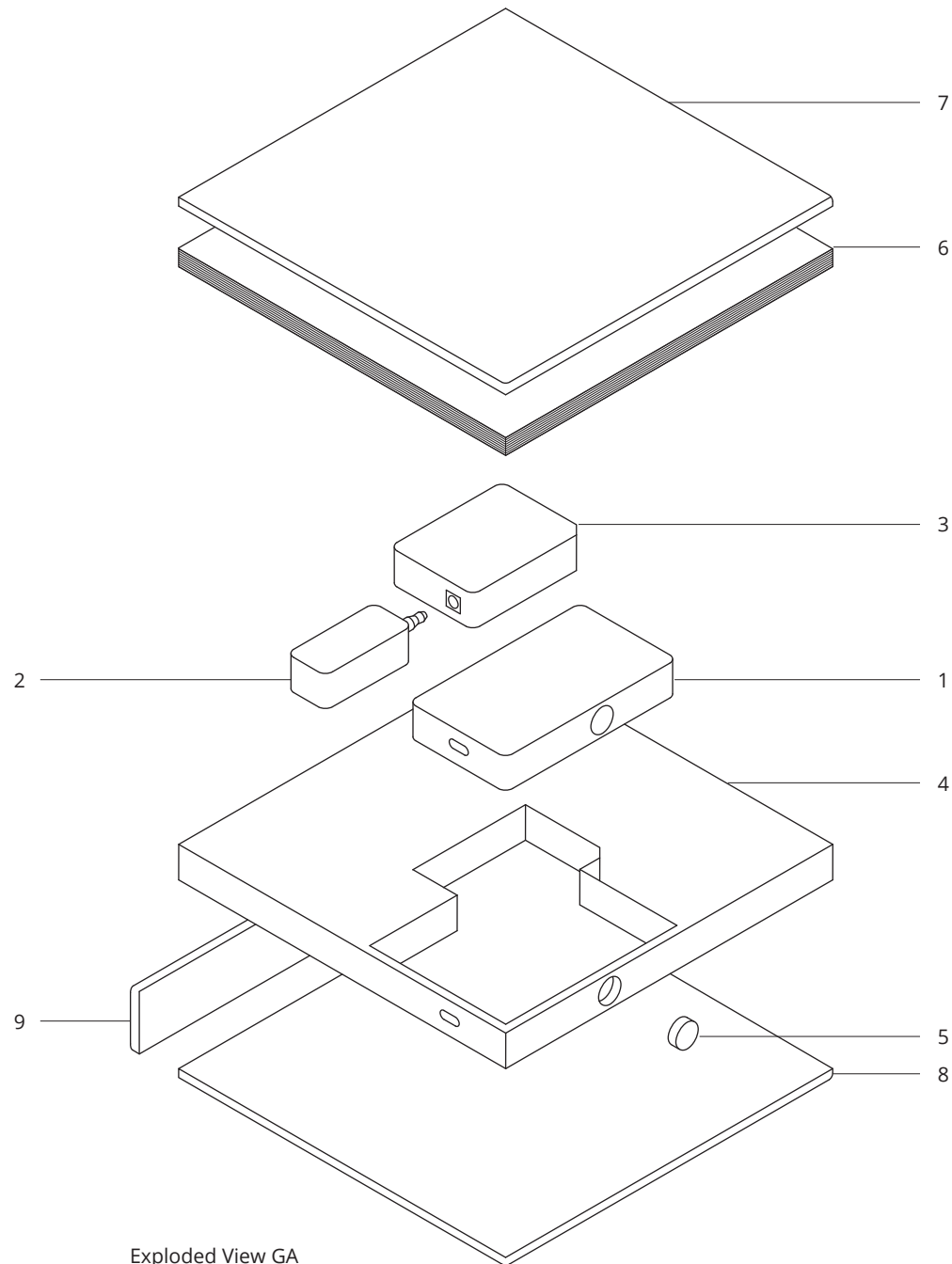


End View 2:1



Plan 2:1

Part Number	Part Name
1	Power Bank
2	Blue-tooth Transmitter
3	PCB
4	Electronic Case
5	Button
6	Paper
7	Hardback



Exploded View GA
2.5:1

Part Number	Part Name
1	Power Bank
2	Blue-tooth Transmitter
3	PCB
4	Electronic Case
5	Button
6	Paper
7	Hardback Front
8	Hardback Back
9	Hardback Spine

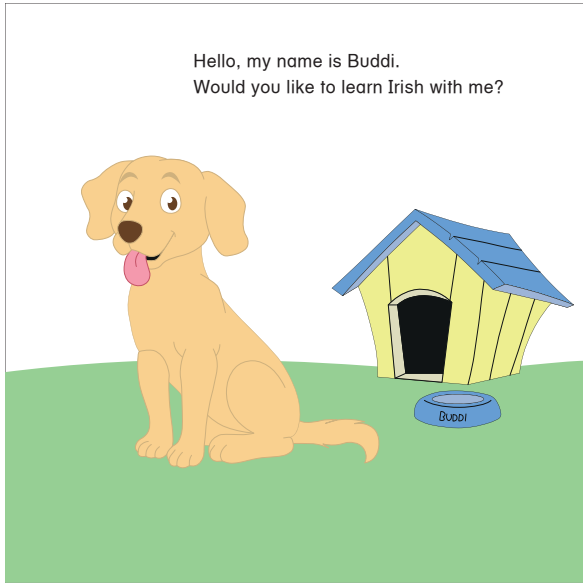
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Production Drawings

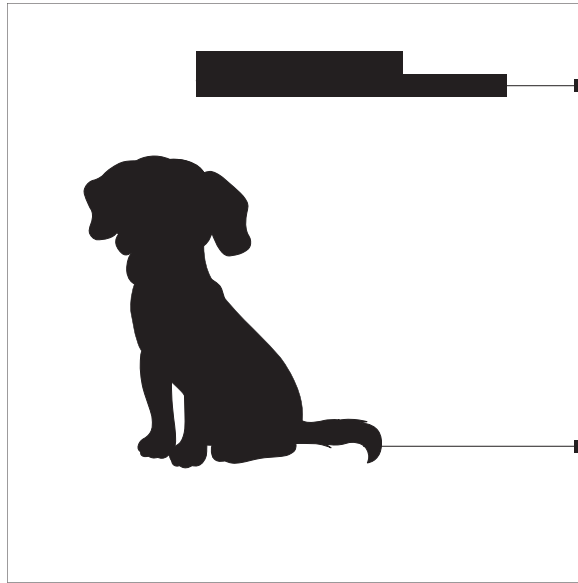
Adobe Illustrator 2020

16353956

Exploded View GA



Print 3:1

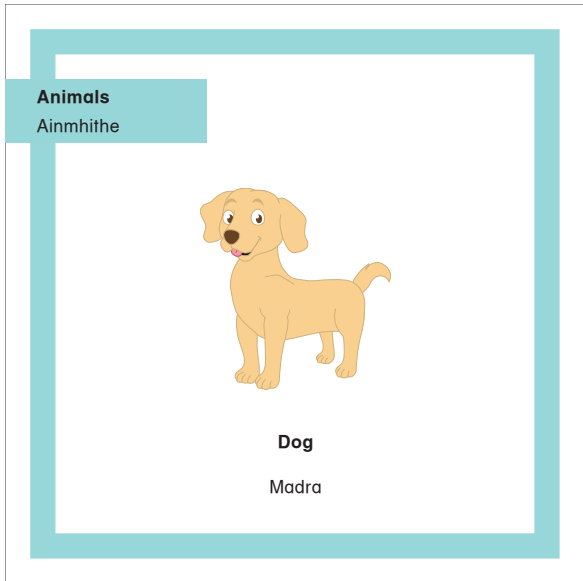


Conductive Ink Print 3:1

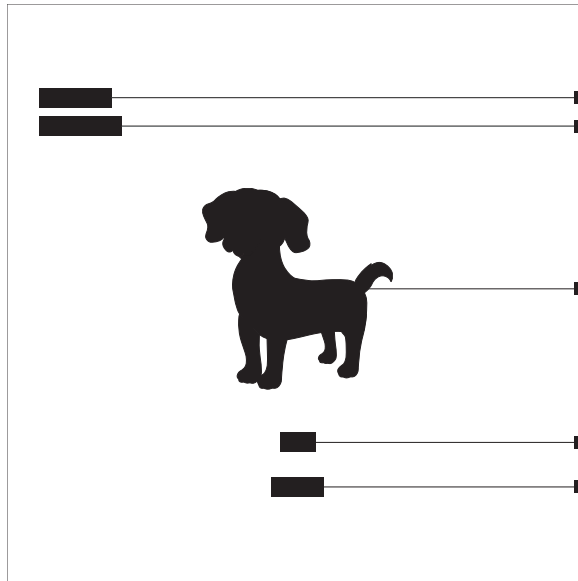
Each book measures 230mm x 230mm and is printed on thick, luxurious 300 GSM paper that's partly recycled, FSC-certified.

Conductive ink is connected through the spine of the book to the printed circuit board.

Each "Conductive Point" produces a unique sound bite or sound effect related to the "Conductive Point" pressed.



Print 3:1



Conductive Ink Print 3:1

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Production Drawings

Detailed Part Drawing

Adobe Illustrator 2020