## ROBYN ADAMS DESIGN PORTFOLIO 2019

## TABLE OF CONTENTS

#### STROODEE

Developing a toy **3D** printer kit for kids

SPACE RACE

Creating a board game using systematic play

12

THE LAVA TABLE

Using lava as a creative medium

21

# STROODEE

3D Printing, Education, & Play Individual Project Spring 2019

### THE PROBLEM

How can we make 3D printing easier to understand and more interactive for kids?

After my fourth year in college, I had the opportunity to teach a 3D printer building summer class for high schoolers. During this class I took notes of a few problems that occurred during the class:

- Due to the digital element of 3D printing, some of the students struggled to fully understand the basic coding and controls for 3D printers.
- Students became uninterested in the 3D printer after the printer had started printing.

From my observations I realized that there was a place for improvement in the 3D printing experience:





### THE MARKET

Many of the kid friendly 3D printers on the market today are *"one click"* print printers that required the user to have some kind of electronic device to send their file to the printer.

These printers are successful in their own way, but the problem is that *they are not actually teaching what it means to 3D print something.* 

### RESEARCH

In order to make 3D printing easier to understand and more interactive for kids I needed to find out:

- How do children learn in today's society?
- What is the most affective way to teach children about technology?
- How and why 3D printing will be beneficial to learn about?





#### DO YOU THINK 3D PRINTING COULD HAVE A BENEFICIAL IMPACT ON CHILDREN?







### PSYCHOLOGY

As children grow and learn, each child develops their own personality and way of learning.

Howard Gardner, a developmental psychologist created *The Theory of Multiple Intelligences.* His theory differentiates human intelligence into eight categories rather than seeing intelligence as a single general ability. He believes that if schools and teachers recognized and supported children's individual learning styles they would learn better.

### **IDEATION**

By analyzing the collected data from various interviews, surveys and secondary research I was able to start formulating ideas for the final product.

One of my first ideas was to create a device that would turn a backpack into a life size 3D printer, but after reviewing all my possible solutions, I determined that creating *a manual 3D printer for kids* would be the best and most feasible solution to solve the "one click printer" problem.

### The product needs to encourage:



Creative Thinking



Problem Solving



Desire To Create Rather Than Buy













### PROTOTYPING

I began my prototyping process by creating cardboard and 3D printed models to test the structure and mechanics of the printer bed and body. At this point I realized that the printer should come as an unassembled kit so that the user has the full experience of building their own 3D printer.

The print head would work *similar to an Etch-A-Sketch design.* Knobs on the lower section of the printer would control the X, Y and Z axis movement.



Etch-A-Sketch Mechanisms



### THE TOY 3D PRINTER KIT FOR KIDS







### THE STROODEE KIT

Unlike a normal 3D printer, Stroodee allows the user to take full control of the printer does. *The user can control the X, Y and Z axis just by turning the knobs on the side of the printer.* 

The extruder is a paste extruder that can print a reusable and *re-extrudable safe clay material*. The extruder is powered by a foot pump that pushes the clay through a tube into the extruder head. The Stroodee kit also comes with fun "Stroodee-Code" projects to help the user learn about coding for a 3D printer.

Included in the kit:

- Assembly Instructions
- 2 Different Kinds of Print Heads
- 4 Different Printing Clays
- Printer Body Parts
- Tools For Assembly
- Stroodee-Code Project Book

# SPACE RACE

Creating a board game using systematic play Team Project Spring 2018

## How can we create a board game using systematic play?

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My role in this project:

- Research kinds of board games & player data
- Create the storyline for the product,
- Design & render the two main playing components



### RESEARCH

I researched where people generally bought their board games, what kind of games people like playing, and what age range we should design the game for.

We came to the conclusion that our target user would be in 26-30 year old range so that we could create a more complex game compared to kids board games



















## INSPIRATION & DEVELOPMENT

The story of the board game is based on two space travelers who are stuck on another planet and need to build a ship and space portal to get home.













PROTOTYPING









### GAME BOARD

### GRAPHICS

My team member developed the graphics for the supply and task cards. The graphics are based on zodiacs and their corresponding stars.





# THE LAVA TABLE

Using Lava as a Creative Medium Individual Project Fall 2016

# How can we use lava as a creative medium?





### INSPIRATION

Artists, Design & Materials

Resin can work with multiple kinds of materials and uneven surfaces, making it a perfect material to contain a piece of lava.

Resin has the ability to *effortlessly pair form with functionality*. Many artist and designers such as Eduard Locota and Alexandre Chapelin use this medium to create unique one of a kind table tops.

Material examples: Wood, Metal, Ceramic, or Concrete



## UNDERSTANDING LAVA

Materials, Tools & Testing

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A. Recycled Basaltic Rock: From the Dresser Trap Rock Quarry in Polk Co., Wisconsin

> **B. Tilt Furnace:** Melted the basaltic rock to the optimal pouring temperature (2200°F)

C. Wood: Lava burned through the wood mold

O. Sand: Guided lava to into the mold

E. Aluminum: Lava binded to the aluminum bowl

> F. Ceramic: Unable to release the lava from the ceramic container







### THE FINAL POUR

Fire Brick & Steel

#### Fire Brick:

The lava did not stick to the bricks. The bricks shaped the lava into a table top like shape

#### Steel Mold:

The steel mold contained and allowed the lava to keep a box like shape

#### Pouring:

A steel and fire brick mold was used for the final pour

## CONSTRUCTION

Gluing & Casting

#### Wooden Base:

After cutting and preparing the walnut boards, they were glued together to create the bottom section of the table top

#### Casting Resin:

- 1. Created an acrylic box around the walnut table top
- 2. Prepped the resin by using a small pressure pot
- 3. Poured the resin into the mold
- 4. Table top was placed into a larger pressure pot to reduce bubble formation in the resin











### Thank You For Reading!

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