



# PORTFOLIO

ZACH RODGERS

Industrial Design  
Carleton University Application

- 1 3D Printed Model Rocket Ship**
- 2 The Recycled Cardboard Tank**
- 3 Lighthouse Glass Mosaic**
- 4 Triple A in Charcoal**
- 5 The Octocup of Clay**
- 6 Phosphorus Filter**
- 7 20<sup>th</sup> Century Prom**
- 8 Heaven in a Box**
- 9 Chocolate Box**
- 10 Virtual House**
- 11 Science Shelf**
- 12 Whaleopoly**

# 3D PRINTED ROCKET SHIP

## SYNOPSIS

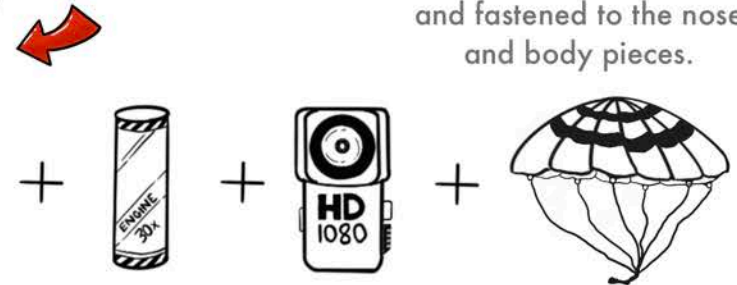
Designed around the Estes A8-5 Model Rocket Engine, this one-of-a-kind lightweight PVC rocket puts a new kind of eye in the sky.

## LOGISTICS

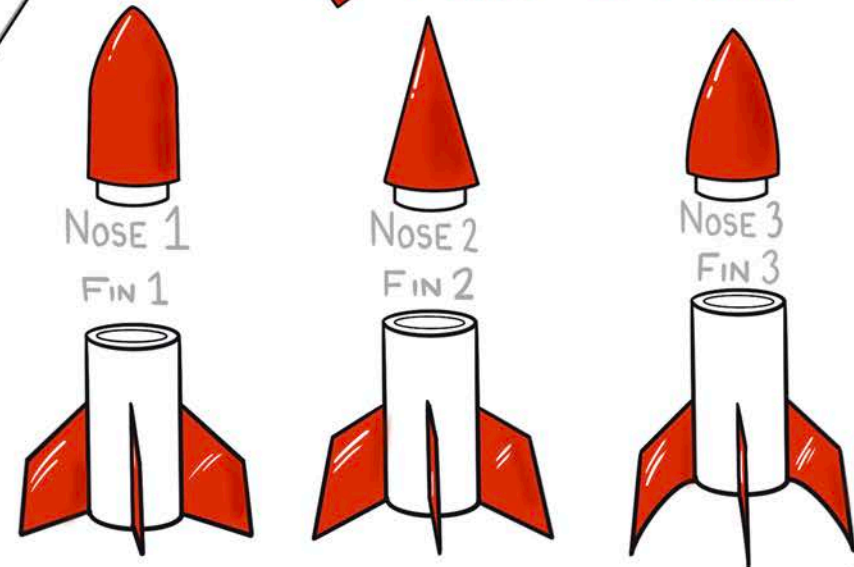
A small, lightweight camera is placed inside facing a peephole to see the surroundings outside.

A small parachute is tucked above the camera and fastened to the nose and body pieces.

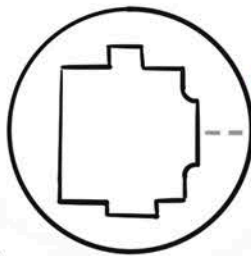
# MODEL



# PART OPTIONS



# TOP



## CAMERA PLAN

The camera's dimensions were measured and a corresponding slot was modeled inside the rocket body.

Extrude

Nose Cone

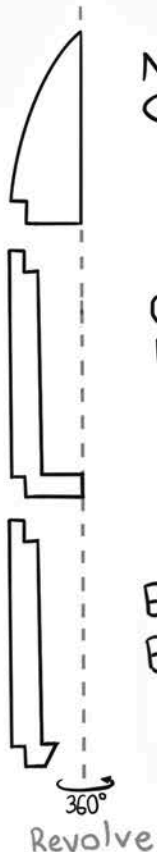
Camera Body

Engine Body

# PROFILE

## MODULAR ROCKETRY

The rocket parts are designed in such a way that the nose cone, camera body, fin piece, and engine base can all fit together. Any number of body segments can be added to make taller rockets, although stability may suffer as a result.



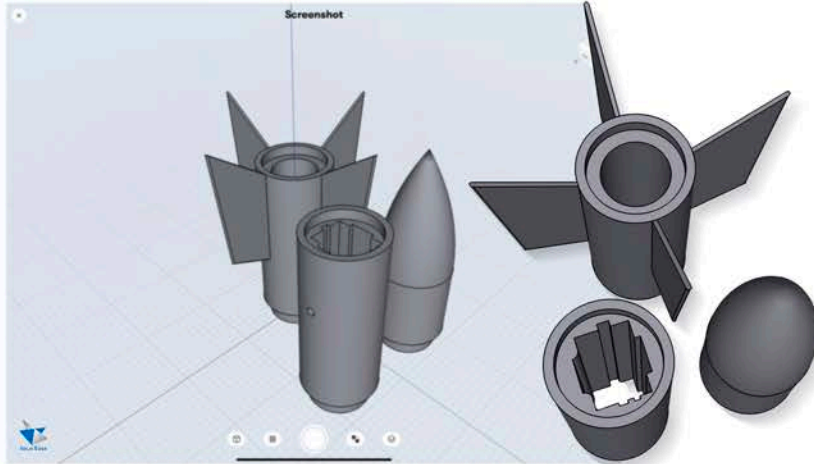
360°  
Revolve



# 3D PRINTED ROCKET SHIP

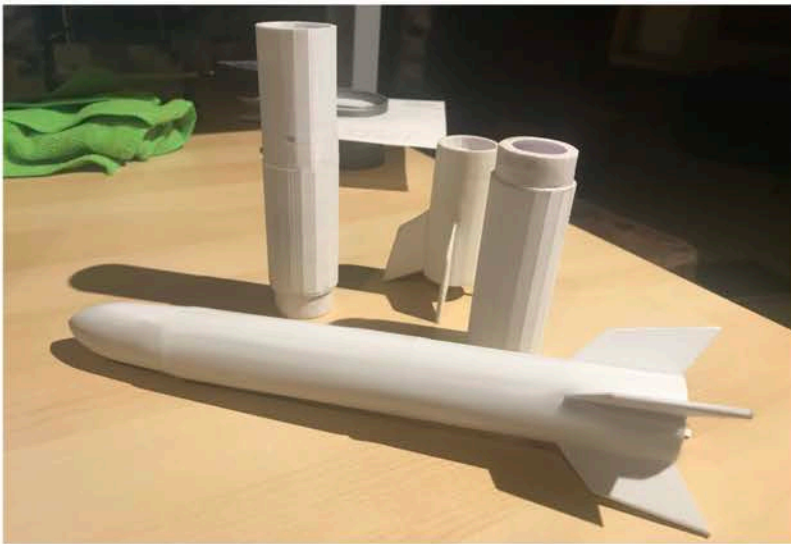
## 3D MODEL OF ROCKET SHIP

The rocket ship was designed in Solid Edge by Seimens, and printed using our school's FlashForge Dreamer, one of the cheapest 3D printers on the market.

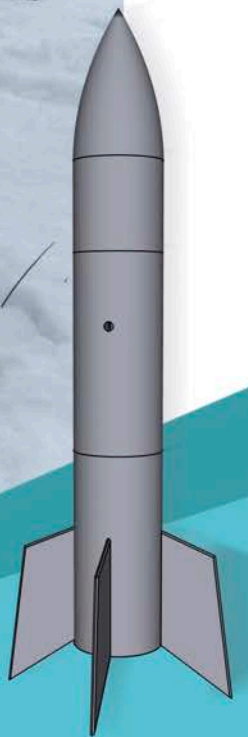


## THE FINAL PRINTOUT

The plans underwent many modifications and adjustments until the final rocket design was achieved. After printing, the pieces needed some light sanding to correct for printing defects.



The Rocket at the launch site in Lion's Head





# THE CARDBOARD TANK

## BACKGROUND

Based on the M4 Sherman Tank for its aesthetic and simplistic style, this model is made fully out of recycled cardboard, glue and a single toothpick. In this project, elements like colour were set aside so as to focus on texturing and detailing the cardboard exterior.



Stage 1



Stage 2



Stage 3

Stage 4



## COMPLETED MODEL

The completed model consists of a rotating head mounted onto a body with the toothpick. Modeling with such an unusual medium brings challenges but is also rewarding once the work is complete.





# LIGHTHOUSE GLASS MOSAIC

## CREATIVE PROCESS

During construction of this piece elements such as colour and shape were taken into consideration first. The sky and clouds are faded so as to be darker near the top, and are made of linear, billowing pieces while the trees are made out of more triangular shapes to more closely resemble natural elements.



## THE LION'S HEAD LIGHTHOUSE

The Lion's Head lighthouse was the gem of my little town. It was recently destroyed by a storm in the Winter of 2020 but its spirit lives on in this artwork.



## Completed Artwork

The final piece was grouted and fitted with a custom wooden frame to be hung in an art show. The design supports different lighting conditions, but below it is shown front lit.



## Window Lighting Effect

When placed in front of a bright window the mosaic will be backlit, making certain glass pieces glow and become more vivid than others, while creating a colourful projection on nearby surfaces.





# TRIPLE A IN CHARCOAL



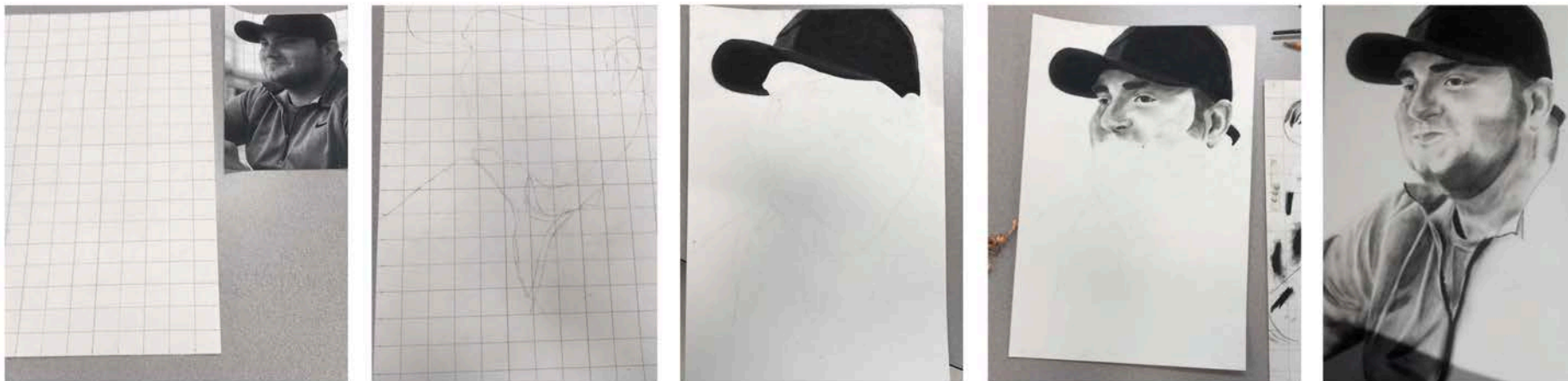
## ORIGIN OF NAME

A confusing name for a simplistic charcoal drawing was derived from the person the portrait is of. Friend, peer and now model Aidan Alexander Adams stars in this charcoal drawing done for a grade 11 art project.



## CREATIVE PROCESS

This medium of portraiture is made almost fully of black charcoal smudged with finger tips and small brushes. Porportional lines were created using a grid pattern, and then many hours of persisition hand eye coordinated drawing and dusting on layers of depth of Triple A onto the canvas.





# THE OCTOCUP

## FIRST TRY AT POTTERY

In order to diversify my skillset I decided to take on pottery. I asked my art teacher and part time potter Michelle Minke to teach me how to throw clay. I spent many days at a studio slowly learning how to throw pottery until I finally was able to make the cylindrical shape of the cup.



## SCULPTED TO PERFECTION

The cup was painted, glazed and fired twice to produce the brilliant colours and texture shown upon the fully useable mug. The octopus wrapped around the cup sides, handle and into the inner walls, making the octopus look realistic and alive.

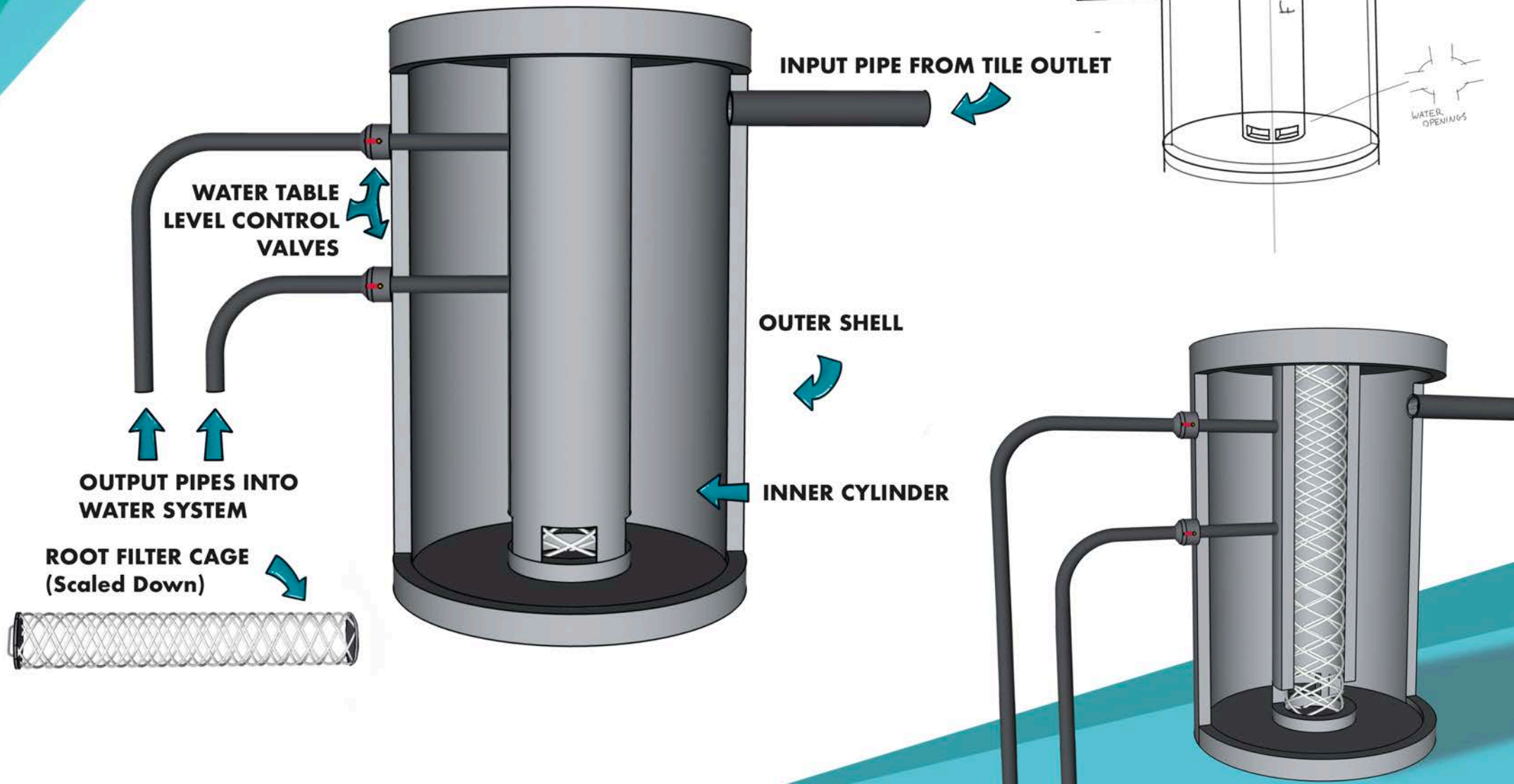




# PHOSPHORUS FILTER

## DESIGN TO CHANGE THE WORLD

The Phosphorus filter design is an ongoing evolution that has finally reached a shareable prototype. The goal of this apparatus is to use tomato roots in order to filter phosphorus out of runoff from tile outlets. This prototype is under construction currently as part of my science fair project.



# 20th CENTURY PROM

## CREATIVE PROCESS

While attempting to perfect the recreation of the 20th Century Fox trademark scene for the BPDS Night On The Red Carpet Prom, I had to take many steps while exploring different mediums. I used an animating program called Blender to make the initial model where I extruded text and added low poly objects to make up the set. Colour nodes were added to texture the objects and an image of a sky was added on. The model was eventually animated and made into a video advertisement but also painted for a poster.



Used a mesh rasterize feature to convert text to a vector series



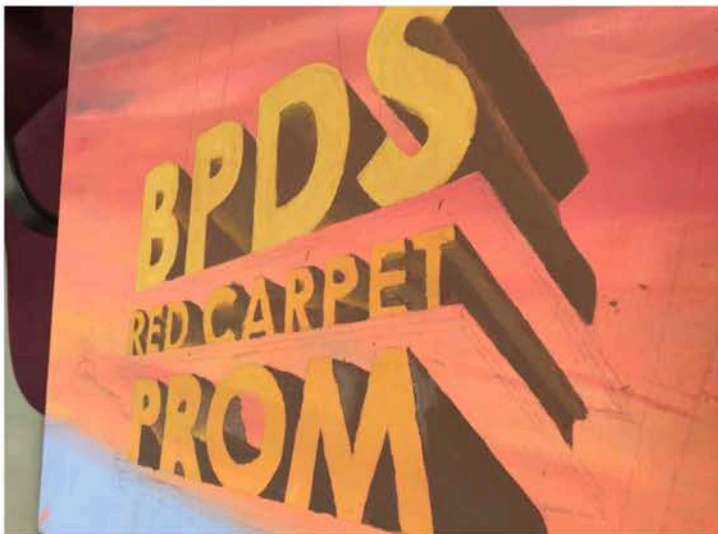
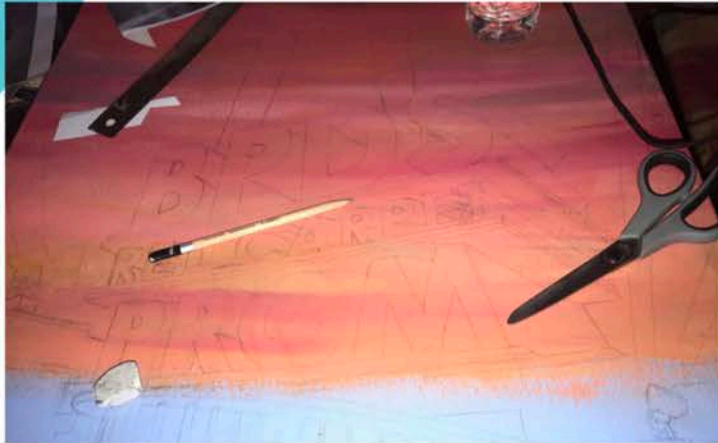
A semi sphere was used as sky with an image projection of a sunset. In addition, light sources were added using built in spotlights to add lighting to the shot.



The final image fully rendered includes lots of shadows to keep less developed objects in the dark.

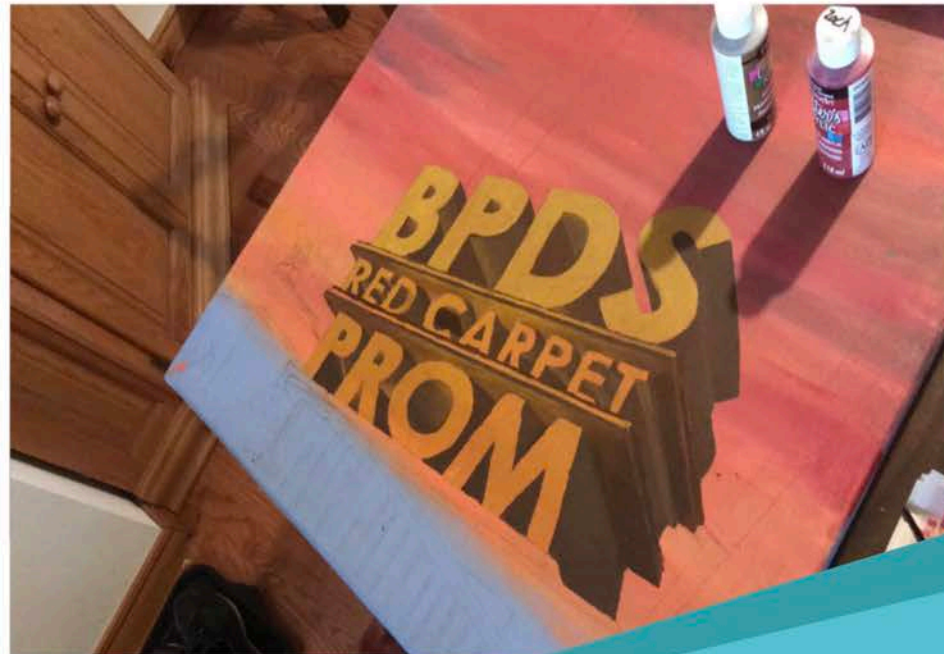


# 20th CENTURY PROM



## ULTRAREALISM

This was my very first time trying to do a painting at such a high resolution. All elements of this project revolve around shadows, highlights, reflections, materials, textures and many aspects related to perspective. It was an interesting challenge recreating an already existing piece, but has more limitations than inventing something new. Painted on a large 60cmx60cm canvas was a blended acrylic sky with perfectly measured angles. Highlights and shadows were added on to give the image texture in attempt to create an ultra realistic look. Finally a glue, water, paint, gloss medium, flour mixture was used to make the lighting rays that shine from the structures base.



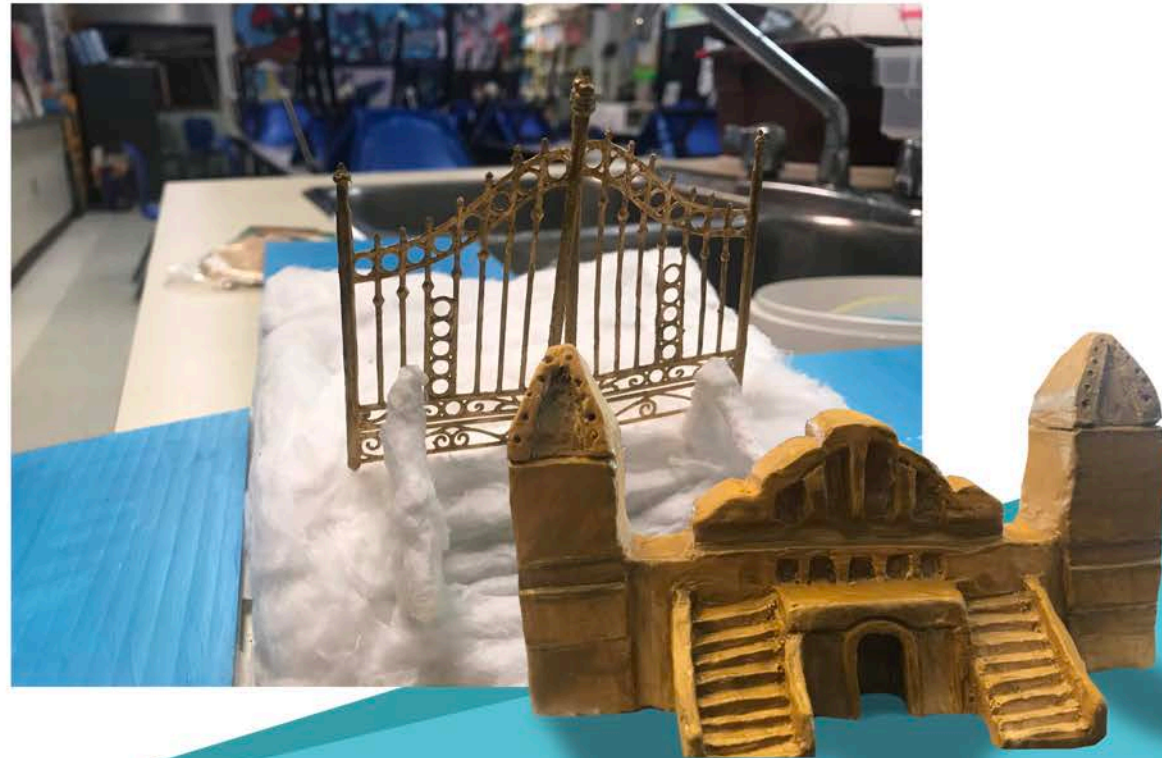
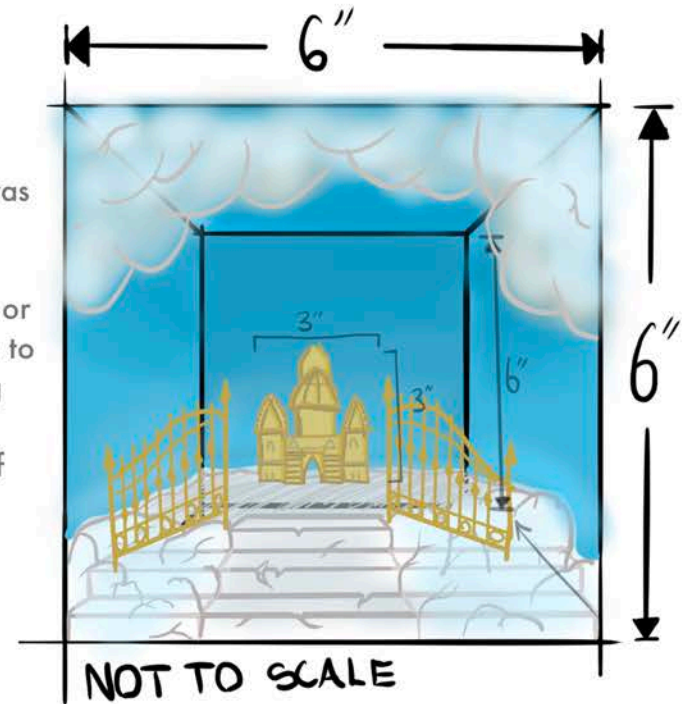


# HEAVEN IN A BOX



## TITLE

The small room project was assigned to me as an art project with intentison to make either a reppelling or appealing world. I chose to make the most appealing sitatuion I could think of. My imaginative design of heaven inside of a box.





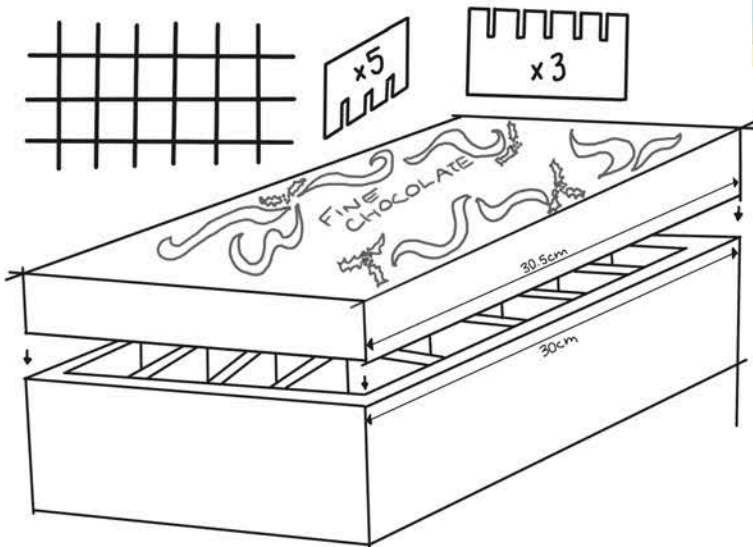
# CHOCOLATE BOX

## DO IT YOURSELF

I made this box from foamboard, coloured cardstock and an assortment of chocolates found at BulkBarn. As nice as 40 dollar chocolate boxes are, it's sometimes nicer to make something yourself with even nicer chocolates. This box was designed exactly the right size, shape, and height to fit these chocolates.

## ONE OF A KIND

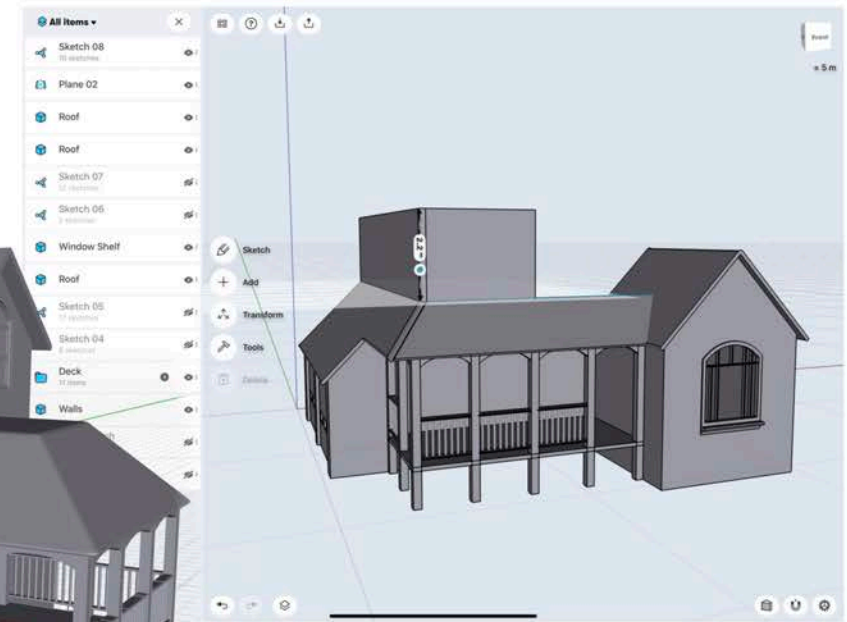
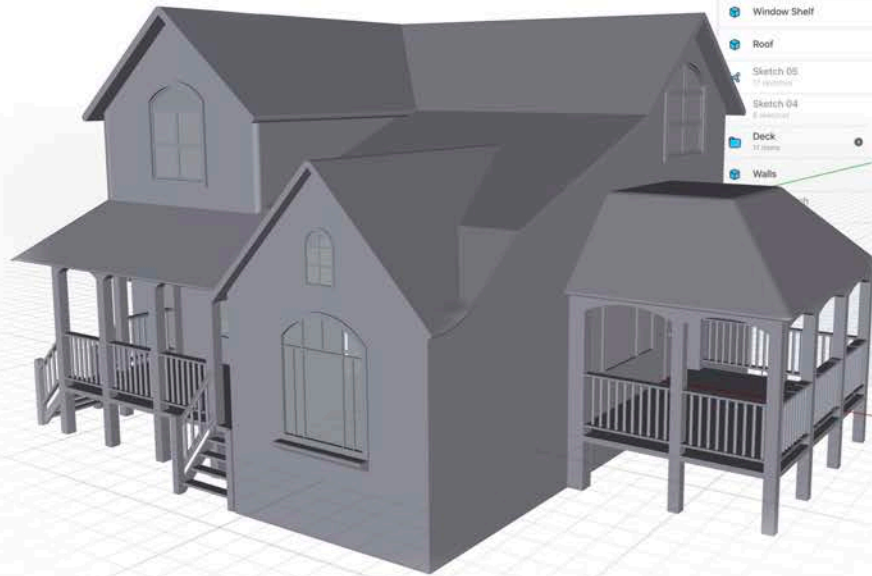
This outstanding design is a show of simplicity, yet how important small detail work really is. Small intricate features of this box make it a special and meaningful present.



# VIRTUAL HOUSE

## CREATIVE PROCESS

The drawing of the house includes more details than the rendering but is not as accurate in perspective. The house was designed to showcase lots of room in a cozy style house.

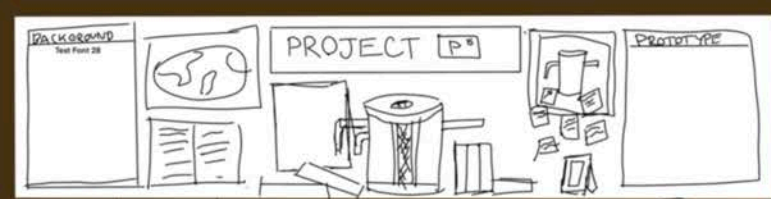


## ARCHITECTURE

The house was first digitally sketched and modeled using Shapr3D on the iPad. This project was done for fun and to learn, therefore isn't perfect and completely empty inside. However the walls, pillars and window are all designed to scale.

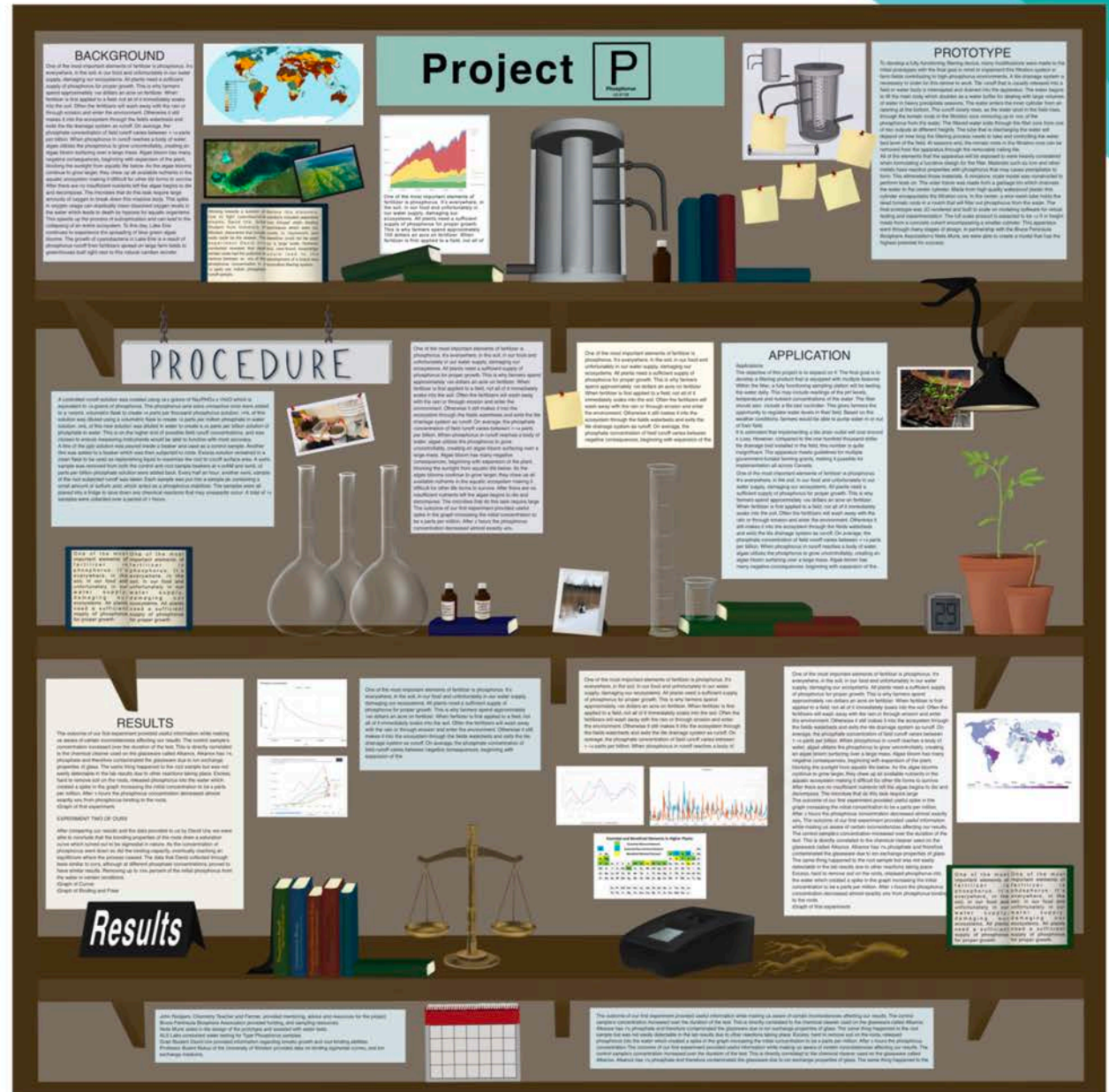






# SCIENCE SHELF

A 120cm by 120cm giant custom art piece created to showcase elements of my most recent science fair project. This board design shows many items used in my project as well as the information and text in the background on posters.



Elements of the poster including text are unfinished as included for perspective.



# WHALEOPOLY (The Game)

## DESIGNING A BOARD GAME

Despite having a similar visual appeal to the classic game Monopoly, this game is quite different in many ways. Made for an English project it is based off much more then just game design. The game has custom drawn elements, specialty items and even 3D modeled board peices.



I intend to play test the game a couple more times before I print it to keep. This game has become so much more than a school project and more something I actually enjoy playing with my friends.

