

# Bilateral Mind

An Interactive Showcase Displaying Worlds from  
Within My Head

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# Abstract

This paper explores the creation of interactive experiences that provide insight into the mind of the author. The experiences, which were displayed in a public showing, focus on different aspects and were curated to allow visitors to explore worlds that had previously only existed in the author's imagination. While each experience is capable of standing alone, when combined, they offer contrasting views of the author's mind. One experience focuses on adding color to the world, while the other takes it away, demonstrating the author's conflicting thoughts. These experiences extend beyond the Virtual Reality (VR) headset, with the space around the areas of play expanding upon the worlds with more interactions. The author's inspiration for these VR pieces stems from their younger years spent creating elaborate fantasy worlds as a means of escaping dark thoughts. This paper highlights how the author's life experiences have influenced their world-building and how the combination of conflicting thoughts has altered their view of the world we live in.

# Acknowledgments

This is a project that I could not have completed without the support of others. I would like to extend my gratitude to the following:

The entire IMGD Community for their support and participation in this project.

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And finally, my advisor and committee chair, Professor Farley Chery for his continued guidance and unwavering support throughout this project and the changing path that was my graduate studies. His constant encouragement to push the boundaries brought this project to life. Thank you for always believing in me, especially when I didn't believe in myself.

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# Overview

## The Project

The focus of this project is to take a closer look into my mind through the creation of interactive experiences focusing on different aspects. These experiences were curated into a showing where visitors were able to visit worlds that had only existed in my imagination until now.

Since each experience focuses on a different aspect, they are able to be shown on their own and have their own user experience. However, shown together, the two major pieces show very different parts of my mind and are meant to be close to opposites of each other. One piece focuses on adding color to the world while the other takes it away demonstrating conflicting thoughts. Each piece goes beyond the experience within the headset as the space around their areas of play expands upon their worlds with more interactions.

## Inspiration

When I was younger I often created elaborate fantasy worlds. These worlds were an escape from the dark thoughts my mind would trap me in as I grew older. My experiences in life have played a role in these worlds and the combinations of them have altered my view of the world we live in. This collection of VR pieces is inspired by the conflicting thoughts of an internal dialogue.

# Components

150 mg

Experience medium: Virtual Reality (VR)

Platform: Vive Pro 2

Time: 10-15 minutes

## Concept

Welcome into someone's head as you are placed into a bedroom to discover more about its owner. Interacting with objects uncovers the owner's thoughts and tells their story all while the color disappears. This might just be a case of an unreliable narrator but these thoughts aren't a work of fiction.

This piece does not have any technical implementations that are beyond basic VR interaction and gameplay. The focus is on exploring my mental health struggles using actual excerpts from a journal that I vent in, especially at my worst times. This is an artistic piece, not meant to educate users on how to spot or help with any mental issues. These are my unapologetic lived experiences. While the excerpts they will hear are real, they were edited to remove identifying factors or private information.

## Experience

Revealing, worry

## Story

### Overview

Take a look at one of the ugly sides of mental health through the explorations of a bedroom. As you interact with objects you learn more about the owner, their thoughts, and the dark place they are in. Do not be fooled by the bright environment as the dark thoughts drain the color from this world. These thoughts touch upon topics that may be triggering to some but offer a view that the owner tries to keep hidden out of fear of everything they have worked for being taken away. It builds up to a more serious topic and then comes down to an end with a quote about improvement and a source of color still in the scene.

### Script

The script for this experience was created by taking real entries from a personal journal of mine. These entries were written when I was at my darkest points in the prior year, covering sensitive topics such as self-harm and passive suicide ideation. Entries containing too many identifying details were ignored while the remaining were given category labels based on their content to

identify which topics they covered. One entry was selected for each topic with supporting lines added to them from unused entries. This resulted in eight different sections covering 8 topics, of which, 6 were used in the final experience.

## Visuals

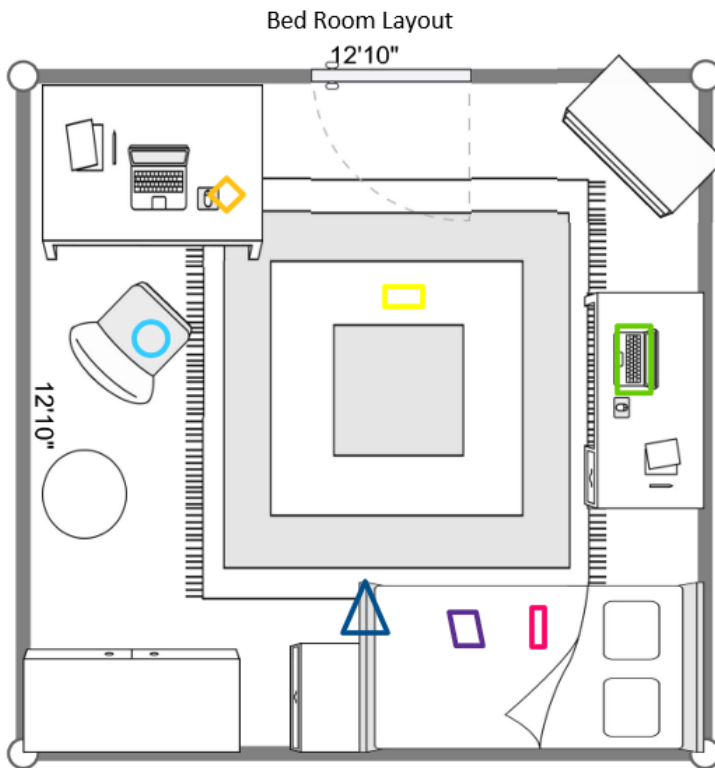
### Style



- Stylized soft cartoon-like with bright colors

### Level Layout

#### Floor Plan



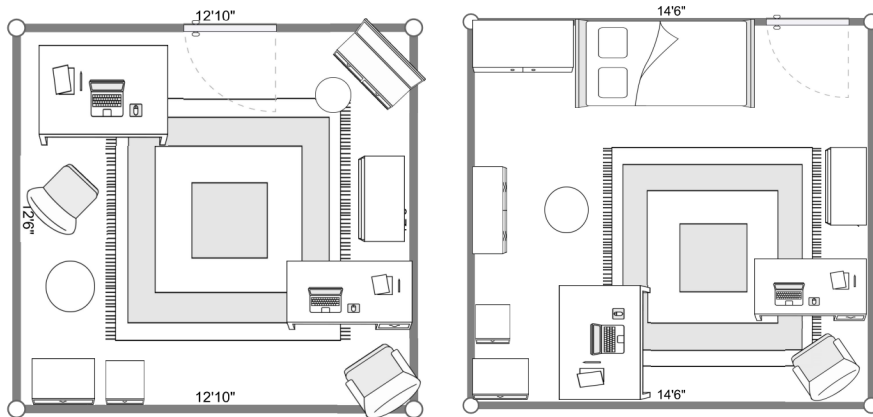
#### Object Key:

- Picture frame
- Computer/Homework
- Video game/cards
- Measuring Tape
- Artist knife
- Dress/Makeup
- Phone
- Mask?

Sizes of room objects are in the pdfs of the layouts

Not all objects were used.

## Alternative Floor Plans



## Objects

### Mirror



The starting object that the user faces upon starting the experience. Covers the topics of dissociation and family. Paired with the door slamming shut and locking and photos falling off the wall.

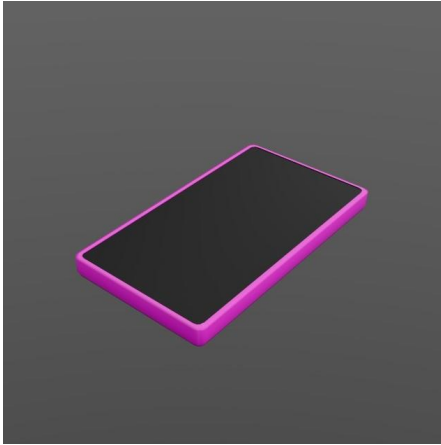
### Laptop



Covers the topics of imposter syndrome and self-worth. Paired with objects jumping and falling off the desk like someone is slamming down on it and a book being thrown off into the wall.

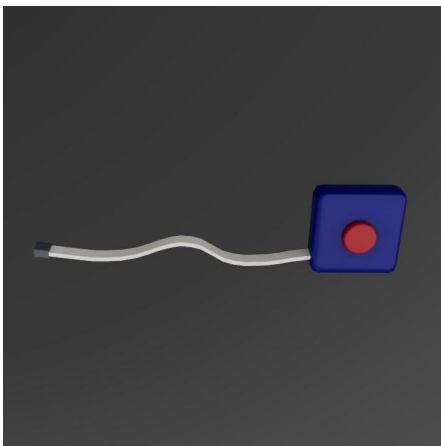


Phone



Covers the topics of being neuroatypical and self-harm. Paired with objects flying off shelves and a diploma falling off the wall.

Measuring tape



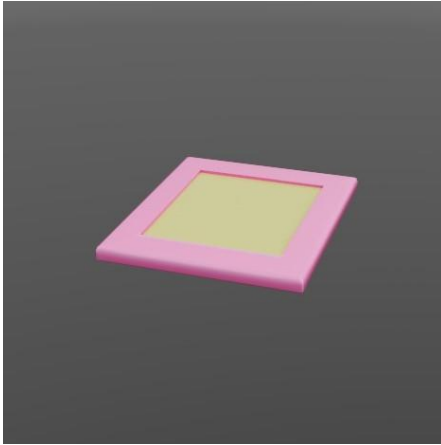
Covers the topics of body image and possible eating disorders. Paired with the dress form shaking and falling and the dresser opening and slamming shut.

Knife



Covers the topics of self-harm and passive suicide ideation. Paired with some remaining parts of the room being messed up and thrown around and the lights flickering and dimming

Picture frame



The final object that holds the last bit of color left in the room. Covers the topic of recovery. Paired with the lighting brightening and the door opening.

## Set Design

Room Floor Plan

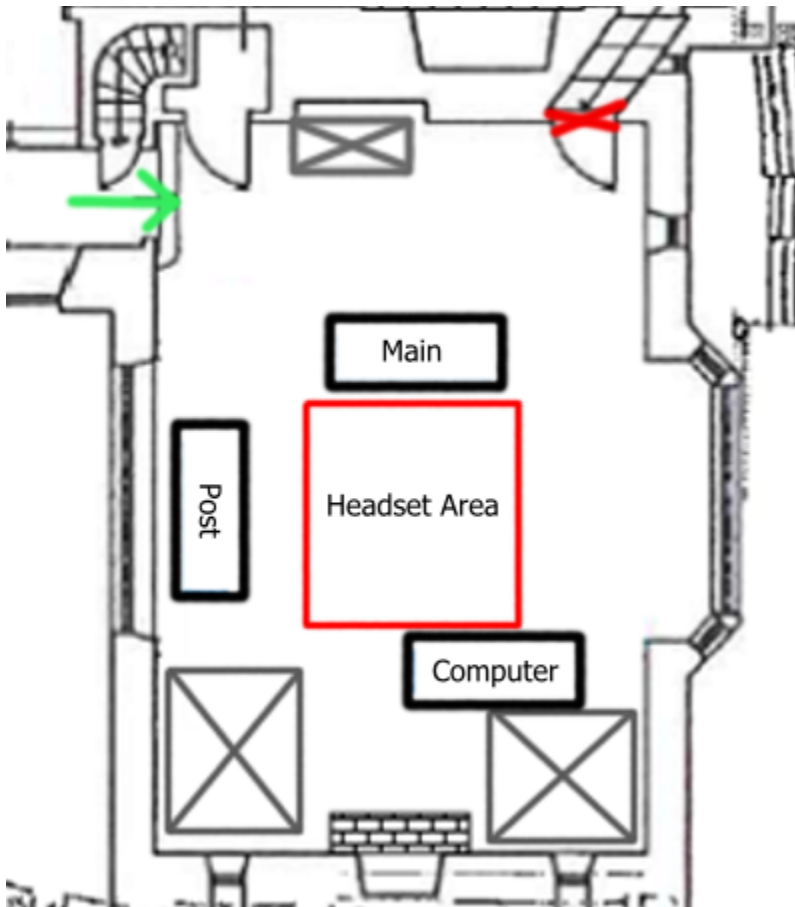
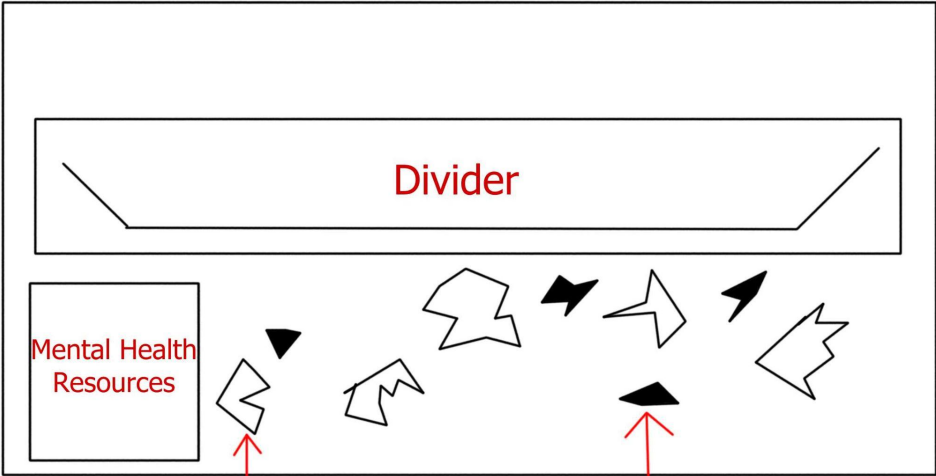


Table Layout



Ripped Journal Page

Broken Toy Piece

# Vibrant Dimensional Lab Adventure

Experience medium: Shifting Reality (AR/VR mix)

Platform: Quest 2

Time: 5-10 minutes

## Concept

Take on the role of an intern in a lab studying the power of color and how to harness it. However, something has gone wrong while you are testing a new version of an invention in development for harvesting power from colors. It's now up to you to save the colors of our world from being taken forever. At least it'll be a good experience to put on your resume.

This project is built on the Shifting Reality template I created in the fall of 2021. It utilizes the passthrough functionalities and API provided and sets up the ability to move between the passthrough AR view and the usual VR view of the Quest family of headsets. While the passthrough view is in black and white, this provides the opportunity to have color correction controls for the user as part of the story.

## Experience

Action/Adventure

## Story

### Overview

The user must enter into another world to hunt down the objects that power the color of our world. Taking on the role of a lab intern, the user places on the headset as they will be testing this new invention. They come to discover they were out of it for a bit after putting it on as a somewhat friendly robot is yelling at them while some weird evil looking guy tells you his master plan. The user is the only one who can follow that guy to his world to hunt down the objects to bring color back. They must destroy the creatures protecting it to gain possession. Unfortunately, there isn't enough time to get them all and the user must then return back to our world and recruit more help.

### Plot

The user takes on the role of an intern in a lab run by a scientist trying to harness power from the colors of the world. This scientist has been pushing the bounds and has no idea what they've gotten everyone into with their latest device. The user's first task is to be one of the testers of this device which is a pair of goggles and controllers (need another term to sound cooler) to visually see the energy output of colors and collect it. The first few rounds of prototypes didn't work out too well but this time nothing can go wrong. Unfortunately, this is not the case as this exploration into the power of colors has alerted an evildoer named Scorag who

collects the power of colors from worlds to our world. The user has the bad luck of being the one testing the headset when he launches his attack. Thankfully Tine was able to arrive in time to limit and control the damage Scorag could cause. It can't hold forever though, meaning someone has to take back what Scorag has stolen. Good thing there just so happens to be an intern available for the job!

The user is guided to the center of the testing area by a lab assistant and a headset is placed on them. They see darkness with only an instruction displayed telling them how to turn on the headset. After they press the button to activate the headset, they see a hazy world and hear a voice telling them to step forward toward it. Tine can now clearly be seen in front of them and informs them that Scorag sent them into their daze in his process of stealing the color from our world. An evil laugh draws the user's attention to Scorag who then explains how what he's done will rid the world of all its color soon. This is confirmed by Tine as they inform the user of what they've done to try and stop it. Scorag states that it is only delaying things and then leaves. Out of options, Tine tells the user that they'll have to go to Scorag's realm to get the core back as they have to stay there to keep the barrier up and be able to open a portal for the user to come back through. The user will still be in contact with Tine through the com system in the goggles but they need to act fast as Tine only has so much power to keep holding the barrier plus they need to make sure they have enough to get the user back.

Once through the portal, Tine states that the user has to grab the core which isn't so simple as Scorag has minions wandering around as defense. Luckily, Scorag is cheap and has very weak minions. The user is able to destroy them with one hit of an energy sword that Tine activates for them. They are then instructed to take out the confused one right in front of them before being sent off to destroy the rest and search for the cores. Once the minions are defeated, the user is instructed to go grab the visible core which moves towards and is absorbed by them once they step in a certain range. Tine informs them that that's all the user will have time for now as their power level is low so they need to bring the user back now or else the user will be stuck there. They then open a portal for the user to enter.

Tine states that they're glad the user was able to make it out before the portal closed but also that they'll now need to make another plan. Thankfully the user got one of the cores but there is still more needed to restore the world's color. This is not something the user can do on their own so they'll need to call in some backup. The contact information for the person they need is somewhere in the lab and the user needs to take off the goggles and go find it.

## Details

### Color Power Collection Project

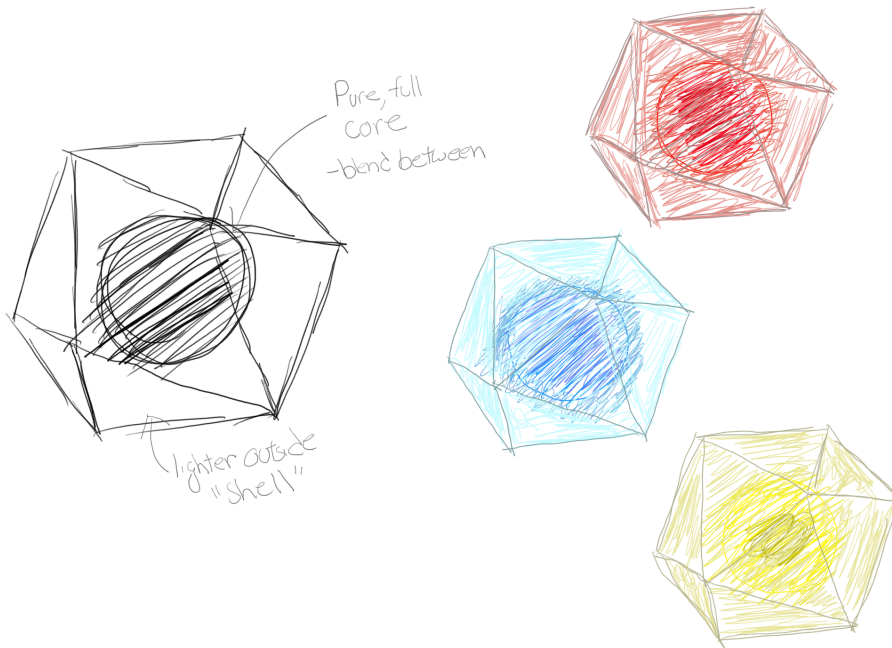
The primary research project for the lab. It aims to provide a new source of energy for the world. After initial research provided information on the large amount of power color contains, the next phase is to figure out a way to harness it. Strange findings have been reported during research but it's unclear what they mean.

## Power Reader and Capture Wands

The device the user is tasked with testing which is the Meta Quest 2. It's designed to show the power levels of the colors in the world and harness them using the controllers paired with it. This is the newest iteration of it as the previous ones had some major flaws.

## Color Cores

Gem-like objects that contain the power source for the world's color. Without these, the world is left black and white.



## Capture Card

A weapon that sends dark waves that draw out color cores and typically trap anyone nearby in a stunned state. Never directly seen by the user. Possibly hidden in the set.

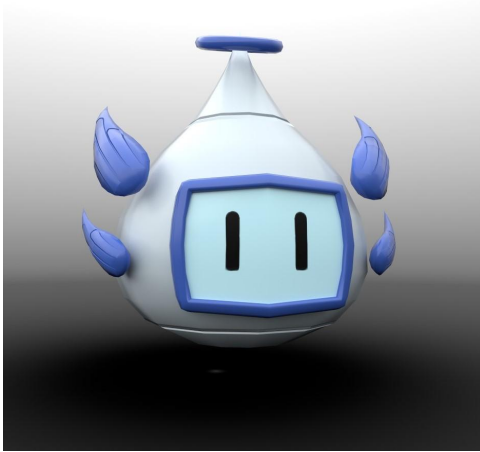
## The Professor

The person in charge of the lab the user is an intern at and the Principal Investigator of the color power project. They are never seen or heard from but they are mentioned in various details of the experience.

## Visuals

### Characters

#### Tine



Some sort of guardian that has possessed a prototype robot that was stored in the lab. They seemed to have already dealt with Scorag before and have failed. Determined not to repeat past mistakes, they are providing the user with guidance in the quest to protect the world. The name comes from a piece found in multiple antidepressant drug names.

#### *Concept Art*

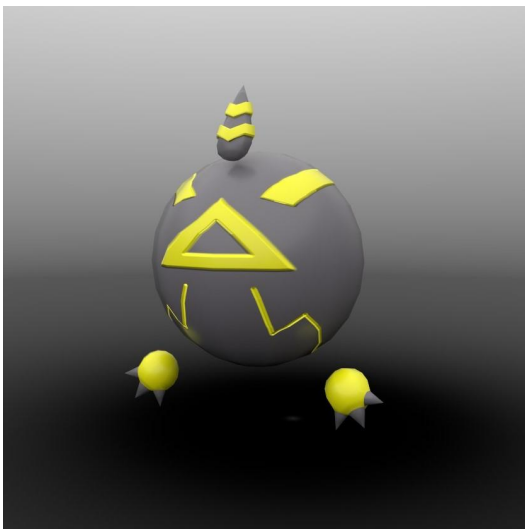


## Scorag



A villain set on destroying the colors of other worlds in order to take the power for himself. They are from a dark world that seems to have driven him mad and caused an incredible desire for power with an unclear master plan but mentioning briefly reviving something. Their full form is never seen and only appears in our world as a mask with a cloud of dark energy. The name comes from the Italian word scoraggiamento meaning discouragement or dejection.

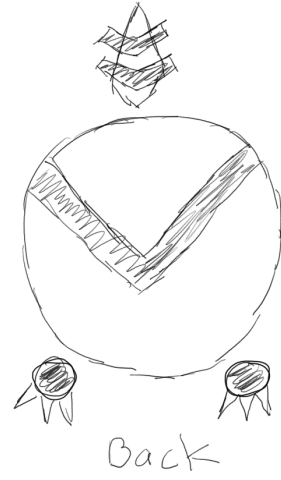
## Prims



Creatures that live in another dimension that are attracted to power sources. They are not very strong and easy to destroy but they are easy to control and ask for basically nothing in return. Their name comes from the use of primitive shapes and primary colors in their design.



Concept Art



Alternative Options



## Environment

### AR World

The AR world utilizes real-world space and does not use any assets to add to it. The only possible addition explored was the addition of a visual indicator of the play space boundary to indicate to users where not to go.

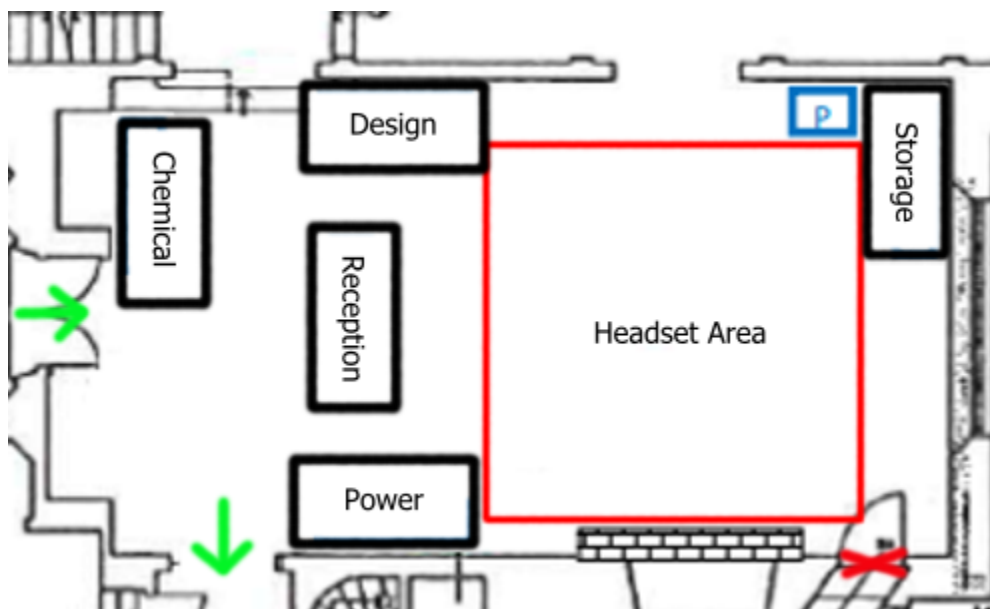
### VR World



A dark barren world that is home to Scorag and the Prims. It has a rocky terrain and a dark menacing sky. An altar-like structure holds the first core for the user to collect.

## Set Design

### Room Floor Plan



Tables

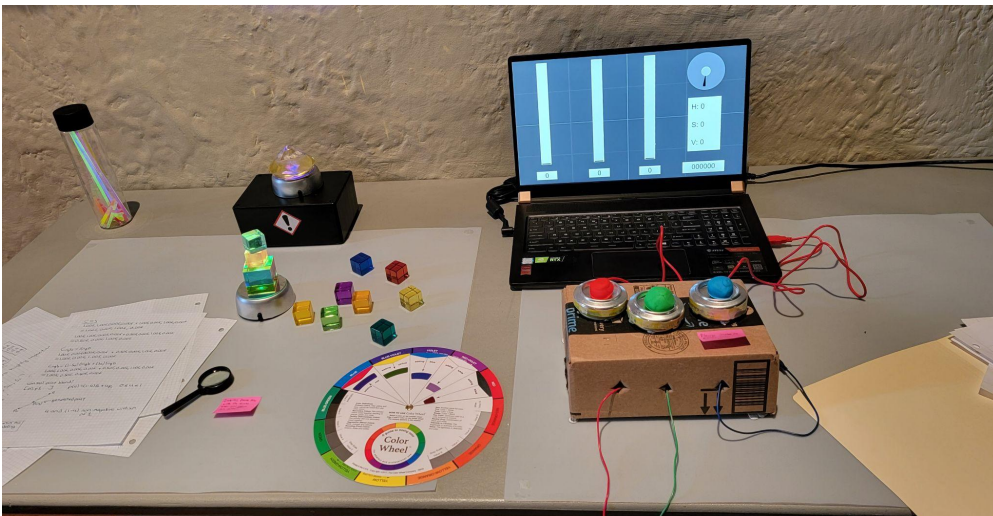
- Reception desk - reception desk for the lab where the inters would usually check in



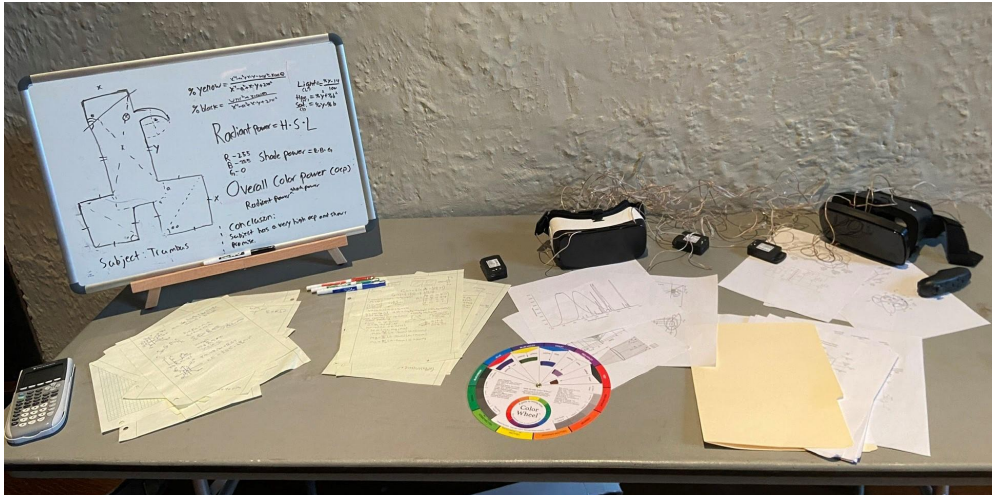
- Chemical Workbench - Area for chemical-based color experiments



- Power Level Workbench - Area for power measuring-based work



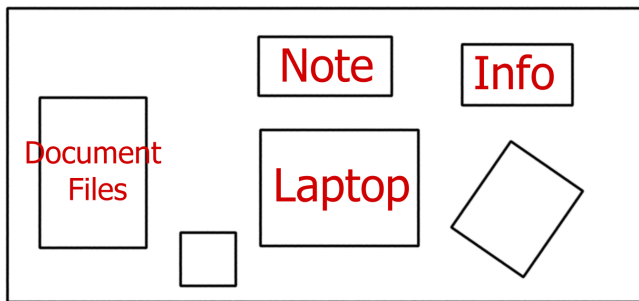
- Equipment Design Bench - Area for designing the Power Reader and Capture Wands



- Testing Headset Storage - Area that holds the headsets and cleaning supplies

### Table Layouts

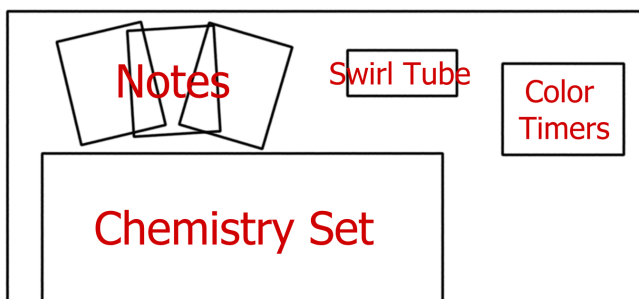
#### Reception desk



#### Decorations

- Receptionist's laptop
- Out-of-office note
- Random office supplies
- Documents to file away

#### Chemical Workbench





## Interactive Objects

- Swirl test tubes for reactions

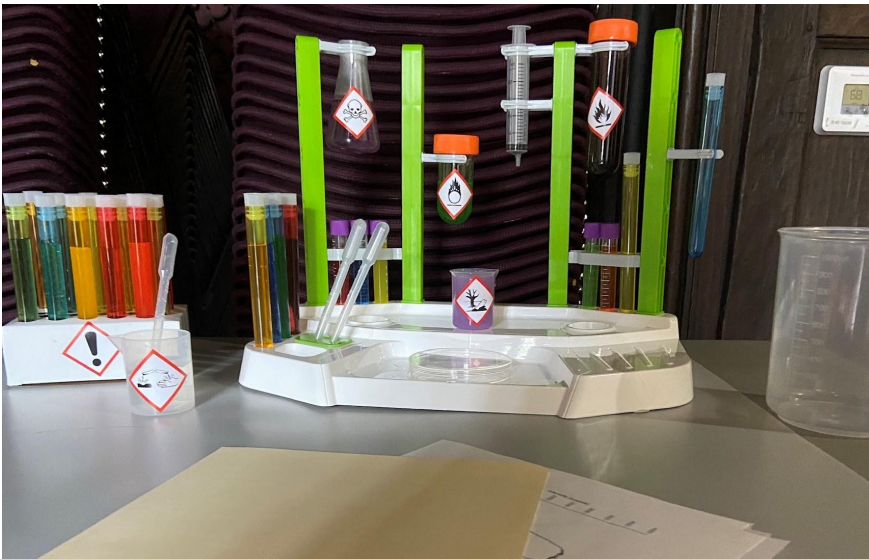


- Note from the professor telling you to do it
- Created using 3 parts water, 1 part isopropyl, food coloring, and expired eyeshadow (mica powder)

- Liquid timers

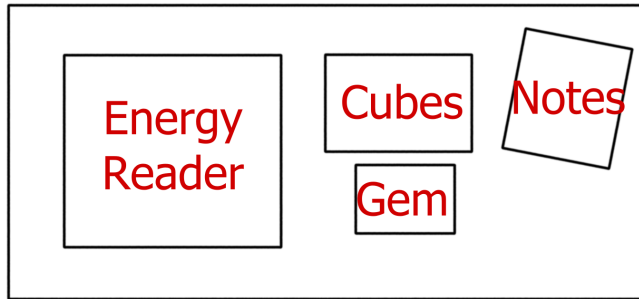
## Decorations

- Chemistry sets



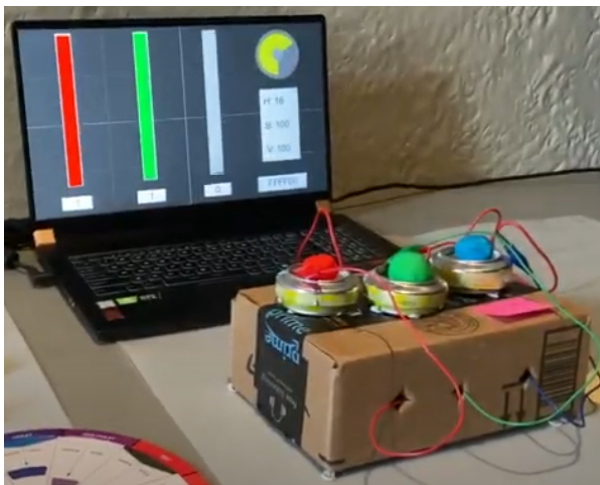
- Filled with colored clear slime to simulate liquid with less risk of a set damaging spill

## Power Level Workbench



### Interactive Objects

- Energy reader



- Makey-Makey controller made from a cardboard box, soda cans, and play-doh
- Controls a Unity application that reads arrow key input to fill bars with colors and mix a color based on the total input
- Color cubes and light

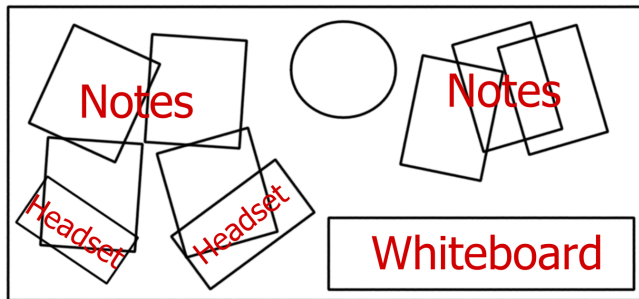


- Light display for visitors to hold up colored transparent acrylic cubes as well as a CMY Cube

## Decorations

- Color calculation documents
  - Created from old computer graphics coursework notes about color and camera rendering. The top pages were created to contain minor story information while the pages glued below were old notes to give the appearance of a stack.

## *Equipment Design Bench*



## Interactive Objects

- Color wheel guide

## Decorations

- “Broken” old headset prototypes
- Whiteboard with calculations
- Headset schematic documents
- Engineering documents
  - Created from old engineering science coursework notes. The top pages were created to contain minor story information while the pages glued below were old notes to give the appearance of a stack.

## *Testing Headset Storage*

- None - lab assistant access only

# Showcase

## Plan

### Time frame

This project was completed over the course of the Spring 2022 semester through Spring 2023. The core development of each of the pieces took place over slightly less than a year as it was spread out over the course of the late 2022 spring semester and early spring 2023. The showcase was held on April 18th, 2023 from 12:30 pm until 7 pm.

### Budget

This project utilized resources that the IMGD program provides and resources already owned. Since these were not enough, a personal budget of \$500 was placed aside to be able to acquire the extra equipment and supplies needed to fill in the gaps.

### Needs

#### Equipment

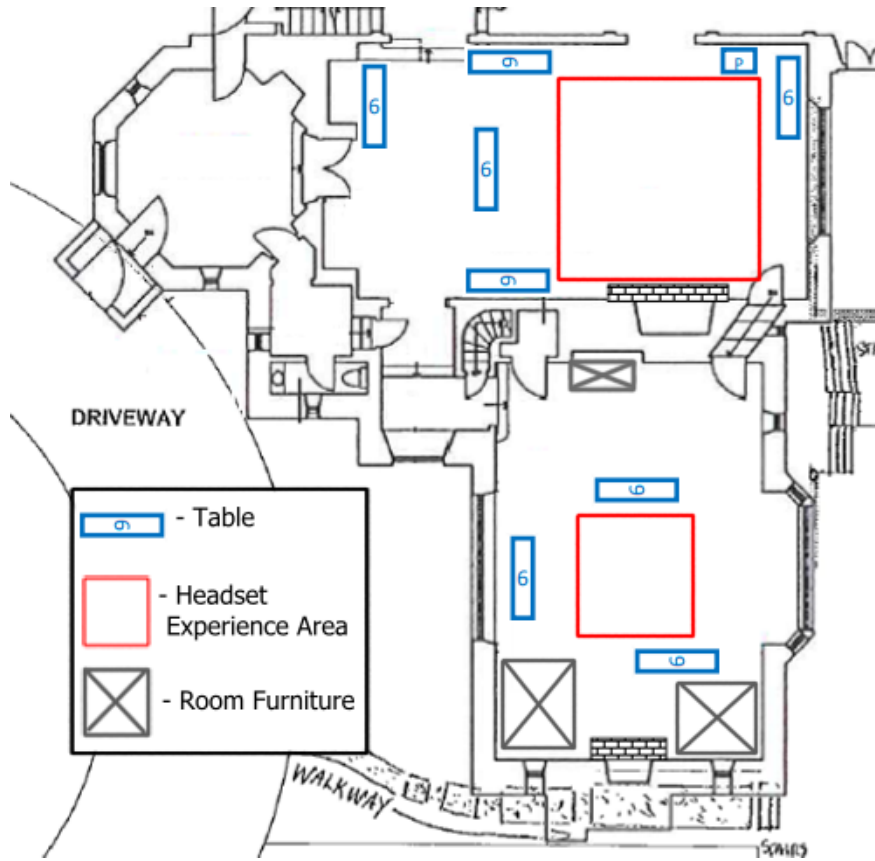
- VR headset (Vive Pro 2)
- VR headset with passthrough capability (Quest 2) x3
- Computer for VR

#### Space

A room or a combination of rooms that has the space for at least 2 VR play spaces and display works with people walking around between them was required for this showcase. The space chosen was the Higgins House on WPI's campus. One piece was set up in the main hall while another was set up in the library to create some separation between them. Other supplemental pieces were set up in the main hall area.



Layout Plan



# Post Mortem

## Went Right

### Opposing Experiences

Each of the pieces and the spaces they were in provided experiences that opposed each other. Visitors had different reactions upon exiting each of the experiences.

### Visitor Exploration

Visitors took the time to explore the space either upon entering or upon leaving. They actively interacted with the interactable pieces in the space and often tried to interact with pieces meant for viewing only such as the documents which were taped down to the tables.

### Budget

Stayed under \$500 for everything. Utilized things that were going to be thrown away such as old children's science kits and phone-based VR headsets that no longer work which helped lower the cost of decor. Keeping within the budget did mean having to cut down on desired parts such as having the documents laminated so visitors could pick them up to take a closer look. Creative alternatives for replacements were used to keep the vision the same but use less expensive solutions.

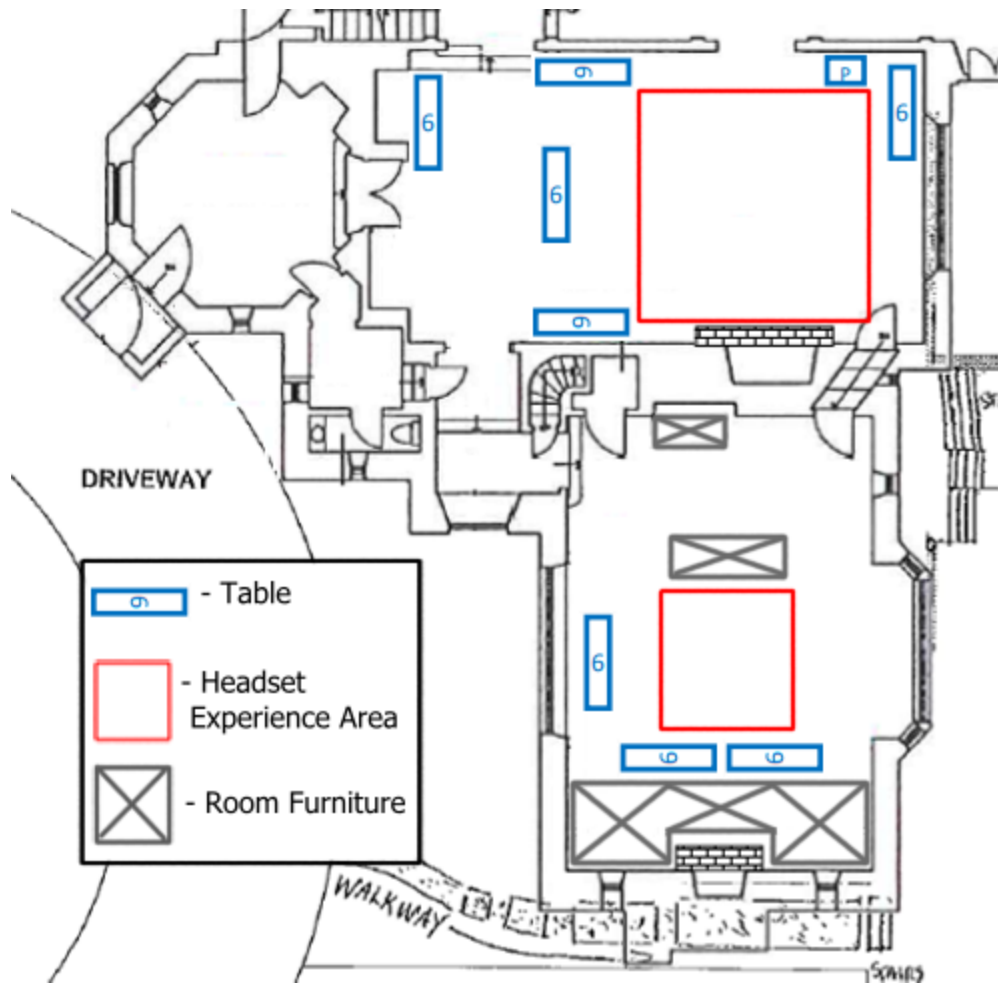
## Went Wrong

### Equipment

The full start of the showcase was delayed due to missing equipment as a PC for VR was not delivered to the space until 2 hours after the start. While communication about the required equipment was communicated over a month in advance, conversations about the requirements did not start until a couple of days before the showcase. Since the PC was not delivered until during the showcase timeslot, no time was allowed for calibration of the application to the full-size play space as prior testing had to be completed in a smaller space. While there seemed to be no major issues with the spacing, this is something I would push to test more before the event if giving the correct equipment on time.

### Space Layout Change

When arriving to set up the space, the library area had a different layout than the one provided by the event's office. It blocked off the play area but prevented the set up of the set table as originally planned. Since the space provided the dark atmosphere desired without any additional set dressing and with no extra resources to replan in the moment do to more pressing equipment issues, the set dressing for the space was scrapped.



## For next time

### Budget

While this showcase was accomplished for under \$500, a larger budget that is broken down into categories would help stay within it while not running out before certain parts are obtained. As the project was close to budget, final details such as signage had to be cut as it would have placed the project over budget.

### Setup Process

Allow for a longer time frame for set up, especially with only one or two people setting things up. While arriving to the setup with parts sectioned off based on where they belonged the process took more time than expected and while other factors contributed, it had the showcase start time delayed by about 30 minutes. The small details tended to be what take the longest to set up such as securing pieces to the table that were not meant to be moved.