Pocket Portal

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High Concept Document

Team

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Working Title

“Pocket Portal”

Genre

The game is a “real-time 3D adventure” where the player can enter a portal that appears in front of them, which would lead to a garden/forest area which includes a scavenger hunt game.

Intended Audience (Target Demographic)

This is a game that is intended for ages 4 and up, or anyone who can use mobile devices, and is intended to be played as a single-player experience. In order to test the game, we hope to build a game and send testers the .apk file from which they can play the game. We will ask for necessary feedback after their testing.

High Concept

A portal AR game to engage users during stay-at-home orders. The goal is for the user to explore a natural landscape right from the user's living room. To make the experience more immersive, users can play a scavenger hunt game. inside the portal. The target platform for our game will be Android mobile devices.

Description

Holding their phone, the user will be able to enter an AR portal door and explore a garden/park scene inside. This scene will include a variety of plants, including various flowers and trees. In addition to exploring, the user will also be able to approach a table in the garden and play a finding objects game.

Features/Gameplay

1. The user will use the app to scan the room or area they are playing in to make the portal appear.
2. The user will enter the portal door by walking forward in the physical space they are playing the game in.
3. The user will also be able to move around and explore the garden/park scene by walking and moving around in the real world trying to find objects for the game.
4. To exit the garden, the user can walk back through the portal door.

Unique Selling Points

- Freedom to enjoy a garden view from the user's house.
- Provides a break time for users staying at home
- A scavenger hunt game to engage the user in an immersive experience inside the portal

Development Platform

Our development platform would be android mobile and tablet devices with a rear camera. We should let all sizes of mobile phone and tablet to accommodate with our portal without destroying the resolution and aspect ratio of our game.

Risk Analysis

1. All four members of our team have never worked in Augmented reality game or 3d game design. This might be a challenge for all of us because of the limitation in time we have.
2. Because of the Covid-19 pandemic, all of us are scattered around the country and in different time zones. Moreover, this will be a new experience for the majority of us to collaborate and work remotely. It might be difficult to hold emergency meetings (those meetings which were not planned beforehand but are needed now), connecting all the different works done by different members and so on.

3. Since we haven't worked on AR portal and 3D game design, the integration of the game within the portal itself might be a challenge for us and if this doesn't work then users/players could be left with nothing to do inside the portal except roaming around.
4. In-person testing will be another issue. While we are not on campus and we are staying inside our homes and social distancing, we are limited to our testing either remotely or with a small number of people who are living with us.

Timeline

Sprint	Description	Start Date	End Date
1	Research on AR and 3D game design Finish design document Title screen and UI Portal door implementation (inside and out)	4/8/20	4/22/20
2	Elements inside the portal (garden/forest)	4/23/2020	5/7/2020
3	Implementation of the game (scavenger hunt game) Testing (5/18/20 -)	5/8/2020	5/22/20

Sprint 1

1. What are the start and end dates for this sprint?

The start and the end dates for this sprint are 4/8/20 and 4/22/20 respectively.

2. What are all the tasks that will be tackled this sprint?

The tasks that will be done during this sprint will be completing the online tutorial, finishing up the design document, making the portal door implementation and be able to head inside and out, and have a rough title screen and UI implemented.

3. Who will be working on each task?

Online tutorial is going to be completed by each member. For the design documentation we will discuss each section with each other and we will be dividing the different sections to each of the members so that all of us will have equal contribution in it.

For the first sprint we are planning to have portal door and some basic UI implemented and each task is going to be completed by:
Portal Door Implementation - Amar
Panel Skeleton Implementation - Ryan & Nrepesh
Buttons and buttons functionality implementation - Emily
*These work divisions might change after our meeting on the weekend.

4. Update globoard.

Sprint 2

1. What is the start and end dates for this sprint?
The start and the end dates for this sprint are 4/23/20 and 5/7/20 respectively.

2. What are all the tasks that will be tackled this sprint?
Implementation of the garden. Button SFX sounds. Finding additional assets for the garden.

3. Who will be working on each task?
All team members hope to work on one section of the garden design.

4. Update globoard.

Sprint 3

1. What is the start and end dates for this sprint?
The start and the end dates for this sprint are 5/8/20 and 5/22/20 respectively.

2. What are all the tasks that will be tackled this sprint?
Implementation of the scavenger hunt.
Implementation of UI elements in the portal scene.
We hope to do testing from 5/18/20 onwards
Working on changing the door design.
Adding a ripple effect as the user enters the door.

3. Who will be working on each task?
Ryan will be working on the implementation of the scavenger hunt and the testing report for the game.
Amar will be working on changing the door design and testing of the game.

Nrepesh will be working on the ripple effect and implementing ARCore for deployment and working on the testing report.
Emily will be working on fixing the anchoring issue in the title scene, the object counter, the victory screen, the google form for testing, and the testing report.

4. Update globoard.

Stand up Meeting 1(4/8/2020)

1. What have you done since the last time you've all virtually met?

Amar: Finished high concept Risk Analysis and Development Platform, started on video tutorial .
Nrepesh: Completed Selling points and High Concept description in the high concept document. Delivered a brief presentation for class.
Ryan: Finished the Targeted Demographics and the Genre of the game for the high concept document.
Emily: Finished high concept Description and Features and Gameplay sections.

2. What will you do between now and the next time you virtually meet?

Amar: Completing online tutorial, research on GUI and assets.
Nrepesh: Completing online tutorial. Completing the first part of the design document. Finish Sprint planning 1.
Ryan: Online tutorial. Finish sprint planning one.
Emily: Complete the online tutorial and work on the Game Mechanics and Rules and Game Elements sections of the Design Document.

3. Is there anything standing in your way?

Amar: Going through some problems in an online tutorial. Need to do some debugging.
Nrepesh: Debugging online tutorial. Online meeting for discussion on design doc and sprint planning 1.
Ryan: Problems with online meetings, going through the online tutorial and maybe debugging it.
Emily: Issues with home wifi and debugging the online tutorial.

Stand up Meeting 2 (4/12/2020)

1. What have you done since the last time you've all virtually met?

Amar: Fixed the Bug. Working on a tutorial. Completed my part of the game document.
Nrepesh: FInished the game tutorial. . Completed “Target Demographics” and partially completed “Legal Analysis”. Setup Globoard.
Ryan: Worked on the design document, filling out the Narrative Game Description and the Game Brief, and worked through the game tutorial and the bugs that were attached to it.
Emily: Worked on the “Game Mechanics and Rules” and “Game Elements” sections of the Design Document. Started the game tutorial.

2. What will you do between now and the next time you virtually meet?

Amar: Finish game tutorial.
Nrepesh: Setup Unity and GitKraken. Work on the rest of the design document.
Ryan: Finish up some issues with the game tutorial, and potentially work on the GUI with
Emily: Finish game tutorial. Work on Design Document.

3. Is there anything standing in your way?

Amar: Nothing standing in my way for now.
Nrepesh: Setting up gitkraken and problems associated with merging.
Ryan: Issues with home wifi bandwidth. Some bugs on the game tutorial.
Emily: Continued issues with home wifi. Some bugs in the game tutorial.

Stand up Meeting 3 (4/15/2020)

1. What have you done since the last time you've all virtually met?

Amar: Continued working on tutorial and design documents and helped Nrepesh with flow chart.
Nrepesh: Finished the color palette and worked with Amar on the flow chart.
Ryan: I haven’t been able to put a lot of work into this project on my end, however, I have continued to work on the design document and the tutorial.
Emily: Continued work on the tutorial, created list of UI elements for design doc, looked for 3d fruit assets.

2. What will you do between now and the next time you virtually meet?

Amar: Finish tutorial and design document. Starting on the project.
Nrepesh: Finish Design doc sections and get started with the project.
Ryan: Finish tutorial
Emily: Finish tutorial.

3. Is there anything standing in your way?

Amar: Issues with some ARKit implementation in Unity. Will probably find some solution by tonight.
Nrepesh: Nothing as such.
Ryan: Issues with home WiFi bandwidth and family that needs me to help them out.
Emily: Issues with Unity and ARKit and technical issues with home wifi and laptop making it difficult to complete the tutorial.

Stand up Meeting 4 (4/21/2020)

1. What have you done since the last time you've all virtually met?

Amar: Finished Design Document, Portal Door Implementation. Fixed a lot of git-kraken stuff.
Nrepesh: We messed around with GitKraken in a meeting. We finished the design document. Skeleton structure of the project. Title screen implementation. Background sound with slider implementation.
Ryan: I've built the credits screen, and wrote the functionality section on the design document. Worked with GitKraken to make sure it was working fine.
Emily: Messed around with GitKraken during last meeting. Tutorial screen implementation.

2. What will you do between now and the next time you virtually meet?

Amar: Planning Sprint 2, Implement Sprint 2 stuff.
Nrepesh: Start planning for sprint 2. Implement stuff for sprint 2.
Ryan: Start planning for sprint 2.
Emily: Start planning for sprint 2, send additional assets for the garden.

3. Is there anything standing in your way?

Amar: Issues with a lot of file not being ignored by git.
Nrepesh: Hopefully the new .ignore file should make the process faster.
Ryan: Hopefully the issue where my files disappear stops happening, and that the .ignore file should work. Also we are moving into AR stuff, which might cause some issues.
Emily: Issues with GitKraken and merging conflicts.

Stand up Meeting 5 (5/7/2020)

1. What have you done since the last time you've all virtually met?

Amar: Finished prototype 2 implementation. Set up git lfs. Shaders implementation.

Nrepesh: Prototype 2 deployment. AR Core implementation, bi directional portal and cutting plane.
Ryan: I have worked on the garden and figured out a weird bug that I had with GitKraken/Unity
Emily: Fixed mushroom bug, implemented button sounds for the title screens.

2. What will you do between now and the next time you virtually meet?

Amar: Working on Prototype 3 which will be our final version of the project.
Nrepesh: Prototype 3 and build version.
Ryan: Working on Prototype 3 which will include the scavenger hunt
Emily: Working in Prototype 3

3. Is there anything standing in your way?

Amar: Still tackling missing prefab issues.
Nrepesh: AR core integration in GitKraken.
Ryan: Further errors and issues with GitKraken, Unity and prefabs refusing to work.
Emily: Issues with Unity and home wifi.

Stand up Meeting 6 (5/19/2020)

1. What have you done since the last time you've all virtually met?

Amar: Shaders Implementation for apples. Changed the door design and added instruction for the game in the portal scene.
Nrepesh: Added the ripple effect and deployed game for testing.
Ryan: Worked on the scavenger hunt, getting the apples into the game, figuring out how to make them work
Emily: Created post-testing survey, implemented object counter, implemented victory screen/ panel

2. What will you do between now and the next time you virtually meet?

Amar: Bug fixing
Nrepesh: Testing and fixing bugs
Ryan: bug fixes
Emily: bug fixes

3. Is there anything standing in your way?

Amar: fixing bugs.

Nrepesh: ARCore needs to fix the portal in one spot.
Ryan: Bugs that might be hard to figure out and house construction.
Emily: Lack of testers, issues with ARCore

Stand up Meeting 7

1. What have you done since the last time you've all virtually met?

Amar:
Nrepesh:
Ryan:
Emily:

2. What will you do between now and the next time you virtually meet?

Amar:
Nrepesh:
Ryan:
Emily:

3. Is there anything standing in your way?

Amar:
Nrepesh:
Ryan:
Emily:

Game Design Document for Pocket Portal

Introduction

A portal AR game to engage users during stay-at-home orders. The goal is for the user to explore a natural landscape right from their living room. To make the experience more immersive, users can play a scavenger hunt game inside the portal. The target platform for our game will be Android mobile devices.

Pocket Portal will allow users to enter through the portal door and take them to a different dimensional experience where they can roam around in the forest/garden and play a scavenger hunt game.

Game Overview

In this period of global pandemic, many people have been ordered to stay home. This game is for people who have to stay inside for many months without meeting any of their friends or new people and without going into a natural landscape. This can be pretty frustrating to them all.

The pocket portal is a game that is trying to help people feel like they have gone outside by just taking out their phone in their living room or any other safe space. This game will allow users to load an interdimensional portal door through which they can find a beautiful forest/garden with hidden treasures. This game will engage players inside the portal which will make it more interactive and more fun.

Narrative Game Description (including Core Game Play)

This game is a peaceful game where the player will be able to navigate through a portal into a forest/garden type area and explore the nature included inside of the portal. This will allow the user a break from the world around them with a fun and relaxing experience.

Inside of the portal, the player will find a forest/garden, through which they can play a scavenger hunt game, that will allow them to fully immerse themselves into the environment inside of the portal. This scavenger hunt game will have the player looking through the world for various items to engage the player more into the game.

Game Brief

- A portal will appear on the user's screen superimposed over the real world for the user to walk into
- Inside of the portal the player can roam around a forest/garden area
- Inside of the portal the player can also play a scavenger hunt-like game to find items hidden inside of the garden/forest

Game Mechanics and Rules

The main objective of the scavenger hunt within the portal will be to find the objects hidden inside the garden scene.

Mechanic	Description	Rules
Movement	The user will be able to move forward, backward, and sideways.	The user's movement will be limited by the amount of space they have in the physical space they are playing in. The player will need to move

		forward “through” the portal door in order to enter the garden.
Item Acquisition	The user will approach a hidden object in order to mark it as found.	The user will need to move around the garden scene in order to find the items.

Game Play Elements

The first element that the user will interact with is the portal door. This will appear on the user’s screen. In order to interact with the door, the user will walk forward to go either through the door and into the portal or back through the portal into the “real world.”

The user will also be able to interact with the hidden objects in the garden. In order to complete their scavenger hunt, the user will need to explore the garden, find objects, and approach them to mark them as found. These objects will include fruit, such as apples.

Targeted Demographic Overview

Demographic **Characteristic**	% of Target
AGE: 5 and above	100%
GENDER: Male Female	 50% 50%
EXPERIENCE WITH TECHNOLOGY (Mobile device, web-based apps): Mobile apps (smartphones, tablets) Web-based apps (online, Internet, browser)	 80% 80%
EXPERIENCE WITH DIGITAL GAMES	75%
EXPERIENCE WITH TEXTING	70%
SOCIO-ECONOMIC STATUS: High Middle Low	 25% 50% 25%
RACE/ETHNICITY (Knox demographics): White Hispanic or Latino Black or African American Asian	 50% 15% 10% 15%

Other	10%

Legal Analysis

Unity (Game development)

We are using Unity Personal to build our game. The terms of use of Unity personal are as follows.

> "The Financial Threshold for Unity Personal is US $100,000 for the most recent twelve (12) month period. To be Tier Eligible to use Unity Personal, your Total Finances may not exceed US $100,000. If your Total Finances exceed US $100,000 you may not use Unity Personal at all, even for internal projects or prototyping." -- Unity Terms of Service Source.

We plan to use royalty free assets and do not plan to advertise the game using any monetary value. Hence, as our total finances for developing the game does not exceed $100,000, we are Tier eligible to use Unity personal for our project.

Unity Game Assets

We will be using Unity Game Assets for art and GUI. The asset policy for unity store is as follows:

> "Once you have purchased an asset from the store, it becomes yours to do with as you like within your games and apps. You will be able to use them in your game for commercial use with no extra payments." Source

Freepic (Background)

Background pictures seen in the game will be used from freepic. freepic.com license of use is as follows:

a. For commercial and personal projects
b. On digital or printed media
c. For an unlimited number of times, continuously
d. From anywhere in the world
e. With modifications or to create derivative works

Attribution is required:
https://www.freepik.com/free-photos-vectors/background">Background photo created by rawpixel.com - www.freepik.com

Source

Google Fonts

Other fonts may be used for instructions, labels, displays, credits, or other. All fonts used will be found through Google Fonts, whose policy is listed here:

> "All the fonts in our catalog are free and open source, making beautiful type accessible

to anyone for any project. This means you can share favorites and collaborate easily with friends and colleagues. Google Fonts takes care of all the licensing and hosting, ensuring that the latest and greatest version of any font is available to everyone." Source

Freesound.org

All SFX and background music for this game is from freesound.org which is under the creative commons license, allowing us to:

> "Share — copy and redistribute the material in any medium or format" and
> "Adapt — remix, transform, and build upon the material for any purpose, even commercially."

Source

ARCore

We will use ARCore to deploy the augmented reality aspect of the game.
"Except as otherwise noted, the content of this page is licensed under the Creative Commons Attribution 4.0 License, and code samples are licensed under the Apache 2.0 License. For details, see our Site Policies."
Source

Logo

"The image can be used for personal use only."
Source
Attribute- https://favpng.com/

User Experience and Game Play Specifics

UI Elements

- Main / Home screen
  - "Play" button to start the game
  - "Tutorial" button that will open the tutorial screen
  - "Settings" button that will open the settings menu
  - "Credits" button that will open the credits screen
- Tutorial Screen
  - "Home" button to close the screen and return to the home menu
- Settings Screen
  - Music slider to control the volume of the music
  - SFX slider to control the volume of the sound effects
  - "Home" button to close the screen and return to the home menu
- Credits Screen
  - "Home" button to close the screen and return to the home menu

- Game / Portal Screen
    - “Home” button to close the screen and return to the home menu
    - “List” button to access the list of items the user needs to find

Level Design and User Interface

Resolution and Aspect Ratio

The aspect ratio will be portrait 16:10, as this will be a mobile game. We plan to use Portrait: 720x1280 px as the best resolution.

Moodboard Nrepesh

- Font
    - Title font: We plan to use “Sea Gardens” as our title font.
    - Text font: We plan to use “Mogra” for our text font.
    - UI font: We plan to use “Sea Gardens” as our UI font as well.
- Color scheme: We plan to use orange, blue, green, brown, soft yellow (outlined below).

From kuler.adobe.com

- Style
    - The style is going to be “Realistic”
- Mood you want to convey
    - Relaxing
    - Happy
    - Calm
    - Serene
    - Entertaining

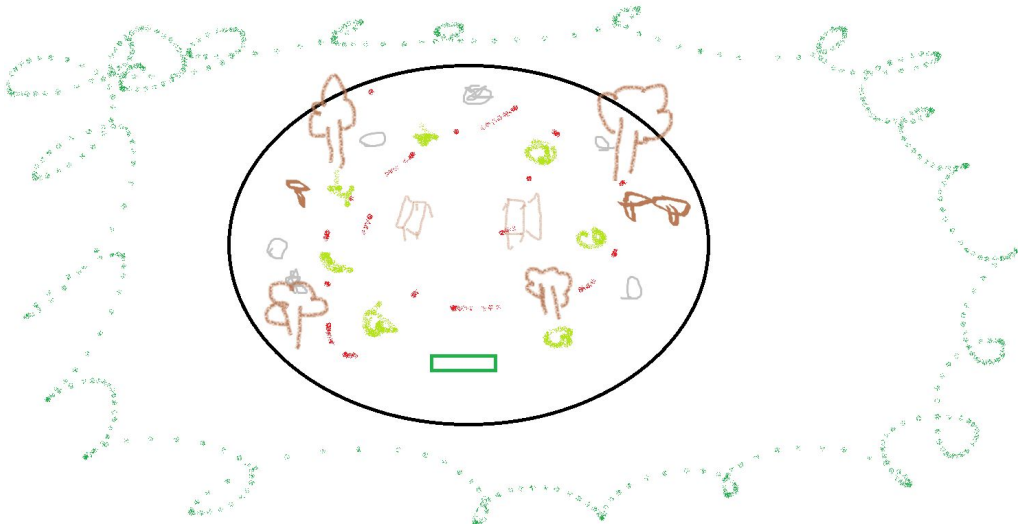
Concept Art

Firewatch (Game)

This is the art from the game firewatch. We are not using this art, however, we are thinking of using their art concept and aesthetic in our game and main menu.

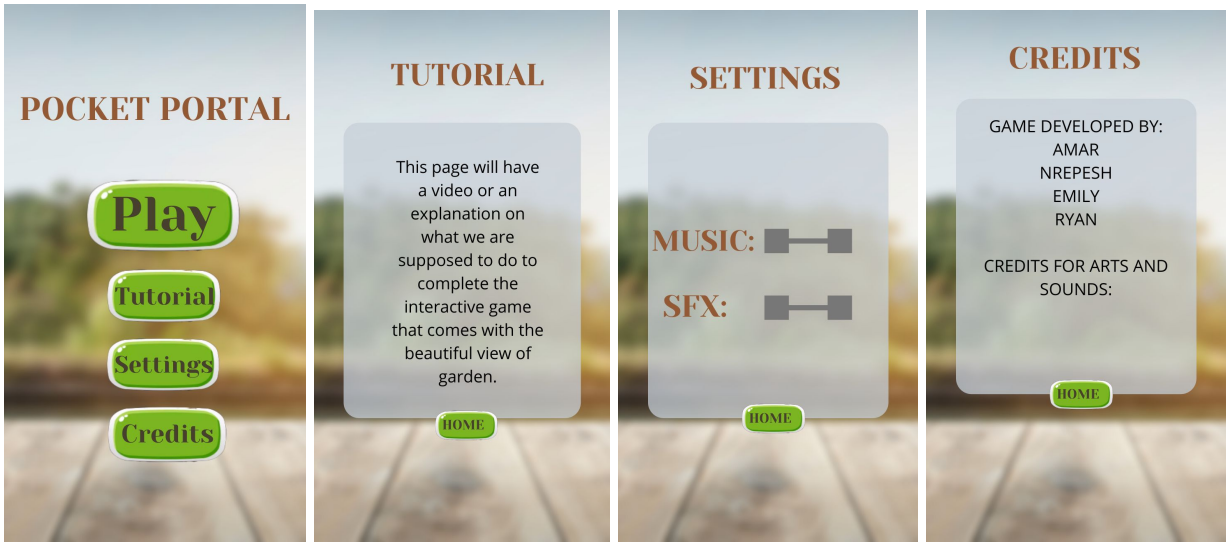
(Link)

This is an example of the forest built form the free asset in Unity Asset Store. We are using these free assets to make the garden/forest in our game.



Park planning (Virtual)

Flowcharts and Storyboards



The game screen will look something like this with a home button and an objective button

(Source)

Functionality

From the title screen, the player can click to a settings screen, which will lead the player to sound and volume option sliders for our game. Also from the title screen the player can access the credits screen, which will house the information about who we are and any other relevant credits for any of our UI elements, art, or music that needs to be attributed. There will also be a help screen accessible from the title screen. Tapping the play button will bring the player to a screen where the player is in front of the portal which is inlaid in the real world. This portal is what will lead the player, when they walk through it, to the other world to interact with the surroundings in that other world. The box collider of the camera will detect the collision of the object the player is looking for.

When we are coding the portal, we will use Unity ARCore, it depends on which one works better for the effect of entering a portal. There will be a box collider on the camera, which will be connected to the camera on the user's device, which will detect when the player walks through the portal or when they find a hidden object. There will also be a sphere collider on any items in the world that the player interacts with. The illusion of the portal will be provided by shaders and how a stencil test will make the objects appear and disappear.

UI

Function	Description	Programmer assigned?	Due date	Targeted build (prototype 1 and prototype 2)	Estimated number of hours
Title Screen with buttons	Title screen for the game, plus play, credits, and about buttons	Nrepesh	4/18/20	Prototype 1	3
Credit Screen with buttons	Credit screen for the game with home button	Ryan	4/22/2020	Prototype 1	3
Settings Screen with buttons	Setting screen for the game with home button and music and SFX sliders	Everyone	4/22/20	Prototype 1	3
Tutorial Screen with buttons	Tutorial screen for the game with home button	Emily	4/22/20	Prototype 1	3
Game Screen with buttons	Instruction button and home button	Amar	4/22/20	Prototype 1	3

Art

Background Image- We will use this image as our background image:

We will blur the image a bit and this will be used for the title screen, credit screen, tutorial screen and settings screen.

GUI pack - We will use button style 5 from this GUI pack for our UI elements:

Environment asset pack - We plan to use this asset pack for our game and all the objects associated with it.

Scavenger hunt item art- We plan to use an apple as the scavenger hunt object but this might be a subject to change as we progress in the game development.

General UI Objects

[Link to assets]

This is only the art for the objects.

Asset	Who	Due date	Build	Estimated Hours
Buttons	Everyone	4/22/20	Design Document	2
Sliders	Everyone	4/22/20	Design Document	2

Title Screen

Art needed for title screen, including environmental and any other art asset not listed in 3.3.1.

Asset	Who	Due date	Build	Estimated Hours
Title Screen	Nrepesh	4/18/20	Prototype I	2
Play button	Nrepesh	4/18/20	Prototype I	2
Credits button	Nrepesh	4/18/20	Prototype I	2
Settings button	Nrepesh	4/18/20	Prototype I	2
Tutorial button	Nrepesh	4/18/20	Prototype I	2
Background Image	Nrepesh	4/18/20	Prototype I	2

Credits Screen

Art needed for credit screen, including environmental and any other art asset not listed in 3.3.1.

Asset	Who	Due date	Build	Estimated Hours
Credits Screen	Ryan	4/22/20	Prototype I	2
Home button	Ryan	4/22/20	Prototype I	2
Text Box	Ryan	4/22/20	Prototype I	2
Background Image	Ryan	4/22/20	Prototype I	2

Tutorial Screen

Art needed for tutorial screen, including environmental and any other art asset not listed in 3.3.1.

Asset	Who	Due date	Build	Estimated Hours
Tutorial Screen	Emily	4/22/20	Prototype I	2
Home button	Emily	4/22/20	Prototype 1	2

Settings Screen

Art needed for settings screen, including environmental and any other art asset not listed in 3.3.1.

Asset	Who	Due date	Build	Estimated Hours
Settings Screen	Everyone	4/22/20	Prototype I	2
Music Slider	Everyone	4/22/20	Prototype I	2
SFX Slider	Everyone	4/22/20	Prototype I	2
Home button	Everyone	4/22/20	Prototype I	2

Level 1

Art needed for the gameplay, including environmental and any other art asset not listed in 3.3.1.

Asset	Who	Due date	Build	Estimated Hours
Portal Door	Amar	4/22/20	Prototype I	3.5

Home Button	Amar	4/22/20	Prototype I	3.5
Instruction button	Amar	4/22/20	Prototype I	3.5
Trees	Everyone	5/6/20	Prototype II	5
Chairs/Bench	Everyone	5/6/20	Prototype II	4
Scavenger Hunt Item	Everyone	5/6/20	Prototype III	5
Scavenger Hunt complete message	Everyone	5/6/20	Prototype III	5

Sound and Music

Sound/Music	Links	Scene/Project	Who	Due Date	Build	# hours
Background Music	link	Gameplay	Ryan	5/22/20	Prototype 3	2
Walking SFX		Gameplay	Nrepesh	5/22/20	Prototype 3	2
Object found SFX	link	Gameplay	Emily	5/22/20	Prototype 3	2
Buttons SFX	link	Title screen	Nrepesh	5/22/20	Prototype 3	2
Won message	link	Gameplay	Amar	5/22/20	Prototype 3	2
Portal enter/exit sound	link	Gameplay	Amar	5/22/20	Prototype 3	2