

# Prismia

A puzzle game for kids & adult  
A journey between the real world and utopia

By Aaron (Zejing) Wang

## Scope

4 months, team of 3

## My Roles

Team Leader  
Game Designer  
(Gameplay, Narrative, Level, System)  
Programmer

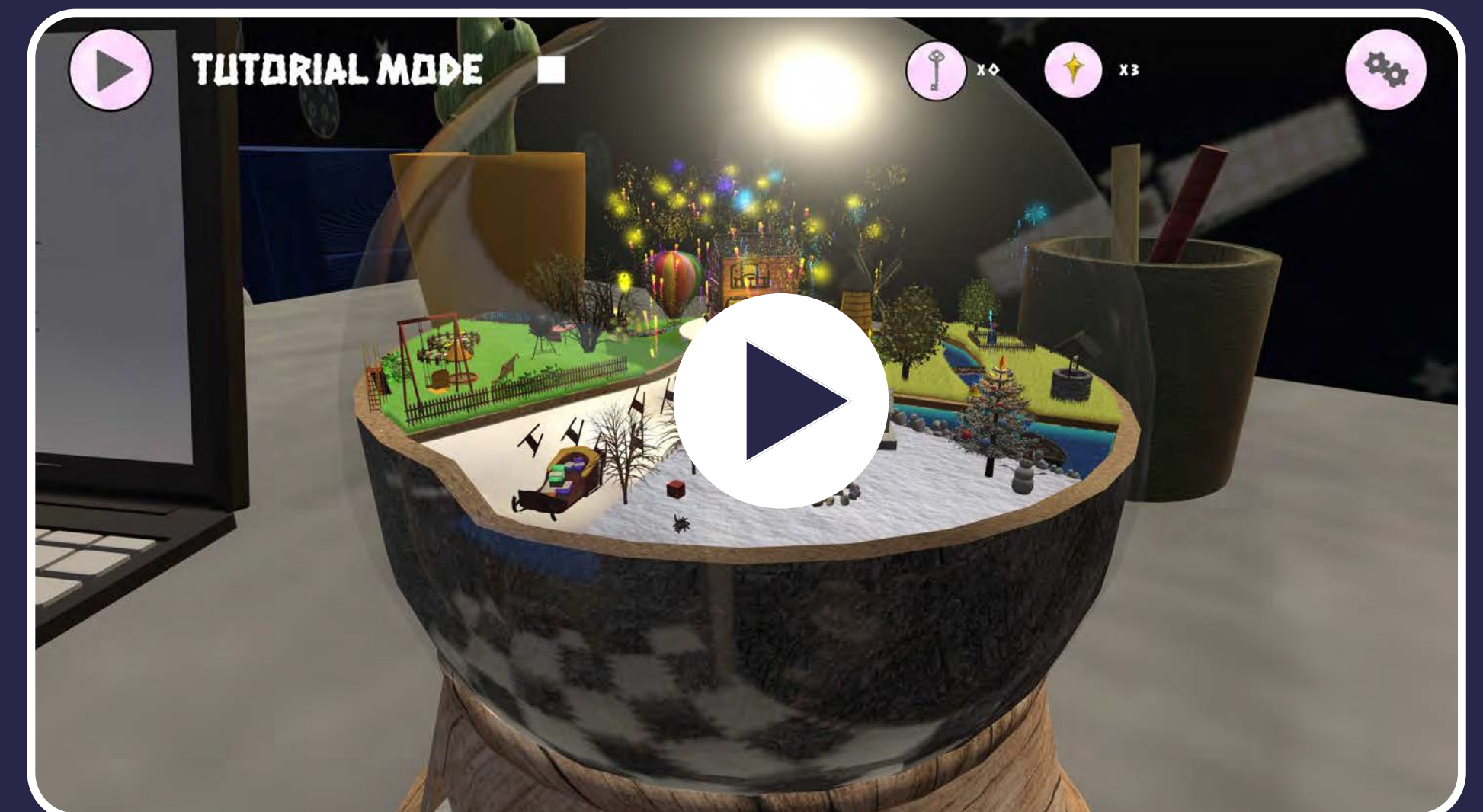
## Game Engine

Unity

## Game Duration

10 mins

## Game Walkthrough on [Youtube](#)



# About Me

I'm Aaron!

Fun fact:  
I master **5 languages!**  
(English, Mandarin, Python, C#, HLSL)



Me and my exhibited work "EMOTION" in Arebyte Gallery, London

Hi👋, I am Aaron, a game designer and programmer. I create interesting games with wonderful tools. I'm studying Media at UCL in the direction of games production.

## My Team

*Uliana* (Left)  
the Model Artist

*Me* (Middle)  
the Programmer  
and  
Game Designer

*Tim* (Right)  
the Animation Artist



Say Hi to my amazing team!

## My Works



**The Prisma (Unity Kids Game)**



Your are viewing!

👁️ One of my most time-consuming and complete works!

**Stratford Wonderland (VR Escape Game)**

**Emotional Weather (Real Time Rendered Weather Simulator)**

**EMOTION (4-Level Unity Console Game)**

and more...



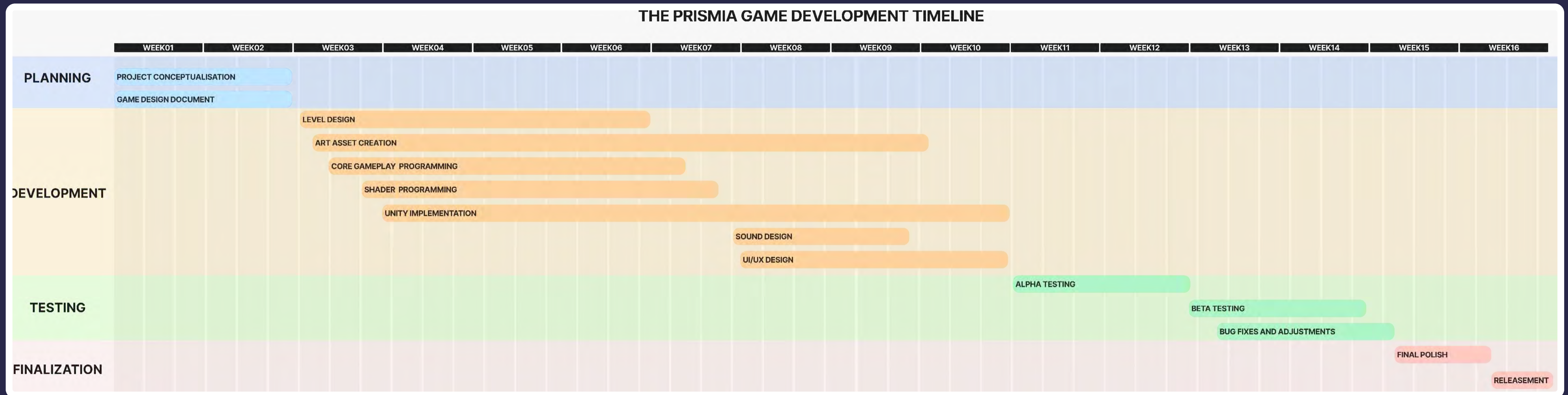
Check them out on:

[www.aaronwang.online](http://www.aaronwang.online)

# Contents



# Development Timeline



# Brainstorm

“Create Different Game Experience for Different Players”

## Target Player & Experience

Children  
age 5-8  
**User**

Offer  
Educational  
Value  
**Value**

Explores  
Utopia and  
Dystopia  
**Meaning**

Adult  
can also  
enjoy & relate  
**Plus...**

### Adult

By creating a carefree and beautiful world for adult, it triggers the thought of “should we go back to the real life or stay in the utopia?”

### Children

The rich colours and beautiful visuals inspire children to develop a love for natural landscapes and deepen their understanding of the environment and nature.

## Research & Inspiration

1



Start from an **daily object** that everyone could related (especially children)

2



Create a sense of **“two worlds”**: a carefree natural world and a realistic world

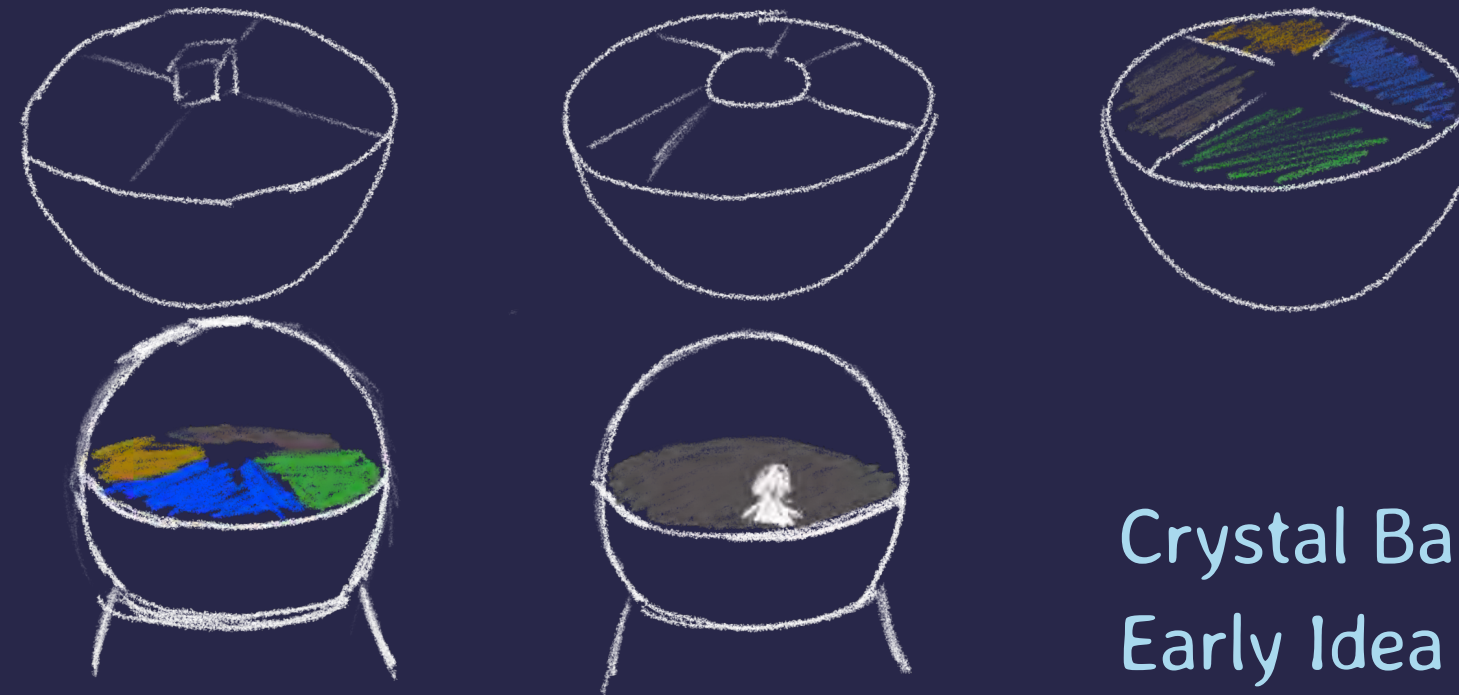
3



**Crystal ball** is a meaningful object and it may hold good memory

## Game Idea Initiation

Children's games is a complex and unique field, we referred to many other children's games and some related research, and decided to use **puzzle solving** as the core gameplay, and develop the game in a crystal ball.



Crystal Ball  
Early Idea

?  
2D or 3D

?  
What should be inside the ball

?  
Where should the crystal ball be placed



## Storytelling

A busy **adult** accidentally enters the world of the crystal ball



Be a **kid** in the Fantastic world in the crystal ball and try to get out.



Succeeded and return to the real world



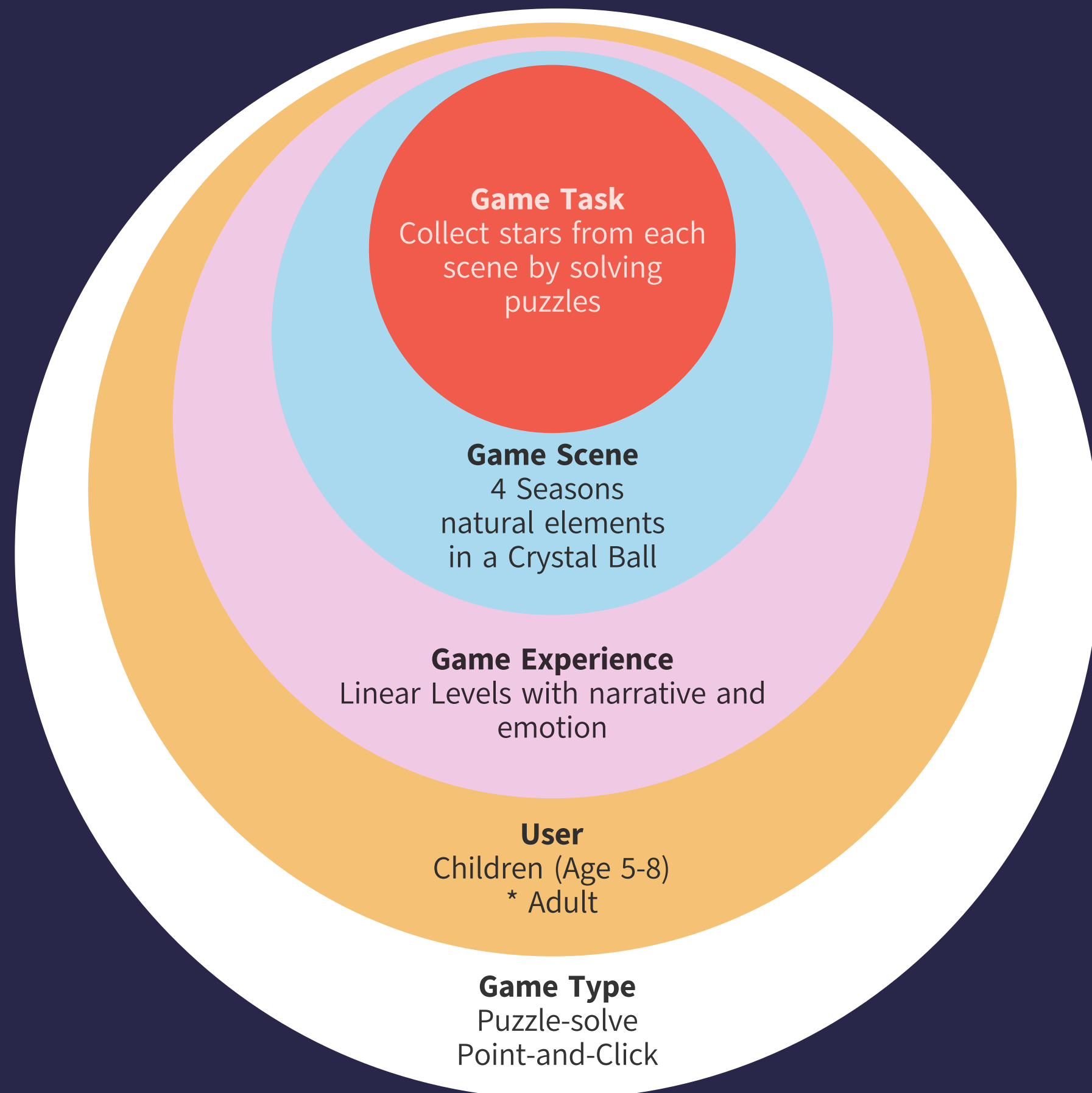
Haha, I'm back

# Game Design

“First, Figure out core design”

When designing the game I decided to list the core elements of the game, and then try to organise the relationships between them, and carry these core ideas through to the production of the game.

## Game Pillars



### Star and Key

User's aim is to finish small quest in the game, by finish the quest, the user will receive a star and unlock next level. This design has make the game easy to understand and digest.

### Not Only Game

The character is an adult who accidentally became a children in the crystal ball world, with this setting, both children and adult can resonate with the game, have different feeling. Not only entertaining, but also inspiring.

### Everything within a Crystal Ball

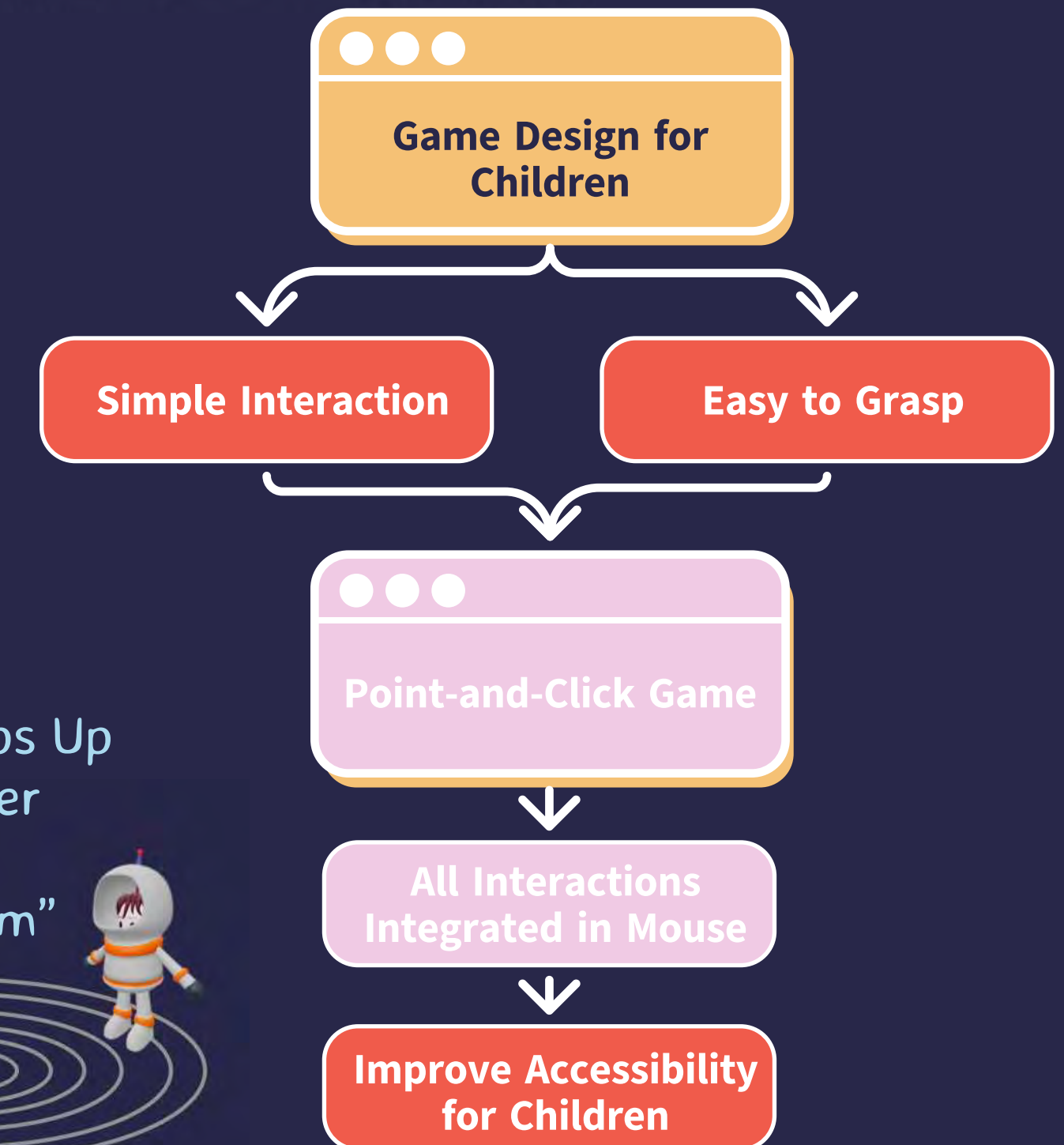
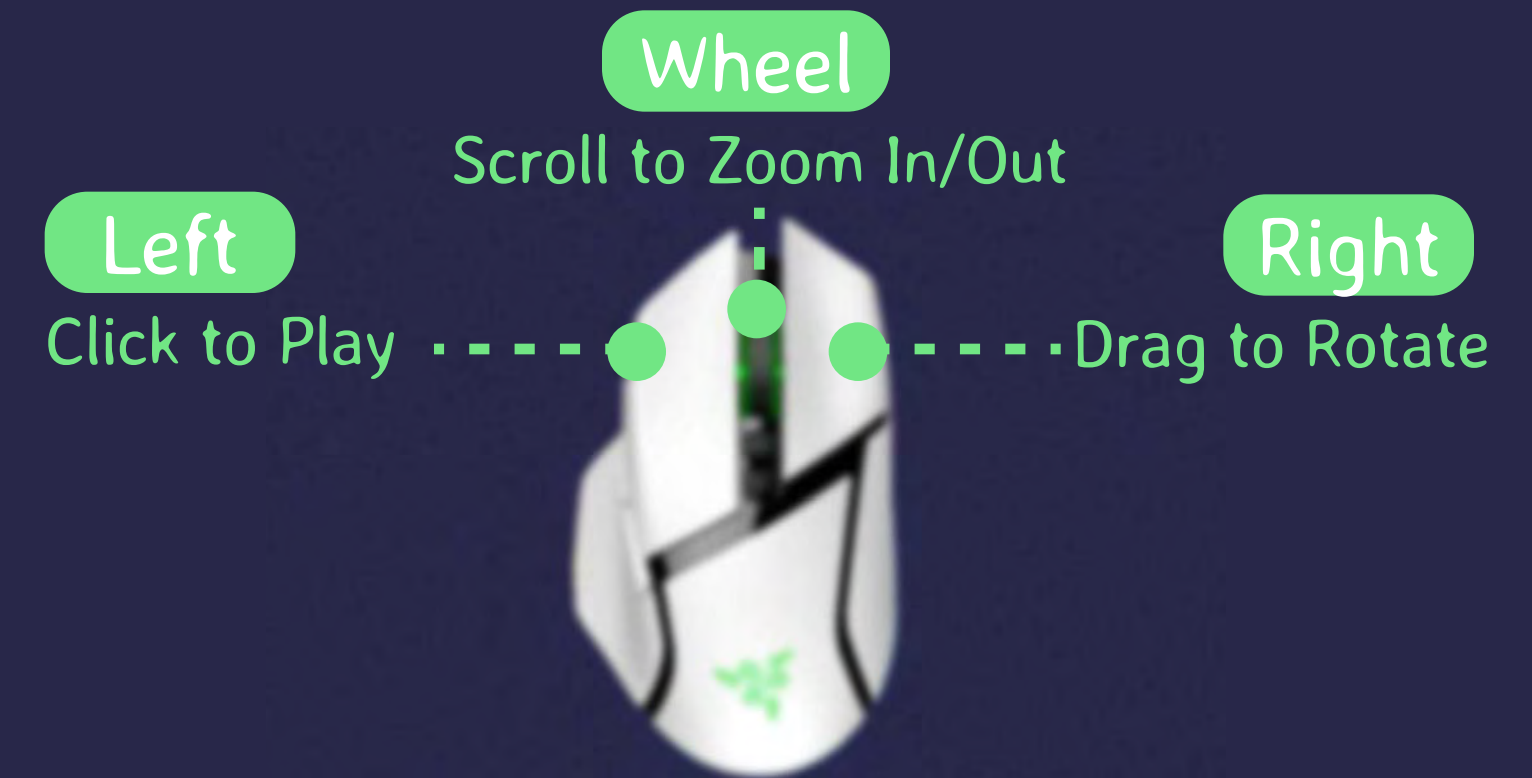
The Game is happened in a crystal ball, and the user have to solve puzzle in the level and try to get out of the ball.

### A Linear Narrative Game Experience

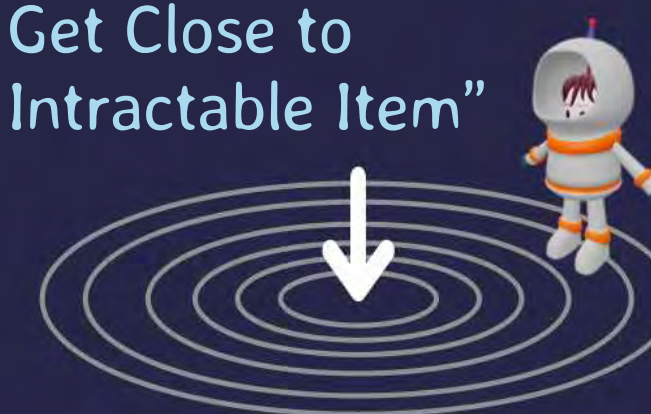
The game features a linear storyline where user will complete levels in the designed order, and not allowed to goes back to make user enjoy the flow of the game

## Game Interaction

In order to make the game more suitable for children players, I tried to design the interactions to be simple and easy to grasp. Therefore I chose to make it a point-and-click game.



“UI Button Pops Up When Character Get Close to Intractable Item”



# Game Design

## “Find that flow in your heart”

I organised the player's overall experience of the game's mind-flow, and with this in mind, created a number of puzzle ideas and assigned the final selected puzzles to the four-seasons-themed level. Each puzzle is closely relevant to the scene, and at the same time, it can stimulate the player's emotions.

### Player Experience Through Levels

Level Progress

# 1

## Spring

Puzzle 1 - Watering flower  
Get (★1/4)

Puzzle 2 - Take air balloon

# 2

## Summer

Puzzle 3 - Fishing  
Get (★2/4)

Puzzle 4 - Across the bridge

# 3

## Autumn

Puzzle 5 - Pick up apple  
Get (★3/4)

Puzzle 6 - Row the boat

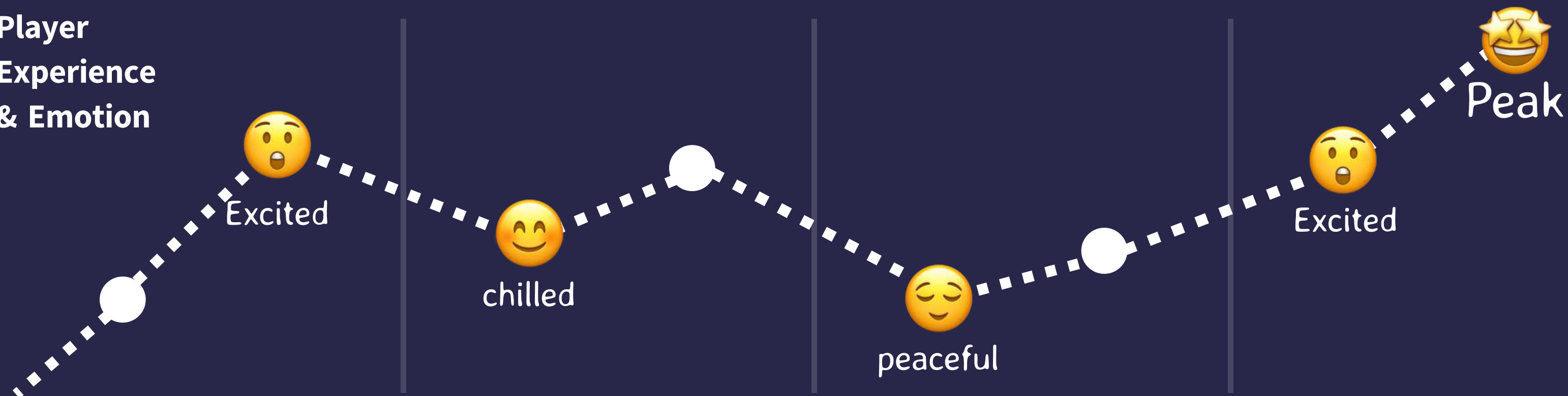
# 4

## Winter

Puzzle 7 - Grill the fish  
Get (★4/4) > Get (🔑)

Puzzle 8 - Set off fireworks in the 🗝️ locked surprise box

Player Experience & Emotion



### Puzzle solving Gameplay

Take Level 4 - Winter Scene as an example

**Step1** Level Start: Find Star Mark and Interact (Grilled Fish) Get 1 Star

**Step2** Star Collected, Find Next Interactive Item(Make a Torch)

**Step3** All 4 Stars Collected (3 From Previous Scene) Unlock Surprise Box

**Step4** Use Torch to Set Off Fireworks

**Step5** Go Back Home (Reality)

Game End

When designing the flow of the winter level player experience, I considered the psychology and needs of children. Because it is winter, we created a festive atmosphere through the Christmas tree in the scene, and I wanted the children to end the game in a warm atmosphere. Through the interaction of 'grilling fish', the winter scene is linked to the summer fishing task.

Finding the way to light the fireworks step by step, and the final explosion of the fireworks with the background music are exciting and novel experiences for children, and I wanted to connect these experiences into a series of puzzle solving that would gradually catalyse the emotions.

# Game Design

## “Terrain based Level Design”

### Problem Solving:

### Create partitions and barriers between 4 levels

Create drop-offs between several maps, and through this drop-off in height, the scene was naturally divided into four parts. And we can use these height differences to create more natural looking effects: waterfalls, rivers, snow, etc. These natural elements are attractive to children.

## Design Level Based on a Sphere

### Challenge

Creating terrain on a square sphere is difficult because it's such a unique shape, and the area that could be used is limited.

In the same time, the goal of the game need to stand out.

### Thinking

To maximize the map I chose to split the sphere in two.

Placed the 'home' in the centre of the map. And creates a sense of purpose.



Level - - - - -

Barrier - - - - -

Barrier is needed to split the levels

Transportation - -

One-way transportation send player to next level

### Spring

### Waterfall



Air Ballon

### Summer

### River



Bridge

### Autumn

### River



Boat

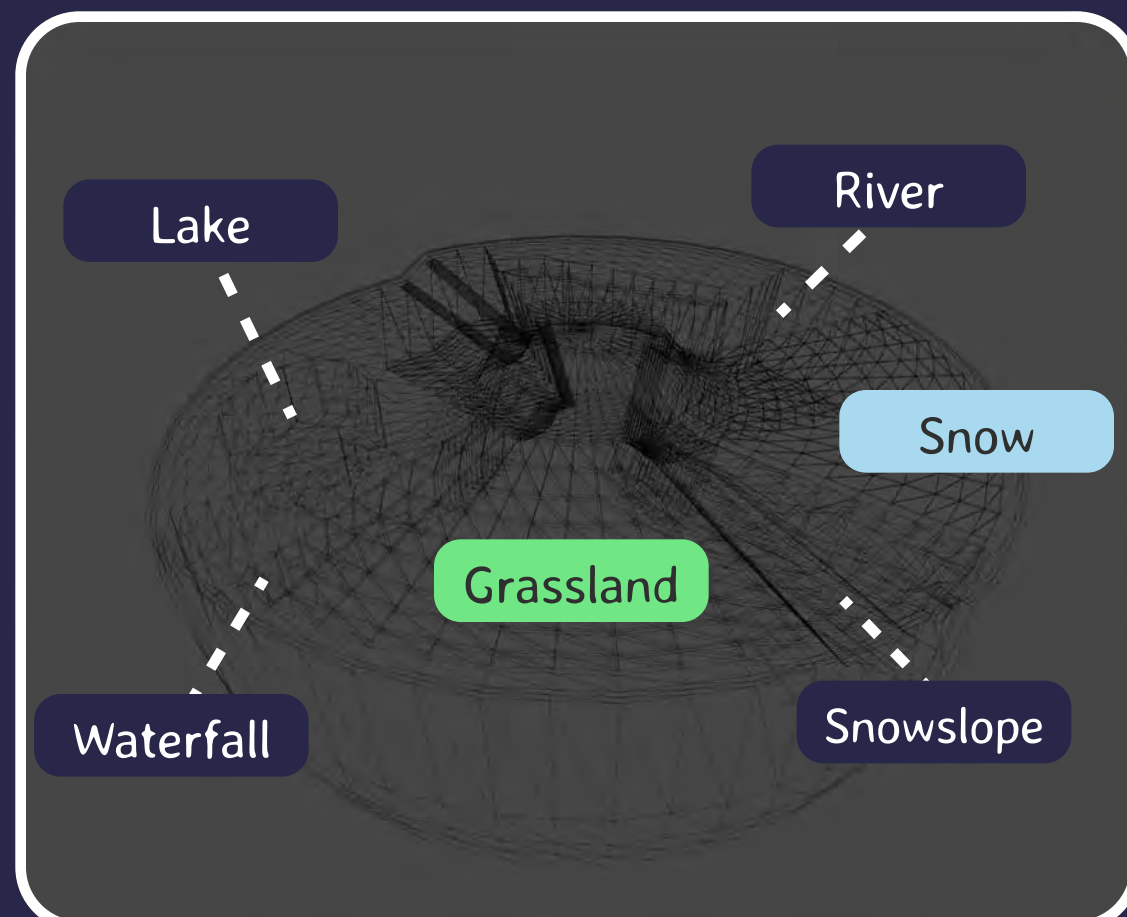
### Winter

### Snow Slope

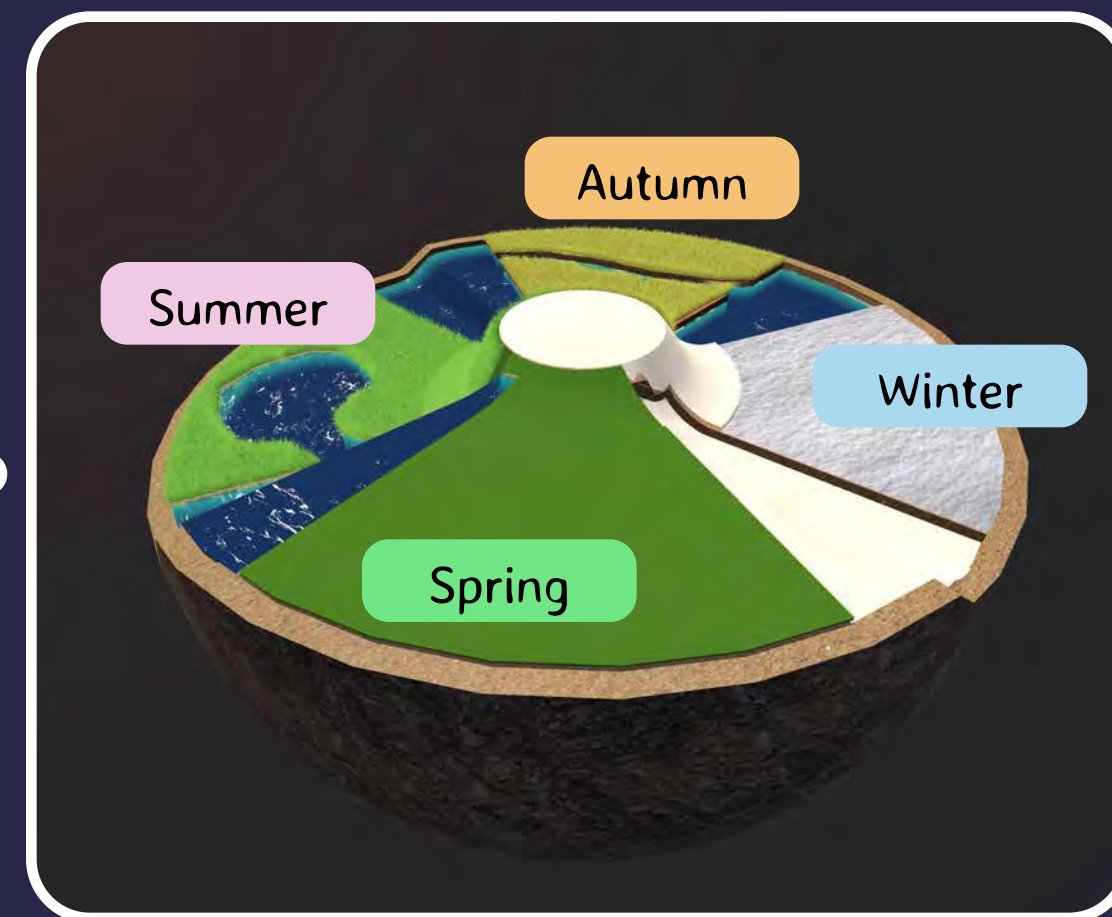


No Transportation

## Terrain Sketch



## Terrain with Materials



## Crystal Ball with Interactive Items



## Finalized Crystal Ball



Credit to Uliana for creating these amazing models

# Game Design

## Camera & View Design



### Camera Position

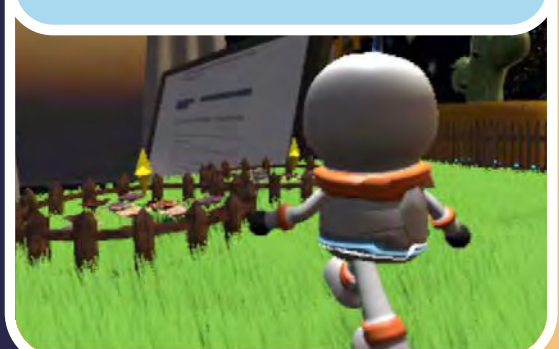
The position of the camera determines the player's angle of view and field of vision, which is very important in the game. When designing the camera position of the game, I tried to highlight the element of 'crystal ball' and the mysterious feeling of puzzle-solving game, and finally decided to use the horizontal perspective to start the game.

What Perspective?

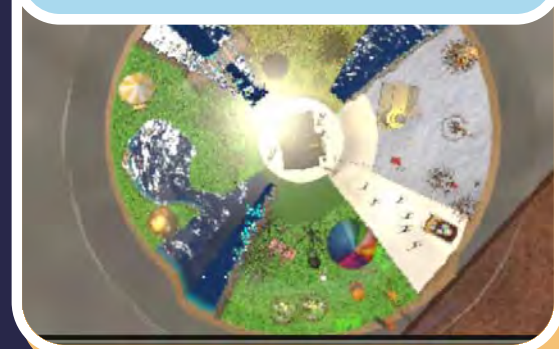
First-Person View



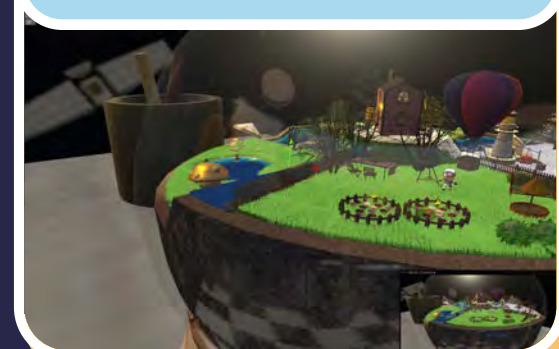
Third-Person View



Top-Down View



Horizontal View



Ruins "Player in Crystal Ball" Feeling

Rejected

Player Knows all levels at once

Rejected

Allow Player to zoom in/out

Better Understanding

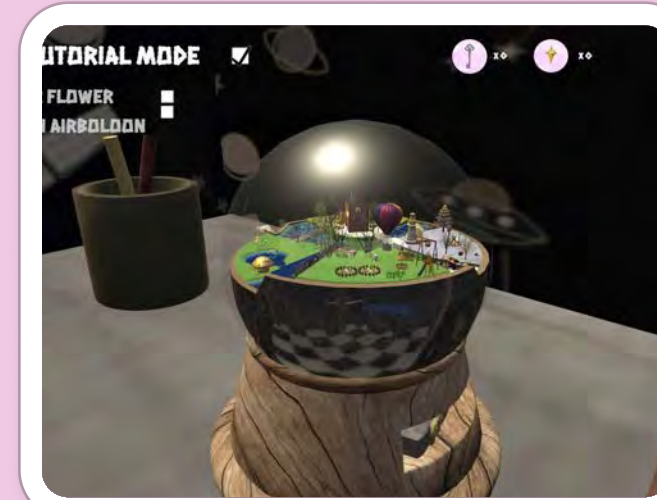
Enable Crystal Ball Rotation

Mimic Real-life crystal ball interaction

Final Camera Perspective

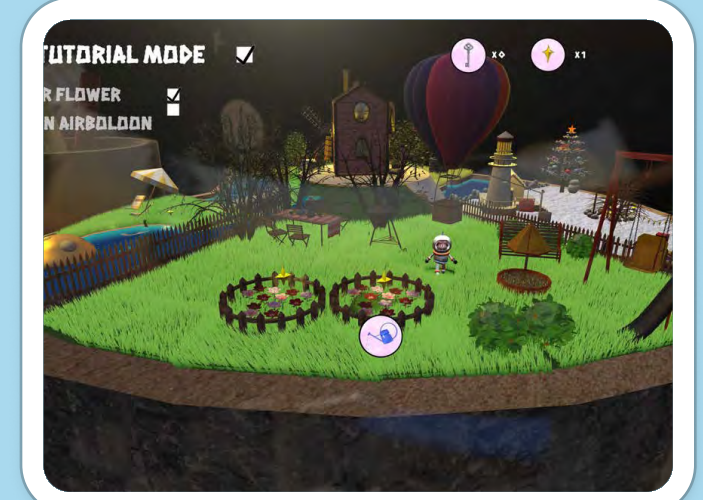
### Spotted Problem

If the player sets the camera distance too far away, they won't be able to see the game's interactions.



### Resolution

Implement a C# scrip therefore, when interaction happen, camera automatically zoom in



### Final Result



Finally, the game uses the mouse to control the camera to rotate around the crystal ball in a horizontal view, and the player can use the mouse wheel to Zoom in/out to good effect.



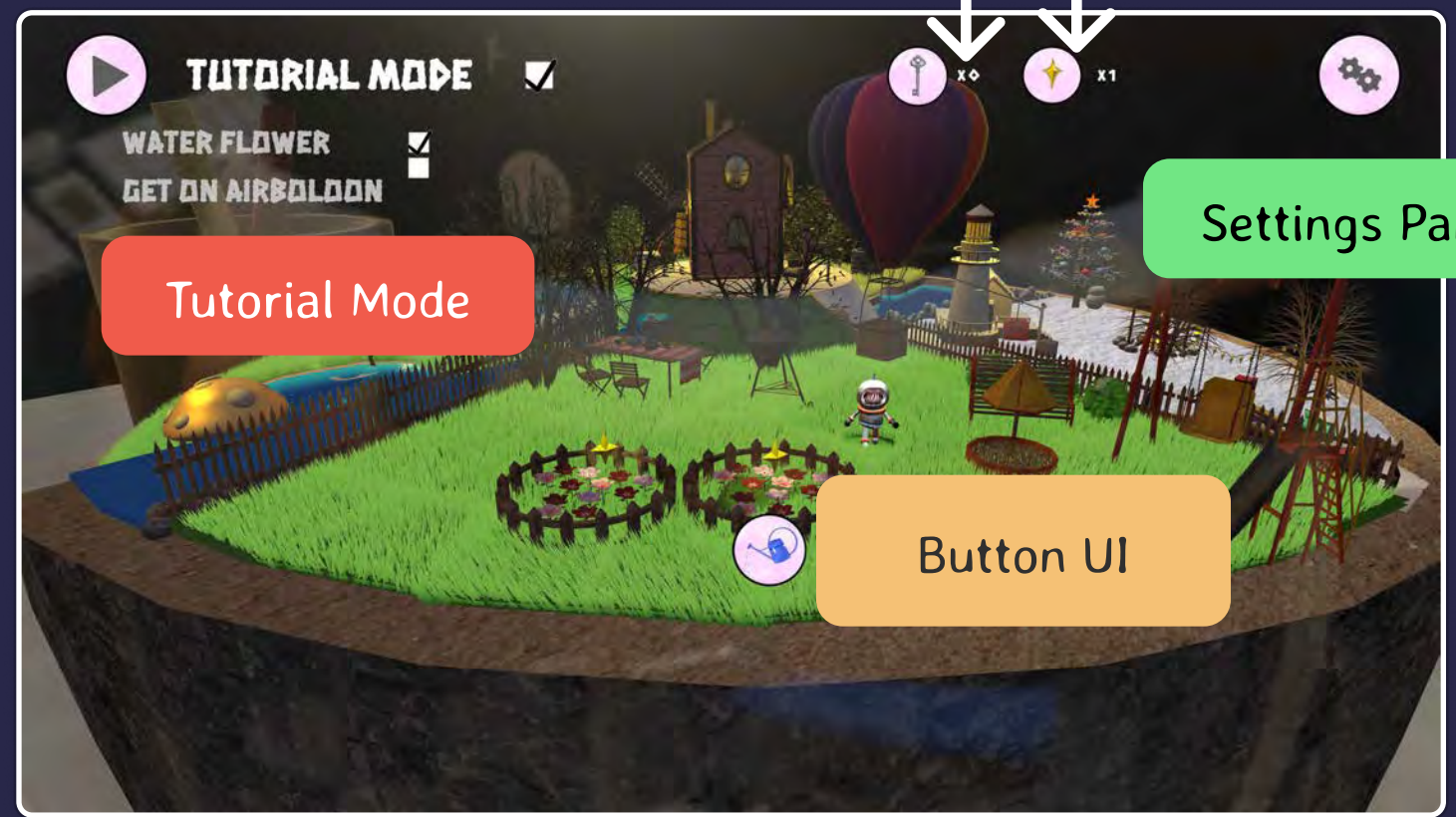
# Game Design

## System and UI Design

### HUD

Reflect Current Star Number  
Update When Triggered

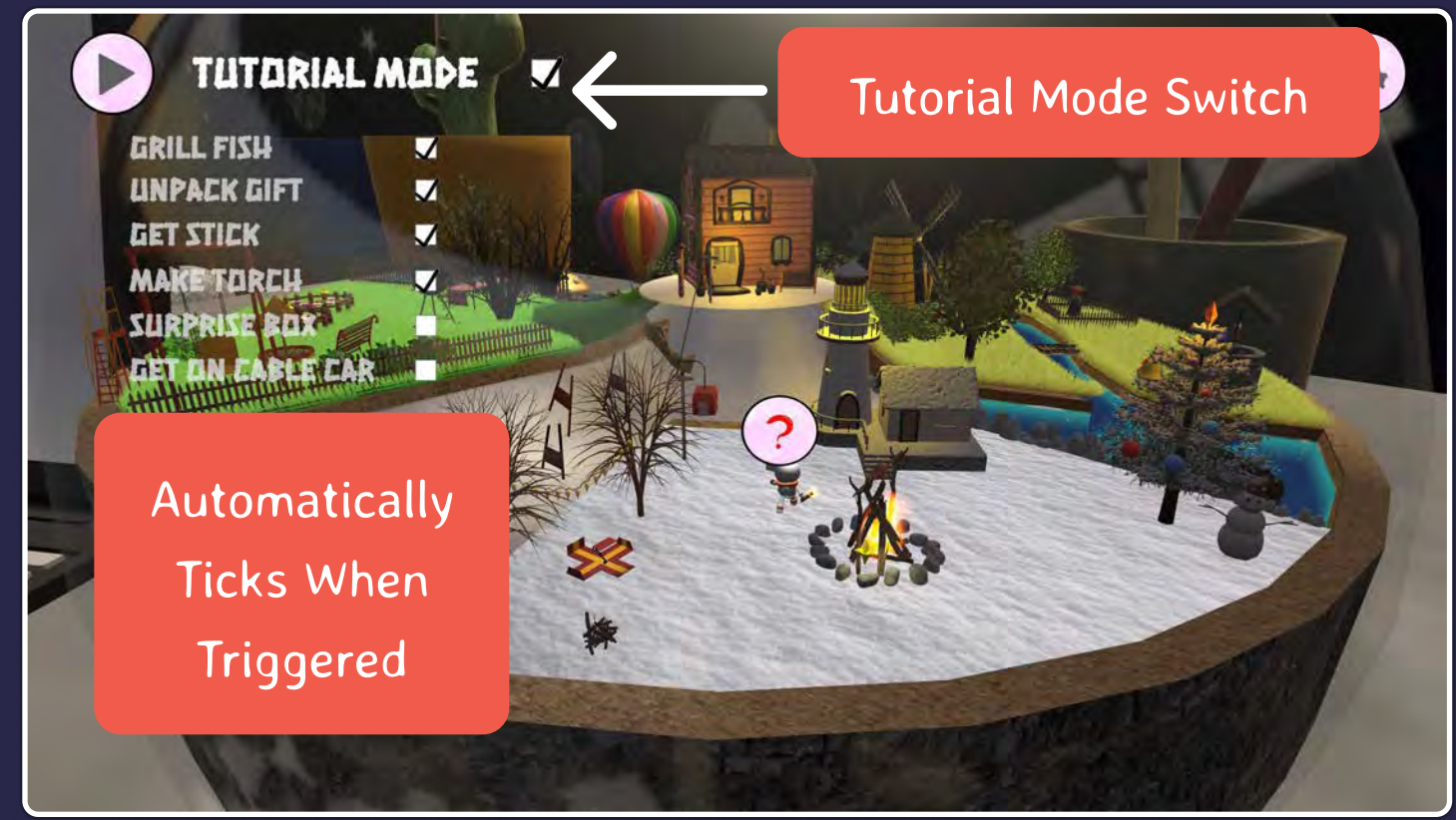
Reflect Weather Key is Collected



### Tutorial Mode System

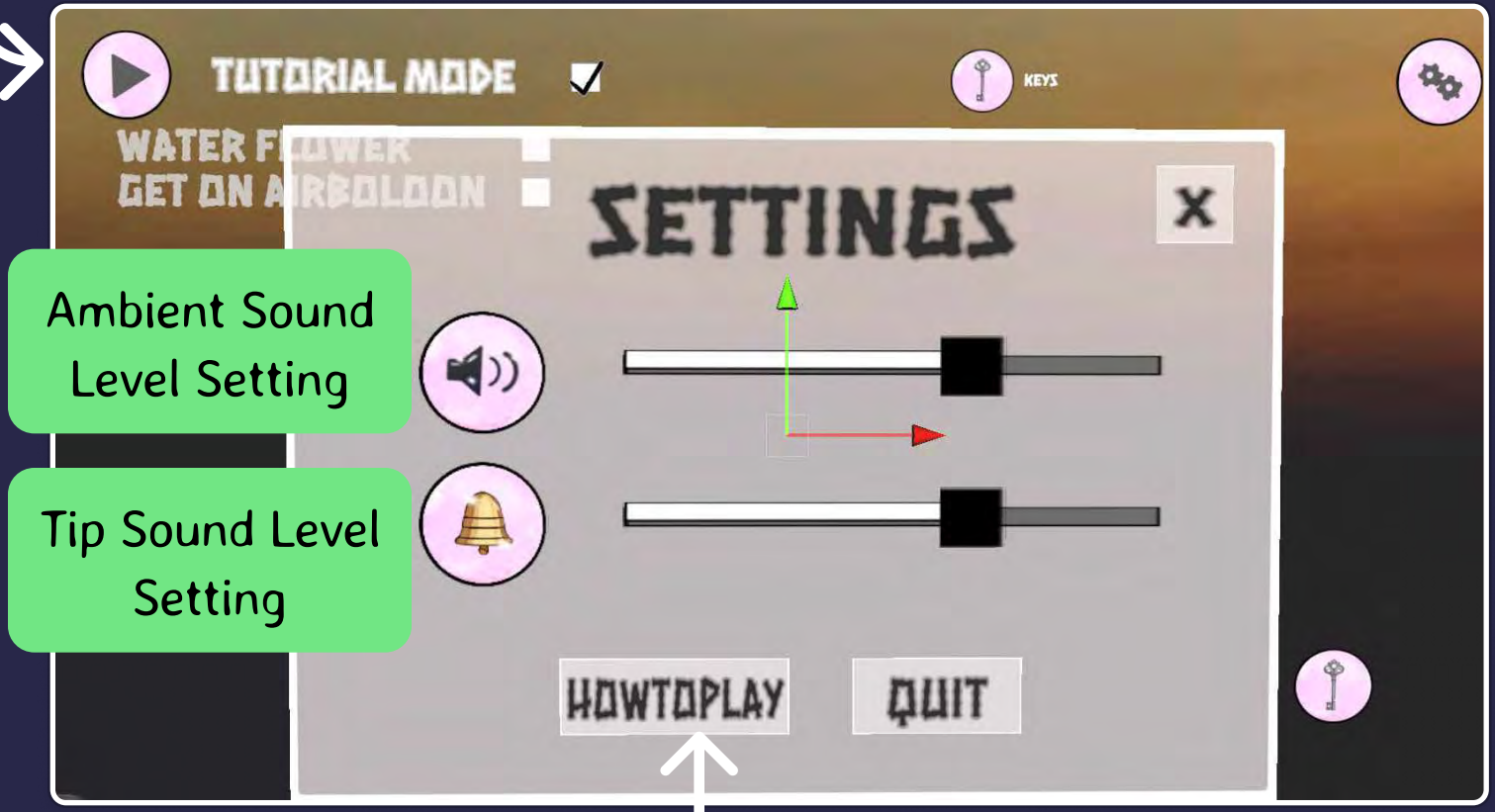
Tutorial Mode Switch

Automatically  
Ticks When  
Triggered

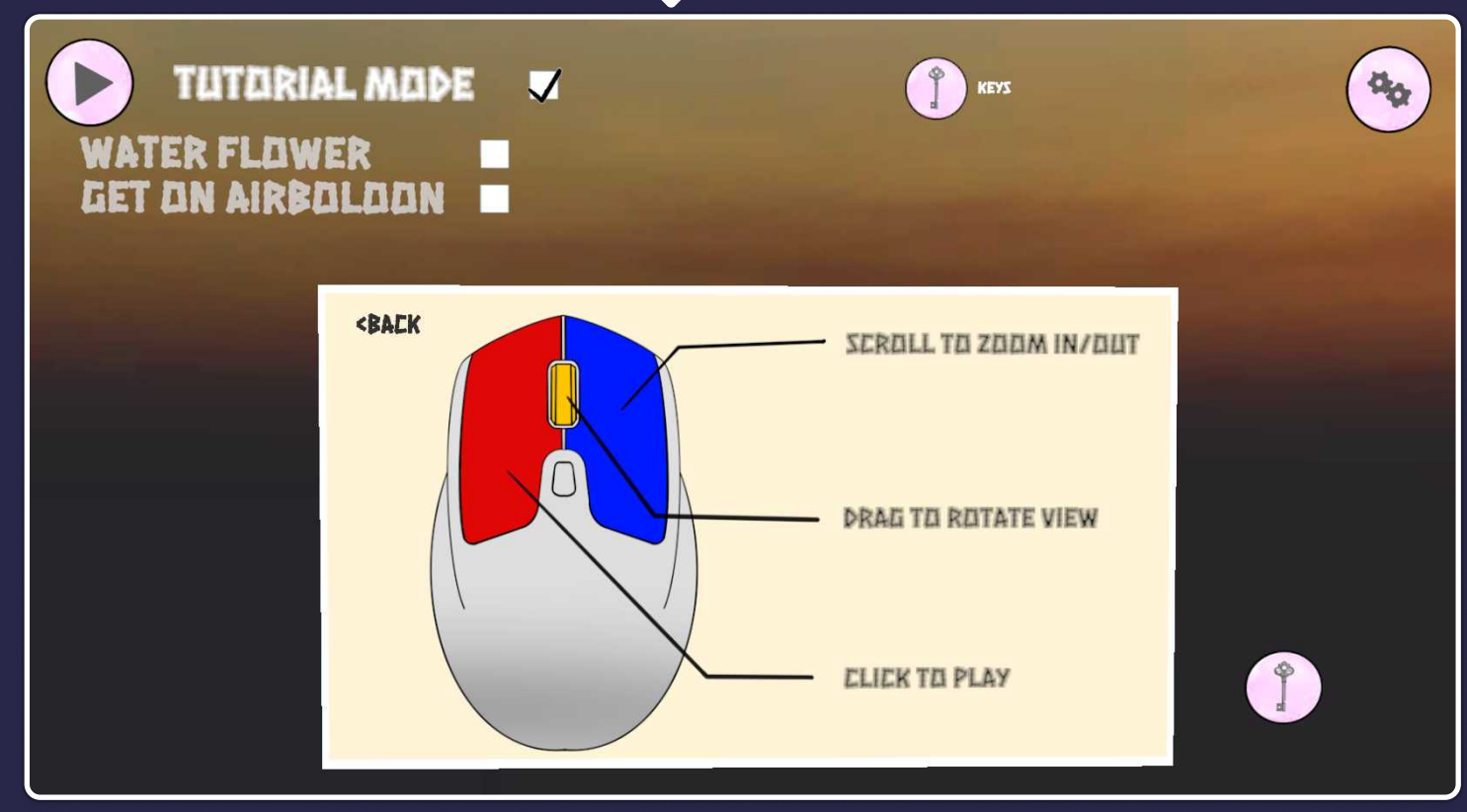


### Settings System

Game Automatically Paused

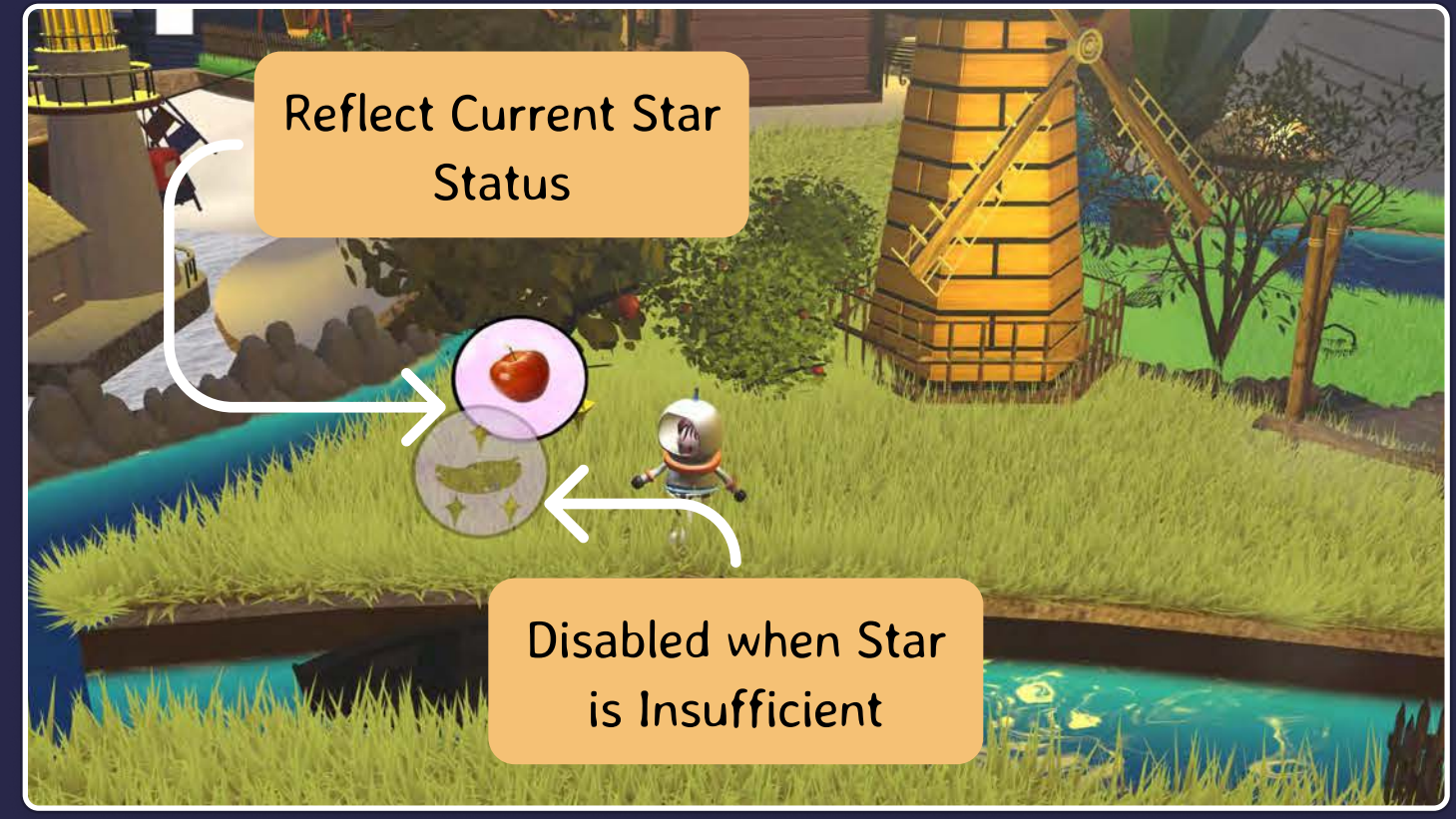


Hint About How to Play



### Button UI

In the game, UI buttons appear on the screen when the player is near an interactable object

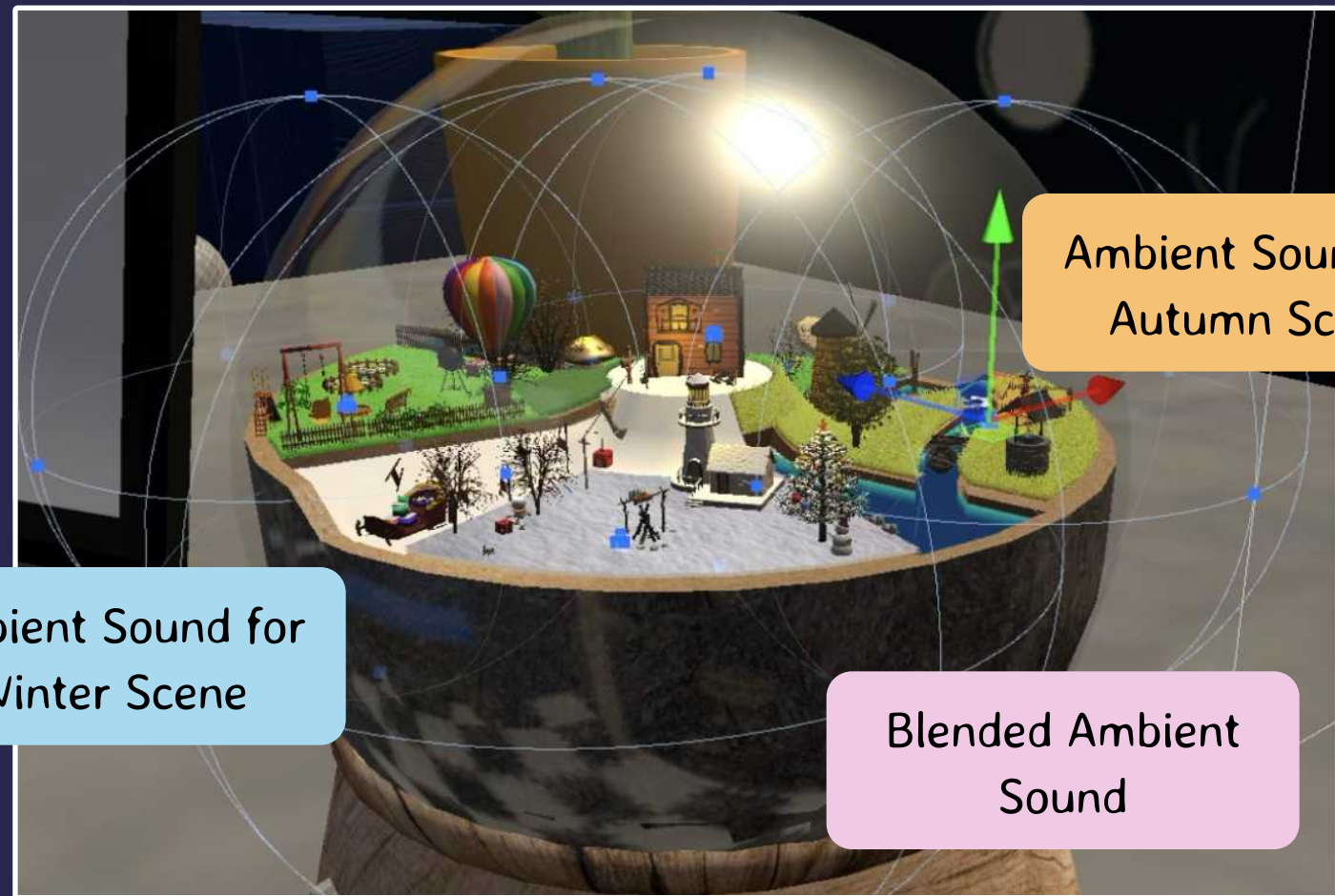


Credit to Tim for creating these visually appealing UI icons

# Game Design

## Sound Design and Production -Create an Immersive Experience

### 3D Triggered Ambient Sound



Ambient Sound for Winter Scene

Ambient Sound for Autumn Scene

Blended Ambient Sound

Ambient Sound A

Blended Sound A&B

Ambient Sound B

#### Sound in This Game

The sound in the game is crucial. There are several types of sounds included in this game: monologues, ambient sounds, cues and effect sounds. I tried to use a lot of 3D music in the project to create a more immersive experience for the player. Not only that, but the sound is also controlled by the script's linkage.

### Sound Mixer for All Background Sound



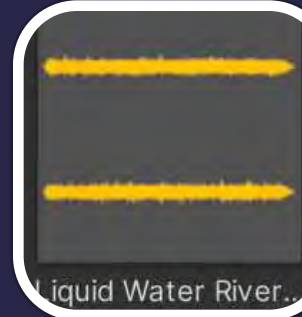
Accurate Control Different Sound Layer

Audio Mixer mixes all the sounds that appear in the game, controlling the volume of different groups of sounds through a progressive hierarchy. The volume parameters are exposed to allow code control.

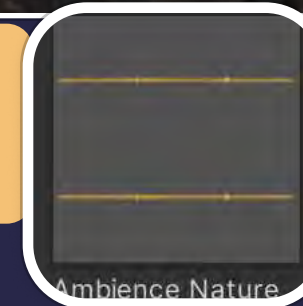
### In-Level Sound Design(Take Spring Level as an Example)



Waterfall Sound



Spring Scene Ambient Sound



Air Bollen Sound(Triggered)



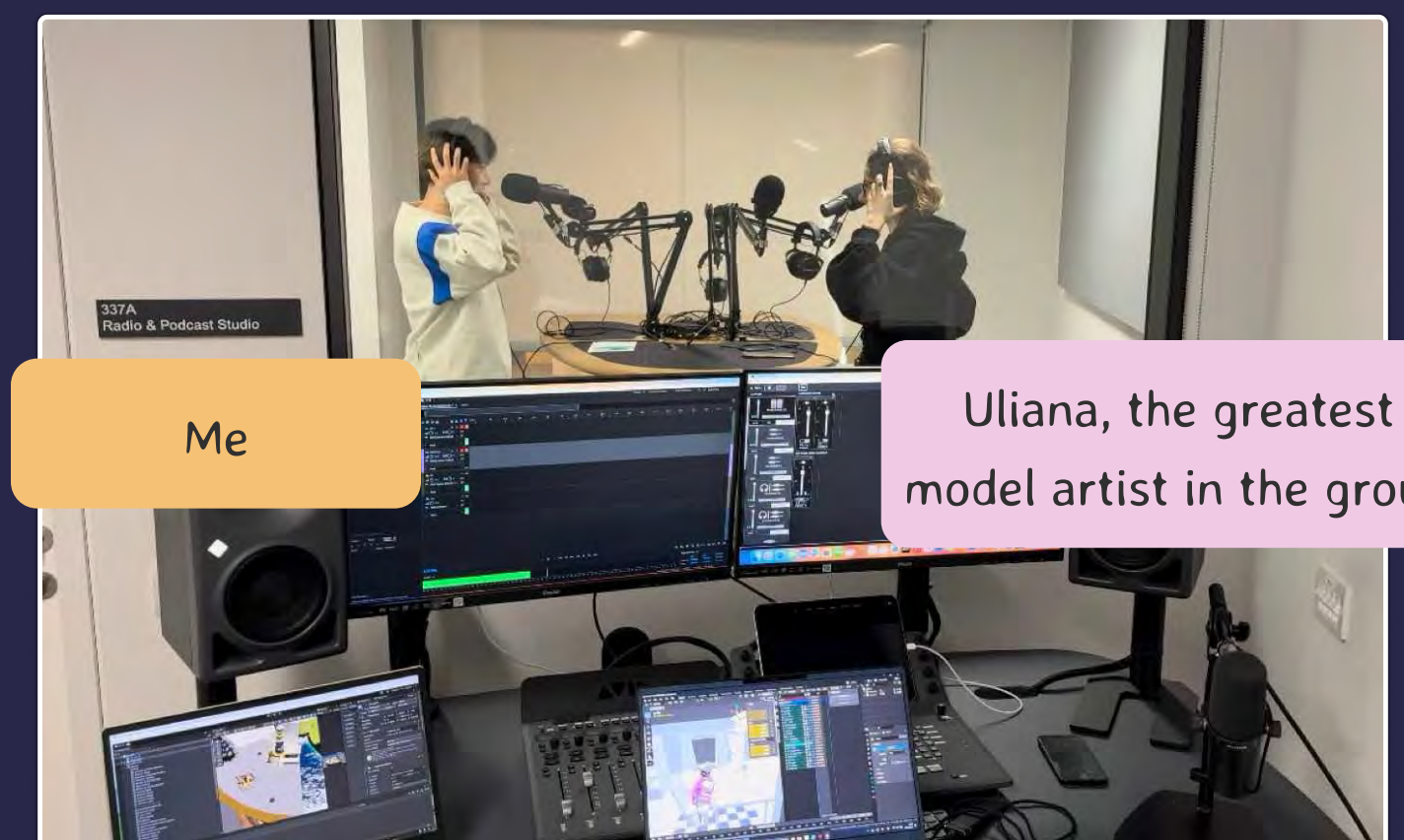
Watering Sound(Triggered)

Footstep Sound(Triggered)



### Game Animation Voice-over (Post-Processed in Au)

I worked with my group to voice the dialogue and narration in the game, and we used Audition software at the same time to do the post effects for the voices. This added a fun and interactive feel to the game.



Me

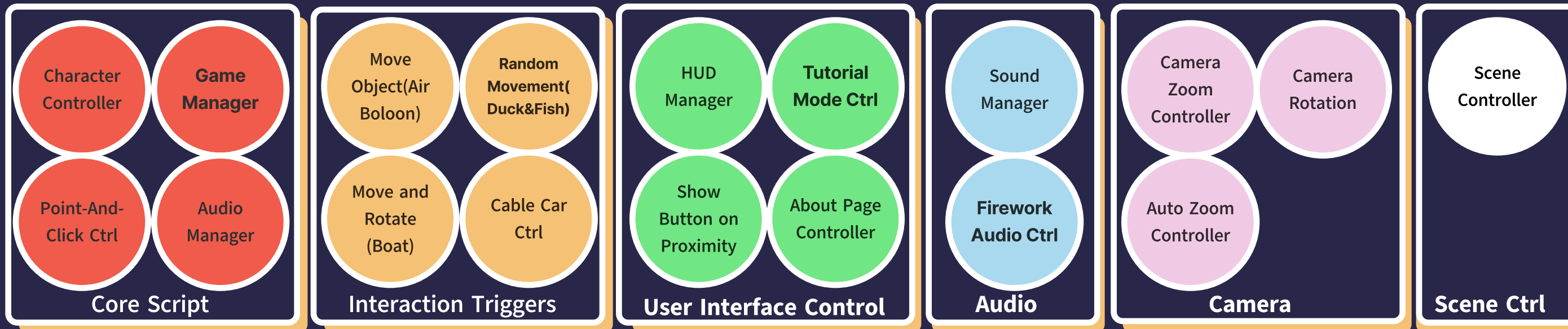
Uliana, the greatest model artist in the group

Voice-over production in Sound Studio

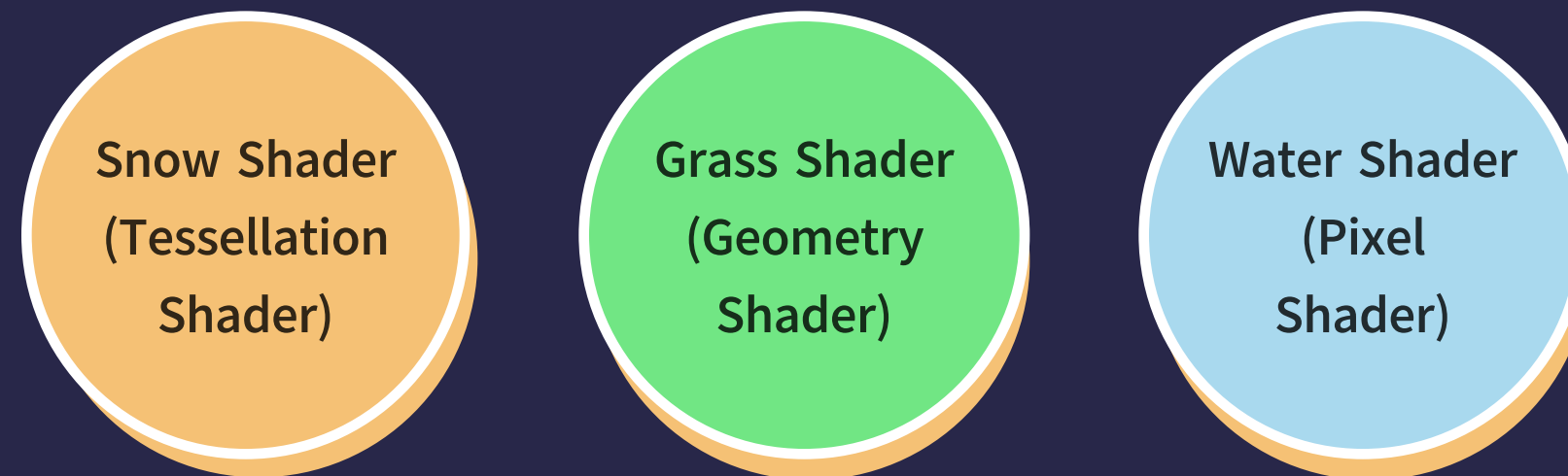
# Game Programming

## Coding and Unity Configuration- How to Bring Ideas into Reality

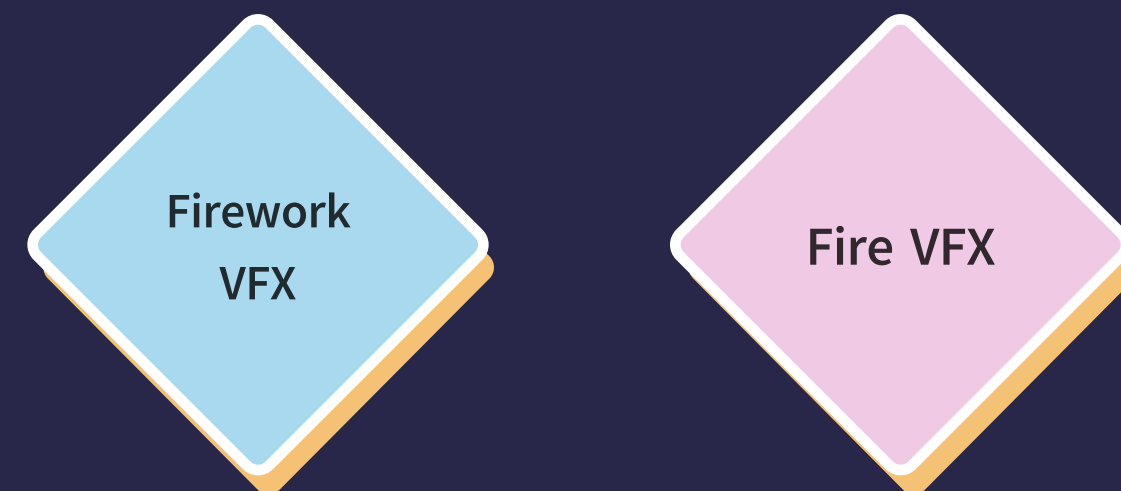
### Game Programming (C#)



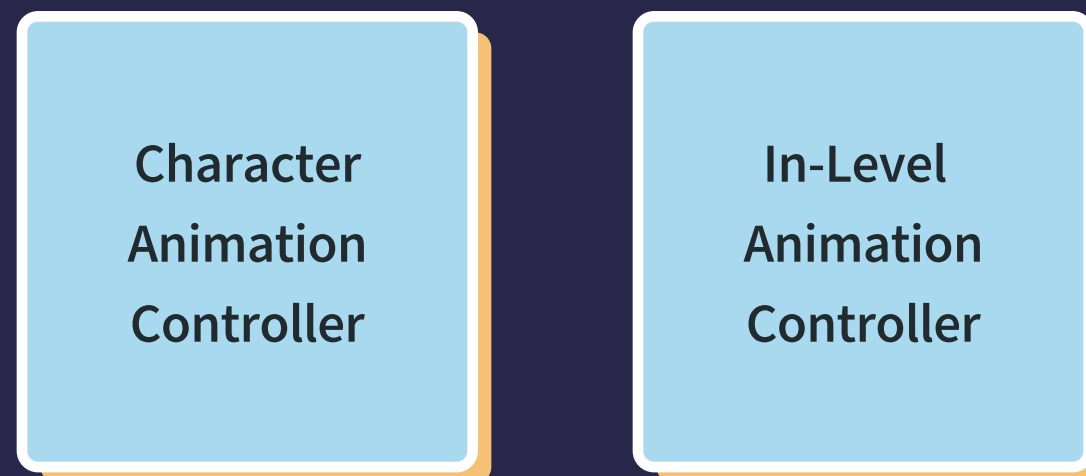
### Shader Programming (HLSL)



### VFX Effect



### Unity Animator



### More...

Glass Globe Material

Environment Cube Map

Lighting

World Building

### Diverse Script Development

I did all the coding and Unity work on the project. In the technical part of the project, I tried to add custom shader while completing the project to bring a better visual effect to the project. At the same time, I also learnt algorithm writing based on Unity AI Navigator, and also wrote nearly 50 different scripts to implement various features of the game.

### Learning While Developing

In this project I tried to learn HLSL code and knowledge of computer graphics to develop shaders for the project. Not only that, I also learnt many different technical methods and functions in the project (e.g. Audio Mixer, ReflectiveProbe, etc.) to improve myself while developing the project.

### Sustainable Programming

During the coding process of the project, I paid special attention to the efficiency of the code and good coding habits - not using redundant code, and naming and indexing all scripts properly. This improved the efficiency of the game and my development.

### Other Functions

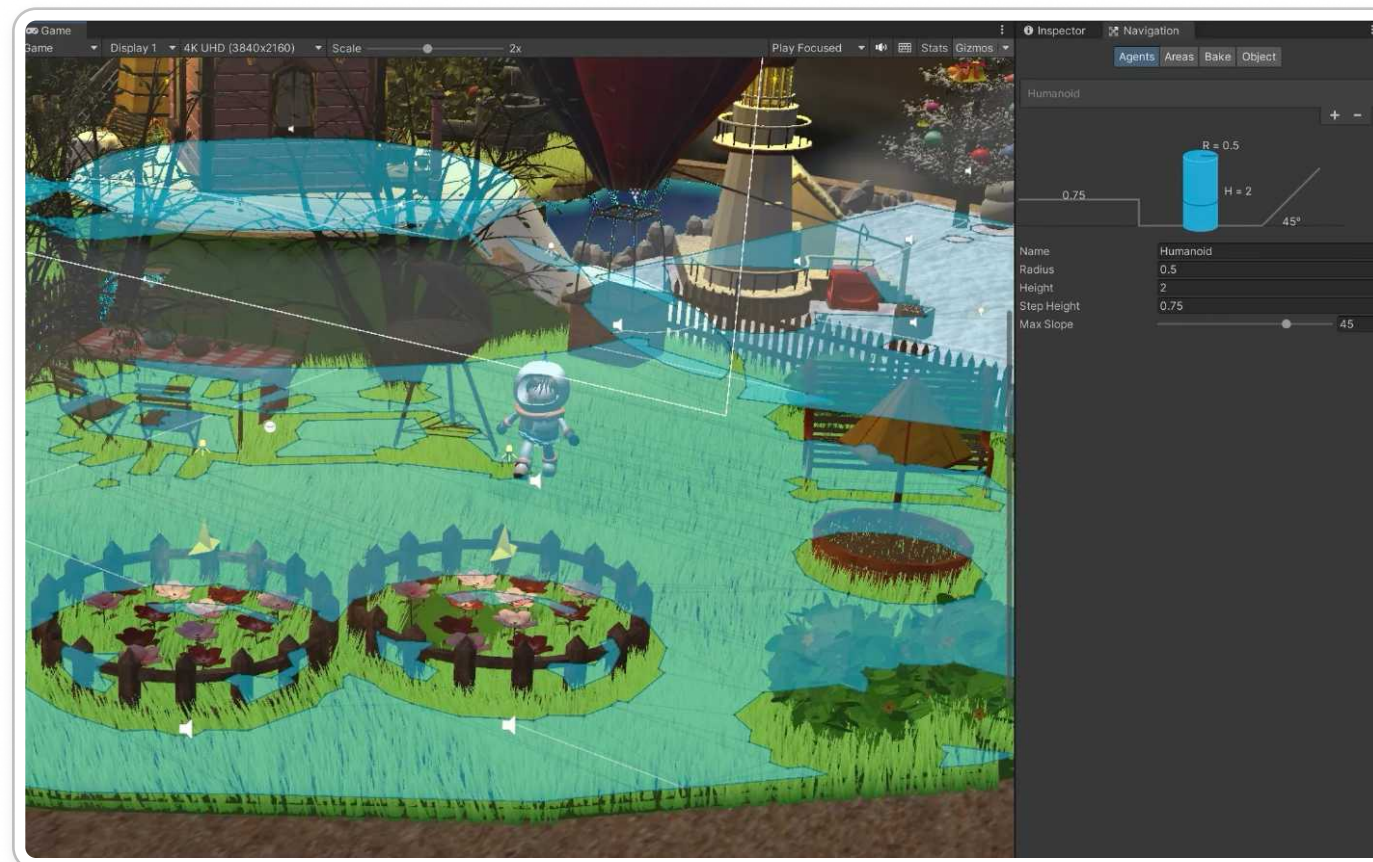
In addition, the project includes several complex particle systems and Unity Animator to realise the complex functions in the game. While focusing on the visual presentation, I also ensure the technical efficiency.

The game uses Unity AI Navigator to complete the control of the character's accessible range.

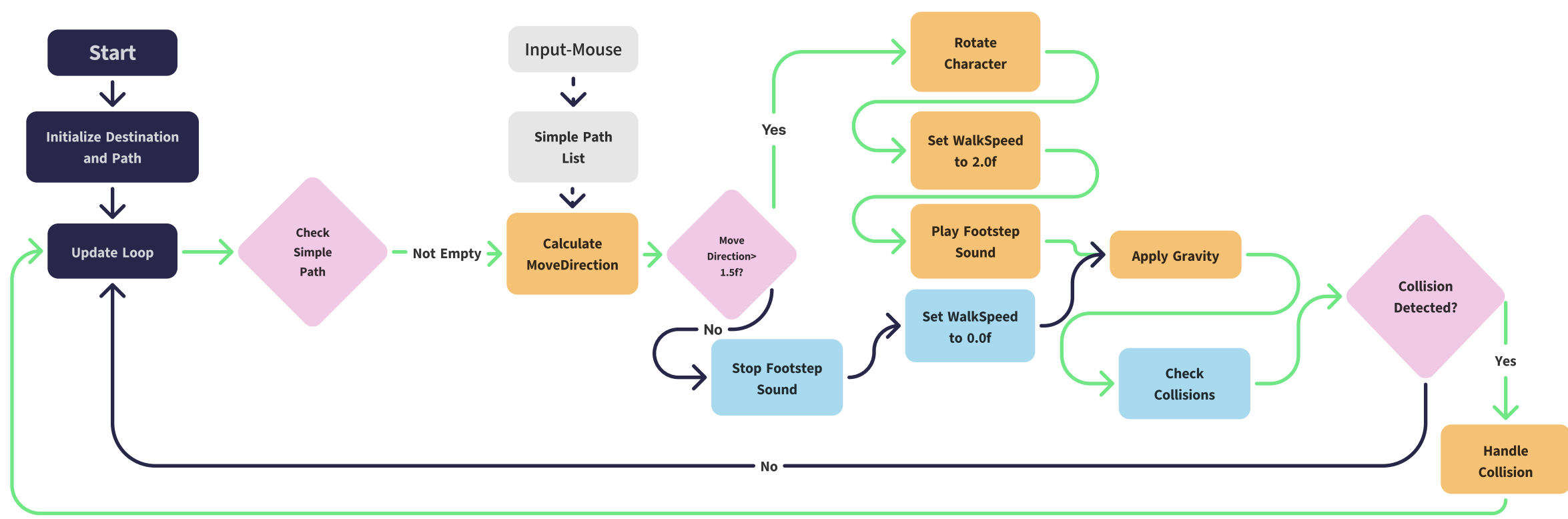
The game's AI Navigation system is implemented by two main scripts:

1. Point-And-ClickController(Calculate Input)
2. Navigation Algorithm(Calculate Path)

The following diagram breaks down the Navigation Algorithm.



Blue Area:  
Walkable Areas



## Other Detailed Problem-solving when Coding

### Calculate UI Appearance Location

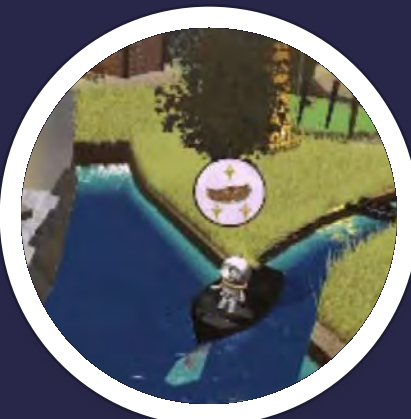
At the beginning of the game design, the UI buttons were always in the bottom right corner, and this didn't fit the normal habits of the interaction, so I made the UI always appear on top of the interactions by switching from world position to screen position

```

uiButton.gameObject.SetActive(true);

Vector3 screenPos =
cam.WorldToScreenPoint(targetObject.position);

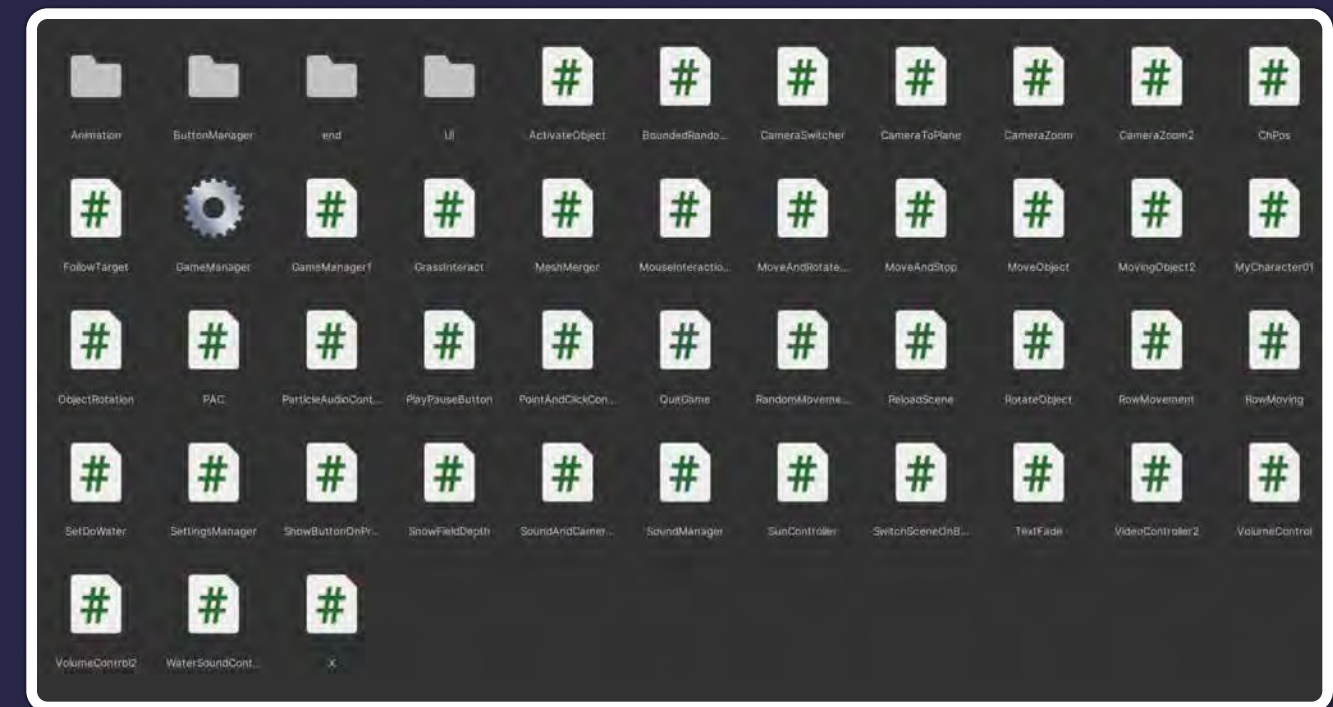
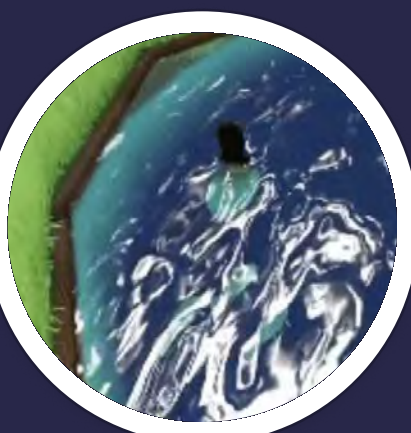
uiButton.GetComponent<RectTransform>().position = new
Vector3(screenPos.x, screenPos.y + buttonOffset, screenPos.z);
    
```



### Duck Movement in Summer Scene

Create a [list] of target objects and have the duck move between them to a randomly chosen destination. Use the LookAt method to control the direction

To add dynamics to the scene, I code the duck to move across the water automatically. Also the target of the movement is random and not repeated.



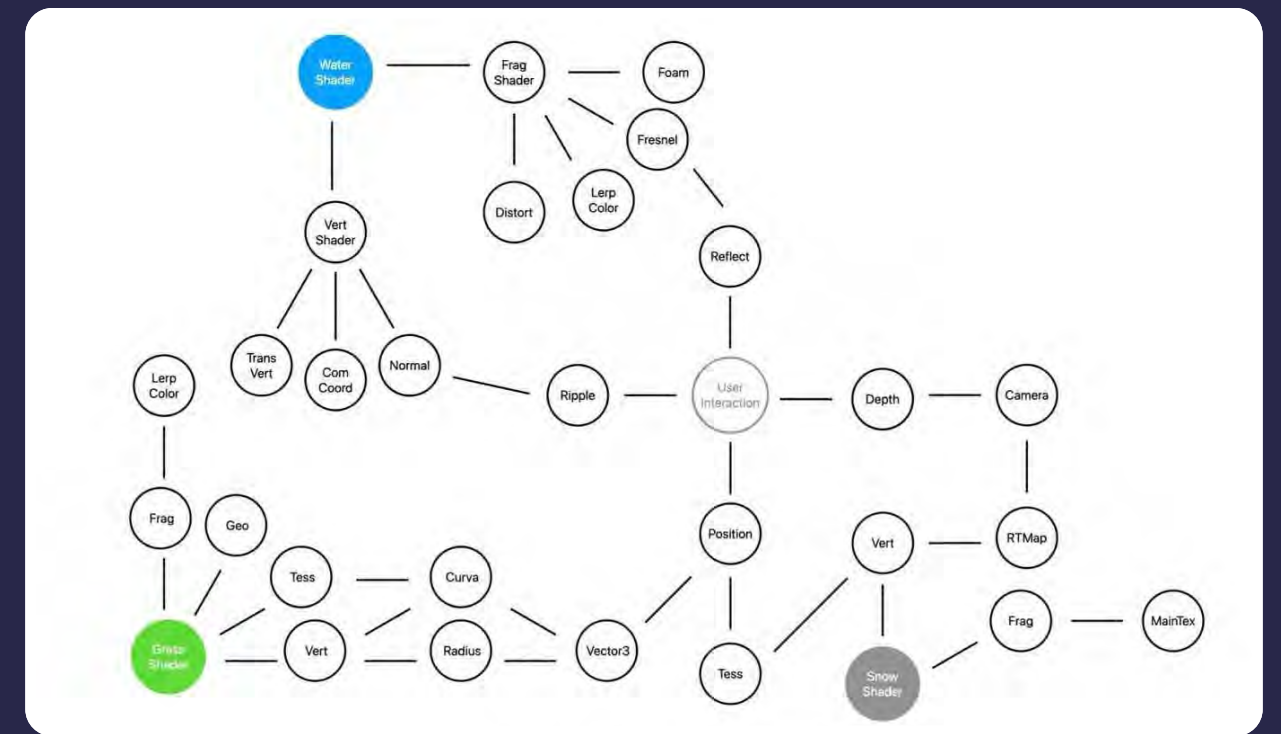
The Game Include more than 50 C# Scripts to ensure all features are working as expected.

Functions including UI, Animation, Sound and more are all realised by C# scripts.

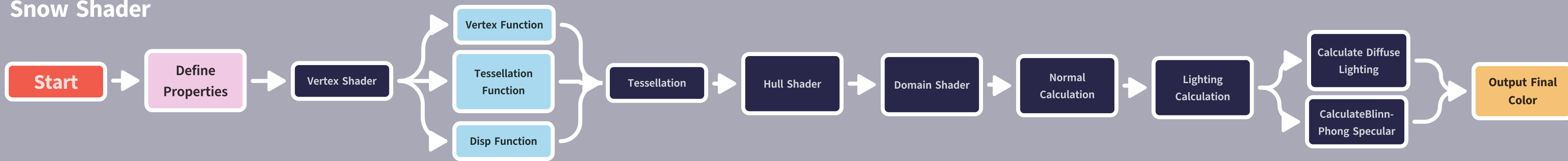
# Game Programming

## “Add vivid details into the scene” Shader Programming

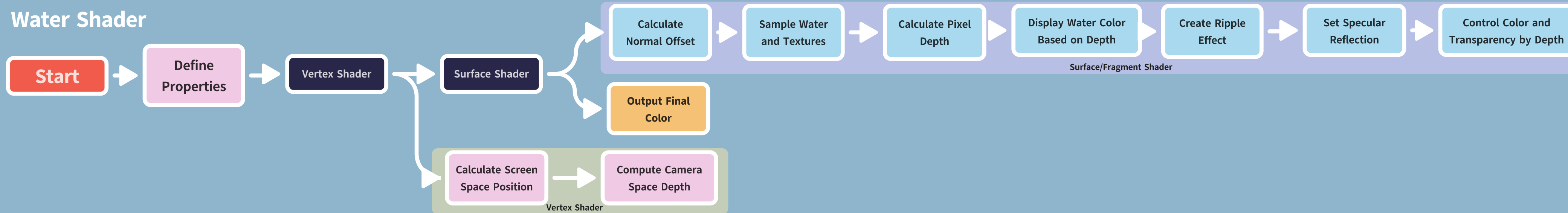
In order to cater to the children's aesthetic and give this game more rich details and colours, I decided to develop some shaders to enrich the experience.



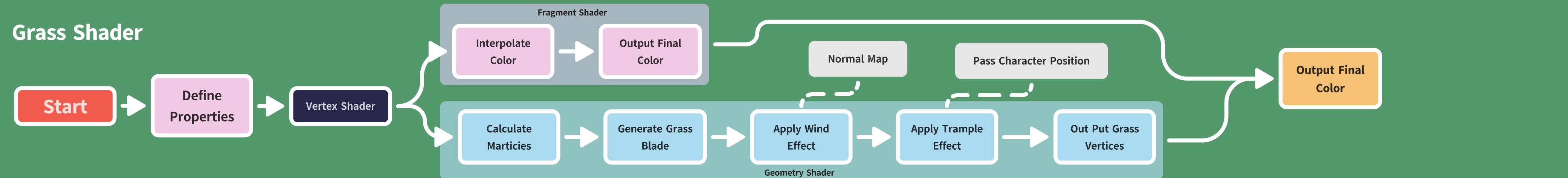
### Snow Shader



### Water Shader



### Grass Shader

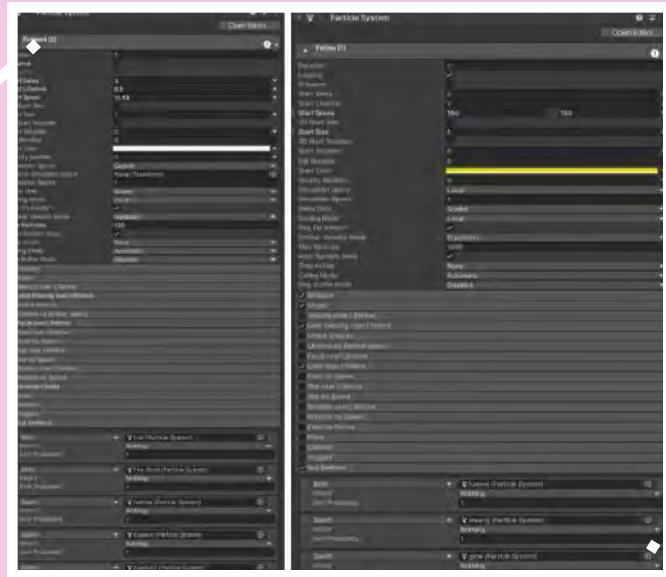


### VFX- Include Firework Particle System and Fire Particle System

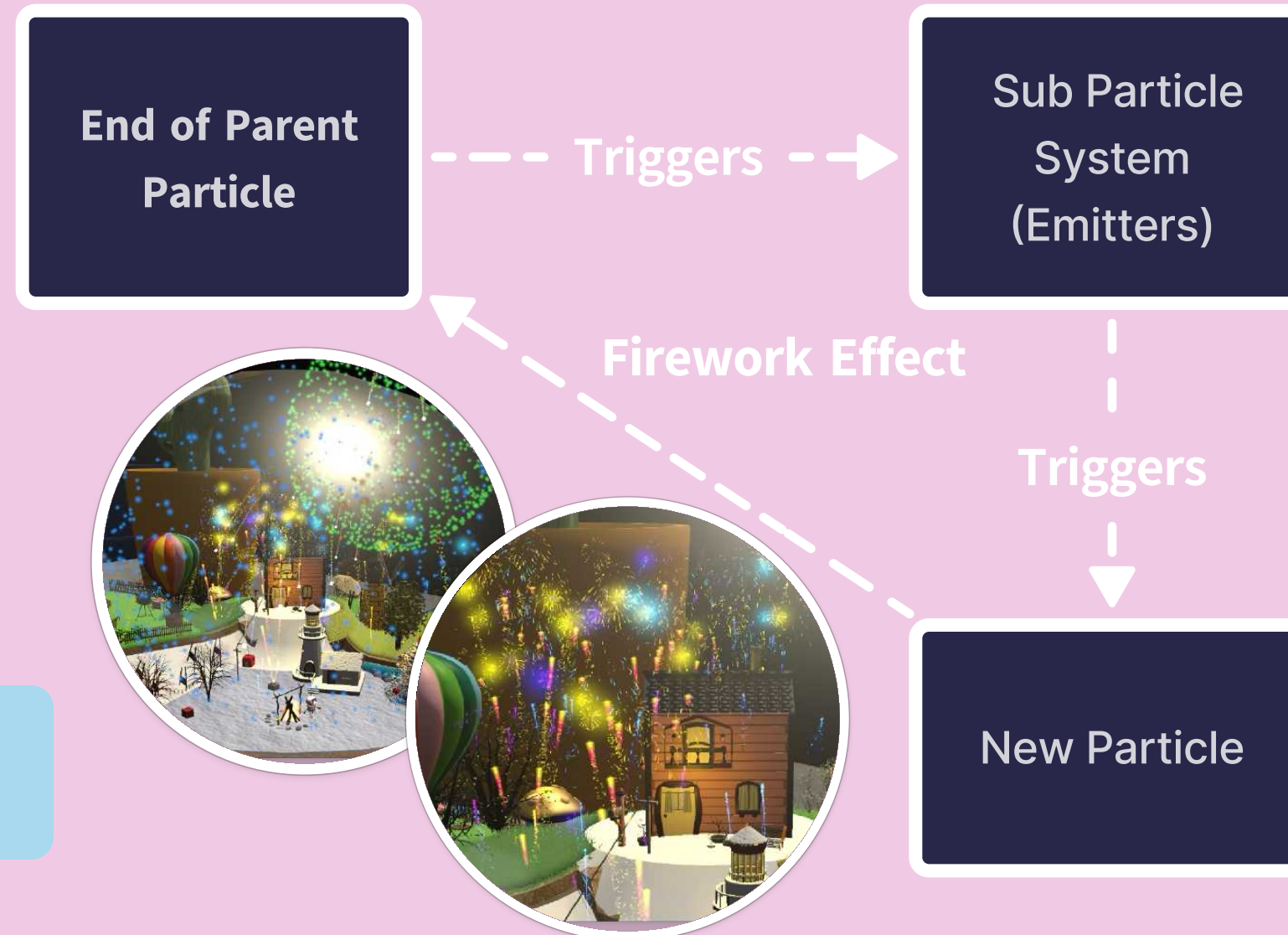
In order to create a more stunning visual effect for the players and further mobilise their emotions, I decided to add fireworks effects at the end of the game.

The fireworks VFX system is very complex and he creates spectacular effects through script triggers which include a master particle system and multiple emitters.

Main Particle System



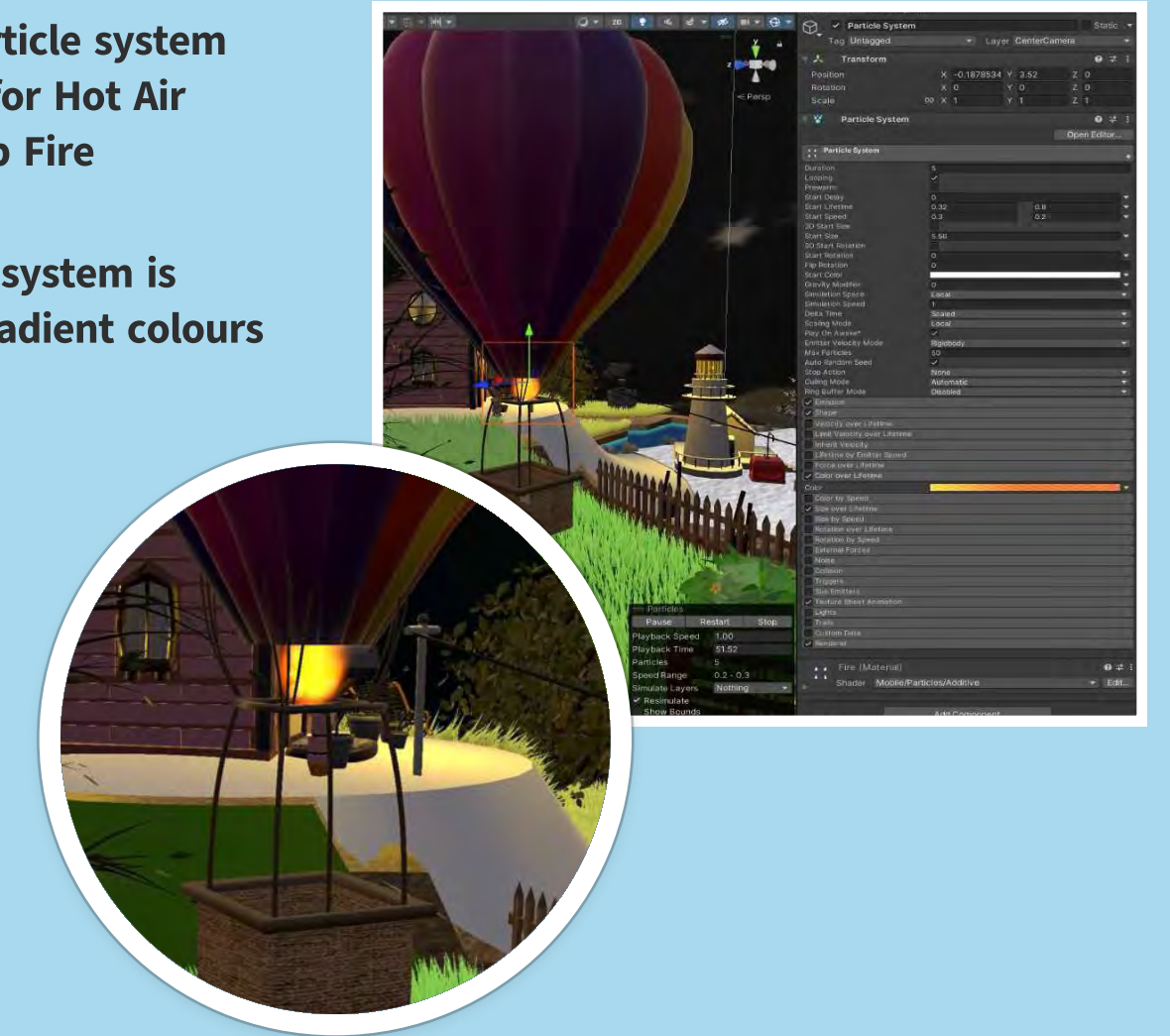
Emitters System



#### Firework Particle System

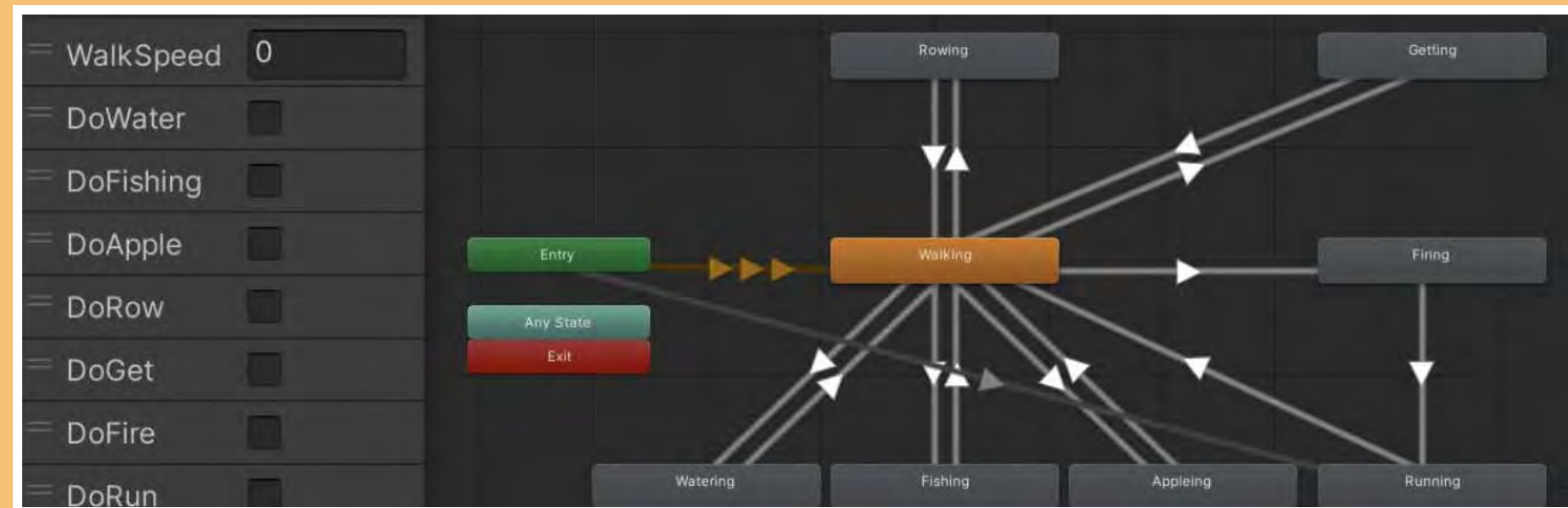
An other fire particle system has been made for Hot Air Bollon and Camp Fire

The fire particle system is dynamic with gradient colours and Sprite.



#### Fire Particle System

### Animator



#### Animator(State Machine) of the Character



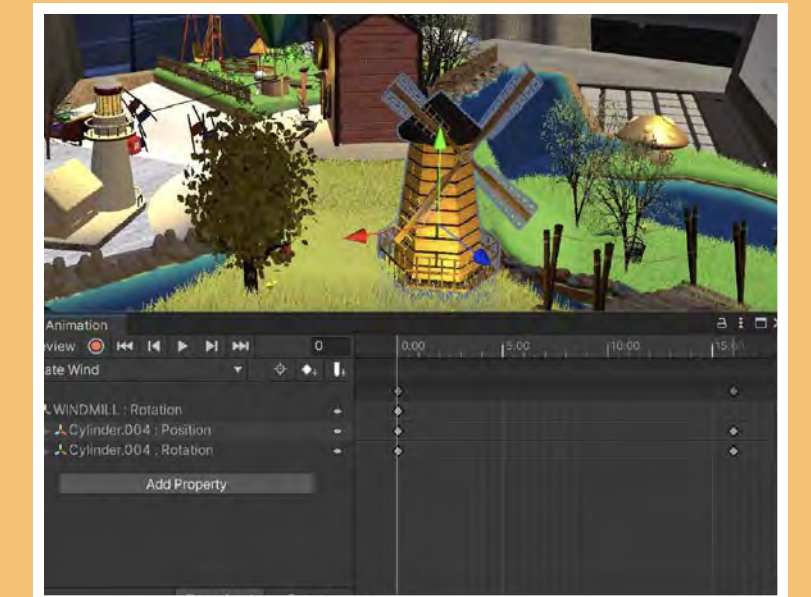
Credit to Tim for creating these animations in Blender

This game features Animator to achieve seamless transition and switching between animations.

Each animation is controlled by a bool, and the main switching function is realised by code.

Project also include animation for other projects in the scene.

Realised by key animation.

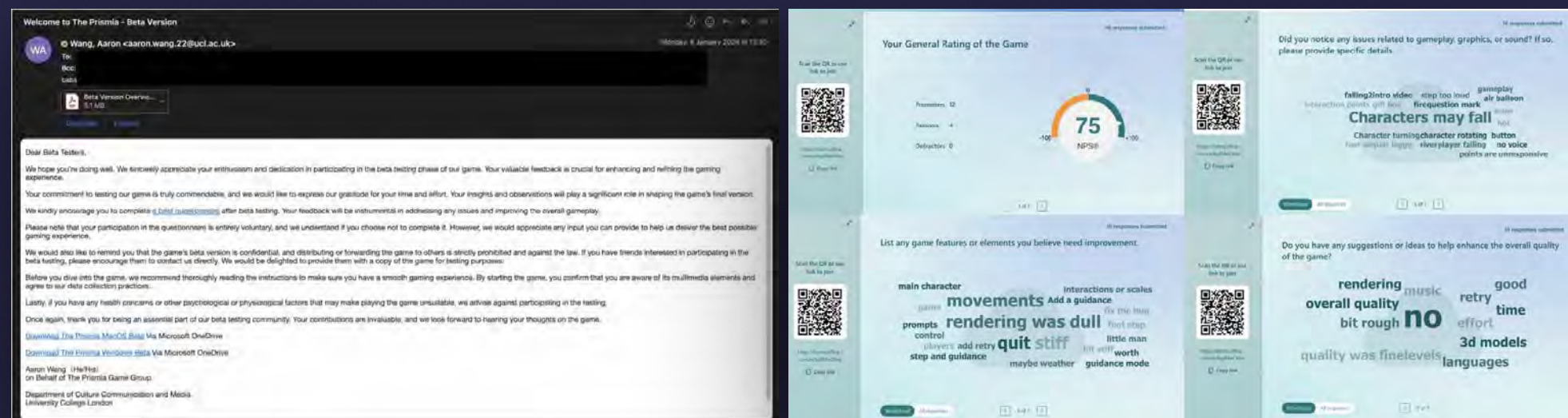


#### Animator for Other Objects

# Game Iteration

## Beta Test and Further Polishment

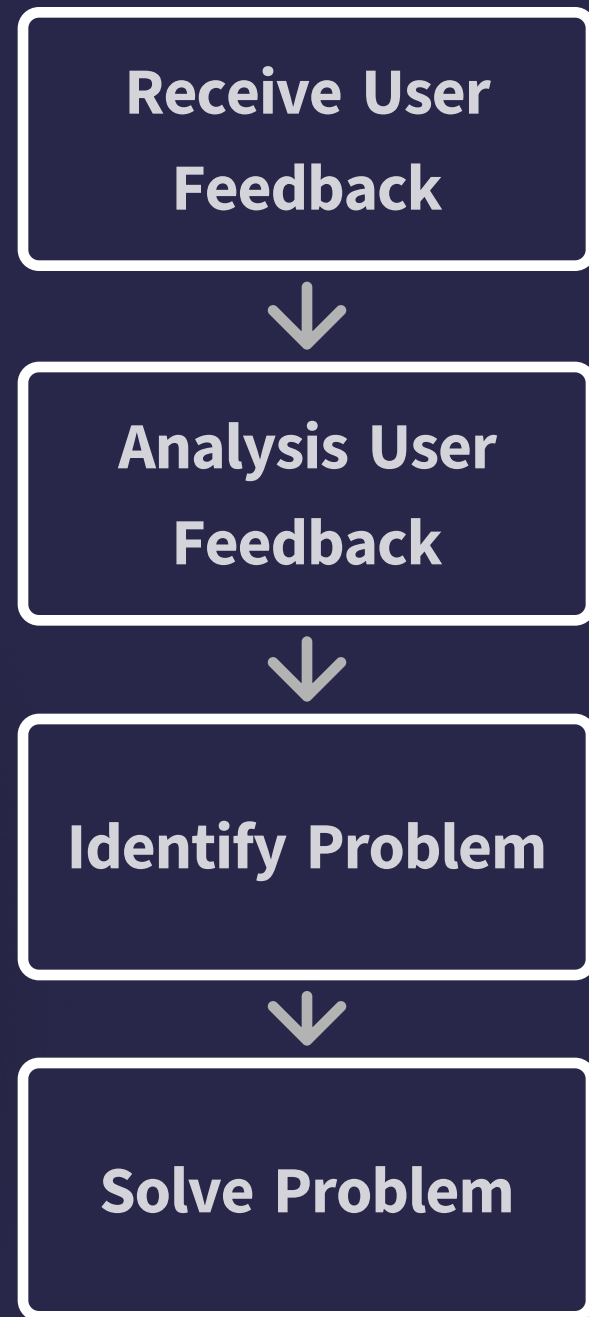
After the game was essentially complete, we invited people to do an internal beta test to test any potential issues the game might have. Based on this, I designed the questionnaire, and make iteration based on feedback.



Game Beta Test Email

Feedbacks from Beta Testers

### Beta Test Problem Solving Flow



### See it

**Issue Raised by Tester**

Characters may spin around involuntarily

**Issue Raised by Tester**

Sometimes game crashed at Winter Level

**Issue Raised by Tester**

Feel lost and have no idea about whats next

### Identify it

**Problem Cause**

Algorithm of AI Navigation script causes

**Problem Cause**

Snow Shader

**Problem Cause**

The indication to user is not enough

### Sorted

**Resolution**

Change the algorithm of MyCharacter script, increase its fault tolerance (from 0.5 to 1.5).

**Resolution**

Replace Snow Shader with a basic shader, disabled interaction function

**Resolution**

Add a Tutorial Mode to the game

## Reflection

### Designing Player-Centric Narrative & Interaction

The game narrative centers on an adult escaping reality within a "crystal ball world." The design encourages players to interact deeply with the story, potentially allowing unique player interpretations and adding depth through NPC interactions and an open-ended conclusion.

### Revelations from Beta Testing

Players have the best insight into the game experience, which often differs greatly from the designer and developer's perspective, especially in children's games. Designers must step outside their own mindset and prioritize player feedback to avoid confusion and ensure clarity in gameplay.

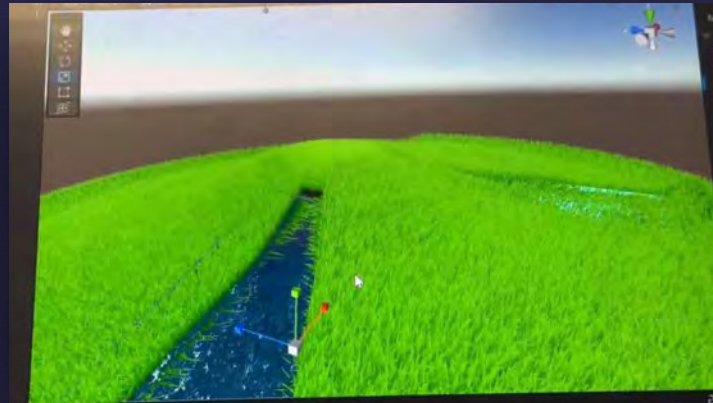
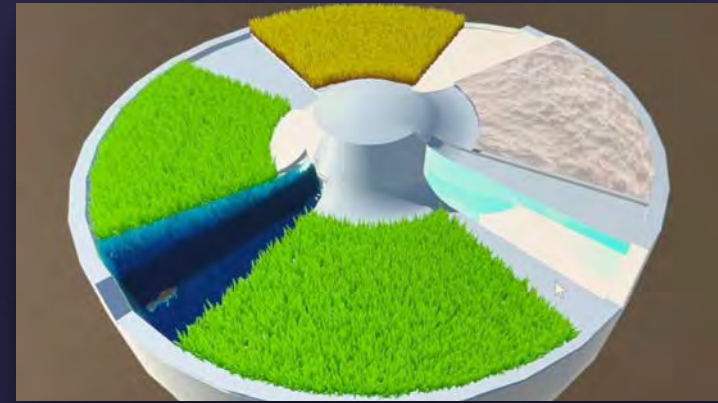
### Enhancing Accessibility & Future Development

Targeted for younger audiences, Prisia features vibrant colors, easy-to-read fonts, and subtitles. Future improvements may include additional levels, mobile platform adaptation, and enhanced UI hints for younger players, aligning with a commitment to accessibility and engagement.

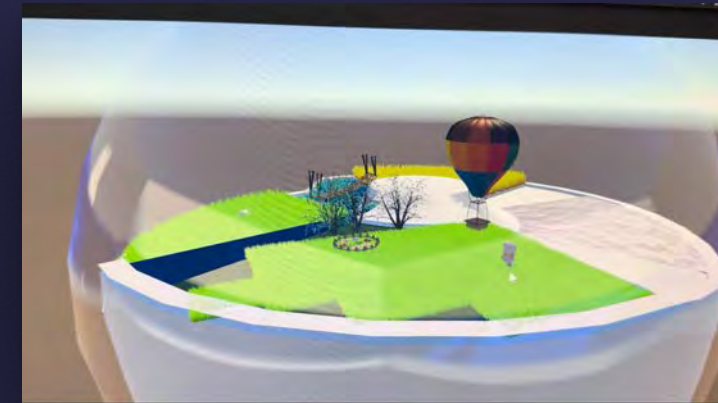
### Group Collaboration & Project Management

My role in this project covered Unity configuration, code writing, and project coordination, with a focus on leadership and team communication. Despite successful teamwork, I realized the importance of mastering GitHub for collaborative work on Unity projects, which will be prioritized in future projects.

# Production Log



2023,10



2023,11



2023,12

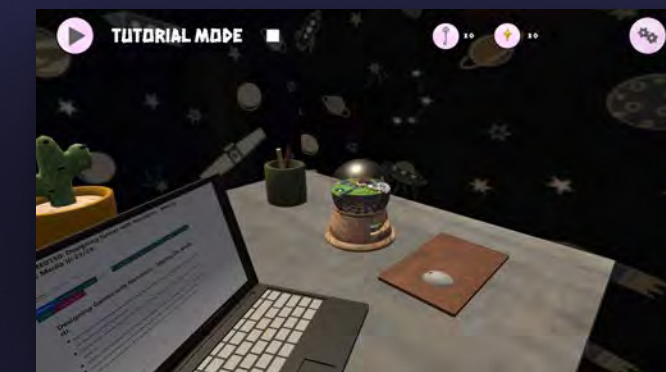


2024,01



**4 Months of Production**  
**4 Levels**  
**150+ Assets**  
**3000+ Lines of Code**  
**1 Polished Game**

# Final Presentation



The Prismia Runs on a PC

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