Declaration Cover Sheet for Project Submission

SECTION 1 *Student to complete*

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SECTION 2 Confirmation of Authorship

The acceptance of your work is subject to your signature on the following declaration:

I confirm that I have read the College statement on plagiarism (summarised overleaf and printed in full in the Student Handbook) and that the work I have submitted for assessment is entirely my own work.

Signature:____ Date:____________

Technical Report

FINAL FRONTIER

Josephine Andrews x12369721 | BSc Honours in Computing | Game Development and Multimedia

Contents

Executive Summary

The game industry has changed massively throughout the years from your simple Pong to the arcades to the now huge online gaming community. The evolution of games is not the only thing that's changing, the attitude is also changing along with it. Some parents see games like junk food, too much is bad. But slowly over time, especially with our increased dependency on technology games are becoming more acceptable. I've seen plenty of parents on the trains, buses, airplanes giving a child a tablet, portable game console or a smart phone with a children's app/games to keep the child occupied on a boring journey to stop them from the familiar phrase "Are we there yet? I'm bored". And now a day I'm even seeing some children focused companies like Leapfrog releasing their own tablets called LeapPads, Smyths even have a section on their website called "Electronic Learning". People are starting to realise instead of restricting games let's make them teach children things.

The concept itself has been around awhile but only lately am I noticing its influx. When I was younger there was a game introduced to help with Maths called Number shark. Of course games aren't for everyone, but for some it's a much better way to learn.

With my game I hope to help children learn in more dynamic ways with so much pressure to get our kids to be the brightest they can be I think having fun time with learning is crucial. Final Frontier is a game to introduce children to the realm outside of our planet, to the other rocky planets in our solar system. The game will give the player a glimpse of what it would be like on other planets, and also have an added fun bonus too.

Introduction

BACKGROUND

Educational games are games explicitly designed with educational purposes, or which have incidental or secondary educational value. Educational games are games that are designed to help people learn about certain subjects, expand concepts reinforce development understand an historical event or culture or assist them in learning a skill as they play.

So therefore educational games are used as a tool for building knowledge in certain areas for children and sometimes adults. A lot of children learn by play so educational games are a perfect way to help children learn. Most games today focus on teaching children about Maths English and even behaviour, but I think there is a lack of games that teach children about the environment, animals and of course space.

As educators, governments and parents realise psychological need and benefits of gaming have on learning, this type of education has gone mainstream. Games are interactive play that teach us goals, rules, adaptation, problem solving, interaction all represented as a story. They also satisfy our fundamental need to learn by providing enjoyment, involvement, structure and motivation all in the game itself while learning. This makes learning seem much less as a choir but fun and encouraged

My Inspiration:

When I was around 5 years old we got our first PC and the first game I had was the Magic school bus space adventure it was a single player game developed by Microsoft in 1994. It thought me a lot about our Solar system and I knew more than most people at my age. Since then I have not seen a game similar, and I feel like it would be very beneficial for them at that age.

In this game the school bus is magic and can transform into almost anything, so it transforms into a spaceship and flies into space. Ms Frizzle (the teacher) gets lost as soon as the bus flies away from earth to win the game the player has to discover the whereabouts of the Friz. To do this the player must play a whatsit game to earn a token to which gives them a clue to which planet Ms Frizzle is on. The player picks which planet to fly to and then they proceed to play a plat former game style and earn the token, to which aids them in winning the game. The game also hosted mini experiments to play and click on things in the environment for them to do something. Example: a volcano erupts when you click it.

With this game in mind I came up with an updated version of the game that would make it friendlier for a modern day children. I decided to change the game to be 3D and more lifelike but still hold a cartoon aspect. This way the player can still be immersed in the environment but still have the appeal of cartoons and bright colours.

My game starts when the player walks into the space station which is orbiting above earth and explained what there assignment is. They must go to each planet and do a task, then when they come back to advance they must solve a puzzle to get a key to open the door to the next level.

The game itself will be based on the rocky planets of our solar system. The player will navigate through the planet collecting certain things that are on the list that the Teacher gave them to find (like a scavenger hunt). Once the player completes this they are returned to the space station and get to choose the next planet to go to.

The main difference between my inspiration and my game idea:

- The player will get to choose who they play as – A girl or a boy
- Better graphics
- More up to date information about our solar system
- Run smoother
- More engagement with the game
- Different Story line
- Assignment find objects not find the teacher

I feel the improvements that I have made to the idea of the game will make the game more interesting for children and also with the updated information will be more beneficial. The fact the child can choose who they get to play as will also mean they are more engaged in the game.

AIMS

The aim of this project is to be a third person 3D educational game for children that will teach children the fundamental of space and the planets in our solar system, but also be fun to play and have good functionality to keep the player engaged.

TECHNOLOGIES

Unreal Engine 4

Unreal Engine 4 is a complete suite of game development tools made by game developers for game developers. Unreal engine 4 supports many different types of games from 2D platformers to 3D Virtual Reality games it gives you everything you need to grow as a developer and there are countless of tutorials online to help you along the way. The games made in unreal engine 4 can be exported to many different platforms such as PC, PlayStation, Xbox and even mobile, this makes it an ideal game engine to use and create games within.

Unreal engine 4 itself uses C++ to code to bring the games to life. The Code view of unreal engine allows you to browser the C++ functions directly on game characters and objects and jump straight to source code lines in Microsoft Visual studios to make changes.

It has many tools that allows the game to have more functionality some of the main ones I used to make my game are:

Blueprints it helps bring your creative visions to life in game. Blueprints enable a rapidly built prototype, quickly without having to go through lines and lines of code. Some main uses of blueprints are object and gameplay behaviours, modify player interfaces, and adjust input controls and much more.

Persona Animation toolset is used to edit the skeletons, skeletal meshes, sockets, animation blueprints and much more. This multi-purpose tool enables you to preview animation sequences and morph targets and also set up animation blend spaces and montages. You can also modify physics and Collison properties for skeletal mesh actors using the physics asset editing tool. This makes life a lot easier when importing characters and animation into your project.

Matinee Cinematics toolset provides director level control over cut scenes dynamic gameplay sequences and movies. Matinee enables you to set up actions within your scenes down to the finest detail, animate scene properties over time and produce awesome filmic moments.

Unreal engine 4 marketplace

The marketplace in unreal engine 4 is where other people who create assets and want to share them can submit and post their own assets, these can be free or paid. Some of the assets are really amazing but also cost a lot. Once these assets are taken they are usually royalty free so if you were to publish your game you can still use them without having to pay to use the assets in the game.

I chose unreal engine 4 for my project because I was introduced to it in my Computer Graphics Design and Animation module and it just clicked with me I love how simplistic the content browser is and how you can customize it to the way you want to work (moving different panels all around the screen, colour coding the folders). And also compared to unity the graphics and power of the engine is far superior.

Mixamo and Fuse

Fuse is a software that allows you to create customized 3D models to the design and specifications that you wish. It's an incredible software, once the character is created you then can upload the character to Mixamo which auto rigs the character skeleton for you and then you can choose to animate it. Once this is all done you can download the character with its included skeleton, materials and animations and import them into unreal engine 4. This software is free as long as you have an adobe account which thankfully I do and was able to use this software. I made all my characters in Fuse and got my animations from Mixamo, it saved me countless hours and I loved the results that I got from using the software.

AutoDesk - 3DS Max

3DS Max is a 3D modelling animation and rendering software. It allows you to customize collaborate and create 3D content quickly. Due to its wide range of tools (and online tutorials) it allows you to grasp the concept quickly so you are able to focus on the creativity for your design. It also has character rigging and animation capabilities. If you are a student you are able to get a free Autodesk license for 3 years which I took up the offer on. For my project I used 3DS max to help make some of the static meshes I use in game.

Game Design analysis

GENERAL OVERVIEW

This project is a video game designed for children between the ages of 7-12. The main purpose of the game is that it is an educational game that teaches children about our solar system focusing on our rocky planets. This is also one of its unique selling points.

GAME ANALYSIS

GAME DESCRIPTION

Genre:

- Children Games – A game designed for the intention of children to be playing it
- Adventure – A game that involves the player to take on a role and play in a story.
- Puzzle – A game that has an element of puzzle solving in it.

Game Elements:

- Collecting – The player has to collect objects to complete the goal of the game
- Exploring – The player has to explore the map/area to progress further in the game
- Puzzle Solving- The player must solve certain puzzles in the game to be able to progress

Game Content:

- Realism (A game type that is similar to reality)
- Action (Actions are used such as jumping)

Theme:

- Educational (Teaches the player about the planets)
- Sci-Fi (Slight science fiction element as spaceships do not exist

Style:

- Realism (The intent for the game to be as realistic as possible eg: when the player shoots a character the walls and background are also affected)

Game Sequence:

- Linear – Storylines (The game only goes in one direction it follows the story, the player does not influence the way the story goes)

Player:

- Single Player (Only one person will play this game at a time it will not have a multiplayer option)

GAME REFERENCE

Game Taxonomy:

- Fictional Game / Narrative (The game is fictional and has a narrative eg people speaking telling you what to do along the way)

Player Immersion:

The player will receive enjoyment that focuses on these headings

- Educational (The game will teach the player new information)
- Visual (The graphics of the game are too be good)
- Audio (There will be soundtrack)

Reference:

The games that are similar in concept are

- The Magic School Bus Lost in the Solar System

GAME TECHNICAL:

Technical From:

My games graphics are

- 3D (3 Dimensional Graphics more true to reality than 2D sprite based games)

View:

The game will be viewed by the player in

- Third Person (This is when the camera is behind the character and the player can see around the character, this viewport allows players to see a more strongly characterized avatar)

Platform:

- Unreal Engine 4

Device:

- PC

GAME SALES

Consumer Group:

- Children (aged 7-12)

Distribution:

- Steam – A digital distribution platform developed by Valve Corporation offering digital rights management multiplayer gaming and social networking services. Steam provides the player with installation and automatic updating of games on multiple computers, and community features such as friend lists and groups, cloud saving and in game voice and chat functionality.

GAME ATMOSPHERE

The atmosphere of the game will have a fun light-hearted upbeat nature. The game is for children so a nice fun sense atmosphere will keep the children interested.

The character's design will have a cartoon aspect to it. I choose this style because children tend to be attracted to more brightly coloured characters like cartoons than real people.

The levels of my game are going to be the inner system planets which include Mercury, Venus, Earth's Moon and Mars.

The audio of the game will be upbeat and fun to get in tune with the atmosphere I aim to achieve.

GAME PLAY

The game will begin with an opening scene of the character going onto a spaceship and going into space. Once on the station they can speak to the teacher who the player will be able to ask a numerous amount of questions. The teacher will tell them that they can access the first planet Mercury but to access the rest they must complete the puzzles, and the correct answer to these puzzles is on the previous level.

The player will then go to Mercury where they have to collect 5 meteorites from the craters using a jetpack. They can converse with the various NPC's around the level, once the 5 meteorites are collected the player is teleported back to the Spaceship.

The player then goes to the first puzzle which is which planet is closest to the sun. The player must walk up and choose which planet it attaches to the player and the player then walks to the sun if the correct planet is chosen (Which is Mercury) it will Spawn beside the sun and a message will pop up on the screen prompting the player to pick up the key, the if the wrong answer is chosen it will say "Oops try again!", once the player has the key they can open the door so they then teleport back to the spaceship and open the door to the next level.

The next level is Venus, which is the hottest planet in the Solar System, so the player has a "CoolDown" bar which goes down gradually as you traverse the landscape, so the player must go to the "Space Igloos" to cool down if they fail to do this and the bar drops to 0 then the player respawns at the start of the level. Once they get to the last igloo they are transported to the spaceship.

Once back on the Spaceship the player goes to the next puzzle which is pick which planet is bigger, Mercury or Venus, if the correct answer is chosen a key will spawn if the wrong answer is chosen it will say "Oops try again!". Once they have the second key they can open the door to the next level which is the Moon.

On the Moon the player must traverse on some platforms, while taking into consideration their jump is higher due to the lack of gravity. There are learning notes scattered throughout the level, once they traverse through this gauntlet they can then teleport back to the spaceship, and can do the next puzzle. This puzzle involves moving the Earth, Moon and Sun in such a way that is creates a Solar Eclipse. Once this is complete the player can then get the key and open to the final level Mars.

On Mars the player takes control of a Buggie Car, and they must go around collecting the rocks within the time limit. Once they do this they will be teleported back to the Spaceship and the player will be prompted to take a mini quiz to get a score, this marks the end of the game

Throughout all the levels there will be Stars to collect, once a certain amount is collected it will open a secret level which is just for fun.

KEY FEATURES

The key features of this game is that it's an educational game for children about space which from my research no modern version exists.

SELLING FEATURES

The selling features of this game is that it's an educational game with unique features that allow the player to learn about space with ease.

PLAYER DEFINITION

The player will be able to walk, run and jump. They will also be able to interact with objects to pick them up and collect them and also interact with NPC. The player begins the game by controlling the character on the space station they then must go to the first level and to unlock additional levels a puzzle must be complete; this is where the main gameplay begins.

PLAYER PROPERTIES

The properties the player will have is

- Star Count (The currency of the game)
- Actions (Interacting with objects)
- Keys
- Jetpack
- Driving

PLAYER INTERFACE

The player will have a Save, Load and options screen available in game. The player will control the character using a keyboard and mouse or controller.

ARTIFICIAL INTELLIGENCE

I have two AI in my game, one is an NPC (Non Player Character) which roams around the map, this gives a nice atmosphere for the player that they aren't the only one in the game.

Another AI I have is a Teacher which responds to the sound of a buzzer and comes over to aid the player if its pressed.

THE STORY

The story is that you are a student in a class and you get brought to a space station. On this station your teacher tells you to explore the planets and at the end you will have a quiz to complete. Each planet will have a different task you must complete to advance the level. You will then go back to the spaceship and to enter the next level you must complete the puzzle to get a key. When the player has visited all the planets they will do a quiz and get a grade.

LEVEL DESIGN

Each of the levels is on one of the rocky planets of the solar system. Mercury Venus Mars and our Moon. The moon will be the tutorial level. After the tutorial they can play any of the other levels in any order the player chooses.

Each level will have a similar objective of collecting stars, and items while looking out for the information pop ups. But each of the levels will have variating obstacles and design also gravity will affect the players jump

Mercury

- Collecting Stars
- Collecting Meteorites in Craters
- Using Jetpack to get out of Craters

Venus

- Staying "Cooled Down"
- Reach the Space Igloos

Earth's Moon

- Interacting with the educational globes
- Traversing the platforms to reach goal

Mars

- Drive the Car
- Collect the rocks within the time limit

AUDIO & SOUND F/X

Each level has its own Music. All music is upbeat and fun tune. The jetpack has its own F/x as well as the doors on the spaceship, and the buttons on the screens.

System

PLAYER REQUIREMENTS

The player's machine must meet the minimal requirements of the unreal engine 4, Those requirements are:

- Windows 7,8 or 10
- Minimum of 4GB of RAM installed
- Dual-Core Intel or AMD processor, 2.0 GHz or Faster
- NVIDIA GeForce 470 GTX or AMD Radeon 6870 HD series Card or Higher

- Desktop PC, Mac or Laptop
- Need to be able to read – text only game
- Understand how to use a keyboard/ mouse or game pad

USABILITY REQUIREMENTS

The game menu should be easy to use and simple to understand. The tutorial should have enough information in it for the player to be able to understand what they need to do in the other parts of the game. The player interface should be bright and appealing to children.

REQUIREMENTS

The requirements specification will outline a number of variables that the player will achieve while playing the game, they are as followed:

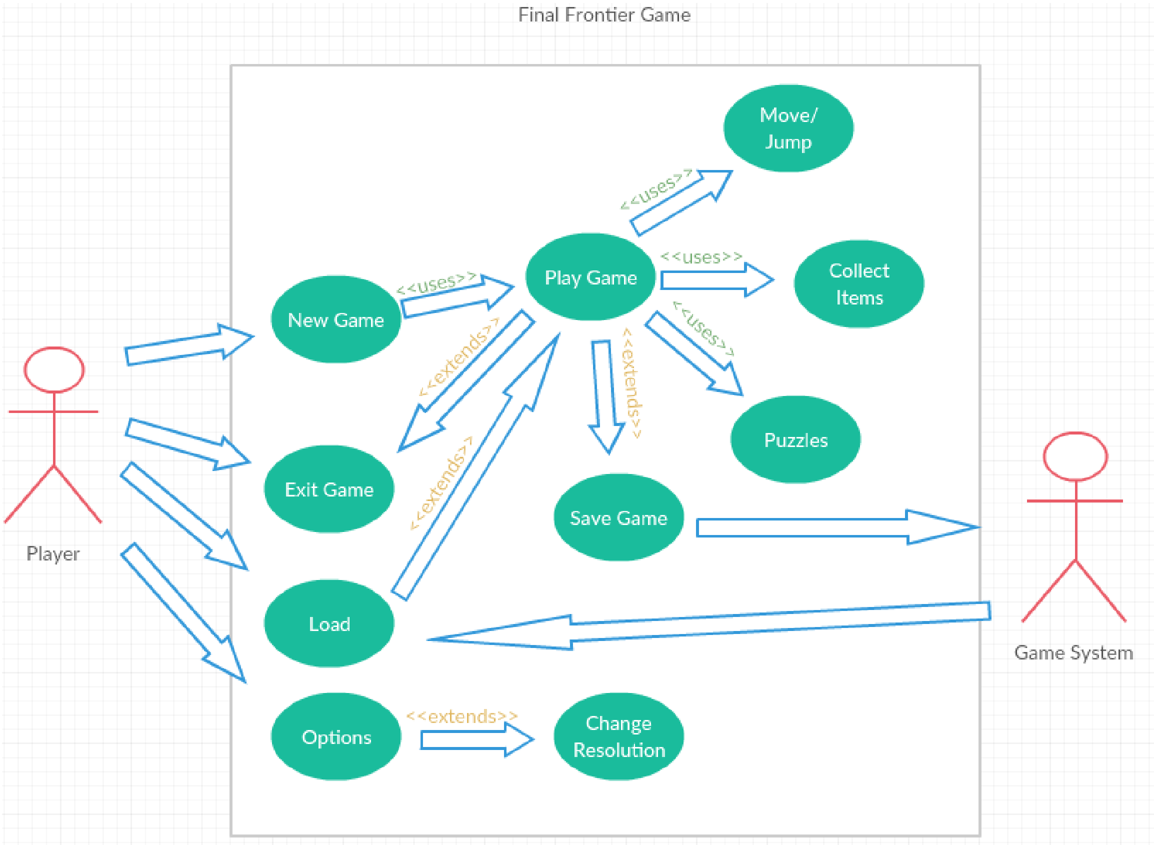
- The player will become aware of the controls and input required to play the game The player will understand the main goal of the game
- The player will understand how to progress in the game within the first 5 minutes

FUNCTIONAL REQUIREMENTS

The main functional requirements for my game Final Frontier are as followed:

- Requirement 1: Play Game/Movement
- Requirement 2: Save Game
- Requirement 3: Load Game
- Requirement 4: Exit Game
- Requirement 5: Collect items
- Requirement 6: Puzzle / Collect Key

MAIN USE CASE DIAGRAM



Requirement 1: <Play Game/Movement>

Description & Priority

The player must be able to play the game (by play I am mean achieve movement using input controls) thus being able to explore the levels of the game, hence the priority on this requirement is large.

Use Case

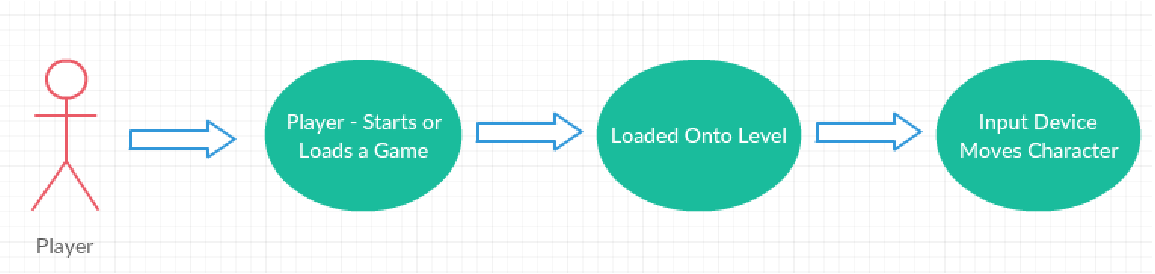
Scope

The scope of this use case is to allow the player to play the game hence moving around the open levels of the game

Description

This use case describes the functions of movement that the player must be able to do in order to play and enjoy the experience.

Use Case Diagram



Flow Description

Precondition

The Game is installed and the Final Frontier icon is on the desktop of the machine. Your desktop or laptop should meet the minimum requirements. A game level should be loaded.

Activation

This use case starts when a player uses their input device (keyboard, mouse or gamepad) to make the character move in a given direction

Main flow

1. The game loads a level for the player
2. The player sends input using the mouse and keyboard
3. The game reads the input and moves the character
4. Steps 2 and 3 are done at nearly the same time so the player does not have to worry about lag time

Alternate flow

A1: Input from a Controller

1. The game loads a level for the player
2. The player send input using the controller
3. The Use Case continues at position 3 of the main flow

Exceptional flow

E1: Optimal Way of Loading the game

1. The game loads a level for the player
2. The player sends input using the mouse and keyboard
3. The game reads the input and moves the character

4. Steps 2 and 3 are done at nearly the same time so the player does not have to worry about lag time

Termination: Process only stops once the play has stop giving input through a device otherwise it does not terminate

Post condition: (There is no post condition as movement and input from a device will always be needed in some way when playing the game)

Requirement 2 <Save Game>

Description & Priority

The player must be able to start the game and load into the level from there they must be able to save the game at any point

Use Case

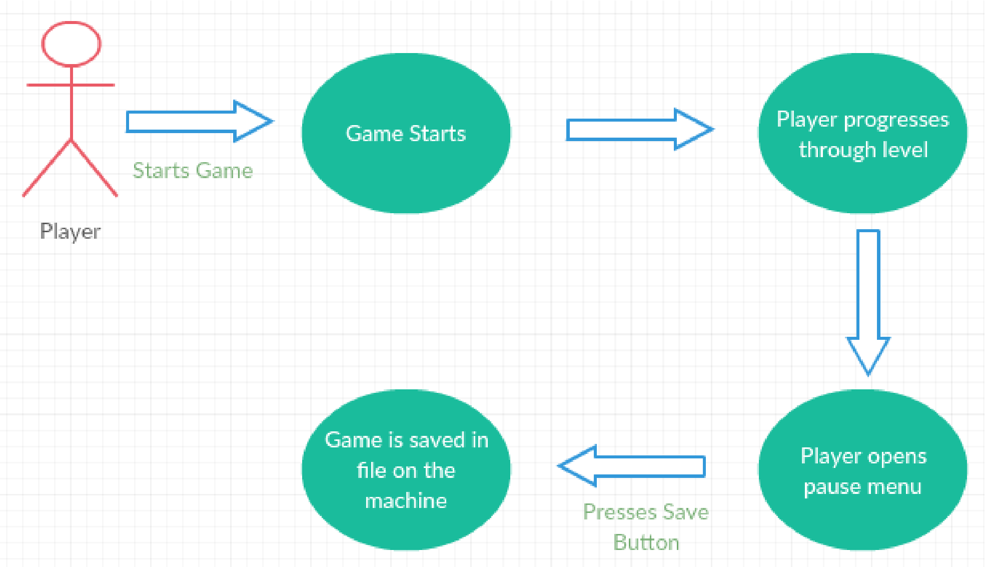
Scope

The scope of this use case is to allow the player to save the game, hence the location and current status on a given level

Description

This use case describes the function of saving an instance of the game, the save will store the player's current status (Location etc.) and the Level Status.

Use Case Diagram



Flow Description

Main flow

1. The game has loaded the level
2. The player can move their character etc. and progress through the level
3. The player brings up the in-game menu
4. The game brings up the in-game menu
5. The player selects Save Here
6. The game creates a save file
7. The game stores the file on the machine

Alternate flow (Does Not Apply)

Exceptional flow

E1: Optimal Way of Saving the game

1. The game has loaded the level
2. The player can move their character etc. and progress through the level
3. The player brings up the in-game menu
4. The game brings up the in-game menu
5. The player selects Save Here
6. The game creates a save file
7. The game stores the file on the machine

Termination: The game saves the file to a target location and returns the player to the game and the level

Post condition: The game system goes into a waiting state; the player may save as much as they want whenever they want

Requirement 3 <Gameplay>

Description & Priority

The player must be able to start the game from the .exe file (see requirement 1 for the number of ways to achieve this), the game should then show the player the main menu. From there a player must be able to click load game, from there they can load a previous saved version of the game and continue on.

Use Case

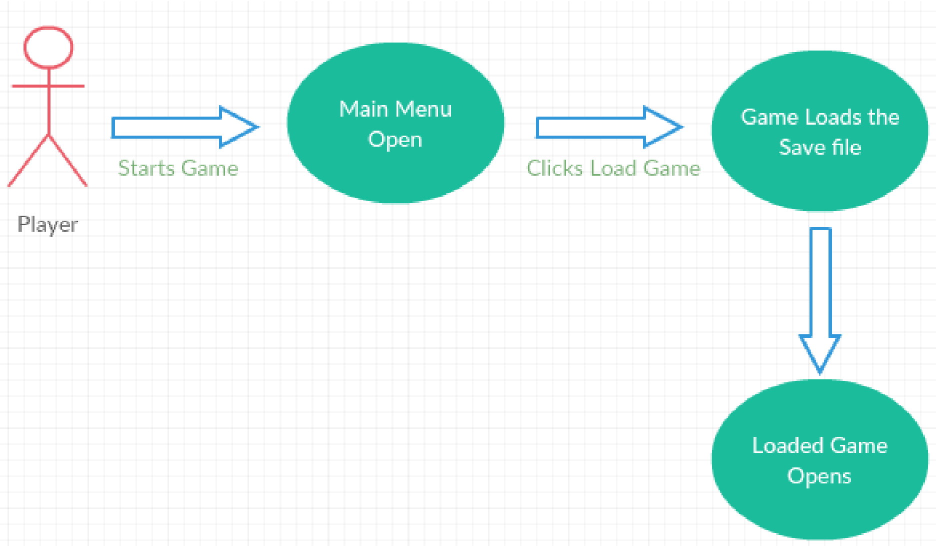
Scope

The scope of this use case is to allow the player to load a saved version of the game, hence continuing on from where they were last

Description

This use case describes the function of loading an instance of the game, the loaded game will allow the player to pick up where they last left off. Insuring they saved the game previously.

Use Case Diagram



Flow Description

Precondition

The Game is installed and the Final Frontier game icon is on the desktop of the machine. Your desktop or laptop should meet the minimum requirements. The player should also have saved the game at least once (see Requirement 2).

Activation

This use case starts when a Player starts the game from the .exe file and the main menu loads.

Main flow

1. The player starts the game from the .exe file
2. The game loads the main menu
3. The player selects the Load Game button on the main menu
4. The game displays a list of saved game files
5. The player selects the one they want
6. The game starts from that saved location

Alternate flow

A1: Load a saved file from an active instance of the game

1. Player brings up the in-game menu
2. Player selects the Load New Game from the in-game menu
3. The Use Case continues at position 4 of the main flow

Exceptional flow

E1: Optimal Way of Loading the game

1. The player starts the game from the .exe file
2. The game loads the main menu
3. The player selects the Load Game button on the main menu
4. The game displays a list of saved game files
5. The player selects the one they want
6. The game starts from that saved location

Termination: The game loads the save file and starts the game from that location.

Post condition: The load game system is inactive during the gameplay

Requirement 4 <Exit Game>

Description & Priority

The player must be able to exit the game from either the main menu or the in-game menu at any time during the instance of the game.

Use Case

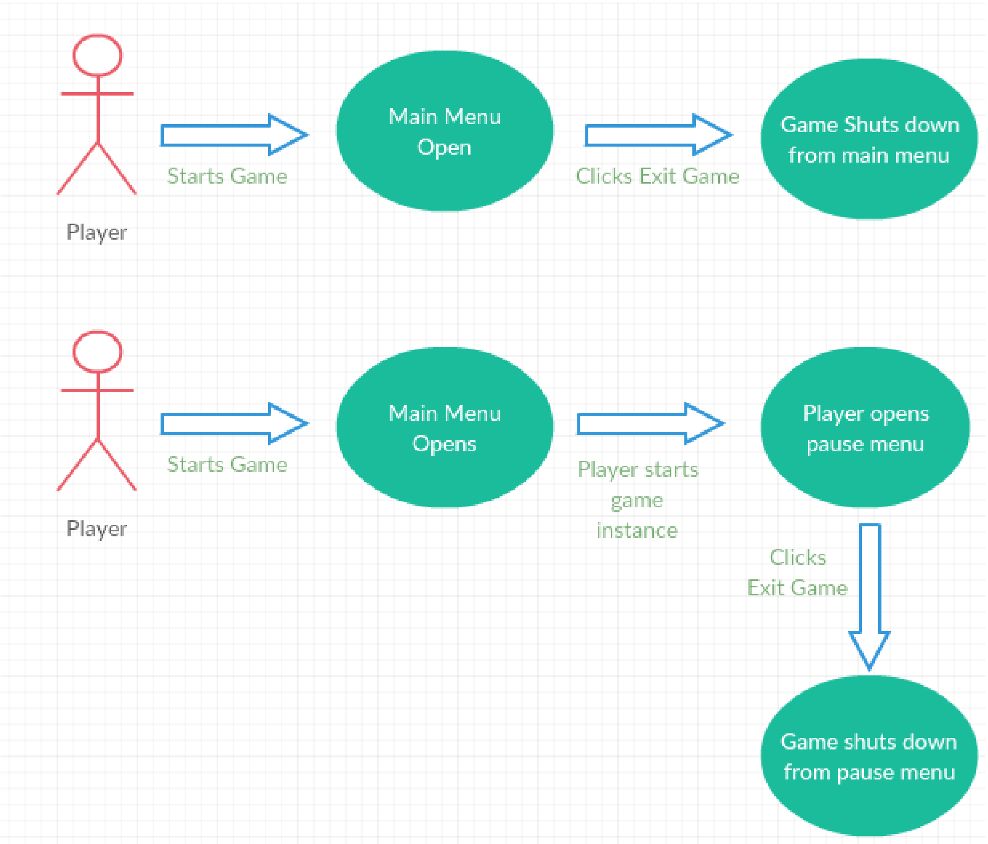
Scope

The scope of this use case is to allow the player to exit the game from either the main menu or the in-game menu.

Description

This use case describes the function of exiting the game from either the main menu or the in-game menu at any time they want, the game will then shut down and the player's desktop will be displayed again and all game functions will have stopped.

Use Case Diagram



<u>Flow Description</u>

Precondition

The Game is installed and the Final Frontier game icon is on the desktop of the machine. Your desktop or laptop should meet the minimum requirements.

Activation

This use case starts when a player starts the game from the .exe file and the main menu loads.

Main flow

1. The player starts the game from the .exe file
2. The game loads
3. The game displays the main menu
4. The player clicks exit
5. The game shuts down all functions
6. The player is then returned to their desktop screen

Alternate flow

A1: Exit from the in-game menu

1. The player starts the game from the .exe file
2. The game loads
3. The game displays the main menu
4. The player starts an instance of the game
5. The player then brings up the in-game menu
6. The game brings up the in-game menu
7. The Use Case continues at position 4 of the main flow

Exceptional flow

E1: Optimal Way of Loading the game

1. The player starts the game from the .exe file
2. The game loads
3. The game displays the main menu
4. The player clicks exit

Termination: The game exits correctly and functions are stopped

Post condition: The game has been stopped successfully

Requirement 5: <Collect Items>

Description & Priority

The player must be able to start an instance of the game (hence load or start a level) during the course of the game the player must be able to interact with the in-game items such as Stars and Meteorites, these items are collectables and numerous of them are scattered in one or all levels These functions have a massive priority as they are key functions of the core game.

Use Case

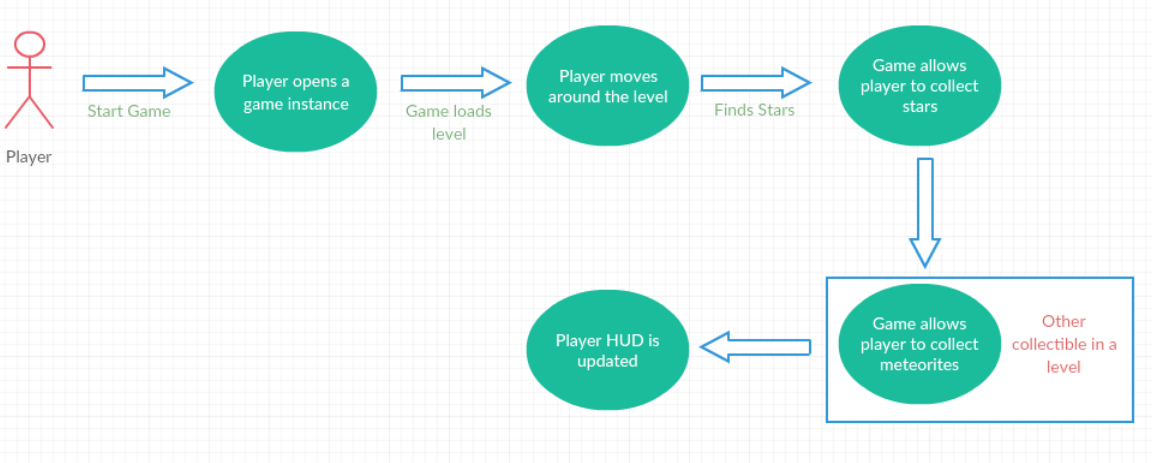
Scope

The scope of this use case is to allow the player to interact with all the different in-game collectable items.

Description

This use case describes the function of the player interacting with the in-game collectable items, Example of such is while the player is on the level Mercury, the player must collect 5 meteorites to continue the game. This functions are key to the core gameplay.

Use Case Diagram


Player
Start Game
Player opens a game instance
Game loads level
Player moves around the level
Finds Stars
Game allows player to collect stars
Game allows player to collect meteorites
Other collectible in a level
Player HUD is updated

Flow Description

Precondition

The Game is installed and the Final Frontier icon is on the desktop of the machine. Your desktop or laptop should meet the minimum requirements. A game level should be loaded and the player is in game

Activation

This use case starts when a Player/Player starts the game, loads a level and finds a collectable item that can be collected.

Main flow

1. The Game loads a level
2. The player moves the character around through the level
3. The player finds a collectable item
4. The game allows the player to pick up the item
5. The HUD is updated

Alternate flow (Does Not Apply)

Exceptional flow (Does Not Apply)

Termination: The game lets the player pick up the item

Post condition: The player can pick up as many collectable stars as the player desires, when the player collects 5 meteorites the Mercury level will end and the player will be teleported back to the Space Ship.

Requirement 6: <Puzzle/Collect Key>

Description & Priority

The player must be able to start an instance of the game (hence load or start a level) during the course of the game the player after they complete the first level must do a puzzle to earn a key to unlock the door to the next level. These functions also have a massive priority as they are key functions of the core game.

Use Case

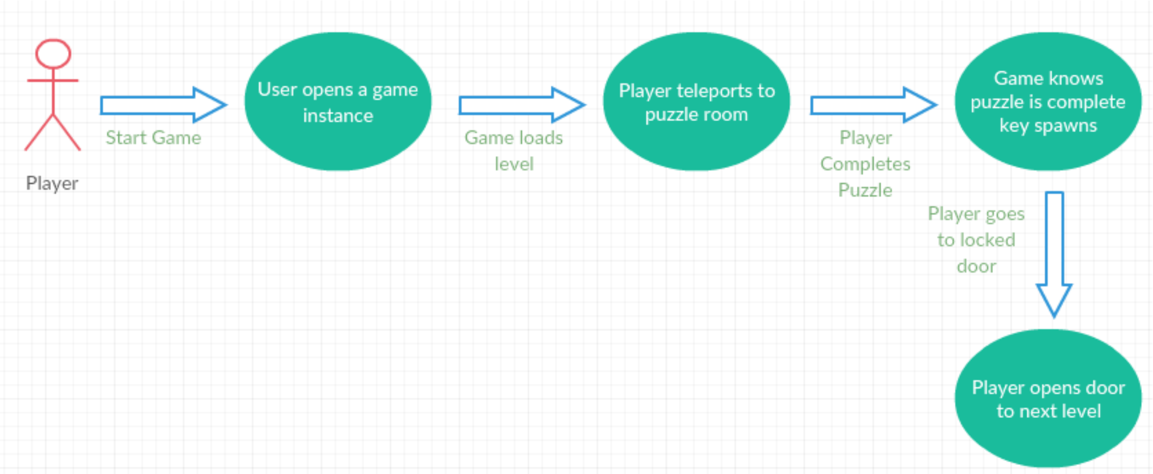
Scope

The scope of this use case is to allow the player to complete puzzles to earn keys to continue to different levels in the game.

Description

This use case describes the function of the player interacting with the in-game collectable items, Example of such is while the after the player is on Mercury (where they learn that it is the closest planet to the sun) they must complete a puzzle by moving which planet they think is closest to the sun, in front of the sun, once this is complete a key will appear and the player can open the door to Venus (the next level)

Use Case Diagram


Player
Start Game
User opens a game instance
Game loads level
Player teleports to puzzle room
Player Completes Puzzle
Game knows puzzle is complete key spawns
Player goes to locked door
Player opens door to next level

Flow Description

Precondition

The Game is installed and the Final Frontier icon is on the desktop of the machine. Your desktop or laptop should meet the minimum requirements. The game level Space Ship should be loaded and the player is in game.

Activation

This use case starts when a Player starts the game, and wants to access the next level but needs the key.

Main flow

1. The Game loads the Space Ship level
2. The player moves the character to the puzzle room
3. The player completes the puzzle
4. The player picks up the newly spawned key
5. The player can now open the door to the next level

Alternate flow (Does Not Apply)

Exceptional flow (Does Not Apply)

Termination: The game opens the door to the next level.

Post condition: The player can do the puzzles as many times as they like. There are also other puzzles for different doors.

NON-FUNCTIONAL REQUIREMENTS

Performance/Response time requirement

The performance requirements for the game are:

Operating system: Windows 7/8 64 bit

Processor: Quad-Core Intel or AMD 2.5 GHz or faster

Memory: 8GB Ram

Video Card/ DirectX Version: DirectX 11 compatible graphics card

Availability requirement

Own website

I can set up my own website that allows players to download the game from. I can advertise the game through social media and approaching YouTubers to play the game and get publicity.

If the game was to be distributed this way I would have full control on pricing and distribution.

Digital Distributor (Steam)

Steam is the most well-known distributor of PC games. Currently they have a system called Steam Greenlight where if there is enough votes for a product by active players on steam it goes on the marketplace for the set price.

If it was successful there would be less of an effort needed to publicise the game to be successful but a lot of the control of the price for example would be taken away.

Unreal Engine 4 Market

You can post your own material on unreal engine marketplace, unreal would have most of the control of the product, and there is not much of a feedback system on how the game is being perceived.

Maintainability requirement

On the website there will be a section to report any bugs or system errors, also on social media they can report and issues they may be having. I feel that these would be the most successful ways to get the product up to the standards needed.

If the game was to be posted on steam, steam allows the developer to apply patches, which can update the game. This would be useful if any unknown bugs or errors where found.

Security requirement

There is no major security requirement for the game, it would not require any internet connection to play the game, therefor they only need to download the game and it will run. AKA have rights to download on the current machine of use.

Extendibility requirement

In the future I could add in Downloadable content which could add in even more questions and quizzes or even different moons of the planets to expand the game. It can also be updated with more new information we learn about the solar system.

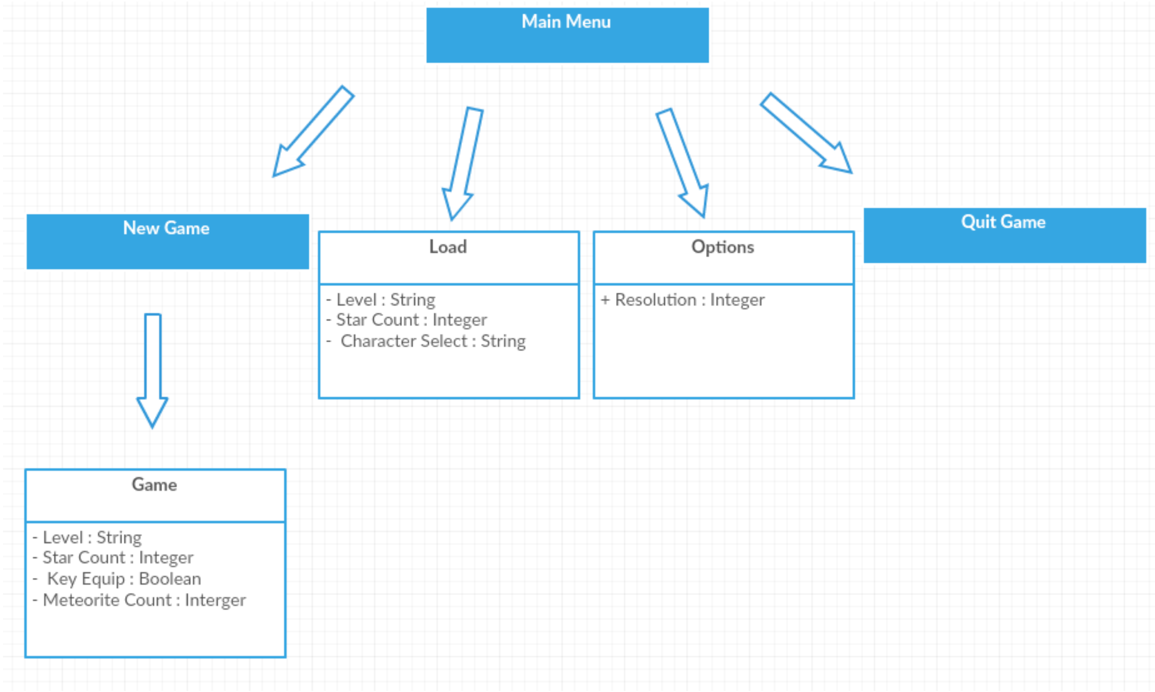
Reusability requirement

The assets that I will make in this game can be used in future DLC or even future projects that I might start.

System Architecture

Final Frontier's system architecture follows the main stream structure when it comes to system design, with a main menu with all the actions available to the user such as start new game, load game options and exit game. When the game starts the player will have a game instance that will have the attributes of level, star count, key equip and meteorites count.

Class Diagram

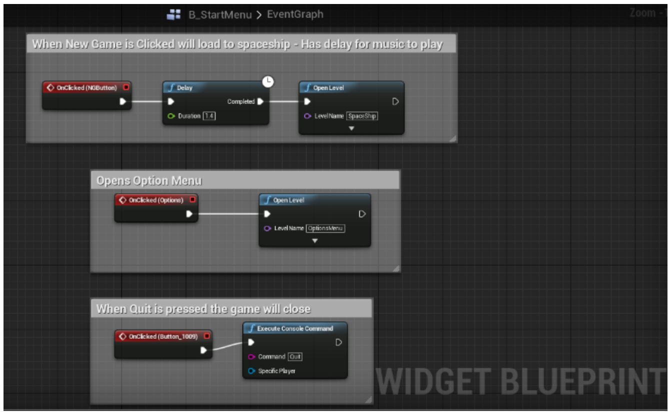


Implementation

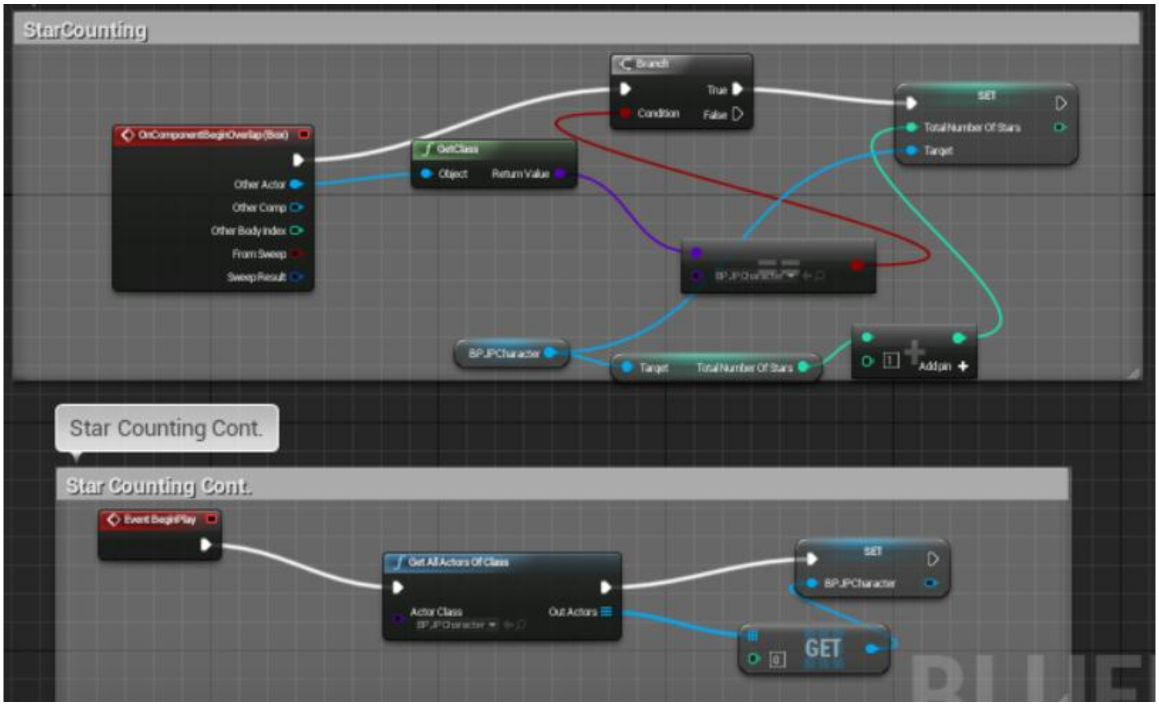
Final Frontier has a lot of implemented functionality this includes,

- **Menu transitions**

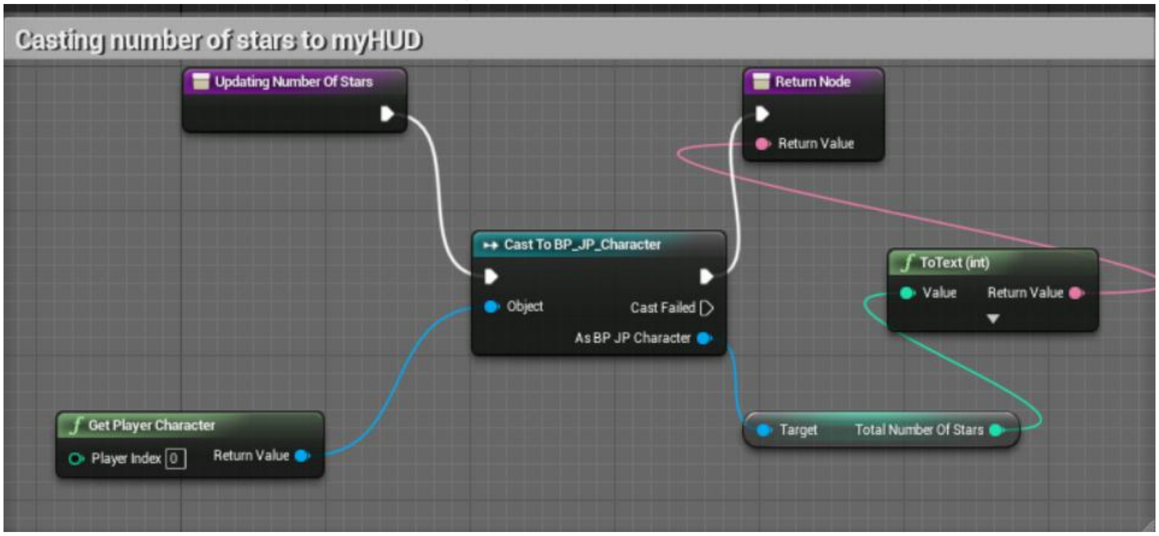
  This is how the player can either Start a new game, load a previous save, enter the options menu or exit the game



- **Collect Stars**

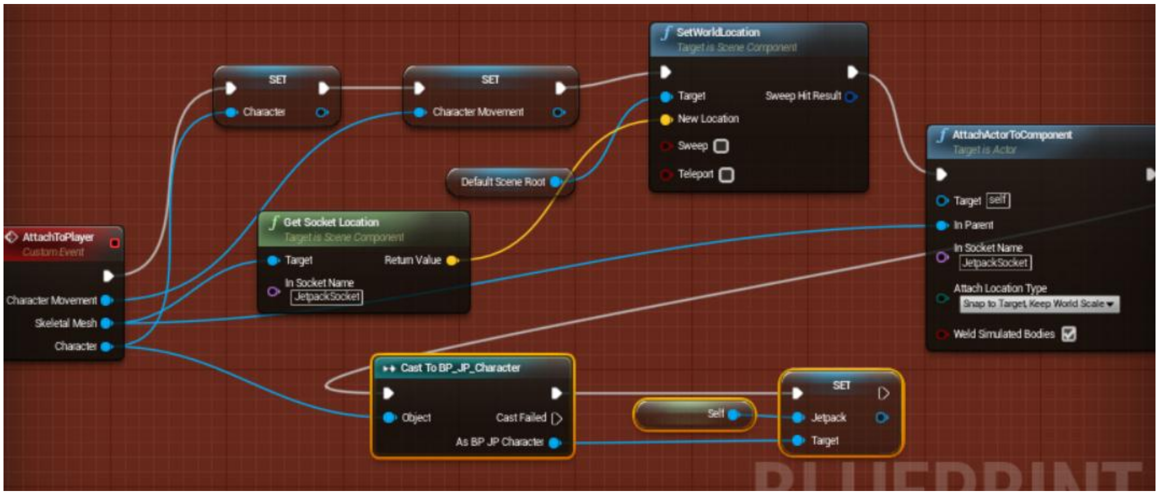


On the star the blueprint adds 1 for everyone 1 picked up this is stored in an array.

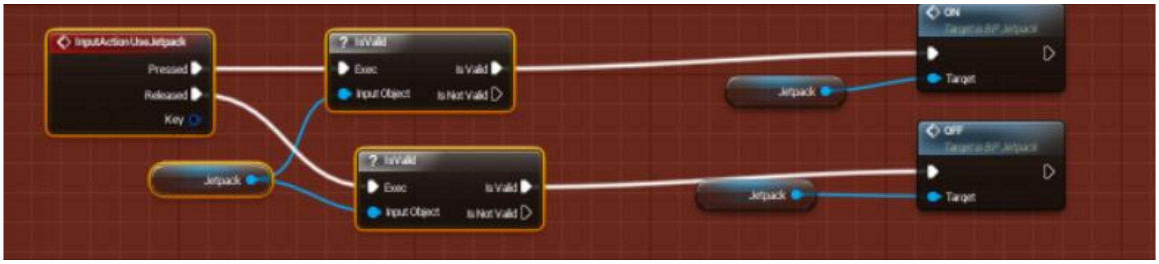


On the HUD this gets the number of stars and casts it to the player, this Is done in a function set on the text in the HUD.

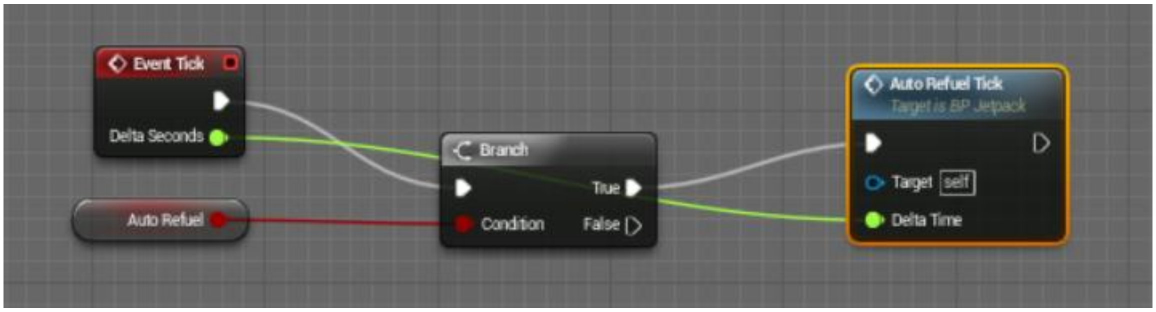
- **Mercury: Jetpack**



To attach the jetpack to the player the player has to be set and the character movement. The location of the character is noted and that is how the jetpack knows where the character is it then attaches itself to the socket on the character.

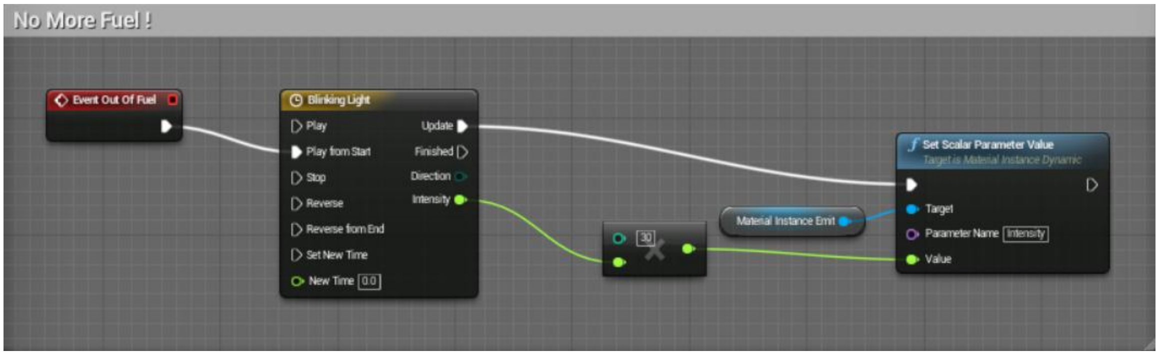


When the input action for the jetpack (which is left mouse click, right trigger on controller) is used it links It to the jetpack and then shows that the jetpack is on, this will then run the thrust, which I have explained further below.



Every “tick” which is frame in game, it will check how much fuel is in the jetpack, it will then auto refuel itself if need be.

For the thrust of the jetpack (the blueprint is too long to take a screenshot of) It checks if there is fuel available which is stored as a variable integer. There will then be a branch if it’s true that there is fuel the thrust goes in the direction that the players character was moving. The jetpack knows this because it checks the velocity of the character. The jetpack then plays the sound and the FX of the flames.

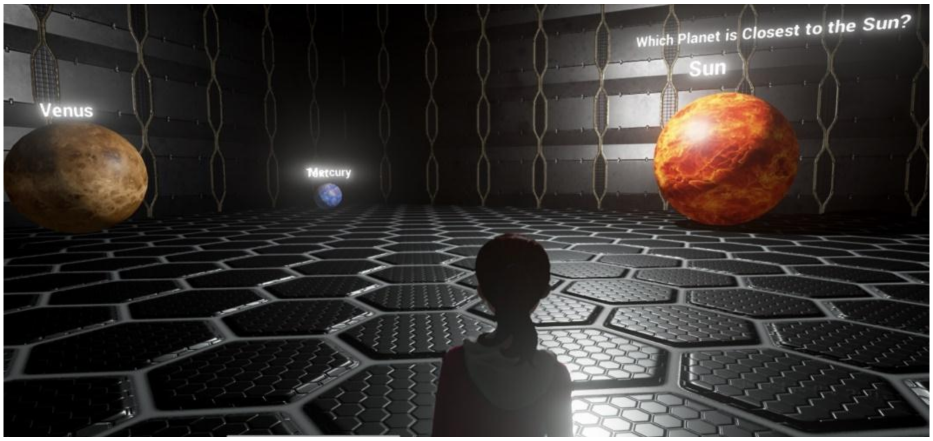


When the jetpack runs out of fuel the event is started and the blinking of the light starts, it ends when the fuel is auto refuelled

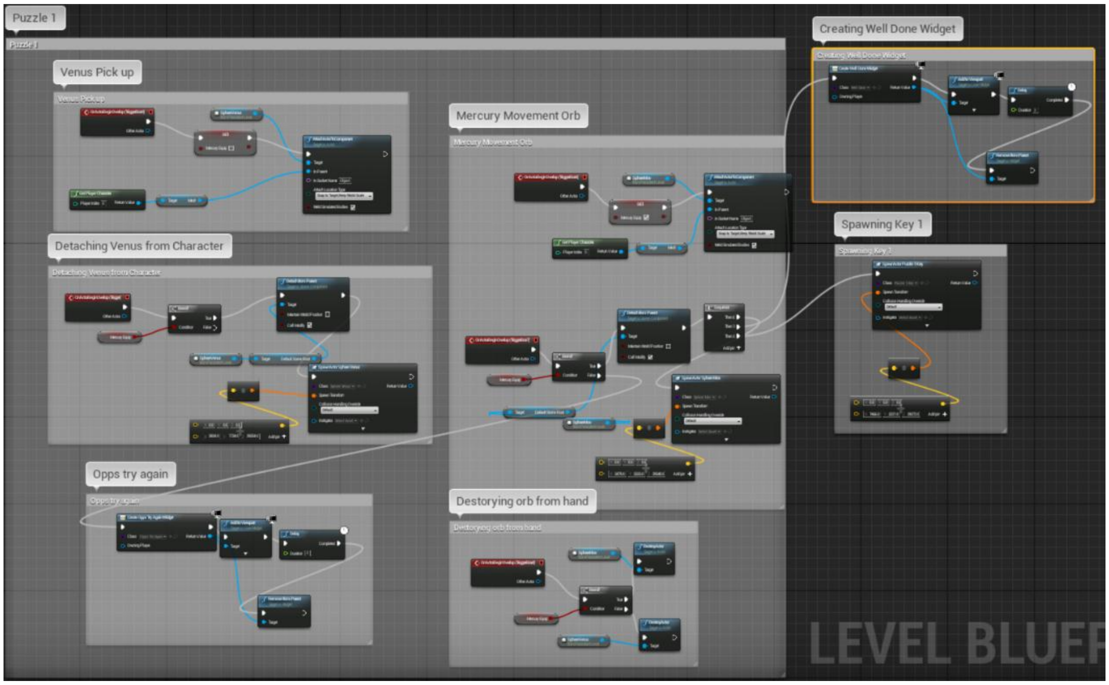
- **Mercury: Collect Meteorites**

The collect meteorites are done in the same process as the stars, it is stored in an array every time one is collected the array is updated and the function in the hood makes it update

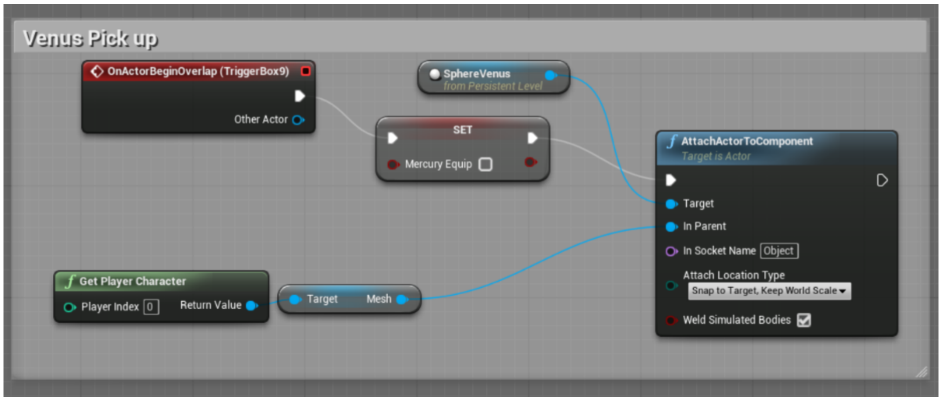
PUZZLE 1



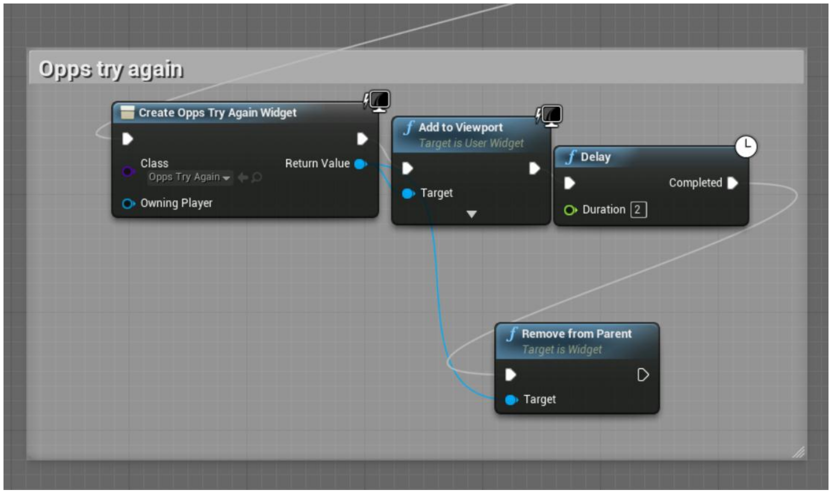
When you complete this puzzle it allows you to open the door to Venus which is the next level. It does this by spawning a key when the player does the puzzle correctly.



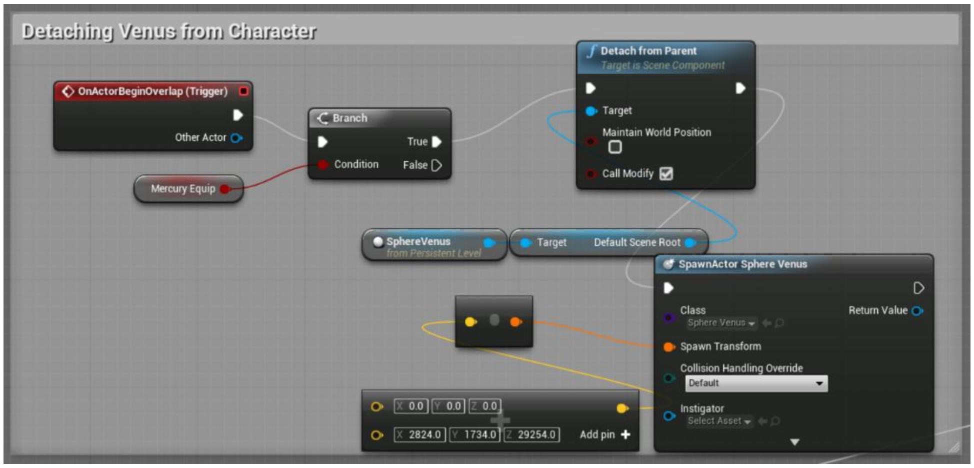
This is the overview of how the puzzle works.



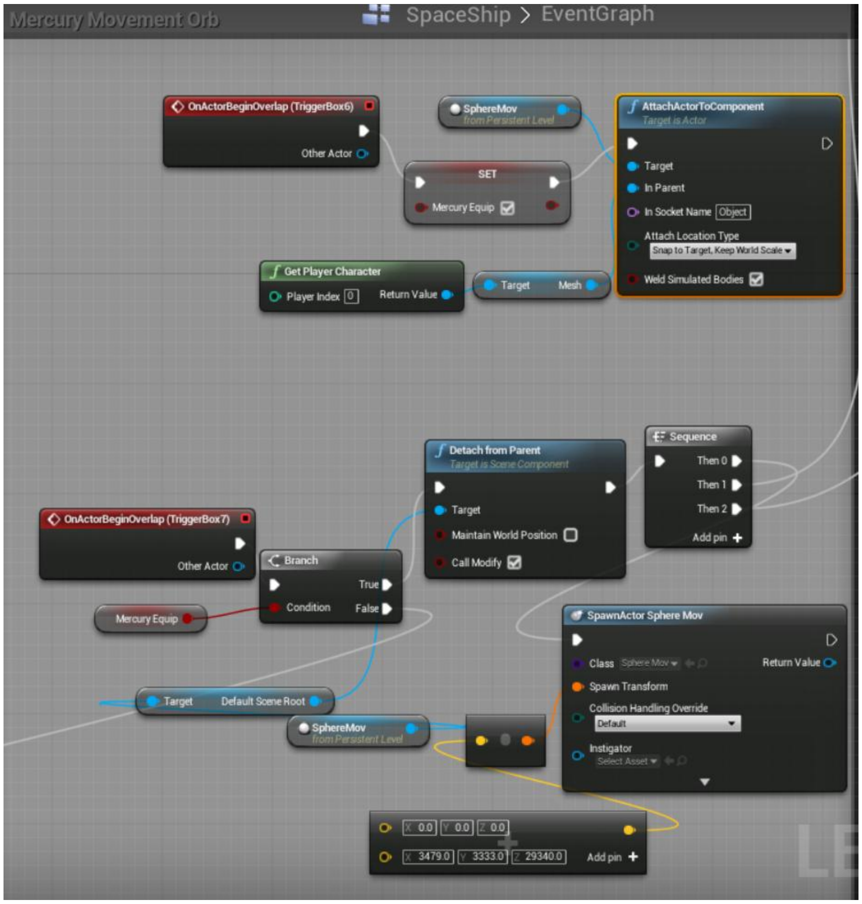
If the player walks over to Venus it attaches to the player's hand, they then have to bring the planet over towards the sun. The Collison box is how the SphereVenus knows to attach to the socket in the character's skeleton called "Object"



If Venus is the one put in front of the Sun, the trigger box will recognise that it is not the right answer and this widget will be displayed saying Oops try again, this gives feedback to the player.



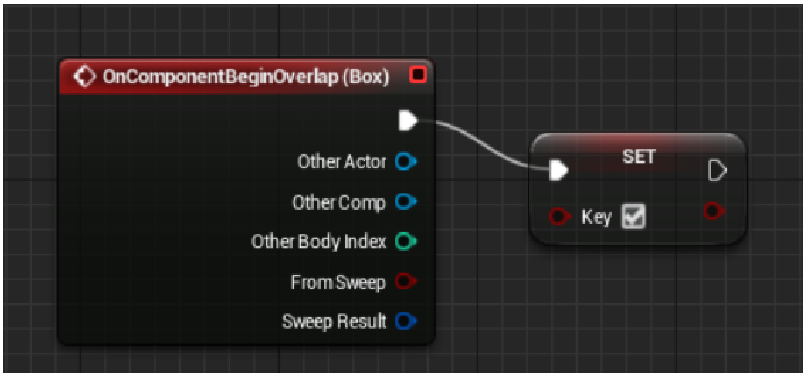
This is how Venus is removed from the player hand, when the player walks over the trigger box, it sees if mercury is equipped and it destroys Venus from the players and then respawns it in its location, based on whether the MercuryEquip condition is true or false, this step happens if the condition is false.



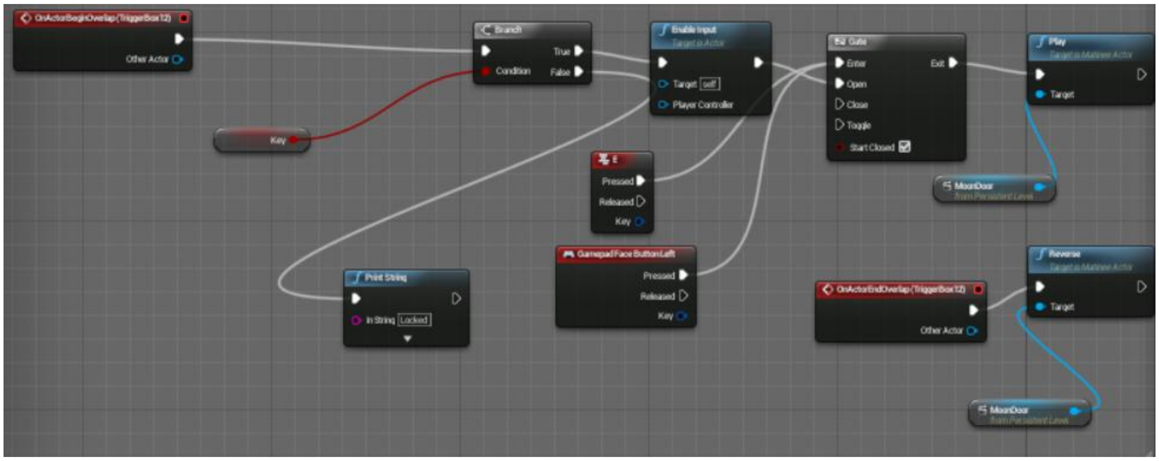
This is for attaching Mercury to the player, it’s done the same way Venus is, but because Mercury is the correct answer it detaches from the parent and gets destroyed I then spawns in front of the sun.

The sequence goes as followed: Respawn Mercury, create a widget and add it to the screen to give the player feedback that they did the correct option, then Spawn a key.

- **Spawn/Collect Key**



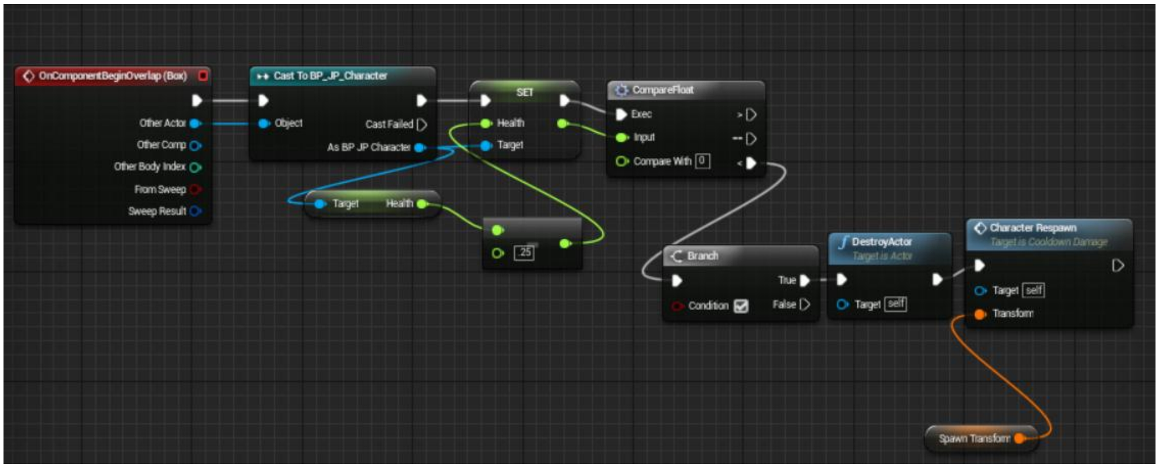
This sets the key variable (which is a Boolean) to true when the key is overlapped



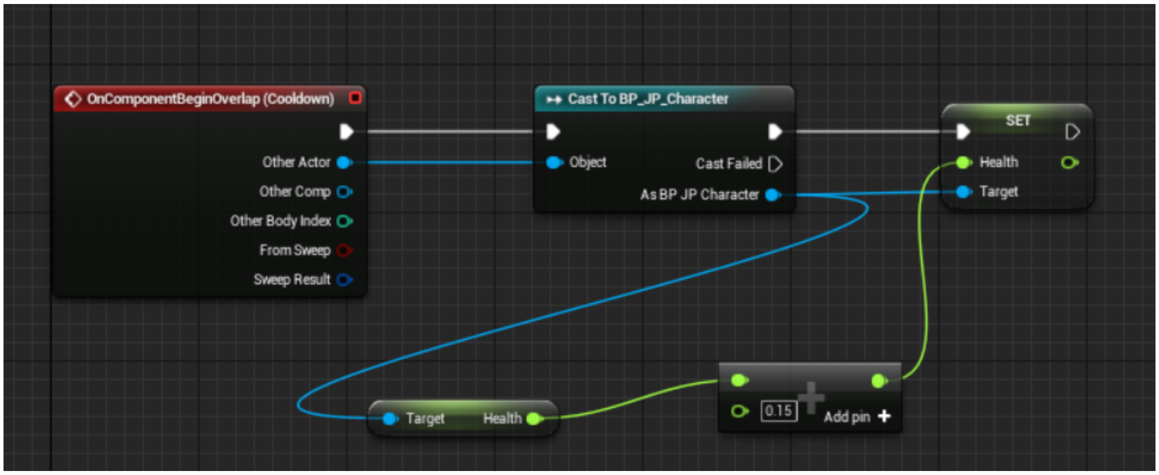
When the player walks up to the door the trigger box checks if the key Boolean is clicked, if the Boolean check comes back as true when the player presses E the matinee will play and the door will open allowing the player into the room.

- **Venus: Cooldown & Respawn**

While the player is on Venus they have a Cooldown bar, this will start to decrease as the player traverses through the platform. I have achieved this by scattering trigger boxes throughout the level. Each time a player hits them .25 will be removed from the bar. When the bar reaches zero or less than the player will respawn at the start of the map.



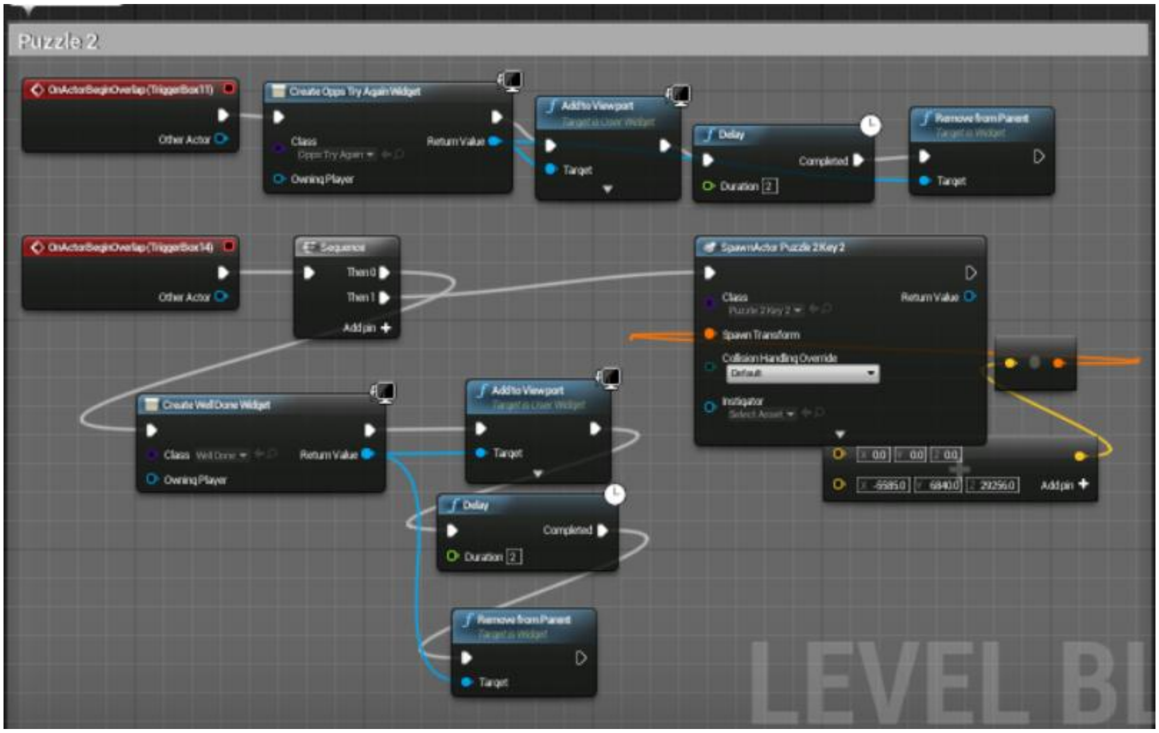
In the SpaceIgloos there is another trigger box, this instead increases the bar back up its casted to the player's character which has the variable health (the cooldown) it then adds .15 each time the box is collided.



PUZZLE 2

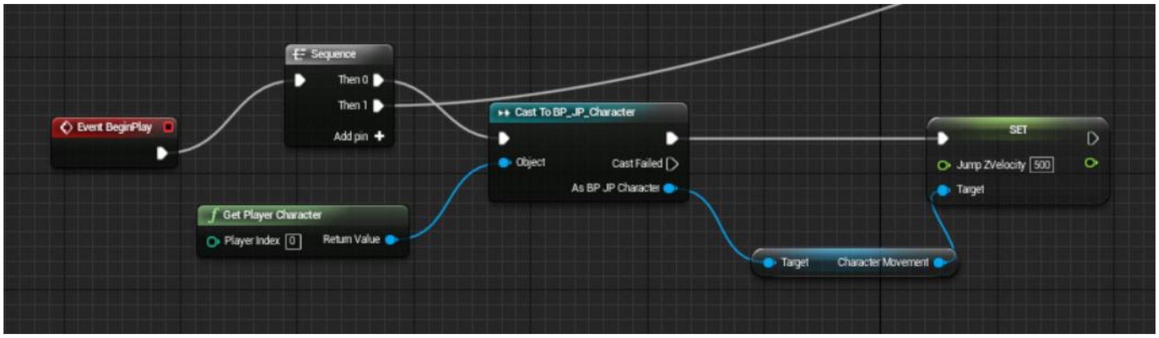
Which Planet is Bigger?

Puzzles 2 involves the player choosing which planet is bigger, Mercury or Venus



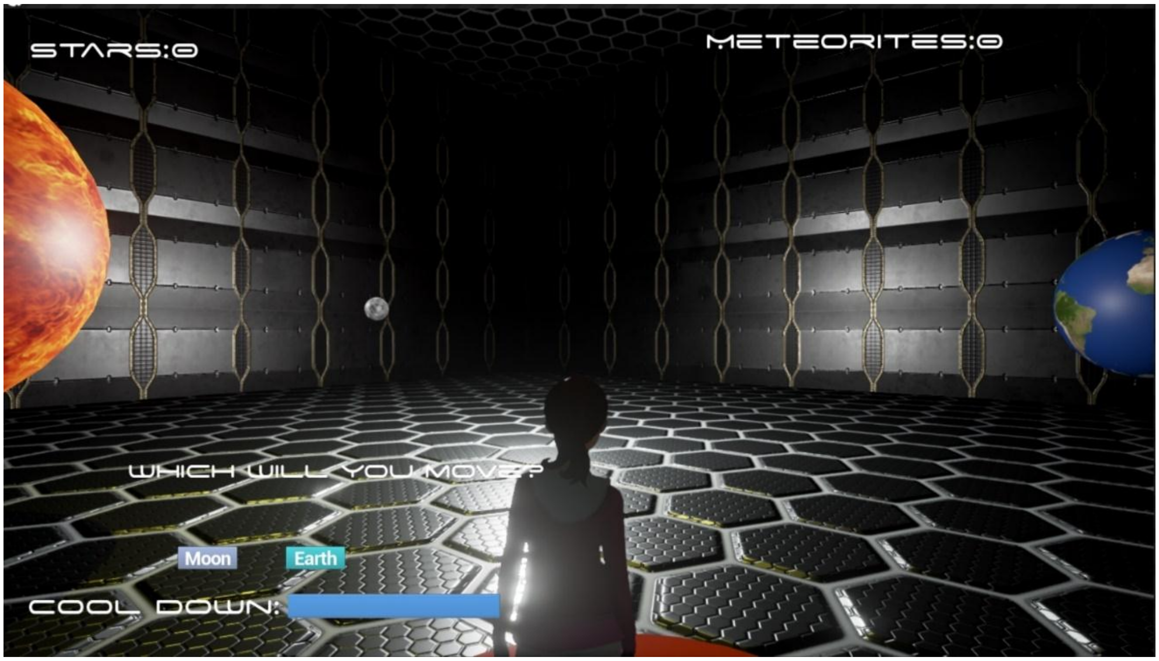
If the player walks towards Mercury, the oops try again widget will appear on the screen. If the player walks towards Venus, the widget saying well done you picked the correct answer will appear and the key will spawn to open the door to the next level.

- **Moon: Jump**

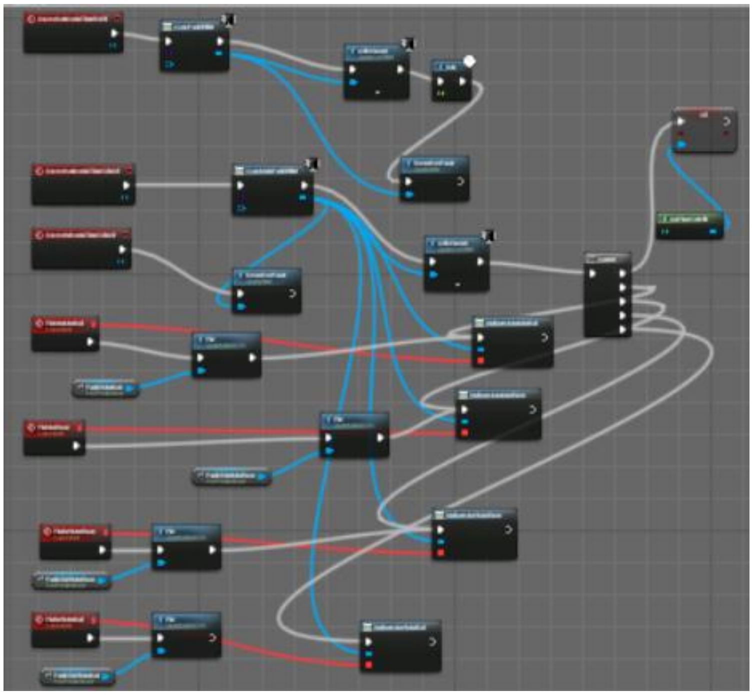


When the game starts in each level the jump velocity is changed to suit each planet/moon. This is then casted to the character. The sequence is here because at the start of the level there is an opening cinematic and a sequence shows that this should be applied first then play the cinematic.

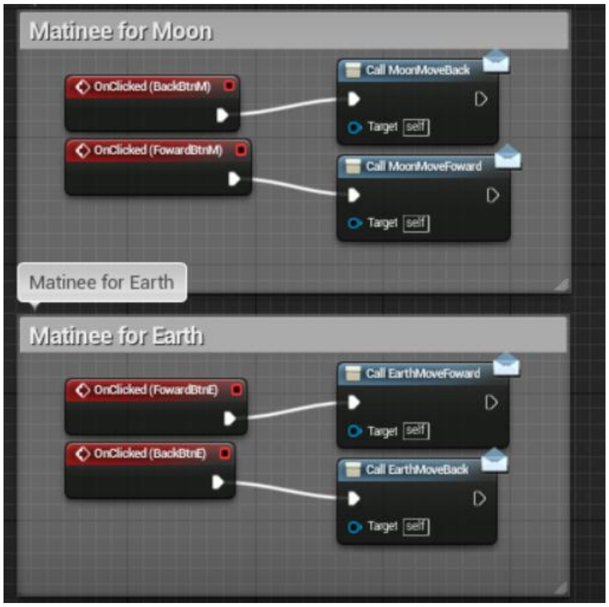
PUZZLE 3



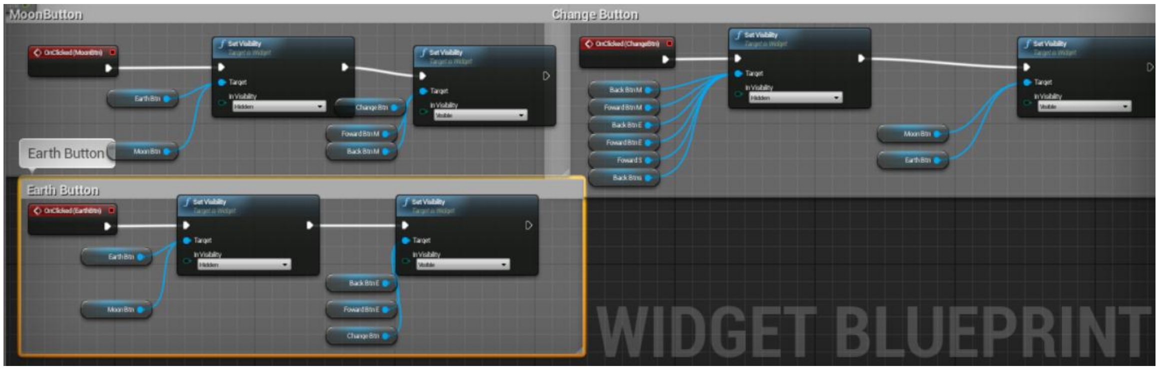
The objective of this puzzle is to demonstrate a solar eclipse the player must move the moon and earth in the position it would need to be in for the solar eclipse to happen. This is controlled by a widget that pops up when the player stands on the red platform.



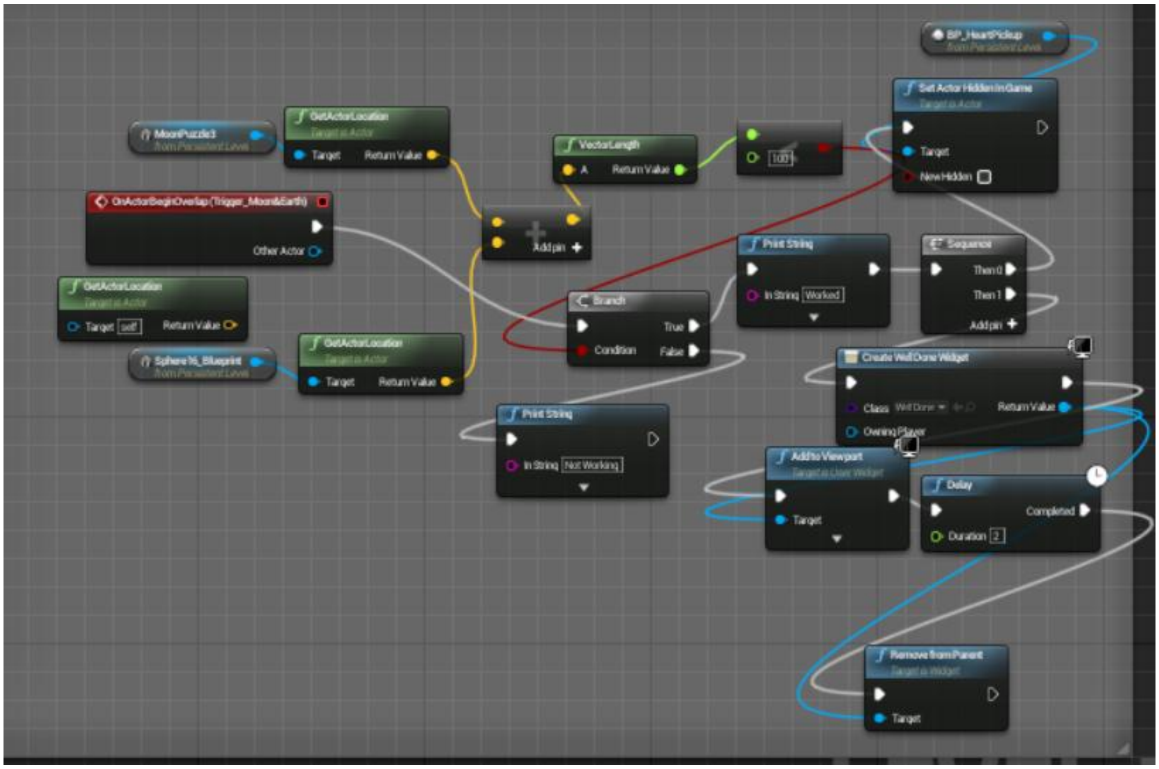
This is the matinee that allows the widget to control the movement of the Moon and Earth in the level. It uses custom events and event dispatchers to achieve this.



In the widget I created event dispatchers which when the buttons are pressed play the matinee for moving the Moon/Earth forward or back.



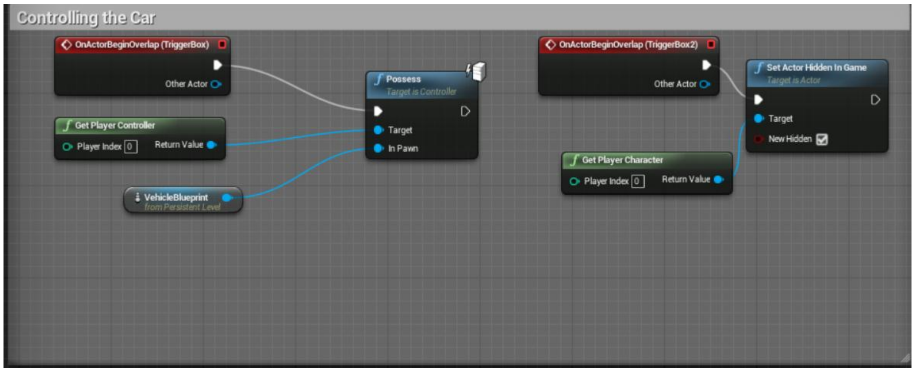
The widget uses the buttons to hide and make visible the buttons that are needed, they are sequenced so that if the player presses the Moon Button, Earth and Moon button will hide and three other buttons; forward, back and change become visible. This is repeated for the Earth button also. When the change button is pressed it makes sure every other button is hidden bar the Moon and Earth button for the player to be able to change the Sphere they wish to move.



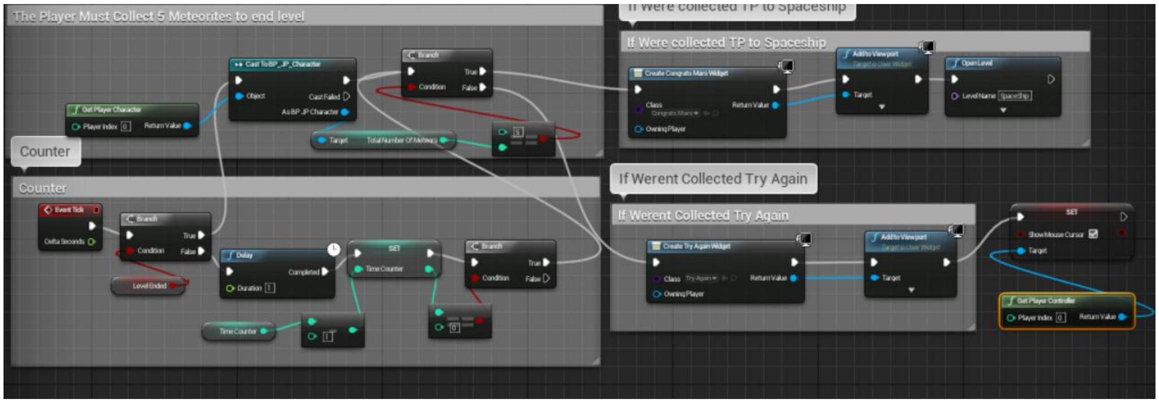
This functionality goes in the main level blueprint, its pretty similar to the other puzzles, the trigger box checks if the two spheres are in the location and if that is true it will reveal the hidden key for the player to collect.

- **Mars: Buggie**

The Mars buggie is another pawn which the player's controller possesses, this is achieved simply with a trigger box and then button the pawn reference as the car. The other character is then hidden so the player cannot see.



- **Mars: Time Countdown**

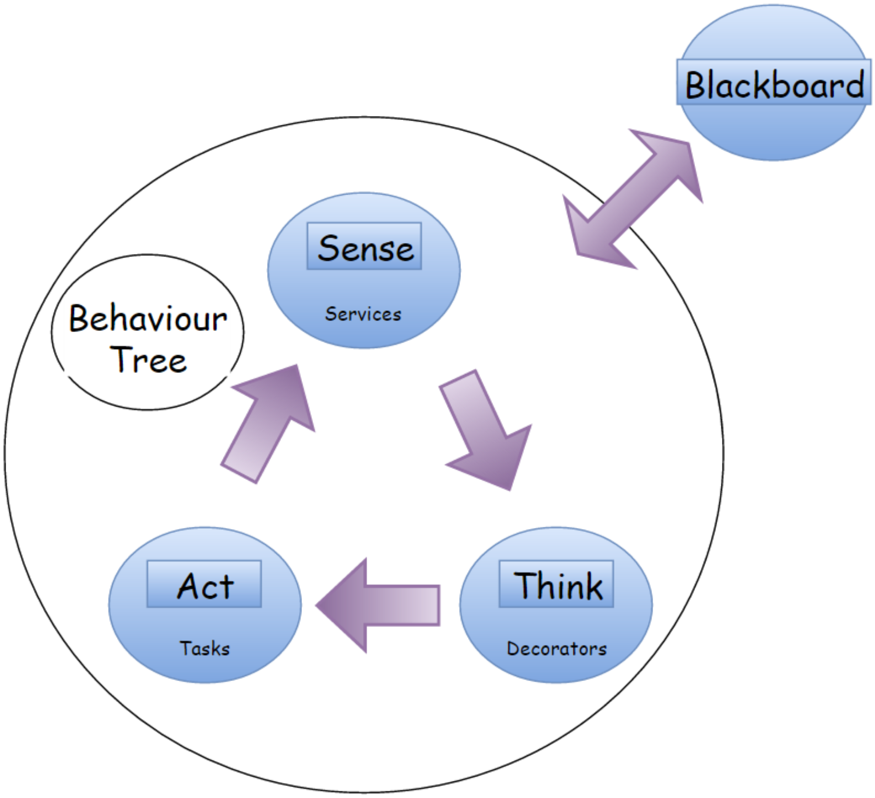


The Mars level requires the player to collect 5 of the meteorites in a set time limit of 120 seconds. I made a variable called Time Count which I set to 120 and then I said if the time count is equal to zero to check if the player has 5 meteors collected, if they do create the congratulations widget and teleport them back to the Spaceship. If not ask the player if they wish to try again.

ARTIFICIAL INTELLIGENCE

Architecture of my AI

This is an overview of how AI works in Unreal Engine 4:



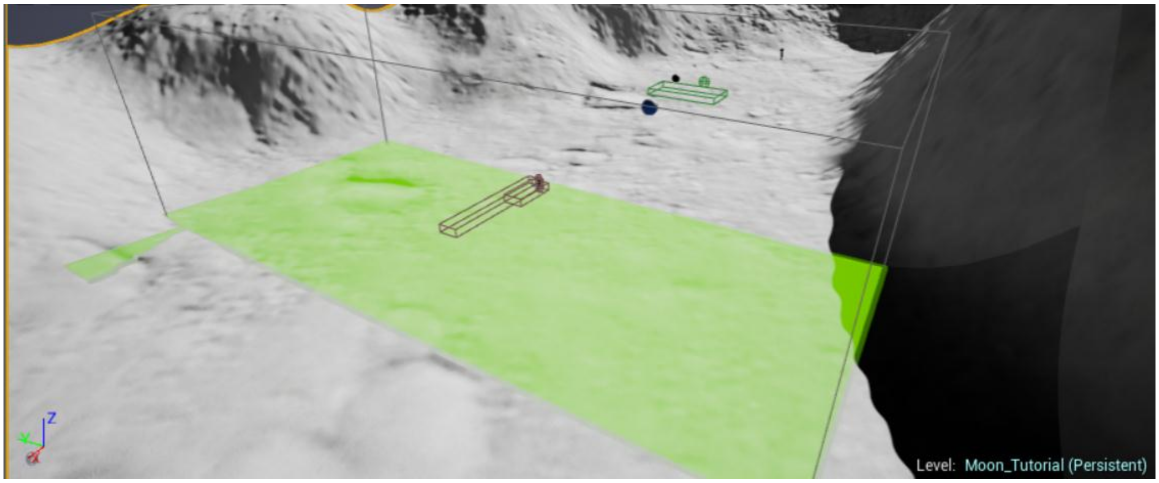
THE AI BLUEPRINT CLASSES IN UE4

To start AI in UE4 you need to make several blueprint classes that work together to make a functional AI, the ones listed below are the classes, and how they act in the group.

- AI Character class
    - "Body"
- Animation Blueprint
    - State machine, blend tree etc,
- AI Controller
    - "Head" (works with AI Character)
- Behaviour Tree
    - "Brain"
- Blackboard
    - "Memory"

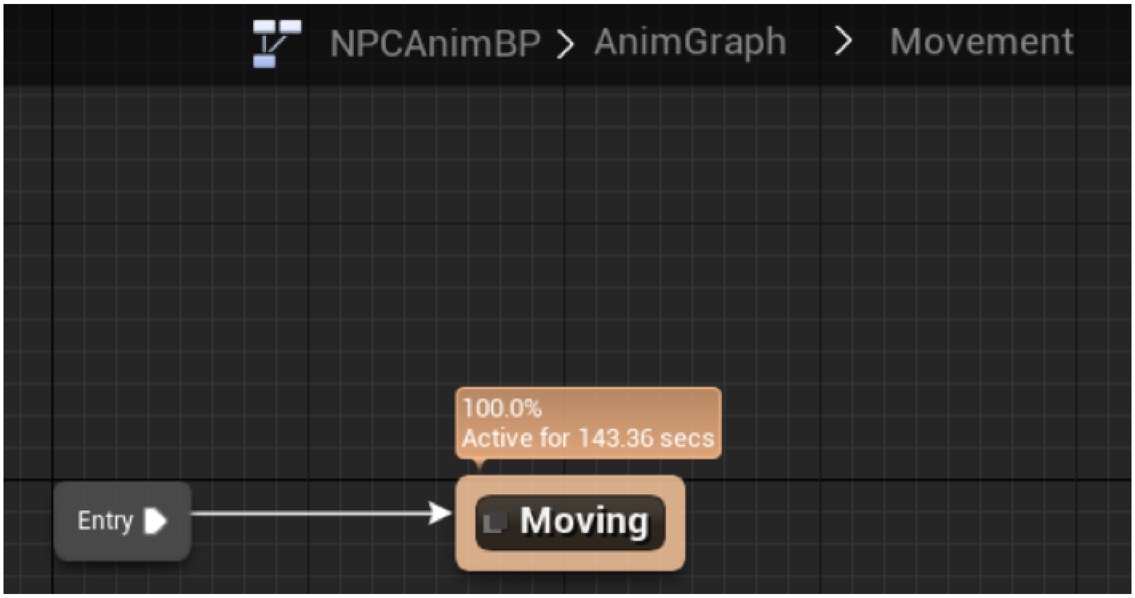
Non Playable Character: Artificial Intelligence

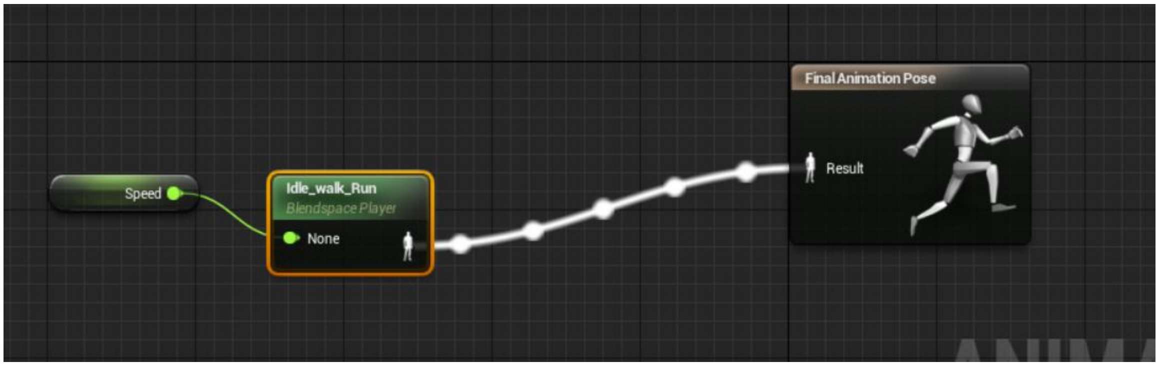
Step One: Adding Nav Mesh Bounds Volume onto the map. This shows the AI where it is allowed go to on the map. As you can see from the picture below it's the Highlighted Green Area.



Step Two: Making The AI Character. I created a AI Character Blueprint class and put in the Skeletal Mesh of my character.

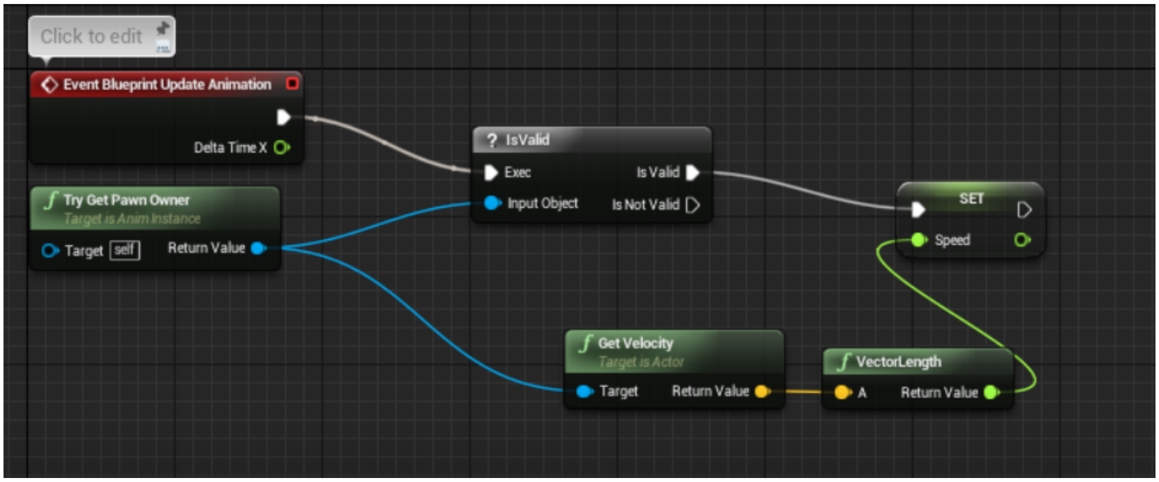
After setting up the Character Blueprint I needed to add in animations. To do this we use a State Machine. I Have One state which is movement



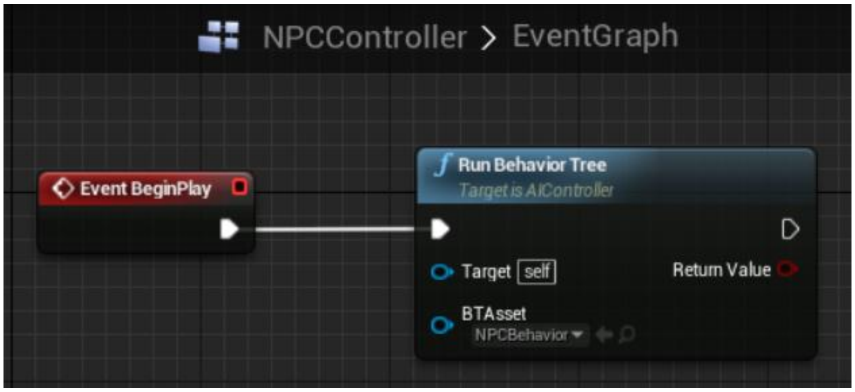


I created a blend space of 3 Animations – Idle, Walking, and Running. I then put a variable speed and linked it to the State of Moving.

In the event graph I added in the update animation this updates the animation every tick. This is so that the character knows whether to walk or run.

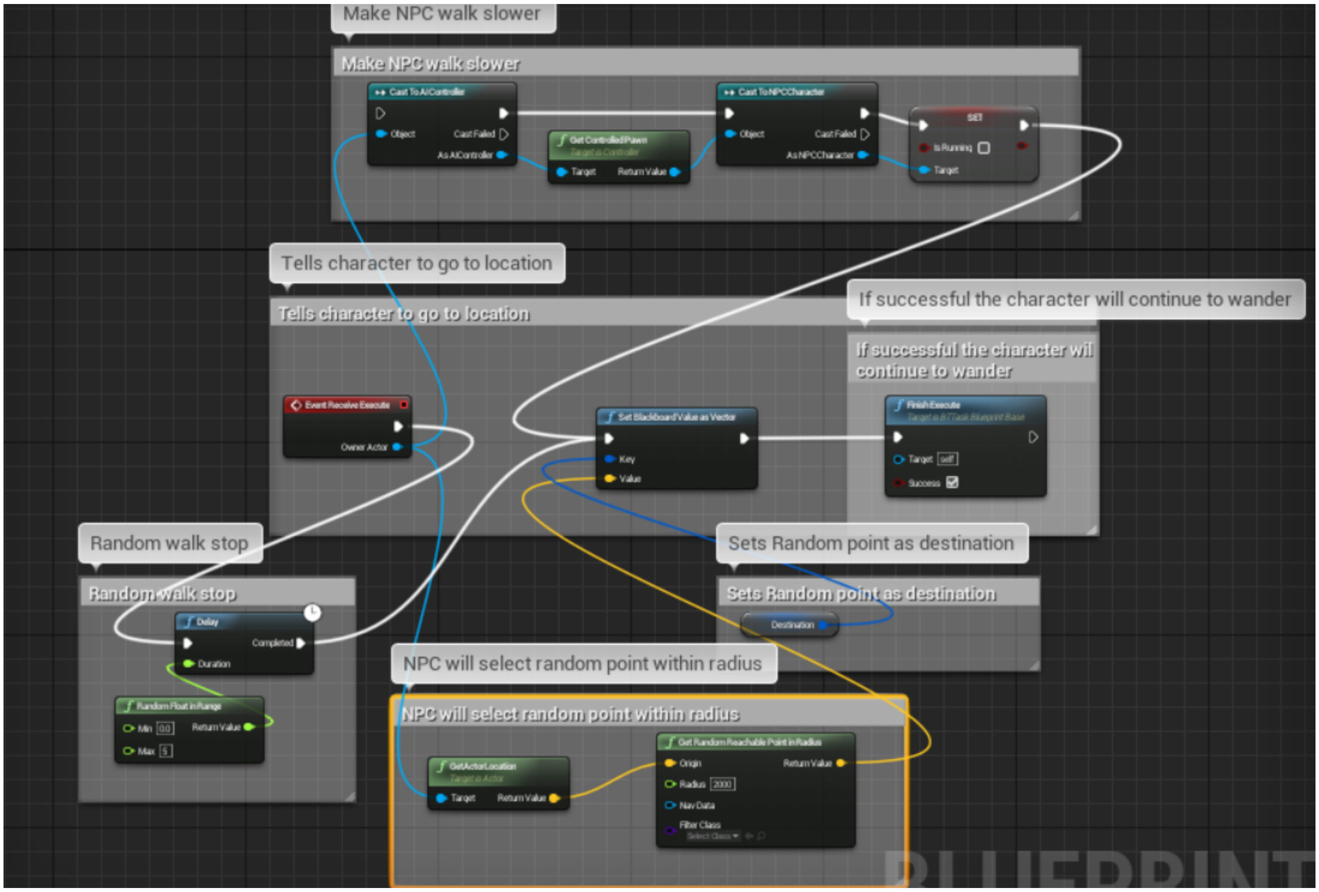


Step Three: AI Controller. I made an AI controller class, this will control the NPC AI Skeletal Mesh, Essentially it's like the brain. In the Controller Class you link the Behaviour Tree. So I made the Behaviour Tree and linked it to the AI Controller. This will then run the tree as soon as the game is played.



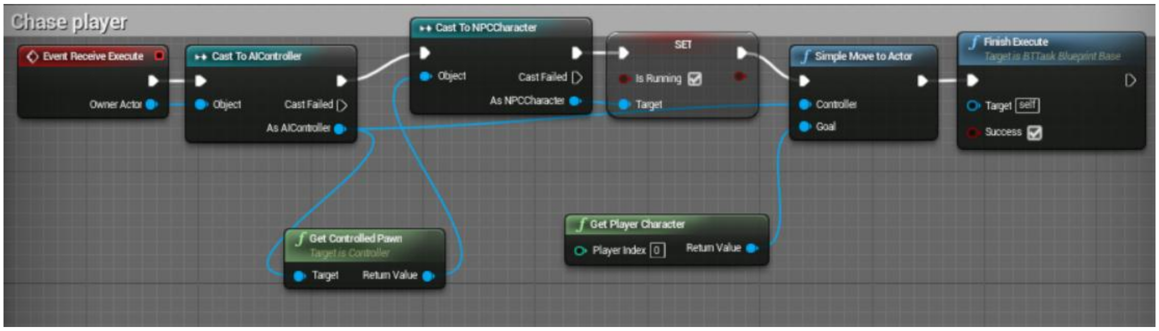
Step Four: Tasks – Wander & ChasePlayer.

I created a task called Wander. This was one of the main coding errors of the AI.



The wander task has a lot going on as you can see from the image above. Each section is commented to show what it does. Basically the NPC will wander around to random points in the Nav Mesh.

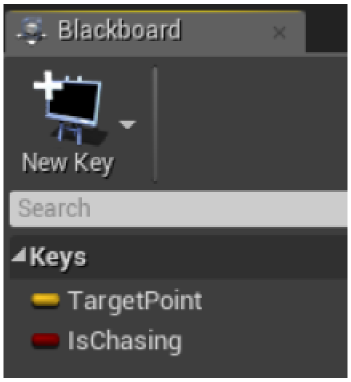
The Second Task I have is Chase Player



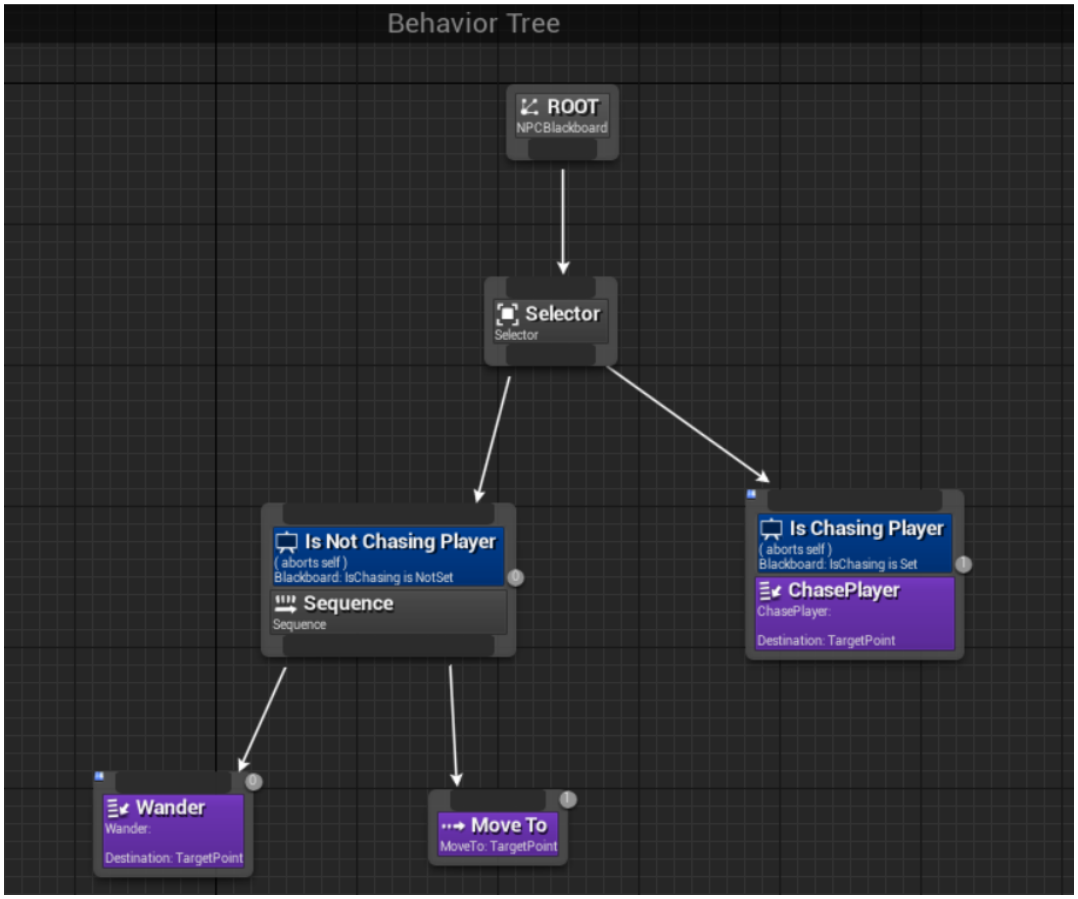
This task was less code heavy, but it involved putting decorators on the behaviour tree later. It basically meant that if the NPC seen the player that he would chase it till he could no longer see the player.

Step Five: Behaviour Tree & Blackboard

I created a blackboard class, this basically holds the variables for the behaviour tree.



I then started working on the behaviour tree.



This is the Behaviour Tree of my NPC Character, it has two branches

Is Not Chasing Player

The NPC wanders around the map (which has the blackboard decorator Is Not Chasing Player) He walks to random points within the nav mesh then stops and looks around, then wanders to another random point, this will continue until a player is seen.

Is Chasing Player

If the NPC sees the player he starts to chase he will run after the player (much faster than when he was wandering around) and then if the player stops, he will stop. This continues until the player is out of sight.

Teacher: AI

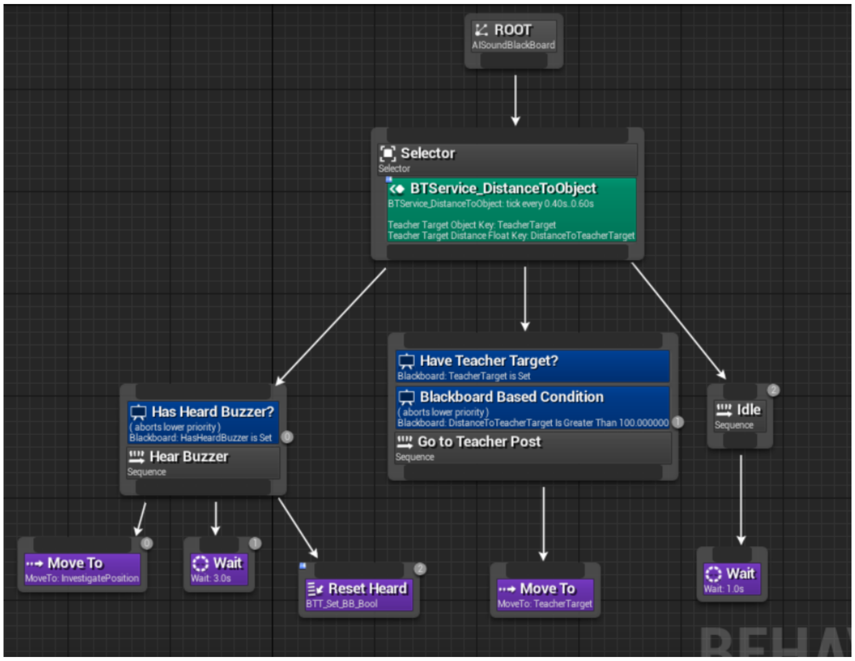
This AI is similar to the NPC:AI but with slight differences, the first set up is basically the same,

Step One: Nav Mesh added to map

Step Two: Making The AI Character.

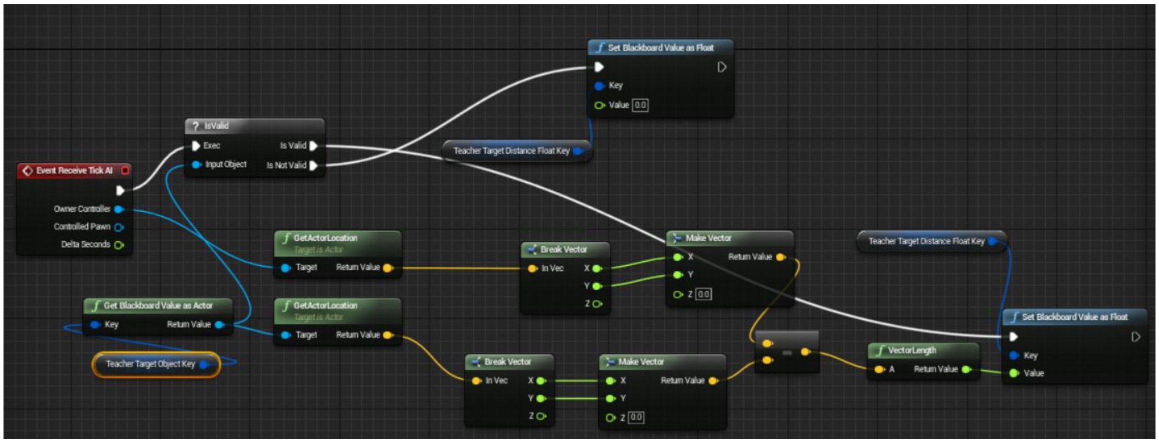
Step Three: AI Controller

Step Four: Behaviour Tree The behaviour tree on this AI is different because it has a different purpose. The Teacher will go to a Target point within the map and wait there till a noise is activated. When the noise is activated she will go to investigate. The noise will be a help Object within the level that the player can press to get help from the Teacher. Once the teacher reaches the noise she stops moving “waits” until she hears another noise.

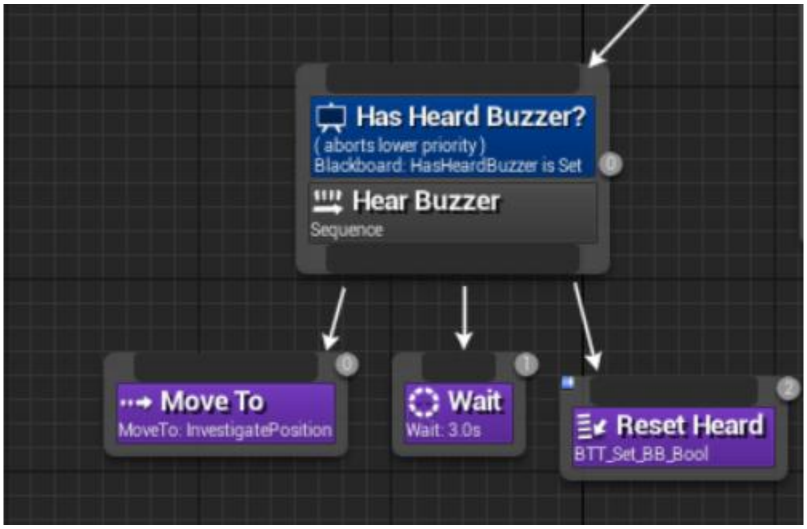

ROOT
AISoundBlackBoard
Selector
Selector
BTService_DistanceToObject
BTService_DistanceToObject: tick every 0.40s..0.60s
Teacher Target Object Key: TeacherTarget
Teacher Target Distance Float Key: DistanceToTeacherTarget
Has Heard Buzzer?
(aborts lower priority)
Blackboard: HasHeardBuzzer is Set
Hear Buzzer
Sequence
Have Teacher Target?
Blackboard: TeacherTarget is Set
Blackboard Based Condition
(aborts lower priority)
Blackboard: DistanceToTeacherTarget Is Greater Than 100.000000
Go to Teacher Post
Sequence
Idle
Sequence
Move To
MoveTo: InvestigatePosition
Wait
Wait: 3.0s
Reset Heard
BTT_Set_BB_Bool
Move To
MoveTo: TeacherTarget
Wait
Wait: 1.0s
BEHAV

Step Five: Service - Distance to Teacher Target

This service will update the distance to teacher target point.

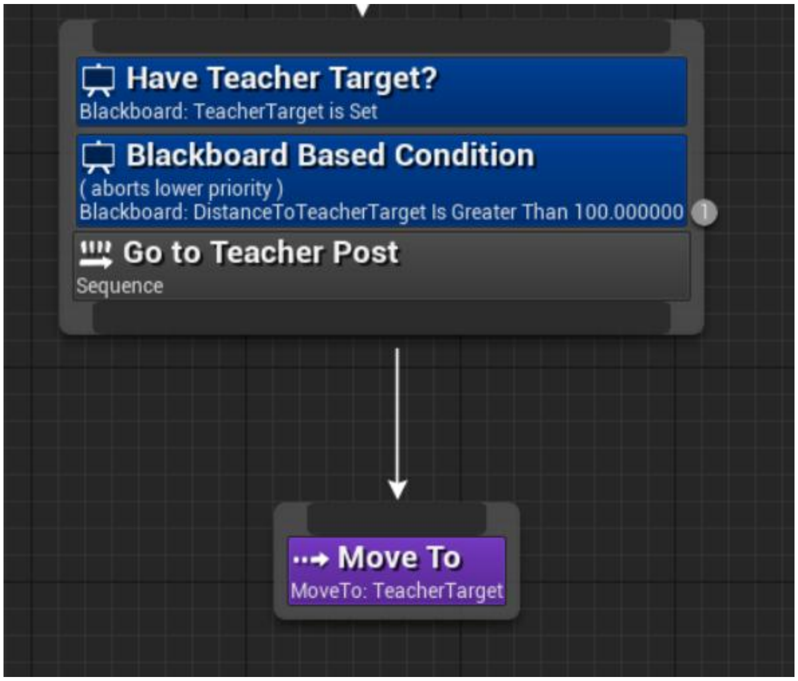


Step Six: Behaviour Tree - Hearing



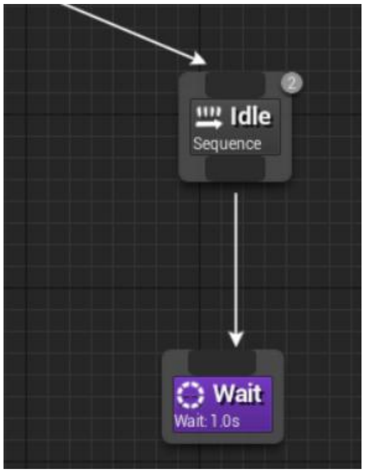
In this part of the behaviour tree if the teacher hears a noise (The buzzer) she walks towards the sound, waits and then gets reset. This is if the player uses a buzzer somewhere else that the teacher will move to that point.

Step Seven: Move to Teacher Post


Have Teacher Target?
Blackboard: TeacherTarget is Set
Blackboard Based Condition
(aborts lower priority)
Blackboard: DistanceToTeacherTarget Is Greater Than 100.000000
1
Go to Teacher Post
Sequence
Move To
MoveTo: TeacherTarget

This branch means the teacher goes to a certain point in the map, which is set by a target point. If a buzzer is heard while they are in this branch, it is aborted as the higher priority is the hearing. When the wait phase has been done in the other branch it then goes back to this branch.

Step Eight: Idle

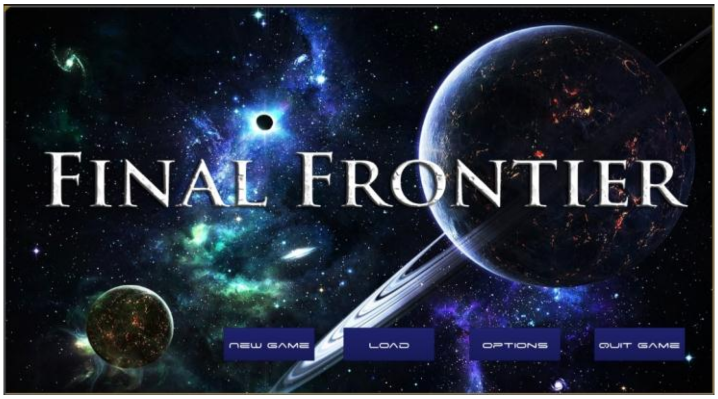


The lowest priority in the tree is idle which the Teacher AI will go into when all other priorities are completed.

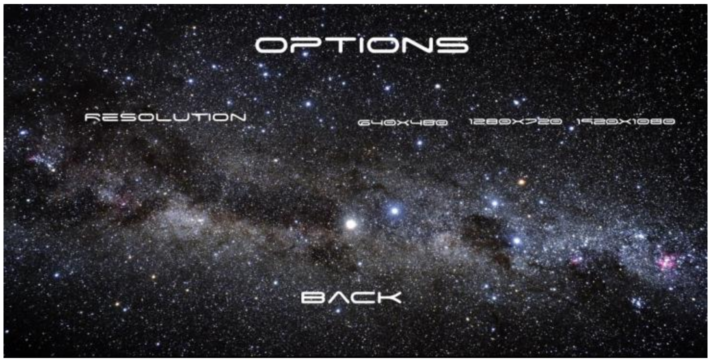
Graphical Player Interface (GUI) Layout

As Final Frontier is a children's game the GUI is very important, it must be easy to understand and use.

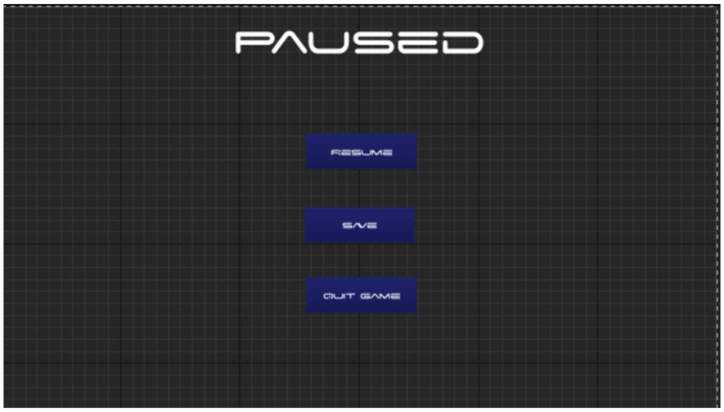
This is the opening screen of the game when the game is run. From here the player can choose new game, load, options and quite game by clicking the buttons



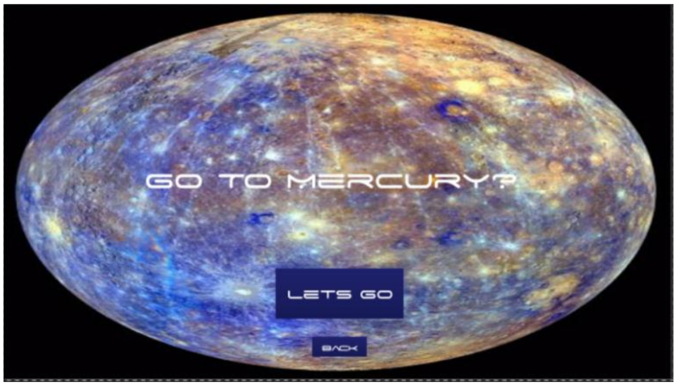
If the player chooses Options this is the screen that is presented, here they can choose the resolution of the game screen.



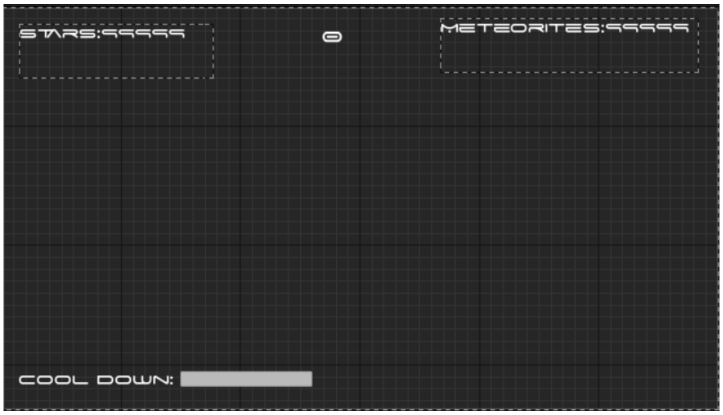
The pause menu will be opened and the players game will freeze and this will be placed in front of the player.



When the player selects new game they open up on the Space ship, from here they are prompted to go to the first level which is Mercury, this screen opens up when you open the screen

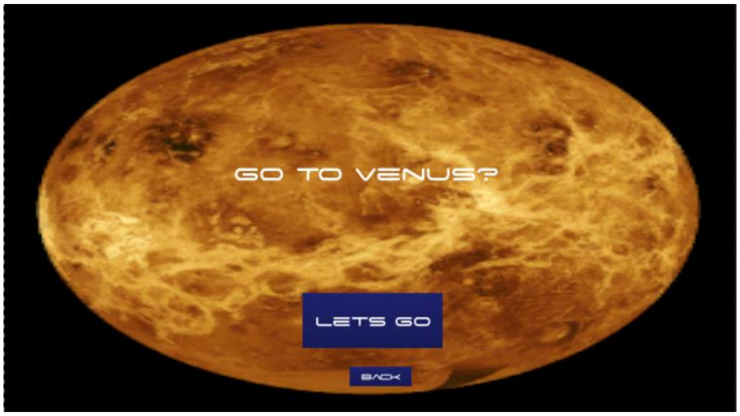


After they open up Mercury the player is greeted with the games HUD this displays the number of stars collected, as well as Meteorites collected and the "CoolDown" bar. These are the various functionality in the game.

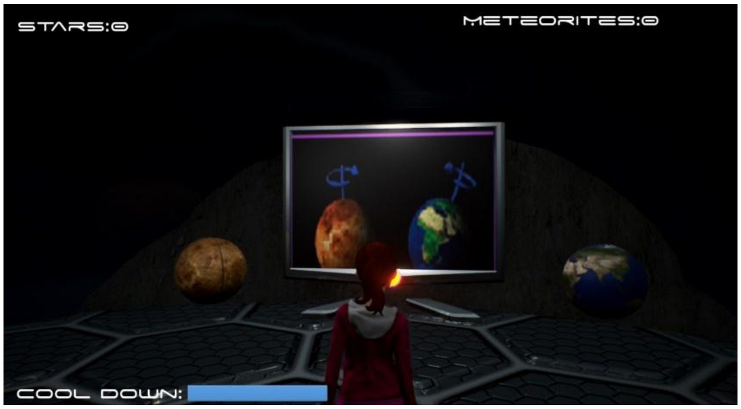


This is a picture of the HUD in the Viewport. The numbers update depending on the number of stars or meteorites collected, the same with the cooldown bar updating during gameplay.

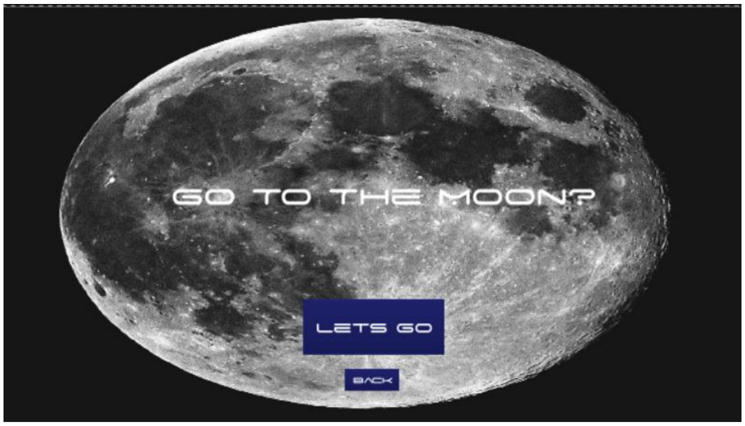
The next level is Venus and to access this the player does a puzzle, when the puzzles complete and they get a key the player opens this screen



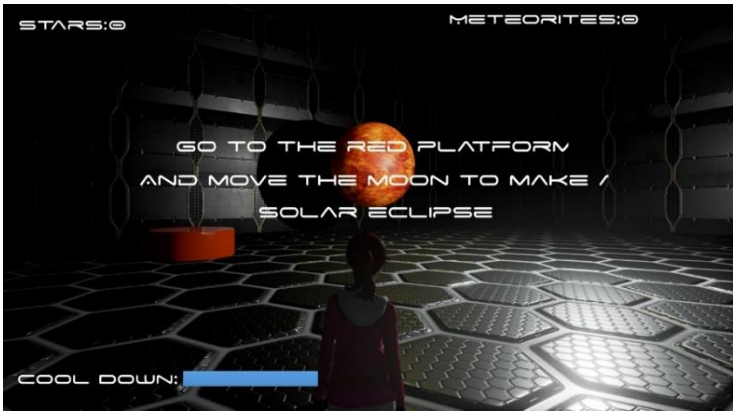
Throughout Venus there is space igloos and in these there is information screens and pop ups



After the player does the puzzle to get Moon key this is the screen they can use to get to Moon.

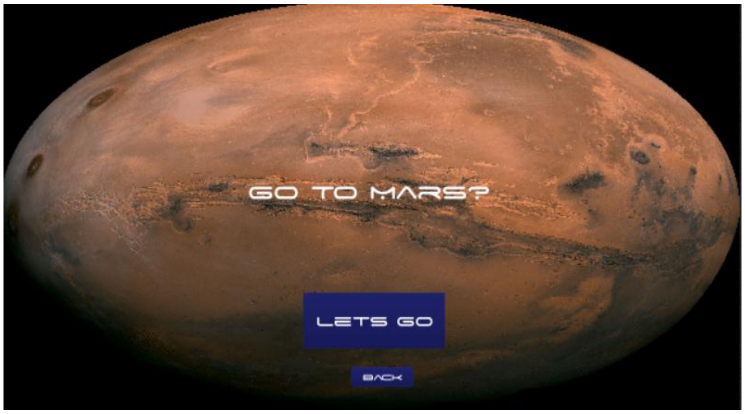


In the third puzzle there is a pop up that helps the user to know what to do

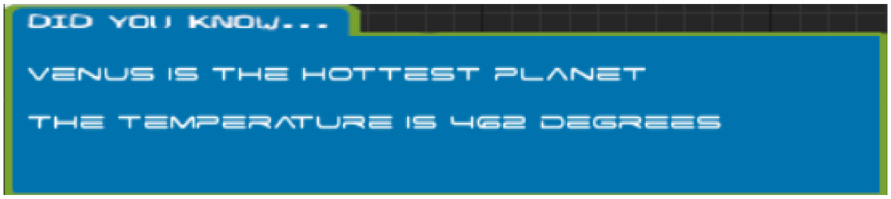


GO TO THE RED PLATFORM
AND MOVE THE MOON TO MAKE A
SOLAR ECLIPSE

After the player does the puzzle to get Mars key this is the screen they can use to get to Mars.


GO TO MARS?

Throughout the levels there are information pop that give information to the player here is an example of one


DID YOU KNOW...

VENUS IS THE HOTTEST PLANET

THE TEMPERATURE IS 462 DEGREES

Testing/Customer Testing

The testing of my project went under a numerous amount of stages I myself, first made sure my game was ready to play. When I felt the game was ready I went to a local primary school of mine and had 30 children test my game.

The style of the questionnaire used had different sorts of questions, such as multiple choice, Likert Scaling (No 1-2-3-4-5 Really Liked), Dichotomous Questions (yes or no) and a normal fill in the blank question. Most of the questions asked were of a closed question format, this is the ease of performing preliminary analysis which is key for the purpose of this survey, it's also ideal for calculating statistical data which is great for the results I needed. I did include some open questions mainly for the Game Review survey, but I did include one open end question in both the pre and post-test and then 2 multiple choices and one dichotomous.

I created a testing document for myself as instructions to make sure I did every step correctly I followed this the entire time for the testing:

Testing Instructions

Intro:

Ask them their name and are they okay with answering some questions and playing the game. Explain if they don't want to play its fine and that they can stop at any time. Tell them not to tell anyone else the answers to the questions or the questions.

Pre-Test

Tell them to give an answer to the question even if they don't know it, and explain its okay if they don't know the answer.

They can ask help for anytime for explaining the question but explain I can't give them the answers

Game

Brief of the game:

You as the player are controlling a character as they explore different planets and do assignments for their classwork. You will travel to two planets Mercury and Venus.

Show them the Spaceship and guide them to the first level

Mercury

They have to collect 5 Meteorites

Puzzle One:

Which Planet is the closest to the sun

Venus

Traverse through the level without respawning

Puzzle Two:

Which Planet is the Biggest Venus or Mercury

Post Test

Ask them to fill out the post questions, again tell them not to worry whether the get the answers right or wrong.

Game Review

Ask them to fill out the questions on the sheet regarding their opinion on what they have seen on the game

Conclusion

Log the results, and await next tester

PRE TEST

The pre-test questions are to see the prior knowledge of the subject (which is the solar system) The following are the questions that the children were asked:

Please Answer All Questions

ID Number: ____   Gender:______

Pre-Test

Which Planet is closest to the Sun?

Answer: ______________________________

Which Planet is similar in size to the Earth?

○ Mercury
○ Venus
○ Mars

Does Venus have volcanoes?

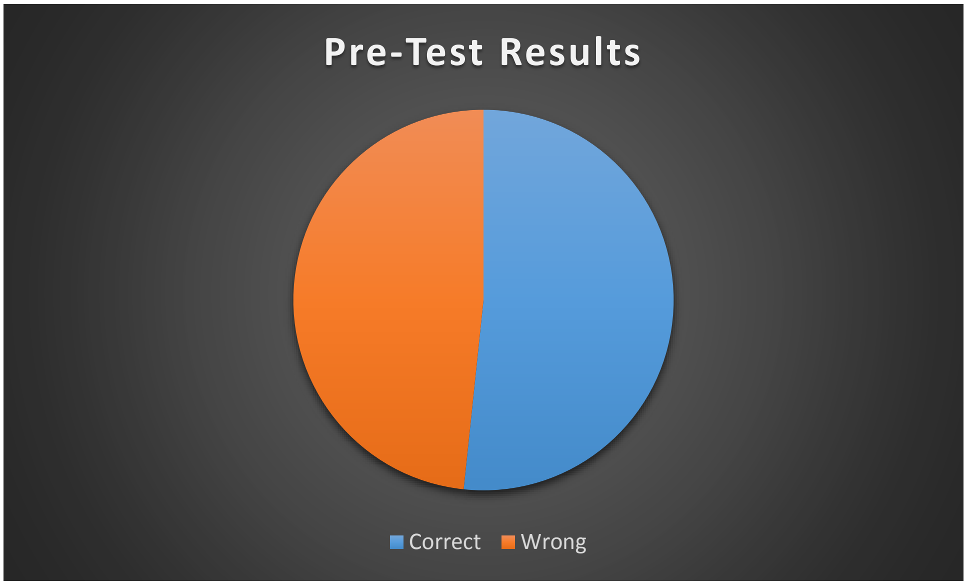
○ Yes
○ No

Does the sun look the same size on Venus as it does on Mercury?

○ Yes, it looks the same size
○ No it looks different

PRE-TEST RESULTS

The following graph indicates the results of the pre-test



The results of the pre-test show that the amount of correct, and wrong answers is very split in half, a lot of these were guesses majority of the students didn't know much on the subject.

POST-TEST

After the game was played the child would then be asked to fill out the post test, in the post test the questions were based on the learning aspects in the game. The following are the questions asked:

Please Answer All Questions

ID Number: ____ Gender:______

Post-Test

1. Is Venus smaller than Mercury?
   - ○ Yes
   - ○ No

2. What does Mercury have a lot of?
   - ○ Craters
   - ○ Mountains
   - ○ Water

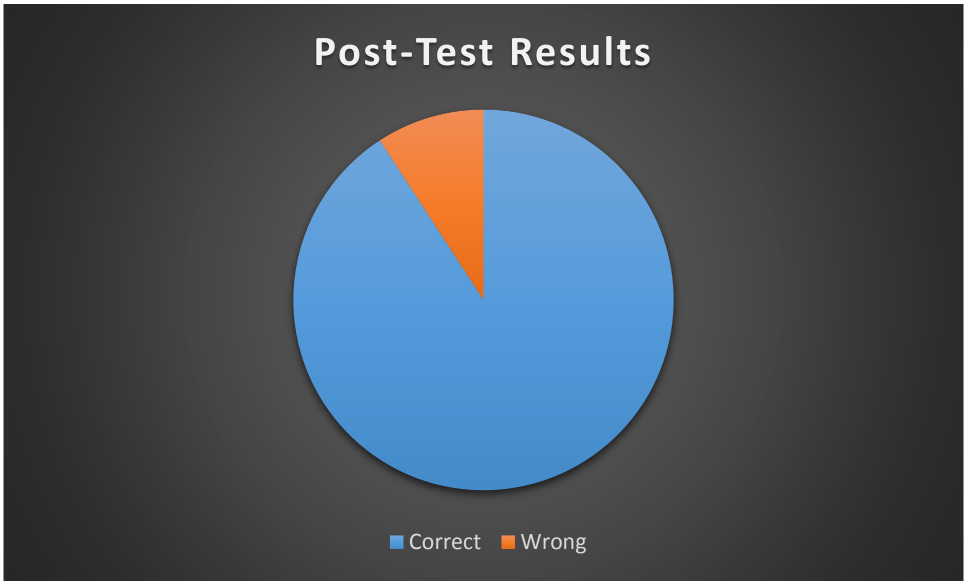
3. How does Venus spin compared to the Earth?

Answer:

4. Which planet does a full orbit of the Sun in the shortest period of time?
   - ○ Mercury
   - ○ Earth
   - ○ Neptune

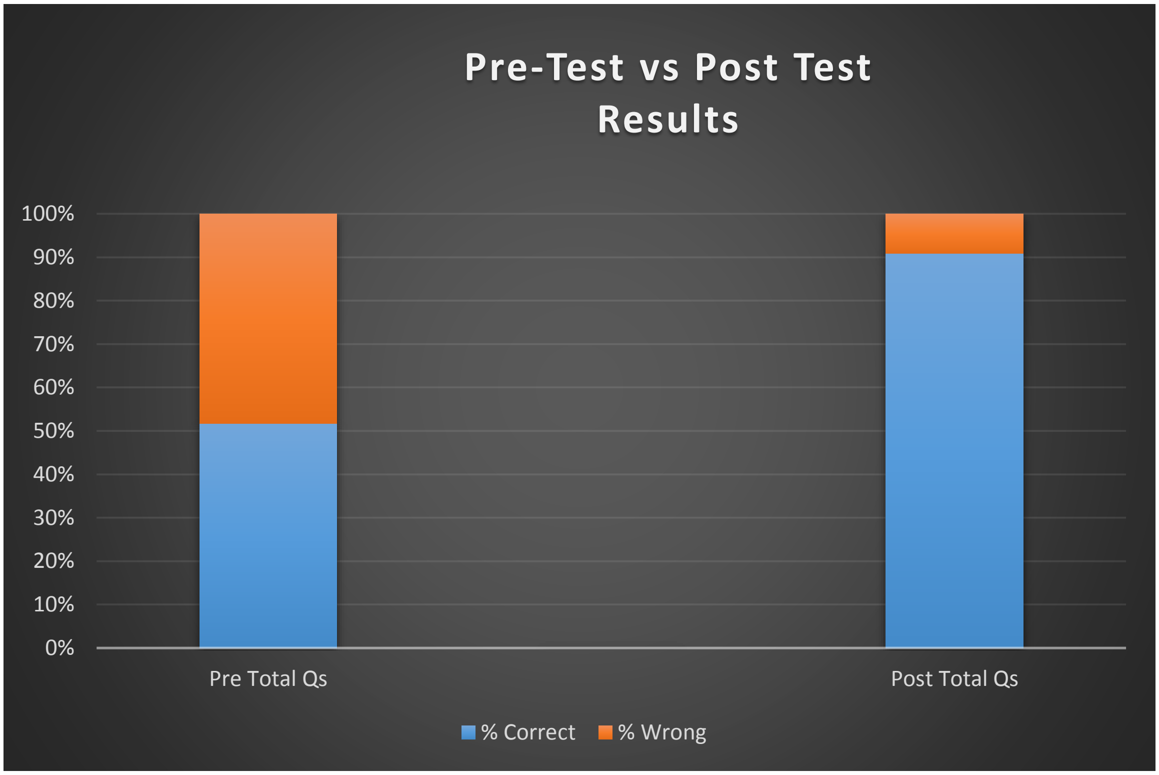
POST-TEST RESULTS

The following graph indicates the results of the post-test



PRE-TEST RESULTS VS POST TEST RESULTS

As you can see when you compare both graphs the results significantly improved from the Pre-test to the Post test. This shows that the educational features in the game do indeed do as I intended which was to teach.



GAME OVERVIEW SURVEY

After the pre-test the gameplay and the post-test were completed I asked the child to fill out this form to see what they actually thought of the game, this if the game is both enjoyable as well as educational.

Game Overview

1. Did you like playing this game?
    1. No
    2. Not Really

    3. Neither Like or Dislike
    4. Liked it
    5. Really Liked it

2. What did you like most?

Answer:

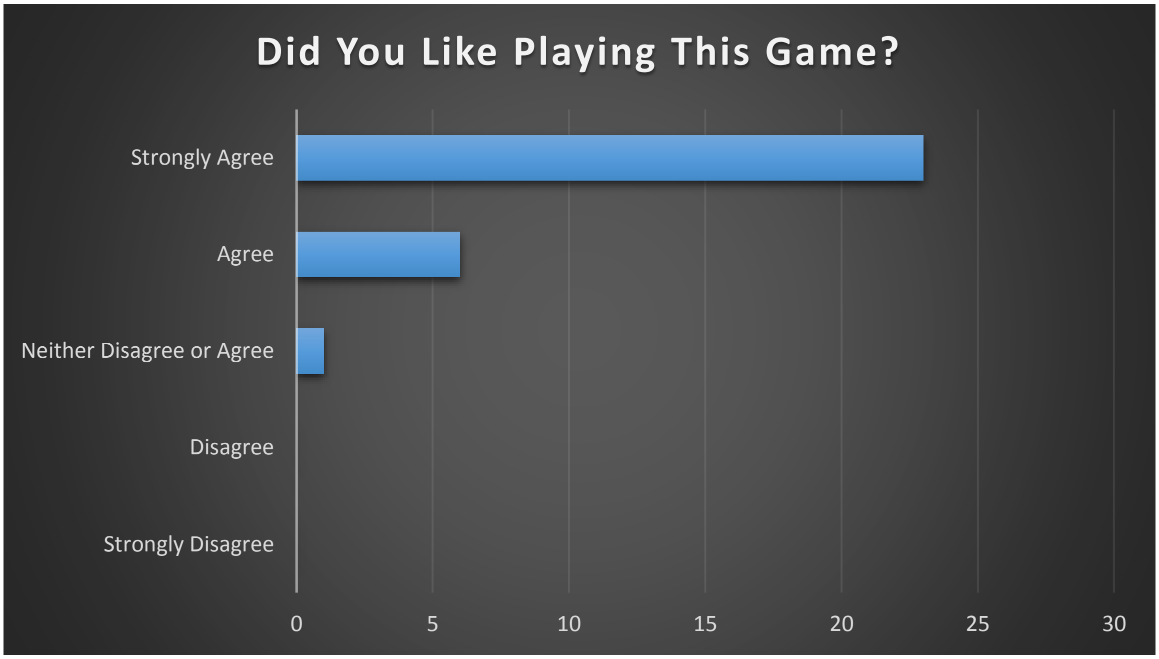
3. Would you play this game again?

Answer:

4. Would you like study other subjects in a game? (Example: English, History, Science)
    - ○ Yes
    - ○ No

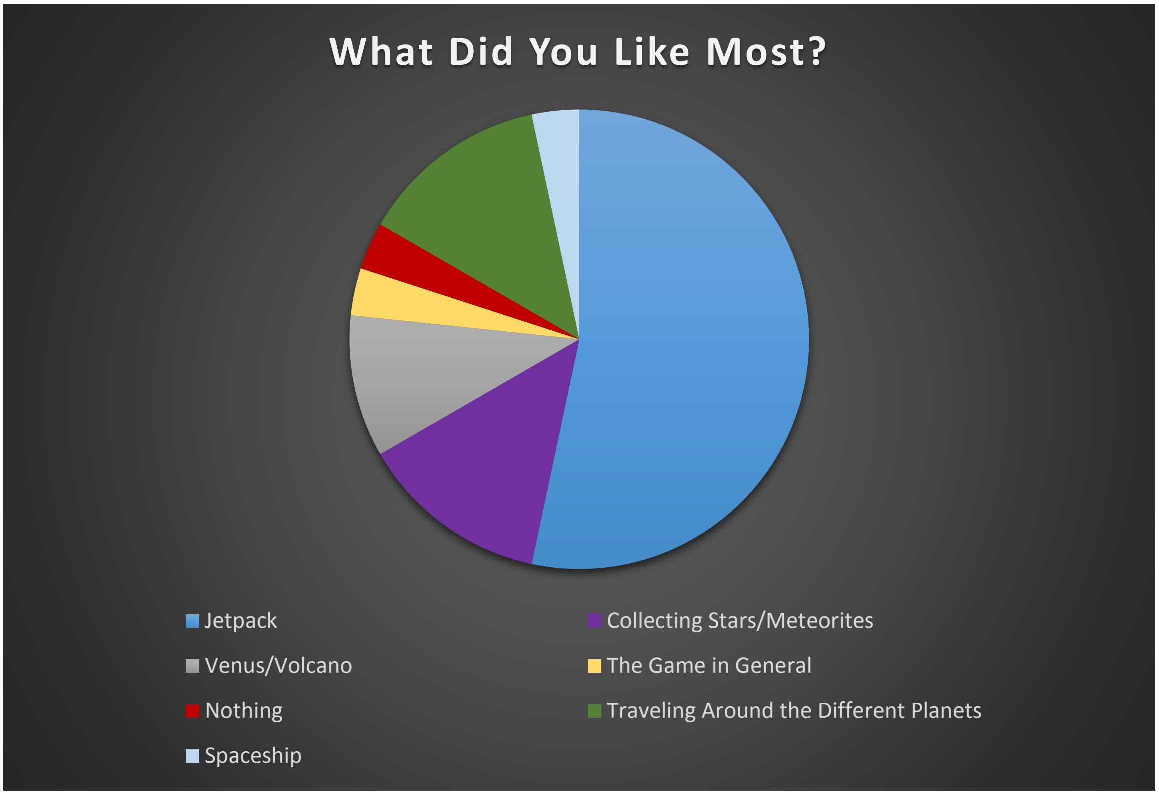
GAME OVERVIEW SURVEY RESULTS

Question 1



As you can see from the results, most of the students really enjoyed playing the game, and the others liked it, and then one student didn't dislike or liked it, this is a great result.

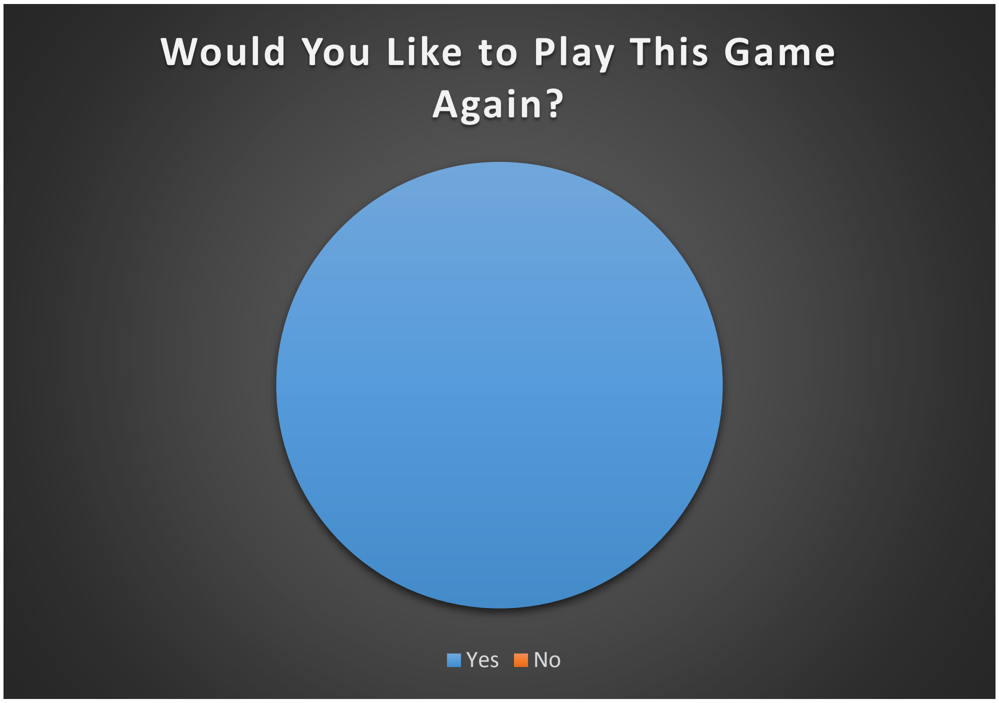
Question 2



As you can see from the pie chart above the most popular feature in Final Frontier is the Jetpack on the level Mercury. While I was doing the testing I could see how excited the students where while they get to play with the jetpack. While others made sure that they got every single star and collectable they could see. A few of the students also got very excited at seeing the volcano on Venus and even tried to walk in the lava.

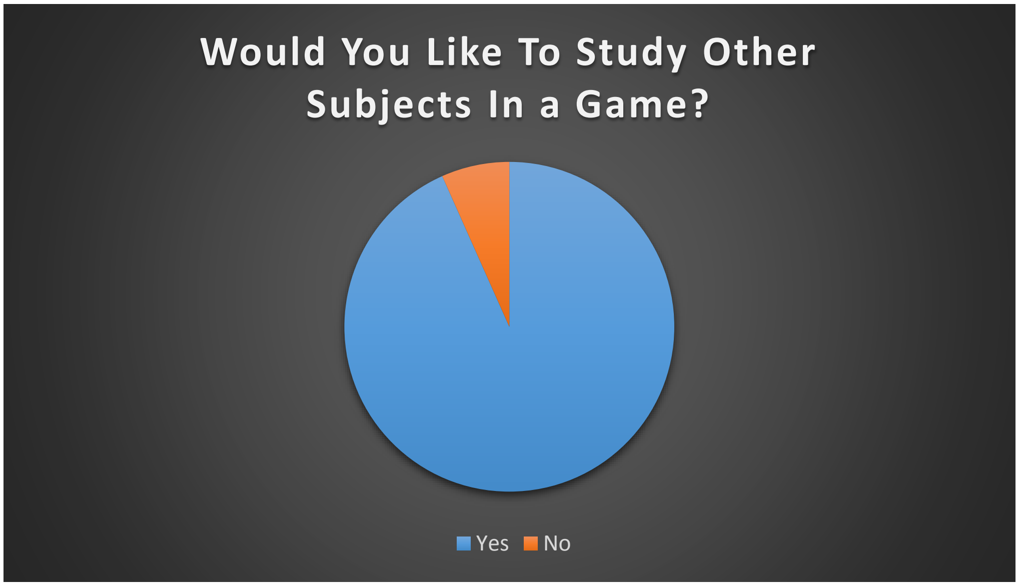
A lot of the students really enjoyed going to the different planets and asked me when the game is finished will they get to visit more than the two planets; it was nice to see such enthusiasm. One student really liked the Spaceship, another just liked the game overall. Then one student said there was nothing that he particularly liked about the game.

Question 3



As you can see from the above Chart, every one of the children said yes that they would like to play the game again, this was great feedback for me as it means that they really did enjoy playing the game.

Question 4

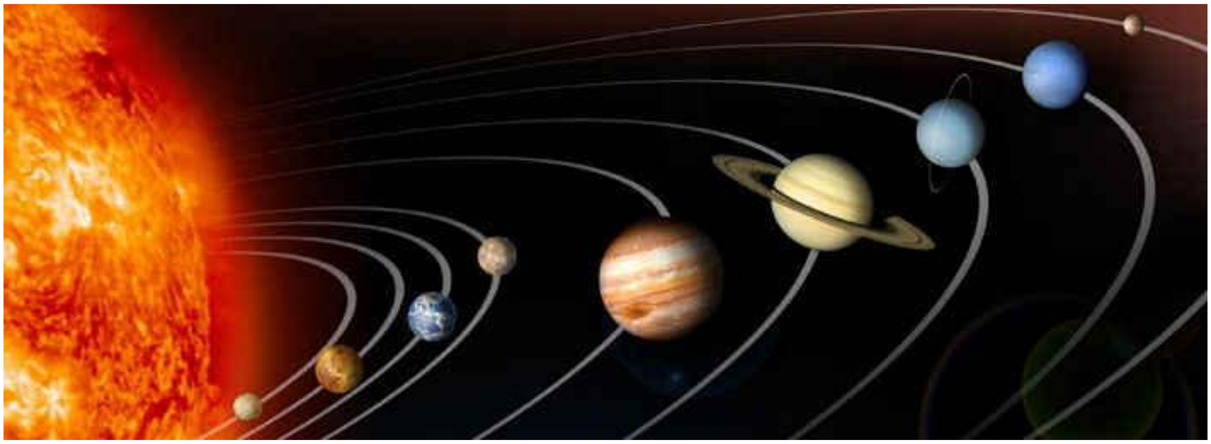


As you can see from the graph majority of the class bar two students would rather play the game as opposed to learning in the normal setting of books.

EDUCATIONAL GAME VS STANDARD TEACHING METHOD

To test if my game is teaching children better than the standard way, I went to another school that's close to me and went to the same age group of students, I wrote out a paragraph explaining what the features my game teaches and gave it to the teacher, the teacher gave out the pre-test to the students and asked them to fill it out. She then taught them in the normal teaching method reading out the facts and giving them out a work sheet. The students were then asked to fill out the post-test.

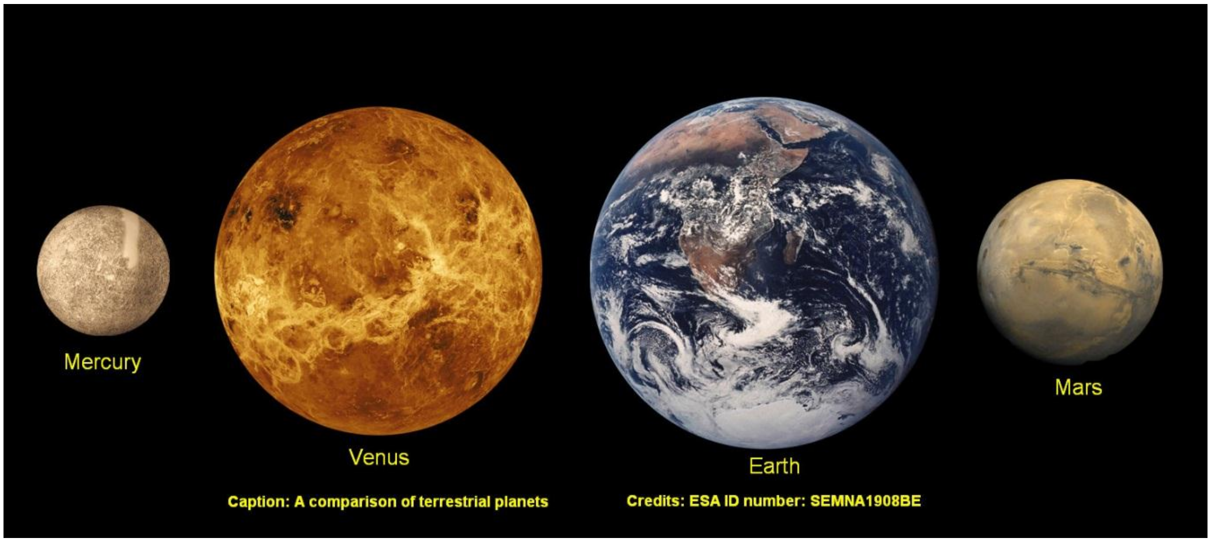
The paragraph I gave this teacher was as such:



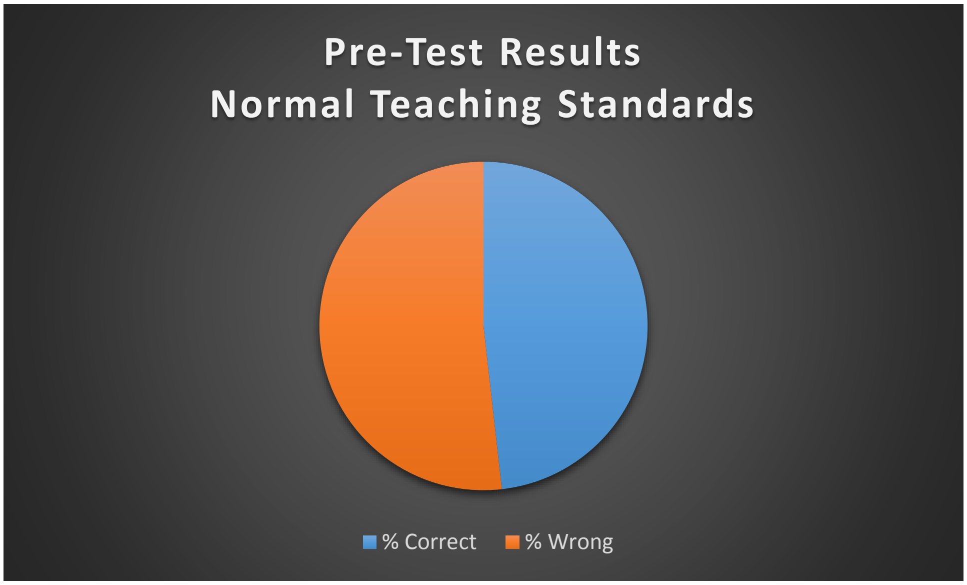
In our solar system we have 8 planets, Mercury Venus, Earth, Mars, Jupiter, Saturn, Uranus, and Neptune. Today, we are going to focus on two planets Mercury and Venus

Mercury is the smallest and closest planet to the sun, but it is not the hottest, Mercury is full of Craters, which are giant holes caused by meteorites.

The next planet is Venus, which is the hottest planet in our solar system because of the clouds of Carbon Dioxide gas that traps in the sun's rays. Venus is very similar size to earth but it actually spins the opposite direction to Earth.

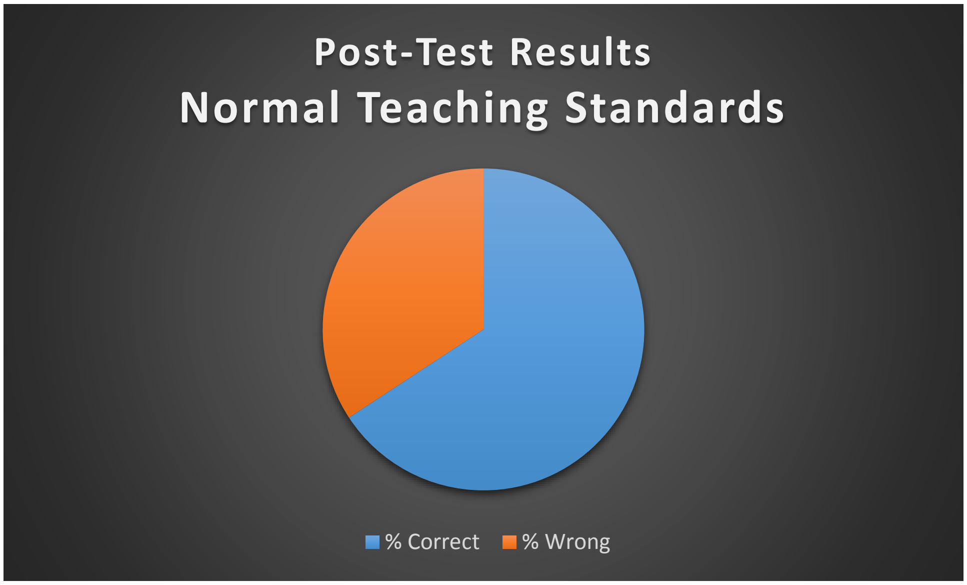

Mercury
Venus
Earth
Mars
Caption: A comparison of terrestrial planets
Credits: ESA ID number: SEMNA1908BE

RESULTS OF PRE-TEST



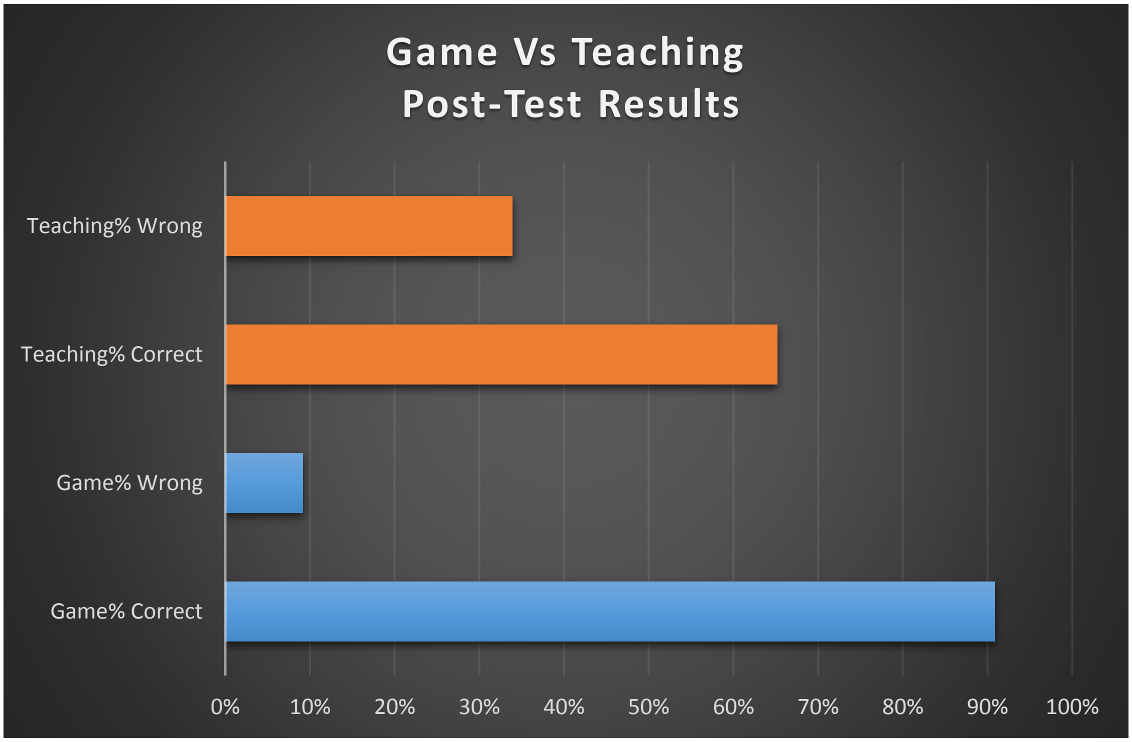
As you can see the results are very similar to the previous class in the Pre-test results, but there was slightly more questions answered incorrectly.

RESULTS OF POST-TEST



As you can see from the chart, the results did improve through the normal teaching method

COMPARISION GAME VS NORMAL TEACHING METHOD



As you can see in the comparison of the results, the students that played the game had an increase of corrected answers compared to the students who learned the normal teaching method. This shows that my project does indeed have a good educational value even compared to the normal teaching method.

EVAULATION OF TESTING

After viewing the Pre-Test results its evident that the students did not know much about the subject matter before hand, most of the students guessed the answers so this would have affected the result.

The Post-Test results are pretty self-explanatory, majority of students got all the questions correct after playing the game.

When comparing both the Pre-test and Post-test results it is evident that after playing the game the students learned about the subject (Space).

The results of the Game Overview survey show that overall most people really liked the game, and the most popular feature in the game was the jetpack. There were a two students who still would rather learn through the traditional way of books, but a majority of the students would rather learn through video games, and all the students would have liked to have played the game again.

After conducting the tests again in another primary school getting the teacher to do the normal method of teaching with the kids and comparing the results with my game taught students I was delighted to see that the children who played my game performed better than those taught the traditional way. This confirmed that my game does indeed accomplish its goals on teaching children about the solar system which I am delighted with.

If I was to redo the testing on a different group of students, I would like to ensure that no students could hear what was going on with other students. The area I did the testing was the area that the students get a drink of water, which resulted in eavesdropping and they knew some answers before they came up to do the test themselves. I would also like to change the time period on which the post-test results where asked, perhaps 3-4 days after they played the game to ensure that the educational part actually got learned.

As a side note the SNA (Special needs assistant) of the class approached me to tell me that some of the students that she has to keep an eye on due to learning difficulties preformed outstanding in this type of learning. The students would usually have difficulty paying attention while reading books, or listening to the teacher talk about subjects, but this type of learning they excelled at, and it was great to see their enthusiasm. The fact the children were so enthusiastic about playing the game really helped with the learning aspects, because they wanted to learn. The puzzles in the game also helped keep the flow of the game while the children still did learn and this really benefited.

Commercialisation

THE MARKET

This project, has a great commercial opportunity there is indeed a gap in the market for educational games, parents are forever trying to find the edge for their children to do better and learn, and as the results from the testing show many children benefit from learning in this

INNOVATION

This project is indeed innovative, it uses the primary school curriculum as a base to teach children through interactive features in the game, this method can be used in various other subjects in the curriculum such as English, Maths, Science etc, there are virtually no games that have this concept so Final Frontier would be one of the first of its kind.

DISTRIBUTION: STEAM GREENLIGHT

As mentioned before Steam is an online distributor of PC games it also has as of September 2015, 6,463 Windows games, 2,323 OSX games and 1,500 Linux games available, the service has over 125 million active players and steam also had as many as 12.5 million concurrent players as of November 2015.

Steam greenlight is a system steam uses to enlist the community's help in picking some of the new games to be released on steam. The developer of the game would post information, screenshots and a trailer for their game and seek a critical mass of community support in order to get selected for distribution. This system also helps developers get feedback from potential customers and start creating an active community around their game during the development process, which is a great asset as the developer can get feedback.

How to submit to steam greenlight

- There is a onetime submission fee of $100
- A square branding image (similar to a box cover) to represent the game in lists and search
- At least 1 video showing gameplay of the game
- At least 4 screenshots or images
- A written description of the game along with the tentative system requirements.

In order to get the game greenlit, it needs to be voted in by the community, the specific number of votes doesn't matter as much as relative interest in a game compared with other games in steam greenlight. Steam reach out to developers as they see the game getting traction regardless of whether they have achieved a specific number of votes or are sitting 1st or 2nd place at any given time. Steam are most interested in finding the games people want in the store not requiring them to hit a specific number of votes. This is extremely beneficial way for both the community and developers to get their games greenlit.

You can post your game on steam greenlight even if the game is still in development, its classified as "Early Access" or "Beta"

All royalties with steam would be worked out when the game has been officially greenlit.

POTENTIAL CUSTOMERS/MARKET

After the testing of the game, majority of the students wanted to know where the game would be available to be purchased from, and asked would I come back and distribute the game to them when its finished. I was also invited to do a presentation about game development and my game in an older class and they two wanted to know whether the game would be available to buy and for them to play it. This signifies that there is already a keen interest in purchasing the product, and as you can see from the results of the testing over **95%** of students said they would like to play this game again. So as it stands Final frontier already has potential customers and has already gotten extremely positive feedback.

COST TO COMMERCIALISE

The only cost that it would to commercialise this product would be the Steam fee of $100 and then the royalties to be discussed with steam after the game has reached Greenlight

POTENTIAL BUYERS/PARTNERSHIPS

After some research around I found a game developer company that specialises in children educational app games, there is a potential that they could help me improve my project by making it available on the app store to make the game have a bigger market and make it more easily accessible. The company is called Story Toys.

I also read over the colleges Intellectual property policy and I understand that if I was to go down this route that I would have to talk to a member of the college to get advice on these subjects.

CONCLUSION

If I was to commercialise Final Frontier I would like to do it through Steam as it has the potential to reach hundreds even thousands of potential players due to its activity. I also think the way games get accepted onto steam through Steam greenlight and community involvement is a great way to get your game approved, as it also gives you an audience to help boost awareness about your game.

Conclusion of Project

Describe the advantages/disadvantages, opportunities and limits of the project.

Final Frontier has many advantages, disadvantages and many opportunities, I will now discuss these topics on what I feel were the main effectors when it comes to my project.

ADVANTAGES

Unreal Engine 4 Graphics

Because I chose unreal engine 4 I was able to bring the planets to life. The power that the game engine has is incredible which really allowed me to make the planets look like they would in real life (based off pictures and knowledge known) When the students who tested my game seen the graphics they were amazed and I found this to be a great advantage, the result would not have been the same if I had used unity.

Mixamo & Fuse Characters

Using Mixamo & Fuse for my characters allowed me to save hours upon hours of painstaking work modelling my own characters from scratch in Blender or 3DS Max, which was great because I could use this time to add more functionality to my game.

Incorporating Primary School Geography Curriculum

After getting access to the primary school curriculum I was able to design the educational features to compliment them in my game to aid in teaching, I feel this was a great advantage that would help my game stand out from the rest of the educational games in the industry. I also feel this is one of the main selling features of my game.

Different Level Types

Final Frontier allows players to visit the different inner planets, each one has its own unique task, Mercury – Collect Meteorites with Jetpack, Venus – Carefully traverse the planet without letting the bar drop, Moon – Get across the platforms, and Mars – Drive the Space Buggie and collect the objects in a time limit. I feel that since the game has so many different features it would be more enjoyable and fun to play, thus more likely that the player will keep wanting to play to see what the next level holds.

Puzzles

For the player to access the next level they need to complete a puzzle, all the puzzles are different but they involve something they learned on the previous level, these puzzles ensure that the player actually learned something along the way, and if they do not know it they can go back to the previous level to find out. I feel this is a great way to ensure the player actually remembers and learns as they play.

DISADVANTAGES

Time Limit

When most video games get designed, it can take years upon years, with a dedicated team working on the game every day. This considering my game could of turned out a lot worse considering the circumstances, but it also could of turned out a lot better if I had more time and it was not just one person working on it.

Chosen Platform

Due to the graphics this game has, (which above I listed as an advantage) it has limited the platform on which the game can be released, most children have wide access to app stores such as Google Play and the Apple Store, but unfortunately most devices would be unable to run this game because of the graphical nature of it. This limits the amount of customers that could have been reached considerably. In any future projects that I would have to consider this carefully.

OPPORTUNITIES

Testing

Due to the nature of Final Frontier being an educational game for children I decided the best place to test it would a class room environment. Because I was able to test it with potential clients I could see real results which was a great opportunity and I thoroughly enjoyed it. Also comparing the post test results of my game and normal teaching standards was a great way to show how most students learn better through play than the standard method.

Steam Greenlight

If my game would get accepted in Steam Greenlight it would mean that users from around the world would have access to my game, and this idea is incredible to even consider. This kind of opportunity would be amazing considering it was just an idea I had back in the summer of 2015 while I was on work placement.

Further Development and Research

With technology ever expanding the possibilities also expand, Final Frontier in the future could be changed dramatically.

Final Frontier only touches on our solar system, the maps could easily be expanded as we learn more about our neighbouring planets, but not only that we could go to the outer planets and visit their moons. When more information is gathered we could even leave our solar system and explore others.

Another route would be to downgrade the graphics and expand the platform on which the game is played, make it available on mobiles (app store), consoles etc.

Another opportunity available would be to incorporate Virtual Reality. This would be a huge selling factor if the market gets bigger. This could be done by creating the game in First Person mode and then simply tweaking the setting for virtual reality. This would make you really feel like you are on the planets, especially with the amazing graphics unreal engine 4 provides

Overall these are only some of the ways Final Frontier could develop it has the opportunity to expand vastly.

Appendices

PROJECT PROPOSAL

OBJECTIVES

The project I am proposing is an Educational 3D platform game designed for children between the ages of 7-12. The main focus of the game is to teach the player about our solar system focusing on the rocky planets (Mercury Venus our Moon and Mars)

The game engine I will be using is Unreal Engine 4 which is well known for its amazing graphics capabilities. I choose this engine because I am going to be working on it for one of my modules and this will give me the head start I need on understanding how it works. This will be beneficial in two ways as it will help me also with any Continuous assessment I have during semester one in Computer graphics design and animation.

I will be using Mixamo and Fuse to create the characters that I will be using in the game engine. This software allows you to customise the character and then you can put it to the way you want it to look to even minute detail, you then upload it to fuse and choose whatever animations you want for the character you then you can add them into unreal engine.

I will be using Cartoony characters to be more attractive for children. The actual maps will be more realistic to give the most real life feel to them.

BACKGROUND

Final Frontier is a children's educational game that will teach them about space.

Educational games are games explicitly designed with educational purposes, or which have incidental or secondary educational value. Educational games are games that are designed to help people learn about certain subjects, expand concepts reinforce development understand an historical event or culture or assist them in learning a skill as they play.

So therefore educational games are used as a tool for building knowledge in certain areas for children and sometimes adults. A lot of children learn by play so educational games are a perfect way to help children learn. Most games today focus on teaching children about Maths English and even behaviour, but I think there is a lack of games that teach children about the environment, animals and of course space.

As educators, governments and parents realise psychological need and benefits of gaming have on learning, this type of education has gone mainstream. Games are interactive play that teach us goals, rules, adaptation, problem solving, interaction all represented as a story. They also satisfy our fundamental need to learn by providing enjoyment, involvement, structure and motivation all in the game itself while learning. This makes learning seem much less as a choir but fun and encouraged

My Inspiration:

When I was around 5 years old we got our first PC and the first game I had was the Magic school bus space adventure it was a single player game developed by Microsoft in 1994. It thought me a lot about our Solar system and I knew more than most people at my age. Since then I have not seen a game similar, and I feel like it would be very beneficial for them at that age.

In this game the school bus is magic and can transform into almost anything, so it transforms into a spaceship and flies into space. Ms Frizzle (the teacher) gets lost as soon as the bus flies away from earth to win the game the player has to discover the whereabouts of the Friz. To do this the player must play a whatsit game to earn a token to which gives them a clue to which planet Ms Frizzle is on. The player picks which planet to fly to and then they proceed to play a plat former game style and earn the token, to which aids them in winning the game. The game also hosted mini experiments to play and click on things in the environment for them to do something. Example: a volcano erupts when you click it.

With this game in mind I came up with an updated version of the game that would make it friendlier for a modern day children. I decided to change the game to be 3D and more lifelike but still hold a cartoon aspect. This way the player can still be immersed in the environment but still have the appeal of cartoons and bright colours.

My game starts when the player walks into the space station which is orbiting above earth and explained what there assignment is.

They are given sheets and they are told what they need to collect from each planet as part of an assignment after they visited all the planets they have to do a quiz about the solar system and they get a grade.

The player then goes to the console in the middle of the room and selects what planet they would like to go to.

The game itself will be based on the rocky planets of our solar system. The player will navigate through the planet collecting certain things that are on the list that the Teacher gave them to find (like a scavenger hunt). Once the player completes this they are returned to the space station and get to choose the next planet to go to.

The main difference between my inspiration and my game idea:

- The player will get to choose who they play as – A girl or a boy
- Better graphics
- More up to date information about our solar system

- Run smoother
- More engagement with the game
- Different Story line
- Assignment find objects not find the teacher

I feel the improvements that I have made to the idea of the game will make the game more interesting for children and also with the updated information will be more beneficial. The fact the child can choose who they get to play as will also mean they are more engaged in the game.

TECHNICAL APPROACH

Brief Description of the Approach:

I plan to get the basic game done firsts, so get the levels (which will be the different planets) complete so overall 9 levels which will include the platforms themselves and a blank model being able to transits across them.

When I complete this I will then move onto the animation of the characters using blender. I want to have two which the player can choose from a Girl and a Boy. I will start by getting the girl working and then will move onto the next step and come back to making the boy at a later date.

When that's done I will begin with designing the background with the use of parallax and sprites. Each level that's based off a planet so the background will reflect that.

I will then add the functionality to the levels, this will be adding objects that the player has to dodge and also the objects the player has to collect in the game to progress.

Then I will be designing the interface the player uses to pick the level they wish to play. This will be a simple menu that that has a "Start, Load, Options, Exit" When they press start the player gets promoted to pick a level "Mercury Venus Earth, Mars etc"

I will move onto the 3D animation of the Main character and teacher using blender and also the inside of the space station, this will be so they can move around the spaceship and the teacher will tell the student on what there assignment is.

To add to the atmosphere of the game I want to add in a 3D cinematic of the rocket the Main character is on to go to the space station this will be the opening to the game. I then want to add for level transition of the rocket leaving the space station and going to the planet of choice.

I then want to add more atmosphere by adding more children into the Main characters class and also finish off the boy model for the main character.

Research:

For aiding me in my project I will be using courses on Pluralsight they have plenty of courses on unreal engine4. I will then watch YouTube videos and help forums to help me if I get stuck on anything. With all these resources I will be able to achieve my game.

SPECIAL REQUIREMENTS

- Mouse & Keyboard / Controller
- PC/Laptop

The game will be able to be played on a pc/laptop and will be both mouse/keyboard and controller friendly.

TECHNICAL DETAILS

Unreal Engine 4

Unreal Engine 4 is a complete suite of game development tools made by game developers for game developers. Unreal engine 4 supports many different types of games from 2D platformers to 3D Virtual Reality games it gives you everything you need to grow as a developer and there are countless of tutorials online to help you along the way. The games made in unreal engine 4 can be exported to many different platforms such as PC, PlayStation, Xbox and even mobile, this makes it an ideal game engine to use and create games within.

Unreal Engine 4 Blueprints

Blueprints helps bring your creative visions to life in game. Blueprints enable a rapidly built prototype, quickly without having to go through lines and lines of code. Some main uses of blueprints are object and gameplay behaviors, modify player interfaces, and adjust input controls and much more.

Autodesk - 3DS Max

3DS Max is a 3D modeling animation and rendering software. It allows you to customize collaborate and create 3D content quickly. Due to its wide range of tools (and online tutorials) it allows you to grasp the concept quickly so you are able to focus on the creativity for your design. It also has character rigging and animation capabilities. If you are a student you are able to get a free Autodesk license for 3 years which I took up the offer on.

Mixamo and Fuse

Fuse is a software that allows you to create customized 3D models to the design and specifications that you wish. It's an incredible software, once the character is created you then can upload the character to Mixamo which auto rigs the character skeleton for you and then you can choose to animate it. Once this is all done you can download the character with its included skeleton, materials and animations and import them into unreal engine 4. This software is free as long as you have an adobe account

EVALUATION

In my project plan I have stated that I will test the project myself the entire time, I will run through the game and make sure that everything I have added works correctly. The first testing will be core mechanics; secondary core mechanics then there will be visual testing.

Towards the end I will have a group of my peers go through the game to see if they find any bugs and glitches, I will then fix these before I go to the primary schools.

When I have finished the testing from myself and my peers I am going to get permission from two primary schools near me for the children to test the game out and get their opinions on the game itself as well as the gameplay.

With all this testing the game should be glitch and bug free by the end of it.

Journal

SEPTEMBER

14/09/15

I have a fair idea of what my project is going to be, and I seem to be one of the only few that have come up with it.

The fact I have a 4-year-old daughter and I noticed barley any of the TV shows or games/App available actually teach children about space and the solar system I thought a game that teaches children about space would be a good idea. I'm not sure what way the game will be done but the idea is a start.

I did a course over the summer in unity to help me understand game engines and hopefully be useful in my game.

15/09/15

I had my first class with graphics and animation we were introduced unreal engine4 I had heard of it before from my friends but we got a first look at it this week and it seems really interesting. I could consider using this for my project.

We spent the class downloading unreal engine4 on the computers as they didn't have it on the machines I can't wait to get stuck into it. I came home today and made sure to download the engine on my PC and also my mams laptop (if I tried to download it on my laptop it would blow up)

16/09/15

Today our lecture finished a bit early so I started on my project proposal I put vague bullet points in about my ideas but some of the titles were a bit confusing so I decided I would ask Eamon on Monday.

18/09/15

Today Glen showed me the blueprint aspect in unreal engine4 as he was playing around with it, he showed me that he made a gun and how to change the size of the bullets it was really cool its making me think I'll choose unreal engine4 for my project as I really like the interface over Unitys

21/09/15

Today we had project class and I asked Eamon a few questions about whether we can use Blueprints in unreal engine4 as there is not much of a coding aspect to it but it is still very technical

He wasn't so sure what we were talking about so I decided to ask Anu tomorrow. I also asked him about the project proposal as I wasn't so sure what some of the titles were such as "Objectives" and "History" Thankfully he cleared these up for me :)

22/09/15

We had our first proper lab with unreal today, it was really fun I really enjoyed it, it feels a lot smoother than unity and more player friendly. I even got a compliment off our lecturer Anu asking if I had used unreal before.

We also asked Anu and the lab assistant Ben if we can use Blueprints in our project and they said yes so at least that's cleared up.

I have decided I will use Unreal for my project. Because we're going to be doing it in the class, and If I do some work outside class I feel this will give me a running start with the project.

28/09/15

Today I started filling in most of my project proposal I previously had bullet points with a vague description of some of it from two weeks ago, but coming in today to the independent study class I decided to get most of it finished so I can start getting some of the work done on the actual project itself.

Going through the proposal today has really made my projects aims and objectives a lot clearer for me. Even though I absolutely despise Gantt charts so this is definitely the hardest part of the proposal for me and hopefully the project!

30/09/15

I went to a spotlight on careers seminar today, and I realised I really need to work harder if I want to get a good job. So when I got home I decided to do a tutorial on pluralsight to get all the basics I need to know about unreal engine4. While I was watching it I noticed he used a software called 3ds max to import static meshes (the objects in the game) and he made them in 3ds max and he also said you can use Maya. So I googled them and I found out because I am a student I can get the software free for 3 years. So I downloaded it and I plan to find some courses online to help me learn how to use them and hopefully they will be useful for making my game. My auntie who is an SNA in a primary school also got confirmation from the teacher that I can bring my game into the classroom to test it around April.

I also finished up my project proposal and submitted it. One down!

OVERVIEW OF SEPTEMBER

- Got my project Idea
- Decided on the software I will use for my project
- Completed my Project Proposal
- Did an online course on unreal engine
- Got Confirmation about testers in a primary school

NEXT MONTH GOALS

- Start the 2D part of my game
- Do online course about Maya/3ds Max
- Start and complete the Requirement Specification Document

OCTOBER

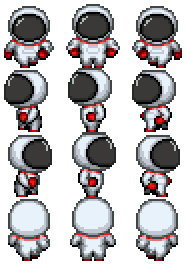
03/10/2015

Today I finished off a tutorial on unreal engine 4, it explained how to box off a level, make your own materials and how to import static meshes in. It will be extremely useful for making the spaceship part of my project. I also looked at the other courses on Pluralsight by the guy that did that one and he has loads of really useful ones, such as making a character in 3ds max and also how to make cut scenes in unreal engine, so I am definitely going to go looking over those.

I began a tutorial on how to make a 2D game in unreal engine 4 and it was by unreal engines very own YouTube channel he explained how to import your own sprite sheet and how to actually make the animations – with flip books.. I got around halfway through when I had to go collect my daughter from her dads was a bit frustrating having to leave halfway through and then I had my choirs to do but I will continue my work tomorrow, after all I finally got a start on it!

06/10/2015

From doing the tutorial the other day I realised I need to make my own sprites so I went to google to get some inspiration and I found this:



This gave me a brainwave of ideas on what I need to do, I'll need to add in jumping animations and possibly a colour change option of the suit (which will be the player's choice) and more drastic running animation but this is pretty much what I need.

07/10/2015

Today I got a blank copy and started writing down the key things I need for my project. I was too tired to start doing the practical end so I thought this was a better option than doing nothing. I got the basics of what I need which such as Into music etc, then I popped down the extras that I would like to get done such as a scoreboard system etc, then I started on the main planets. I've decided to do Mercury, Venus and Mars.

I also started going "window shopping" in the Epic games marketplace, I found music assets that I could buy and would suit my game at a reasonable price too. Unfortunately there were virtually no 2D assets so that was a bit of a let-down, but I will just make my own it should be fine.

So with this realisation I started thinking of what kind of assets I would need, so the colour of the rocks on the planet, what kind of background there would be. And also what kind of trials would the player have to deal with – bearing in mind this is a children's game so to keep the difficulty relatively simple

12/10/2015

Today I have decided I am not going to do my game in 2D. I have come to the conclusion I don't have the time or skill to make my own sprites for the character or the background etc. But in 3D I would be able to mould them and make my own material in the blueprints. So this has changed my mind and I will start on my game tonight.

We did a 2D game in class today for Animation and Graphic design and I really did enjoy it but looking at one of my peers (who is also making a 2D game) drawing on a digital drawing tablet doing pixel by pixel I decided against it, with my situation it would be way too time consuming.

20/10/2015

I haven't been able to do much lately because I fell ill and then I had to get my wisdom teeth out so I haven't been in the best shape but tomorrow I have a CA and I sat down to do some work on unreal engine 4. Anu told us that we have a choice on what kind of world we like so I decided to create desert oasis. I realised that there is no basic sand material so I had to make my own and I was determined. I figured out how to do it and I successfully made my own sand.

I got a Jpeg and added it into unreal engine I then created it as a material. I then added in the dirt texture and constant to remove the shine and make it more gravely looking. This will help my project immensely now I am able to make my own material so for sand all I would have to do is change it to a red colour to match Mars.

I had my meeting with Cristina today in a group with other students who have her as a supervisor. She said I might have to go to the ethnic committee about testing my project on children in a school so I need to look into this.

26/10/2015

I was playing the first mass effect and I got inspiration for an idea of my game. I'm going to try add in a level on the moon in a lunar rover type vehicle.

This is a screenshot from the game, and what gave me the idea. I've decided it will be more guided like the player will have to collect a certain amount of collectable objects such as stars or rocks.

28/10/2015

With two assignments due I have not done much of actual work on the project. So I have started the requirements specification document and I won't get much of the project done till that's done as my other assignment is due on the same day as this.

OVERVIEW OF OCTOBER

- Changed my project from 2D to 3D
- Learned how to create my own material
- Had my first meeting with my supervisor
- Got another idea to add to my game

NEXT MONTH GOALS

- Start the maps for the levels in the game
- Start the modelling of the character
- Start the starting widget for the game

NOVEMBER

14/11/2015

I've had a lot of work to do for my other subjects so I haven't been able to do much also my family is riddled with sickness and its starting to catch up to me. I sat down to try and get a start on the game but I couldn't get it to work but I know what's wrong – I tried to make a reddish rock material and nothing I was doing looked right. So I decided I'd leave it for another day and try again since I'm not feeling 100%

16/11/2015

Today while we were in independent study my friend Jamie told me about this site called Mixamo which allows you to make characters and rig them, this website is going to save me so much time. I had a look and there exactly what I need. They have children models and I will be able to have loads of different options to be able to change. They also have adult models too which I can use for the teachers. I just need to figure out how I'm going to get a space suit on them.

18/11/2015

We used the oculus rift today in class and I have decided that I want to try use it in my game. If I manage to do this then I won't need to have a spacesuit as it would turn into a first person game. The oculus took us awhile to start up but its crazy experience using it also gave me a slight headache after using it.

After the class I decided to check the age restrictions for it for children as I know the 3DS has a 7+ age limit, and I was right the age limit is 7 so I decided to change the age limit for the game, which I was considering doing anyway due to the ability to read.

21/11/2015

Today I sat down and decided that I was going to get some work done on my project and I did! I made my characters on Mixamo decided on what animations to use and I then imported it into unreal engine and got them moving and working in the engine! I was so proud of myself it's the first real breakthrough I had with the project.

This is the female character Lucy.

Since I want to do my game in oculus rift I might not need the characters because if it's in oculus it will be in first person view and not third person. But If I can't get the oculus to work I have this as a backup plan.

23/11/2015

After the success of importing the character I was trying to figure out how to I was going to make the terrain of the game. I found this site it has a software called World Creator which lets you make height maps which can be imported into unreal engine and then the map would be created.

I can get a free 30 day trial so I'm going to wait till I have enough time to go through them and make all the maps I need for my game.

DECEMBER

This month was a tough month for me. My brother passed away suddenly and I still had some college assignments due so this inhibited me from doing any project work. Currently the exams are coming up so I'm going to be concentrating on them but thankfully we only have three exams so when they are over and done I am going to work hard on the project to get the maps and character moving for the mid-point presentation.

I am also going to try get some functionality in the game such as picking up items etc for the mid-point presentation.

NEXT MONTH GOALS

- Start and complete maps of the game
- Have the character running around the maps
- Start the starting widget for the game
- Have item pickup

JANUARY

15/01/2016

Exams are over and it's time to get cracking. And I sure did, I got the moon done. It looks awesome. Now that that major part is complete I can start adding to the level. I have a fair few Ideas but I want to try get the landscape as realistic as possible as well.

One thing that's bothering me at the moment though is that my character isn't going to be in a spacesuit for the mid-point presentation I hope that doesn't lose me marks haha.

Over the next few days I hope to get a sun and earth added in to give the more realistic effect.

My goal is for mid-point presentation to have the Moon as a tutorial level that has Pick ups interactive objects in the level and also a main menu GUI and a pause menu. If I manage to get this much done I'll be happy. I also would like to try get a Save/Load done but I won't push my luck too much.

24/01/2016

Today I made a sun. I can't show here but the material moves, just like on the real sun. I am extremely happy with the outcome of this it looks really good.

25/01/2016

Today in college I forgot to bring my project into college with me. So I decided to work on how to design a Start Menu widget and my friend Jamie helped me with it so I got it done a lot faster than I expected. I couldn't bring it home with me so I took screenshots and learned how to make it and I redid it at home I'm pretty satisfied with the turnout

The New Game button when pressed will bring you to the moon level, currently the load doesn't work but I will amend that in the future.

I have an issue on getting it to work 100% though so I will have to have a chat with Jamie in the coming days and hopefully he can help me fix it.

26/01/2016

Today as soon as I got home I sat down and started on getting a few things done. I got a jump pad working. When a character steps/jumps on it they get launched in the air.

Here is the blueprints on how it works. On the node LaunchCharacter the Launch Velocity Z: is what you change on how high you want the character to go up in the air.

I also added in a planet Earth today

I added Earth Material onto a sphere and increased the spheres size. The shine also gave it a really nice effect I think.

27/01/2016 – 31/01/2016

These days have been pretty blurred into together. I got A LOT of my project done and I'm not sure what was on each day so I decided just to group it together. From the last post I have the moon map, a front menu, a jump pad and a sun and earth. From there these have what I got done:

- Added in an options menu to the opening screen with change resolution buttons
- Added an exit button to the opening screen
- Changing Resolution on screen
- Remade the moon map smaller to deal with loading times
- Added obstacle course using shapes and BSP to the Moon level
- Added a HUD to my game screen
- Successfully added my character into the project
- Added stars that update when you collect them
- Added in moving platforms onto the levels using matinee
- Got a spaceship map complete
- Added in NPC
- Have an interactive screen in spaceship to choose which level to go to
- Added trigger box doors on spaceship that open when you get close
- Added sound to the spaceship and moon level.

Overall I am delighted with the progress I made this month considering the rocky December I had. The only issue I'm having at the moment is Lucy jump animation. It's only starting mid jump and I'm not sure how to fix it.

I'm now focusing on my technical report for my midpoint presentation and I hope to do very well in it.

NEXT MONTH GOALS:

- Get Lucy jump animation working
- Start on Save/Load System
- Get information pop up

FEBRUARY

I didn't document the days this month I have been given other projects so I have been too busy to jot everything down day by day.

This month I had my Mid-point presentation, it didn't go as I expected, I didn't get as high as grade as I expected. I was a bit disappointed but after having a talk with Cristina I understand where I need to go from here to improve my grade.

I need to organise the testing with the school that my auntie works in. I got her email and am going to email her over the next few days and explain what I will be doing. I will also need to get a permission slip done for the children's parents to sign to ensure they are happy with them testing my game. Cristina said I should have a pre-test which will test their knowledge of space before they played the game and then have a test afterward also. This way I can then do a good testing section in my final report.

I lost marks in my technical report due to the requirements not being specific enough of being an educational game. After talking to Cristina about the educational aspect of my game I realised I need to add a variety of educational aspects in such as organising the heaviest metals on a planet etc. So I need to figure out how I'm going to do this what I've come up with is:

- ✓ Each planet will have different gravity values which effects the jump rate

Mercury Facts

- ○ Most cratered planet in the solar system
- ○ Smallest Planet
- ○ Second Hottest
- ○ Year on Mercury is 88 days
    - ➢ Asteroids & Craters and its "Fastest Planet"

Venus Facts

- ○ A Day on Venus is longer than a year on earth
- ○ Hottest Planet – 462 degrees Celsius
- ○ Over 1000 Volcanoes
- ○ Rotates opposite way than most planets
- ○ Atmospheric pressure is 92 times greater than earth
    - ➢ Greenhouse gas – hottest planet

Moon Facts

- ○ Neil Armstrong first man on moon
- ○ Moon has quakes
- ○ Moon is drifting away
- ○ Controls the tides on earth
    - ➢ Eclipses

Mars Facts

- ○ Largest dust storms in solar system
- ○ Smaller than earth
- ○ Liquid water
- ○ Sun half the size from mars
    - ➢ Rocks & Why the sand is red

So far these are the facts I have come up with for the child to learn while there playing. The ones with the arrows are what the sort of experiment will be on the planet.

Gameplay wise this month I managed to successfully add in:

- A pause menu
- Change character screen

I'm currently in the process of adding in an inventory system, and NPC AI.

For our Applied Artificial intelligence module our project is to add in some AI to our final year project so I decided to add in a NPC character that will patrol around a certain area and when he sees the player he will run faster towards the player and wave, he will also give helpful hints to the player.

And I am currently developing this.

I am also in the process of developing a Save/load system but it's going to be very difficult.

I got in contact with the Primary school teacher I will be doing the testing in her class and I explained the process etc and she seemed very excited. She also sent me the curriculum for geography which is the section that space is covered so I can now edit my requirements to suit this.

NEXT MONTH GOALS:

- Implement the AI
- Start organising the testing question sheets
- Get the save load system working
- Try implement the shop system

MARCH

The months have started to fly in, Exams start next month and I've 2 projects due, one of which is Artificial intelligence.

AI Project:

I added in an NPC roam and when he sees the player he starts to chase, it was only small but It uses behaviour trees and tasks etc.

I also added in an AI that can hear a sound. I did it that a Teacher runs to a certain point and if you make a sound the teacher runs over to the location of the sound. I'm going to use this for a Help Option, if the player gets stuck.

I can add this into my main project which will be of some benefit. I had originally planned to use a robot to do this but I opted for just having a teacher roaming around instead.

Other Objectivities

I had a meeting with Cristina and we discussed certain aspects of what I need to get done. The testing is a major part of my project and I need to get educational features in. I have interactive educational learning features in but NOT testing, so I need to devise a way to do this. I have one issue standing in my way though, EXAMS.

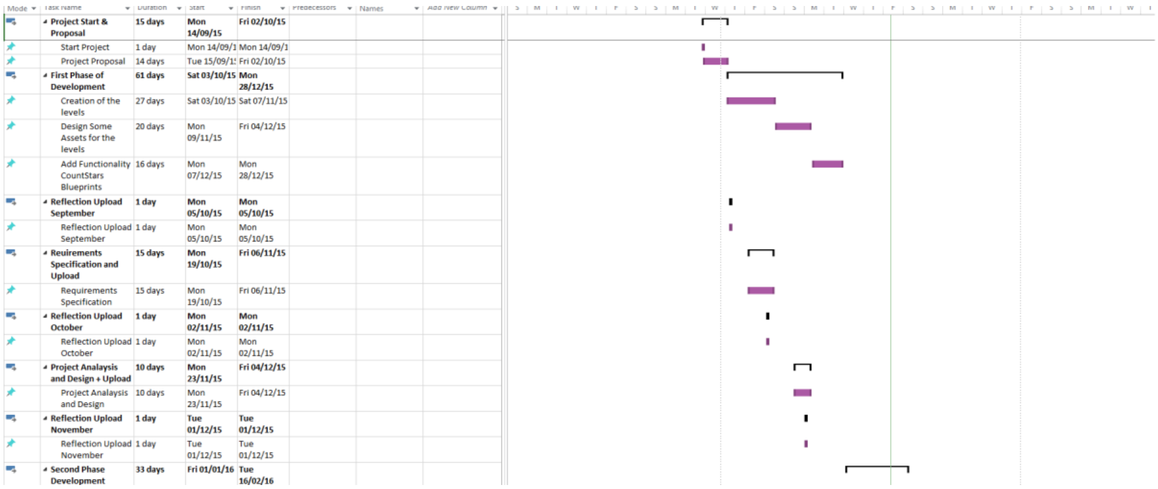
I've changed the layout of my starter map. Each planet loading area will be behind a door. To open the door a task must be completed, the answer to the task will lie on the previous planet. This way it's an easier way to test if they learned something while playing the previous level.

After my exams are complete I will continue to work on this so I can get it ready for the testing in April.

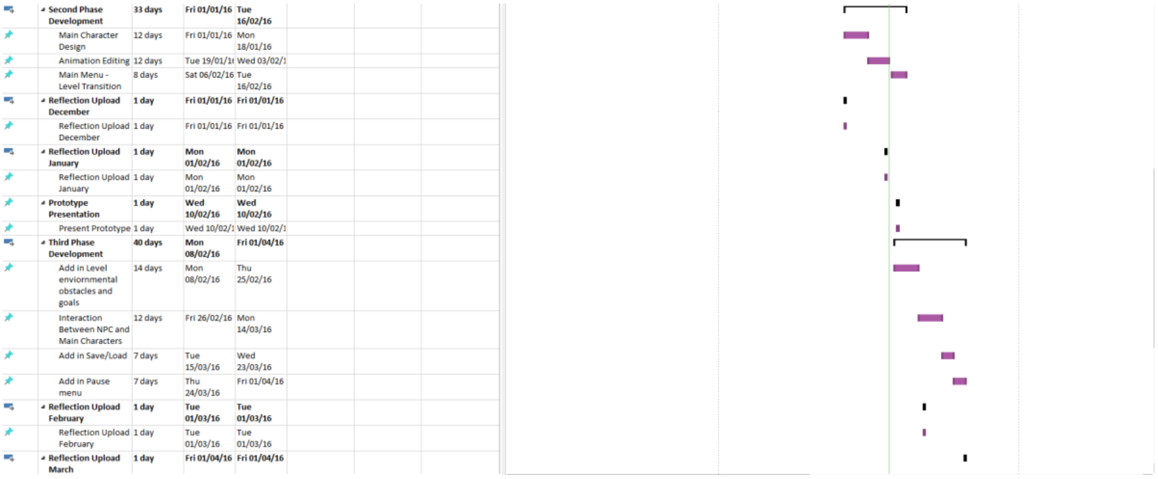
NEXT MONTH GOALS:

- Start polishing off project
- Get testing complete
- Start final documentation
- Get poster done

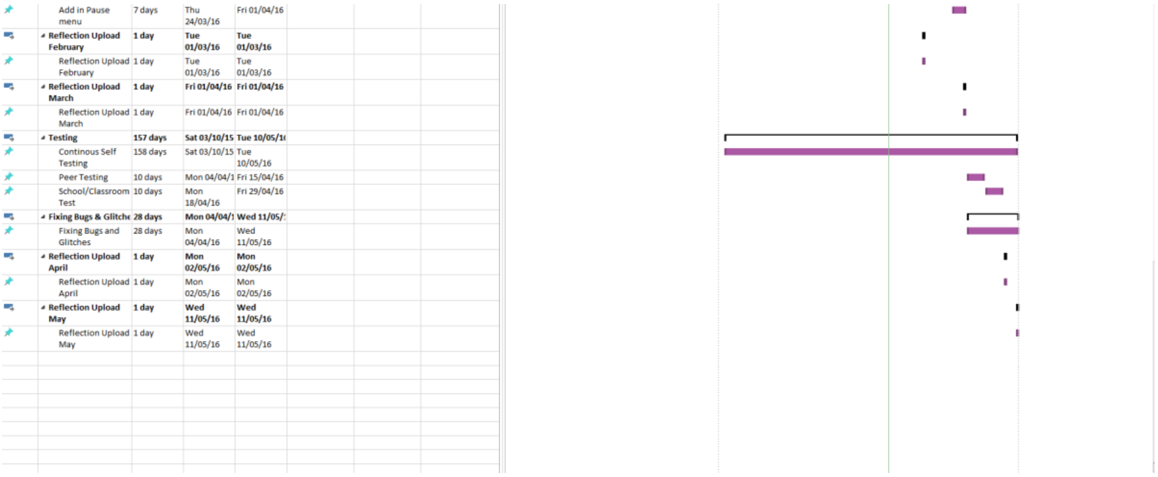
Project Plan



Mode	Task Name	Duration	Start	Finish	Predecessors	Names	Add New Column
▬	**Project Start & Proposal**	**15 days**	**Mon 14/09/15**	**Fri 02/10/15**			
📌	Start Project	1 day	Mon 14/09/1	Mon 14/09/1			
📌	Project Proposal	14 days	Tue 15/09/1!	Fri 02/10/15			
▬	**First Phase of Development**	**61 days**	**Sat 03/10/15**	**Mon 28/12/15**			
📌	Creation of the levels	27 days	Sat 03/10/15	Sat 07/11/15			
📌	Design Some Assets for the levels	20 days	Mon 09/11/15	Fri 04/12/15			
📌	Add Functionality CountStars Blueprints	16 days	Mon 07/12/15	Mon 28/12/15			
▬	**Reflection Upload September**	**1 day**	**Mon 05/10/15**	**Mon 05/10/15**			
📌	Reflection Upload September	1 day	Mon 05/10/15	Mon 05/10/15			
▬	**Reuirements Specification and Upload**	**15 days**	**Mon 19/10/15**	**Fri 06/11/15**			
📌	Requirements Specification	15 days	Mon 19/10/15	Fri 06/11/15			
▬	**Reflection Upload October**	**1 day**	**Mon 02/11/15**	**Mon 02/11/15**			
📌	Reflection Upload October	1 day	Mon 02/11/15	Mon 02/11/15			
▬	**Project Analaysis and Design + Upload**	**10 days**	**Mon 23/11/15**	**Fri 04/12/15**			
📌	Project Analaysis and Design	10 days	Mon 23/11/15	Fri 04/12/15			
▬	**Reflection Upload November**	**1 day**	**Tue 01/12/15**	**Tue 01/12/15**			
📌	Reflection Upload November	1 day	Tue 01/12/15	Tue 01/12/15			
▬	**Second Phase Development**	**33 days**	**Fri 01/01/16**	**Tue 16/02/16**			



▬	**Second Phase Development**	**33 days**	**Fri 01/01/16**	**Tue 16/02/16**			
📌	Main Character Design	12 days	Fri 01/01/16	Mon 18/01/16			
📌	Animation Editing	12 days	Tue 19/01/1(	Wed 03/02/1			
📌	Main Menu - Level Transition	8 days	Sat 06/02/16	Tue 16/02/16			
▬	**Reflection Upload December**	**1 day**	**Fri 01/01/16**	**Fri 01/01/16**			
📌	Reflection Upload December	1 day	Fri 01/01/16	Fri 01/01/16			
▬	**Reflection Upload January**	**1 day**	**Mon 01/02/16**	**Mon 01/02/16**			
📌	Reflection Upload January	1 day	Mon 01/02/16	Mon 01/02/16			
📌	**Prototype Presentation**	**1 day**	**Wed 10/02/16**	**Wed 10/02/16**			
📌	Present Prototype	1 day	Wed 10/02/1	Wed 10/02/1			
▬	**Third Phase Development**	**40 days**	**Mon 08/02/16**	**Fri 01/04/16**			
📌	Add in Level enviornmental obstacles and goals	14 days	Mon 08/02/16	Thu 25/02/16			
📌	Interaction Between NPC and Main Characters	12 days	Fri 26/02/16	Mon 14/03/16			
📌	Add in Save/Load	7 days	Tue 15/03/16	Wed 23/03/16			
📌	Add in Pause menu	7 days	Thu 24/03/16	Fri 01/04/16			
▬	**Reflection Upload February**	**1 day**	**Tue 01/03/16**	**Tue 01/03/16**			
📌	Reflection Upload February	1 day	Tue 01/03/16	Tue 01/03/16			
▬	**Reflection Upload March**	**1 day**	**Fri 01/04/16**	**Fri 01/04/16**			



📌	Add in Pause menu	7 days	Thu 24/03/16	Fri 01/04/16			
▬	**Reflection Upload February**	**1 day**	**Tue 01/03/16**	**Tue 01/03/16**			
📌	Reflection Upload February	1 day	Tue 01/03/16	Tue 01/03/16			
▬	**Reflection Upload March**	**1 day**	**Fri 01/04/16**	**Fri 01/04/16**			
📌	Reflection Upload March	1 day	Fri 01/04/16	Fri 01/04/16			
▬	**Testing**	**157 days**	**Sat 03/10/15**	**Tue 10/05/1(**			
📌	Continous Self Testing	158 days	Sat 03/10/15	Tue 10/05/16			
📌	Peer Testing	10 days	Mon 04/04/1	Fri 15/04/16			
📌	School/Classroom Test	10 days	Mon 18/04/16	Fri 29/04/16			
▬	**Fixing Bugs & Glitche**	**28 days**	**Mon 04/04/1**	**Wed 11/05/:**			
📌	Fixing Bugs and Glitches	28 days	Mon 04/04/16	Wed 11/05/16			
▬	**Reflection Upload April**	**1 day**	**Mon 02/05/16**	**Mon 02/05/16**			
📌	Reflection Upload April	1 day	Mon 02/05/16	Mon 02/05/16			
▬	**Reflection Upload May**	**1 day**	**Wed 11/05/16**	**Wed 11/05/16**			
📌	Reflection Upload May	1 day	Wed 11/05/16	Wed 11/05/16			

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