# Game Design Document

WIP (Last edited 21/11/24)

## Concept

This game offers a short, fun, and challenging fast-paced platformer experience. It features controls and a graphical style reminiscent of the original Resident Evil games.

## Story

N/A

## Game Structure

The game consists of two levels, both challenging players with progressively difficult platforming and puzzle-solving tasks. As the player advances, they'll face increasing threats, more complex puzzles, and tougher platforming challenges.

## Players

Players can use either a controller or keyboard and mouse, though KBM is recommended for the best gameplay experience.

## Action

The player controls a marble which is influenced by physics. The player can accelerate, decelerate and rotate their desired look direction.

## Objective

The player's objective is to reach the end of each level. A stopwatch displayed in the top-right corner of the HUD enhances replay value by encouraging players to complete levels as quickly as possible. This feature adds a competitive element, motivating players to improve their times with each attempt.

## Graphics

### Aspect ratio

The game will be locked at a 4:3 aspect ratio. Black borders will fill the unused horizontal space on 16:9 and ultrawide displays.

### Fixed camera angles

Players will view the world through fixed camera angles, reminiscent of cinematic shots in movies. Each scene will feature pre-rendered image backgrounds, with the player character and essential prop elements being rendered in real-time 3D and superimposed over these images.

## Resolution

The game will render internally at a resolution of 320×240. The resulting frame will then be upscaled to fit the player's screen resolution. This upscaling process will use the Nearest Neighbor algorithm to maintain the game's pixelated aesthetic.

Select scenes, including the title and end screens, will be internally rendered at a higher resolution of 640×480. This is because these scenes require extra detail that cannot be shown with a 320×240 resolution.

## 3D assets

3D assets will be made with a strict polygon limit to mimic the limitations of the PlayStation (PSX) hardware.

## Pre-rendered backgrounds

Each scene will showcase a pre-rendered background image that fills the entire screen. These background images will match the game's internal resolution, being either 320×240 or 640×480.

# Data Storage

## Background images

Due to the resolution of the background images being very low compared to textures in modern video games, every scene background for the current level can easily be loaded into memory during the initial loading screen. This is important as loading times in between each scene could potentially be a nuisance to the player and might hurt the pacing of the game.

Background images will be either 320×240 or 640×480. They will be compressed.

## 3D assets

All 3D assets for the level will be loaded in during the initial loading screen and will be stored in memory until they are not needed anymore. 3D assets that appear in all levels (such as the player model) will be stored until the player exits to the main menu.

## Sound effects and music

Sound effects and music will be loaded in during the level's initial loading screen and will be stored in memory until the player exits to the main menu. It's important that audio is played instantly as any delayed audio could be off-putting to the player.

Sound effects and music will be compressed.

# Target System

This game will be produced for these platforms: Windows PC

### Windows PC

This version will be targeting a modern Windows 10 22H2 system with a graphics card capable of rendering with Direct3D11. At least 4GB of RAM will be recommended to handle overhead from Windows and other runtimes.

## Development Tools

### Game engine

Unity 6 (6000.0.20f1) will be used as the game's engine.

https://unity.com

### 3D Asset creation

Blender will be used to model 3D assets.

https://blender.org

### Texture creation

Adobe Photoshop will be used to create textures for the game

https://www.adobe.com/uk/products/photoshop.html

### Animation

Blender will be used to make the animations for the 3D assets and will also be used to model and render the pre-rendered scene backgrounds.

https://blender.org