

Nip to the Shop



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Aims, Objective and Deliverables

The first step in making this project was to define what the goal meant:

- Reactive – What the player can interact with.
- Dynamic – What Environment can interact with the player.

The level's gameplay revolves around physics-based puzzles, with the core gameplay loop focused on the player interacting with reactive and/or dynamic environmental elements to solve challenges and progress, with the overall predicted outcome of the level being:

Maximum:

- A designed and playable segment of a level that the player can interact with
- Implementation of dynamic environment used for progression
- Structured open-ended linear progression throughout the level

Minimum:

- A completed level design that demonstrates how the environment would react to the player
- A clearly defined method of progression
- Technical examples showcasing reactive and dynamic environmental systems

As for the story, the project centres on the player discovering that they have run out of sandwich filler at home and must go to the shop to buy more. Upon leaving the house, the player falls into a canyon and the base of a mountain and must navigate through the terrain, using the environment to reach the shop atop the mountain.

Research

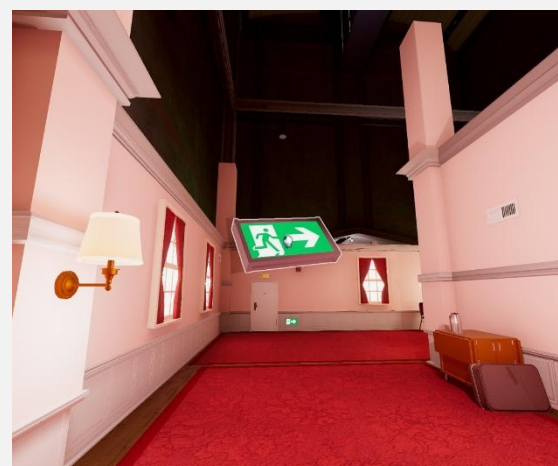
A game that shares similarities with the project goal is *Human Fall Flat* (No Brakes Games, 2016). It features a dynamic and reactive environment that the player must utilise to complete puzzles and progress. Players are required to grab, move, and manipulate objects within their surroundings to solve these challenges, which is what the goal of the project is about. However, the puzzles *Human Fall Flat* (No Brakes Games, 2016) are generally linear in their solutions. Additionally, due to its third-person perspective and physics-based grabbing system, performing complex movements and interactions with the environment can be difficult, which limits the potential for multiple creative solutions.



Regarding the project's controls, I intend for it to be a first-person game to avoid the control issues present in *Human Fall Flat* (No Brakes Games, 2016). A first-person perspective allows for more precise placement and interaction with environmental objects, which in turn enables greater potential for creative solutions.



An example of this approach can be seen in *Superliminal* (Pillow Castle Games, 2019). Its first-person controls allow players to accurately and carefully manipulate objects, as they are held directly in the centre of the player's view. In contrast, in *Human Fall Flat* (No Brakes Games, 2016), players must carry objects using the character's hands in a physics-driven manner that can feel imprecise and awkward, thereby limiting the range of possible interactions and creative solutions.



The game's visual style should feature a low-poly art aesthetic and subtle humour, like in *Human Fall Flat* (No Brakes Games, 2016) and *Astroneer* (System Era Softworks, 2019).

The low-poly style keeps the environment visually simple and easy to read, allowing players to clearly distinguish objects from the surrounding environment. *Astroneer* (System Era Softworks, 2019) serves as a strong example of how a low-poly aesthetic can maintain clarity while remaining visually engaging.

Additionally, subtle comedy complements the creative problem-solving required by the gameplay, encouraging players to think outside the box and discover both obvious and hidden solutions to puzzles.



Development Method

The best method of developing this project is to prioritise the features required to produce the project and develop them incrementally.

To achieve this goal some fundamental features are required, such as:

- Physics System - essential core mechanic required to make this project work.
- Puzzles - fundamental core of the gameplay loop.
- Grab/Pickup ability - fundamental to the gameplay loop and player interaction.
- First Person controls - critical system for the player to operate the character.
- Movable Objects - required for the gameplay to function and provides the dynamic and reactive environment.

As well as the fundamentals, some additional features were added:

- Meshed Environment – for visual appeal.
- Throw ability - expands the range of available solutions for puzzles.
- Heavy and Light Objects – Allows weight functionality that affects the player when carrying a heavy object.

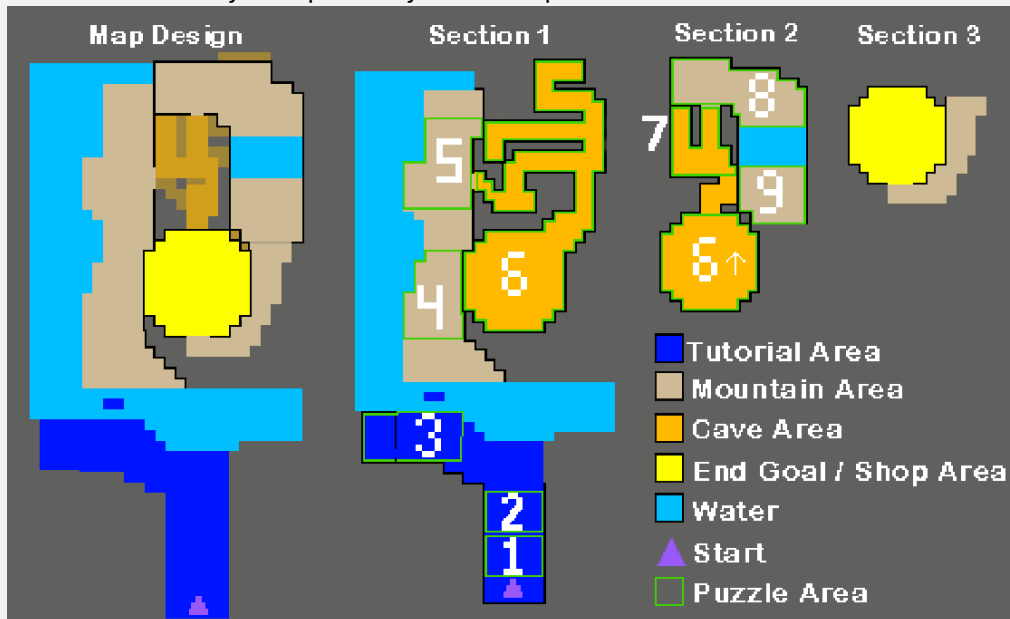
Among these additional features, there are some optional features I could add to benefit the project as well, such as:

- Sound effects – Used for audible feedback for actions as well as ambiance.
- Rotate Ability – Quality of life adjustment for managing held objects which could have an impact on puzzles.
- “Fun” Objects – Objects which hold no purpose in progression but rather are used to entertain the player.
- Subtle Comedy elements - To provide an extra bit of entertainment to the player which does not affect the flow or progression of the level.

This method allows the project to adapt and adjust in the event of a change of scope through testing and/or implementation.

Project Production

For the player, the goal of the level is to go to the shop and buy some food, hence the level's name. To create a level that naturally leads the player to the shop while naturally incorporating puzzles that challenge them into the environment, I designed the setting to take place in a canyon and on a mountain. This unique environment allows the puzzles to arise organically through the player navigating their way through the terrain, while also emphasizing the importance of the surroundings to the player for finding solutions to the puzzles. And allows a sense of progression to be conveyed to the player by always having the shop loom over the player, as the player can tell that they are getting closer to the end by their proximity to the shop.



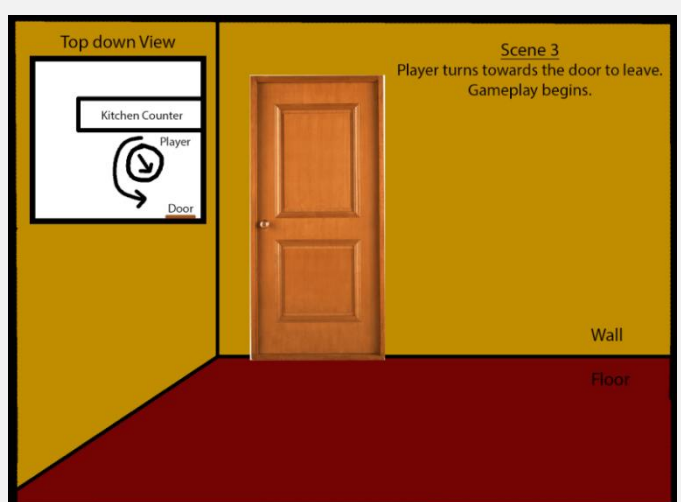
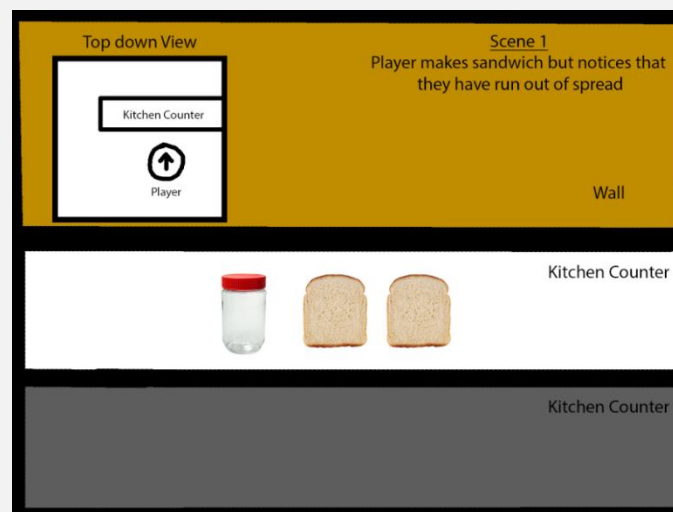
The level features nine puzzles that hinder the player's progression, and each of these puzzles teaches or expands the player's understanding of the level's mechanics. Each puzzle offers multiple solutions rather than just one. This design choice allows the puzzles to follow the Reactive and Dynamic design philosophy by not restricting the player to a single solution and rewarding curiosity in how the player interacts with the environment.



Level Sections

Introduction Sequence

Upon starting the level, a cutscene plays that introduces the player to the level's goal: going to the shop. It depicts the player making a sandwich, only to discover they have run out of spread. Then the camera pans to a sale pamphlet on spread at the shop, prompting the player to turn around and begin the level.



Puzzle 0 / Tutorial

The level begins in the player's house before they head to the shop, and the goal of the first puzzle is to leave the house. The only solution is for the player to grab the door handle, open the door, and exit. This puzzle acts as the level's tutorial, as it introduces the grab mechanic and requires the player to understand how it works to progress. Also, the player's house is furnished with fun objects so every object, excluding the cutscene objects, is Reactive, which allows the player to trash their own house for fun.



Puzzle 1

The player is presented with the first puzzle: a locked door. This puzzle is like Puzzle 0 but introduces an additional element, a lock. The player must grab the key and manoeuvre it into the lock to open the door. Like the previous puzzle, this one has only one solution, as it is designed to teach the player that certain objects have uses.



Puzzle 2

Puzzle 2 introduces the player to alternative solutions and the throw mechanic. This puzzle has two possible solutions:

- The player can either create a staircase using the stones to climb over the wall, suggested by the initial placement of the stones.
- The player throws a stone through the cracked window using the newly introduced throw mechanic.



Puzzle 3

Puzzle 3 requires the player to cross a river with 2 possible solutions:

- The player builds a bridge using nearby planks
- The player launches themselves across with a catapult hidden behind a breakable wall, like the window, next to a conveniently placed pickaxe.

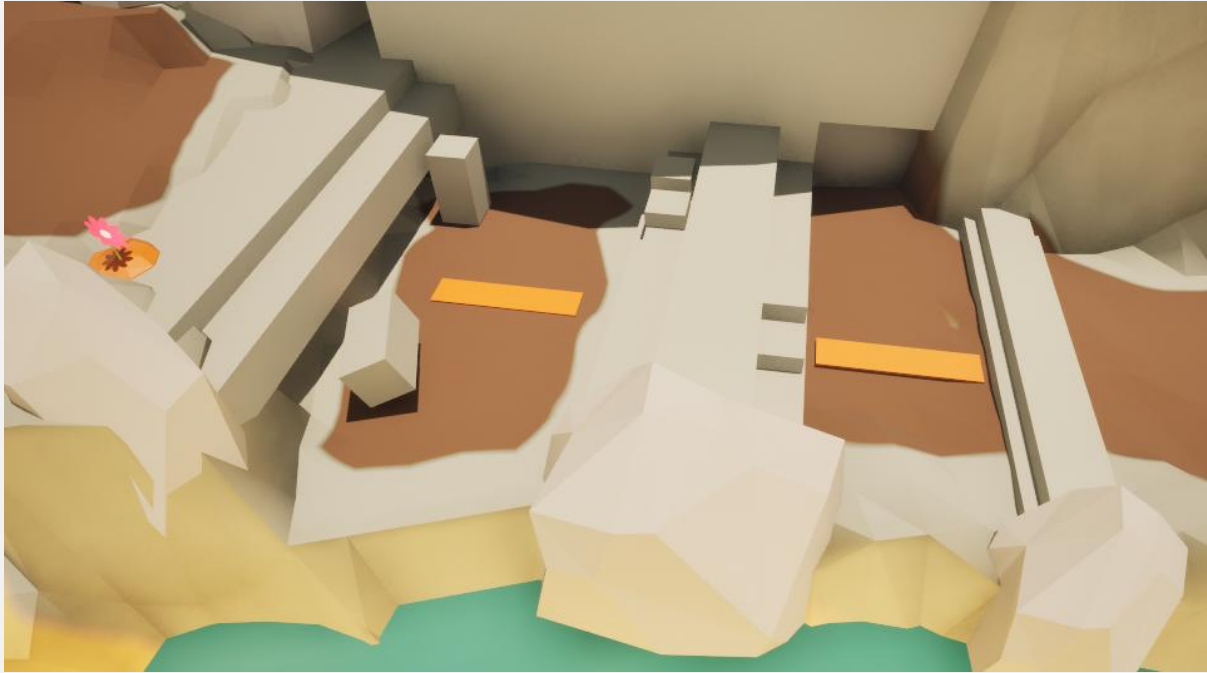
This puzzle introduces two new mechanics: rotating objects and breakable walls. The breakable wall adds another dynamic element to the environment, rewarding the player with progression or alternative solutions when destroyed. The rotate mechanic is also introduced here, as it allows the player to more easily position the planks when constructing the bridge.



Puzzle 4

Puzzle 4 requires the player to cross mountainous terrain using the Reactive stones and planks to progress. The player can use one of these stones to break a hidden breakable wall, which opens a path around the terrain.

Uniquely, this puzzle has no direct solution (aside from the alternative path) and instead relies on the player's intuition to use the surrounding objects to create their own way forward.



Puzzle 5

This puzzle has only one solution because it introduces the player to the cannon, which is required to clear the cave entrance and progress. The cannon itself cannot be directly interacted with (Dynamic). Instead, the player must interact with the cannonball and the torch to operate it, by loading the cannonball into the cannon and lighting the fuse with the torch to fire it, to clear the cave entrance.



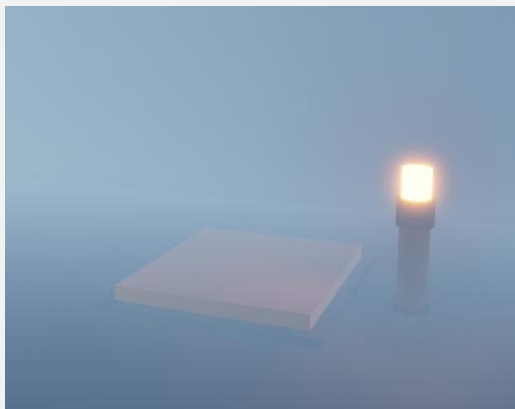
Puzzle 6

For Puzzle 6, it consists of 3 different, linear, areas inside of the caves that only have 1 solution each:

- The opening area requires the player to unlock a door by navigating through a dark maze to find a key, to which the player can grab a torch to illuminate their way.



- After the locked door, the player is introduced to the Pressure Plate and Lever mechanic inspired by *Human Fall Flat* (No Brakes Games, 2016), which requires the player to learn to progress.



- Next, the player is required to scale a vertical shaft by using several pressure plates and levers to construct a path forward.



The reason for the 3-in-1 puzzle is that Puzzle 6 was originally intended to be one long, dark maze like the first area. However, this was quickly found to be uninteresting and, more importantly, did not support the project's goals. As a result, it was redesigned to introduce pressure plates and levers.

Puzzle 7

The main solution for Puzzle 7 is to use the cannon to clear the obstruction from the cave. However, the method by which the player acquires the torch and cannonball adds a dynamic aspect to the puzzle.

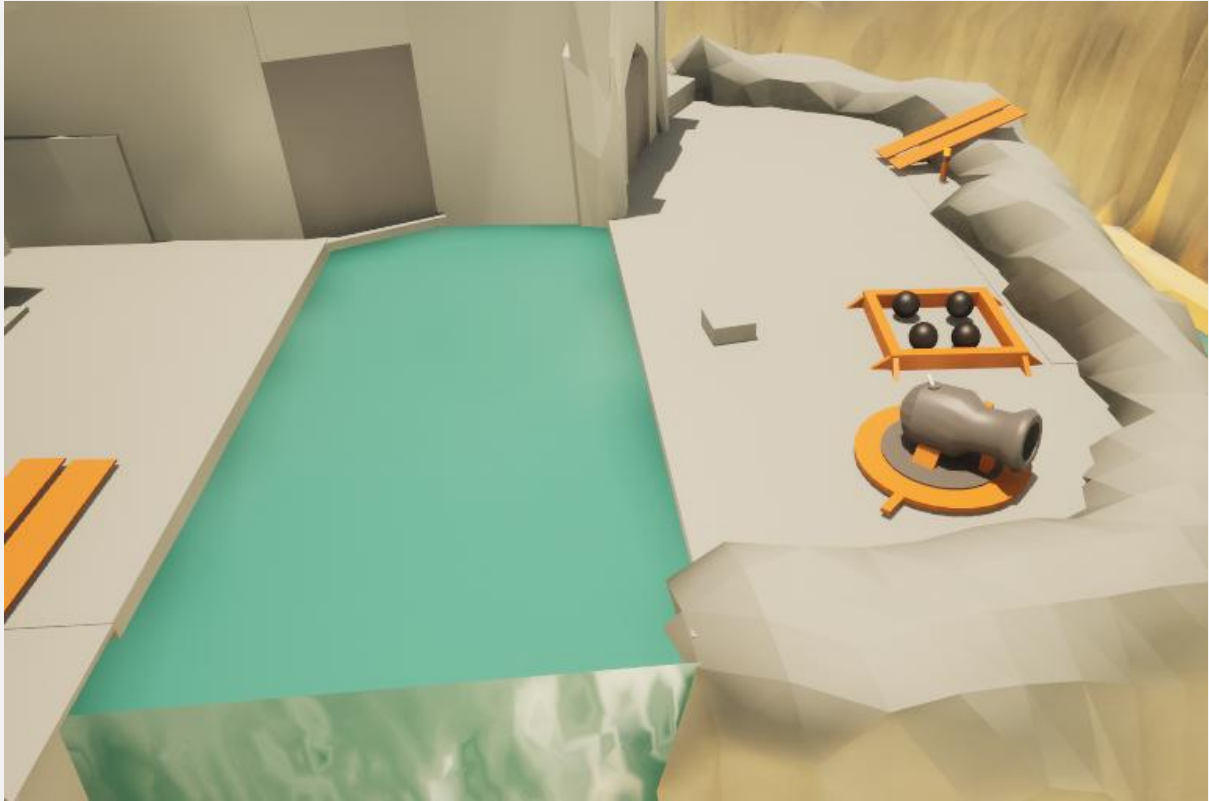
The torch can be obtained either by activating a pressure plate to knock it down or by using a stick to grab it. Similarly, the cannonball can be acquired by knocking it down with the stick or by using the spare cannonball from the previous room.

Once the player has both items, there are multiple ways to use them on the cannon. The items can be thrown directly to it, or the player can use a stick to operate a lever that creates a platform leading to the cannon.



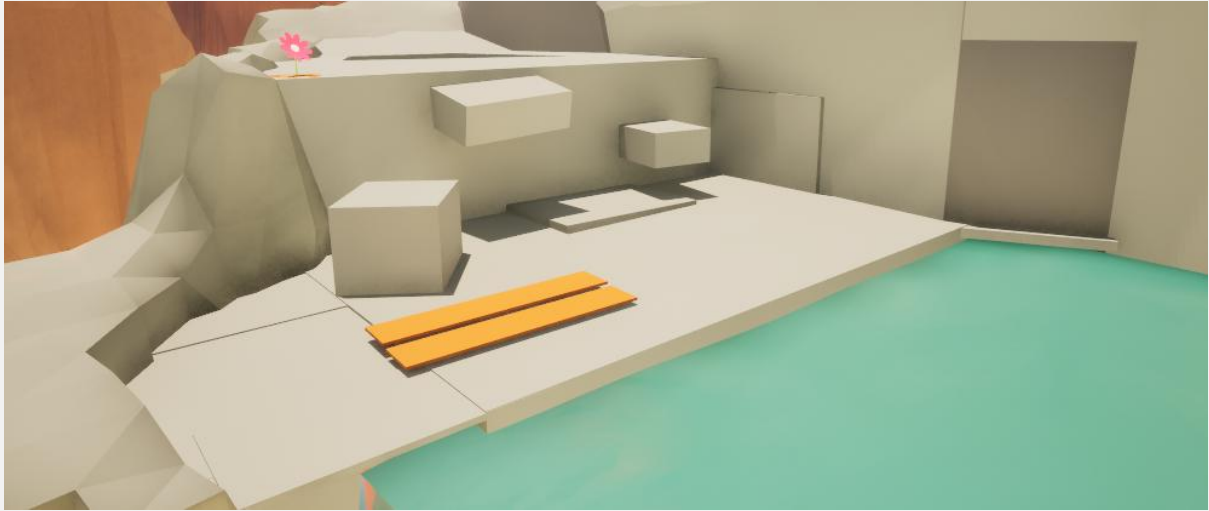
Puzzle 8

Puzzle 8 has no directly obvious solution with the hindrance being a body of water too wide to bridge across, but the player should be able to identify 3 explodable cannons opposite a rotatable cannon, and if the player shoots all 3, it will cause an explosion on the mountain which debris creates a bridge across and opens the next Puzzle area. Or if the player shoots the breakable to the next puzzle area, they can create a bridge using planks to the next puzzle.



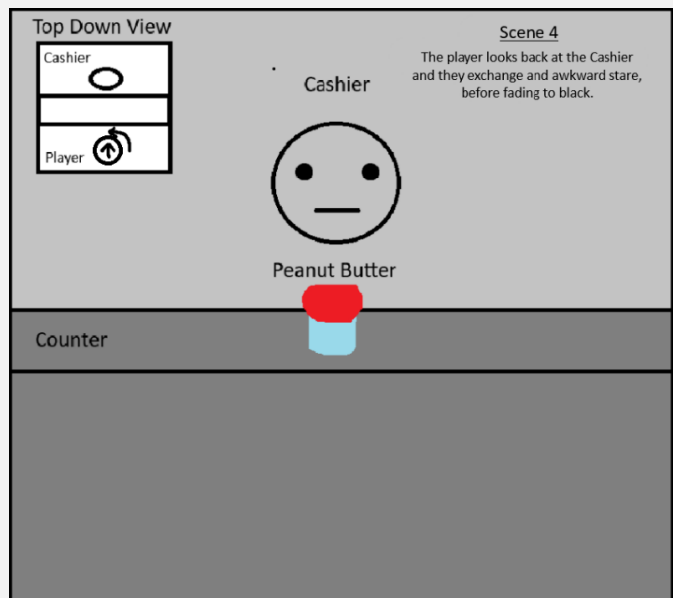
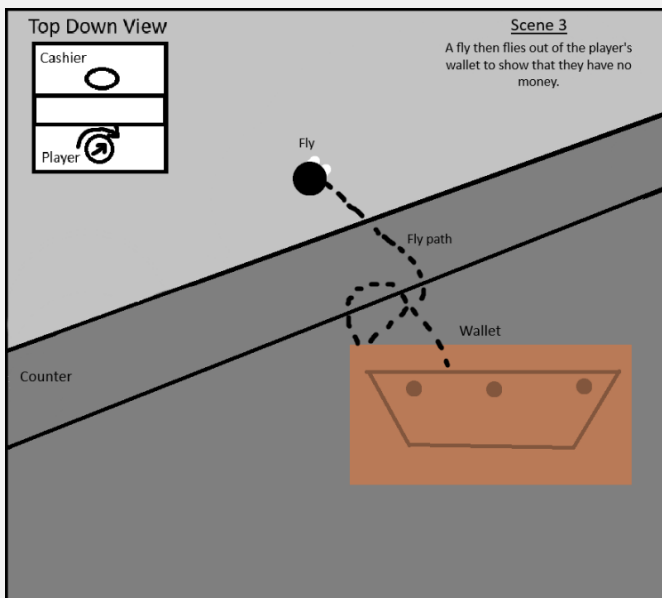
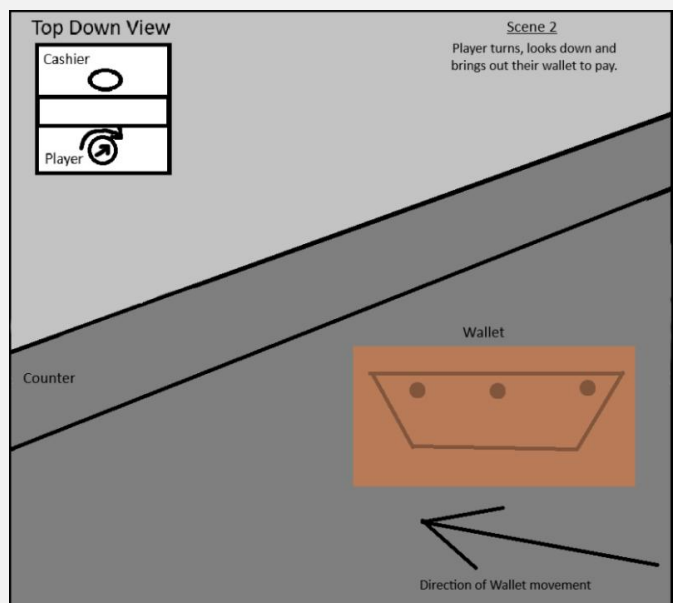
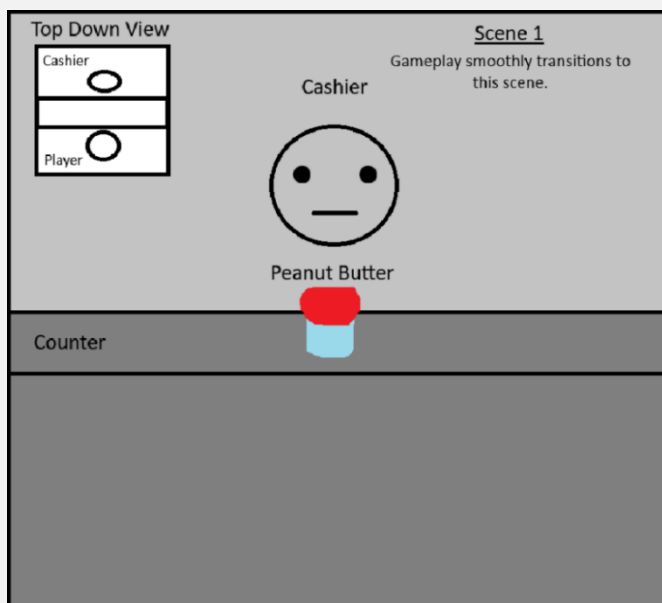
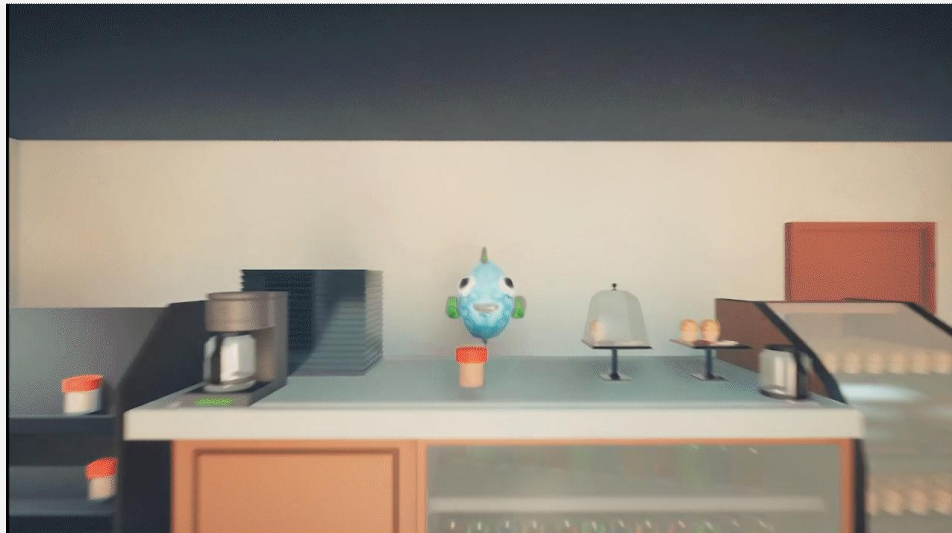
Puzzle 9

The final Puzzle of the level requires the player to scale a wall by creating a path using several levers and Pressure Plates, or the player can activate a secret lever using the stick from Puzzle 7 to access a hidden catapult to launch themselves up the wall instead.



Ending

Once the player finally reaches the shop, their final task is to place a jar of spread on the counter to purchase it. After doing so, a cutscene begins: the player pulls out their wallet, only for a fly to emerge, suggesting they have no money. The camera then pans back to the cashier for an awkward yet comical stare between the player and cashier, before fading to black and ending the level.



Play Tests

To confirm that the reactive and dynamic environment was being utilised by players to progress, playtesting was conducted with willing participants. The data collected from this test included:

- Time to complete each puzzle: To identify if any puzzle was too difficult.
- Solution used: To determine the most common solution and discover any unexpected approaches.
- Exploits, glitches, softlocks, and bugs.
- Number of Fun Objects had to be cut because it confused the testers by cluttering the Puzzles.

From this data, several notable observations were made throughout the level:

- Intro: Testers often spent a lot of time in their house, “trashing” the environment for fun.
- Puzzle 2: Most testers preferred using the alternative window solution over building the staircase.
- Puzzle 9: Many testers created only half of the intended route up the wall and then used a plank to bridge the rest, a solution that was unexpected but welcomed.
- Ending: The fish used for the cashier was originally a placeholder, but testers found it hilarious, so it was kept.

Softlocks

In these tests, most of the data involved various ways the level could be softlocked. Most of these methods involved throwing key objects required for progression into unreachable locations or moving the player out of bounds.

To prevent this, I surrounded the playable area with a boundary barrier. If a key object passes this barrier, it is briefly teleported back to its starting position, and if the player passes it, they are teleported back to their current puzzle. This boundary resolved most softlocks; however, some exceptions remained:

- Puzzle 1: The player can throw the key over the door or wall.
- Puzzle 2: All stones can be thrown over the wall before smashing the window.
- Puzzles 3, 4, and 5: All key objects can be thrown over the river before removing the Puzzle 3 bridge.
- Puzzle 7: The cannonballs and torch can be thrown into Puzzle 8 before the entrance is destroyed.

All these softlocks share a common issue: key objects can be thrown into locked playable areas. The standard boundary cannot prevent this because the player needs access to these areas to progress. To solve this, a new boundary barrier was implemented. It functions like the original barrier, but once the player passes it, the barrier is deactivated, preventing softlocks from occurring before the area is unlocked.

During playtesting, one oversight was discovered: in Puzzle 8, the player could softlock themselves by using all cannonballs before destroying the wall. To address this, a cannonball spawner was added to ensure the player never runs out of cannonballs in Puzzle 8.

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