Game 4: "Pint-Sized Pixel Puzzle"
Design Document

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CMPM 120 – Spring 2024

Design Brief

One of my favorite games growing up was LittleBigPlanet (and all of its subsequent sequel games) and I have always loved the puzzle-platformer genre. For this final project, I want to take inspiration from those games and create a small-scale puzzle platformer with distinctly themed levels.

Levels

There will be three levels, each with a distinct visual theme, a quirk in the player's movement physics related to the environment, and a new style of puzzle.

Level 1: Forest Farm

Inspired by forest-themed, woodsy levels from LittleBigPlanet 1 and other platformer games like Kirby's Return to Dreamland, this level will have the player traverse over treetops and down in fields of growing vegetables. The player will have tight movement physics with little drag, fast acceleration, a high jumping height, and strong control over their movement. For this level, the leaves and branches of the trees will act as platforms, but will only be collidable from the top, so the player can jump up through the platform and land on the top of it. Additionally, they will be able to press the shift key and fall downwards through the platform.

For this level, I will be using environmental assets from Kenney Assets' Pixel Platformer Pack and Farm Expansion for the pixel platformer series.

Level 2: Candyland

The second level will be inspired by one of my favorite areas of LittleBigPlanet 2, a pink, frothy candyland full of sweets and frosted cake platforms. The player will still have tight movement physics, but for this level, I will modify them to make the player feel as if the ground is sticky. Initial acceleration and jumping will be more difficult on frosted areas, but stopping and landing will be quick and sharp.

For this level, I will be using environmental assets from Kenney Assets' Food Expansion for the pixel platformer, and miscellaneous assets from the Pixel Platformer Pack as well.

Level 3: Glacier Lake

The third level will be inspired by ice- and water-themed levels and involve a swimming mechanic unique to the level. Part of this level will take place on land, and part of it will be underwater. For the land, the player's movement physics will be icier, with longer time to accelerate and stop, and sliding along the ground once the player is moving, and shorter jumps than the first level. For the water portion of this level, the player can swim underwater indefinitely. (If I have time, I would like to implement a drowning mechanic where the player has limited breath.) The player will not be buoyant, so they can stay in one place underwater and swim downwards with no extra resistance (again, if I have time, I would like to implement these physics.)

For this level, I'll be using the Pixel Platformer Pack to create the icy landscape and water components, as well as the switches and buttons.

Gameplay

Before they begin the game, the player will be able to choose one of five alien sprites to play as, from the Pixel Platformer Pack characters, just as a cosmetic choice but also to have a chance to display the controls of the game.

The player will have to traverse the levels in order, and the only end-of-level condition for each level is to make it to the end. The only hazards are falling out of the bounds of the map in certain areas, and making mistakes in the puzzle that lead it to be unsolvable – in this case, there will be a restart button that takes the player back to the beginning of the level.

There are coins for the player to collect, which will carry across levels and the number of coins collected will constitute the player's score at the end of the game. Some coins will be in hidden places that the player must explore a little extra to find, or solve an additional puzzle.

As stated, the only endgame condition is for the player to make it to the end of all three levels. Progress is saved between levels, so dying in a certain level will only take you back to the beginning of the current level and only erase your coins from the current level, not the game as a whole.

Puzzle Elements

Level 1

To start off easy, the puzzle elements of the first level will simply be moving blocks into place to unlock areas the player cannot reach by jumping. The player will be able to push the blocks into place by walking into them. Some puzzles will involve different sizes of blocks, but they will all be pushable with the same force.

Level 2

The puzzle elements for the second level will involve moving blocks/food objects, as well as pressing buttons to open walls, gates, etc. to be able to move forward in the level. The player will also have to combine puzzle solving skills and move blocks to be on top of buttons in order to keep a door open, or in cases where they have to press multiple buttons to open the door.

Level 3

The puzzles in the third level will involve flipping switches and pushing buttons to open areas by swimming over them. Ideally, I would also implement a grabbing mechanic where you grab blocks to move them into place over puzzle elements.

Effects and Juice

For visual particle effects, I will use elements from the Platformer Art Pixel Redux pack and repurpose them as particle effects.

For sound effects, I will use the Impact Sounds pack and RPG Audio pack for impact sounds and miscellaneous sound effects, and the Music Jingles pack for musical jingles indicating death, success, etc.

Lastly, to show the player the controls, I will use assets from the Pixel Input Prompts pack.

Learning Objectives

My learning objectives for this game project are as follows:

- Create fun and engaging puzzles for a platformer game
- Create visually distinct levels with different feels and mechanics

- Implement a start and end screen, with character selection
- Transition between levels, retaining information from previous levels
- Properly reset levels during deaths/between replays
- Implement different movement physics on different levels
- Implement swimming physics and be able to differentiate it from normal movement
- Implement puzzle solving interactivity, like pushing blocks, buttons, and switches
- Make my own spritesheet atlases from desired effects, and implement a custom spritesheet
- Work with varying hitboxes (ex. able to collide from top, but not bottom)

Rubric

Table 1: Rubric

Criteria	Evaluations			
Levels transition and reset properly	3	2	1	0
Puzzles close off previously inaccessible areas and are solvable	3	2	1	0
Each level has distinct movement physics		2	1	0
Different kinds of platforms have different hitboxes		2	1	0
Swimming has a distinct feel & difficulty from regular movement		2	1	0
Start/end screen properly start and reset game			1	0
Each environment has appropriate and different game juice effects			1	0
Each level's puzzles are distinct and build off of each other in difficulty			1	0