Michael de Freitas CPS-253 Final Project Proposal

Content I am exclusively working on:

Breakable/Destructible tiles, resources dropping from tiles, procedural generation, custom tile types (not all tiles will behave the same)

1. Concept/Theme

This project focuses on developing a mechanic in which players can destroy tiles within procedurally generated maps to gain resources. These resources function as an in-game currency, allowing players to purchase items and placeable objects that aid in defending against waves of enemies. The game concept revolves around a strategic balance between gathering resources and utilizing them effectively to survive increasing enemy pressure. In this mechanic, each map is procedurally generated, creating diverse and unpredictable environments. Players can mine resources by breaking down tiles on the map. The destroyed tiles yield different amounts of resources based on their rarity or type, adding a strategic layer to the player's choices. Players must manage limited resources while balancing the need to gather materials with the urgency of defending their base against waves of enemies. This mechanic can be implemented in various settings, but for this project, it is developed as part of a larger endless wave survival game.

2. Mechanic

Tile Destruction

The core mechanic involves players breaking tiles on the procedurally generated map to obtain resources. Each map tile is destructible and is represented by different types of terrain, such as stone, dirt, or rare mineral deposits. The player interacts with the map by selecting a tool, such as a pickaxe or mining drill, or weapon to target and break the tiles. The interaction is designed to be simple and intuitive: the player moves their character over to a tile, targets it, and performs a mining action, or shooting the tile instead. Depending on the type of tile, the destruction time will vary, softer tiles like dirt are easier to break, while harder ones like stone or metal take longer to mine. This creates a dynamic flow where players must make quick decisions about which tiles to prioritize based on their immediate resource needs. While weapons can damage tiles, tools are more efficient at accomplishing this task

Resource Generation

Upon destroying a tile, the player is rewarded with resources specific to that tile type. Each tile drops resources at a defined rate; for instance, breaking a dirt tile might yield a small amount of a common resource, while a rare mineral tile might provide a large quantity of a high-value

resource. These resources are stored in the player's inventory, displayed on the game's user interface (UI) through a counter. The game uses a variety of resource types to increase depth and strategy. For example, common resources might be abundant but necessary for basic items, while rare resources allow players to craft more powerful defensive structures. The UI plays an important role in showing the player how many resources they have accumulated, allowing them to make informed decisions about resource spending.

Buying Items and Placeables

The resources gathered from tile destruction are the primary currency in the game's economy. Players can access an in-game shop where they spend resources to buy items or placeable objects, such as turrets, traps, or barricades, which help defend against enemy waves. The shop interface is designed to be straightforward: players can scroll through a list of available items, each showing the cost in resources.

The balance between resource gathering and spending is crucial. Players need to decide whether to focus on mining more resources or purchasing defensive items to protect themselves from the growing threat of enemy waves. The system encourages players to think strategically, as overspending or mismanaging resources can lead to overwhelming pressure from enemies.

Strategic Impact

The destruction of map tiles creates an interesting dynamic in terms of gameplay strategy. As players destroy tiles, they alter the environment, which can have both positive and negative effects. For instance, breaking tiles might open new paths for enemies to attack the player's base, requiring careful consideration of where and when to mine. Conversely, destroying certain tiles can block off enemy access points or create new defensive choke points.

This destruction mechanic, combined with the need to gather resources and fend off enemies, makes for a compelling loop of decision-making. Players must constantly balance the immediate need for resources with the long-term survival strategy of base defense. The procedurally generated maps add another layer of complexity, as no two environments will be the same, keeping the gameplay fresh and unpredictable.

3. Target Audience

The target audience for this mechanic consists of players who enjoy strategy games with resource management elements. Specifically, the game is designed for fans of survival and base-building genres, where players must balance resource gathering with base defense. The endless wave feature appeals to players who enjoy increasingly challenging gameplay.

This mechanic is intended for a broad audience, including casual and more experienced gamers. The procedural generation of maps keeps each playthrough fresh and engaging for replayability, while the destruction and resource management mechanics create depth for more advanced players who enjoy strategic decision-making.

4. Visual Design

While this project is focused on the gameplay mechanics rather than the visual design, the intended aesthetic would fit within a minimalist or low-poly style. This visual approach allows players to focus on the gameplay without being overwhelmed by overly detailed graphics. The tiles themselves could be color-coded or stylized to represent their type and rarity (e.g., dirt tiles could be light brown, stone tiles could be gray, and rare mineral tiles could be glowing blue or green).

The UI should be clean and straightforward, ensuring that resource counters and shop interfaces are easily accessible and readable. The simplicity of the visuals would also help communicate the game's core mechanics without requiring complex animations or high-resolution textures.

5. Scope of Demo

The scope of the demo will focus on implementing the core mechanics necessary to showcase the tile destruction and resource management system. Specifically, the following features will be built:

1. **Procedural Map Generation**: A system that generates a grid-based map with different types of tiles, each with varying destruction times and resource yields.
2. **Tile Destruction Mechanic**: The player will be able to interact with and destroy tiles on the map, with appropriate animations and feedback (e.g., tile breaks, resources are added to the counter).
3. **Resource Management**: The resources gathered from destroyed tiles will be tracked in the UI, allowing players to see how much currency they have accumulated.
4. **Basic Shop Interface**: A functional shop where players can spend their resources on items or placeables. While the number of items will be limited for the demo, the core buying and placing functionality will be present.

This scope is manageable within the project timeframe and ensures that the demo will demonstrate the core mechanics effectively. Additional features, such as more complex map generation or enemy AI, will not be implemented, as they fall outside the focus of this project.

The figure demonstrating a player shooting a weapon altering the health of tiles in the map, weakening them and eventually leading to their destruction

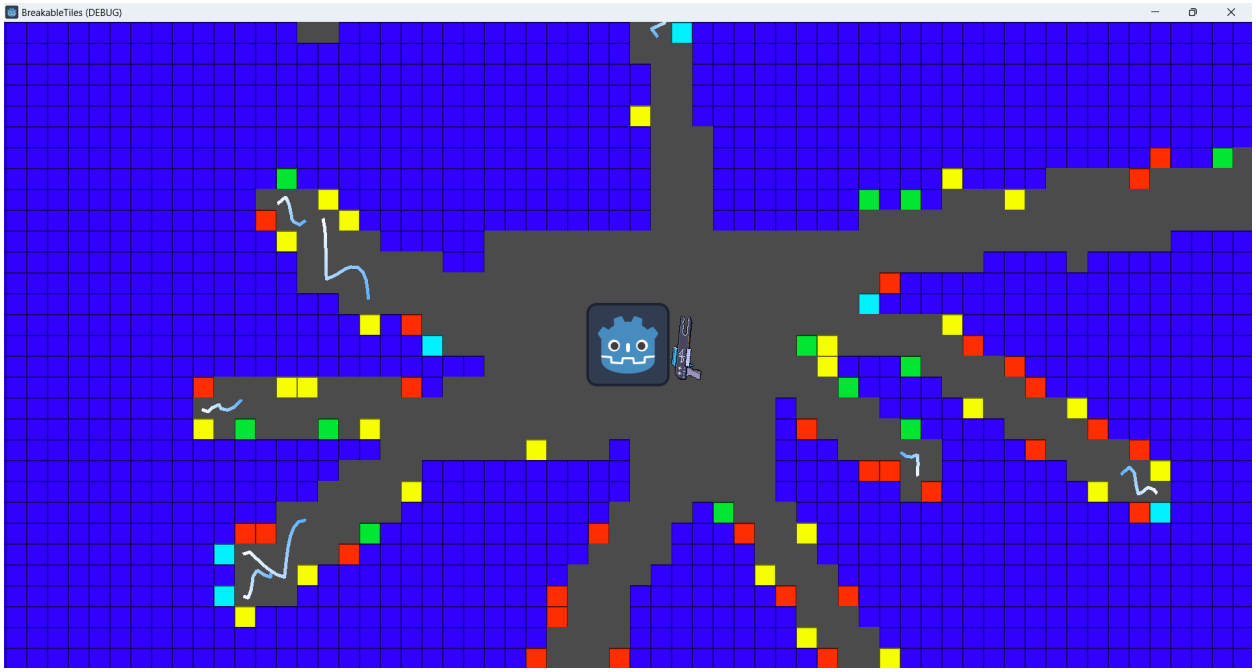
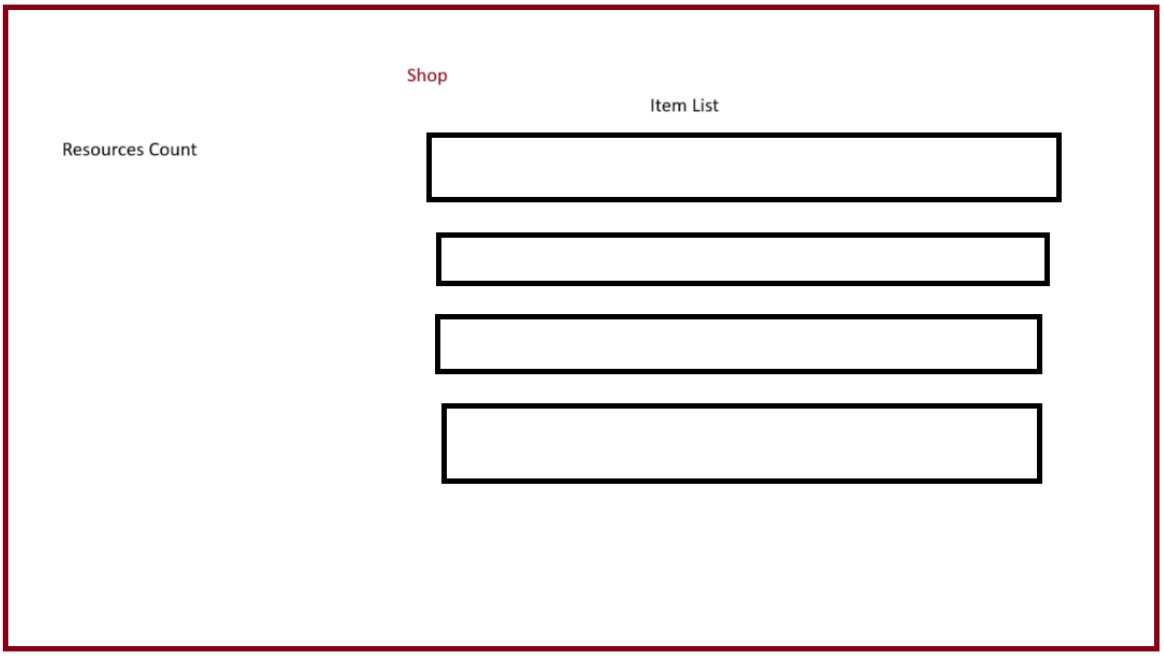


Figure Demonstrating UI elements in the game that will change with acquisition of resources

Basic Demonstration of what shop would look like:



Sections of this document, including detailed descriptions of the game mechanic, structure of the document, and overall project scope, were created with assistance from OpenAI's GPT-4 language model, ChatGPT.