UFO Invasion: Tower Defense - Game Documentation Report

Game Overview:

UFO Invasion: Tower Defense is an action-packed tower defense game where players defend Earth from waves of alien invaders. The objective is to strategically place and upgrade turrets to fend off UFOs that progressively become more challenging. Players must manage their resources, plan turret placements, and time their upgrades to protect their base and prevent the UFOs from reaching Earth.

Key Features/Functionalities:

- **Wave-based gameplay** with increasing enemy difficulty.
- **Turret mechanics** offering different types of defense options.
- **Resource management** through a gold system.
- **Strategic planning** and tactical decisions required to succeed.

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2. Core Mechanics

The gameplay is centered around **strategic turret placements**, **upgrades**, and **resource management**. Players are tasked with placing turrets along enemy paths and defending Earth from increasingly difficult UFOs. The difficulty escalates through waves, requiring careful planning and quick decision-making.

2.1 Turrets

Each turret in the game serves a unique function, providing varied damage output and utility for different enemy types. Players must choose the right combination of turrets to handle different threats.

2.1.1 Cannon Turret

- **Cost**: 60 gold
- **Damage**: 25 per shot
- **Description**: A reliable turret for early waves, the Cannon Turret deals consistent single-target damage to UFOs. Its affordability and

straightforward functionality make it an ideal choice for managing the initial wave of alien invaders.

2.1.2 Ballista Turret

- ○ **Cost**: 75 gold
- ○ **Damage**: 50 per shot (area of effect)
- ○ **Description**: The Ballista Turret launches a single arrow bomb that deals 50 damage and affects multiple enemies within its blast radius. This turret is effective for handling groups of fast-moving UFOs.

2.1.3 Blaster Turret

- ○ **Cost**: 120 gold
- ○ **Damage**: 70 per cannonball
- ○ **Description**: The Blaster Turret fires two cannonballs simultaneously, each inflicting 70 damage. It is designed for tougher UFOs, providing a significant boost in firepower when dealing with stronger or larger enemies.

2.2 Projectile Mechanics

Projectiles serve as the primary means of offense for turrets in **UFO Invasion**. The mechanics of projectiles are handled through specific scripts (e.g., `projectile.gd`, `arrow.gd`, `blaster.gd`), which manage targeting and damage calculation. Each projectile travels in a straight line toward its target and deals damage upon impact. The varying effects of different projectile types encourage players to experiment with turret placement and timing.

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3. Enemy Behavior

The **alien invaders** in the game follow predetermined paths toward the player's base. Enemies are divided into two primary types, each with its unique attributes and difficulty curve.

3.1 Enemy Types

- **Fighter UFO**: Fast-moving and fragile, this UFO type has lower health but can reach the base quickly.

- **Alien Tank**: Slower but more durable, this UFO type has higher health and deals more damage.

Each enemy begins with 100 health, with health increasing by 5% per wave. As waves progress, enemies become more difficult to defeat, requiring strategic planning and stronger defenses.

3.2 Pathfinding System

The enemies navigate the map using a **pathfinding system** designed to optimize movement. The path routes are configured using the `path_generator_config.gd` file, and the path assignments are handled by the `path_generator.gd` script. This ensures that enemies follow a set route toward the player's base, maintaining a smooth and predictable movement even as the number of invaders increases.

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4. Wave System

The game operates on a wave-based structure, where the difficulty increases incrementally with each new wave. As players progress, UFOs become tougher, requiring more advanced strategies and careful resource management.

4.1 Wave Progression

- **Enemy HP**: Increases by 5% with each wave.
- **Number of UFOs**: Remains constant, but the strength of each enemy escalates.

The wave progression is managed by the `wave.gd` script, which triggers new waves at set intervals or based on player actions. As the game advances, the challenge intensifies, encouraging players to constantly adapt their strategies to keep up with the increasing difficulty.

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5. Player Interaction

The **Player Interaction system** provides a smooth, intuitive experience for placing turrets and managing wave progression. The system ensures that players can focus on strategy without being bogged down by unnecessary complexity.

5.1 Action Buttons

- **Place Turrets**: Players use the action buttons to place turrets at strategic points on the map.
- **Start Waves**: Players initiate new waves through simple UI buttons, managed by the `action_button.gd` and `activity_button.gd` scripts.

The user interface is designed to be straightforward, enabling players to focus on making tactical decisions without being distracted by complicated controls.

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6. Gold System

The **Gold System** rewards players with gold for defeating UFOs, providing the necessary resources to place and upgrade turrets. Each type of enemy yields a different amount of gold upon defeat.

6.1 Gold Rewards

- **Fighter UFO**: 20 gold
- **Alien Tank**: 30 gold

The game begins with a base amount of 100 gold, which players can use to start building their defenses. As waves progress, players must carefully manage their gold to upgrade turrets and strengthen their defenses. The gold system incentivizes strategic decision-making, encouraging players to prioritize which enemies to target for maximum resource gain.

This documentation report serves as a comprehensive guide to understanding the core functionalities and mechanics that drive **UFO Invasion**. Players and developers alike can use this as a resource to better understand the game's systems and enhance their gameplay experience.