Frogz&Gobz Game Design Document (GDD)

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***‘Catchin’ frogz with one hand and blastin’ gobz with the other!’*** – Nicholas Lozben

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# 1 Game Overview

Title: Frogz&Gobz

Platform: Mac and PC standalone

Genre: 2D Sidescroller, Shooter, Survival

Rating: (10+) ESRB

Target: Casual gamer (aging from 12 - 30)

Release date: April, 2022

Publisher: Nicholas Lozben

Description: Frogz&Gobz is a sidescrolling 2D shooter game in which the player must collect a certain number of frogs to win. The game takes place in a world where frogs are loved and goblins are hated. The player must be the hero that saves all of the frogs from the goblins by catching them with the net. Along the way, the player will shoot the goblins with the revolver. Both frogs and goblins will continue to spawn until the game ends by either dying from the goblins or collecting enough frogs. The world is randomly generated with three vertical caves and one horizontal cave. On either end of the map is a tunnel that can be used to climb to the top. Underground there are more frogs to save; however, goblins horde down there as well.

# 2 High Concept / Genre

Frogz&Gobz puts the player in a randomly generated world with many caves to explore. The player must be the hero that saves the frogs from the pesky goblins. Be sure to blast the goblins with the revolver and save the frogs with the net!

# 3 Unique Selling Points

* Unique and comedic storyline
* Funny audio
* Procedurally generated map creates a unique game experience each time

# 4 Platform Minimum Requirements

Most computers will work. A mouse and keyboard are necessary.

# 5 Competitors / Similar Titles

Some similar titles include Terraria and Mario Bros. The world looks similar to Terraria while the gameplay could be compared to Mario Bros.

# 6 Synopsis

In a world where frogs are loved and goblins are hated, you must be the hero to save the frogs from the goblins. Don’t be afraid to blast some goblins along the way!

7 Game Objectives

The objective of the game is to catch the goal number of frogs.

8 Game Rules

The player is to run around the world and avoid being killed by the goblins. The player can wall jump, and tunnels on either side of the map can be used to climb from the underground caves to the surface level. The goblins will deal 5, 10, or 20 damage when touched depending if the difficulty is on easy, medium, or hard. The objective of the game is to catch a certain number of frogs. On easy, goblins are killed with 3 shots of the revolver and 20 frogs must be caught to win. On medium, goblins are killed with 4 shots of the revolver and 35 frogs must be caught to win. On hard, goblins are killed with 5 shots of the revolver, and 50 frogs must be caught to win.

9 Game Structure

The user must create a character and select a difficulty when doing this. The player will play the game until catching the correct number of frogs, or until being killed by the goblins. If killed by the goblins, a losing screen is displayed. If the correct number of frogs are caught, then a winning screen is displayed.

10 Game Play

10.1 Game Controls

* **Move Left:** A or left arrowkey
* **Move Right:** D or right arrowkey
* **Jump:** space or up arrowkey (there is wall jumping)
* **Use Net:** right mouse
* **Shoot:** left mouse (point with the mouse to aim)

10.2 Game Camera

The game camera will follow the player in a sidescrolling fashion.

### 10.2.1 HUD

### Graphical user interface, text, chat or text message Description automatically generated

This HUD will be displayed in the top left corner as the game is played. “Player Name Displayed Here” is where the player’s name will be displayed. The green bar underneath this is the health bar which displays how much health the player has. The health bar will turn from green to red when at 40% or less. The 0 next to the small goblin and frog images is the count of either goblins killed or frogs caught respectively. The “You must catch 20 frogs to win!” is a text that will display how many frogs are needed to win. In this case it says “20” because the difficulty is set to easy.

11 Players

11.1 Characters

Chart

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The user can choose between a grey, blue, or green player.

11.2 Metrics

* **Health:** 100
* **Wall Jumping:** true
* **Shots to Kill Goblin:** 3 (easy), 4 (medium), 5 (hard)

## 11.3 States

* **Idle:** The idle state shows the player just standing there. This state happens when the player is not moving.
* **Running:** The running state shows an animation of the player’s legs moving back and forth. This state is active when the player is moving.
* **Swing Net:** The swing net state shows an animation of the player swinging the net. This state is active when the player right clicks to swing their net.

11.4 Weapons

* **Revolver:** Aim by pointing with the mouse. Shoot with left click. Shoots bullets that do damage to the goblins (35 on easy, 25 on medium, 20 on hard). There is a 1 second cooldown between shooting bullets, and it only affects the goblins (cannot shoot frogs)
* **Net:** Use the net by right clicking. This is an animation of the player swinging the net, and if any frogs are nearby, then they will be caught. There is a 2 second cooldown between net swings, and it will only affect the frogs (cannot catch goblins).

12 Character Line-up

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13 NPC

13.1 Goblin

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The goblin is the only enemy NPC in the game. The goblin constantly attempts to move towards the player. If the goblin touches something else such as the ground or another goblin, the goblin will jump. If the goblin touches the player, the player will take 5 damage on easy, 10 damage on medium, and 20 damage on hard.

### 13.1.1 Goblin States

**Running:** The running state shows an animation of the goblin’s legs moving back and forth. This state is always active because the goblin is constantly moving toward the player.

13.1.2 Goblin Spawn Points

The goblin randomly spawns every 4 seconds anywhere over the entire width of the map. There is a 50% chance that they will spawn above the ground, on the surface of the world, and there is a 50% chance that they will spawn in the horizontal underground cave. Goblins will continue to spawn until the game is won or lost.

13.2 Frog



The frog is the only friendly NPC in the game. The frog constantly hops around. If the frog hops into a wall, there is a 2/3 chance that the frog will start to hop in the other direction, and there is a 1/3 chance that the frog will jump super high and far to get over it. When the player uses their net in range of a frog, the frog will be caught. This means that the frog disappears, and the frogs caught counter will increase by 1.

13.2.1 Frog States

**Hopping:** The hopping state shows an animation of the frog jumping forward. This state is always active because the frog is always moving.

13.2.2 Frog Spawn Points

The frog randomly spawns every 2 seconds anywhere over the entire width of the map. There is a 50% chance that they will spawn above the ground, on the surface of the world, and there is a 50% chance that they will spawn in the horizontal underground cave. Frogs will continue to spawn until the game is won or lost.

14 Art

14.1 Setting

The game takes place in a randomly generated 2D world. The top of the world shows grass, three blocks under the grass show dirt, and all other blocks show stone. There are always 3 randomly generated vertical caves, 1 randomly generated horizontal cave, and 2 vertical tunnels on the left and right sides of the map that can be used to climb back to the top of the world using wall jumping.

## 14.2 Level Design

The randomly generated landscape and caves in this 2D world allows for a slightly different experience every time. Although the world is different every time, there are still consistencies that make sure the game is similar enough during each play. There are always 3 randomly generated vertical caves, 1 randomly generated horizontal cave, and 2 vertical tunnels on the left and right sides of the map that can be used to climb back to the top of the world using wall jumping. Additionally, both goblins and frogs will periodically spawn in a random place over the map. The goblins and frogs with both get stuck underground often, and this allows for both a bigger risk and a bigger reward when exploring the underground region of the map.

14.3 Audio

* **Theme Music:** This audio is the background music that plays from the moment the Frogz&Gobz is launched, throughout gameplay, and until the game is quit.
* **Swish:** This audio is the sound effect that plays when the player uses their net.
* **Frog:** This audio is the noise that frogs are constantly making. It is very quiet as to not create too much noise when there are many frogs spawned on the map.
* **Goblin:** This audio is the noise that goblins are constantly making. It is very quiet as to not create too much noise when there are many goblins spawned on the map.
* **Gunshot:** This audio is the sound effect that plays when the player shoots their revolver.
* **Hurt:** This audio is the sound effect that plays when the player or a goblin takes damage.
* **Jump:** This audio is the sound effect that plays when the player jumps.

15 Procedurally Generated Content

15.1 Environment / Level

The game environment / level is a randomly generated 2D world. This is done using the 2D tilemap and Perlin Noise. The Perlin Noise function generates wavelike values that aren’t completely random, but instead, they gradually increase and decrease. This creates the random terrain because this wave will be different every time. I use this function to determine the height at each x value of the tilemap. Everything underneath this tilemap height that I generate from Perlin Noise because ground that the player and NPCs will collide with. One block underneath this Perlin Height becomes grass texture, three blocks underneath the grass becomes dirt texture, and everything else becomes stone texture. I also randomly generate 3 vertical caves by tunneling from the bottom of the world to the top of the world, and these vertical caves split the world into quarters. A horizontal tunnel is randomly generated by tunneling from the left side of the map to the right side of the map and randomly increasing or decreasing the height of the tunnel by 2.

**Background pattern

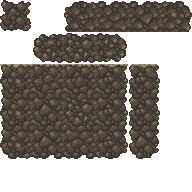
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## 15.2 Artificial Intelligence NPC

Goblins and frogs both randomly spawn anywhere along the width of the world either above the grass or inside of the horizontal tunnel.

## 15.3 Visual Arts

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Textures for grass, dirt, and stone.

## 15.4 Minimum Viable Product (MVP)

The minimum viable product includes just the grey player color, one difficulty, only a build for Mac.

# 16 Wish List

* Add things that the player can pick up to heal
* Make the underground dark, and add lanterns to illuminate it
* Add an easter egg of a new gun that can be picked up if the player climbs to the top of the world
* Make better sound effects for the frog and goblin

## 17 Bibliography

*2D Player Movement In Unity*. (n.d.). Www.youtube.com. Retrieved April 23, 2022, from https://youtu.be/K1xZ-rycYY8

*2D Shooting in Unity (Tutorial)*. (n.d.). Www.youtube.com. Retrieved April 23, 2022, from https://www.youtube.com/watch?v=wkKsl1Mfp5M&t=465s

bearmetal. (2015, December 16). *Grass Tile*. OpenGameArt.org. https://opengameart.org/content/grass-tile-0

Bendux. (n.d.). *Smooth Camera Follow In Unity*. Www.youtube.com. Retrieved April 23, 2022, from https://youtu.be/ZBj3LBA2vUY

Brackeys. (2017, May 31). *Introduction to AUDIO in Unity*. YouTube. https://youtu.be/6OT43pvUyfY

Brackeys. (2018). 2D Animation in Unity (Tutorial) [YouTube Video]. In *YouTube*. https://www.youtube.com/watch?v=hkaysu1Z-N8

donnie9171. (2018, January 29). *Gun and bullet*. OpenGameArt.org. https://opengameart.org/content/gun-and-bullet

edomin. (2017, December 14). *Colt 1851 Navy*. OpenGameArt.org. https://opengameart.org/content/colt-1851-navy

*How to make a 2D Bow and Arrow with UNITY & C#!* (n.d.). Www.youtube.com. Retrieved April 23, 2022, from https://www.youtube.com/watch?v=tNwLaGUJTK4&t=139s

*How to make a 2D Wall Jump & Wall Slide using UNITY & C#!* (n.d.). Www.youtube.com. Retrieved April 23, 2022, from https://youtu.be/KCzEnKLaaPc

*How to make a Health Bar (Unity 2D Tutorial for Beginners)*. (n.d.). Www.youtube.com. Retrieved April 23, 2022, from https://www.youtube.com/watch?v=Gtw7VyuMdDc&t=130s

InanZen. (2013, April 28). *Frog animation sprite sheet*. OpenGameArt.org. https://opengameart.org/content/frog-animation-sprite-sheet

*MELEE COMBAT in Unity*. (n.d.). Www.youtube.com. https://youtu.be/sPiVz1k-fEs

*Procedural patterns to use with Tilemaps - (Part II)*. (n.d.). Unity Blog. Retrieved April 23, 2022, from https://blog.unity.com/technology/procedural-patterns-to-use-with-tilemaps-part-ii

*Procedural patterns you can use with Tilemaps (Part I)*. (n.d.). Unity Blog. https://blog.unity.com/technology/procedural-patterns-you-can-use-with-tilemaps-part-i

RGA-GT. (2019, February 15). *The Best of RGA-GT Music Pack*. OpenGameArt.org. https://opengameart.org/content/the-best-of-rga-gt-music-pack

sithoius. (2013, April 22). *Rock Tileset*. OpenGameArt.org. https://opengameart.org/content/rock-tileset

Studio, Y. P. (2018, August 18). *Ground Tiles*. OpenGameArt.org. https://opengameart.org/content/ground-tiles-4

*Unity Tutorial (2021) - Add some VISUAL INDICATORS*. (n.d.). Www.youtube.com. Retrieved April 23, 2022, from https://www.youtube.com/watch?v=wuoQqdjaJOc

*Unity Tutorial (2021) - Making an Enemy Spawner*. (n.d.). Www.youtube.com. Retrieved April 23, 2022, from https://www.youtube.com/watch?v=SELTWo1XZ0c

All other assets and code not included in the bibliography were created by Nicholas Lozben