

## **Instructions:**

This demo is a simulation of a single wave of enemies in Johnny Froggy vs The Invaders. It starts off where you as the player have to set down 3 cannons in whatever position you feel is best to protect your house. The green orb on the map will indicate where the cannon will be placed. You will have to hold Aim before selecting a location to let the game know you intend to put a canon there. Once that is done, combat will begin. Once combat starts you will be able to mount cannons and aim your whistle attack. Enemies will try to get into your house, and each one that makes it there will damage your house's health. If the house's health reaches 0, it's game over. Survive the wave of enemies and you win. Press ESC to exit the game after the round or at any time.

## **Player Control Scheme**

Action	Input
Jump	Space
Sprint	Shift
Aim	Right Click (Hold)
Whistle/Place Weapon	Left Click
Use Weapon	4
Camera	Mouse
Forward	W
Back	S
Left	A

Right	D
Close Game	'ESC' Key

### **Mounted Weapon Control Scheme**

Action	Input
Shoot	Left Click
Dismount	5
Camera	Mouse

---

### **Marking Scheme Summary:**

#### ***Completeness:***

Meshes- All necessary meshes were imported from Unity's Asset Store and sized correctly for the scene. All rigged meshes work with the given animations. All necessary textures for the objects are rendering correctly and work with the HDRP pipeline.

Game Area- Imported a suitable tropical island map for the game demo. All textures are rendered through the HDRP pipeline. Player character can successfully traverse through the world without falling through the ground plane.

UI- The game has two crosshairs, one for the player aiming view and one for the cannon view. Both were made in Paint by myself and imported into the scene. When the player gets near a cannon, a text canvas will appear on screen over the cannon to instruct the player on the button

prompt to use it. Both enemies and the tower object have a health bar that updates as their health value changes and follows them across the screen.

### ***Functionality:***

Use as a Demo- The focus was to get the basics of the shooting mechanics and tower defense functionality done. The demo contains the one scene where after the player successfully places down three cannons, enemies will begin to spawn and head for the tower. The winning and losing conditions are present. If the tower falls under 0hp, the game stops and the loss message appears. If the player manages to kill all of the enemies, the win message appears. The player can harm enemies using their whistle attack with typical third person shooter mechanics, let the cannon AI do it for them, or mount a cannon and do it that way.

Diverse Meshes- All meshes were picked according to how well they fit with the aesthetic of the game. Johnny's Frog mesh is appropriately cartoonish, as well as the rat character mesh used for the enemies. The game arena I imported relies on solid cell shades, much like the intended vision for the final game. The canon and wrecked ship meshes fit with the island/pirate-esque aesthetic.

Triggers/Scripting/Interaction- Multiple instances have been issued in the scene. The player mounting the cannon is the most intuitive, requiring scripting to change the camera, UI, and player interface. Colliders are used throughout to determine enemy hitboxes. Scripting was necessary to use all of Unity's Input System.

Importing Animated Characters/Models- Both the Frog mesh and the Rat mesh were fully rigged upon being imported into the game. I mapped the Frog's animations to the already implemented Third Person Starter Asset pack animator along with its mesh. The Rat mesh I implemented with a simple animator connected to its NavAgent.

Complexity of Demo World- The Demo world is relatively simple as far as mechanics go save for the character sprites. Rocks and foliage meshes are scattered around the main game area and two shipwreck meshes have been placed on the scene for some thematics.

### ***Look, Feel, Visual Style:***

Coherence of Aesthetic- No glaring changes to artistic design. All models were picked according to their adherence to the game's theme.

---

### **External Assets**

#### ***Frog Mesh***

Description: Used for player character. Rigged with built in animations.

Citation:

WDallgraphics 2019, *Frog Toon Animated*, Unity Asset Store, viewed December 2021,

<https://assetstore.unity.com/packages/3d/characters/frog-toon-animated-57706>

#### ***Rat Mesh***

Description: Used for rat enemy. Rigged with built in animations.

Citation:

LukeBox 2021, *Rat - Casual Fantasy*, Unity Asset Store, Viewed December 2021,

<https://assetstore.unity.com/packages/3d/characters/creatures/rat-casual-fantasy-198865>

#### ***House Mesh***

Description: Used for Johnny's house mesh.

Citation:

Monqo Studios 2020, *Lowpoly Fantasy Houses*, Unity Asset Store, Viewed December 2021,

<https://assetstore.unity.com/packages/3d/environments/historic/lowpoly-fantasy-houses-166985>

### ***Cannon and Cannonball Mesh***

Description: Used for the cannon weapon and its projectile.

Citation:

Z3nder 2017, *Ship Canon*, Unity Asset Store, Viewed December 2021,

<https://assetstore.unity.com/packages/3d/props/weapons/ship-cannon-86213>

### ***Tropical Island Area***

Description: The arena where the game demo takes place. All rocks and plant meshes are in this package.

Citation:

Purple Sky 2019, *Tropical island (HDRP)*, Unity Asset Store, Viewed December 2021,

<https://assetstore.unity.com/packages/3d/environments/tropical-island-hdrp-151046>

### ***Shipwreck Mesh***

Description: A mesh of a shipwreck that was added into the scene as a decorative piece.

Citation:

Tetronum 2017, *Wrecked Sailing Ship*, Unity Asset Store, Viewed December 2021,

<https://assetstore.unity.com/packages/3d/vehicles/sea/wrecked-sailing-ship-96750>

---

### **Scripts:**

Title: ThirdPersonController

Author: Unity Technologies

Description: Handles Character movement and animations. Determines if character is prepping cannons

Date: Jun 9, 2021

Edit: Dec 14, 2021

Edit Author: Philip Smith

Code version: 1.0

Availability:

<https://assetstore.unity.com/packages/essentials/starter-assets-third-person-character-controller-196526>

Title: StarterAssetsInputs

Author: Unity Technologies

Description: Registers the player button inputs

Date: Jun 9, 2021

Edit: Dec 14, 2021

Edit Author: Philip Smith

Code version: 1.0

Availability:

<https://assetstore.unity.com/packages/essentials/starter-assets-third-person-character-controller-196526>

Title: ShooterController

Author: Code Monkey

Description: Handles Character aiming, shooting, and selecting a cannon to mount

Date: Aug 11, 2021

Edit: Dec 12, 2021

Edit Author: Philip Smith

Code version: 1.0

Availability: <https://www.youtube.com/watch?v=FbM4CkqtOuA>

Title: GameStateController

Author: Philip Smith

Description: Allows player to quit the game with the 'ESC' key

Title: CanonAIController

Author: inScope Studios

Description: Intermediary between the Cannon's Idle and Lock On states. Handles changing states.

Date: Mar 17, 2021

Edit: Dec 11, 2021

Edit Author: Philip Smith

Code version: 1.0

Availability: <https://youtu.be/VnfD5wGEXFw>

Title: CanonAIState

Author: inScope Studios

Description: Abstract class of Cannon's AI States.

Date: Mar 17, 2021

Edit: Dec 11, 2021

Edit Author: Philip Smith

Code version: 1.0

Availability: <https://youtu.be/VnfD5wGEXFw>

Title: CanonAIIdleState

Author: inScope Studios

Description: Idle state of Cannon AI. When an enemy enters the collider, it becomes the cannon's target and the state switches to Lock On. If the target dies, any other target in the collider becomes the new target.

Date: Mar 17, 2021

Edit: Dec 11, 2021

Edit Author: Philip Smith

Code version: 1.0

Availability: <https://youtu.be/VnfD5wGEXFw>

Title: CanonAILockOnState

Author: inScope Studios

Description: Lock On state of Cannon AI. The Cannon turns to its target and starts shooting projectiles. If the target dies or exits the collider, the Cannon is sent back into Idle state.

Date: Mar 17, 2021

Edit: Dec 11, 2021

Edit Author: Philip Smith

Code version: 1.0

Availability: <https://youtu.be/VnfD5wGEXFw>

Title: CanonShooterController

Author: Code Monkey

Description: Handles Cannon aiming, shooting, and dismounting.

Date: Aug 11, 2021

Edit: Dec 12, 2021

Edit Author: Philip Smith

Code version: 1.0

Availability: <https://www.youtube.com/watch?v=FbM4CkqtOuA>

Title: CanonBall

Author: Code Monkey

Description: Applies velocity to the Cannon ball's rigidbody, applies damage to enemies when they enter the collider, and destroys the object when anything other than the player or a cannon enters the collider.

Date: Aug 11, 2021

Edit: Dec 12, 2021

Edit Author: Philip Smith

Code version: 1.0

Availability: <https://www.youtube.com/watch?v=FbM4CkqtOuA>

Title: CanonPrepController



Author: Philip Smith

Description: Handles spawning in cannons where the player indicates.

Title: PromptController

Author: TheKiwiCoder

Description: Maps the cannon prompt UI to the cannon's position on the screen.

Date: Dec 18, 2020

Edit: Dec 14, 2021

Edit Author: Philip Smith

Code version: 1.0

Availability: <https://www.youtube.com/watch?v=oLT4k-lrnwg>

Title: PlayerEnterController

Author: Philip Smith

Description: Handles when a player is close enough to a cannon to use it.

Title: RatNavBehaviour

Author: TheKiwiCoder

Description: Handles Rat character animations and movement using NavAgent.

Date: Dec 18, 2020

Edit: Dec 12, 2021

Edit Author: Philip Smith

Code version: 1.0

Availability: <https://www.youtube.com/watch?v=oLT4k-lrnwg>

Title: EnemyBehaviourController

Author: TheKiwiCoder

Description: Handles enemy health values and destroys enemy game object when it reaches 0.

Date: Dec 18, 2020

Edit: Dec 12, 2021

Edit Author: Philip Smith

Code version: 1.0

Availability: <https://www.youtube.com/watch?v=oLT4k-lrnwg>

Title: CharacterHealthBar

Author: TheKiwiCoder

Description: Has health bar UI mapped to the intended object's position on the screen. Updates the bar when health value changes.

Date: Dec 18, 2020

Edit: Dec 12, 2021

Edit Author: Philip Smith

Code version: 1.0

Availability: <https://www.youtube.com/watch?v=oLT4k-lrnwg>

Title: EnemySpawnController

Author: Philip Smith

Description: Handles enemy spawns. At set intervals it will spawn a new enemy along with a new canvas for its health bar.

Title: TowerController

Author: TheKiwiCoder

Description: Keeps track of the tower's remaining health and destroys the object when it reaches 0.

Date: Dec 18, 2020

Edit: Dec 12, 2021

Edit Author: Philip Smith

Code version: 1.0

Availability: <https://www.youtube.com/watch?v=oLT4k-lrnwg>

Title: SceneCanvasController

Author: Philip Smith

Description: Handles the Win or Lose condition end cards when all enemies are defeated or the tower is destroyed.

Title: VertexJitter

Author: Bouchard, S

Description: Animates Text Ui to shake

Date: Dec 18, 2020

Availability: Unity TextMeshPro Package