

# GAME DEVELOPMENT PIPELINE – Assignment 1 – AY2425 – RELEASE 170125

## Game Design Document

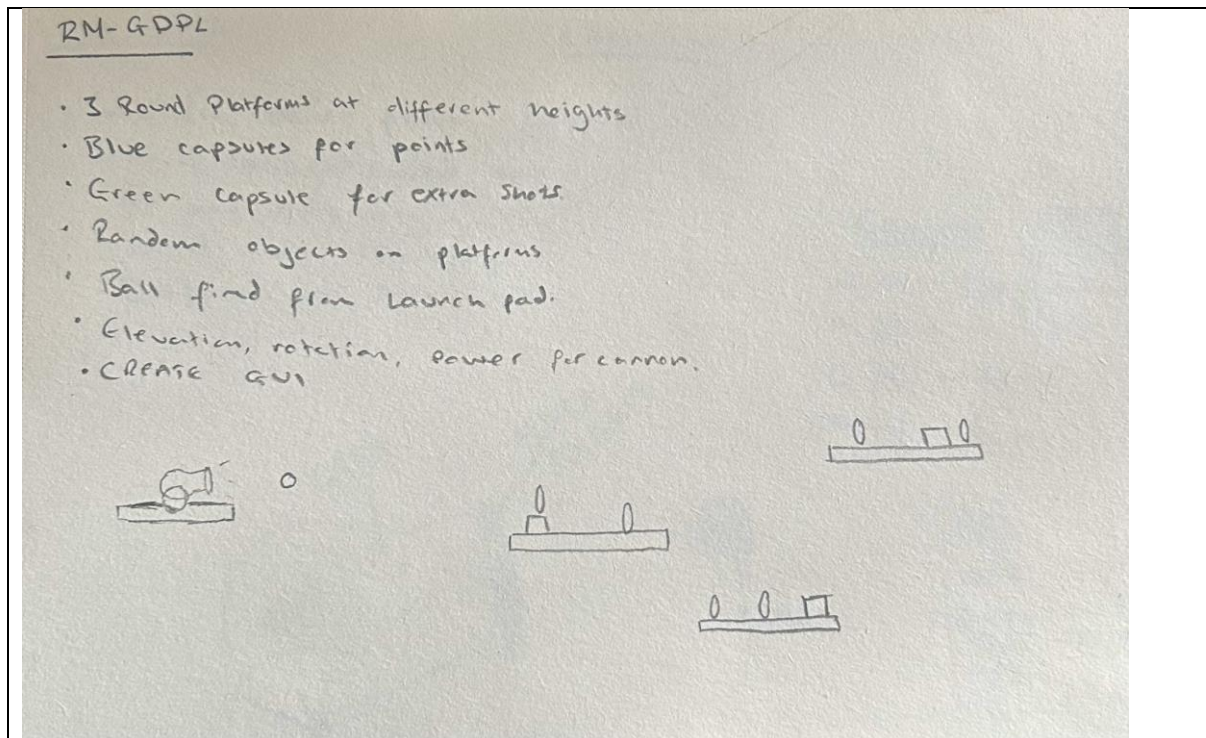
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### LEVEL DESIGN

#### Initial Game Design Sketches



## RM - GDPL

## CANNON

Launch ball from cannon.

Cannon Asset found online

↳ Needs changing.

• Start with 10 shots.

• Despawn ball after 10s

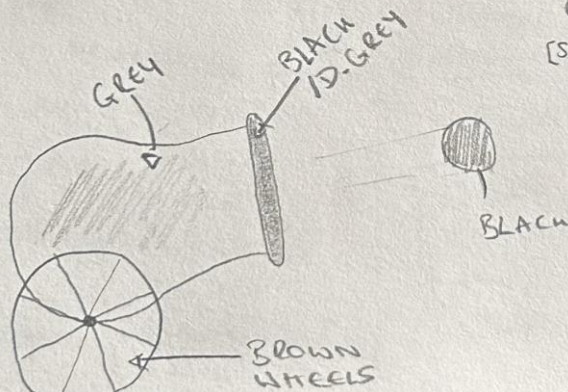
Controls - Display on screen.

W/S - Elevation

A/D - Rotation

Q/E - Power

[SPACE] - Fire



### VFX

Blast Sound

Wheels turning

Shot Projection

### SFX

Blast

Wheel crank

## RM - GDPL

## TARGETS

### GREEN

- +3 Shots when hit
- Has gravity / can be knocked
- Spawn Randomly.
- Chime sound when hit
- Small VFX

### ASSETS

- Must be green

Replace with Goblin?

SPAWN

RANDOMLY

ON

PLATFORMS

Skeleton?

Zombie?

Person?

Robot?

Pirate?

Animal

### BLUE

- +1 score when hit
- Has gravity / can be knocked.
- Hit 5 to win
- Chime sound when hit
- Small VFX

### ASSETS

- Must be Blue

Replace with target

SPAWN

RANDOMLY

ON

PLATFORMS

Goblin

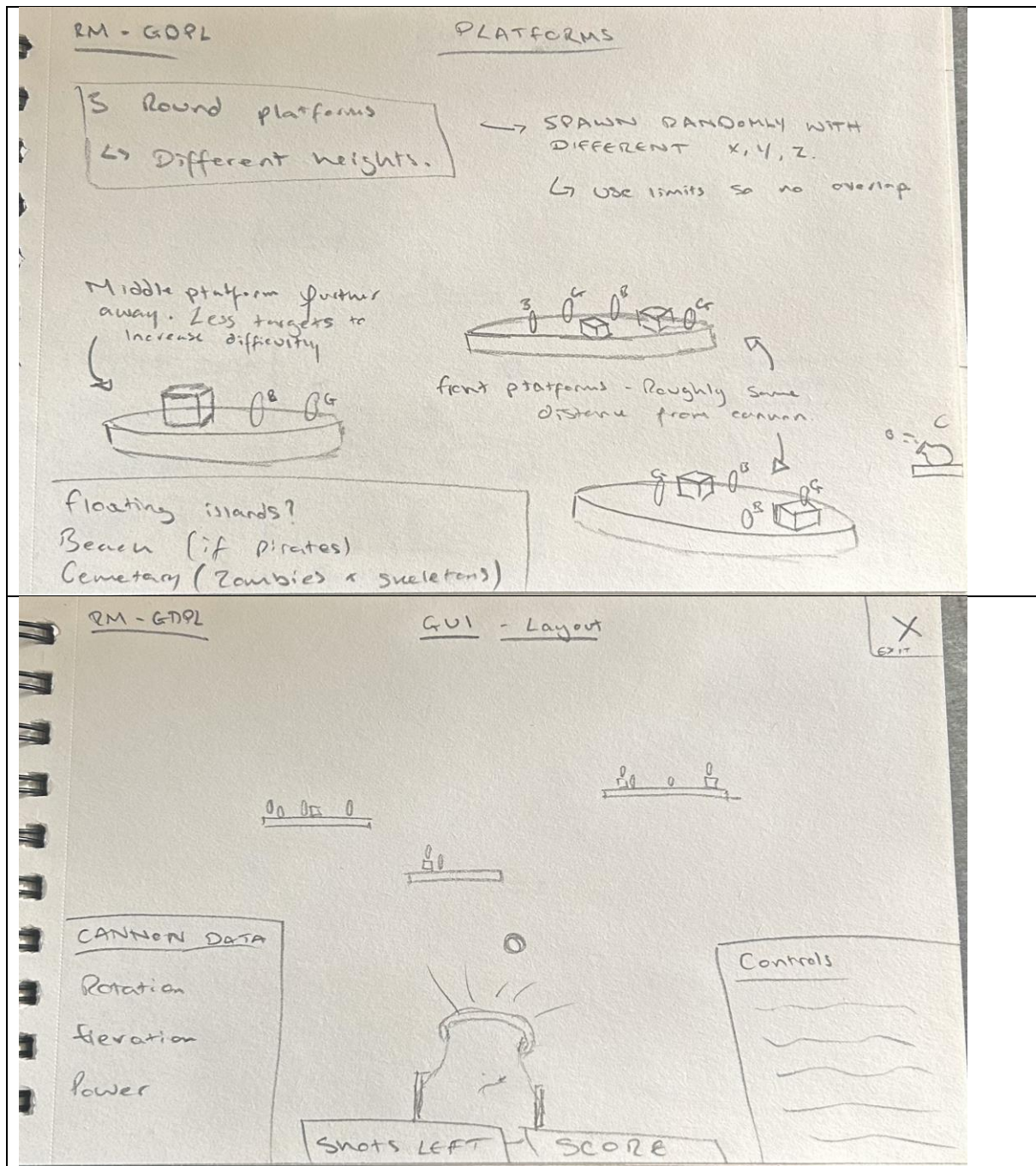
Skeleton

Robot

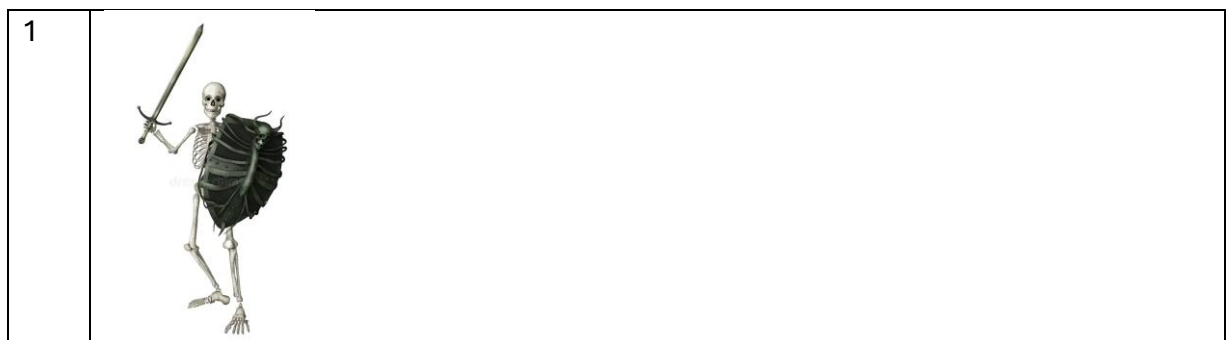
Ghost?

Animals?





## Mood Board



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3	
4	



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6








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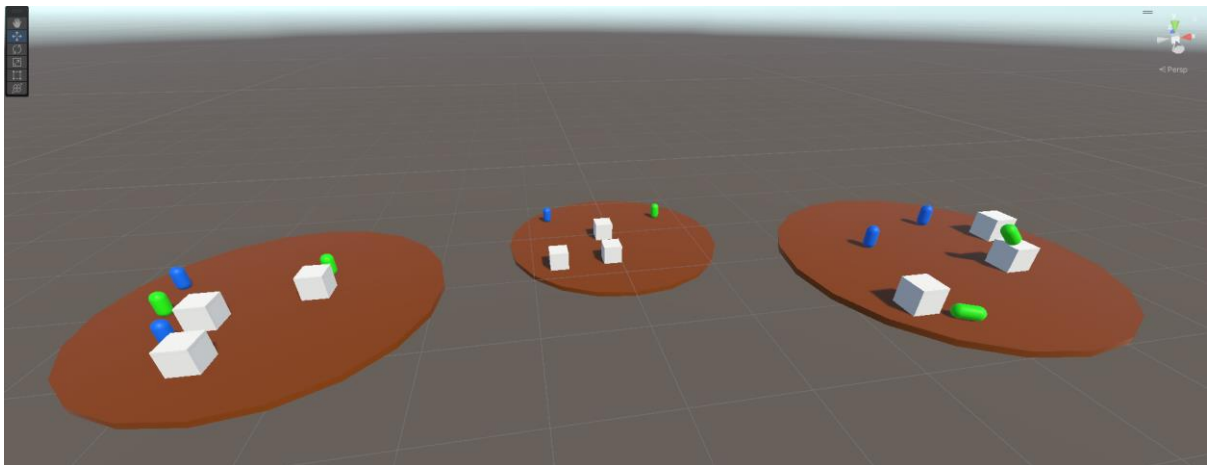
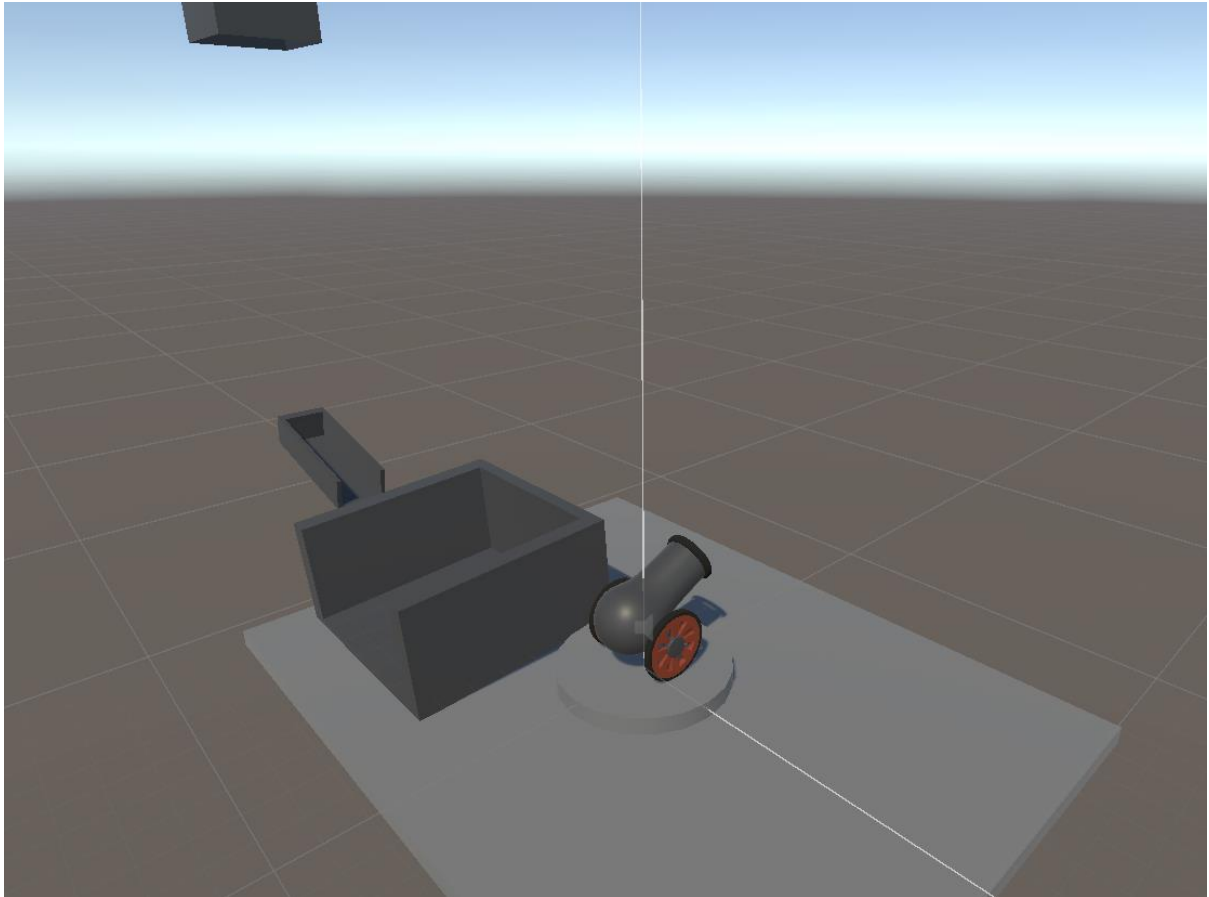


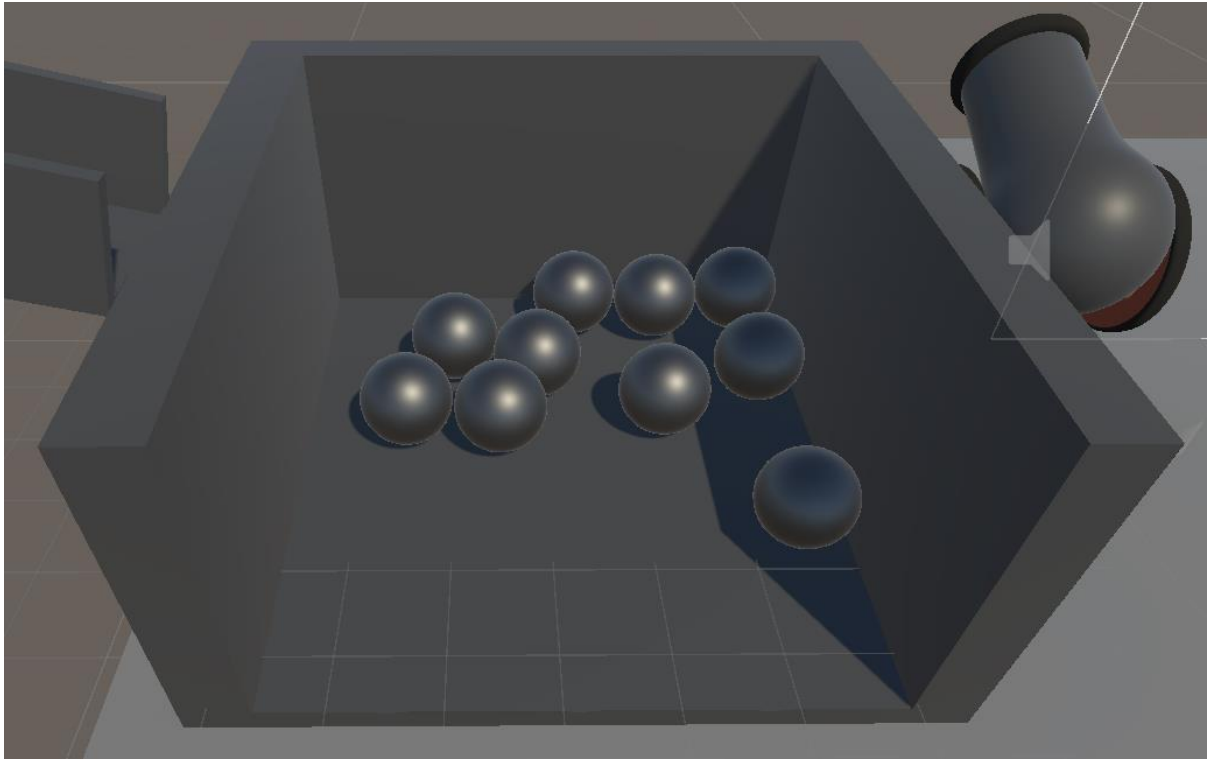
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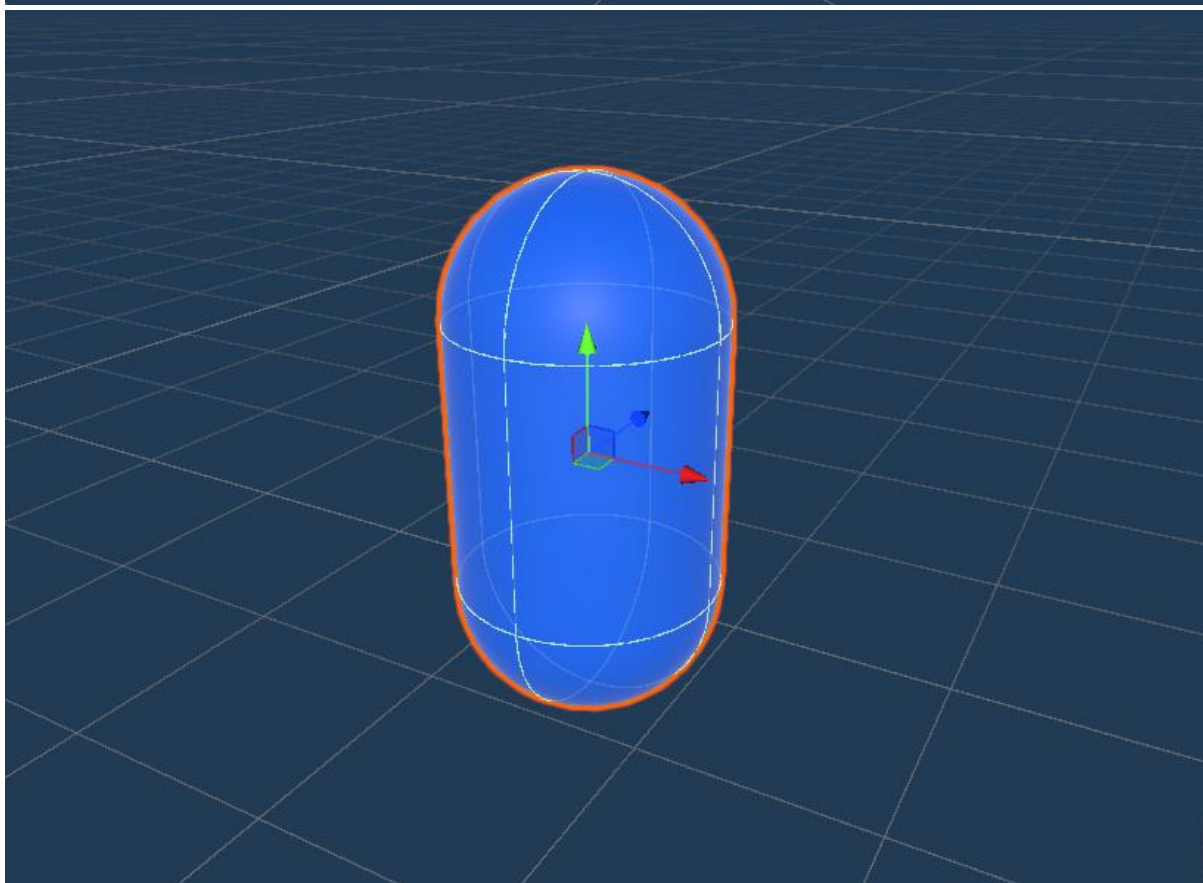
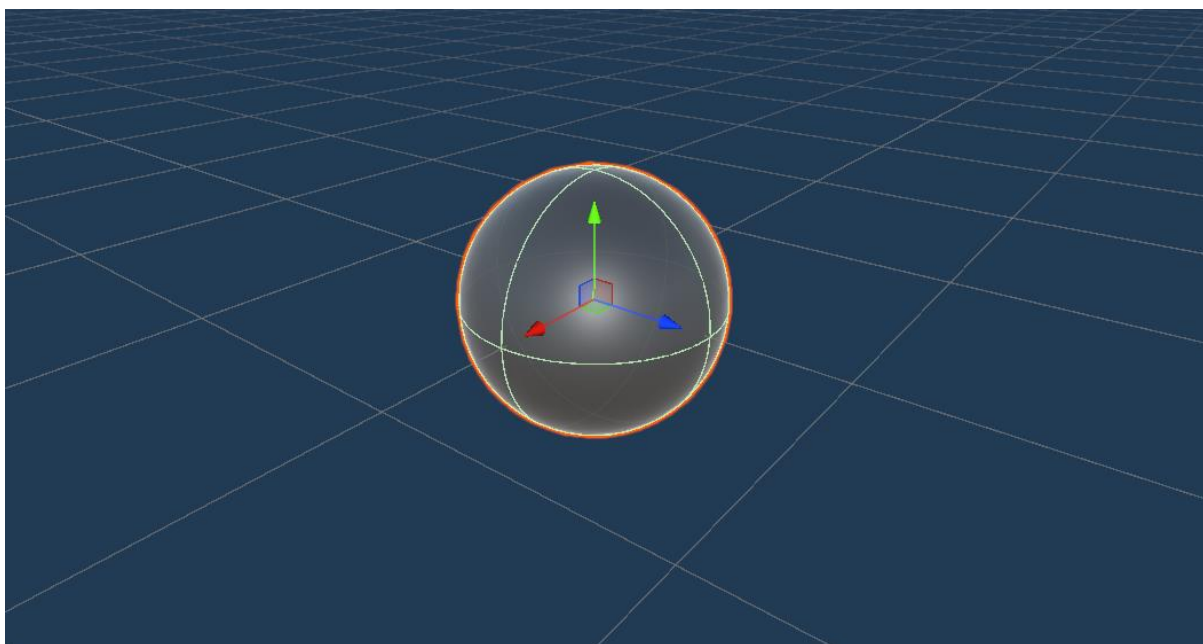
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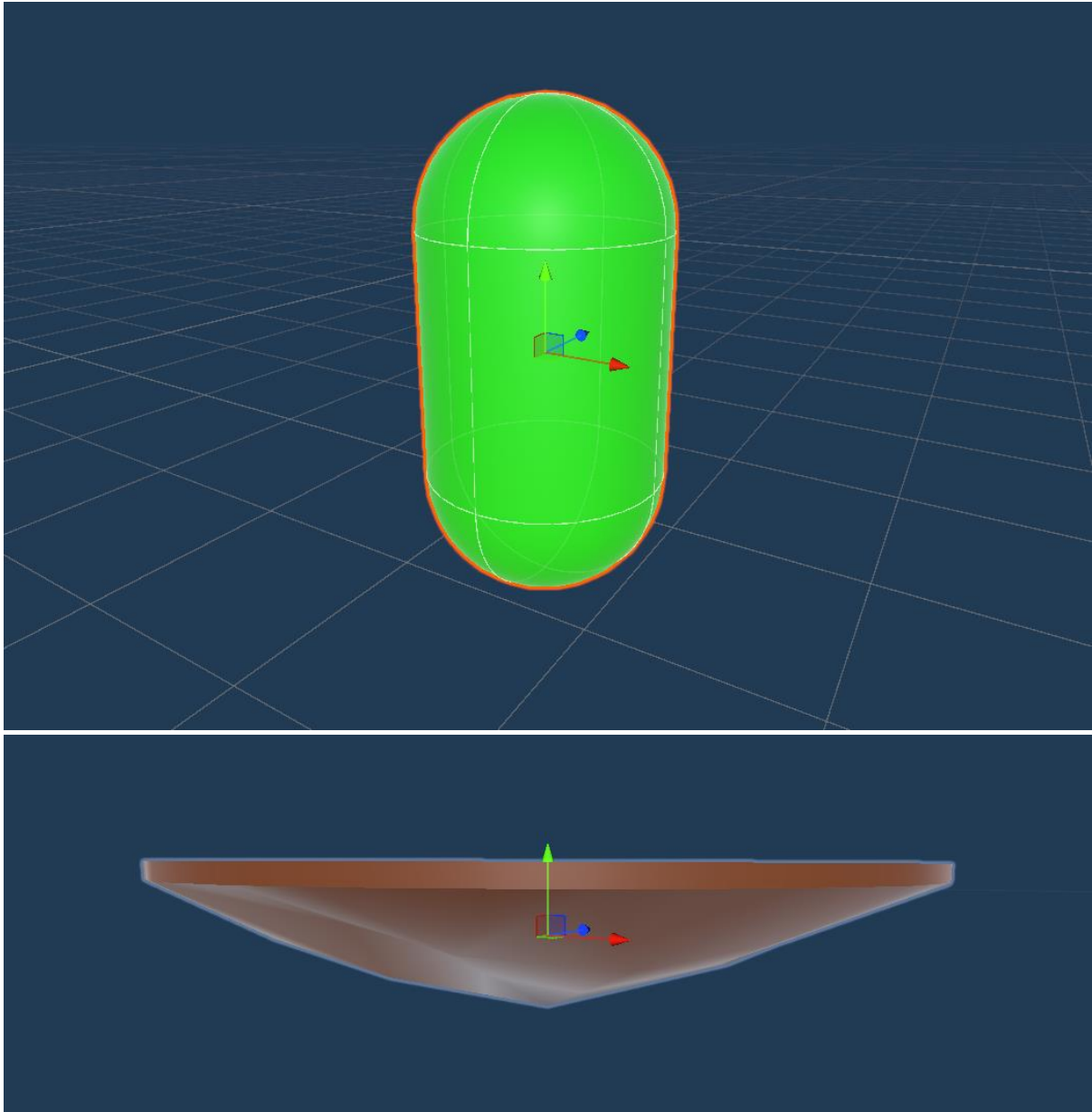
Blocking Out











### Asset List

ASSET TYPE	SUBTYPE	NAMING CONVENTION	FILE FORMAT	ANNOTATIONS
3D Asset	Props	BlueCapsule	.prefab	Blue capsules will spawn randomly across the different platforms, when hit by the ball they will increase the score by 1
		Cannon	.prefab	The cannon is controlled by the player. The player uses WS/AD to change elevation and rotation,

				Q/E to control power, I/O to change rotation speed, SPACE to fire the cannon, and P to toggle the shot projection
		CannonBall	.prefab	The cannonball is what is fired out of the cannon. The player starts with 10, when reaching 0 – and the player hasn't hit all blue targets - the game ends and the player loses
		GreenCapsule	.prefab	Blue capsules will spawn randomly across the different platforms, when hit by the ball they will increase the shotcount by 3
		VisualCannonBall	.prefab	VisualCannonballs are used to represent the shotcount visually. At the start of the game 10 will spawn in the crate and 1 will disappear each time the cannon is fired. If the player hits a green capsule, 3 more visual balls will spawn and drop down to the others.
		RedCapsule	.prefab	The red capsule appears on Level 3 only, the final level. If the player managed to hit the red capsule then they win the game, seen by loading the win scene.
	Obstacles	Lantern	.prefab	Lanterns appear spread across the different platforms. They are used to give off small amounts of light. The player can hit them with the cannonball.



		obstacle	.prefab	Obstacles appear as crates, these are randomly spawned across the different platforms on each level. They can be hit with the cannonball.
	Environment	CannonVFX	.prefab	The cannon VFX are played each time the cannon is fired by the player. This creates flashes, sparks, fire and smoke to appear from the end of the cannon, mirroring a cannon blast.
		Post	.prefab	The post prefab is a lamppost, with a lamp connected, hanging by a rope. This appears across the 3 levels and sits upon the same platform as the cannon.
		Tree	.prefab	Pine trees will randomly spawn in the background of each level – below the platforms, on the ground. They can be hit with a cannonball, however they cannot move.
		Platform Left	.prefab	This is one of 3 platforms that appear across all 3 levels. This appears on the far left of the level.
		Platform Middle	.prefab	This is one of 3 platforms that appear across all 3 levels. This appears in the centre of the level – in line with the cannon.
		Platform ML	.prefab	This is one of 2 platforms that appears only on level 2. This

				appears on the left of the level, between the Centre and Left platforms.
		Platform MR	.prefab	This is one of 2 platforms that appears only on level 2. This appears on the right of the level, between the Centre and Right platforms.
		Platform Right	.prefab	This is one of 3 platforms that appear across all 3 levels. This appears on the far right of the level.
Scripts		CameraVFX	.cs	This script makes the camera shake when the player fires the cannon.
		CannonController	.cs	This is the script where the cannon controls are set up, as well as most of the different variables seen throughout the other scripts, such as Rotation, Speed, Power, Shot Count, Score. This is also where the cannonballs are created when shot, and where the blast audio is played.
		DestroyBall	.cs	DestroyBall is attached to a large invisible box below the platforms, it will destroy the different objects that fall onto it, then also add to the score or shot count if it was a blue or green capsule.
		DrawProjection	.cs	This script handles creating the shot projection from the cannon. It uses a

				lineRenderer to create the line which can be toggled on or off by pressing "P". On level 3, this projection is disabled.
		HitCapsule	.cs	HitCapsule handles the logic of hitting a capsule. If a green capsule is hit then the shot count is increased by 3. If a blue capsule is hit by the ball then the score is increased by 1, and finally if a red capsule is hit on level 3, then it will load the "Win" scene.
		HUDController	.cs	HUDController stores all of the different variables seen throughout the game and displays them on the screen for the player. It contains the cannon variables (Rotation, Elevation, Power, Speed, Projection), as well as the game variables (Score, Shotcount)
		LevelManager	.cs	This script is where the win and lose conditions for each level are stored. For example: on level 1 if the player gets a score of 5, then level 2 will load, however if the player runs out of shots, then the "Lose" scene will load.
		Music	.cs	The music script stores the 2 custom background music tracks, each to be randomly selected



				when starting each level.
		Restart	.cs	The Restart script will work on both the win or lose scene, it allows the player to press “R”, to restart the game by loading Level1 again.
		SpawnerLevel1	.cs	This script handles all the random spawn locations of the different objects on level 1. This is where the background trees are created, based off random coordinates. Then each of the 3 platforms are assigned random coordinates to spawn. Then the obstacles and capsules are created and placed based on the locations of those platforms. The code is modular and can easily be altered to create different levels.
		SpawnerLevel2	.cs	This script is similar to the level 1 spawning script, except it creates more platforms, which then requires more capsules and obstacles based off the new platform coordinates. Once again, everything has random spawn positions.
		SpawnerLevel3	.cs	Similar to the last 2 spawning scripts, except this time only 1 platforms spawns with 1 capsule on it – the red one. There are a few obstacles which will also spawn here.

		VisualCannonBalls	.cs	This script will create “visualCannonBalls”, which are just cannonballs for the player to see. The amount of cannonballs that spawn will reflect the shotcount. With cannonballs being deleted when the cannon is fired, then extra cannonballs will spawn if a green capsule is hit. The player cannot interact with these, it is purely for a visual shot count.
Materials	Material	Cannon-Grey	.mat	This material is applied to both the cannon and the crate of visualCannonBalls
		Cannonball	.mat	This material is applied the cannonballs as well as the visualCannonBalls
		Crate	.mat	This material is used on the square obstacles on the platforms to make them appear like wooden crates
		Ground	.mat	This is a simple green material, used to create a green field beneath the platforms
		WOOD	.mat	This material is used on the wooden platform that the cannon stands on, as well as the cannon’s wheels
		Trees	.mat	This is a simple green material, slightly lighter shade than the ground. It is applied to the leaves of the trees.
	VFX	blueSkeletonEyes	.mat	This makes the blue skeleton’s eyes glow with a blue hue, to

				inform the player that this is a blue “Capsule”
		greenSkeletonEyes	.mat	This makes the green skeleton’s eyes glow with a green hue, to inform the player that this is a green “Capsule”
		redSkeletonEyes	.mat	This makes the red skeleton’s eyes glow with a red hue, to inform the player that this is a red “Capsule”
		lanternGlow	.mat	This material is given to the lanterns around the level to allow them to glow with a yellow hue.
		orangeSparks	.mat	This is assigned to the cannonVFX to allow the cannon to blast fire and sparks which appear both yellow and orange
		smokeVFX	.mat	SmokeVFX is also assigned to the cannonVFX to create a shade for the smoke to appear
Textures		Crate	.jpg	This is a wooden crate texture applied to the obstacles around the different levels
		cannonball	.jpg	This texture was given to the cannonball material
		WOOD	.jpg	This is a simple wood texture that was applied to the platform that the cannon sits upon
Audio	SFX	CannonBlast <sup>[1]</sup>	.mp3	This is a simple cannonBlast sound effect that is played when the cannon is fired
	BackGround Music	BG1	.wav	This is one of the pieces of background music that is randomly



				selected to play at the start of each level
		BG2	.wav	This is one of the pieces of background music that is randomly selected to play at the start of each level
Backgro unds	Backgroun d	Lose-Scene	.jpg	This is a .jpg version of the Lose Scene – which appears when the player loses the game
		Lose-Scene	.psd	This is a .psd version of the Lose Scene – this is the original file which can be changed and altered if needed.
		Win-Scene	.jpg	This is a .jpg version of the Win Scene – which appears when the player wins the game
		Win-Scene	.psd	This is a .psd version of the Win Scene – this is the original file which can be changed and altered if needed.
Scenes	Levels	Level1	.unity	This is the easiest level in the game, it is also the first to load
		Level2	.unity	This is the second level of the game, which will load after completing level one
		Level3	.unity	This is the final and hardest level of the game, it appears only when the player has finished level 1 and 2.
	W/L Screen	Lose	.unity	This is a lose scene that will load if the player runs out of shots before hitting all the targets
		Win	.unity	This is a win scene that will load if the player manages to hit the red target on level 3

## Scheduling

W/C	TASK	END DATE	COMPLETE?
10/03/25	Sketches complete.	16/03/25	Y
10/03/25	Create Initial Block-Out	16/03/25	Y
17/03/25	Create Ball Launcher	24/03/25	Y
17/03/25	Create Target Spawning	24/03/25	Y
17/03/25	Create Target Functions	24/03/25	Y
24/03/25	Create GUI – with controls on screen	30/03/25	Y
24/03/25	Replace Assets with Assets from Packs	30/03/25	Y
24/03/25	Create Sound Effects	30/03/25	Y
24/03/25	Create Background Music	30/03/25	Y
31/03/25	Create Additional Features / Mechanics?	13/04/25	Y
7/04/25	Create VFX	13/04/25	Y
28/04/25	Script Video	05/05/25	Y
28/04/25	Create Demo Video	05/05/25	Y
28/04/25	Create Windows Build	05/05/25	Y
05/05/25	ZIP + Submit	08/05/25	Y

## Game Testing Summary

Before adding a new feature to the project, I would duplicate the project to have a save point before adding a feature. Then I would create the feature as simple as I could, to a point where the game would run. If the game ran but there were errors with the feature, I would go through the code to debug and then run again after every fix until the feature works. When creating the project, I started with the basic features on the specification before attempting to add extra, just so the core mechanics of gameplay were in place, this including creating a working cannon, and capsules that could be hit with the ball.

## Asset Packs List

Stylish Cannon Pack:

[https://assetstore.unity.com/packages/3d/props/weapons/stylish-cannon-pack-174145?srltid=AfmBOorGOjkqfVkJllyx1b7AfYi0KwNjFyg\\_aTu6gejJl\\_MRGYWrNoP](https://assetstore.unity.com/packages/3d/props/weapons/stylish-cannon-pack-174145?srltid=AfmBOorGOjkqfVkJllyx1b7AfYi0KwNjFyg_aTu6gejJl_MRGYWrNoP)

10 Skyboxes Pack:

<https://assetstore.unity.com/packages/2d/textures-materials/sky/10-skyboxes-pack-day-night-32236>

## Mini Simple Characters:

<https://assetstore.unity.com/packages/3d/characters/humanoids/fantasy/mini-simple-characters-skeleton-free-demo-262897>

## REFERENCES

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- 12 - Studio, E., 2025. *Holzkiye Stockfoto 97546664 / Shutterstock* [online]. Shutterstock. Available from: <https://www.shutterstock.com/de/image-photo/wooden-box-97546664> [Accessed 4 May 2025].
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#### Audio References

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