

Pigeon Pirates

“Pigeon Pirates” is the next installation in our “Pigeon Planet” series. It follows the events of Pigeon Planet which our group had submitted for the 2024 STEM Video Game challenge. Unlike the first game, where you play as a human, in ‘Pigeon Pirates’ you play as a pigeon under the service of the pigeon king.

In the 2024 STEM Video Game Design Competition, we received relatively high scores for our actual game, but an abysmal score for our planning document, and hence this will be our primary goal for this year’s competition.

Planning

Organisation

Responsibility

Our team consists of 4 members: Ayaan Gupta, Adam Sheridan, Cameron Leighton and Marcus McGloughlin, and we all took on a specific role throughout the process.



Ayaan Gupta

Audio Designer



Adam Sheridan

Team Manager and
Programmer



Cameron Leighton

Sprite Designer



Marcus McGloughlin

Sprite Designer

These roles play into our strengths as individuals. Adam is a good coder with experience in coding on Unity and is a good leader. Ayaan has experience with writing original music, as well as creating other forms of audio. Both Cameron and Marcus are excellent at creating digital sprites and animations. In addition, all members of our team are friends and collaborate well with each other.

Submission Guidelines:

To ensure that our group meets the submission guidelines we will do a few things. We will revise our game design document before submitting, to ensure that it addresses all required points and is of good quality. We will also ensure that our concept for our game matches the theme for the competition, to ensure that we meet those requirements. We will also ensure that we are coding in the correct software and that all our code is accessible by the judges.

Workflow:

Our first priority is to develop a basic outline of the story. We will then begin to develop our music, code and sprites concurrently from there, and continue to develop our story. As these tasks are the responsibility of different members, they can be completed side by side, making our progress more efficient and faster.

As game development progresses, the main storyline must be completed to allow for more accurate timelines for the other components. From there, we can begin to compile our different components and send them to our coder to incorporate in the game.

We will make a progress check at the end of each month to ensure that we are on track to meet our deadlines, and adjust them, if necessary. Our due dates have intentionally been left fluid with this in mind.

Timeline:

Objective	Timeframe
Basic Story Outline	December 2024
Base code + game (simplified)	Mid to late Term 2 2025
Music Completed	June 2025
First round of beta testers	May 2025
Makes changes based on Round 1	Late May 2025
Second round of beta testers	June 2025
Make changes based on Round 2	Late June 2025
Third round of beta testing	July 2025
Final bug fixing and details	July 2025
Full submission	20 th June -> 23 rd July 2025

Technical Requirements:

Pigeon Pirates will be designed on Unity. While the game can run on all resolutions, some UI glitches may be seen when the screen is too wide. It is recommended that the game be played in full screen mode if possible. It can also be played on all operating systems, due to our use of WebGL to publish the game.

Designing

When we began designing our game, the first question related to whether our new game design should be 2D or 3D? There were discussions that were had within our group on the format of the game we would design. The options were 2D platformer games or an immersive 3D environment. Eventually, we decided that it would fit with the theme more if it was 2D, as well as the fact that it would enable us to make a more refined game, as our game last year was 2D as well, as well as the fact that 2D Platformers are streamlined with a simple goal in mind, but also offer room for a kind of semi-open-world, especially because of the map aspect of the game. From here, we developed our game to what has now become Pigeon Pirates.

Game overview

Game Title

Pigeon Pirates

Our 2024 game was titled 'Pigeon Planet', in which you are a human who has crash landed on the Pigeon King's Planet. We wanted to make 2025's game related to 2024's, while also fitting this year's theme of journey. As such, we decided to make the game nautical-related. The title of our game gives a nod to our previous game, while also relating to our game story as outlined below.

Game description:

In Pigeon Pirates, the Pigeon King has taken a loan from the notorious pirate Blackbird, and he is unable to pay off this debt. He has recruited you, his loyal pigeon servant, to sail across the seas and find treasures to pay to Blackbird and eventually defeat him in a heroic battle to save the kingdom.

There are several islands you can sail to. These islands instead are occupied by different subjects of the kingdom. These people will teach you skills which will help you to pass through "Hero's Isle" and finally defeat blackbird.

Characters:

Player – You, the player, are a pigeon, and a loyal and trusted subject of the Pigeon King. He has enlisted you to aid him in finding treasure for the kingdom, to pay off his debt.

Pigeon King – He is the leader of the pigeon kingdom and is heavily in debt to the pirate Blackbird. He has a good heart and believes in you but is unable to further aid you on your quest.

Blackbird – The most feared pirate in the seven seas. He has given the Pigeon King a loan which you are attempting to pay off and is the main boss fight at the end of the game.

Citizens of the Kingdom – Scattered across different islands, various citizens will help you learn skills, which will help you defeat blackbird.

Environment

The game takes place on a fictional planet called Pigeon Planet, which was the setting of our previous game, Pigeon Planet, as well. The kingdom is made of various islands, scattered across an ocean.

Theme

This year's theme

This year's theme, 'Journey', has many applications in a video game. It can describe the physical journey a character may take, the learning that takes place throughout the game and what the character gains through the game.

Link to your game

Our game links to the theme 'Journey' in multiple ways. The most direct way that it links is through the player's journey through the different islands. They begin on Royal Island with the King, but can then travel to the Windy Archipelago, the Bay of Birds, the Mountain Towns and finally the Hero's Isle.

The journey is also represented in the growth of the player. It is possible to beat "Hero's Isle" (the final level) without learning any skills, but it is made far easier by learning different skills on the other islands. This growth and learning of new skills is part of the player's journey to beat the final level. This is supposed to highlight that while some tasks may be possible without any growth, learning from others and growing as an individual can make tasks easier. We intend for this to give the player a sense of journey through character growth, in addition to the physical journey that they undertake.

Gameplay/mechanics

Objectives/Goals

The end goal of the game is to find the treasure on Hero's Isle and defeat the Pirate Blackbird. To aid with this main goal, the player may choose to learn different skills on different islands, such as double jumping, gliding and shooting.

Perspective

The game is a mix of side on, platformer like gameplay for the main part of the game and top down for the boat when you are traveling.

Controls

'Pigeon Pirates' follows a simple WASD/Arrow keys movement system, using the E button to interact with objects around the map. The Escape button is used to access the menu/pause the game. The F button or left click are used to attack.

Instructions/Tutorials

Jump/Up – Up Arrow/W/Space (The player can also double jump after completing “Windy Archipelago”)

Move left – A/Left Arrow

Move right – D/Right Arrow

Move down – S/Down Arrow

Gliding – To glide, press and hold any of the jump keys while already in the air. If the player has double jump enabled, they will have to press and hold it after jumping twice. (The player may do this after they have visited the Windy Archipelago)

Shoot – F (The player may shoot seeds to deter enemies after visiting the “Bay of Birds”)

Visual and Audio design

Style

Our games visual style is loosely based on games like Super Mario World and other SNES games. All sprites have a pixelated design, and are made in the online software named ‘Piskel’. They are either 32 by 32 pixels, or 64 by 64 pixels. These sprites are designed with the game story and theme in mind, with the islands and the characters representing both the physical and the mental journey of the player. Another distinctive feature of Pigeon Pirate’s sprite style is the lack of black borders. This is to give the visuals a more vibrant look, amplifying the island hopping, sub-tropical feel.

Our music is originally composed on the music software ‘Musescore’. To connect with the theme, our music is nautically inspired and written based on what instruments could be coupled with the area. On the ocean, the piece simply uses a piano, which contrasts with the other pieces which use several other instruments and varying instrumentation.

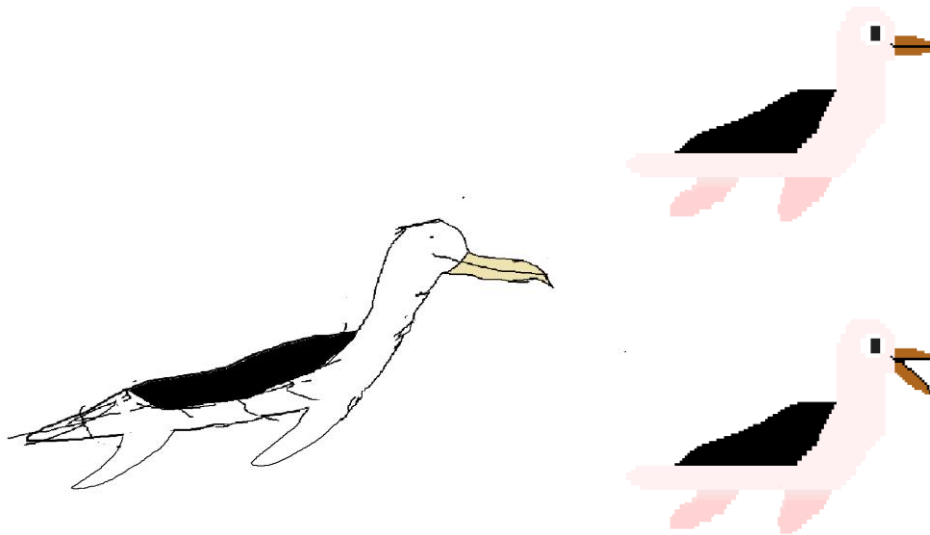
Screenshots of the Music Scores

Below are screenshots of the music scores, taken from Musescore. As mentioned above, all music is originally composed using the Musescore software. It is important to note that all the music is designed to loop and do not have definite endings (except for the blackbird battle music which simply repeats at the end.)

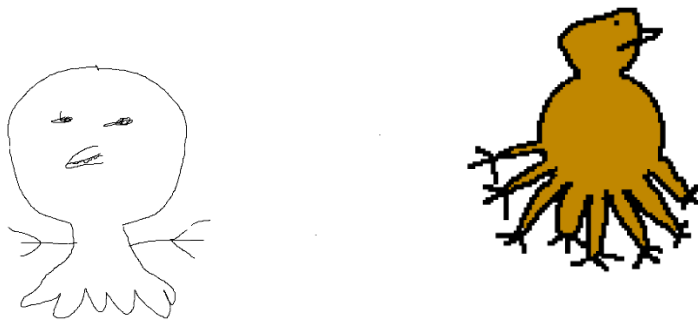
Sprite Concepts and final designs:

Below are two of our original sprite concepts and our final designs. Please note that both were omitted from the game due to time constraints.

The Mosacawrus, (Concept on the Left and the Final Design on the Right):



The Krakhen (Original Concept on the left and the Design before it was omitted on the right):



Process

As mentioned above, all sprites were created on an online software known as Piskel. For environmental sprites, no conceptualisation was needed, and the sprites were drawn from scratch. For the character sprites, multiple concepts were drawn before the most favoured ones were selected and drawn onto Piskel.

For the musical process, instrumentation and the key in which the piece was composed in were selected based on the requirements and use of the piece. For the upbeat pieces, higher and brighter instruments were chosen, and a more positive key. For the darker pieces, deeper and darker sounding instruments were chosen, and a harsher key. Much research was done to create professional-sounding soundtracks. To get inspiration, Ayaan listened to triple A game soundtracks as well as indie soundtracks, especially in seafaring games such as “Sea of Thieves” to decide on the tone that Pigeon Pirates needed to have. His plan was to create an immersive experience for the player, creating greater depth in emotional experience as well as gameplay.

Reflecting

Monthly Recaps

Each month we attempted to collate work that we did during it. Unfortunately for some months we either didn’t have enough work to report on or neglected to add it.

November 2024

Game Development:

In the month of November, we began to develop the game story. We determined the basic outline of a journey through many islands, hunting for treasure. We also developed ideas for some bosses, such as the Krakhen, Blackbird and the Mosacawus.

Sprite Design:

We enlarged sprites from the original game Pigeon Planet and edited some of them to be pirates. We also began to make sprites for the starting castle, and an island for once a map is added to the game.

Music:

No music work was completed this month, as the story had not been set.

February 2025

Following the summer holidays, we began to further develop Pigeon Pirates.

Game Development

We amended our story so that rather than a “set” story, the game was a more open world with a number of different islands, and different scenes on each. We also added the interactive map, which you can access by pressing “e” while near the boat. When

pressed, you will get on the boat and can travel to different islands by pressing “e” when near one.

Sprite Design:

In Sprite Design, we created more island background sprites. In addition to this, we created a moving ocean background in the end of the introductory scene.

Music:

In addition to this, the ocean theme was written this month. A singular piano was determined be the instrumentation of the piece, to have a simple feel, while still having a wide range of musical melodies. This melody had a syncopated rhythm, with nautical style chords.

March 2025

Game Development

During this month, we added the ability to travel to different islands, along with animations for the player’s movement. We also fixed a bug where the player character would get stuck on the floor. This was caused by overlap of objects, and we just had to delete objects that overlapped each other.

Sprite Design

During this month, there were significant developments in the region of sprite design, with waves, player character walking animations and a new kind of pigeon that appears on the ‘Bay Island’ as well as the sprite for the Mosacawus. Concept designs for Blackbird, the Krakhen and the Mosacawus were also created. As well as characters and enemies, background sprites were also made, such as a palm tree.

Music

During this month the adventure theme began to be written. This musical theme was primarily brass based, to ensure a strong and adventurous melody, to match the theme of the island.

April 2025

Game Development

This month, as it was the school holidays, minimal work was done on the development of the game

Sprite Design:

This month, we made the islands more detailed by adding trees and bushes. We also added a grotto on the southern island, which will be expanded later.

Music

The adventure theme was refined in this month. The melodies were edited to have improved harmonical content, while also adding a second horn part to improve the base line.

May 2025

Game Development

During May, we added two different elements that go hand in hand- enemies and attacking. To attack, the player can either click the “F” key or left click on mouse, which makes the pigeon spit out a seed to shoot. We introduced multiple enemies including a swooping red bird that tracks the player and began work on the final boss- Blackbird, the fearsome pirate. (we decided to omit the Mosacawus and the Krakhen as bosses, in the interest of time)

Sprite Design

This month we created more background sprites including bushes and other foliage, as well as producing the sprites for multiple enemies and the seed sprite that the pigeon spits out. In addition, we created the sprite for Blackbird.

Music

In this month, the starting theme was written. This theme makes use of a darker key and increasing crescendos and instrumentation. It uses primarily stringed instruments to have an ominous tone.

June 2025

Game development

This month we worked on the Blackbird boss battle, developing the story line for this battle was an important focus for us this month. Further developments were made on the map as well. We also reflected on the theme, “Journey” and decided to change earlier bits of the game to better reflect this. We intend to add extra islands that you must visit to gain new skills before facing the boss fight and final island.

Large work was done on the Blackbird boss fight. His fight has two phases. In the first, you dodge his cannonballs, which will fall from the ceiling as he shoots at you after 20

cannonballs have fallen, a small boat will be sent out. If it reaches you, the second phase will be initiated, where you are boarded by the pirates and must fight them off.

Before the fight, however, you must find the towns treasure on the Hero's Isle. After you take their treasure, be it peacefully or with force, when you leave the island you will be encountered by the Blackbird, and his fight will begin.

Sprite Design

This month saw the addition of the cave tiles set, a collection of tiles for use in making cave sections of the map. Blackbirds ship was also created, with a rocking animation.

Music

The music for the pirate theme was written this month. This music was written with a combination of woodwinds and strings, with additional percussion to have an ominous sound. This piece has gradually building tension, similar to the starting theme, to create suspense and an ominous sound.

July 2025

Game development

This month, we yet again changed the islands. The only island with treasure now is "Hero's Isle". Hero's Isle is a challenging level to beat, but is possible without any skills, which you can gain from visiting other islands. The intention is that the player will be unable to beat the island on their first go, but can learn new skills (Shooting, Double jump and Gliding) to pass through the island.

We also changed the Blackbird boss fight. He now shoots different numbers of cannonballs at the player in different phases. In between phases, the player will be able to fire back, dealing damage and eventually defeating him.

In response to feedback we received, we added a toggleable "hints" system to the top left corner, telling you the current goal and any relevant controls. We also added a controls screen that the player can choose to visit on the main menu at the start of the game.

Sprite Design

We didn't make new sprites this month, but we did add an explosion animation for Blackbird's death as well as adding the different island sprites to the map. We also added 2 new fonts: "Rapscaillon" and "Nugie Romantic" (Both of which are free to use).

Music

We added all needed music to scenes, and lowered the volume on most levels, as it was quite loud. We also added a sound effect for the ship being hit in the boss fight, as well as “talking noises” during dialogue, similar to ‘Animal Crossing’ or ‘Undertale’.

Beta Testing:

We also had multiple beta tests, which helped us get an idea of what players would like us to add.

Round One (May)

Testing

We received this feedback and made these observations during our first round of Beta Testing:

- Many of the players found it interesting that you can get caught on the wall (they spent time trying to climb it).
- There was a bug that allowed you to double jump on wall.
- Many players skipped the kings dialogue.
- A few players jumped off the edge.
- All players beat the enemies very easily.
- Many players got softlocked in a room that had no exit.
- Many players described the game as too quick

Fixing

We responded to the feedback by:

- Fixing the bug that allowed you to double jump on the wall by making jumping only possible if the player had been on the floor.
- We added an exclamation sign above important characters/items to signal that it is important to interact with.
- We began revising the game story to make the game longer, and ended up removing the cave as part of this.

Round Two (June)

Testing

We received this feedback and made these observations during our second round of Beta Testing:

- Players recommended adding a legend for movement.
- Players enjoyed the new boss fight, but still found the game relatively short.
- Journey was only explored through the physical adventure across islands, and not in the characters growth.
- Some needed instructions for how to proceed in the boss fight, or were unsure of when they were hit.

Fixing

We responded to the feedback by:

- Adding 3 more islands for the player to visit before facing “Hero’s Isle” that they can visit in any order. While the player can technically beat “Hero’s Isle” immediately, it is very difficult. The intention is for the player to attempt the island, and after failing, travelling to the other islands to learn new skills before trying again.
- Adding an NPC in the Blackbird boss fight that indicates when phases end.
- Adding explosion animations for when the ship is hit by a cannonball.

Round Three (July)

Testing

We received this feedback and made these observations during our third and final round of Beta Testing:

- Players appreciated the fact that all music was original.
- Players liked the vibrant visuals of the islands.
- Players enjoyed the non-linear design and the ability to go between islands.
- Players found the use of animations to be effective.
- A bug was found where the player could launch themselves using seeds shot at certain points.
- Players found the boss fight “creative and enjoyable”.
- Players found some text tough to read.
- Players reported controls sometimes janky.
- A bug was found where the music wouldn’t repeat on Royal Island.
- The game doesn’t make it clear when you died.
- The player was able to fall off the cliff on the Bay of Birds island
- Some disliked the lack of a health bar.
- Some disliked the randomness of the boss fight (Cannonballs shooting at random locations)
- The games controls aren’t shown to the player at the start.

Fixing

We responded to the feedback by:

- Putting the text on a darker colour background to make it easier to read.
- Adding invisible walls on Bay of Birds to eliminate possibility of falling off.
- Adding chances for the player to attack back in the boss fight.
- Making a control screen appear if the player clicks

Project Execution:

Please write what skills you need to learn for next time, whether we were able to finish the game and incorporate everything, what worked well and what you would do differently next time in any order.

Adam's Reflection:

I had so much fun creating this year's game. Unlike last year, we planned much of the game in advance, which allowed me to complete most of it early on, letting me add details that we couldn't fit in last time. My skills as a coder have grown significantly, especially with my use of different unity scenes, as well as communication between scripts using different functions. If I had extra time, or if I could do-over the game, I would start even earlier to add more detail. I feel like parts of the game that I made later on were much more polished than earlier parts. Next year I plan to enter again and make a game I can be even more proud of.

Ayaan's Reflection:

Throughout this project, I was able to make pieces that suited the game and compose them under time pressure. I was able to include all of the pieces I had made, though I would have liked to make an individual one for each island. Next year, I will attempt to work quicker, and learn to compose music with more varied instrumentation, rather than just using classically based ones, which are ones I am more comfortable with. If I was to redo the project, I would attempt to establish a clear outline of the game earlier on, so that there was more time to compose music.

Marcus's Reflection:

During the process of making our game, I was the co sprite creator with Cameron, and we were tasked with working on the game design document. I have become a much better sprite creator over the time we spent making this game. One thing I especially liked about the game were the open world mechanics, I would have preferred if we made more continuation with the first game, pigeon planet, which this game is a sequel. I probably could have worked harder to make a larger number of sprites that fit in better with the style of the already existing game and with the style of the other sprite creator, I also could have added more to the game design document.

Cameron's Reflection:

During our project for the Australian STEM Video Game challenge I was challenged as a digital artist to improve my sprite making skills, as well as coherence between sprites. Almost all of my sprites were included, such as the island tiles and the trees. Next year I will focus more on the Game Design Document earlier on, making sprites later on when the game is more developed. I also plan on learning more on sprite design and animation, and stepping into 3D and vector art next year, which is well outside my

comfort zone. If I were to redo this project from the start, I would probably assist in nailing down the story line before touching any game elements.