AUSTRALIAN STEM

VIDEO GAME CHALLENGE

2024 WINNER

Elora
The Night's Sky

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Australian Stem Comp

Elora Lippey, 2024, The Night's Sky

Planning

Started early February

Responsibility and Workload

Since my team only has one member (it's me! Surprise!) the roles and responsibilities must be managed by me. To make sure I don't burn out or not get enough work done, I have laid out a plan for the season which I will follow as best as I can throughout, adjusting as necessary if goals seem unachievable or too achievable within the timeframe. I will also use this plan as an easy way to make sure I know what needs to be done.

Roles and Responsibilities	Completed by
Brainstorming and researching the best platforms to create the game with.	March 1
Deciding on the type of game and how to incorporate the theme which includes: - The setting - The characters - The story - The controls - Level count and game duration - The genre	March 10
Developing skills required for game creation by: - Creating multiple test games to get more accustomed with the language and platform - Creating music using BandLab in multiple styles to explore which is best for my game	March 22

- Exploring ways to include parallax and perspectives	
FLL International Championship (not working during this time)	7 – 23 April
Coding a prototype and finetuning controls and movement - Sharing the prototype with peers, friends and family - Collecting feedback about ease of gameplay and how fun it was	26 April
Responding to feedback and finetuning. - Research common control layout and decide on the best one - Begin to development of prototype into final game - Creating Art/Musical assets for the game	30 June
FLL Asia Pacific Championship (not working during this time)	2 – 7 July
Bug testing, reflecting and finetuning. Completing documentation.	8-22 July
Submitting the game.	23 July

Quite a few jobs can be done at one time, since most art-related jobs are done on another device. For examples, all art assets will likely be made as needed throughout coding, then given a final polish at the end to make sure they all look cohesive. All art will likely be made in Krita, and all music in BandLab.

To ensure my game matches the submission requirements, I will make sure to check back to the submission requirements when a big change in the plan for the game happens. Since things rarely work perfectly, it is quite likely that timeframes for tasks may need to be adjusted throughout. In this situation, I will make sure to re-read the submission requirements to make sure my game hasn't strayed from the original mission, along with making sure that the game still fits the theme the best it can.

The aim is to have the prototype for the game ready for testing shortly after getting back from the FLL International Championships in Houston. Since I started quite late in the competition, I don't have that much time, so the game testing phase will be merged with the coding phase, instead of being separate, distinct phases. Again, Since I'm on a time crunch, I aim to have the Game ready a week before the final submission date, leaving a week to write the reflection parts of the GDD and to have some wiggle room in case something goes wrong.

Designing

In my opinion, simpler is better when it comes to names, so that's why my game is simply called "The Night's Sky". The name not only sums up the game pretty neatly (it's a game about the night sky) but the peculiar spelling that makes it seem like the sky **belongs** to the night sparking curiosity and making the name sound more poetic. It makes it pretty clear what to expect heading into it and means there will be no confusion when the players are faced with the not-so-sudden not-really-realization that the game is, in fact, about the night sky (as per the title).

The game is a 2D platformer set in… drumroll please…. The Night Sky (I'm sensing a theme). In the game, the only way to reach the goal (the brightest star in the sky) is to use your lasso to swing from the hundreds of stars all over the level. There is a constellation in each level the player can complete by swinging on each star. These constellations act as an extra challenge, like the collectables you would find in most 2D platformers. It's mostly physics based gameplay, but the way the swinging mechanism interacts with the physics not only feels natural, but is also feels like the character has momentum, meaning it feels way cooler when you finally get that smooth jump between 3 stars in a row (only to inevitably fall flat on your face because of a cloud, and have to start again).

Though unintentional at first, after getting people to test the demo, I quickly realized at the start that I created a rage game and decided to lean into it. Most play testers very much had a response something along the lines of "OH, this is cool… Oops, I missed it… damn, again?… NO, GO AWAY CLOUD…OH MY GOD NOOOOOOO" shortly followed by "Are there any more levels? No? Are you gonna make some? I wanna keep playing!". Like most rage games, what's even better than finally finishing the level is managing to string together a sick combo, and then proceeding to describe it to everyone who didn't see it (and those who did) with much enthusiasm. The game is mostly targeted towards teens and young adults, although really anyone can play it. The character you play as is a small, vaguely lil guy shaped cloud of shadow, with two glowing eyes. The original plan was for him to be fulfilling the task of the Night (hence the grammar in the name) and bringing light back to the world after dark, however unfortunately, due to time and skill restraints that plan ended up not being feasible. I hope to continue coding the game after the competition and finishing it fully.

This game had many inspirations, I've always loved playing video games and wanted to code my own, so this competition was the perfect way to start (nothing like a good bit of friendly competition to stop you procrastinating). The original inspiration for the game was simply looking up at the sky. I've always loved the night sky, and a competition where the prompt was "Stars" seemed like the perfect way to show off how amazing it is to everyone. The plan from the start was for the game to teach the stories behind the aboriginal

constellations of my area, and to teach people about the dreamtime and the old stories. Unfortunately, this plan fell through, as I was unable to find an expert on the matter and ran out of time. I ended up just picking some of my favourite modern constellations. I plan to continue the game after this competition, and hopefully include the stories of the aboriginal peoples in it.

A piece of artwork originally planned to be in the game. This is the dark emu, which can be seen in the arch of the Milky Way galaxy. I drew all the game art myself, including this.

One game that is similar is called “Cut the Rope”. Cut the rope is a 2D Puzzle game from 2010, where you need to deliver a piece of candy to the mouth of a little green goblin by cutting rope the candy is attached to and swinging it. While the gameplay is very different, the physics of the rope is very similar, and what I had in mind when I first started to code the game. However, the difference is, in my game, you are the “candy” and instead of cutting rope to swing, you lasso onto stars. My game teaches you about the constellations while still allowing for a fun time. It’s also incredibly aesthetically pleasing, as the image of a hundred stars gently twinkling is always gorgeous, no matter how simplified. There are no other games like The Night’s Sky, and even when the competition is finished, I will keep developing it because I believe it is a well thought out, educational game with unique gameplay and entertaining physics.

This year's theme is stars, and my game heavily ties into the theme throughout. My entire game relates to the theme, as the whole point of my game is stars, constellations, and astronomy. Stars are a strong visual theme throughout, with everything from buttons to backgrounds covered in them. My game is about stars, and without the existence of stars within it, it would not be any different from any other 2D platformer out there. I took "Stars" to mean the floating ball of gas in the sky, and have not only added educational tidbits, but many things have been added for accuracy's sake, even though they don't affect the game. For example, the brightness of the background and decorations changes depending on how full the moon is. There are more stars on the two levels with new moons. The constellation Lacerta is quite dim and only visible in good conditions, which is why it is in the first crescent moon level, where there is less light pollution from the moon.

Gameplay

The main aim of the game is to complete all 9 levels by touching the brightest star. All levels also have an optional secondary objective of completing the constellation by swinging from every star in the constellation at least once. The player can also choose to try and beat their own high score once they run out of levels. Each level is a little harder than the next and offers more extreme challenges. The last level is the hardest of them all, since it is a time crunch to try and beat the level before an approaching storm makes it impossible.
The original animation I made that prompted the game:
https://gifyu.com/image/S5sk7\

Sketching how I wanted the swinging to work:
Option 1: https://gifyu.com/image/S5x7m
Option 2: https://gifyu.com/image/S5x7n
(I chose option 1)

This was the first video of my game, when I only had the lasso function. As you can see, I also haven't turned off my colliders with stars, and I kept running into them:
https://yourimageshare.com/ib/4GUyi7stnB

This is another video, taken later before I renovated the menu with my own sprites, this was also before I had made proper music, so I had to make do:
https://yourimageshare.com/ib/cCH3IEANMS

The game is a 2D platformer, as is viewed from the side view.

The player controls the using the “WASD” or Arrow keys and by clicking and holding with the mouse to swing and jump from star to star, completing the objectives of each level. The sprite starts on the ground. And can then walk around using the WAD keys as follows.

W/↑: Jump

A/←: Move Left
D/→: Move Right

Once the player has moved within distance and lassoed a star by clicking and holding the left mouse button, the WASD key or the arrow keys are used to control the swing and movement from the star.

W/↑: Shorten the lasso
A/←: Swing left
S/↓: Lengthen the lasso
D/→: Swing right

While in the air, you can also press W/↑ to jump. This only works when your air jump has recharged, which only happens every 10 seconds. (3 seconds for the last level).

With the combination of those keys the player can control the lasso and swing towards another star. They then release the left mouse button and jump across, left clicking once again to grab onto another star. If the player misses the star, they fall and can either catch another star on the way down or fall all the way to the ground and start climbing all over again. Again, the goal is to jump from star to star, making your way across the level, then collide with the final brightest star at the end to complete and move to the next level.

An optional tutorial was included in the first level to teach the player how the controls work.

Many changes were made throughout the design process, according to feedback from the play testers. For example, there was originally no plan for a mini map, but everyone who

tried the game said that they were frustrated because they didn't know where they needed to go, so I added a mini map in the bottom corner. Some changes were also made to ensure the game better fit the rubrics, such as adding more imersive sound, and noises for when the player is walking or lands.

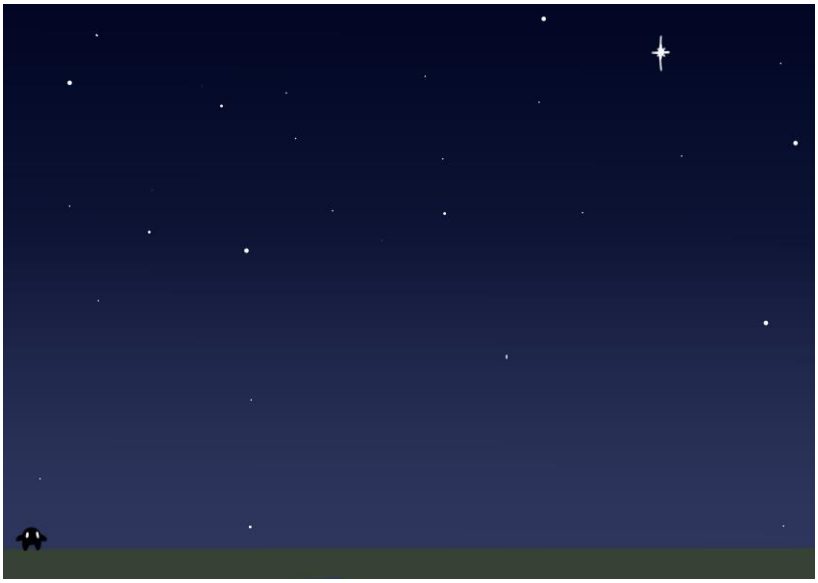
Visual and Audio Design

The game has a coherent and simple art style throughout. All assets were hand drawn by me using a software called Krita and match my unique art style that I have developed over years of digital art. A lot of them were drawn on my computer, meaning it was harder to achieve clean lines and neat colouring, which is why all the assets are lineless and contain only a few well picked colours. Throughout the menus and background of the whole game, there is constant astronomical and star imagery, for example, instead of numbering the levels, they all have a phase of the moon. The music was also made by me, using a software called Bandlabs. Inspired by a 2D platformer called Hollow Knight, I picked a synthetic grand piano as the main tune, because it fit the gentle and calm, but also somewhat sober atmosphere. One level (level 9, with the approaching storm) also has low drums in the background, adding to the urgency of the level. I used next to no platform assets, excluding blank shape sprites for the floor and menus, because I prefer the look of my own art style. I did, however, use some sound effects from free to use website for the landing and walking sound effects, and the sound effects for catching a star and completing a constellation were created using a synthetic bell instrument in bandlab. I tried to record these sounds using a microphone and a triangle but ultimately decided they sounded better when I did not record them.

This was the first plan for how the game would look:

Once the competition is complete, I still plan to upgrade the level background to something of this caliber. This drawing is of The Dark Emu, an aboriginal constellation.

Upon realizing that this was too complicated to be doable with in the timeframe, I downsized to this:



I ended up liking the placeholder character so much that I kept him and named him Darko.

I achieved my desired visual style by drawing all my own art and keeping a couple of things in mind as I did so.
(For the foreground/background assets)

1. No gradients. Only large swathes of flat colour. (The backgrounds are exempt from this rule, along with the glow around some objects)
2. Use the lasso tool to mark out highlights, do not use any kind of semi-transparent brush, flat colours **only**.
3. No need for extra shape detail. If it gets the point across it's perfect, no need for anything more.

(For the constellation images)

1. Use tablet instead of computer so the lines are nicer.
2. Clean outline with white brush, in my normal style.
3. Add fur/feather/scale details for some variety.
4. Loosely fill in with a semi-transparent brush and set opacity low, put it behind line art.

All music was made using Bandlab, I mostly just hit record, and hit notes till it sounded cool then went back to fix it up after.

It took a lot of work and effort (and a healthy dose of procrastination) to get to the finished product, and although it isn't exactly how I wanted it from the start, I'm incredibly proud of how far my skills have come since the start of the year. I still plan to improve on the game and develop it more once the competition is over.

All constellations and a few choice examples of the game art are at the bottom of the GDD.

Reflecting

Throughout the game making process, I managed to drag all manner of people into testing, from friends to family to even kind of semi friend acquaintance types who like playing video games. I mostly wanted to see if the game was enjoyable, and luckily the response seemed to be a resounding yes. In the later stages when I was ironing out all the wrinkles, I had my family help find bugs by trying to get through all the levels and telling me whenever something broke (which was more than I would have wanted). Quite a few problems popped up, the most common having to do with me changing something in one scene and forgetting to change it in another, or something in the code being a *bit* too much of a botch job to perform right. These were generally fixed by adding more logging output so I could see what was going on. Most of the bugs taught me about the language and the platform since I am still quite new to it.

Overall, I'm very happy with the finished product. There did end up being quite a few things that didn't make it to the game, like short story cutscenes and more levels. The main thing I didn't add was constellations from the aboriginal people from this area, and although it didn't make it into this version, I hope to add it later, since I plan to keep working on this game.

Next year, I think the biggest skill I must learn is better time and mental resource management, as well as just learning the language a bit better. Since this is my first time ever coding a game, I hope next year I'll be able to start a lot stronger, and really knock it out of the park.

This year, one thing that really worked well was the order that I did things, I decided early on that there wasn't much point making it look pretty if it didn't do anything, so I just started coding, and made a bunch of simple place holder sprite and menus. I think this allowed me to get most of the coding done without worrying about it looking perfect.

Next year, I need to start earlier, this year I didn't even find out about the competition until February, and because I was also part of a robotics team that was attending internationals at the time, I was quite busy. I also think that I should find a team, because not only will the task be spread between more people (many hands make fast work), but I will also have people to hold me accountable to the timeframes I set.

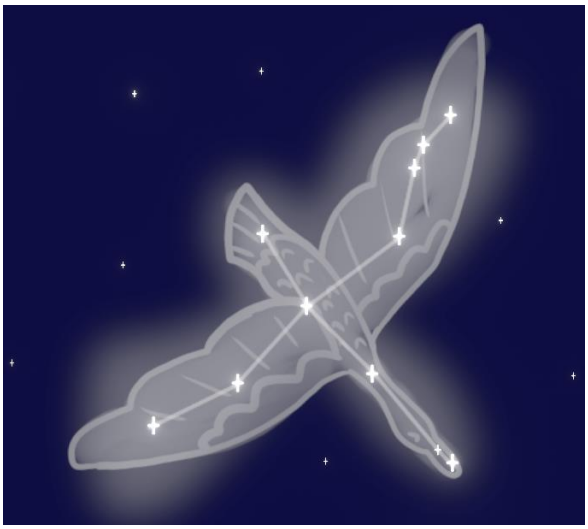
To the Judges:
Thankyou so much for putting all this work in and reading all this documents! Your work really is appreciated! (Also don't forget to drink plenty of water and take frequent breaks!)

Constellations

Level 1/Tutorial – Equuleus

Level 2 – Lacerta

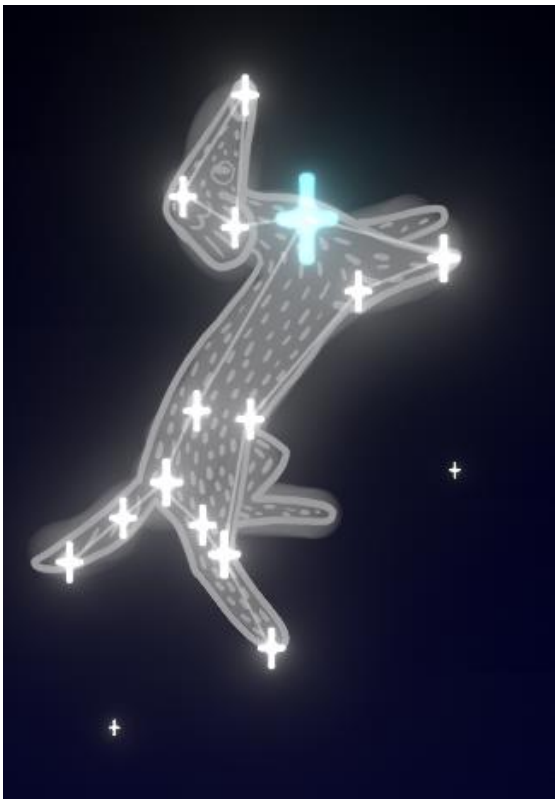
Level 3 – Cygnus



Level 4 – Capricorn

Level 5 - Crux

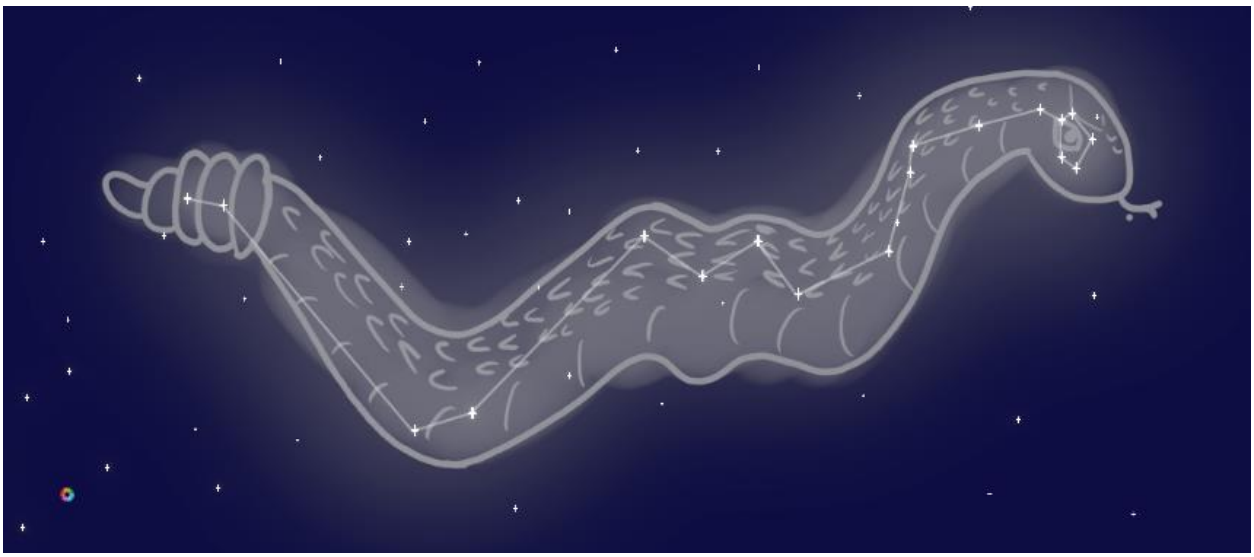
Level 6 – Canis Major (Brightest star in the sky)



Level 7 – Crater

Level 8 – Corvus

Level 9 – Hydra

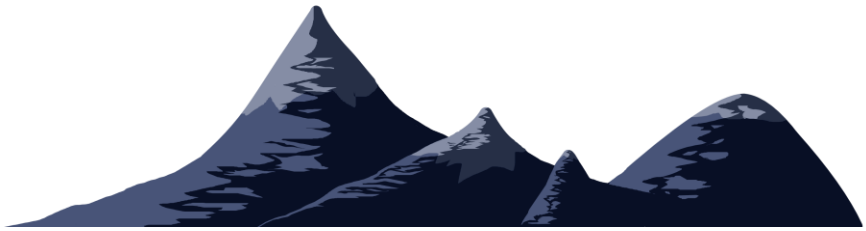


General Game Art

Bush

Tree

Mountains – Level 5



Menu background – Main Menu and Level picker Scenes

Clouds – Level 8

Air Jump Wings Animation

https://gifyu.com/image/SDMhk