I choose my cave environment because my individual VR game will be closely related to what I wanted to make for this project. I already started to make the cave environment for my game in Blender so I cut it in half to create a smaller space for the VFX demo. Then exported it to Unity and made some scaling tweaks. From there I played with the lighting effects.

This proved to be slightly difficult in the beginning because I couldn’t get the lighting inside the cave just right without it looking awful. Eventually, I found out that I needed to make the map static and bake the light map in the Lighting interface. However, I kept running into the issue of glitchy lighting, where random lines of light would streak through my cave. There still seems to be a streak still there but it’s less noticeable than before and decided not to mess further with it, fearing making it worse. After achieving lighting to my liking, I started adding my particles.

The first particle system I made was the god rays, emitting from the entrance hole. I first started with a YouTube tutorial, but after seeing how the YouTuber managed it, I edited it to my own liking such as sizing, start lifetime, material transparency, etc. Because the setting was in a cave, I wanted to add a dust particle to make it more immersive. I started with the base particle system then changed the shape, color, size, max particles, emission, and a slow noise frequency to add some randomness to the floating particles. After my two particle systems, I started my VFX Graph portion of the assignment.

My first visual effect was a spell tablet that will act as an indicator for the player in my game to learn a spell. The current spell tablet I have is for an ice spell, so I envisioned a magical aurora with droplets of ether floating around the tablet. So I started with one of the VFX Graph presets and edited the floaties to my liking. The other VFX effect I wanted to add to my demo was my spell for my fireball spell. I wanted a similar effect as the ice spell so I started with the same preset and edited from there. The variation I made between the two was the temperature of how each effect felt. The fire effect had a warmer feel while the ice one felt much colder. I also made the fire spell with more spark-like particles instead of ether-like. Both objects had point lights attached to them to add more lighting to the cave environment, but it still felt too dark. So I decided to add one more particle system to help light up the scene - torches.  
 I originally thought about using glowing mushrooms that would just have point lights attached to them. But I decided to throw in one more particle system from the torches. I might however, add that idea in my VR game to give the player a sense a more magical immersion.

I started with a primitive cube and then scaled it to make it slim to represent the base shape of a torch. After, I made a quick animation sheet in photoshop for the flames to add a realistic effect. Back in Unity, I created a particle system, changed the material to my animation sheet, checked the texture animation sheet to scroll through the sheet, and added noise, color over lifetime, and size over lifetime. I also added another point light with an orange hue and a high intensity to simulate a torch. I duplicated that and placed them around the map to help with the lighting. I also started with trying to make the scene like some of my sketches for my VR game. I added rocks and boulders to add a more interesting and natural scene.

Research:

[Simple GODRAY PARTICLE TUTORIAL (Unity URP)](https://youtu.be/kbsd6askiCY)

[Unity VFX Tutorials - 08 - Basics (Fire)](https://youtu.be/5Mw6NpSEb2o)

[Unity 2020 URP - How to get total darkness in scene](https://youtu.be/uSmXlEkJDJI)

GitHub Link-

<https://github.com/CarsonCrawford37/Unity-Particle-Effects-VFX-Graph>