Level Design

Sebastian Grygorczuk - STEM Institute at CCNY

Today's Agenda

We're going to be designing a level in Crabber!

Today you will learn about:

- Your role as a level designer
- All interactable elements in a level
- Methods of manipulating the provided Game Assets to create a game.

Crabber

Crabber is a 3D Isometric Puzzle platformer where the goal is to travel the level, collect the optional fruit and save the crab at the end.

It’s inspired by the Frogger 2 Swampy's Revenge.

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What are the Rules of the Game?

In this game you play as Crabber! He is controlled with the WASD/Arrow Keys to turn or move in the direction that's clicked. You can also click Space to jump over a space that including over game obstacles.

The challenge of the game is to find the correct path to traverse while avoiding deadly obstacles and falling into the poisonous water.

Role of Level Designer

As a level designer your job is to use the provided Game Assets. We'll go over the different Game Assets you will be playing with.

You have to balance making the game difficult and fun while introducing different mechanics over time.

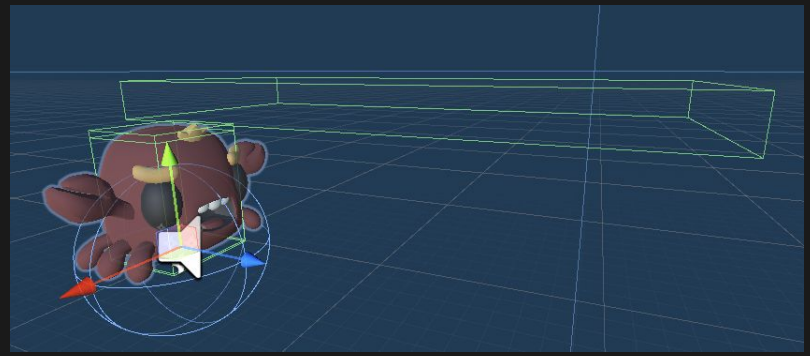
You can use the levels I put together as a template for how you could go about it.

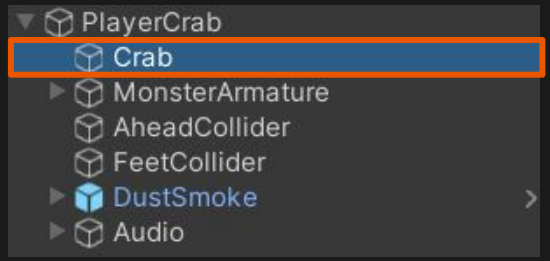
Crabber

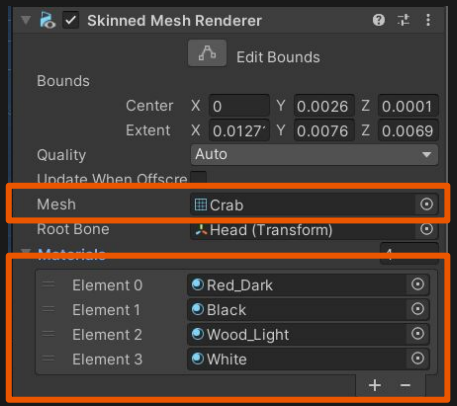
There's a lot of components that make up Crabber but the only one I recommend you messing around with is the Crab Game Object.

That game object holds the skinned Mesh Renderer component, which dictates the mesh that defines Crabber and allows you to change the materials that are used to color Crabber.

The player has three Colliders on them, one to interact physically with the platforms, a second one to trigger whenever they are actiley on the platform and a third to indicate where or not they can perform a jump.



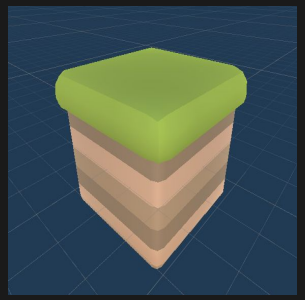


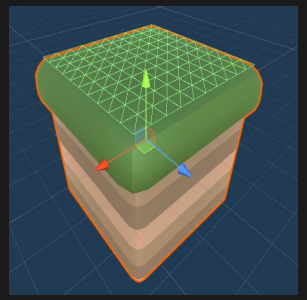


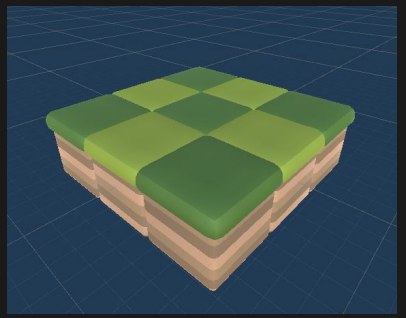
Platforms

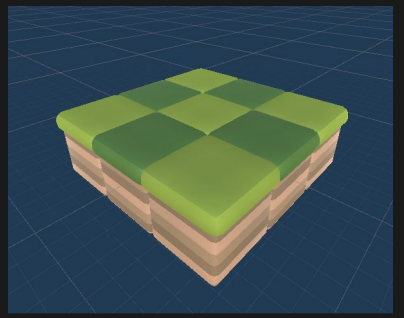
Platform makes up the safe area that Crabber can traverse. There are purposely two different colors of the platform to allow the player to calculate the distance when jumping.

These platform are nested inside bigger PreFabs that are a collection of the platforms.





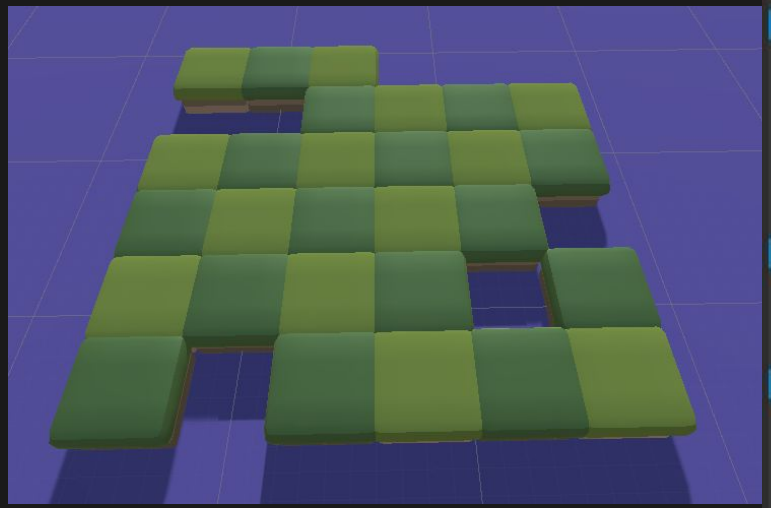


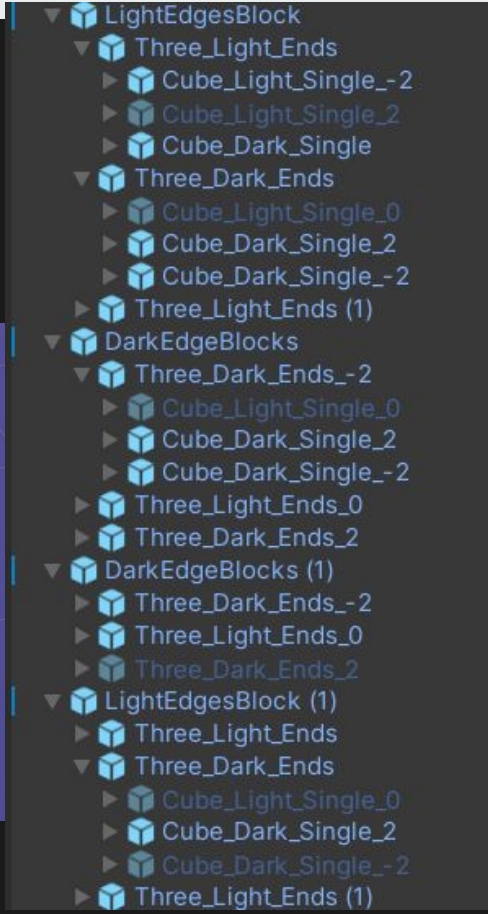


Creating an Area

To create a interesting traversal path it's best to just plot down a couple of the bigger Platform Chunks and the start knocking out areas.

The more you knock out the more of a path you'll start to build in your head and once you got something you can start adding obstacles or collectibles to incentive or distinctive the player from going in a direction.





Water

Water is a big component as it means death for the player if he ever falls of the platform.

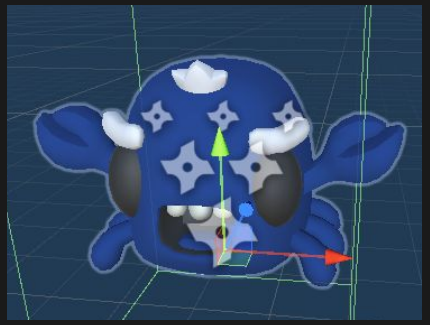
It takes up a large amount of space so you want it to look pleasing to the eye but have some indicator that it's a threat.

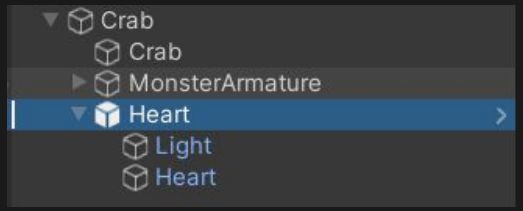
Victory Goal

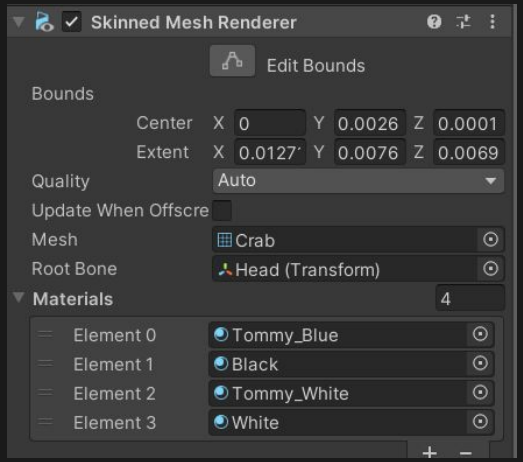
In the context of Crabber you were looking for you lost siblings that have wandered off and you have to find them and rescue them.

You can change the mesh to be anything you'd like but it should be distinct so that the player can recognize it as the end of the level.

The Victory Goal Crab does have a VFX connected to it in name of Heart I don't recommend messing with it as it will take too much time.







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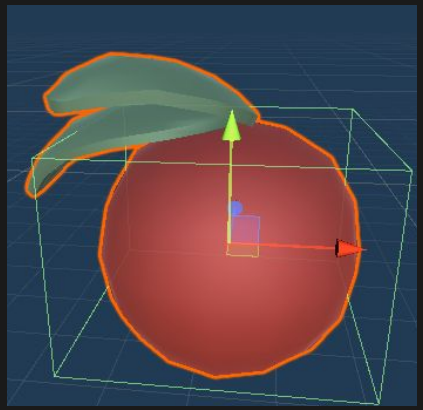
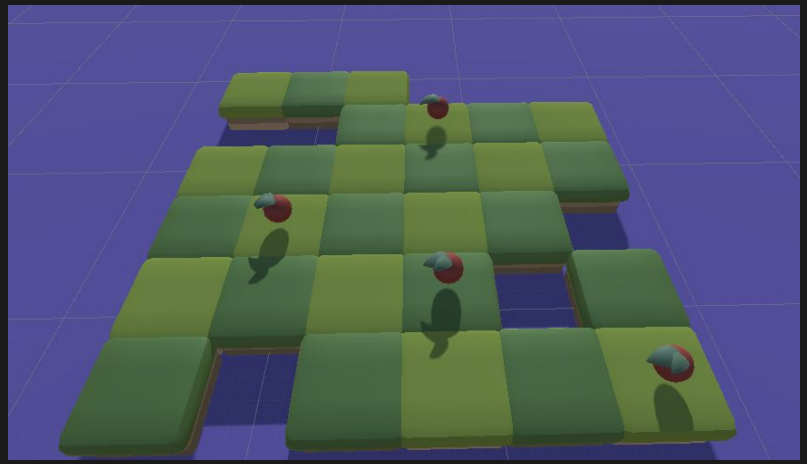
Additional Collectible

In the base game the fruit is a single collectible in each level, however since we're only putting together one level you can use them as coins in Mario or keep them at their original purpose as hidden away treasure that insitvices exploring.

Feel free to change the Mesh or the Materials used to indicate the collectible.





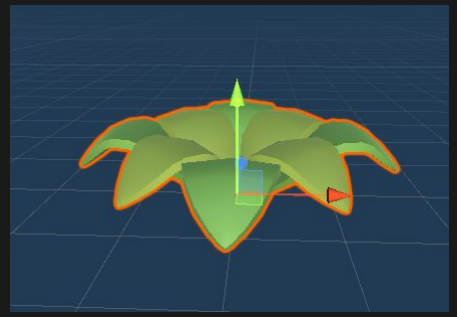
Non Lethal Obstacle

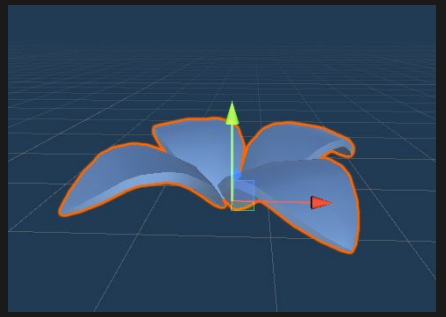
There are two types of items littlere in the world the flowers which don't have collider and are just used to decorate the world and then there are rocks and bushes which actively stop the player from moving forward.

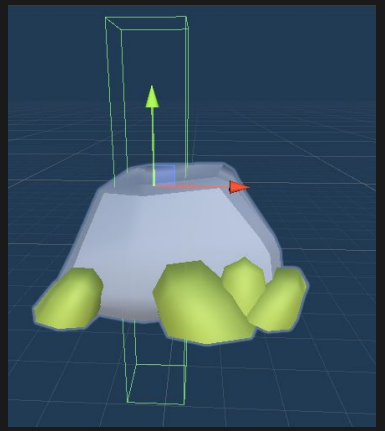
Rocks and bush need to be jumped over, but can't be jumped on top of.

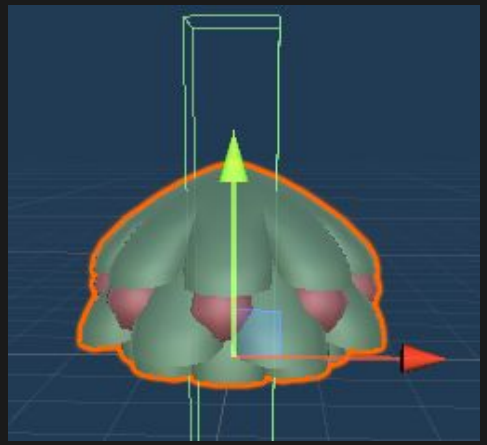
Meaning it the player is one away from a rock or bush the can jump over it but if the rock or bush is two spaces away they won't be able to jump

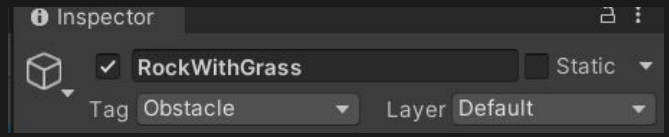
The way player know that they can't jump over the obstacle is because it has a tag "Obstacle"











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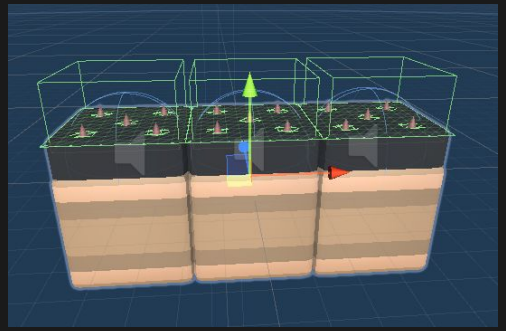
Lethal Obstacles

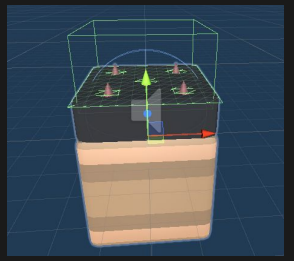
For the two active threats you have Spike Platforms and Saw. You also have a nested Prefab that uses three of them at once.

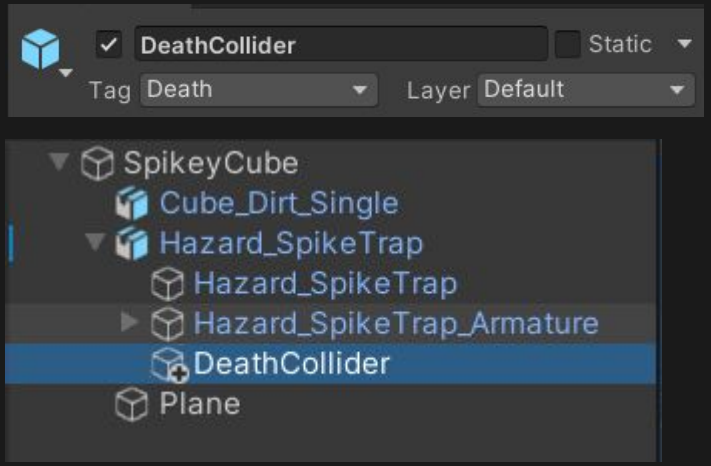
Don't change the Spike Mesh, since the Animation connected to the Spikes doesn't' translate to any other mesh and the player won't see the death incoming.

The Collider that dictates the death is hidden away and connected to the animator to move along with the spikes.

It has a Death Tag connected to it that tell the player to die when collided with.

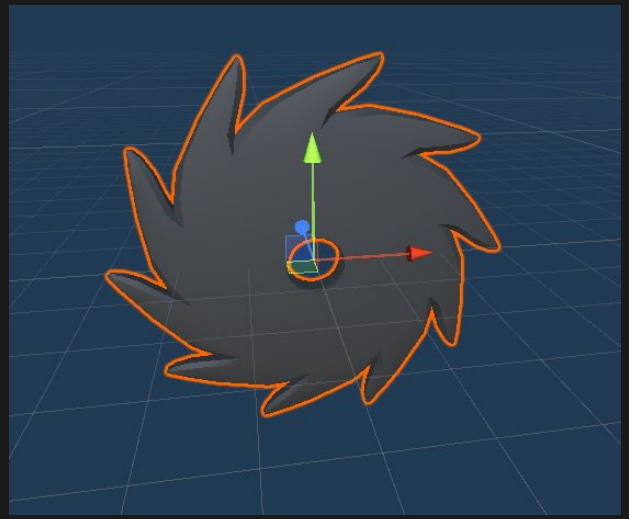


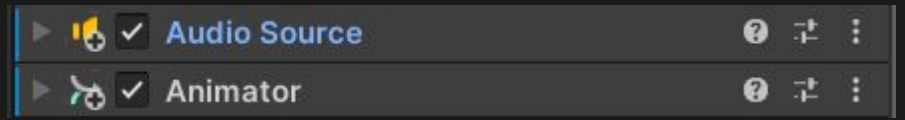




Lethal Obstacles

The Saw is set to to use an spinning and moving animation. If you want some of them to be static objects you can toggle the Enable for the Animator Component and probably should do same for the Audio otherwise you'll just have a noisy Circle.



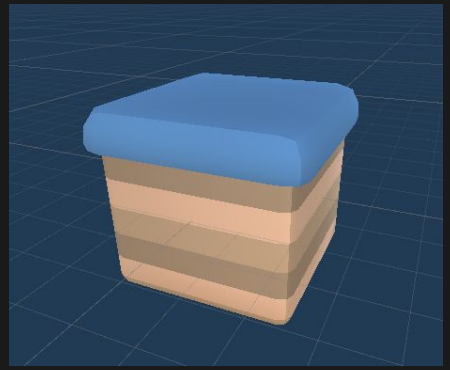


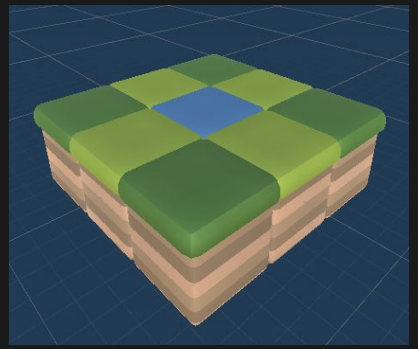
Checkpoint

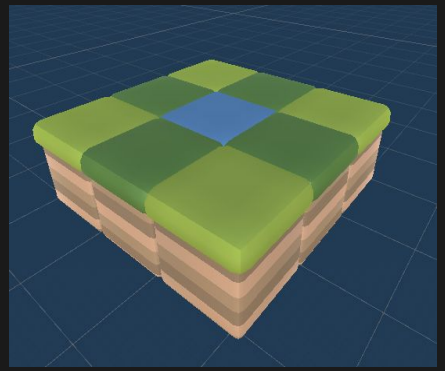
There are checkpoint platform that allow the player to change their respawn point.

It’s indicated by the blue platform top and has a VFX connected to it that pulses.

You also have it nested in Platform PreFabs to make area creation easier.





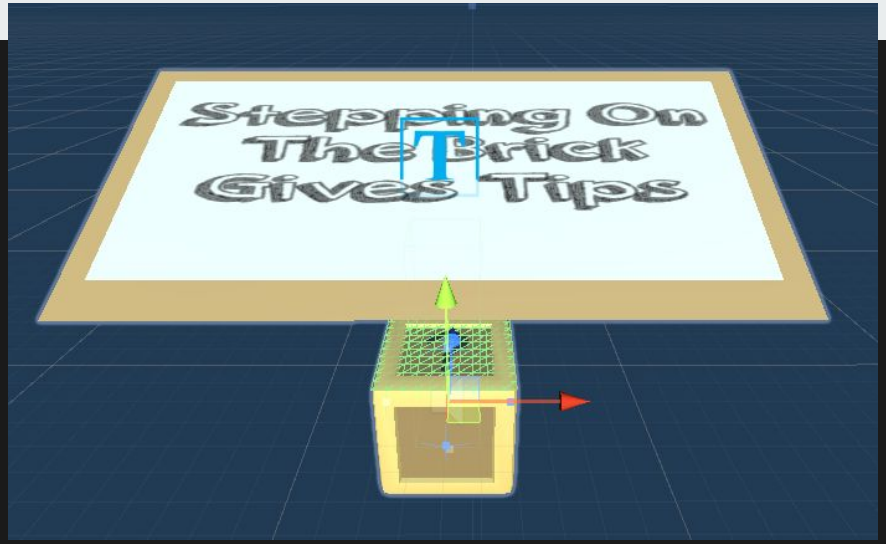


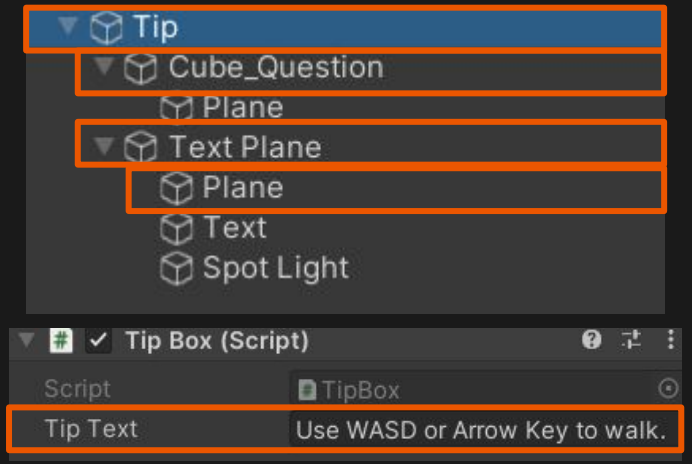
Hint Box

The HitBox is made up of several game objects and you can tweak them to your liking.

Inside the Tip Game Object you will find a Script that lets you edit what the text says.

While the Cube_Question can have it's 3D Mesh and material changes and the Text Plane and Plane can have the Material changes.





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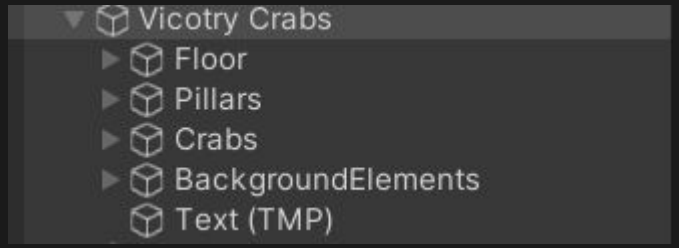
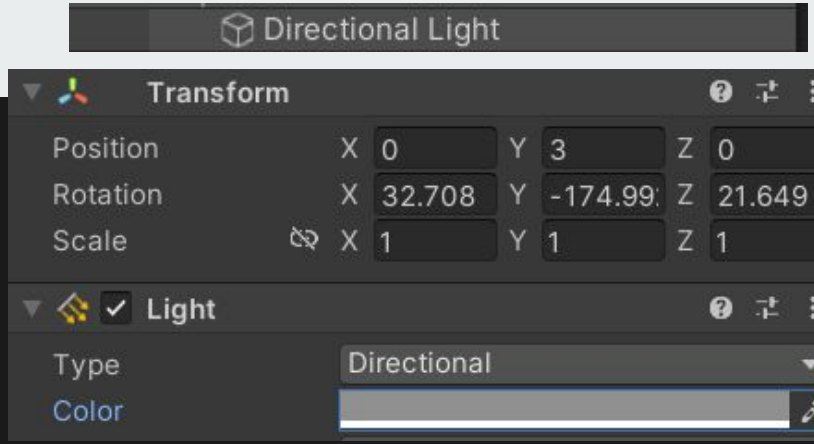
Victory Area

The victory area is pretty much up for grabs, you can change the look of any of the Game Objects here and put anything on the background text.

Once the player reaches the victory goal they will be presented

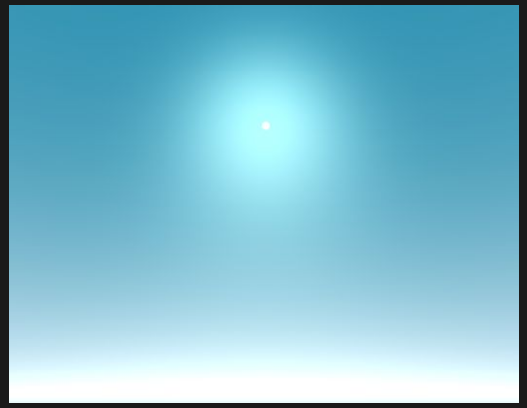


Lighting & Sky Box



You can change the feel of the level by adjusting the Lighting. Change the rotation and which the sun hits the level or modify the Color that the light is emitting.

Similarly you can change the Sky Box to open of the premade ones in the Customizable Skybox -> Stylized Skybox -> Material folder by dragging and dropping them into the sky.



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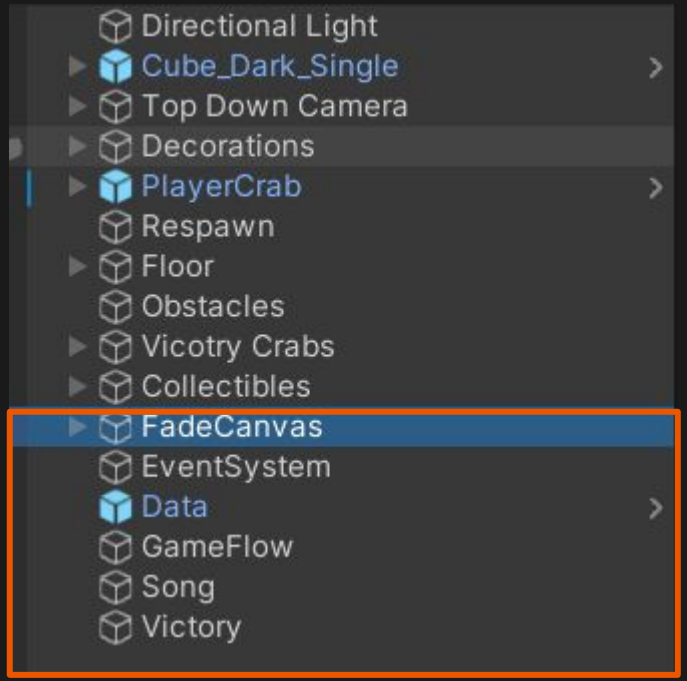
Things to Not Edit

There are few things in the game that make it possible to run and you should avoid editing them for the time being.

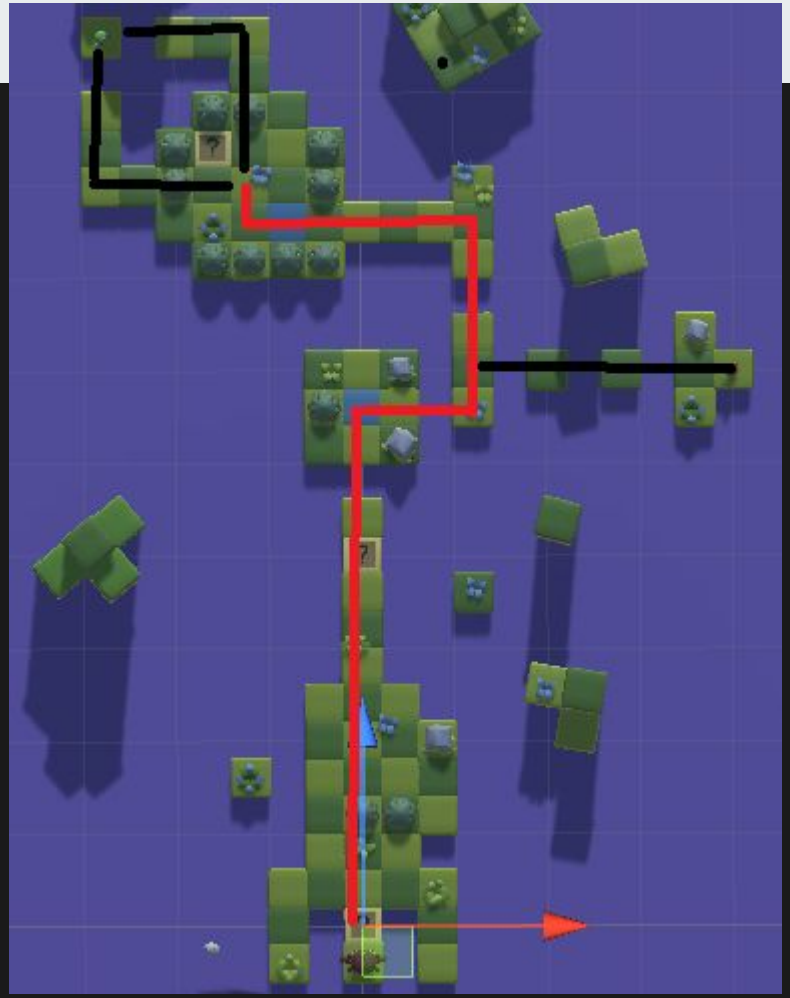
Everything in the orange box should be left alone otherwise the game can crash.



Level One

Level One is pretty simple, it has a few Hint Boxes that tell you how to move, jump and that you can jump over obstacles.

It also shows you that there are hidden pathways that will lead to fruit.



Level Two

Level Two goes about introducing the first active lethal obstacle of spikes.

It also introduced the idea of having multiple routes to get to end of the level. Depending on what the Player finds easier they can choose the direction they want to go. Giving player a choices allows them to feel clever when they find the right path.

It also foreshadows the use of heights by introducing them on the path to the collectible.

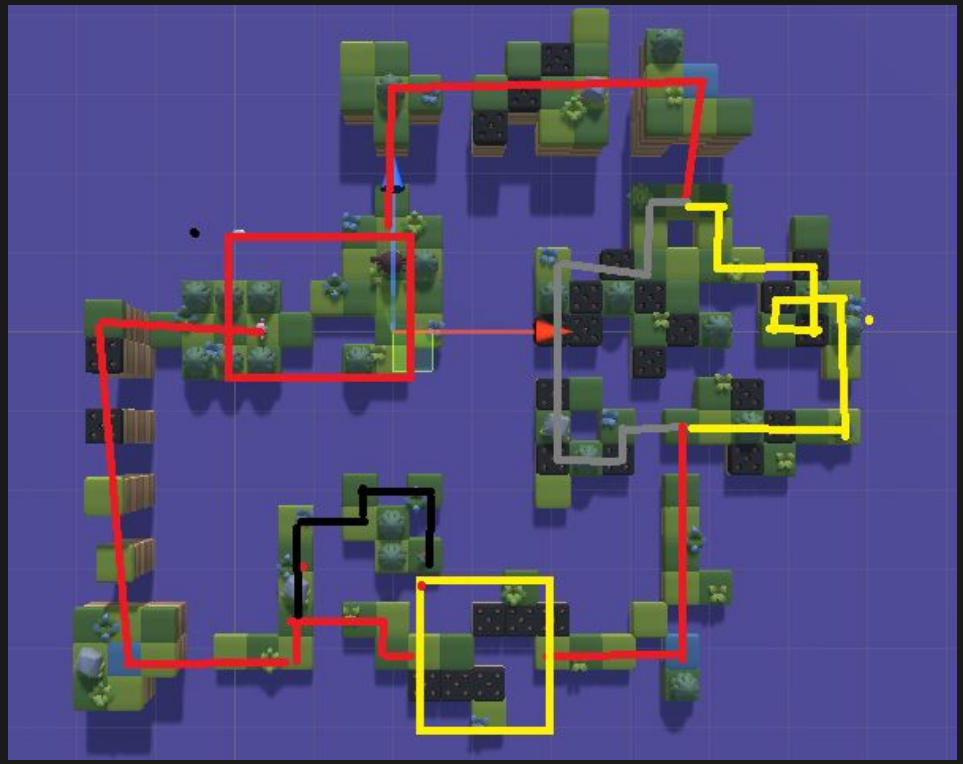
Level Three

Level three introduced the idea of height into the platforming.

Unless you change the Camera angle at which the game is going I don't recommend using height as it's hard to navigate.

This level also introduced the idea that you have to wait between spikes, in the yellow box it's impossible to just run to run through and jump without dying so the player has to pause and wait for the next cycle of spikes.

There's also a fund way of teasing the player by placing the end goal just out of reach as shown in the red area incentivizing them to get it even more.



Level Four

This level introduces Saw. This is being a new threat you want to let the player breathe a little and familiarize itself with it by removing some the challenges you've placed on the player thus far, such as spikes and heights.

Using the Mirrored look may not be as complex as the paths in the previous levels but it still gives the player that choice to make their own path.

Level Five

For the final level you want to bring together all of the mechanics that you've introduced throughout the game and start mixing them with each other.

Letting the player get used to the Saw again, then bring back the winding paths and spikes and finally merging them into and big challenge.

Asset Pack - Ultimate Platformer Pack

The Assets for this game come from Ultimate Platformer Pack and all of the assets are still stored in the Project Files so you can use any of the Meshes inside of it to make Crabber your own game.

Additional Ideas and Start

- You can create additional obstacles both lethal or not by giving Game Object Colliders and applying the “Death” or “Obstacle” tags to them.
- You can create 3D Physics objects that Crabber has to push out of his way
- You can create create a 3D Terrain that Crabber has to traverse.
- Create a variant of the hint box and turn them into NPC that you can talk to

There’s a mostly Empty Scene View in the Class Level Folder open it up and benign to design

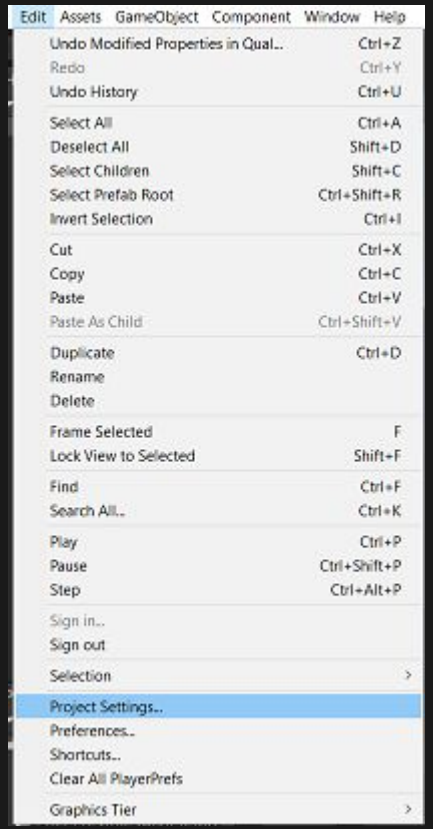
Game Settings

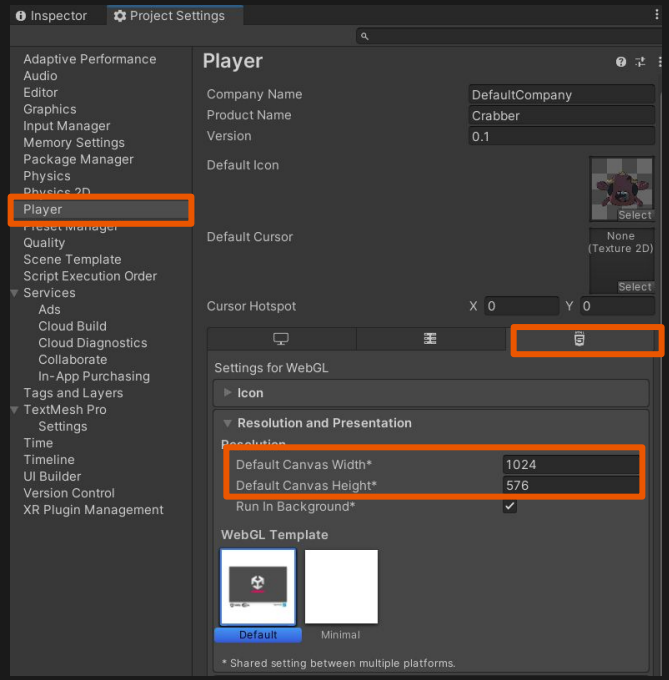
We will have to make sure some setting are set.

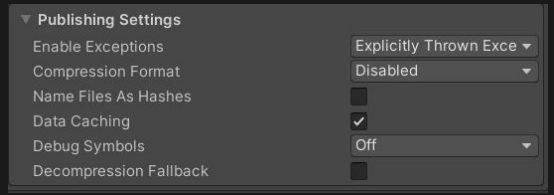
By going to Edit->Project Setting will open up the Project Setting View.

Inside there you will find many internal setting for the project. We only care about the Player at the moment which controls how the game will display.

We go specifically to the WebGL setting and set the width and height to be 1024x546 and in the Publishing settings we make sure the Compression Format is disabled, having it on makes the game unable to load on web.







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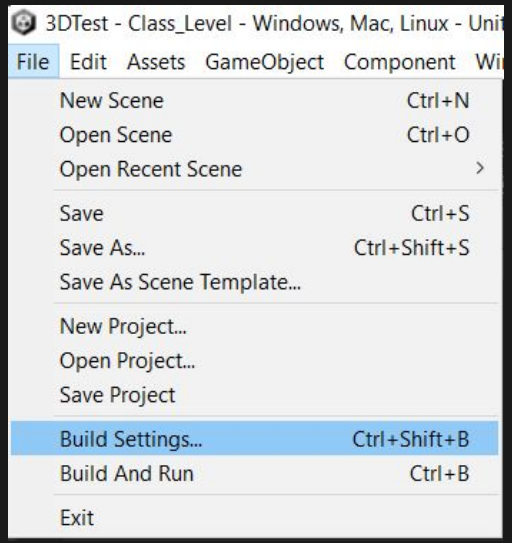
Creating a Build

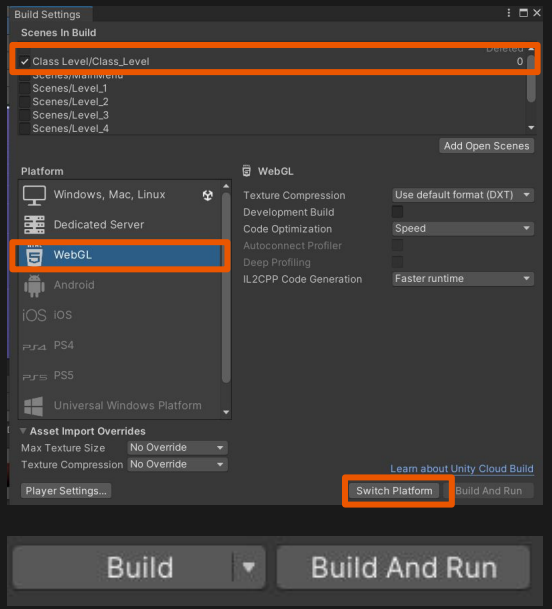
You can create many Build for all of the different platforms we are going to work with WebGL for the most part as it an even ground allowing us to play the games we create on the Web using platform such as Itch.Io

It's important to have your scene as top one in the list as that will be the scene that the game will execute upon.

Select the WebGL setting and if you aren't set on it you can click switch platform. Give it a moment to reconfigure the system.

Once all of that is set the button should turn into Build. This process will take a bit of time.



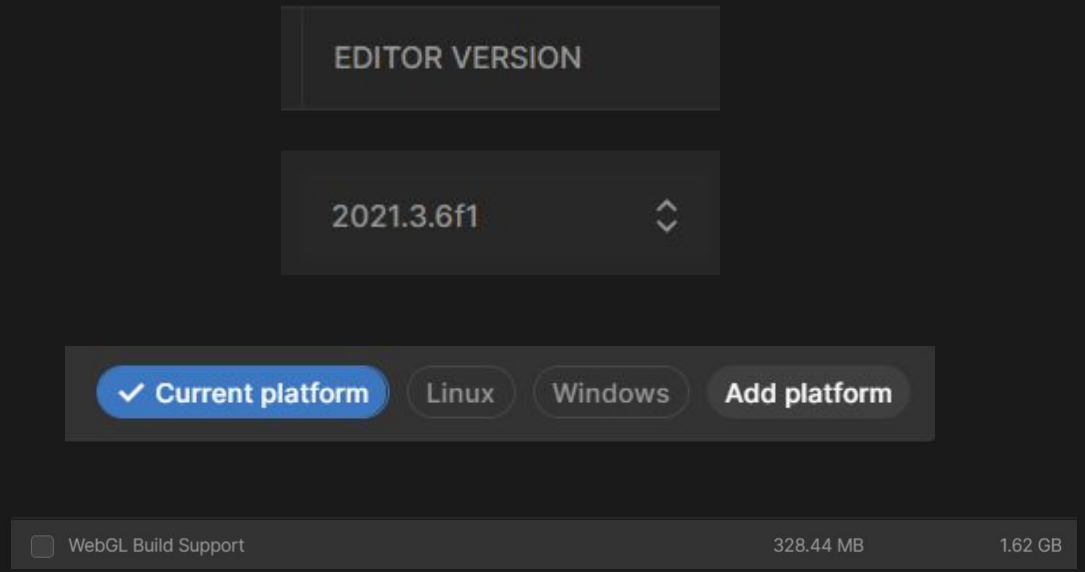


WebGL Ready

To make sure we can create a WebGL build you first have to have Unity install the capabilities. Check your Unity Hub and click on the version of Unity you have installed.

There you should be able to see current platforms that Unity is ready to Build to.

Click add and scroll down till you find WebGL Build Support. It's a big file so give it time download.



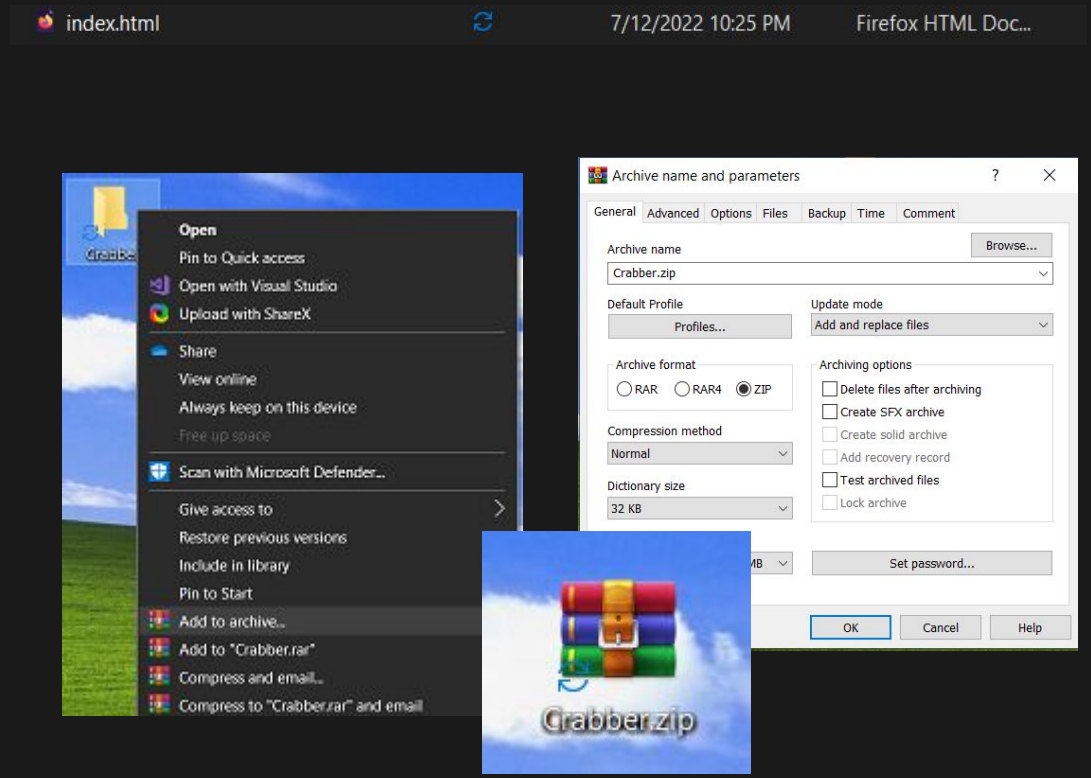
Using the Build and Zipping the Files

Once you have the program build complete a folder should pop up with the build files.

You will see a index.html file, if you double click that you will be able to open the game in your browser.

However you can't share this with anyone since the browser is running off of your computer locally. To make it work we'll have to upload it to a hosting website.

The website we will use is Itch.io and you will have to Zip the file to uploaded.



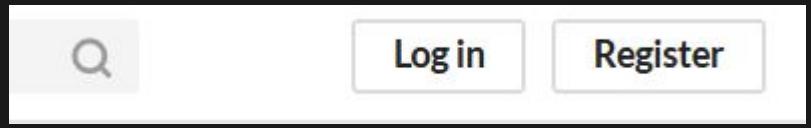
Sebastian Grygorczuk - STEM Institute at CCNY

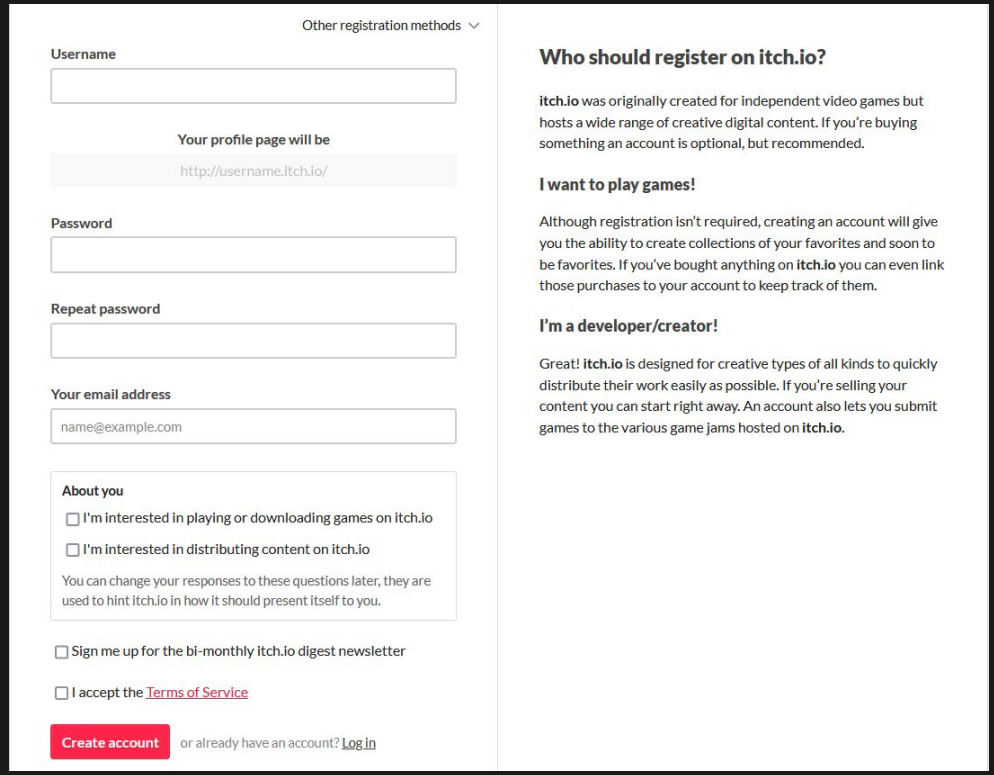
Itch.Io Account

Itch.Io is a indie game dev platform where you can play and upload games.

We're going to be uploading the game here so that

Go to https://itch.io/ and click Register





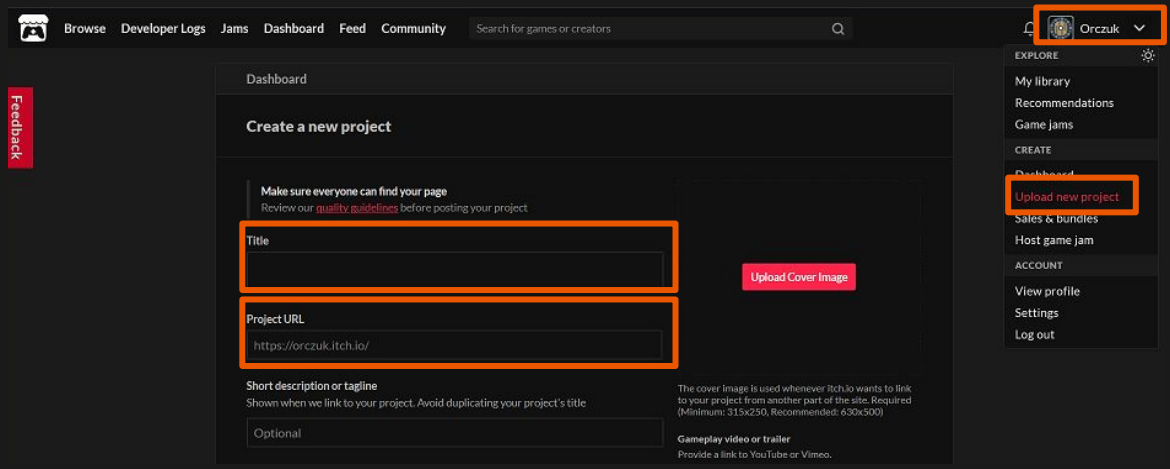
Creating New Upload

Once you have your account set up you will be able to click Upload New Project under the Account Button.

Once you're on the Page you have to fill out the Title for the project name it whatever you'd like your game to be called followed by - Your Full Name

Example

Crabber - Sebastian Grygorczuk



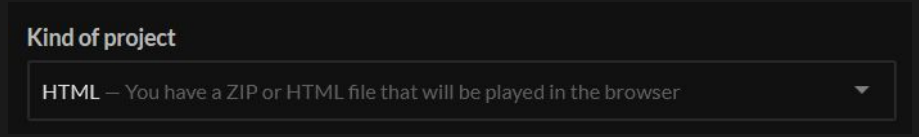
Uploading

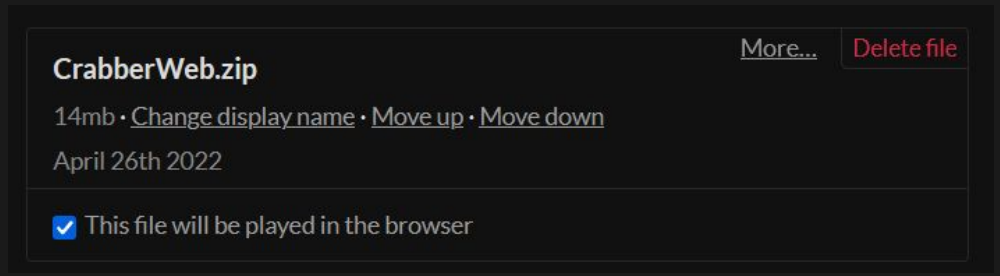
Once you have your Zip file ready you can upload it.

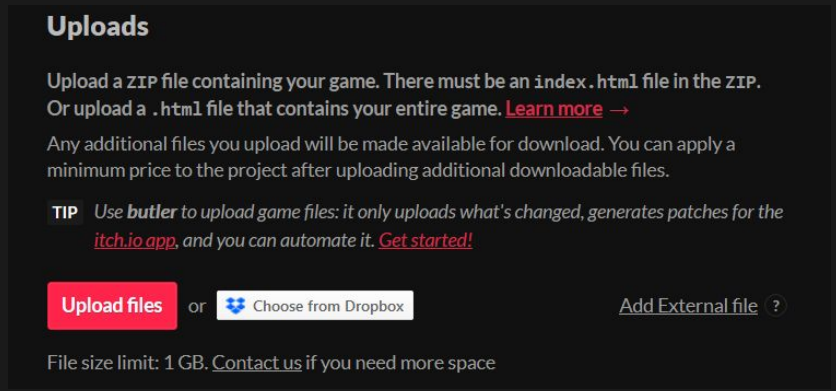
First make sure that the project is set the HTML that way you will have the option to display it on the Web.

After that click the upload Files button and select the Zipped Folder. Give it a few moments to download.

Once it's there you can indicate that this field is going to be used to play on the web.



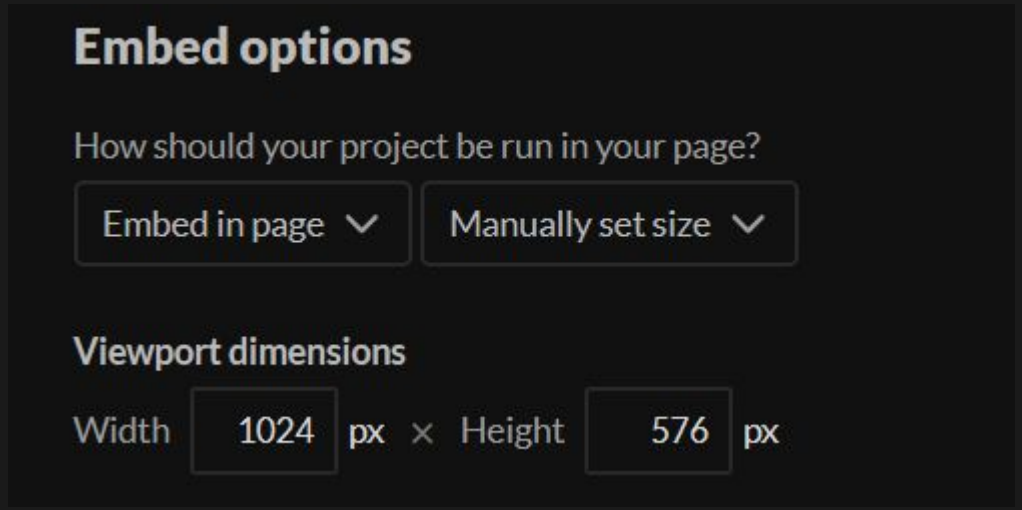




Dimension

We already set the Crabber game to a preset of 1024 by 576 in the Unity engine.

We used this one as it's a 16x9 resolution and it's small enough to fit on the web page without the need for scrolling.



Publishing

Once all of that is done you can set the visibility restricted if you don't want random stranger on the internet to view it and set the password to STEM so that we can share the games between each other in the class.