Introduction

First of all, thank you for purchasing the asset. As an independent developer, it's challenging to strike a balance between doing what you love and earning the necessary means to sustain oneself. Therefore, being able to create assets for the Unity Store that appeal to a wider audience is truly a pleasure for me. Hence, I sincerely thank you.

This asset was made according to my personal preferences, so there may be some functions that don't work exactly as you desire. If you need personalized assistance, please don't hesitate to email me at manelramosroyo@gmail.com

I created this asset primarily because I wanted to have a day and night cycle while also having the ability to edit the sun's orbit and achieve a Super Mario Galaxy-like effect. This effect allows you to see both parts of the skybox, including the ground and the sky, as well as a starry night sky. I may have veered off the main topic a bit and started adding events and other features, but I thought it would be more appealing to a broader audience. With that being said, let's get started.

What will we find in this asset?

In this asset, you will find 3 files (4 including this PDF). Firstly, we have the LightingPreset. This script stores 3 gradients that will modify the AmbientColor, FogColor, and DirectionalColor. You can create as many LightingPresets as you want for different scenes. This feature is very useful for easily customizing the colors of each scene.

Secondly, we have the EventInfo. This script serves as the foundation for all the events you will find in the LightingManager. You can name the event (for better organization), specify the time of day when it should be executed, assign UnityEvents, and have a control boolean.

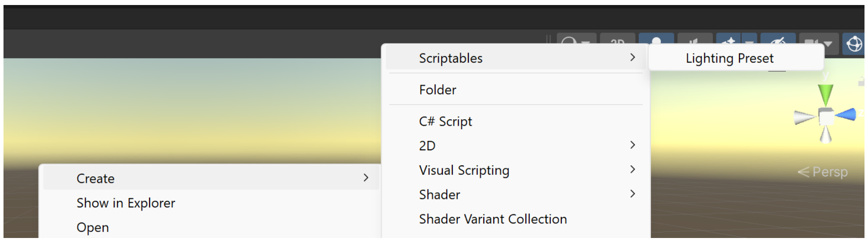
Finally, we have the LightingManager, where all the magic happens. I won't go into too much detail in this introduction, but here you can modify the time of day, specify the sunrise and sunset times, adjust the progressive intensity and shadows of the directional light, set the duration of the cycle in seconds, and a few other things.

Will you be updating the asset?

My current intention (as of 19/06/2023) is to improve the asset based on user feedback. Therefore, I would appreciate it if you could send me messages with possible enhancements and/or any issues you have encountered while using the asset.

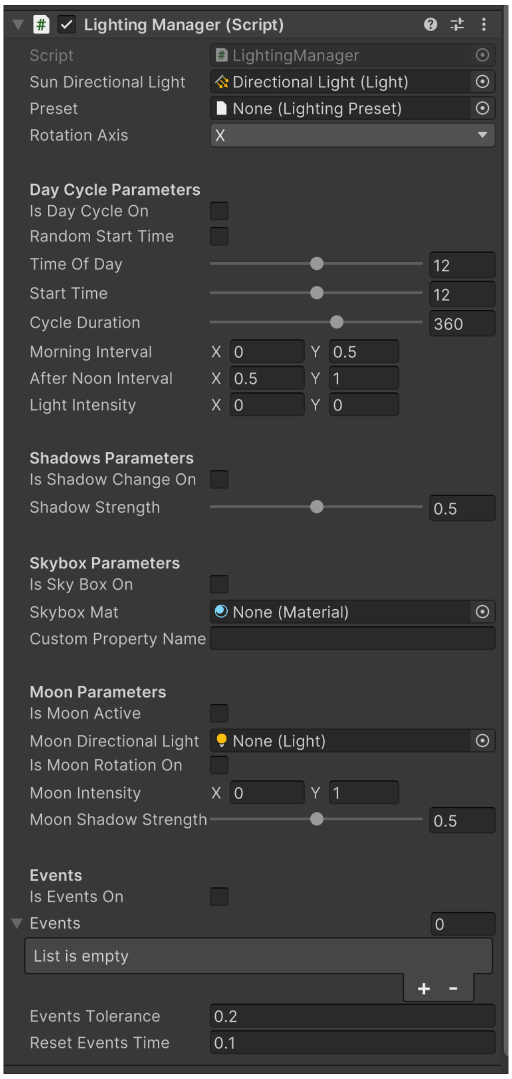
Getting started

After downloading and importing the asset, the first thing we need to do is create a LightingPreset. Without it (even if it's empty), the LightingManager won't work. To create a LightingPreset, right-click in the "Project" panel, go to Create > Scriptables > Lighting Preset.



You can give any name you want to this preset, as long as it's easy to identify. Now you can freely edit the gradients. I have included an example gradient in the asset folder.

Now, we can go to the scene where we want to add the day and night cycle. Create an empty GameObject and add the LightingManager to it. It should look something like this:



Lighting Manager (Script)

Script	LightingManager
Sun Directional Light	Directional Light (Light)
Preset	None (Lighting Preset)
Rotation Axis	X

Day Cycle Parameters

Is Day Cycle On	☐
Random Start Time	☐
Time Of Day	12
Start Time	12
Cycle Duration	360
Morning Interval	X 0 Y 0.5
After Noon Interval	X 0.5 Y 1
Light Intensity	X 0 Y 0

Shadows Parameters

Is Shadow Change On	☐
Shadow Strength	0.5

Skybox Parameters

Is Sky Box On	☐
Skybox Mat	None (Material)
Custom Property Name	

Moon Parameters

Is Moon Active	☐
Moon Directional Light	None (Light)
Is Moon Rotation On	☐
Moon Intensity	X 0 Y 1
Moon Shadow Strength	0.5

Events

Is Events On	☐
Events	0

List is empty

+ -

Events Tolerance	0.2
Reset Events Time	0.1

Don't get overwhelmed just yet. There are many variables and things to consider, but it's simpler than it seems. Before making any changes, add the LightingPreset you created earlier to the Preset variable.

Now, let's explain what each variable does (the code is organized and commented, so you can easily modify it if you find the need to). By default, some preset values have been set, which I recommend if you don't have specific preferences.

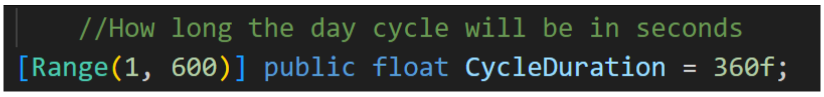
- SunDirectionalLight: This is our directional light that we'll use as the sun. It has been added by default, so no action is needed. If you find that it's not the correct directional light, manually correct it.
- Preset: This is where we assign our LightingPreset to modify the following:
    - AmbientColor: Modifies the ambient color of the scene.
    - DirectionalColor: Modifies the color of the light emitted by our sun.
    - FogColor: Modifies the color of the scene's fog.

(Note: These are gradients that allow color modification as time passes, with the midpoint of the gradient representing midday. That's why I recommend using the exact same color at the beginning and end of the gradient to create a smooth transition between different days.)

- RotationAxis: You can select the axis on which you want the directional light to rotate. This allows you to create interesting effects for sci-fi games or alien planets. I'm looking for a solution to create "orbits" that would enable diagonal rotation of the sun, for example. However, it's currently not possible with the current code.

Day Cycle Parameters:

- IsDayCycleOn: This variable allows you to disable the day and night cycle to maintain a static time.
- RandomStartTime: When enabled, this variable causes the game to start at a random time of day.
- TimeOfDay: This parameter allows us to modify the time in the editor. It's likely the variable you'll use the most.
- StartTime: If you haven't enabled RandomStartTime, the game will start at the time you choose with this variable.
- CycleDuration: This determines the real-time duration of the day and night cycle. You should choose it in seconds. The slider has a maximum of 600 (10 minutes), but if you want to set a longer duration, you can go into the script and modify the following:



```
    //How long the day cycle will be in seconds
[Range(1, 600)] public float CycleDuration = 360f;
```

    - Modify the second parameter within the Range. This allows you to set any duration you want.

- MorningInterval: This variable (similar to the next one, AfterNoonInterval) represents the time interval for the morning cycle. It is calculated by dividing the desired hour of the day (based on 24 hours) by 24. The values for both parameters (MorningInterval and AfterNoonInterval) should always be between 0 and 1. I recommend not overlapping one interval with the other.

- AfterNoonInterval: As mentioned earlier, this is the time interval for the afternoon cycle. It is calculated by dividing the desired hour (based on 24 hours, e.g., 18:00) by 24 (18/24 = 0.75).
- LightIntensity: This parameter controls the minimum and maximum intensity of the directional light.

Shadows Parameters:

- IsShadowChangeOn: This allows you to enable or disable the change in shadows during sunrise and sunset.
- ShadowStrength: This parameter indicates the maximum strength of the shadows. (Note: By default, the directional light has shadows disabled. This parameter won't have any effect if shadows are disabled. For proper use, change the shadow type of the directional light to Soft or Hard Shadows.)

Skybox Parameters:

- IsSkyBoxOn: This parameter allows you to enable or disable the editing of a shader parameter of the skybox.
- SkyboxMat: This is a reference to the skybox material.
- CustomPropertyName: If you want to modify any variable of the skybox shader, you need to enter its code reference here. Usually, it will be something like: _ShaderParameter (you must enter the exact name or it won't work).

These parameters will be used to change the special parameter between 1 and 0. It will be 1 during the night and 0 during the day (with a transition during sunrise and sunset). This will make more sense when you see the shader I've created. If you don't want to use any special skybox feature, you can disable it or delete it from the source code.

Moon Parameters:

This is experimental, so I recommend keeping it disabled for now, but it serves the same function as the sun, but acting as the moon. The use of these functions is optional, and their sole purpose is to provide more tools, but it's currently not very efficient, and I'm looking for better solutions. I'm not responsible for any visual issues that may arise.

- IsMoonActive: As not many people will want to use this feature, I made it easily deactivatable.
- MoonDirectionalLight: Here, you should select the second directional light to be used as the moon (it won't be automatically selected like the other one).
- IsMoonRotationOn: This allows you to disable moon rotation.
- MoonIntensity: Similar to LightIntensity, this parameter controls the minimum and maximum intensity of the moon.
- MoonShadowStrength: Similar to ShadowStrength, but for the moon.

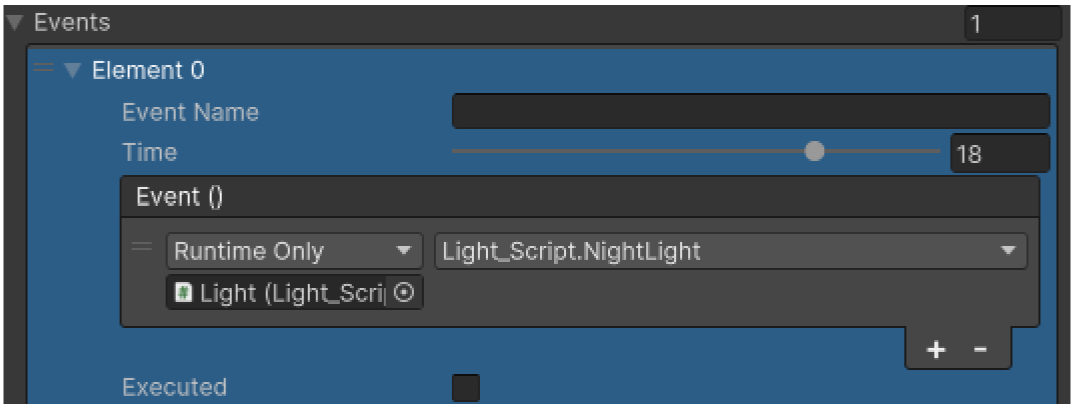
Events:

This is the best part of all. With this, you can create custom events based on the time of the day cycle.

- IsEventsOn: This parameter allows you to enable or disable events.
- Events: Here, you can add as many events as you want by clicking the plus symbol. Within the events, you'll find the following parameters:

- EventName: This is a way to name the events. It has no functionality other than for debugging purposes.
- Time: This is the time of the day at which the events will be executed.
- Event(): Click the plus symbol again, and a box will appear where you can enter an object or scene reference. Place the object that has a code reference to the event you want to execute, and then use the dropdown on the right to select your script and function.
- Executed: This is a control boolean. It ensures that the event is executed only once.

Once you have added an event it should probably look like this:



- EventsTolerance: Events won't execute EXACTLY at the predicted time, but within an interval defined by this parameter. This is done to ensure that the event is always executed. I recommend setting this value between 0.1 and 0.05, although it can be smaller for longer cycles.
- ResetEventsTime: With this parameter, you can choose at what time all events will reset so they can be executed again the next day. I recommend setting it to 0.1 or 23.9.

And that concludes the list of variables. With all of this, you should know how to use the asset perfectly. I want to remind you that I'm not an expert programmer, so there may be certain bugs and/or limitations in the code, but you can use this code as a base to expand the functionality. But if you are a beginner don't hesitate to reach out to me for help.

(Note: I've made all the editable parameters public so you can easily use and modify them with other scripts, but I wouldn't recommend going overboard with it since it can cause bugs with the execution of the events.)

Skybox:

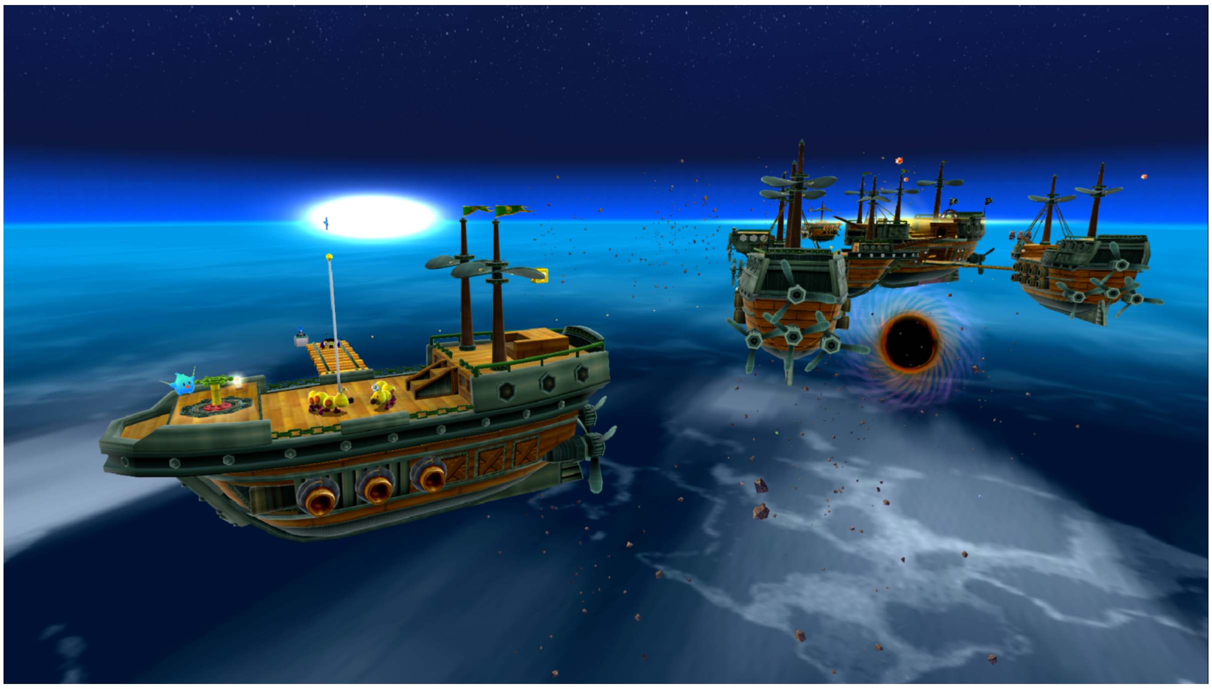
This will probably be more useful to people that are looking to recreate a skybox similar to those in Super Mario Galaxy, but I'll link some sources that I found helpful to create nice looking skyboxes. (I will also be fangirling a little since I love talking about this)

If you want something simple you can always use the basic procedural skybox shader from Unity itself. It's basic, but it does the job and has some cool looking effects when merging in the horizon. (It also works with the LightingManager).

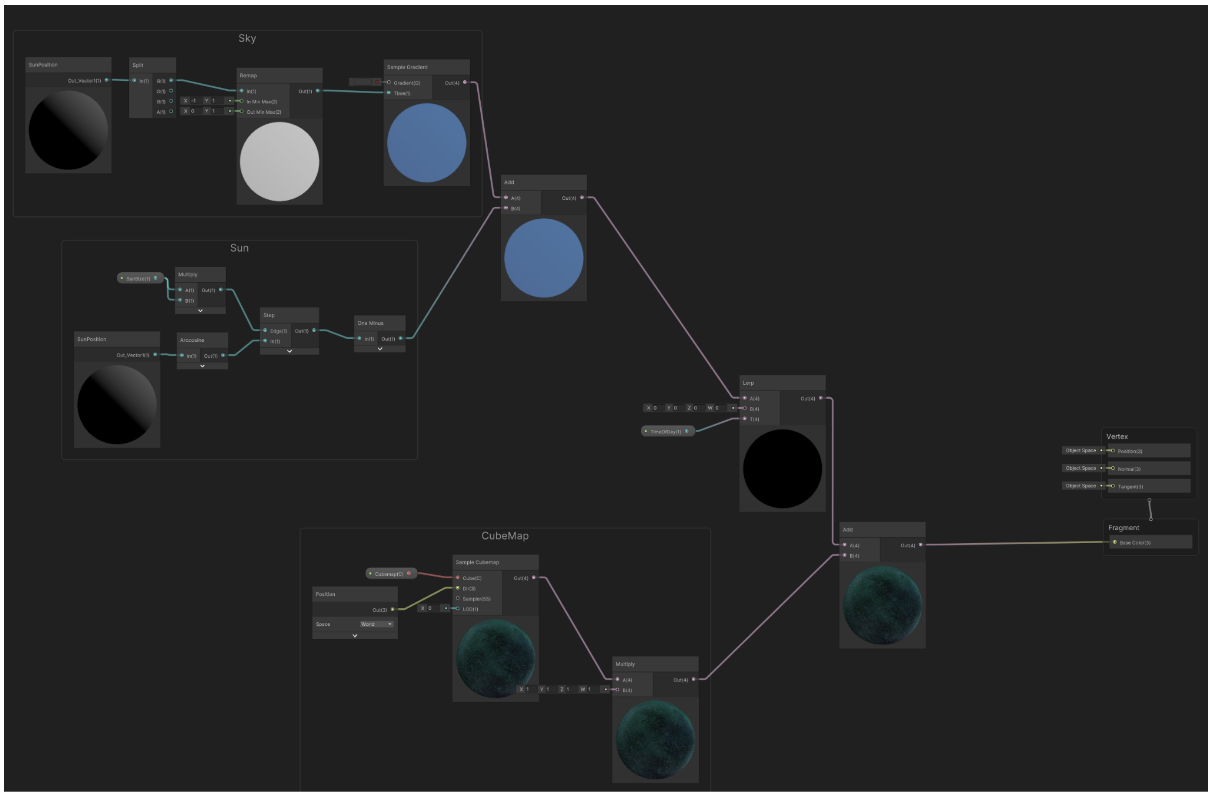
If you don't know what the default procedural skybox shader is, create a material in unity, open the shader tab in the upper part of the inspector and go to Skybox/Procedural (I have created one in the Skyboxes folder just for you <3). To see it in action just drop the material right in the sky of the scene. You can change the sun size and other variables such as color, atmosphere, etc... If you get some volumetric clouds asset you could get a really good looking sky with that.

BUT what i recommend the most is to do your own shader so you can customize your sky as you want. Doing shader is so fun if you get the hang of it (or just look into some tutorials. If you want some tutorials or shaders themselves from me you can ask me directly and I'll do my best to comply).

My main focus was to create a skybox that was all sky. No ground, no horizon. Even though you can cheat the skybox by making a horizon and putting a planet underneath like they do in Super Mario Galaxy. Players don't put much thought into skyboxes, BUT I DO. I SEE WHAT YOU DID NINTENDO. I DO NOT FORGIVE YOU. CHEATING LIKE THIS IS CRUEL. I FEEL BETRAYED. ALL MY LIFE I THOUGHT MARIO WAS FLOATING IN AN ENDLESS STARRY NIGHT SKY BUT THEY HAVE LIED TO ME.



With that in mind I created this shader (that is included in the asset) that uses a cubemap (cubemaps are so cool i love them so much) for the universal render pipeline. (Note: It can be easily transported to HDRP if needed, but it won't work on built-in. I recommend using URP)



It gets the position of the directional light (in the scene it will get the one that is set as the sun in the rendering assets) and makes a sky with a sun in the middle (I've made a subgraph that takes the position of the directional light so if you just drop it on you personal shader graph you can use it too). The sky is a gradient map with transparency at the end to mimic the sky. All this is above the cubemap that I mentioned before. With the special variable that you can put in the LightingManager you can make the sun and the sky invisible, making the skybox solely the cubemap.

The magic here is to get good looking cubemaps or panoramics and put them inside your skybox. Where can you get cubemaps and panoramics?? Don't be alarmed, I got you, you are in good hands my friend:

With the rise of AI someone decided to make the best decision ever and invest into making a free AI that makes panoramic images that can be used as skyboxes (as you can see, I'm very thrilled about this): https://skybox.blockadelabs.com/

You can make panoramics in a lot of different styles. Very useful and recommended. It's obviously not perfect, but you can always download the AI generated panoramics and modify them yourself in photoshop. Here's a link on how to make your own panoramics in Photoshop:
https://www.youtube.com/watch?v=XZmr-XYRw3w&ab_channel=CiroContinisio

With the new AI implemented in photoshop (unfortunately I don't own any adobe products so i can't talk with much confidence on this) you can easily change whatever the AI made wrong or that you'd wish to be different.

If you want to make AI generated cubemaps (oh god i love cubemaps so much), just like the one I used in the demo scene, you can make them here: https://tools.wwwtyro.net/space-3d/index.html#animationSpeed=0.1&fov=107&nebulae=true&pointStars=true&resolution=1024&seed=4it9exs52dfk&stars=true&sun=false

Remember that with the rise of AI, specially with photoshop, a lot of artists now are getting replaced. If you can, please, support artists with their craft. Imagine cubemaps made by human hands, by human artists themselves… I'd love that, and so should you.

There are a lot of different ways to make skyboxes. One of the many ways that Super Mario Galaxy lies to us is by making a sphere follow the player (or making it so massive that you can never get close to it) with a projected texture of a sky(normally a cubemap). They also made some skyboxes be 2 semispheres. The upper half slowly rotated to simulate some cloud movement, while in the other half was a night sky full of stars that didn't move at all.

I found the sphere method to be quite powerful for some not-open world games. Obviously now it isn't quite necessary since Unity handles the skybox for us, but in ancient times, when falsehoods were a driving force in video games, it made sense and was very useful. Now I don't think you'll need that method to make skyboxes, but if you are looking to make retro looking games this would be your go to.

Make with all of this what you will, my knowledge has now passed down to you… Hopefully for the best.

Sincerely,

Your beloved Sydewa

(This document will be expanded with future updates, so check it out every update for new info on skyboxes)

Contact info

If you ever have the need to talk to me about the asset feel free to contact me via mail: manelramosroyo@gmail.com

Or on this discord server (don't be alarmed if we are the only ones in the server, it's just an easy way to talk to me directly, since i'm more active on discord): https://discord.gg/rFkja7k7zF

If you could mention me in the credits of your projects it would be highly appreciated, and I'd love to see what you do with this asset. Thanks again for buying from the asset store!