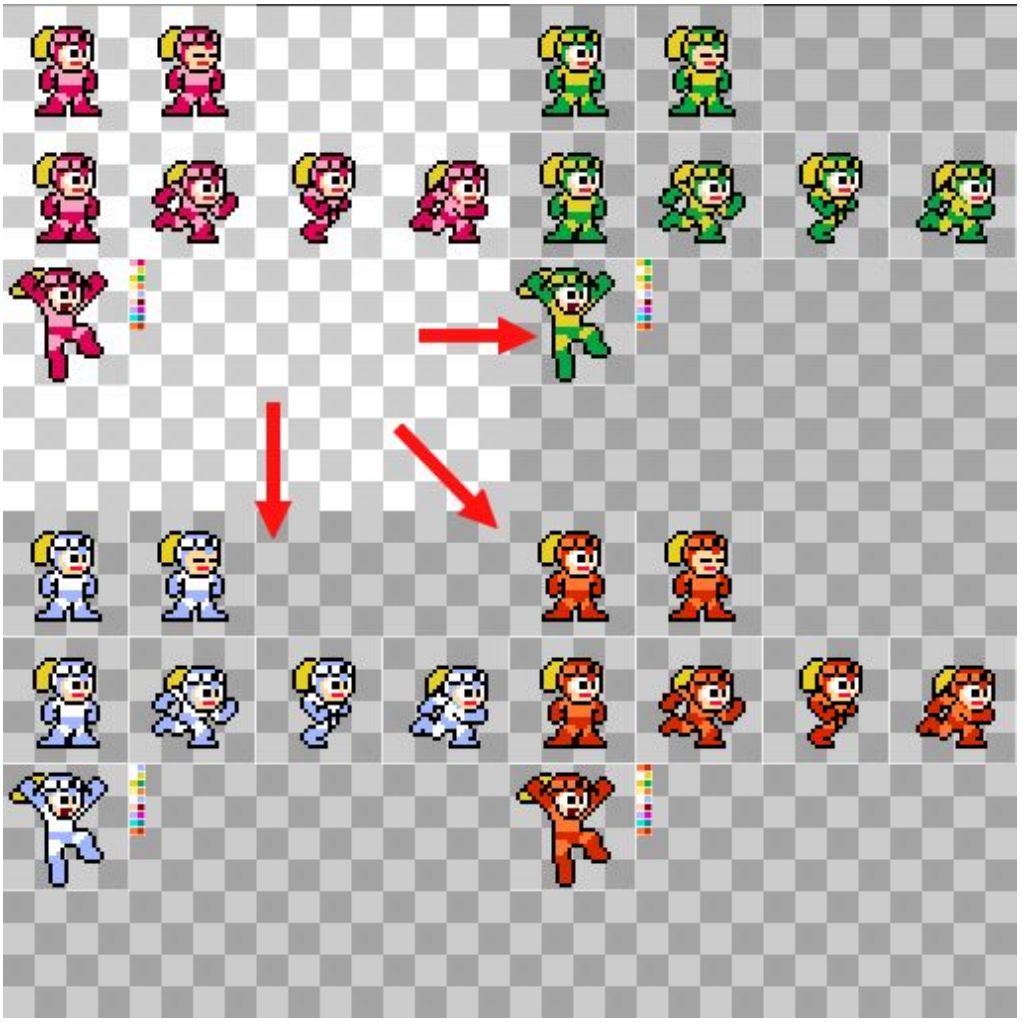
Color Palette Swapper

This document will explain what is and how to setup property the Color Palette Swapper for your projects.

What is Color Palette Swapper?

Color Palette Swapper is a system projected to swaps sprites colors based on palettes. A palette swap is the process to swap a graphic element set of finite colors (commonly known as palettes) by another one, so this graphic element can be reused as a distinct new element or to indicate some gameplay change. On Unity, the graphic element is a texture or sprite. Using this technique, one sprite can be used to create many distincts gameobjects in the same game using differents palettes. This allow us to save both computer memory and development time.



In the image above we can see that one character sprite sheet has been used to produce 3 characters with 3 distinct colors, all achieved on run-time. This demonstrate in practice why this process has been so used on the game development industry.

How it works?

Palettes assets should be created beforehand in order to be used. Each palette contains an array of colors that represents the palette itself and a field called Color Position File Path. This fields contains the path for the Color Position file. The purpose of this file is to hold the position information of each pixel color from the whole texture associated to the palette. This is mainly done to further optimize the swap color process and therefore to increase performance at run-time.

ColorPaletteSwapper script is a component that allows your sprite texture to swap between color palettes set previous by you. This component should be attached to any Gameobject that has a *SpriteRenderer* component on it. If a *SpriteRenderer* component is not present, one will be attached automatically.

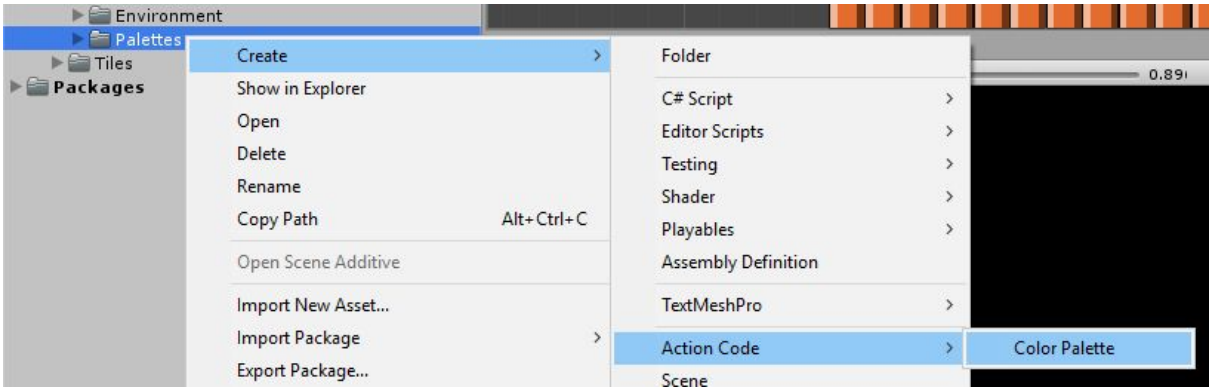
How to setup?

This section will provide a short tutorial on how to setup a simple platform character named *MegaWoman* who can swaps her main colors during gameplay. The **01 - Inicial Scene** provided on the Scenes folder is the perfect place to start this tutorial so please open it.

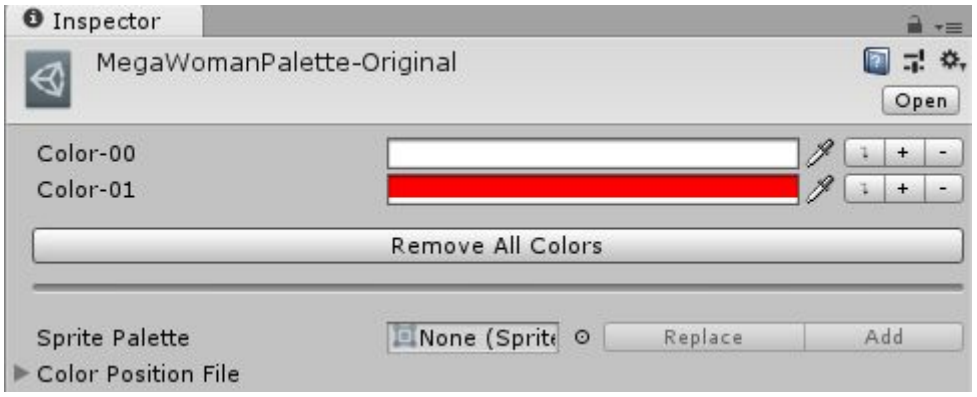
In this scene, we have a basic level grid *tilemap*, a *MegaWoman* character and a camera that follow her. If you play the scene right now you will notice that is simply a basic 2D platformer character running sideways over the level, with no color swap behaviour. Let's change it.

First, you need to create a new palette asset that will hold the information of the sprite texture from *MegaWoman* character texture. This palette will be used as the default one and should contain all the colors we want to change during gameplay. Know which color are they is fundamental to proceed on this step.

We can create a new Palette asset going under Project Tab, selecting the folder we want to store it and **Right Click** > **Create** > **Action Code** > **Color Palette**.

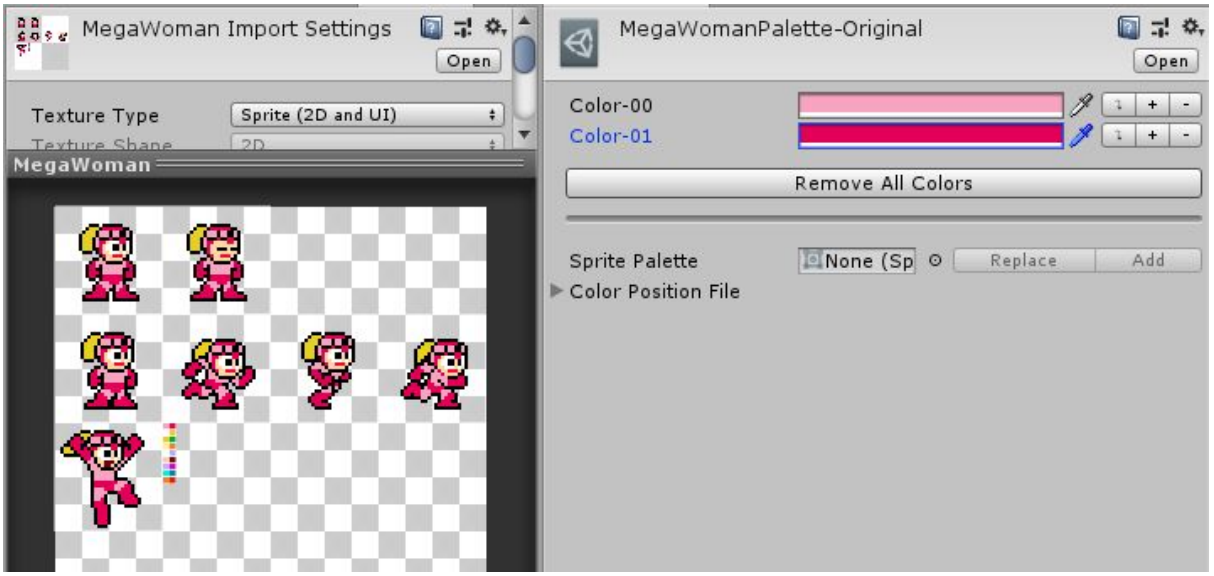


Rename the new palette whatever name you want. To keep things organized, let's rename to *MegaWomanPalette-Original*. From here, we can add colors manually or using a sprite containing the colors we need.



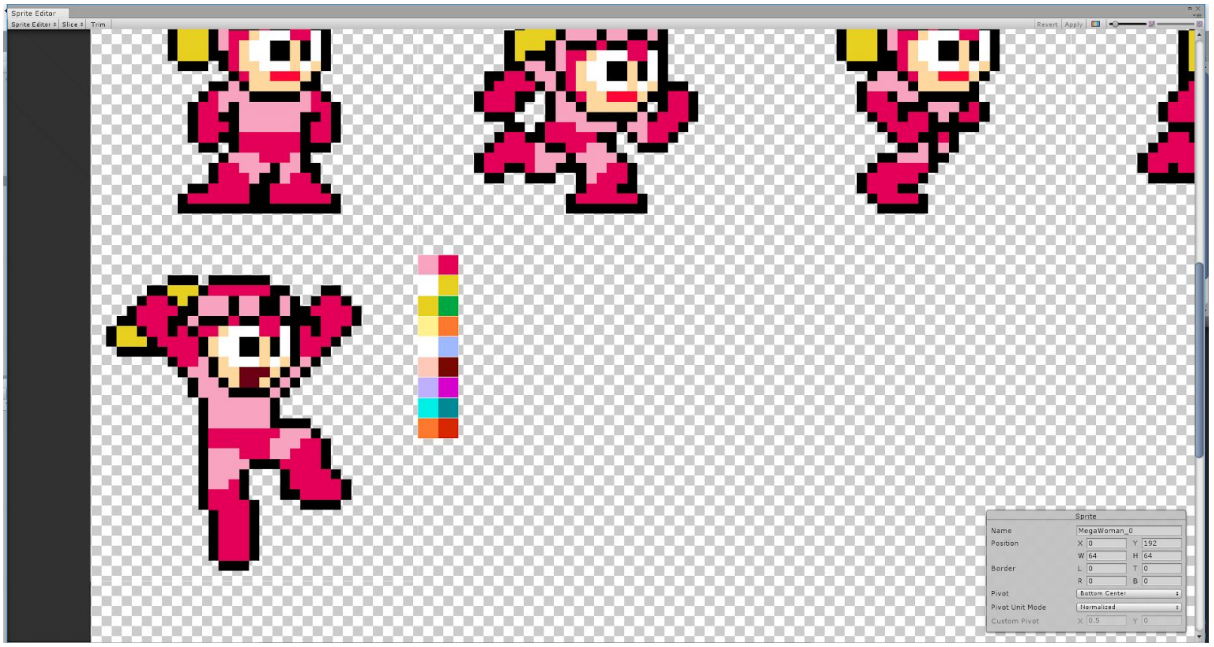
MegaWoman is a basic 8 bit character so her color palette is very limited. It consists of two colors: ***light pink*** and ***dark pink***. You can add each color one by one manually by clicking on the **Add Color Manually** button and move, add or remove colors fields.

You can select the colors for this palette using the  *Eyedropper Color Tool* button next to each color field and select the colors direct on the sprite texture, as shown on the image below:



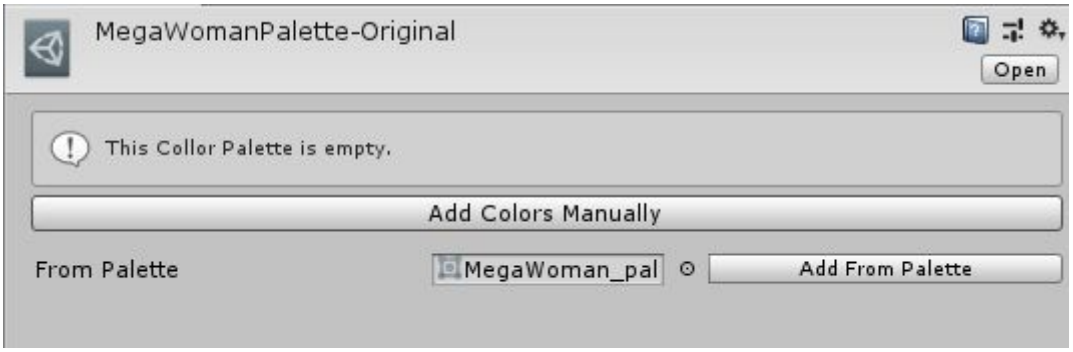
Another and better way to do this is to submit a sprite containing each color for the palette. Let's first remove all colors from our current palette by clicking on **Remove All Colors** button.

MegaWoman texture contains 9 palettes grouped over each one as rows.

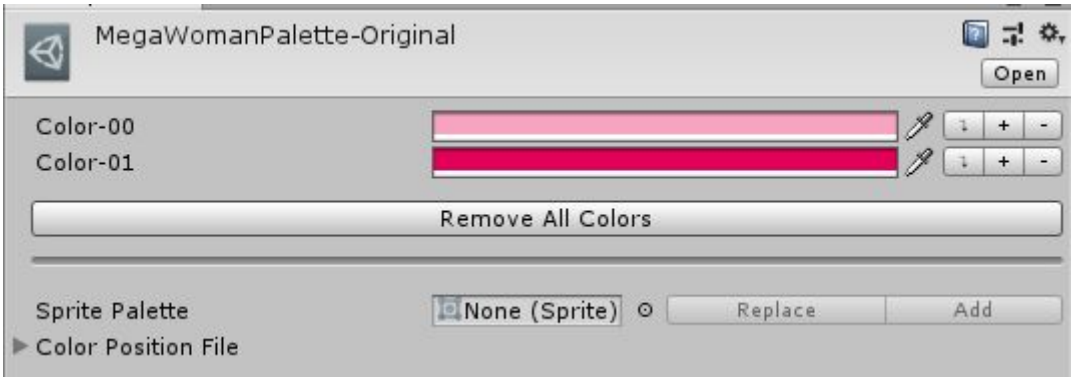


Note that each palette contains 2 colors and sprites properly named were created to each one. The first palette is the original one and should be used to create the palette asset.

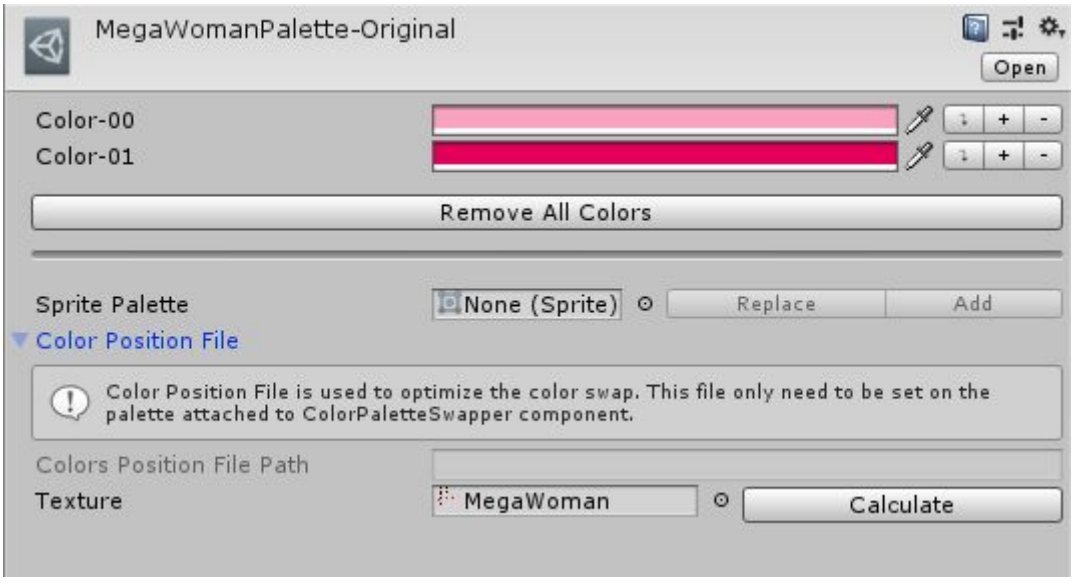
Selecting back the *MegaWomanPalette-Original* asset, find and select a sprite called *MegaWoman_palette-original*. Put this sprite on the field **From Palette** and click on the button **Add From Palette**, as shown below:



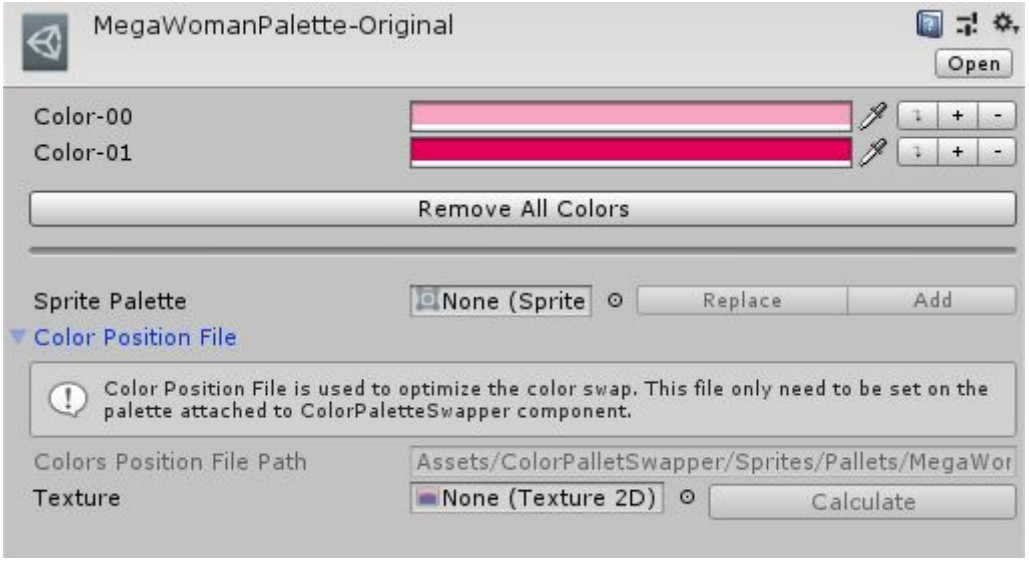
All the colors present on the color *MegaWoman_palette-original* sprite will be copied.



When all colors are proper set, it's time to create the Color Position File. Click and open the Color Position File label field, select, drag and drop the *MegaWoman* texture asset to the **Texture** field and hit the **Calculate** button.

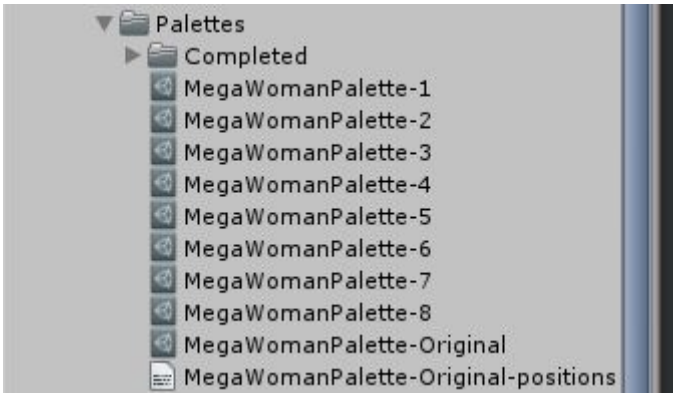


A text file asset will be created as *MegaWomanPalette-Original*-position.txt. This file only need to be set for this palette. Note that the **Color Position File Path** field will be automatically set.

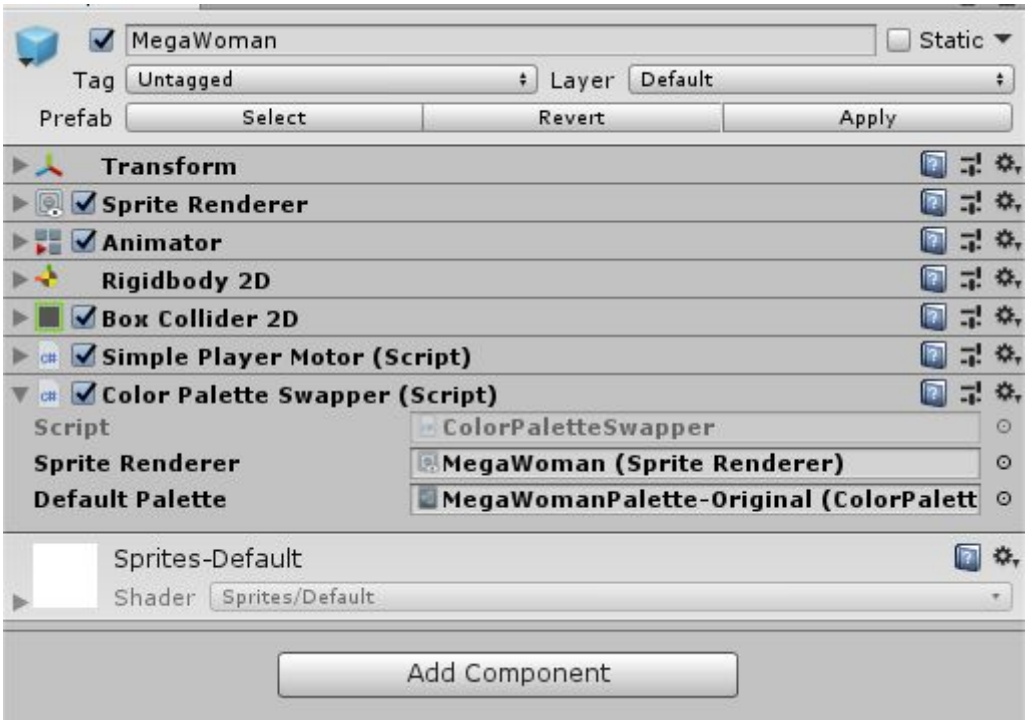


ATTENTION: The texture asset provided as input early (MegaWoman) should be marked as **Read/Write Enabled** and Compression method must be set to **None**.

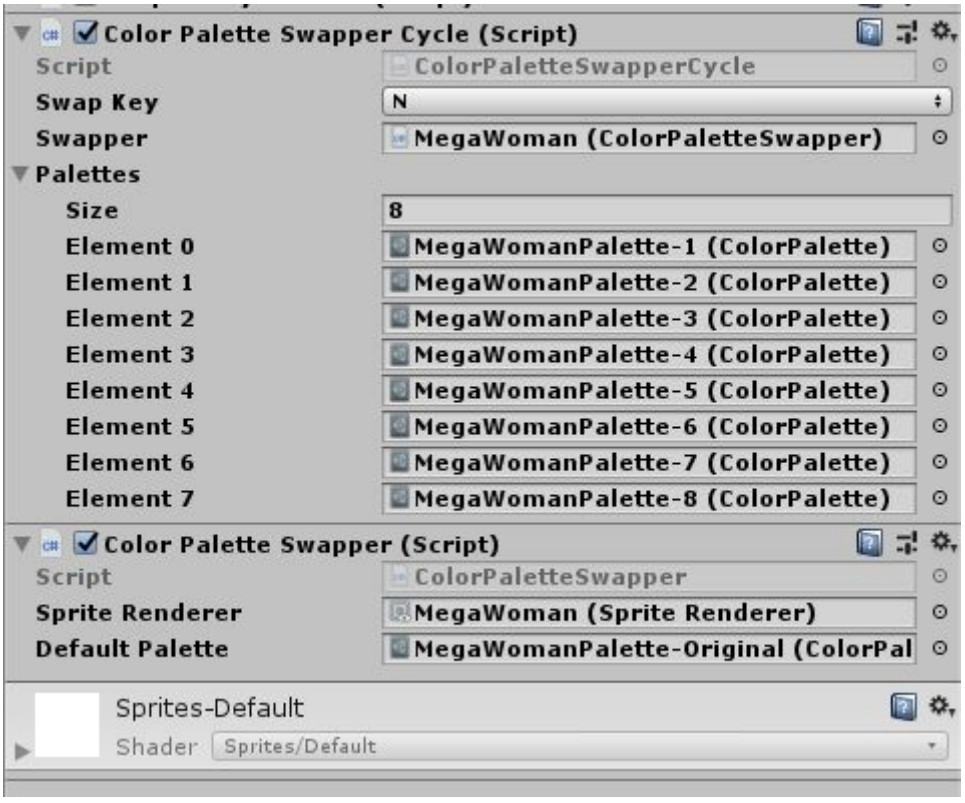
This palette is done. Now it's time to create the other ones which gonna be swapped at gameplay. Similar to the previous process, create palettes assets and use the appropriates sprites as **From Palette** inputs. When finish, you gonna have something like this:



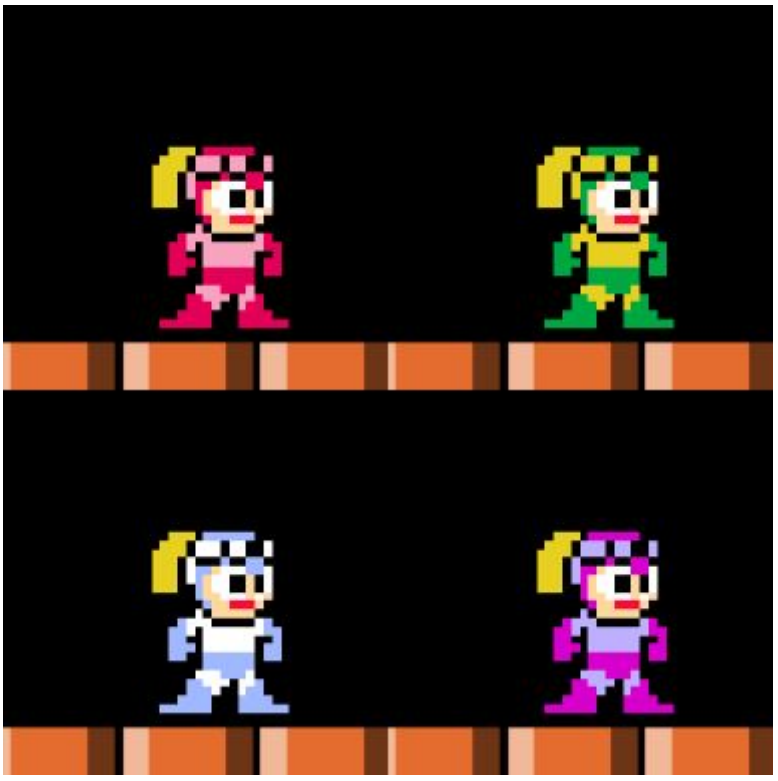
Finally, all the palettes assets are done. Open the **01 - Inicial Scene** if you didn't already, select the *MegaWoman* gameobject and attach the *ColorPaletteSwapper* script to it. The script will automatically detect or create a *SpriteRender* component for you. You just need to bind the first palette you created to **Default Palette** field, as shown below:



You can use the *ColorPaletteSwapperCycle* script to quickly test the swapper process. Attach it to *MegaWoman* gameobject and bind each palette asset to the **Palettes** array field.



Now, you can play the game and press **N** on your keyboard to cycle through the palettes during gameplay.



The *ColorPaletteSwapperCycle* script only calls the function **SwapColor** from the *ColorPaletteSwapper* component to cycle between the palettes array provided by you every

time the **N** key is pressed. You can create or integrate your own logic into your scripts by calling the **SwapColor** function and passing a palette as parameter.

Further Information

All the palettes created in the last section are available on Sprites/Palettes/Completed folder. Also, if you need more information on how to use this component, please see the **02 - Complete Scene** available on Scenes folder or watch the main tutorial video.

Thanks for reading.