Reactive
Banners and Flags
Help Document
UE5.2.0 Update

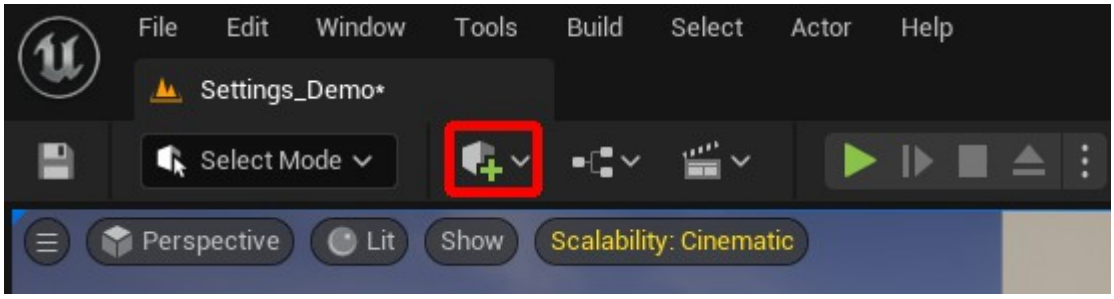
Index

Intro

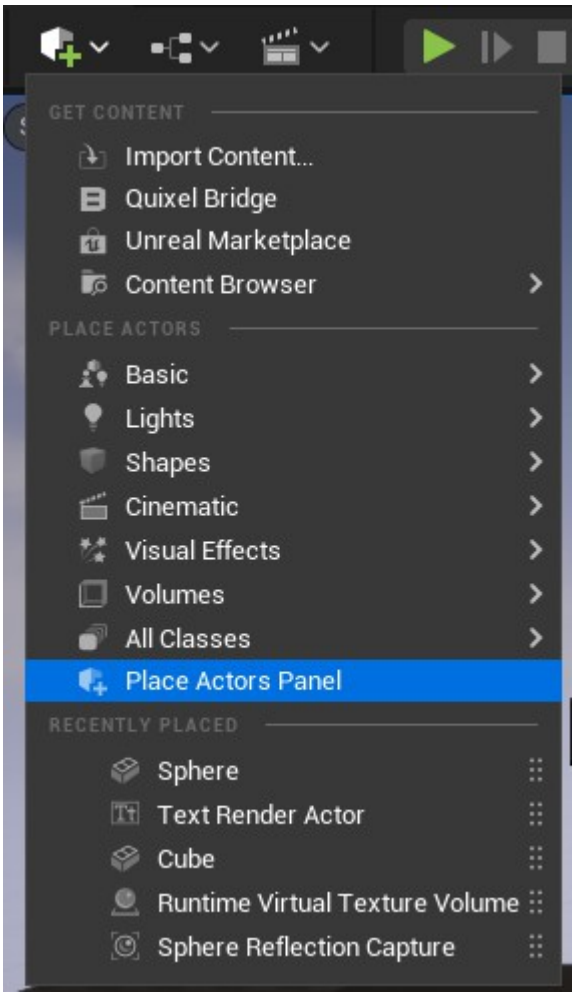
Hello, and welcome to the Reactive Banners and Flags Help Document. The goal of this document is to give you an overview of the product and provide tips on how to use and customize the items in your project.

Getting Your Banners and Flags To Blow In The Wind

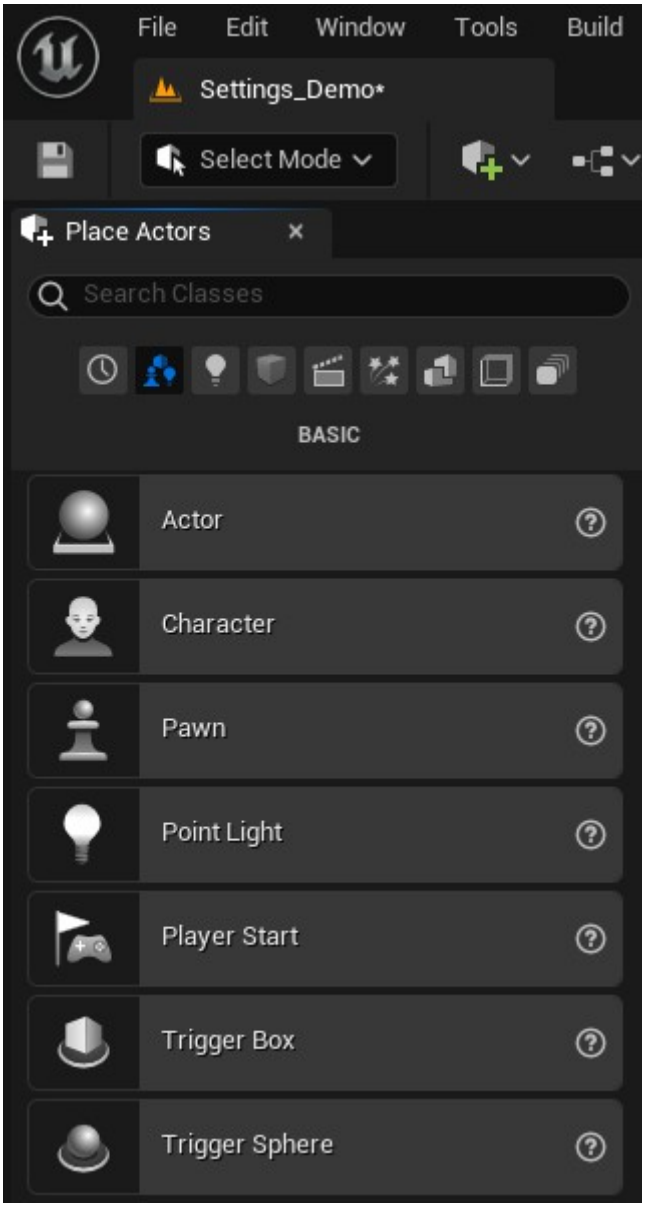
The Banners and Flags in this pack have already been set up with cloth physics, so you only need to place them in your level. To get extra movement you will need to add “wind” into your scene. With the default layout, look for the Quick Add button (Highlighted with red below) on the top left of your window.



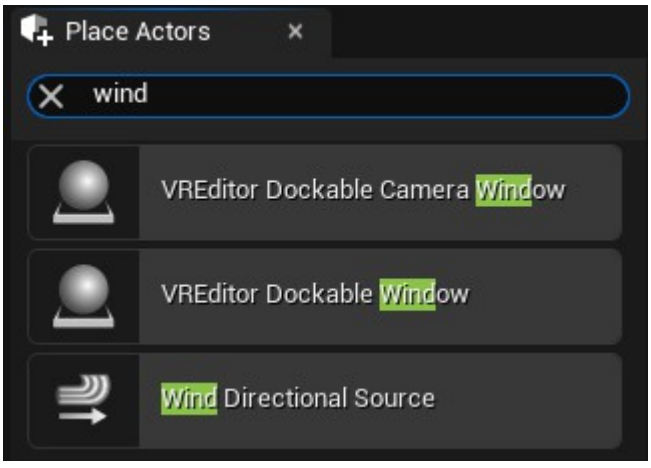
Click on it to expand it and click on Place Actors Panel.



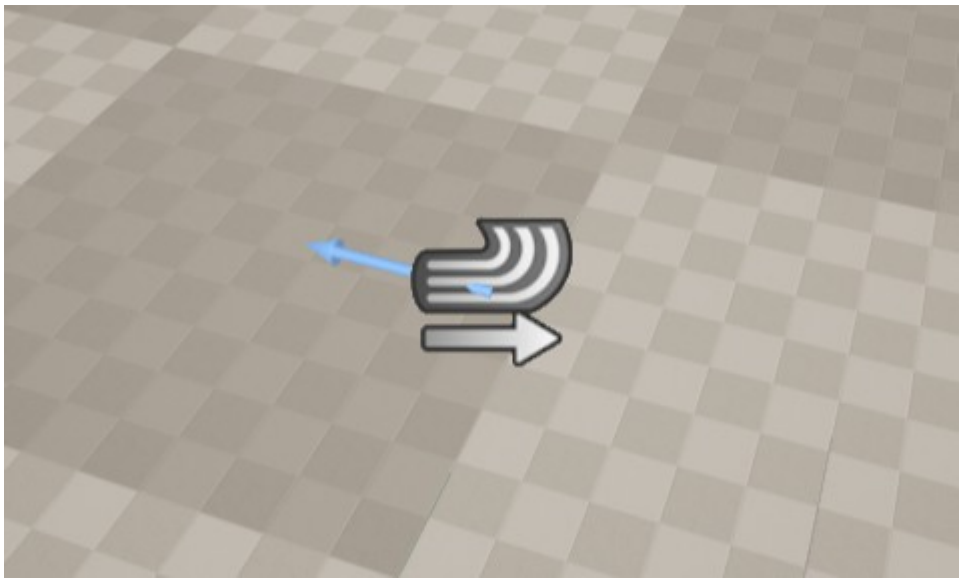
This should open the Place Actors tab.



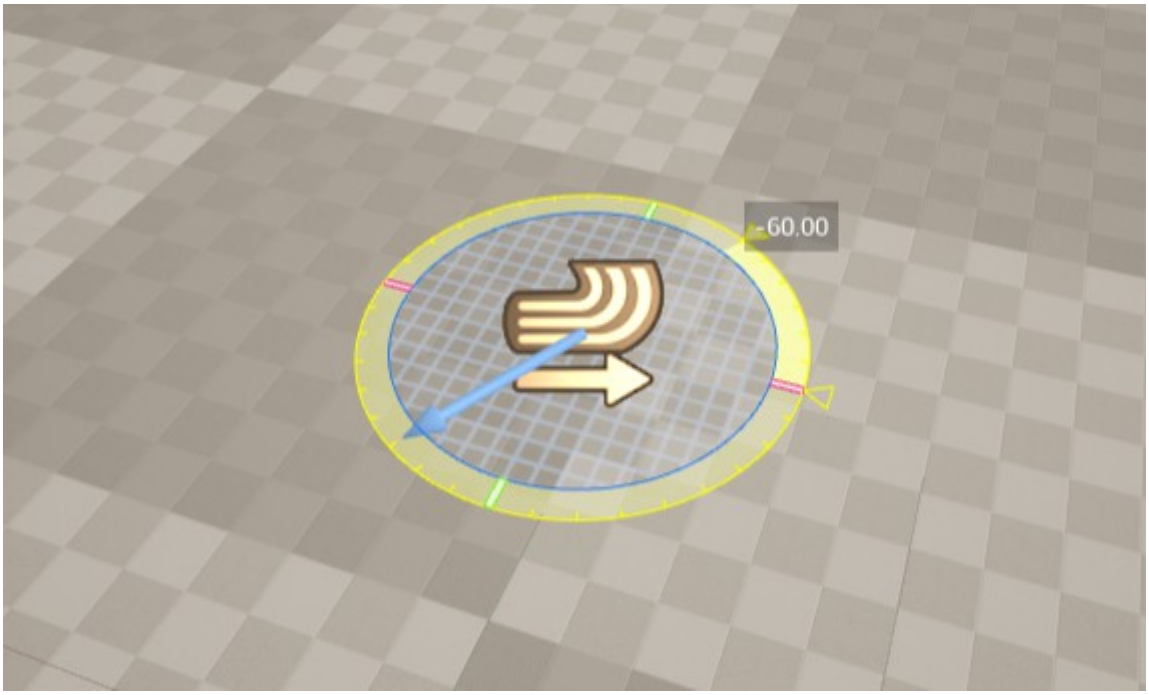
Click in the Search bar and enter Wind.



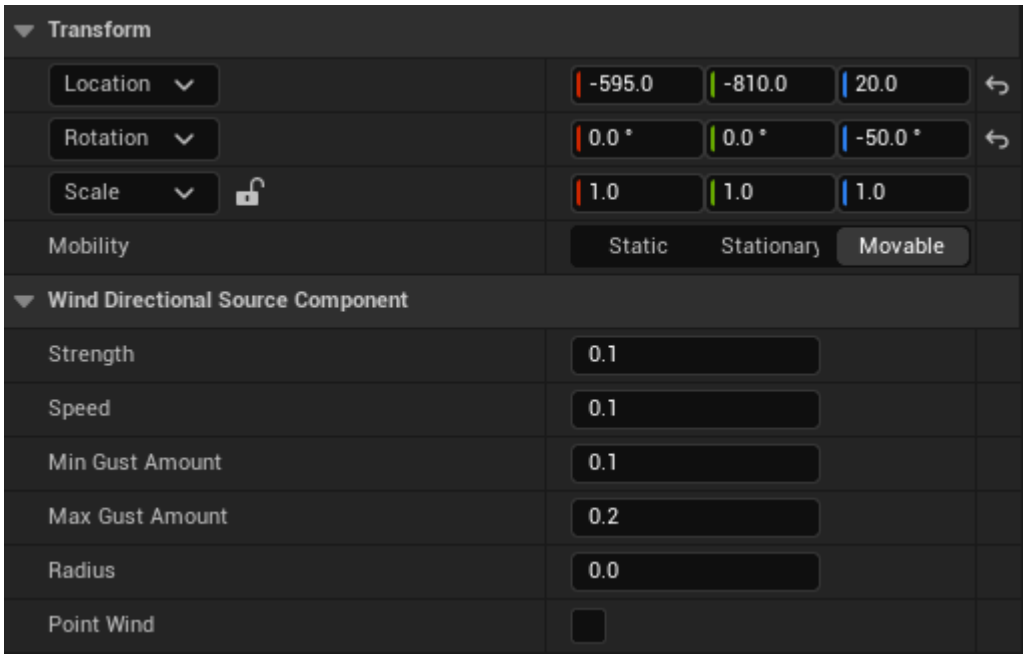
Click and drag the Wind Directional Source into your scene.



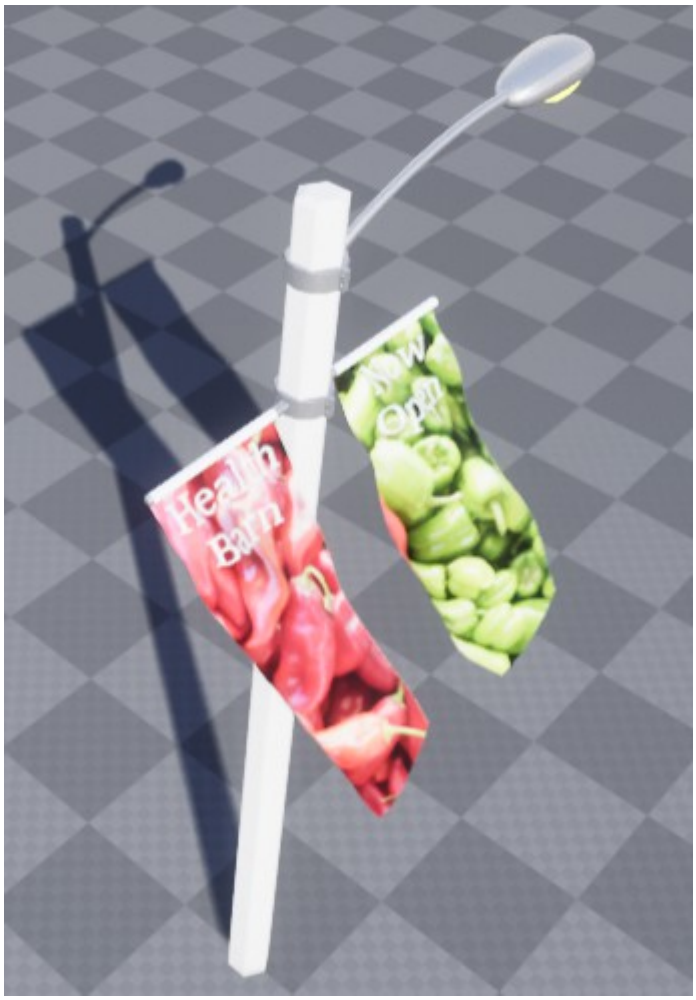
Use the Rotate function to adjust the wind's direction.



The Details Tab will allow you to change the Strength and Speed of the wind component.



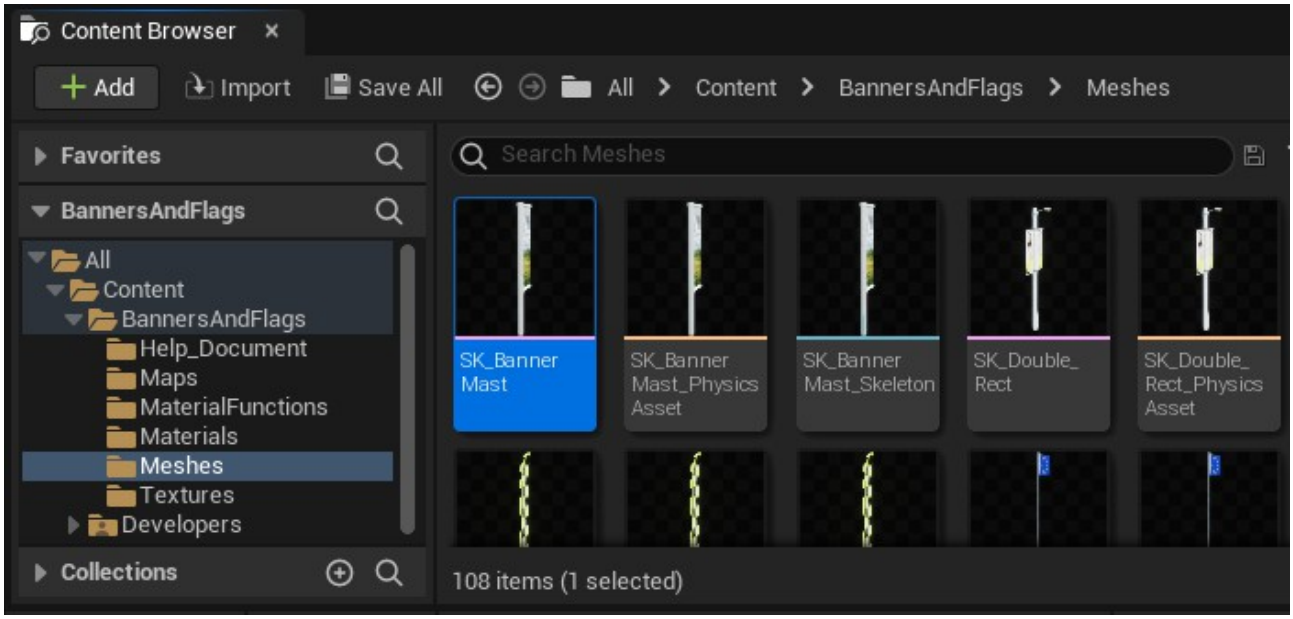
Click on Play to see how it looks. You may want to play around with these settings until you get the effect you want.



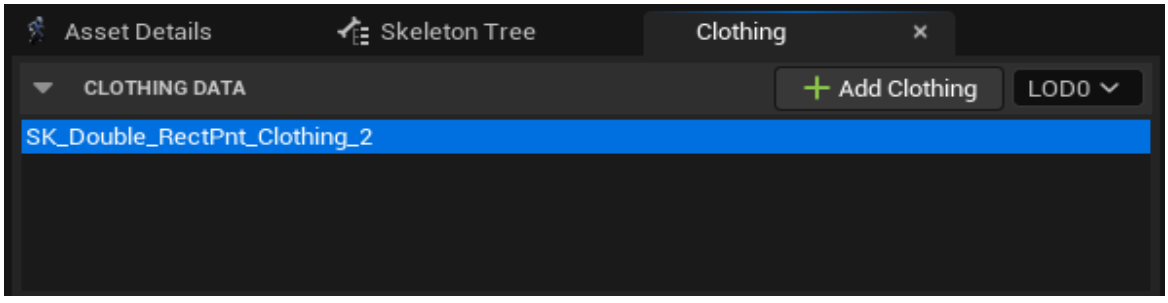
Adjusting How The Banners and Flags React To The Wind

Not all cloth based items react to the Wind Directional Source item in the same way, so you may find yourself in a situation where one item is blowing wildly while another barely reacts to the wind. When that happens you may need to adjust one of the two to get a more consistent effect.

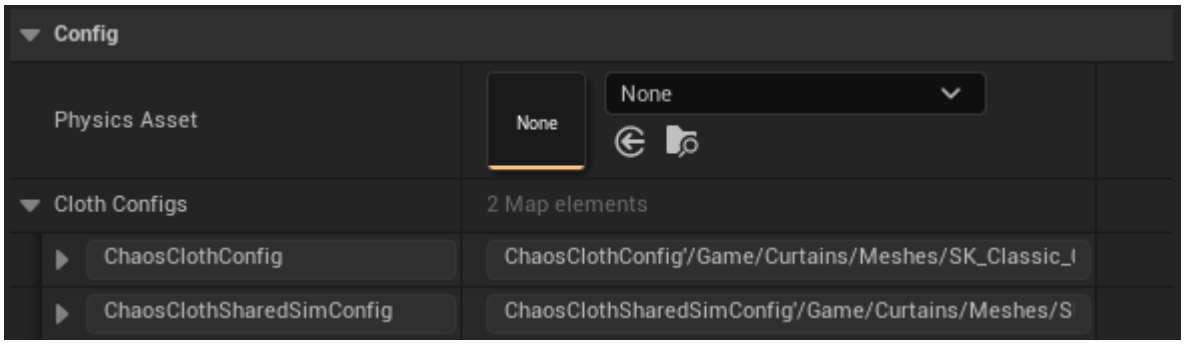
Navigate to the BannersAndFlags/Meshes folder and open the mesh you want to edit. (Optional) If you are worried about changing settings, create a duplicate of the mesh you want to edit and make any changes to that version. That way, in case something goes wrong, you can delete the copy and try again.



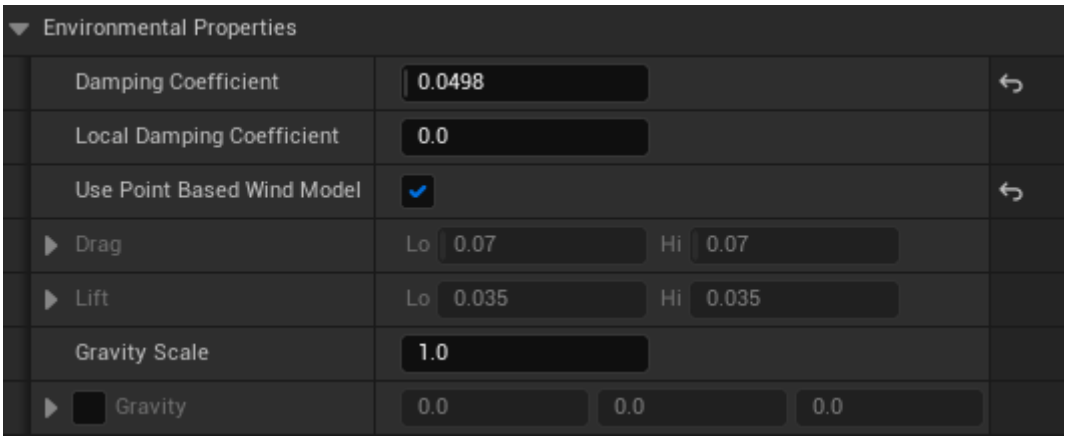
Click on the Clothing tab and select the set of Clothing Data.



Expand the Cloth Configs and ChaosClothConfig tabs.

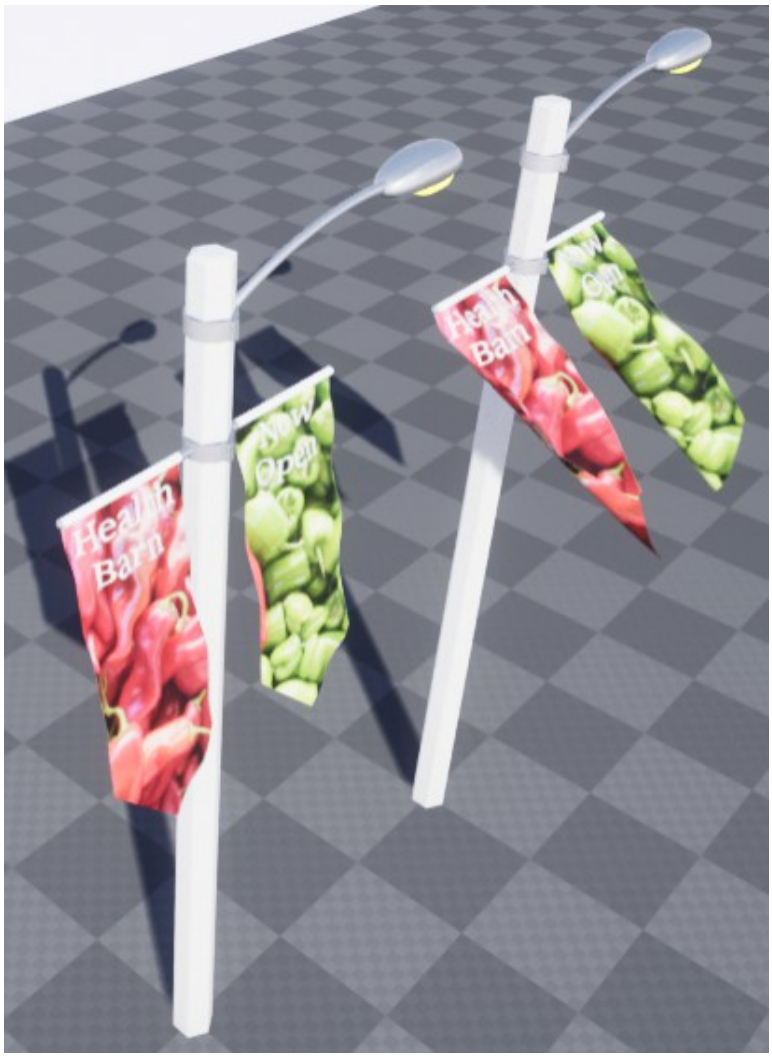


Then expand the Environmental Properties section.

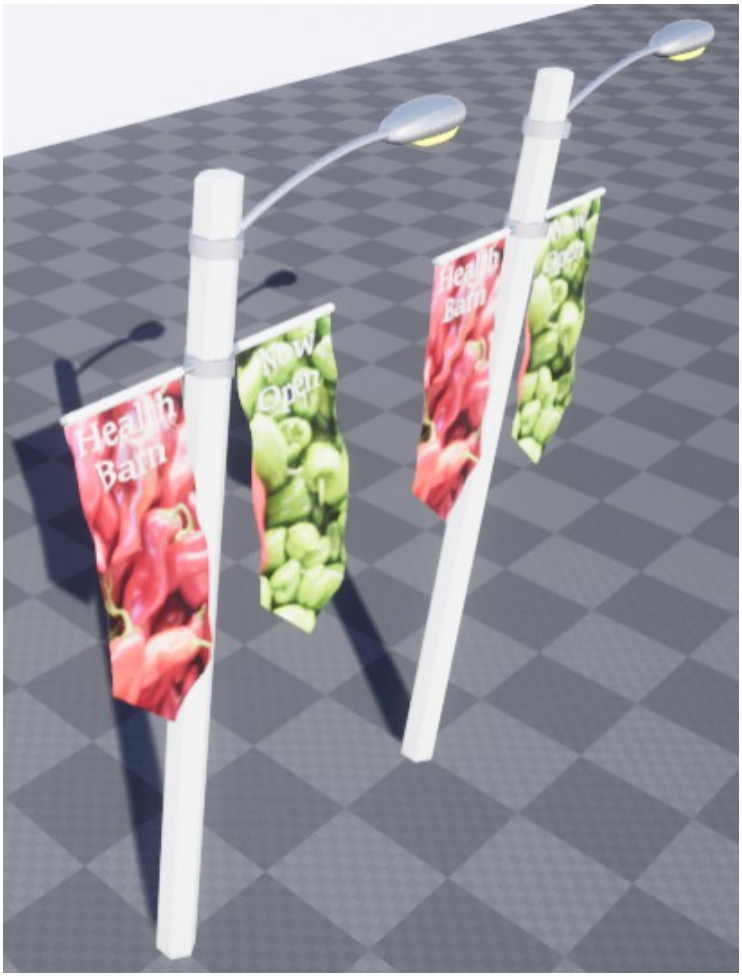


Adjust the Gravity Scale value. Lowering the value will make the item react more strongly to the wind direction source.

Let's change the gravity Scale value to 0.1 and then see how it reacts compared to a banner that has a Gravity Scale setting of 1.



As we can see, the item with the lower gravity scale (on the right) is reacting a lot more to the wind. Changing the Gravity Scale setting to 2 has the following effect:



Once you have a value you are happy with click on Save and close the banner or flag. This is by no means the only way to change how the cloth reacts to the Wind Source Item, but it is the easiest.

Changing The Look Of Your Banners and Flags

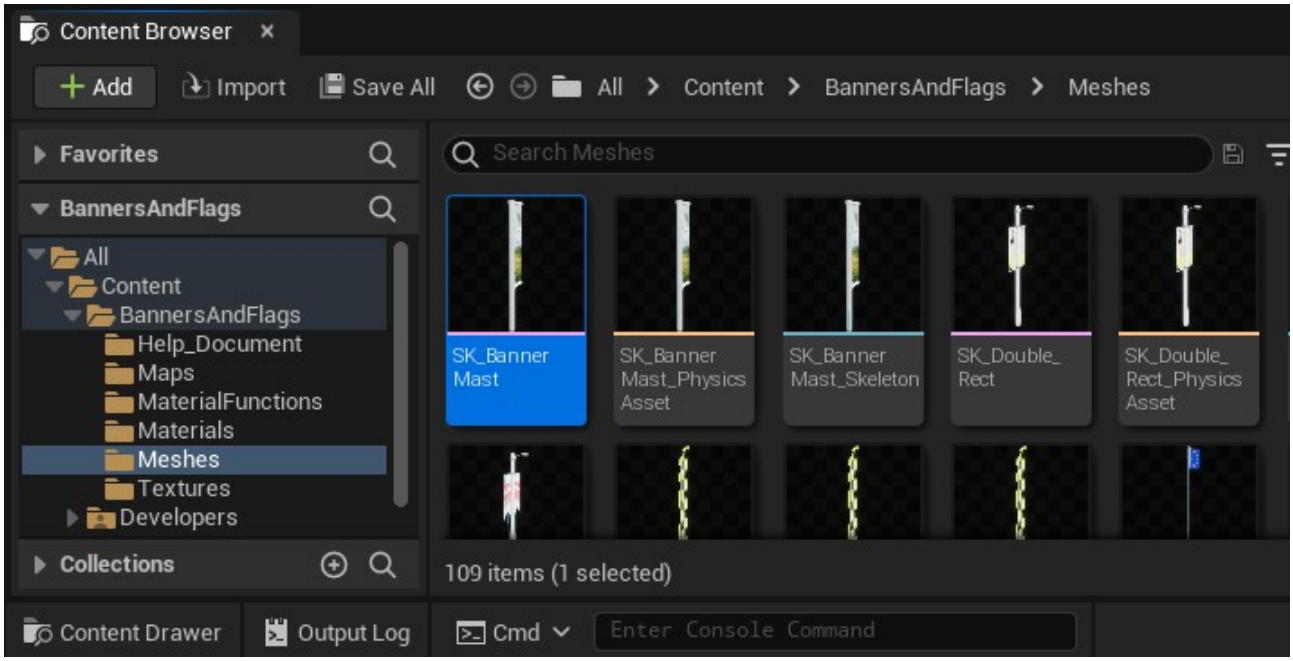
We have tried to make it as easy as possible to change the look of your banners and flags. There are three main ways to change the look of your banners and flags.

- Choosing a new material,
- changing an existing material,
- and creating and applying a new cloth image texture.

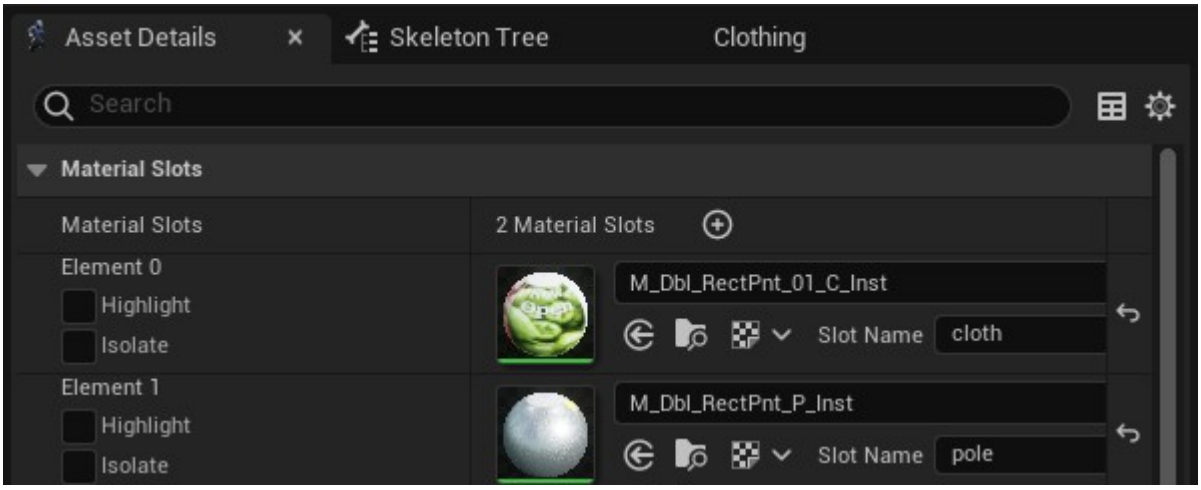
Getting the look you want may take a bit of each, so let's go over them.

Choosing and Applying a New Default Material Instance

Each banner and flag has two materials assigned to it, one for the cloth part of the mesh and one for the pole/support part. To see what materials are applied to a mesh you need to navigate to the BannersAndFlags/Meshes folder and find the item you want to edit. You'll see that each banner and flag consists of three parts: the mesh, the physics asset and a skeleton.

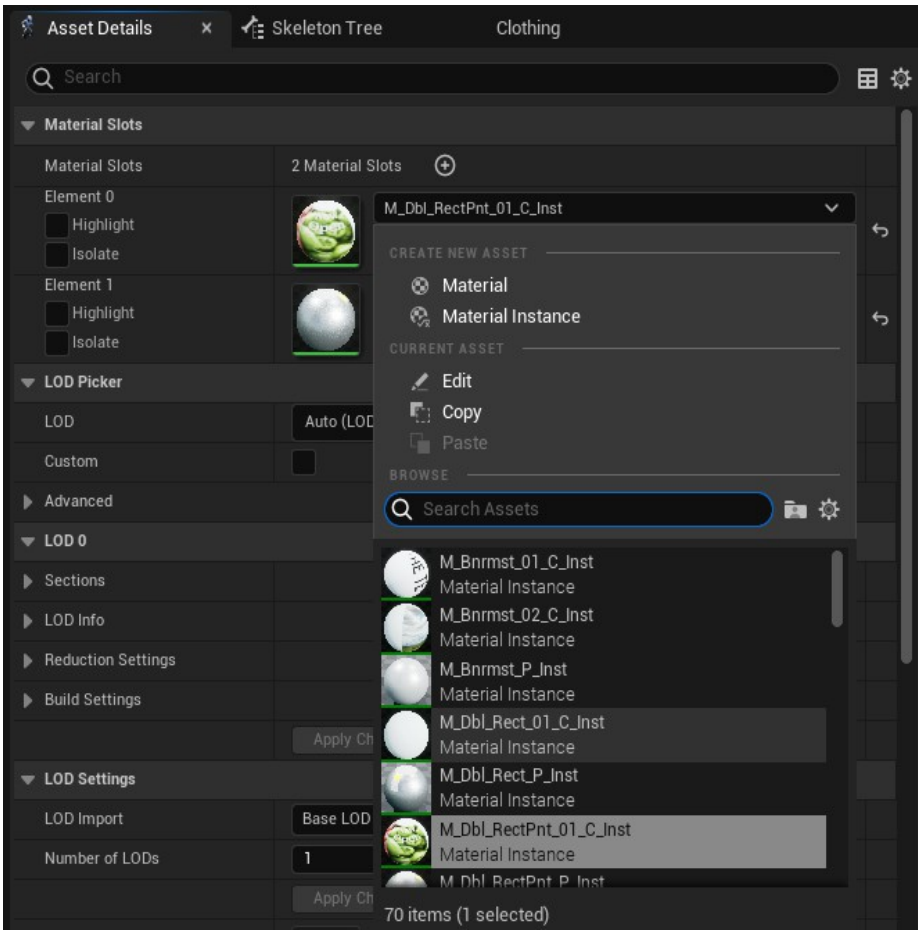


We want to open the mesh. After you have opened the mesh, click on the Asset Details tab.

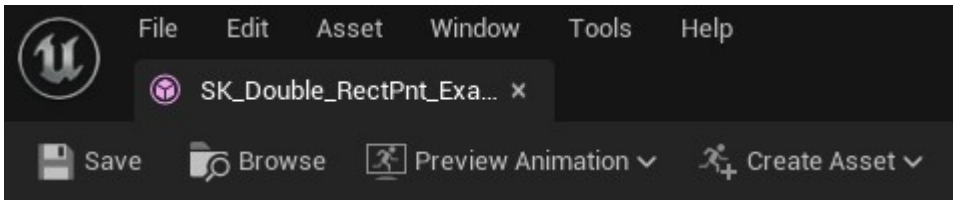


At the top, in the Materials Slots section, we can see the two materials applied to the mesh. These are the default materials that will be applied to the flag when you place it in your scene. The first item will always be the cloth part and the second item the pole part. You will also notice that the cloth material name ends with C_Inst and the pole material ends with P_Inst. We added this to make it clear which materials are for cloth and which are for poles.

To select a different material, click on the name of the material you want to change and search for the new material in the dropdown menu that appears.



With the new material selected, click on Save to save these changes.

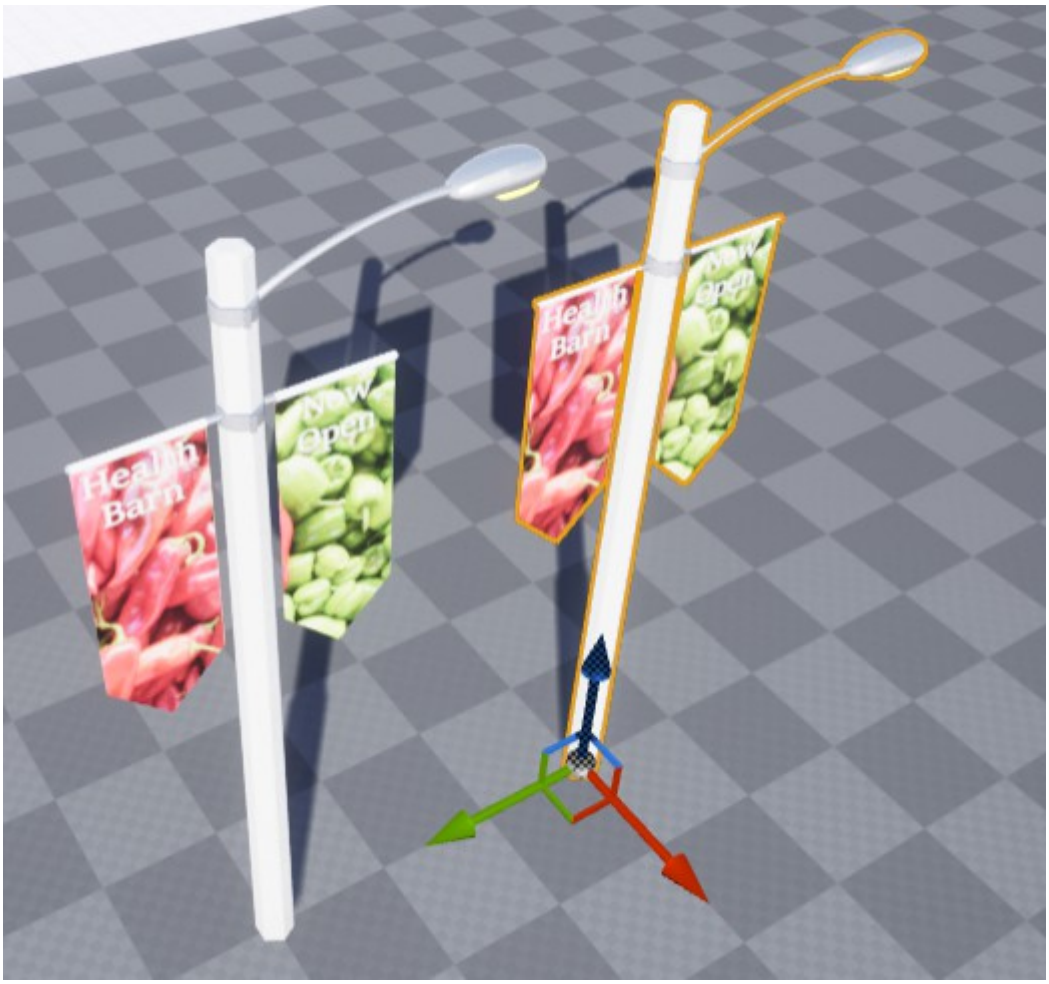


Now, when you place this mesh in your scene, the new material you chose will automatically be applied to the mesh.

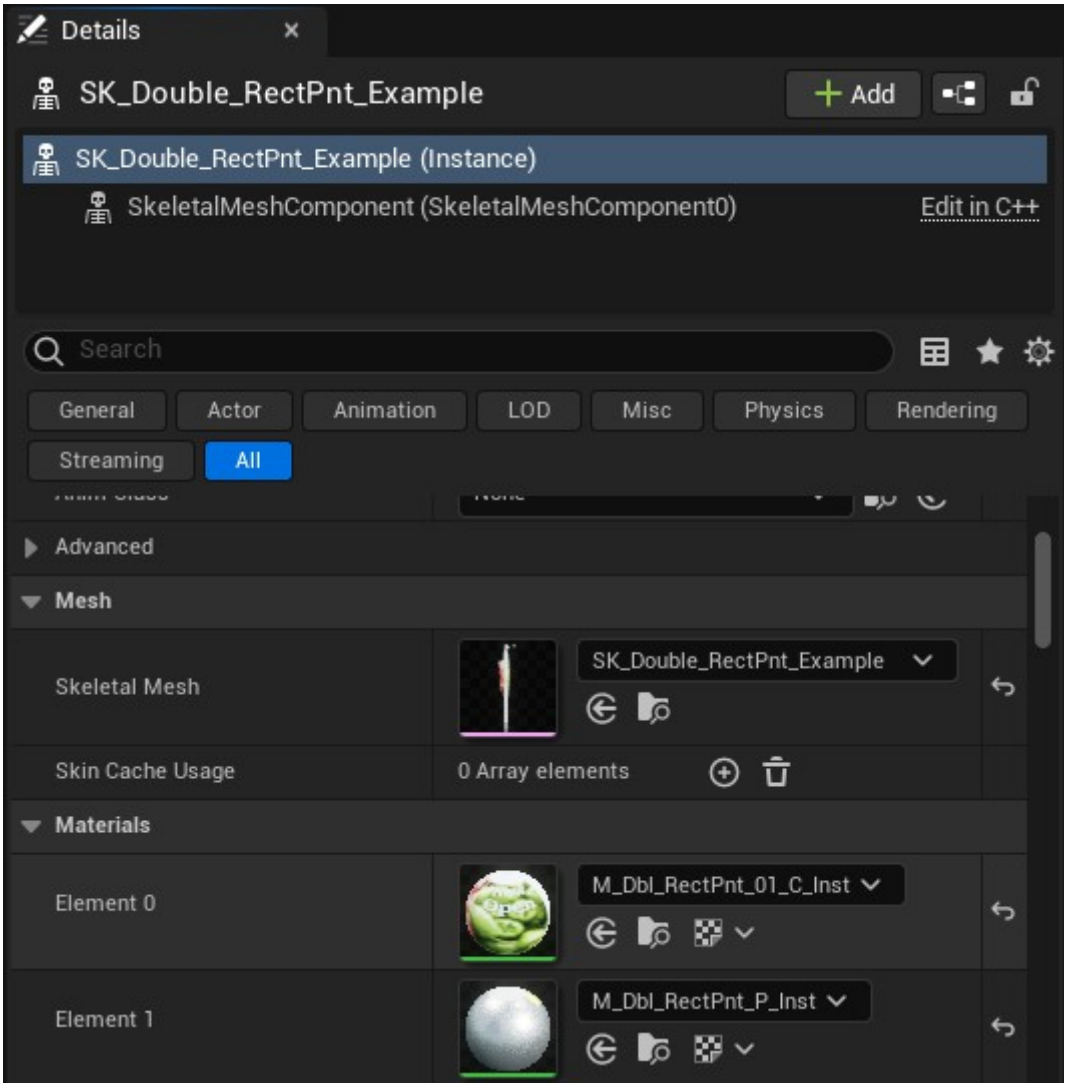
Take Note: When you change the default material, any instance of your flag or banner that has been placed in a scene previously with the default material applied will now have the new material applied in those scenes.

Choosing and Applying a Material Instance Directly In Your Scene

You can change the material a flag uses without changing the flag's default material. To do this, make sure the flag is already in your scene. Click on the flag to select it.

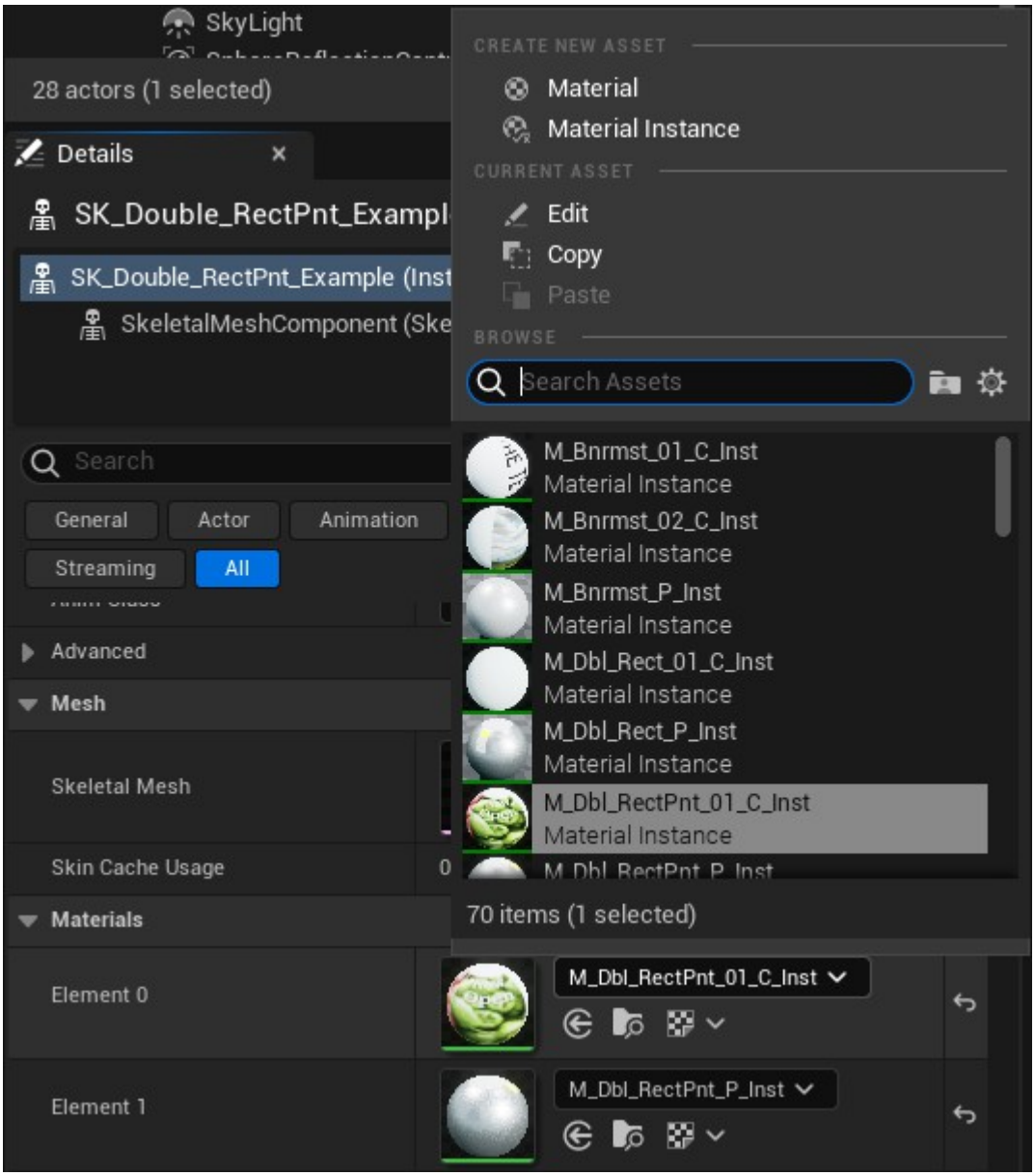


The details tab, on the right by default, will now fill with details and settings for this instance of the flag. So if we make changes to this flag, it will only apply to the selected flag. Scroll down the Details tab until you see the Materials section.

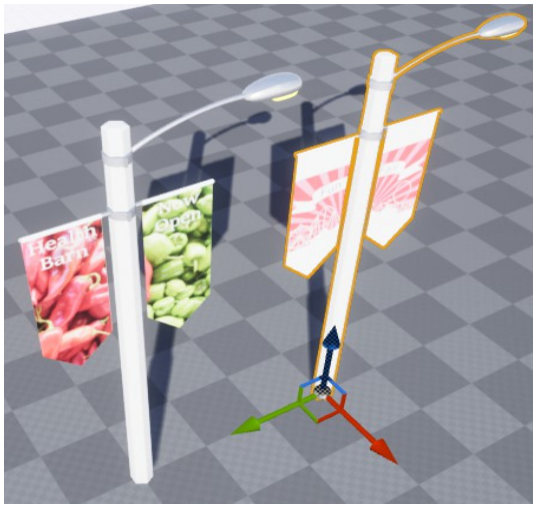


From here we can select a new material that will be applied to the selected flag.

Click on the name of the material and select the new material you want to use from the dropdown menu.

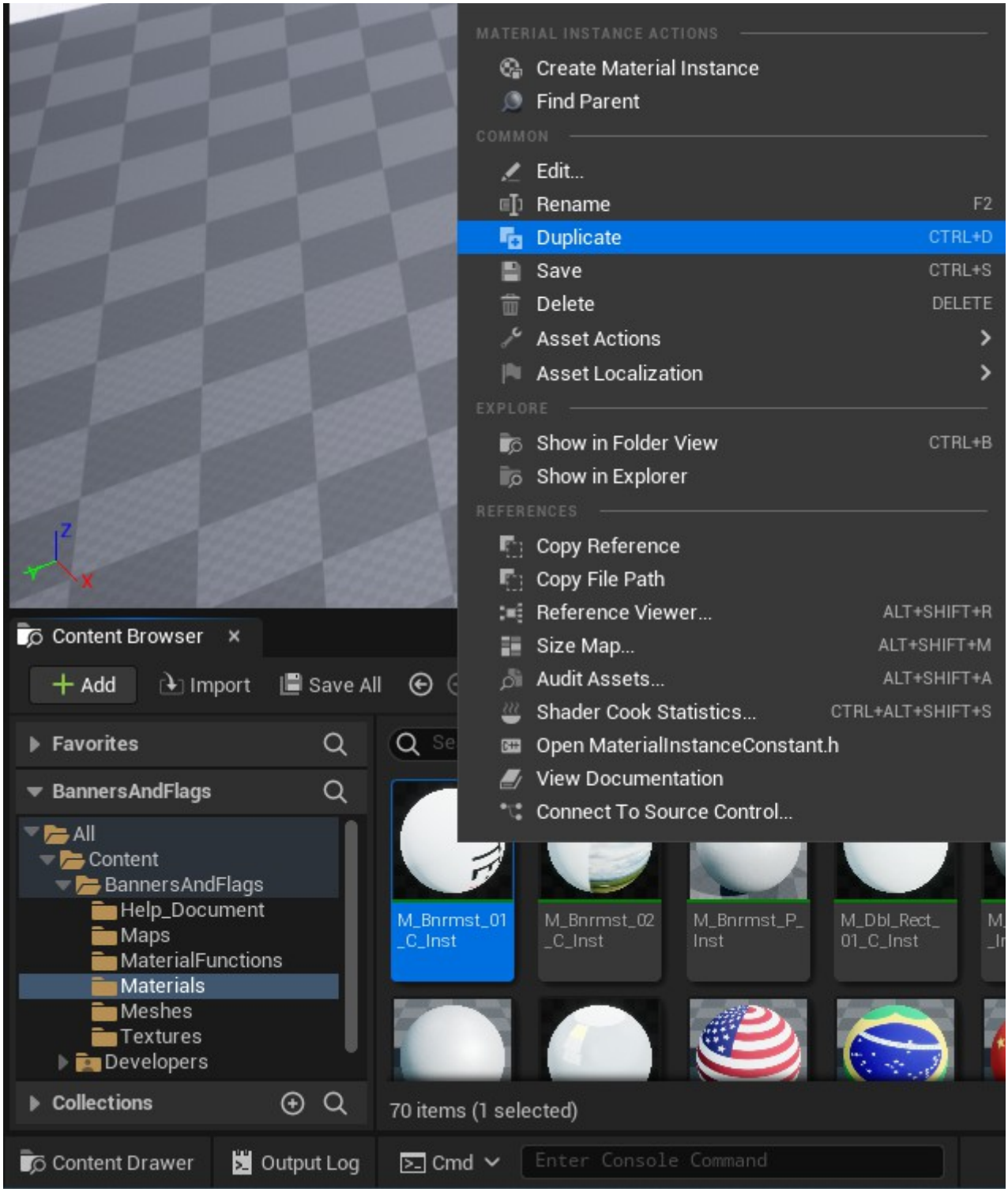


Once the new material has been selected the flag in your scene should look different.



Creating a New Material Instance

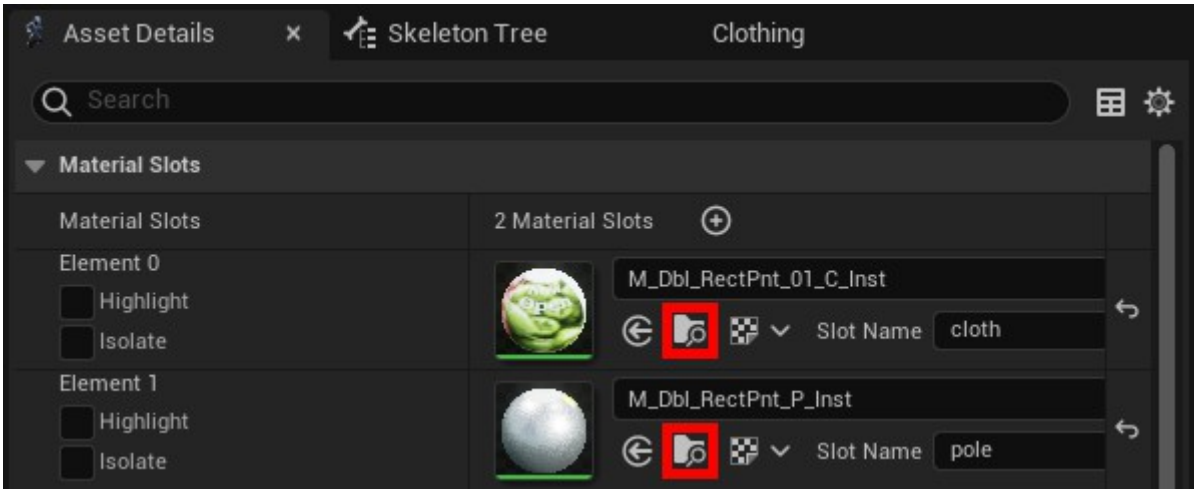
Creating a new material instance is as easy as selecting an existing material in the Materials folder, right-clicking, and selecting Duplicate.



Rename the new instance and double-click to open it.

(Optional) A good idea when creating a new material instance is to create a duplicate of an instance that is as close to your new instance as possible. This is especially useful when the material is more complex. What we recommend is to start by looking at the particular banner or flag you want to create the new material instance for. In the Meshes folder, locate the banner or flag and double-click the mesh file to open it.

Open the Asset Details tab and scroll until you see the Material Slots section. To quickly locate a material, click on the browse button below the material's name.

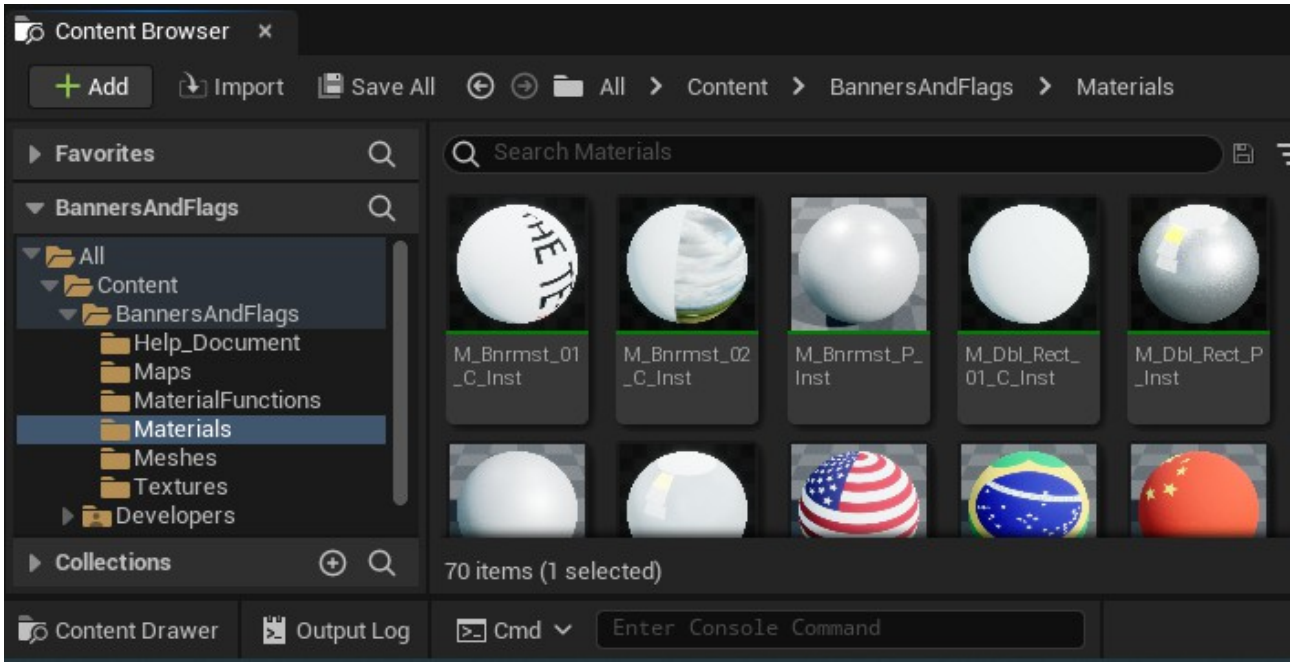


Your view should jump to the Materials folder with the specific material highlighted. From here you can either duplicate the material instance as explained above, or simply open the material instance if you only want to edit it. Whether you are editing an existing material instance or an new one, the settings will all be the same.

Changing the Look of a Material Instance

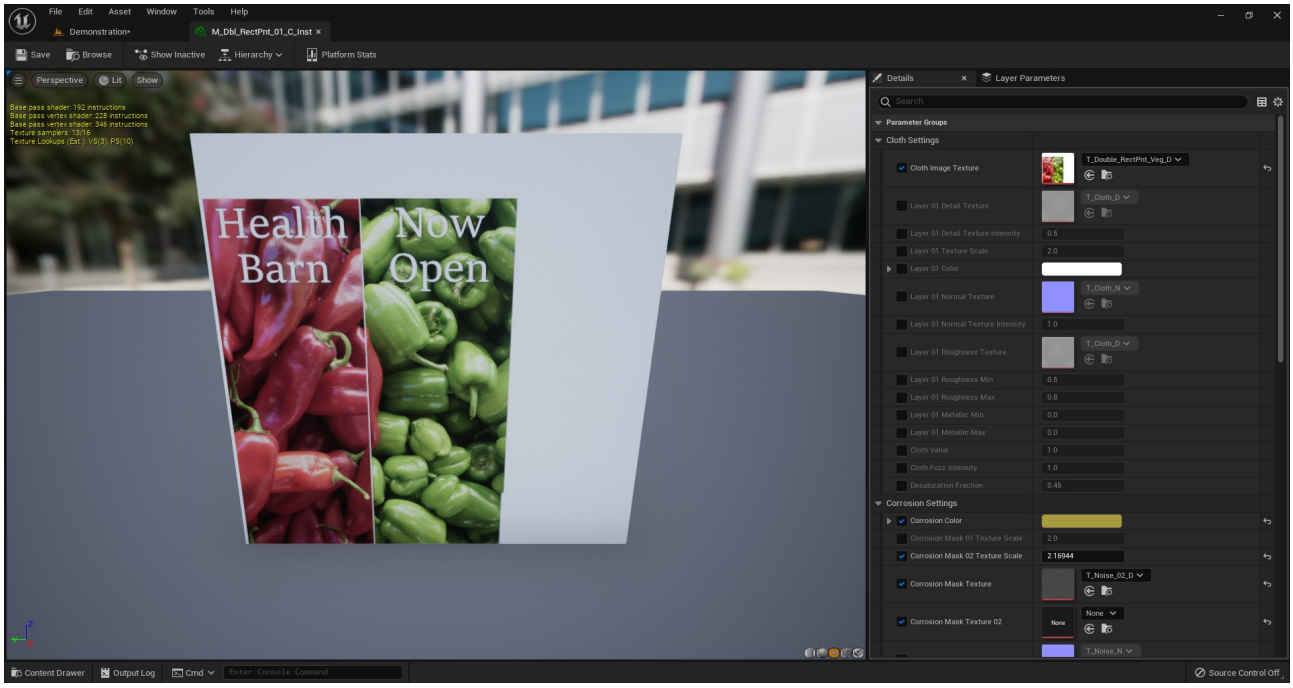
The items in this pack all use instances of one of three materials. You can easily edit one of the existing instances or create a copy of one.

Start by navigating to the Materials Folder in your content browser.



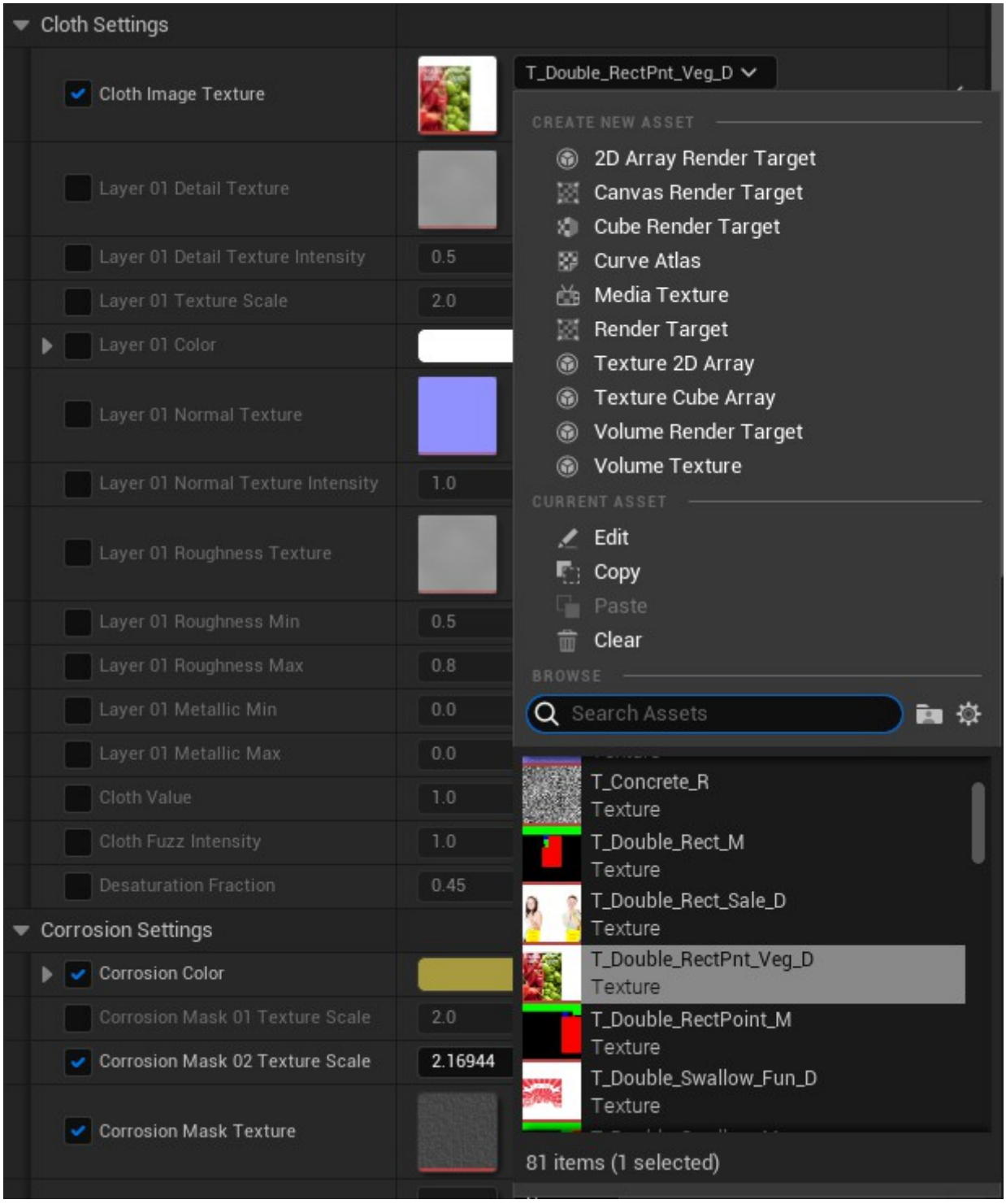
Open the material instance you want to edit.

Cloth Settings



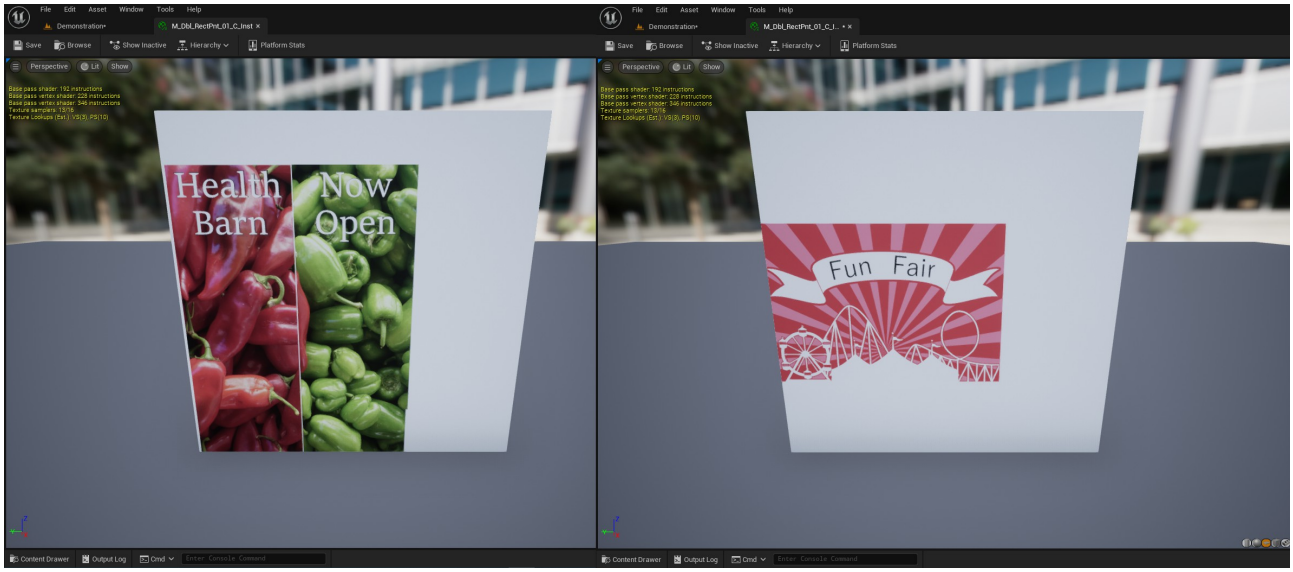
By default you can't edit the settings, you need to enable each one by clicking on the check box next to each setting. Let's start with Cloth Image Texture.

Cloth Image Texture: For many the Cloth Image Texture will be the only setting they ever need to change, since it has the biggest effect on the look of cloth materials. To change the texture, click on the texture's name to expand the dropdown list.



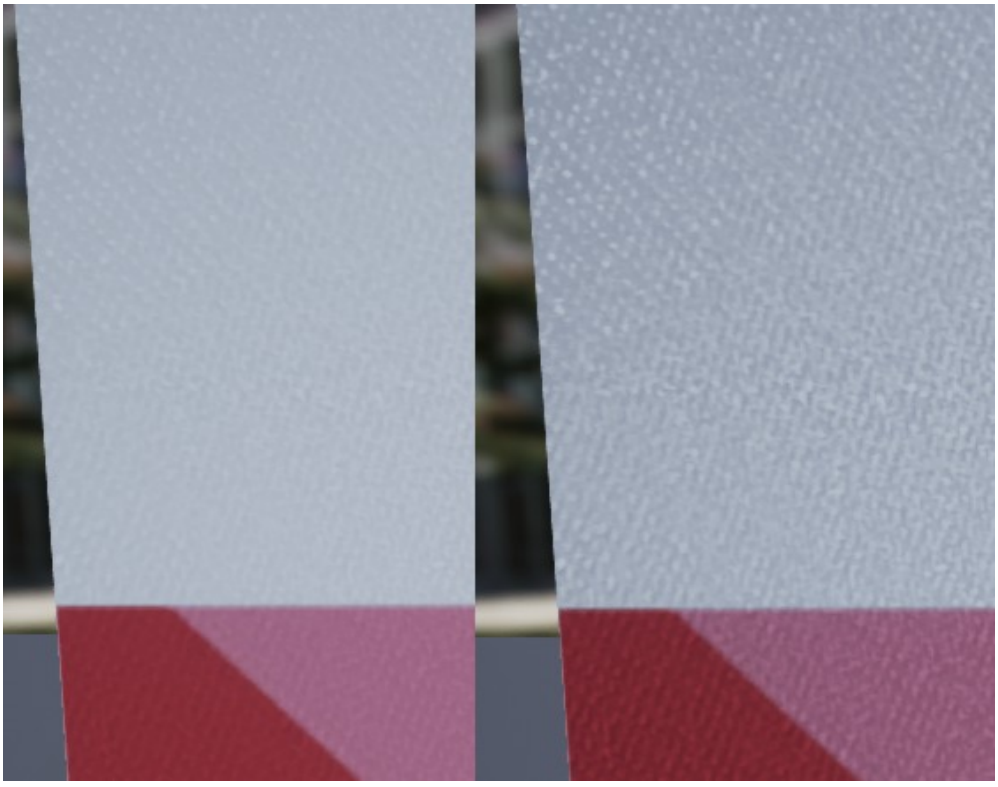
Scroll or search through the list and select the new texture you want to use.

The Preview window will update as you make changes to the material. In the image below we can see the difference only choosing a new Cloth Image Texture makes to the material.



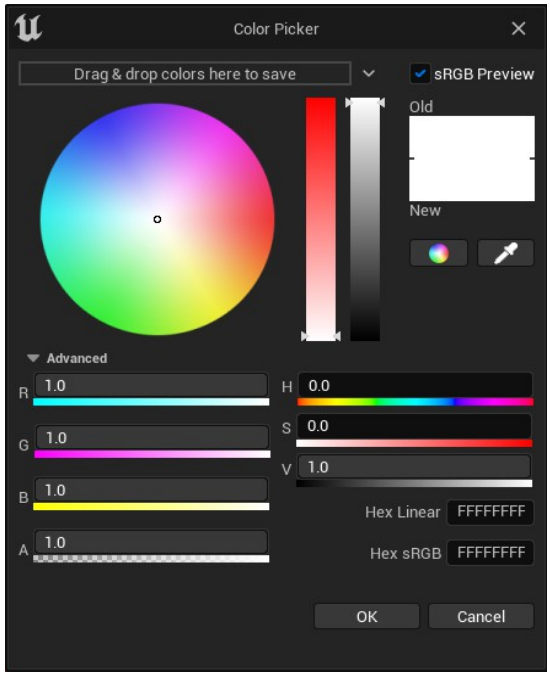
We'll go through creating a new texture later in the document.

Layer 01 Detail Texture: The Detail Texture is a repeating pattern used to create the cloth look. You can choose a new texture if you want to drastically change the texture of the cloth, but you can also change the *way* the texture is used to change the feeling of the cloth. To change the texture, expand the dropdown and select the texture you want to use.
Layer 01 Detail Texture Intensity: Adjusting the intensity value will change how clearly you can see the detail added by the detail texture.



Layer 01 Texture Scale: Adjust how often the Pattern texture repeats. Higher numbers cause more repeats or smaller patterns.

Layer 01 Color: Layer Color allows you to choose a color that is added to the Cloth Image Texture. By default this is set to white so that it doesn't interfere with your Cloth Image Texture, but it is there if you find that you want to tint everything a certain color. Click on the color box to open the Color Picker.



Choose your new color and click on okay.

The preview window on the left shows the changes you make in real-time.
Layer 01 Normal Texture: The Normal Texture adds some depth and extra detail to the material. By default it matches the Detail Texture, so changing the Detail Texture Scale will also change the Normal Texture's scale.
Layer 01 Normal Texture Intensity: Adjust how pronounced the normal texture is. Values around 0 make it hard to see (left) and higher numbers make it more obvious (right).

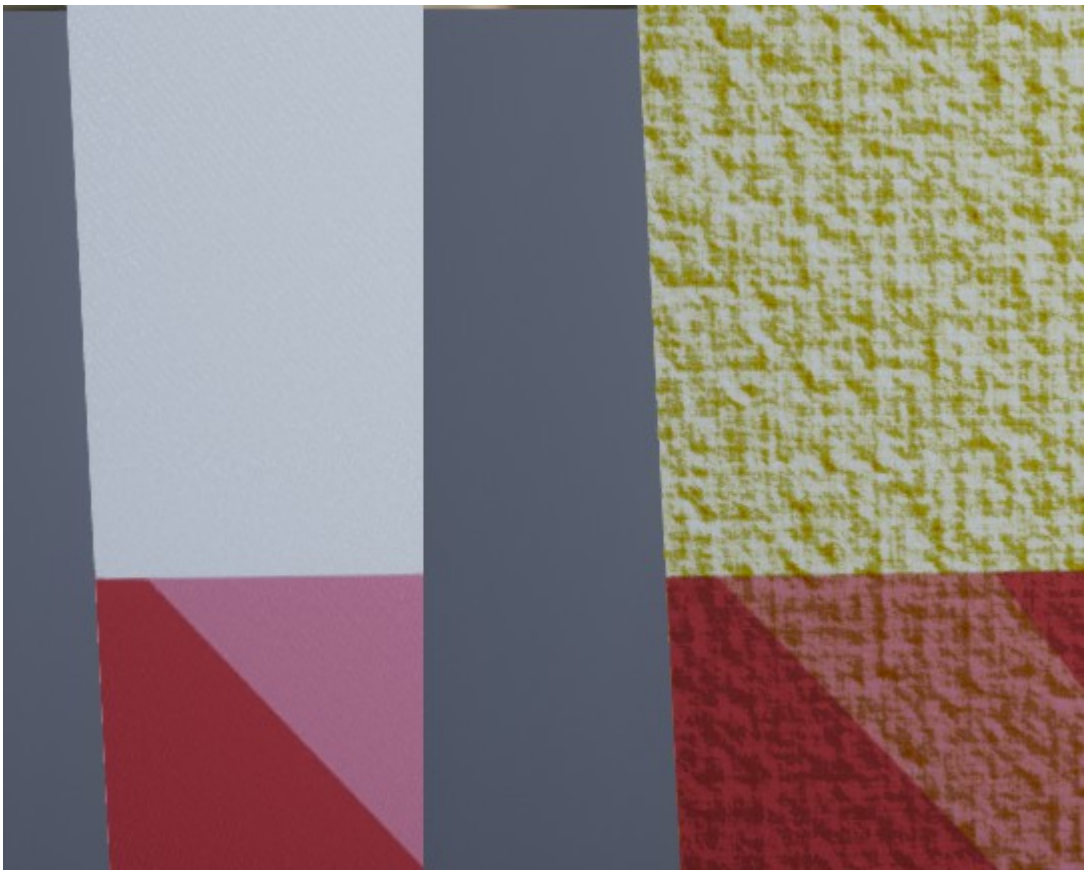
Layer 01 Roughness Texture: The Roughness Texture is used to give variety to the roughness applied to the material. A greyscale texture is used with the values between white and black determining what roughness is applied to what area.

In the screenshot above we can see the difference between alternating rough and smooth blocks we created by applying a checkerboard roughness texture.
The Roughness Texture is also used to determine the minimum and maximum metallic values applied to the material.
Layer 01 Roughness Min: The Roughness Min value is the roughness value applied to the black parts of your roughness texture.
Layer 01 Roughness Max: The Roughness Max value is the roughness value applied to the white parts of your roughness texture.
Any areas that aren't pure white or black will fall somewhere between the Min and Max values you set.
Layer 01 Metallic Min: The Metallic Min value is the metallic value applied to the black parts of your roughness texture.
Layer 01 Metallic Max: The Metallic Max value is the metallic value applied to the white parts of your roughness texture.
Any areas that aren't pure white or black will fall somewhere between the Min and Max values you set.

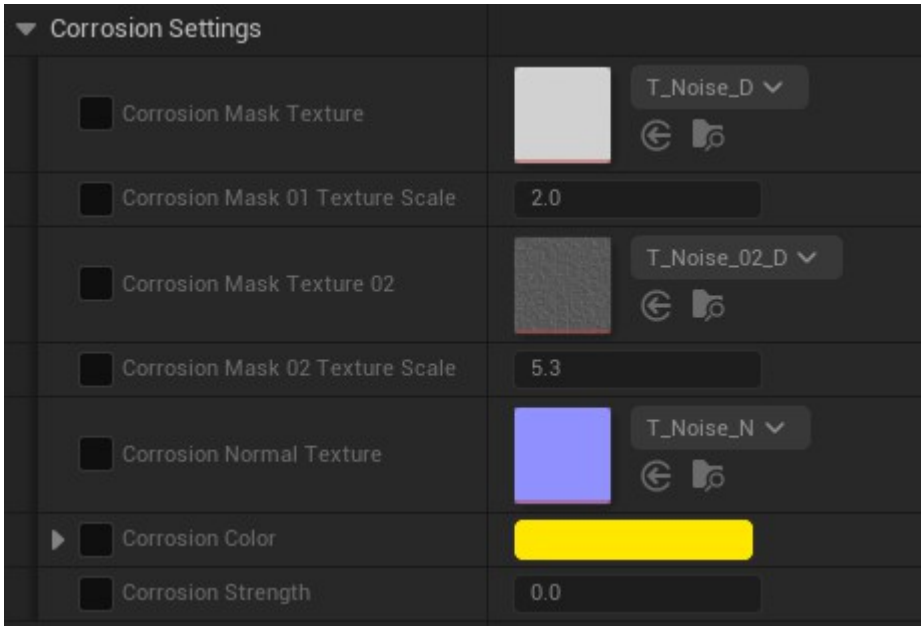
In the image above we can see alternating squares of metallic and non metallic areas. Experimentation could probably lead to some interesting results.
Cloth Value: The Cloth Value setting allows you to adjust the cloth shader value.
Cloth Fuzz Intensity: The Cloth Fuzz Intensity allows you to adjust the fuzz shader value.
Desaturation Fraction: The Desaturation Fraction value allows you to desaturate the colors of the cloth, like clothes that lose color after many washes.

Corrosion Settings

Below the normal cloth settings we have the Corrosion Settings. These settings allow you to create the look of dirt or rust on the cloth and pole parts.

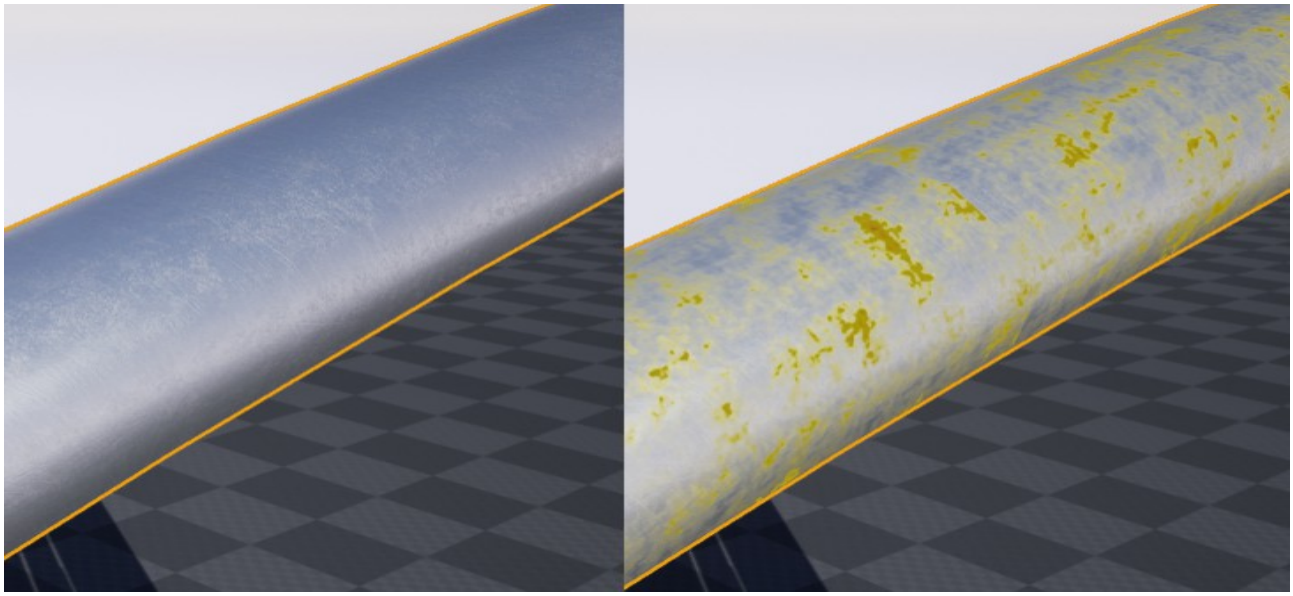


In the image above we can see the difference between clean cloth on the left and "dirty" cloth on the right.



Corrosion Mask Texture: The Corrosion Mask Texture allows you to use a grayscale texture to determine how your dirt/corrosion will look. Whiter colors will appear dirty, while pure black will remain clean. Darker grey areas will be somewhere in between.
Corrosion Mask 01 Texture Scale: Change the Texture scale value to determine how often the texture will tile.
Corrosion Mask Texture 02: A second mask texture can be used to create more variety in your dirty look. This will also help cover any obvious tiling.
Corrosion Mask 02 Texture Scale: This setting allows you to set how often the second mask texture repeats. To help prevent obvious tiling, make sure the scale is not the same as mask 1.

Corrosion Normal Texture: The Corrosion Normal Texture allows you to choose a normal texture that is added to the areas with corrosion. This is useful when you have an area with rust, for example, that actually damages metal.

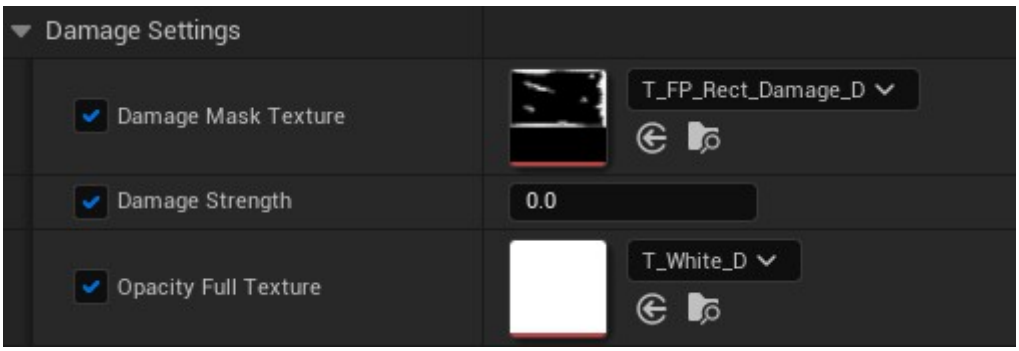


Corrosion Color: Corrosion Color allows you to choose what color the dirt/corrosion on your material is.
Corrosion Strength: Corrosion Strength allows you to set the overall strength of the corrosion effect.

Damage Settings

The Damage Settings allow you to create the impression of damaged and worn cloth. Nothing stays perfect forever.

In the image above we can see the difference between a nice new flag on the left and a damaged one on the right.



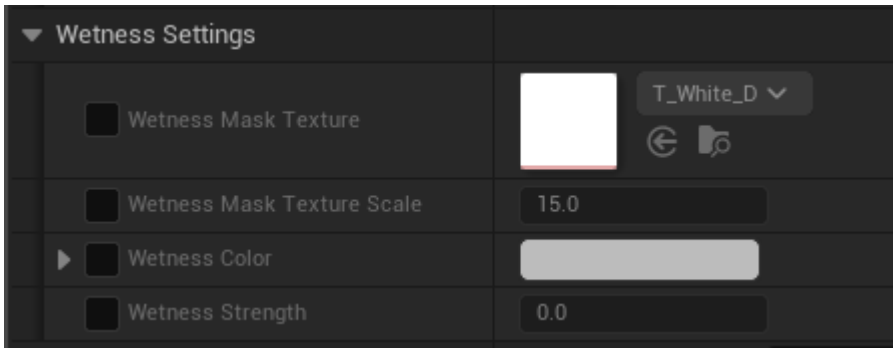
Damage Mask Texture: The Damage Mask Texture is a greyscale texture that determines what the the damage looks like and where it forms first. Whiter areas will disappear first with darker parts dissolving gradually as the Damage Strength is turned up. Each banner and flag comes with its own default damage texture, but you can choose new ones to create new damage patterns.

Damage Strength: The damage strength setting allows you to adjust how damaged the material is. In other words, as the strength increases more and more of the darker parts on your Damage Mask Texture will disappear. In the screenshot above we can see the difference between a strength of 0.2 on the left and 0.3 on the right. The default damage textures don't come with gray gradients, so the effect will be largely the same, regardless of the Damage Strength.

Wetness Settings

Wetness Settings allow you to create the impression that your banners and flags have gotten wet.

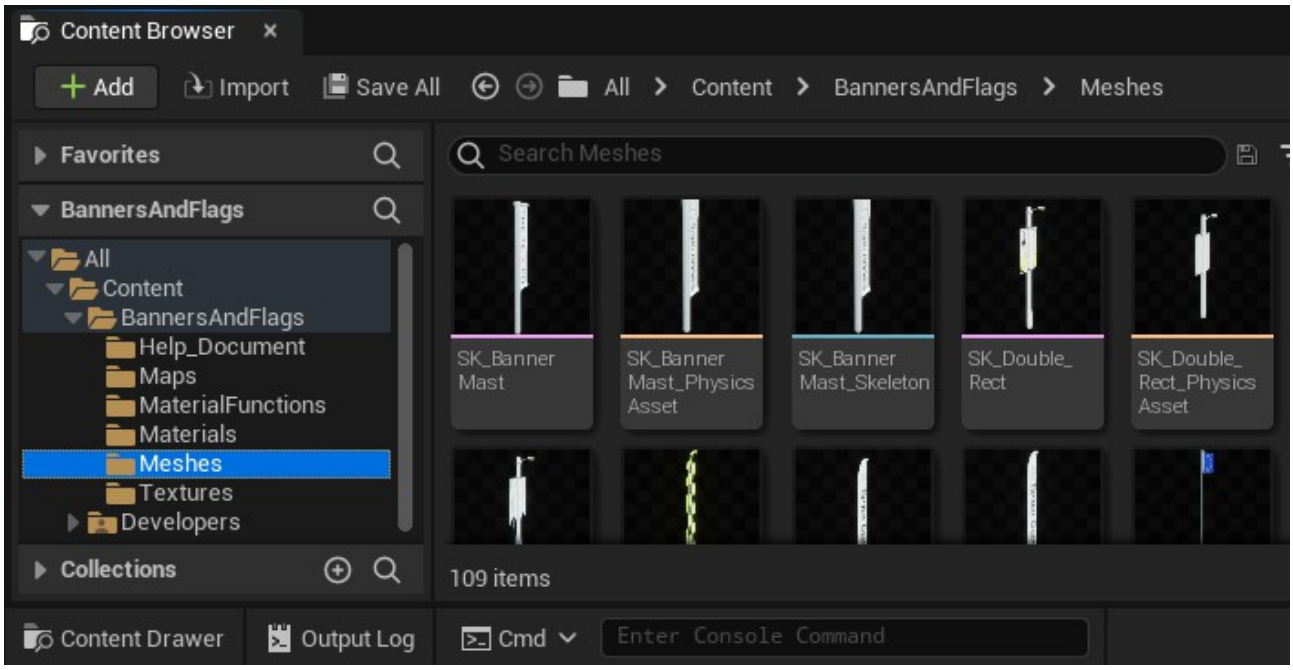
In the image above we can see a dry material on the left and a wet material on the right.



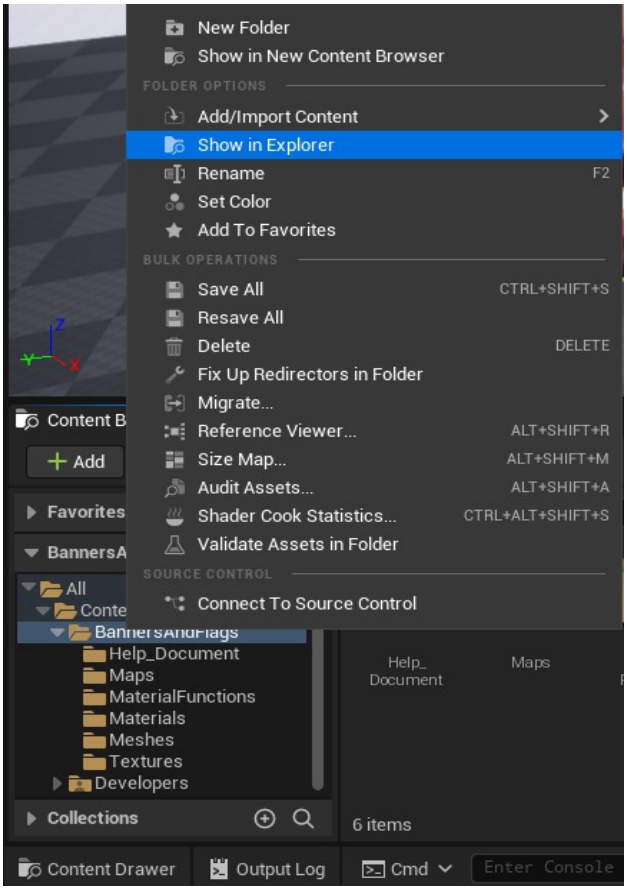
Wetness Mask Texture: The Wetness Mask Texture is a greyscale texture that determines where the wetness effect is applied. White areas are the wettest and black or darker areas are less wet. Using a white texture, like we are doing by default, creates a uniform wetness.
Wetness Mask Texture Scale: The Wetness Mask Texture Scale setting allows you to set how frequently the Wetness Mask Texture repeats.
Wetness Color: One of the tricks we use to create the wetness effect is by darkening the material's original color. By default we do this by adding a bit of grey to the color, but with the Wetness Color setting you can adjust the value to get the exact look you want.
Wetness Strength: The Wetness Strength setting allows you to adjust how strongly the wetness effect is applied on the material.

Creating Cloth Image Textures Using Flag Templates

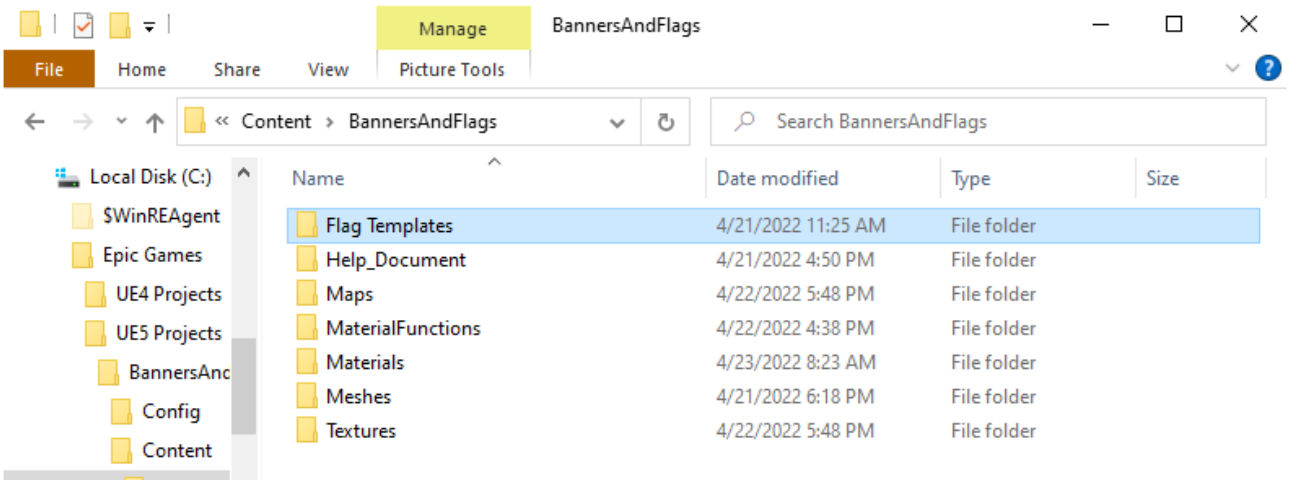
The first thing we need to do when creating a new cloth image texture is to determine which banner or flag the texture is for. The reason for this is that each banner and flag has its own UV map and the locations of the visible flag areas vary greatly.



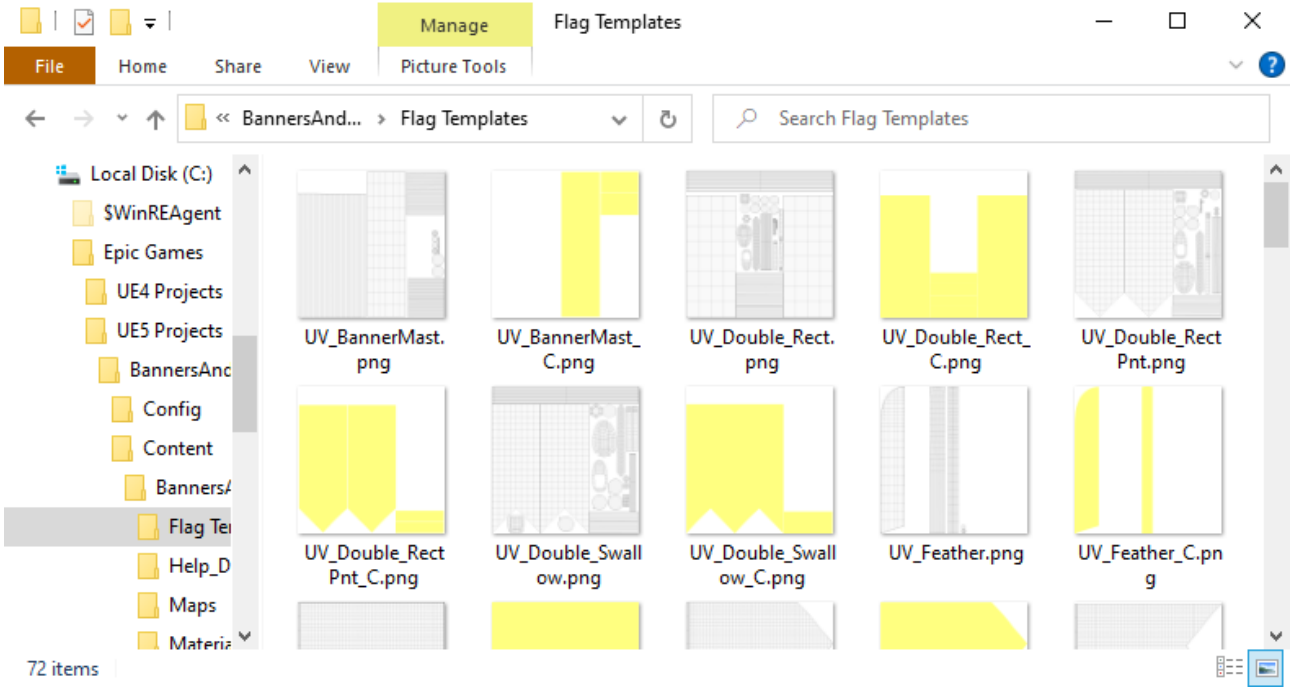
In the Content Browser, right-click on the BannarsAndFlags folder and click on Show in Explorer.



A new navigation window will open in the location of your project on your hard-drive.

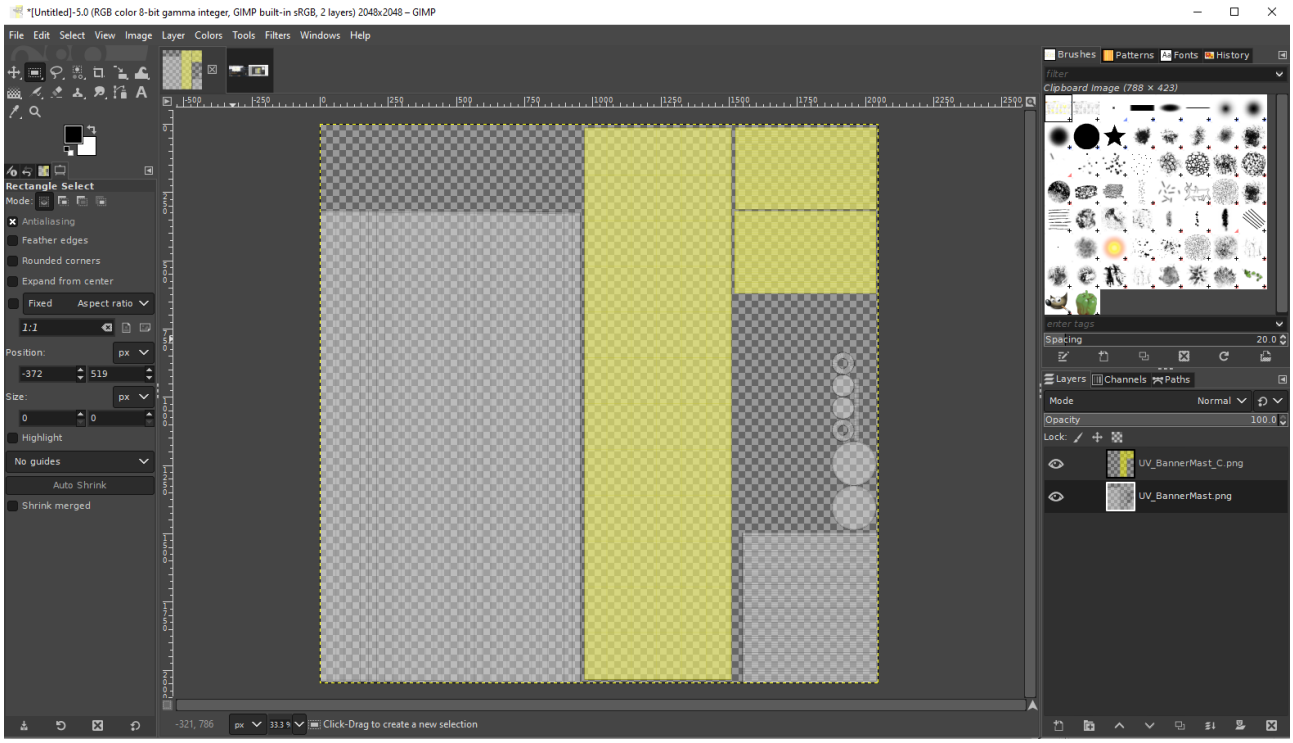


One of the folders is called Flag Templates. Open it.

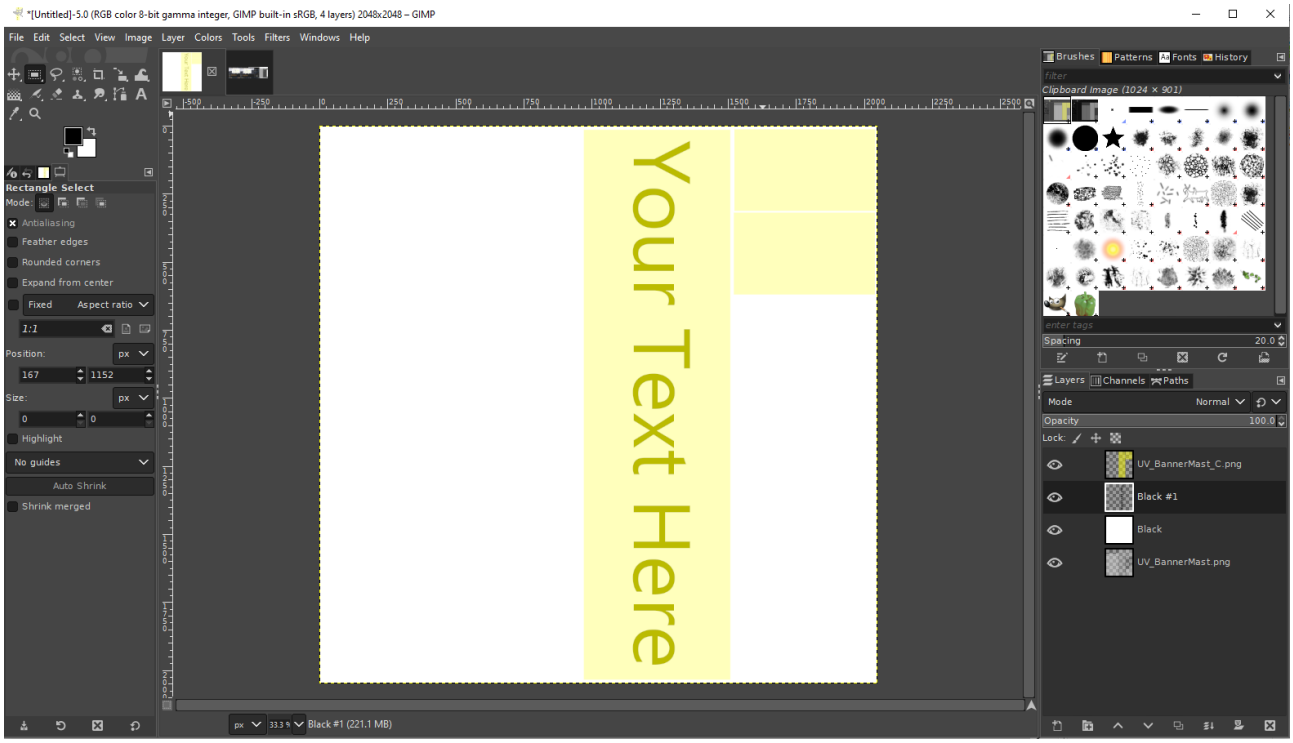


Inside the folder you will find two template images for each banner and flag. The first image shows a normal UV map of the banner or flag. The second shows, highlighted in yellow, the cloth area of the UV map. When you create your Cloth Image Texture for a flag, the content you want to show on your flag needs to match the yellow area in the template.

Find the template with the same name as the flag you looked at earlier and open it in your image manipulation software of choice. For this example we'll use Gimp, but any will do.

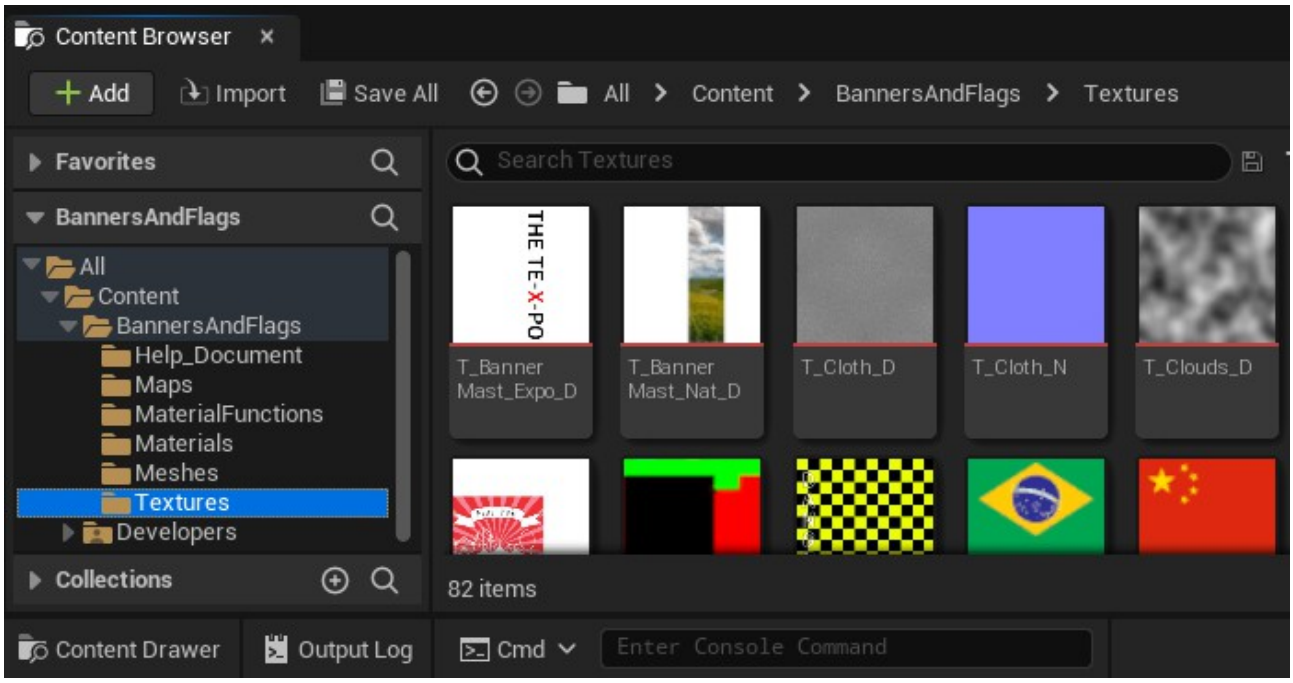


Add your text and images so that they match the yellow area.

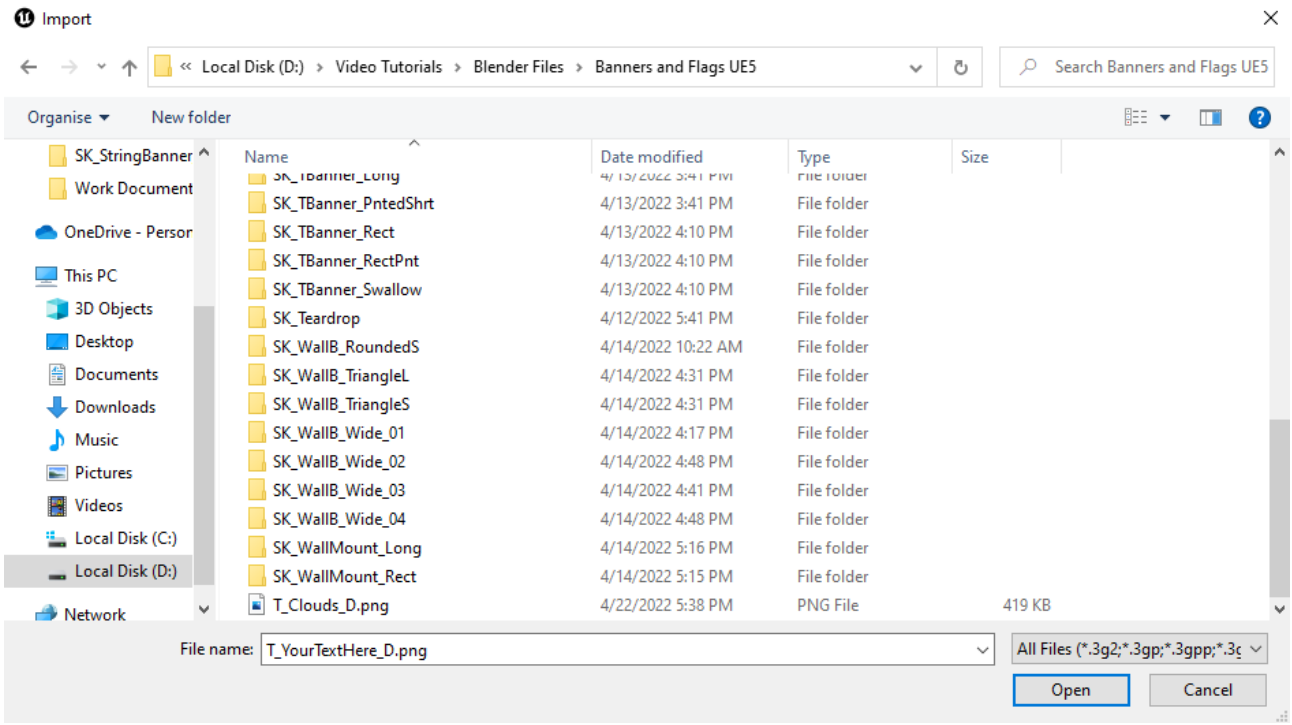


Once you are happy, hide the template layers, save and export your new Cloth Image Texture.

Go back to your Unreal Engine project and navigate to the BannersAndFlags/Textures folder.

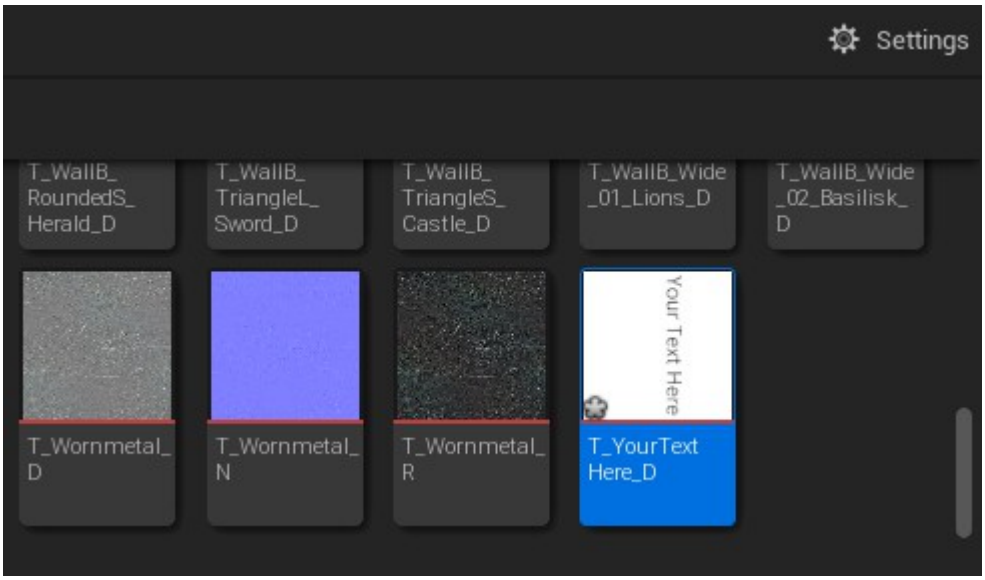


Click on import at the top of the Content Browser and navigate to the folder where you saved your new texture.

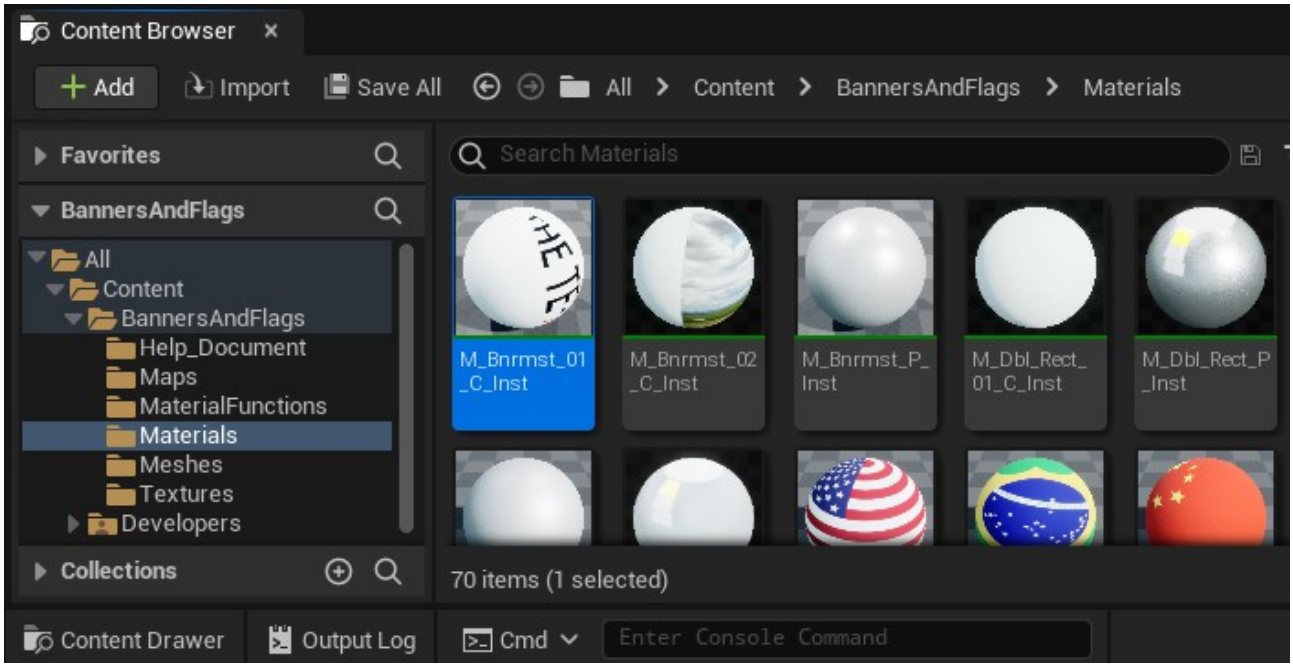


Select the texture and click on Open.

Your texture should appear in your Textures folder.

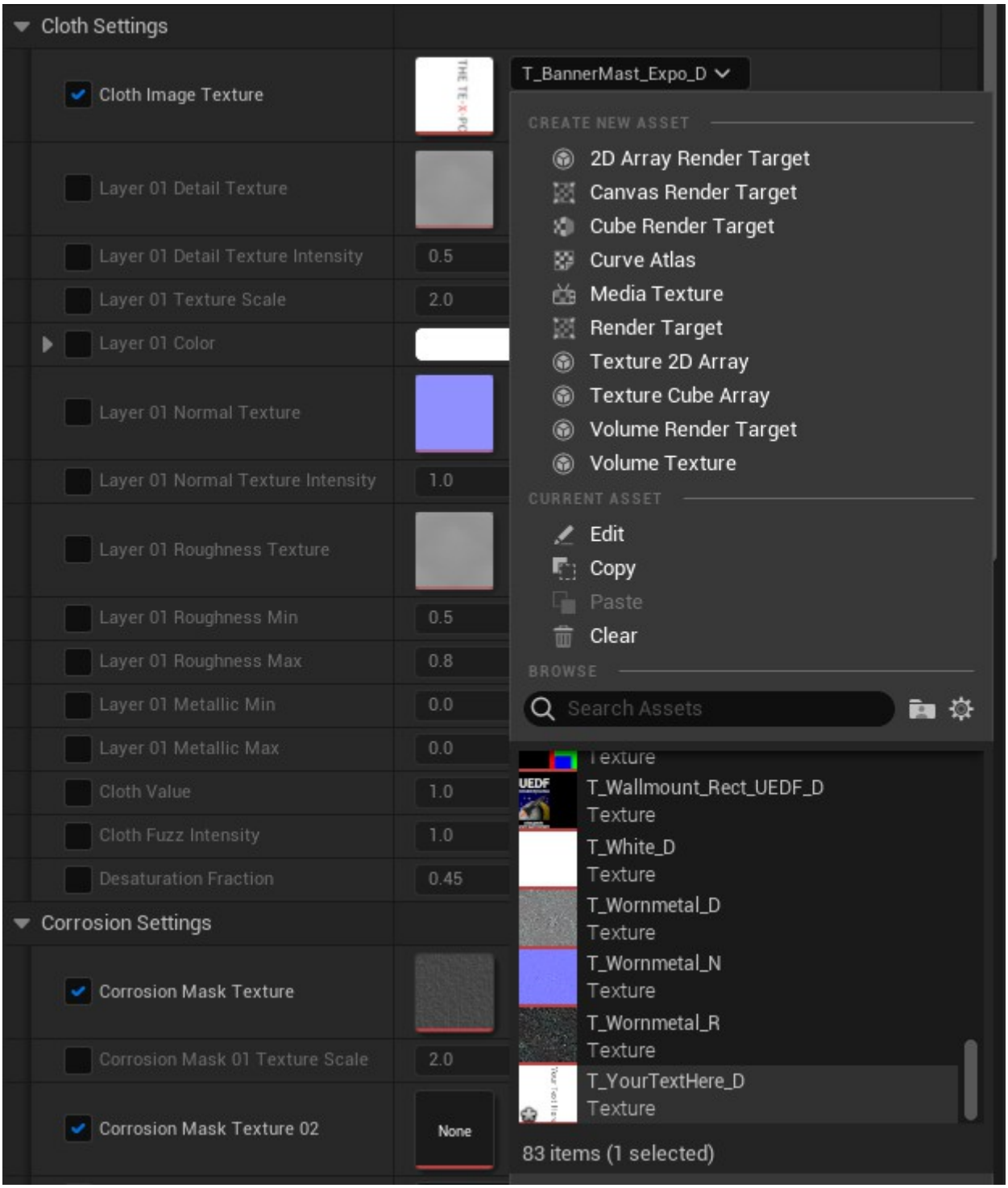


Navigate to the Materials folder and look for a material you want to use your new texture in.



Create a new instance or open an existing one, as explained earlier in the document.

Expand the Cloth Image Texture dropdown, look for your new texture and select it.

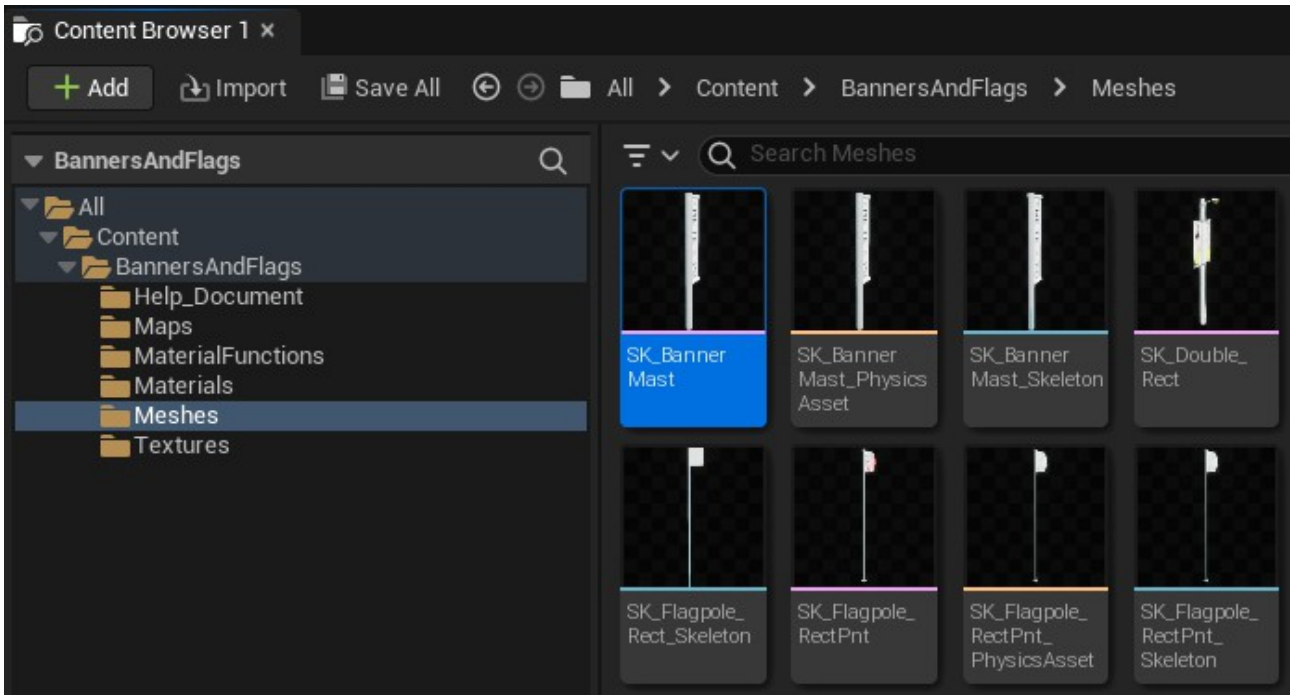


You should see the new texture in the preview window.

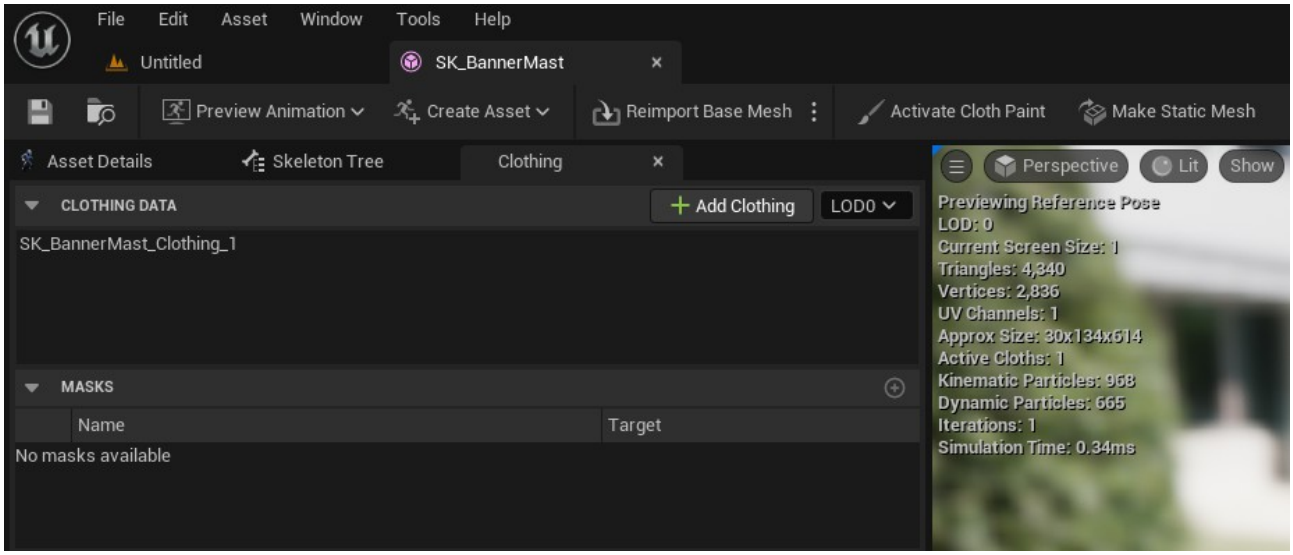
Click on save and open the banner or flag to see how it looks.

Performance Optimization

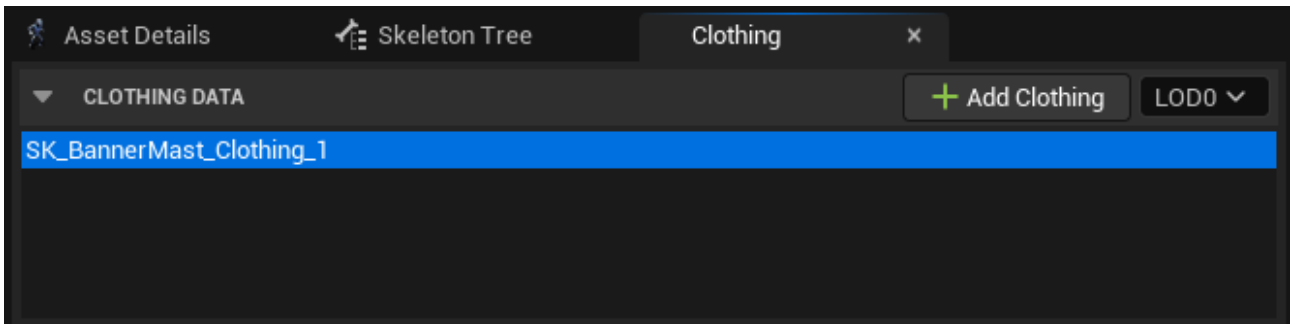
By default we tried to strike a balance between performance and high quality simulation. This means that there is some room to reduce CPU cost, but it could lead to odd or unrealistic behavior in the cloth simulation. We'll go over a few settings you can adjust to improve performance if the flags are proving too taxing.



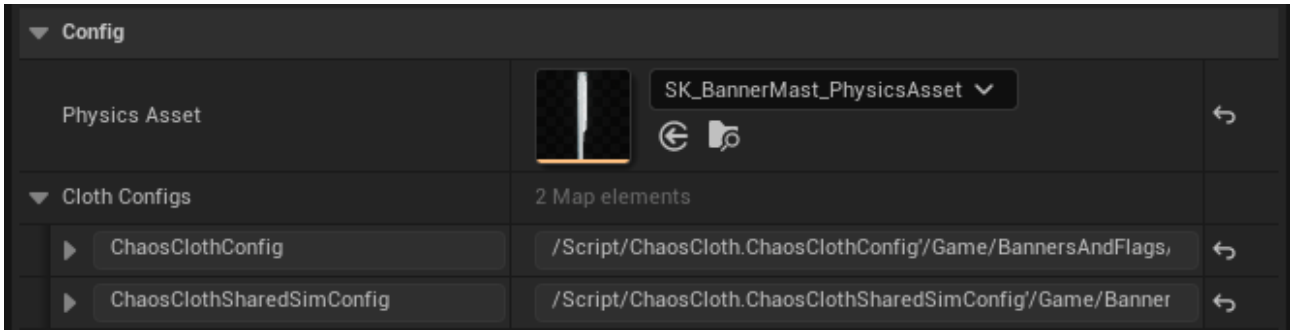
Navigate to the Meshes folder and open the flag you want to edit.



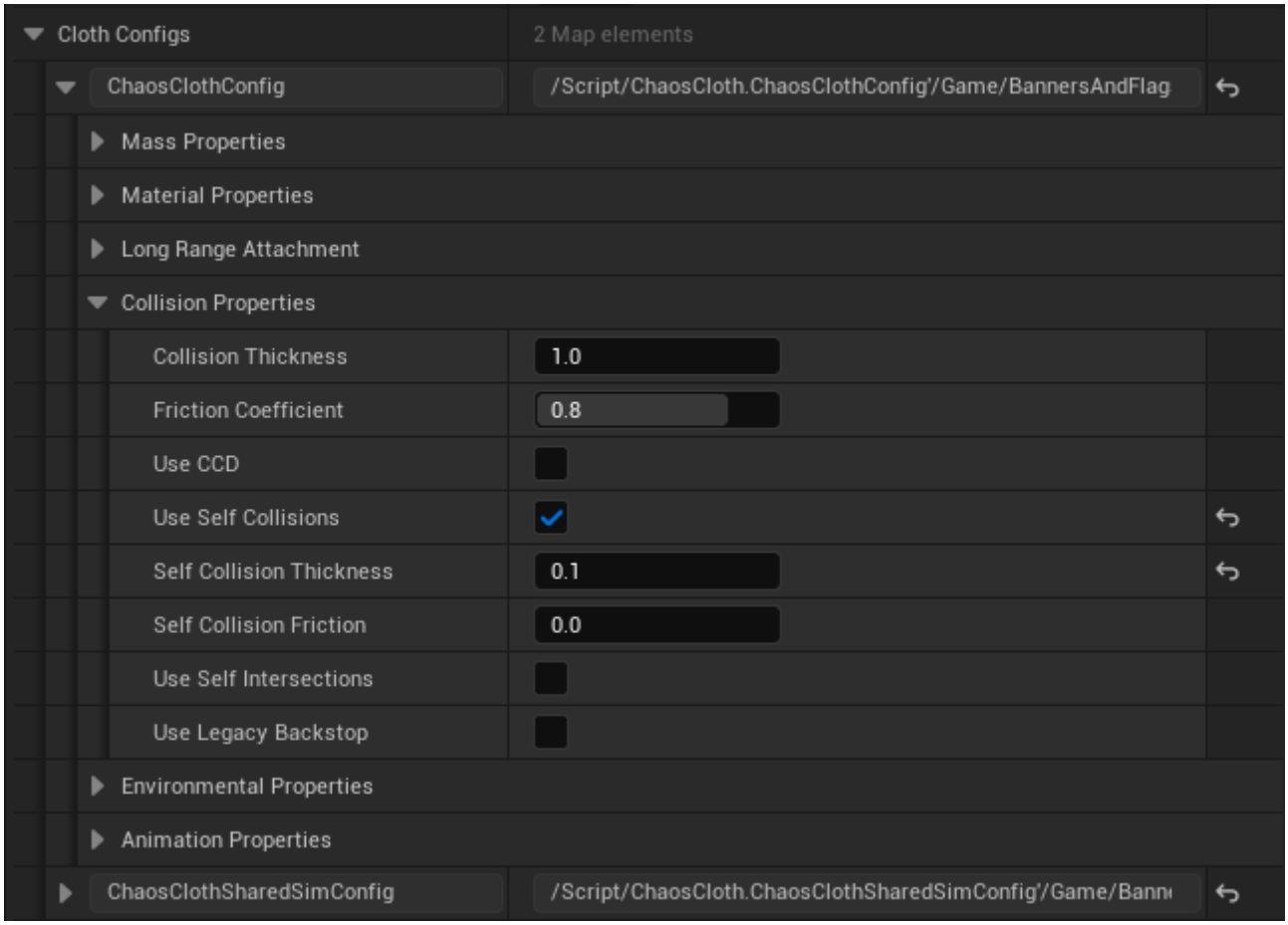
Open the Clothing tab.



Select the banner or flag data in the Clothing Data section. This will populate the Config section with the clothing data settings.



Expand the ChaosClothConfig section and then the Collision Properties sub-section.



Use CCD: Disabling this setting may improve performance a bit, but could lead to the cloth clipping through items.

Use Self Collisions: We found that disabling self collisions improved performance quite a bit. If there is no chance that the cloth will interact with itself, it can always be turned off. Alternatively you can leave it enabled, but reduce the next setting.
Self Collision Thickness: Lowering the Self Collision Thickness value will also improve performance because fewer collisions will occur. Setting the thickness too high (starting at about 0.5, depending on the mesh density) will not only cause slower performance, but will also make the cloth behave very erratically as it continuously collides with itself.
Use Self Intersections: Disabling Use Self Intersections also improves performance quite a bit.

Next, expand the ChaosClothSharedSimConfig section and then the Simulation sub-section.

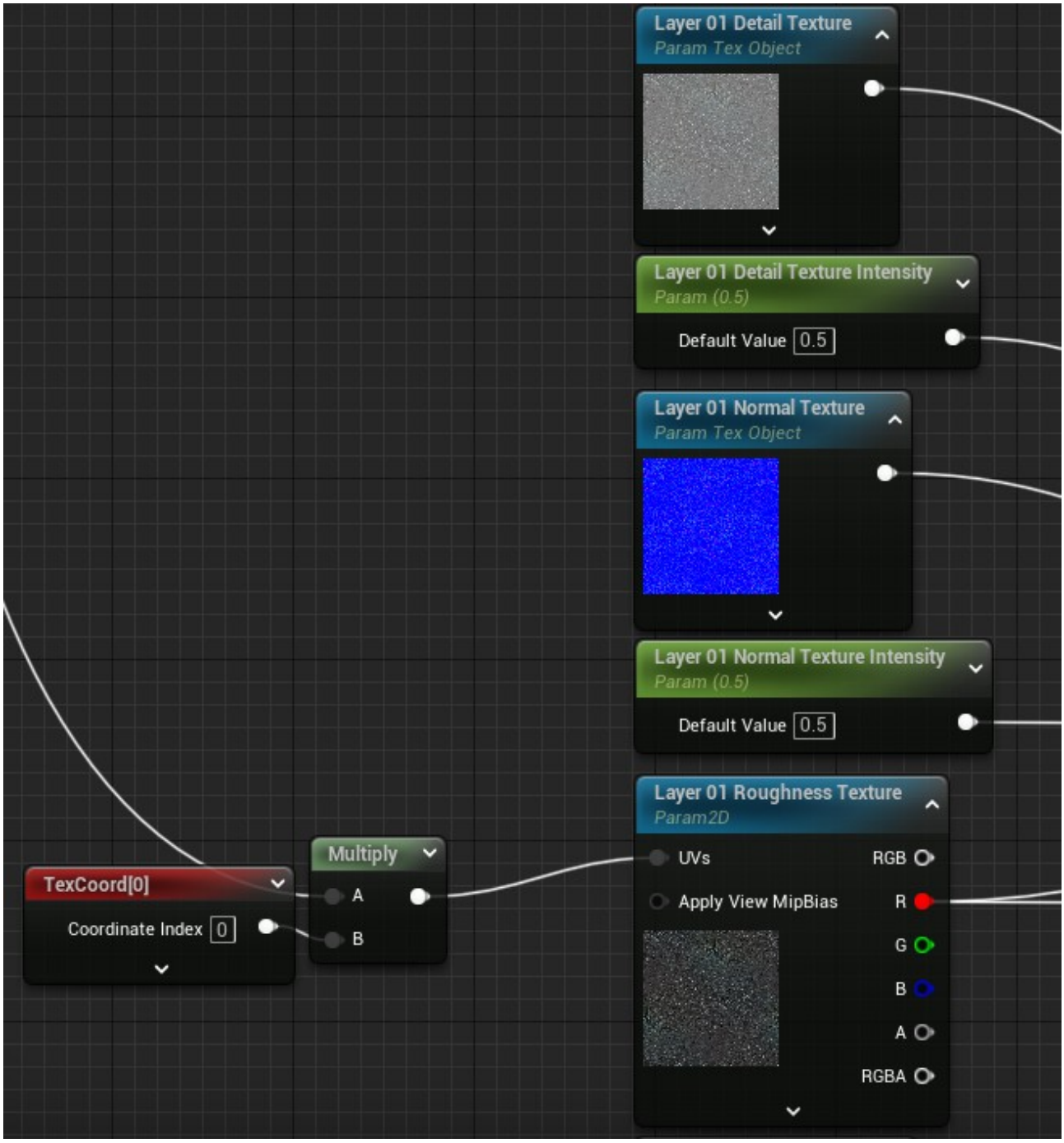
Lowering the values of **Iteration Count**, **Max Iteration Count** and **Subdivision Count** may also improve performance, but at the cost of cloth stability. For some banners, like the Long, Medium and Regular String banners you may see the cloth drooping when these values are set too low.

There is no single correct combination of settings that will both look good and behave realistically, so experiment until you find a combination that works with the particular mesh in your scene.

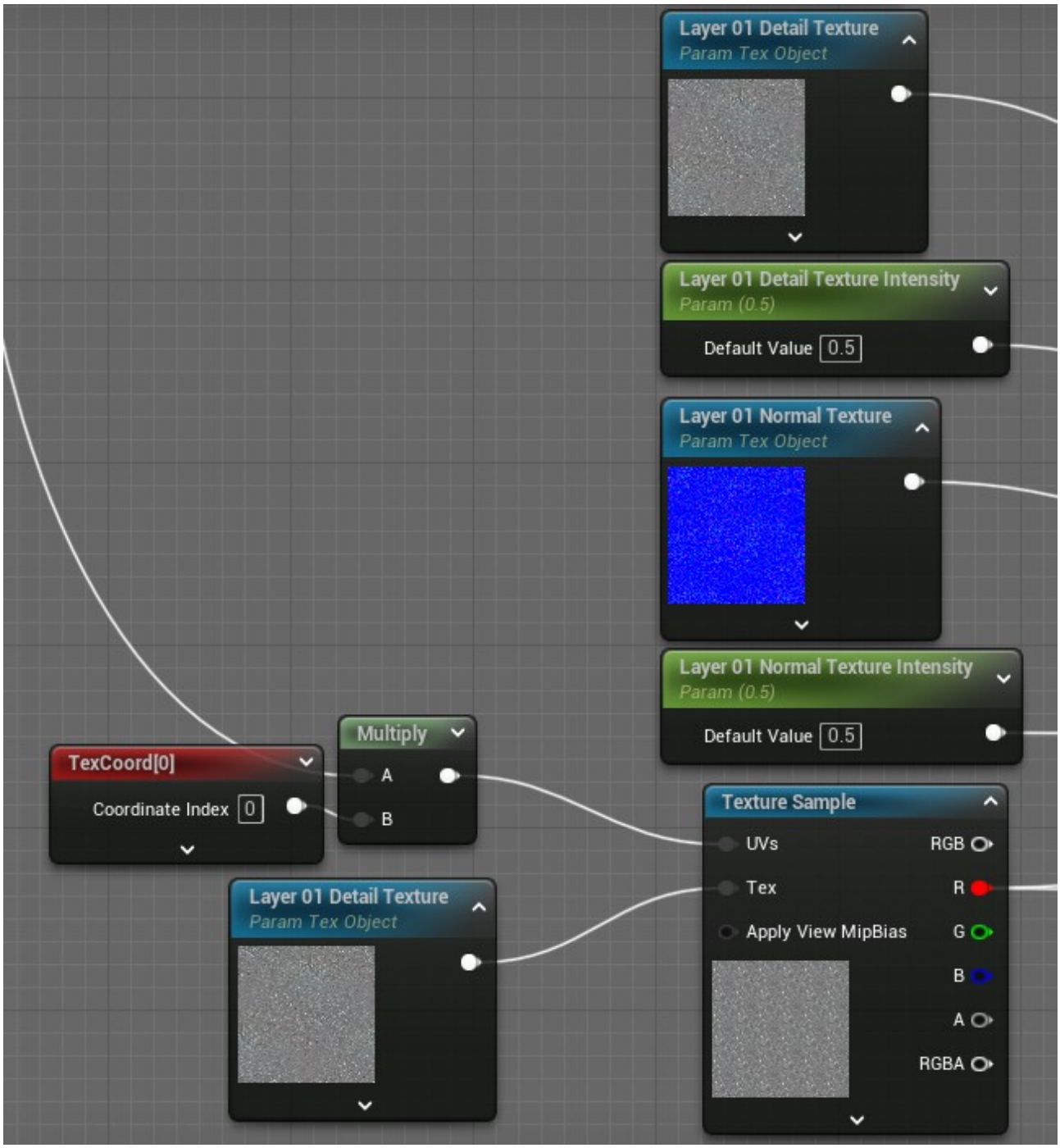
Changes in Unreal Engine 5.2

Because of changes Unreal Engine 5.2 made to Materials, we had to make a few changes to the M_Flag_Pole_Triple material and its instances. We had to reduce the number of Texture Samplers used in the material, because after the update we exceeded the maximum Texture Sample Count allowed in a Material.

Below we can see what the nodes used to look like:



Below we can see the new configuration:



In short, we're using the Layer Detail Texture Sample for the Base Roughness and Base Metallic as well. The texture was the same in the past, so it doesn't change the look of the default materials. The main difference is that the texture for Base Roughness and Metallic can't be unique anymore, but since we used the same texture anyway, it shouldn't affect anyone using the default material and instances.

Conclusion

We have tried to cover the most obvious questions you may have when using these banners and flags, but we're sure we missed some. If you have any questions or problems, please feel free to email us at support@tijgergames.com and we'll do our best to help you.