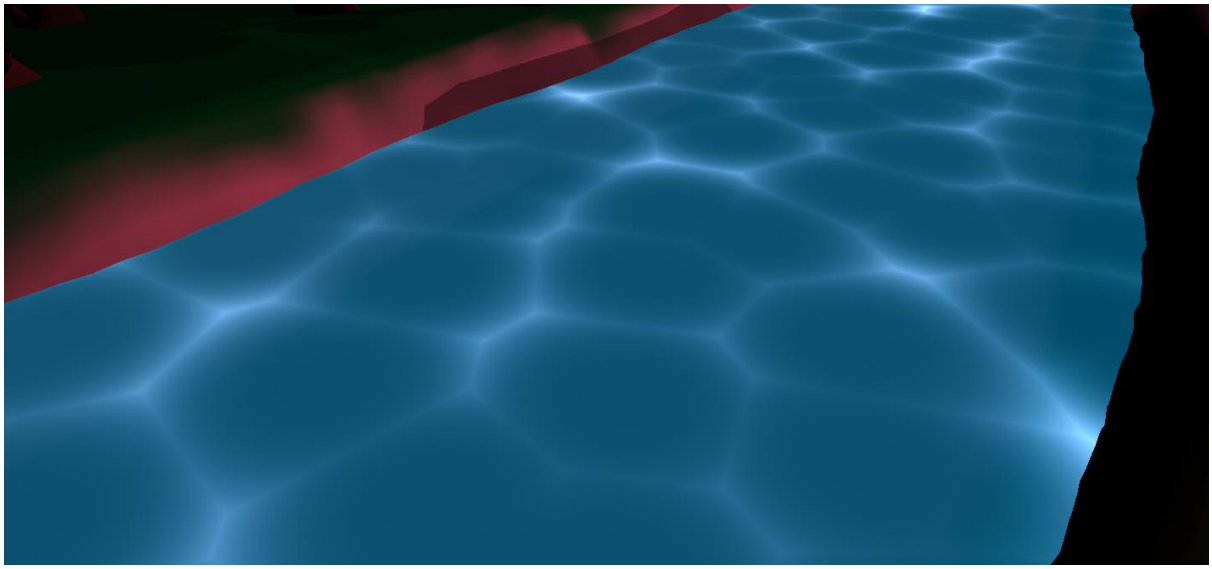
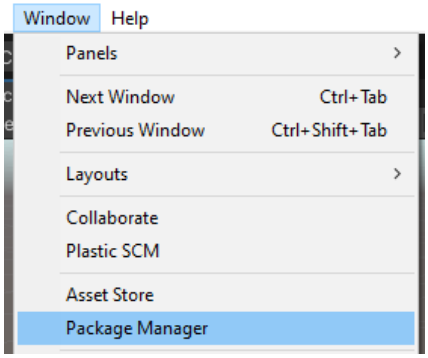
Cartoon Water Shader

By Nathan Stalley

In this tutorial, we will be making a water shader that can be used as water in your Unity project. This water shader is highly customisable and the settings can be played around with to fit your needs.

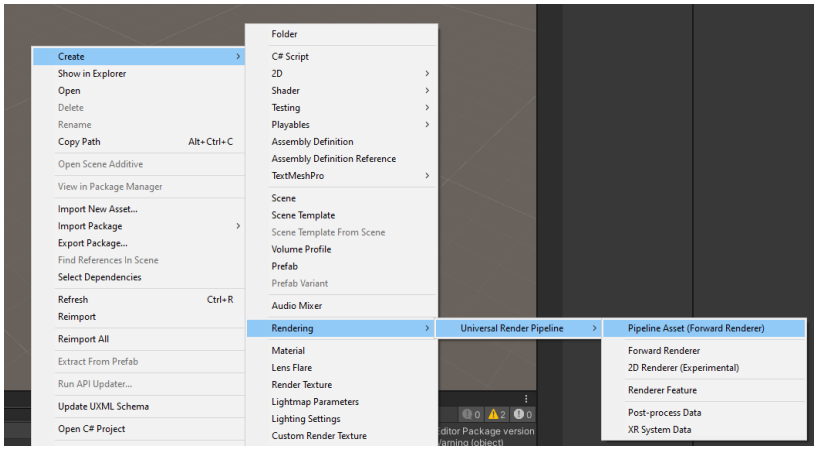


To start off with, we need to upgrade our project to Universal Render Pipeline (URP). To do this, go to Window then Package Manager. This will open the Package Manager window, use the search bar to search for Universal RP, then install and import the package.

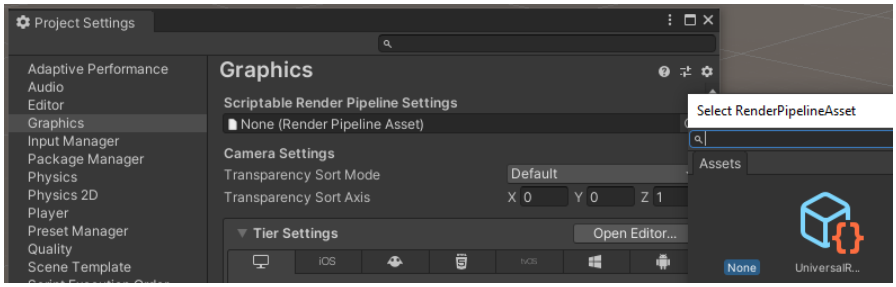


After URP has installed, there are a couple more steps that we need to take before we can start making the water shader.

First you need to right click in your assets folder, go to Create, Rendering, Universal Render Pipeline and then Pipeline Asset (Forward Rendering). This will create a couple of objects in your asset folder, which we need to put into the graphics settings.

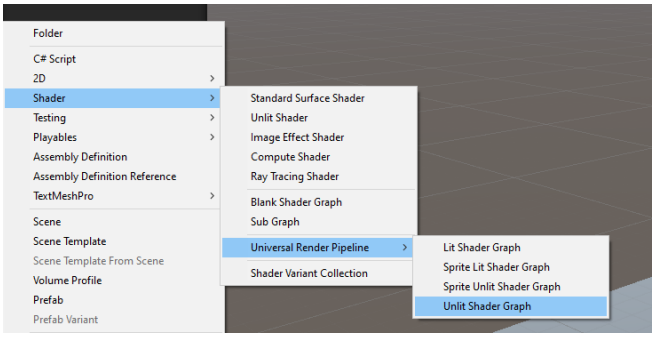


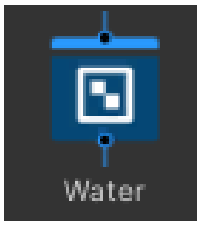
To do this final step, go to Edit, Project Settings, Graphics (here we will select the object that we just created) and then we also need to go to Quality and do the same thing here. Once these steps are completed, you have successfully upgraded your project to URP and can start on making the water shader.



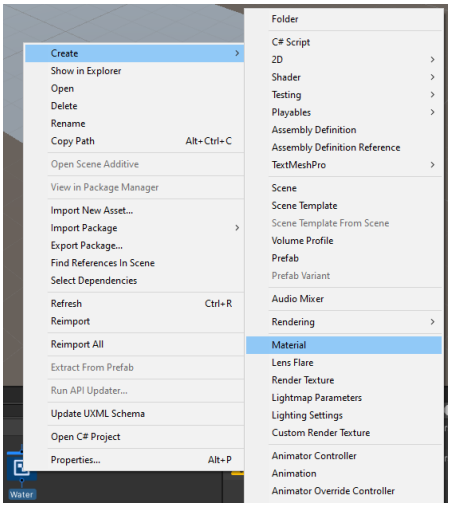
The first step of making the water shader is to create a plane, to do this, right click in the hierarchy, select 3D Object, and then Plane, you can re-size this to fit your needs, but I will just leave it at its default size for the moment.

Next, we need to add in the Shader Graph so that we can get to creating the shader. To do this, click on the 'plus' sign in your project folder, scroll up to Shader, then Universal Render Pipeline and then select Unlit Shader Graph. This will create an object that you can name in your assets folder and should look like this, I named mine Water to keep things simple.



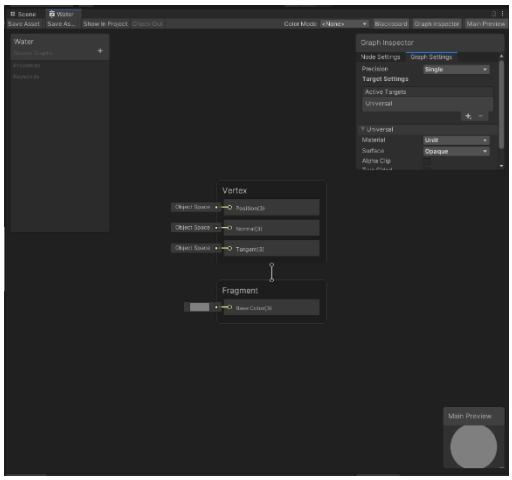


We then need to create a material based on this shader, so right click on the new object you just created, go up to Create and then select Material. Name this material as you please, once again, I just named mine water to keep things simple.

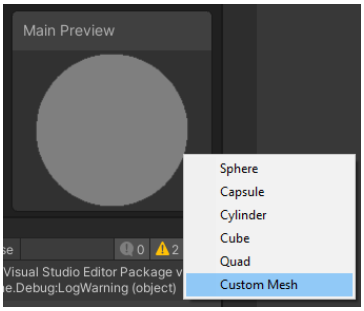


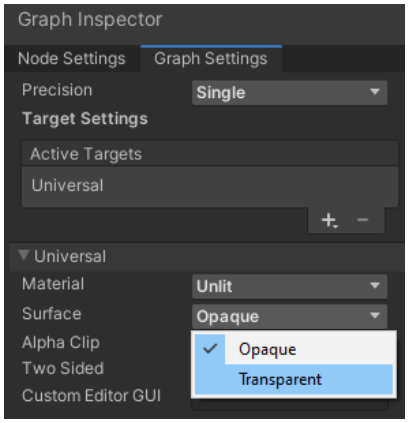
After this, select the material and drag it onto the plane in the scene view, nothing will majorly change, but this is fine as we have not started making the shader yet.

Now we can start creating the shader, so double click on the shader icon (the blue square) and you should get a new window open that looks like this.



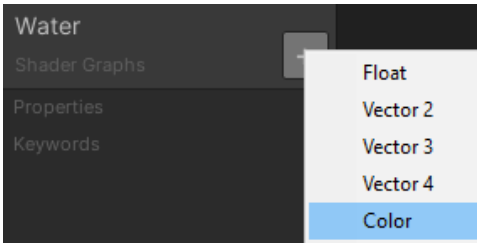
The first thing we will do is change the preview from a sphere to our plane. To do this, right click on the sphere and select Custom Mesh. From here, search for your Plane object and select that, once selected, you can use the mouse buttons to move and rotate the plane so you can see it.



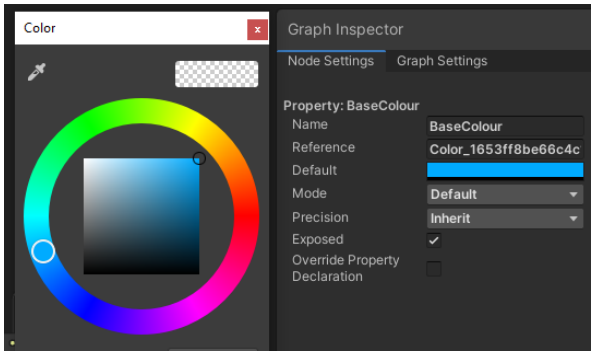


The next step we will take is to set the surface type from Opaque to Transparent, this will help to give the water a better look to it.

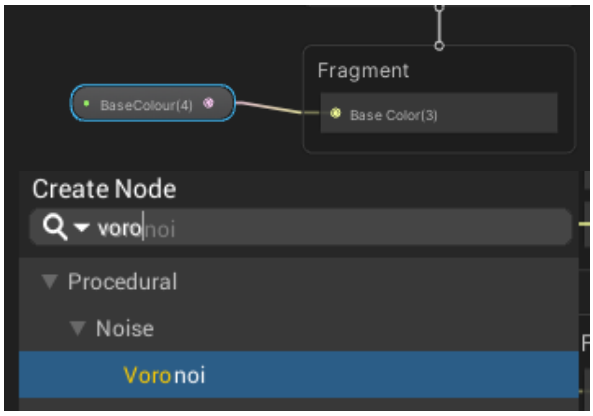
We do this by going to the Graph Inspector and then under Graph Settings scroll down to the Universal section, click on the drop-down box next to Surface and then we select Transparent.



Next, we are going to add a base colour to the shader. To do this, click on the little 'plus' sign over on the Shader Graphs window and then select Color.



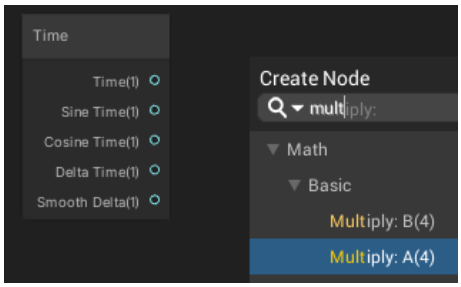
From here, you can go back to the Graph Inspector and you can change the colour to something more suitable. I have gone with a blue colour, as we are creating water, but you could also do a red/orange colour if you wanted to use this to make lava instead of water.



The next step is to get the colour into the shader, to do this, we simply click and drag the base colour from the Shader Graphs on the left-hand side of the screen and onto the empty space in the middle. From here, we can connect the colour to the shader by clicking and dragging the circle icons together.

The next step we will do is to add some ripples to the shader to give it a better-looking effect. To do this, make sure you are on the empty space in the shader window and press the 'Space bar' here we will search for 'Voronoi' and then press Enter when you have it selected.

Next, we will distort the Voronoi modifier to make the cells look more like ripples, to do this, create a Time node (by pressing space and typing in time) and then drag from the circle next to Time(1) into the empty space and then type Multiply and add it as a node.



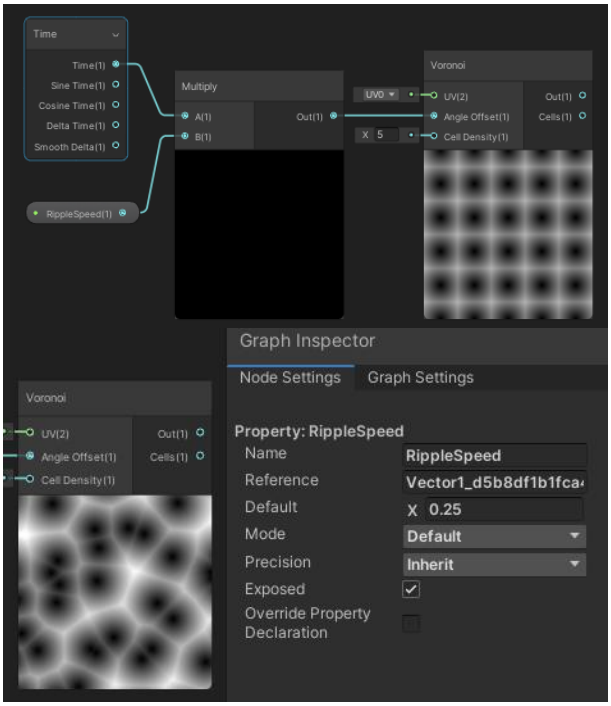
We then need a node to control the speed of the ripples that we have just created. To do this, we will create a Float.

To do this, we will click on the 'plus' and select Float, we will name this one 'RippleSpeed'.

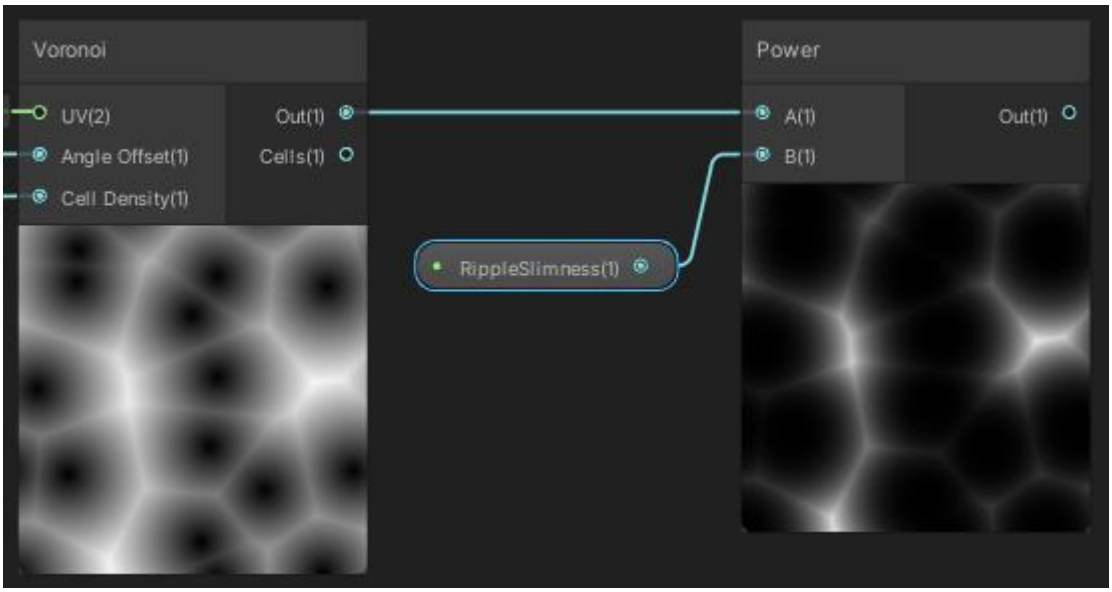
Once we have our RippleSpeed, we can drag the Float object into the empty space and connect it to the B part of the Multiply node. Once those are connected, we can connect the Out part of the Multiply node to the Angle Offset of the Voronoi node.

From here, we can change the speed of the ripples inside of the Graph Inspector by changing the x value. As you can see, the ripples have started to displace already.

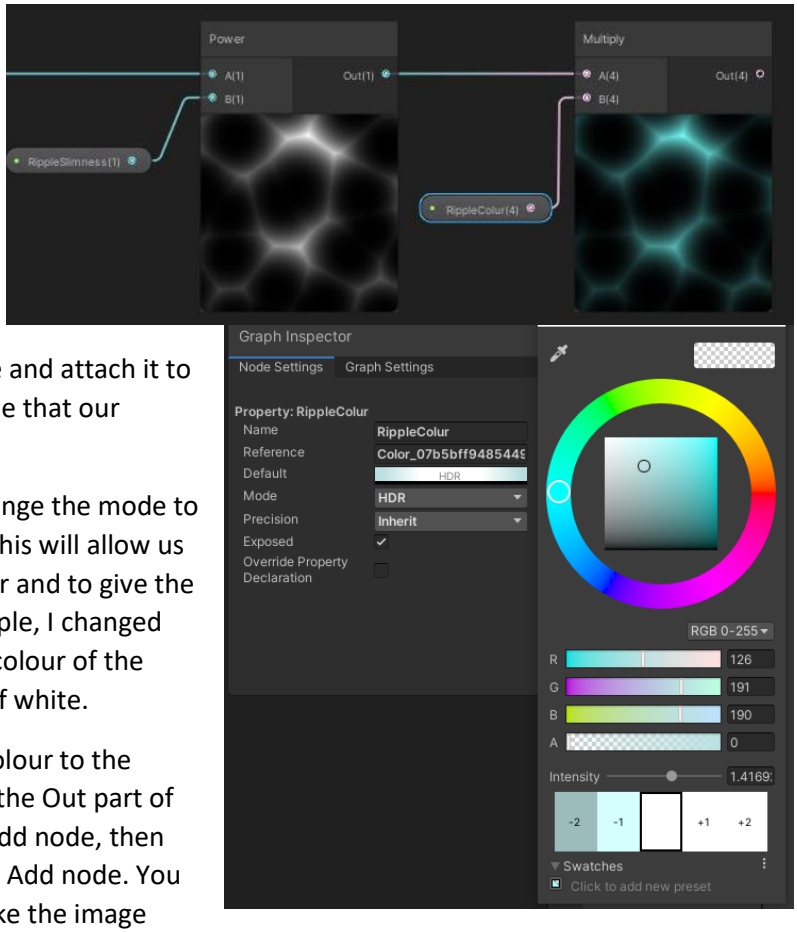
You can also can the value of the Cell Density on the Voronoi node to add more or less ripples within a certain area. We will make a new Float and call it RippleDensity and attach this to the Cell Density on the Voronoi node. This will allow us to change this value from within the Graph Inspector and help to tidy up the Shader Graph.



Next, we will add some thickness to the ripples. To do this, we will attach a Power node to the Out section of the Voronoi node, we will also create a new Float and call this one RippleSlimness, we will attach this to the Power node and we can change the x value to change the thickness of the ripples.



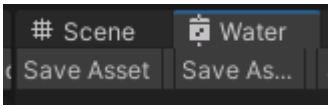
Next, we will add some colour to the ripples. To do this, we will drag out the Power node into a Multiply node, we then need to create a Color value, we will name this one RippleColour. Change the colour to what you desire within the Graph Inspector and then drag the RippleColour into the empty space and attach it to the Multiply node. You will now see that our shader is starting to take shape.

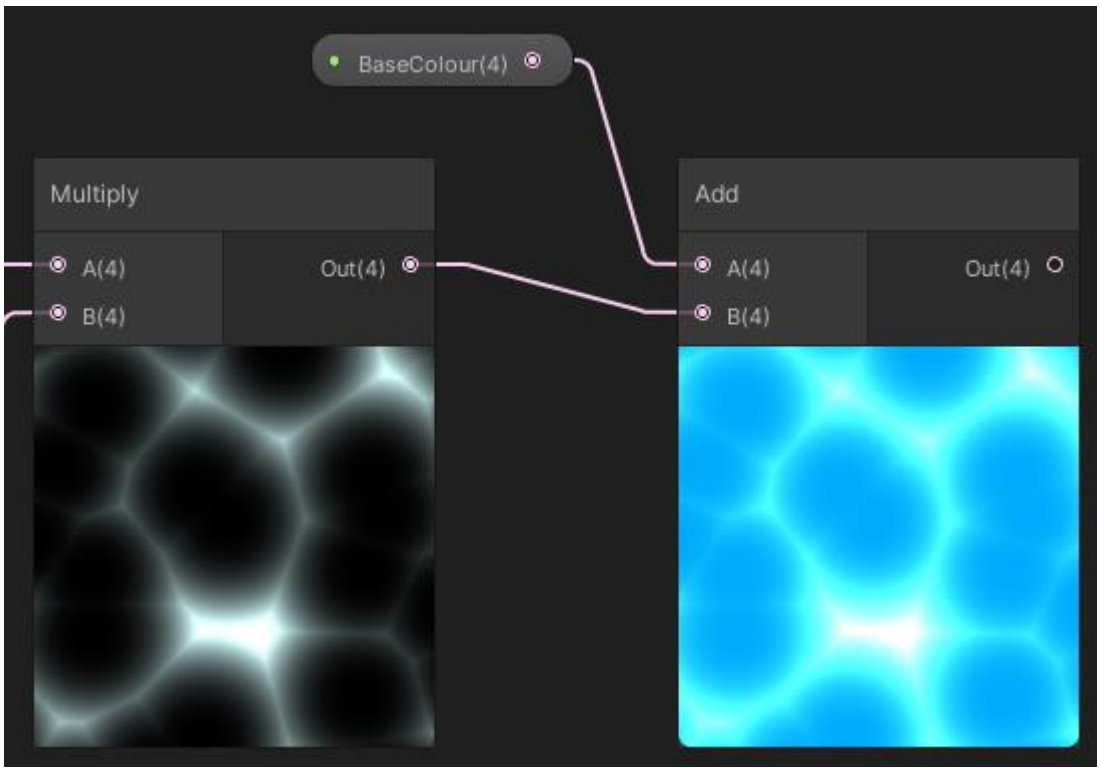


With the RippleColour, we will change the mode to HDR within the Graph Inspector. This will allow us to add some intensity to the colour and to give the ripples a shine effect. In this example, I changed the intensity by +1 and made the colour of the ripples a lighter blue, with a hint of white.

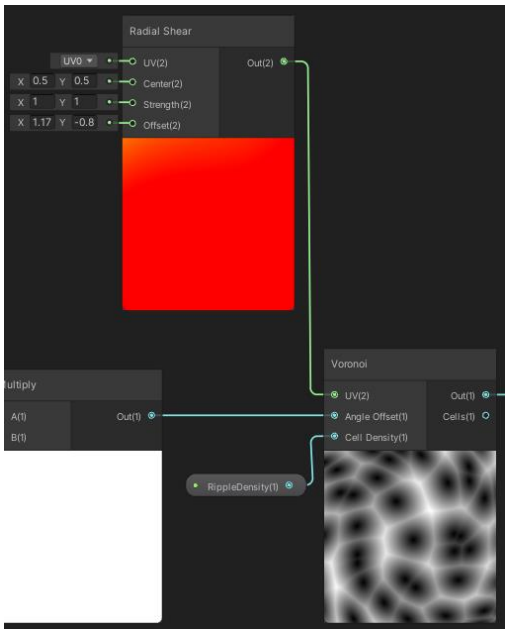
Next, we need to add the RippleColour to the BaseColour. To do this, drag from the Out part of the Multiply node and create an Add node, then drag the BaseColour node into the Add node. You should get something that looks like the image below and the water is starting to take shape.

At this point, we will save the shader by clicking on Save Asset at the top of the shader window, just to be on the safe side.





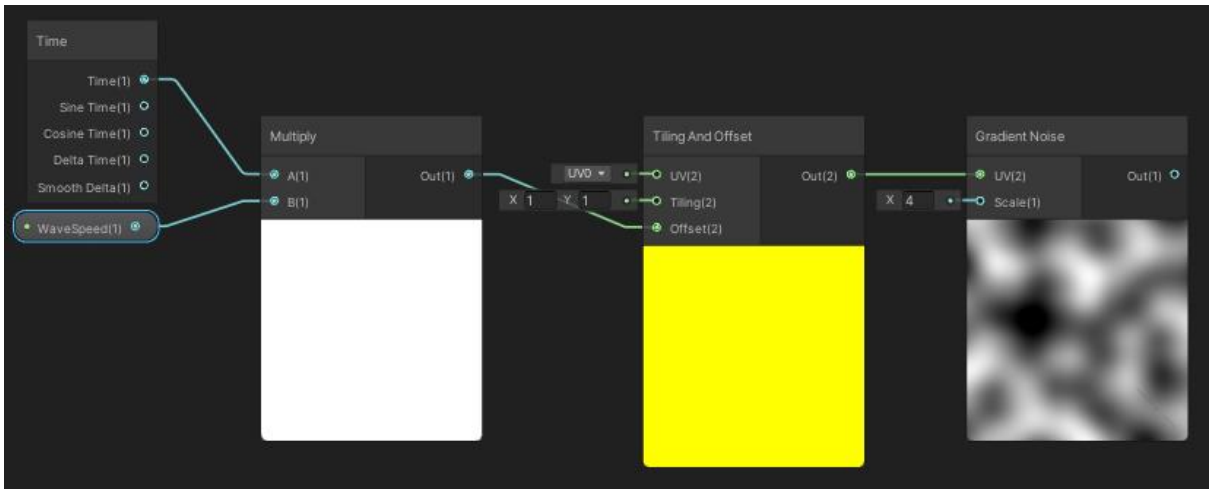
Next, we are going to add some randomness to the ripples, to do this, we are going to add a Radial Shear node and attach this to the Voronoi node.



In this example, I have set the Strength to a value of 1 on both the x and the y, but you can play around with these to get an effect that you desire.

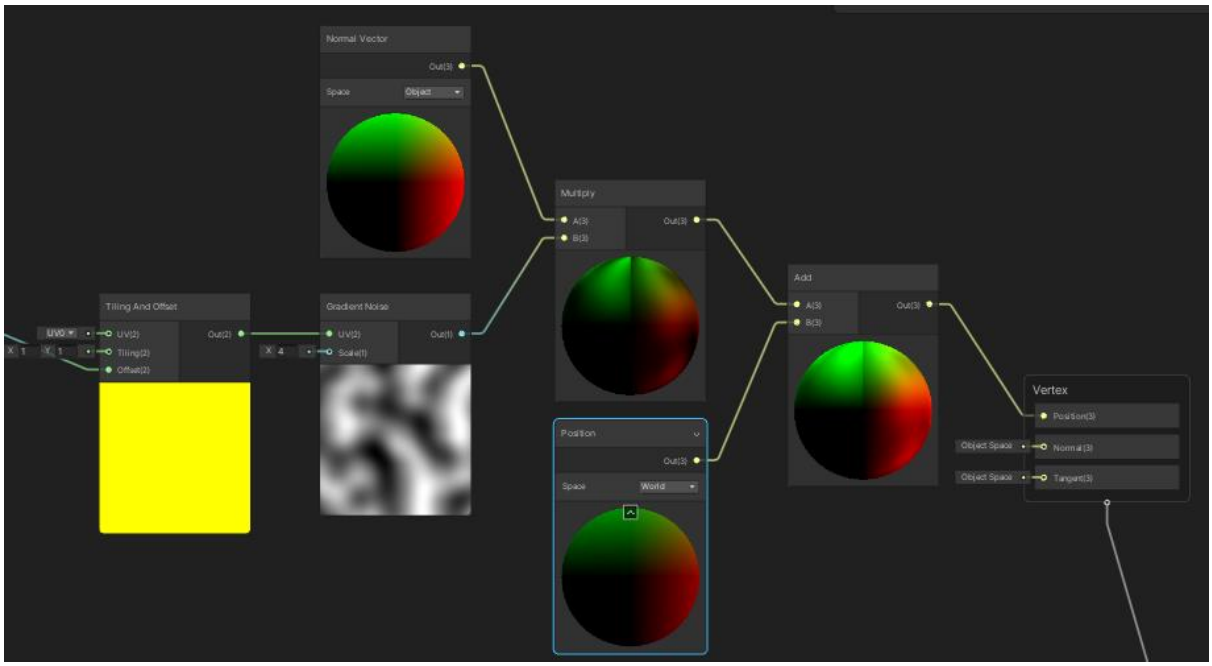
The next thing we are going to do is to add some waves to the water, so that the water is not just on a static plane.

First, start by creating a Float and calling this WaveSpeed, I set the x value to 0.1 in this example. Drag this Float along with a Time node into a Multiply node and then drag the Out of the Multiply node into the Offset of a Tiling and Offset node. Then create a Gradient Noise node and drag the out of the Tiling and Offset node into the UV of the Gradient Noise node.



The final step of this tutorial is to add some height to the waves, this is a simple step that requires just a few more nodes and then and then your cartoon water will be complete and ready to be used in your project.

To make the waves move up and down, we will add in a Normal Vector node and we will multiply this node with the Gradient Noise node that we just finished working on. Then we will add in a Position node and use the Add node to connect both the Multiply and Position nodes together, we then drag from the Out part of the Add node and drag that to the Position section of the main Vertex node. Make sure that the last Add node from the Colour of the water is connected to the Base Colour part of the main Fragment node.



Once you have completed these steps, your water is complete. Save your asset and return to your main scene, from here, you can play around with the xyz settings of your plane to get the size that you desire. In my example, I kept the x and z scale values at 1 and changed the y value to 0.5 and this is the result that I got.