

Instructions

2D Water Distortion Shader

Files Included

- SampleScene.unity
- reflection_surface.mat
- shader_water.shader
- sample_scene.png
- reflection_surface.renderTexture
- texture_wave_distortion.png

Purpose of Files

SampleScene.unity

This is a scene where I have set up an example use case for the shader.

reflection_surface.mat

This is the material that stores the shader and its configuration.

shader_water.shader

This is the actual shader file that does all the water distortion effects on the texture that is applied to the Quad.

sample_scene.png

Image used to demonstrate the effect. This image is rendered onto the surface of the Quad.

reflection_surface.renderTexture

This is the texture that the ReflectionCamera renders to. This texture is also used by the shader.

texture_wave_distortion.png

This texture is used by the shader to determine how to distort the Render Texture.

Shader Properties

Texture (Texture)

This property takes in the reflection_surface.renderTexture as the source texture to be modified. Regular tiling and offset is applied here.

Water Distortion Texture (Texture)

This is the texture that shader moves based on Wave Speed property and offsets each pixel of the source image to left or right based on the color in the texture. If you want distortion of a different pattern change this texture. Changing this texture is not recommended unless you have good understanding on how distortion based on RGB channels works. Tiling and offset properties of this texture have no effect.

Distortion Strength (float)

This property determines how strong the distortion is. The greater the number here the more the texture stretches horizontally.

Wave Speed (float)

This property determines how fast the Water Distortion Texture is moved vertically. In other words, this is how fast the wave effect seems to be moving vertically.

Wave Density (float)

This property determines how many times the Water Distortion Texture is tiled vertically. This affects the density of the waves that travel vertically.

General Tint (Color)

This is a color that is applied as an additive color to the texture outcome. Use this to dim the water or give it a different hue.

Distance Tint (Gradient, Color to Color)

Distance Tint Color Start – This is the color that appears at the top of the water.

Distance Tint Color End – This is the color that appears at the bottom of the water.

This works similar to the General Tint, but can have 2 colors forming a gradient. This is useful if you want to have a color tint at one edge of the water and fade away or turn into another color at the other edge of the water.

Enable Pixelation (float in form of a boolean)

Ticking this property pixelates the outcome making it have a more pixel art look to it.

Enable General Tint (float in form of a boolean)

This property determines if General Tint is used or not.

Enable Distance Tint (float in form of a boolean)

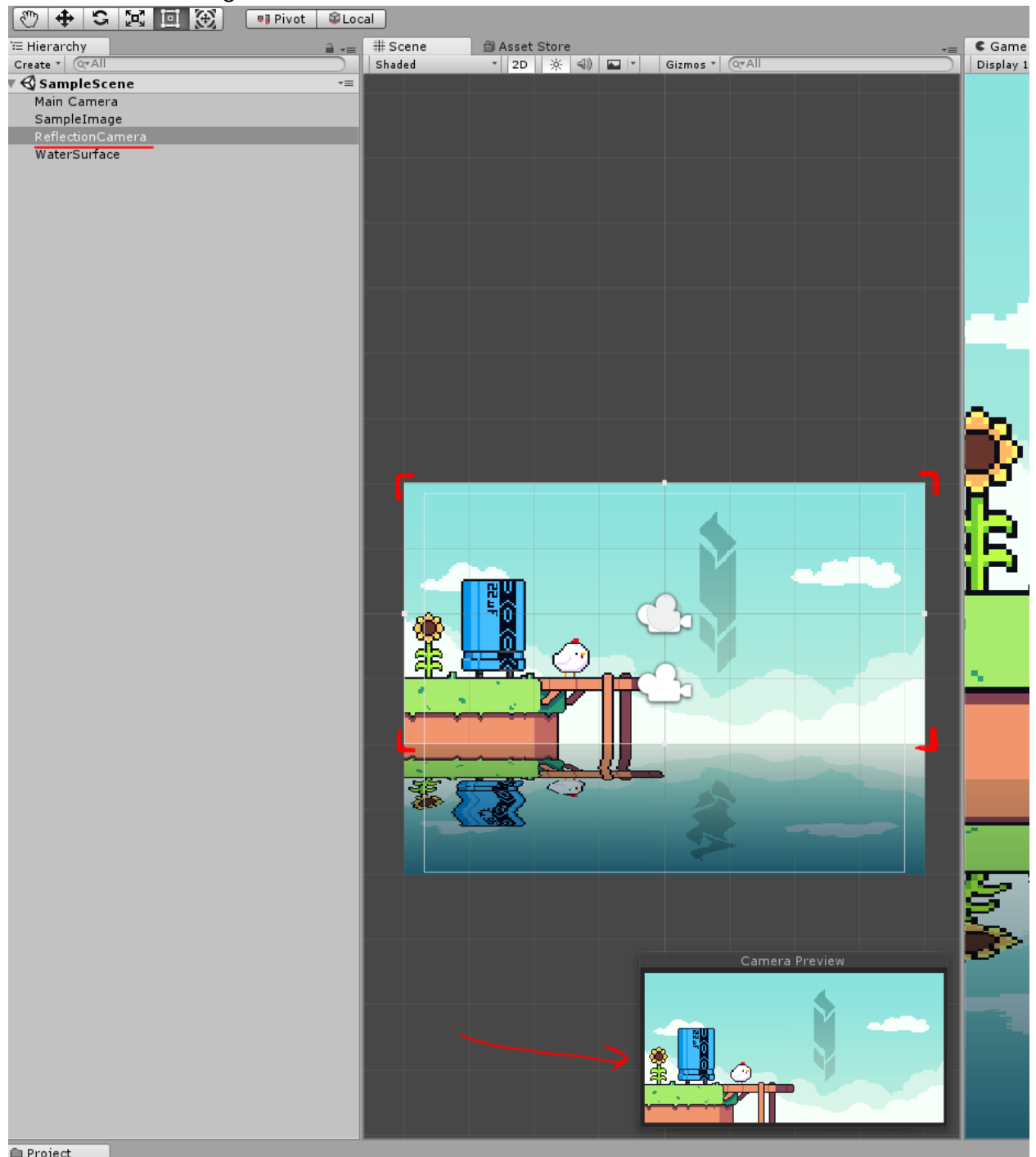
This property determines if Distance Tint is used.

Setup

In order for this shader to work correctly following steps need to be reproduced:

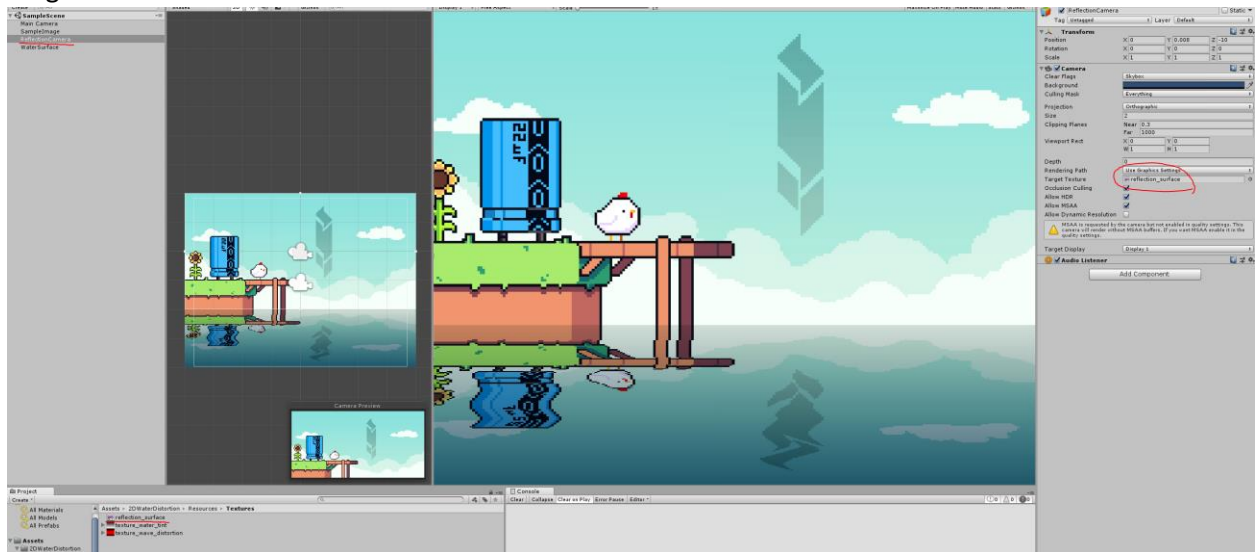
- 1) First we need to setup the scene. This can be your 2D platformer world or any other scene with a side view. Nothing under the reflection are will be rendered.
- 2) We need a separate camera that renders whatever it sees into a Render Texture. Lets call this a ReflectionCamera, since it will render everything that needs to be reflected. This camera needs to be setup so that it does not see the water itself. Best result is achieved by aligning the bottom of the camera view to the top of the water surface. ReflectionCamera bounds highlighted with

red corners in the image below.

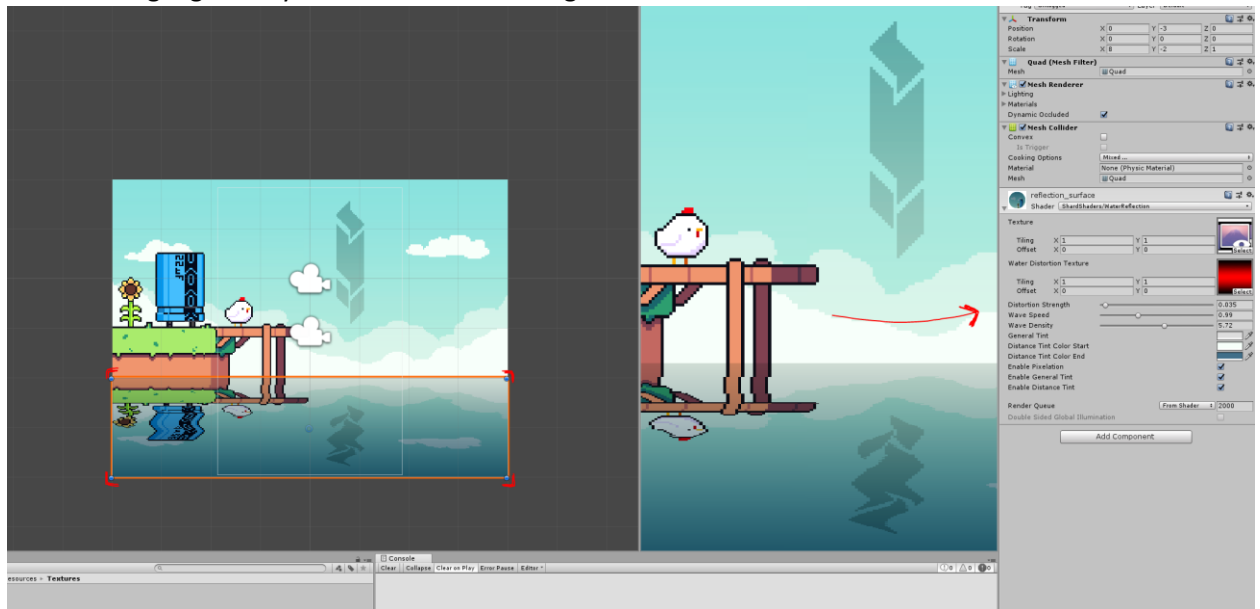


- 3) Render Texture needs to be created in Unity by right clicking in the Project view and selecting Create > Render Texture. This texture then needs to be assigned to the ReflectionCamera's

Target Texture field.



- 4) Next we need to create a surface to add the render texture onto. Quad works best for this case. Create a Quad by right clicking in the Hierarchy view and selecting 3D Object > Quad. Bounds of the Quad highlighted by red corners in the image below.



- 5) Once Quad is created we'll also need a material that will go onto that quad and use the shader.
- 6) Once we have both the Quad and the material to go onto it we need to drag and drop the material onto the Quad. See image above for how it should look.

- 7) From the materials properties we need to select the shader that will be found under ShardShaders/WaterReflection.

