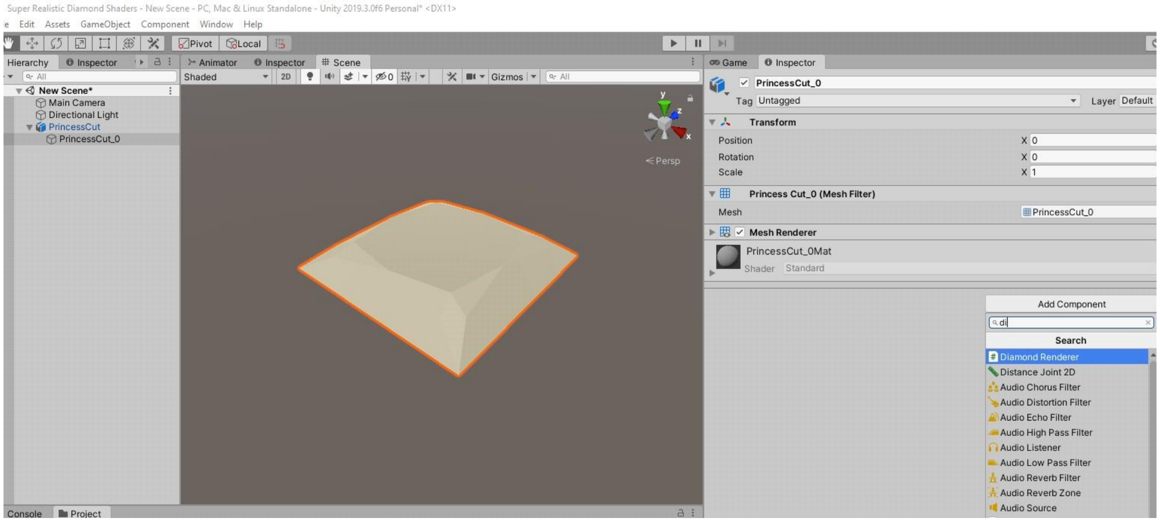
Place the model in the scene, add the Diamond Render script to the model, under the MeshRenderer component.

Do not forget to check the Read\Write box in the model settings, this is mandatory for the script to be able to read the model, also make sure that the normals of the model are correct, not smoothed. Also, your model must have the correct cut and the correct topology so that the refraction is correct.



Super Realistic Diamond Shaders - New Scene - PC, Mac & Linux Standalone - Unity 2019.3.0f6 Personal* <DX11>

New Scene*
- Main Camera
- Directional Light
- PrincessCut
  - PrincessCut_0

☑ PrincessCut_0
Tag Untagged Layer Default

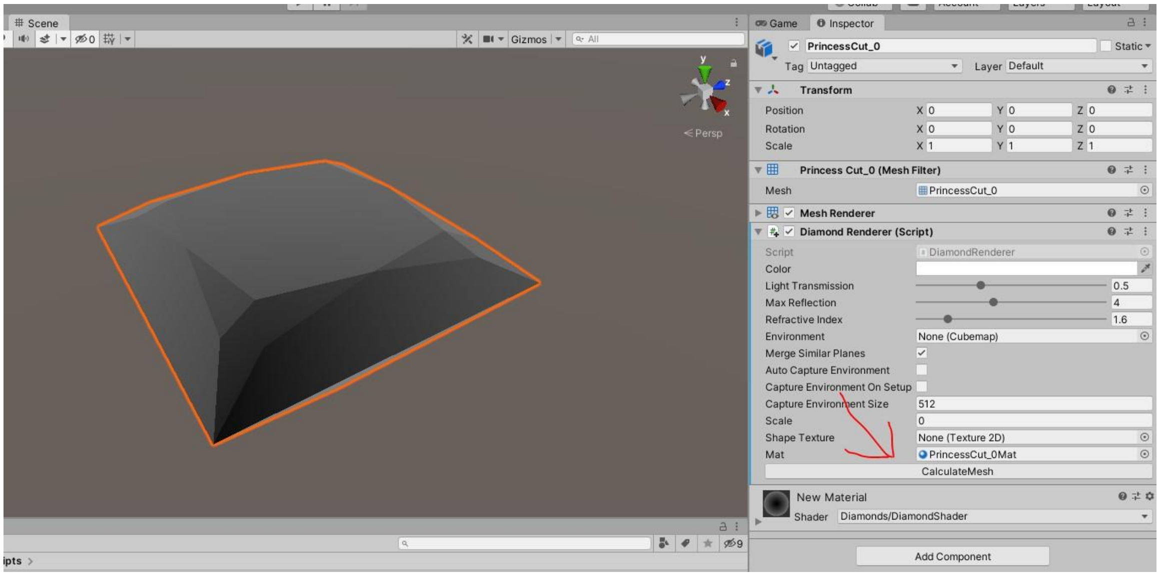
Transform
Position X 0
Rotation X 0
Scale X 1

Princess Cut_0 (Mesh Filter)
Mesh PrincessCut_0

☑ Mesh Renderer
PrincessCut_0Mat
Shader Standard

Add Component
di

Install the material with the DiamondShader shader



☑ PrincessCut_0 □ Static
Tag Untagged Layer Default

Transform
Position X 0 Y 0 Z 0
Rotation X 0 Y 0 Z 0
Scale X 1 Y 1 Z 1

Princess Cut_0 (Mesh Filter)
Mesh PrincessCut_0

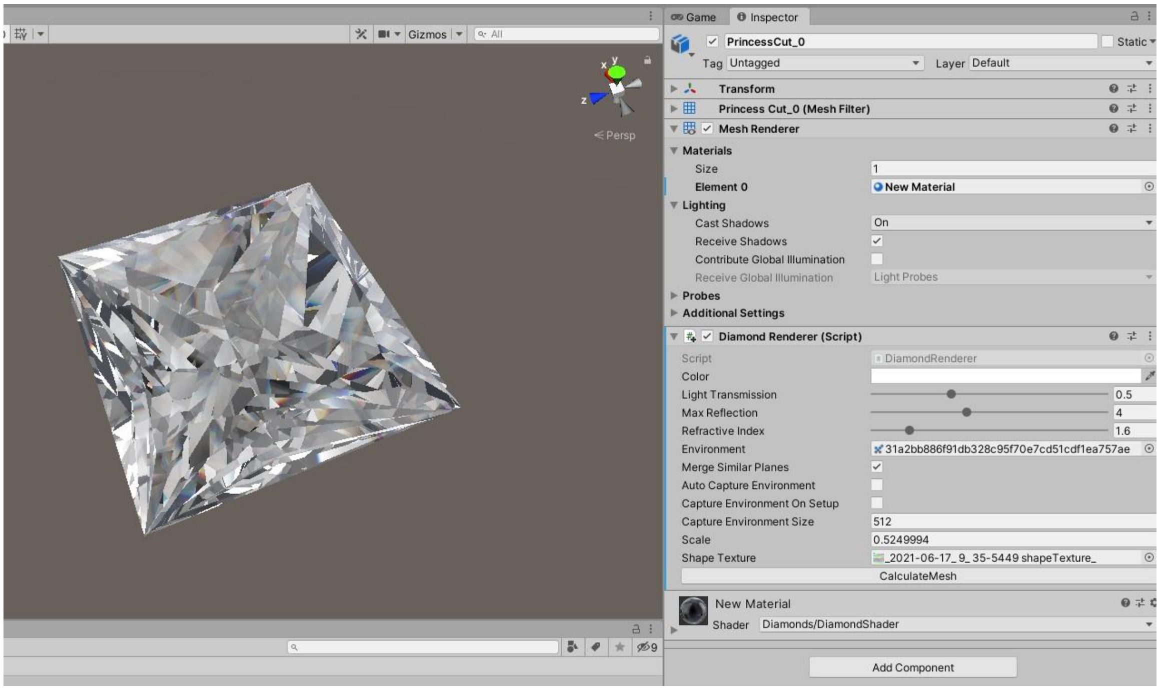
☑ Mesh Renderer

☑ Diamond Renderer (Script)
Script DiamondRenderer
Color
Light Transmission 0.5
Max Reflection 4
Refractive Index 1.6
Environment None (Cubemap)
Merge Similar Planes ☑
Auto Capture Environment □
Capture Environment On Setup □
Capture Environment Size 512
Scale 0
Shape Texture None (Texture 2D)
Mat PrincessCut_0Mat
CalculateMesh

New Material
Shader Diamonds/DiamondShader

Add Component

After that, click on the CalculateMesh button, the script will perform calculations and create data based on the model that the shader will process each frame, this approach will give good performance. If you change the model or change the geometry, press this button.



☑ PrincessCut_0 □ Static

Tag Untagged   Layer Default

Transform

Princess Cut_0 (Mesh Filter)

☑ Mesh Renderer

Materials

Size	1
Element 0	New Material

Lighting

Cast Shadows	On
Receive Shadows	☑
Contribute Global Illumination	□
Receive Global Illumination	Light Probes

Probes

Additional Settings

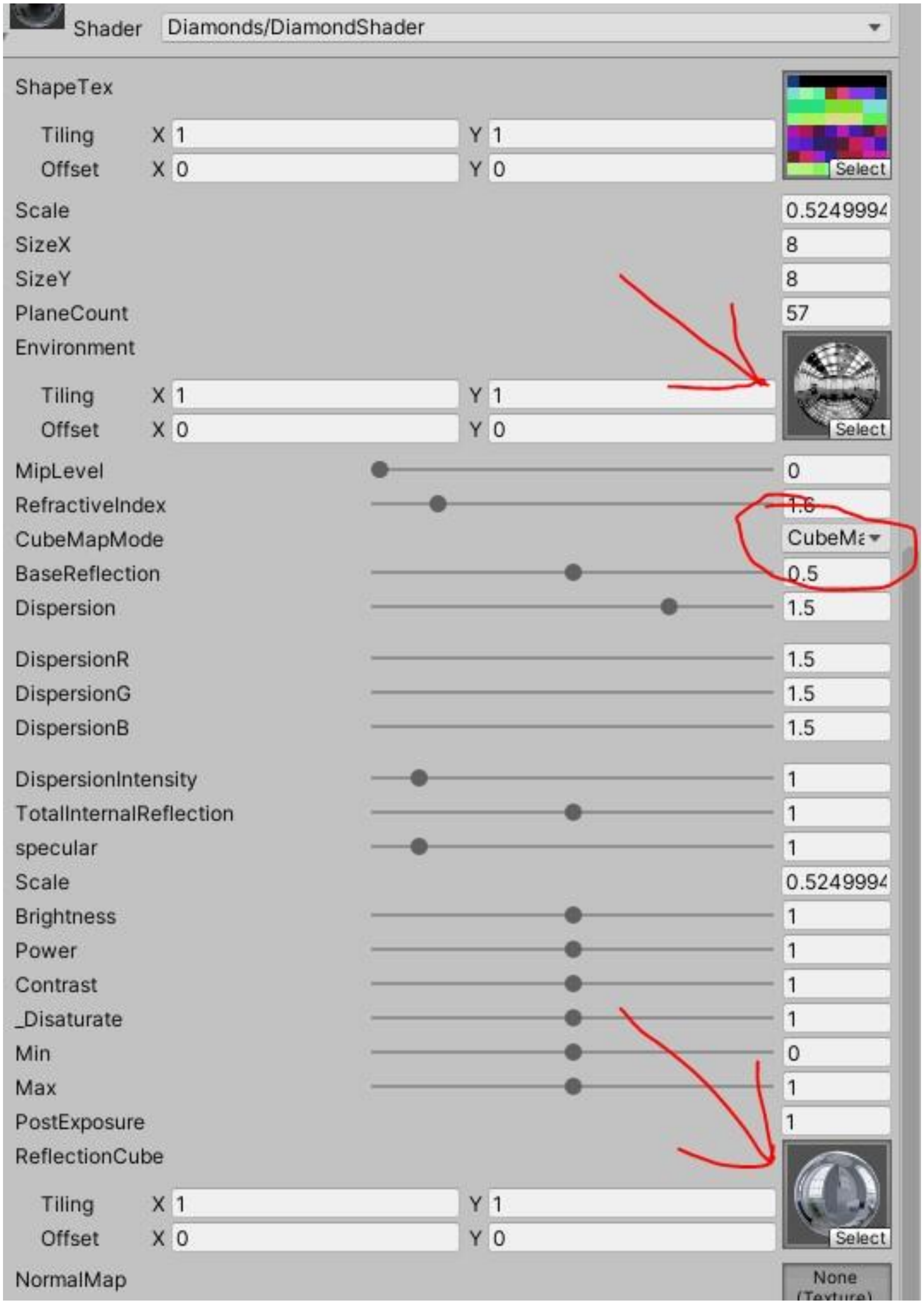
☑ Diamond Renderer (Script)

Script	DiamondRenderer
Color	
Light Transmission	0.5
Max Reflection	4
Refractive Index	1.6
Environment	31a2bb886f91db328c95f70e7cd51cdf1ea757ae
Merge Similar Planes	☑
Auto Capture Environment	□
Capture Environment On Setup	□
Capture Environment Size	512
Scale	0.5249994
Shape Texture	_2021-06-17_9_35-5449 shapeTexture_

New Material

Shader Diamonds/DiamondShader

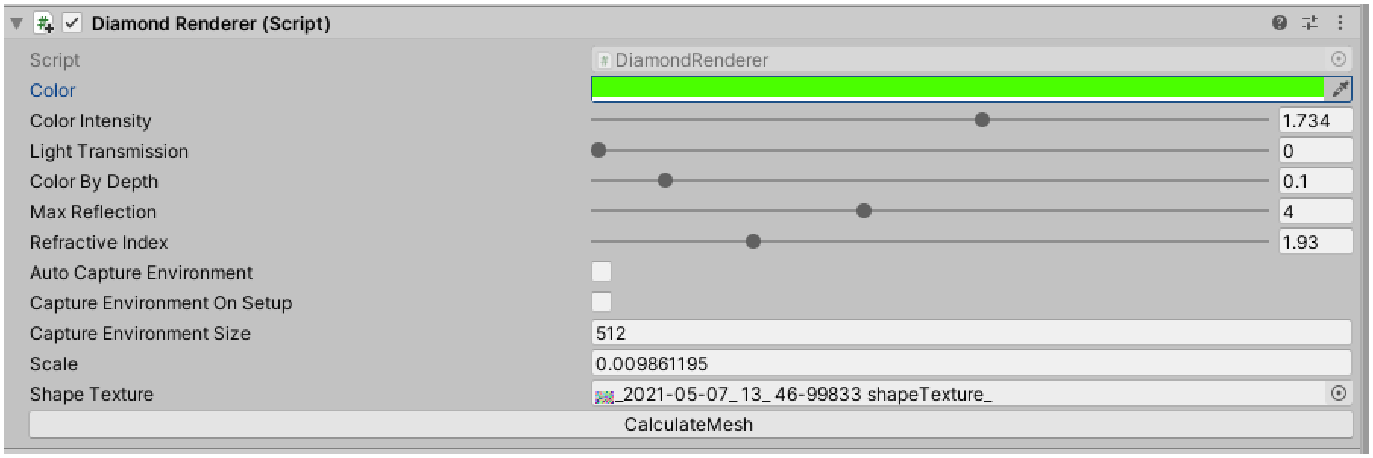
The next step is usually to select the desired cubmap or change the type to ReflectionProbe. There are only 2 cubemaps, 1 cubemap is needed for internal refractions and reflections, and the second for external reflection (regulated by the Specular value)



Shader: Diamonds/DiamondShader

ShapeTex				
Tiling	X	1	Y	1
Offset	X	0	Y	0
Scale	0.5249994			
SizeX	8			
SizeY	8			
PlaneCount	57			
Environment				
Tiling	X	1	Y	1
Offset	X	0	Y	0
MipLevel	0			
RefractiveIndex	1.6			
CubeMapMode	CubeMa			
BaseReflection	0.5			
Dispersion	1.5			
DispersionR	1.5			
DispersionG	1.5			
DispersionB	1.5			
DispersionIntensity	1			
TotalInternalReflection	1			
specular	1			
Scale	0.5249994			
Brightness	1			
Power	1			
Contrast	1			
_Disaturate	1			
Min	0			
Max	1			
PostExposure	1			
ReflectionCube				
Tiling	X	1	Y	1
Offset	X	0	Y	0
NormalMap	None (Texture)			

Let's analyze the script parameters.



Diamond Renderer (Script)

Script DiamondRenderer

Color 🟩

Color Intensity 1.734

Light Transmission 0

Color By Depth 0.1

Max Reflection 4

Refractive Index 1.93

Auto Capture Environment ☐

Capture Environment On Setup ☐

Capture Environment Size 512

Scale 0.009861195

Shape Texture _2021-05-07_13_46-99833 shapeTexture_

Color: Sets the color for the selected model, the alpha of this color is responsible for the saturation intensity.

Color Intensity: This parameter increases the color saturation

ColorByDepth: this parameter is needed to determine how much the colors of the diamond should depend on the depth of refraction of light in the diamond, if the diamond turns black when changing this parameter, reduce the value of "ColorIntensity"

Light Transmission: this slider is responsible for the transmission of light areas of the cubmap from the color, i.e. if, for example, the color of the stone is set = green and Light Transmission = more than 1, then where you have light areas of the cubmap there will be a more intense green color, less saturated, it will be more colorless, try with some bright color.

Max Reflection: A very important parameter, the performance and appearance of a diamond strongly depends on it, this is the number of passes that the shader performs, the more passes the more internal reflections and refractions, the higher the parameter, the slower the shader works, I do not advise setting high values for mobile phones, it is better to set 3-4 for small stones.

RefractiveIndex: this is the refractive index, usually in the real world it is equal to a diamond = 2.417, but I often put this value lower because it often looks better, I noticed many artists do this, but it's up to you, it all depends on your scene and your goals.

Auto Capture Environment: If enabled, the scene will be recorded in the cubmap and used in the material (it does not work for AR, it will be written about AR at the end of the documentation)

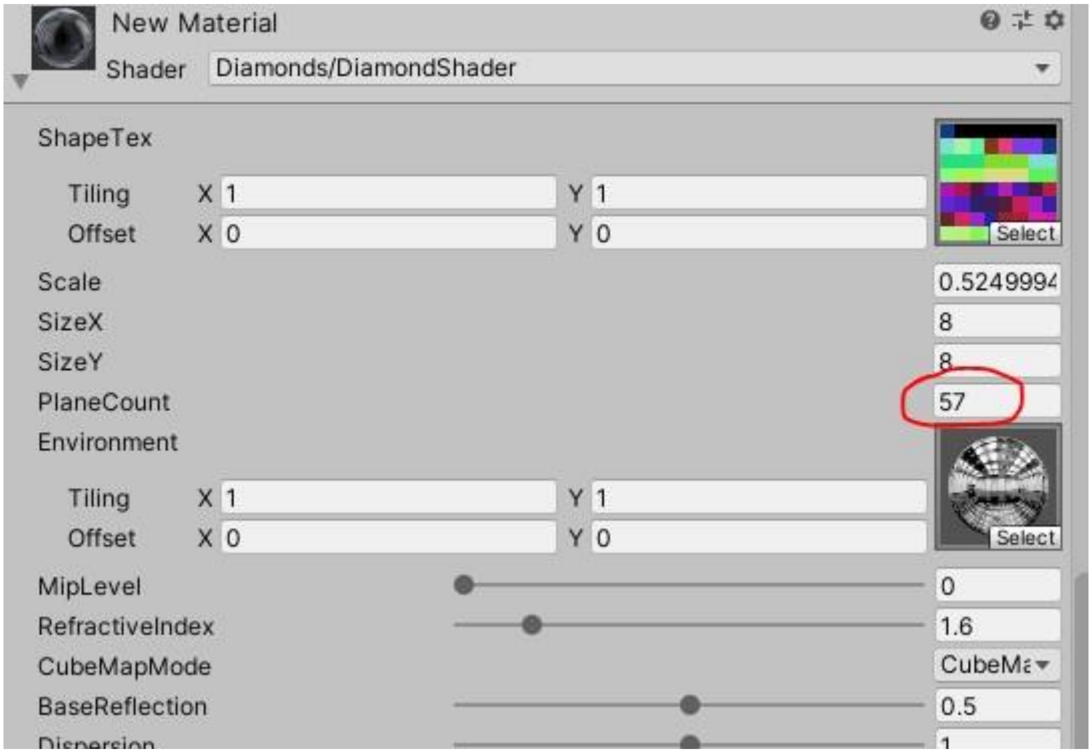
Capture Environment on Setup: cubemap will be recorded only when the CalculateMesh button is pressed

Capture Environment Size: the size of the recorded cubmap

Scale: The value of this parameter is set automatically by the script, it determines the correct size of the model, if suddenly it did not work correctly, you can edit it manually, but this has not happened for me.

ShapeTexture: This is the data that the script has written to the texture, if it has written too many pixels, then perhaps your model has too many polygons.

Regarding polygons, make sure that your model has a fairly low number of polygons, performance depends very much on this. Below is an example of my model, Plane Count in the material means the number of polygons that will be calculated in the shader, if you have too large a value, then reduce the number of polygons in your program where you make models, usually such a tool in Cinema4d as polygon reduction helps me, it is also in blender and possibly in other programs, if your topology is initially correct, this tool often creates a good cut with a significant reduction in polygons.



New Material

Shader Diamonds/DiamondShader

ShapeTex

Tiling X 1 Y 1

Offset X 0 Y 0

Scale 0.5249994

SizeX 8

SizeY 8

PlaneCount 57

Environment

Tiling X 1 Y 1

Offset X 0 Y 0

MipLevel 0

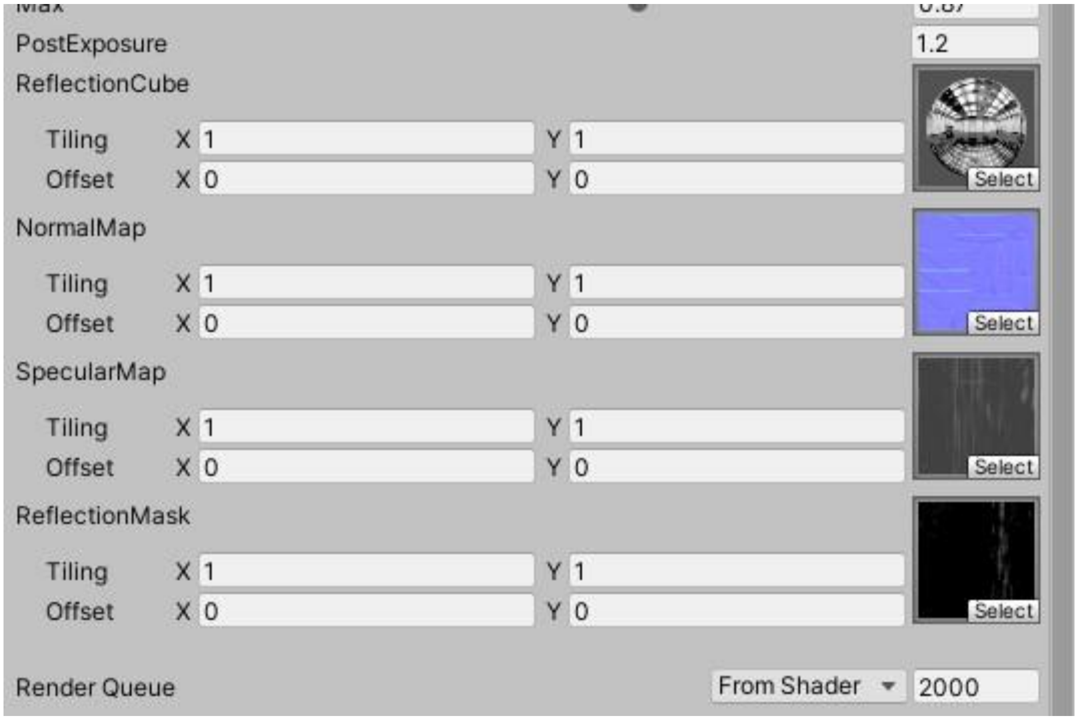
RefractiveIndex 1.6

CubeMapMode CubeMa

BaseReflection 0.5

Dispersion 1

As for the chamfers on the edges of the stone, it is better not to do them, instead use baked normals and specularMap to create the illusion of chamfers, below I gave an example from the demo scene, it turned out a good result, despite the fact that I did not do it for a long time, give this task to a 3d artist who knows how to work with baking normals and texturing to make an excellent result, these 3 textures will also allow you to add stains on the stones and make them more realistic.



Max 0.87

PostExposure 1.2

ReflectionCube

Tiling X 1 Y 1

Offset X 0 Y 0

NormalMap

Tiling X 1 Y 1

Offset X 0 Y 0

SpecularMap

Tiling X 1 Y 1

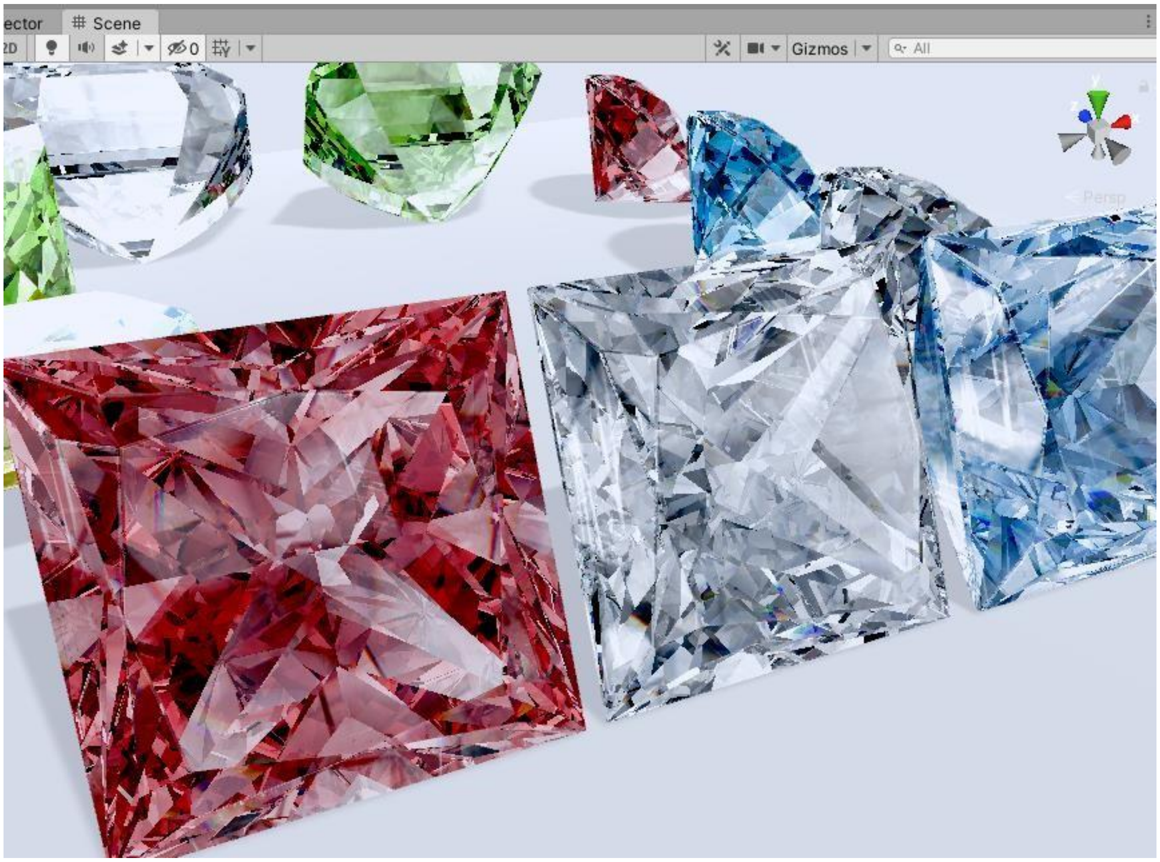
Offset X 0 Y 0

ReflectionMask

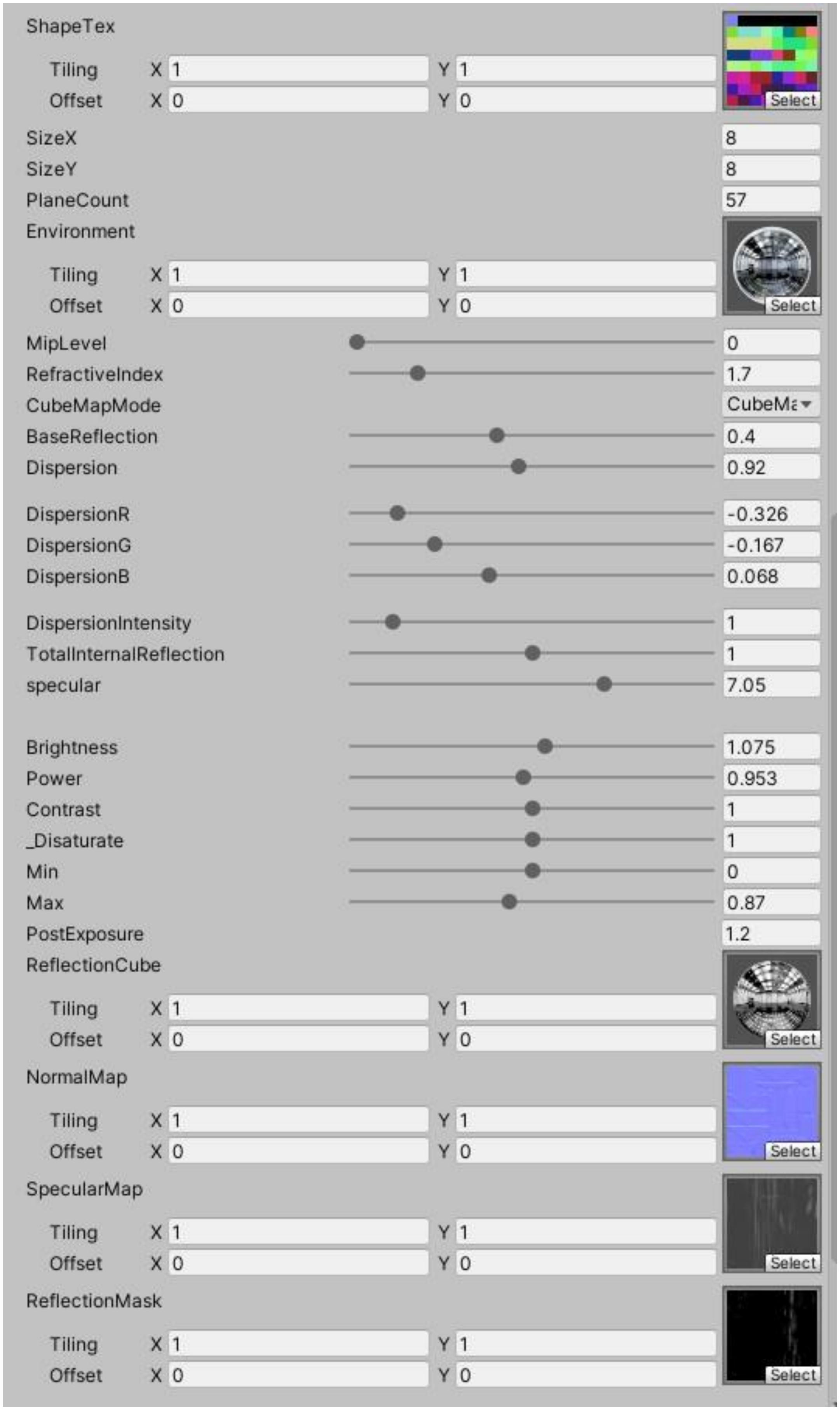
Tiling X 1 Y 1

Offset X 0 Y 0

Render Queue From Shader 2000



Let's analyze all the parameters of the material:



```
ShapeTex
   Tiling   X 1      Y 1
   Offset   X 0      Y 0
SizeX                          8
SizeY                          8
PlaneCount                     57
Environment
   Tiling   X 1      Y 1
   Offset   X 0      Y 0
MipLevel                       0
RefractiveIndex                1.7
CubeMapMode                    CubeMa▾
BaseReflection                 0.4
Dispersion                     0.92

DispersionR                    -0.326
DispersionG                    -0.167
DispersionB                    0.068

DispersionIntensity            1
TotalInternalReflection        1
specular                       7.05

Brightness                     1.075
Power                          0.953
Contrast                       1
_Disaturate                    1
Min                            0
Max                            0.87
PostExposure                   1.2
ReflectionCube
   Tiling   X 1      Y 1
   Offset   X 0      Y 0
NormalMap
   Tiling   X 1      Y 1
   Offset   X 0      Y 0
SpecularMap
   Tiling   X 1      Y 1
   Offset   X 0      Y 0
ReflectionMask
   Tiling   X 1      Y 1
   Offset   X 0      Y 0
```

ShapeTex: As I already wrote , these are calculated polygons from the script, they are saved to the ShapeTextures folder with their unique number and date.

SizeXY: ShapeTex dimensions

PlaneCount: the number of polygons that will be processed, make sure that it is low enough

Environment: cubemap, which is used for refractions and reflections inside the stone

MipLevel: if MipMaps are enabled in the cube map, then you can choose the Mip Level to be used, the performance is almost not affected.

RefractiveIndex: this is the refractive index, usually in the real world it is equal to a diamond = 2.417, but I often put this value lower because it often looks better, I noticed many artists do this, but it's up to you, it all depends on your scene and your goals.

CubMapMode: Choose what to use, a cubmap or a ReflectionProbe from the scene (ReflectionProbe is especially important for AR, more on this below)

Base Reflection: This value determines how strongly the reflections will be visible in relation to the refracted light, always at the level of 0.3 - 0.6

Dispersion: This is the setting of the color dispersion, search the Internet for more information what it is, the level determines how far the light beams are separated from each other forming a different color.

DispersionRGB: These 3 values are needed in order to separate each color from each other with a different length.

Dispersion Intensity: this is the saturation or intensity of the dispersion effect

Total Internal Reflection: This value is in order to determine from which place it is possible to interrupt reflections, it is desirable to leave it at the initial level, but it may be useful to someone

Specular: This regulates the intensity of external reflections.

Brightness: The brightness of internal refractions/reflections.

Power: Raises the output result to a power, makes a more powerful and juicy result by the type of contrast, but it works a little differently.

Contrast: This is the contrast of the output result, the light areas are lighter, the dark ones are darker

Desaturate: Reduces saturation in light areas

Min: regulates the darkness in the stone

Max: Adjusts the brightness

PostExposure: Highlights the final result, makes it light or dark

ReflectionCube: This is a cubmap for external reflections

NormalMap: This is a normal map, it is necessary to give volume to external reflections, without a ReflectionCube, a normal map is useless

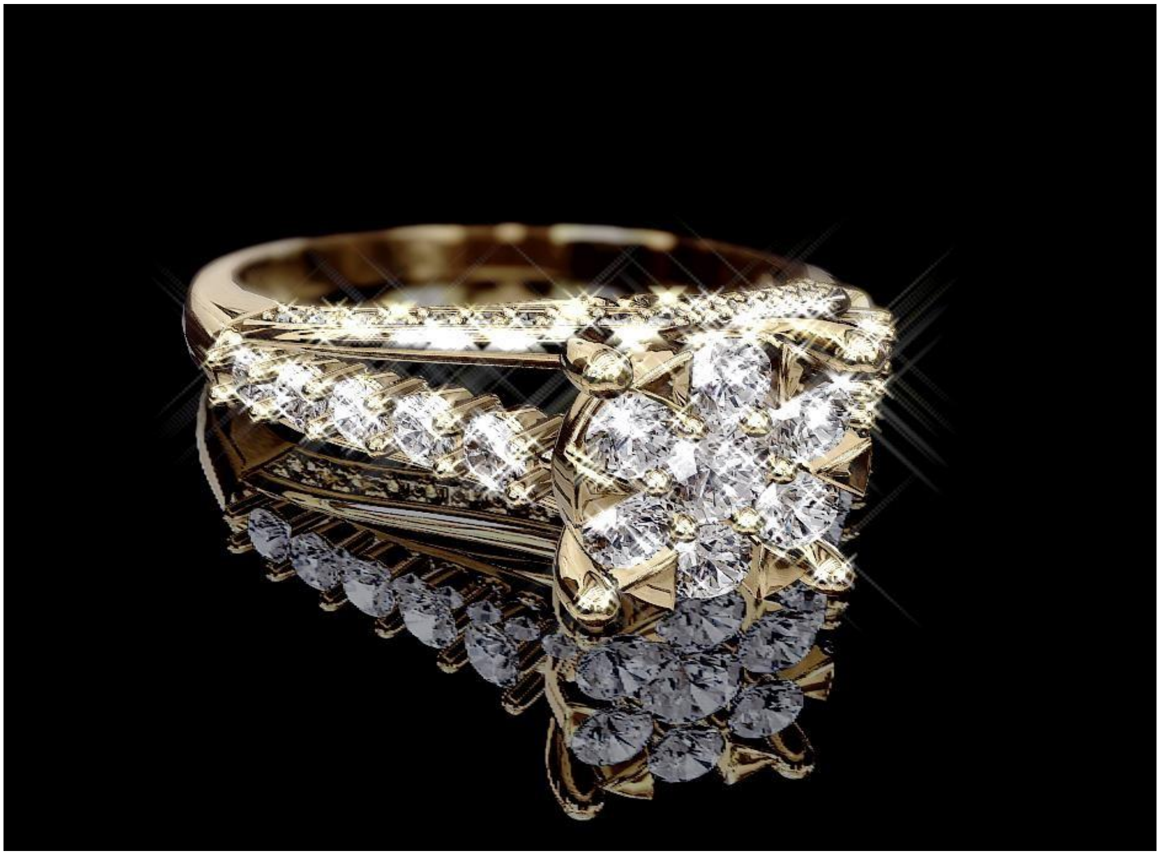
SpecularMap: This map is for changing the intensity of external reflections

ReflectionMask: adds reflections regardless of the "specular" value"

Flares

In addition to the shader for diamonds and the script, there is also a post-effect with flares in the asset.

To use in URP, import Unitypackage from the URP folder. Use the "UniversalRenderPipelineAsset_Renderer Flares" file in your Universal Render Pipeline Asset.



The first block is the basic values for image correction, so that it can be used without standard postprocessing, as well as 2 layers of glare at the bottom, for small points and large points on the screen, it calculates light points and creates glare in these places.

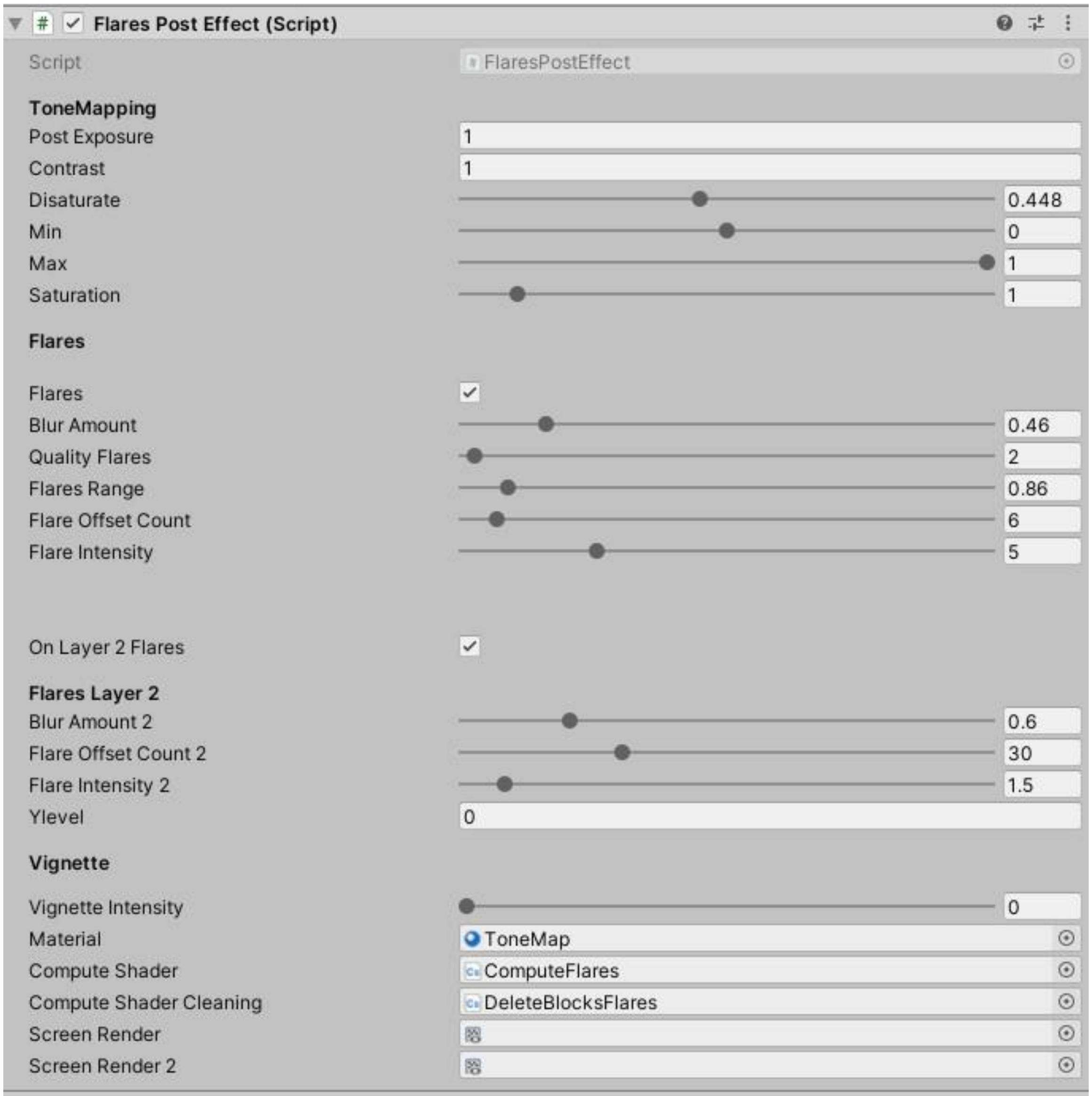
Blur Amount: This is the shift of all the pixels of the rays, adjust it so that the ray looks without noise.

Quality Flares: the lower the value, the higher the quality and more pixels are used to create highlights, this will help change the size of the desired rays, this does not affect performance. Flares Range: With this slider, you can adjust the threshold for creating glare

Flares Offset Count: Attention this slider greatly affects performance, the higher the value, the more passes occur and the smoother the beam turns out and it can be made longer.

Flare Intensity: This is the transparency of the rays

Level: This is the position in the world space, beyond which the rays do not appear, for example, so that the rays do not work from the white floor, the standard value is 0, from it and above, and the rays work



☑ Flares Post Effect (Script)

Script: FlaresPostEffect

ToneMapping

Post Exposure: 1
Contrast: 1
Disaturate: 0.448
Min: 0
Max: 1
Saturation: 1

Flares

Flares: ☑
Blur Amount: 0.46
Quality Flares: 2
Flares Range: 0.86
Flare Offset Count: 6
Flare Intensity: 5

On Layer 2 Flares: ☑

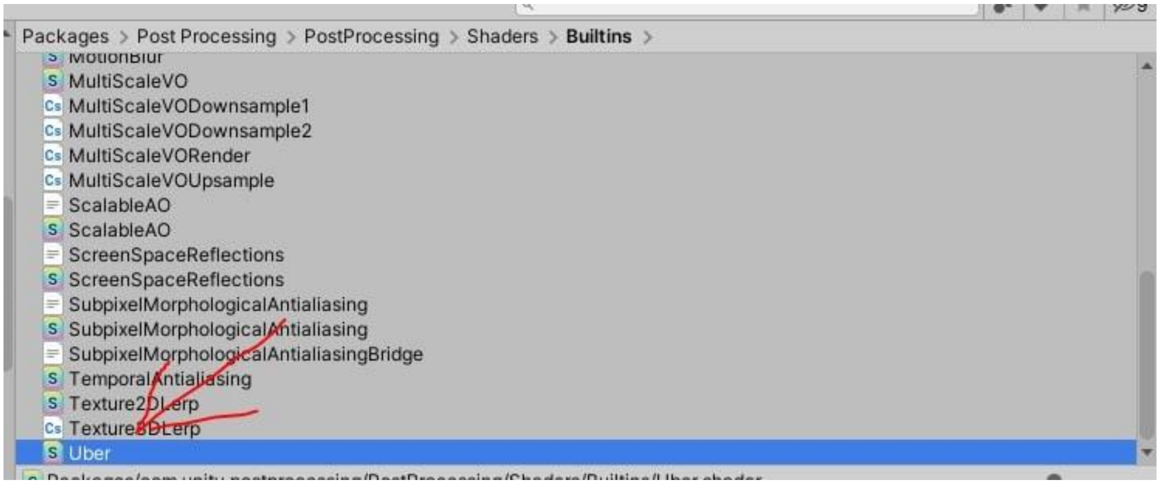
Flares Layer 2

Blur Amount 2: 0.6
Flare Offset Count 2: 30
Flare Intensity 2: 1.5
Ylevel: 0

Vignette

Vignette Intensity: 0
Material: ToneMap
Compute Shader: ComputeFlares
Compute Shader Cleaning: DeleteBlocksFlares
Screen Render:
Screen Render 2:

Now I will describe what to do if the glare flashes too much when combined with standard post effects (everything is fine without them), this happens because of the Post-Process Layer component and its anti-aliasing, in order to fix at least part of the strong twitching, you need to go to this folder below and open the Uber. shader file



Packages > Post Processing > PostProcessing > Shaders > **Builtins** >

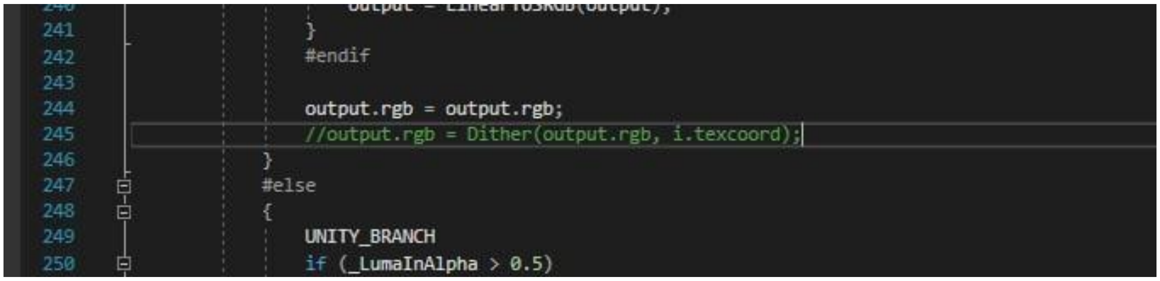
- MotionBlur
- MultiScaleVO
- MultiScaleVODownsample1
- MultiScaleVODownsample2
- MultiScaleVORender
- MultiScaleVOUpsample
- ScalableAO
- ScalableAO
- ScreenSpaceReflections
- ScreenSpaceReflections
- SubpixelMorphologicalAntialiasing
- SubpixelMorphologicalAntialiasing
- SubpixelMorphologicalAntialiasingBridge
- TemporalAntialiasing
- Texture2DLerp
- Texture3DLerp
- Uber

Packages/com.unity.postprocessing/PostProcessing/Shaders/Builtins/Uber.shader

You need to find the line that is green, you will have it white and active, comment out as in the screenshot and add an entry instead:

```
output.rgb = output.rgb;
```

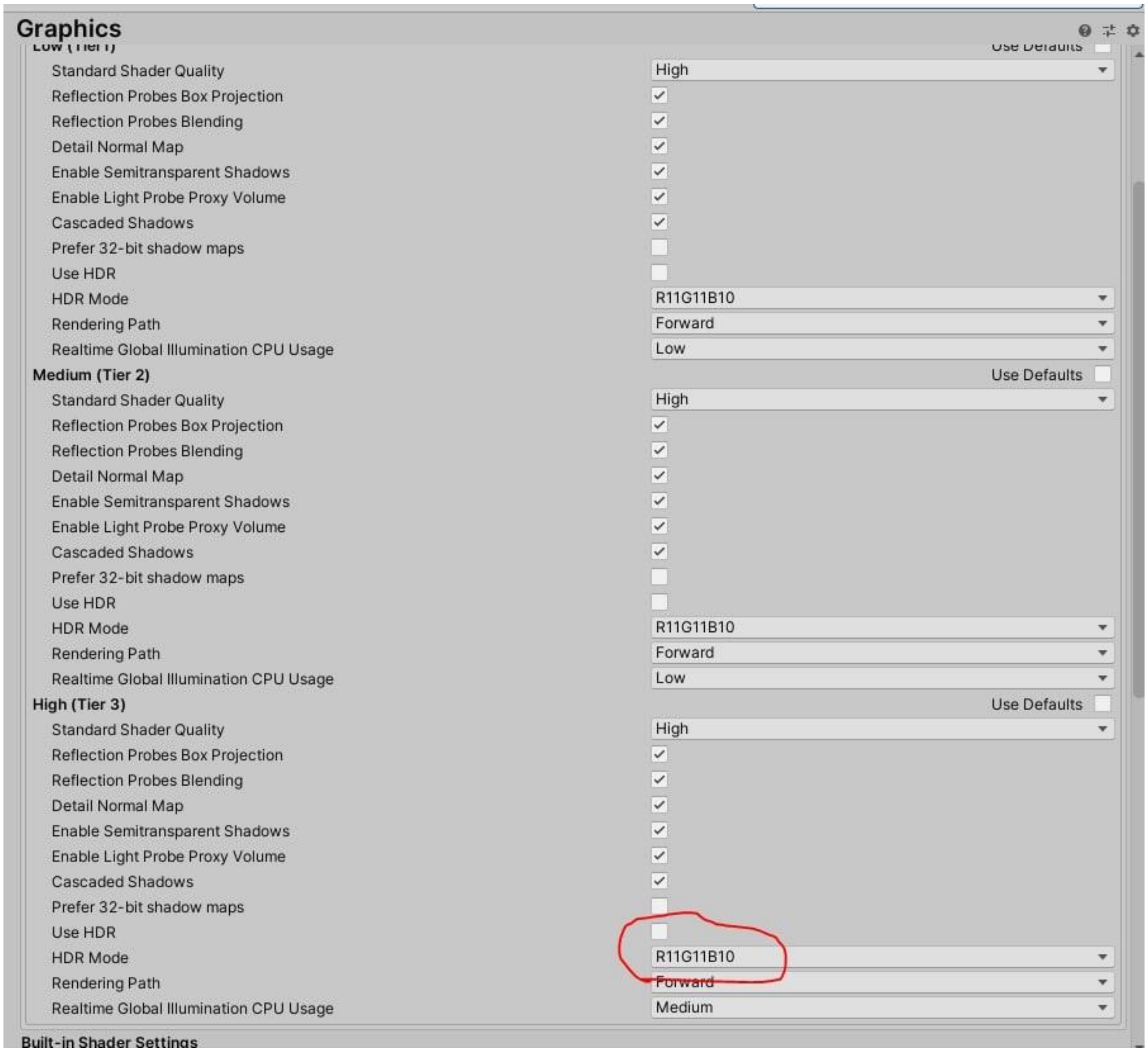
```
This will disable the built-in dithering and the noise that creates the Post-Process Layer
will decrease
```



```
                output = LinearToSRGB(output);
            }
            #endif

            output.rgb = output.rgb;
            //output.rgb = Dither(output.rgb, i.texcoord);
        }
        #else
        {
            UNITY_BRANCH
            if (_LumaInAlpha > 0.5)
```

In my project, I used the following graphics settings:



Graphics

Low (Tier 1)	Use Defaults □
Standard Shader Quality	High
Reflection Probes Box Projection	☑
Reflection Probes Blending	☑
Detail Normal Map	☑
Enable Semitransparent Shadows	☑
Enable Light Probe Proxy Volume	☑
Cascaded Shadows	☑
Prefer 32-bit shadow maps	□
Use HDR	□
HDR Mode	R11G11B10
Rendering Path	Forward
Realtime Global Illumination CPU Usage	Low
Medium (Tier 2)	Use Defaults □
Standard Shader Quality	High
Reflection Probes Box Projection	☑
Reflection Probes Blending	☑
Detail Normal Map	☑
Enable Semitransparent Shadows	☑
Enable Light Probe Proxy Volume	☑
Cascaded Shadows	☑
Prefer 32-bit shadow maps	□
Use HDR	□
HDR Mode	R11G11B10
Rendering Path	Forward
Realtime Global Illumination CPU Usage	Low
High (Tier 3)	Use Defaults □
Standard Shader Quality	High
Reflection Probes Box Projection	☑
Reflection Probes Blending	☑
Detail Normal Map	☑
Enable Semitransparent Shadows	☑
Enable Light Probe Proxy Volume	☑
Cascaded Shadows	☑
Prefer 32-bit shadow maps	□
Use HDR	□
HDR Mode	R11G11B10
Rendering Path	Forward
Realtime Global Illumination CPU Usage	Medium

Built-in Shader Settings

Stage design

To create realistic stones in the scenes, I had to sort through 600 HDRI and more suitable ones, there are only less than a dozen left, so write on the Internet, for example, "**beautiful interior**" and download 300 pieces at once and check all of them to find the right one for your scene. The shader does everything possible to create realistic stones, it makes the correct rendering of diamonds as life, everything else depends on the shape of the scene.По поводу антиалияснига, советую использовать TemporalAntialiasing чтобы грани внутри бриллиантов были более четкие, если подкрутить значение Sharpness.

При использовании Color Grading используйте лучше режим custom, чтобы светлые участки не затемнялись.

Mirror Reflection

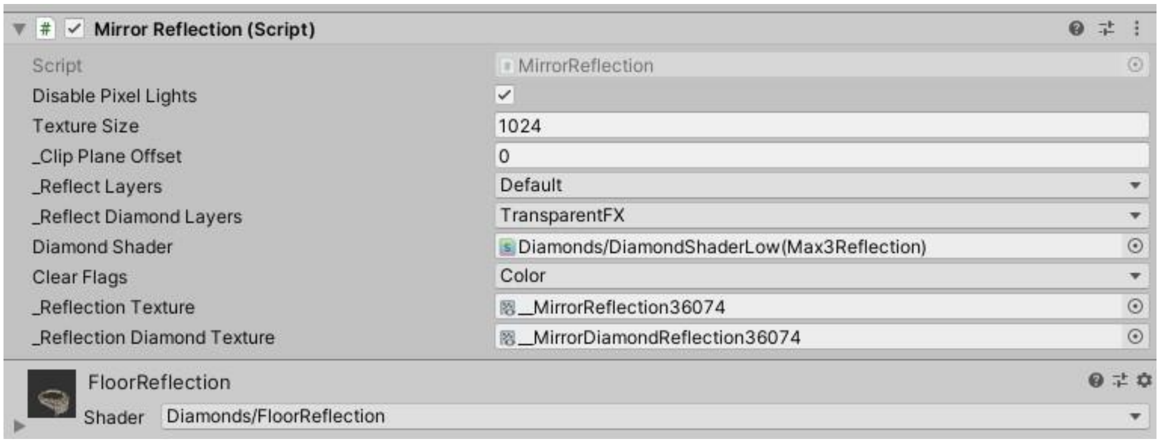
For some scenes the "MirrorReflection" script will be useful

It is needed to create reflections on the floor, with the help of the shader you can change the transparency of the reflections and adjust the size in the script, the size will greatly affect the performance, I also created a second shader for diamonds that has pass restrictions, the value "Diamond Shader".

It is necessary so that not stones from the scene are rendered in reflections, but stones with a replaced shader, with a faster one, for this there is a division into layers in the script,

_Reflect Layers: this is the first layer that the camera renders

_Reflect Diamond Layers: this is the layer for the diamond where the shader will be replaced in the materials

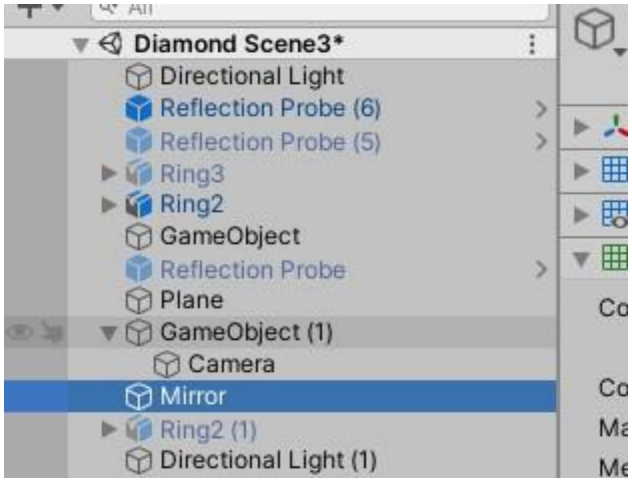


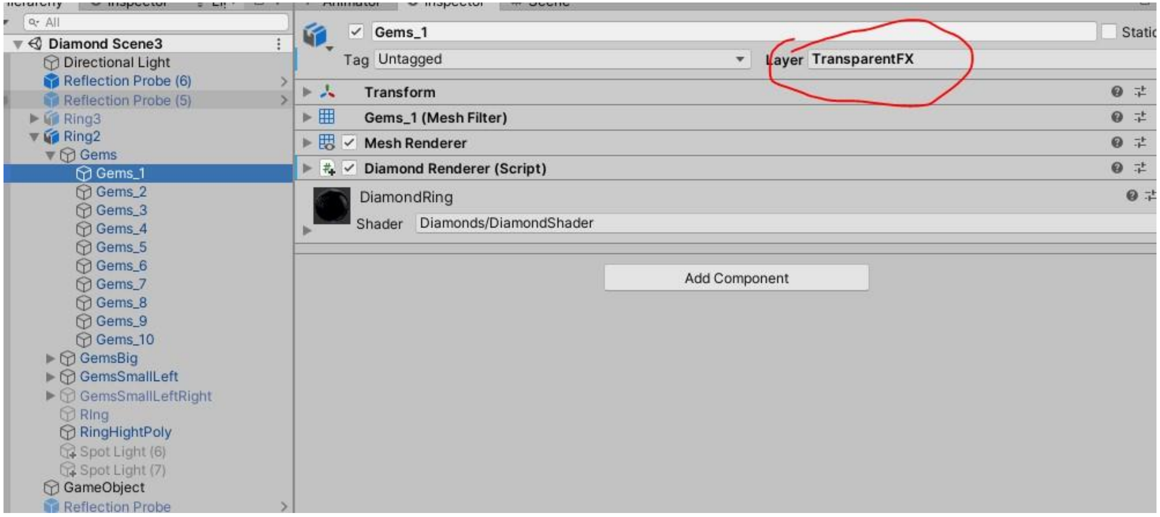
Mirror Reflection (Script)

Script	MirrorReflection
Disable Pixel Lights	✓
Texture Size	1024
_Clip Plane Offset	0
_Reflect Layers	Default
_Reflect Diamond Layers	TransparentFX
Diamond Shader	Diamonds/DiamondShaderLow(Max3Reflection)
Clear Flags	Color
_Reflection Texture	__MirrorReflection36074
_Reflection Diamond Texture	__MirrorDiamondReflection36074

FloorReflection

Shader Diamonds/FloorReflection





☑ Gems_1

Tag Untagged

Layer TransparentFX

Shader Diamonds/DiamondShader

AR

In order for the image from the camera to be transmitted to the stones and to make refractions taking into account the environment, you need to use the " AR Environment Probe Manager" https://docs.unity3d.com/Packages/com.unity.xr.arfoundation@2.2/manual/environment-probe-manager.html

You will need to make a prefab with ReflectionProbe and with this component and create it on the stage, and in the materials of the stones put it in the mode of using ReflectionProbe.

Mobile applications and optimization

Before creating applications for mobile devices, delete the script "ImportPostProcces. cs" inche it will constantly change the color space to Linear, this was only necessary to demonstrate the scenes, since they were created on Linear, use all the above described parameters that affect performance so that everything works quickly on mobile devices,

The most basic ones are:

Max Reflection in the script; the number of

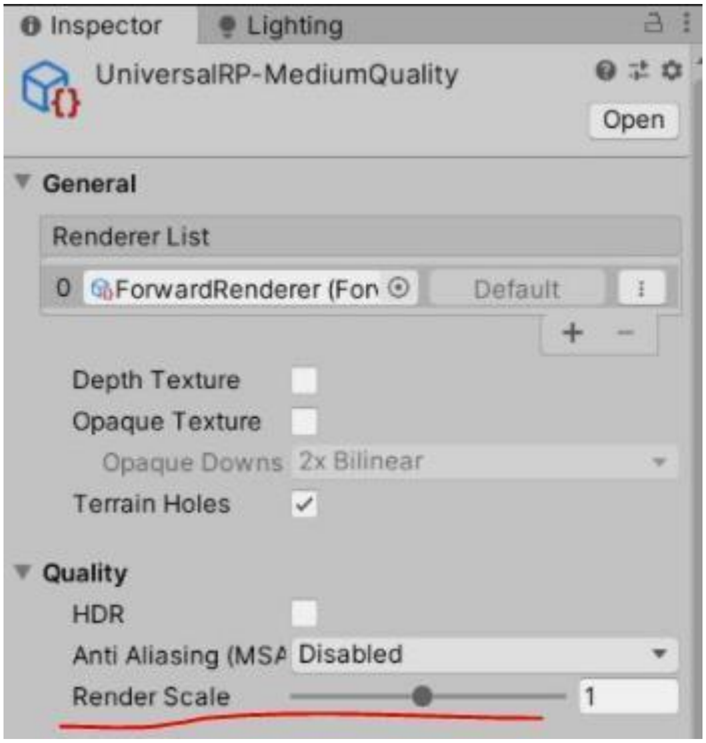
polygons in the diamond model;

Flares Offset Count in the script for flares;

The Mirror Reflection script and its render size.

I also want to note that it is the size of the diamonds on the screen that has a big impact on performance, and not the number of diamonds, since calculations take place pixel by pixel, the fewer pixels a diamond occupies, the less calculations need to be performed, keep this in mind when creating scenes.

Also, for even greater optimization, you can switch to URP and use such a feature as the render size, the smaller this parameter is, the higher the FPS will be, but the lower the quality of the render will be.



UniversalRP-MediumQuality

General

Renderer List

0 ForwardRenderer (Forn Default

Depth Texture □

Opaque Texture □

Opaque Downs 2x Bilinear

Terrain Holes ☑

Quality

HDR □

Anti Aliasing (MSA Disabled

Render Scale 1

Write me an email if you need help, any help related to this asset

andreygraphics.online@gmail.com

Version: 1.3