

Shader integration with Curved World system

1. Include **CurvedWorld_Base.cginc** file inside vertex shader pass.

```
#include "Assets/VacuumShaders/Curved World/Shaders/cginc/CurvedWorld_Base.cginc"
```

(This is file path by default, it may be different)

2. Inside vertex shader pass use one of the two Curved World macros:

- **CURVED_WORLD_TRANSFORM_POINT (float4 vertex)** – Transforms only vertex, suitable for unlit shaders.
- **CURVED_WORLD_TRANSFORM_POINT_AND_NORMAL (float4 vertex, float3 normal, float4 tangent)** – Transforms vertex and normal, suitable for shaders requiring correctly rotated normal for calculating: light, specular, reflection, etc.

If vertex shader pass does per-vertex animation, displace, wind or other per-vertex effects then Curved World transformation must be used after them.

Steps 1 and 2 must be used in all vertex shader passes.

3. (Optional step) If shader uses **Fallback** shader then it also must be modified for Curved World or can be used one of the built-in shaders provided by Curved World:

- **"Hidden/VacuumShaders/Curved World/VertexLit/Diffuse"** – for opaque shaders.
- **"Hidden/VacuumShaders/Curved World/VertexLit/Cutout"** – for cutout (alpha test) shaders.
- **"Hidden/VacuumShaders/Curved World/VertexLit/Transparent"** – for transparent shaders.

4. (Optional step) If shader requires camera Depth and Normal textures for image effects then must be defined custom **RenderType** or used one of the Curved World's built-in RenderTypes:

- **"RenderType"="CurvedWorld_Opaque"** – for opaque shaders.
- **"RenderType"="CurvedWorld_TransparentCutout"** – for cutout shaders.

That's all.

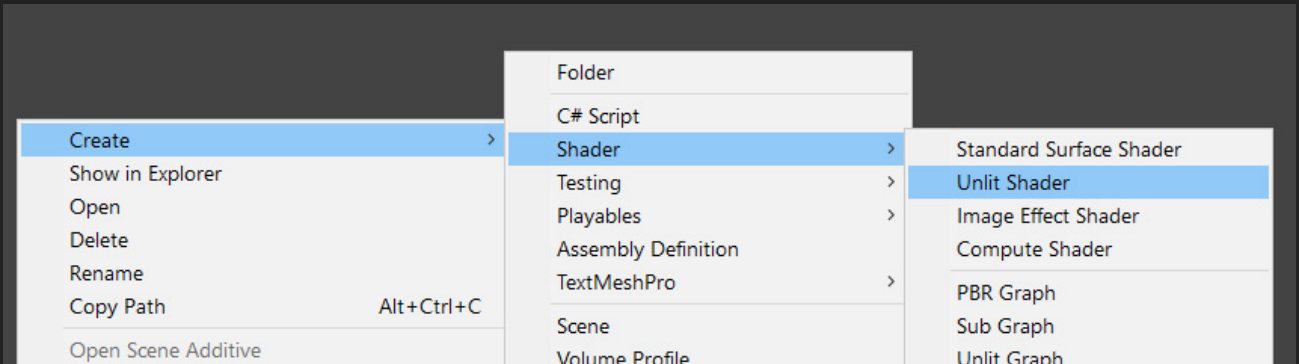
Check two example shaders inside Shaders/Example folder:

1. **"Custom/Example_Unlit"**
2. **"Custom/Example_Surface"**

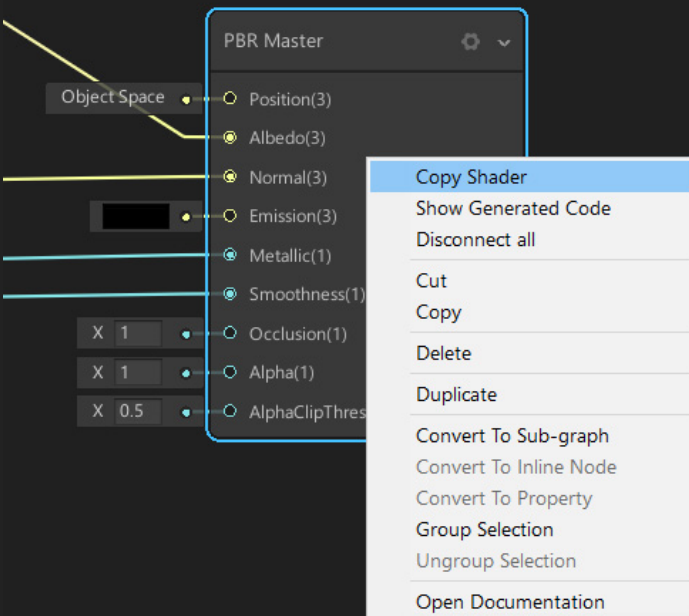
Curved World integration with Shader Graph

Curved World effect cannot be directly constructed in Shader Graph using nodes, however it can be integrated into HLSL shader created by Shader Graph.

1. Create new Unlit shader file



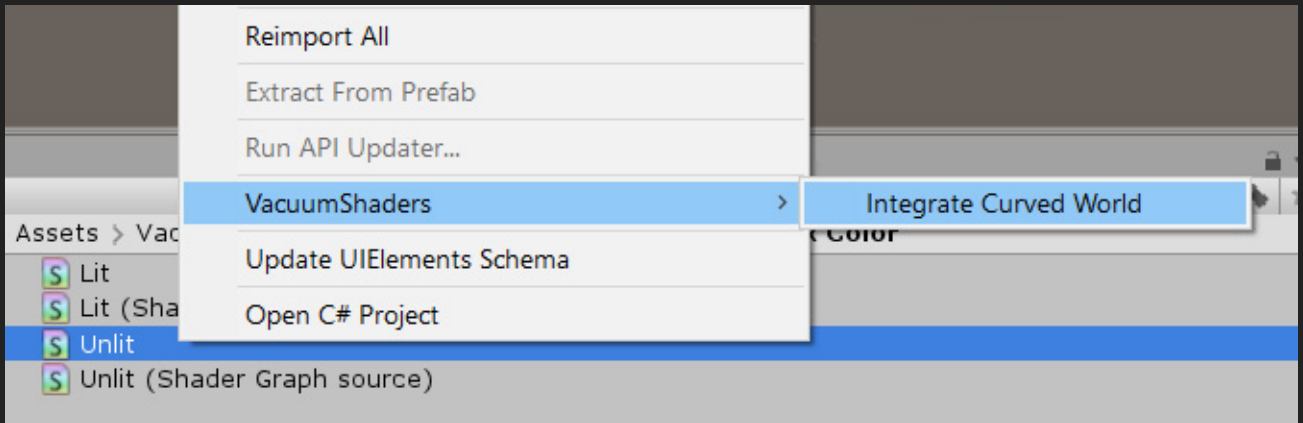
2. Open Shader Graph file you want Curved World to integrate with. Right click on Master node and select Copy Shader. HLSL shader is now copied into system memory as text.



3. Open just created Unlit shader file in any text editor and delete all content.
4. Past shader copied into memory by CTRL+V.
5. Save file and close it.

Steps above creates HLSL shader from Shader Graph. We will add Curved World effect inside this shader file.

6. Right click shader file and from context menu select **VacuumShaders** > **Integrate Curved World**.



7. Shader is ready to use.
It is a copy of a Shader Graph file but with Curved World bending effect.