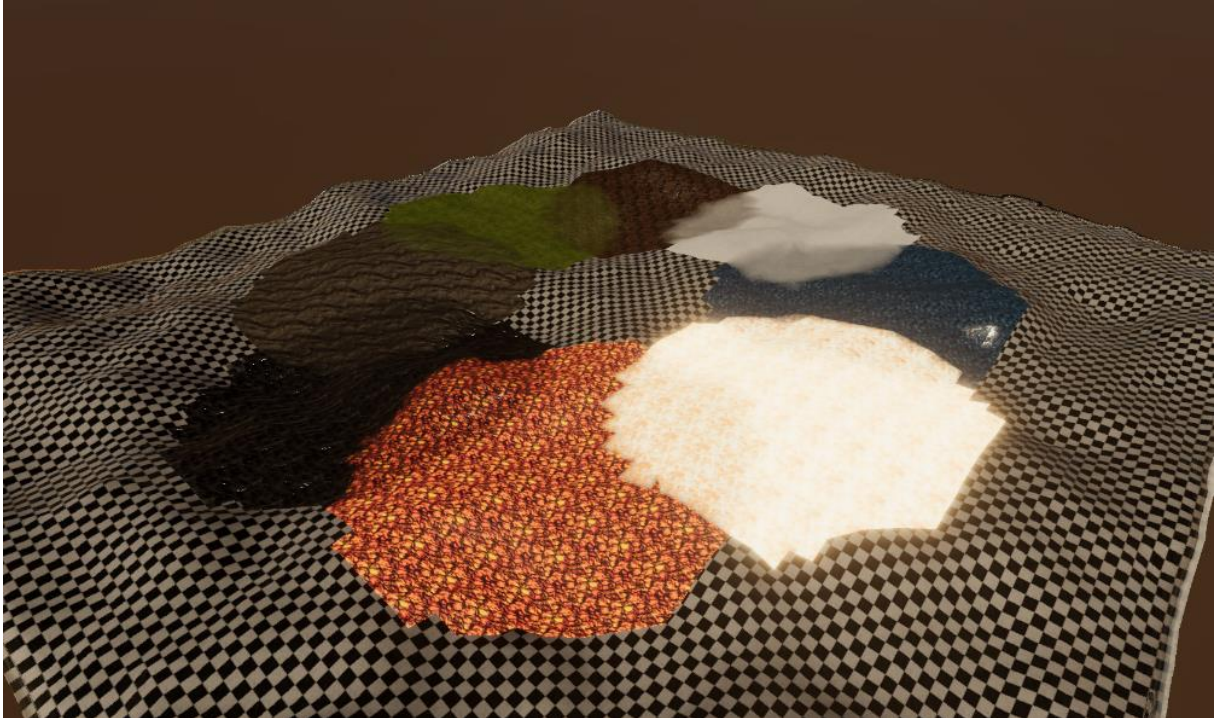

VOXELICA HDRP & URP SUPPORT



INTRODUCTION

Voxelica works independent of the render pipeline used as the voxel engine itself just generates the volumetric representation which is a traditional mesh according to the hull generator.

This means that shader provided by Unity can be used. This also means that you do not need special shader when you are using a texture atlas where Voxelica manipulates the UV coordinate according to the voxel value.

The case where you need special shader occurs when you are using multi-layered workflows where Dimension 0 is used for density and Dimension 1-X are written into the UV3-8 coordinates.

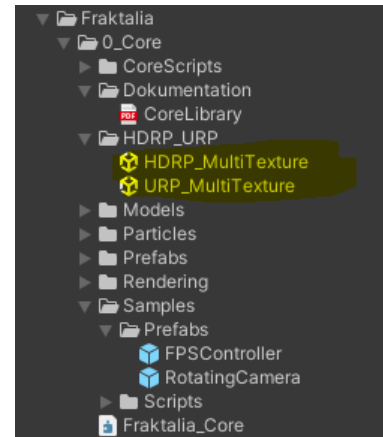
Since those setups require shader which read and utilize those additional UV coordinates, special shader are included for URP and HDRP.

Since the special materials are also used in other assets I develop, they are in the 0_Core folder and not in the Voxelica folder.

HDRP

The content for the HDRP render pipeline is located under Fraktalia > 0_Core > HDRP_URP > HDRP_MultiTexture.

Double click and import the content of the HDRP_MultiTexture package.



This package contains shader related to multi texturing and requires TextureArrays.

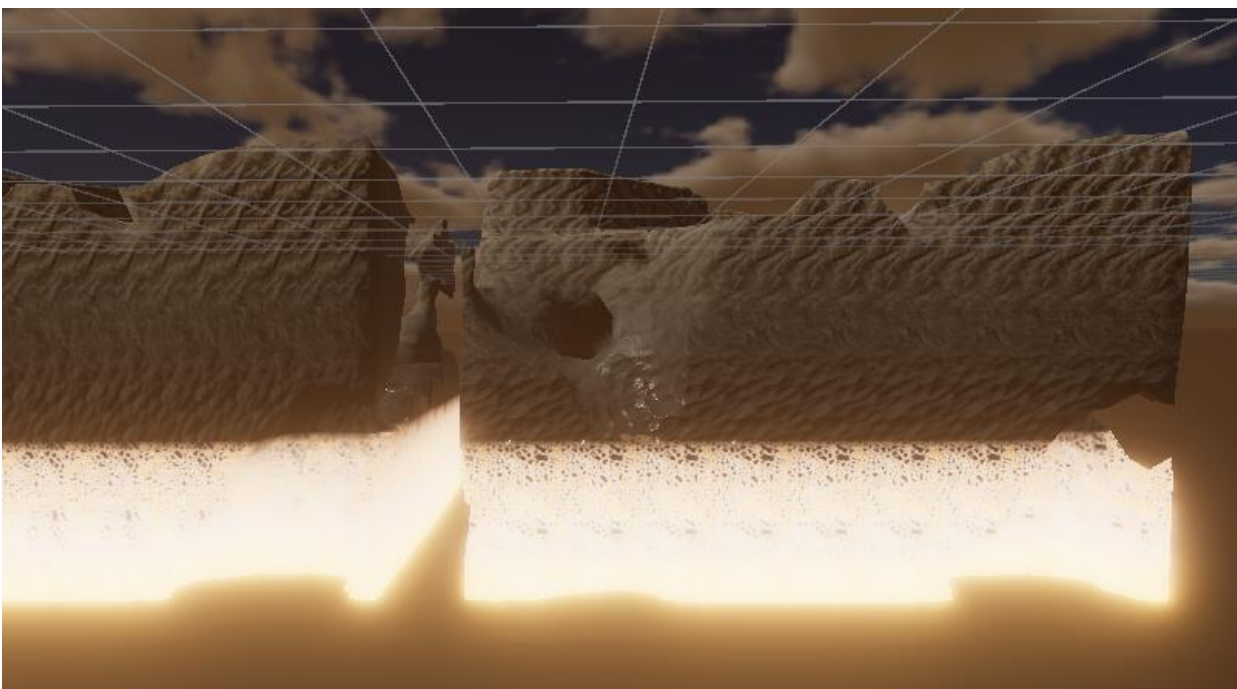
Overall there are 2 types of MultiTexture shader: UV3 and UVBlend. Both come with a normal variant which requires UV coordinates and one which is Triplanar (more expensive).

UV3

This shader only uses one dimension for texturing. So a setup using UV3 version usually has Dimension 0 for density and Dimension 1 for texturing. This material requires texture arrays where the voxel value is used for the texture lookup.

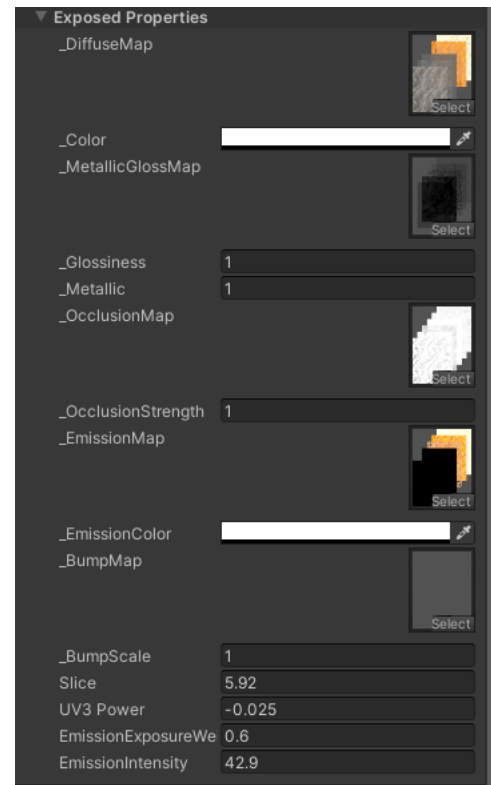
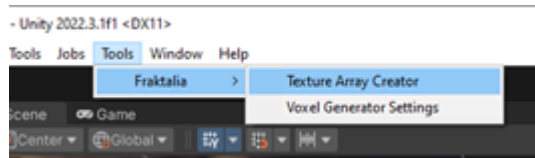
One example use case is to have a material like rock where Dimension 1 should simulate Temperature like in the image below.

Voxel ID of 0 would be cold while a Voxel ID of 255 would be extremely hot. In the image below you can see how the material turns from rock to obsidian and then to glowing lava.



As mentioned, the URP variant requires TextureArrays, in order to create them, a texture array generation tool is included.

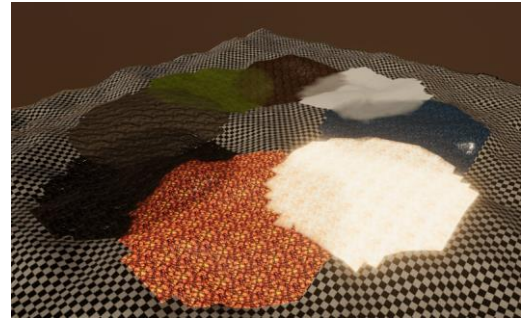
You can open the creator under Tools > Fraktalia > Texture Array Creator



UV BLEND

UV Blend is what you expect when using the Unity Terrain system as it consists of multiple layers. It consists of the base layer and currently up to 8 additional layers.

Every UV channel supports 4 layers as it is a Vector4, however currently HDRP only supports the lookup of UV0-UV3. UV0 is used for your conventional UV mapping and UV1 is used by Unity for lightmaps.



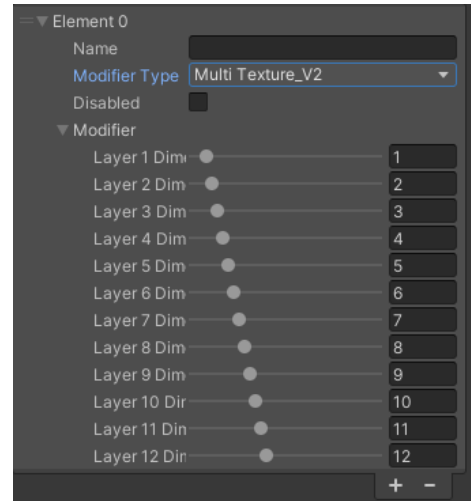
So only UV2 and UV3 can be used which is the reason why a total of 8 layers are supported. I have no idea why Unity decided to limit it to UV0-3 even though UV4-8 exists.

Therefore theoretically 24 layers could be possible in the future and desperately could be extended to 32 by utilizing vertex colors and UV1.

Like UV3, this version also requires TextureArrays.

It is important that a Voxel Generator must have a dimension count of 9 while using the ModularUniformVisualHull script.

Additionally it must contain the Multi Texture V2 post process module which writes into the UV coordinates like in the right screenshot. Layer 1-8 are used for texturing.



URP

The URP version contains the identical variations as the HDRP version contains.

From the appearance, the URP versions look almost identical to the standard versions.

Functionality wise they are identical to the HDRP versions. Even the ShaderGraphs almost look identical.

