

3D Game Programming Texture Mapping

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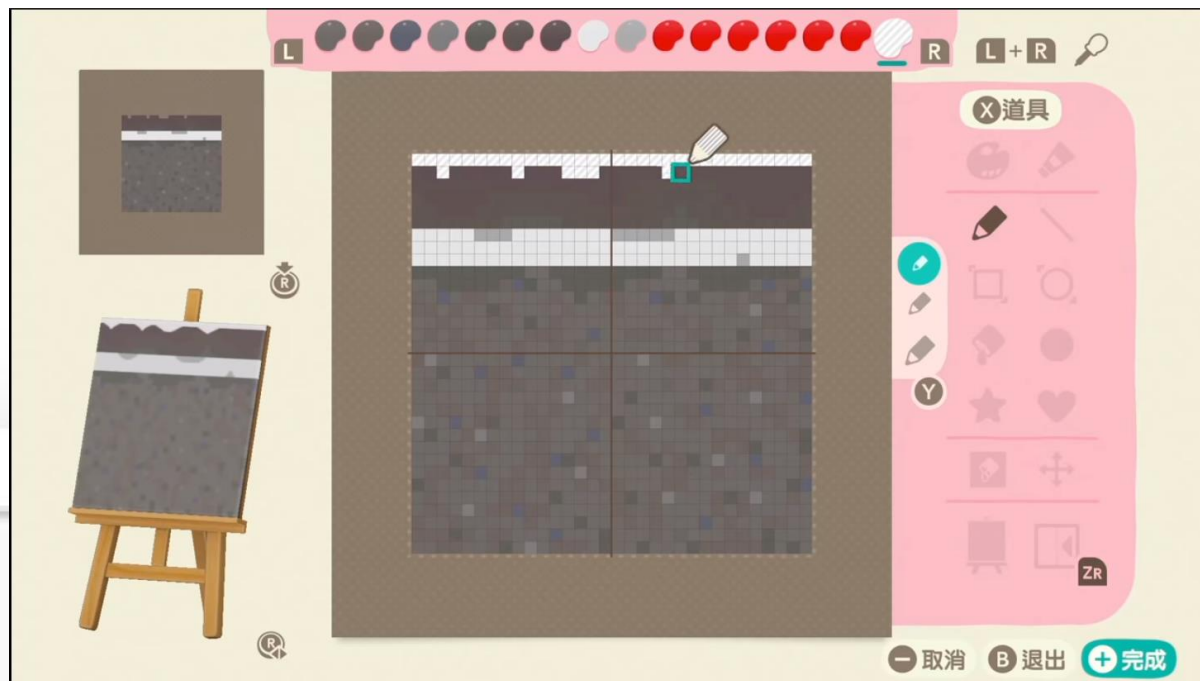


Virtua Fighter
1993



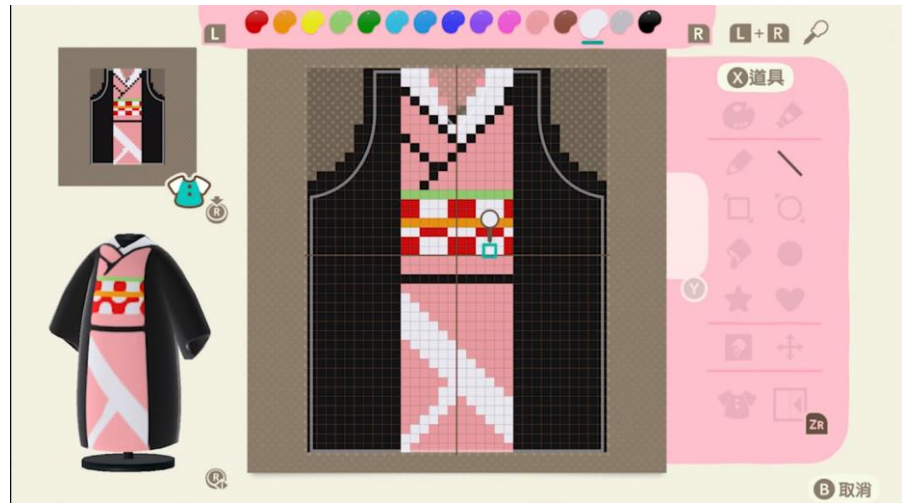
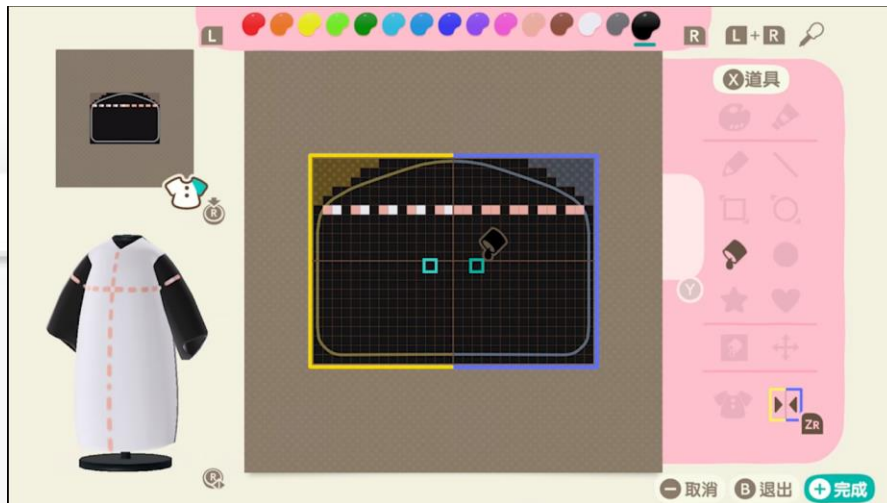
Virtua Fighter 2
1994

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超逼真柏油道路教學！〔
集合啦！動物森友會〕





[動物森友會-襪豆子服裝DIY過程鬼滅之刃](#)

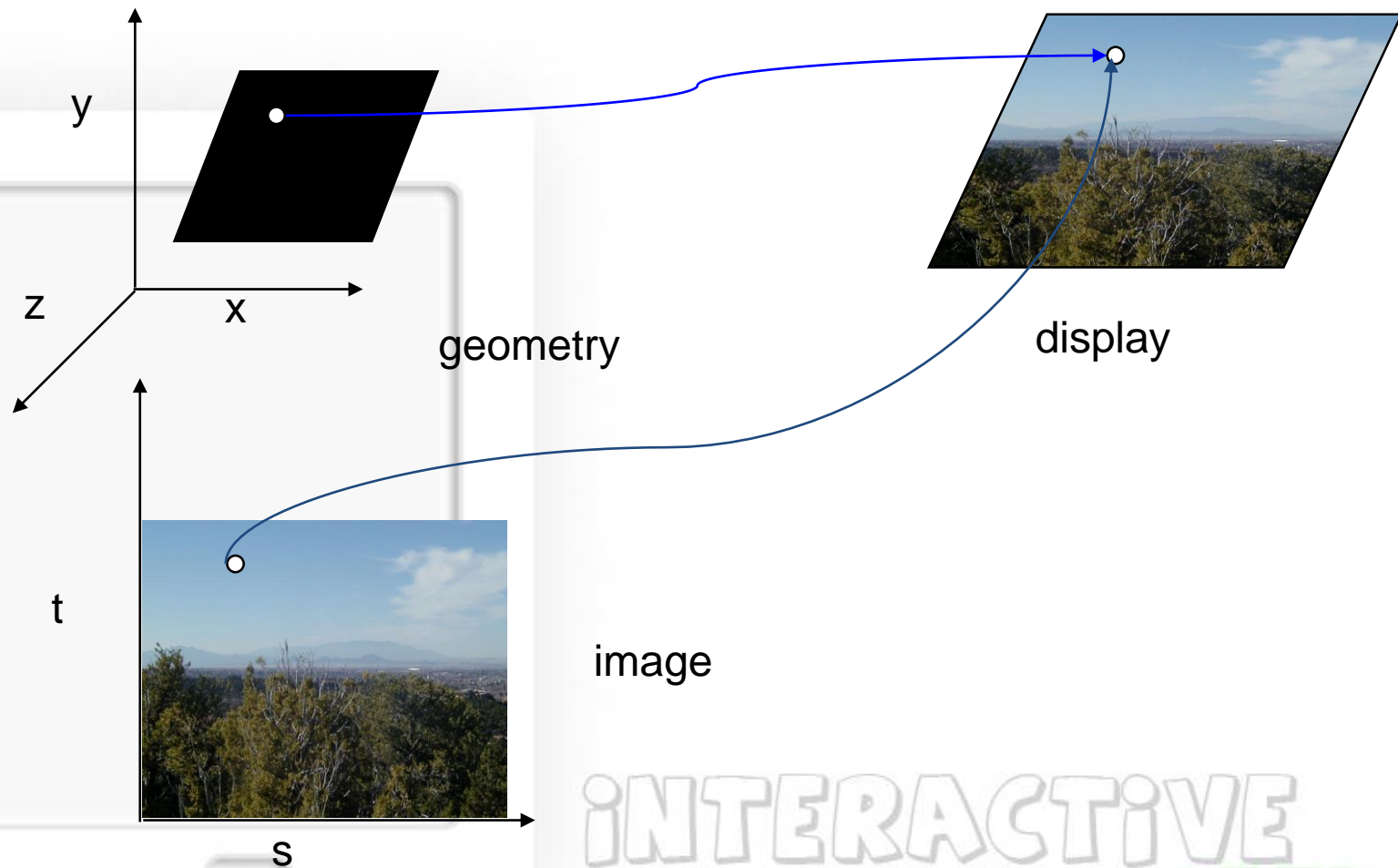
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Outline

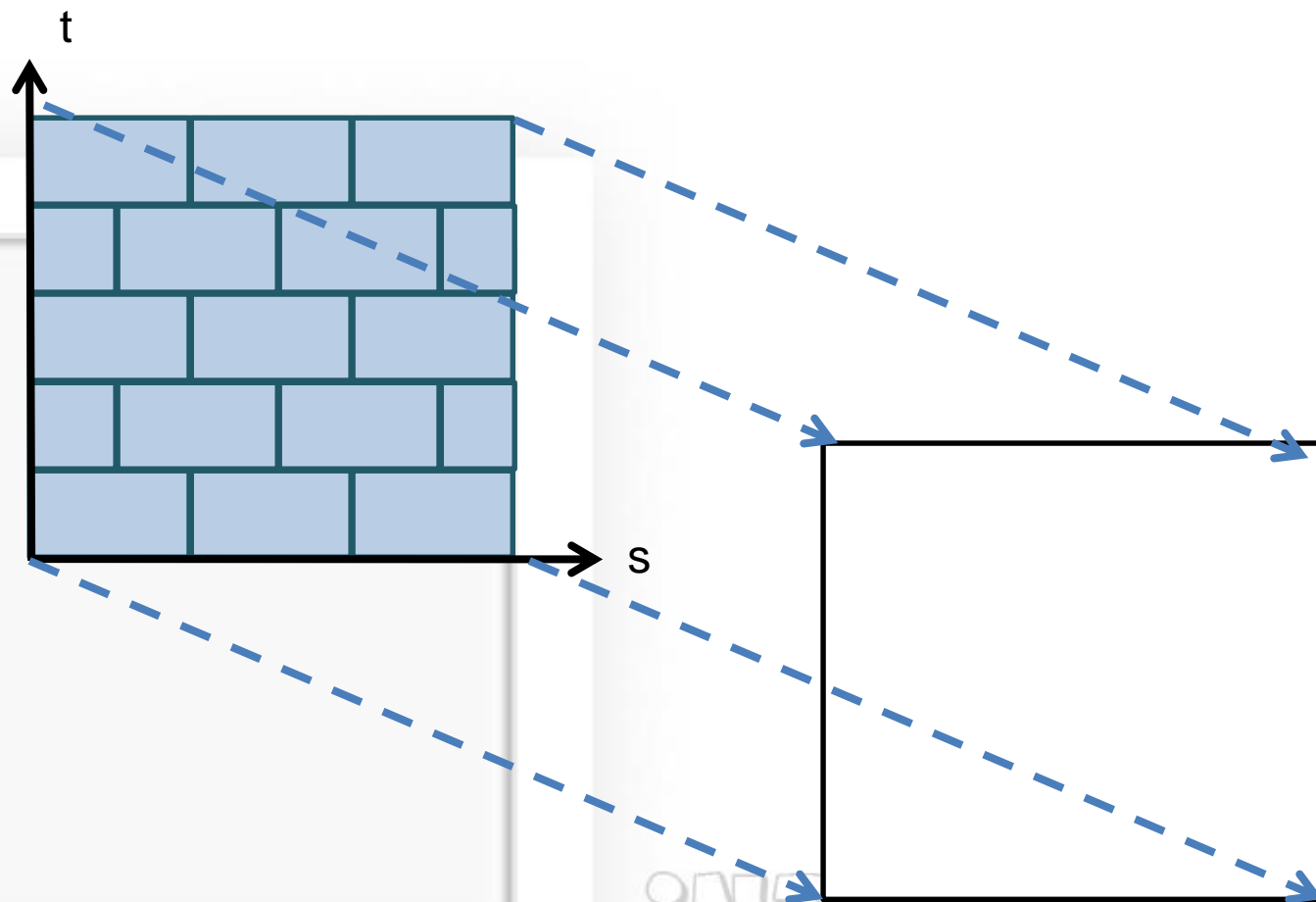
- ✍ Texture Mapping: The Basics
 - Mapping textures to geometry
- ✍ Texture image in Unity
- ✍ Texture with material
- ✍ Render Texture

Texture Mapping

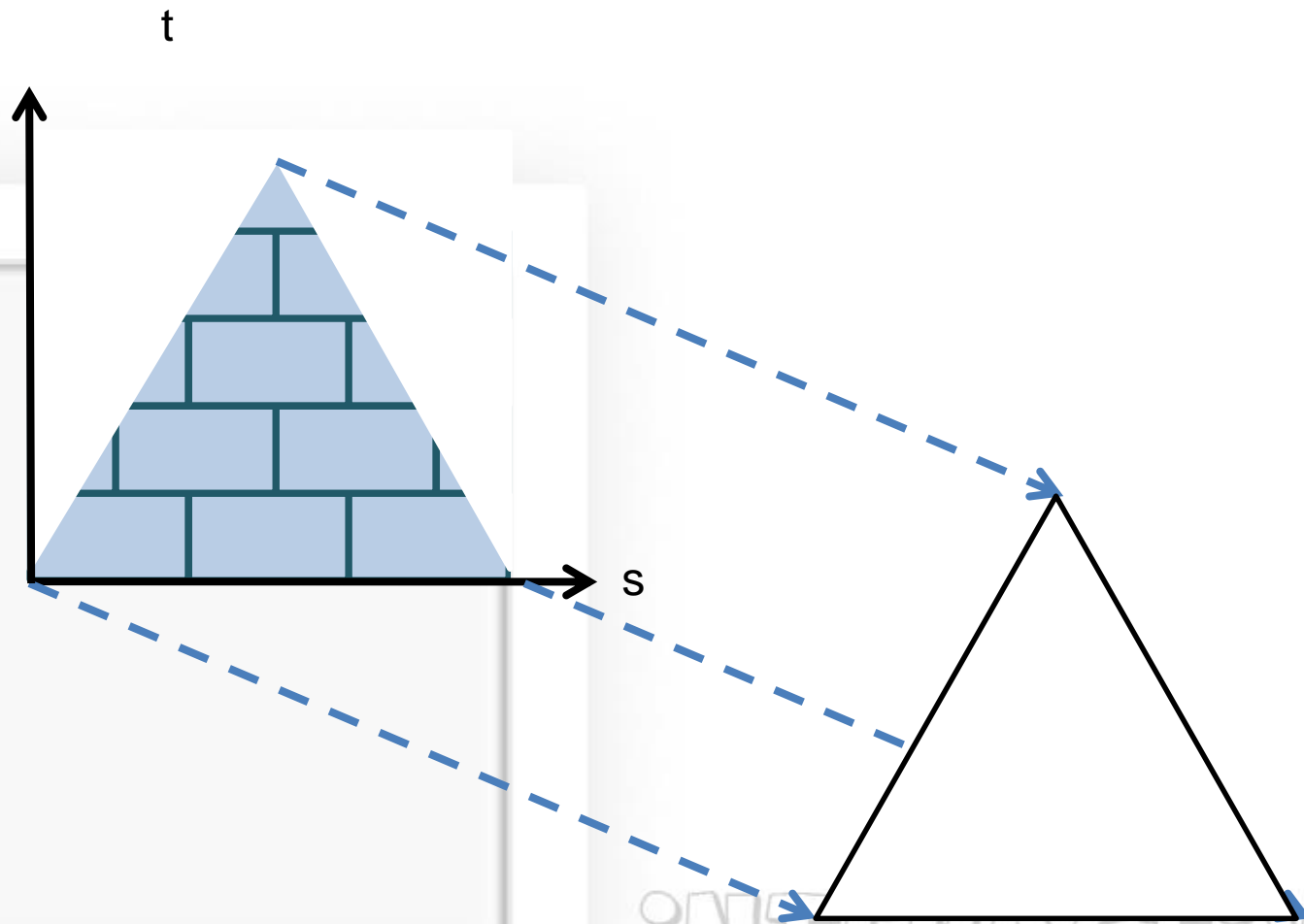


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Mapping a Texture

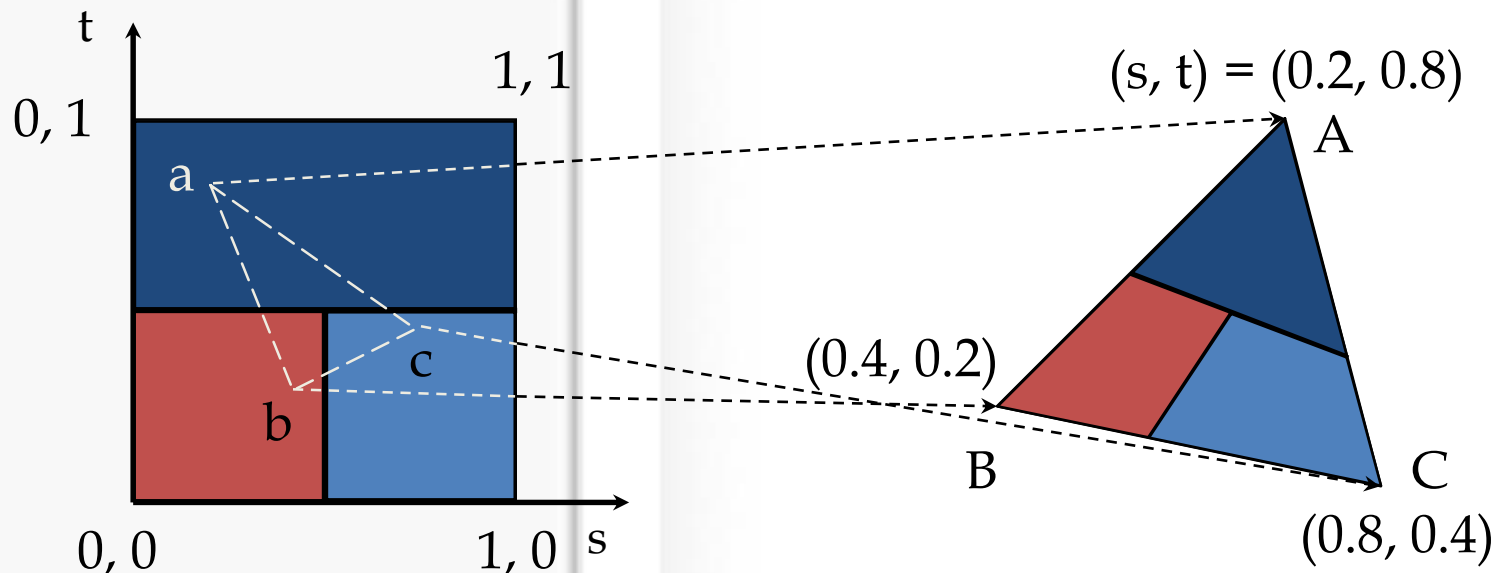


Mapping a Texture



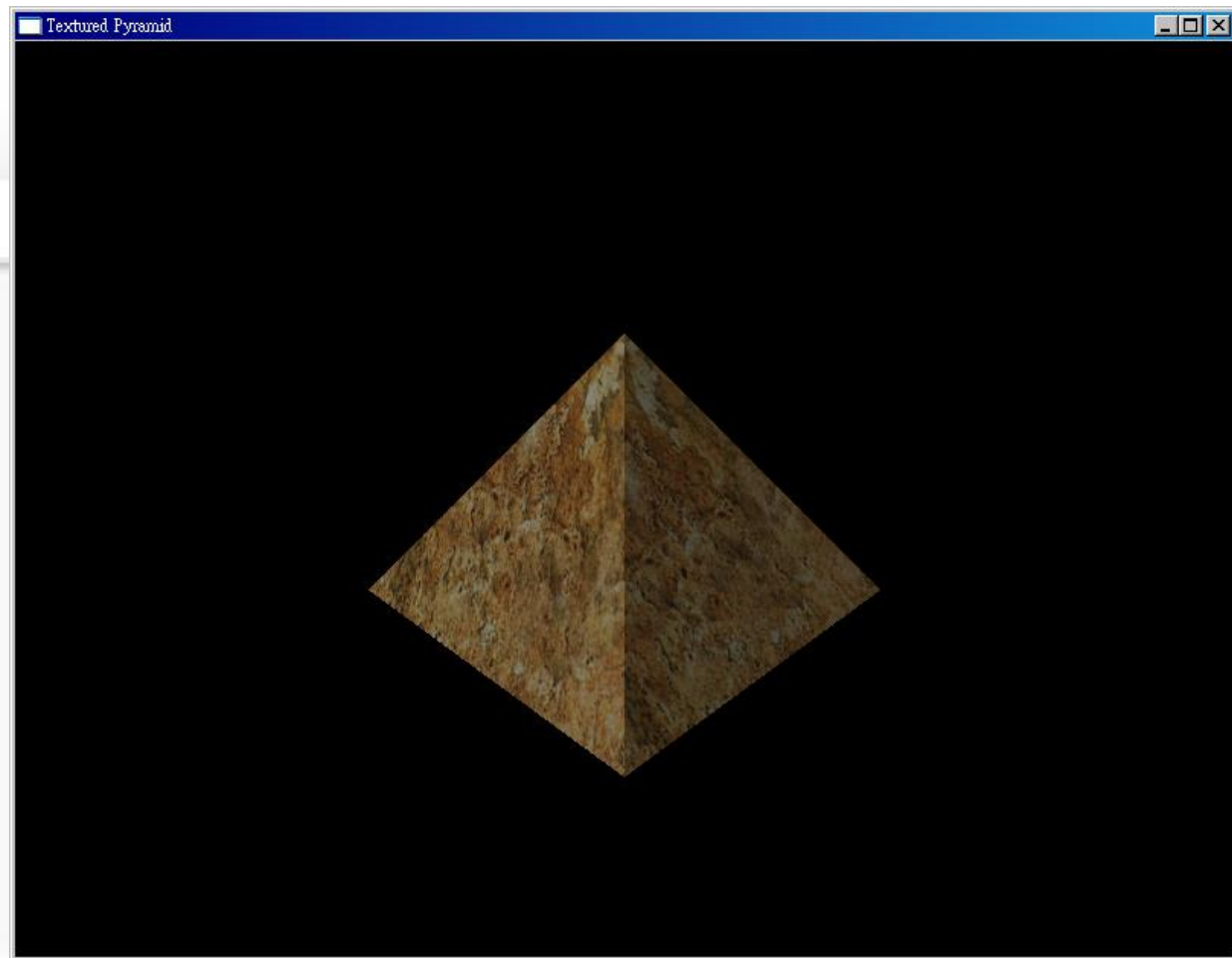
Mapping a Texture

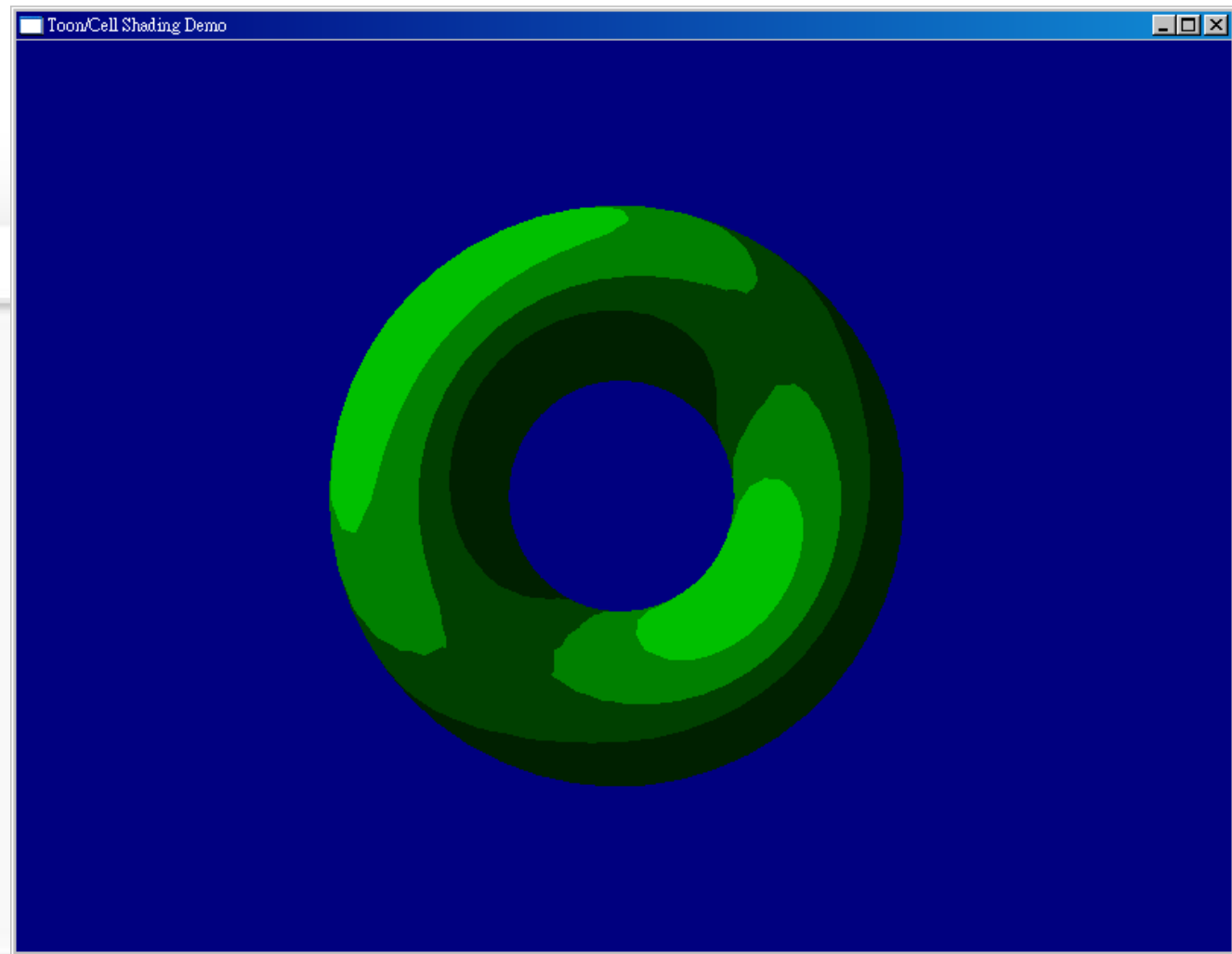
- Based on parametric texture coordinates
- TexCoord* ()** specified at each vertex





Texture image

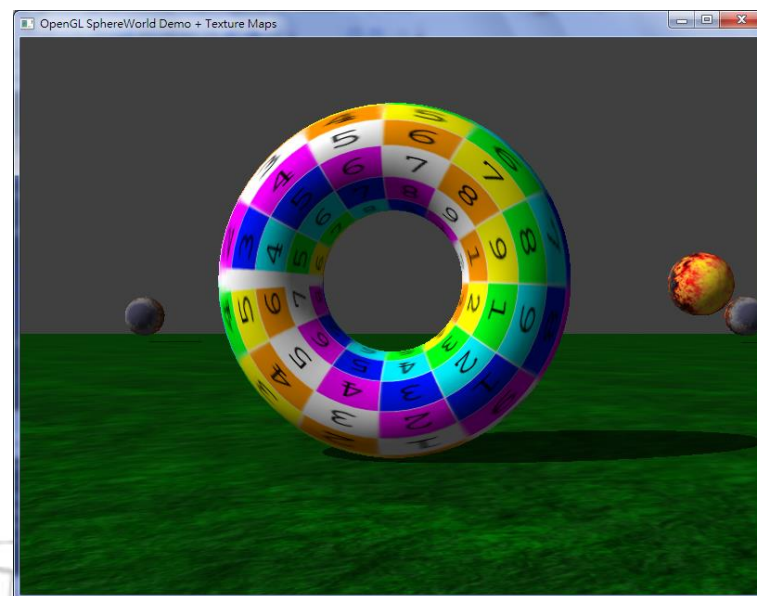
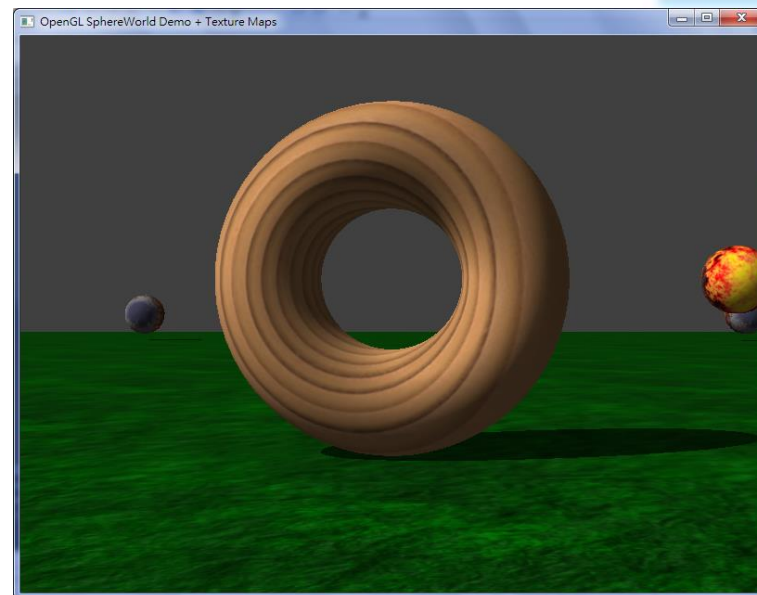




1D Texture

UV mapping

1	2	3	4	5	6	7	8	9	0	1	2
2	3	4	5	6	7	8	9	1	2	3	4
3	4	5	6	7	8	9	1	2	3	4	5
4	5	6	7	8	9	1	2	3	4	5	6
5	6	7	8	9	1	2	3	4	5	6	7
6	7	8	9	1	2	3	4	5	6	7	8
7	8	9	1	2	3	4	5	6	7	8	9
8	9	1	2	3	4	5	6	7	8	9	1
9	1	2	3	4	5	6	7	8	9	1	2
1	2	3	4	5	6	7	8	9	1	2	3
2	3	4	5	6	7	8	9	1	2	3	4
3	4	5	6	7	8	9	1	2	3	4	5



Skeleton

2D CONCEPT



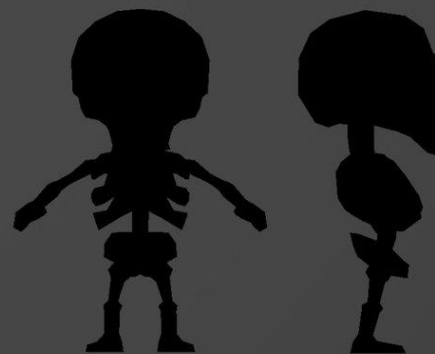
© Angry Mob Games



Total tris: 1100



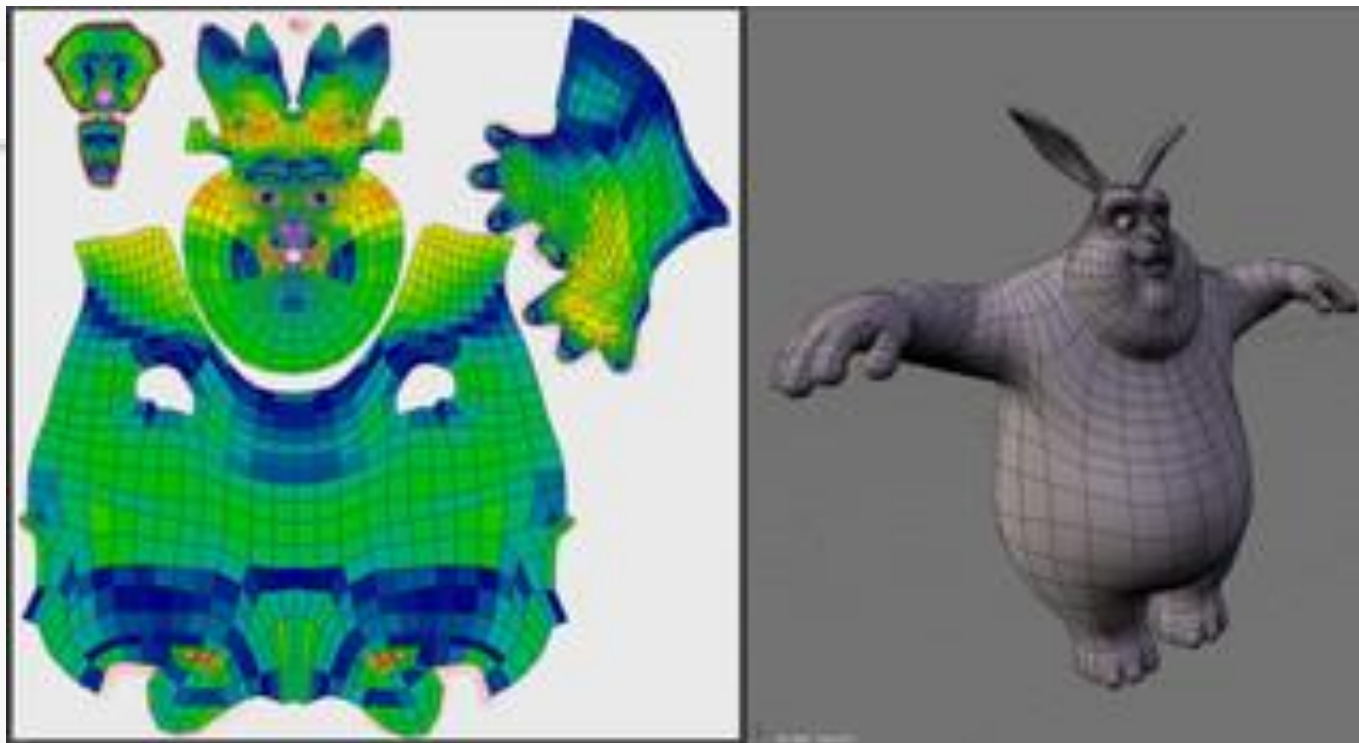
512x512 TEXTURE



© Angry Mob Games

3D model & texture by Rodrigo Gonçalves . RodrigoPixel.com.br

Complex model

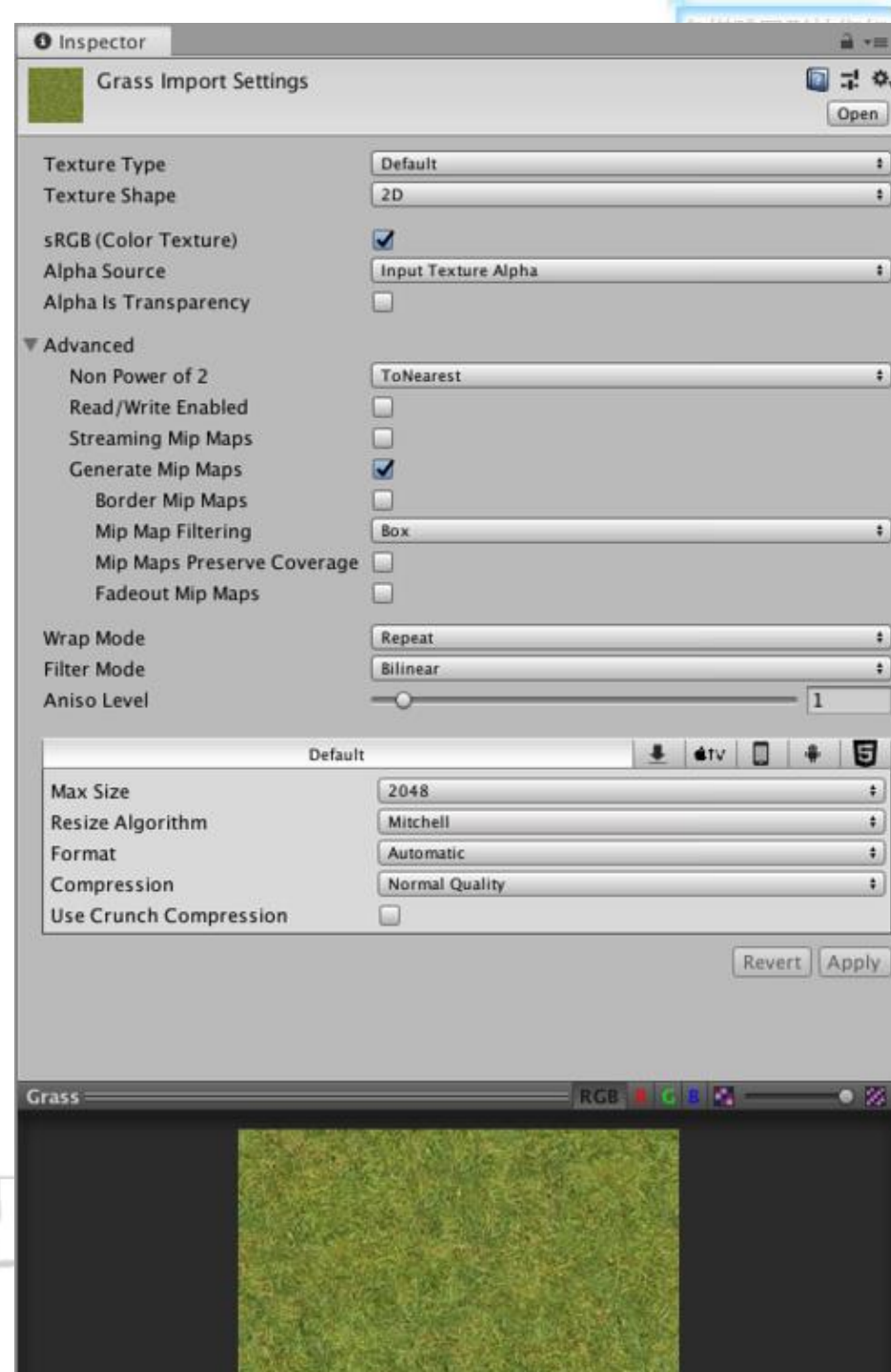


Blender uv mapping

Texture in Unity

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Texture



Texture Types

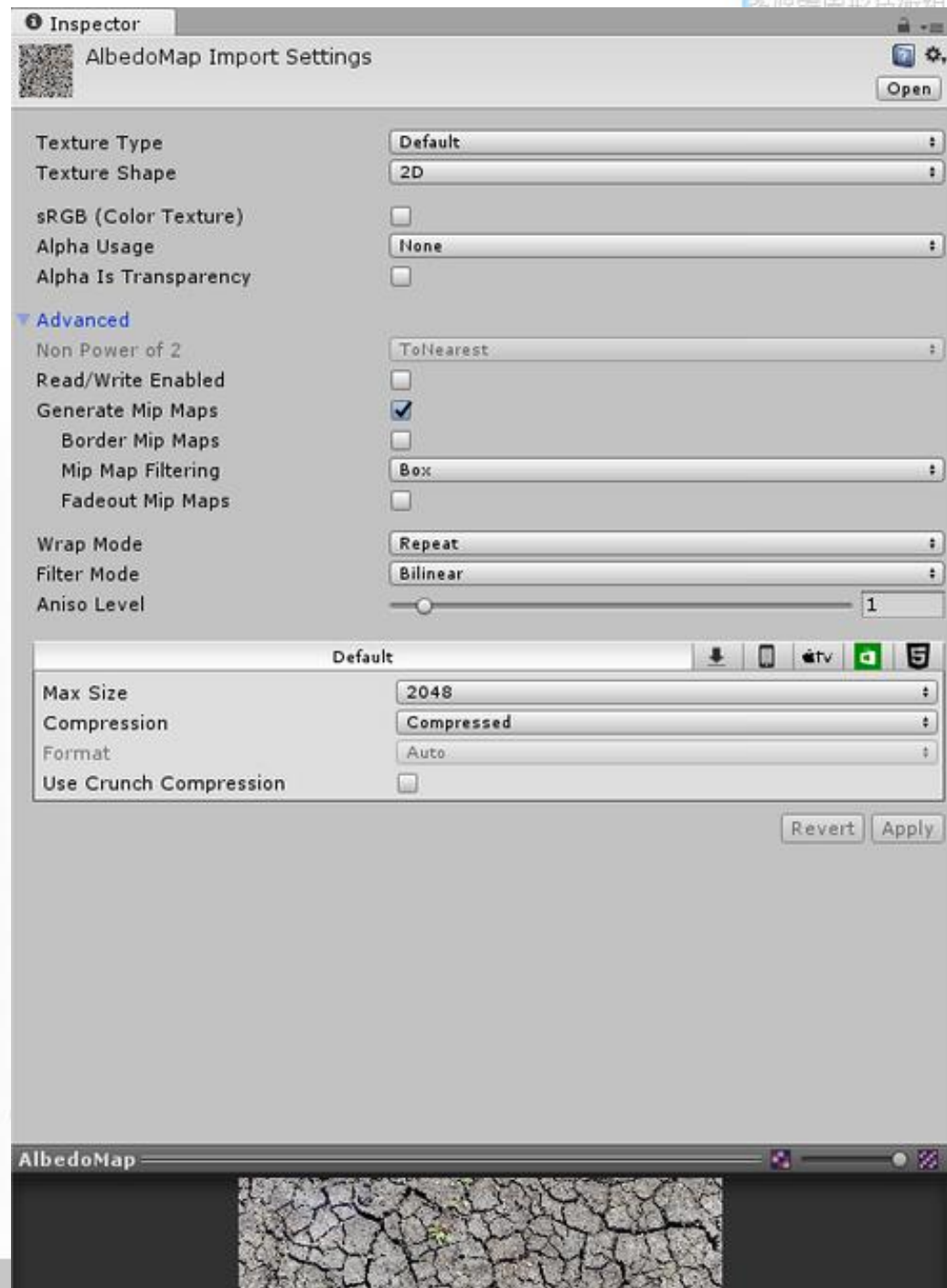


Alpha Source

- None
- Input Texture Alpha
- From Gray Scale



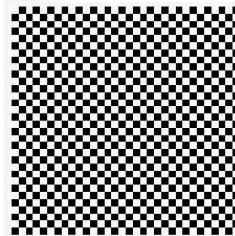
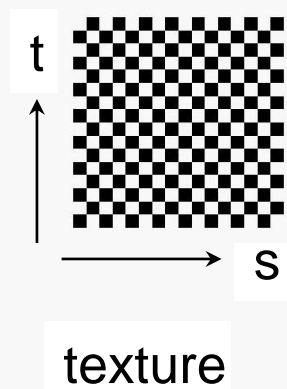
Alpha is Transparency



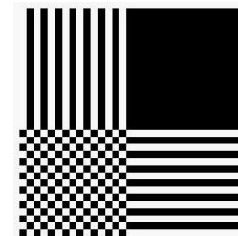
Wrap Mode

Clamping: if $s, t > 1$ use 1, if $s, t < 0$ use 0

Wrapping: use s, t modulo 1

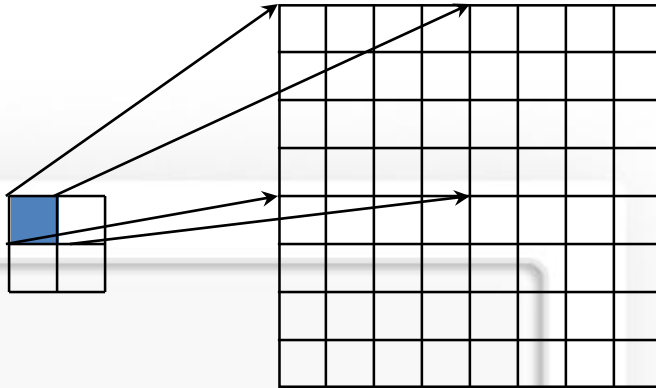


REPEAT



CLAMP

Magnification and Minification



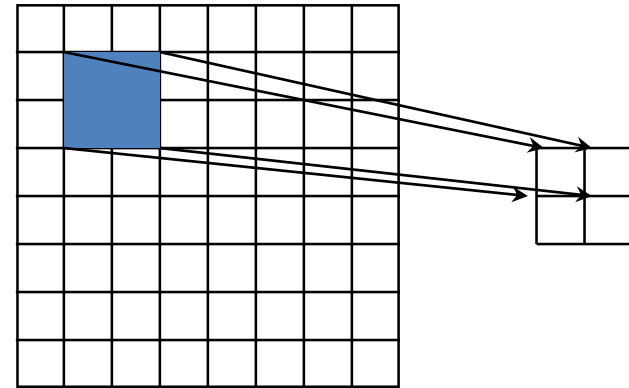
Texture

Polygon

Magnification

more than one pixel can cover a texel
(*magnification*)

Can use point sampling (nearest texel)



Texture

Polygon

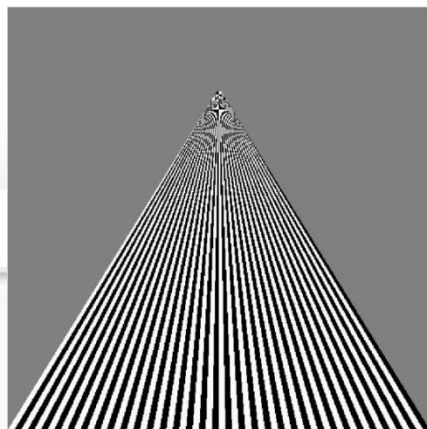
Minification

More than one texel can cover a pixel
(*minification*)

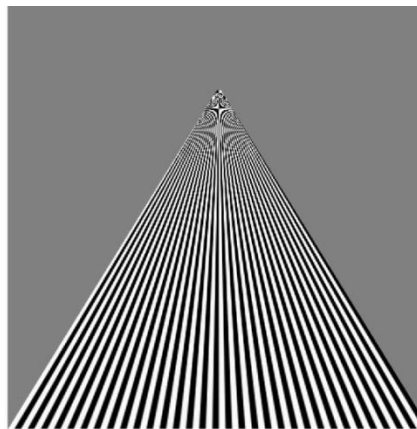
linear filtering
(2 x 2 filter) to obtain texture values

Example

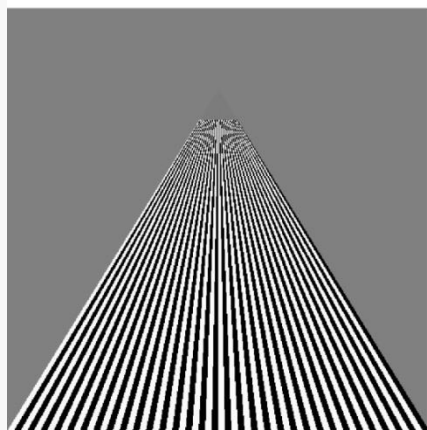
point
sampling



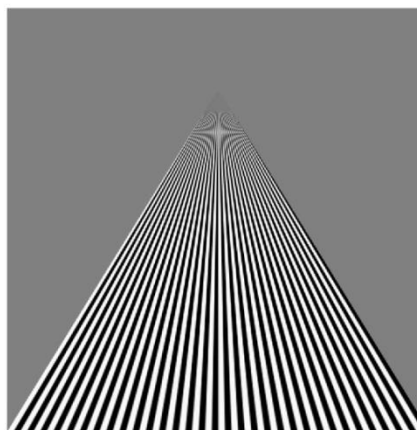
linear
filtering



mipmapped
point
sampling



mipmapped
linear
filtering

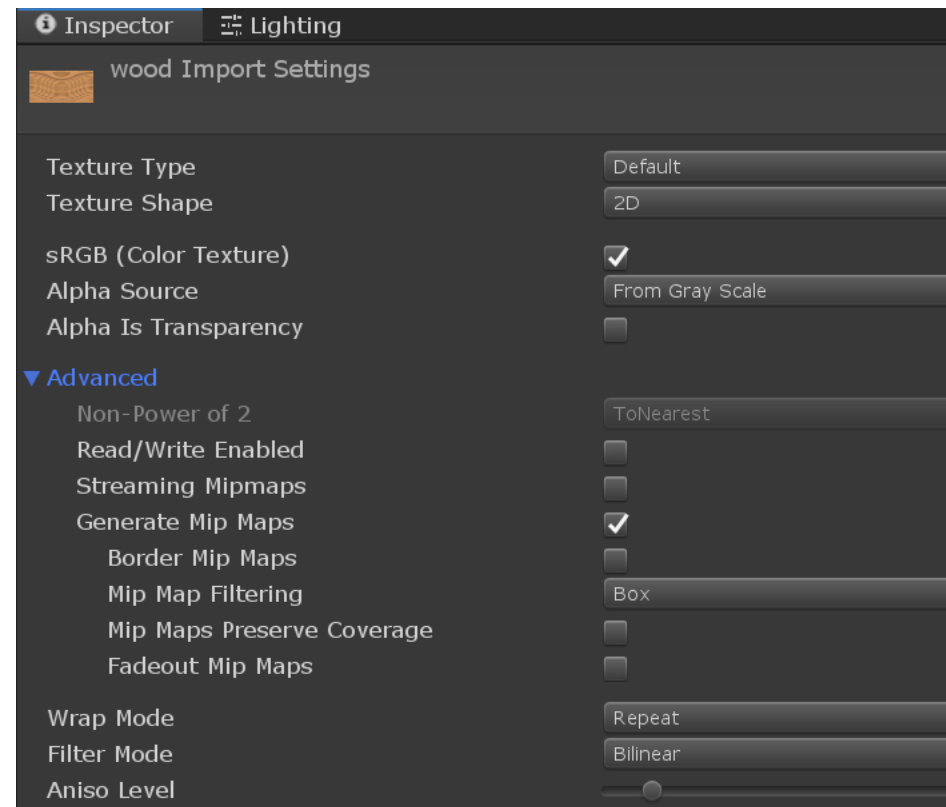


Multiple level of Detail

- ✎ Mipmaps – many things in a small place



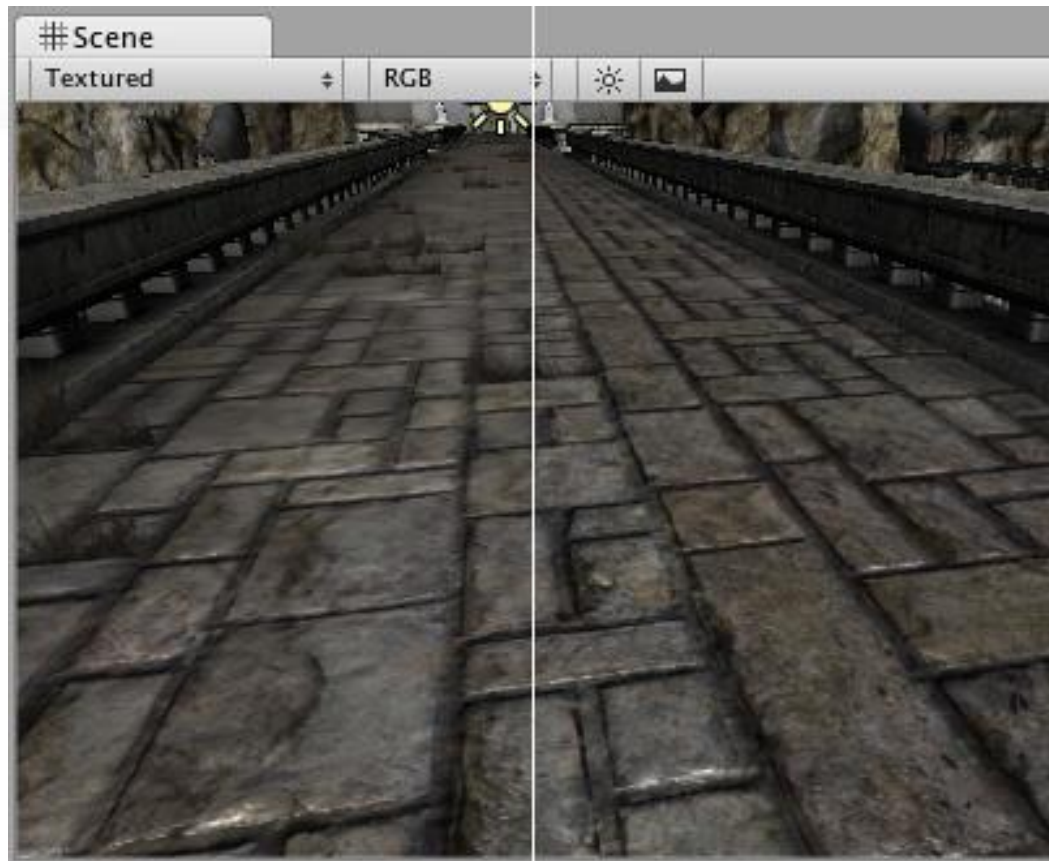
Multiple level of Detail



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Anisotropic filtering

Anisotropic filtering increases Texture quality when viewed from a grazing angle.



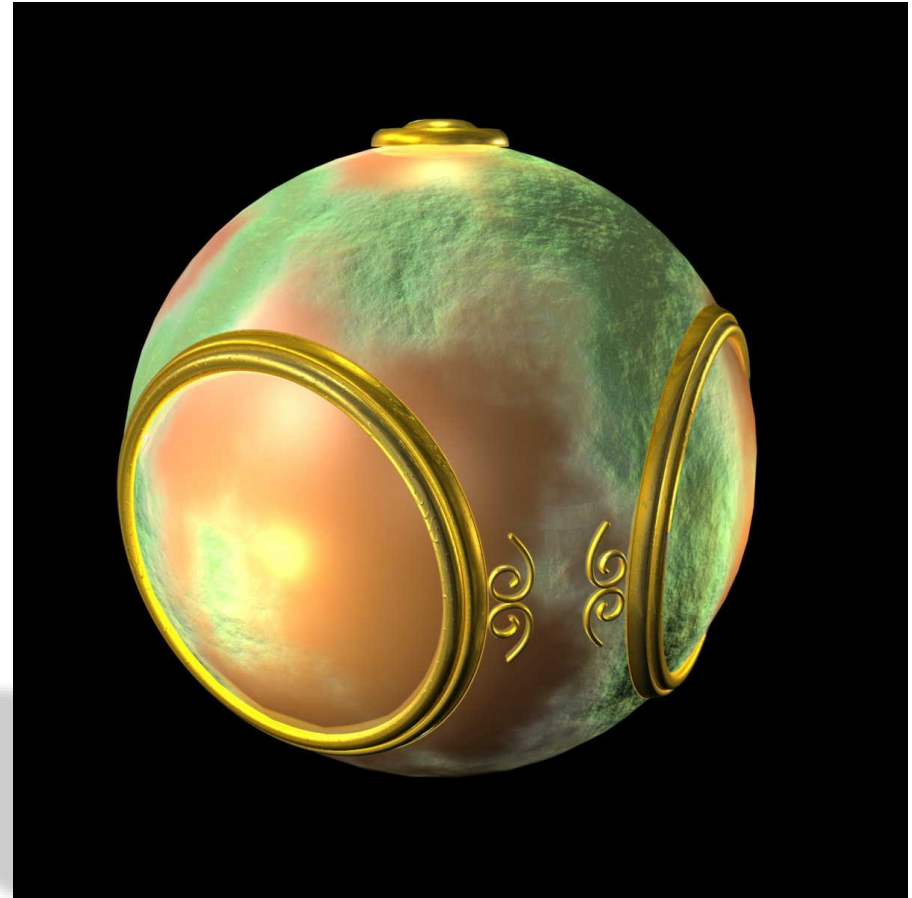
No Anisotropy (left) / Maximum Anisotropy (right),
used on a ground Texture

Texture with Material

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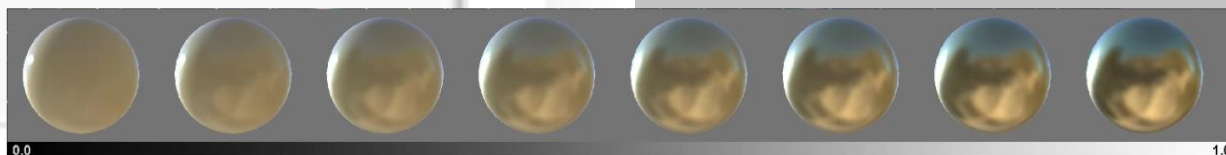
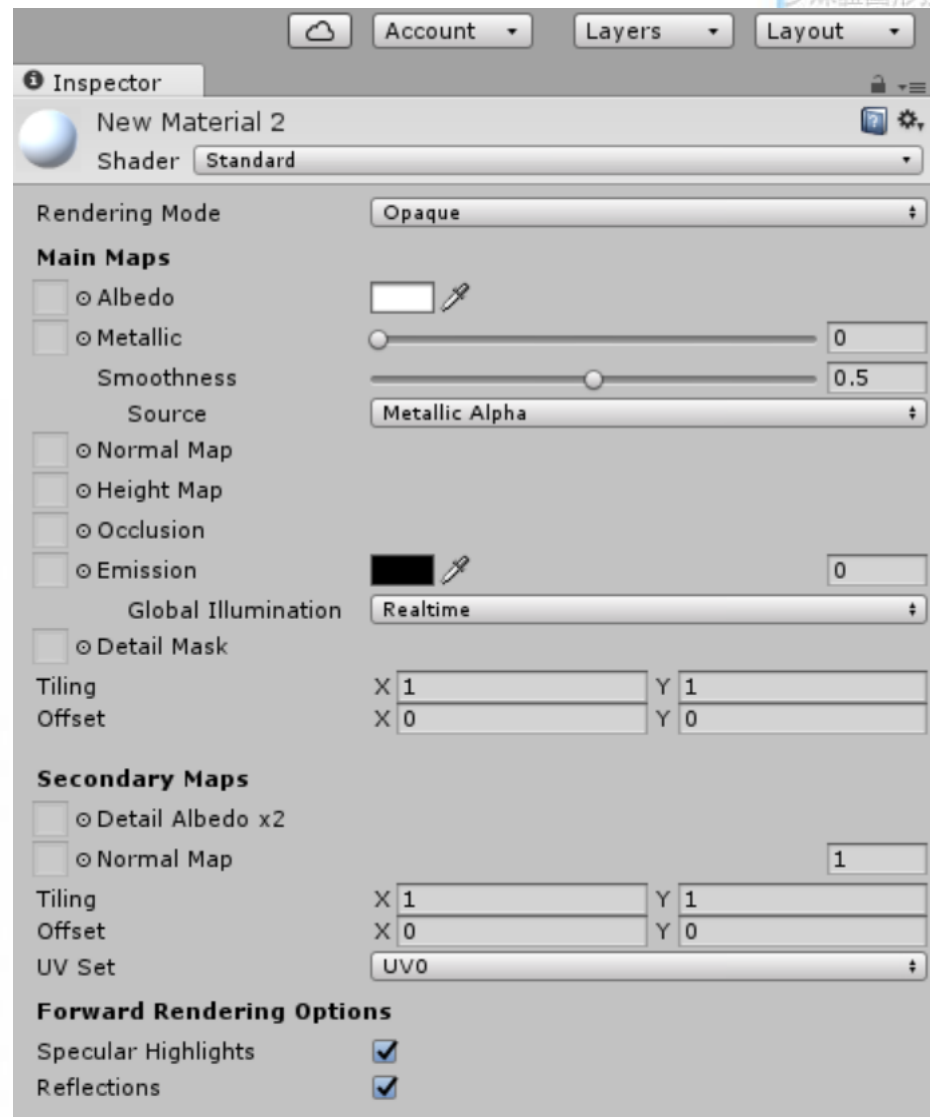
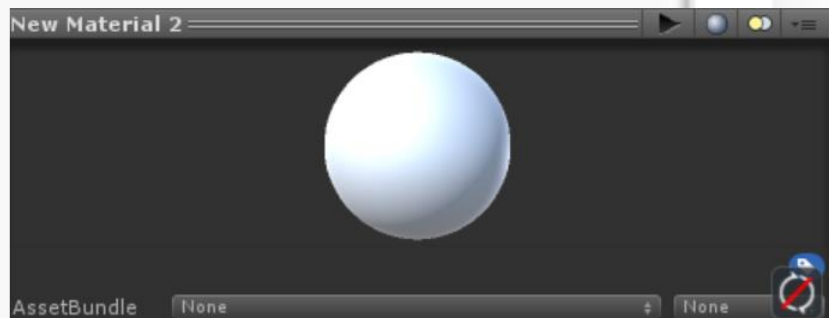


Environment Mapping
Skybox / [Reflection Probe](#)



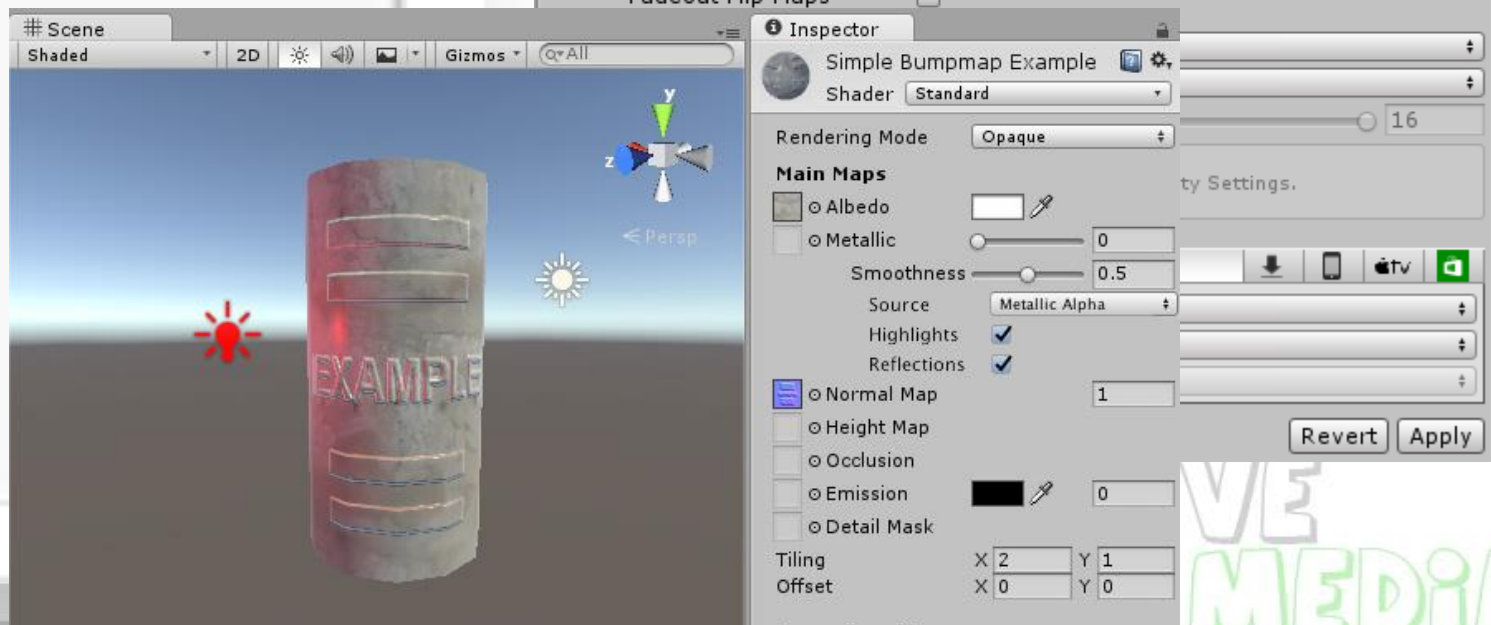
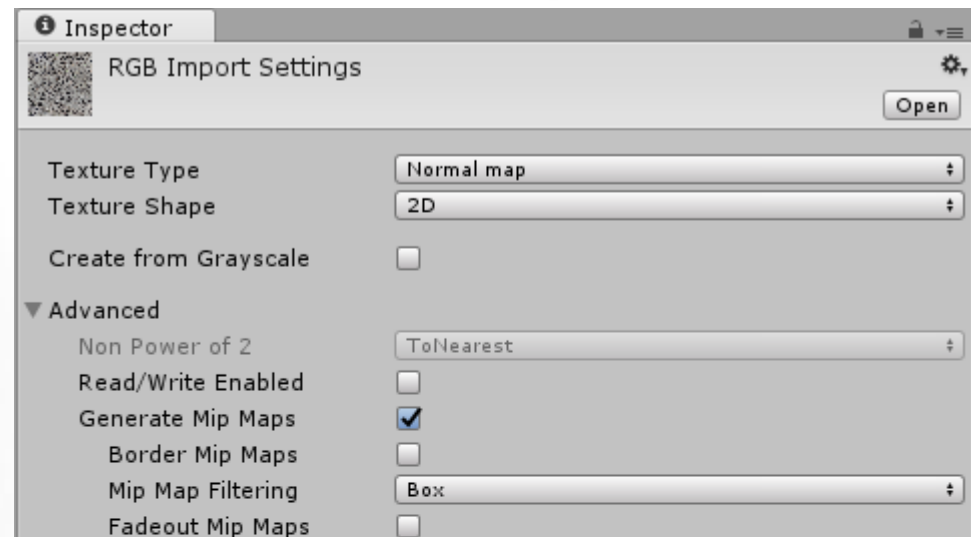
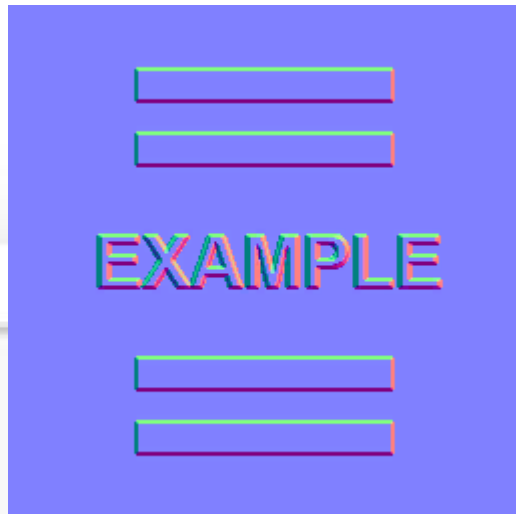
Bump Mapping

Standard



Metallic

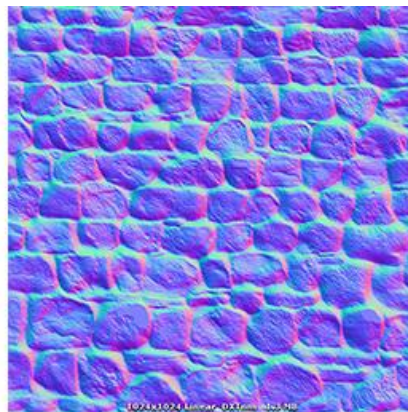
Texture type: Normal Map



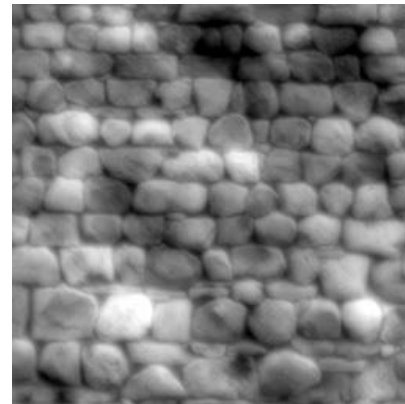
Height Maps



albedo



Normal



Height



High Poly -> Low Poly



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Render Texture

