3D Game Programming Texture Mapping

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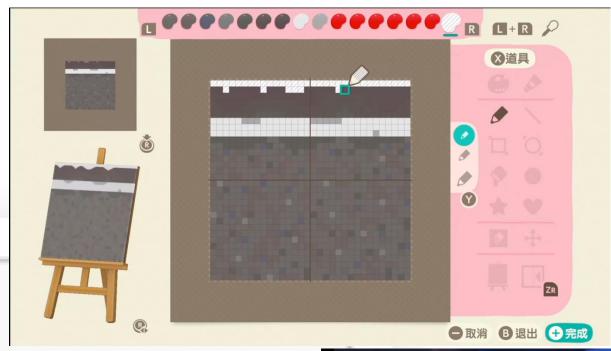


Virtua Fighter 1993



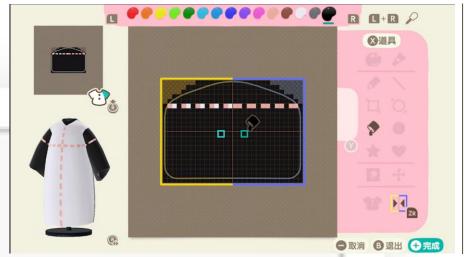
Virtua Fighter 2 1994

INTERACTI



〔Anzu TV〕從頭教你畫! 超逼真柏油道路教學!〔 集合啦!動物森友會〕









動物森友會-禰豆子服裝DIY過程鬼滅之



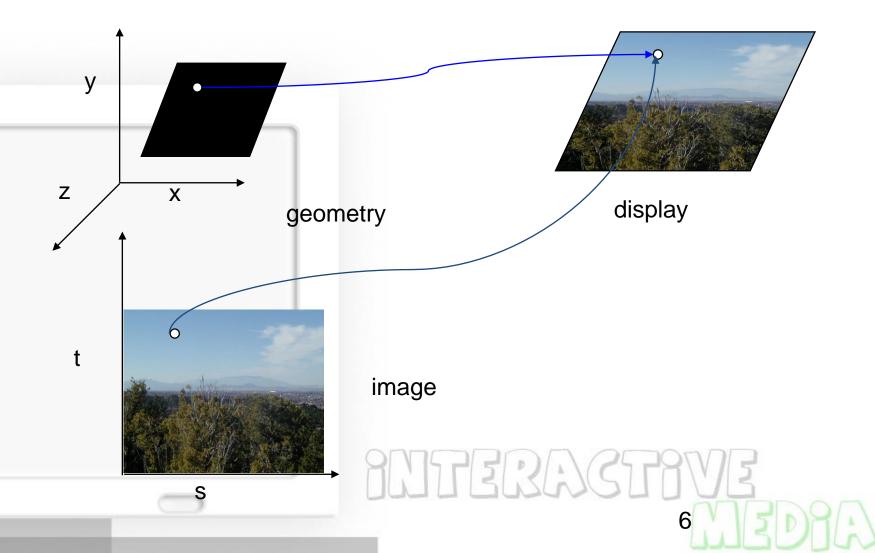
Outline

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

Render Texture

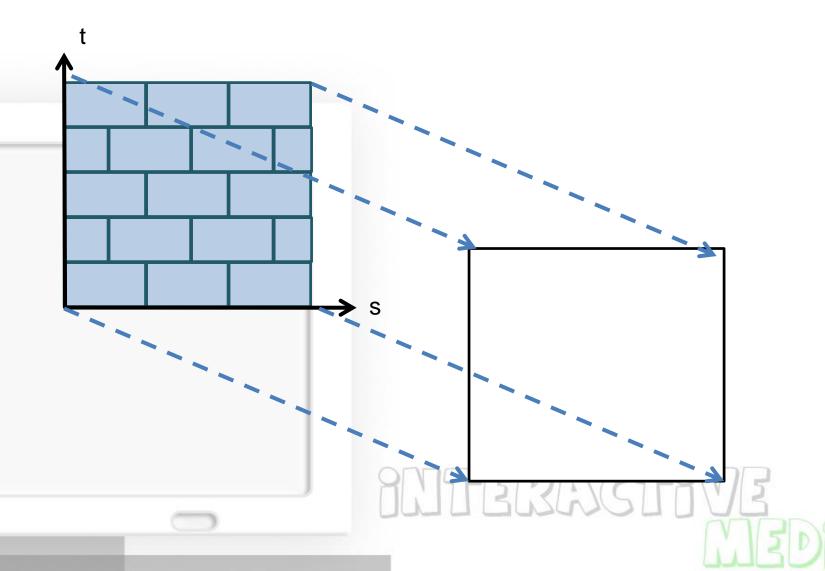


Texture Mapping



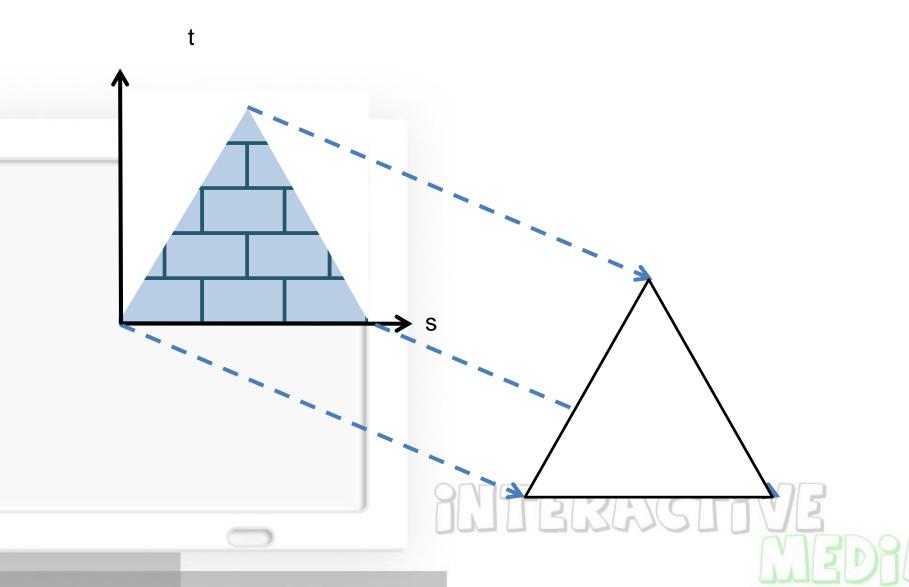


Mapping a Texture





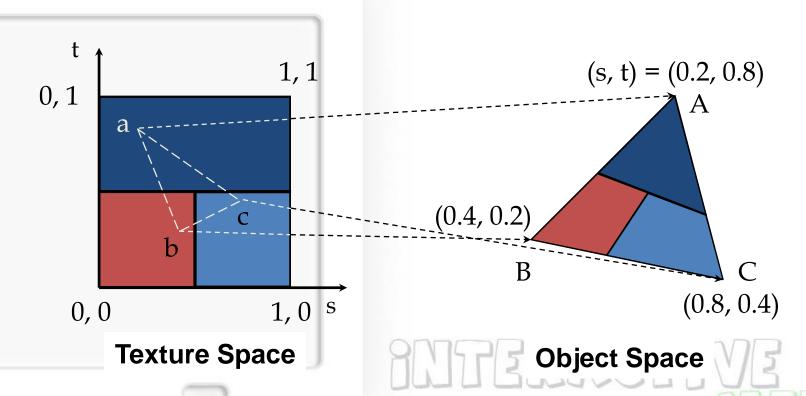
Mapping a Texture





Mapping a Texture

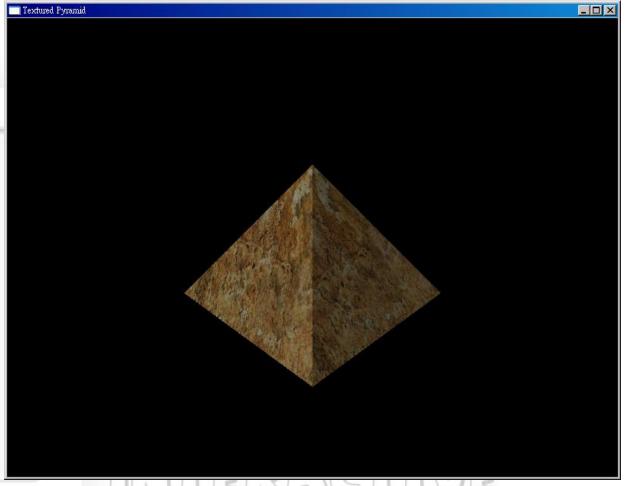
- Based on parametric texture coordinates
- Texcoord* () specified at each vertex

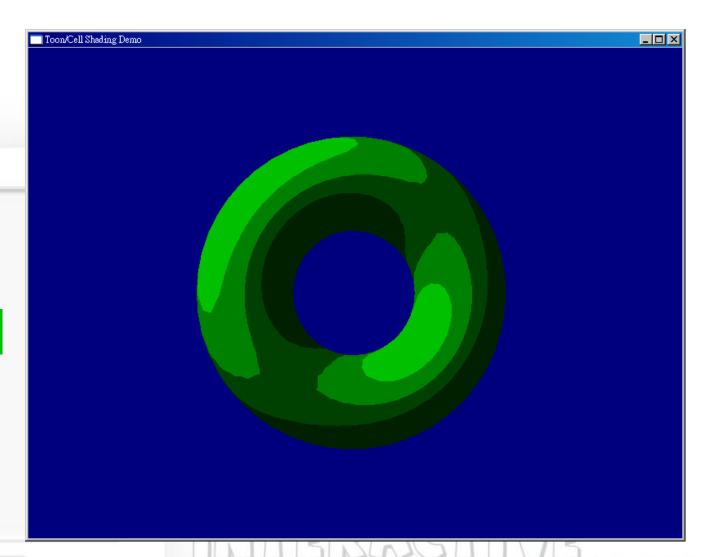






Texture image

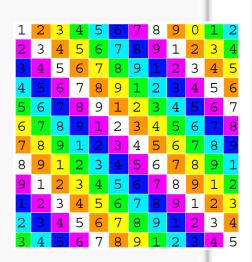


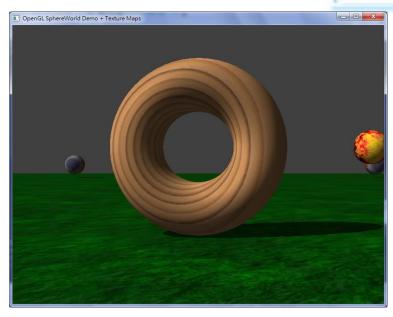


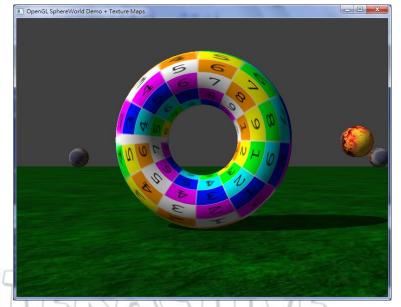


多媒體圖形技術組

UV mapping







Skeleton



2D CONCEPT





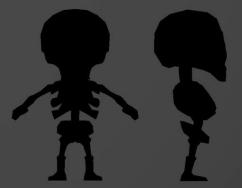






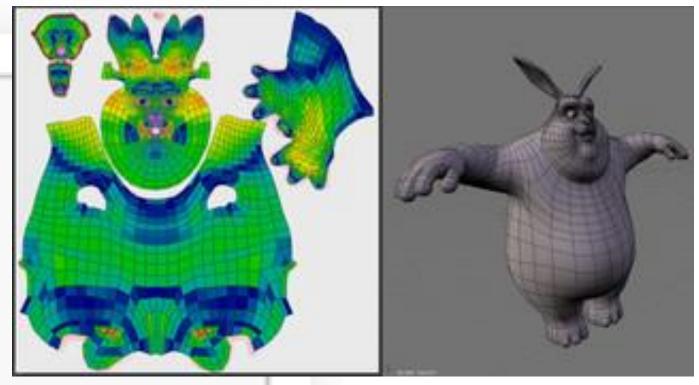








Complex model



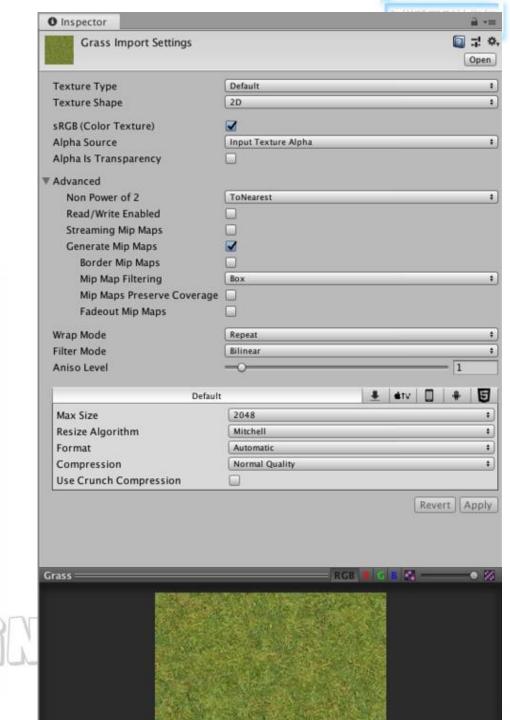
Blender uv mapping

Texture in Unity

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Texture

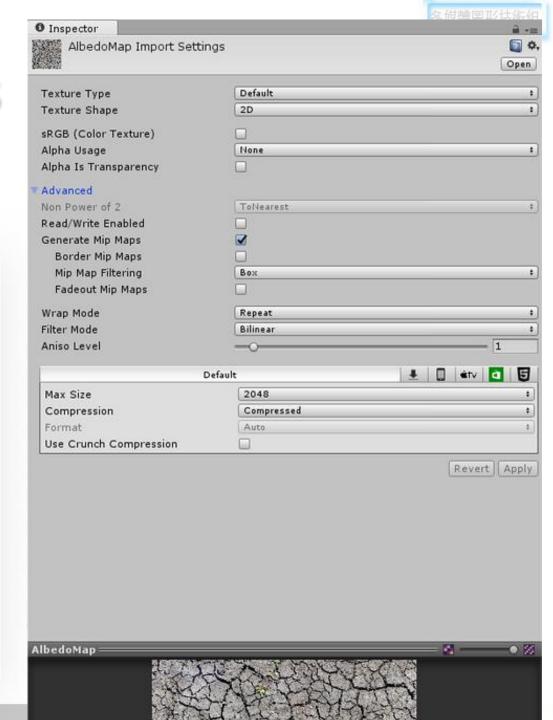


Texture Types

Alpha Source

- None
- Input Texture Alpha
- From Gray Scale
- Alpha is
 Transparency



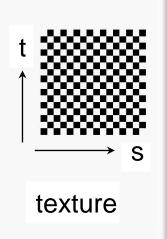


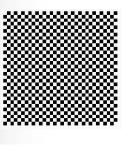


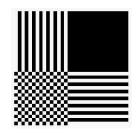
Wrap Mode

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

Wrapping: use s,t modulo 1





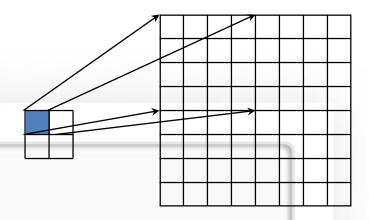


REPEAT

CLAMP



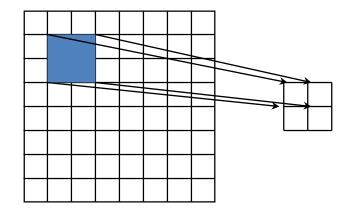
Magnification and Minification



Texture Polygon Magnification

more than one pixel can cover a texel (magnification)

Can use point sampling (nearest texel)



Texture Polygon

Minification

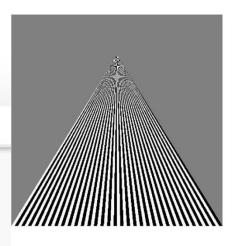
More than one texel can cover a pixel (*minification*)

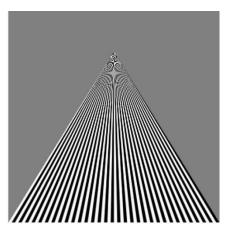
linear filtering (2 x 2 filter) to obtain texture values



Example

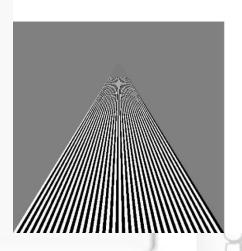
point sampling

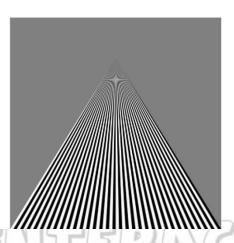




linear filtering

mipmapped point sampling





mipmapped linear filtering



Multiple level of Detail

Mipmaps – many things in a small place











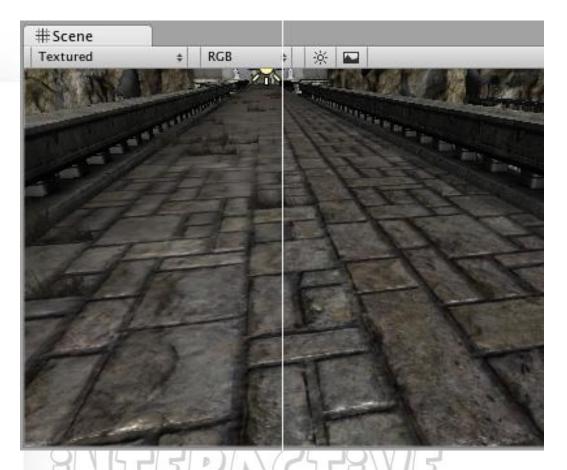
Multiple level of Detail

wood Import Settings	
wood Import Settings	
Texture Type	Default
Texture Shape	2D
sRGB (Color Texture)	₹
Alpha Source	From Gray Scale
Alpha Is Transparency	
▼ Advanced	
Non-Power of 2	
Read/Write Enabled	
Streaming Mipmaps	
Generate Mip Maps	✓
Border Mip Maps	
Mip Map Filtering	Box
 Mip Maps Preserve Coverage	
Fadeout Mip Maps	
Wrap Mode	Repeat
Filter Mode	Bilinear
Aniso Level	



Anisotropic filtering

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



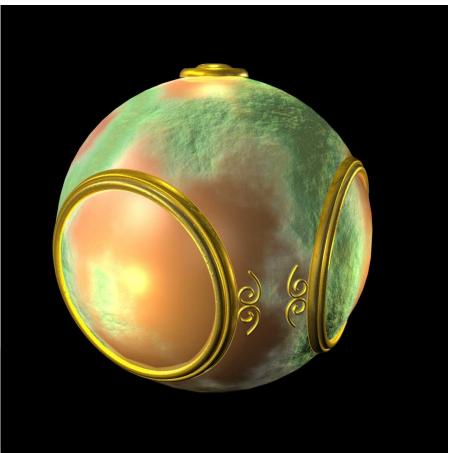
No Anisotropy (left) / Maximum Anisotropy (right), used on a ground Texture

Texture with Material

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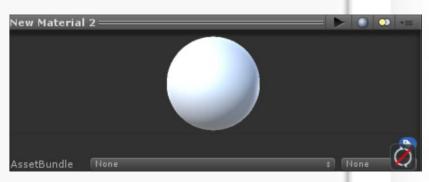


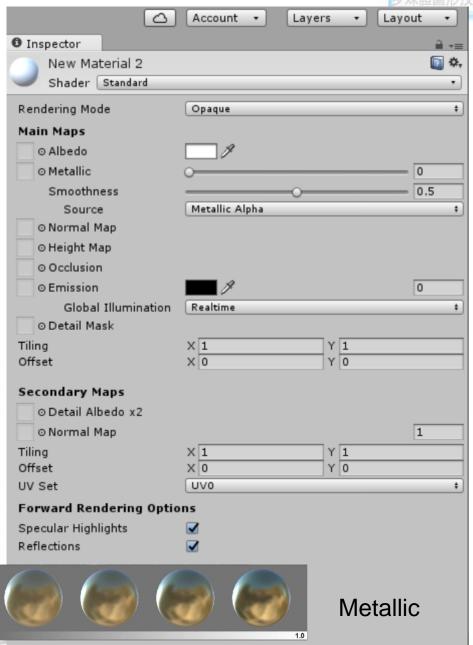


Environment Mapping Skybox / Reflection Probe

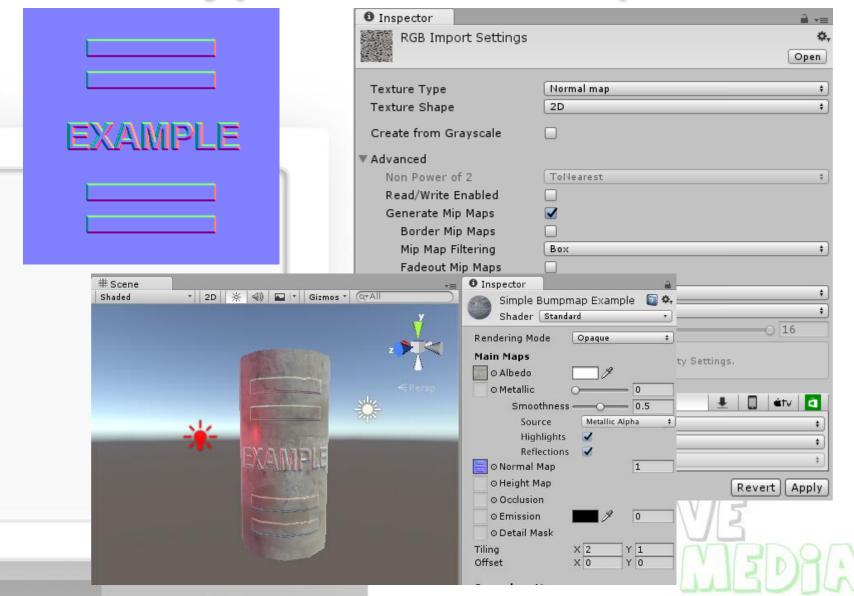
Bump Mapping

Standard





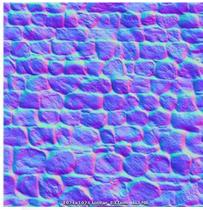
Texture type: Normal Map

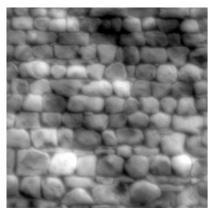




Height Maps







albedo

Normal

Height









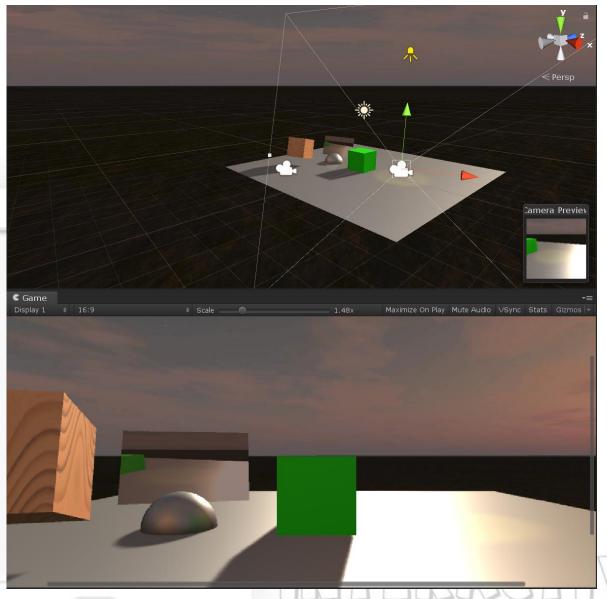
High Poly -> Low Poly



Render Texture

▽ Camera		New Render Texture	
Tag Untagged	‡ La yer Default		
人 Transform			
Position	X 2.32 Y 1.320983	Dimension	:
Rotation	X 15.513 Y -24.558	Size	2
Scale	X 1 Y 1	Anti-aliasing	
🖆 🗸 Camera		Enable Compatible Color Format	Ţ.
Clear Flags	Skybox	Color Format	F
Background		Depth Buffer	7
Culling Mask	Everything	Enable Mip Maps	
Projection	Perspective	Auto generate Mip Maps	
FOV Axis	Vertical		
Field of View		Dynamic Scaling	
Physical Camera		Wrap Mode	
Clipping Planes	Near 0.3	Filter Mode	
	Far 1000	Aniso Level	
Viewport Rect	X 0 Y 0		
	W 1 H 1		
Depth	0		
Rendering Path	Use Graphics Settings		MA
Target Texture	■ New Render Texture	コーピラック ハイフィー	$\langle V V I \rangle$

2, Lighting	
New Render Texture	
Dimension	2D
Size	256
Anti-aliasing	None
Enable Compatible Color Format	✓
Color Format	R8G8B8A8_UNORM
Depth Buffer	At least 24 bits depth (with stenci
Enable Mip Maps	
Auto generate Mip Maps	✓
Dynamic Scaling	
Wrap Mode	Clamp
Filter Mode	Bilinear
Aniso Level	



MEDIA