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# COMP3421 Week 2

— Movement, materials, and  
geometry —

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# Transformations?



# Transformations.

- How do you move an object in the editor?
  - That's right, you edit it's transform...
- Can we do this through blueprints?
- Yes we can!!

# What are materials, anyway?

- Essentially, materials define how objects reflect light.
- If we have no light, then the object will appear completely black. If there is light, then it will reflect some of that light, making it appear that colour
  - This is the “diffuse” or “albedo” component of the material.
- Some objects are super shiny, others are not. Shiny highlights are referred to as “specular” highlights. They are generally related to the roughness of the surface.
  - In Unreal Engine we will generally just alter the “roughness” of a material, and leave the specular value alone...
- We can even perform a kind of visual illusion and create surfaces that appear to have depth to them, without ever adding more geometry to our scene (adding too much geometry slows down graphics applications).
  - This is related to the “normal” component of the material...this will hopefully make more sense when we talk about lighting later in the course.

## Example diffuse/albedo map:

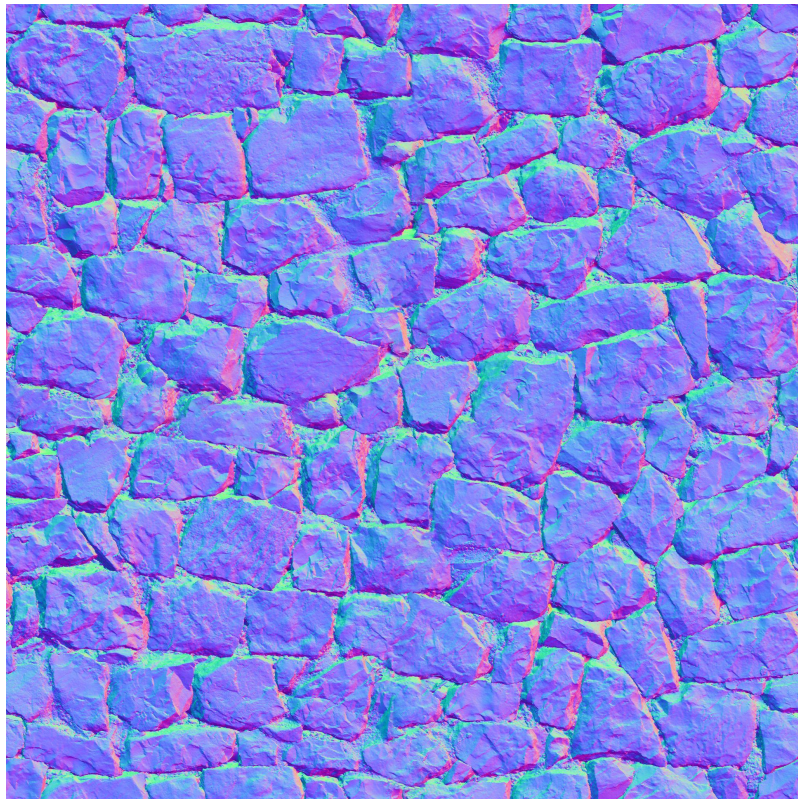


# Example roughness map





# Example normal map



# Previously used textures were found from

<https://polyhaven.com/>

This is a useful free resource for textures and models.



# Some shortcuts...

## GENERIC BLUEPRINT HOTKEYS

Find in Content Browser.....	CTRL+B
Save in Blueprint.....	CTRL+S
Redo.....	CTRL+Y
Undo.....	CTRL+Z
Find within Blueprint.....	CTRL+F
Find in all Blueprints.....	CTRL+SHIFT+F
Complete Blueprint.....	F7

## BLUEPRINT NODE ACTIONS

Rename Node.....	F2
Toggle Breakpoint.....	F9
Clear all Breakpoints.....	CTRL+SHIFT+F9
Select all.....	CTRL+A
Cut selection.....	CTRL+X
Copy selection.....	CTRL+C
Paste selection.....	CTRL+V
Duplicate Selection.....	CTRL+W
Move selection.....	Arrow Keys
Delete Selection.....	Del

## BLUEPRINT NODE CREATION HOTKEYS

Graph Action menu.....	RMB
Array Get Node.....	A+LMB
Branch Node.....	B+LMB
Comment Box Node.....	C
Delay Node.....	D+LMB
Sequence Node.....	S+LMB
Gate Node.....	G+LMB
For Each Loop Node.....	F+LMB
Multi-Gate Node.....	M+LMB
Do 'n' times Node.....	N+LMB
Do Once Node.....	O+LMB
BeginPlay Node.....	P+LMB

## BLUEPRINT NODE PIN ACTIONS

Pin Context Menu.....	RMB on pin
Highlight connected wires.....	Hover on pin
Connect to another pin.....	LMB drag to pin
Filtered actions.....	LMB drag to graph
Break all connections.....	ALT+LMB on pin
Move all connections.....	CTRL+LMB to pin



## Unreal Engine Hotkeys Cheatsheet

### BLUEPRINT NAVIGATION HOTKEYS

Pan around Graph.....	RMB + DRAG
Zoom in/out.....	Mwheel U/D
Zoom in extra.....	CTRL + Mwheel U/D
Zoom to fit selection.....	Home
Go to child graph.....	PgDn
Go to parent graph.....	PgUp

### VARIABLE ACTIONS WITHIN BLUEPRINT

VARIABLE GET.....	CTRL+Drag
VARIABLE SET.....	SHIFT+Drag
REPLACE VARIABLE.....	Drag to edge
GET/SET AS APPROPRIATE.....	Drag to Match

### MATERIAL EDITOR HOTKEYS

Constant.....	1+LMB
Constant2Vector.....	2+LMB
Constant3Vector.....	3+LMB
Constant4Vector.....	4+LMB
Panner.....	P+LMB
TextureCoordinate.....	U+LMB
MaterialFunctionCall.....	F+LMB
Add.....	A+LMB
Divide.....	D+LMB
Multiply.....	M+LMB
OneMinus.....	O+LMB
Power.....	E+LMB
ScalarParameter.....	S+LMB
VectorParameter.....	V+LMB
TextureSample.....	T+LMB
LinearInterpolate.....	L+LMB

### VIEWPORT CAMERA SHORTCUTS

Perspective View.....	ALT + G
Front View.....	ALT + H
Side View.....	ALT + K
Top View.....	ALT + J

## PLAY WORLD HOTKEYS

Play.....	ALT+P
Pause.....	PAUSE
Fullscreen.....	F11
Posses/Eject.....	F8
Command Console.....	` / ~

## VIEWPORT NAVIGATION

Movement (standard).....	LMB/RMB+Drag
Movement (game).....	RMB + WASD
Movement (maya).....	ALT + LMB/RMB
Zoom.....	Mwheel U/D
Focus selection.....	F
Wireframe view.....	ALT+2
Unlit view.....	ALT+3
Lit view.....	ALT+4
Grid size + .....	SHIFT+[
Grid size - .....	SHIFT+]

## VIEWPORT TRANSFORMATION

Translate.....	W
Rotate.....	E
Scale.....	R
Toggle Move/Rot/Scale.....	SPACEBAR
Duplicate Selected.....	ALT+[translate]
Vertex Snapping.....	V

## LEVEL EDITOR HOTKEYS

Context menu.....	RMB
Save All.....	CTRL+S
Rename.....	F2
Clear selection.....	ESC
Show NavMesh.....	P
Jump to bookmark.....	0-9
Set bookmark.....	CTRL + 0-9
Measure tool (otho).....	MMB + Drag
Hide selected.....	H
Unhide all.....	CTRL + H
Snap to Floor.....	END
Snap Pivot to floor.....	ALT+END
Snap bounds to floor.....	SHIFT+END
Snap Origin to grid.....	CTRL+END

Let's take a look at geometry brushes + static meshes

