VIDEO GAME CONCEPTS

UNREAL ENGINE

SECTION

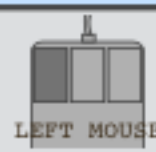
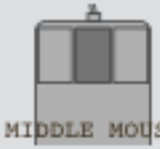
REVIEW SUMMARIES

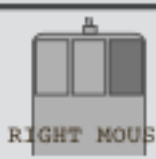
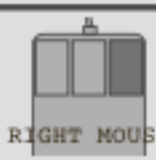
Keys Summary

QWERTY Keys	
W	Move
E	Rotate
R	Scale

Miscellaneous	
SHIFT + Move Tool	Moving an object carries the camera along with it
ALT + Move Tool	Selected object is duplicated and moved
SHIFT + F1	Regain mouse control while game is playing in preview
END	Selected object lowers to the surface of the ground

Mouse Camera Control (Miscellaneous)	
 + Q	Lift Upward
 + E	Lower Downward
 + Z	Lens Zoom Out
 + C	Lens Zoom In

Mouse Camera Control	
ALT + 	Tumble Camera
ALT + 	Pan Camera
ALT + 	Dolly Camera ("Zoom")

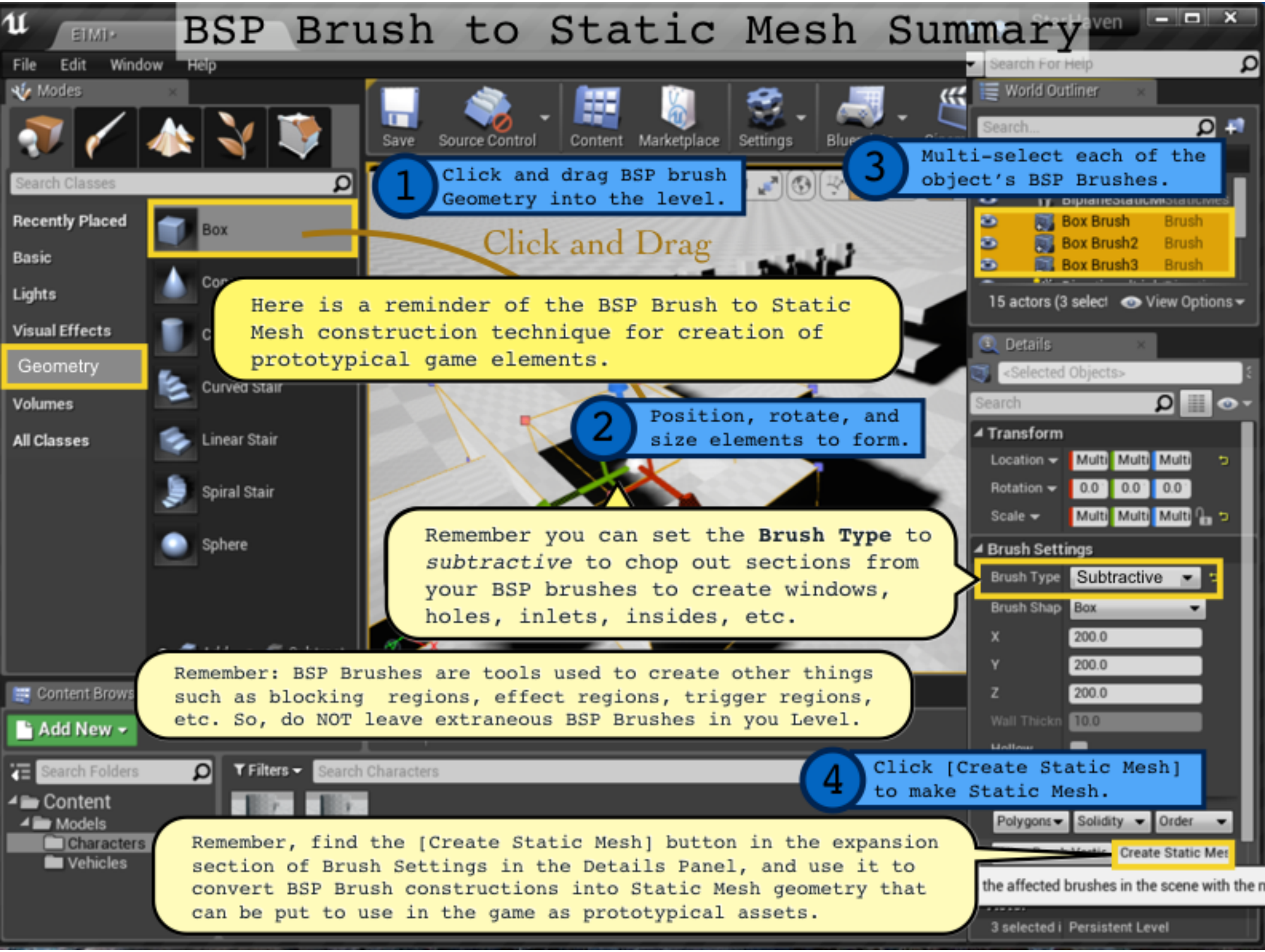
Mouse Camera Control (**Preferred**)	
 + W	Fly Forward
 + A	Strafe Left
 + S	Fly Backward
 + D	Strafe Right

Asset Summary

Here is a reminder about various **Asset Types** and how they can be **applied to** the Unreal Engine:

Asset	Usage
Pebbles, small rocks, grasses, flowers, and similar debris…	Landscape Materials
Large rocks, trees, and large similar debris…	Landscape Foliage
Game characters, vehicles, artificial intelligence agents, …	Pawn Blueprint
Building chunks, furniture, walls, doors, destructible pieces…	Static Mesh (Blueprint Optional)

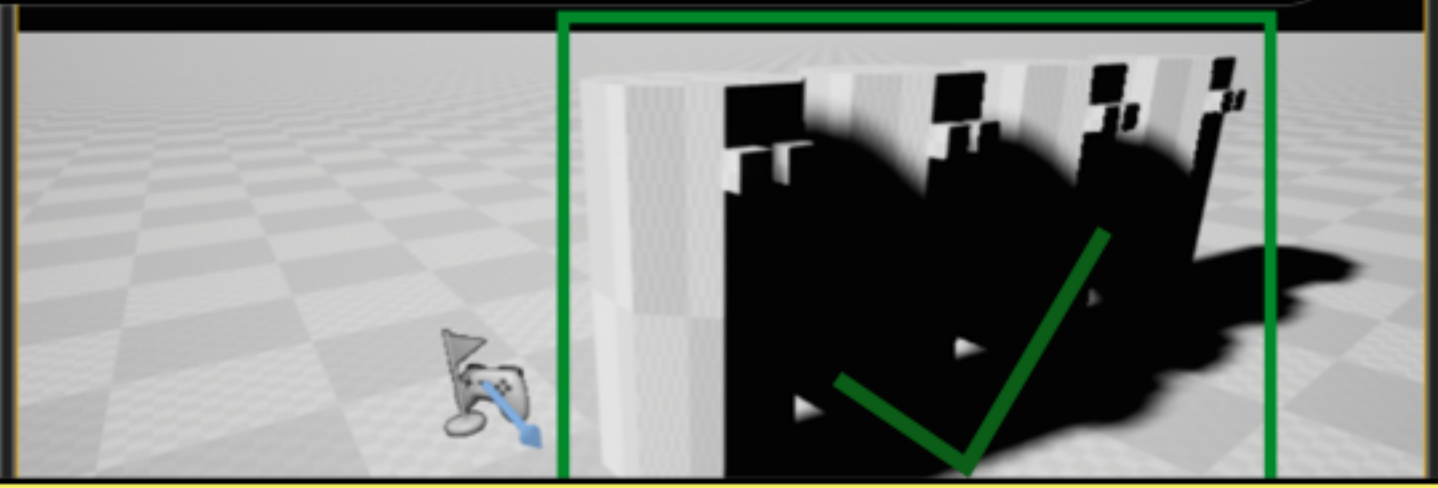
BSP Brush to Static Mesh Summary



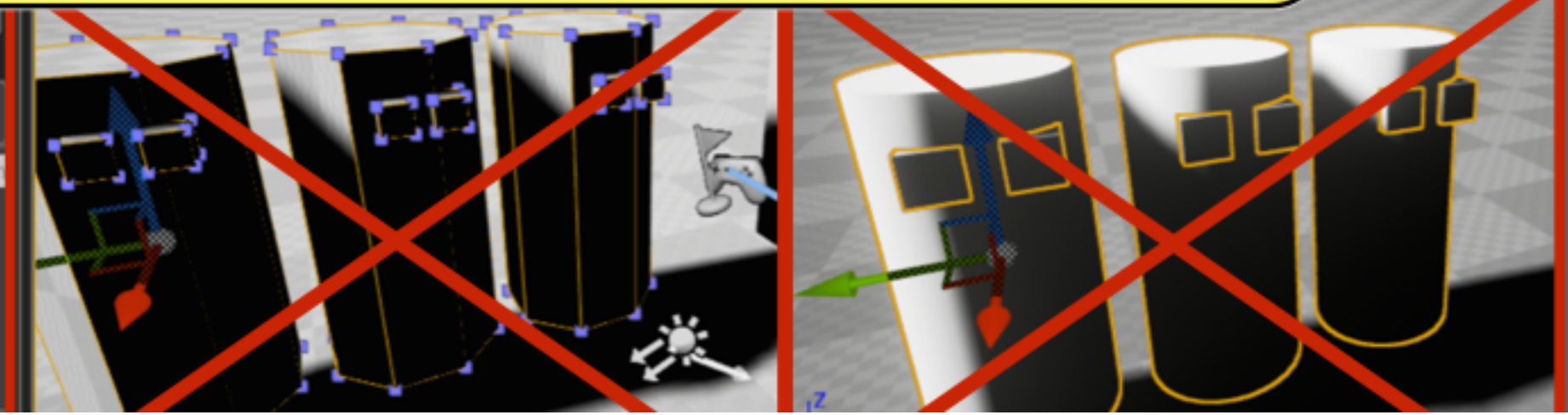
BSP Brush to Static Mesh Summary

Here is a reminder what a Static Mesh is… It is a geometric object that is stored on the video card and reused for the separate instances of a visible object.

Remember that Static Meshes act as the geometric appearance of elements in our game, can be imported and exported for refinement in Maya or Max.



Remember to avoid the incorrect ways to prototype, e.g. do not leave BSP Brushes by themselves and avoid using basic geometric primitives for construction of a game element that should be a static mesh.



Terrain Sculpting Summary

Here are reminders of basic terrain sculpting:

Hold down [SHIFT] with the **Sculpt Tool**, and use it to *lower* the terrain surface.

Shift + Click and Drag

Click and Drag

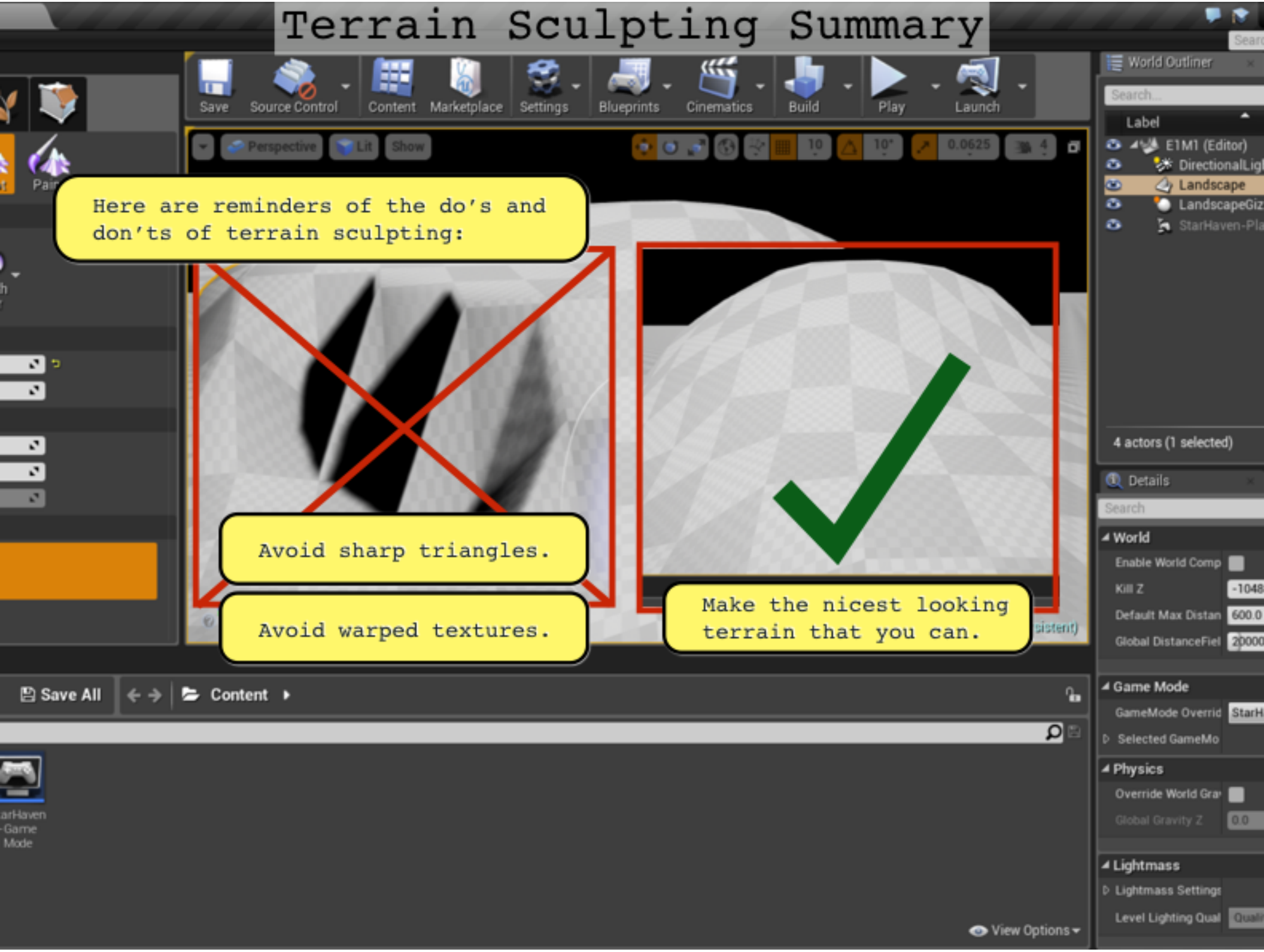
Click and drag with the Sculpt Tool to create mountains.

Use the **Flatten Tool** to *erase* the terrain by first clicking in the area depicting the desired height, and then scrubbing that height over the top of surfaces that you want to become that height.

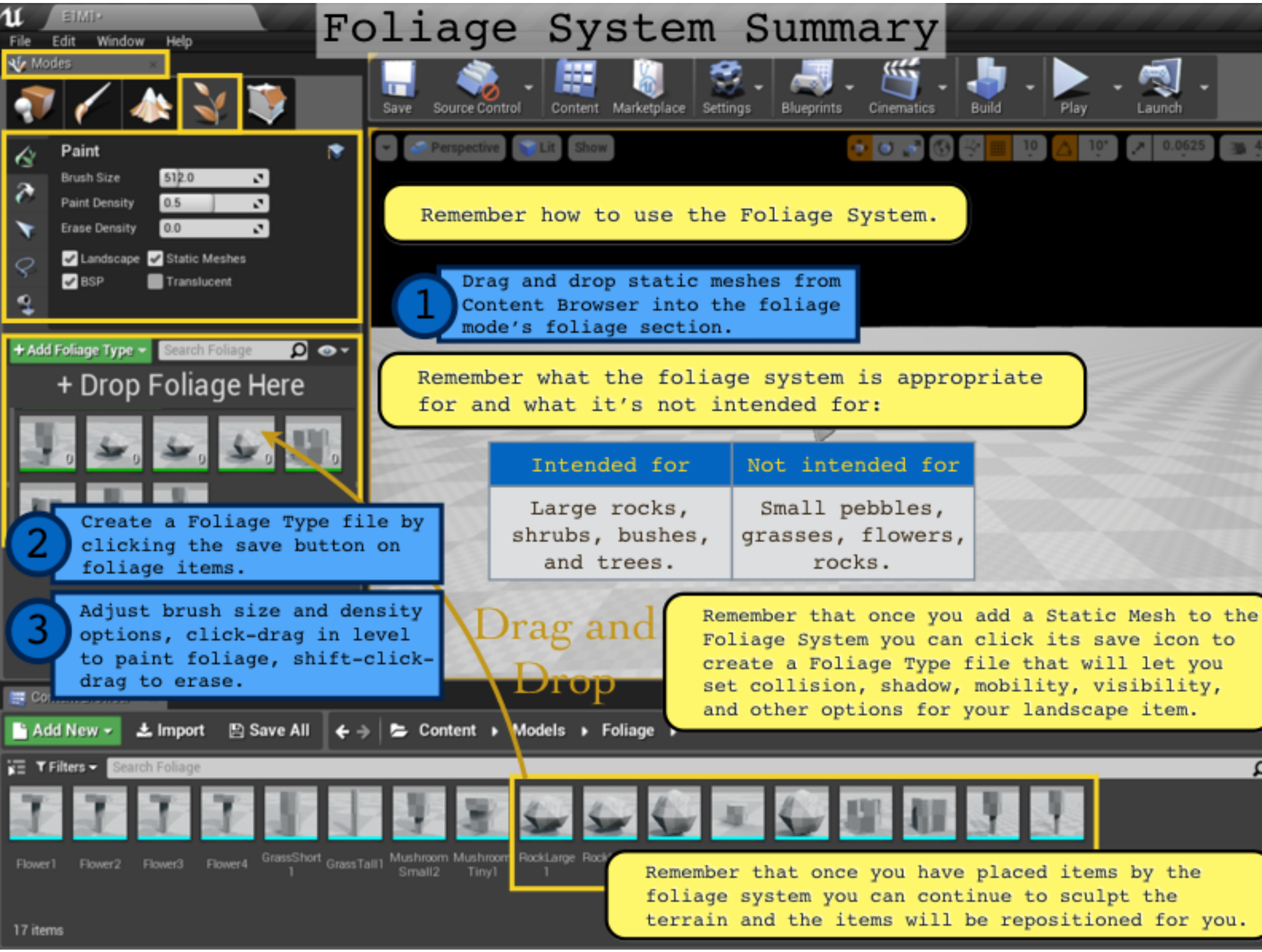
Click and Drag

Use the Flatten Tool to create plateaus.

Terrain Sculpting Summary

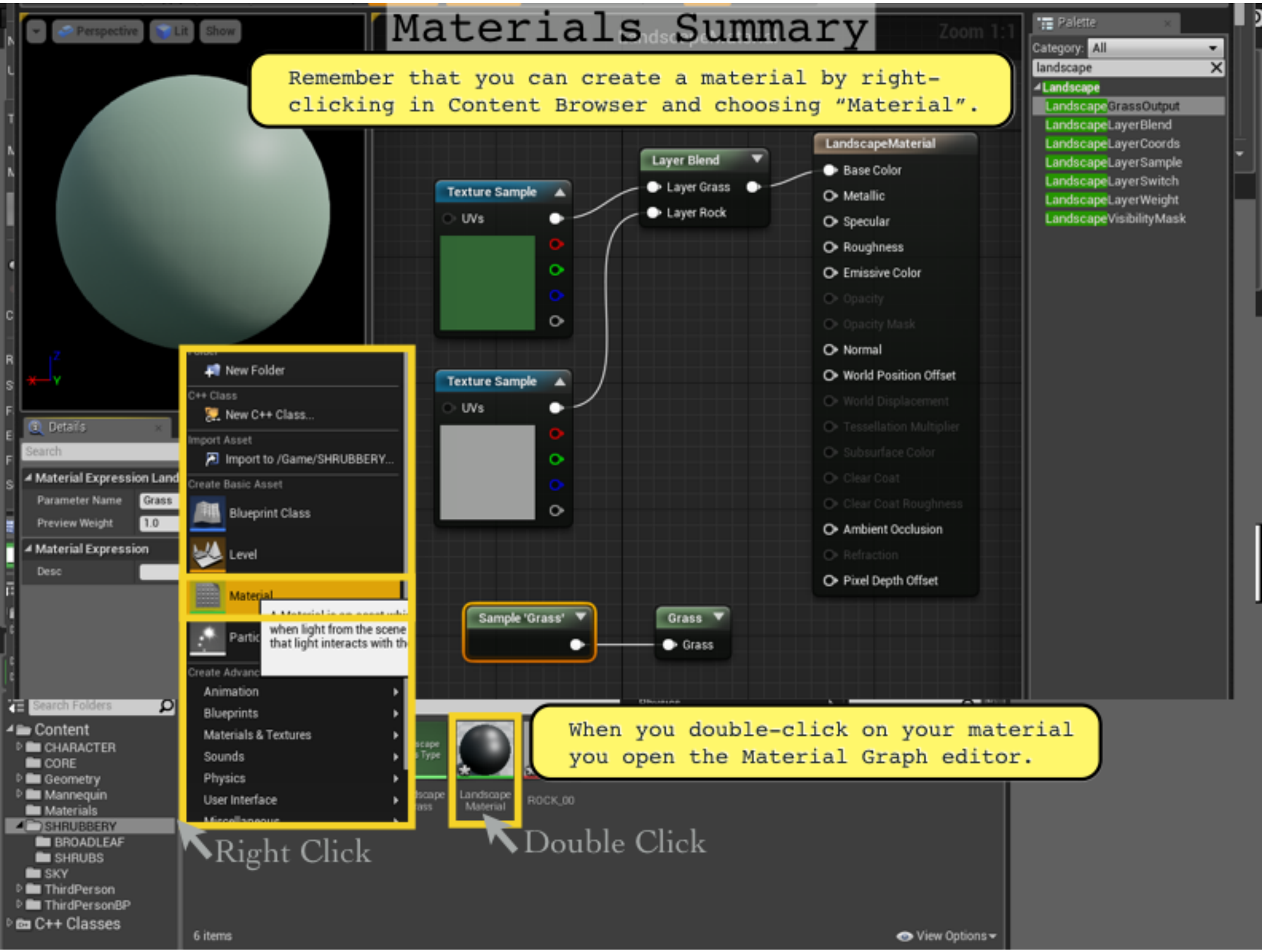


Foliage System Summary



Textures Summary

Materials Summary



Materials Summary

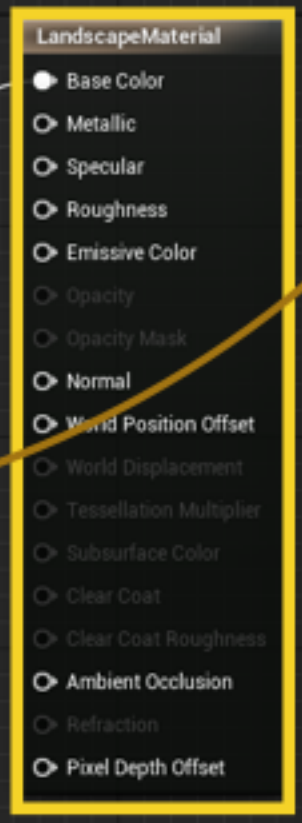
Hold 'T' and click to create a Texture Sampler.

Select the texture sampler and use the Details Panel to select the texture it will sample from.

Here are various keys you can hold down and then click to create a variety of elements:

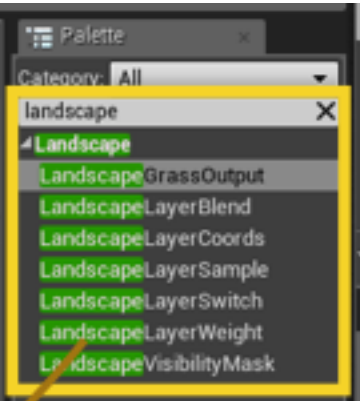
Key	Effect
1	Single value node
2	Two value node
3	Three value node (RGB or XYZ)
4	Four value node (RGBA or XYZW)
T	Texture Sampler
...	...

Click and drag to connect output pins of one node to input pins of another node.



Drag and Drop

Remember you can find elements by *right-clicking*, and also by *searching in the palette on the right.*



MATERIAL

SHRUBBERY
BROADLEAF
SHRUBS
SKY
ThirdPerson
ThirdPersonBP
C++ Classes
6 items
View Options

Landscape's Material Summary

Remember that small items like pebbles, rocks, grass, flowers, and hay can be applied from a **Landscape's Material**.

1. Use palette to apply **Landscape Layer Blend**, **Landscape Grass Output**, and **Landscape Layer Sample** into material.

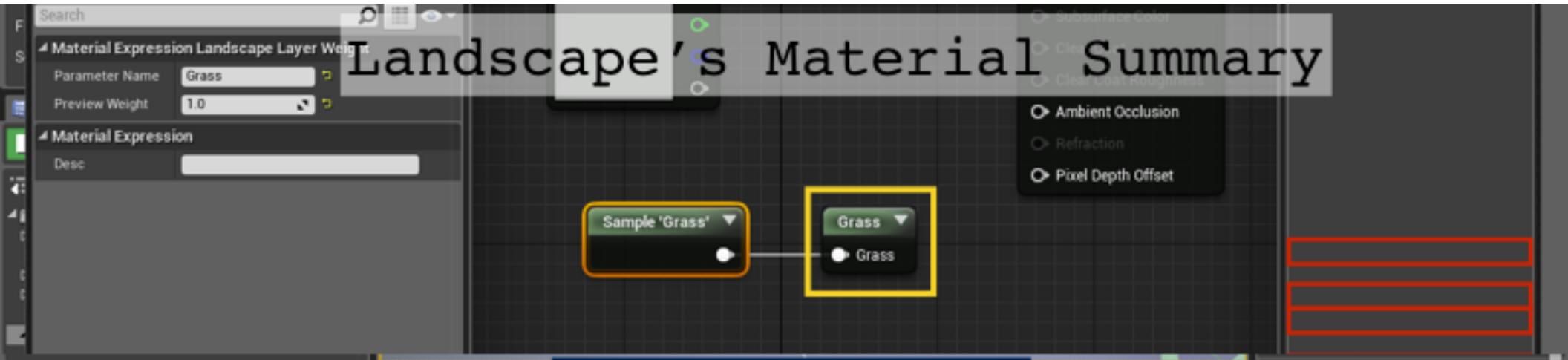
2. Setup **Landscape Layer Blend** in Details Panel to have desired landscape layers.

3. Setup **Landscape Grass Output** in Details Panel to specify which layers will sprout geometry on them and to create **Landscape Grass Type** info.

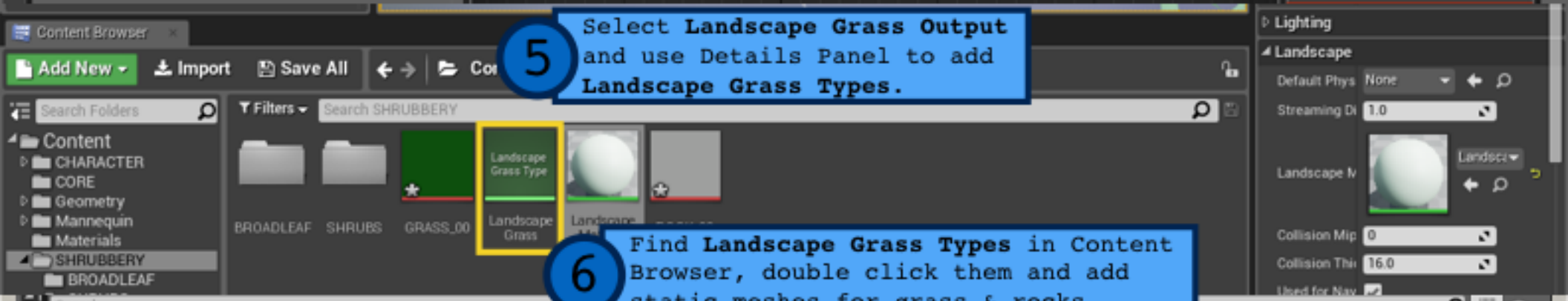
4. Setup **Landscape Layer Sample** in Details Panel to specify which layer to sample from and connect it to desired layer of **Landscape Grass Output**.

Remember that the Landscape Layer Blend is blending the color of the landscape surface while the Landscape Grass Output is designating the geometry that should be emitted on that layer.

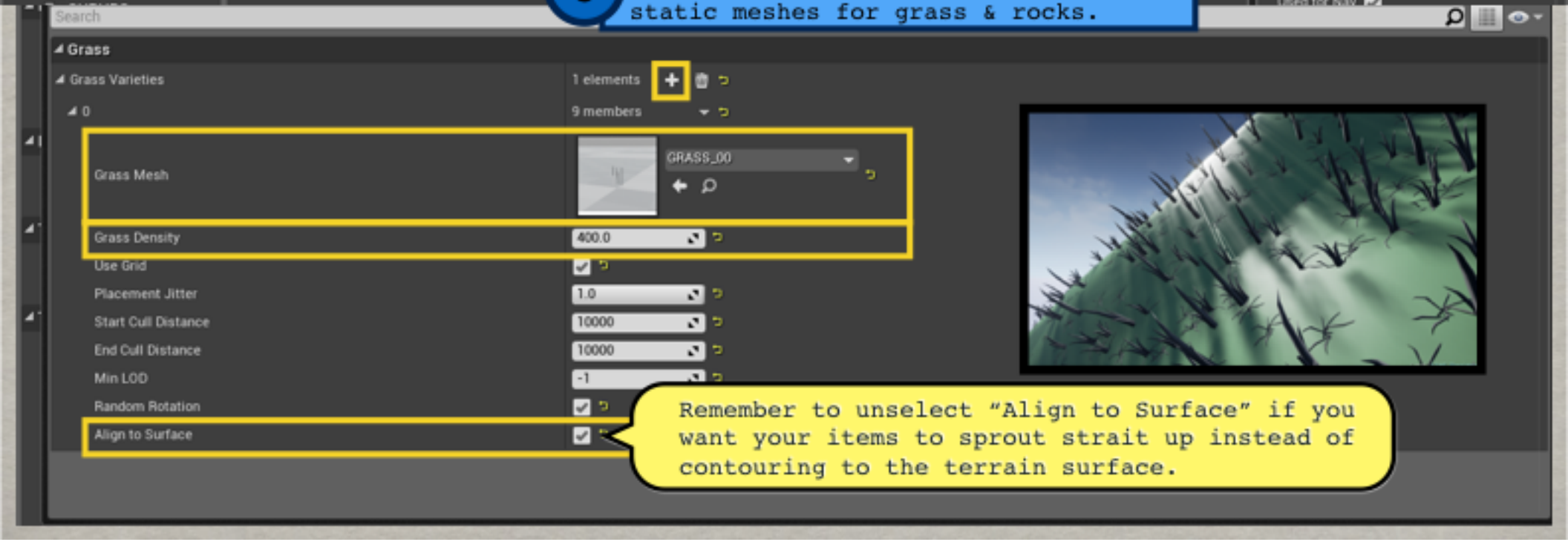
Landscape's Material Summary



5 Select **Landscape Grass Output** and use Details Panel to add **Landscape Grass Types.**



6 Find **Landscape Grass Types** in Content Browser, double click them and add static meshes for grass & rocks.



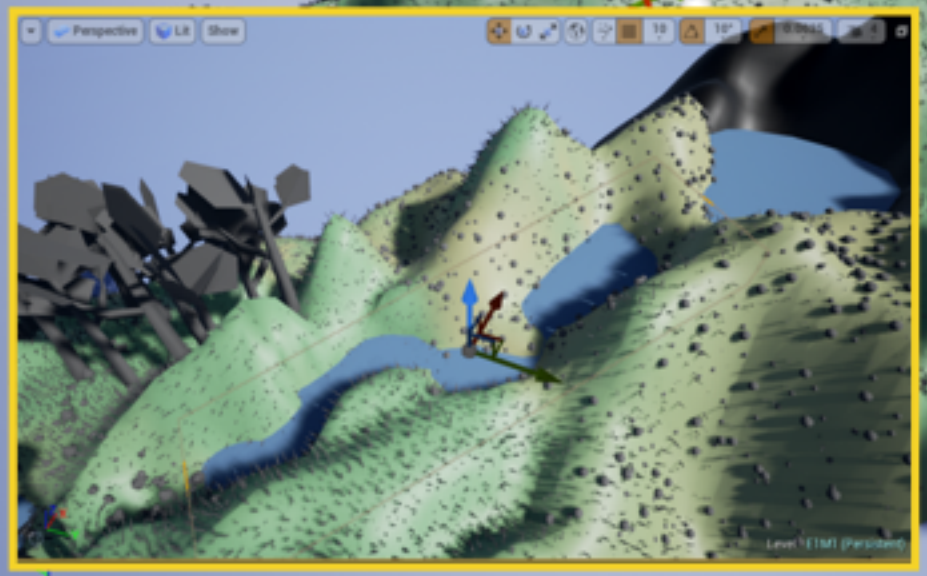
Remember to unselect "Align to Surface" if you want your items to sprout strait up instead of contouring to the terrain surface.

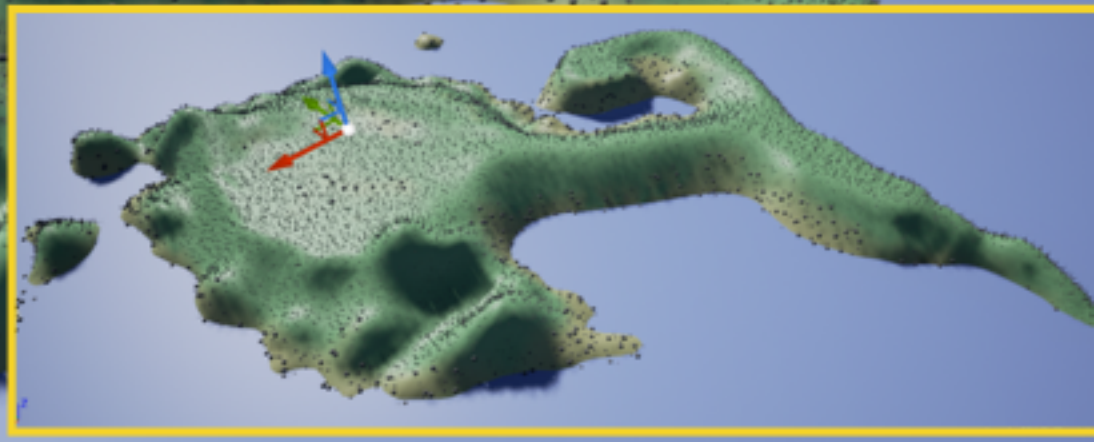
Landscape Feature Summary

Use the **Landscape** techniques to sculpt and create a variety of areas for your level.

Water Feature Summary

Use the **BSP to Static Mesh**, **Materials**, and **Textures** techniques to create OceanWater, LakeWater, and RiverWater objects, and place instances of them throughout your level.

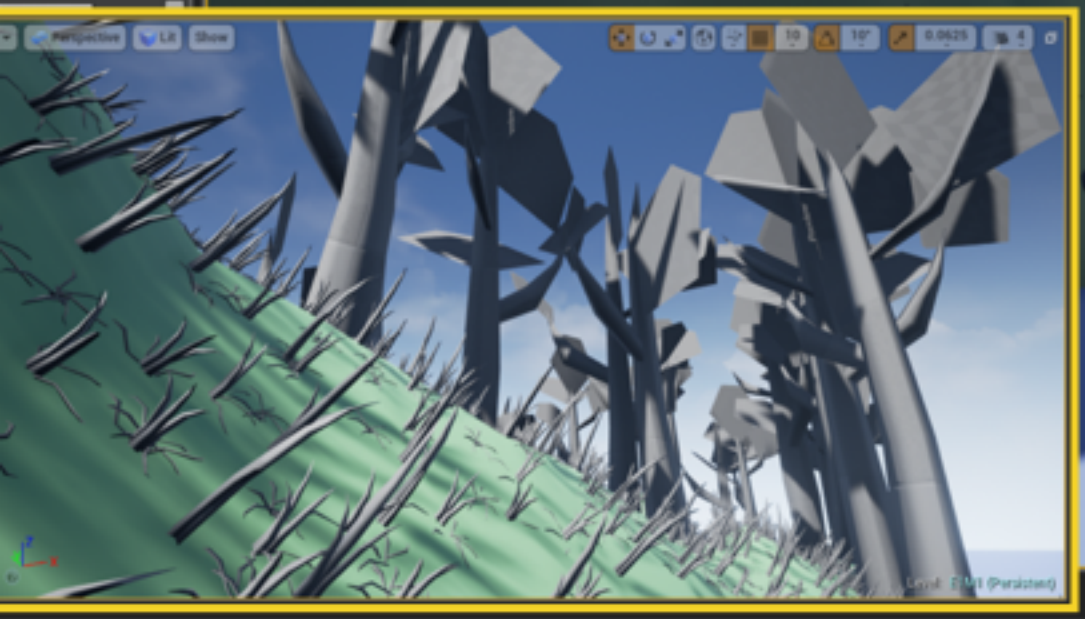


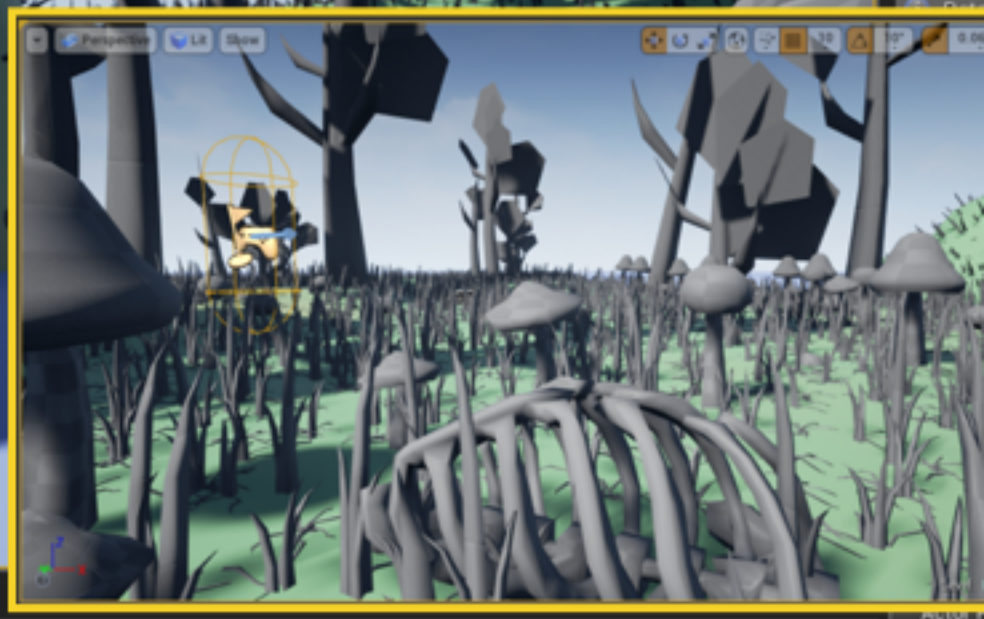


Be sure to create separate textures and materials for each unique object, and name them after the objects, e.g. OceanWater, LakeWater, and RiverWater.

Scenery Feature Summary

Use the **BSP to Static Mesh**, **Landscape Foliage**, and **Landscape Material** techniques to create and properly place pebbles, rocks, flowers, grasses, bushes, shrubs, ferns, mushrooms, trees and other environmental assets.





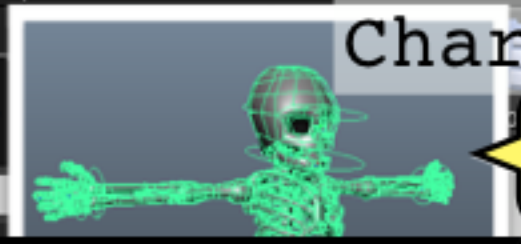
Save All | Content ▸ Models ▸ Trees ▸

Flower1 Flower2 Flower3 Flower4 GrassShort1 GrassTall1 MushroomSmall2 MushroomTiny1 RockLarge1 RockLarge2 RockMedium1 RockPebble1 RockSmall1 ShrubSmall1 ShrubSmall2 TreeLarge1 TreeSmall1

3 items (1 selected)

View Options

Character Pawn Feature Summary



See in a companion slide deck: Maya Introduction, Character Modeling, Rigging, and Animating.

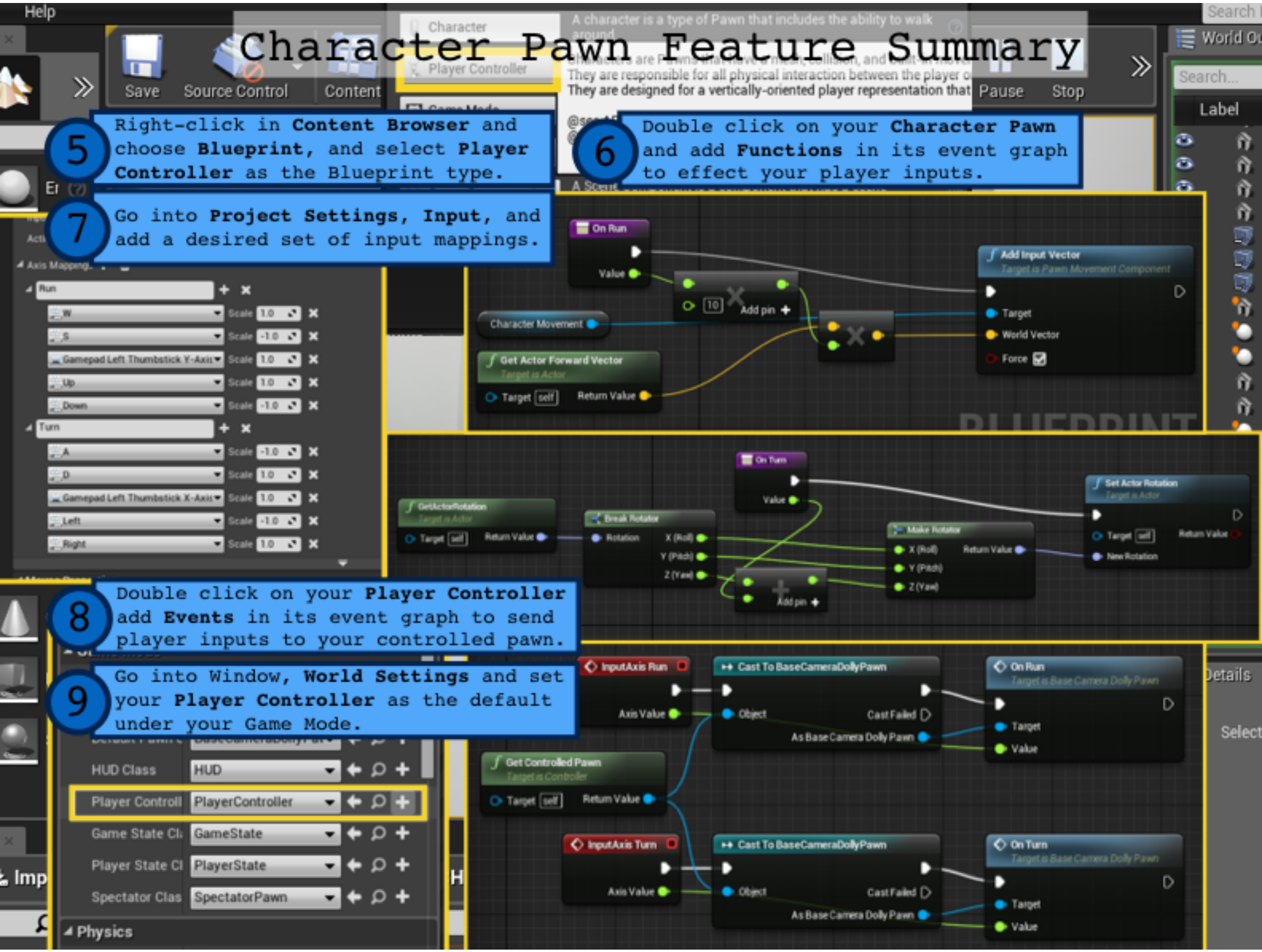
Create a **Character Pawn:**

1. Right-click in **Content Browser** and choose **Blueprint**, and select **Character** as the Blueprint type.
2. Double-click on your **Character Pawn**, go into **Viewport** and **Add Components** Spring Arm, Static Mesh and Camera and set them up.
3. Go into Windows, **World Settings** and set your character pawn as the default pawn class.
4. Run the project and you should see your character pawn appear.

NOTE: If you do not see your pawn correctly, try: Save, Exit, Reopen, and also uncheck "Use controller yaw" in your pawn setting if it is constraining your pawn to your controller's yaw unnecessarily.

REMEMBER: Follow additional slides to swap in a better looking character geometry.

Character Pawn Feature Summary



Smooth Camera Dolly Feature Summary

1. Right-click in **Content Browser** and choose **Blueprint**, select **Pawn**, and save as Camera Dolly.

2. Go into **World Settings** and set your Camera Dolly pawn as the **Default Pawn Class**.

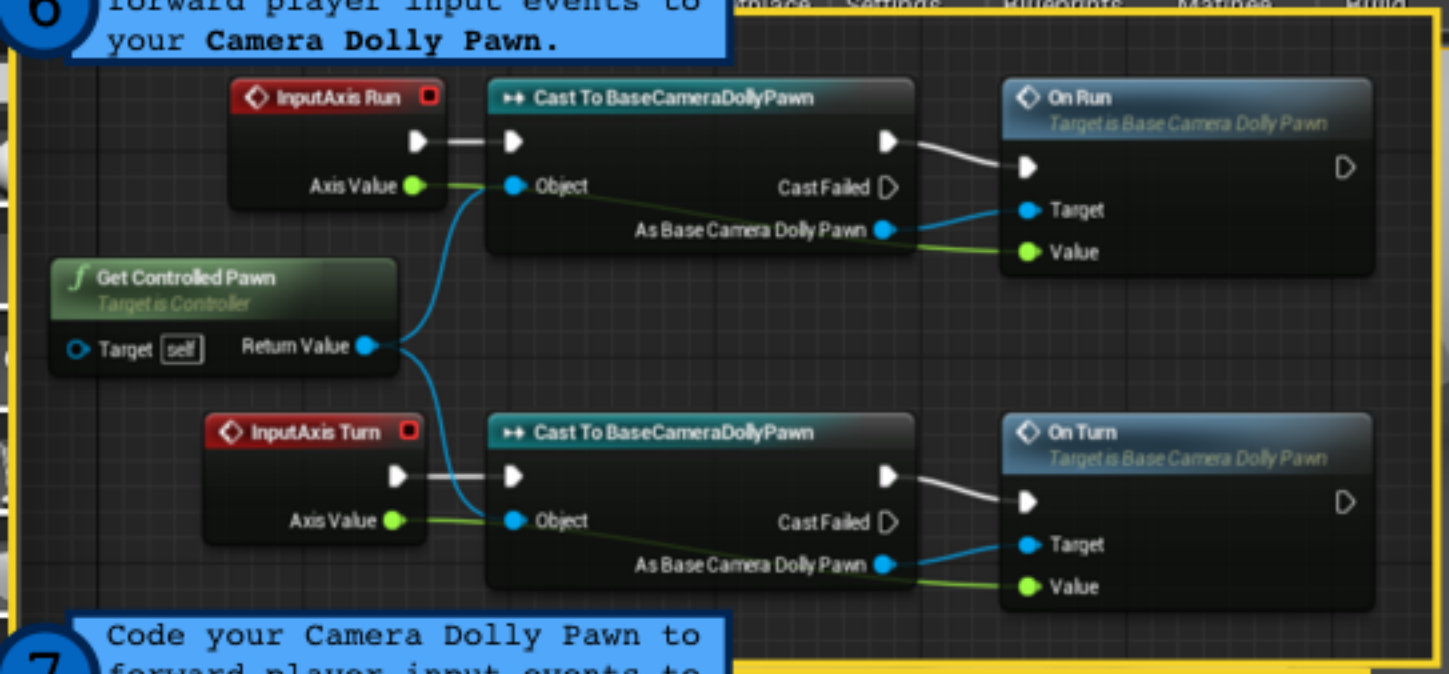
3. Double click on your **Camera Dolly Pawn**, add Spring Arm and Camera, no geometry.

4. In Camera Dolly Pawn's BeginPlay event spawn a character and remember them in a variable called Controlled Pawn.

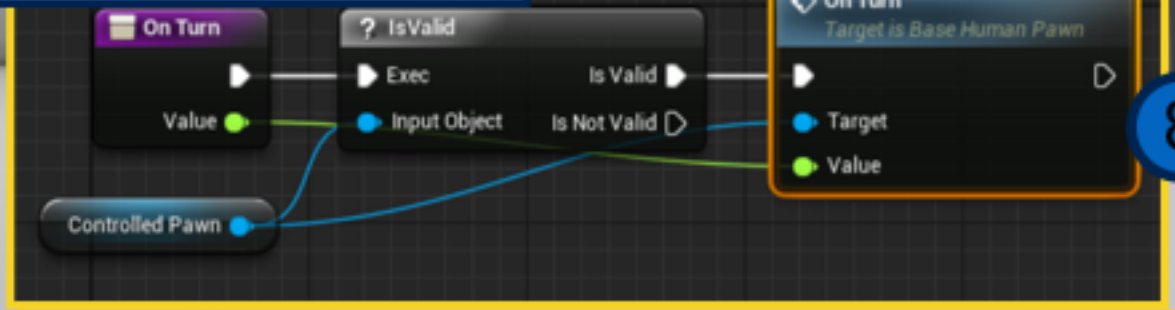
5. Run your project and check that both your camera dolly and chase character are spawned and appear in the game.

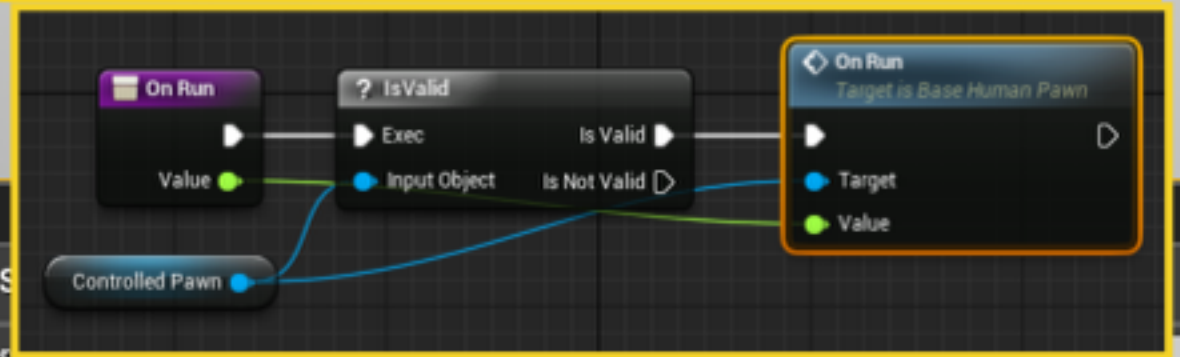
Smooth Camera Dolly Feature Summary

6 Code your **Player Controller** to forward player input events to your **Camera Dolly Pawn.**

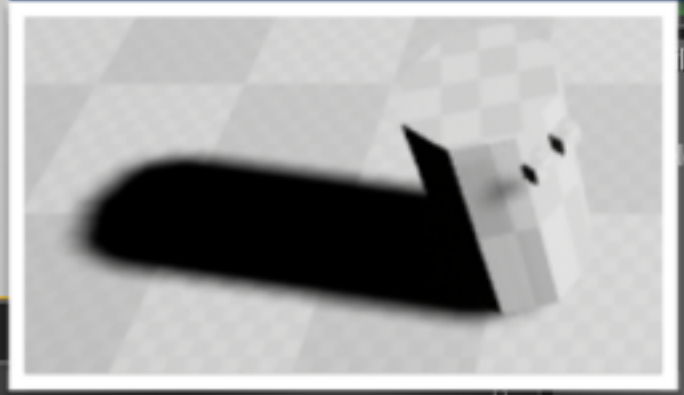


7 Code your Camera Dolly Pawn to forward player input events to your **Controlled Pawn** variable.





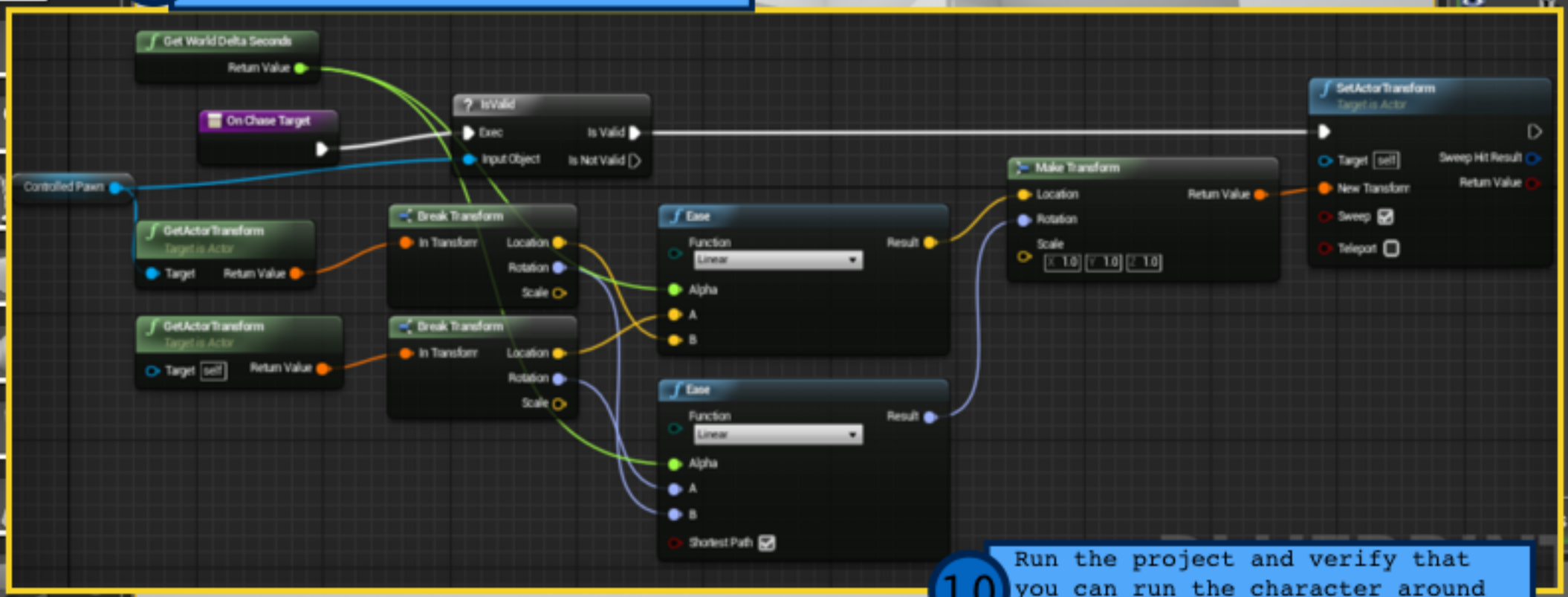
8 Run the project and verify that you can run the character around while camera does not chase yet



Smooth Camera Dolly Feature Summary

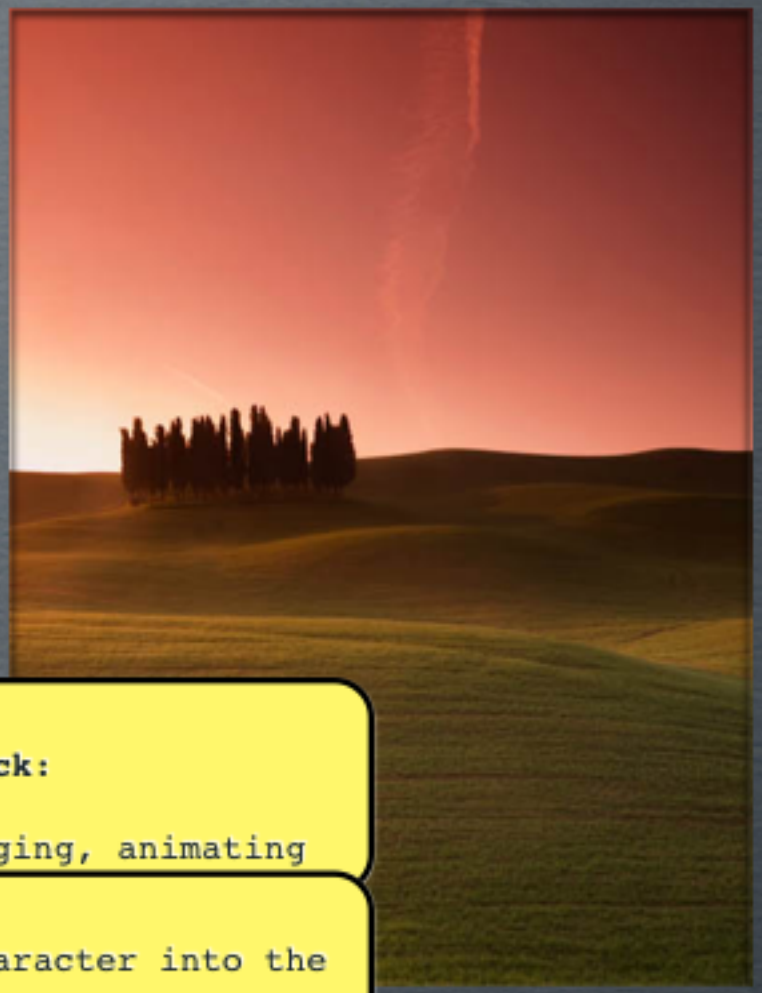
9 Code your **Camera Dolly Pawn** to chase after your **Controlled Pawn** variable.

10 Run the project and verify that you can run the character around with a smooth chase camera.



SECTION

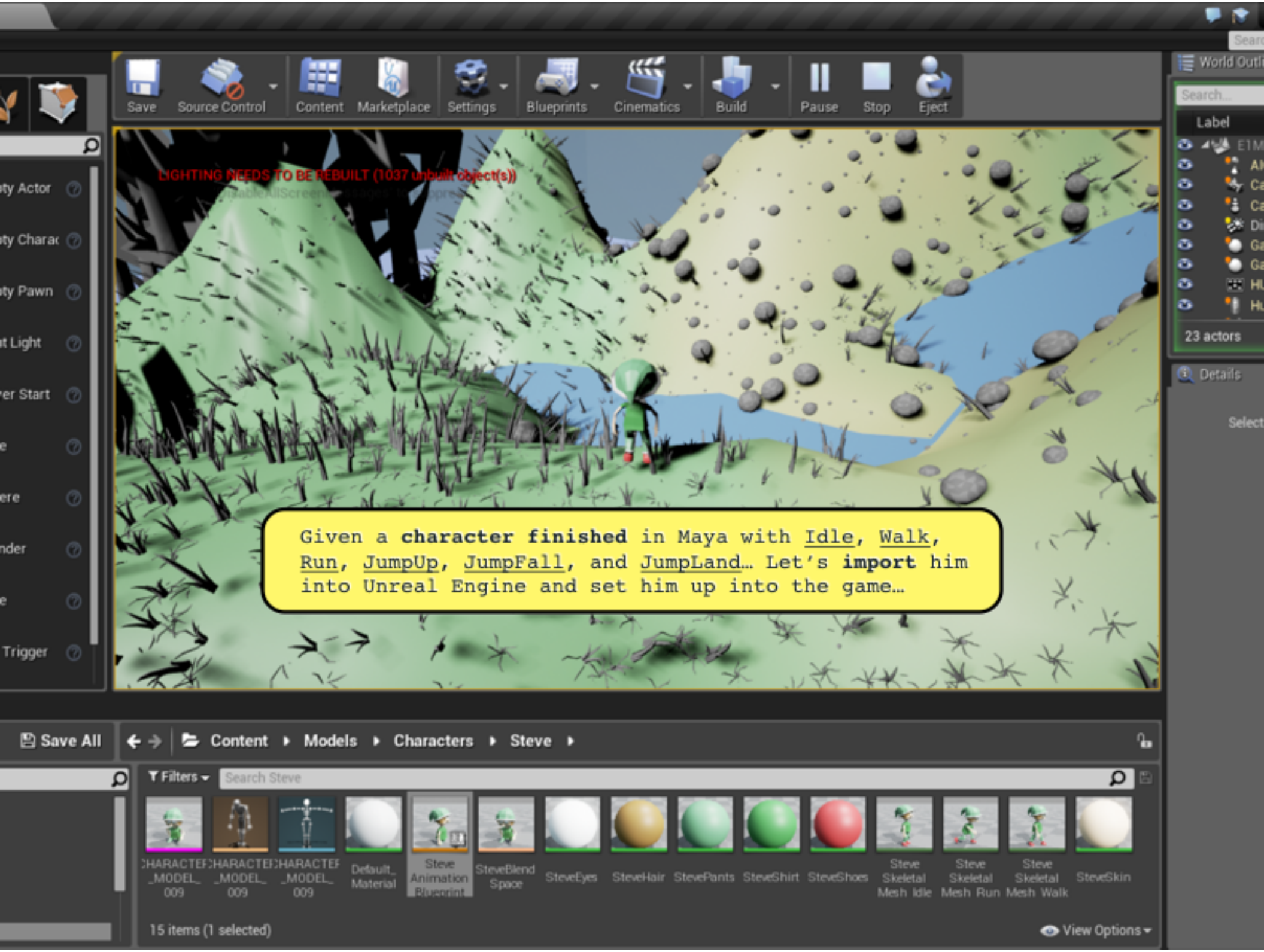
GAME CHARACTER

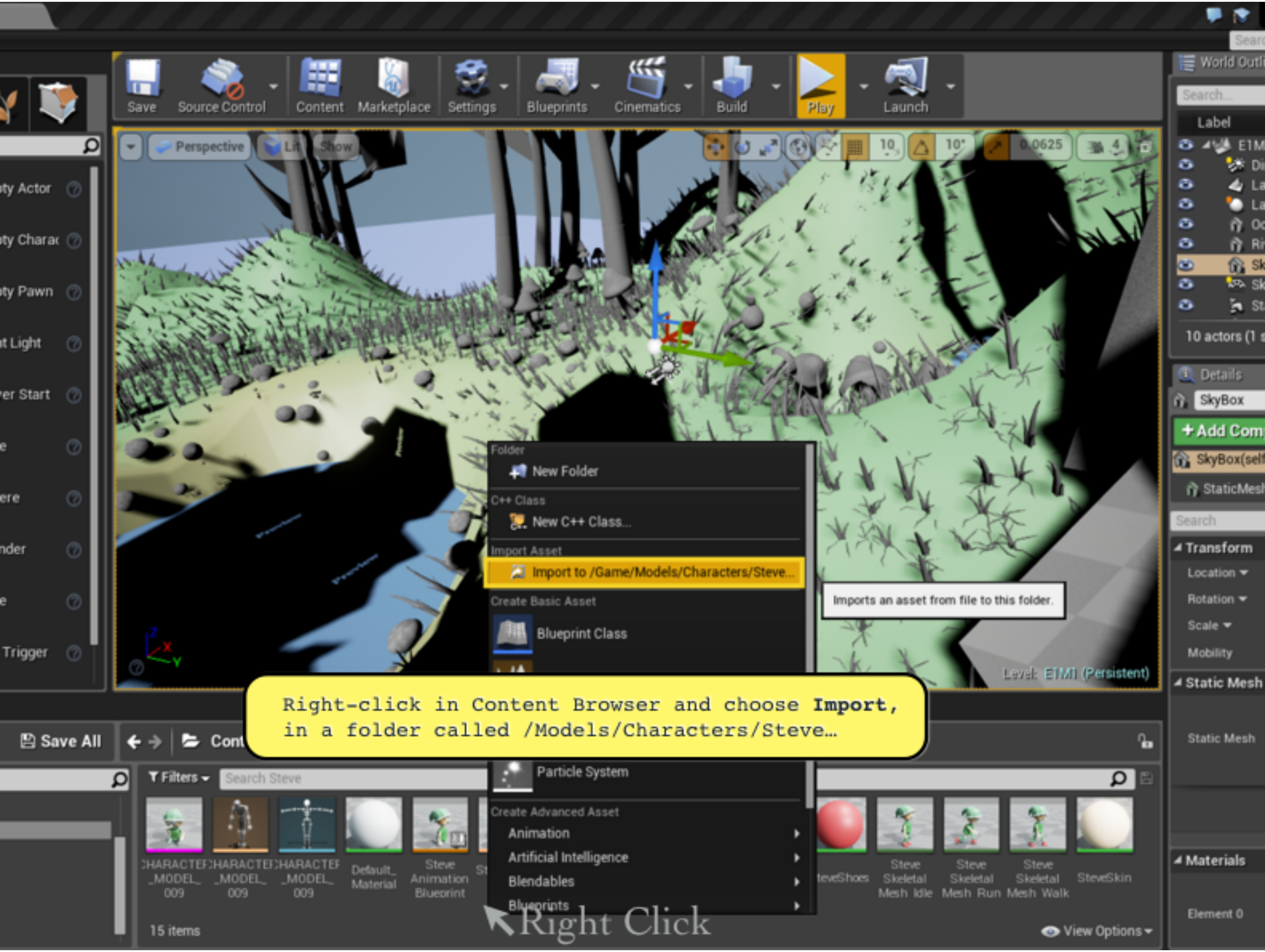


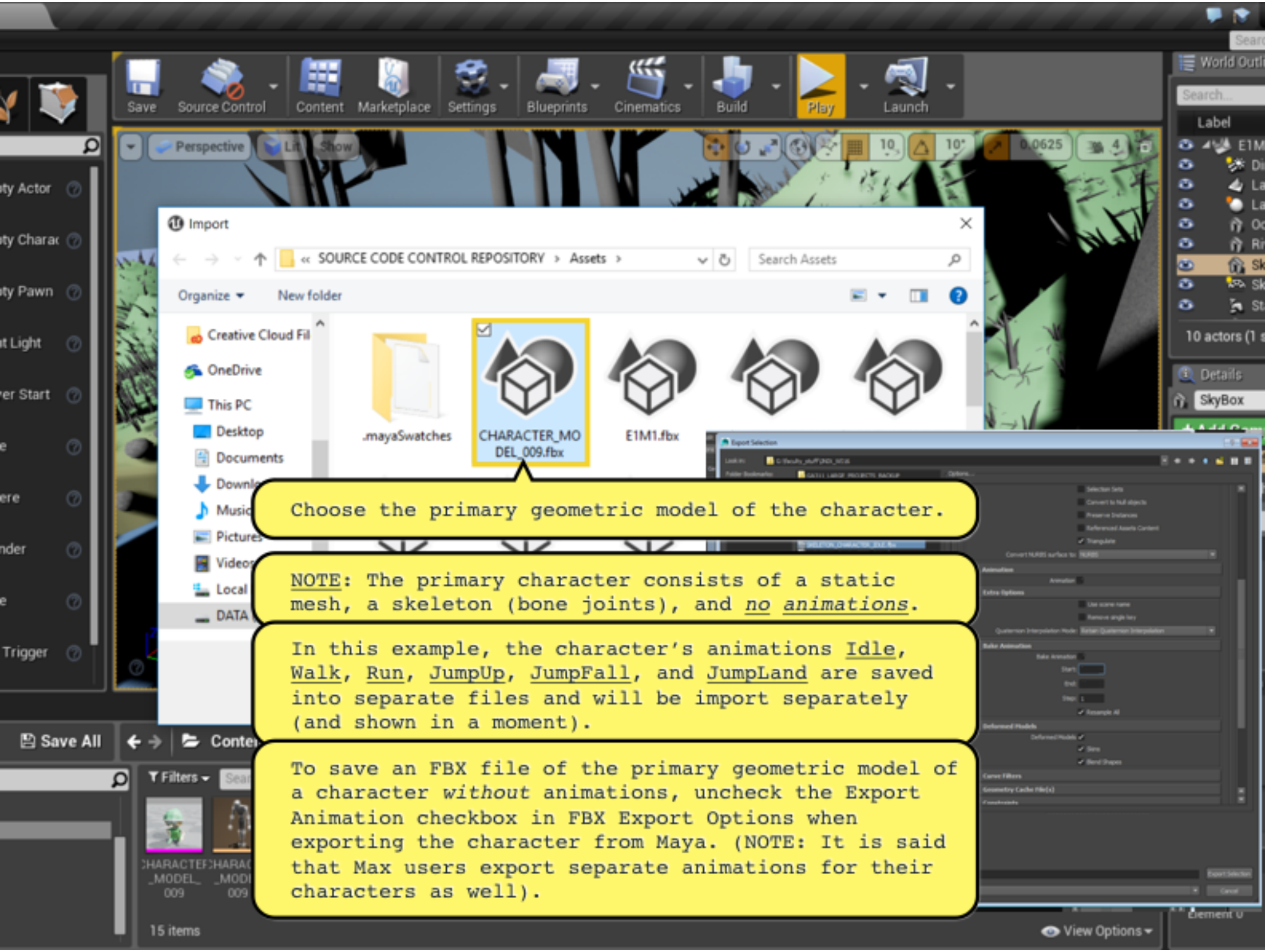
IMPORTANT:
See in a companion slide deck:
Maya introduction
Character modeling, rigging, animating

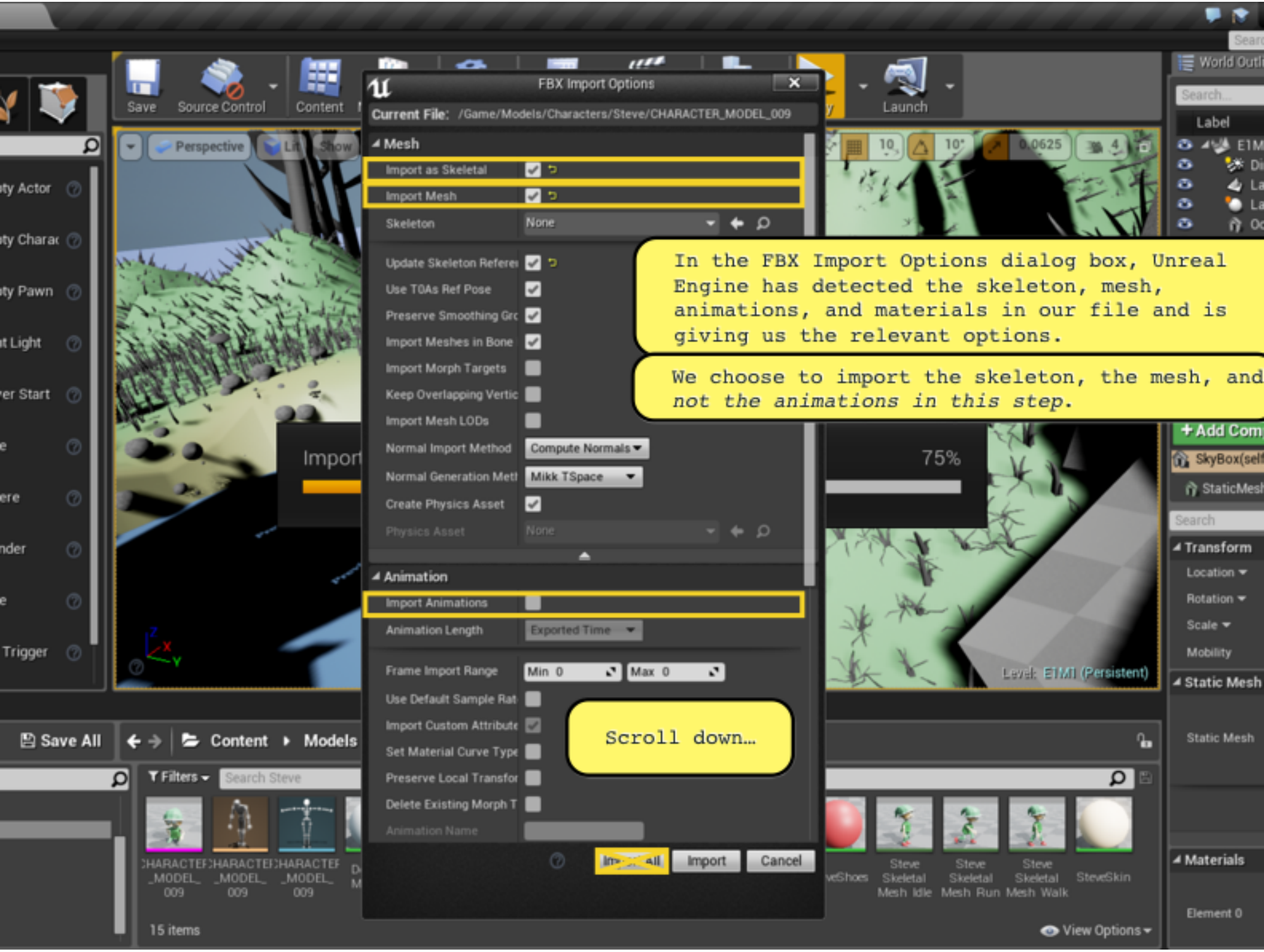
See NEXT:
Importing a finished character into the Unreal Engine.

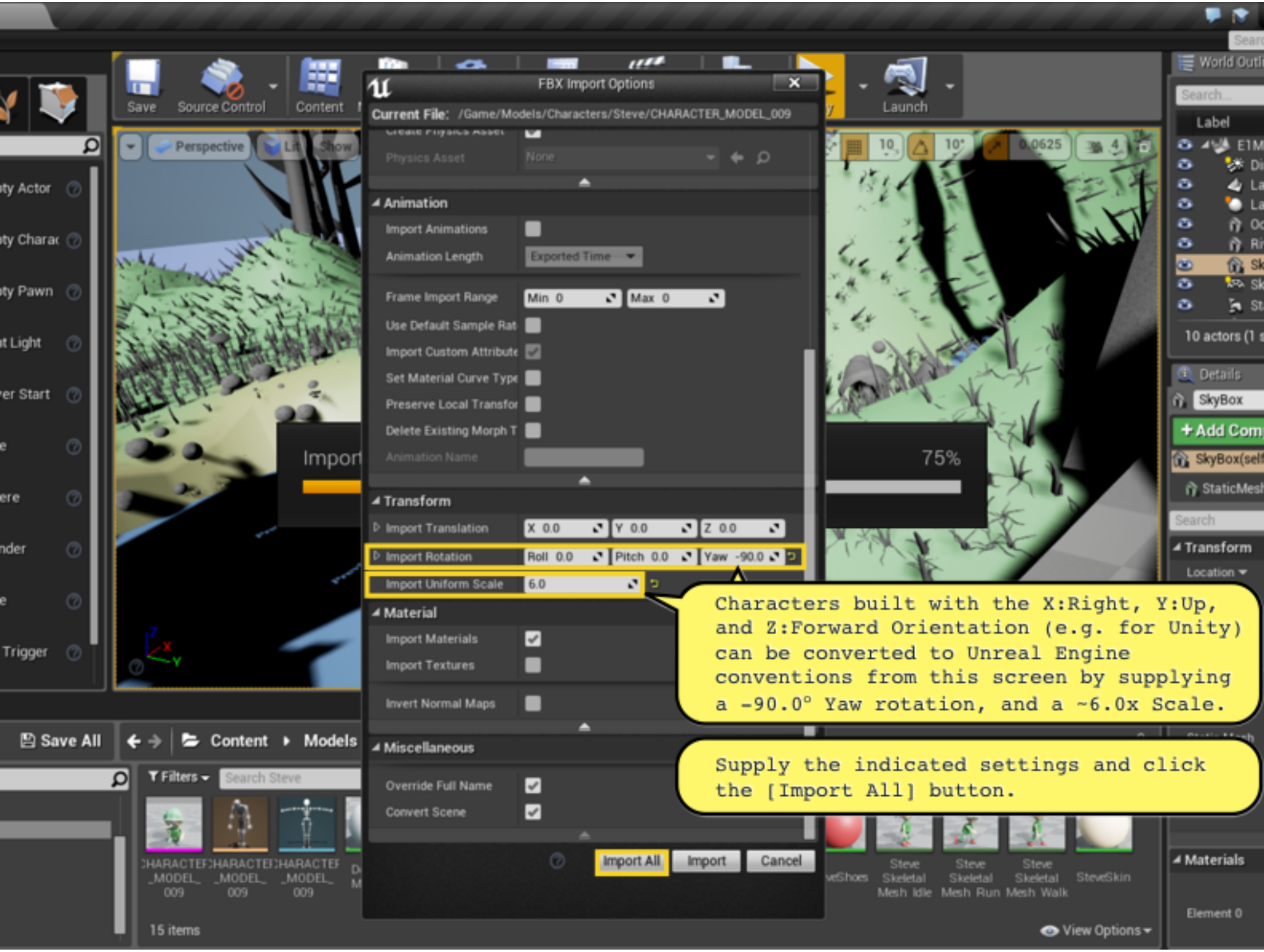
See further in THIS slide deck:
Taking the characters further to include jump start, jump fall, and jump land.

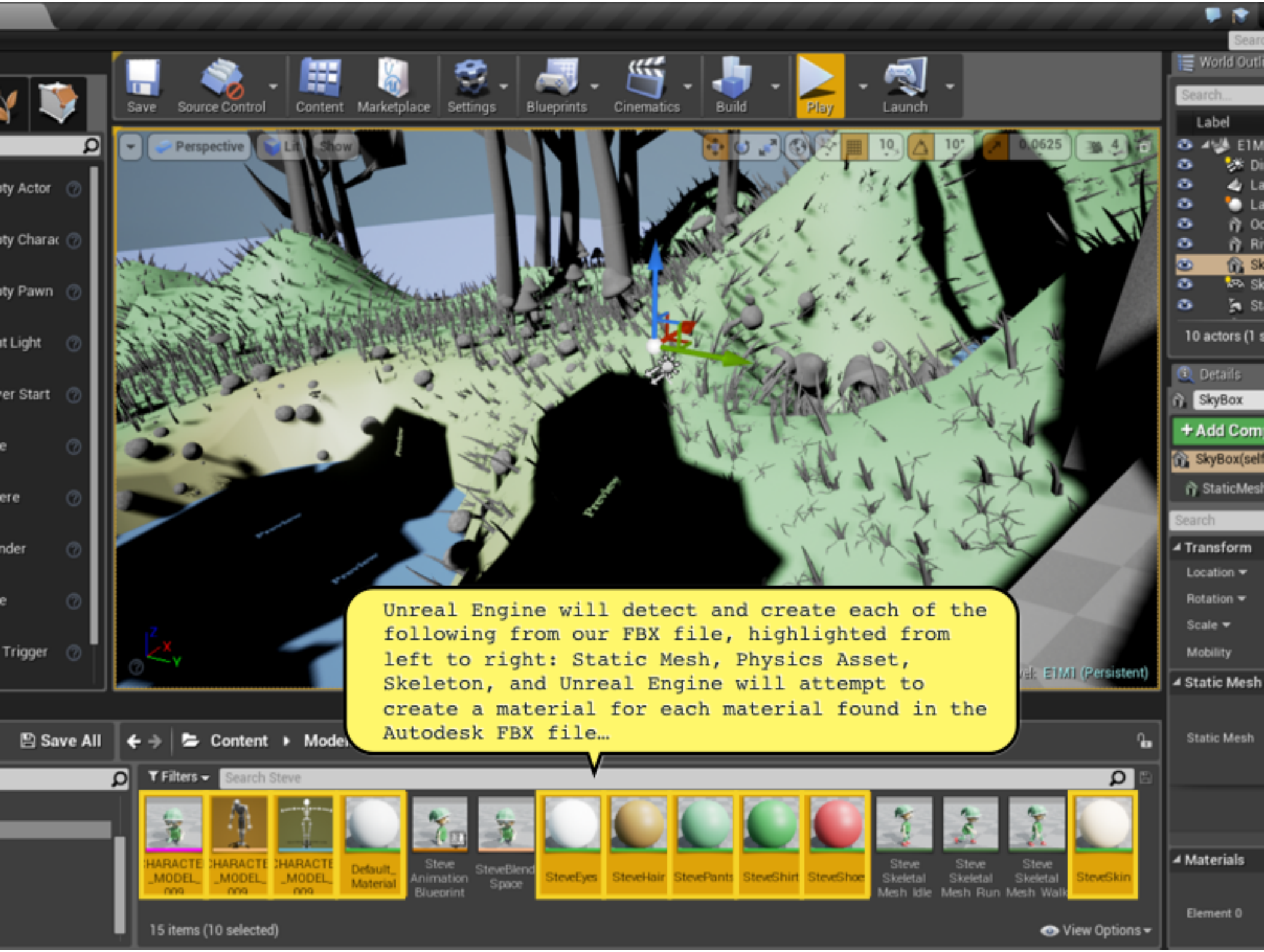

Save
Source Control
Content
Marketplace
Settings
Blueprints
Cinematics
Build
Pause
Stop
Eject
LIGHTING NEEDS TO BE REBUILT (1037 unbuilt object(s))
Given a character finished in Maya with Idle, Walk, Run, JumpUp, JumpFall, and JumpLand… Let's import him into Unreal Engine and set him up into the game…
Save All
Content
Models
Characters
Steve
Filters
Search Steve
Default_ Material
Steve Animation Blueprint
SteveBlend Space
SteveEyes
SteveHair
StevePants
SteveShirt
SteveShoes
Steve Skeletal Mesh Idle
Steve Skeletal Mesh Run
Steve Skeletal Mesh Walk
SteveSkin
15 items (1 selected)
View Options
World Outl
Label
23 actors
Details

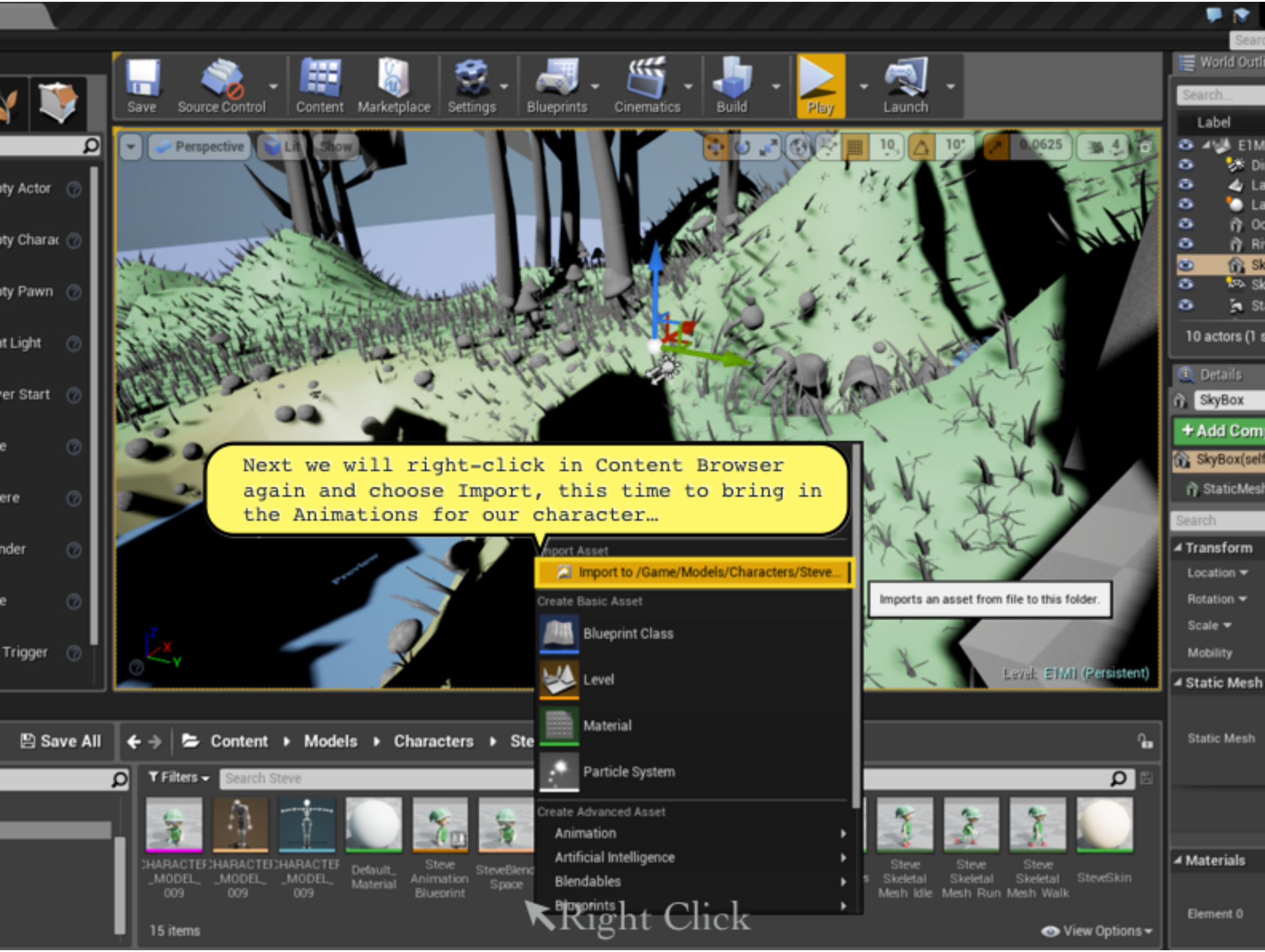

Save
Source Control
Content
Marketplace
Settings
Blueprints
Cinematics
Build
Play
Launch
Perspective
Lit
Show
Folder
New Folder
C++ Class
New C++ Class...
Import Asset
Import to /Game/Models/Characters/Steve...
Create Basic Asset
Blueprint Class
Imports an asset from file to this folder.
Level: ETM1 (Persistent)
Right-click in Content Browser and choose Import, in a folder called /Models/Characters/Steve…
Save All
Filters
Search Steve
Particle System
Create Advanced Asset
Animation
Artificial Intelligence
Blendables
Blueprints
Default_ Material
Steve Animation Blueprint
Steve Skeletal Mesh Idle
Steve Skeletal Mesh Run
Steve Skeletal Mesh Walk
SteveSkin
15 items
View Options
Right Click
World Outl
Label
Details
SkyBox
+ Add Com
Transform
Location
Rotation
Scale
Mobility
Static Mesh
Materials
Element 0

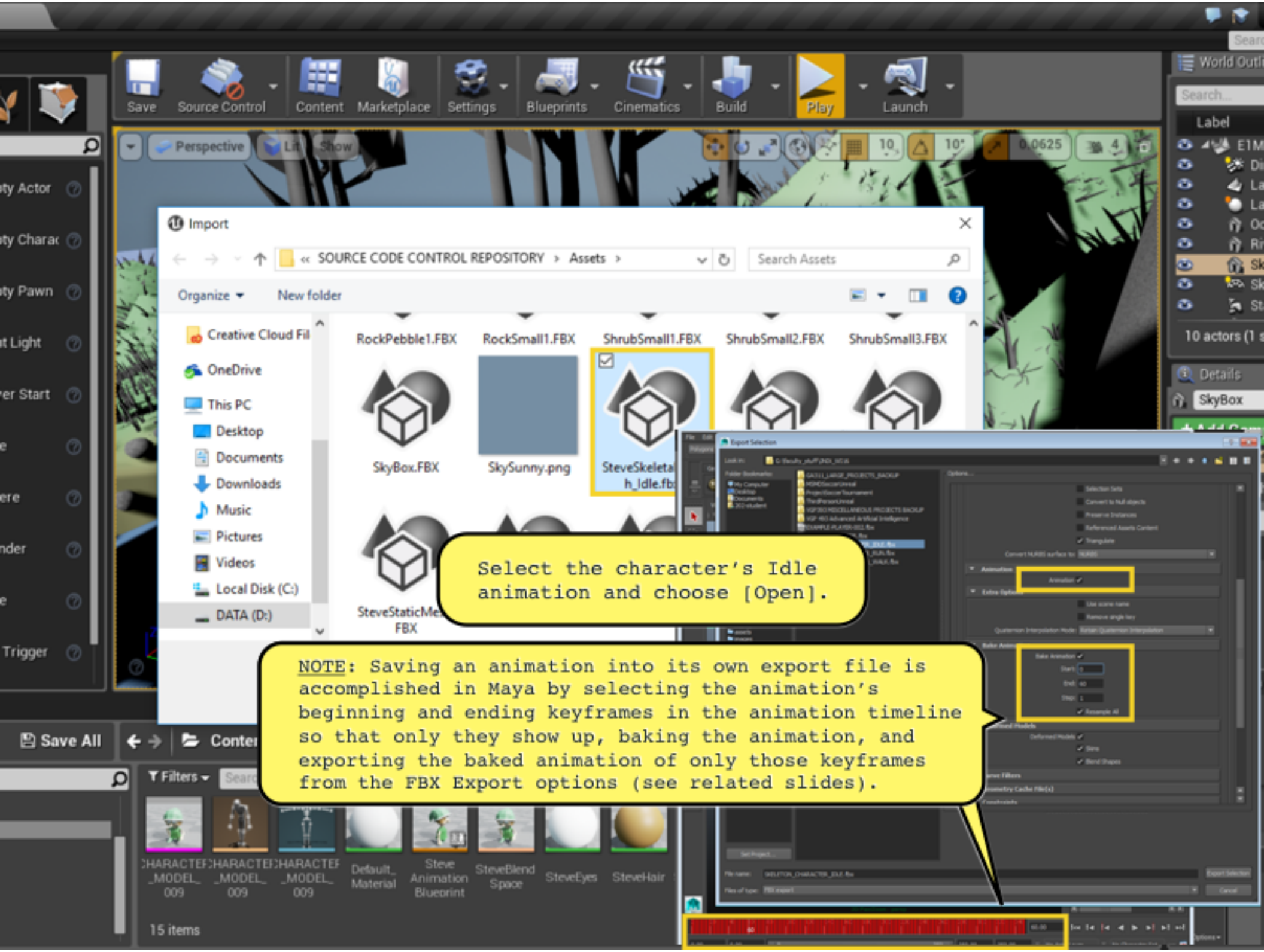

Save
Source Control
Content
Marketplace
Settings
Blueprints
Cinematics
Build
Play
Launch
Perspective
Lit
Show
Import
« SOURCE CODE CONTROL REPOSITORY › Assets ›
Search Assets
Organize
New folder
Creative Cloud Fil
OneDrive
This PC
Desktop
Documents
Pictures
Local
DATA
.mayaSwatches
CHARACTER_MODEL_009.fbx
E1M1.fbx
Choose the primary geometric model of the character.
NOTE: The primary character consists of a static mesh, a skeleton (bone joints), and no animations.
In this example, the character's animations Idle, Walk, Run, JumpUp, JumpFall, and JumpLand are saved into separate files and will be import separately (and shown in a moment).
To save an FBX file of the primary geometric model of a character without animations, uncheck the Export Animation checkbox in FBX Export Options when exporting the character from Maya. (NOTE: It is said that Max users export separate animations for their characters as well).
Save All
Filters
15 items
View Options
World Outli
Label
10 actors (1
Details
SkyBox

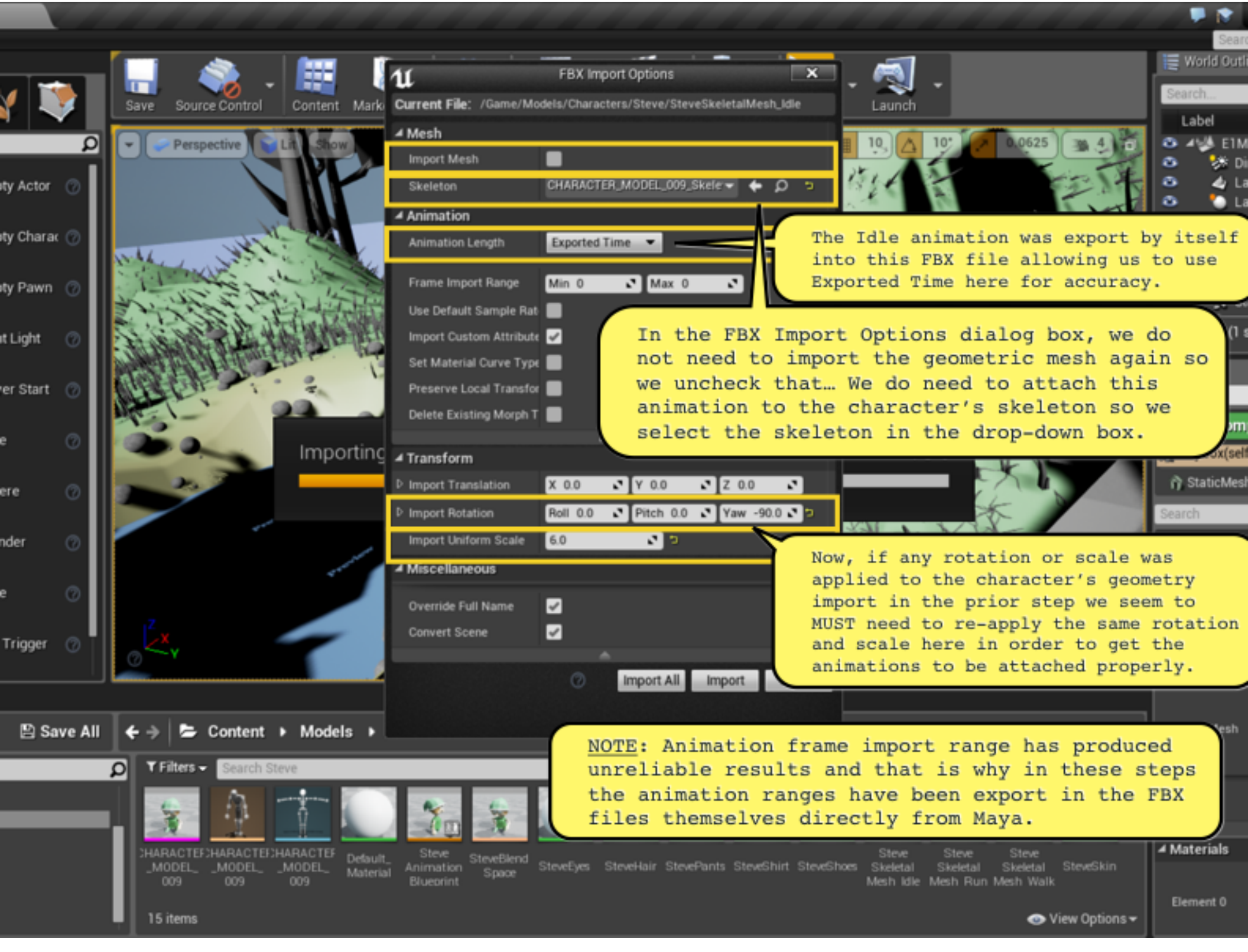

FBX Import Options
Current File: /Game/Models/Characters/Steve/CHARACTER_MODEL_009
Mesh
Import as Skeletal
Import Mesh
Skeleton
None
Update Skeleton Referer
Use TOAs Ref Pose
Preserve Smoothing Gr
Import Meshes in Bone
Import Morph Targets
Keep Overlapping Vertic
Import Mesh LODs
Normal Import Method
Compute Normals
Normal Generation Met
Mikk TSpace
Create Physics Asset
Physics Asset
None
Animation
Import Animations
Animation Length
Exported Time
Frame Import Range
Min 0
Max 0
Use Default Sample Rat
Import Custom Attribute
Set Material Curve Type
Preserve Local Transfor
Delete Existing Morph T
Animation Name
Import All
Import
Cancel
In the FBX Import Options dialog box, Unreal Engine has detected the skeleton, mesh, animations, and materials in our file and is giving us the relevant options.
We choose to import the skeleton, the mesh, and not the animations in this step.
Scroll down…
Save
Source Control
Content
Launch
Perspective
Lit
Show
Import
75%
Level: ETMI (Persistent)
Save All
Content
Models
Filters
Search Steve
15 items
View Options
Steve Skeletal Mesh Idle
Steve Skeletal Mesh Run
Steve Skeletal Mesh Walk
SteveSkin
Transform
Location
Rotation
Scale
Mobility
Static Mesh
Materials
Element 0

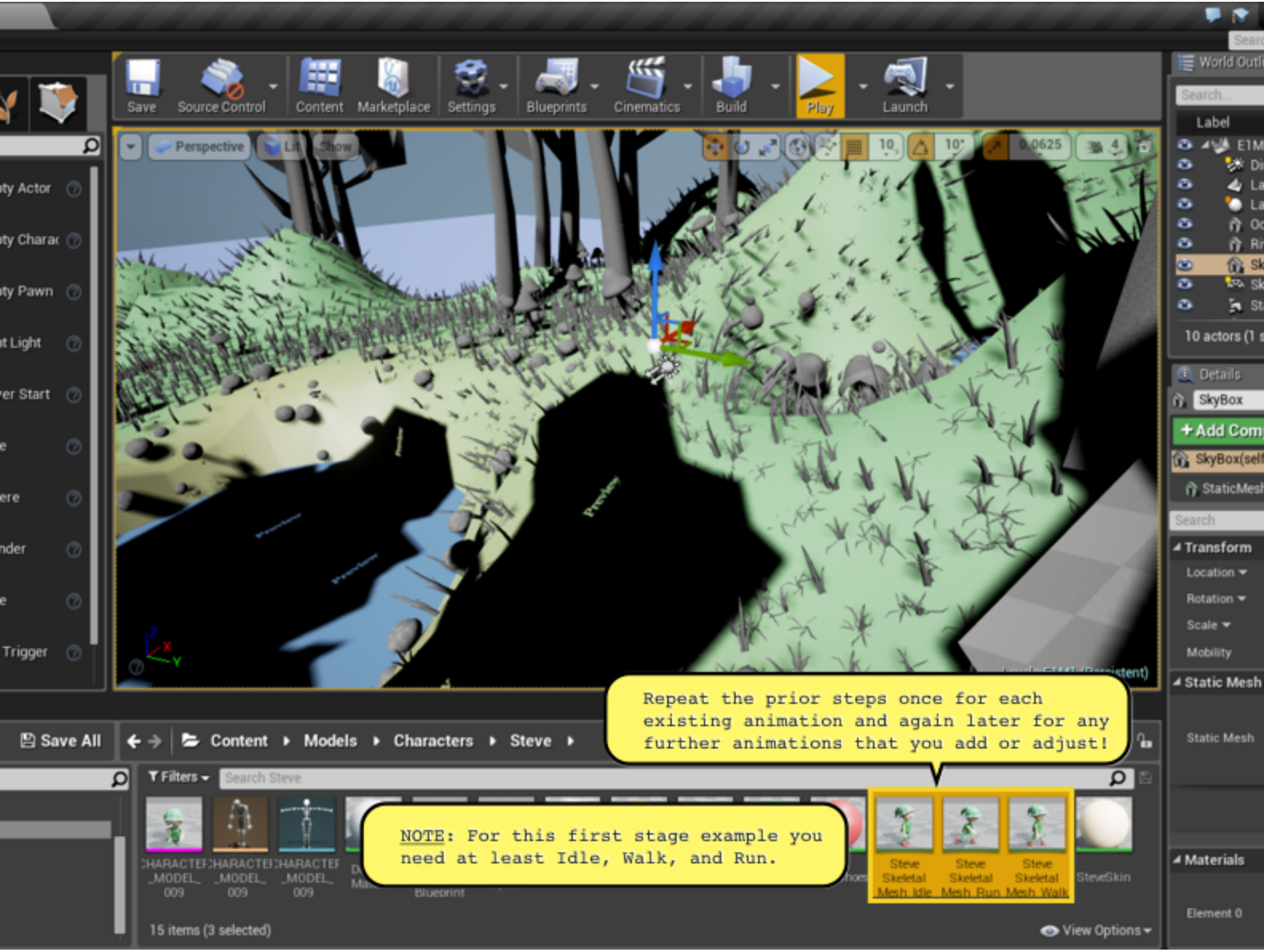

FBX Import Options
Current File: /Game/Models/Characters/Steve/CHARACTER_MODEL_009
Physics Asset
None
Animation
Import Animations
Animation Length
Exported Time
Frame Import Range
Min 0
Max 0
Use Default Sample Rat
Import Custom Attribute
Set Material Curve Type
Preserve Local Transfor
Delete Existing Morph T
Animation Name
Transform
Import Translation
X 0.0
Y 0.0
Z 0.0
Import Rotation
Roll 0.0
Pitch 0.0
Yaw -90.0
Import Uniform Scale
6.0
Material
Import Materials
Import Textures
Invert Normal Maps
Miscellaneous
Override Full Name
Convert Scene
Import All
Import
Cancel
Characters built with the X:Right, Y:Up, and Z:Forward Orientation (e.g. for Unity) can be converted to Unreal Engine conventions from this screen by supplying a -90.0° Yaw rotation, and a ~6.0x Scale.
Supply the indicated settings and click the [Import All] button.
Save
Source Control
Content
Launch
Perspective
Lit
Show
75%
Save All
Content
Models
Filters
Search Steve
15 items
View Options
Details
SkyBox
Add Com
Transform
Location
Materials
Element 0
10 actors (1

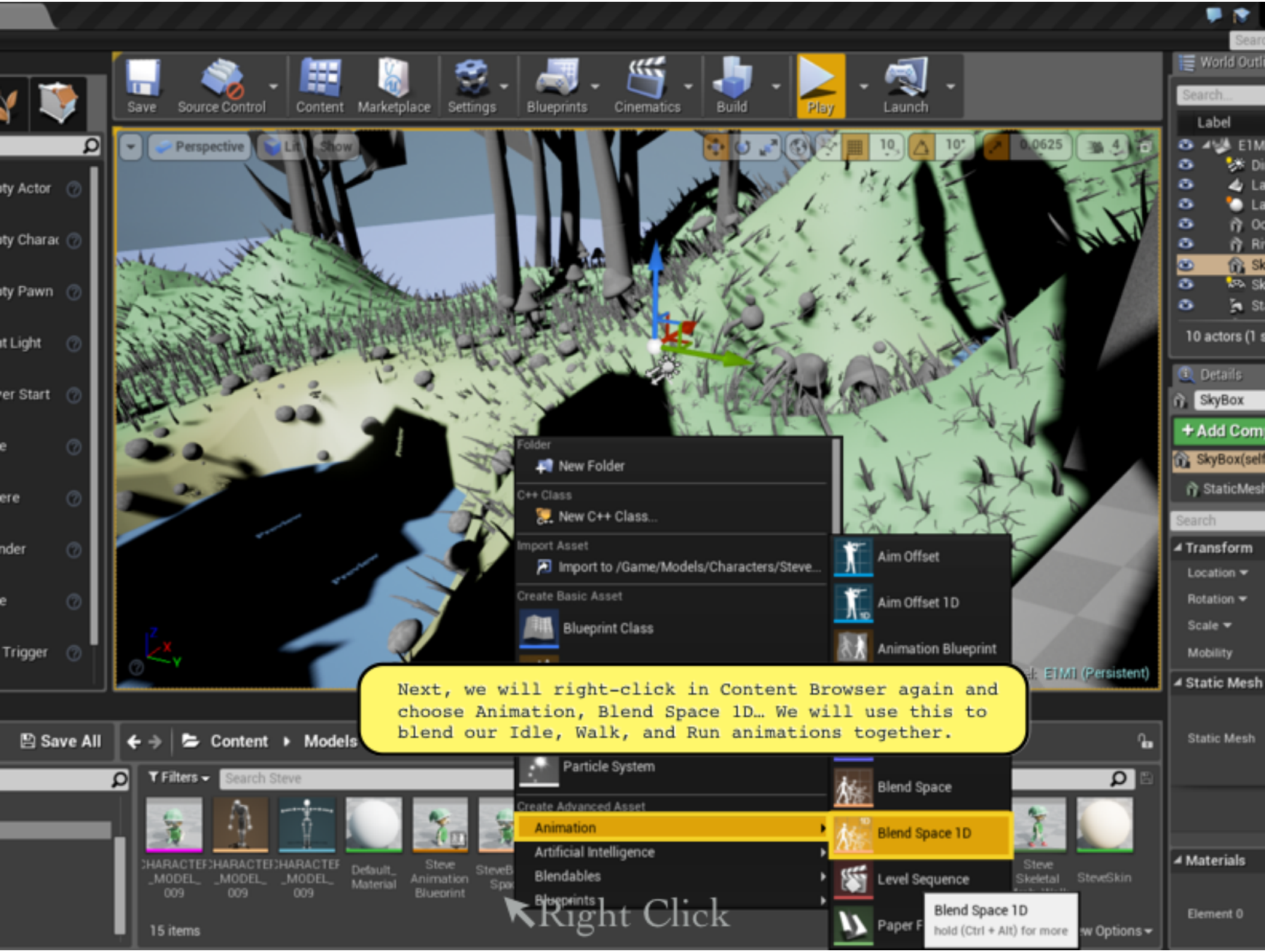

Save
Source Control
Content
Marketplace
Settings
Blueprints
Cinematics
Build
Play
Launch
Perspective
Lit
Show
Unreal Engine will detect and create each of the following from our FBX file, highlighted from left to right: Static Mesh, Physics Asset, Skeleton, and Unreal Engine will attempt to create a material for each material found in the Autodesk FBX file…
Save All
Content
Filters
Search Steve
Default_ Material
Steve Animation Blueprint
SteveBlend Space
SteveEyes
SteveHair
StevePants
SteveShirt
SteveShoe
Steve Skeletal Mesh Idle
Steve Skeletal Mesh Run
Steve Skeletal Mesh Walk
SteveSkin
15 items (10 selected)
View Options
World Outl
Label
10 actors (1
Details
SkyBox
+ Add Com
SkyBox(self
StaticMesh
Search
Transform
Location
Rotation
Scale
Mobility
Static Mesh
Static Mesh
Materials
Element 0

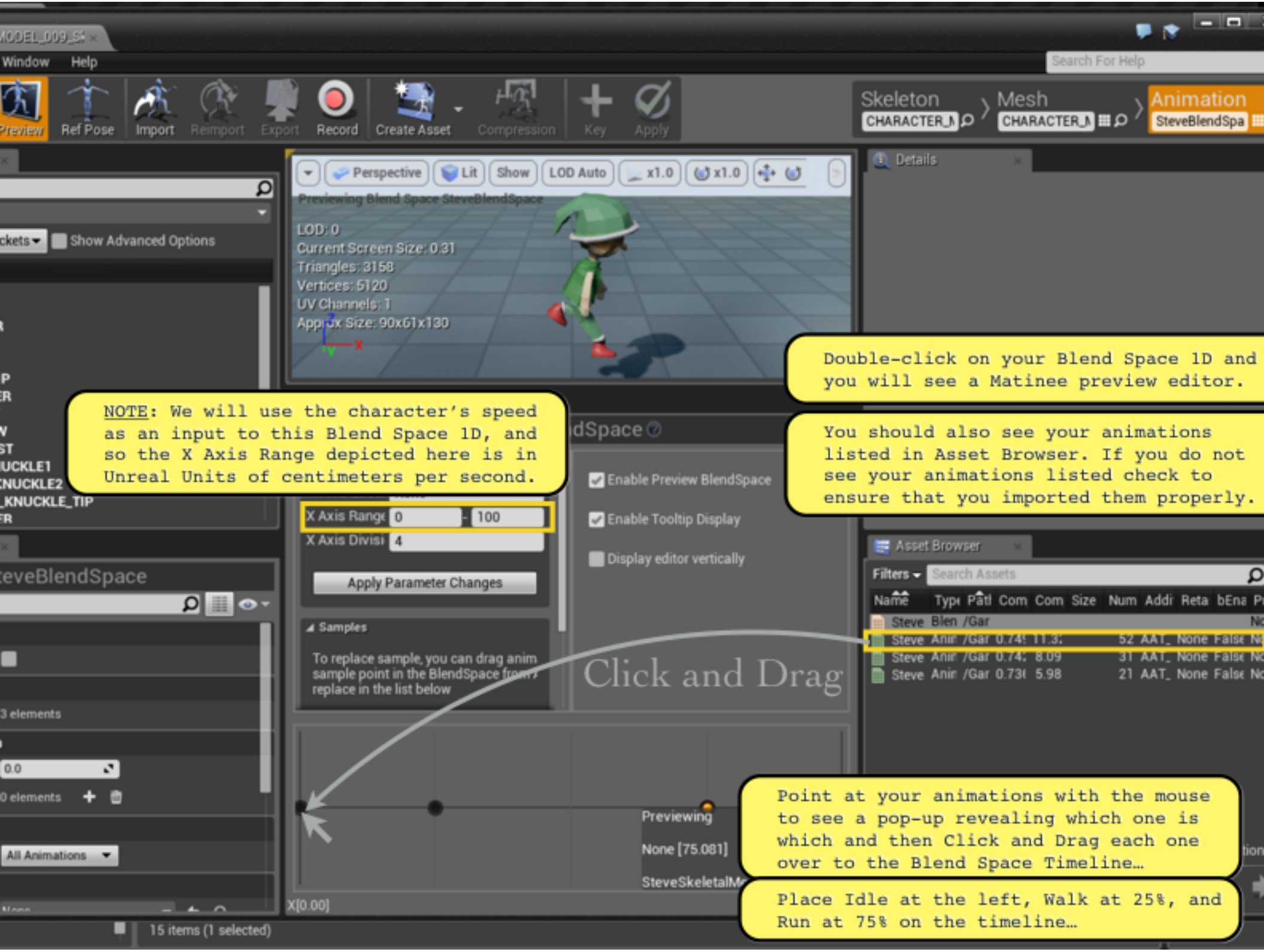

Save
Source Control
Content
Marketplace
Settings
Blueprints
Cinematics
Build
Play
Launch
Perspective
Lit
Show
Next we will right-click in Content Browser again and choose Import, this time to bring in the Animations for our character…
Import Asset
Import to /Game/Models/Characters/Steve...
Create Basic Asset
Blueprint Class
Level
Material
Particle System
Create Advanced Asset
Animation
Artificial Intelligence
Blendables
Imports an asset from file to this folder.
Level: ETM1 (Persistent)
Save All
Content
Models
Characters
Filters
Search Steve
Default_ Material
Steve Animation Blueprint
Steve Skeletal Mesh Idle
Steve Skeletal Mesh Run
Steve Skeletal Mesh Walk
SteveSkin
15 items
View Options
Right Click
World Outl
Label
10 actors (1
Details
SkyBox
+ Add Com
SkyBox(self
StaticMesh
Search
Transform
Location
Rotation
Scale
Mobility
Static Mesh
Static Mesh
Materials
Element 0

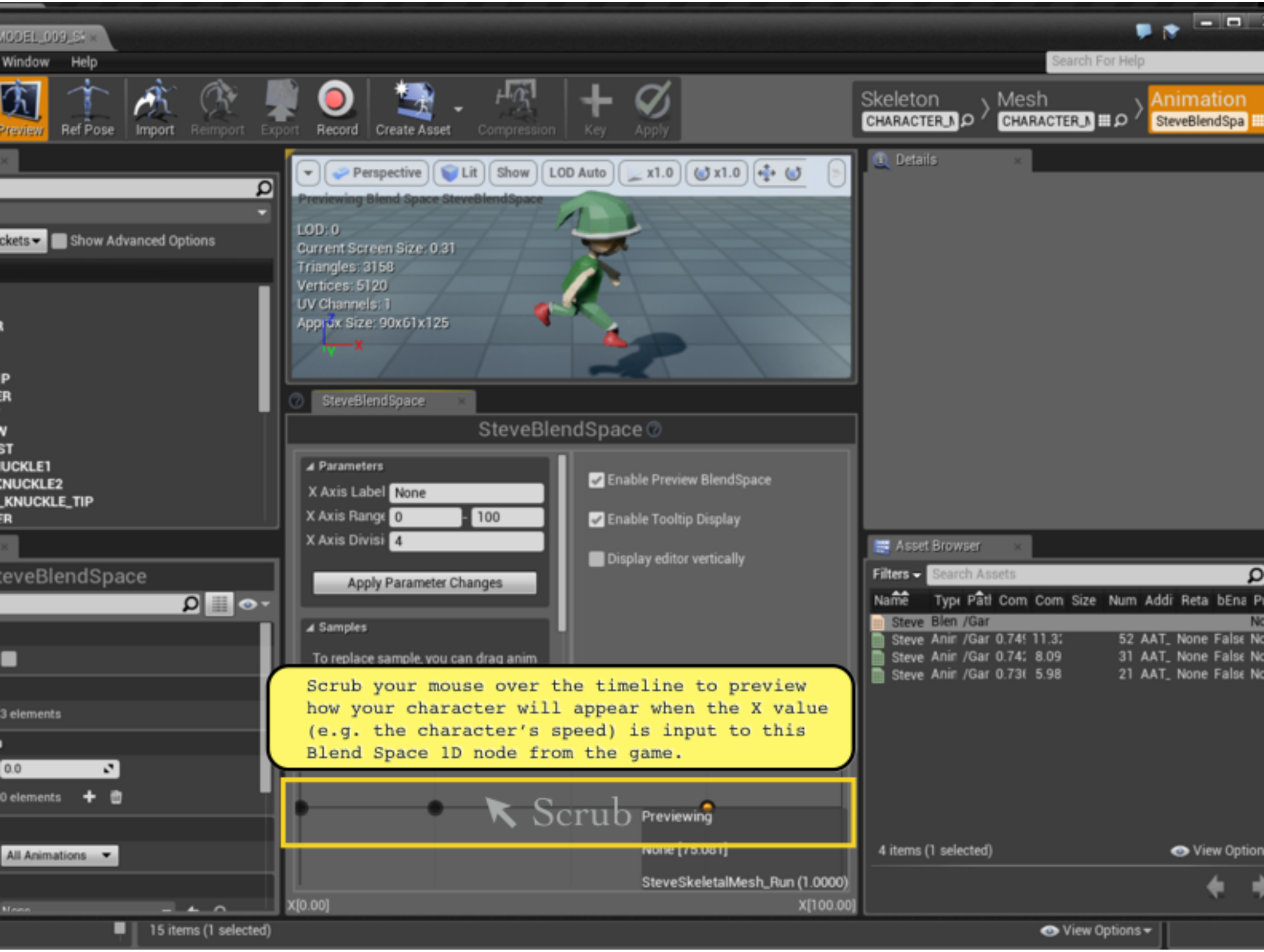

Save
Source Control
Content
Marketplace
Settings
Blueprints
Cinematics
Build
Play
Launch
Perspective
Lit
Show
Import
« SOURCE CODE CONTROL REPOSITORY › Assets ›
Search Assets
Organize
New folder
Creative Cloud Fil
OneDrive
This PC
Desktop
Documents
Downloads
Music
Pictures
Videos
Local Disk (C:)
DATA (D:)
RockPebble1.FBX
RockSmall1.FBX
ShrubSmall1.FBX
ShrubSmall2.FBX
ShrubSmall3.FBX
SkyBox.FBX
SkySunny.png
SteveStaticMe
FBX
Select the character's Idle animation and choose [Open].
NOTE: Saving an animation into its own export file is accomplished in Maya by selecting the animation's beginning and ending keyframes in the animation timeline so that only they show up, baking the animation, and exporting the baked animation of only those keyframes from the FBX Export options (see related slides).
Save All
Filters
Default_ Material
Steve Animation Blueprint
SteveBlend Space
SteveEyes
SteveHair
15 items
World Outli
Label
10 actors (1
Details
SkyBox


FBX Import Options
Current File: /Game/Models/Characters/Steve/SteveSkeletalMesh_Idle
Mesh
Import Mesh
Skeleton
CHARACTER_MODEL_009_Skele
Animation
Animation Length
Exported Time
Frame Import Range
Min 0
Max 0
Use Default Sample Rat
Import Custom Attribute
Set Material Curve Type
Preserve Local Transfor
Delete Existing Morph T
Transform
Import Translation
X 0.0
Y 0.0
Z 0.0
Import Rotation
Roll 0.0
Pitch 0.0
Yaw -90.0
Import Uniform Scale
6.0
Miscellaneous
Override Full Name
Convert Scene
Import All
Import
The Idle animation was export by itself into this FBX file allowing us to use Exported Time here for accuracy.
In the FBX Import Options dialog box, we do not need to import the geometric mesh again so we uncheck that… We do need to attach this animation to the character's skeleton so we select the skeleton in the drop-down box.
Now, if any rotation or scale was applied to the character's geometry import in the prior step we seem to MUST need to re-apply the same rotation and scale here in order to get the animations to be attached properly.
NOTE: Animation frame import range has produced unreliable results and that is why in these steps the animation ranges have been export in the FBX files themselves directly from Maya.
Save
Source Control
Content
Launch
Perspective
Save All
Content
Models
Filters
Search Steve
15 items
View Options
Materials
Element 0


Save
Source Control
Content
Marketplace
Settings
Blueprints
Cinematics
Build
Play
Launch
Perspective
Lit
Show
Repeat the prior steps once for each existing animation and again later for any further animations that you add or adjust!
NOTE: For this first stage example you need at least Idle, Walk, and Run.
Save All
Content
Models
Characters
Steve
Filters
Search Steve
Steve Skeletal Mesh Idle
Steve Skeletal Mesh Run
Steve Skeletal Mesh Walk
SteveSkin
15 items (3 selected)
View Options
Transform
Location
Rotation
Scale
Mobility
Static Mesh
Materials
Element 0


Save
Source Control
Content
Marketplace
Settings
Blueprints
Cinematics
Build
Play
Launch
Perspective
Lit
Show
Folder
New Folder
C++ Class
New C++ Class...
Import Asset
Import to /Game/Models/Characters/Steve...
Create Basic Asset
Blueprint Class
Aim Offset
Aim Offset 1D
Animation Blueprint
Next, we will right-click in Content Browser again and choose Animation, Blend Space 1D… We will use this to blend our Idle, Walk, and Run animations together.
Save All
Content
Models
Filters
Search Steve
Particle System
Create Advanced Asset
Animation
Artificial Intelligence
Blendables
Blueprints
Blend Space
Blend Space 1D
Level Sequence
Paper F
Blend Space 1D
hold (Ctrl + Alt) for more
Right Click
15 items
Transform
Location
Rotation
Scale
Mobility
Static Mesh
Materials
Element 0


Window
Help
Search For Help
Preview
Ref Pose
Import
Reimport
Export
Record
Create Asset
Compression
Key
Apply
Skeleton
CHARACTER_M
Mesh
CHARACTER_M
Animation
SteveBlendSpa
Perspective
Lit
Show
LOD Auto
x1.0
x1.0
Previewing Blend Space SteveBlendSpace
LOD: 0
Current Screen Size: 0.31
Triangles: 3158
Vertices: 5120
UV Channels: 1
Approx Size: 90x61x130
Details
Show Advanced Options
NOTE: We will use the character's speed as an input to this Blend Space 1D, and so the X Axis Range depicted here is in Unreal Units of centimeters per second.
Double-click on your Blend Space 1D and you will see a Matinee preview editor.
You should also see your animations listed in Asset Browser. If you do not see your animations listed check to ensure that you imported them properly.
Enable Preview BlendSpace
Enable Tooltip Display
Display editor vertically
X Axis Range
0
100
X Axis Divisi
4
Apply Parameter Changes
Samples
To replace sample, you can drag anim sample point in the BlendSpace from replace in the list below
Asset Browser
Filters
Search Assets
Name
Type
Path
Com
Com
Size
Num
Addi
Reta
bEna
Steve Blen /Gar
Steve Anir /Gar 0.74 11.3 52 AAT_ None False
Steve Anir /Gar 0.74 8.09 31 AAT_ None False
Steve Anir /Gar 0.73 5.98 21 AAT_ None False
Click and Drag
Point at your animations with the mouse to see a pop-up revealing which one is which and then Click and Drag each one over to the Blend Space Timeline…
Previewing
None [75.081]
Place Idle at the left, Walk at 25%, and Run at 75% on the timeline…
All Animations
15 items (1 selected)

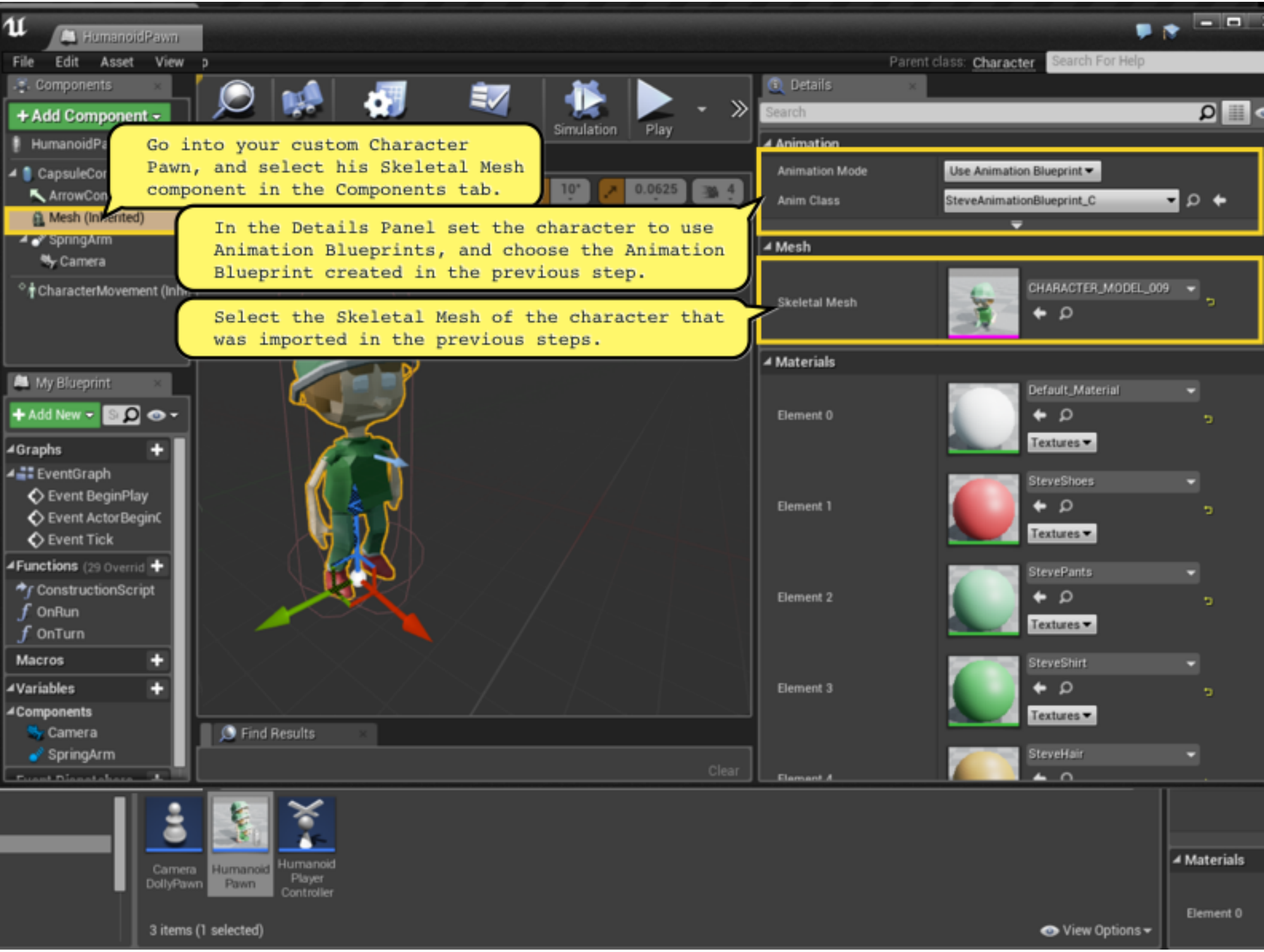

Window
Help
Search For Help
Preview
Ref Pose
Import
Reimport
Export
Record
Create Asset
Compression
Key
Apply
Skeleton
CHARACTER_M
Mesh
CHARACTER_M
Animation
SteveBlendSpa
Perspective
Lit
Show
LOD Auto
x1.0
x1.0
Previewing Blend Space SteveBlendSpace
LOD: 0
Current Screen Size: 0.31
Triangles: 3158
Vertices: 5120
UV Channels: 1
Approx Size: 90x61x125
Details
Show Advanced Options
SteveBlendSpace
SteveBlendSpace
Parameters
X Axis Label
None
X Axis Range
0
100
X Axis Divisi
4
Apply Parameter Changes
Samples
To replace sample, you can drag anim
Enable Preview BlendSpace
Enable Tooltip Display
Display editor vertically
Asset Browser
Filters
Search Assets
Name
Type
Path
Com
Com
Size
Num
Addi
Reta
bEna
Steve Blen /Gar
Steve Anir /Gar 0.74 11.3 52 AAT_ None False
Steve Anir /Gar 0.74 8.09 31 AAT_ None False
Steve Anir /Gar 0.73 5.98 21 AAT_ None False
4 items (1 selected)
View Option
Scrub your mouse over the timeline to preview how your character will appear when the X value (e.g. the character's speed) is input to this Blend Space 1D node from the game.
Scrub
Previewing
SteveSkeletalMesh_Run (1.0000)
X[0.00]
X[100.00]
All Animations
15 items (1 selected)
View Options

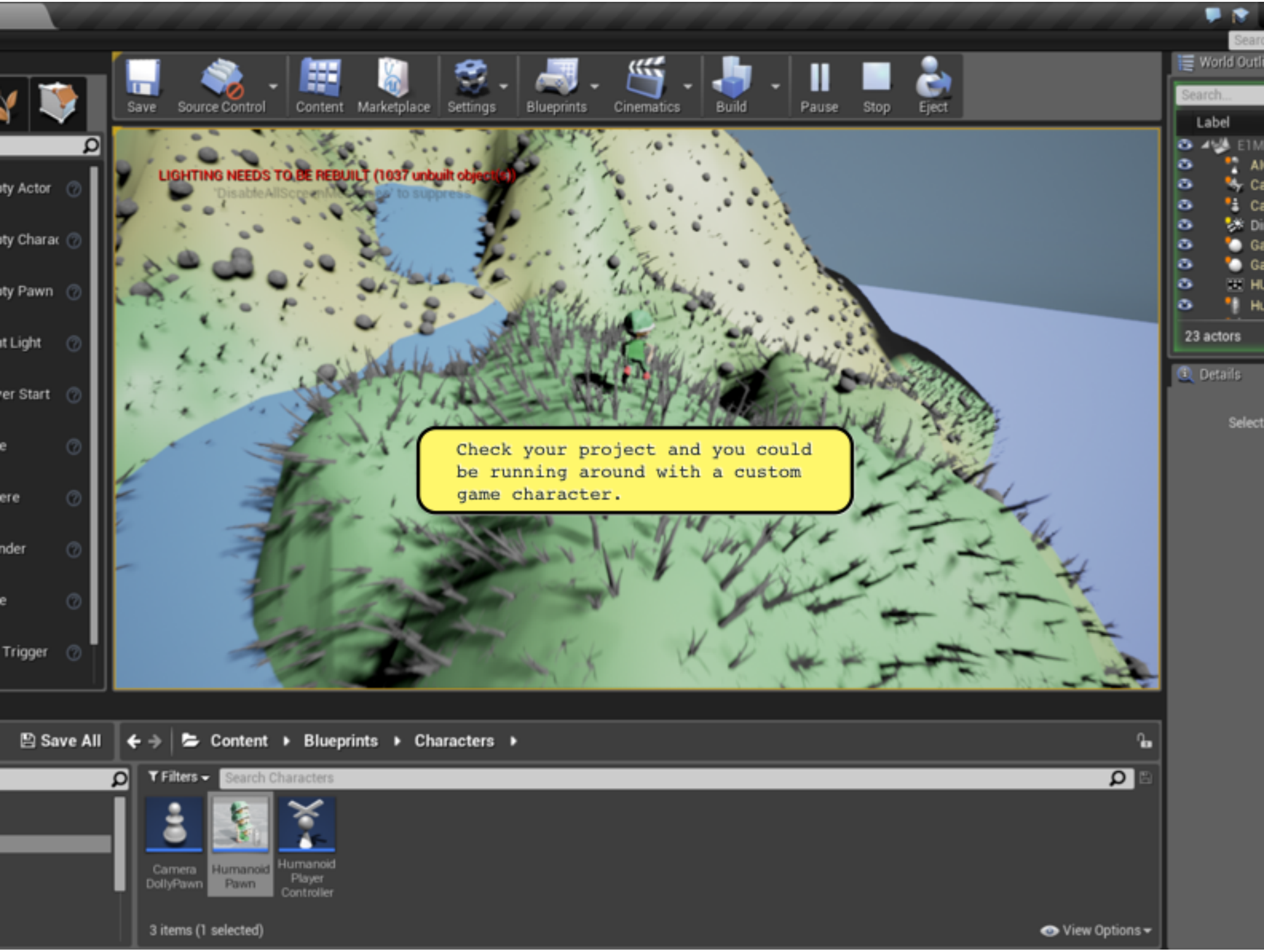

View
Debug
Window
Help
Parent class: Anim Instance
Search For Help
Find in CB
Preview
Ref Pose
Record
Search
Class Settings
Class Defaults
Play
Skeleton
CHARACTER_M
Mesh
CHARACTER_M
Animation
(None)
Graph
SteveAnimatio
Lit
Show
LOD Auto
Anim Graph
Event Graph
SteveAnimationBlueprint > Anim Graph
Speed
SteveBlendSpace
Blendspace Player
None
Final Animation Pose
Result
ANIMATION
Right-click in Content Browser and choose Animation, Animation Blueprint…
Name it SteveAnimationBlueprint, find it in Content Browser, and double-click on it to open it in the Animation Blueprint editor.
Folder
New
C++ Class
New
Import Asse
Impo
Edit Defa
s are not saved in
t Motion from Mor
Create Basic Asset
Blueprint Class
Level
Material
Particle System
Create Advanced Asset
Animation
Artificial Intelligence
Blendables
Blueprints
Aim Offset 1D
Animation Blueprint
Animation Composite
Animation Montage
Blend Space
Blend Space 1D
Level Sequence
Paper F
Blend Space
hold (Ctrl + Al
Right Click
15 items (1 selected)
Search
Default
Speed
0.0
Root Motion
Root Motion Mode
Root Motion from Montages Only
Optimization
Run Updates in Worker Threa
Warn About Blueprint Usage
SteveHair
StevePants
SteveShirt
SteveShoes
Steve Skeletal Mesh Idle
Steve Skeletal Mesh Run
Steve Skeletal Mesh Walk
SteveSkin
Materials
Element 0
View Options


View
Debug
Window
Help
Parent class: Anim Instance
Search For Help
Find in CB
Preview
Ref Pose
Record
Search
Class Settings
Class Defaults
Play
Skeleton
CHARACTER_M
Mesh
CHARACTER_M
Animation
(None)
Graph
SteveAnimatio
Lit
Show
LOD Auto
Anim Graph
Event Graph
SteveAnimationBlueprint > Anim Graph
Final Animation Pose
SteveBlendSpace
Blendspace Player
Speed
None
Result
ANIMATION
Click and Drag
Edit Defaults
Asset Browser
My Blueprint
Add New
Search
Graphs
EventGraph
Event BI
AnimGraph
Functions (2 Overridable)
Macros
Variables
Speed
Optimization
Run Updates in Worker Threa
Warn About Blueprint Usage
Click-and-drag your SteveBlendSpace (Blend Space 1D) from Content Browser, into the Material Editor's Animation Graph of your SteveAnimationBlueprint.
Default_ Material
Steve Animation Blueprint
SteveBlend Space
SteveEyes
SteveHair
StevePants
SteveShirt
SteveShoes
Steve Skeletal Mesh Idle
Steve Skeletal Mesh Run
Steve Skeletal Mesh Walk
SteveSkin
15 items (1 selected)
View Options
Materials
Element 0


View
Debug
Window
Help
Parent class: Anim Instance
Search For Help
Find in CB
Preview
Ref Pose
Record
Search
Class Settings
Class Defaults
Play
Skeleton
CHARACTER_M
Mesh
CHARACTER_M
Animation
(None)
Graph
SteveAnimatio
Lit
Show
LOD Auto
Anim Graph
Event Graph
SteveAnimationBlueprint > Anim Graph
Final Animation Pose
SteveBlendSpace
Blendspace Player
Speed
None
Result
Click and Drag
ANIMATION
Edit Defaults
Asset Bro
Add New
Graphs
EventGra
Event B
AnimGra
Functions
Macros
Variables
Speed
Click the [+] create button next to Variables inside SteveAnimationBlueprint. Create a variable named "Speed" and set its datatype to Float.
Click-and-drag your Speed variable into the SteveAnimationBlueprint Animation Graph, as a "get" of the variable, and connect it as the input into your Blend Space 1D node.
oot Motion from Montages Only
Run Updates in Worker Threa
Warn About Blueprint Usage
NOTE: In this step we have created a variable whose value we are using to determine the X input to our Blend Space 1D, and connect the Blend Space 1D's output to our Final Animation Pose node.
Steve Skeletal Mesh Walk
SteveSkin
Materials
Element 0
15 items (1 selected)
View Options

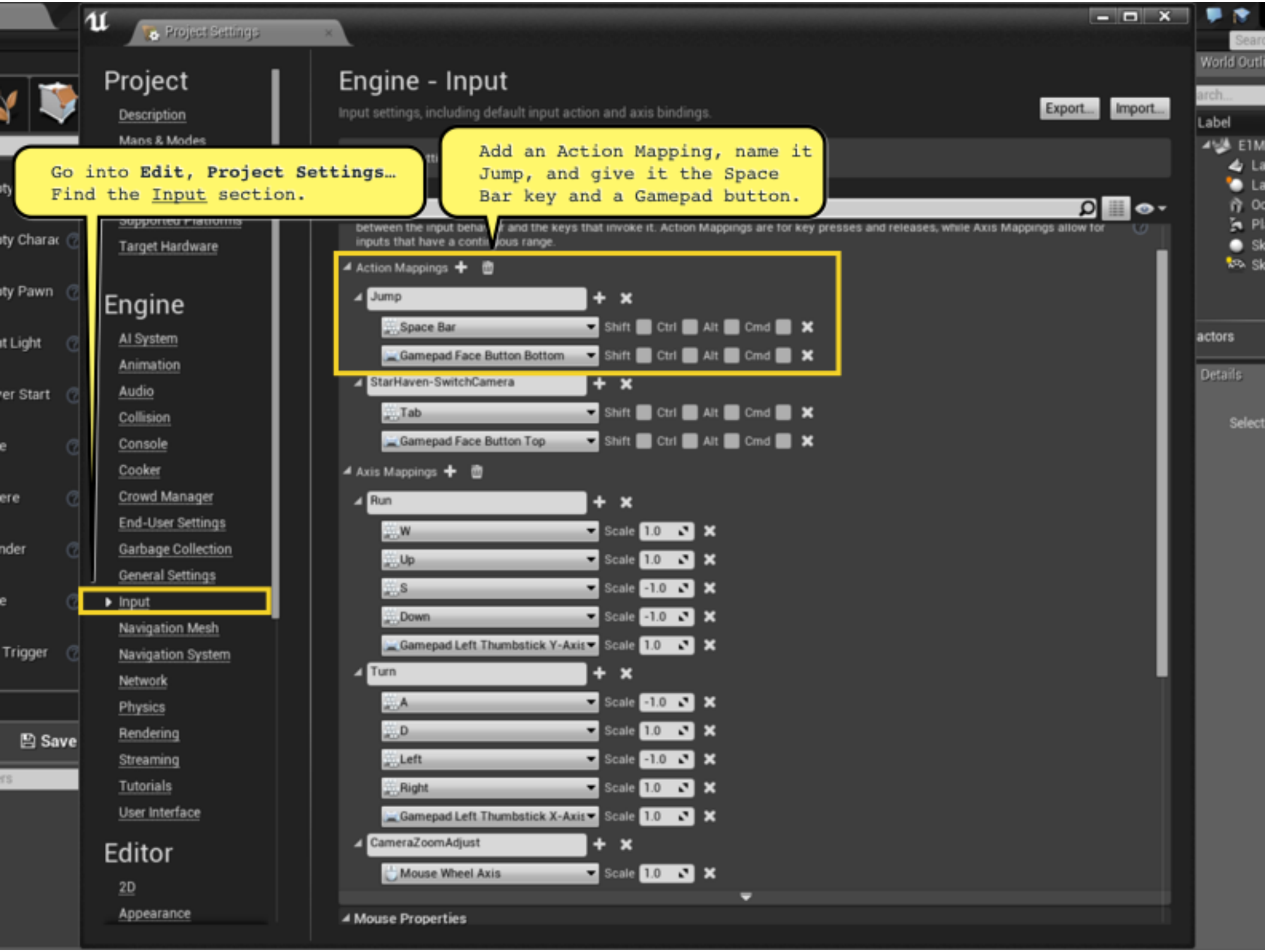

In the SteveAnimationBlueprint's Event Graph, use the Try Get Pawn Owner, Get Velocity, and VectorLength functions to read the speed of the character, and set it into the Speed variable so that its value will be accurate each time the animation updates.
Event Blueprint Update Animation
Delta Time X
SET
Speed
Try Get Pawn Owner
Target is Anim Instance
Target
self
Return Value
Get Velocity
Target is Actor
Target
Return Value
VectorLength
A
Return Value
Anim Graph
Event Graph
Asset Browser
My Blueprint
Add New
Search
Graphs
EventGraph
Event Blueprint Update Animation
AnimGraph
Functions (2 Overridable)
Macros
Variables
Speed
Default
Speed
0.0
Root Motion
Root Motion Mode
Root Motion from Montages Only
Optimization
Run Updates in Worker Threa
Warn About Blueprint Usage
Materials
Element 0
15 items (1 selected)
View Options

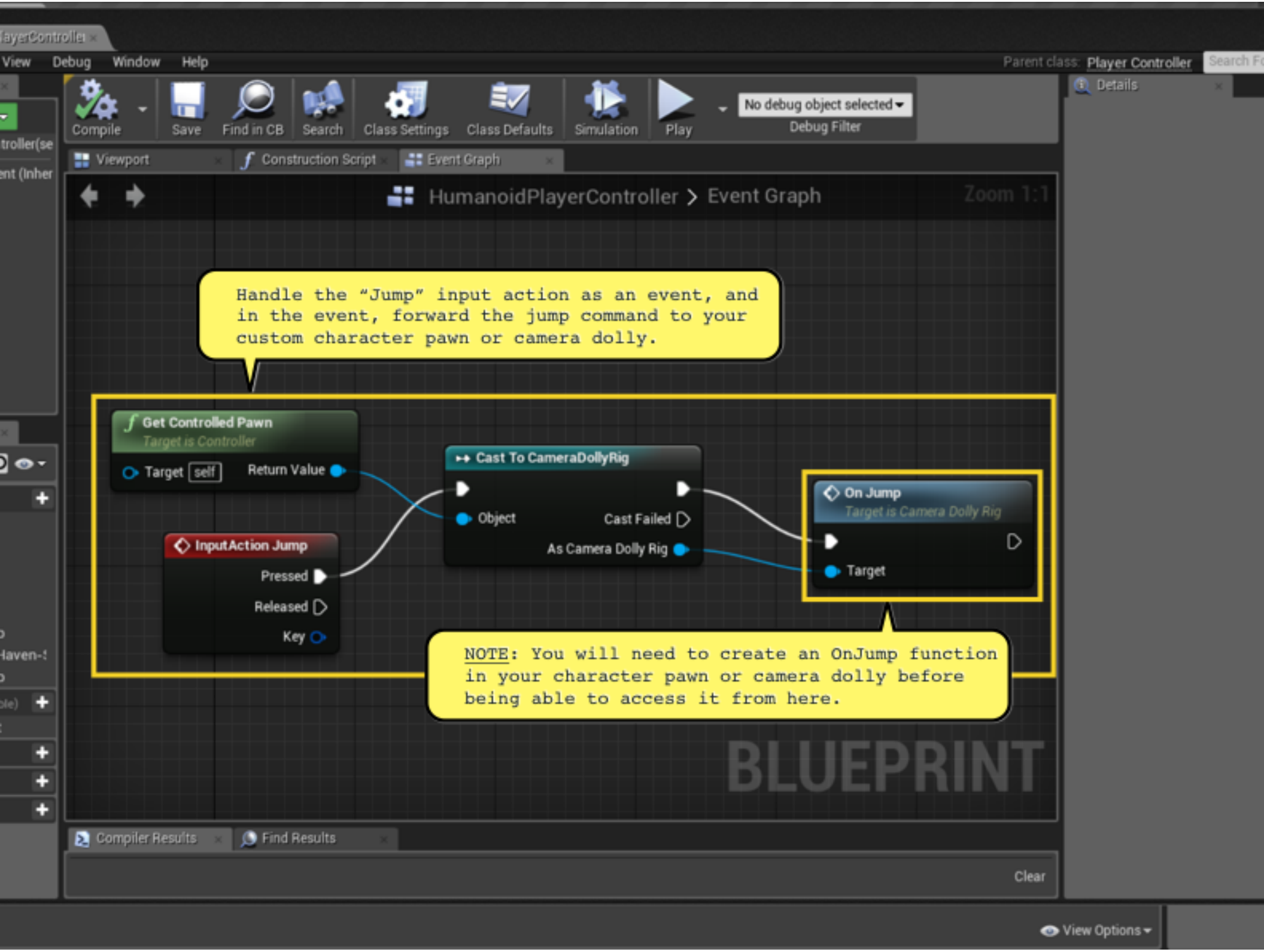

HumanoidPawn
File Edit Asset View
Parent class: Character
Search For Help
Components
+ Add Component
HumanoidPa
CapsuleCor
ArrowCon
Mesh (Inherited)
SpringArm
Camera
CharacterMovement (Inh
Simulation
Play
Go into your custom Character Pawn, and select his Skeletal Mesh component in the Components tab.
In the Details Panel set the character to use Animation Blueprints, and choose the Animation Blueprint created in the previous step.
Select the Skeletal Mesh of the character that was imported in the previous steps.
Details
Search
Animation
Animation Mode
Use Animation Blueprint
Anim Class
SteveAnimationBlueprint_C
Mesh
Skeletal Mesh
CHARACTER_MODEL_009
Materials
Element 0
Default_Material
Textures
Element 1
SteveShoes
Element 2
StevePants
Element 3
SteveShirt
SteveHair
My Blueprint
+ Add New
Graphs
EventGraph
Event BeginPlay
Event ActorBeginC
Event Tick
Functions (29 Overrid
ConstructionScript
OnRun
OnTurn
Macros
Variables
Components
Camera
SpringArm
Find Results
Clear
Camera DollyPawn
Humanoid Pawn
Humanoid Player Controller
3 items (1 selected)
View Options
Materials
Element 0

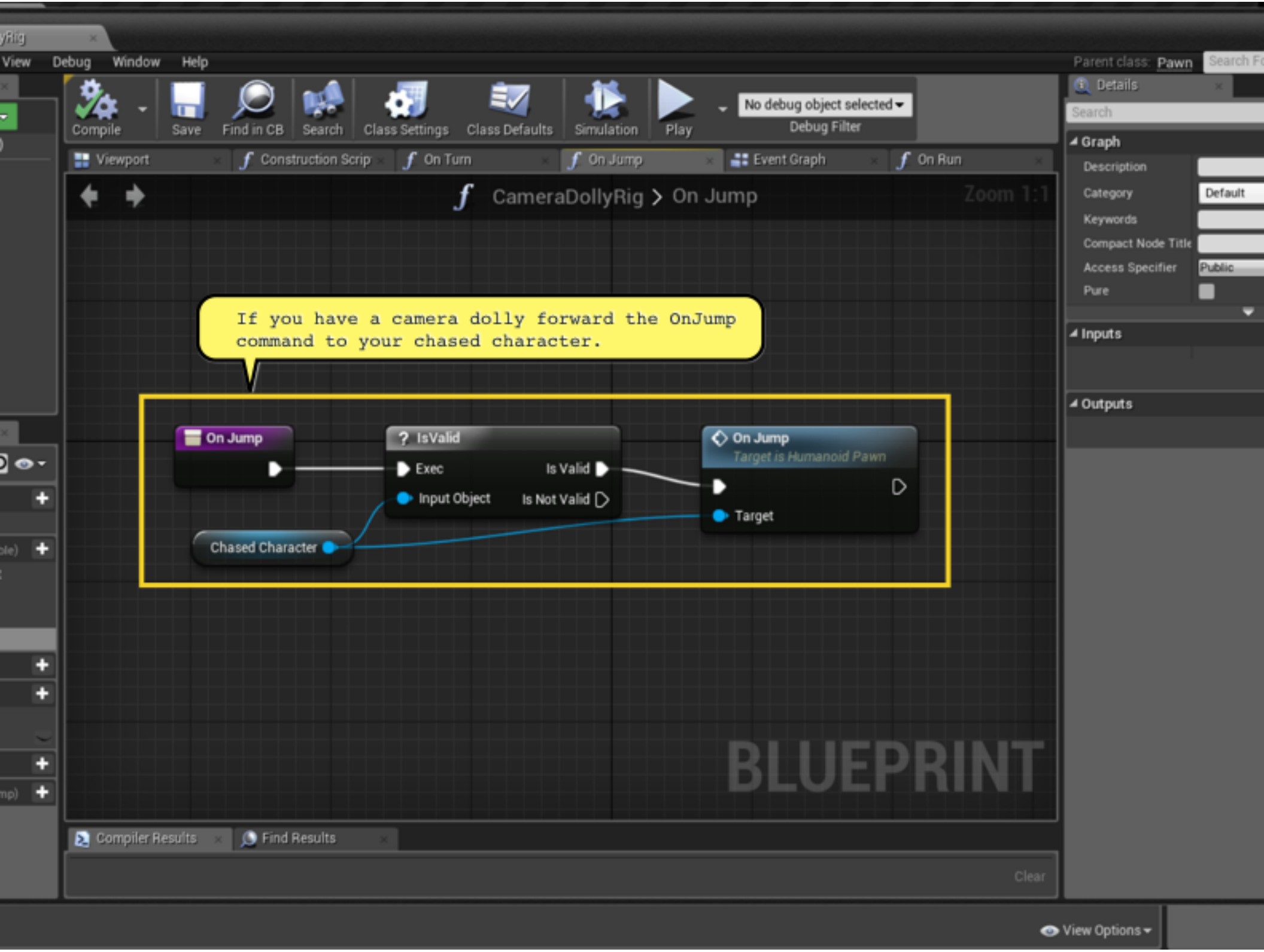

Save
Source Control
Content
Marketplace
Settings
Blueprints
Cinematics
Build
Pause
Stop
Eject
LIGHTING NEEDS TO BE REBUILT (1037 unbuilt object(s))
Check your project and you could be running around with a custom game character.
Save All
Content
Blueprints
Characters
Filters
Search Characters
Camera DollyPawn
Humanoid Pawn
Humanoid Player Controller
3 items (1 selected)
View Options
World Outl
Label
23 actors
Details

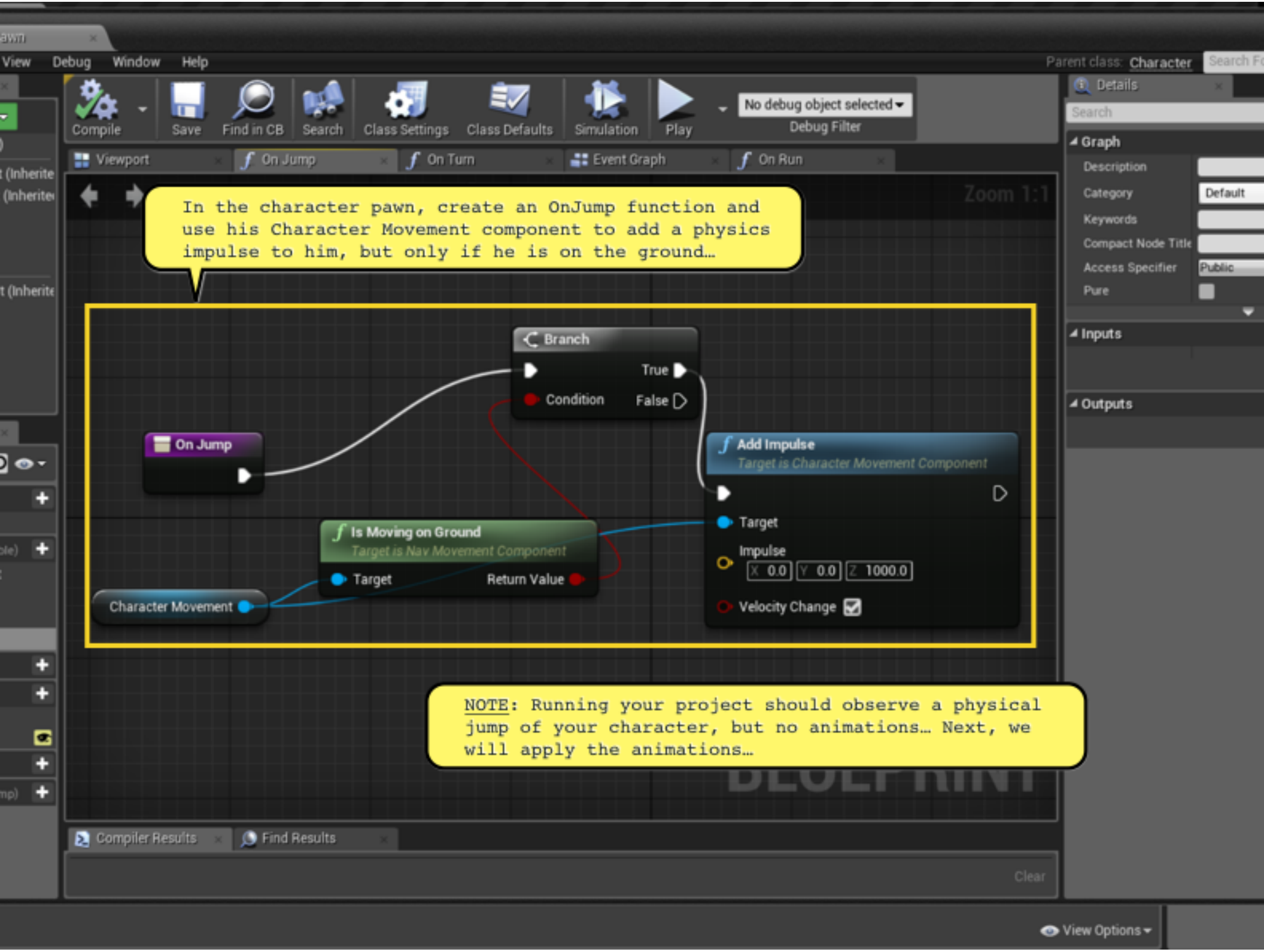
SECTION

EXTENDING CHARACTER WITH JUMP AND OTHER ANIMATIONS


Project Settings
Project
Description
Maps & Modes
Target Hardware
Engine
AI System
Animation
Audio
Collision
Console
Cooker
Crowd Manager
End-User Settings
Garbage Collection
General Settings
Input
Navigation Mesh
Navigation System
Network
Physics
Rendering
Streaming
Tutorials
User Interface
Editor
2D
Appearance
Engine - Input
Input settings, including default input action and axis bindings.
Export...
Import...
Go into Edit, Project Settings…
Find the Input section.
Add an Action Mapping, name it Jump, and give it the Space Bar key and a Gamepad button.
Action Mappings
Jump
Space Bar
Shift Ctrl Alt Cmd
Gamepad Face Button Bottom
Shift Ctrl Alt Cmd
StarHaven-SwitchCamera
Tab
Shift Ctrl Alt Cmd
Gamepad Face Button Top
Shift Ctrl Alt Cmd
Axis Mappings
Run
W
Scale 1.0
Up
Scale 1.0
S
Scale -1.0
Down
Scale -1.0
Gamepad Left Thumbstick Y-Axis
Scale 1.0
Turn
A
Scale -1.0
D
Scale 1.0
Left
Scale -1.0
Right
Scale 1.0
Gamepad Left Thumbstick X-Axis
Scale 1.0
CameraZoomAdjust
Mouse Wheel Axis
Scale 1.0
Mouse Properties

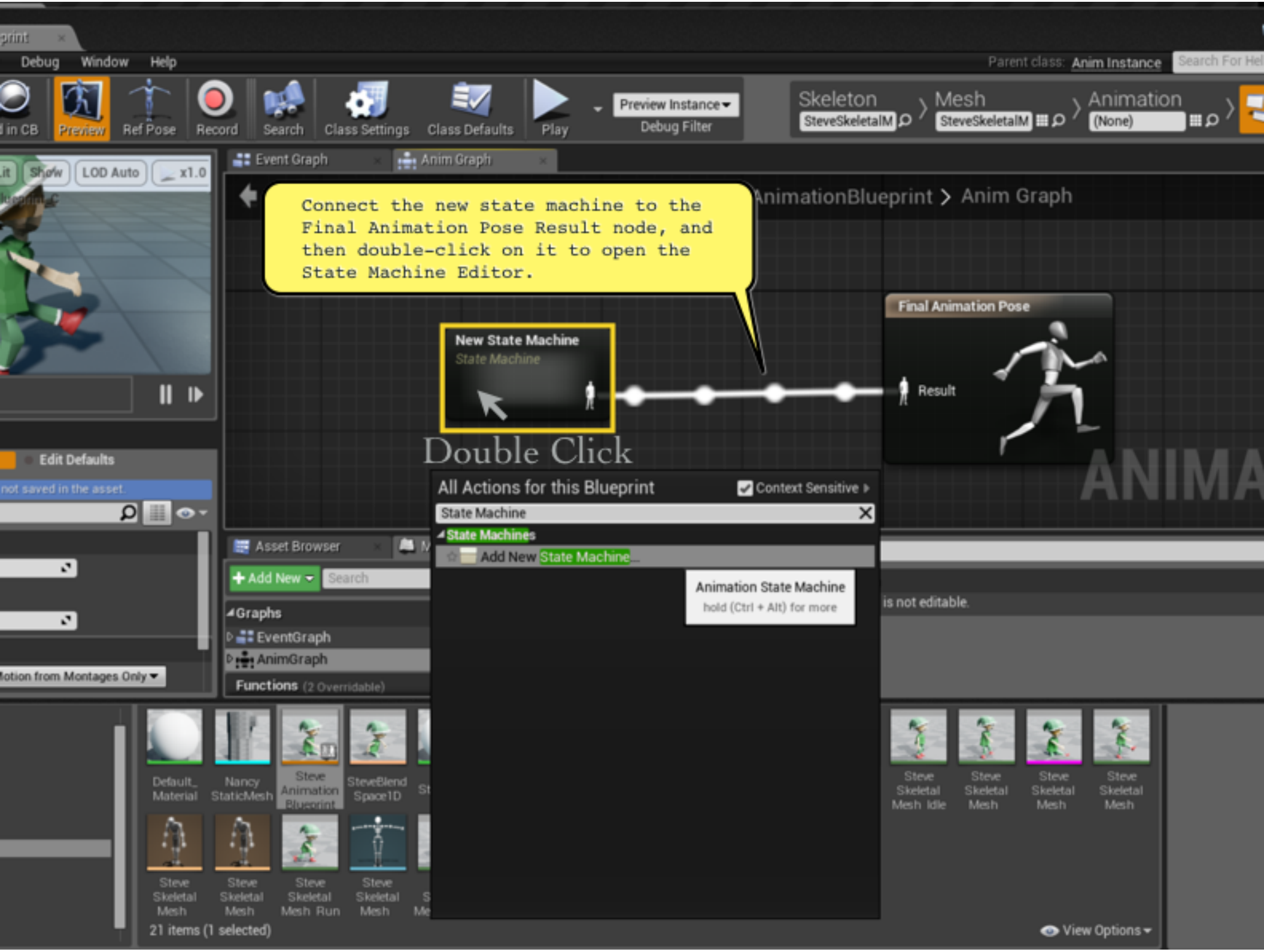

View
Debug
Window
Help
Parent class: Player Controller
Compile
Save
Find in CB
Search
Class Settings
Class Defaults
Simulation
Play
No debug object selected
Debug Filter
Details
Viewport
Construction Script
Event Graph
HumanoidPlayerController > Event Graph
Zoom 1:1
Handle the "Jump" input action as an event, and in the event, forward the jump command to your custom character pawn or camera dolly.
Get Controlled Pawn
Target is Controller
Target
self
Return Value
Cast To CameraDollyRig
Object
Cast Failed
As Camera Dolly Rig
InputAction Jump
Pressed
Released
Key
On Jump
Target is Camera Dolly Rig
Target
NOTE: You will need to create an OnJump function in your character pawn or camera dolly before being able to access it from here.
BLUEPRINT
Compiler Results
Find Results
Clear
View Options

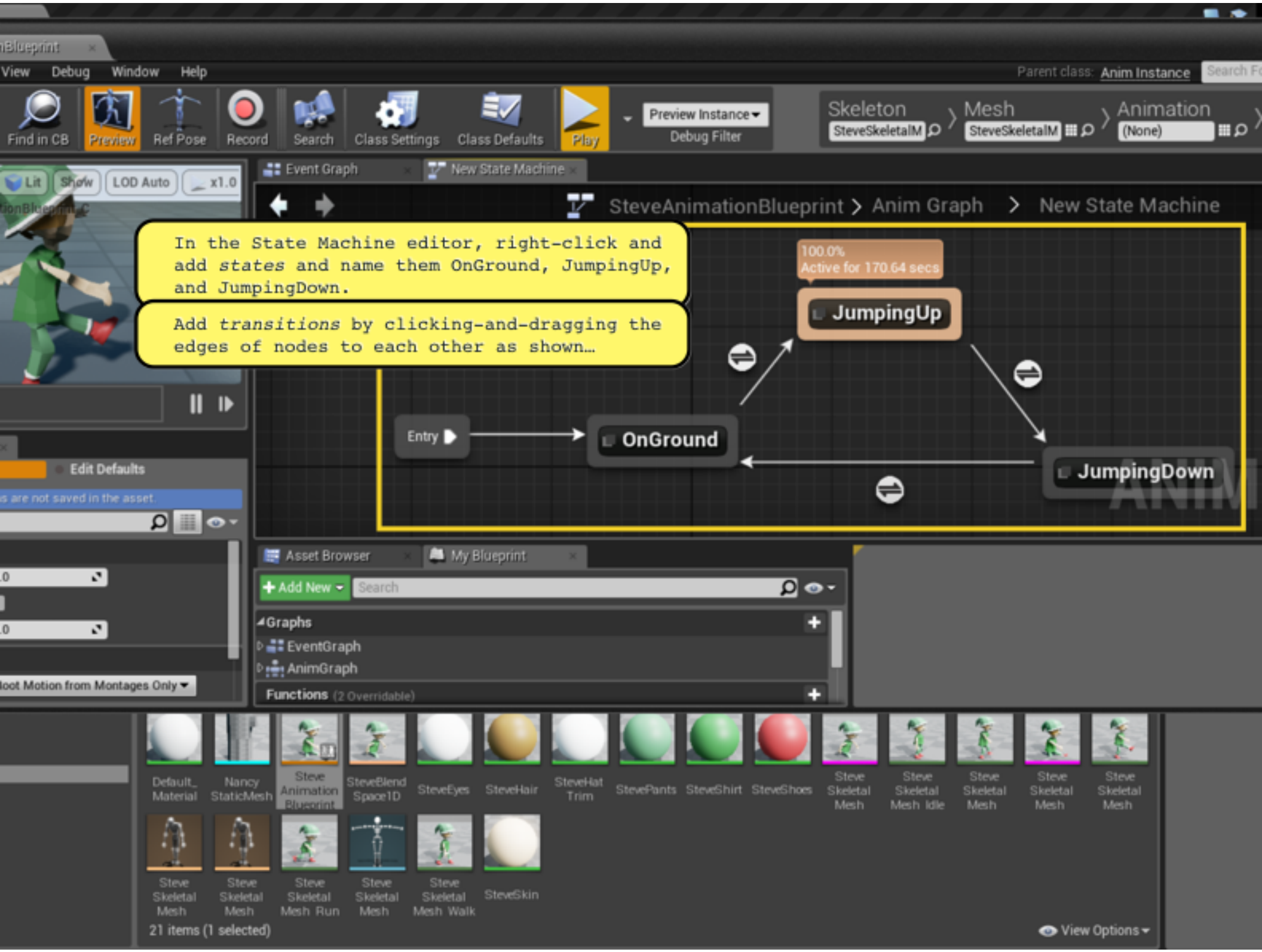

View
Debug
Window
Help
Parent class: Pawn
Compile
Save
Find in CB
Search
Class Settings
Class Defaults
Simulation
Play
No debug object selected
Debug Filter
Details
Search
Graph
Description
Category
Default
Keywords
Compact Node Title
Access Specifier
Public
Pure
Inputs
Outputs
Viewport
Construction Scrip
On Turn
On Jump
Event Graph
On Run
CameraDollyRig > On Jump
Zoom 1:1
If you have a camera dolly forward the OnJump command to your chased character.
On Jump
IsValid
Exec
Is Valid
Input Object
Is Not Valid
On Jump
Target is Humanoid Pawn
Target
Chased Character
BLUEPRINT
Compiler Results
Find Results
Clear
View Options


View
Debug
Window
Help
Parent class: Character
Compile
Save
Find in CB
Search
Class Settings
Class Defaults
Simulation
Play
No debug object selected
Debug Filter
Details
Search
Graph
Description
Category
Default
Keywords
Compact Node Title
Access Specifier
Public
Pure
Inputs
Outputs
Viewport
On Jump
On Turn
Event Graph
On Run
Zoom 1:1
In the character pawn, create an OnJump function and use his Character Movement component to add a physics impulse to him, but only if he is on the ground…
Branch
True
Condition
False
On Jump
Add Impulse
Target is Character Movement Component
Target
Impulse
X 0.0
Y 0.0
Z 1000.0
Velocity Change
Is Moving on Ground
Target is Nav Movement Component
Target
Return Value
Character Movement
NOTE: Running your project should observe a physical jump of your character, but no animations… Next, we will apply the animations…
Compiler Results
Find Results
Clear
View Options


Anim Graph
Event Graph
SteveAnimationBlueprint > Anim Graph
Final Animation Pose
SteveBlendSpace
Blendspace Player
Speed
None
Result
Double-click your character's Animation Blueprint to open it up in the Persona and Blueprint Editors.
Currently, you are using a Speed variable you created (which is being set to the character's velocity from the Event Graph of this Animation Blueprint)…
That Speed variable is being input into a Blend Space 1D, which is then using it to blend the Idle, Walk, and Run animations together, and that is being fed into the character's final animation pose…
Graphs
Functions
Macros
Variables
Speed
15 items (1 selected)

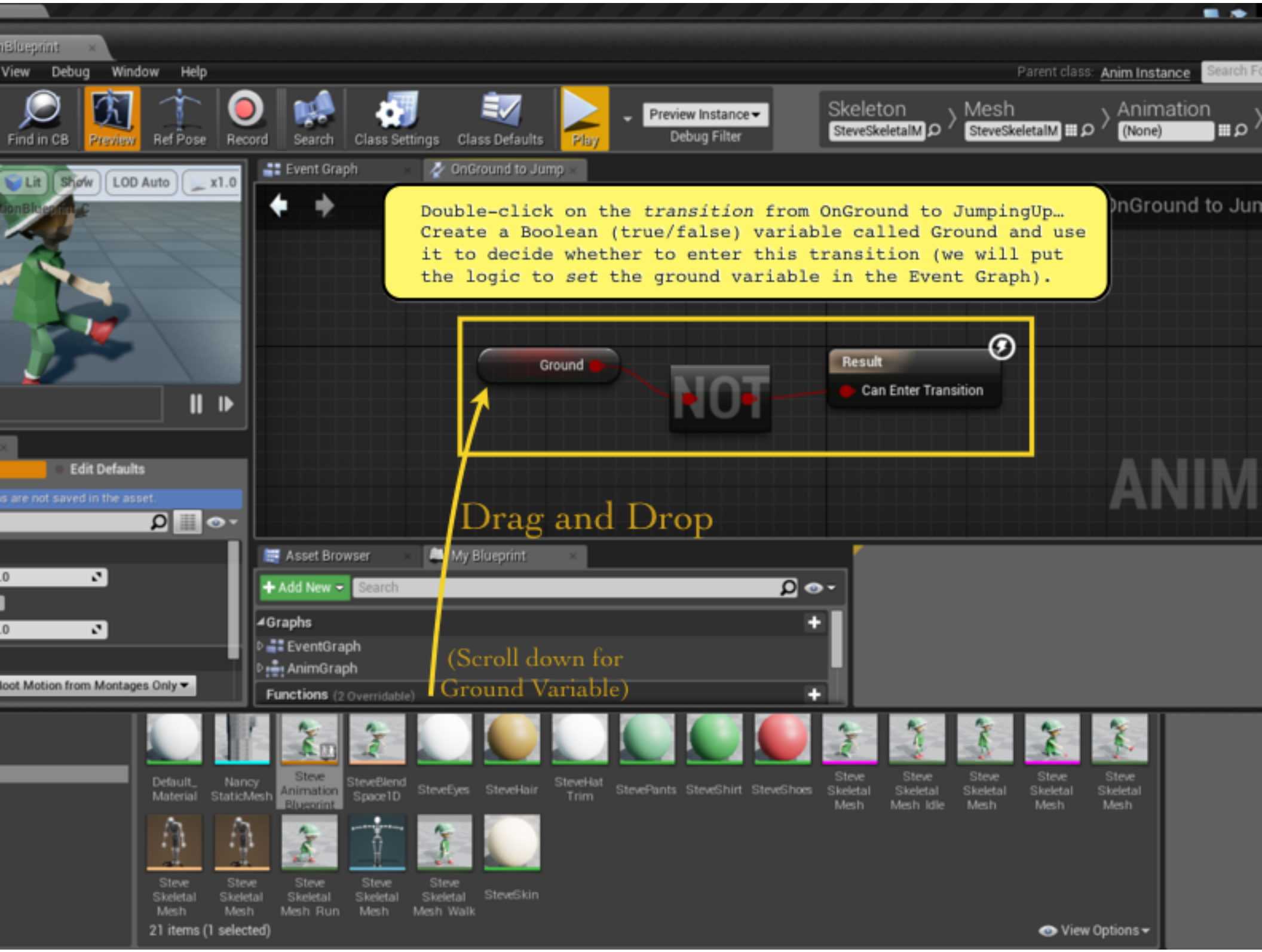

We need to add a more complicated logic into the character's Animation Blueprint's Anim Graph… (So that we can Idle, Walk, Run and Jump as well as other things…)
Right-click in Anim Graph and choose Add New State Machine.
Debug
Window
Help
Parent class: Anim Instance
Preview
Ref Pose
Record
Search
Class Settings
Class Defaults
Play
Preview Instance
Debug Filter
Skeleton
SteveSkeletalM
Mesh
SteveSkeletalM
Animation
(None)
Event Graph
Anim Graph
LOD Auto
x1.0
New State Machine
State Machine
Result
Right Click
All Actions for this Blueprint
Context Sensitive
State Machine
State Machines
Add New State Machine...
Animation State Machine
hold (Ctrl + Alt) for more
Edit Defaults
not saved in the asset
Asset Browser
Add New
Search
Graphs
EventGraph
AnimGraph
Functions (2 Overridable)
is not editable.
Default_ Material
Nancy StaticMesh
Steve Animation Blueprint
SteveBlend Space1D
Steve Skeletal Mesh idle
Steve Skeletal Mesh
Steve Skeletal Mesh
Steve Skeletal Mesh
Steve Skeletal Mesh
Steve Skeletal Mesh
Steve Skeletal Mesh Run
Steve Skeletal Mesh
21 items (1 selected)
View Options

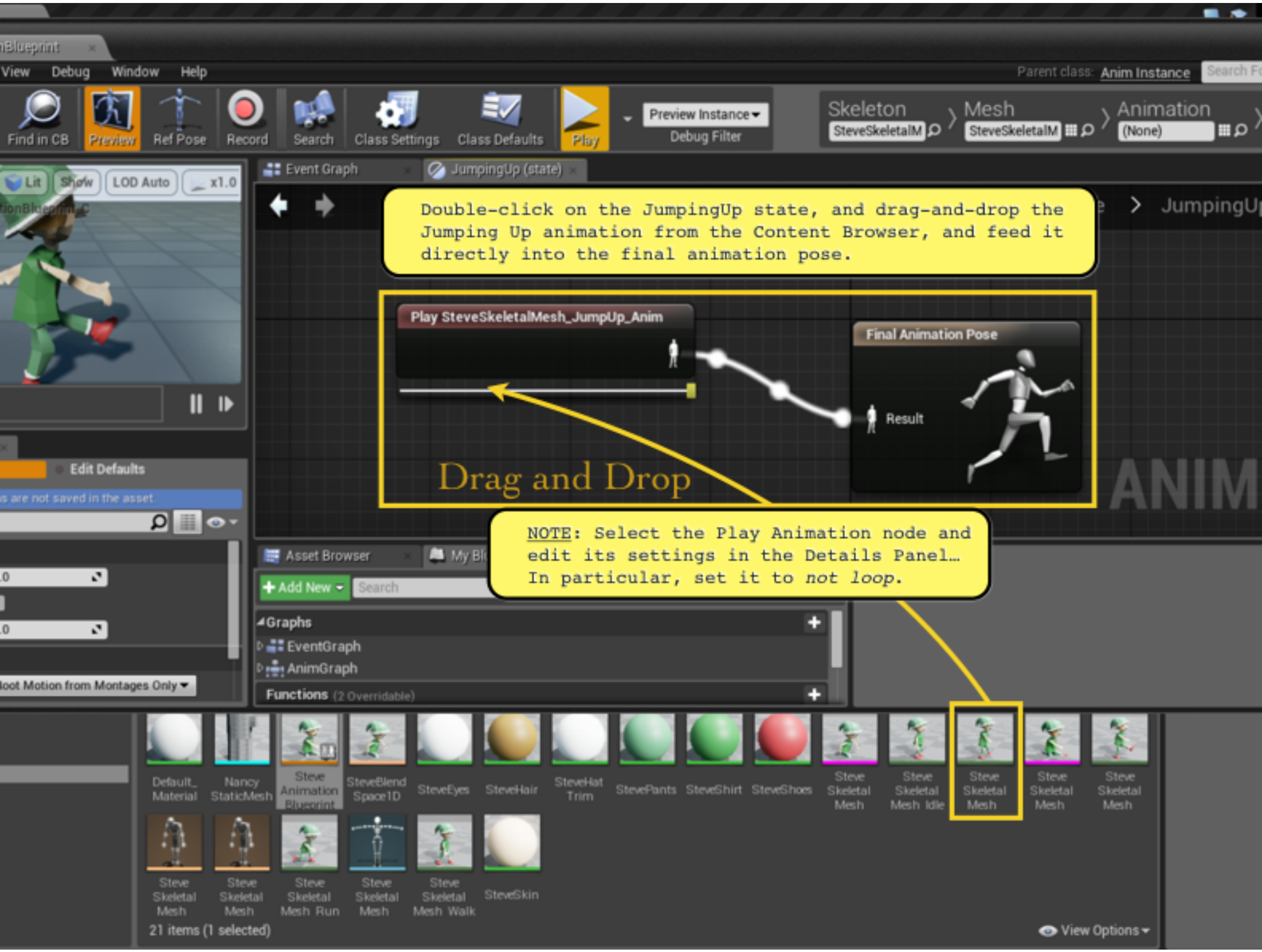

Debug
Window
Help
Parent class: Anim Instance
Search For Hel
Preview
Ref Pose
Record
Search
Class Settings
Class Defaults
Play
Preview Instance
Debug Filter
Skeleton
SteveSkeletalM
Mesh
SteveSkeletalM
Animation
(None)
Event Graph
Anim Graph
AnimationBlueprint > Anim Graph
Connect the new state machine to the Final Animation Pose Result node, and then double-click on it to open the State Machine Editor.
New State Machine
State Machine
Double Click
Final Animation Pose
Result
ANIMA
LOD Auto
x1.0
Edit Defaults
not saved in the asset
All Actions for this Blueprint
Context Sensitive
State Machine
State Machines
Add New State Machine...
Animation State Machine
hold (Ctrl + Alt) for more
Asset Browser
Add New
Search
Graphs
EventGraph
AnimGraph
Functions (2 Overridable)
is not editable.
Motion from Montages Only
Default_ Material
Nancy StaticMesh
Steve Animation Blueprint
SteveBlend Space1D
Steve Skeletal Mesh idle
Steve Skeletal Mesh
Steve Skeletal Mesh
Steve Skeletal Mesh
Steve Skeletal Mesh
Steve Skeletal Mesh
Steve Skeletal Mesh Run
Steve Skeletal Mesh
21 items (1 selected)
View Options

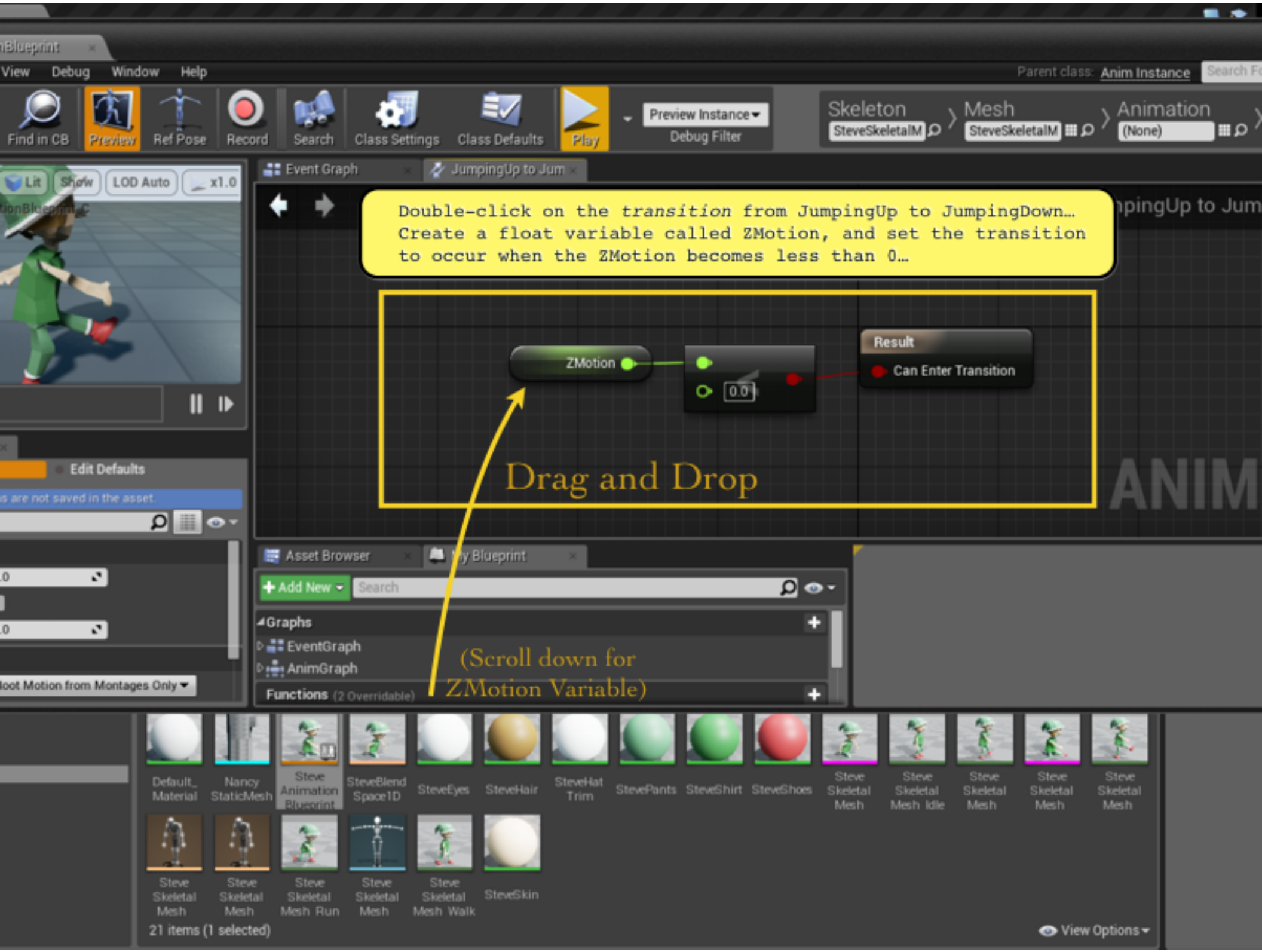

View
Debug
Window
Help
Parent class: Anim Instance
Find in CB
Preview
Ref Pose
Record
Search
Class Settings
Class Defaults
Play
Preview Instance
Debug Filter
Skeleton
SteveSkeletalM
Mesh
SteveSkeletalM
Animation
(None)
Lit
Show
LOD Auto
x1.0
Event Graph
New State Machine
SteveAnimationBlueprint > Anim Graph > New State Machine
In the State Machine editor, right-click and add states and name them OnGround, JumpingUp, and JumpingDown.
Add transitions by clicking-and-dragging the edges of nodes to each other as shown…
100.0%
Active for 170.64 secs
JumpingUp
Entry
OnGround
JumpingDown
Edit Defaults
Asset Browser
My Blueprint
Add New
Search
Graphs
EventGraph
AnimGraph
Functions (2 Overridable)
Default_ Material
Nancy StaticMesh
Steve Animation Blueprint
SteveBlend Space1D
SteveEyes
SteveHair
SteveHat Trim
StevePants
SteveShirt
SteveShoes
Steve Skeletal Mesh
Steve Skeletal Mesh Idle
Steve Skeletal Mesh
Steve Skeletal Mesh
Steve Skeletal Mesh
Steve Skeletal Mesh
Steve Skeletal Mesh
Steve Skeletal Mesh Run
Steve Skeletal Mesh
Steve Skeletal Mesh Walk
SteveSkin
21 items (1 selected)
View Options

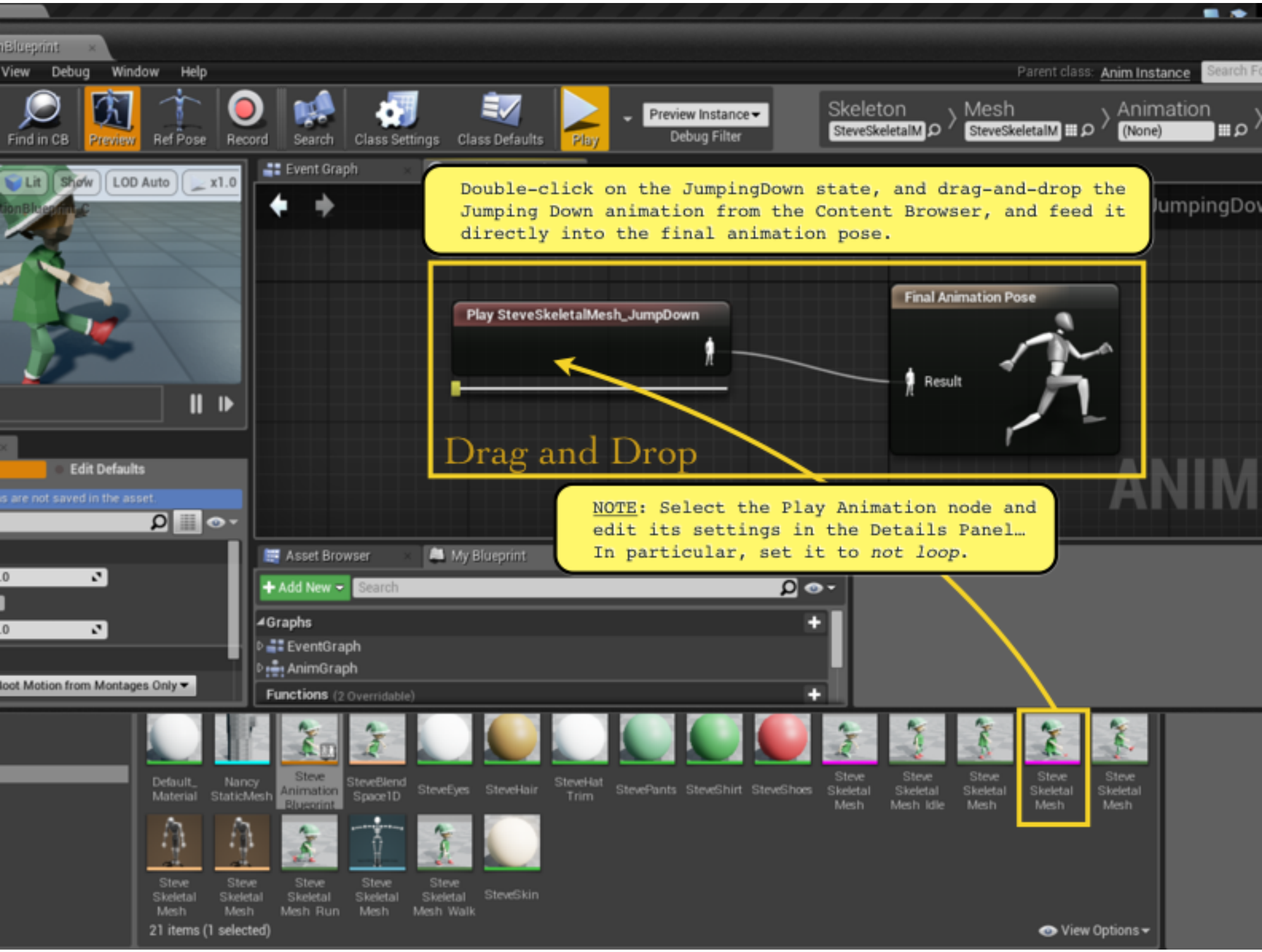

View
Debug
Window
Help
Parent class: Anim Instance
Find in CB
Preview
Ref Pose
Record
Search
Class Settings
Class Defaults
Play
Preview Instance
Debug Filter
Skeleton
SteveSkeletalM
Mesh
SteveSkeletalM
Animation
(None)
Lit
Show
LOD Auto
x1.0
Event Graph
OnGround (state)
SteveAnimationBlueprint > Anim Graph > New State Machine > OnGround
Double-click on the OnGround state, and inside it, reproduce the graph that you created before with the Blend Space 1D node.
Final Animation Pose
Result
SteveBlendSpace1D
Blendspace Player
Speed
None
ANIM
Drag and Drop
Edit Defaults
Asset Browser
My Blueprint
Add New
Search
Graphs
EventGraph
AnimGraph
Functions
(Scroll down for Speed Variable)
Default_ Material
Nancy StaticMesh
Steve Animation Blueprint
SteveBlend Space1D
SteveEyes
SteveHair
SteveHat Trim
StevePants
SteveShirt
SteveShoes
Steve Skeletal Mesh
Steve Skeletal Mesh Idle
Steve Skeletal Mesh
Steve Skeletal Mesh
Steve Skeletal Mesh
Steve Skeletal Mesh
Steve Skeletal Mesh Run
Steve Skeletal Mesh
Steve Skeletal Mesh Walk
SteveSkin
21 items (1 selected)
View Options


View
Debug
Window
Help
Parent class: Anim Instance
Find in CB
Preview
Ref Pose
Record
Search
Class Settings
Class Defaults
Play
Preview Instance
Debug Filter
Skeleton
SteveSkeletalM
Mesh
SteveSkeletalM
Animation
(None)
Lit
Show
LOD Auto
x1.0
Event Graph
OnGround (state)
SteveAnimationBlueprint > Anim Graph > New State Machine > OnGround
Click on the back arrow to take you back to the main state machine graph.
Final Animation Pose
Result
SteveBlendSpace1D
Blendspace Player
Speed
None
ANIM
Edit Defaults
Asset Browser
My Blueprint
Add New
Search
Graphs
EventGraph
AnimGraph
Functions (2 Overridable)
Default_ Material
Nancy StaticMesh
Steve Animation Blueprint
SteveBlend Space1D
SteveEyes
SteveHair
SteveHat Trim
StevePants
SteveShirt
SteveShoes
Steve Skeletal Mesh
Steve Skeletal Mesh Idle
Steve Skeletal Mesh
Steve Skeletal Mesh
Steve Skeletal Mesh
Steve Skeletal Mesh
Steve Skeletal Mesh
Steve Skeletal Mesh Run
Steve Skeletal Mesh
Steve Skeletal Mesh Walk
SteveSkin
21 items (1 selected)
View Options

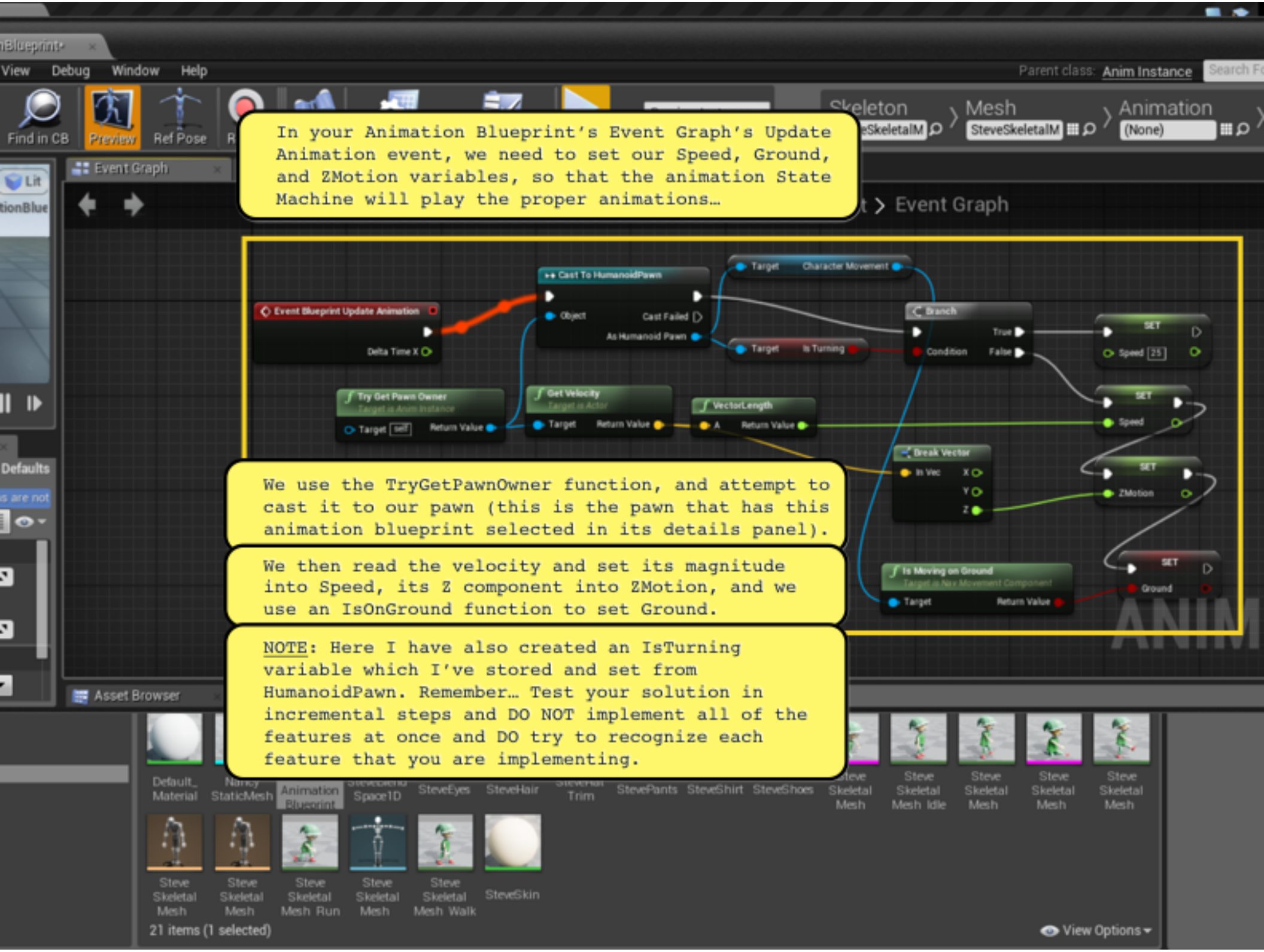

View
Debug
Window
Help
Parent class: Anim Instance
Find in CB
Preview
Ref Pose
Record
Search
Class Settings
Class Defaults
Play
Preview Instance
Debug Filter
Skeleton
SteveSkeletalM
Mesh
SteveSkeletalM
Animation
(None)
Lit
Show
LOD Auto
x1.0
Event Graph
OnGround to Jump
Double-click on the transition from OnGround to JumpingUp… Create a Boolean (true/false) variable called Ground and use it to decide whether to enter this transition (we will put the logic to set the ground variable in the Event Graph).
Ground
NOT
Result
Can Enter Transition
Edit Defaults
Drag and Drop
Asset Browser
My Blueprint
Add New
Search
Graphs
EventGraph
AnimGraph
Functions (2 Overridable)
(Scroll down for Ground Variable)
Default_ Material
Nancy StaticMesh
Steve Animation Blueprint
SteveBlend Space1D
SteveEyes
SteveHair
SteveHat Trim
StevePants
SteveShirt
SteveShoes
Steve Skeletal Mesh
Steve Skeletal Mesh Idle
Steve Skeletal Mesh
Steve Skeletal Mesh
Steve Skeletal Mesh
Steve Skeletal Mesh
Steve Skeletal Mesh
Steve Skeletal Mesh Run
Steve Skeletal Mesh
Steve Skeletal Mesh Walk
SteveSkin
21 items (1 selected)
View Options

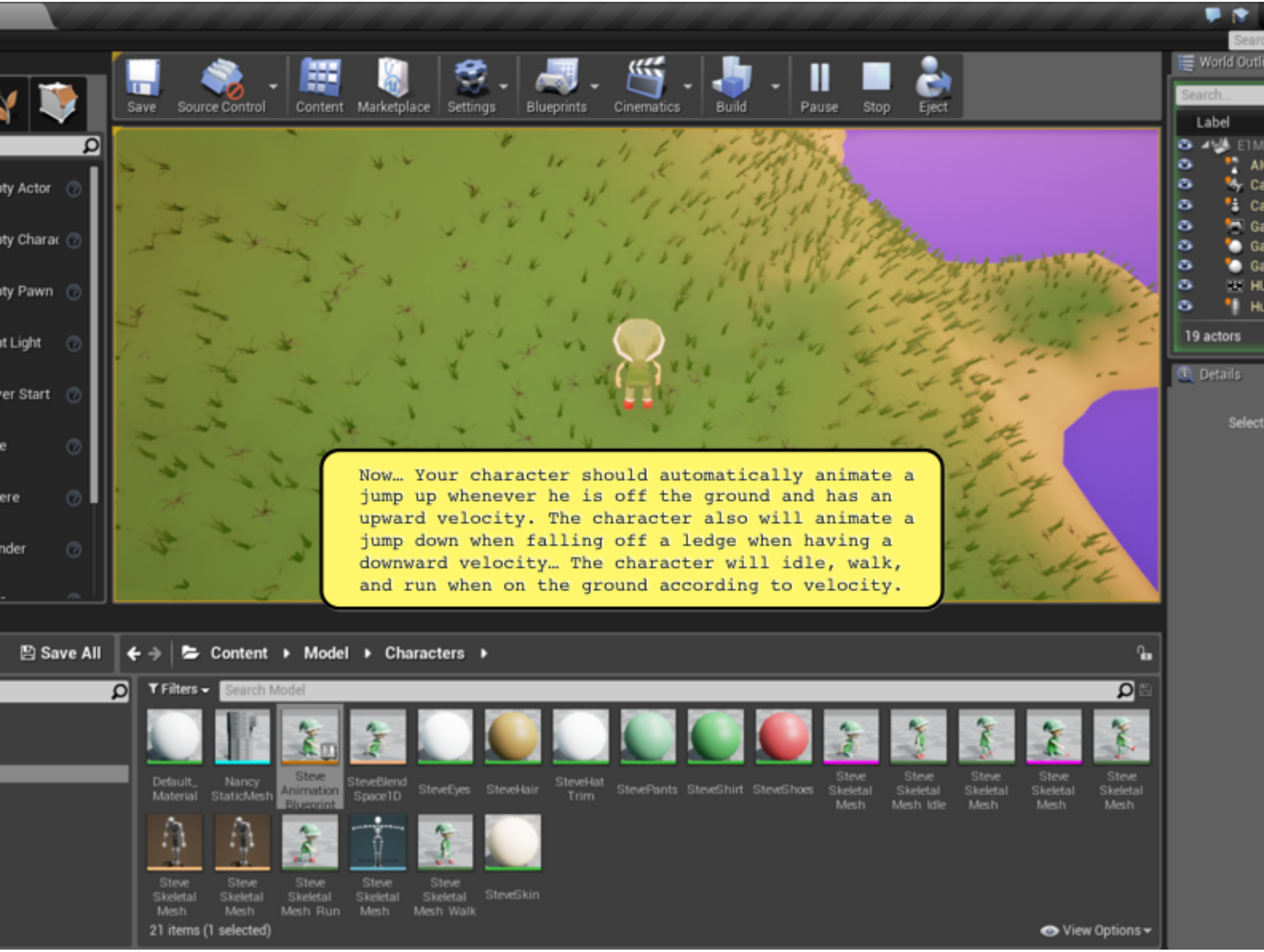

View Debug Window Help
Parent class: Anim Instance
Find in CB
Preview
Ref Pose
Record
Search
Class Settings
Class Defaults
Play
Preview Instance
Debug Filter
Skeleton
SteveSkeletalM
Mesh
SteveSkeletalM
Animation
(None)
Event Graph
JumpingUp (state)
Double-click on the JumpingUp state, and drag-and-drop the Jumping Up animation from the Content Browser, and feed it directly into the final animation pose.
Play SteveSkeletalMesh_JumpUp_Anim
Final Animation Pose
Result
Drag and Drop
NOTE: Select the Play Animation node and edit its settings in the Details Panel… In particular, set it to not loop.
Edit Defaults
Asset Browser
Add New
Search
Graphs
EventGraph
AnimGraph
Functions (2 Overridable)
Default_ Material
Nancy StaticMesh
Steve Animation Blueprint
SteveBlend Space1D
SteveEyes
SteveHair
SteveHat Trim
StevePants
SteveShirt
SteveShoes
Steve Skeletal Mesh
Steve Skeletal Mesh Idle
Steve Skeletal Mesh
Steve Skeletal Mesh
Steve Skeletal Mesh
Steve Skeletal Mesh
Steve Skeletal Mesh
Steve Skeletal Mesh Run
Steve Skeletal Mesh
Steve Skeletal Mesh Walk
SteveSkin
21 items (1 selected)
View Options


View Debug Window Help
Parent class: Anim Instance
Find in CB
Preview
Ref Pose
Record
Search
Class Settings
Class Defaults
Play
Preview Instance
Debug Filter
Skeleton
SteveSkeletalM
Mesh
SteveSkeletalM
Animation
(None)
Lit
Show
LOD Auto
x1.0
Event Graph
JumpingUp to Jum
Double-click on the transition from JumpingUp to JumpingDown…
Create a float variable called ZMotion, and set the transition
to occur when the ZMotion becomes less than 0…
ZMotion
0.0
Result
Can Enter Transition
Drag and Drop
Edit Defaults
Asset Browser
Add New
Search
Graphs
EventGraph
AnimGraph
Functions (2 Overridable)
(Scroll down for
ZMotion Variable)
Default_ Material
Nancy StaticMesh
Steve Animation Blueprint
SteveBlend Space1D
SteveEyes
SteveHair
SteveHat Trim
StevePants
SteveShirt
SteveShoes
Steve Skeletal Mesh
Steve Skeletal Mesh Idle
Steve Skeletal Mesh Run
Steve Skeletal Mesh Walk
SteveSkin
21 items (1 selected)
View Options


View
Debug
Window
Help
Parent class: Anim Instance
Find in CB
Preview
Ref Pose
Record
Search
Class Settings
Class Defaults
Play
Preview Instance
Debug Filter
Skeleton
SteveSkeletalM
Mesh
SteveSkeletalM
Animation
(None)
Lit
Show
LOD Auto
x1.0
Event Graph
Double-click on the JumpingDown state, and drag-and-drop the Jumping Down animation from the Content Browser, and feed it directly into the final animation pose.
Play SteveSkeletalMesh_JumpDown
Final Animation Pose
Result
Drag and Drop
NOTE: Select the Play Animation node and edit its settings in the Details Panel… In particular, set it to not loop.
Edit Defaults
Asset Browser
My Blueprint
Add New
Search
Graphs
EventGraph
AnimGraph
Functions (2 Overridable)
Default_ Material
Nancy StaticMesh
Steve Animation Blueprint
SteveBlend Space1D
SteveEyes
SteveHair
SteveHat Trim
StevePants
SteveShirt
SteveShoes
Steve Skeletal Mesh
Steve Skeletal Mesh Idle
Steve Skeletal Mesh
Steve Skeletal Mesh
Steve Skeletal Mesh
Steve Skeletal Mesh
Steve Skeletal Mesh Run
Steve Skeletal Mesh
Steve Skeletal Mesh Walk
SteveSkin
21 items (1 selected)
View Options


View Debug Window Help
Parent class: Anim Instance
Find in CB
Preview
Ref Pose
Record
Search
Class Settings
Class Defaults
Play
Preview Instance
Debug Filter
Skeleton
SteveSkeletalM
Mesh
SteveSkeletalM
Animation
(None)
Lit
Show
LOD Auto
x1.0
Event Graph
JumpingDown to G
New State Machine
JumpingDown to
Double-click on the transition from JumpingDown to OnGround and use the Ground variable as the indicator of whether to take the transition…
Ground
Result
Can Enter Transition
Drag and Drop
ANIM
Edit Defaults
Asset Browse
Add New
Check that you have all states and transitions described for your character as desired.
Graphs
EventGraph
AnimGraph
Functions (2 Overridable)
(Scroll down for Ground Variable)
Default_ Material
Nancy StaticMesh
Steve Animation Blueprint
SteveBlend Space1D
SteveEyes
SteveHair
SteveHat Trim
StevePants
SteveShirt
SteveShoes
Steve Skeletal Mesh
Steve Skeletal Mesh Idle
Steve Skeletal Mesh
Steve Skeletal Mesh
Steve Skeletal Mesh
Steve Skeletal Mesh
Steve Skeletal Mesh
Steve Skeletal Mesh Run
Steve Skeletal Mesh
Steve Skeletal Mesh Walk
SteveSkin
21 items (1 selected)
View Options


In your Animation Blueprint's Event Graph's Update Animation event, we need to set our Speed, Ground, and ZMotion variables, so that the animation State Machine will play the proper animations…
We use the TryGetPawnOwner function, and attempt to cast it to our pawn (this is the pawn that has this animation blueprint selected in its details panel).
We then read the velocity and set its magnitude into Speed, its Z component into ZMotion, and we use an IsOnGround function to set Ground.
NOTE: Here I have also created an IsTurning variable which I've stored and set from HumanoidPawn. Remember… Test your solution in incremental steps and DO NOT implement all of the features at once and DO try to recognize each feature that you are implementing.
Event Graph
Asset Browser
Cast To HumanoidPawn
Event Blueprint Update Animation
Try Get Pawn Owner
Get Velocity
VectorLength
Branch
Break Vector
Is Moving on Ground
SET
Speed
ZMotion
Ground
IsTurning
21 items (1 selected)
View Options


Save
Source Control
Content
Marketplace
Settings
Blueprints
Cinematics
Build
Pause
Stop
Eject
Now… Your character should automatically animate a jump up whenever he is off the ground and has an upward velocity. The character also will animate a jump down when falling off a ledge when having a downward velocity… The character will idle, walk, and run when on the ground according to velocity.
Save All
Content
Model
Characters
Filters
Search Model
Default_ Material
Nancy StaticMesh
Steve Animation Blueprint
SteveBlend Space1D
SteveEyes
SteveHair
SteveHat Trim
StevePants
SteveShirt
SteveShoes
Steve Skeletal Mesh
Steve Skeletal Mesh Idle
Steve Skeletal Mesh Run
Steve Skeletal Mesh Walk
SteveSkin
21 items (1 selected)
View Options
19 actors
Details

IMPORTANT:

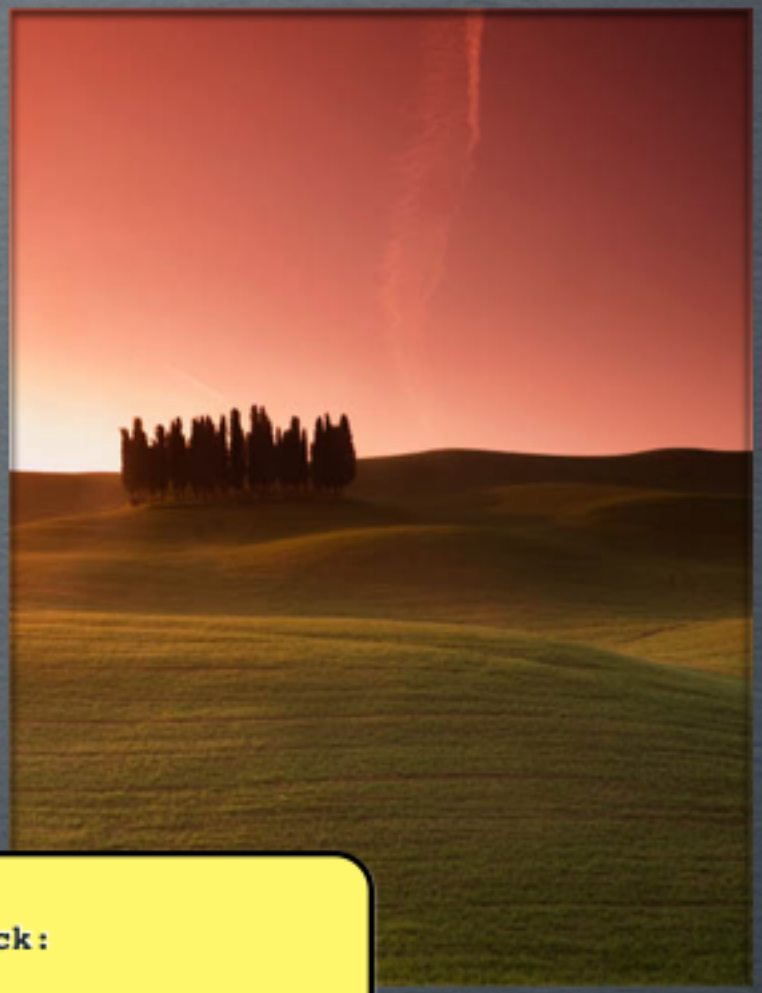
- ☒ When the chase camera reaches the character the camera itself does NOT go inside the character.
- ☒ When the chase camera's line of site to the character is obstructed it DOES NOT remain on the outside of a building or inside a tree.
- ☒ When the character runs inside a building, next to a big object, or by a large hill, the chase camera DOES NOT go inside the hill or large object to a place where the camera should not be.

MAKE SURE YOU HAVE SET EVERYTHING PROPERLY AND ASK

* Use a PlayerController by itself if that is all your game needs.
* Use a PlayerController with a Character Pawn, a camera and a spring arm, if that is all your game needs for simple settings and good results. Be sure to set your Spring Arm to probe so it will adjust for indoor, outdoor, and other objects.
* Use a PlayerController, Camera Dolly Pawn, Character Pawn, for more complicated camera control. Set your Camera Dolly to probe so it will adjust for indoor, outdoor, and other objects. Set your Character Pawn to not interfere with the probe of your Camera Dolly Pawn so that the Camera Dolly will not fly inside of it thinking it is a building.

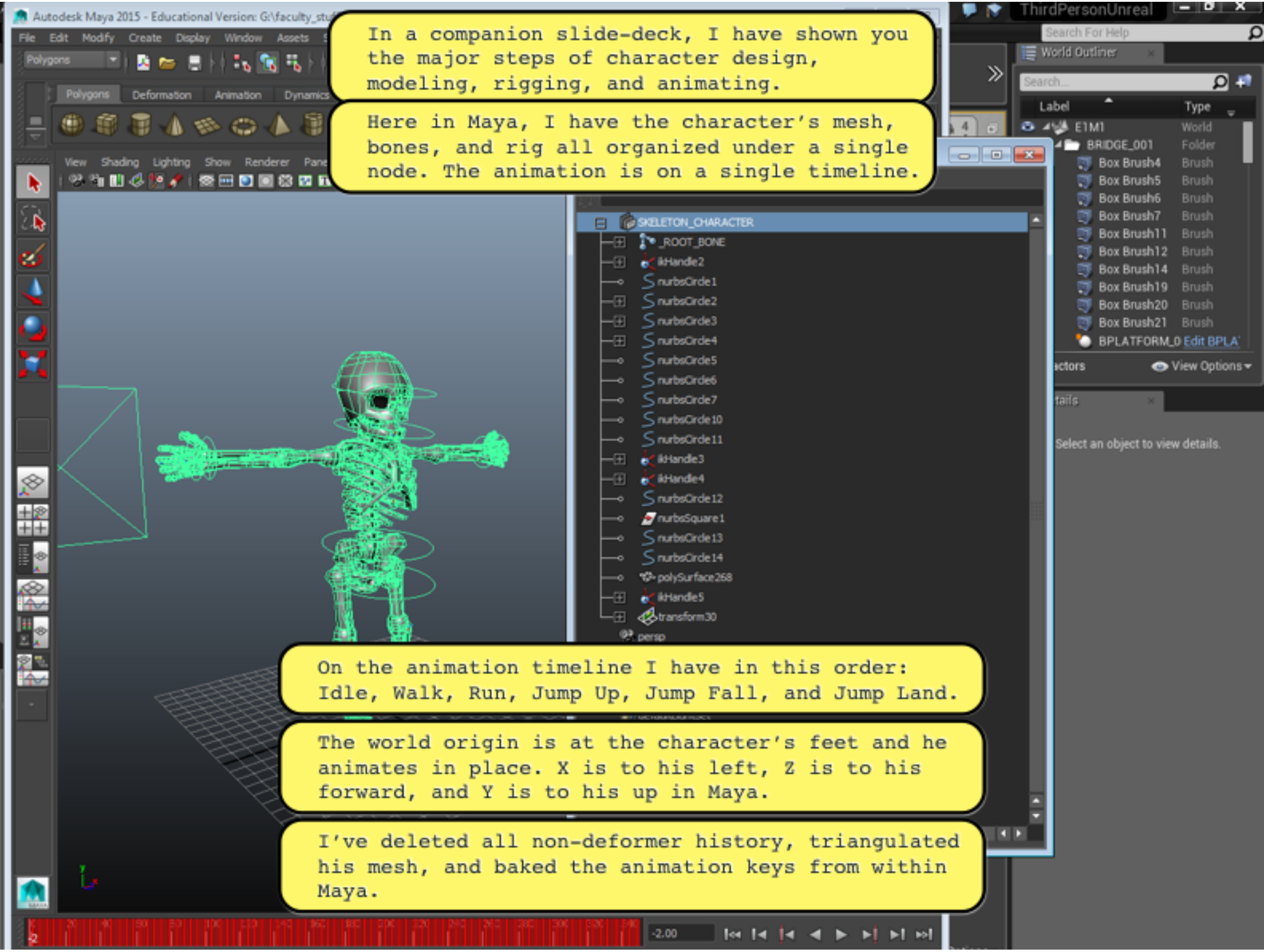
SECTION

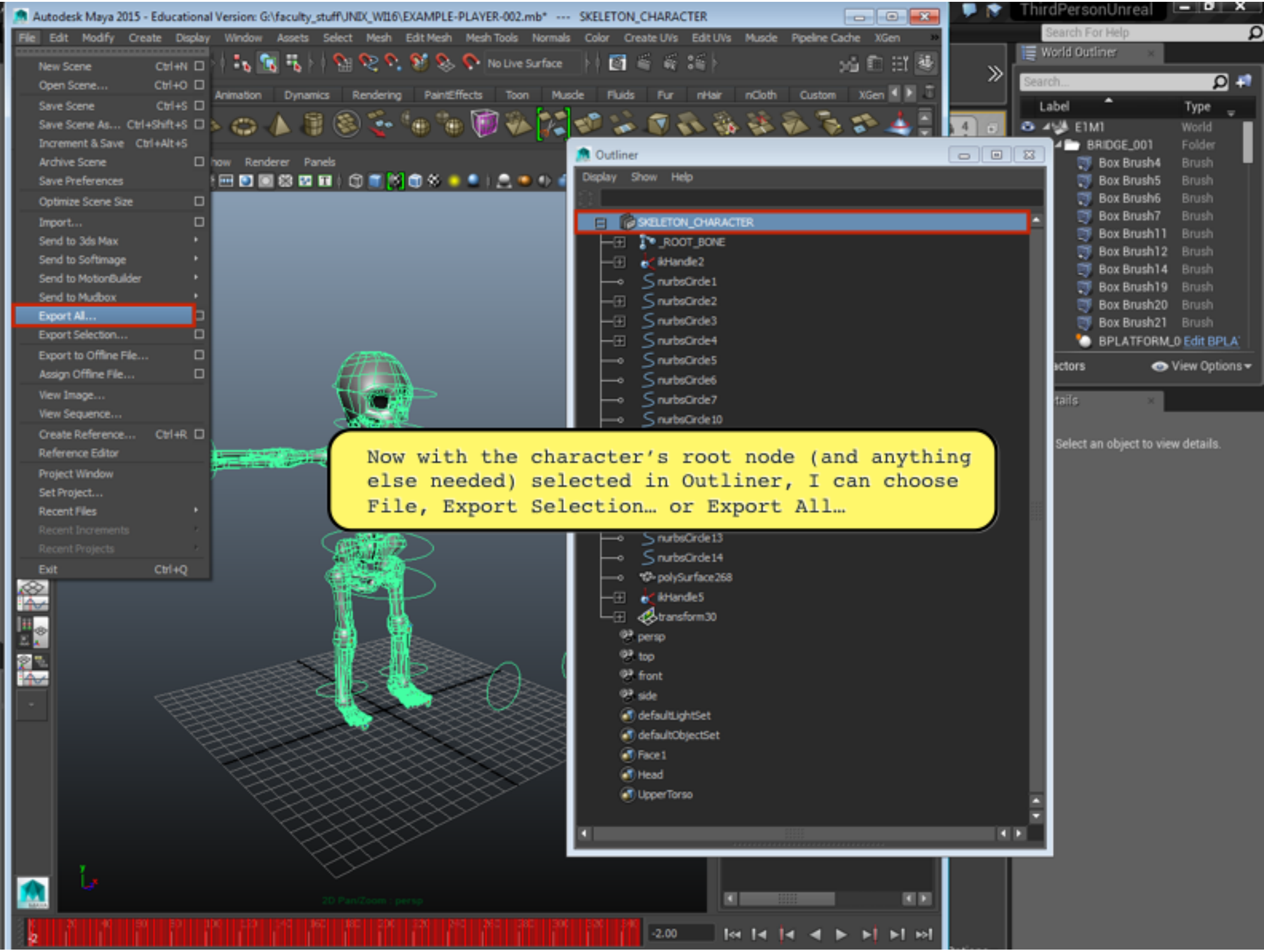
CUSTOM GAME CHARACTER (ADVANCED)

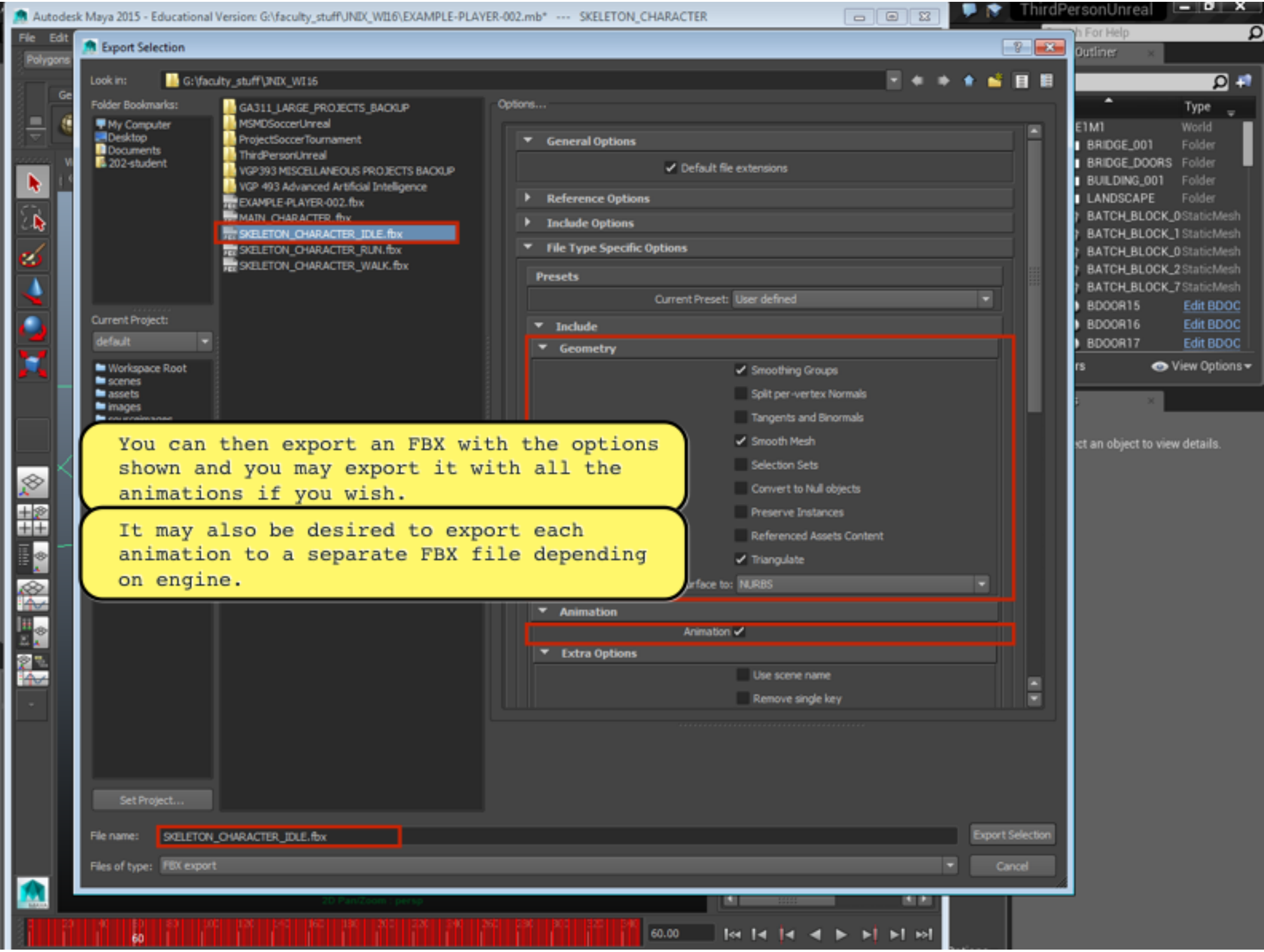


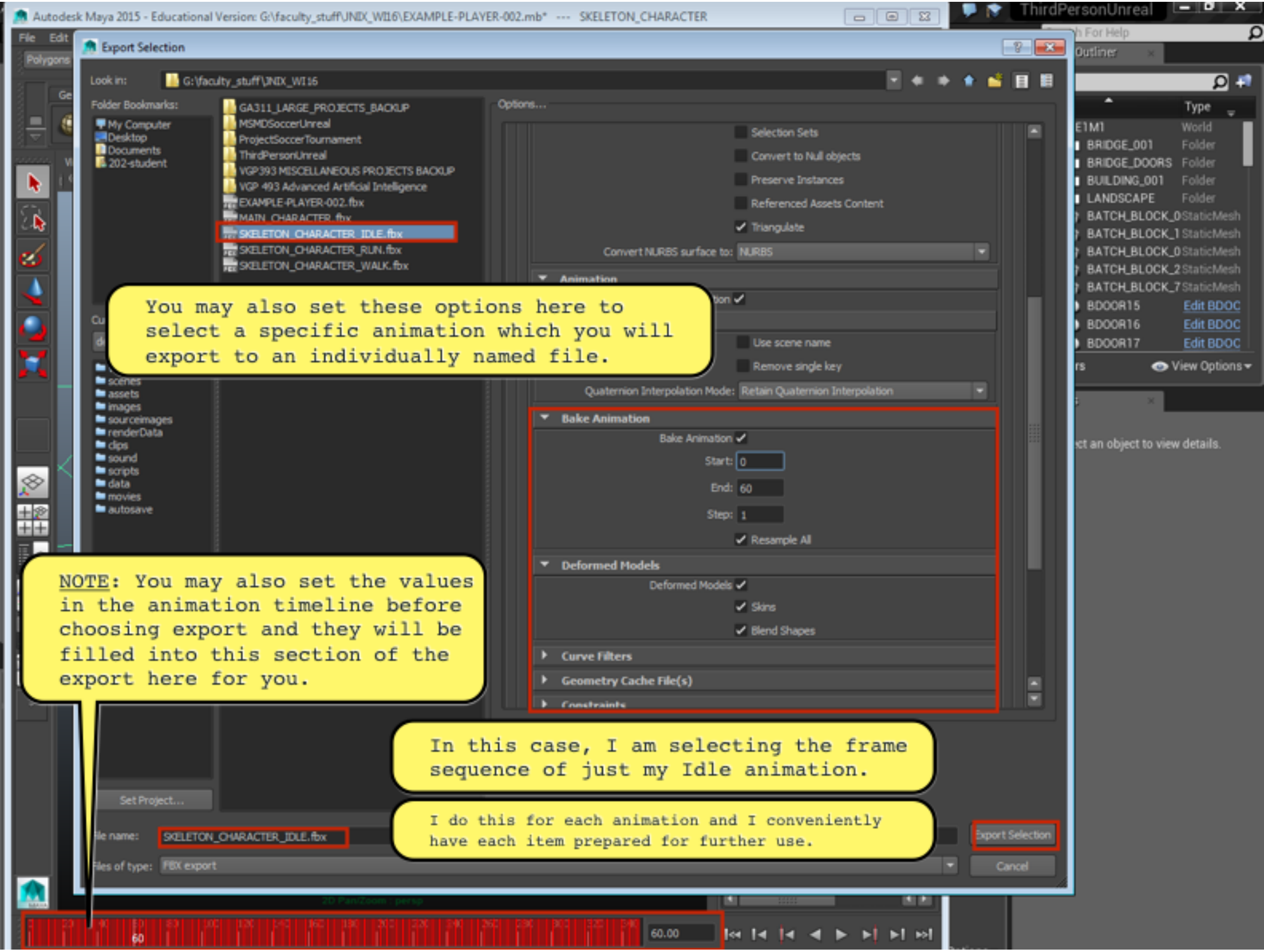
IMPORTANT:
See in a companion slide deck:
- Maya introduction
- Character modeling, rigging, animating

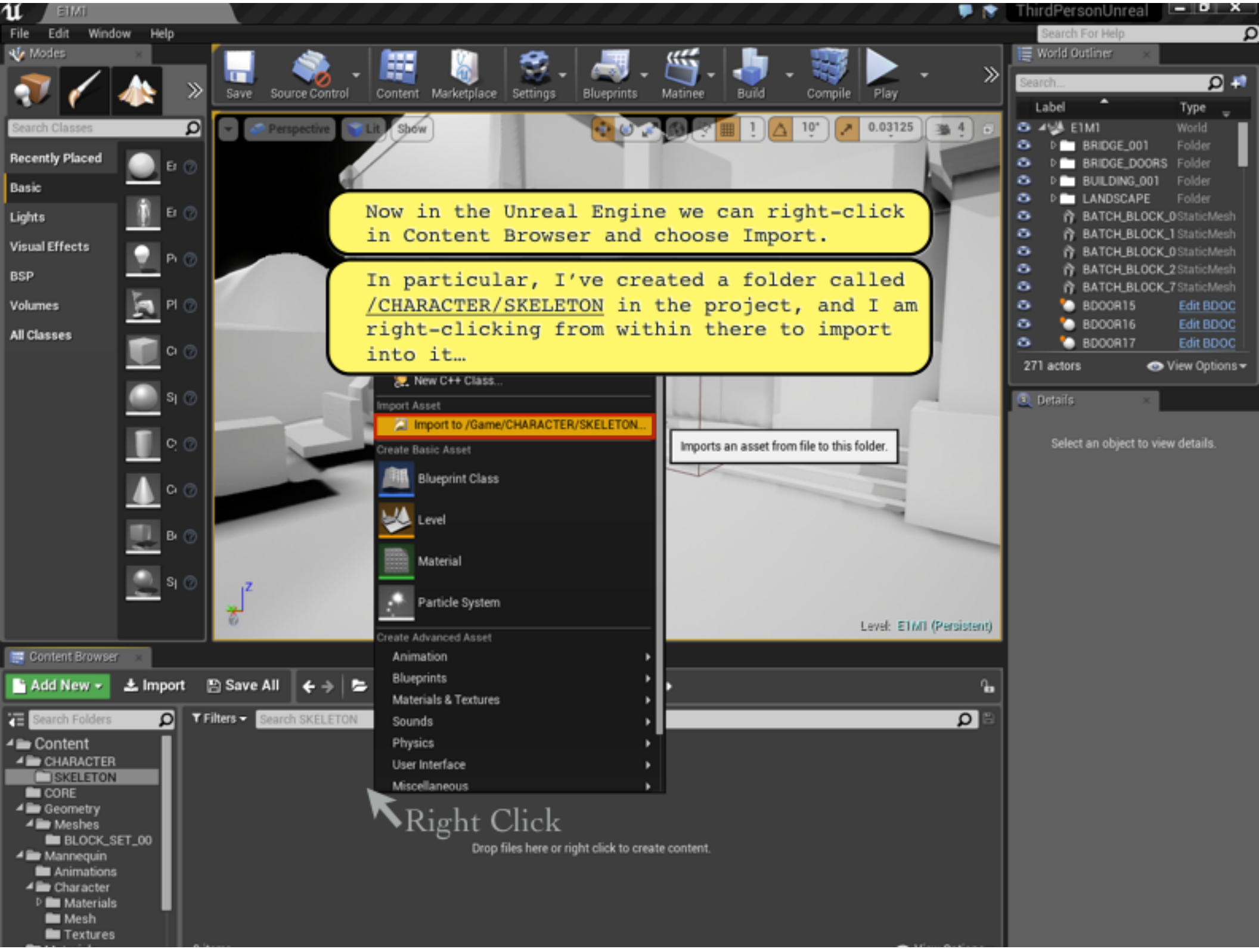
See in THIS slide deck:
- Importing the character into Unreal Engine and applying into the game.

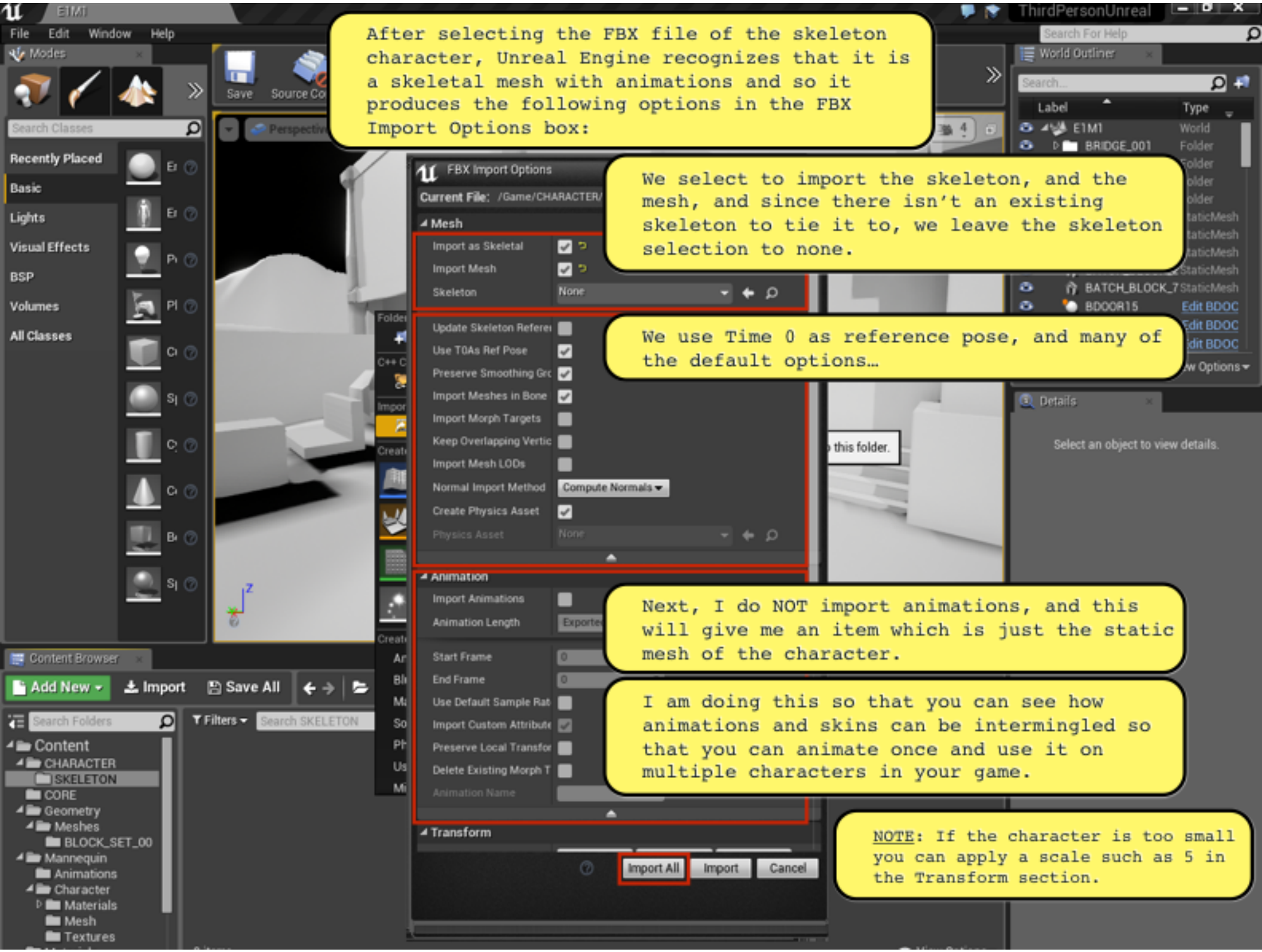

In a companion slide-deck, I have shown you the major steps of character design, modeling, rigging, and animating.
Here in Maya, I have the character's mesh, bones, and rig all organized under a single node. The animation is on a single timeline.
On the animation timeline I have in this order: Idle, Walk, Run, Jump Up, Jump Fall, and Jump Land.
The world origin is at the character's feet and he animates in place. X is to his left, Z is to his forward, and Y is to his up in Maya.
I've deleted all non-deformer history, triangulated his mesh, and baked the animation keys from within Maya.
Autodesk Maya 2015 - Educational Version: G:\faculty_stu
ThirdPersonUnreal
World Outliner
Label
Type
E1M1
World
BRIDGE_001
Folder
Box Brush4
Box Brush5
Box Brush6
Box Brush7
Box Brush11
Box Brush12
Box Brush14
Box Brush19
Box Brush20
Box Brush21
BPLATFORM_0
Edit BPLA
View Options
Select an object to view details.
SKELETON_CHARACTER
_ROOT_BONE
ikHandle2
nurbsCircle1
nurbsCircle2
nurbsCircle3
nurbsCircle4
nurbsCircle5
nurbsCircle6
nurbsCircle7
nurbsCircle10
nurbsCircle11
ikHandle3
ikHandle4
nurbsCircle12
nurbsSquare1
nurbsCircle13
nurbsCircle14
polySurface268
ikHandle5
transform30
persp

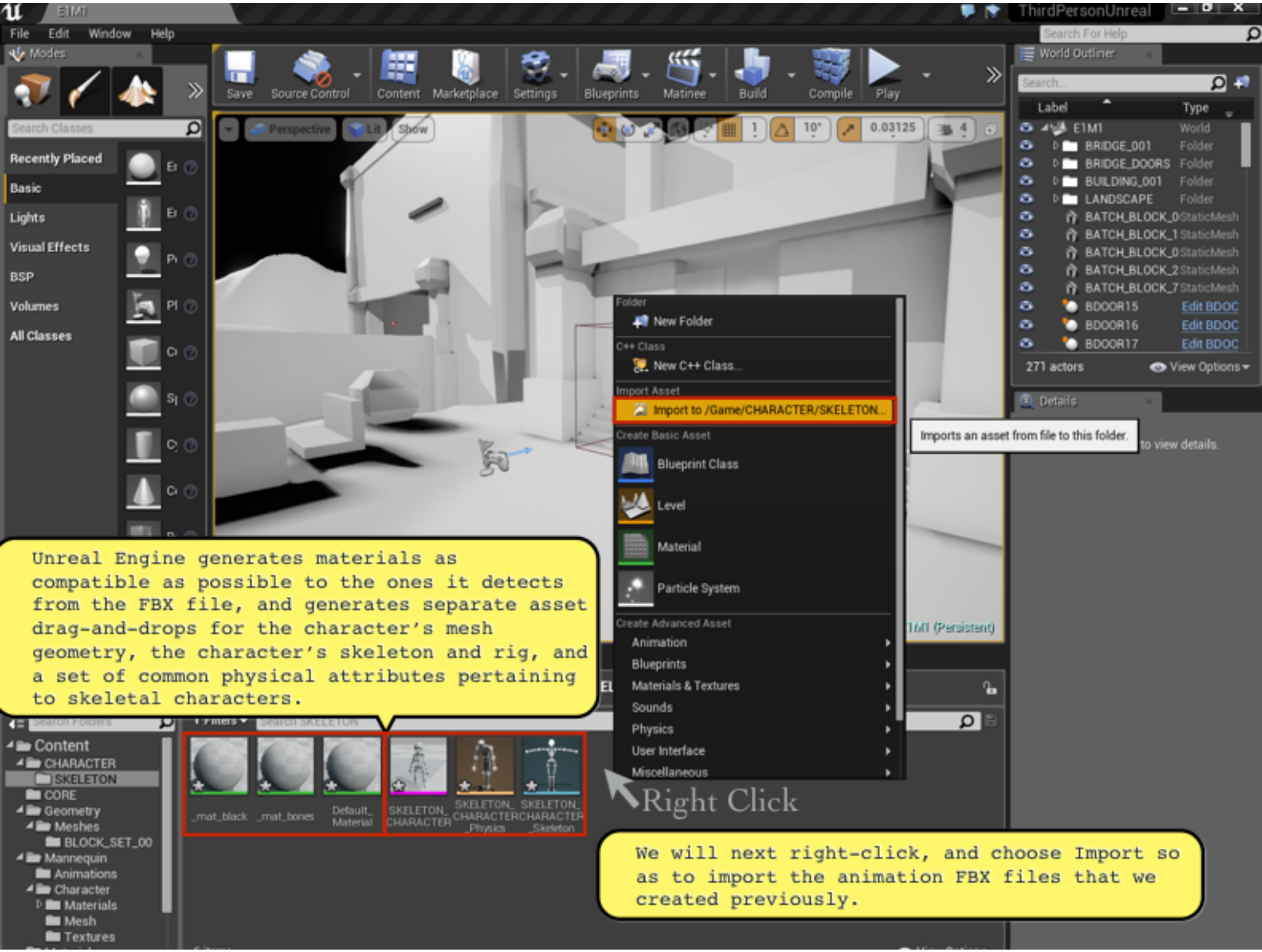

Autodesk Maya 2015 - Educational Version: G:\faculty_stuff\UNIX_W16\EXAMPLE-PLAYER-002.mb* --- SKELETON_CHARACTER
File Edit Modify Create Display Window Assets Select Mesh Edit Mesh Mesh Tools Normals Color Create UVs Edit UVs Muscle Pipeline Cache XGen
New Scene Ctrl+N
Open Scene... Ctrl+O
Save Scene Ctrl+S
Save Scene As... Ctrl+Shift+S
Increment & Save Ctrl+Alt+S
Archive Scene
Save Preferences
Optimize Scene Size
Import...
Send to 3ds Max
Send to Softimage
Send to MotionBuilder
Send to Mudbox
Export All...
Export Selection...
Export to Offline File...
Assign Offline File...
View Image...
View Sequence...
Create Reference... Ctrl+R
Reference Editor
Project Window
Set Project...
Recent Files
Recent Increments
Recent Projects
Exit Ctrl+Q
Outliner
Display Show Help
SKELETON_CHARACTER
_ROOT_BONE
ikHandle2
nurbsCircle1
nurbsCircle2
nurbsCircle3
nurbsCircle4
nurbsCircle5
nurbsCircle6
nurbsCircle7
nurbsCircle10
nurbsCircle13
nurbsCircle14
polySurface268
ikHandle5
transform30
persp
top
front
side
defaultLightSet
defaultObjectSet
Face1
Head
UpperTorso
Now with the character's root node (and anything else needed) selected in Outliner, I can choose File, Export Selection… or Export All…
ThirdPersonUnreal
World Outliner
Label Type
E1M1 World
BRIDGE_001 Folder
Box Brush4 Brush
Box Brush5 Brush
Box Brush6 Brush
Box Brush7 Brush
Box Brush11 Brush
Box Brush12 Brush
Box Brush14 Brush
Box Brush19 Brush
Box Brush20 Brush
Box Brush21 Brush
BPLATFORM_0 Edit BPLA
View Options
Select an object to view details.

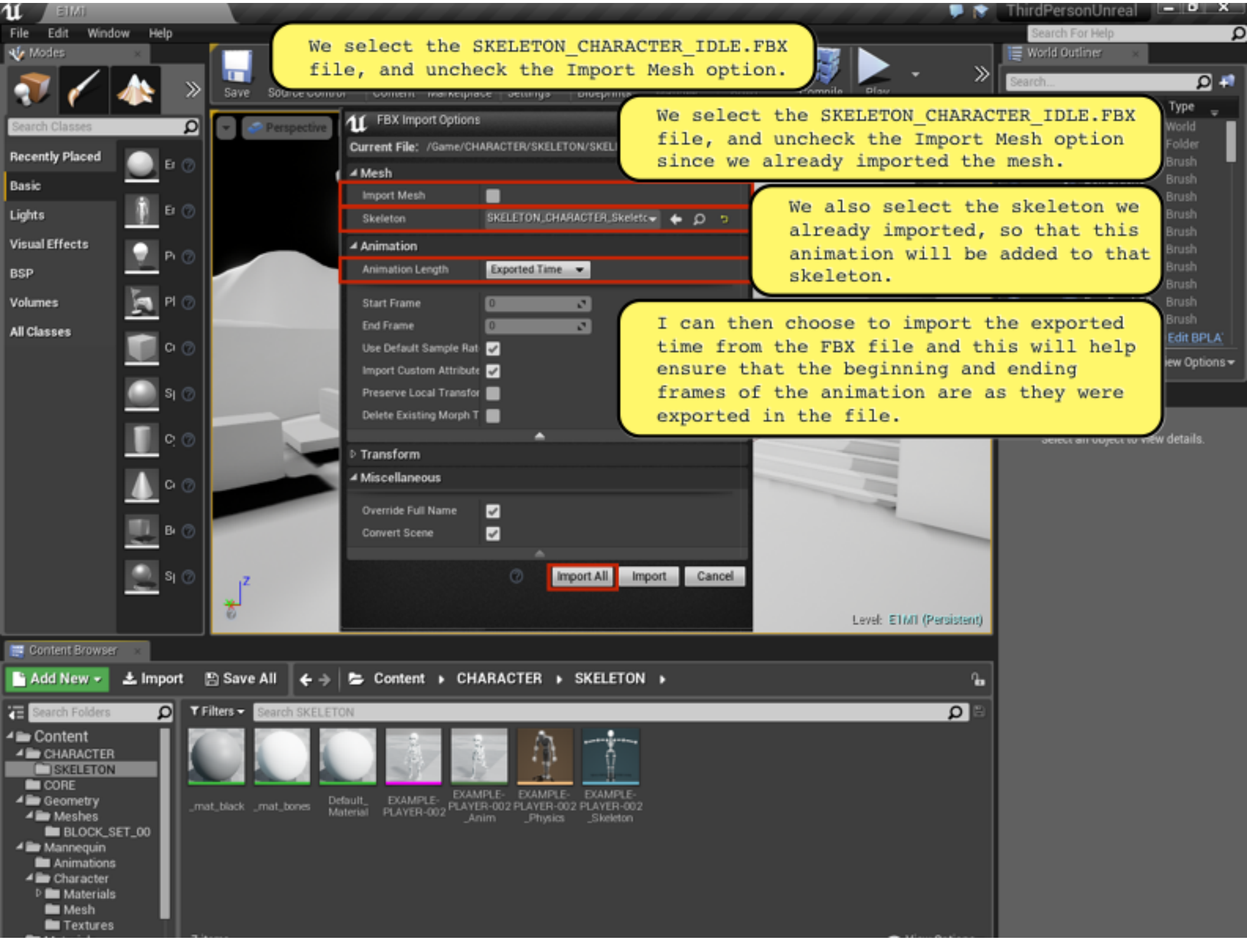

Autodesk Maya 2015 - Educational Version: G:\faculty_stuff\UNIX_WI16\EXAMPLE-PLAYER-002.mb* --- SKELETON_CHARACTER
ThirdPersonUnreal
Export Selection
Look in: G:\faculty_stuff\UNIX_WI16
Folder Bookmarks:
My Computer
Desktop
Documents
202-student
GA311_LARGE_PROJECTS_BACKUP
MSMDSoccerUnreal
ProjectSoccerTournament
ThirdPersonUnreal
VGP393 MISCELLANEOUS PROJECTS BACKUP
VGP 493 Advanced Artificial Intelligence
EXAMPLE-PLAYER-002.fbx
MAIN_CHARACTER.fbx
SKELETON_CHARACTER_IDLE.fbx
SKELETON_CHARACTER_RUN.fbx
SKELETON_CHARACTER_WALK.fbx
Current Project:
default
Workspace Root
scenes
assets
images
Set Project...
Options...
General Options
Default file extensions
Reference Options
Include Options
File Type Specific Options
Presets
Current Preset: User defined
Include
Geometry
Smoothing Groups
Split per-vertex Normals
Tangents and Binormals
Smooth Mesh
Selection Sets
Convert to Null objects
Preserve Instances
Referenced Assets Content
Triangulate
NURBS
Animation
Animation
Extra Options
Use scene name
Remove single key
File name: SKELETON_CHARACTER_IDLE.fbx
Export Selection
Files of type: FBX export
Cancel
You can then export an FBX with the options shown and you may export it with all the animations if you wish.
It may also be desired to export each animation to a separate FBX file depending on engine.
Outliner
Type
E1M1 World
BRIDGE_001 Folder
BRIDGE_DOORS Folder
BUILDING_001 Folder
LANDSCAPE Folder
BATCH_BLOCK_0 StaticMesh
BATCH_BLOCK_1 StaticMesh
BATCH_BLOCK_0 StaticMesh
BATCH_BLOCK_2 StaticMesh
BATCH_BLOCK_7 StaticMesh
BDOOR15 Edit BDOC
BDOOR16 Edit BDOC
BDOOR17 Edit BDOC
View Options
ct an object to view details.
60.00

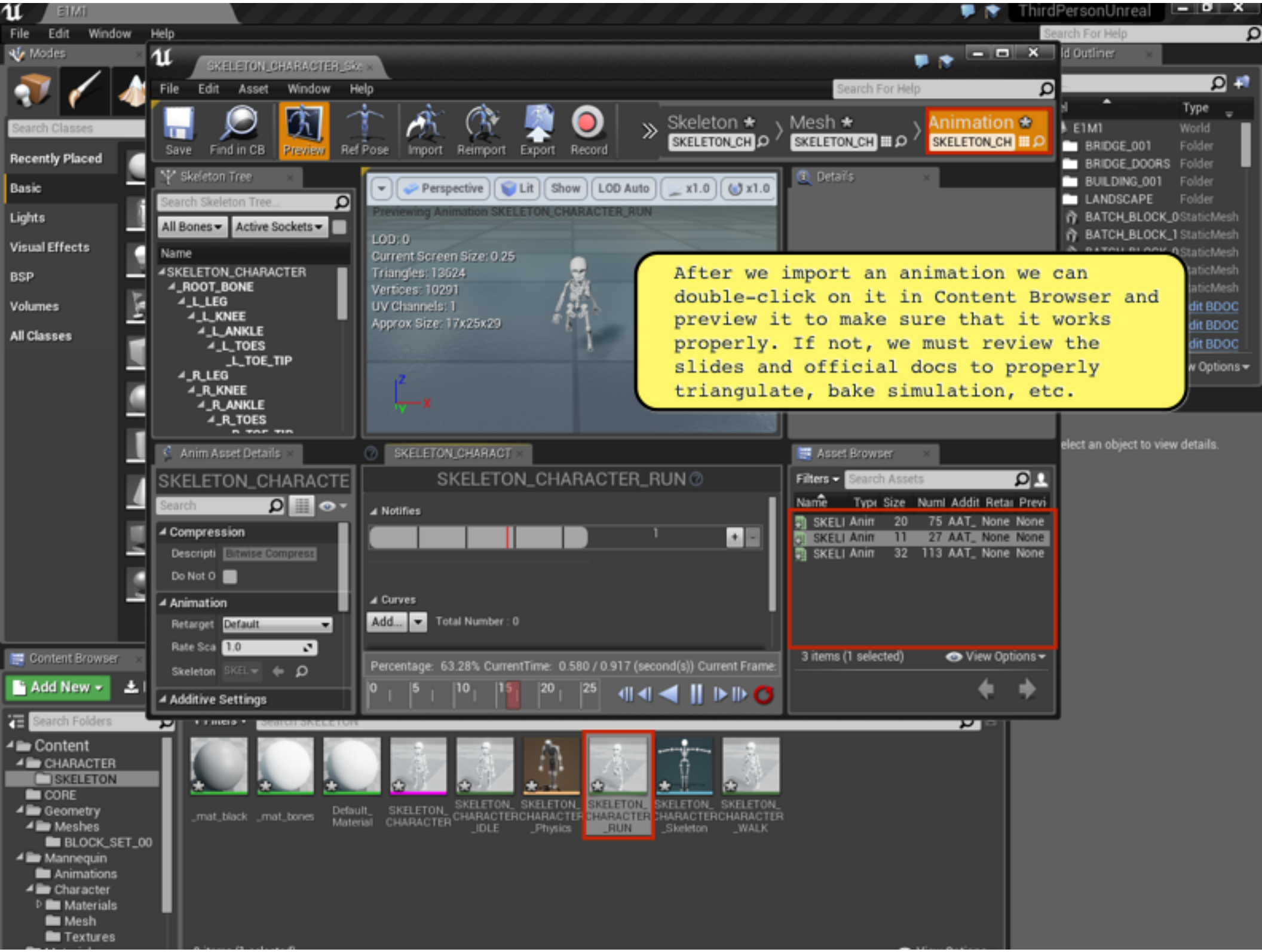

Autodesk Maya 2015 - Educational Version: G:\faculty_stuff\UNIX_WI16\EXAMPLE-PLAYER-002.mb* --- SKELETON_CHARACTER
ThirdPersonUnreal
Export Selection
Look in: G:\faculty_stuff\UNIX_WI16
Folder Bookmarks:
My Computer
Desktop
Documents
202-student
GA311_LARGE_PROJECTS_BACKUP
MSMDSoccerUnreal
ProjectSoccerTournament
ThirdPersonUnreal
VGP393 MISCELLANEOUS PROJECTS BACKUP
VGP 493 Advanced Artificial Intelligence
EXAMPLE-PLAYER-002.fbx
MAIN_CHARACTER.fbx
SKELETON_CHARACTER_IDLE.fbx
SKELETON_CHARACTER_RUN.fbx
SKELETON_CHARACTER_WALK.fbx
Options...
Selection Sets
Convert to Null objects
Preserve Instances
Referenced Assets Content
Triangulate
Convert NURBS surface to: NURBS
Animation
Use scene name
Remove single key
Quaternion Interpolation Mode: Retain Quaternion Interpolation
Bake Animation
Bake Animation
Start: 0
End: 60
Step: 1
Resample All
Deformed Models
Deformed Models
Skins
Blend Shapes
Curve Filters
Geometry Cache File(s)
Constraints
You may also set these options here to select a specific animation which you will export to an individually named file.
NOTE: You may also set the values in the animation timeline before choosing export and they will be filled into this section of the export here for you.
In this case, I am selecting the frame sequence of just my Idle animation.
I do this for each animation and I conveniently have each item prepared for further use.
Set Project...
File name: SKELETON_CHARACTER_IDLE.fbx
Files of type: FBX export
Export Selection
Cancel
Outliner
Type
BRIDGE_001 Folder
BRIDGE_DOORS Folder
BUILDING_001 Folder
LANDSCAPE Folder
BATCH_BLOCK_0 StaticMesh
BATCH_BLOCK_1 StaticMesh
BATCH_BLOCK_0 StaticMesh
BATCH_BLOCK_2 StaticMesh
BATCH_BLOCK_7 StaticMesh
BDOOR15 Edit BDOC
BDOOR16 Edit BDOC
BDOOR17 Edit BDOC
View Options

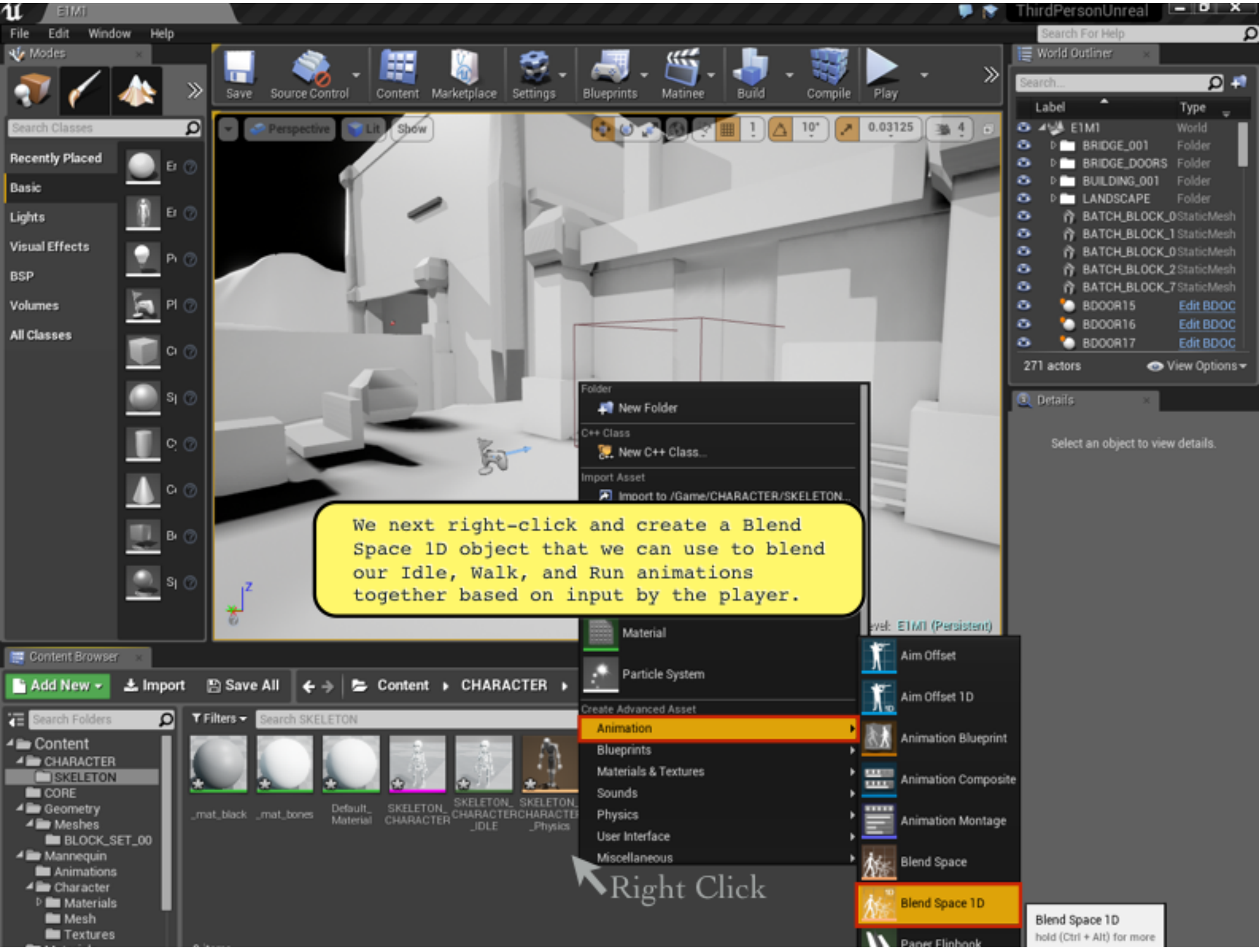

Now in the Unreal Engine we can right-click in Content Browser and choose Import.
In particular, I've created a folder called /CHARACTER/SKELETON in the project, and I am right-clicking from within there to import into it…
Import to /Game/CHARACTER/SKELETON...
Imports an asset from file to this folder.
Right Click
Drop files here or right click to create content.

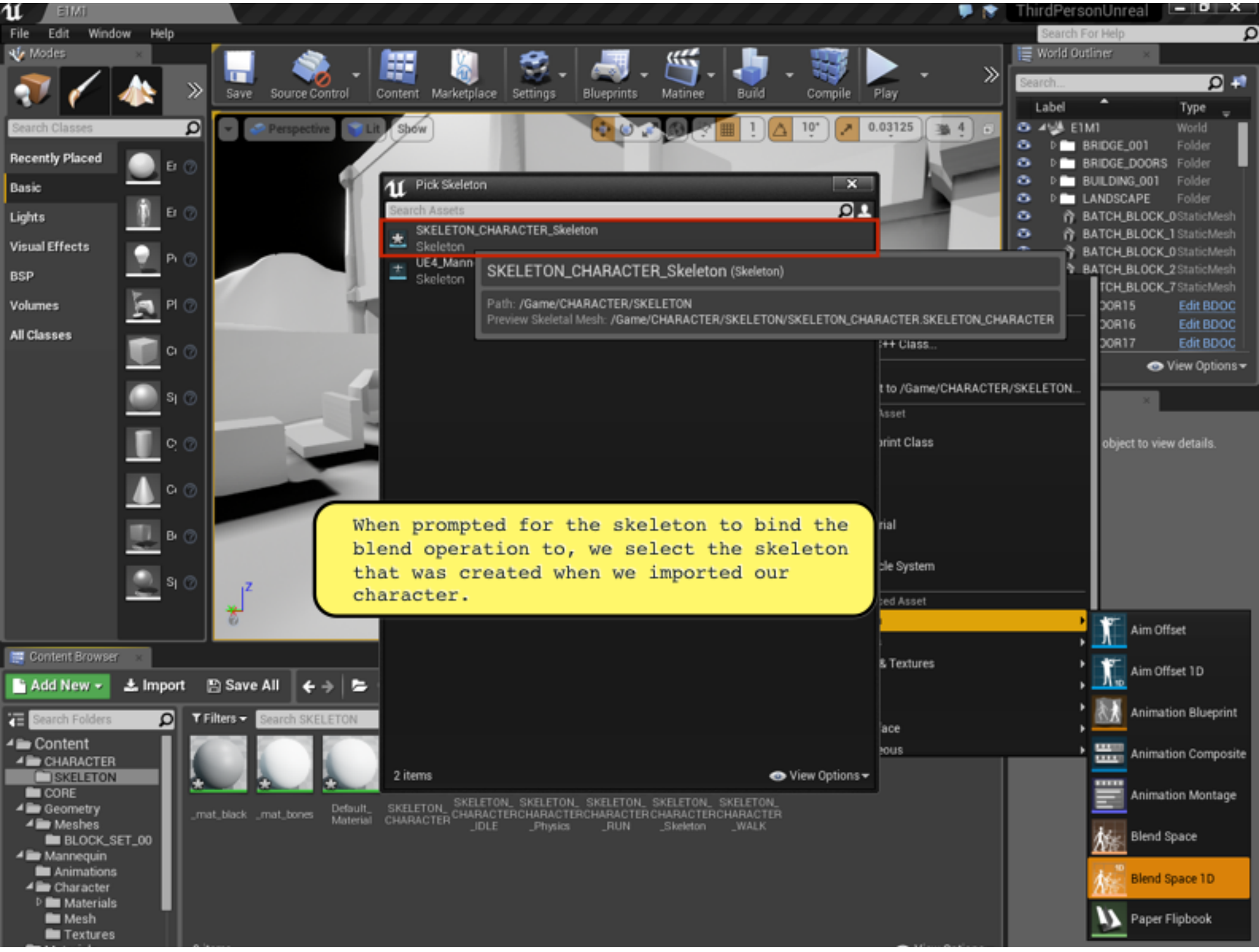

After selecting the FBX file of the skeleton character, Unreal Engine recognizes that it is a skeletal mesh with animations and so it produces the following options in the FBX Import Options box:
We select to import the skeleton, and the mesh, and since there isn't an existing skeleton to tie it to, we leave the skeleton selection to none.
We use Time 0 as reference pose, and many of the default options…
Next, I do NOT import animations, and this will give me an item which is just the static mesh of the character.
I am doing this so that you can see how animations and skins can be intermingled so that you can animate once and use it on multiple characters in your game.
NOTE: If the character is too small you can apply a scale such as 5 in the Transform section.
FBX Import Options
Current File: /Game/CHARACTER/
Mesh
Import as Skeletal
Import Mesh
Skeleton
None
Update Skeleton Referer
Use T0As Ref Pose
Preserve Smoothing Gr
Import Meshes in Bone
Import Morph Targets
Keep Overlapping Vertic
Import Mesh LODs
Normal Import Method
Compute Normals
Create Physics Asset
Physics Asset
Animation
Import Animations
Animation Length
Start Frame
End Frame
Use Default Sample Rat
Import Custom Attribute
Preserve Local Transfor
Delete Existing Morph T
Animation Name
Transform
Import All
Import
Cancel
Content Browser
Add New
Import
Save All
Search Folders
Filters
Search SKELETON
Content
CHARACTER
SKELETON
CORE
Geometry
Meshes
BLOCK_SET_00
Mannequin
Animations
Character
Materials
Mesh
Textures
World Outliner
Label
Type
E1M1
World
BRIDGE_001
Folder
BATCH_BLOCK_7
StaticMesh
BDOOR15
Edit BDOC
Details
Select an object to view details.
this folder.

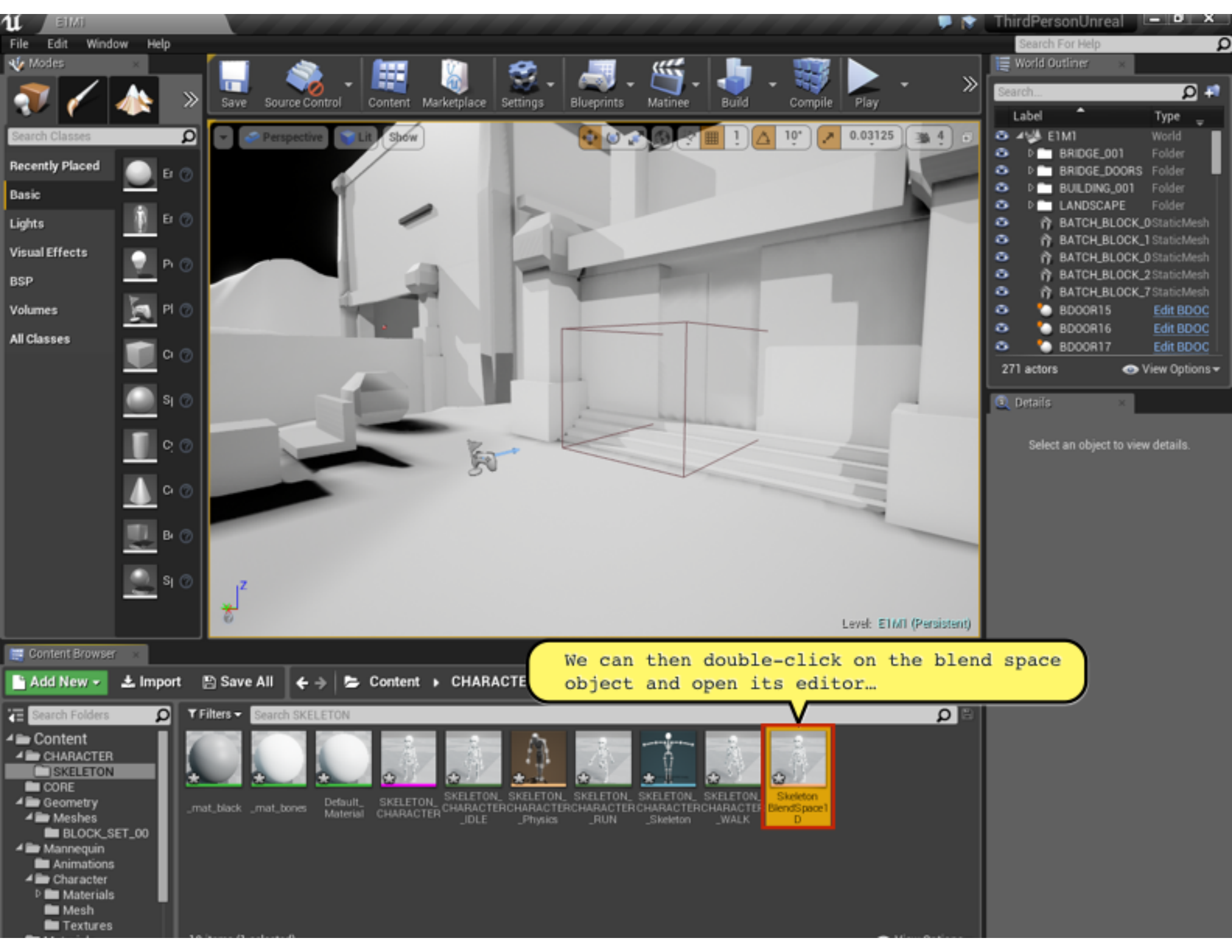

File Edit Window Help
Save
Source Control
Content
Marketplace
Settings
Blueprints
Matinee
Build
Compile
Play
Perspective
Lit
Show
Recently Placed
Basic
Lights
Visual Effects
BSP
Volumes
All Classes
World Outliner
Label
Type
E1M1
BRIDGE_001
BRIDGE_DOORS
BUILDING_001
LANDSCAPE
271 actors
View Options
Details
Folder
New Folder
C++ Class
New C++ Class...
Import Asset
Import to /Game/CHARACTER/SKELETON...
Imports an asset from file to this folder.
Create Basic Asset
Blueprint Class
Level
Material
Particle System
Create Advanced Asset
Animation
Blueprints
Materials & Textures
Sounds
Physics
User Interface
Miscellaneous
Unreal Engine generates materials as compatible as possible to the ones it detects from the FBX file, and generates separate asset drag-and-drops for the character's mesh geometry, the character's skeleton and rig, and a set of common physical attributes pertaining to skeletal characters.
Content
CHARACTER
SKELETON
CORE
Geometry
Meshes
BLOCK_SET_00
Mannequin
Animations
Character
Materials
Mesh
Textures
_mat_black
_mat_bones
Default_Material
SKELETON_CHARACTER
SKELETON_CHARACTER_Physics
SKELETON_CHARACTER_Skeleton
Right Click
We will next right-click, and choose Import so as to import the animation FBX files that we created previously.

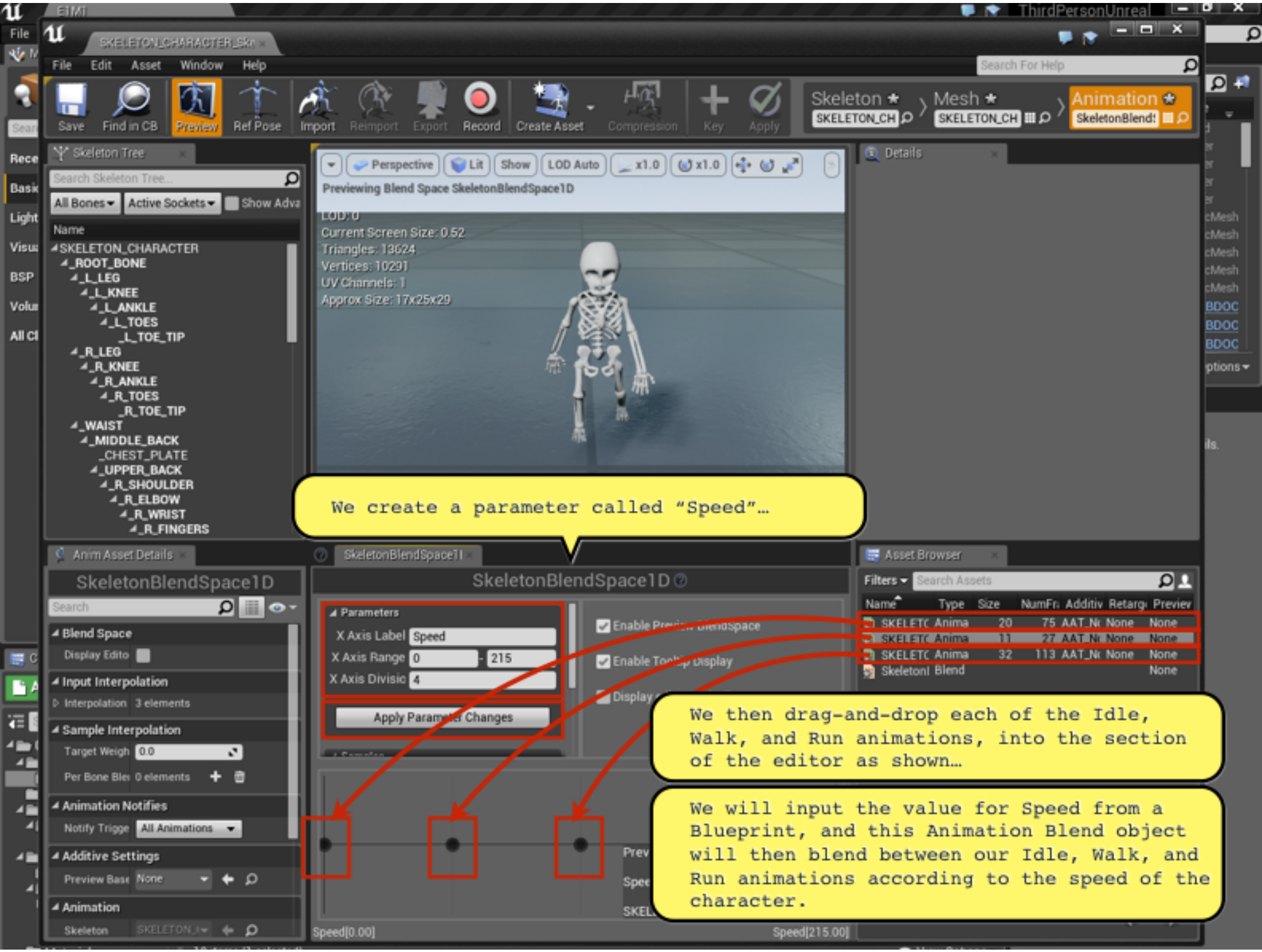

We select the SKELETON_CHARACTER_IDLE.FBX file, and uncheck the Import Mesh option.
We select the SKELETON_CHARACTER_IDLE.FBX file, and uncheck the Import Mesh option since we already imported the mesh.
We also select the skeleton we already imported, so that this animation will be added to that skeleton.
I can then choose to import the exported time from the FBX file and this will help ensure that the beginning and ending frames of the animation are as they were exported in the file.
FBX Import Options
Current File: /Game/CHARACTER/SKELETON/SKEL
Mesh
Import Mesh
Skeleton
SKELETON_CHARACTER_Skelet
Animation
Animation Length
Exported Time
Start Frame
End Frame
Use Default Sample Rat
Import Custom Attribute
Preserve Local Transfor
Delete Existing Morph T
Transform
Miscellaneous
Override Full Name
Convert Scene
Import All
Import
Cancel
Content Browser
Add New
Import
Save All
Content
CHARACTER
SKELETON
Search SKELETON
_mat_black
_mat_bones
Default_ Material
EXAMPLE-PLAYER-002
EXAMPLE-PLAYER-002_Anim
EXAMPLE-PLAYER-002_Physics
EXAMPLE-PLAYER-002_Skeleton

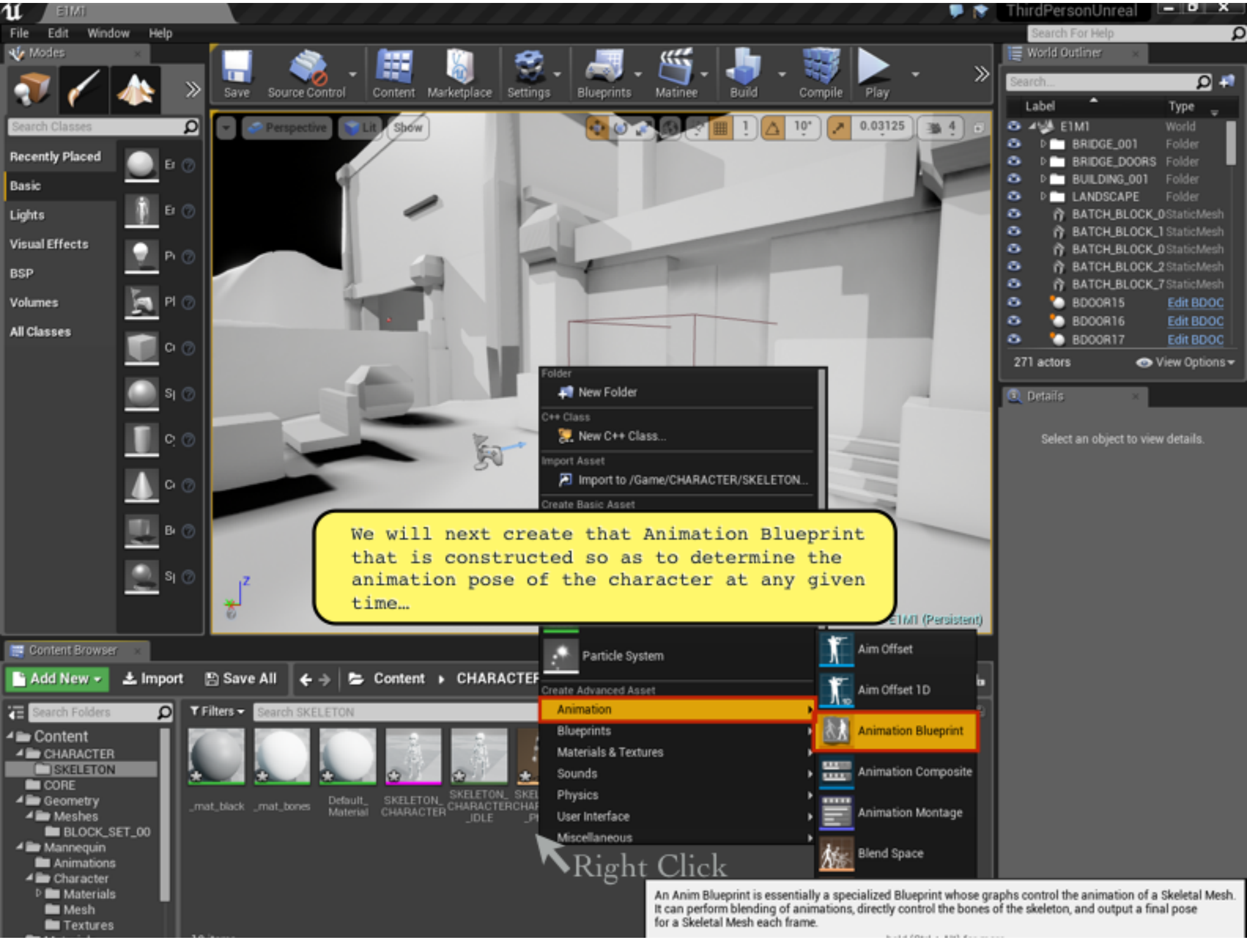

After we import an animation we can double-click on it in Content Browser and preview it to make sure that it works properly. If not, we must review the slides and official docs to properly triangulate, bake simulation, etc.

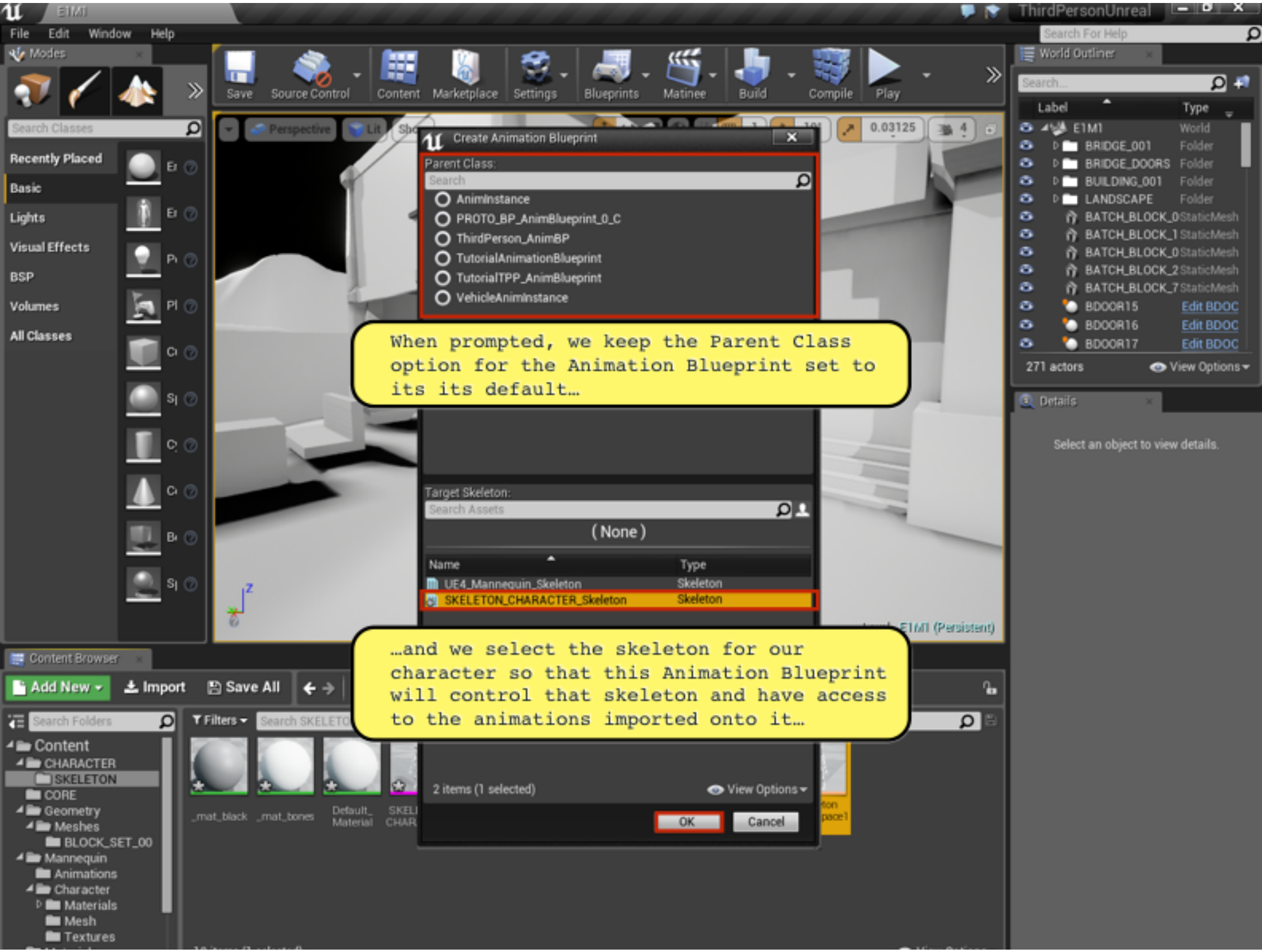

We next right-click and create a Blend Space 1D object that we can use to blend our Idle, Walk, and Run animations together based on input by the player.
Right Click
Blend Space 1D
hold (Ctrl + Alt) for more

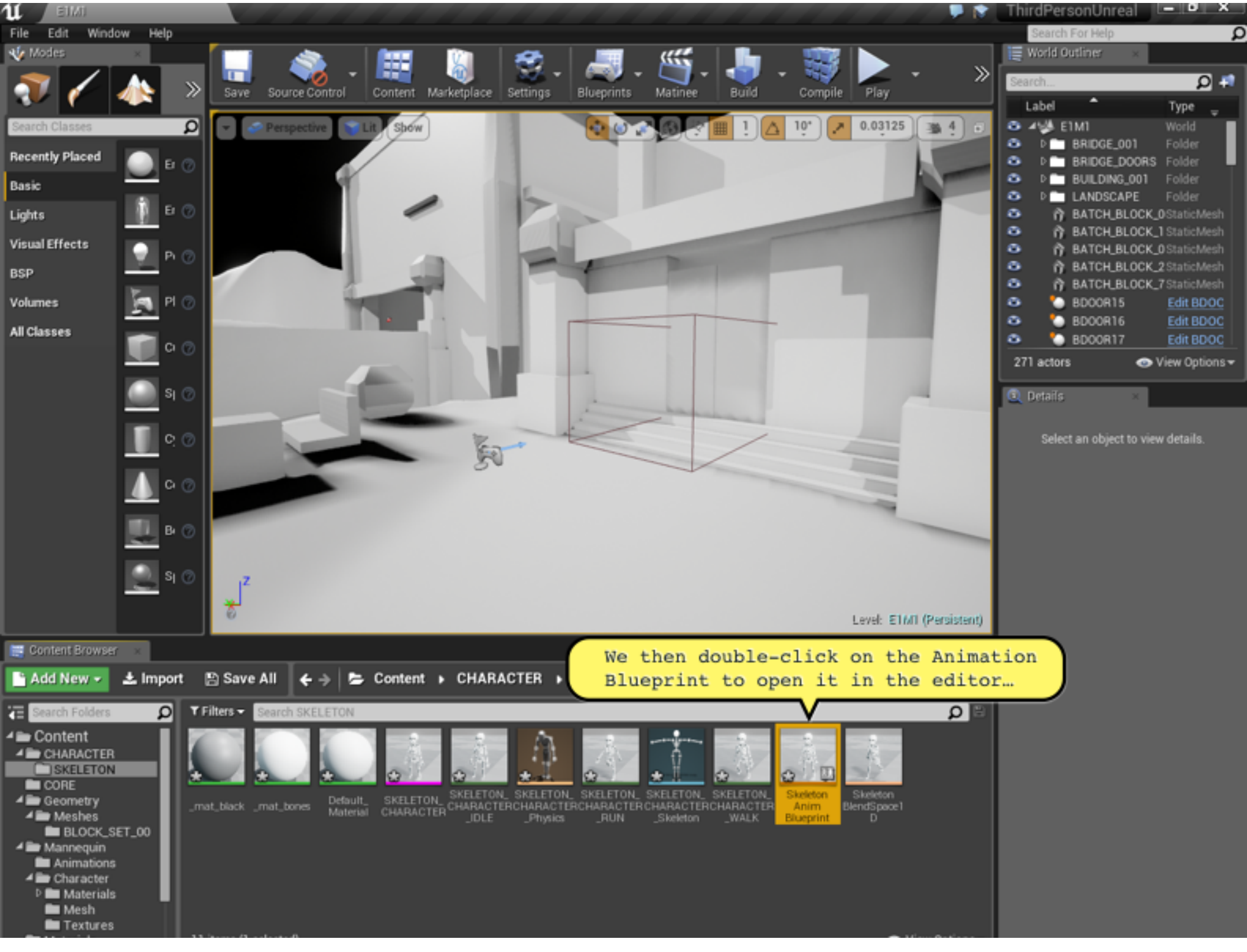

When prompted for the skeleton to bind the blend operation to, we select the skeleton that was created when we imported our character.

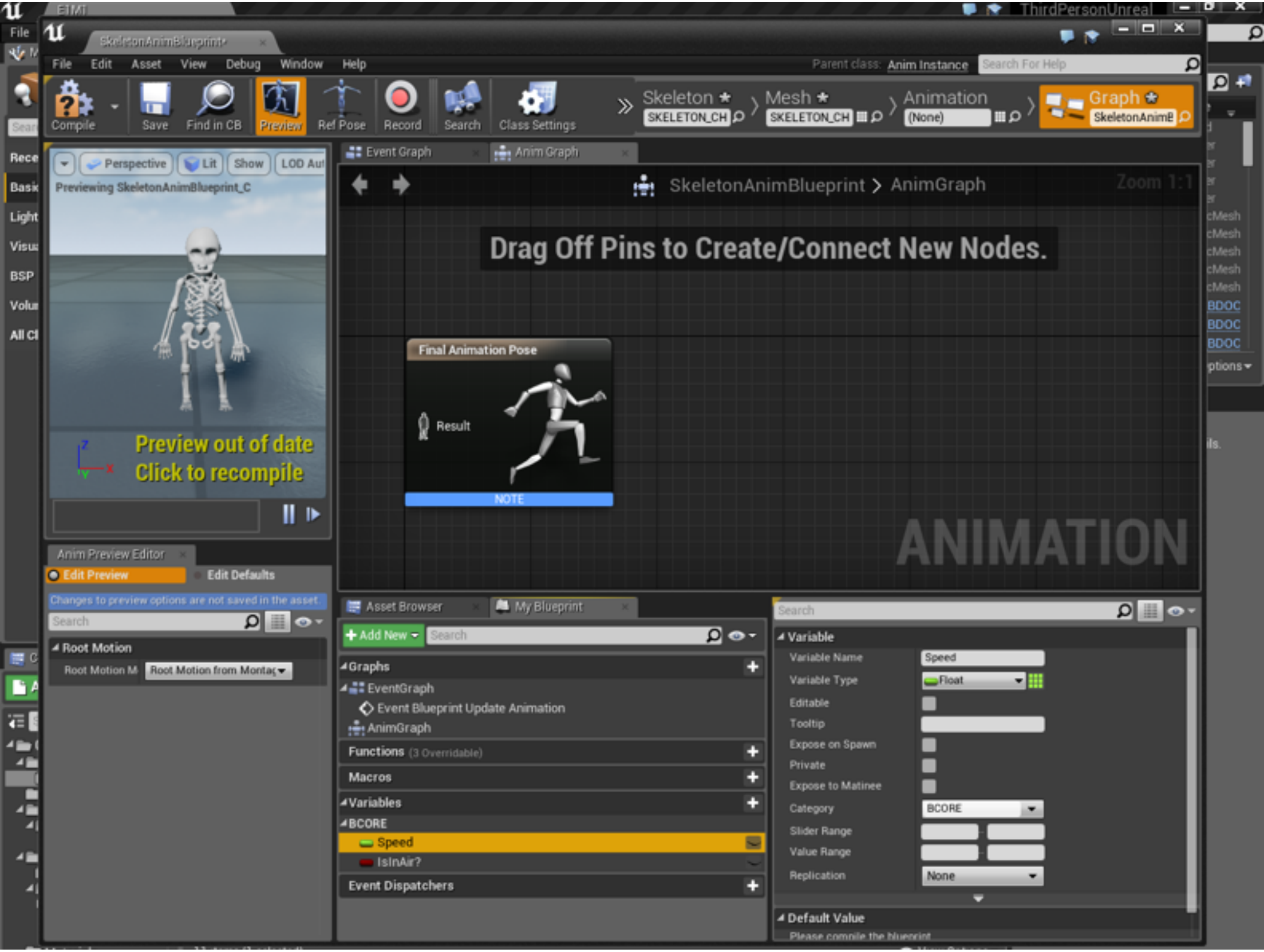

File Edit Window Help
Save
Source Control
Content
Marketplace
Settings
Blueprints
Matinee
Build
Compile
Play
Recently Placed
Basic
Lights
Visual Effects
BSP
Volumes
All Classes
Perspective
Lit
Show
Level: E1M1 (Persistent)
World Outliner
Label
Type
E1M1
BRIDGE_001
BRIDGE_DOORS
BUILDING_001
LANDSCAPE
271 actors
View Options
Details
Select an object to view details.
Content Browser
Add New
Import
Save All
Content
CHARACTE
We can then double-click on the blend space object and open its editor…
Search Folders
Filters
Search SKELETON
Content
CHARACTER
SKELETON
CORE
Geometry
Meshes
BLOCK_SET_00
Mannequin
Animations
Character
Materials
Mesh
Textures
_mat_black
_mat_bones
Default_ Material
SKELETON_ CHARACTER
SKELETON_ CHARACTER _IDLE
SKELETON_ CHARACTER _Physics
SKELETON_ CHARACTER _RUN
SKELETON_ CHARACTER _Skeleton
SKELETON_ CHARACTER _WALK
Skeleton BlendSpace1 D

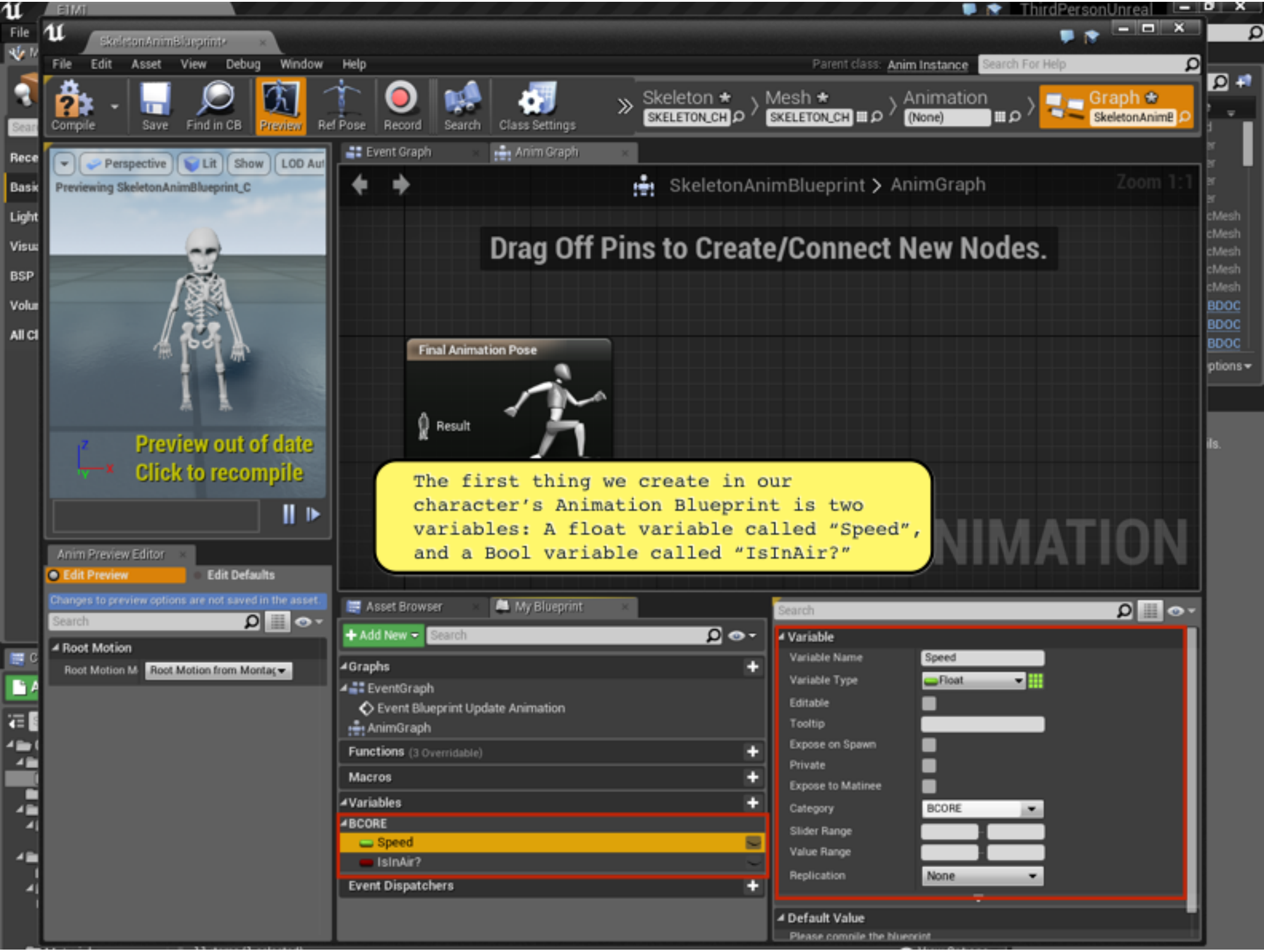

We create a parameter called "Speed"…
We then drag-and-drop each of the Idle, Walk, and Run animations, into the section of the editor as shown…
We will input the value for Speed from a Blueprint, and this Animation Blend object will then blend between our Idle, Walk, and Run animations according to the speed of the character.

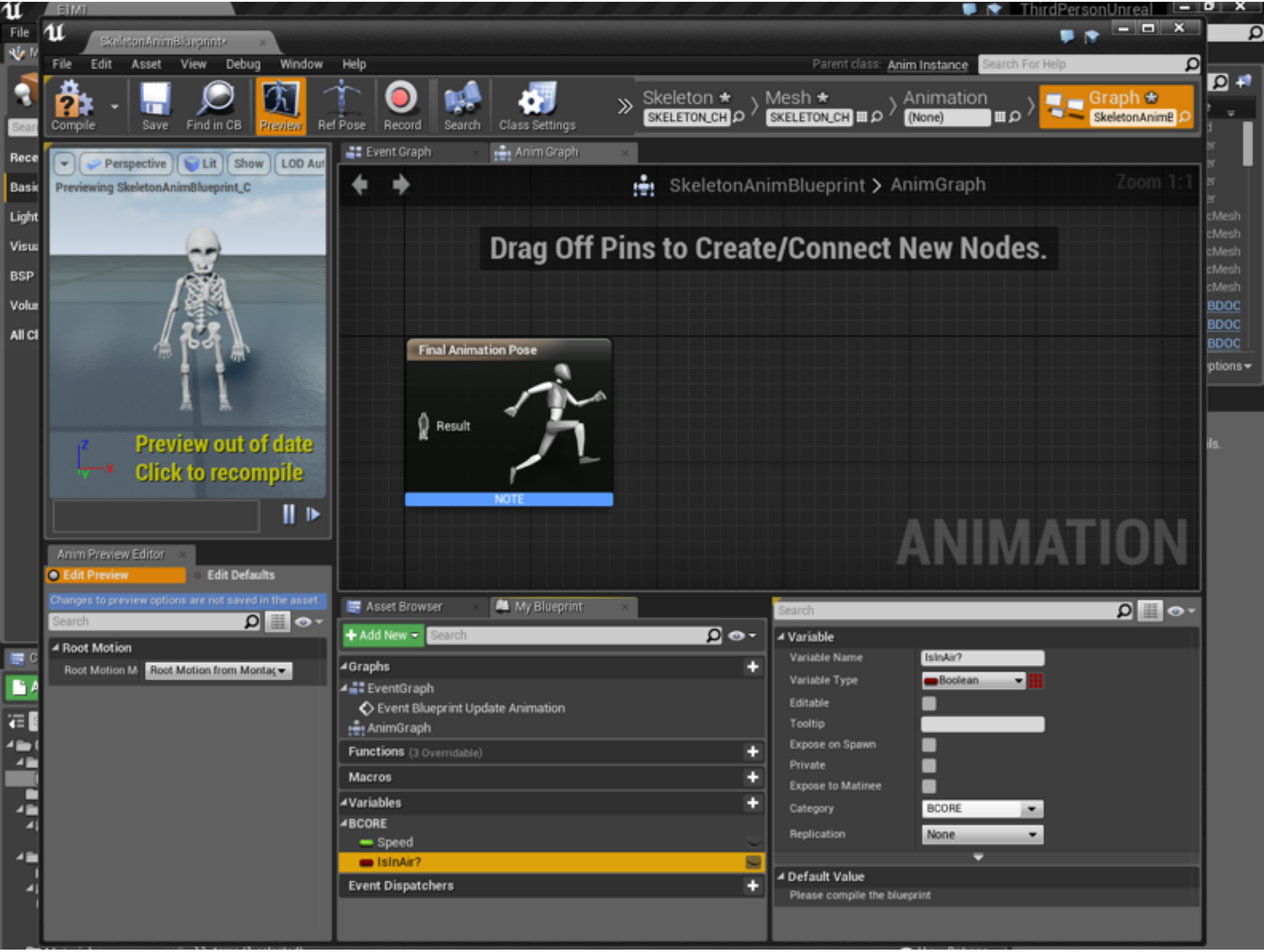

File Edit Window Help
Save
Source Control
Content
Marketplace
Settings
Blueprints
Matinee
Build
Compile
Play
Recently Placed
Basic
Lights
Visual Effects
BSP
Volumes
All Classes
World Outliner
Label
Type
E1M1
BRIDGE_001
BRIDGE_DOORS
BUILDING_001
LANDSCAPE
271 actors
View Options
Details
Select an object to view details.
Folder
New Folder
C++ Class
New C++ Class...
Import Asset
Import to /Game/CHARACTER/SKELETON...
Create Basic Asset
We will next create that Animation Blueprint that is constructed so as to determine the animation pose of the character at any given time…
Particle System
Create Advanced Asset
Animation
Blueprints
Materials & Textures
Sounds
Physics
User Interface
Miscellaneous
Aim Offset
Aim Offset 1D
Animation Blueprint
Animation Composite
Animation Montage
Blend Space
Right Click
Content Browser
Add New
Import
Save All
Content
CHARACTER
Search Folders
Filters
Search SKELETON
Content
CHARACTER
SKELETON
CORE
Geometry
Meshes
BLOCK_SET_00
Mannequin
Animations
Character
Materials
Mesh
Textures
_mat_black
_mat_bones
Default_ Material
SKELETON_ CHARACTER
SKELETON_ CHARACTER _IDLE
An Anim Blueprint is essentially a specialized Blueprint whose graphs control the animation of a Skeletal Mesh. It can perform blending of animations, directly control the bones of the skeleton, and output a final pose for a Skeletal Mesh each frame.


When prompted, we keep the Parent Class option for the Animation Blueprint set to its its default…
…and we select the skeleton for our character so that this Animation Blueprint will control that skeleton and have access to the animations imported onto it…
Create Animation Blueprint
Parent Class:
AnimInstance
PROTO_BP_AnimBlueprint_0_C
ThirdPerson_AnimBP
TutorialAnimationBlueprint
TutorialTPP_AnimBlueprint
VehicleAnimInstance
Target Skeleton:
(None)
UE4_Mannequin_Skeleton
SKELETON_CHARACTER_Skeleton
2 items (1 selected)
OK
Cancel


File Edit Window Help
Save
Source Control
Content
Marketplace
Settings
Blueprints
Matinee
Build
Compile
Play
Perspective
Lit
Show
Level: E1M1 (Persistent)
Label
Type
E1M1
BRIDGE_001
BRIDGE_DOORS
BUILDING_001
LANDSCAPE
271 actors
View Options
Select an object to view details.
Add New
Import
Save All
Content
CHARACTER
We then double-click on the Animation Blueprint to open it in the editor…
Search Folders
Filters
Search SKELETON
Content
CHARACTER
SKELETON
CORE
Geometry
Meshes
BLOCK_SET_00
Mannequin
Animations
Character
Materials
Mesh
Textures
_mat_black
_mat_bones
Default_ Material
SKELETON_ CHARACTER
SKELETON_ CHARACTER _IDLE
SKELETON_ CHARACTER _Physics
SKELETON_ CHARACTER _RUN
SKELETON_ CHARACTER _Skeleton
SKELETON_ CHARACTER _WALK
Skeleton Anim Blueprint
Skeleton BlendSpace1 D

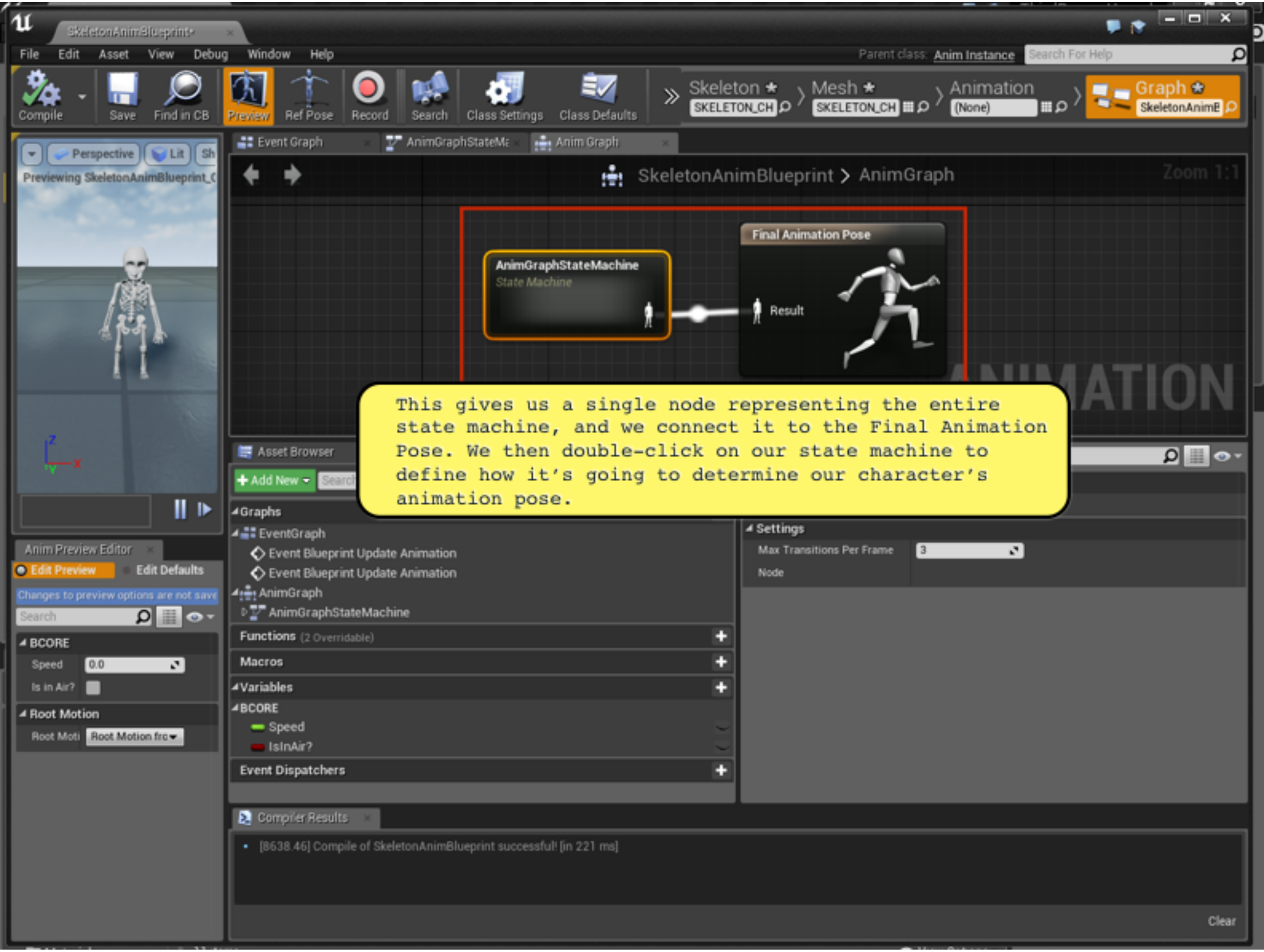

SkeletonAnimBlueprint
File Edit Asset View Debug Window Help
Parent class: Anim Instance
Search For Help
Compile
Save
Find in CB
Preview
Ref Pose
Record
Search
Class Settings
Skeleton
SKELETON_CH
Mesh
SKELETON_CH
Animation
(None)
Graph
SkeletonAnimB
Perspective
Lit
Show
LOD Auto
Previewing SkeletonAnimBlueprint_C
Preview out of date
Click to recompile
Event Graph
Anim Graph
SkeletonAnimBlueprint > AnimGraph
Zoom 1:1
Drag Off Pins to Create/Connect New Nodes.
Final Animation Pose
Result
NOTE
ANIMATION
Anim Preview Editor
Edit Preview
Edit Defaults
Changes to preview options are not saved in the asset.
Search
Root Motion
Root Motion M
Root Motion from Monta
Asset Browser
My Blueprint
Add New
Search
Graphs
EventGraph
Event Blueprint Update Animation
AnimGraph
Functions (3 Overridable)
Macros
Variables
BCORE
Speed
IsInAir?
Event Dispatchers
Search
Variable
Variable Name
Speed
Variable Type
Float
Editable
Tooltip
Expose on Spawn
Private
Expose to Matinee
Category
BCORE
Slider Range
Value Range
Replication
None
Default Value
Please compile the blueprint


SkeletonAnimBlueprint
File Edit Asset View Debug Window Help
Parent class: Anim Instance
Search For Help
Compile
Save
Find in CB
Preview
Ref Pose
Record
Search
Class Settings
Skeleton
SKELETON_CH
Mesh
SKELETON_CH
Animation
(None)
Graph
SkeletonAnimB
Perspective
Lit
Show
LOD Aut
Previewing SkeletonAnimBlueprint_C
Preview out of date
Click to recompile
Event Graph
Anim Graph
SkeletonAnimBlueprint > AnimGraph
Zoom 1:1
Drag Off Pins to Create/Connect New Nodes.
Final Animation Pose
Result
The first thing we create in our character's Animation Blueprint is two variables: A float variable called "Speed", and a Bool variable called "IsInAir?"
NIMATION
Anim Preview Editor
Edit Preview
Edit Defaults
Changes to preview options are not saved in the asset.
Search
Root Motion
Root Motion M
Root Motion from Monta
Asset Browser
My Blueprint
Add New
Search
Graphs
EventGraph
Event Blueprint Update Animation
AnimGraph
Functions (3 Overridable)
Macros
Variables
BCORE
Speed
IsInAir?
Event Dispatchers
Search
Variable
Variable Name
Speed
Variable Type
Float
Editable
Tooltip
Expose on Spawn
Private
Expose to Matinee
Category
BCORE
Slider Range
Value Range
Replication
None
Default Value
Please compile the blueprint


SkeletonAnimBlueprint
File Edit Asset View Debug Window Help
Parent class: Anim Instance
Search For Help
Compile
Save
Find in CB
Preview
Ref Pose
Record
Search
Class Settings
Skeleton
SKELETON_CH
Mesh
SKELETON_CH
Animation
(None)
Graph
SkeletonAnimB
Perspective
Lit
Show
LOD Au
Previewing SkeletonAnimBlueprint_C
Preview out of date
Click to recompile
Event Graph
Anim Graph
SkeletonAnimBlueprint > AnimGraph
Zoom 1:1
Drag Off Pins to Create/Connect New Nodes.
Final Animation Pose
Result
NOTE
ANIMATION
Anim Preview Editor
Edit Preview
Edit Defaults
Changes to preview options are not saved in the asset.
Search
Root Motion
Root Motion M
Root Motion from Monta
Asset Browser
My Blueprint
Add New
Search
Graphs
EventGraph
Event Blueprint Update Animation
AnimGraph
Functions (3 Overridable)
Macros
Variables
BCORE
Speed
IsInAir?
Event Dispatchers
Search
Variable
Variable Name
IsInAir?
Variable Type
Boolean
Editable
Tooltip
Expose on Spawn
Private
Expose to Matinee
Category
BCORE
Replication
None
Default Value
Please compile the blueprint


In the main Event Graph of our character's Animation Blueprint, we can handle the UpdateAnimation event by first retrieving the "Pawn Owner" of our object. That will give us information about the motion of our character.
We can then check if our character is falling through the air and set the "IsInAir?" variable accordingly…
…and we can then check the speed of the character, and set the Speed variable accordingly.
Now that our variables are set, we will use them to decide how to animate our character…
RETRIEVE CHARACTER CONTROLLER FROM UNREAL
IF THE CHARACTER IS FALLING SET ISINAIR TO TRUE
GET THE CHARACTER'S VELOCITY AND SET IT INTO SPEED
ANIMATION
File
Edit
Asset
View
Debug
Window
Help
Compile
Save
Find in CB
Preview
Ref Pose
Record
Event Graph
Anim Preview Editor
Edit Preview
Edit Defaults
BCORE
Speed
Is in Air?
Root Motion
Asset Browser
My Blueprint
Add New
Graphs
Graph Node


File Edit Asset View Debug Window Help
Parent class: Anim Instance
Search For Help
Compile
Save
Find in CB
Preview
Ref Pose
Record
Search
Class Settings
Class Defaults
Skeleton
SKELETON_CH
Mesh
SKELETON_CH
Animation
(None)
Graph
SkeletonAnimB
Event Graph
Anim Graph
SkeletonAnimBlueprint > AnimGraph
Zoom 1:1
Perspective
Lit
Previewing SkeletonAnimBlueprint_C
Inside the Anim Graph, we will create a state machine that will use the Speed and IsInAir? variables to decide which animation to play at any given time…
Final Animation Pose
Right Click
All Actions for this Blueprint
Context Sensitive
Search
Leap Motion
Live Streaming
Math
Misc.
Networking
Online
Pawn
Rendering
Skeletal Controls
Slot
Sprite
State Machines
Add New State Machine...
Steam VR
Tools
User Interface
Utilities
Variables
Viewport
We produce the state machine by right-clicking and choosing Add New State Machine.
ANIMATION
Anim Preview Editor
Edit Preview
Edit Defaults
Changes to preview options are not save
Search
BCORE
Speed
0.0
Is in Air?
Root Motion
Root Moti
Root Motion fro
Asset Browser
My Blueprint
Add New
Search
Graphs
Search
BCORE
Speed
0.0


SkeletonAnimBlueprint*
File Edit Asset View Debug Window Help
Parent class: Anim Instance
Search For Help
Compile Save Find in CB Preview Ref Pose Record Search Class Settings Class Defaults
Skeleton SKELETON_CH
Mesh SKELETON_CH
Animation (None)
Graph SkeletonAnimB
Perspective Lit Sh
Previewing SkeletonAnimBlueprint_C
Event Graph AnimGraphStateMa Anim Graph
SkeletonAnimBlueprint > AnimGraph
Zoom 1:1
Final Animation Pose
AnimGraphStateMachine
State Machine
Result
This gives us a single node representing the entire state machine, and we connect it to the Final Animation Pose. We then double-click on our state machine to define how it's going to determine our character's animation pose.
Asset Browser
Add New
Graphs
EventGraph
Event Blueprint Update Animation
Event Blueprint Update Animation
AnimGraph
AnimGraphStateMachine
Functions (2 Overridable)
Macros
Variables
BCORE
Speed
IsInAir?
Event Dispatchers
Settings
Max Transitions Per Frame 3
Node
Anim Preview Editor
Edit Preview
Edit Defaults
Changes to preview options are not save
Search
BCORE
Speed 0.0
Is in Air?
Root Motion
Root Moti
Root Motion fro
Compiler Results
[8638.46] Compile of SkeletonAnimBlueprint successful! [in 221 ms]
Clear

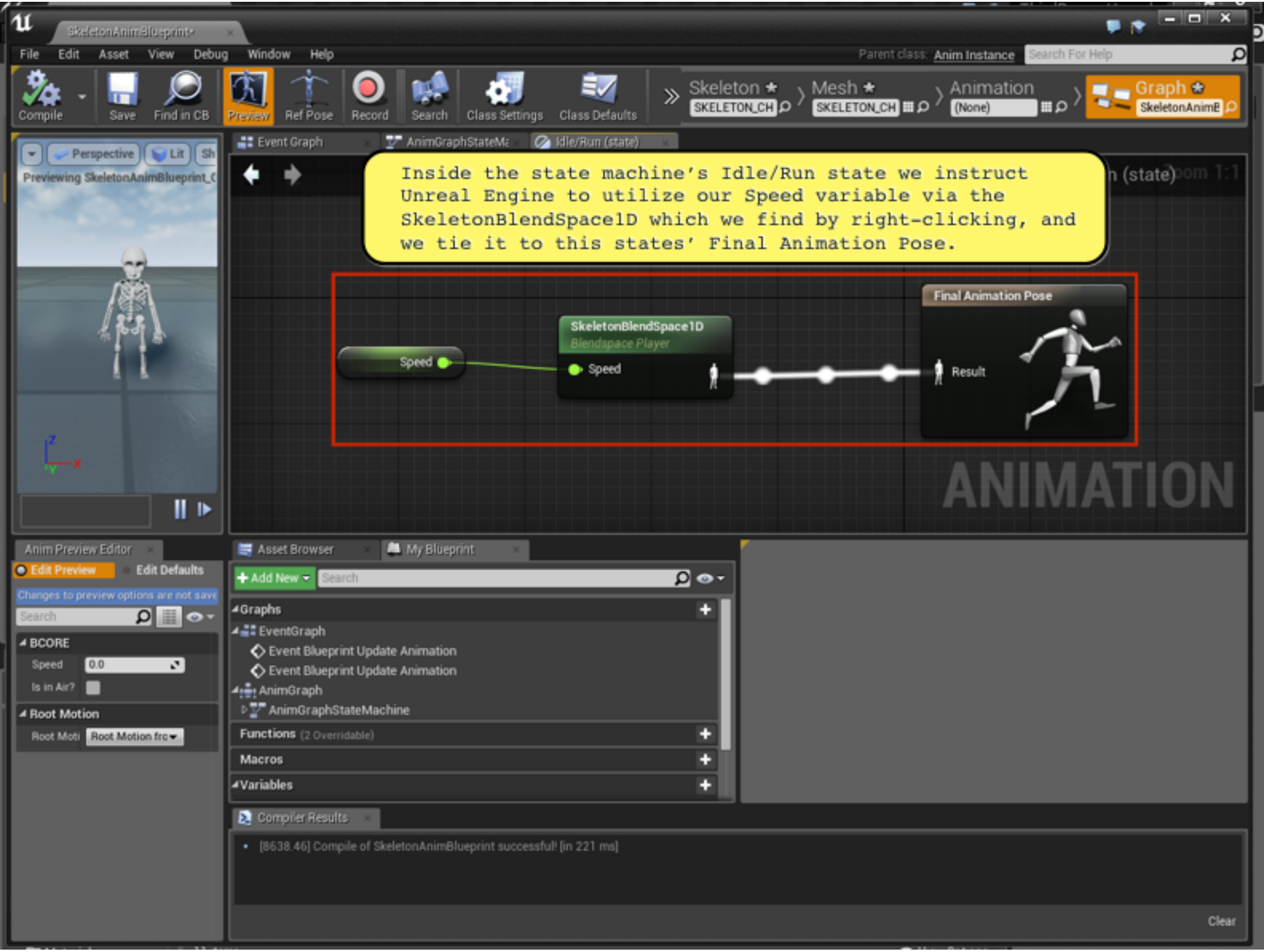
NOTE: State nodes are added by right-clicking, and transition connections are applied by clicking and dragging from one state node's outer rim to another state node's outer rim.

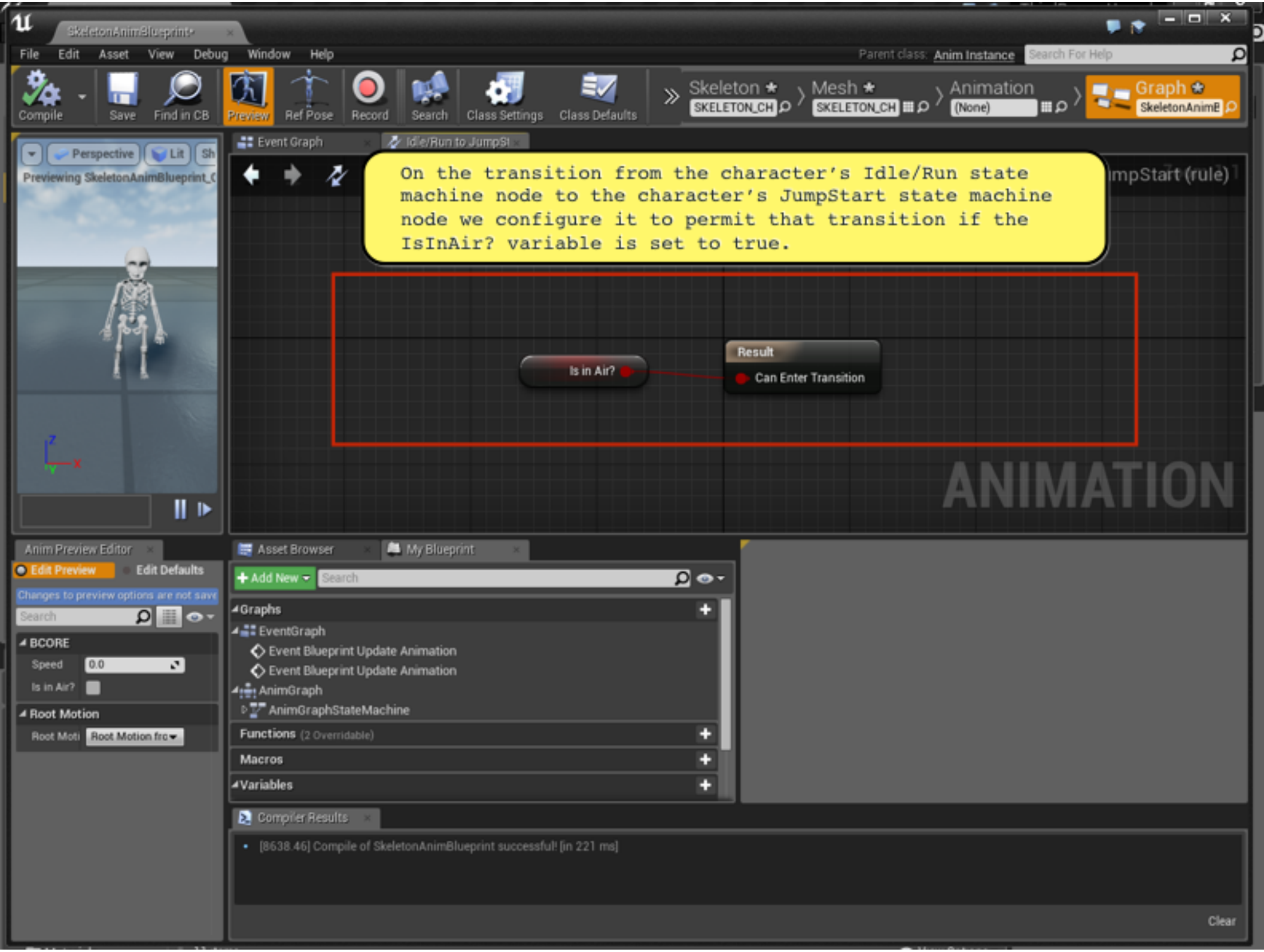
We then may construct any logic depicting the various animations and their transitions able to be performed by our individual game character.

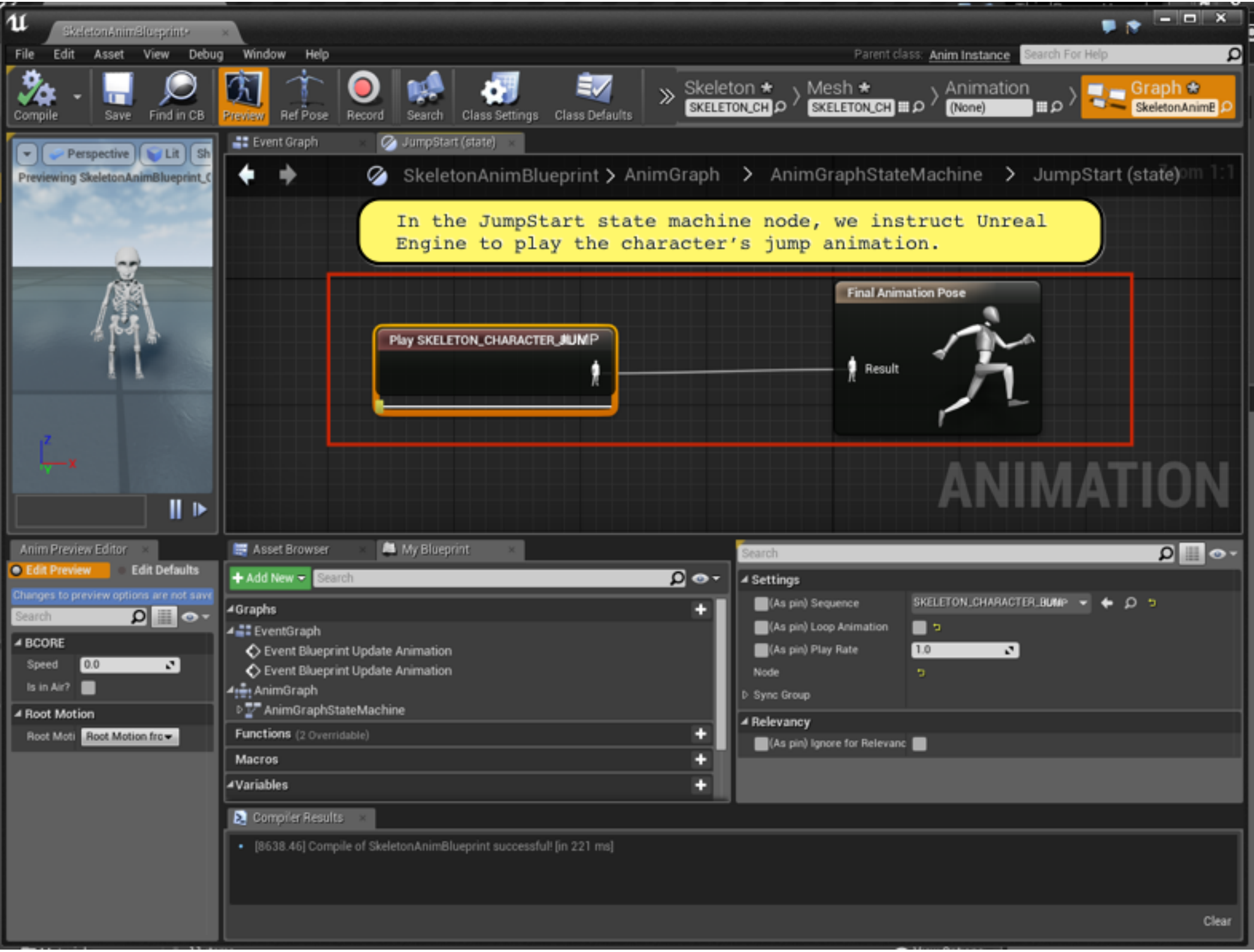
Here we have a character compatible to Unreal Engine's example third person character.

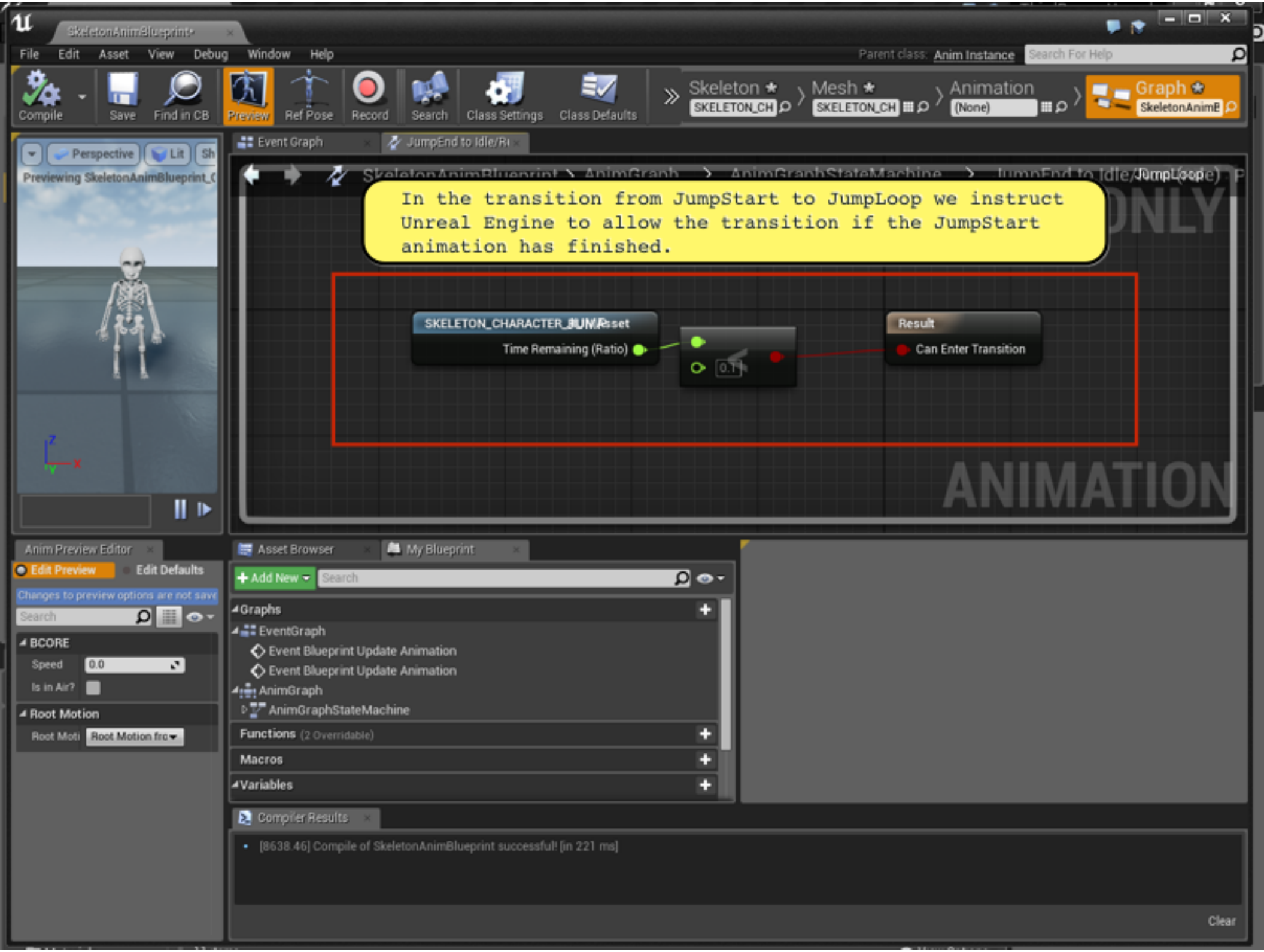
We have a single Idle/Run node which uses the Blend Space 1D to blend the Idle, Walk, and Run animations together.

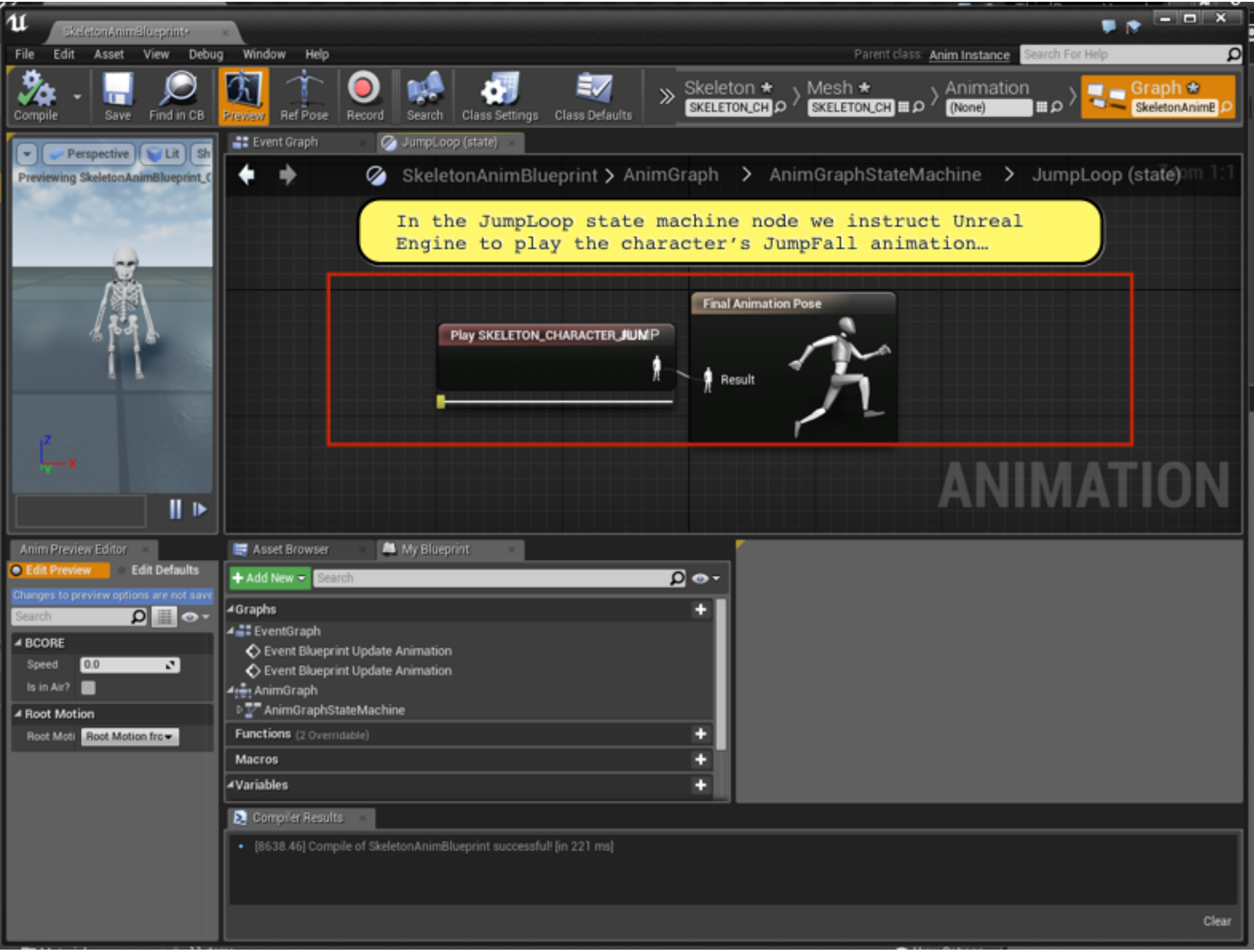
We also have a JumpStart, JumpLoop, and JumpEnd, and we have transitions between them which use the Speed and IsInAir? variables to decide whether to transition state.

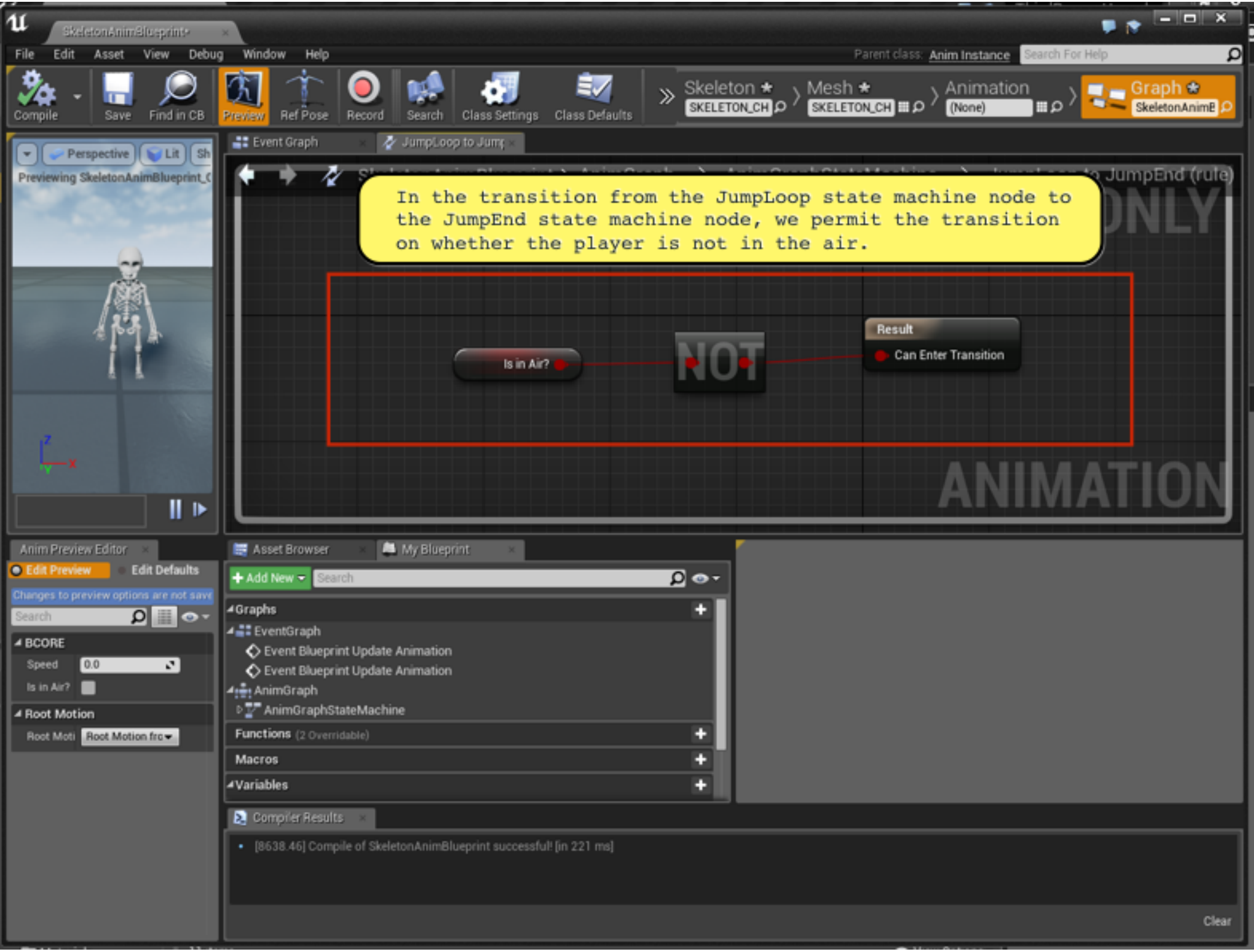

File Edit Asset View Debug Window Help
Parent class: Anim Instance
Search For Help
Compile
Save
Find in CB
Preview
Ref Pose
Record
Search
Class Settings
Class Defaults
Skeleton
SKELETON_CH
Mesh
SKELETON_CH
Animation
(None)
Graph
SkeletonAnimB
Perspective
Lit
Previewing SkeletonAnimBlueprint_C
Event Graph
AnimGraphStateMa
Idle/Run (state)
Inside the state machine's Idle/Run state we instruct Unreal Engine to utilize our Speed variable via the SkeletonBlendSpace1D which we find by right-clicking, and we tie it to this states' Final Animation Pose.
Speed
SkeletonBlendSpace1D
Blendspace Player
Speed
Final Animation Pose
Result
ANIMATION
Anim Preview Editor
Edit Preview
Edit Defaults
Changes to preview options are not save
Search
BCORE
Speed
0.0
Is in Air?
Root Motion
Root Moti
Root Motion fro
Asset Browser
My Blueprint
+ Add New
Search
Graphs
EventGraph
Event Blueprint Update Animation
Event Blueprint Update Animation
AnimGraph
AnimGraphStateMachine
Functions (2 Overridable)
Macros
Variables
Compiler Results
[8638.46] Compile of SkeletonAnimBlueprint successful! [in 221 ms]
Clear

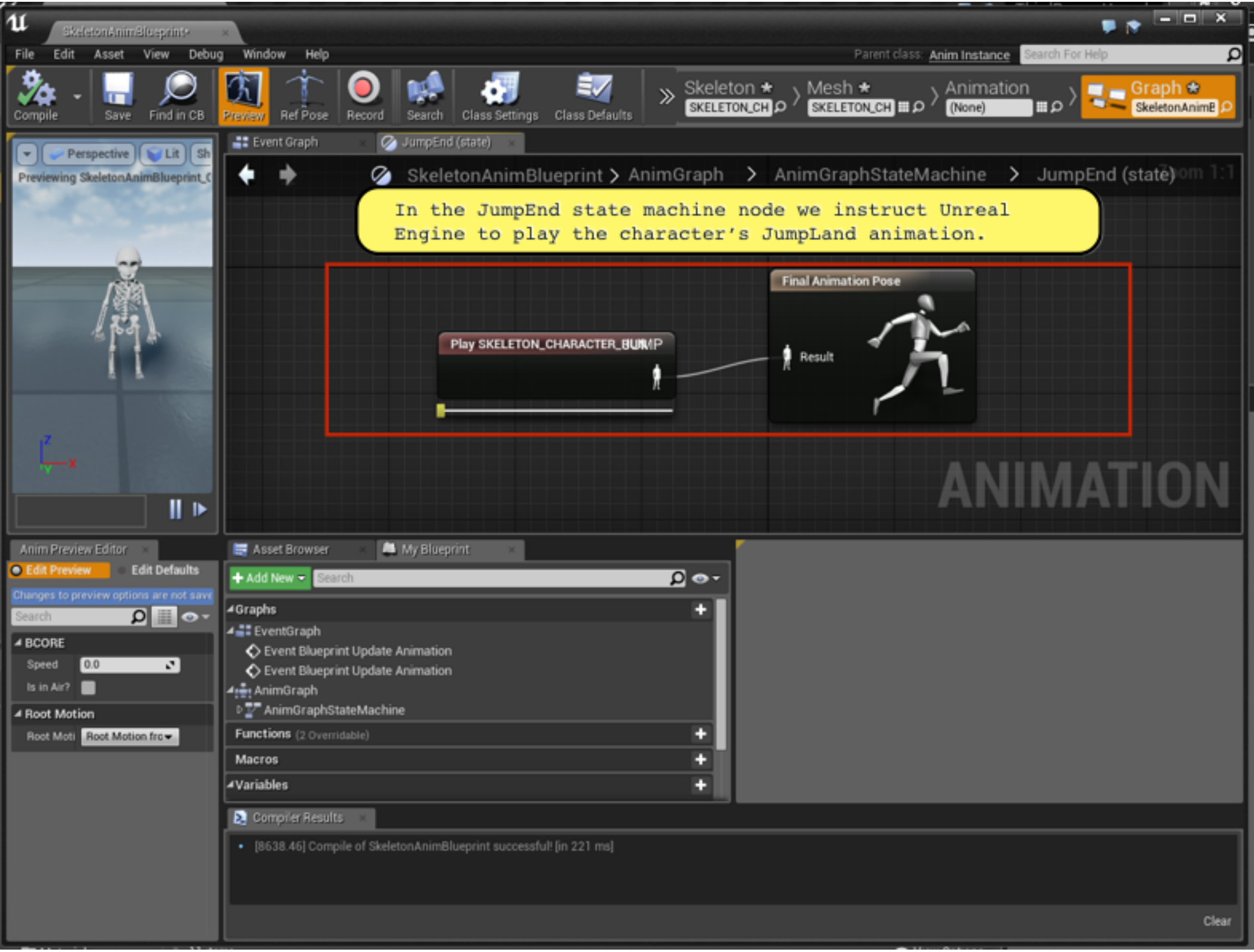

File Edit Asset View Debug Window Help
Parent class: Anim Instance
Search For Help
Compile
Save
Find in CB
Preview
Ref Pose
Record
Search
Class Settings
Class Defaults
Skeleton
SKELETON_CH
Mesh
SKELETON_CH
Animation
(None)
Graph
SkeletonAnimB
Perspective
Lit
Previewing SkeletonAnimBlueprint_C
Event Graph
Idle/Run to JumpSt
On the transition from the character's Idle/Run state machine node to the character's JumpStart state machine node we configure it to permit that transition if the IsInAir? variable is set to true.
mpStart (rule)
Is in Air?
Result
Can Enter Transition
ANIMATION
Anim Preview Editor
Edit Preview
Edit Defaults
Changes to preview options are not save
Search
BCORE
Speed
0.0
Is in Air?
Root Motion
Root Moti
Root Motion fro
Asset Browser
My Blueprint
+ Add New
Search
Graphs
EventGraph
Event Blueprint Update Animation
Event Blueprint Update Animation
AnimGraph
AnimGraphStateMachine
Functions (2 Overridable)
Macros
Variables
Compiler Results
[8638.46] Compile of SkeletonAnimBlueprint successful! [in 221 ms]
Clear

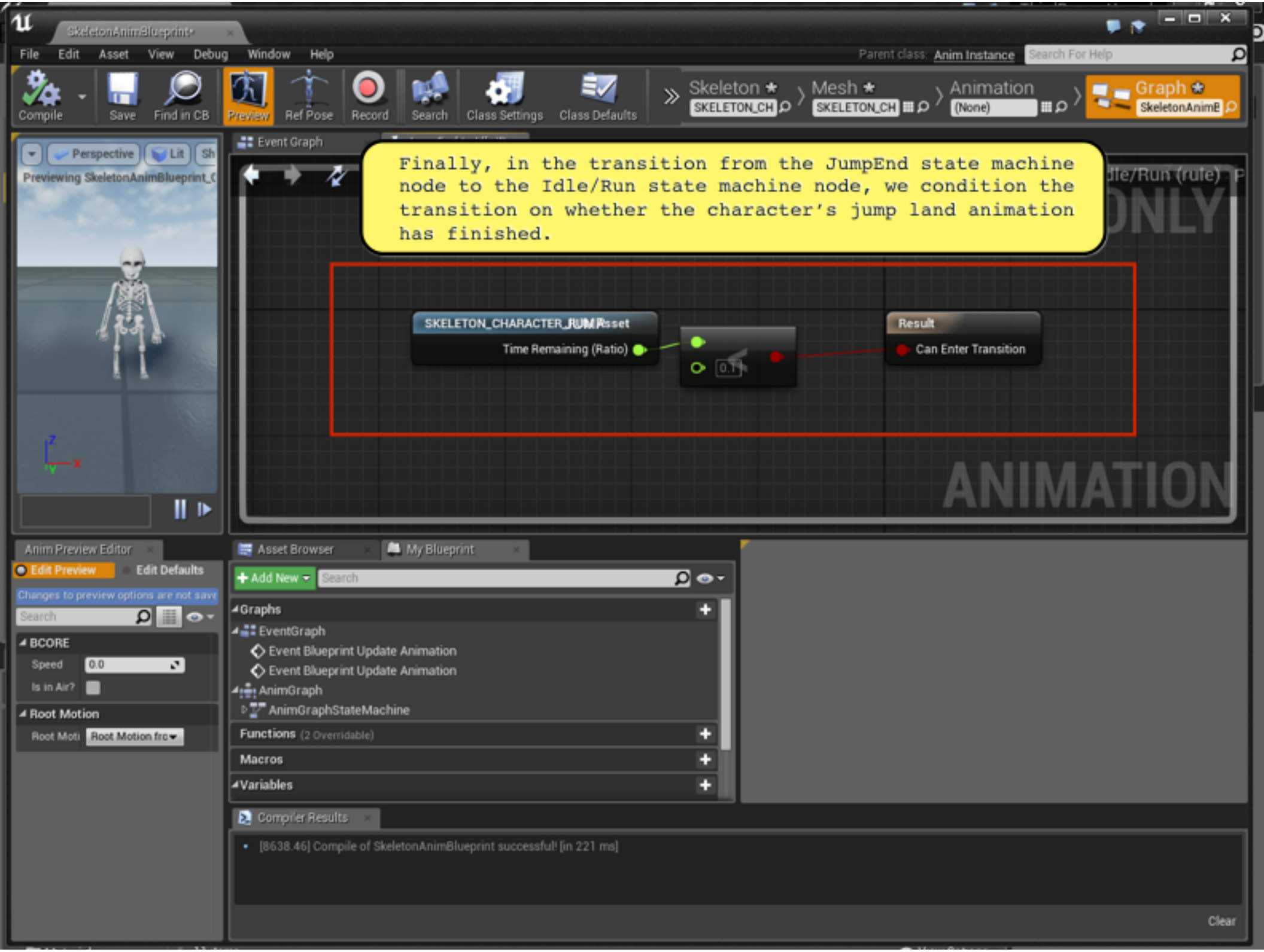

File Edit Asset View Debug Window Help
Parent class: Anim Instance
Search For Help
Compile
Save
Find in CB
Preview
Ref Pose
Record
Search
Class Settings
Class Defaults
Skeleton
SKELETON_CH
Mesh
SKELETON_CH
Animation
(None)
Graph
Perspective
Lit
Previewing SkeletonAnimBlueprint_C
Event Graph
JumpStart (state)
SkeletonAnimBlueprint > AnimGraph > AnimGraphStateMachine > JumpStart (state)
In the JumpStart state machine node, we instruct Unreal Engine to play the character's jump animation.
Play SKELETON_CHARACTER_JUMP
Final Animation Pose
Result
ANIMATION
Anim Preview Editor
Edit Preview
Edit Defaults
Changes to preview options are not save
BCORE
Speed
0.0
Is in Air?
Root Motion
Root Moti
Root Motion fro
Asset Browser
My Blueprint
Add New
Search
Graphs
EventGraph
Event Blueprint Update Animation
Event Blueprint Update Animation
AnimGraph
AnimGraphStateMachine
Functions (2 Overridable)
Macros
Variables
Search
Settings
(As pin) Sequence
SKELETON_CHARACTER_JUMP
(As pin) Loop Animation
(As pin) Play Rate
1.0
Node
Sync Group
Relevancy
(As pin) Ignore for Relevanc
Compiler Results
[8638.46] Compile of SkeletonAnimBlueprint successful! [in 221 ms]
Clear

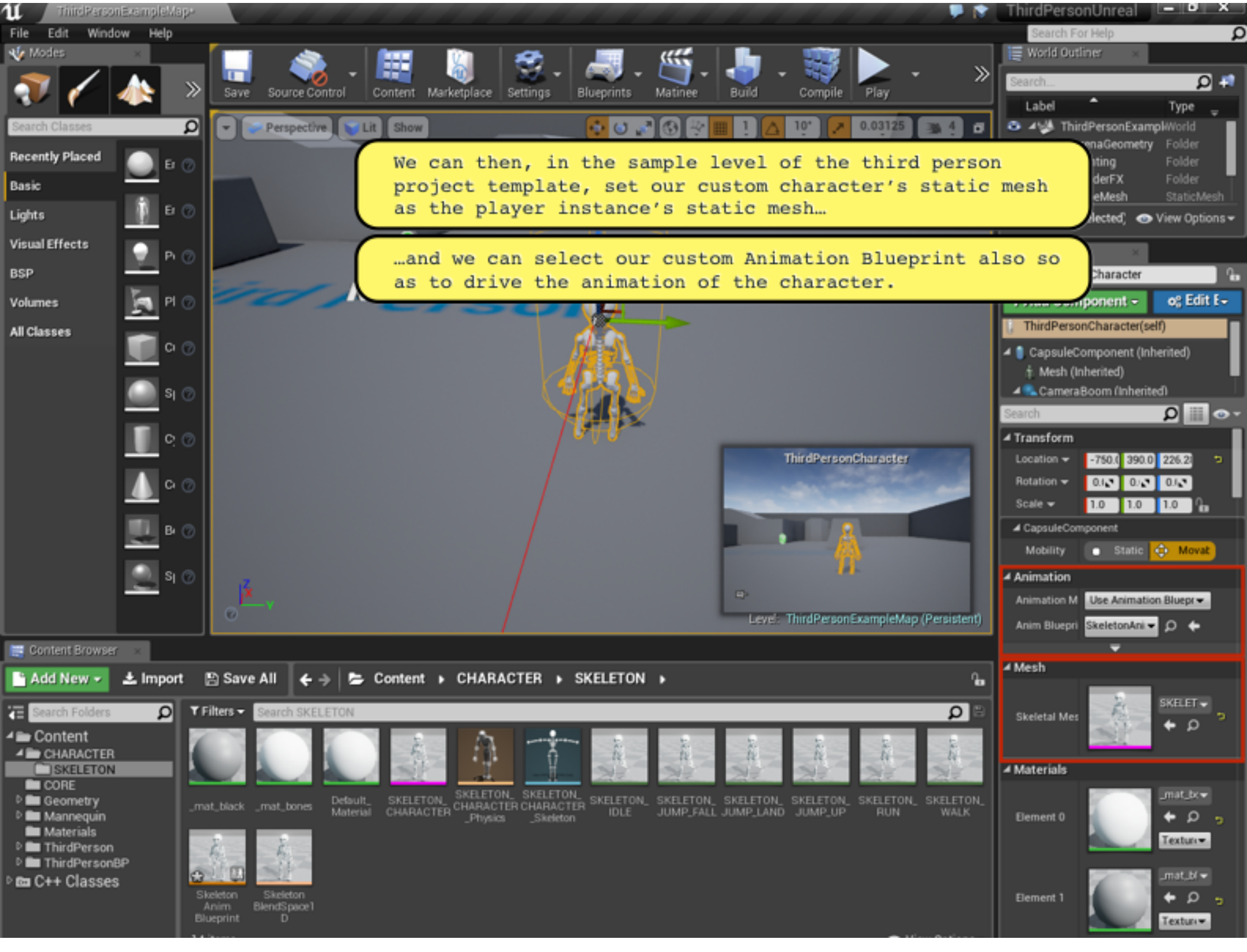

In the transition from JumpStart to JumpLoop we instruct Unreal Engine to allow the transition if the JumpStart animation has finished.
SKELETON_CHARACTER_JUMPAsset
Time Remaining (Ratio)
0.1
Result
Can Enter Transition
ANIMATION
Compile
Save
Find in CB
Preview
Ref Pose
Record
Search
Class Settings
Class Defaults
Skeleton
Mesh
Animation
Graph
Event Graph
AnimGraph
AnimGraphStateMachine
Anim Preview Editor
Edit Preview
Edit Defaults
Asset Browser
My Blueprint
Add New
Graphs
EventGraph
Event Blueprint Update Animation
Event Blueprint Update Animation
AnimGraph
AnimGraphStateMachine
Functions
Macros
Variables
Compiler Results
[8638.46] Compile of SkeletonAnimBlueprint successful! [in 221 ms]
Clear

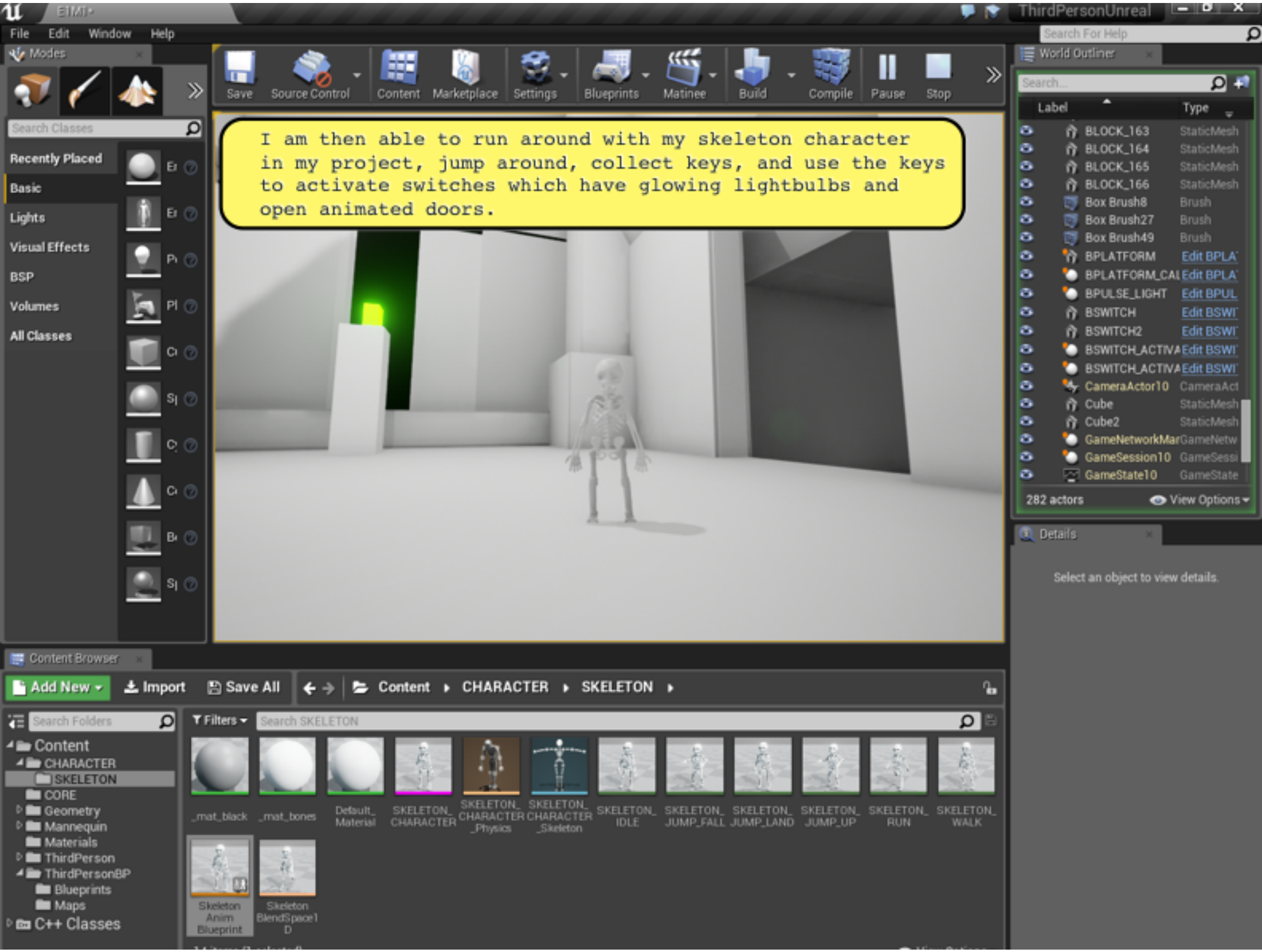

File Edit Asset View Debug Window Help
Parent class: Anim Instance
Search For Help
Compile
Save
Find in CB
Preview
Ref Pose
Record
Search
Class Settings
Class Defaults
Skeleton
SKELETON_CH
Mesh
SKELETON_CH
Animation
(None)
Graph
SkeletonAnimB
Perspective
Lit
Previewing SkeletonAnimBlueprint_C
Event Graph
JumpLoop (state)
SkeletonAnimBlueprint > AnimGraph > AnimGraphStateMachine > JumpLoop (state)
In the JumpLoop state machine node we instruct Unreal Engine to play the character's JumpFall animation…
Final Animation Pose
Play SKELETON_CHARACTER_JUMP
Result
ANIMATION
Anim Preview Editor
Edit Preview
Edit Defaults
Changes to preview options are not save
Search
BCORE
Speed
0.0
Is in Air?
Root Motion
Root Moti
Root Motion fro
Asset Browser
My Blueprint
+ Add New
Search
Graphs
EventGraph
Event Blueprint Update Animation
Event Blueprint Update Animation
AnimGraph
AnimGraphStateMachine
Functions (2 Overridable)
Macros
Variables
Compiler Results
[8638.46] Compile of SkeletonAnimBlueprint successful! [in 221 ms]
Clear


File Edit Asset View Debug Window Help
Parent class: Anim Instance
Search For Help
Compile
Save
Find in CB
Preview
Ref Pose
Record
Search
Class Settings
Class Defaults
Skeleton
SKELETON_CH
Mesh
SKELETON_CH
Animation
(None)
Graph
Perspective
Lit
Previewing SkeletonAnimBlueprint_C
Event Graph
JumpLoop to Jump
In the transition from the JumpLoop state machine node to the JumpEnd state machine node, we permit the transition on whether the player is not in the air.
Is in Air?
NOT
Result
Can Enter Transition
ANIMATION
Anim Preview Editor
Edit Preview
Edit Defaults
Changes to preview options are not save
Search
BCORE
Speed
0.0
Is in Air?
Root Motion
Root Moti
Root Motion fro
Asset Browser
My Blueprint
+ Add New
Search
Graphs
EventGraph
Event Blueprint Update Animation
Event Blueprint Update Animation
AnimGraph
AnimGraphStateMachine
Functions (2 Overridable)
Macros
Variables
Compiler Results
[8638.46] Compile of SkeletonAnimBlueprint successful! [in 221 ms]
Clear


File Edit Asset View Debug Window Help
Parent class: Anim Instance
Search For Help
Compile
Save
Find in CB
Preview
Ref Pose
Record
Search
Class Settings
Class Defaults
Skeleton
SKELETON_CH
Mesh
SKELETON_CH
Animation
(None)
Graph
Perspective
Lit
Previewing SkeletonAnimBlueprint_C
Event Graph
JumpEnd (state)
SkeletonAnimBlueprint > AnimGraph > AnimGraphStateMachine > JumpEnd (state)
In the JumpEnd state machine node we instruct Unreal Engine to play the character's JumpLand animation.
Final Animation Pose
Play SKELETON_CHARACTER_BUMP
Result
ANIMATION
Anim Preview Editor
Edit Preview
Edit Defaults
Changes to preview options are not save
Search
BCORE
Speed
0.0
Is in Air?
Root Motion
Root Moti
Root Motion fro
Asset Browser
My Blueprint
+ Add New
Search
Graphs
EventGraph
Event Blueprint Update Animation
Event Blueprint Update Animation
AnimGraph
AnimGraphStateMachine
Functions (2 Overridable)
Macros
Variables
Compiler Results
[8638.46] Compile of SkeletonAnimBlueprint successful! [in 221 ms]
Clear

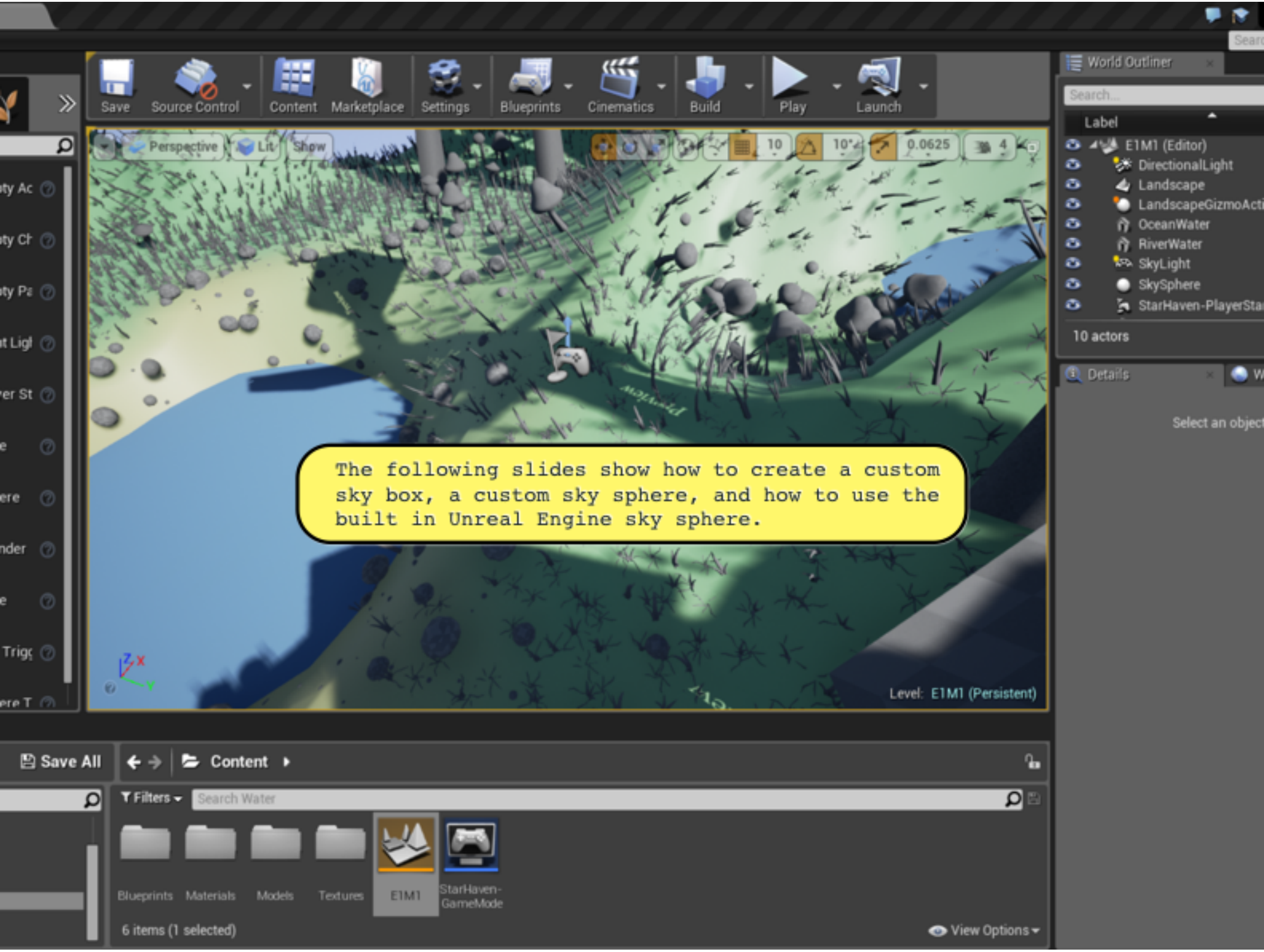

File Edit Asset View Debug Window Help
Parent class: Anim Instance
Search For Help
Compile
Save
Find in CB
Preview
Ref Pose
Record
Search
Class Settings
Class Defaults
Skeleton
SKELETON_CH
Mesh
SKELETON_CH
Animation
(None)
Graph
Perspective
Lit
Previewing SkeletonAnimBlueprint_C
Event Graph
Finally, in the transition from the JumpEnd state machine node to the Idle/Run state machine node, we condition the transition on whether the character's jump land animation has finished.
SKELETON_CHARACTER_JUMP Asset
Time Remaining (Ratio)
0.1
Result
Can Enter Transition
ANIMATION
Anim Preview Editor
Edit Preview
Edit Defaults
Changes to preview options are not save
Search
BCORE
Speed
0.0
Is in Air?
Root Motion
Root Moti
Root Motion fro
Asset Browser
My Blueprint
+ Add New
Search
Graphs
EventGraph
Event Blueprint Update Animation
Event Blueprint Update Animation
AnimGraph
AnimGraphStateMachine
Functions (2 Overridable)
Macros
Variables
Compiler Results
[8638.46] Compile of SkeletonAnimBlueprint successful! [in 221 ms]
Clear

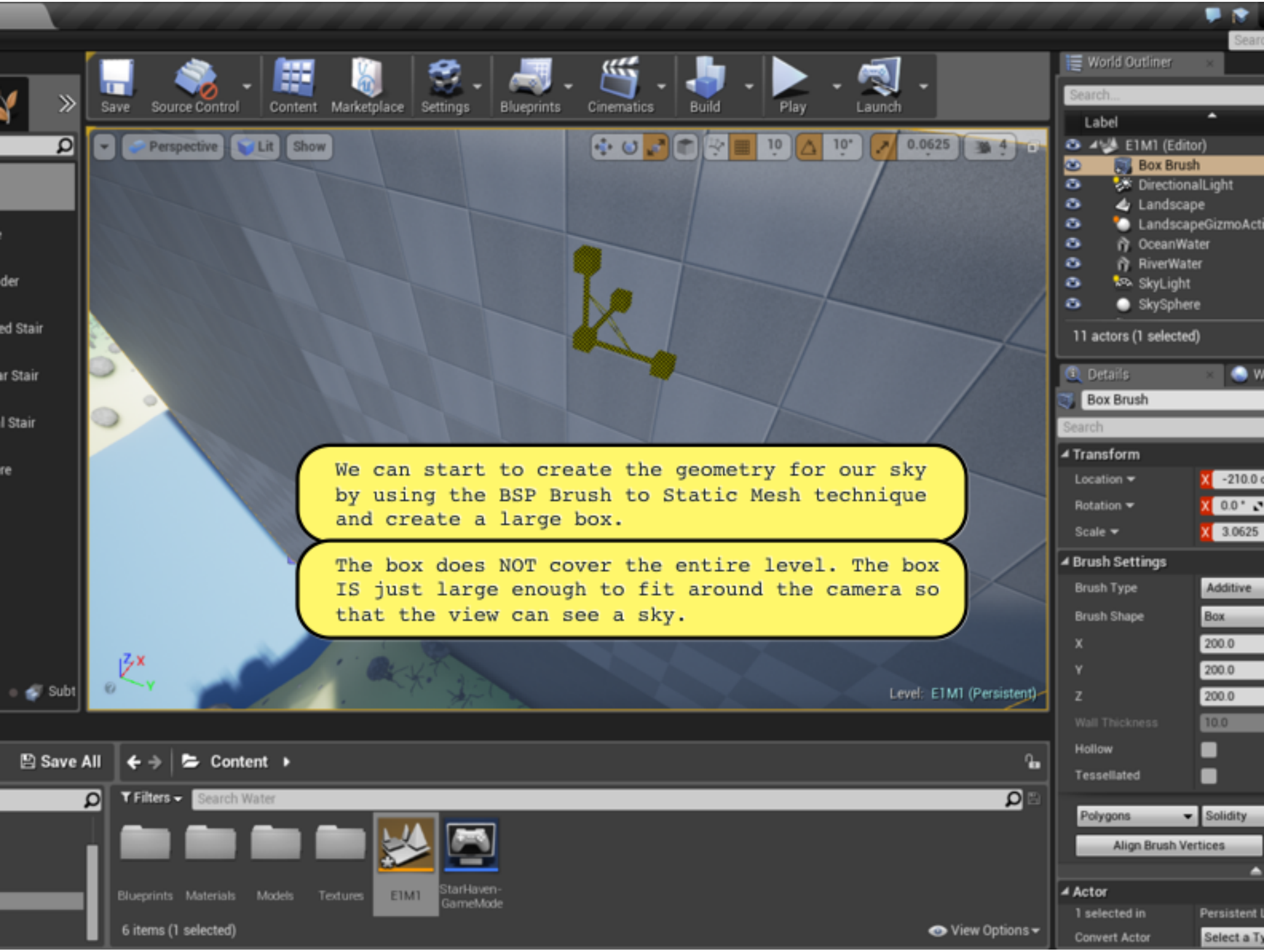

We can then, in the sample level of the third person project template, set our custom character's static mesh as the player instance's static mesh…
…and we can select our custom Animation Blueprint also so as to drive the animation of the character.
ThirdPersonExampleMap
ThirdPersonUnreal
File Edit Window Help
Modes
Save Source Control Content Marketplace Settings Blueprints Matinee Build Compile Play
Perspective Lit Show
World Outliner
Label Type
ThirdPersonCharacter(self)
CapsuleComponent (Inherited)
Mesh (Inherited)
CameraBoom (Inherited)
Transform
Location Rotation Scale
CapsuleComponent
Mobility Static Movable
Animation
Animation Mode Use Animation Blueprint
Anim Blueprint SkeletonAnimBP
Mesh
Skeletal Mesh SKELETON
Materials
Element 0
Element 1
ThirdPersonCharacter
Level: ThirdPersonExampleMap (Persistent)
Content Browser
Add New Import Save All
Content CHARACTER SKELETON
Search Folders
Filters
Search SKELETON
Content
CHARACTER
SKELETON
CORE
Geometry
Mannequin
Materials
ThirdPerson
ThirdPersonBP
C++ Classes
_mat_black _mat_bones Default_Material SKELETON_CHARACTER SKELETON_CHARACTER_Physics SKELETON_CHARACTER_Skeleton SKELETON_IDLE SKELETON_JUMP_FALL SKELETON_JUMP_LAND SKELETON_JUMP_UP SKELETON_RUN SKELETON_WALK
Skeleton Anim Blueprint
Skeleton BlendSpace1D

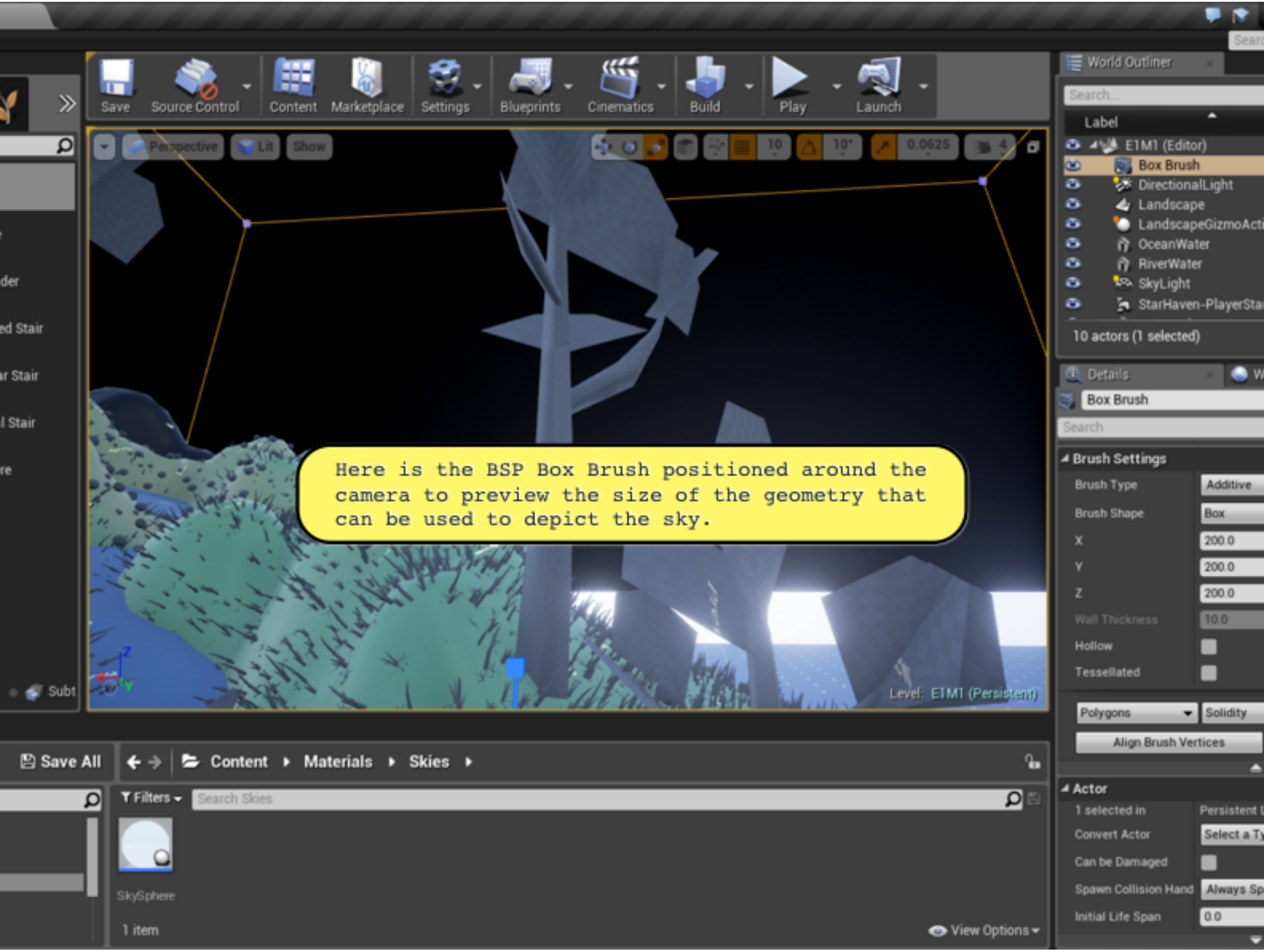

I am then able to run around with my skeleton character in my project, jump around, collect keys, and use the keys to activate switches which have glowing lightbulbs and open animated doors.

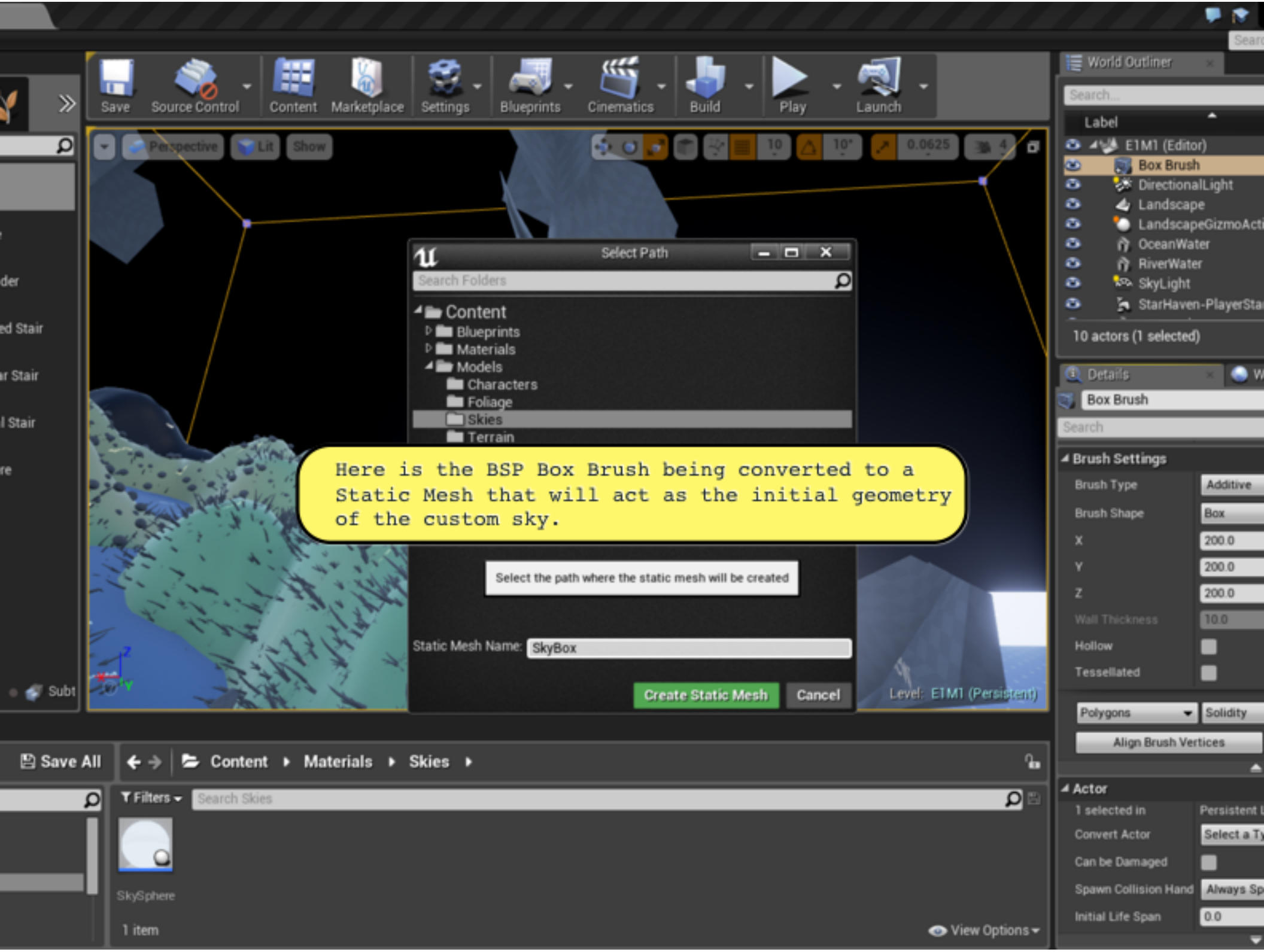
SECTION

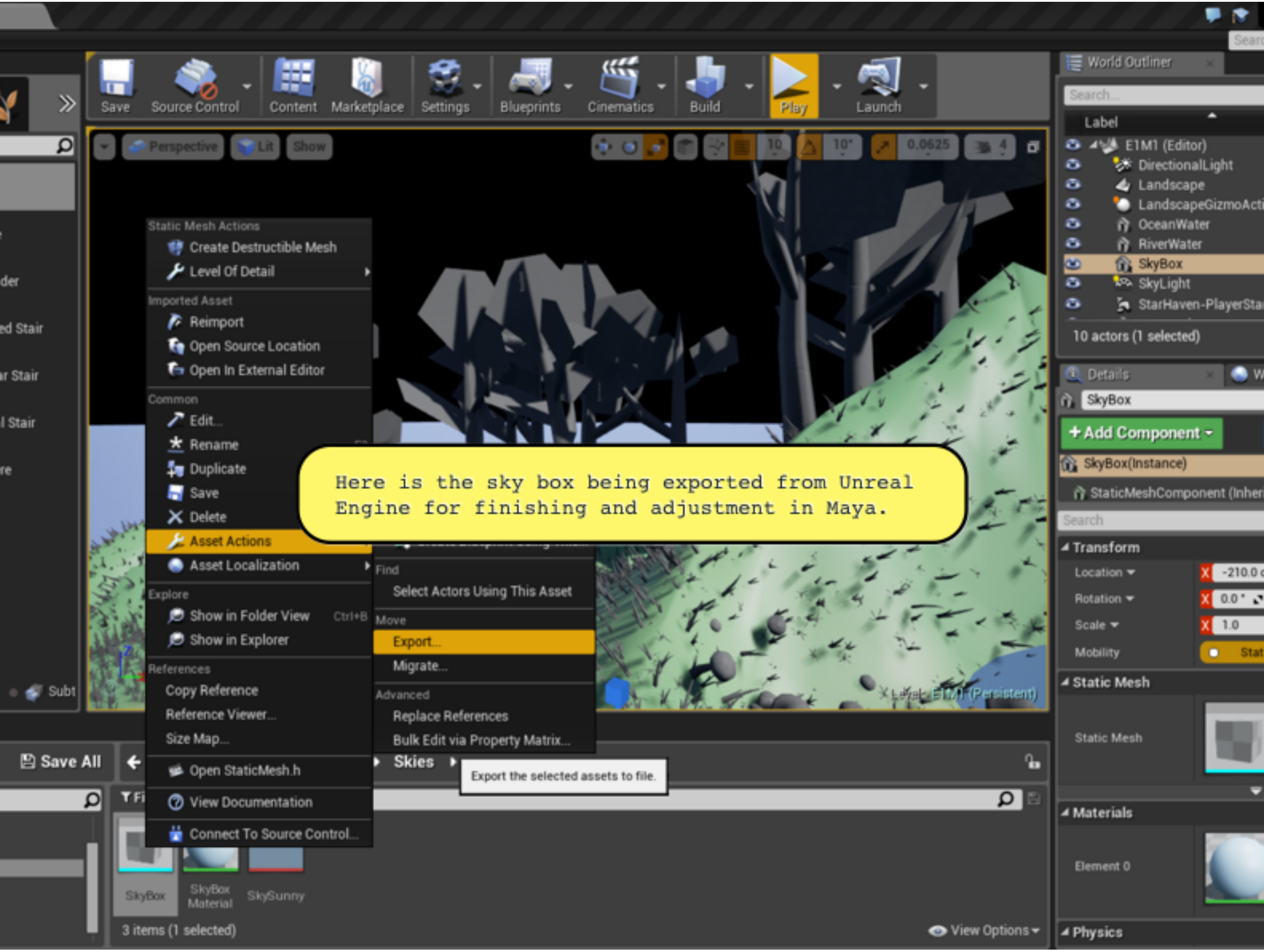
S K Y

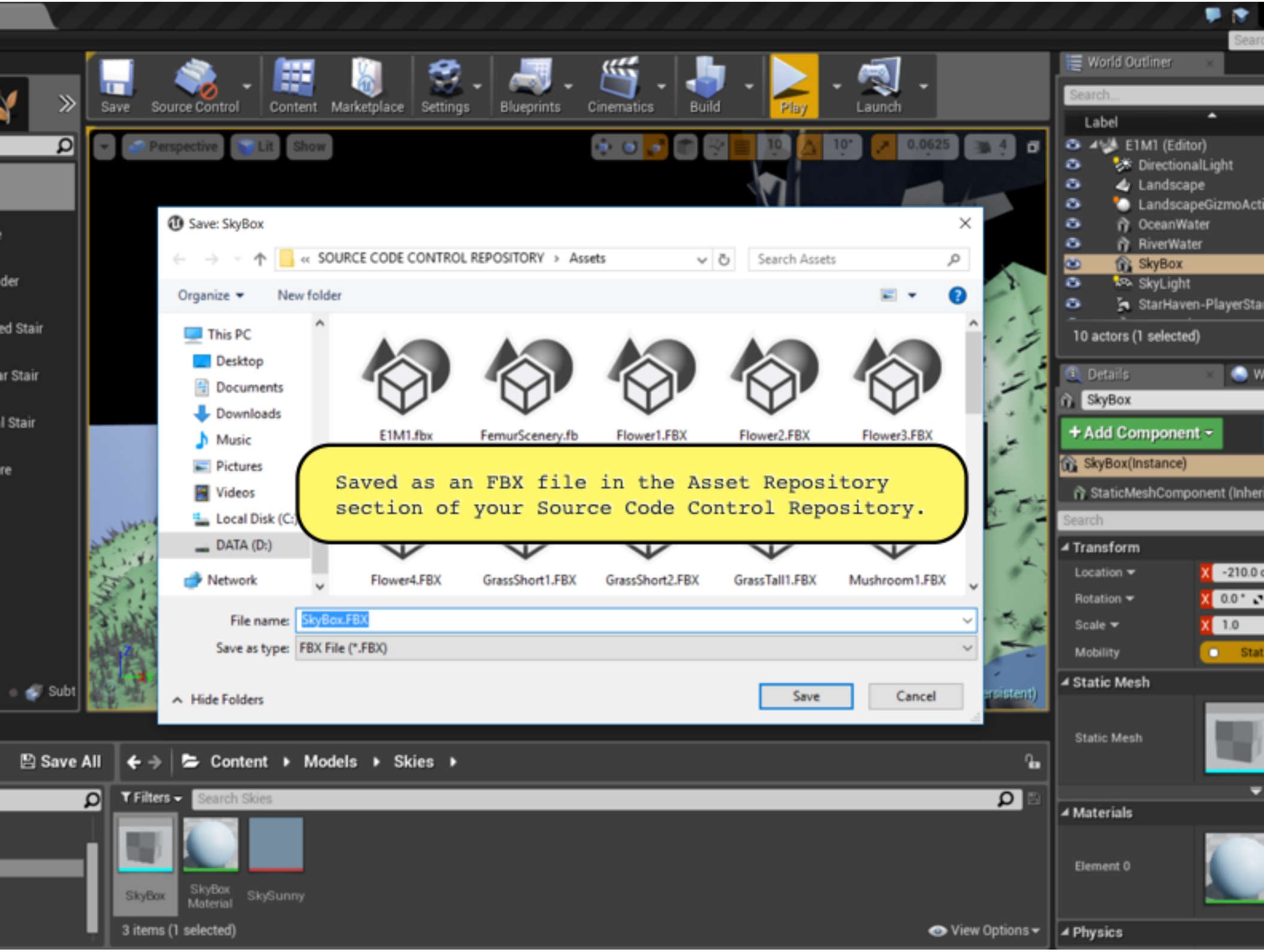

Save
Source Control
Content
Marketplace
Settings
Blueprints
Cinematics
Build
Play
Launch
World Outliner
Search...
Label
E1M1 (Editor)
DirectionalLight
Landscape
LandscapeGizmoActi
OceanWater
RiverWater
SkyLight
SkySphere
StarHaven-PlayerSta
10 actors
Details
Select an object
Perspective
Lit
Show
10
10°
0.0625
4
The following slides show how to create a custom sky box, a custom sky sphere, and how to use the built in Unreal Engine sky sphere.
Level: E1M1 (Persistent)
Save All
Content
Filters
Search Water
Blueprints
Materials
Models
Textures
E1M1
StarHaven-GameMode
6 items (1 selected)
View Options

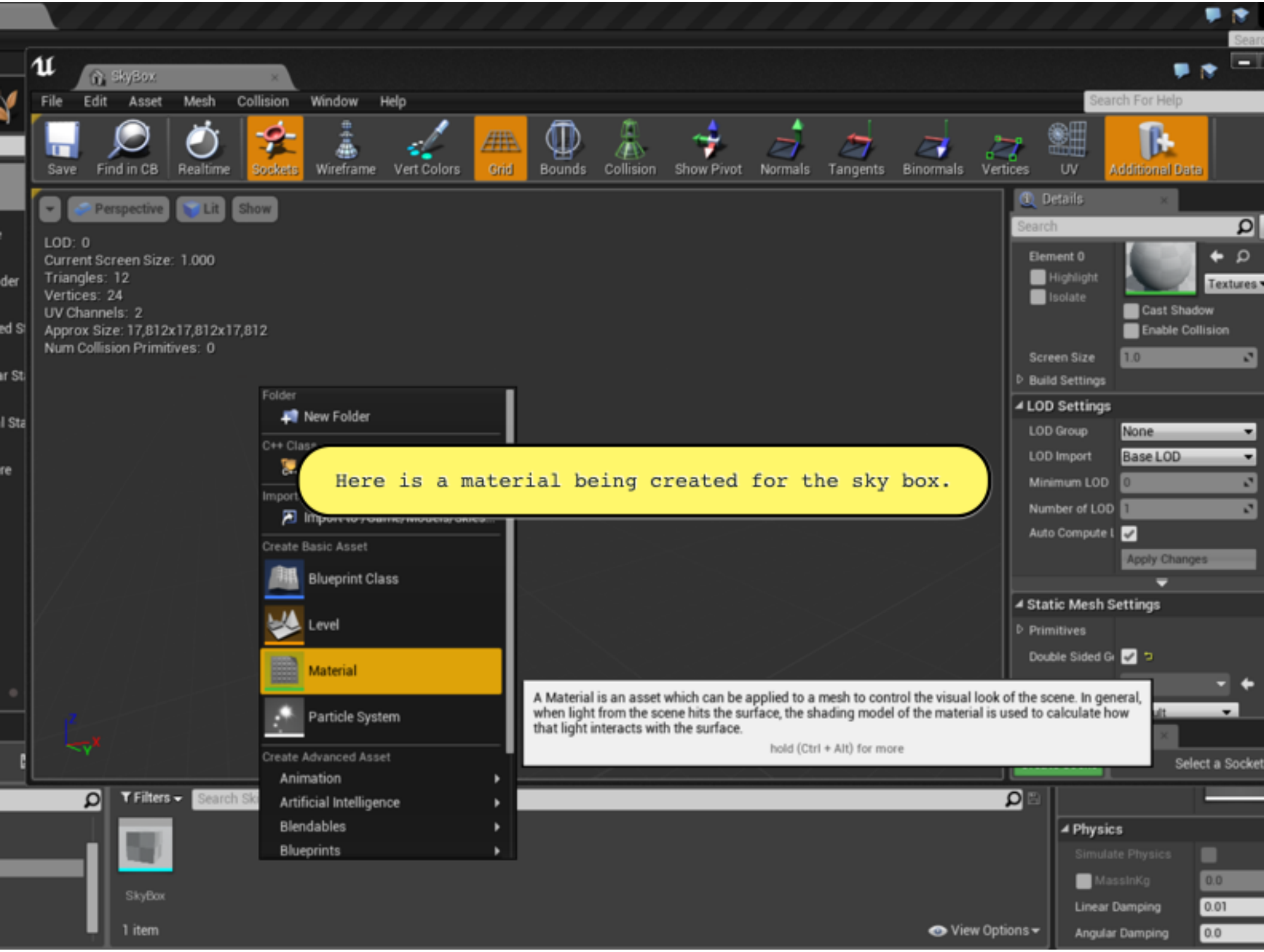

Save
Source Control
Content
Marketplace
Settings
Blueprints
Cinematics
Build
Play
Launch
Perspective
Lit
Show
We can start to create the geometry for our sky by using the BSP Brush to Static Mesh technique and create a large box.
The box does NOT cover the entire level. The box IS just large enough to fit around the camera so that the view can see a sky.
Level: E1M1 (Persistent)
World Outliner
Label
E1M1 (Editor)
Box Brush
DirectionalLight
Landscape
OceanWater
RiverWater
SkyLight
SkySphere
11 actors (1 selected)
Details
Box Brush
Transform
Location
Rotation
Scale
Brush Settings
Brush Type
Additive
Brush Shape
Box
X
Y
Z
200.0
Wall Thickness
10.0
Hollow
Tessellated
Polygons
Solidity
Align Brush Vertices
Actor
Save All
Content
Filters
Search Water
Blueprints
Materials
Models
Textures
E1M1
StarHaven-GameMode
6 items (1 selected)
View Options

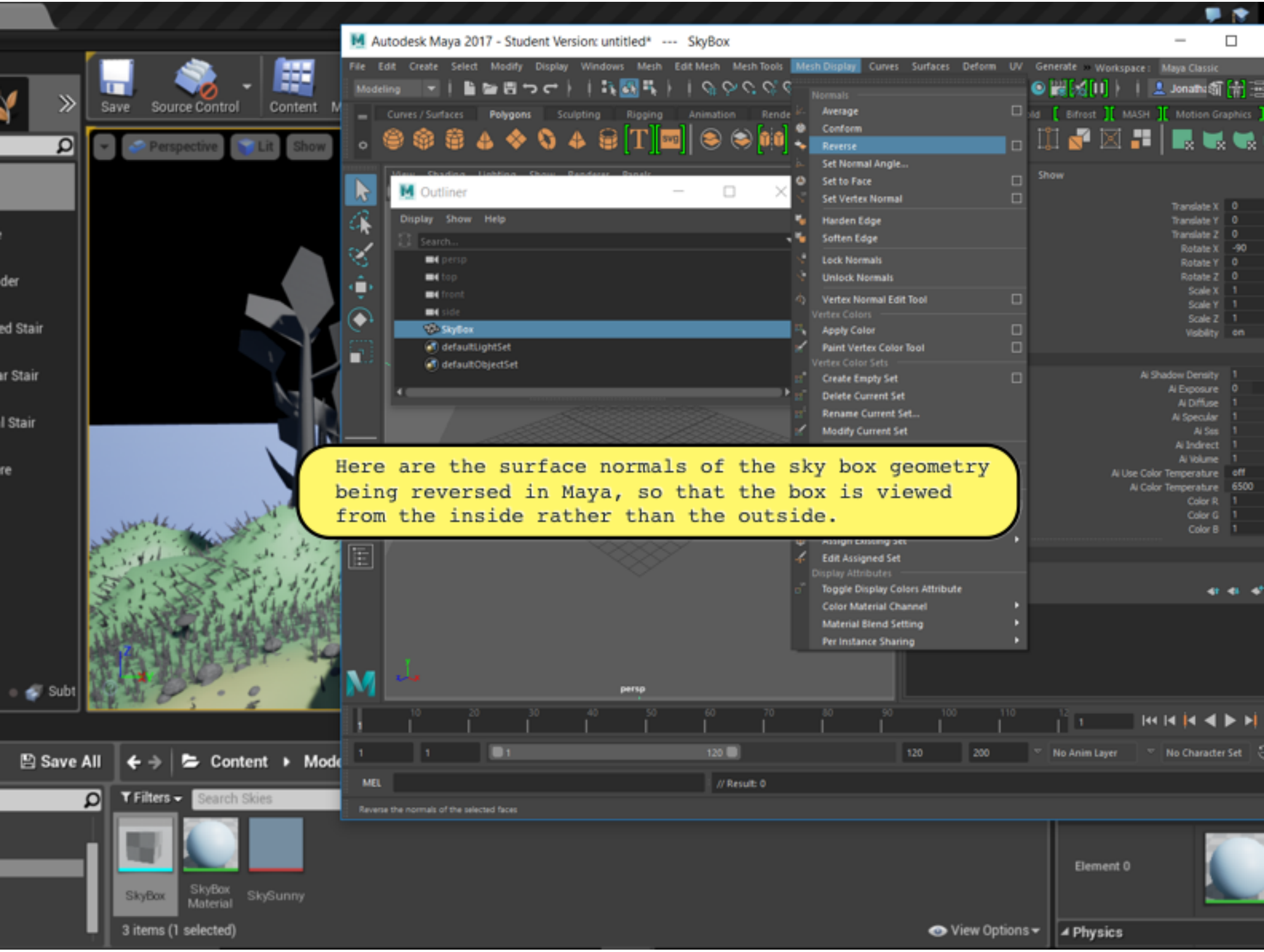

Save
Source Control
Content
Marketplace
Settings
Blueprints
Cinematics
Build
Play
Launch
Perspective
Lit
Show
Here is the BSP Box Brush positioned around the camera to preview the size of the geometry that can be used to depict the sky.
Level: E1M1 (Persistent)
World Outliner
Label
E1M1 (Editor)
Box Brush
DirectionalLight
Landscape
OceanWater
RiverWater
SkyLight
10 actors (1 selected)
Details
Box Brush
Brush Settings
Brush Type
Additive
Brush Shape
Box
X
200.0
Y
200.0
Z
200.0
Wall Thickness
10.0
Hollow
Tessellated
Polygons
Solidity
Align Brush Vertices
Actor
1 selected in
Convert Actor
Can be Damaged
Spawn Collision Hand
Initial Life Span
0.0
Save All
Content
Materials
Skies
Filters
Search Skies
SkySphere
1 item
View Options

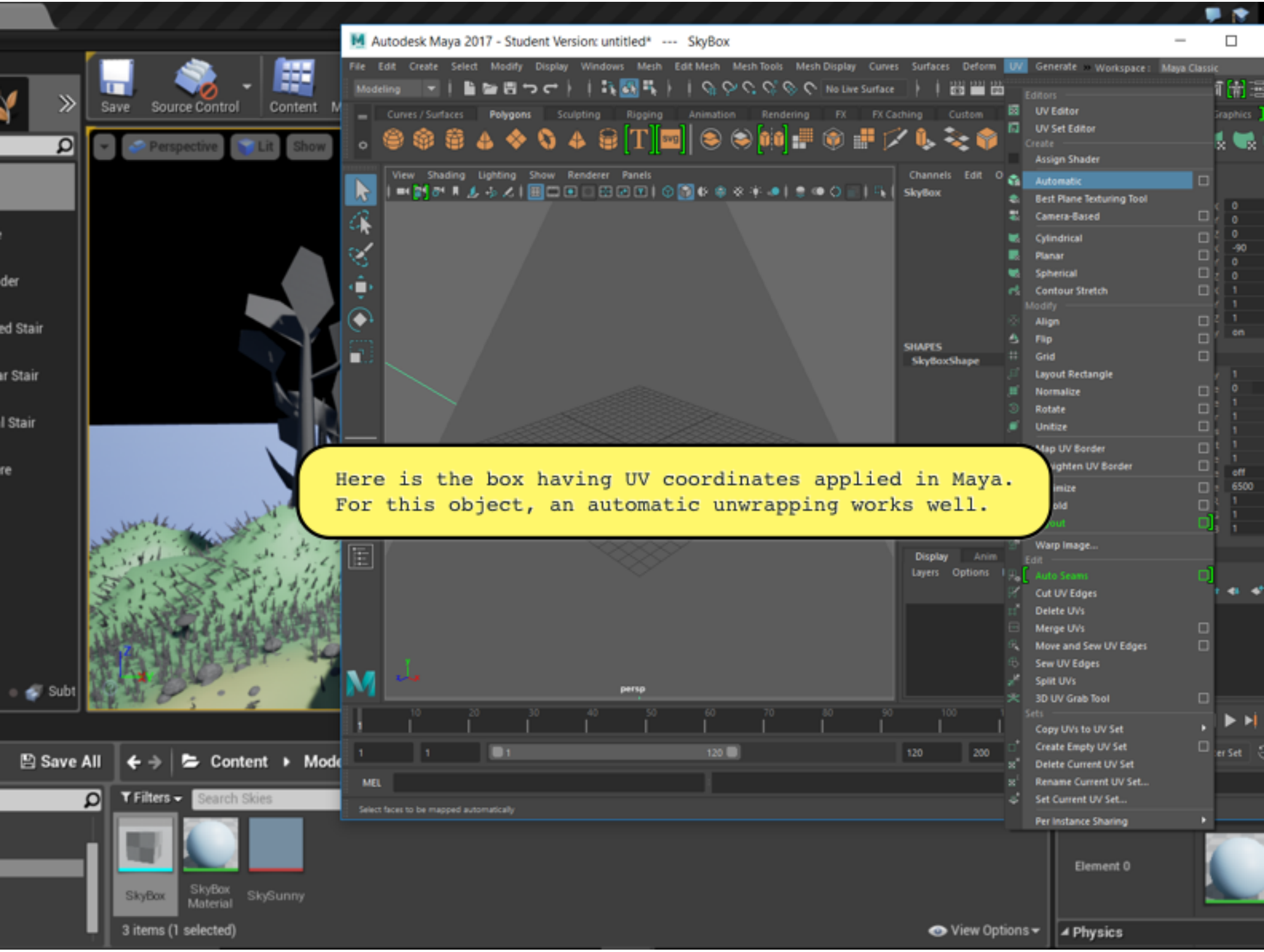

Save
Source Control
Content
Marketplace
Settings
Blueprints
Cinematics
Build
Play
Launch
World Outliner
Label
E1M1 (Editor)
Box Brush
DirectionalLight
Landscape
OceanWater
RiverWater
SkyLight
10 actors (1 selected)
Details
Box Brush
Brush Settings
Brush Type
Additive
Brush Shape
Box
X
200.0
Y
200.0
Z
200.0
Wall Thickness
10.0
Hollow
Tessellated
Polygons
Solidity
Align Brush Vertices
Actor
1 selected in
Convert Actor
Can be Damaged
Spawn Collision Hand
Initial Life Span
0.0
Select Path
Search Folders
Content
Blueprints
Materials
Models
Characters
Foliage
Skies
Terrain
Here is the BSP Box Brush being converted to a Static Mesh that will act as the initial geometry of the custom sky.
Select the path where the static mesh will be created
Static Mesh Name:
SkyBox
Create Static Mesh
Cancel
Level: E1M1 (Persistent)
Save All
Content
Materials
Skies
Filters
Search Skies
SkySphere
1 item
View Options

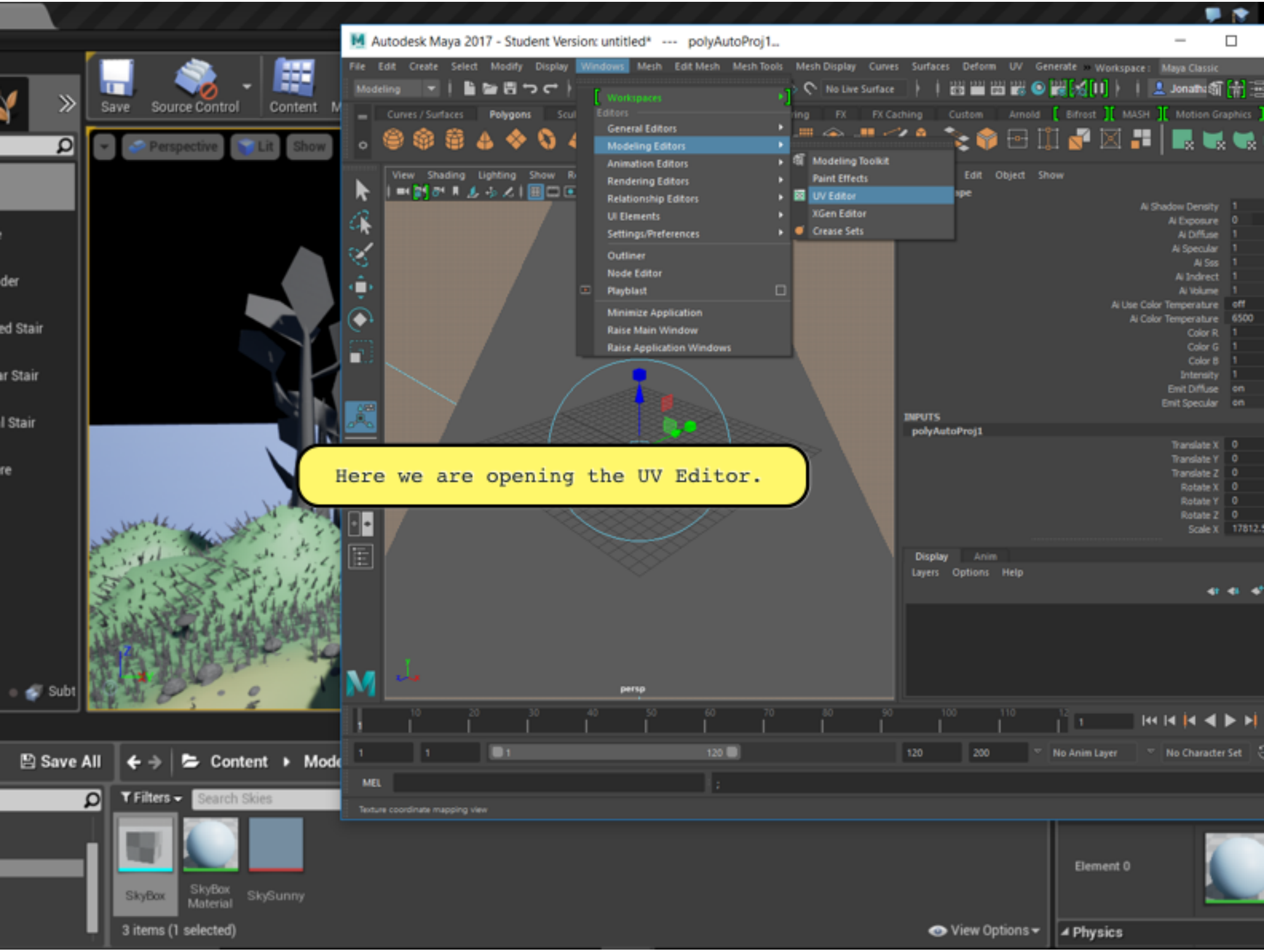

Here is the sky box being exported from Unreal Engine for finishing and adjustment in Maya.
Save
Source Control
Content
Marketplace
Settings
Blueprints
Cinematics
Build
Play
Launch
Perspective
Lit
Show
Static Mesh Actions
Create Destructible Mesh
Level Of Detail
Imported Asset
Reimport
Open Source Location
Open In External Editor
Common
Edit...
Rename
Duplicate
Save
Delete
Asset Actions
Asset Localization
Explore
Show in Folder View
Ctrl+B
Show in Explorer
References
Copy Reference
Reference Viewer...
Size Map...
Open StaticMesh.h
View Documentation
Connect To Source Control...
Find
Select Actors Using This Asset
Move
Export...
Migrate...
Advanced
Replace References
Bulk Edit via Property Matrix...
Skies
Export the selected assets to file.
World Outliner
Label
E1M1 (Editor)
DirectionalLight
Landscape
OceanWater
RiverWater
SkyBox
SkyLight
10 actors (1 selected)
Details
SkyBox
+ Add Component
SkyBox(Instance)
Transform
Location
Rotation
Scale
Mobility
Static Mesh
Materials
Element 0
Physics
Save All
SkyBox
SkyBox Material
SkySunny
3 items (1 selected)
View Options

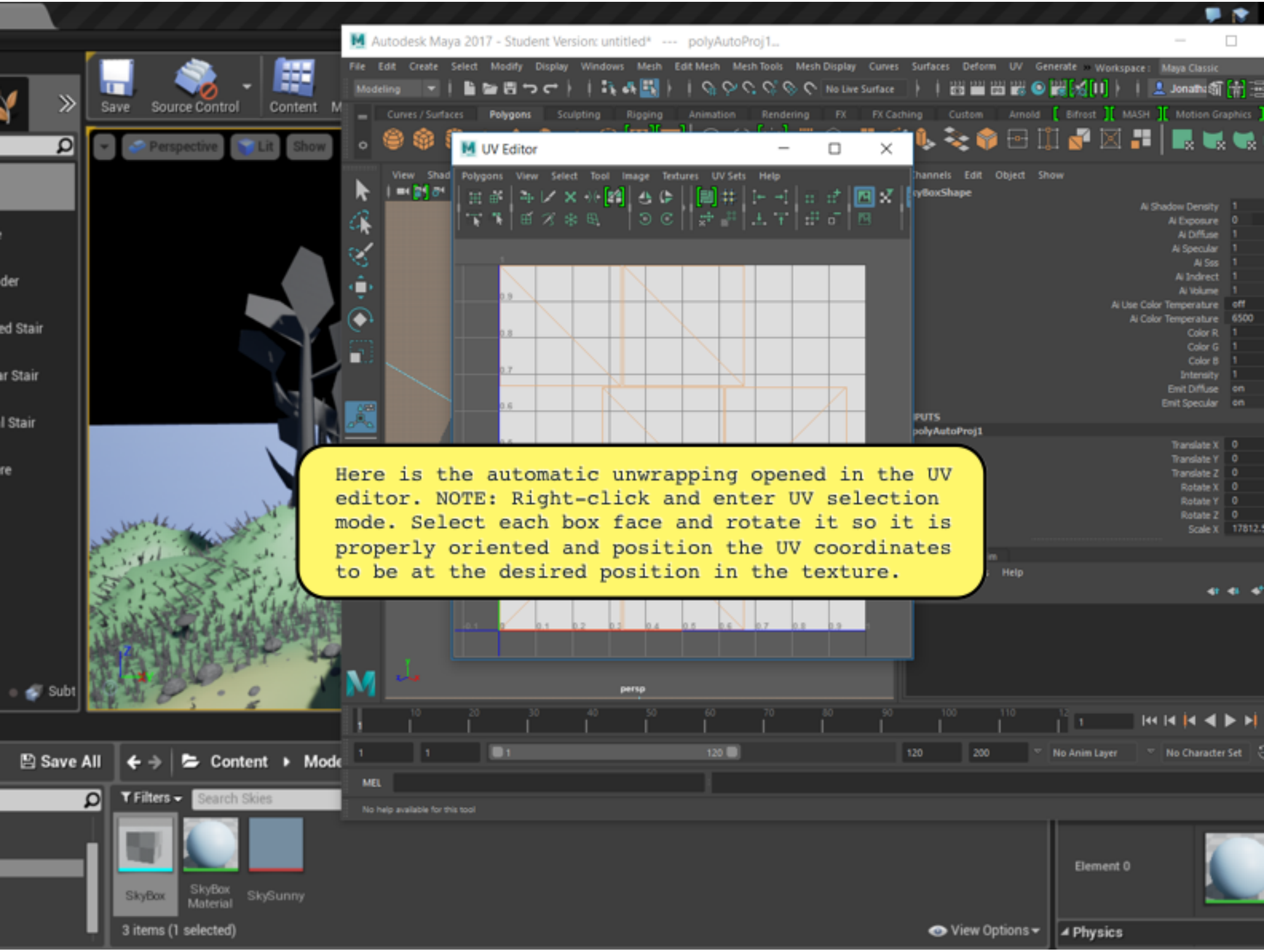

Save
Source Control
Content
Marketplace
Settings
Blueprints
Cinematics
Build
Play
Launch
Perspective
Lit
Show
Save: SkyBox
SOURCE CODE CONTROL REPOSITORY › Assets
Search Assets
Organize
New folder
This PC
Desktop
Documents
Downloads
Music
Pictures
Videos
Local Disk (C:)
DATA (D:)
Network
E1M1.fbx
FemurScenery.fb
Flower1.FBX
Flower2.FBX
Flower3.FBX
Flower4.FBX
GrassShort1.FBX
GrassShort2.FBX
GrassTall1.FBX
Mushroom1.FBX
Saved as an FBX file in the Asset Repository section of your Source Code Control Repository.
File name:
SkyBox.FBX
Save as type:
FBX File (*.FBX)
Hide Folders
Save
Cancel
World Outliner
Search...
Label
E1M1 (Editor)
DirectionalLight
Landscape
LandscapeGizmoActi
OceanWater
RiverWater
SkyBox
SkyLight
StarHaven-PlayerSta
10 actors (1 selected)
Details
SkyBox
+ Add Component
SkyBox(Instance)
StaticMeshComponent (Inher
Search
Transform
Location
Rotation
Scale
Mobility
Static Mesh
Static Mesh
Materials
Element 0
Physics
Save All
Content
Models
Skies
Filters
Search Skies
SkyBox
SkyBox Material
SkySunny
3 items (1 selected)
View Options

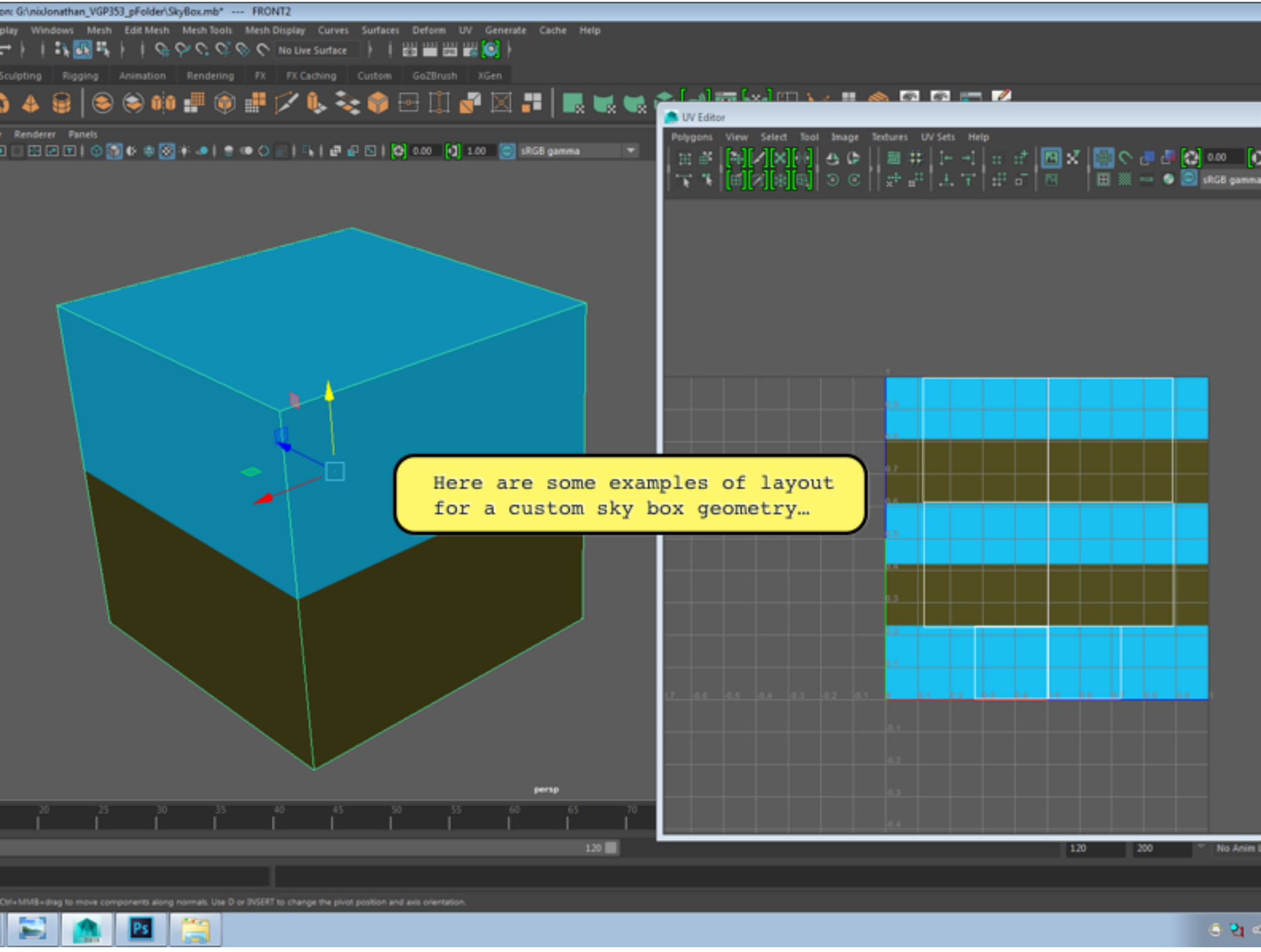

SkyBox
File Edit Asset Mesh Collision Window Help
Search For Help
Save Find in CB Realtime Sockets Wireframe Vert Colors Grid Bounds Collision Show Pivot Normals Tangents Binormals Vertices UV Additional Data
Perspective Lit Show
LOD: 0
Current Screen Size: 1.000
Triangles: 12
Vertices: 24
UV Channels: 2
Approx Size: 17,812x17,812x17,812
Num Collision Primitives: 0
Here is a material being created for the sky box.
Folder
New Folder
Create Basic Asset
Blueprint Class
Level
Material
Particle System
Create Advanced Asset
Animation
Artificial Intelligence
Blendables
Blueprints
A Material is an asset which can be applied to a mesh to control the visual look of the scene. In general, when light from the scene hits the surface, the shading model of the material is used to calculate how that light interacts with the surface.
hold (Ctrl + Alt) for more
Details
Search
Element 0
Highlight
Isolate
Textures
Cast Shadow
Enable Collision
Screen Size
1.0
Build Settings
LOD Settings
LOD Group
None
LOD Import
Base LOD
Minimum LOD
Number of LOD
Auto Compute L
Apply Changes
Static Mesh Settings
Primitives
Double Sided G
Select a Socket
Filters
SkyBox
1 item
View Options
Physics
Simulate Physics
MassInKg
Linear Damping
0.01
Angular Damping
0.0

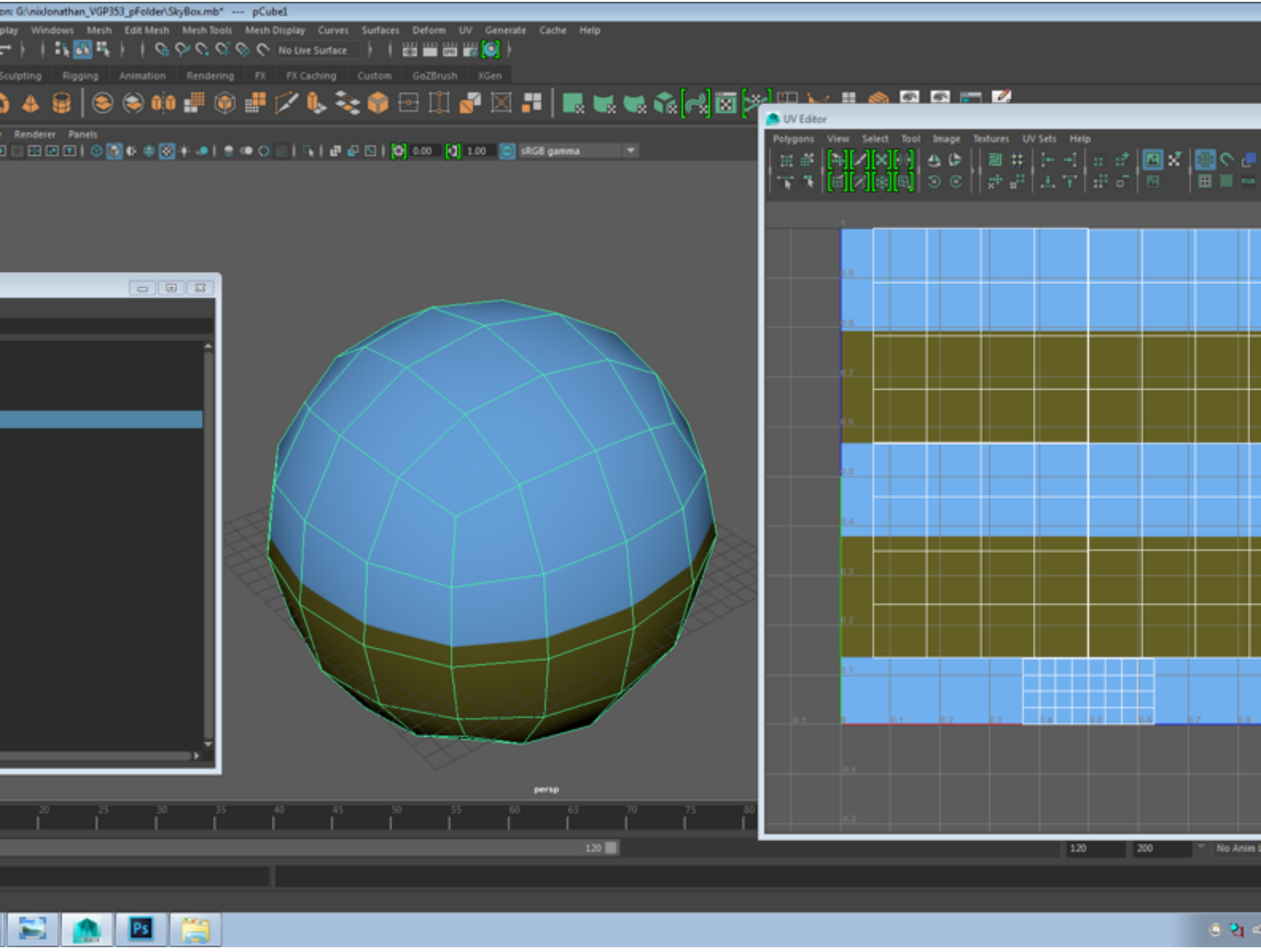

Autodesk Maya 2017 - Student Version: untitled* --- SkyBox
Here are the surface normals of the sky box geometry being reversed in Maya, so that the box is viewed from the inside rather than the outside.
Save
Source Control
Content
Save All
Content
SkyBox
SkyBox Material
SkySunny
3 items (1 selected)
Reverse the normals of the selected faces

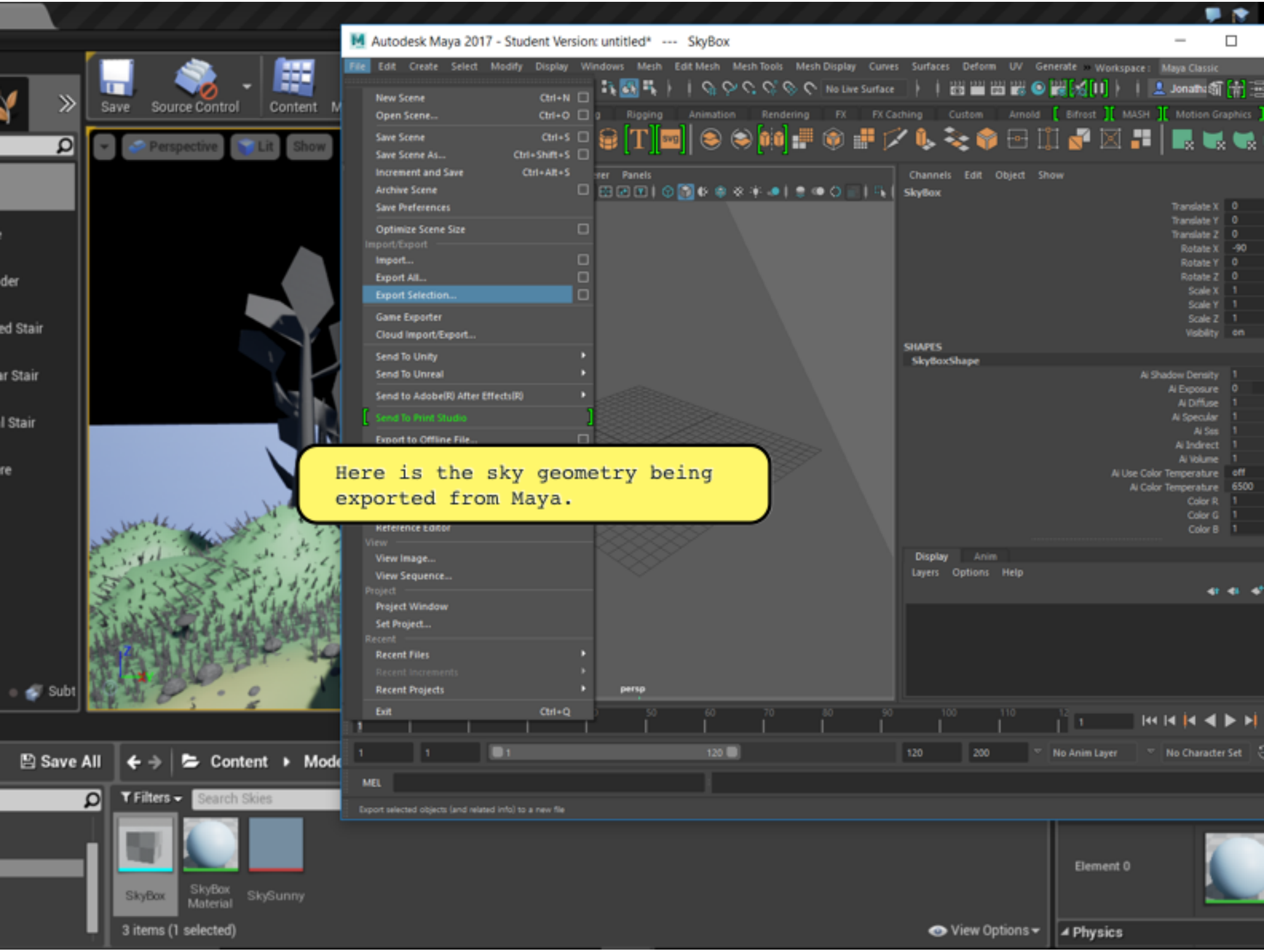

Autodesk Maya 2017 - Student Version: untitled* --- SkyBox
Here is the box having UV coordinates applied in Maya.
For this object, an automatic unwrapping works well.
Save
Source Control
Content
Save All
Content
Filters
Search Skies
SkyBox
SkyBox Material
SkySunny
3 items (1 selected)
Element 0
Physics
View Options
Select faces to be mapped automatically

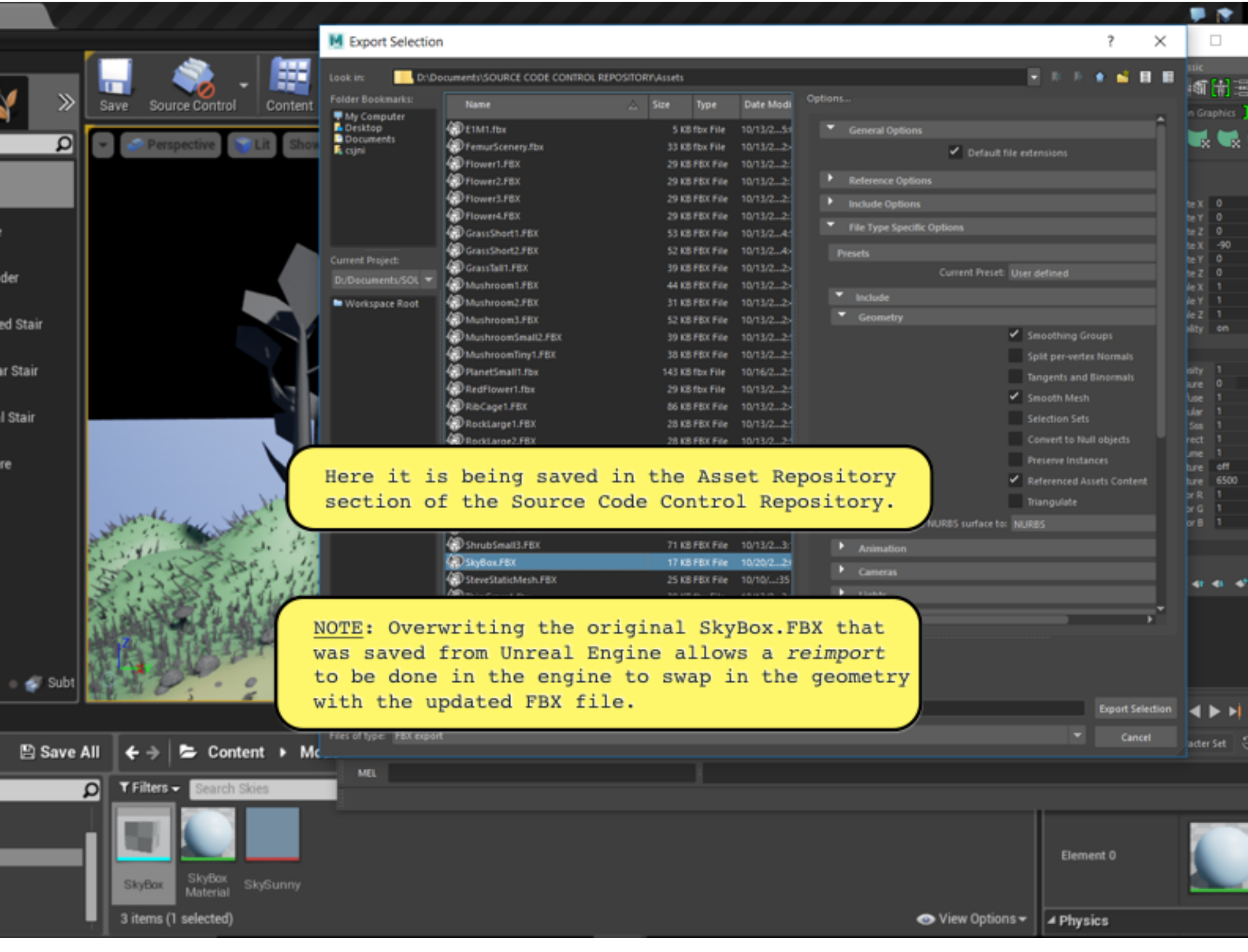

Autodesk Maya 2017 - Student Version: untitled* --- polyAutoProj1...
Here we are opening the UV Editor.
Save
Source Control
Content
Save All
Content
Filters
Search Skies
SkyBox
SkyBox Material
SkySunny
3 items (1 selected)
Element 0
View Options
Physics

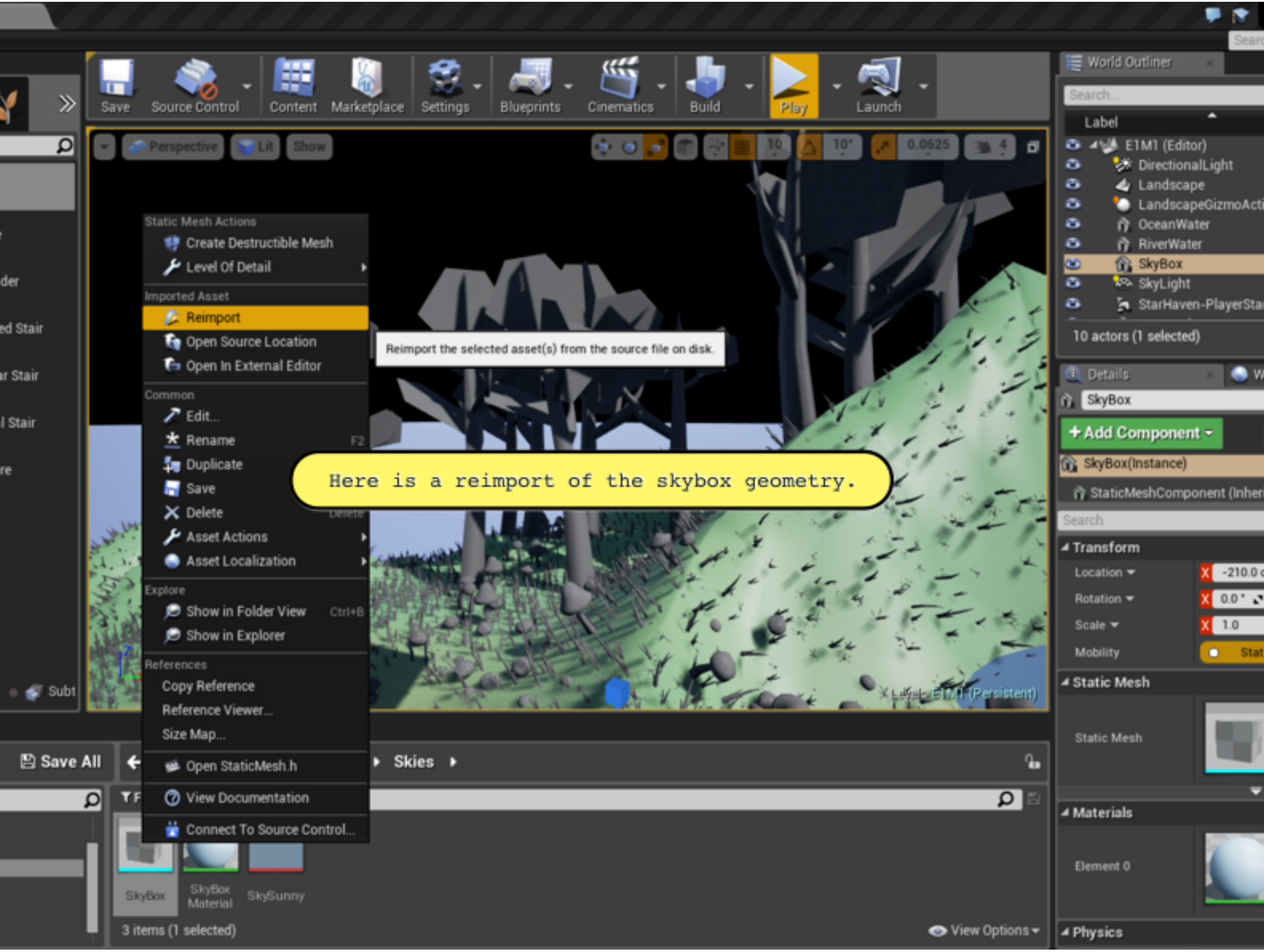

Here is the automatic unwrapping opened in the UV editor. NOTE: Right-click and enter UV selection mode. Select each box face and rotate it so it is properly oriented and position the UV coordinates to be at the desired position in the texture.

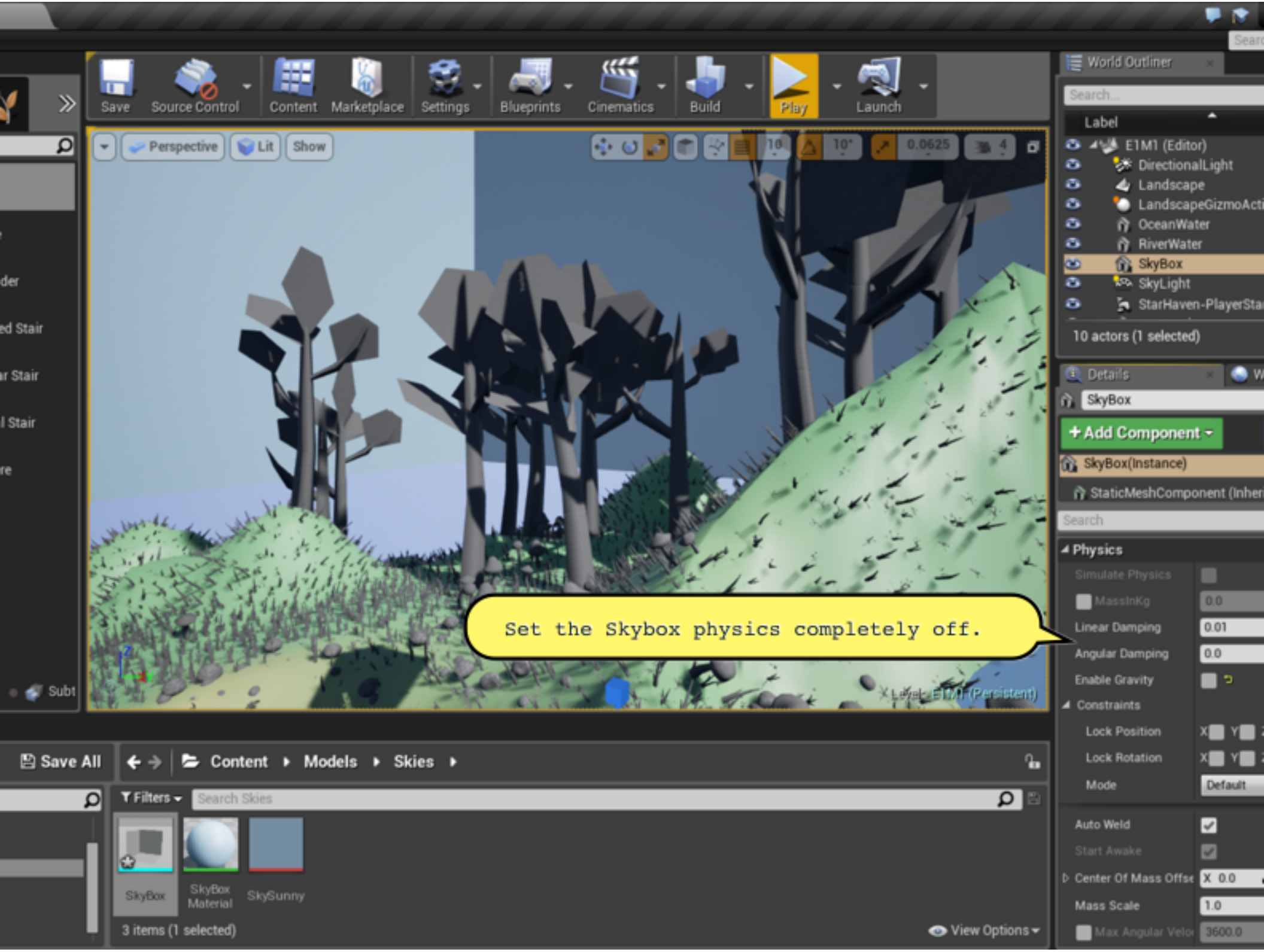

UV Editor
Here are some examples of layout for a custom sky box geometry…

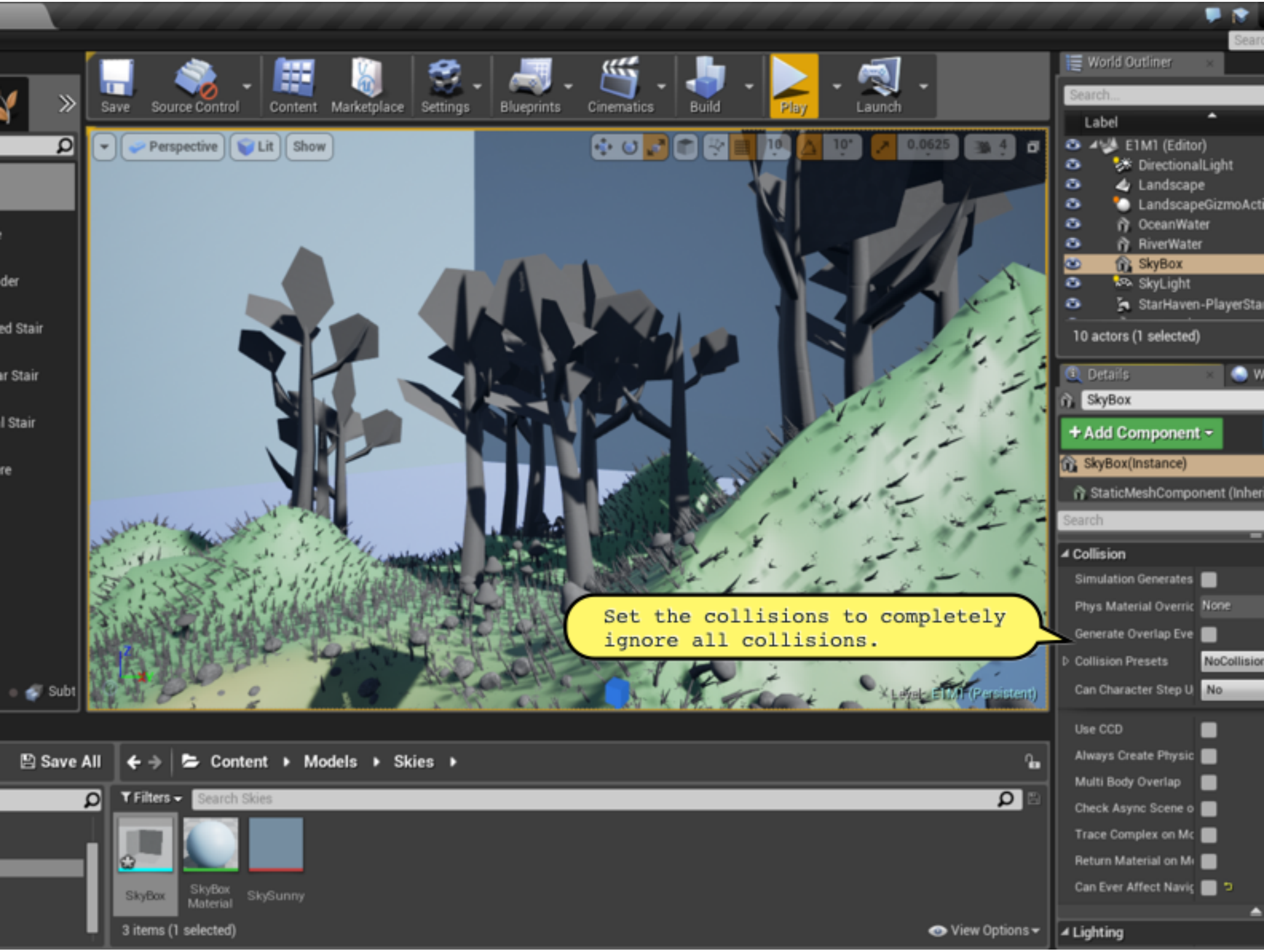

G:\nixJonathan_VGP353_pFolder\SkyBox.mb* --- pCube1
Windows Mesh Edit Mesh Mesh Tools Mesh Display Curves Surfaces Deform UV Generate Cache Help
No Live Surface
Sculpting Rigging Animation Rendering FX FX Caching Custom GoZBrush XGen
Renderer Panels
sRGB gamma
UV Editor
Polygons View Select Tool Image Textures UV Sets Help
persp

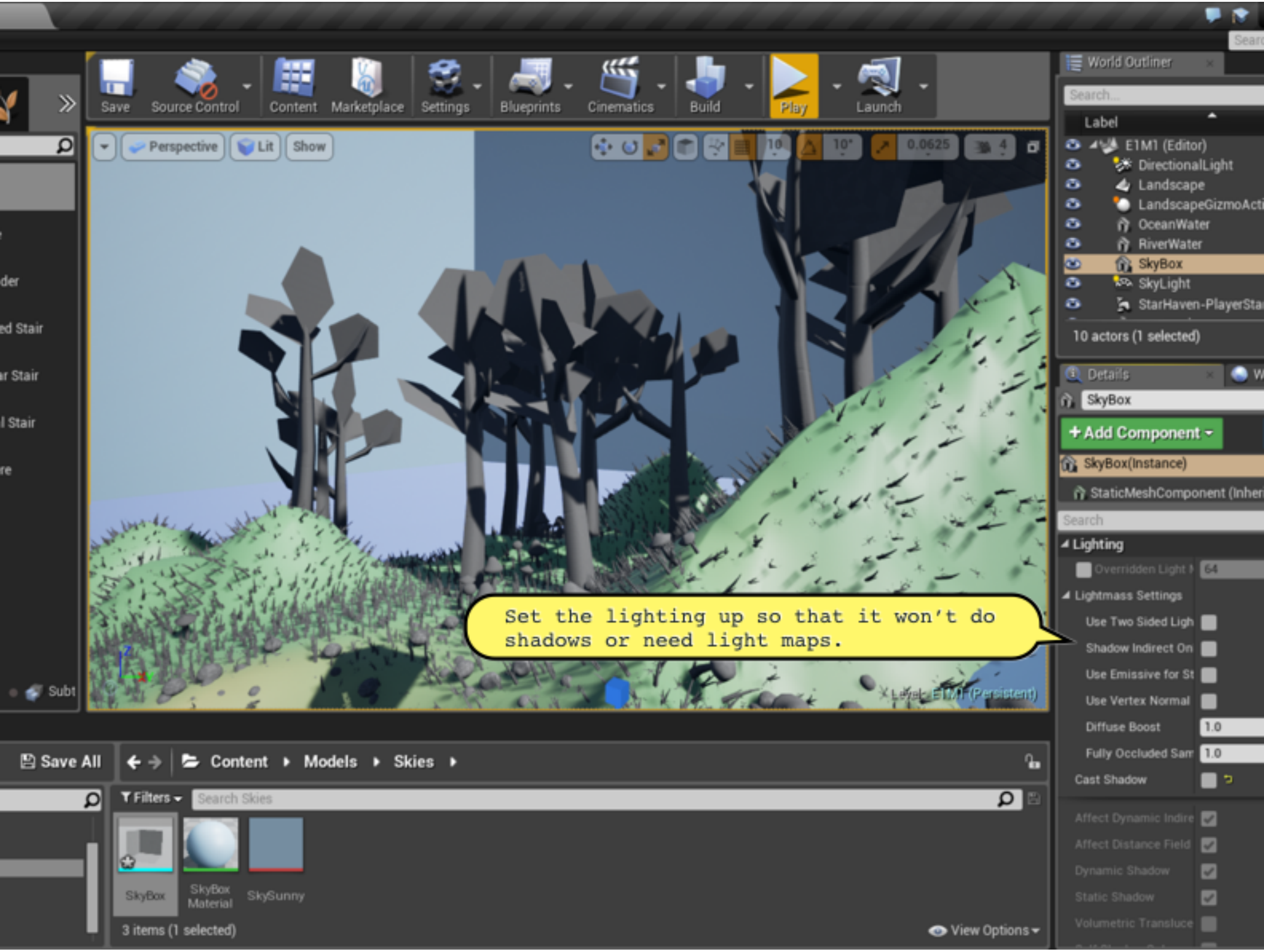

Autodesk Maya 2017 - Student Version: untitled* --- SkyBox
Here is the sky geometry being exported from Maya.
Save
Source Control
Content
Save All
Content
Filters
Search Skies
SkyBox
SkyBox Material
SkySunny
3 items (1 selected)
Element 0
Physics
View Options

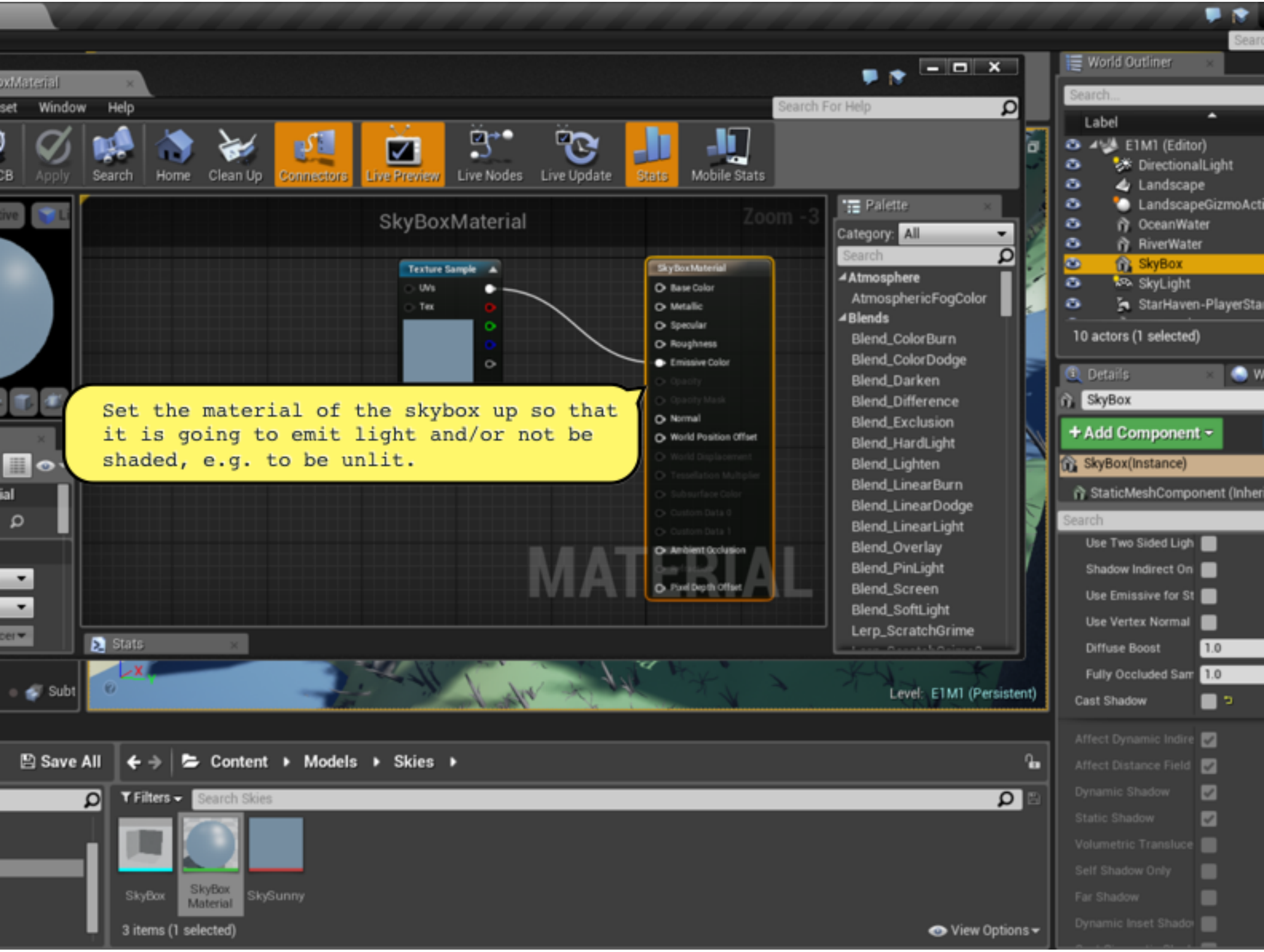

Export Selection
Look in: D:\Documents\SOURCE CODE CONTROL REPOSITORY\Assets
Folder Bookmarks:
My Computer
Desktop
Documents
csjni
Current Project:
D:/Documents/SOL
Workspace Root
Name
Size
Type
Date Modi
E1M1.fbx 5 KB fbx File
FemurScenery.fbx 33 KB fbx File
Flower1.FBX 29 KB FBX File
Flower2.FBX 29 KB FBX File
Flower3.FBX 29 KB FBX File
Flower4.FBX 29 KB FBX File
GrassShort1.FBX 53 KB FBX File
GrassShort2.FBX 52 KB FBX File
GrassTall1.FBX 39 KB FBX File
Mushroom1.FBX 44 KB FBX File
Mushroom2.FBX 31 KB FBX File
Mushroom3.FBX 52 KB FBX File
MushroomSmall2.FBX 39 KB FBX File
MushroomTiny1.FBX 38 KB FBX File
PlanetSmall1.fbx 143 KB fbx File
RedFlower1.fbx 29 KB fbx File
RibCage1.FBX 86 KB FBX File
RockLarge1.FBX 28 KB FBX File
ShrubSmall3.FBX 71 KB FBX File
SkyBox.FBX 17 KB FBX File
SteveStaticMesh.FBX 25 KB FBX File
Options...
General Options
Default file extensions
Reference Options
Include Options
File Type Specific Options
Presets
Current Preset: User defined
Include
Geometry
Smoothing Groups
Split per-vertex Normals
Tangents and Binormals
Smooth Mesh
Selection Sets
Convert to Null objects
Preserve Instances
Referenced Assets Content
Triangulate
NURBS surface to: NURBS
Animation
Cameras
Export Selection
Cancel
Files of type: FBX export
Here it is being saved in the Asset Repository section of the Source Code Control Repository.
NOTE: Overwriting the original SkyBox.FBX that was saved from Unreal Engine allows a reimport to be done in the engine to swap in the geometry with the updated FBX file.
Save
Source Control
Content
Perspective
Lit
Save All
Content
Filters
Search Skies
SkyBox
SkyBox Material
SkySunny
3 items (1 selected)
MEL
Element 0
View Options
Physics

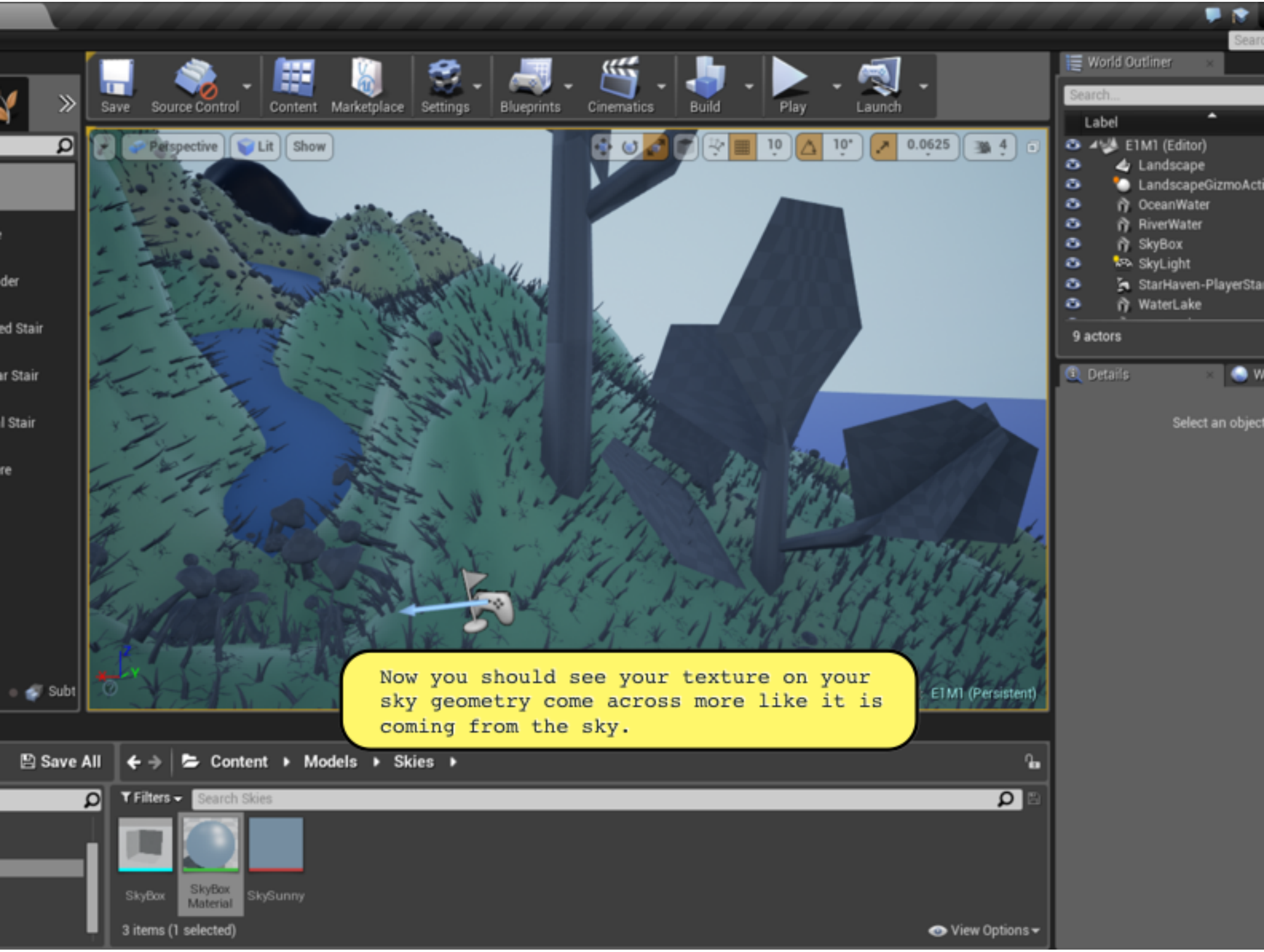

Save
Source Control
Content
Marketplace
Settings
Blueprints
Cinematics
Build
Play
Launch
Perspective
Lit
Show
Static Mesh Actions
Create Destructible Mesh
Level Of Detail
Imported Asset
Reimport
Open Source Location
Open In External Editor
Common
Edit...
Rename
F2
Duplicate
Save
Delete
Asset Actions
Asset Localization
Explore
Show in Folder View
Ctrl+B
Show in Explorer
References
Copy Reference
Reference Viewer...
Size Map...
Open StaticMesh.h
View Documentation
Connect To Source Control...
Reimport the selected asset(s) from the source file on disk.
Here is a reimport of the skybox geometry.
Level: E1M1 (Persistent)
World Outliner
Label
E1M1 (Editor)
DirectionalLight
Landscape
OceanWater
RiverWater
SkyBox
SkyLight
10 actors (1 selected)
Details
SkyBox
+ Add Component
SkyBox(Instance)
Transform
Location
Rotation
Scale
Mobility
Static Mesh
Materials
Element 0
Physics
Save All
Skies
SkyBox
SkyBox Material
SkySunny
3 items (1 selected)
View Options

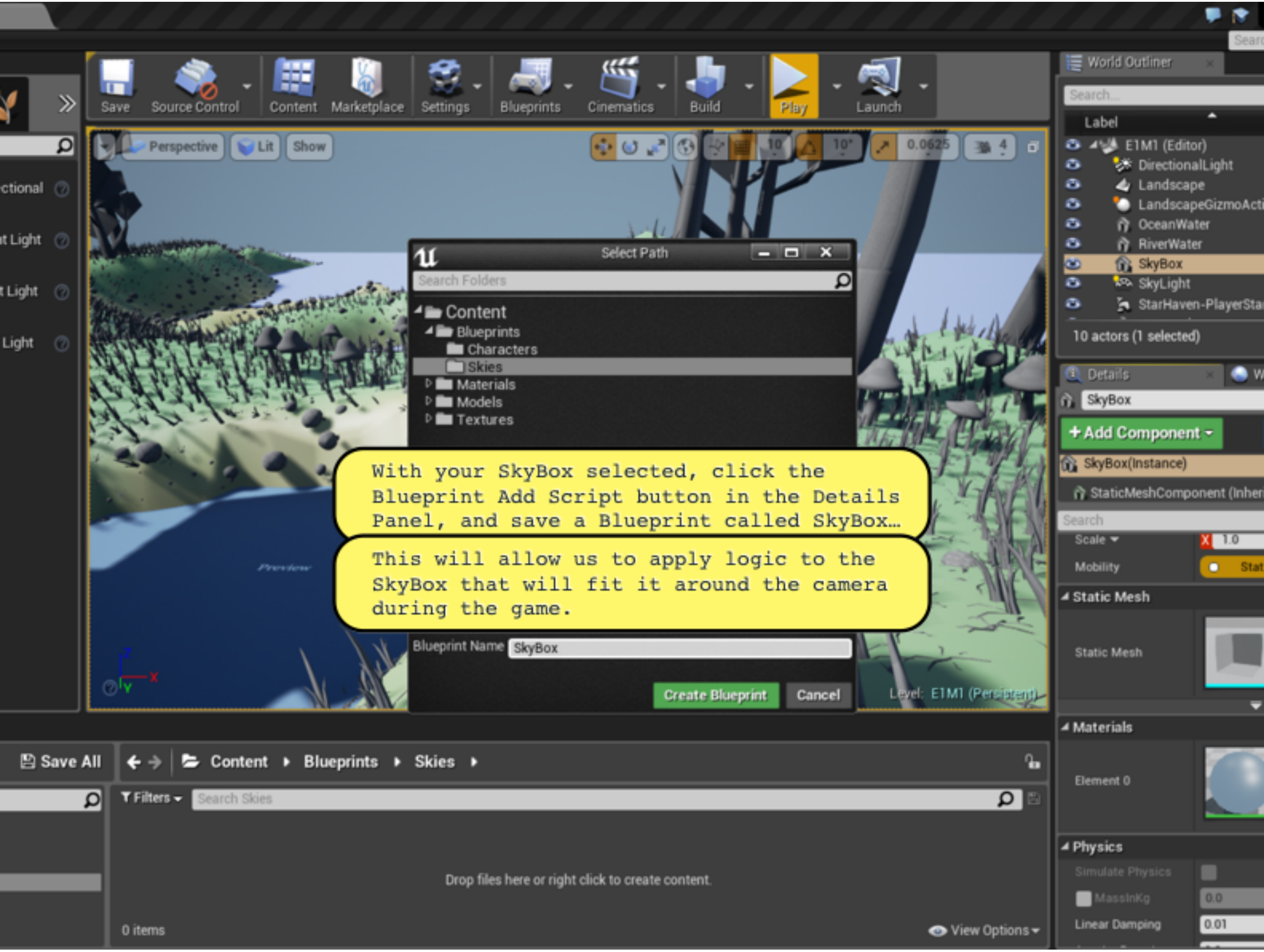

Save
Source Control
Content
Marketplace
Settings
Blueprints
Cinematics
Build
Play
Launch
Perspective
Lit
Show
World Outliner
Label
E1M1 (Editor)
DirectionalLight
Landscape
OceanWater
RiverWater
SkyBox
SkyLight
10 actors (1 selected)
Details
SkyBox
+ Add Component
SkyBox(Instance)
StaticMeshComponent (Inher
Physics
Simulate Physics
MassInKg
Linear Damping
Angular Damping
Enable Gravity
Constraints
Lock Position
Lock Rotation
Mode
Default
Auto Weld
Start Awake
Center Of Mass Offse
Mass Scale
Set the Skybox physics completely off.
Save All
Content
Models
Skies
Filters
Search Skies
SkyBox
SkyBox Material
SkySunny
3 items (1 selected)
View Options

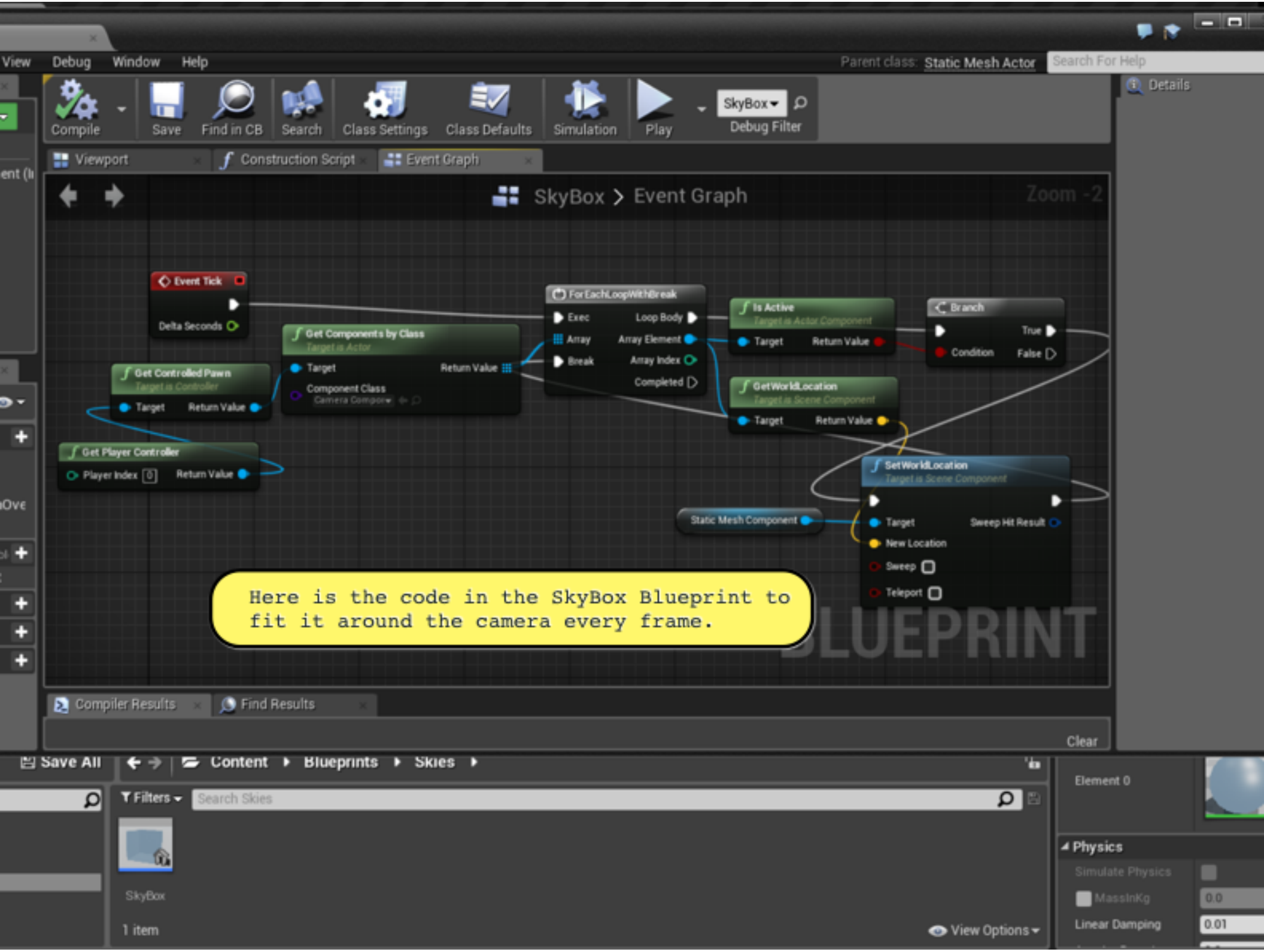

Save
Source Control
Content
Marketplace
Settings
Blueprints
Cinematics
Build
Play
Launch
Perspective
Lit
Show
Set the collisions to completely ignore all collisions.
Level: E1M1 (Persistent)
World Outliner
Label
E1M1 (Editor)
DirectionalLight
Landscape
OceanWater
RiverWater
SkyBox
SkyLight
10 actors (1 selected)
Details
SkyBox
+ Add Component
SkyBox(Instance)
StaticMeshComponent (Inher
Collision
Simulation Generates
Phys Material Overric
None
Generate Overlap Eve
Collision Presets
Can Character Step U
No
Use CCD
Always Create Physic
Multi Body Overlap
Check Async Scene o
Trace Complex on Mc
Return Material on M
Can Ever Affect Navig
Lighting
Save All
Content
Models
Skies
Filters
Search Skies
SkyBox
SkyBox Material
SkySunny
3 items (1 selected)
View Options

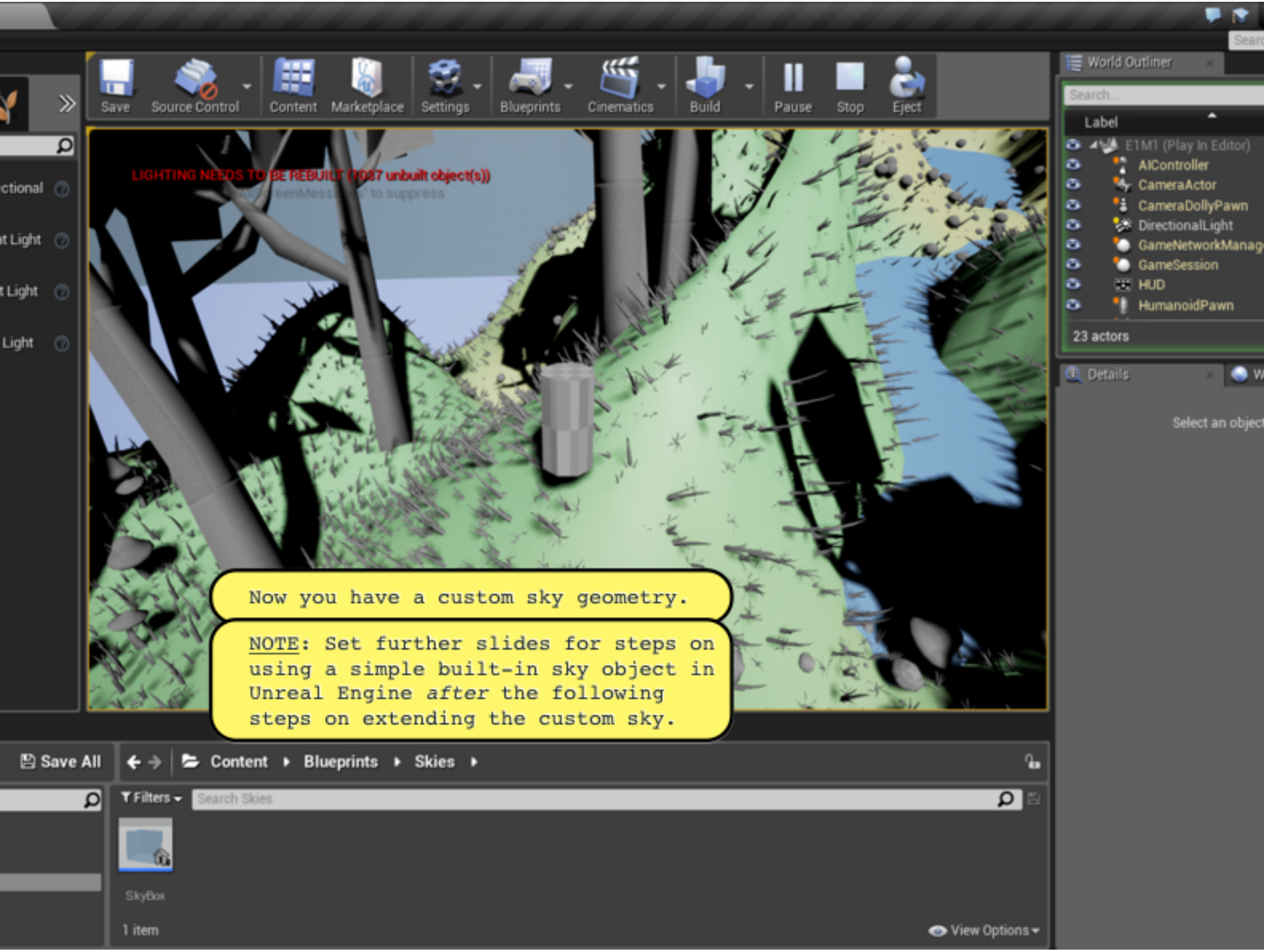

Save
Source Control
Content
Marketplace
Settings
Blueprints
Cinematics
Build
Play
Launch
Perspective
Lit
Show
Set the lighting up so that it won't do shadows or need light maps.
Level: E1M1 (Persistent)
World Outliner
Label
E1M1 (Editor)
DirectionalLight
Landscape
OceanWater
RiverWater
SkyBox
SkyLight
10 actors (1 selected)
Details
SkyBox
+ Add Component
SkyBox(Instance)
StaticMeshComponent (Inher
Lighting
Lightmass Settings
Use Two Sided Ligh
Shadow Indirect On
Use Emissive for St
Use Vertex Normal
Diffuse Boost
Fully Occluded Sam
Cast Shadow
Affect Dynamic Indire
Affect Distance Field
Dynamic Shadow
Static Shadow
Volumetric Transluce
Save All
Content
Models
Skies
Filters
Search Skies
SkyBox
SkyBox Material
SkySunny
3 items (1 selected)
View Options


Window
Help
Search For Help
Apply
Search
Home
Clean Up
Connectors
Live Preview
Live Nodes
Live Update
Stats
Mobile Stats
SkyBoxMaterial
Zoom -3
Texture Sample
UVs
Tex
SkyBoxMaterial
Base Color
Metallic
Specular
Roughness
Emissive Color
Normal
World Position Offset
Ambient Occlusion
Pixel Depth Offset
Set the material of the skybox up so that it is going to emit light and/or not be shaded, e.g. to be unlit.
MATERIAL
Palette
Category: All
Search
Atmosphere
AtmosphericFogColor
Blends
Blend_ColorBurn
Blend_ColorDodge
Blend_Darken
Blend_Difference
Blend_Exclusion
Blend_HardLight
Blend_Lighten
Blend_LinearBurn
Blend_LinearDodge
Blend_LinearLight
Blend_Overlay
Blend_PinLight
Blend_Screen
Blend_SoftLight
Lerp_ScratchGrime
Stats
Level: E1M1 (Persistent)
World Outliner
Search...
Label
E1M1 (Editor)
DirectionalLight
Landscape
LandscapeGizmoActi
OceanWater
RiverWater
SkyBox
SkyLight
StarHaven-PlayerSta
10 actors (1 selected)
Details
SkyBox
+ Add Component
SkyBox(Instance)
StaticMeshComponent (Inher
Search
Use Two Sided Ligh
Shadow Indirect On
Use Emissive for St
Use Vertex Normal
Diffuse Boost
1.0
Fully Occluded Sam
1.0
Cast Shadow
Affect Dynamic Indire
Affect Distance Field
Dynamic Shadow
Static Shadow
Volumetric Transluce
Self Shadow Only
Far Shadow
Dynamic Inset Shado
Save All
Content
Models
Skies
Filters
Search Skies
SkyBox
SkyBox Material
SkySunny
3 items (1 selected)
View Options


Save
Source Control
Content
Marketplace
Settings
Blueprints
Cinematics
Build
Play
Launch
Perspective
Lit
Show
World Outliner
Label
E1M1 (Editor)
Landscape
OceanWater
RiverWater
SkyBox
SkyLight
WaterLake
9 actors
Details
Now you should see your texture on your sky geometry come across more like it is coming from the sky.
E1M1 (Persistent)
Save All
Content
Models
Skies
Filters
Search Skies
SkyBox
SkyBox Material
SkySunny
3 items (1 selected)
View Options

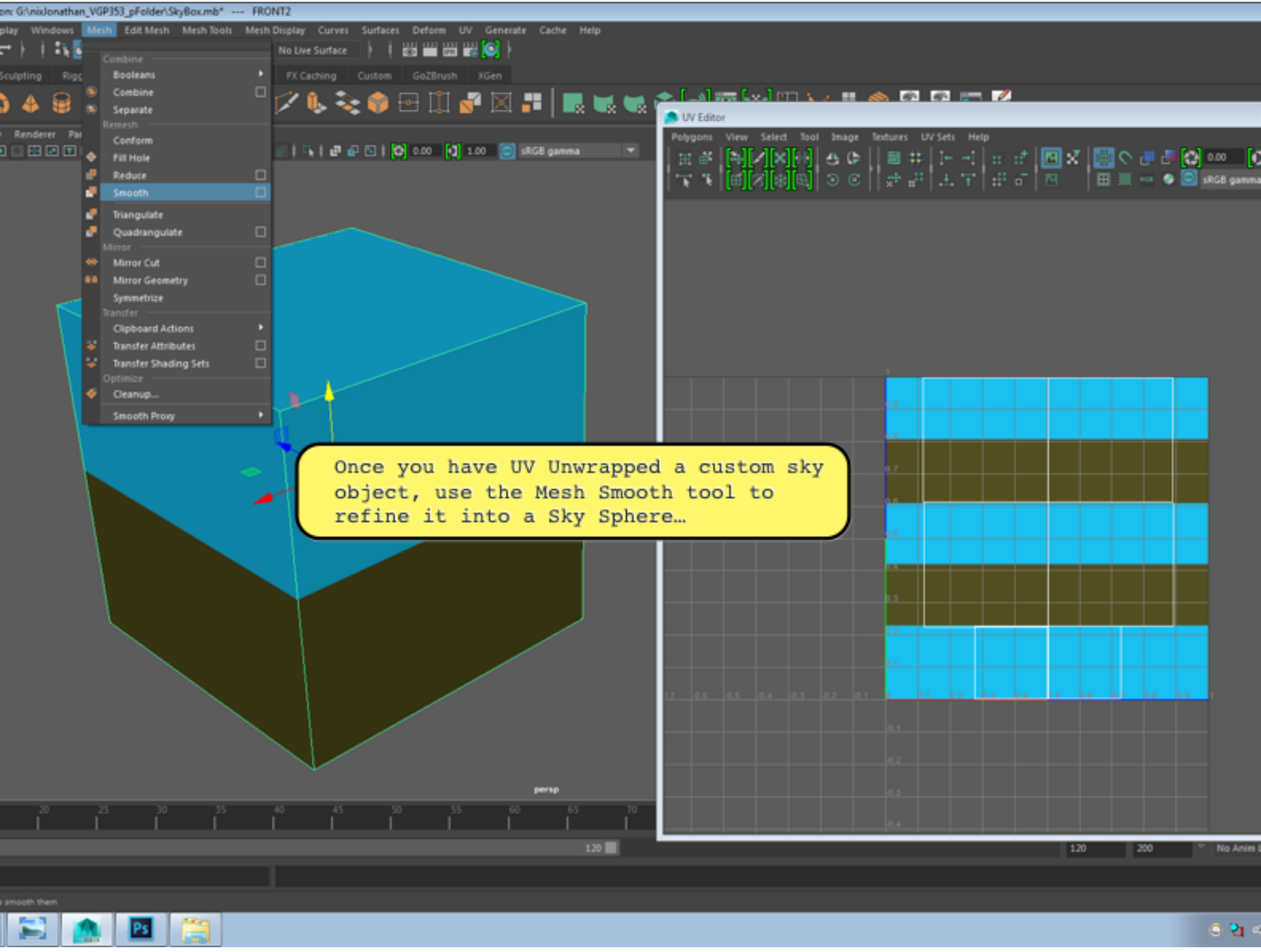

Save
Source Control
Content
Marketplace
Settings
Blueprints
Cinematics
Build
Play
Launch
Perspective
Lit
Show
Select Path
Search Folders
Content
Blueprints
Characters
Skies
Materials
Models
Textures
With your SkyBox selected, click the Blueprint Add Script button in the Details Panel, and save a Blueprint called SkyBox…
This will allow us to apply logic to the SkyBox that will fit it around the camera during the game.
Blueprint Name
SkyBox
Create Blueprint
Cancel
Level: E1M1 (Persistent)
World Outliner
Label
E1M1 (Editor)
DirectionalLight
Landscape
OceanWater
RiverWater
SkyBox
SkyLight
10 actors (1 selected)
Details
SkyBox
+ Add Component
SkyBox(Instance)
Scale
Mobility
Static Mesh
Static Mesh
Materials
Element 0
Physics
Simulate Physics
Linear Damping
0.01
Save All
Content
Blueprints
Skies
Filters
Search Skies
Drop files here or right click to create content.
0 items
View Options

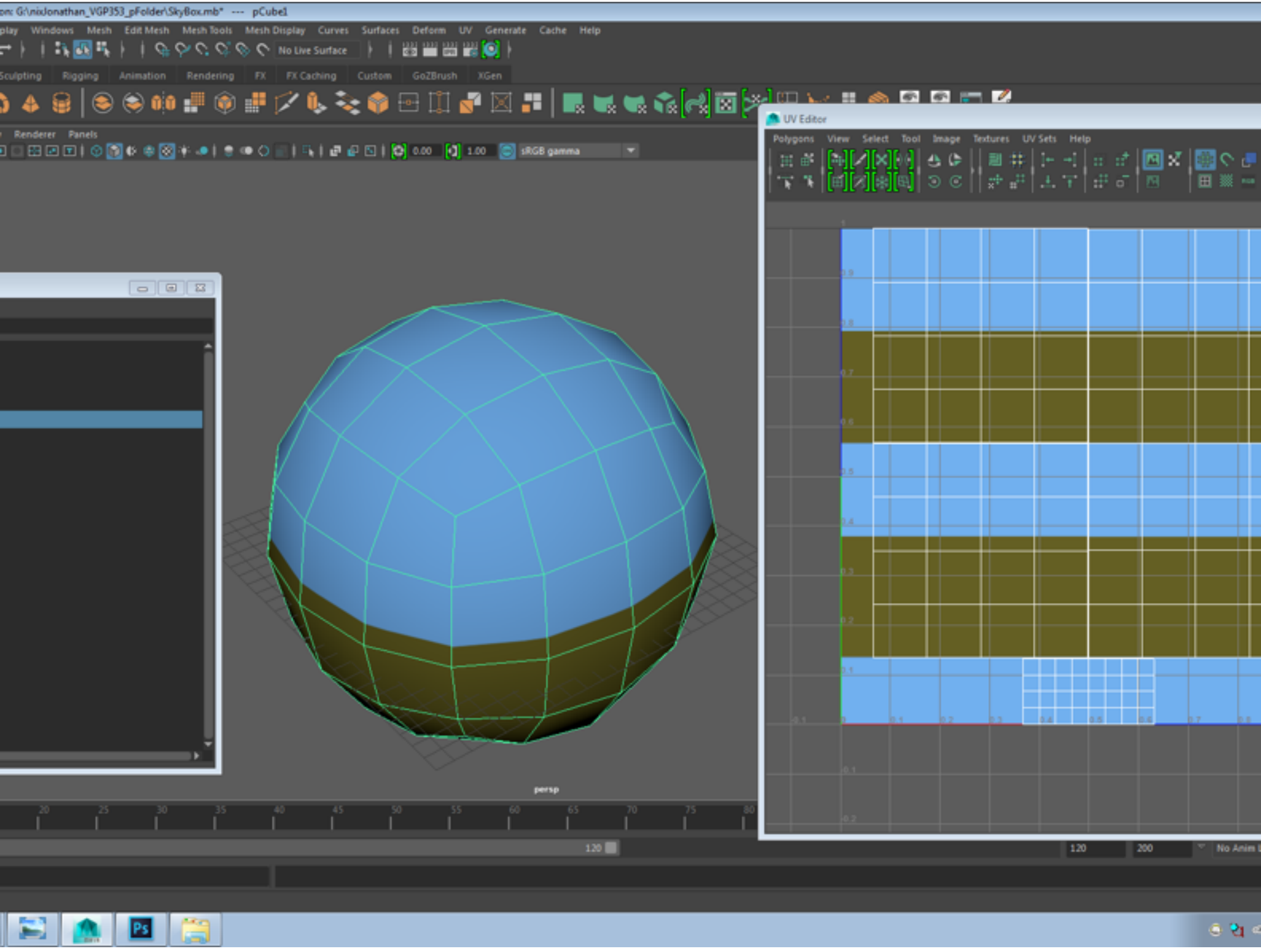

View
Debug
Window
Help
Parent class: Static Mesh Actor
Search For Help
Compile
Save
Find in CB
Search
Class Settings
Class Defaults
Simulation
Play
SkyBox
Debug Filter
Details
Viewport
Construction Script
Event Graph
SkyBox > Event Graph
Zoom -2
Event Tick
Delta Seconds
Get Controlled Pawn
Target is Controller
Target
Return Value
Get Player Controller
Player Index
Return Value
Get Components by Class
Target is Actor
Target
Return Value
Component Class
ForEachLoopWithBreak
Exec
Array
Break
Loop Body
Array Element
Array Index
Completed
Is Active
Target is Actor Component
Target
Return Value
Branch
Condition
True
False
GetWorldLocation
Target is Scene Component
Target
Return Value
SetWorldLocation
Target is Scene Component
Target
New Location
Sweep
Teleport
Sweep Hit Result
Static Mesh Component
Here is the code in the SkyBox Blueprint to fit it around the camera every frame.
BLUEPRINT
Compiler Results
Find Results
Clear
Save All
Content
Blueprints
Skies
Filters
Search Skies
SkyBox
1 item
View Options
Element 0
Physics
Simulate Physics
MassInKg
Linear Damping
0.01

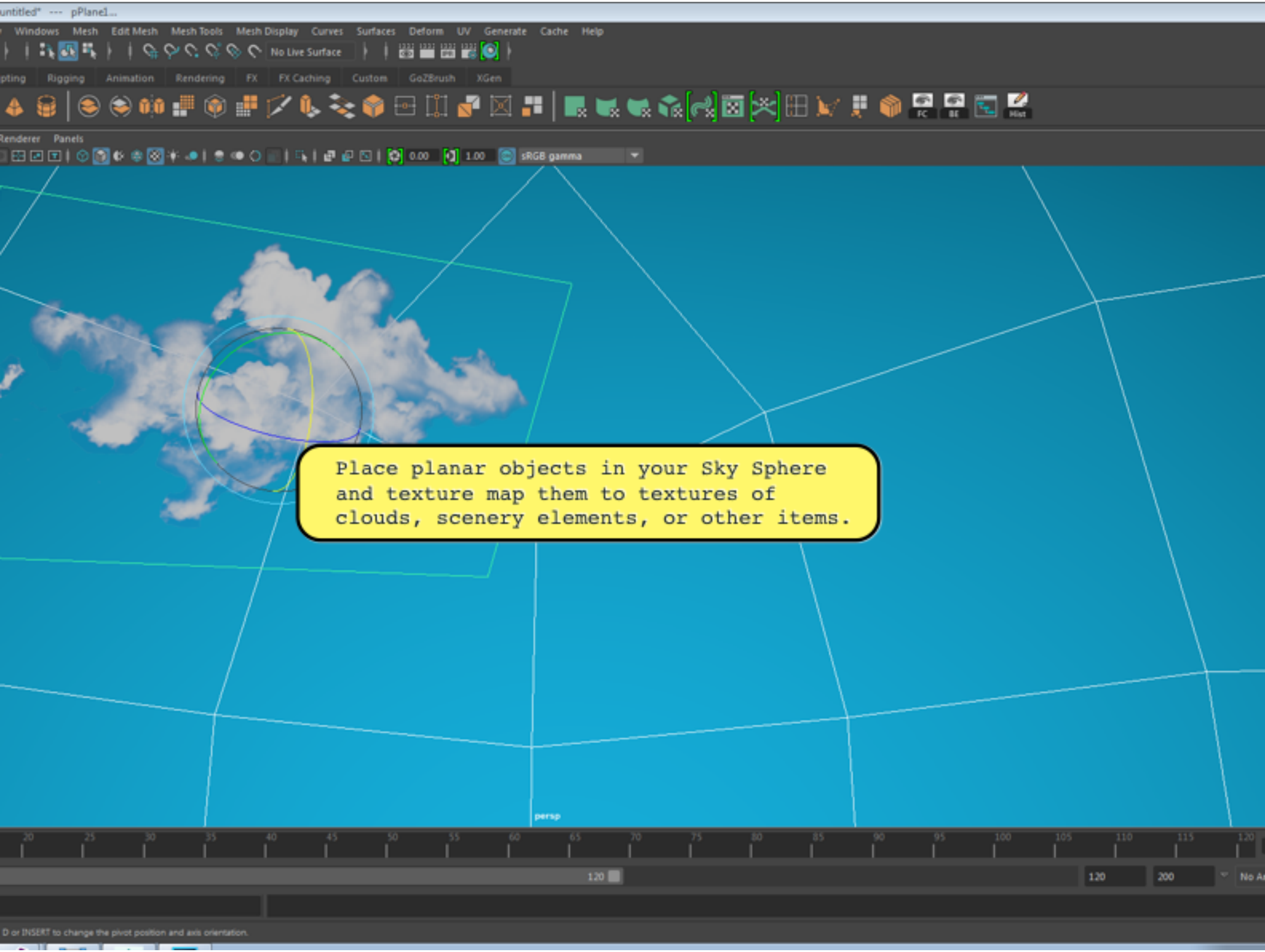

Save
Source Control
Content
Marketplace
Settings
Blueprints
Cinematics
Build
Pause
Stop
Eject
World Outliner
Search...
Label
E1M1 (Play In Editor)
AIController
CameraActor
CameraDollyPawn
DirectionalLight
GameSession
HUD
HumanoidPawn
23 actors
Details
LIGHTING NEEDS TO BE REBUILT (7037 unbuilt object(s))
Now you have a custom sky geometry.
NOTE: Set further slides for steps on using a simple built-in sky object in Unreal Engine after the following steps on extending the custom sky.
Save All
Content
Blueprints
Skies
Filters
Search Skies
SkyBox
1 item
View Options

SECTION

EXTENDING THE CUSTOM SKY


Mesh
Edit Mesh
Mesh Tools
Mesh Display
Curves
Surfaces
Deform
UV
Generate
Cache
Help
Combine
Booleans
Combine
Separate
Remesh
Conform
Fill Hole
Reduce
Smooth
Triangulate
Quadrangulate
Mirror
Mirror Cut
Mirror Geometry
Symmetrize
Transfer
Clipboard Actions
Transfer Attributes
Transfer Shading Sets
Optimize
Cleanup...
Smooth Proxy
UV Editor
Polygons
View
Select
Tool
Image
Textures
UV Sets
Help
persp
Once you have UV Unwrapped a custom sky object, use the Mesh Smooth tool to refine it into a Sky Sphere…


G:\nixJonathan_VGP353_pFolder\SkyBox.mb* --- pCube1
Windows Mesh Edit Mesh Mesh Tools Mesh Display Curves Surfaces Deform UV Generate Cache Help
No Live Surface
Sculpting Rigging Animation Rendering FX FX Caching Custom GoZBrush XGen
Renderer Panels
sRGB gamma
UV Editor
Polygons View Select Tool Image Textures UV Sets Help
persp


Place planar objects in your Sky Sphere and texture map them to textures of clouds, scenery elements, or other items.

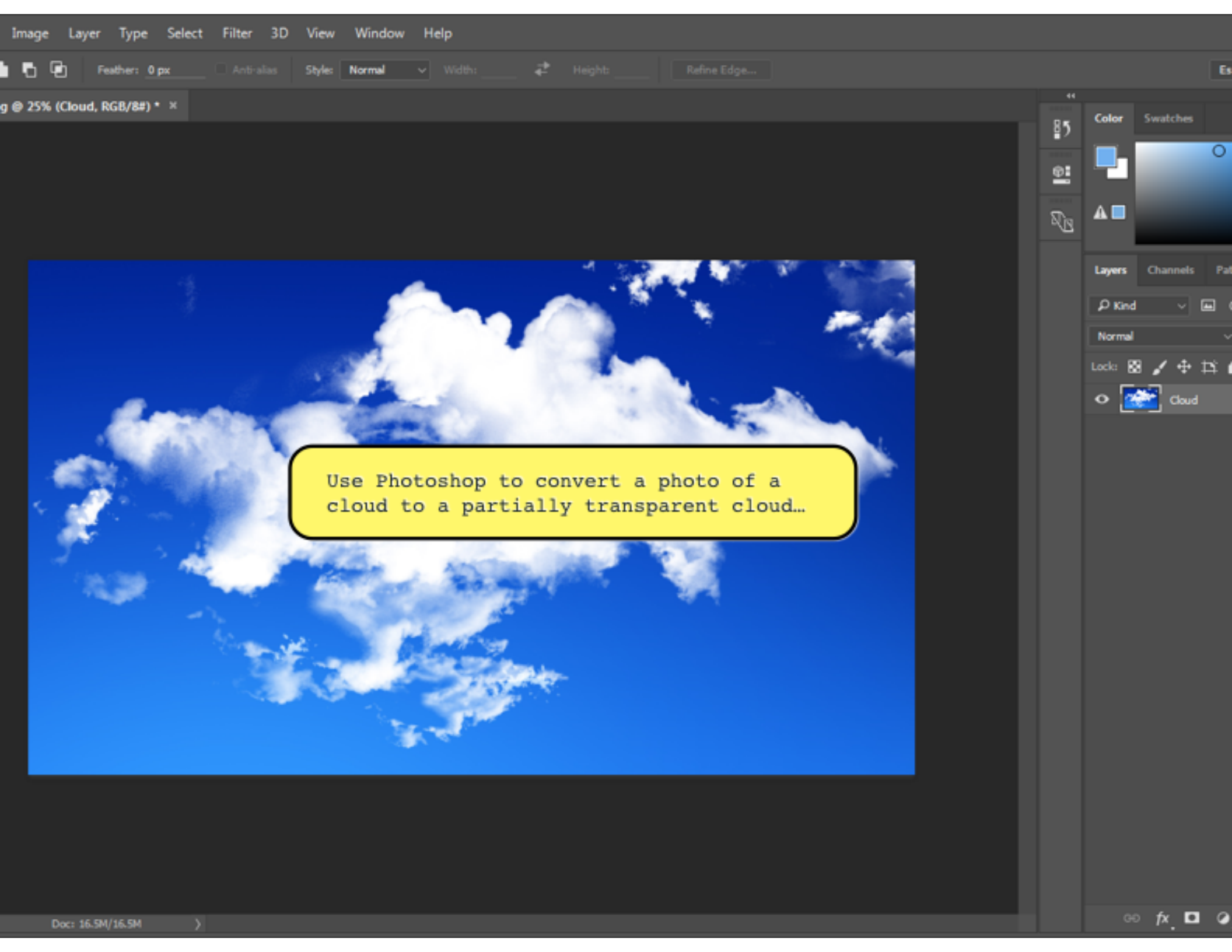
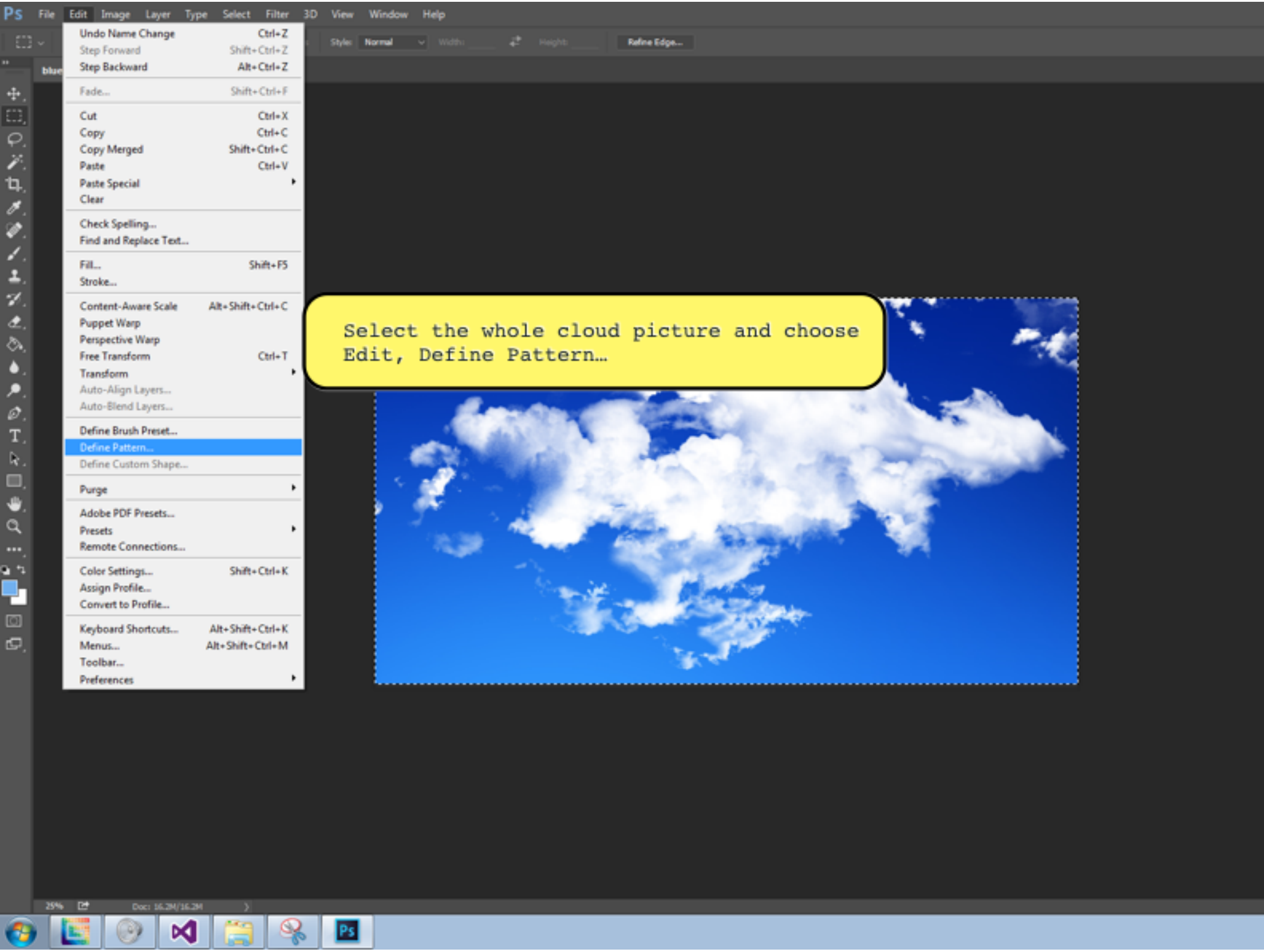
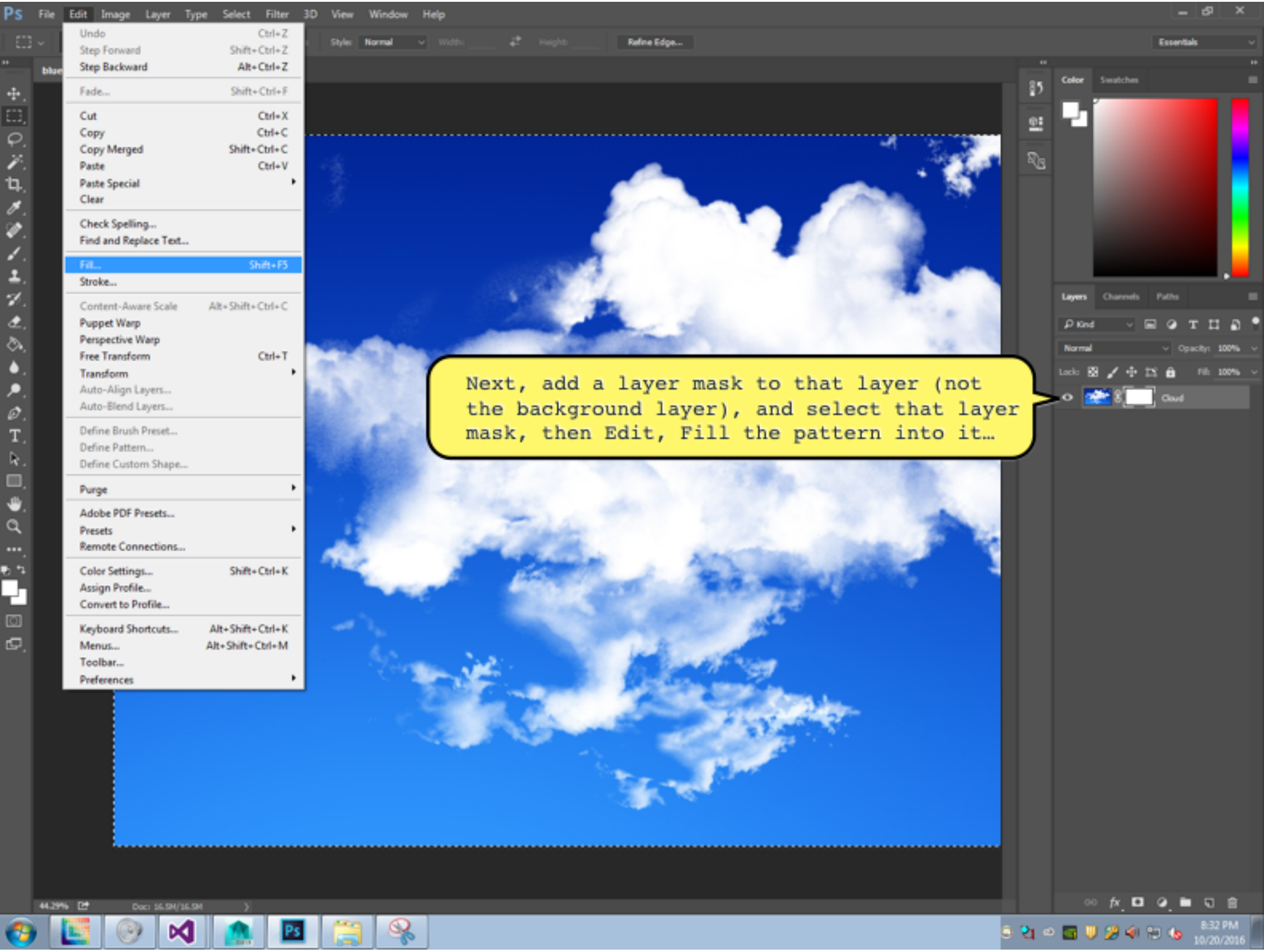
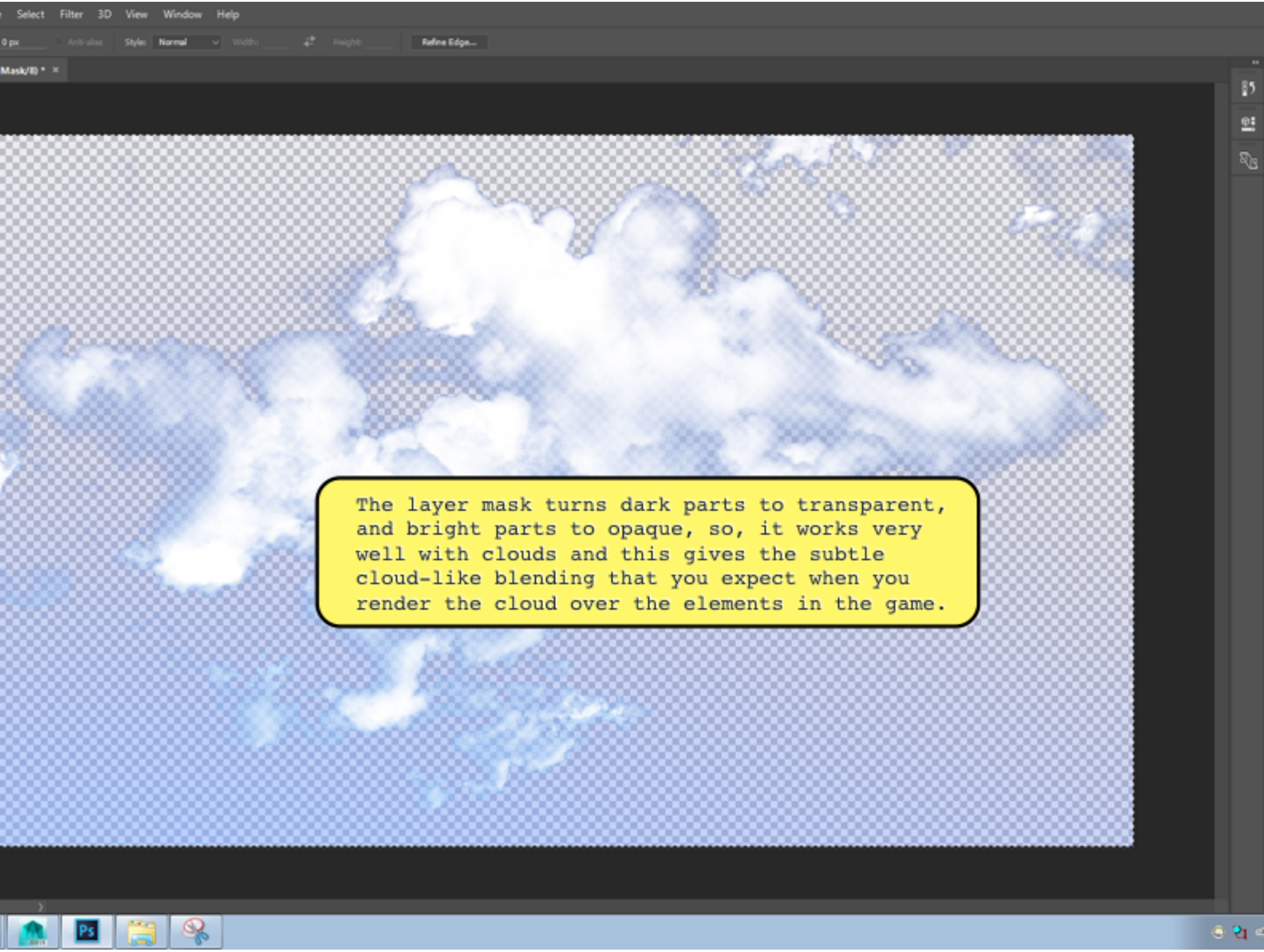


Image Layer Type Select Filter 3D View Window Help
Feather: 0 px
Anti-alias
Style: Normal
Width:
Height:
Refine Edge...
@ 25% (Cloud, RGB/8#) *
Use Photoshop to convert a photo of a cloud to a partially transparent cloud…
Color
Swatches
Layers
Channels
Kind
Normal
Lock:
Cloud
Doc: 16.5M/16.5M


File Edit Image Layer Type Select Filter 3D View Window Help
Undo Name Change Ctrl+Z
Step Forward Shift+Ctrl+Z
Step Backward Alt+Ctrl+Z
Fade... Shift+Ctrl+F
Cut Ctrl+X
Copy Ctrl+C
Copy Merged Shift+Ctrl+C
Paste Ctrl+V
Paste Special
Clear
Check Spelling...
Find and Replace Text...
Fill... Shift+F5
Stroke...
Content-Aware Scale Alt+Shift+Ctrl+C
Puppet Warp
Perspective Warp
Free Transform Ctrl+T
Transform
Auto-Align Layers...
Auto-Blend Layers...
Define Brush Preset...
Define Pattern...
Define Custom Shape...
Purge
Adobe PDF Presets...
Presets
Remote Connections...
Color Settings... Shift+Ctrl+K
Assign Profile...
Convert to Profile...
Keyboard Shortcuts... Alt+Shift+Ctrl+K
Menus... Alt+Shift+Ctrl+M
Toolbar...
Preferences
Select the whole cloud picture and choose Edit, Define Pattern…

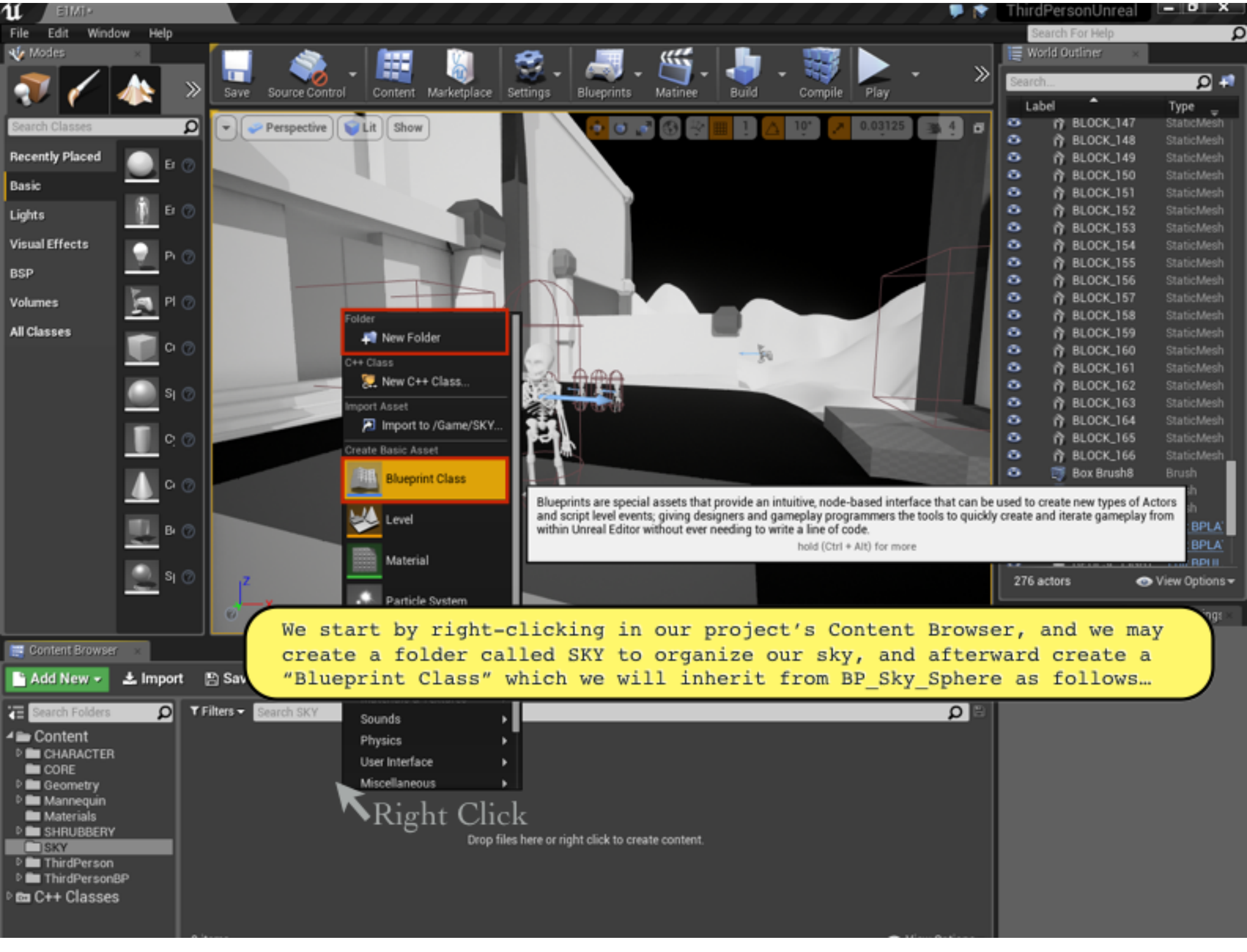

File Edit Image Layer Type Select Filter 3D View Window Help
Undo Ctrl+Z
Step Forward Shift+Ctrl+Z
Step Backward Alt+Ctrl+Z
Fade... Shift+Ctrl+F
Cut Ctrl+X
Copy Ctrl+C
Copy Merged Shift+Ctrl+C
Paste Ctrl+V
Paste Special
Clear
Check Spelling...
Find and Replace Text...
Fill... Shift+F5
Stroke...
Content-Aware Scale Alt+Shift+Ctrl+C
Puppet Warp
Perspective Warp
Free Transform Ctrl+T
Transform
Auto-Align Layers...
Auto-Blend Layers...
Define Brush Preset...
Define Pattern...
Define Custom Shape...
Purge
Adobe PDF Presets...
Presets
Remote Connections...
Color Settings... Shift+Ctrl+K
Assign Profile...
Convert to Profile...
Keyboard Shortcuts... Alt+Shift+Ctrl+K
Menus... Alt+Shift+Ctrl+M
Toolbar...
Preferences
Next, add a layer mask to that layer (not the background layer), and select that layer mask, then Edit, Fill the pattern into it…
Layers
Channels
Paths
Cloud

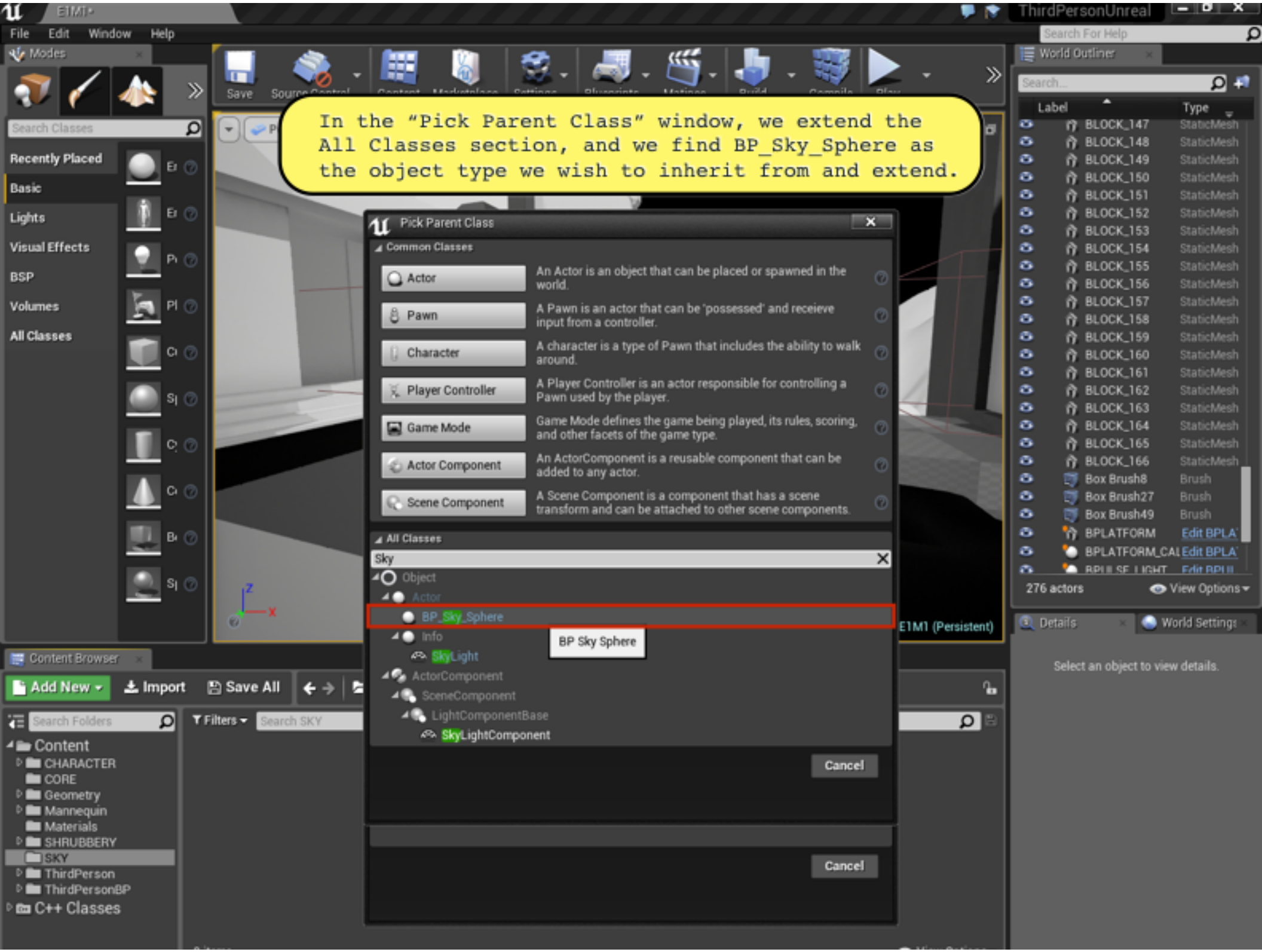

Select Filter 3D View Window Help
Refine Edge...
The layer mask turns dark parts to transparent, and bright parts to opaque, so, it works very well with clouds and this gives the subtle cloud-like blending that you expect when you render the cloud over the elements in the game.

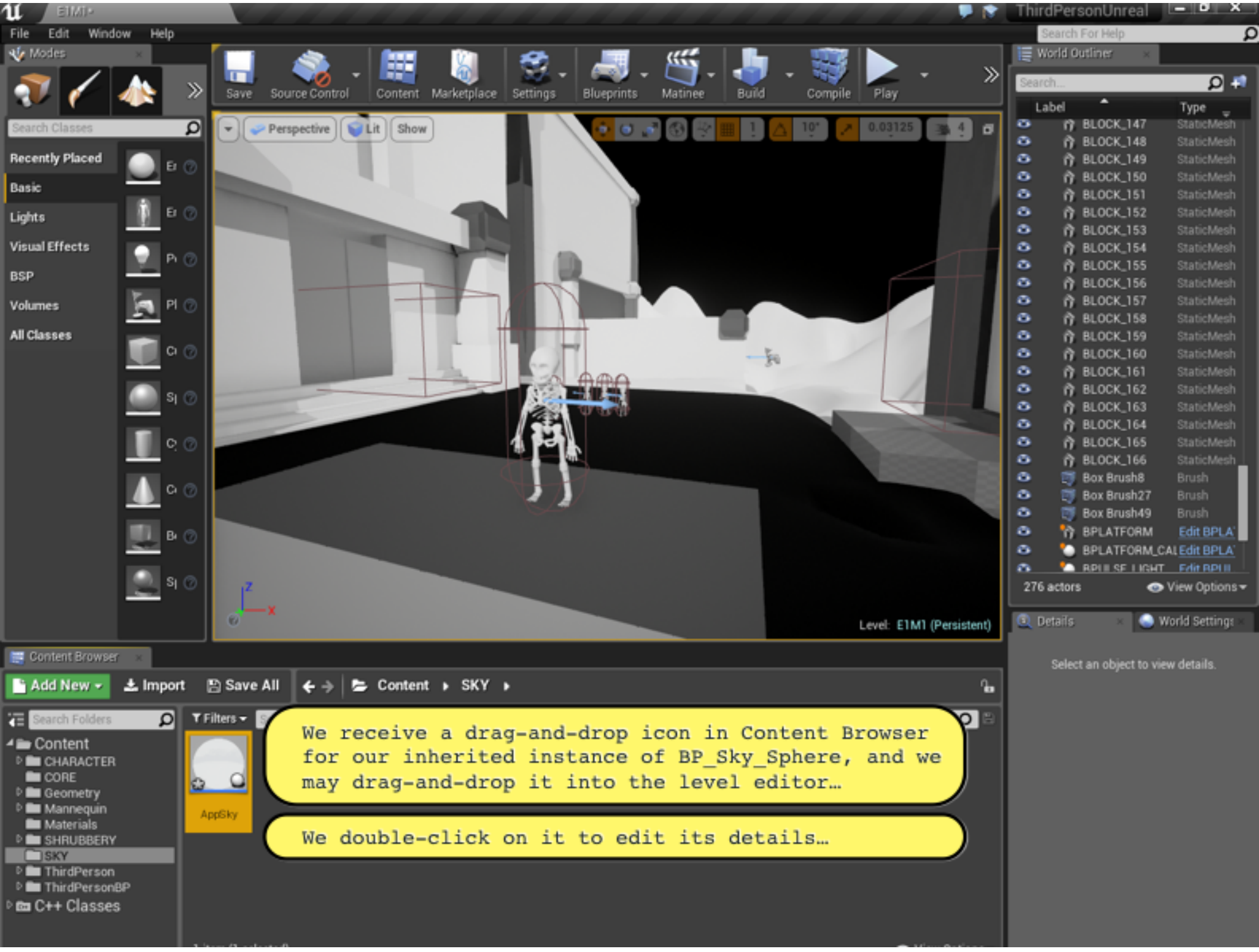
SECTION

SKY WITH UNREAL ENGINE'S SKY SPHERE

I've shown you how to build custom sky. You can also use a pre-built sky object that is provided in the engine.


File Edit Window Help
Search For Help
Modes
Save
Source Control
Content
Marketplace
Settings
Blueprints
Matinee
Build
Compile
Play
World Outliner
Search Classes
Recently Placed
Basic
Lights
Visual Effects
BSP
Volumes
All Classes
Perspective
Lit
Show
Folder
New Folder
C++ Class
New C++ Class...
Import Asset
Import to /Game/SKY...
Create Basic Asset
Blueprint Class
Level
Material
Particle System
Blueprints are special assets that provide an intuitive, node-based interface that can be used to create new types of Actors and script level events; giving designers and gameplay programmers the tools to quickly create and iterate gameplay from within Unreal Editor without ever needing to write a line of code.
hold (Ctrl + Alt) for more
276 actors
View Options
We start by right-clicking in our project's Content Browser, and we may create a folder called SKY to organize our sky, and afterward create a "Blueprint Class" which we will inherit from BP_Sky_Sphere as follows…
Content Browser
Add New
Import
Search Folders
Filters
Search SKY
Content
CHARACTER
CORE
Geometry
Mannequin
Materials
SHRUBBERY
SKY
ThirdPerson
ThirdPersonBP
C++ Classes
Sounds
Physics
User Interface
Miscellaneous
Right Click
Drop files here or right click to create content.


In the "Pick Parent Class" window, we extend the All Classes section, and we find BP_Sky_Sphere as the object type we wish to inherit from and extend.
Pick Parent Class
Common Classes
Actor
An Actor is an object that can be placed or spawned in the world.
Pawn
A Pawn is an actor that can be 'possessed' and receieve input from a controller.
Character
A character is a type of Pawn that includes the ability to walk around.
Player Controller
A Player Controller is an actor responsible for controlling a Pawn used by the player.
Game Mode
Game Mode defines the game being played, its rules, scoring, and other facets of the game type.
Actor Component
An ActorComponent is a reusable component that can be added to any actor.
Scene Component
A Scene Component is a component that has a scene transform and can be attached to other scene components.
All Classes
Sky
Object
Actor
BP_Sky_Sphere
Info
SkyLight
ActorComponent
SceneComponent
LightComponentBase
SkyLightComponent
BP Sky Sphere
Cancel
Cancel
World Outliner
276 actors
View Options
Details
World Settings
Select an object to view details.
Content Browser
Add New
Import
Save All
Content
CHARACTER
CORE
Geometry
Mannequin
Materials
SHRUBBERY
SKY
ThirdPerson
ThirdPersonBP
C++ Classes


File Edit Window Help
Search For Help
Modes
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Search Classes
Recently Placed
Basic
Lights
Visual Effects
BSP
Volumes
All Classes
Perspective
Lit
Show
Level: E1M1 (Persistent)
World Outliner
Search...
Label
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BPLATFORM Edit BPLA
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276 actors
View Options
Details
World Settings
Select an object to view details.
Content Browser
Add New
Import
Save All
Content ▸ SKY ▸
Search Folders
Filters
Content
CHARACTER
CORE
Geometry
Mannequin
Materials
SHRUBBERY
SKY
ThirdPerson
ThirdPersonBP
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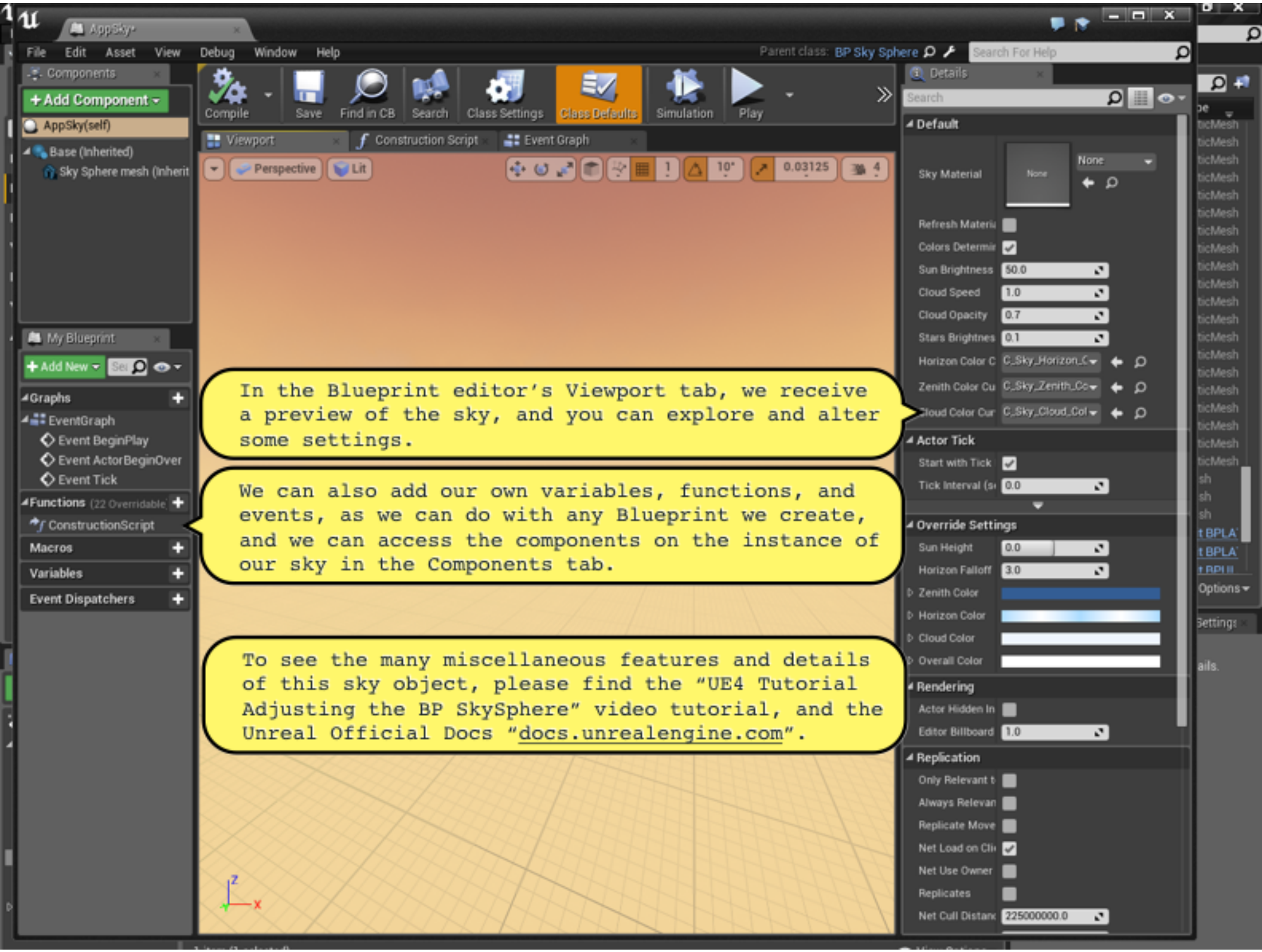
AppSky
We receive a drag-and-drop icon in Content Browser for our inherited instance of BP_Sky_Sphere, and we may drag-and-drop it into the level editor…
We double-click on it to edit its details…


AppSky*
File Edit Asset View Debug Window Help
Parent class: BP Sky Sphere
Search For Help
Components
+ Add Component
AppSky(self)
Base (Inherited)
Sky Sphere mesh (Inherit
Compile Save Find in CB Search Class Settings Class Defaults Simulation Play
Viewport
Construction Script
Event Graph
Perspective Lit
My Blueprint
+ Add New
Graphs
EventGraph
Event BeginPlay
Event ActorBeginOver
Event Tick
Functions (22 Overridable
ConstructionScript
Macros
Variables
Event Dispatchers
In the Blueprint editor's Viewport tab, we receive a preview of the sky, and you can explore and alter some settings.
We can also add our own variables, functions, and events, as we can do with any Blueprint we create, and we can access the components on the instance of our sky in the Components tab.
To see the many miscellaneous features and details of this sky object, please find the "UE4 Tutorial Adjusting the BP SkySphere" video tutorial, and the Unreal Official Docs "docs.unrealengine.com".
Details
Search
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Sky Material
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Refresh Materiu
Colors Determir
Sun Brightness 50.0
Cloud Speed 1.0
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Zenith Color
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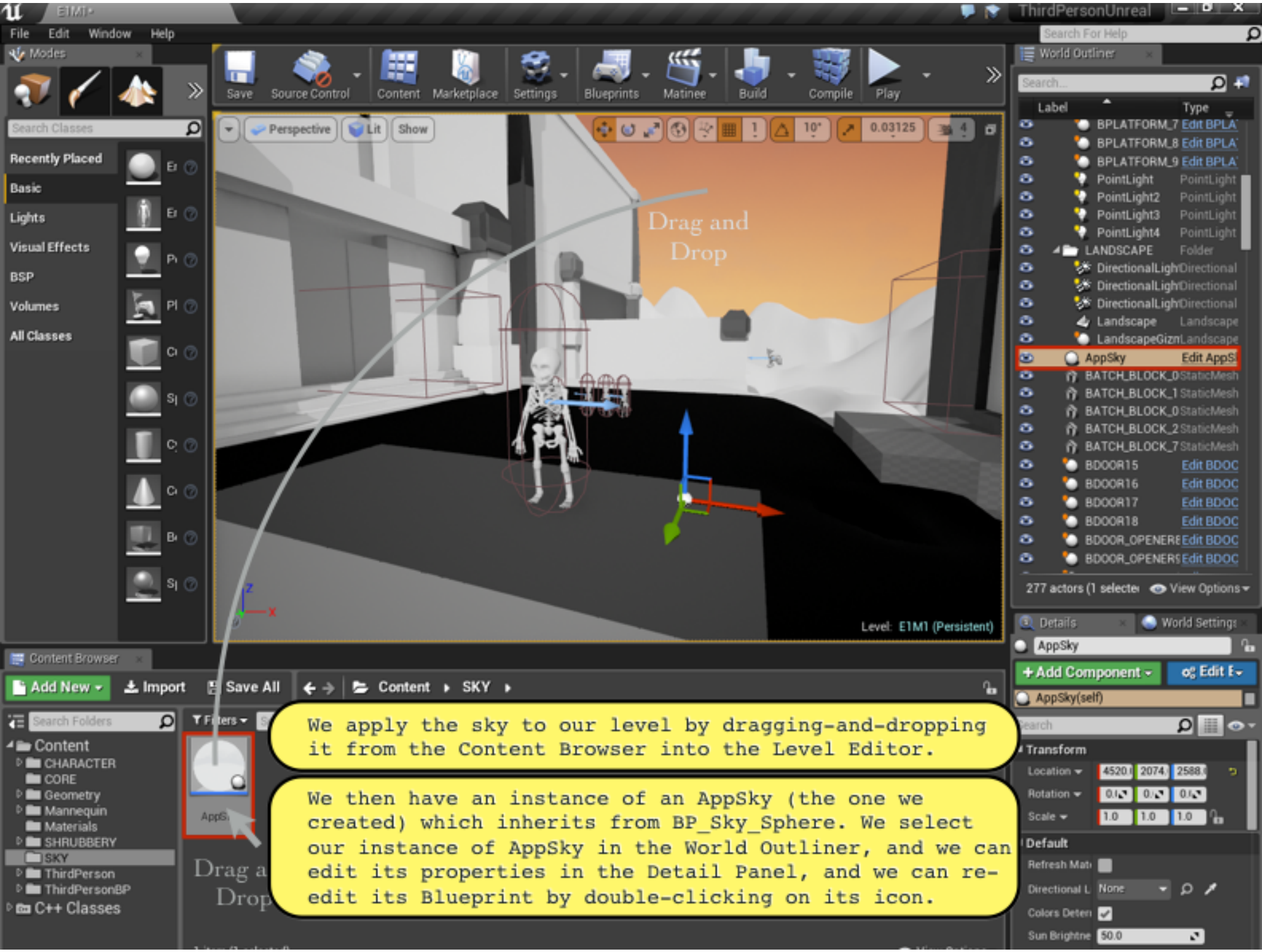
File Edit Window Help
Save Source Control Content Marketplace Settings Blueprints Matinee Build Compile Play
Perspective Lit Show
Drag and Drop
Level: E1M1 (Persistent)
World Outliner
Label Type
277 actors (1 selecte View Options
Details World Settings
AppSky
+ Add Component
AppSky(self)
Transform
Location Rotation Scale
Default
Add New Import Save All
Content SKY
Search Folders
Content
CHARACTER
CORE
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Mannequin
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We apply the sky to our level by dragging-and-dropping it from the Content Browser into the Level Editor.
We then have an instance of an AppSky (the one we created) which inherits from BP_Sky_Sphere. We select our instance of AppSky in the World Outliner, and we can edit its properties in the Detail Panel, and we can re-edit its Blueprint by double-clicking on its icon.

Week 4: Homework

Continue to sculpt a terrain and apply a Landscape Material with Grass, Rock, Sand or other layers, and geometry to sprout out on those layers.

Utilize the Terrain Foliage system to place bushes, shrubs, trees, and other items on your terrain.

Continue exploring getting a character rig and/or camera dolly system into your project.

~ Due: Next week ~