

Animation in Blender

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Getting Started

- Delete the default camera and light (x)
- Rename *Cube* mesh (this will be the name of the mesh in Unity)
- Create model
- T-pose
- UV layout / texturing









Add Armature

- Object Mode > Add > Armature
- Select bone > Object properties > Viewport Display > In Front
 - Previously called X-Ray
- Select bone > Tab (Edit Mode)
- Move top and bottom bone points using translate on Z-axis (G, Z)



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Extruding Bones

- Check *Options > X-Axis Mirror*
- Select top point on body bone, Shift + E to extrude in both directions to make arm bones
- Shift + E again to make "hand" (lower arm) bones
- E, Z to make head bone
- With bottom body bone selected, Shift
 + E to make leg bones
- Shift + E again to make "feet" (lower leg) bones





Renaming Bones

- Important to rename the bones to something else
 - Be sure to leave the "L" and "R" at the end of mirrored bones







Posing

- Tab to go back to object mode
- Left click mesh, Shift + left click armature (bones)
 - Mesh should be outlined in orange and armature outlined in light orange
- Ctrl + P (with mouse in the model window), select With Automatic Weights
- Select armature, then select *Pose Mode* in the menu
- Now the select bones should be light blue
- Translating / Rotating a selected bone should also now move the mesh









Weight Painting

- Go back to object mode, then select the mesh
- Select Weight Paint in the menu
- Select the desired bone under Vertex Groups
 - This is why it is important to rename the bones
- Red (1) > High control by bone
- Blue (0) > No control by bone
- Can paint either by faces or vertices (recommend vertices)
- Set painting value (0 to 1) by setting the weight value
- Mesh will transform as you paint (helpful)
- Can also set the radius size of the brush

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Animating

- Select the Animation tab
- Select the armature and then Pose mode
- Can select Pose > Clear Transform > All to reset bone positions
- Change left view to Action Editor
- Make sure frame on timeline is set to 1
- Change keying to LocRot
- Set end frame to desired value



Walk Animation

- Set arm and leg bones to desired positions
 - Left arm forward, left leg back, right arm back, right left forward
 - Also see "walk cycles"
- With all bones selected
 - I (insert key frame at 1)
 - Move to last key frame
 - I (insert at last key frame ex: 30)
 - Alternatively, duplicate keyframe in timeline (Shift + D)
 - Mouse pointer must be in pose window to insert key frame
- Move to halfway between start and end frame
- With ONLY arms and leg bones selected
 - Pose > Copy Pose
 - Pose > Paste Pose Flipped
 - Press I to insert key frame
- Press the forward triangle to play in the timeline controls
- Rename the animation to "Walking" and press the shield icon



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Import into Unity

- Export to .fbx and drag into Unity
 - Could previously drag the .blend file into Unity, but this no longer appears to correctly import animations
- Select model, and on the Rig tab set Animation type to *Legacy*, then press Apply
- On the Animation tab, set wrap mode to *Loop*
- Adjust start and end frames as needed
- Press Apply when done





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Armature Walking		:
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Add Loop Frame		
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	Clamp Forever	
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Using the Animation

- Drag the model into the object hierarchy or scene
 - Pull in texture if needed
 - Suggest parenting model to empty game object
 - Have parent game object handle movement, collisions, etc





Second Animation

- Press the button to create a new animation in Blender
- Name the animation "Standing" and press the shield icon
- Delete the existing keyframes (A, X, Delete Keyframes)
- Ensure that Standing animation is selected
- Pose > Clear Transform > All
- Create animation as previous. Add head bob in middle
- Should now be able to switch between Standing and Walking animations







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DESIGN



Changing Animations in Unity

- Import/Reimport model file
- Should now have two animations on the animation tab
- Can remove the "Armature |" prefix if desired



24 FP:

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O Unity Message 0 references void Update() { fCountdown -= Time.deltaTime; if (fCountdown <= 0f) {</pre> changeAnimation(); fCountdown += fMaxCountdown;

O Unity Script 0 references

float fCountdown;

GameObject model;

bool isWalking;

float fMaxCountdown;

O Unity Message 0 references void Start() {

fMaxCountdown = 2f;

isWalking = false;

fCountdown = fMaxCountdown;

1 reference private void changeAnimation() { isWalking = !isWalking; if (isWalking) { model.GetComponent<Animation>().Play("Armature|Walking"); } else { model.GetComponent<Animation>().Play("Armature|Standing");



Issues with Legacy Animation

X

DESIGN

- No smoothing between Standing and Walking animations
 - Snaps into place
 - Quick and easy if smoothing is not needed or noticable

Godot



- Can drag and drop the .fbx file directly into the Godot file pane
- Then drag the .fbx into the Scene
- Open the node, can view animations and armature bones
- Remember to add a Camera
- Click the loop icon to loop the animation
- Add script to AnimationPlayer and call play(<animation name>)

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	+ Add Track	↔ 0
# Called when the node enters the scene	😭 Armature	
func readv():	🗹 🔶 Arm_L	+++
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play("root watking")		•
pass # Replace with function body.	🗹 🔶 Body	+
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Animation Armature|Walking





Unreal Engine

- Drag and drop FBX file into the Content Browser (or use Add/Import button, Import to /Game)
- Check Import Animations
- Can't import .blend files
- Must export smoothing data
- Must have single root bone
 - In Edit mode, select any bones not connected to the root (such as leg bones)
 - Select root (such as body bone) last, then Ctrl + P
 - Also see this post:

https://answers.unrealengine.com/questions/109814/multiple-roots-are-found-in-thebone-hierarchy-we.html

• <u>Very Important</u> - *Armature* must be renamed to *root*, otherwise animations won't work



Blender Export File Formats

Extension	Name	Animations	Text / Binary	Supported by Unity
FBX	Autodesk Filmbox	Yes	Binary	Yes
OBJ	Wavefront	No	Text	Yes
DAE	Collada	Yes	Text (XML)	Yes
gITF, gIB	Graphics Language Transmission Format	Yes	Text (JSON) or Binary	No
ABC	Alembic		Binary	No
USDC	Universal Scene Description		Binary	No
BVH	Motion Capture		Text	No
PLY	Polygon File Format, Stanford		Text	No
STL			Binary	No
X3D	X3D Extensible 3D		Text (XML)	No

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Useful Sites

Mixamo.com for animations

Support & Services

Get started

Community

Learn more

- blender.org
- unity.com

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Products

Solutions

- godotengine.org
- unrealengine.com

Case Studies Learning



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