Game asset creation with Blender and Substance Painter

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Contents

1. Determine what kind of asset is needed

Which object is it?

What art style should be used?

2. Creating the 3D model

2.1 Before modeling

1. Find main reference and other references
2. Duplicate main reference picture and split the object into parts marked with numbers from 1-n in GIMP
3. Insert main reference in Blender as background image and scale it to the correct size
4. Create collection for each object marked with a number in the main reference and create the subcollections main, secondary, bool for each main collection

2.2 Modeling with Blender

2.2.1 Guidelines to follow

- Create one part at a time, start with part 1 until it is finished and then continue
- Keep it organized, move parts to the right collections
- Dont use marked sharp edges without bevel weight also, so dont keep sharp edges without bevel

2.2.2 Choose a modeling workflow

- Subdivision surface workflow
- Bool and Bevel workflow

Bool and Bevel workflow is recommended as it is easier, takes less time, creates way less polygons

2.2.3 Modeling with the bool and bevel workflow

1. Model part without bevels, model smooth curvature but not sharp edge bevels
2. Fix doubles, face orientation, object scale, object rotation
2. Add bevel modifier with 1 segment, harden normals and weight as limit
3. Mark edge bevel weights

Repeat with next part until all parts are finished

When all parts are finished, continue part by part

1. Fix doubles, face orientation, object scale, object rotation
2. Check if everything looks good, fits
3. Duplicate entire asset root collection
4. Apply all modifiers
5. Fix doubles, face orientation, object scale, object rotation
6. Join objects, that should represent 1 part of the asset
7. Set origin point to world origin on every object

2.3 Preparing the model for shading

2.3.1 Correct Separation of asset

EVERY TEXTURE NEEDS ITS OWN UV MAP!

Every material in Blender becomes one texture set in Substance Painter

Every material should have its own uv map

You can use one armature for multiple objects and animate them that way

Possibilities:

- asset to one object and one material
- asset to multiple objects and every object has 1 uv map and 1 material

2.3.2 Create UV Maps

1. Smart UV Unwrap model with angle 55° or something similar
2. Pack Uvs with UVPackmaster

2.3.3 Create Materials

Use 1 material for each UV map, so in Substance every texture set will be 1 UV map and one texture

or

Use multiple materials per UV map to split parts in Substance for easier organization, but don’t use a material in multiple UV maps

2.3.4 Exporting to FBX

Geometry options

- Use normals only as smoothing option
- Don’t use anything else except apply modifiers

3. Shading the Modeling

- Conform to the PBR guidelines with help of the PBR validation tool

4. Animating the model

4.1 Forward Kinematic Rig

4.2 Inward Kinematic Rig

Arm example

1. Select lower arm bone in pose mode and add Inverse Kinematic bone constraint
    - Target: Armature
    - Bone: Hand

2. Disconnect hand bone with ctrl+p, disconnect bone, not clear parent
3. Set chain length in IK constraint and set it to 2 (to the upper arm)
4. Unparent hand bone
5. Parent hand bone to forearm
6. Duplicate Hand bone and rename it to hand_IK, unparent hand_IK

7. change lower arm ik constraint bone to the new hand_IK bone
8. Add copy rotation constraint to hand bone with target hand_IK
9. IK Constraint set pole target to new bone with the right position
10. If it doesnt work correctly, slightly move arm bones and set pole angle in IK constraint
11. Parent hand_IK to root