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Preproduction

Before I start working in blender I first start with building reference boards, which is basically just a compilation of images to give me a clear idea of what I'm going to be making later.

This can be a very simple board or very detailed depending on the detail and how specific I want to be with my character. Let me quickly take you through my process for building my reference boards.

Step 1,

If I'm working for myself, I start by making a brief to give me an idea of what images I need to start looking for. It can be really helpful to also write down the personality of the character which will be used later when pushing the shape of the character to convey the message of our character.

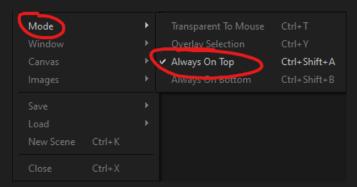
Step 2,

I personally like using Pinterest for finding reference images, just because the "find similar function" is so easy and the recommendations for images are better than search engines in some cases or some big projects.

Here is when I nail down what I want my character to look like, from hair to the shape of the character, from the clothing to the smallest prop.

These images make your life a lot easier in the process and is totally worth it. Step 3,

Start compiling images into PureRef, which is basically a software that you can drop images into, to have floating on your screen while you're working.



Make sure you have your reference board in always on top mode so you can while you're working you don't have to keep going back and forth between your reference and blender scene.

Modelling

When you start designing characters, the first thing you gotta do is get yourself a base mesh. You can either create it yourself or just download one online, but either way, it's gonna be the foundation for everything you do from there on out. Now, there are two big things you need to think about: proportions and topology.

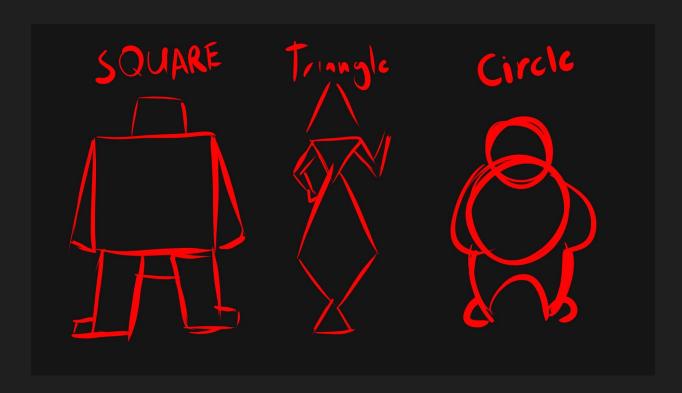
Proportions are super important, especially if you're trying to give your character a unique, stylized look. You wanna play around with the proportions to give your character a certain vibe that helps tell their story. And that's where shape language comes in - it's basically using different shapes to communicate what your character is all about.

Shape language plays a crucial role in conveying the essence of a character. Three fundamental shapes that are commonly used in shape language are the square, triangle, and circle. Each shape has its own unique properties and conveys a distinct message to the audience.

The square shape is often associated with stability, strength, and reliability. Characters with a square shape language are often portrayed as grounded, practical, and no-nonsense. The sharp edges of the square can be used to create a sense of authority and dominance, making it a popular choice for villains or authoritarian figures. On the other hand, rounded squares can give off a more approachable and friendly vibe.

The circle shape is often used to convey softness, friendliness, and approachability. Characters with a circular shape language are often depicted as warm, comforting, and nurturing. The round edges of the circle can create a sense of safety and familiarity, making it a popular choice for characters who are meant to be trusted or relied upon. Additionally, circles can be used to create a sense of playfulness and whimsy, making it a popular choice for characters meant to be entertaining or comedic.

Finally, the triangle shape is often used to convey power, aggression, and danger. Characters with a triangular shape language are often depicted as sharp, edgy, and unpredictable. The pointed edges of the triangle can create a sense of tension and danger, making it a popular choice for antagonistic characters or creatures. In contrast, inverted triangles can give off a more stable and grounded impression, making it a popular choice for heroic characters.

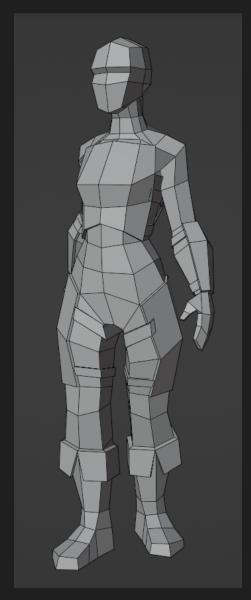


The other thing you need to think about when making your base mesh is having good topology is essential for ensuring that they animate and deform properly.

Topology refers to the flow and organization of polygons on the character's mesh.

Poor topology can result in deformations, glitches, and other issues that can detract from the player's immersion. So, what makes for good topology in game characters?

Firstly, it's important to have an efficient mesh with as few polygons as possible while still maintaining the desired level of detail. This helps to optimize performance by reducing the strain on the game engine. Additionally, having a clean and organized mesh can help to facilitate the rigging and skinning process, allowing the character to move and bend in a more natural and realistic way.



Another important consideration is edge flow. This refers to the way that the edges of polygons are organized to follow the natural contours of the character's body. Proper edge flow can help to ensure that the character animates and deforms smoothly and realistically, with minimal distortion or stretching. It's also important to have good edge loops around joints and areas of deformation, as this can help to maintain volume and prevent unwanted collapsing or stretching.

The easiest way I have found to learn topology is by looking at other people's models, you can easily find the character models from games and start breaking them apart to see how their model's topology flows or go download some models from online that you like the look off, make sure they're for animation or the topology might terrible. Sketchfab is useful for this because you don't even have to download the model, you can use the inspect feature that will show you the wireframe of the model and from there you can study the topology.

Now that we have a clean base mesh we need to go about creating the clothing, hair and props for our characters.

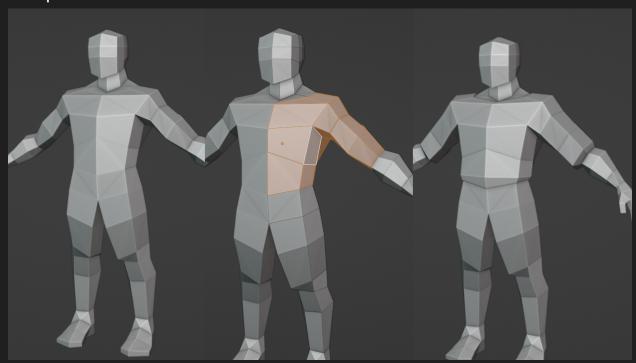
Clothing:

When designing the clothing for your character this is the point where you can push the shape of your character even more. This is also when I start to lean more on the references I gathered in the beginning since I'm not great at clothing design.

Again it's all about conveying the story of your character through the design choices you make.

The simplest way I've found to make clothing is to duplicate parts of the base mesh, then start moving around, adding geometry and removing some, until you get the shape you want. Then go to the modifier tab and add a solidify to give some thickness to your model.

Example:



This process can be repeated and then for the rest of the clothing in your character design unless you have something that doesn't fit the shape of the character like a cape or parts of a dress.

Props:

Adding in more props can help tell more of a story with your character, fleshing out the backstory and helping audiences resonate with them. Adding more detail can also really help when making low poly characters, the low poly counts don't give us an excuse to be lazy and make bad art. There has to be a reason behind everything we do.

I like to break down the shapes of all the small assets into their simplest forms, almost like the shape language, and then with the simplest modelling tools turn

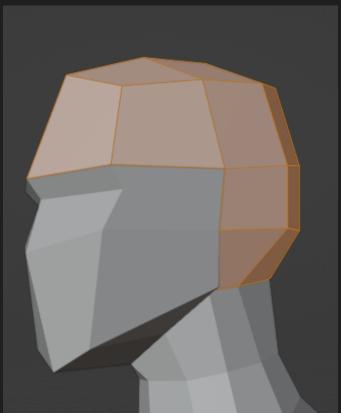
them into 3D. With low poly creating assets isn't too confusing because you don't have to worry about adding in a ton of details and managing a ton of geometry.

Hair:



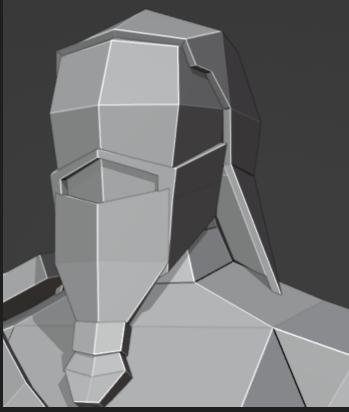
This is a quick drawing breaking down the shape of the hair with simple straight lines. I will use this to make the hair in 3D.

Basically all I do is duplicate the scalp from the head and add a solidify, and then start extruding hair down.











Here are some examples of hair if you would like to see how I've made some of my character's hair.

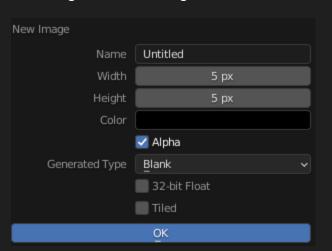
Adding in some extra strands helps make the hair look really nice.

Texturing

The way I used to make models for games was to use blender's built-in materials which turns out to be really bad for games, the standard method for games is to use a UV Texture which is going through the character and adding seams in each part to lay it flat and paint textures.

But if we're making flat textures, there's no point in having to paint the image, we can just do something called a UV Atlas, a small image where each pixel is a different colour and this can be mapped to your model by selecting the parts of your mesh that you want to make a single colour and clicking U > Unwrap or if you run into an error click U > Smart UV Project.

Creating a low res image:

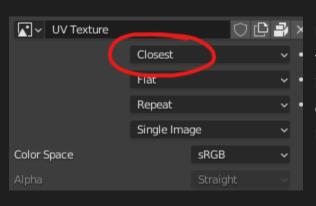


Low Res image to paint colours:

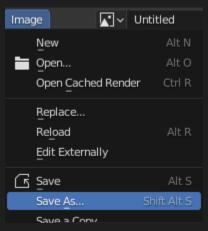


Make sure you set the image properties in blender to be closest so that there's no smoothing between pixels on the image.

Which would end up with random colours getting generated and random smoothing with the colours.



If you want to save the image, open the image editor or UV editor and click Image > Save as.



Rigging

Rigging can be either very complex or very simple, in a nutshell, it's a bone structure that can be used later to move and animate your character, which is very important for games as most characters will have movement and animation.

Here's an example of a rig for my camel.



I've heard from some beginners that they are confused about where to place the bones.

Something you can try to make rigging easier is to use the reference of a human skeleton to see where the actual bones are placed in the human body.

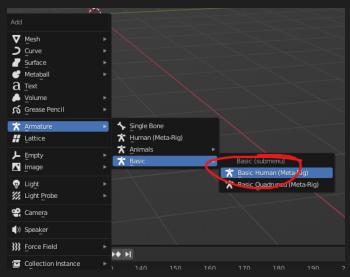
These are going to be around places that pivot like elbows, knees, shoulders, etc.

A quick way to build a skeleton to start placing the bones without having to extrude all the bones and name them which is a very

time-consuming task.

All you have to do is go Edit >
Preferences > Addons then search
for rigify. Now if you go press Ctrl A
these new menus will pop up under
the armature tab.

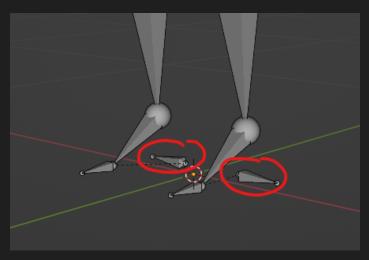
This will create a simple rig that I like to use for my rigs. The only thing I have to do is place finger bones and name them.

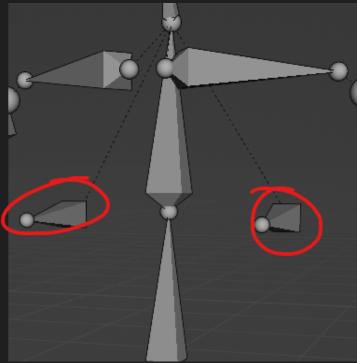


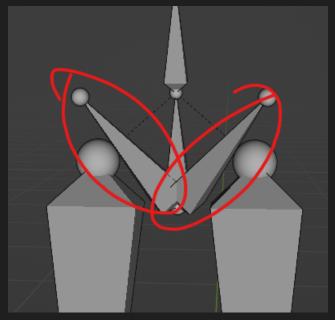
The usual naming convention is something along the lines of "Bonename.L" so for the hand it would be Hand.L and now when you've done the left side of the rig press Armature > Symmetrize, in the bottom left you can click the black box and chose which side of your rig you want to override with the other side.



Another thing you need to do is delete a couple of bones to streamline the character, especially for games.





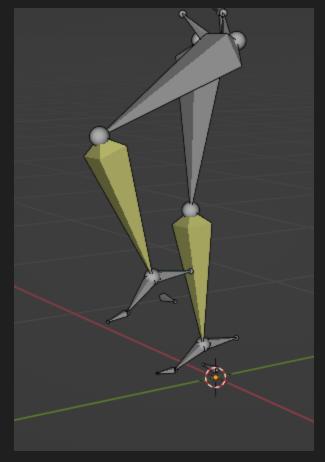


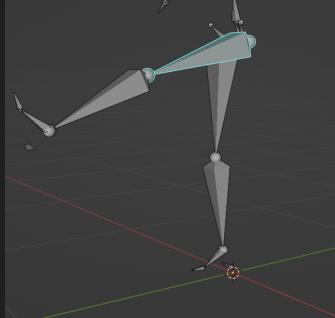
These bones don't really help with your animation or posing so I delete them whenever I create a rig with rigify.

The next topic to cover is adding IK to your rig. IK rigging is when you create a bone a the end of a chain of bones (Like the leg or arm) then you can move the bone and it moves the rest of the leg/arm.

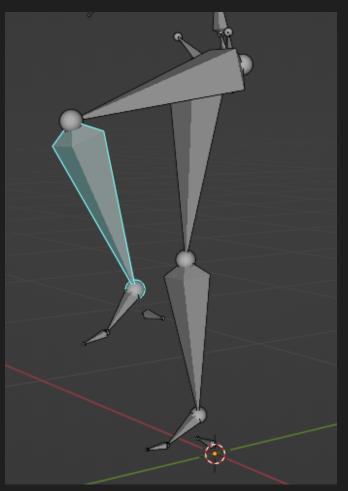
IK Leg movement

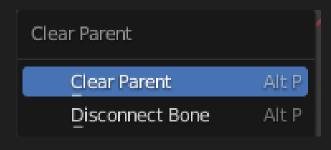
FK Leg Movement

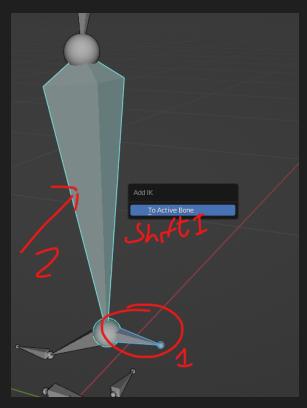




All you have to do is create a small bone a the ankle joint or the wrist joint then press Alt P > clear parent. Then select the IK bone and the bone to be the last bone (the forearm bone or calf bone)
And press Shift + i to add the Ik to active bone.







Another example to the right is the arm bone.

IK is really useful for when you're doing animation, if you're moving the pelvis

bone in FX the legs will follow with you can you have to spend a bunch of time rotating all the bones in the leg to fix the position but in IK you just drag the pelvis bone and the feet stick to the ground.

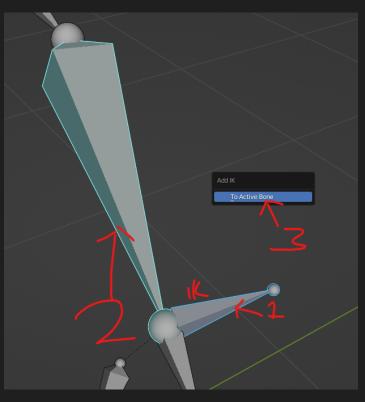
Heres how to add the IK to a leg bone.

Make sure to select the IK bone then the

Leg bone then press shift i > to the active

bone.

The highlighted bone is the active one.



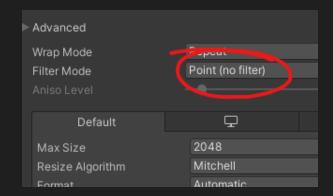
Exporting to a Game Engine

When exporting your models the steps all you need to do is to select all the parts of your mesh and rig that you want to export, go to the top right, click File > Export > FBX and copy the settings from this screenshot.

These are the settings I use for unity, which may not be the best, but I think this is the way to do it. The only thing you might want to change is the apply transforms if you don't already do that in your scene.

Then go to your game engine, for example unity, and drag the fbx file into your scene.

You're going to have to create a material with your UV atlas and set the filter mode on the image to point to not have any blurring between colours



Then add the image to the material and drag it onto your character.

And you're DONE!

