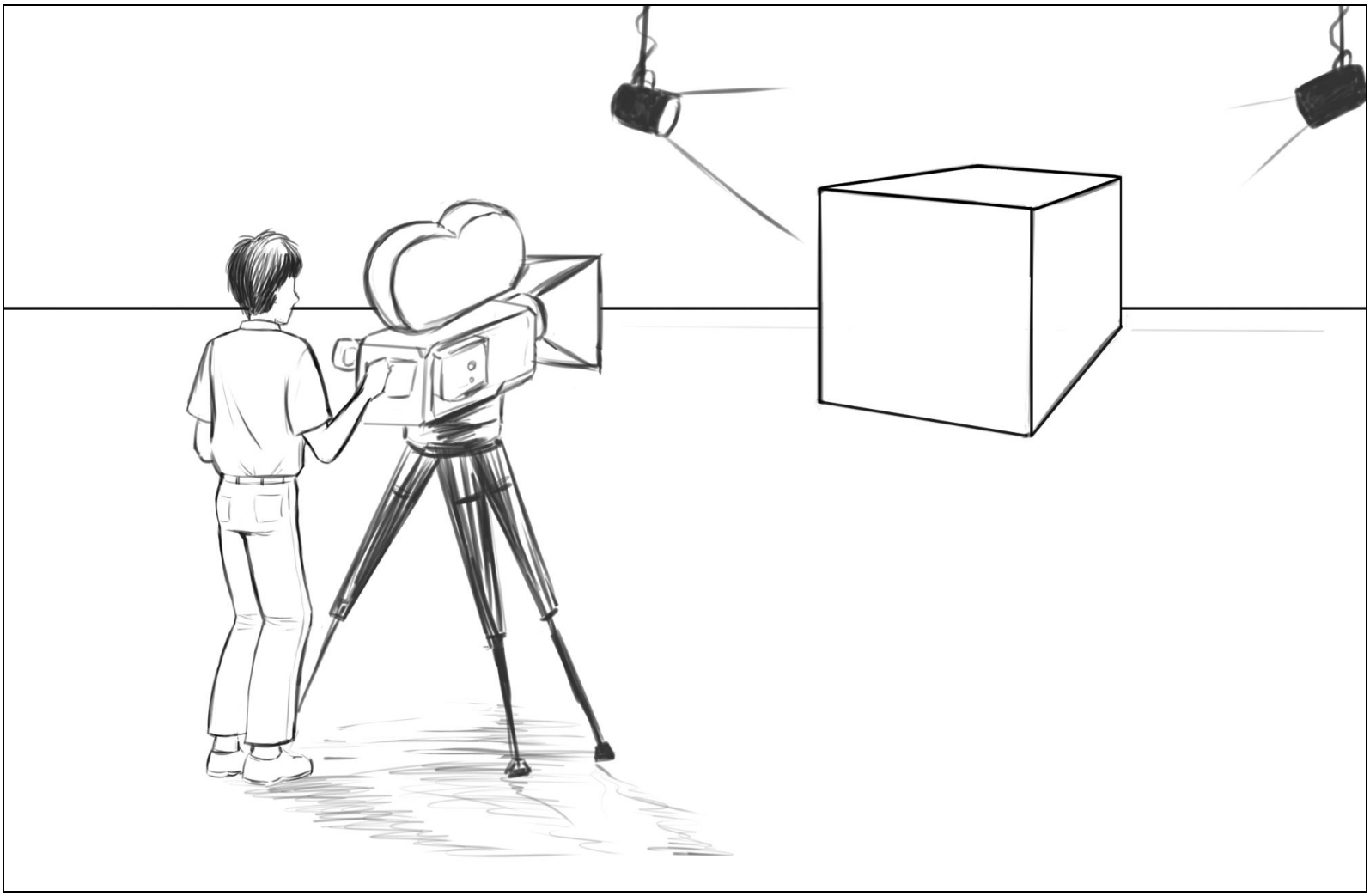
1

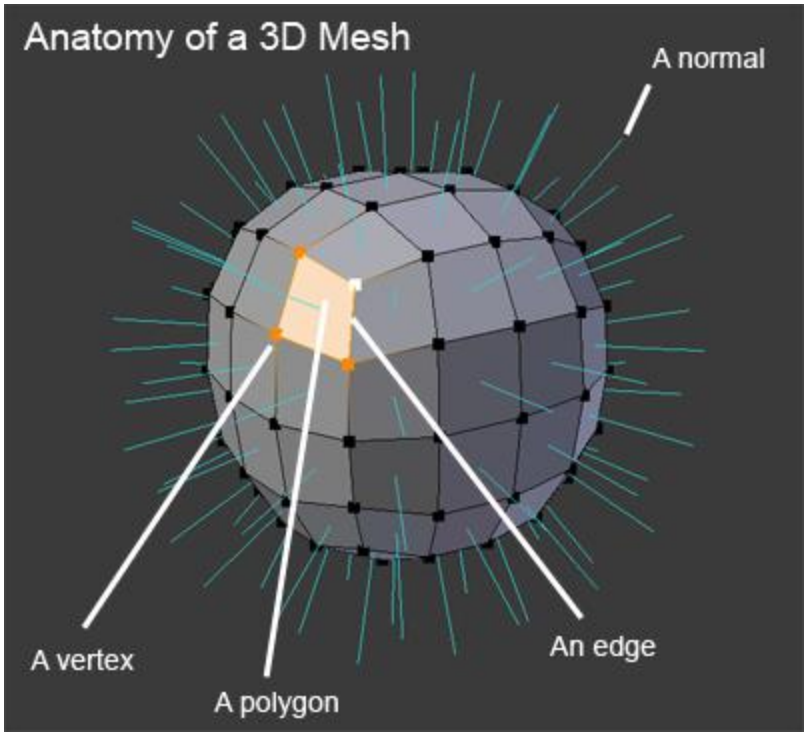
Straight into Blender!

An overview of the 3D workflow

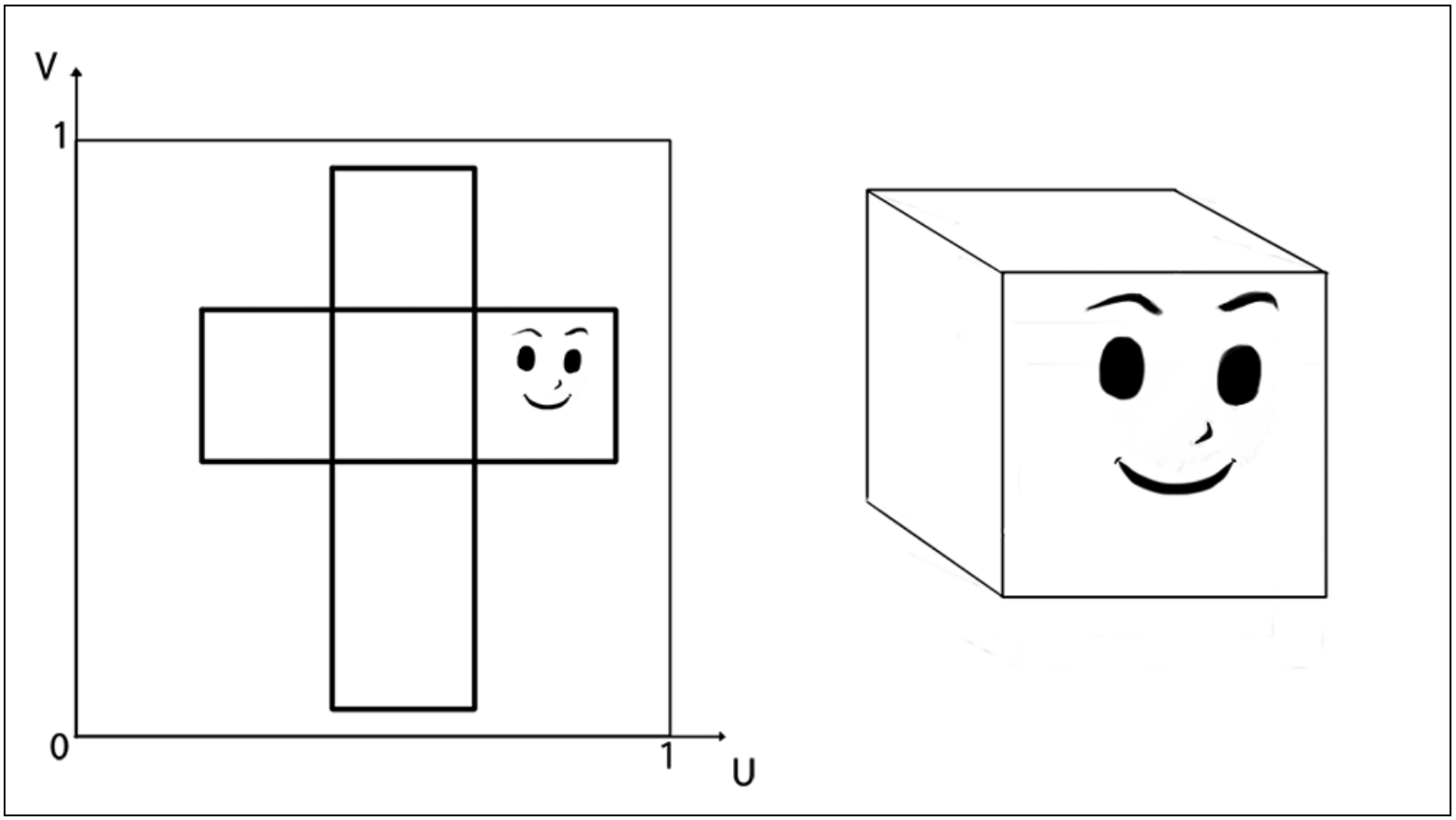
Anatomy of a 3D scene



A 3D scene looks like a film set.



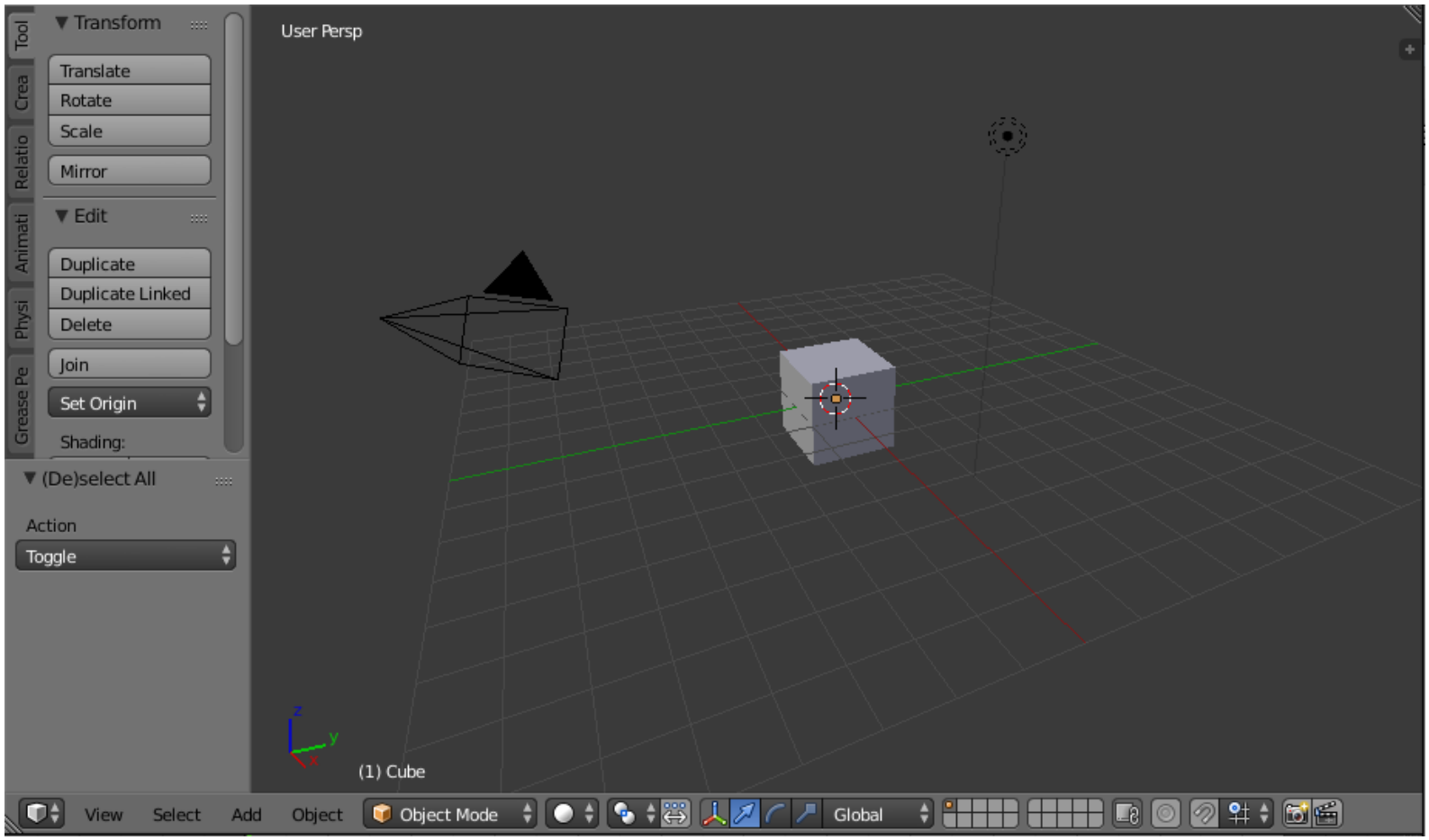
Anatomy of a 3D Mesh



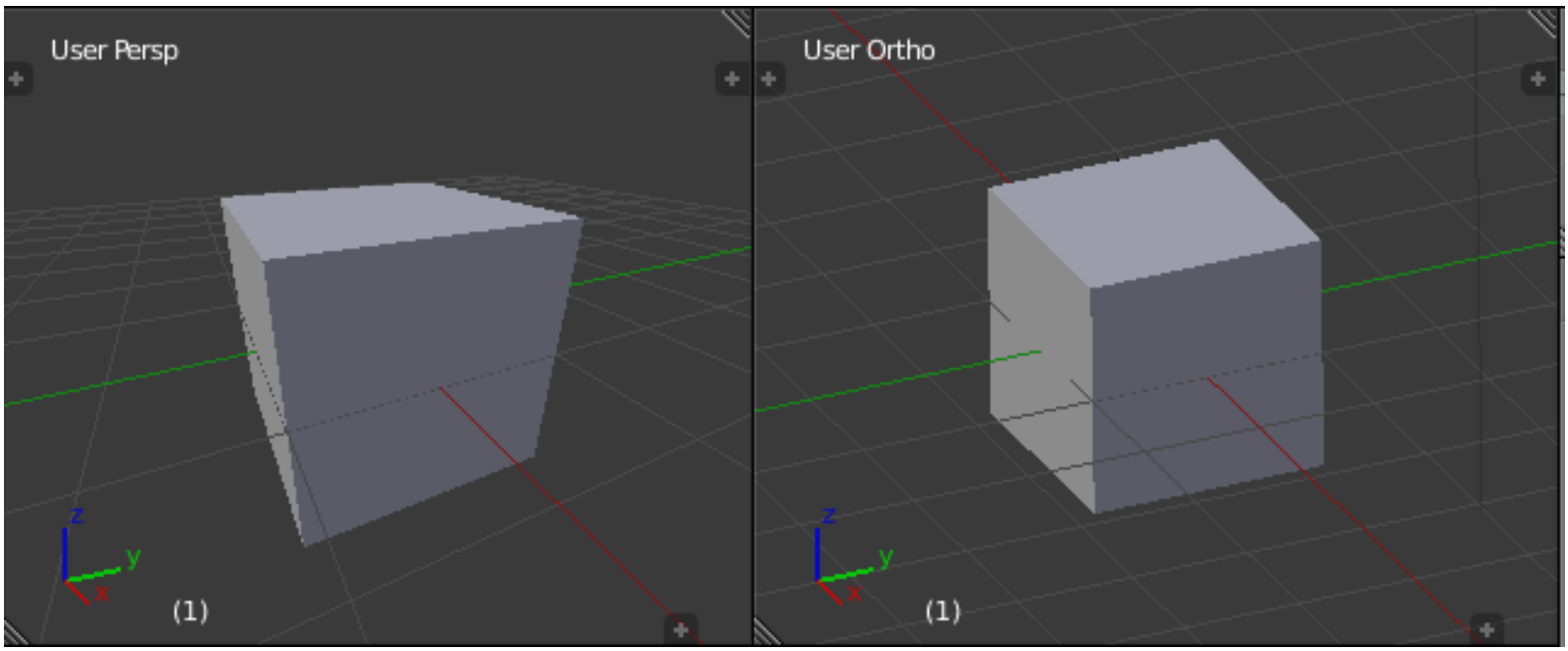
This is the representation of the UV mapping process. The texture on the left is projected to the 3D model on the right.

Getting used to the navigation in Blender

An introduction to the navigation of the 3D Viewport

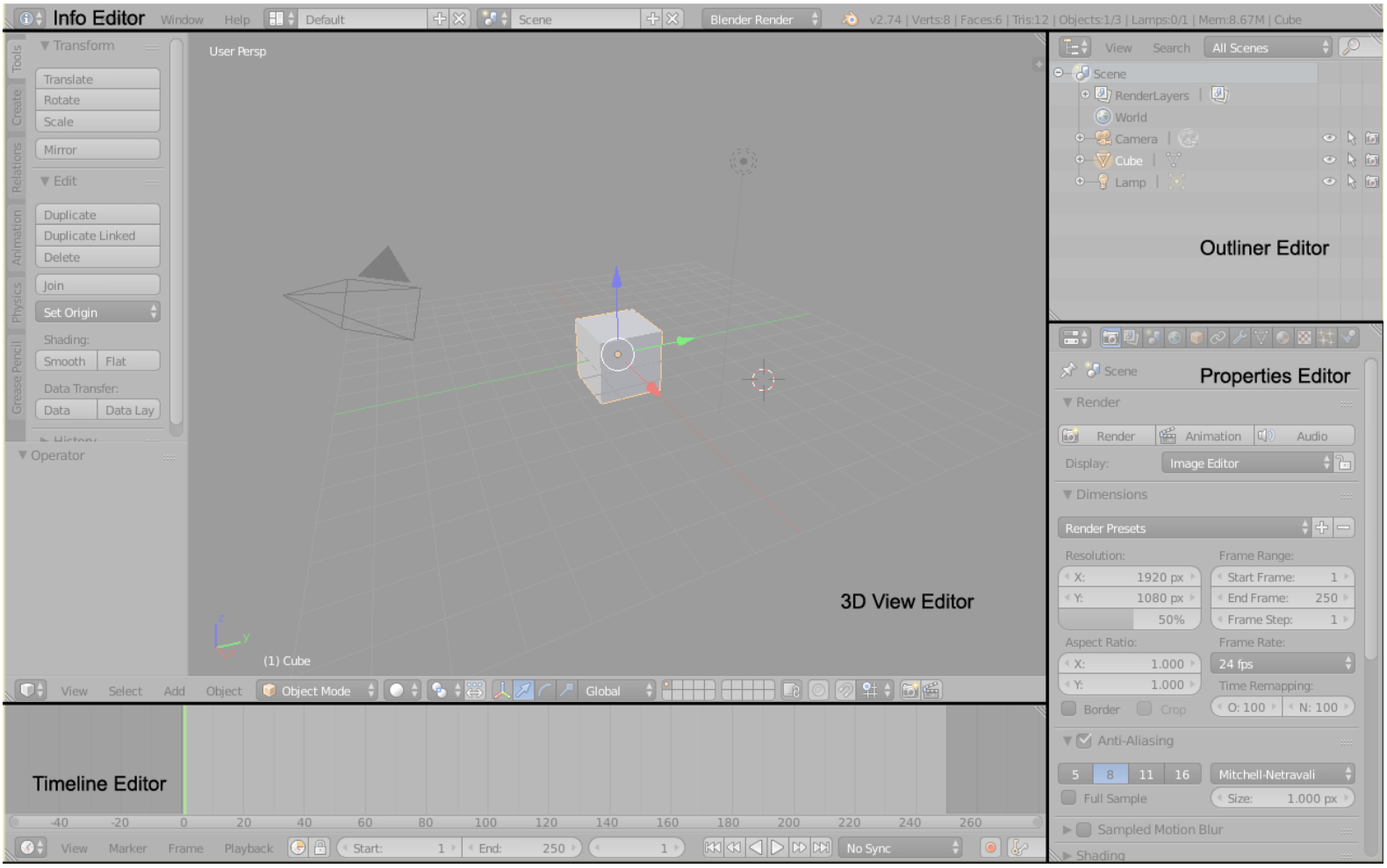


The Blender 3D Viewport



The difference between Perspective (left) and Orthographic (right)

What are editors?

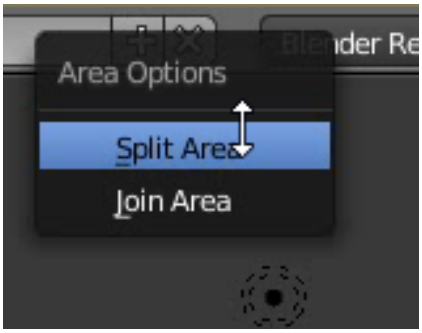


In this picture you can see how Blender is divided into editors.

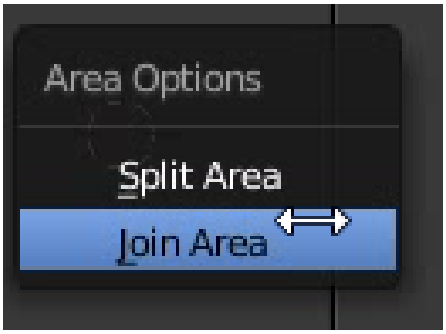
Anatomy of an editor

The header of the 3D View-port. The first button is for switching between editors, and also, we can switch between the menus and options

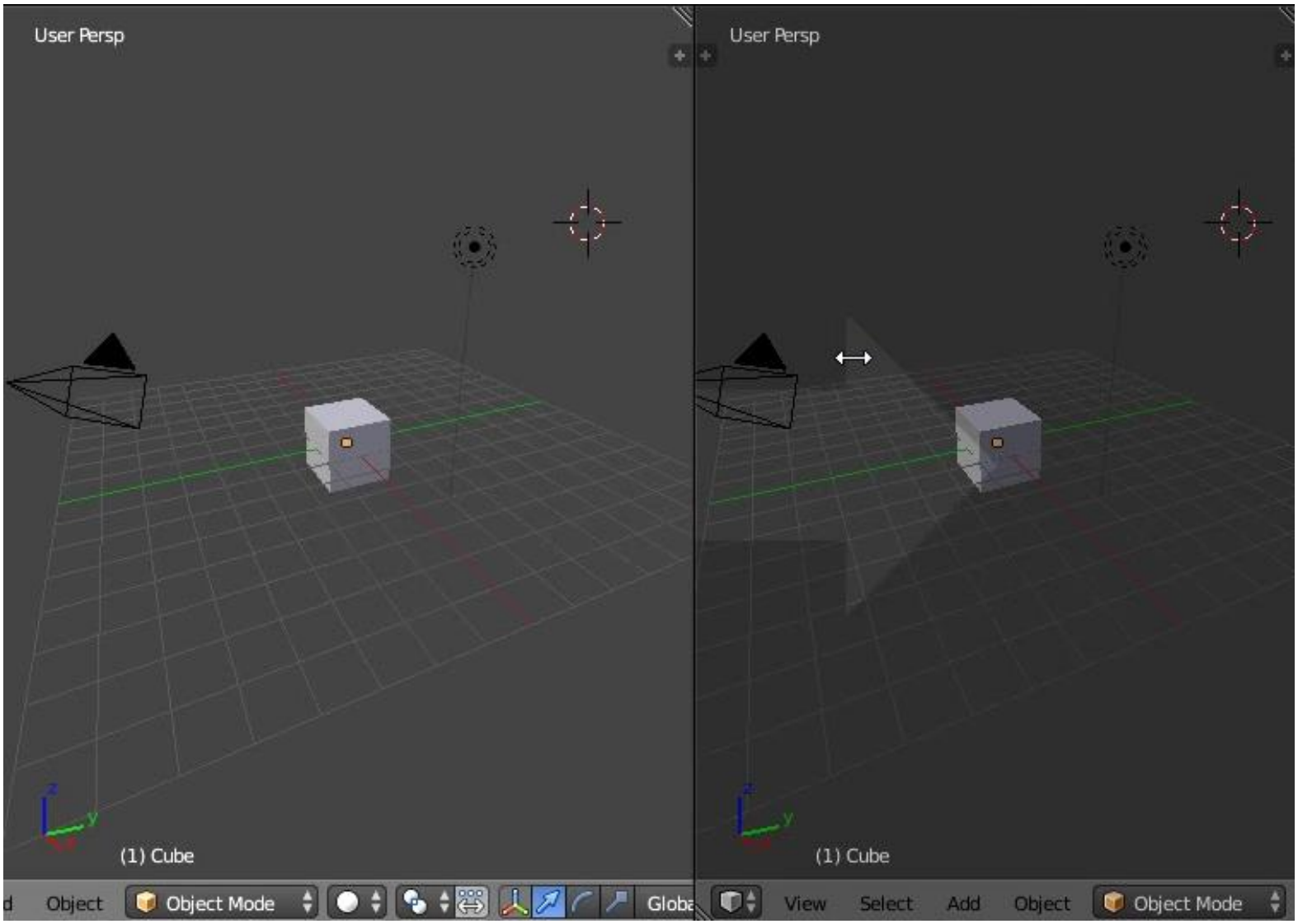
Split, Join, and Detach

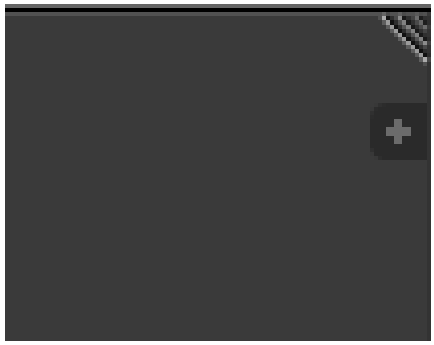


Right-click on the border of an editor to split it in two editors



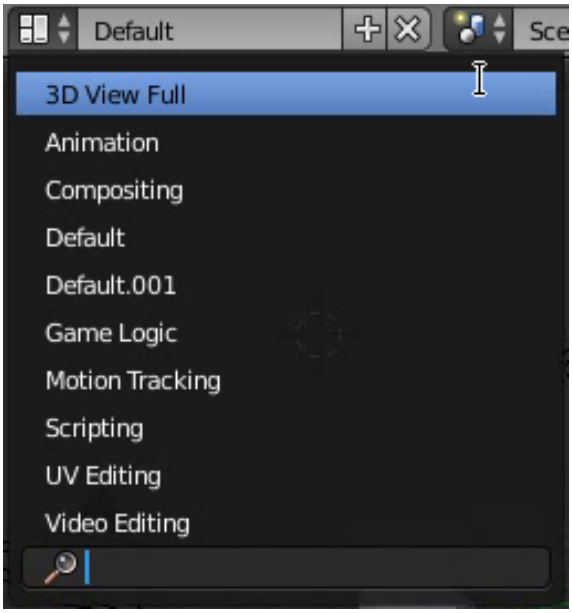
Use the Join Area option to join two editors together.





The top right corner of an editor

Some useful layout presets



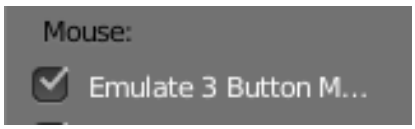
The layout presets drop-down menu

Setting up your preferences

An introduction to the Preferences window

The different tabs that compose the Preferences window

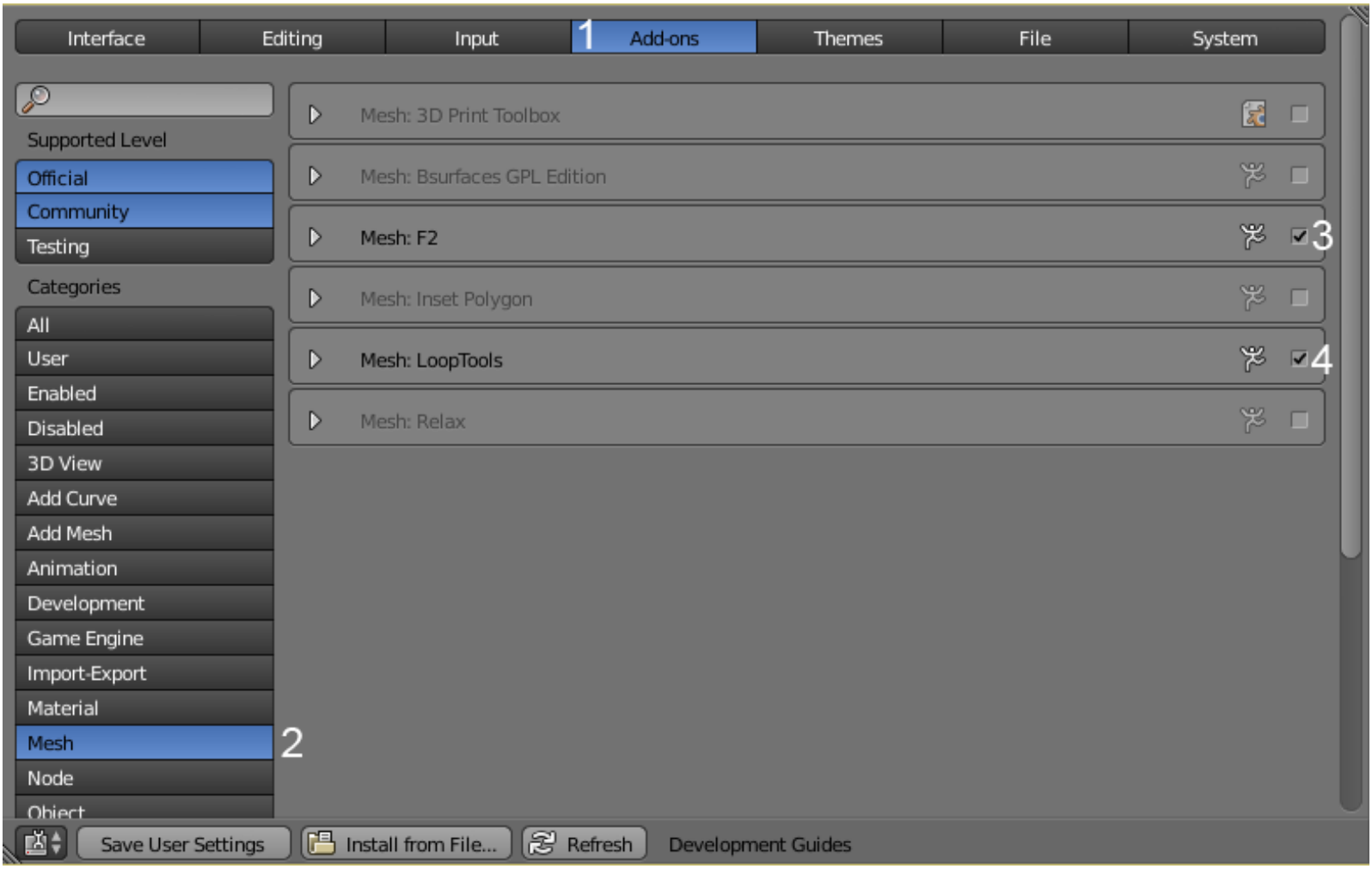
Customizing the default navigation style



The Emulate 3 Button Mouse will be very useful when sculpting using a pen tablet.

The Emulate Numpad allows you to use the numeric keys above the QWERTY keys in order to switch views or toggle the perspective on or off.

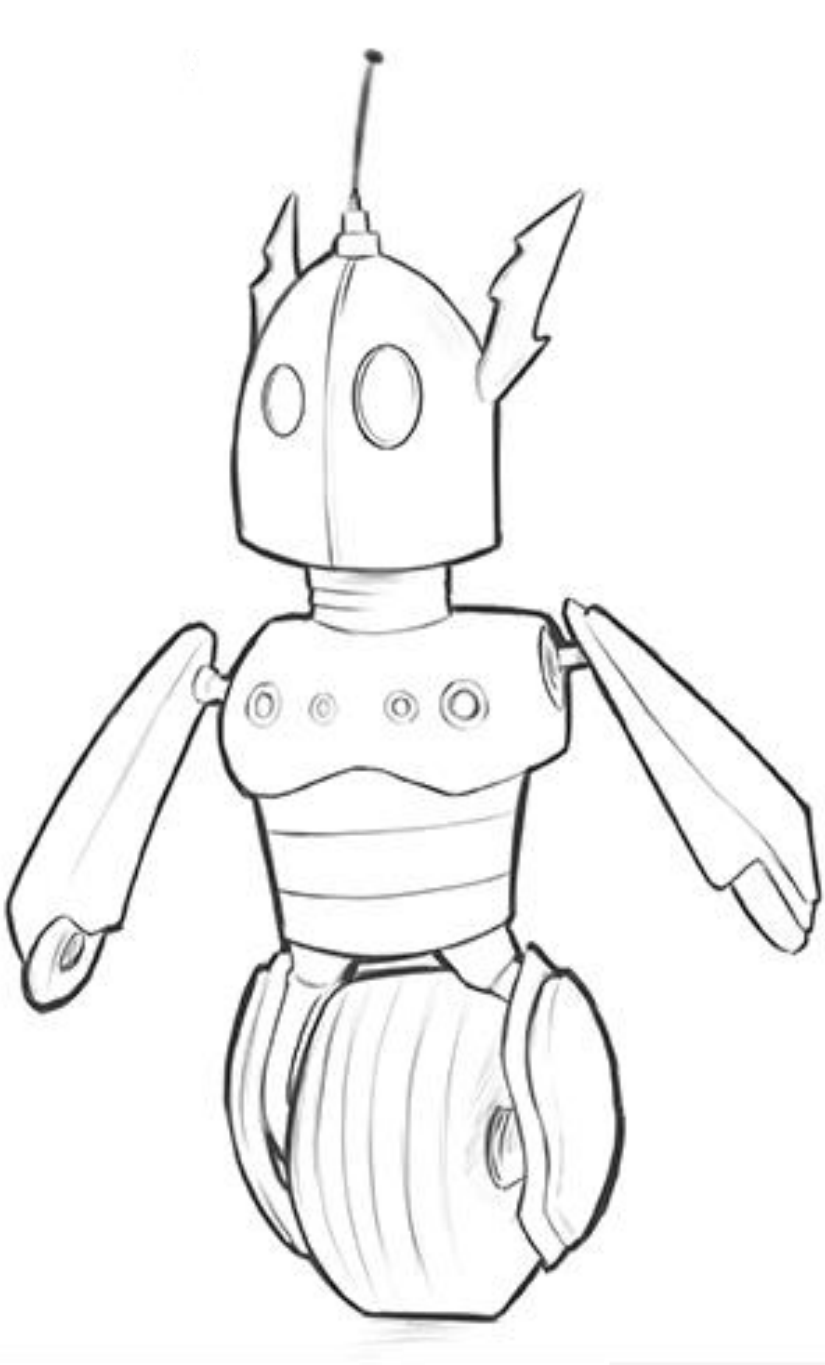
Improving Blender with add-ons

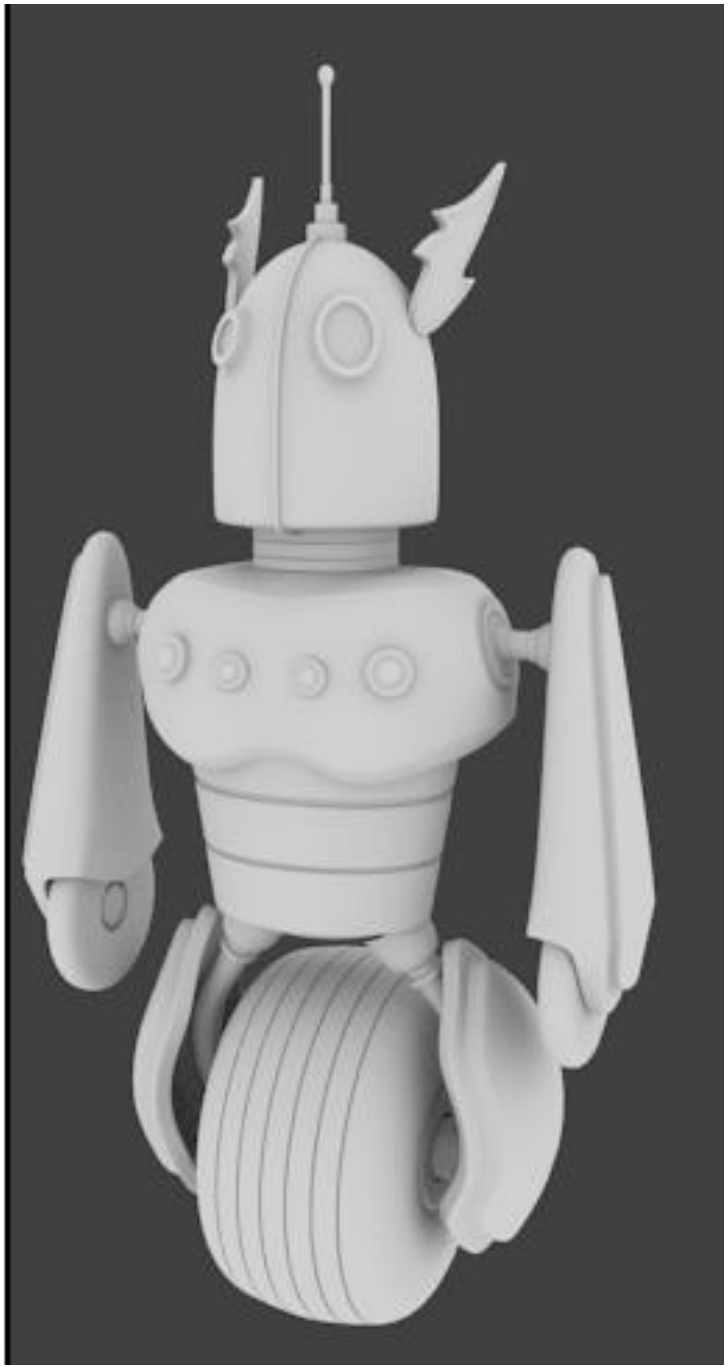


Steps for Add-ons activation

2

Robot Toy – Modeling of an Object

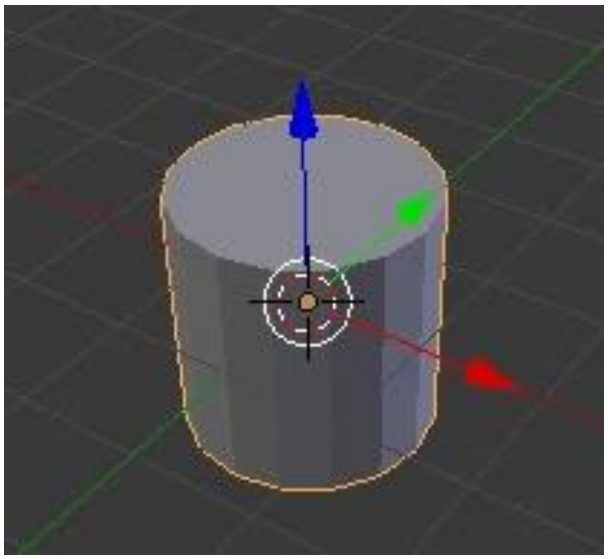




You will start the 3D robot modeling (shown on the right) using a sketch as a reference (shown on the left) with Krita (another open source tool for 2D art).

Let's start the modeling of our robot toy

Adding the Head primitive



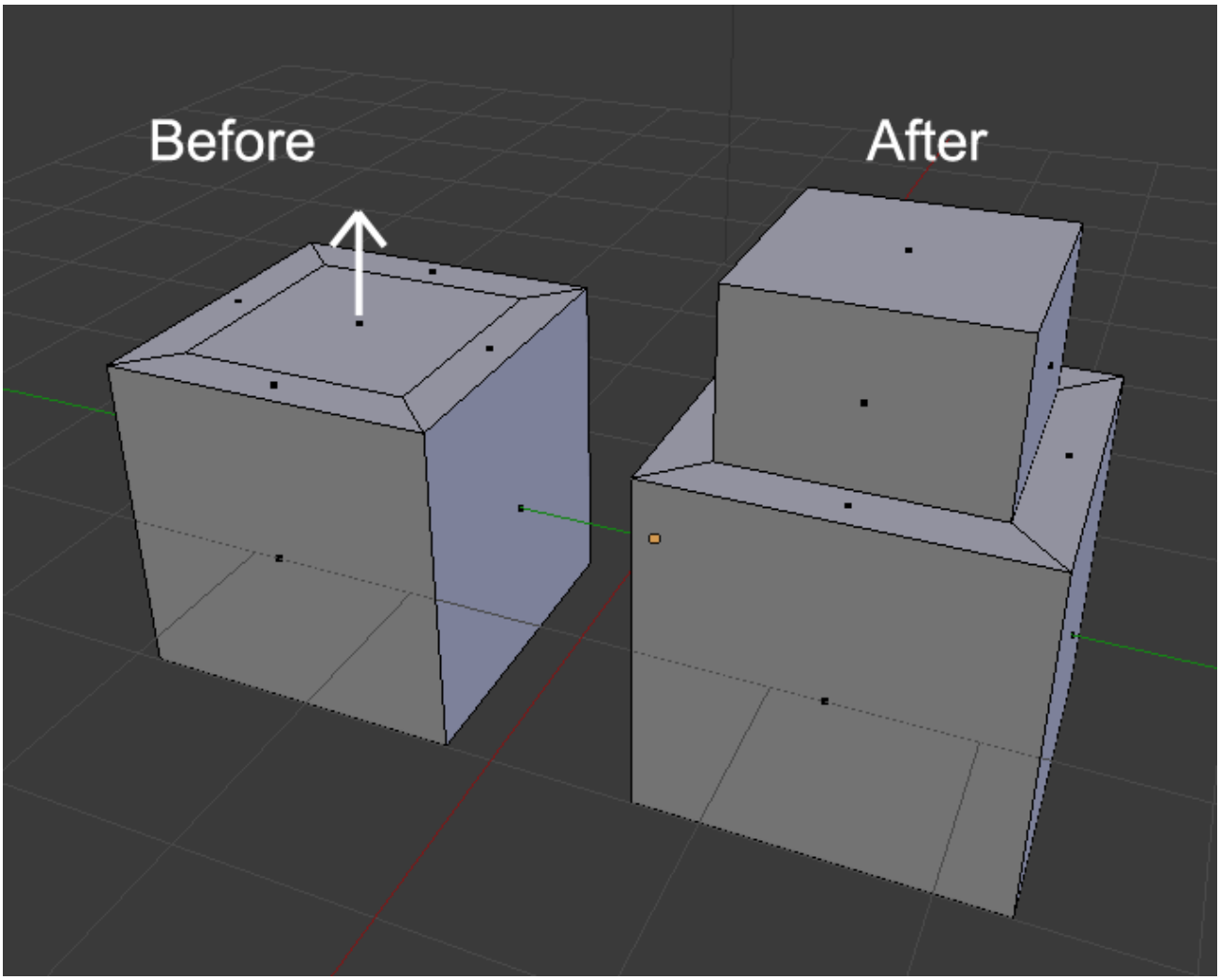
The cylinder located at the cursor position (center of the world) that we will use as a base for the head of the robot.

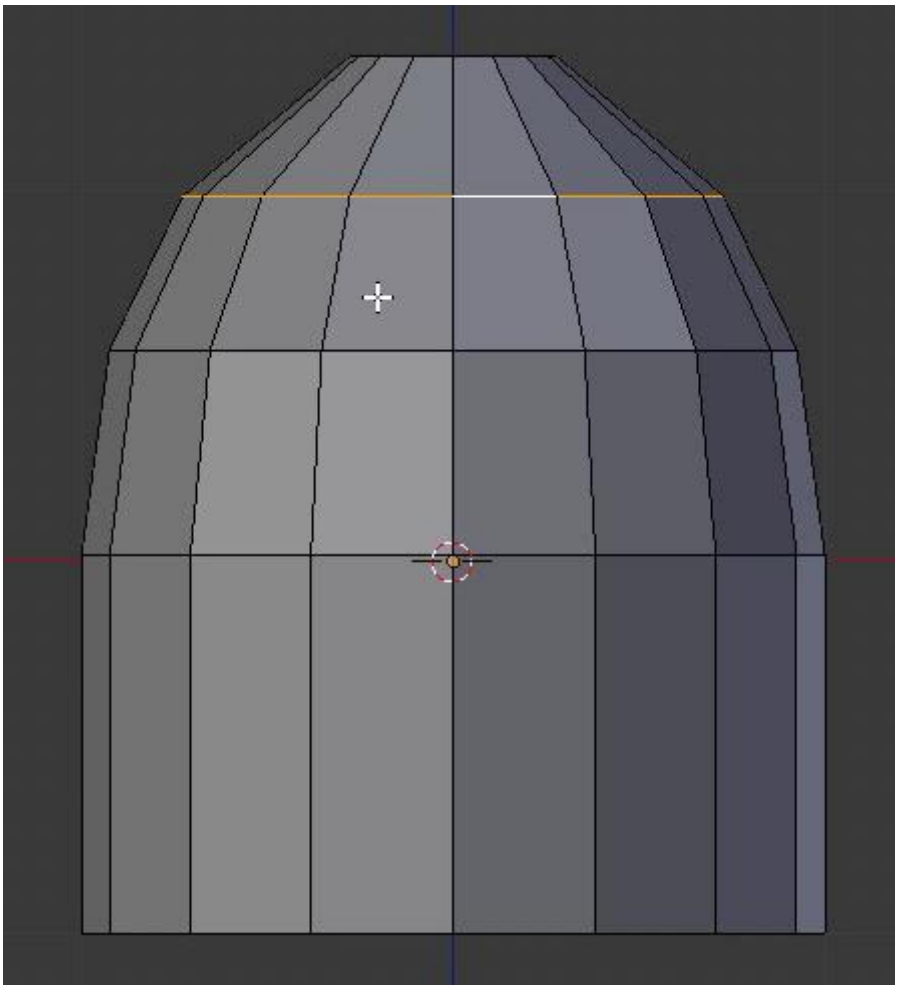
The Edit Mode versus the Object Mode

The top face moved down in the Edit Mode with the Z axis of the Gizmo tool or by pressing the G + Z shortcut.

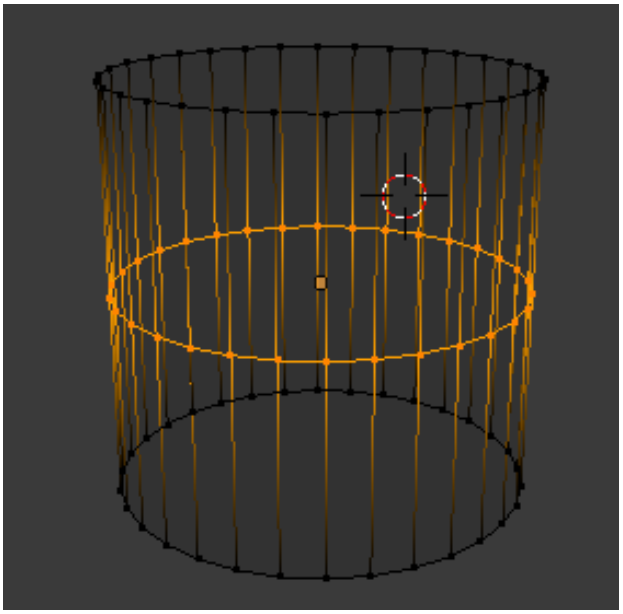
Using the basic modeling tools

Modeling the head

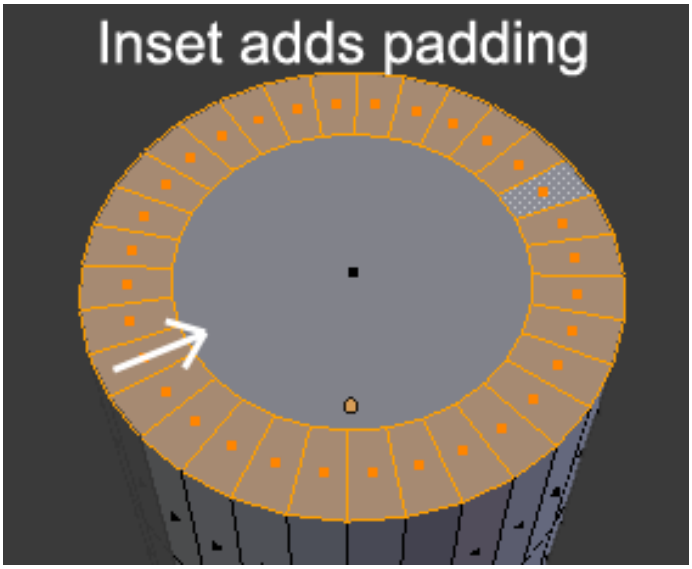


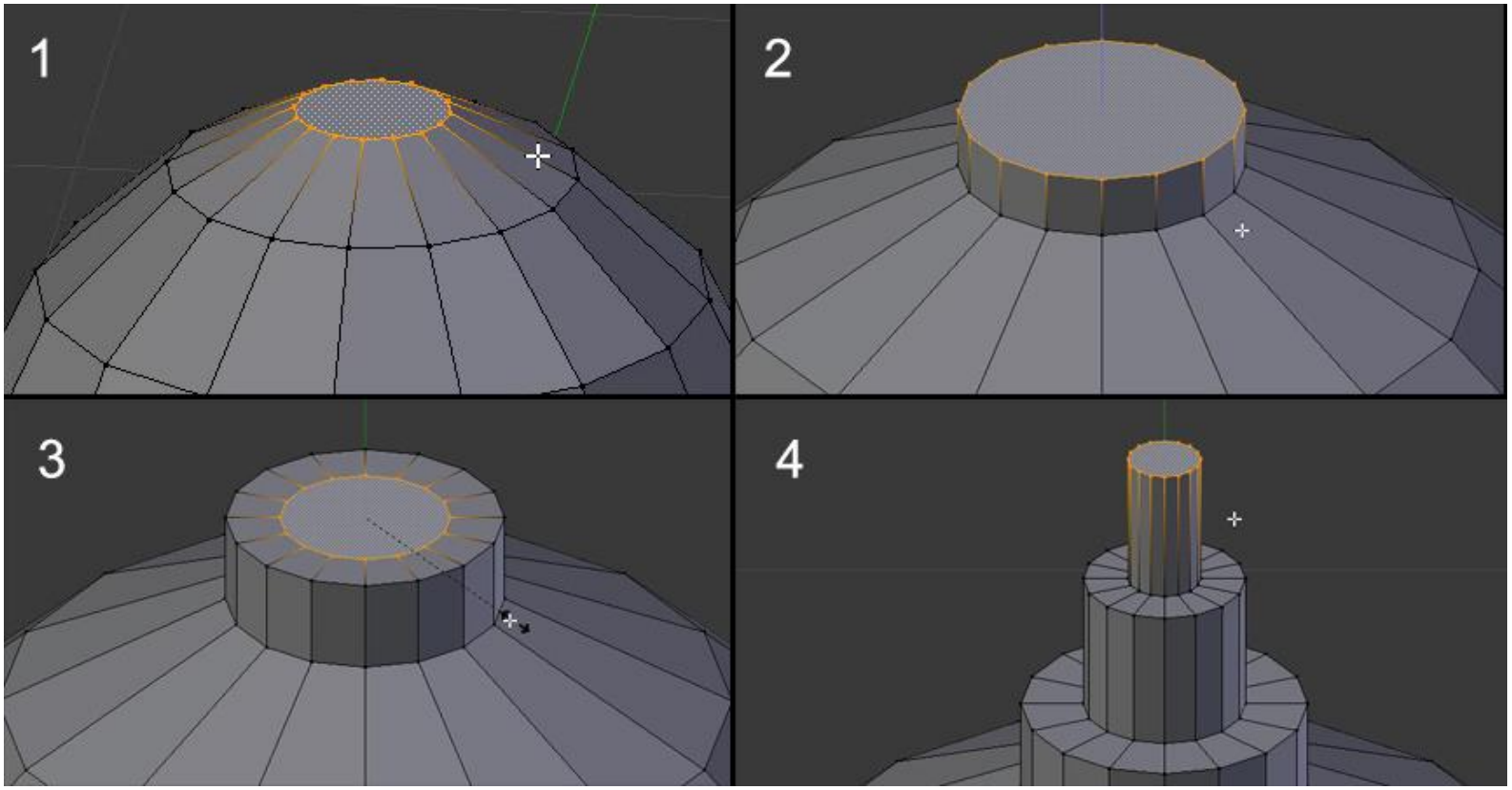


Shaping of the head with extrusions.

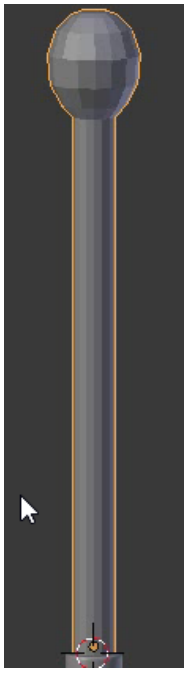


Modeling the antenna

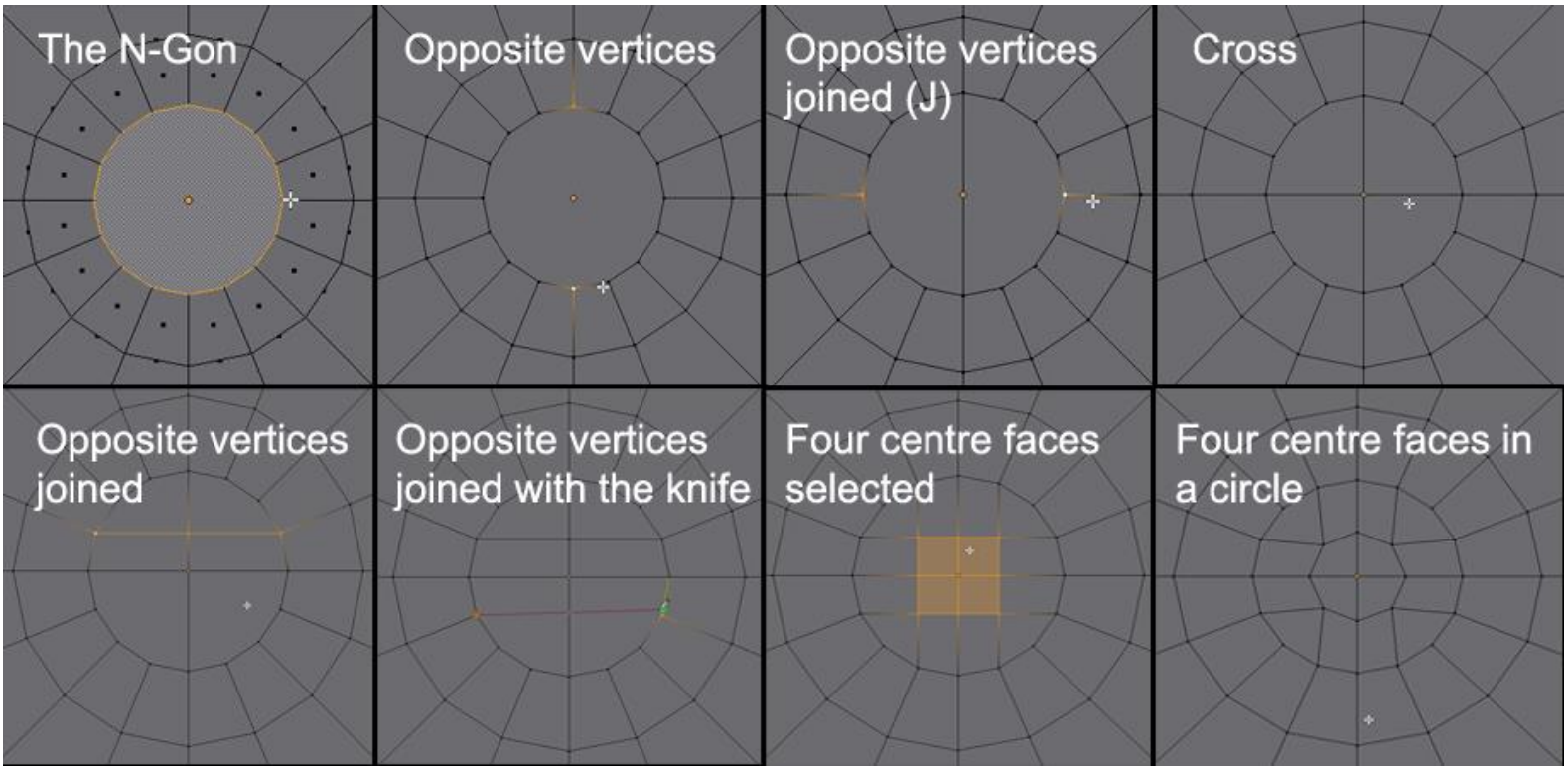




The different steps to model the base of the antenna. Succession of insets and extrusions.

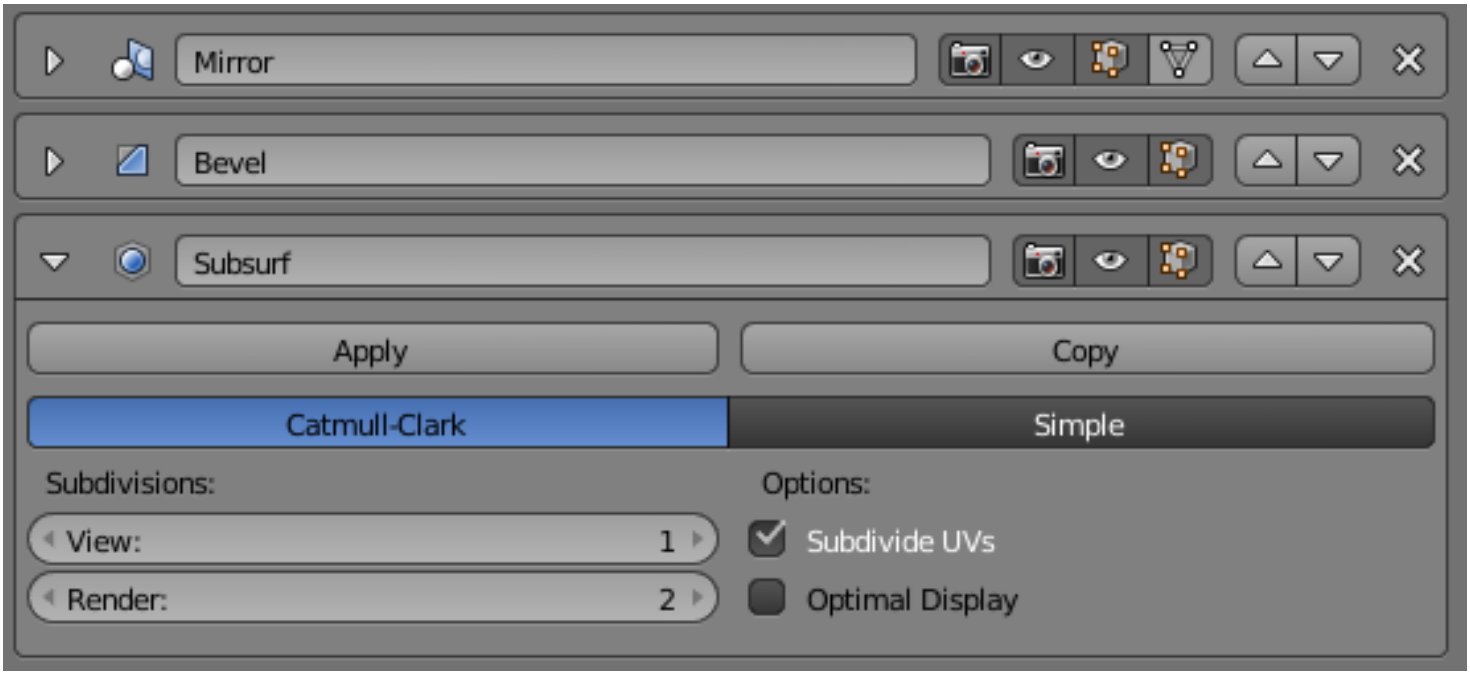


The stem with the different extrusions that we have shaped like a sphere with the smooth tool

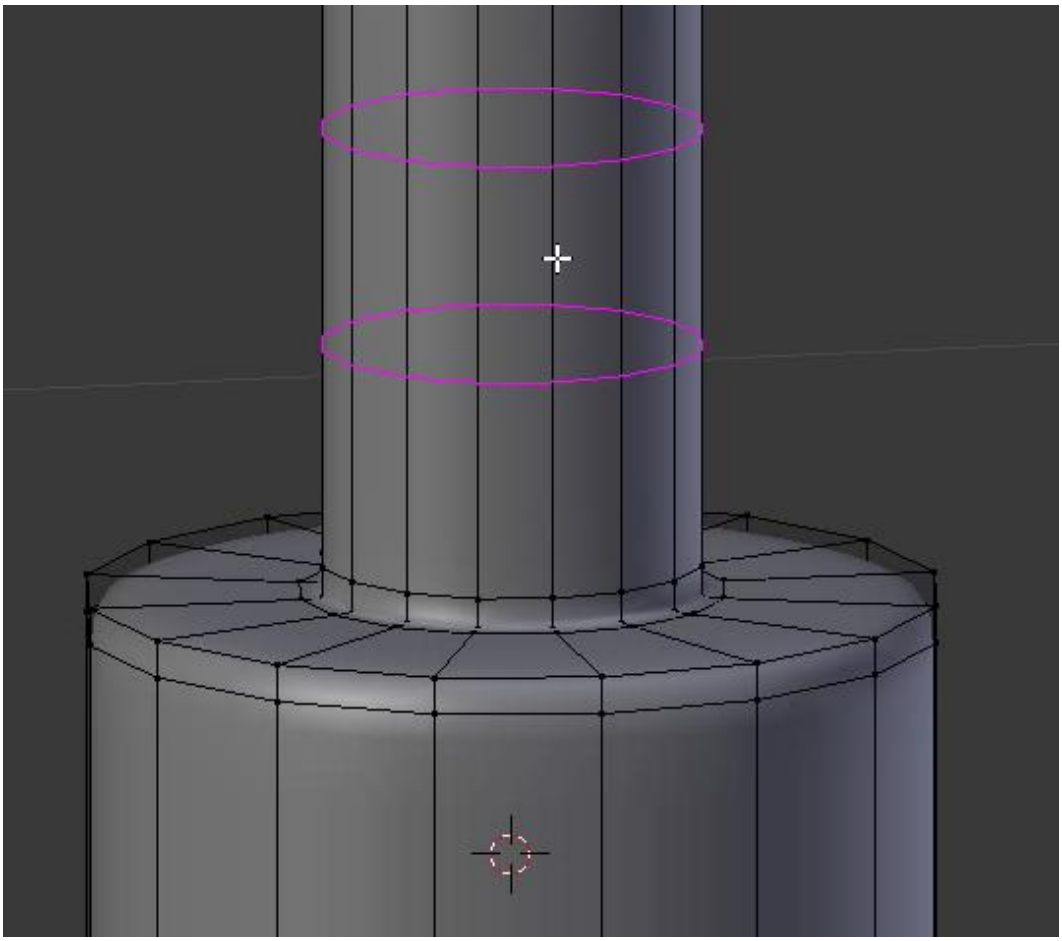


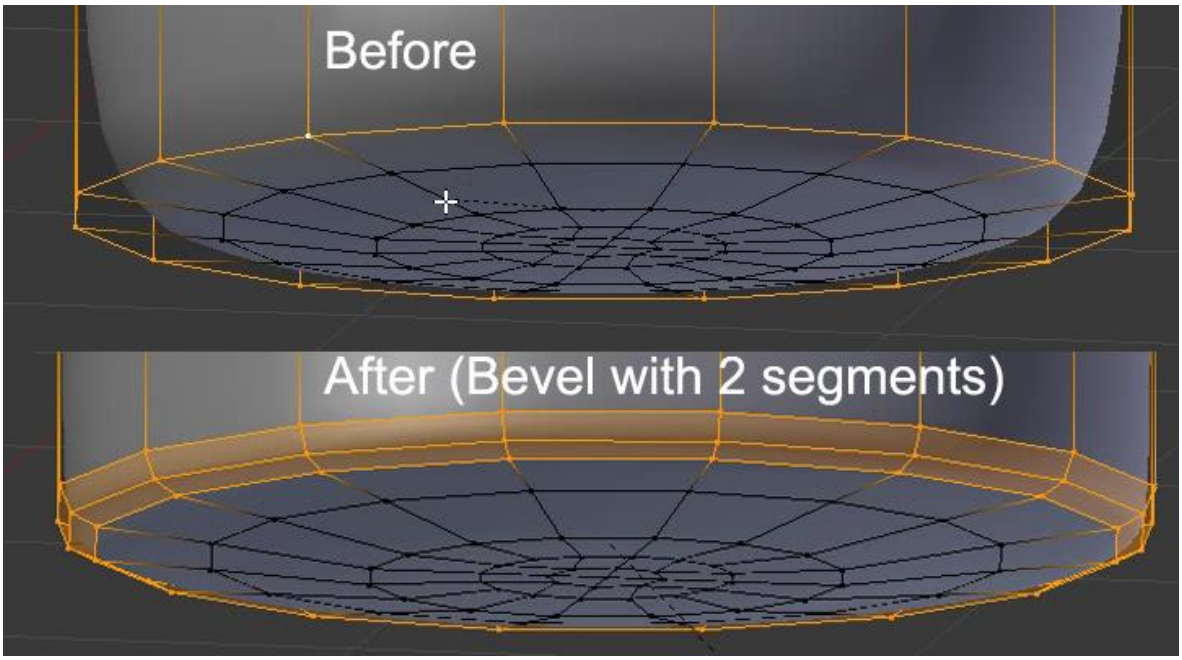
N-Gon Correction with the Join tool and the Knife

An introduction to the Subdivision Surface modifier

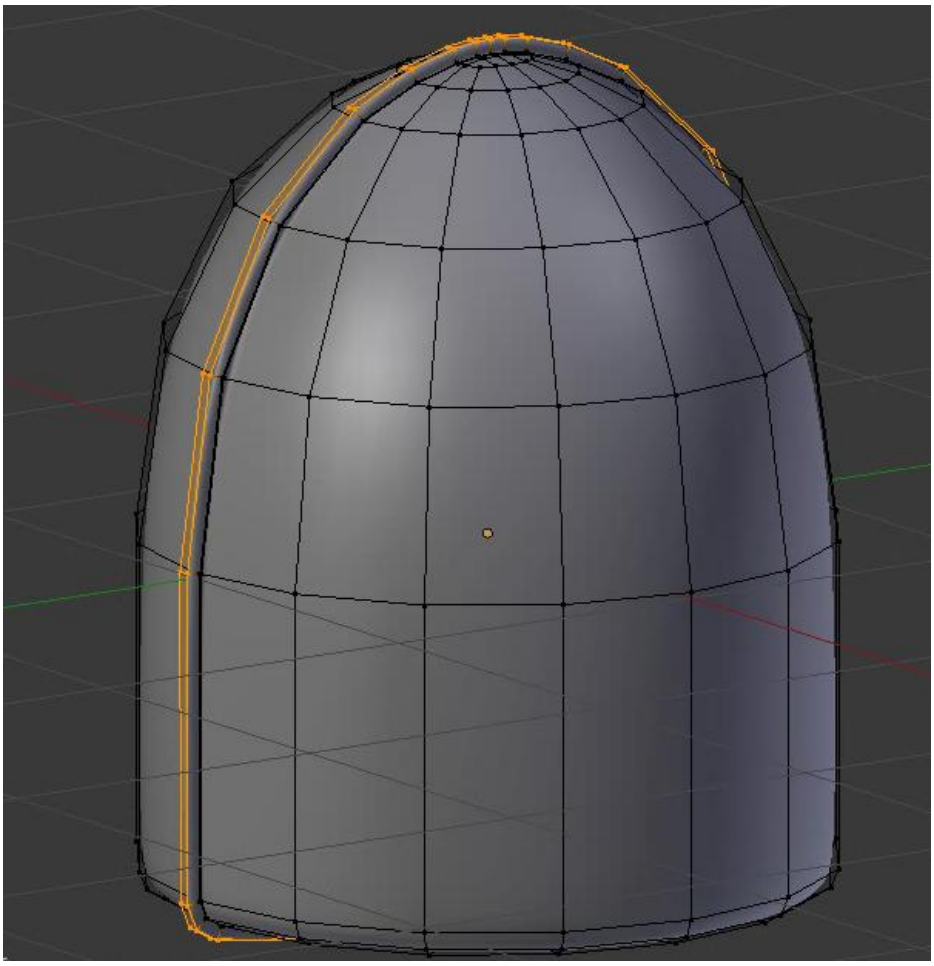


The stack of three modifiers of an object. The Subdivision surface applies over the Mirror and the Bevel modifier.



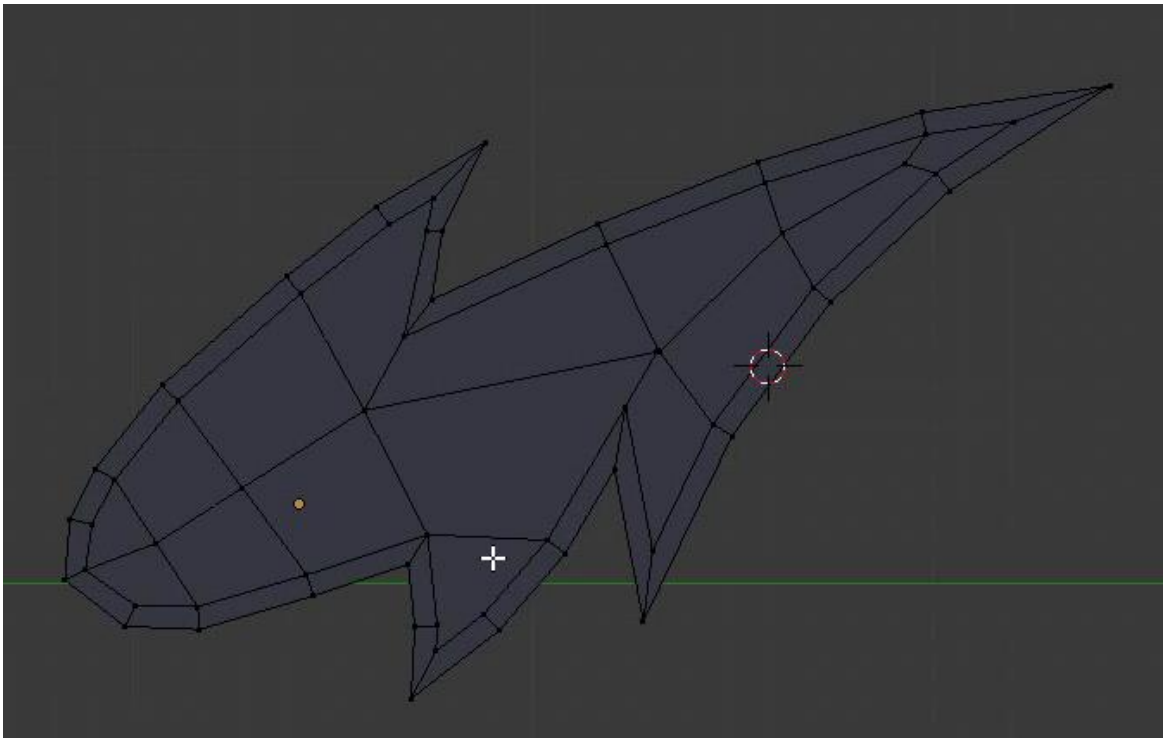


Improving the head shape

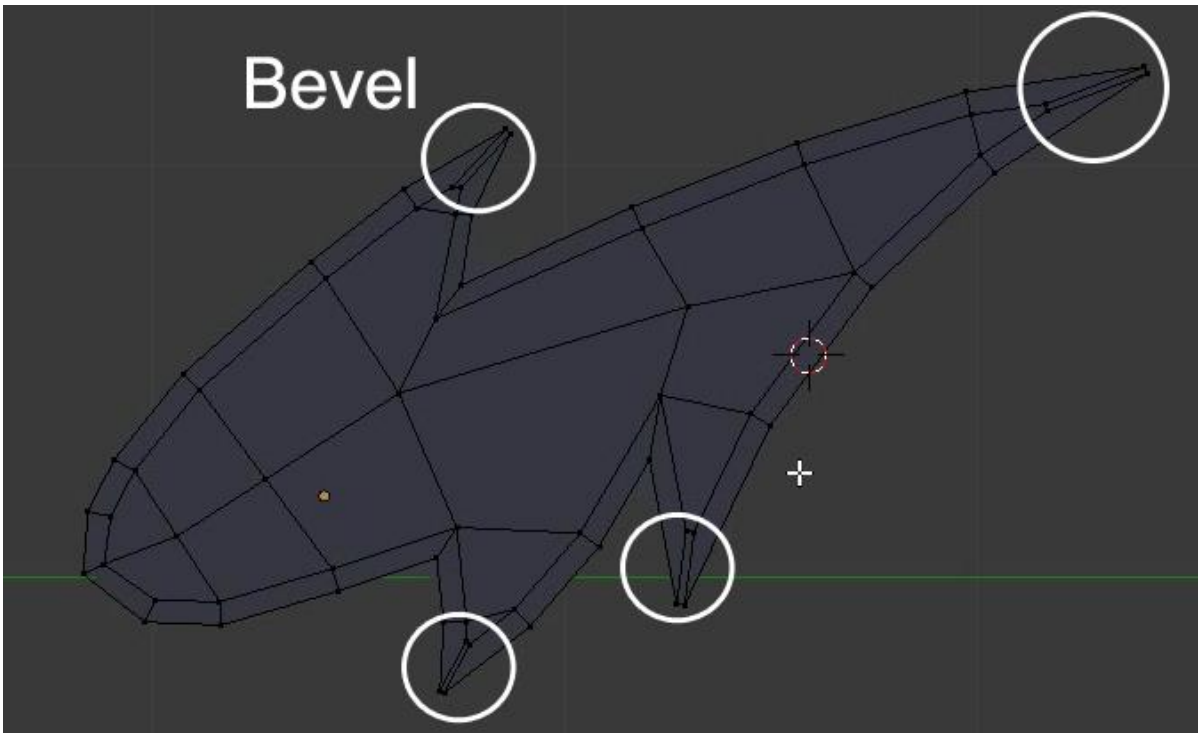


The head shape without the antenna.

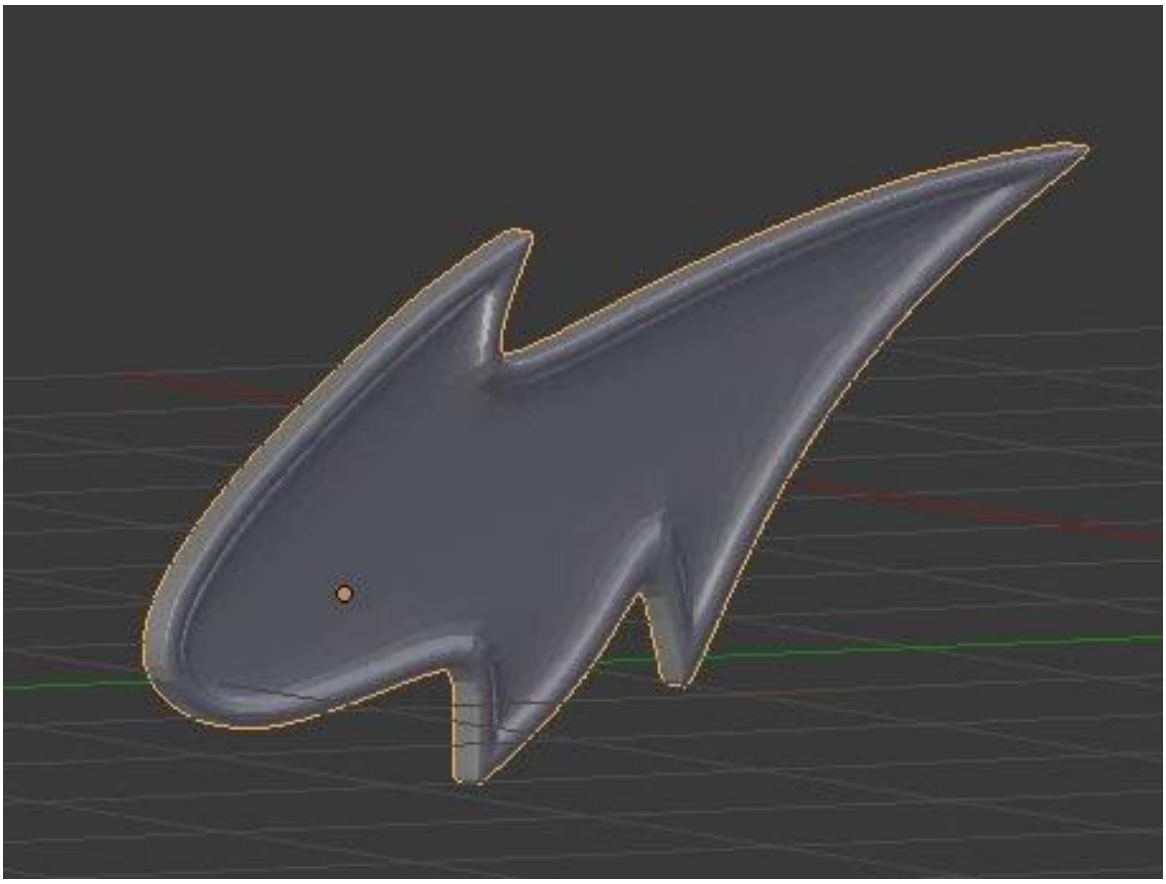
Modeling the thunderbolts



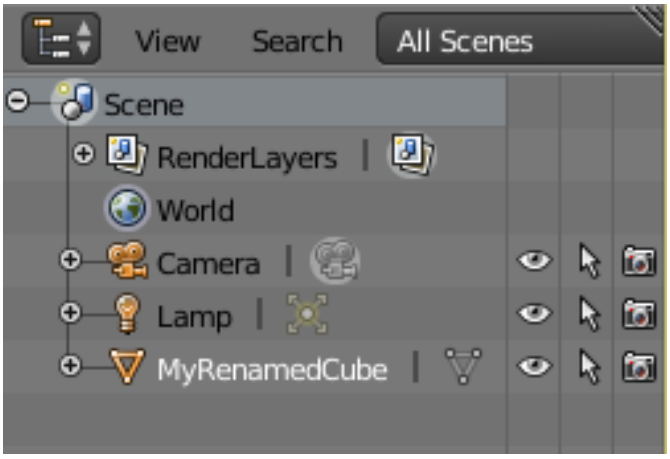
The thunderbolt shape.



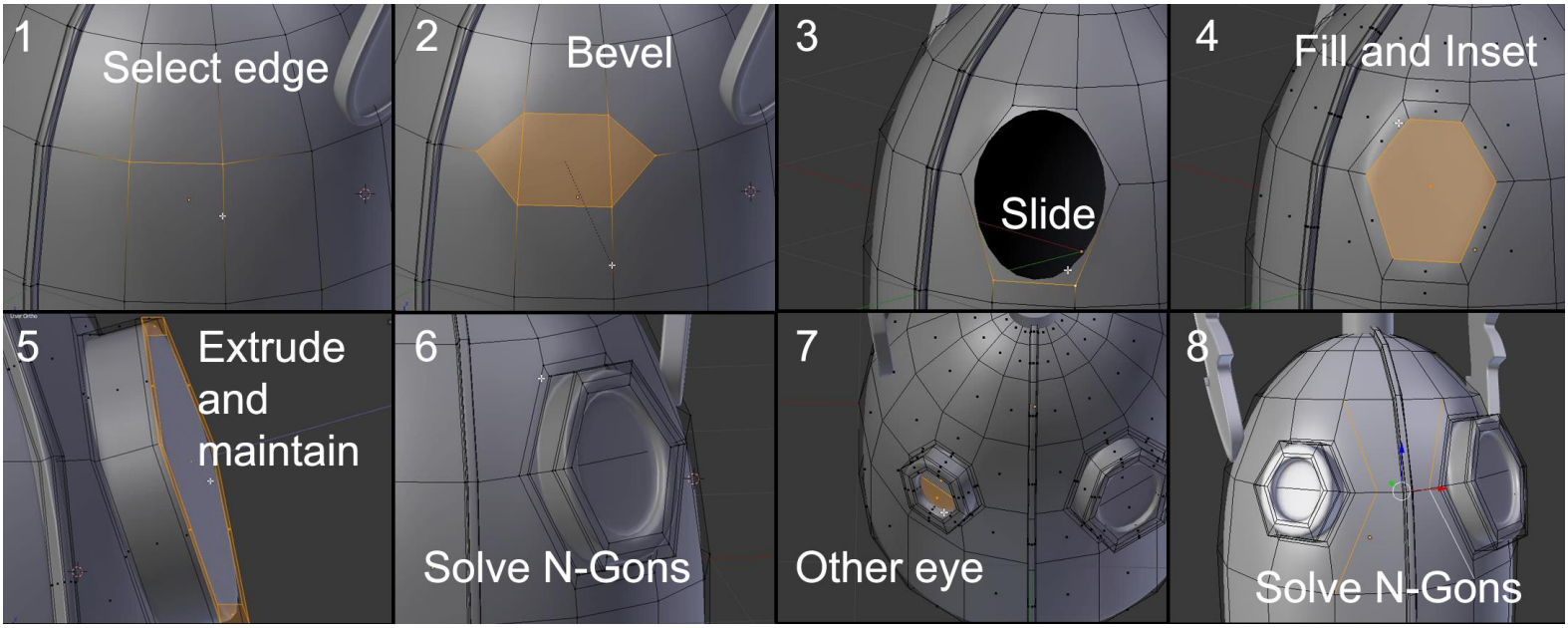
Maintaining the spikes with bevels.



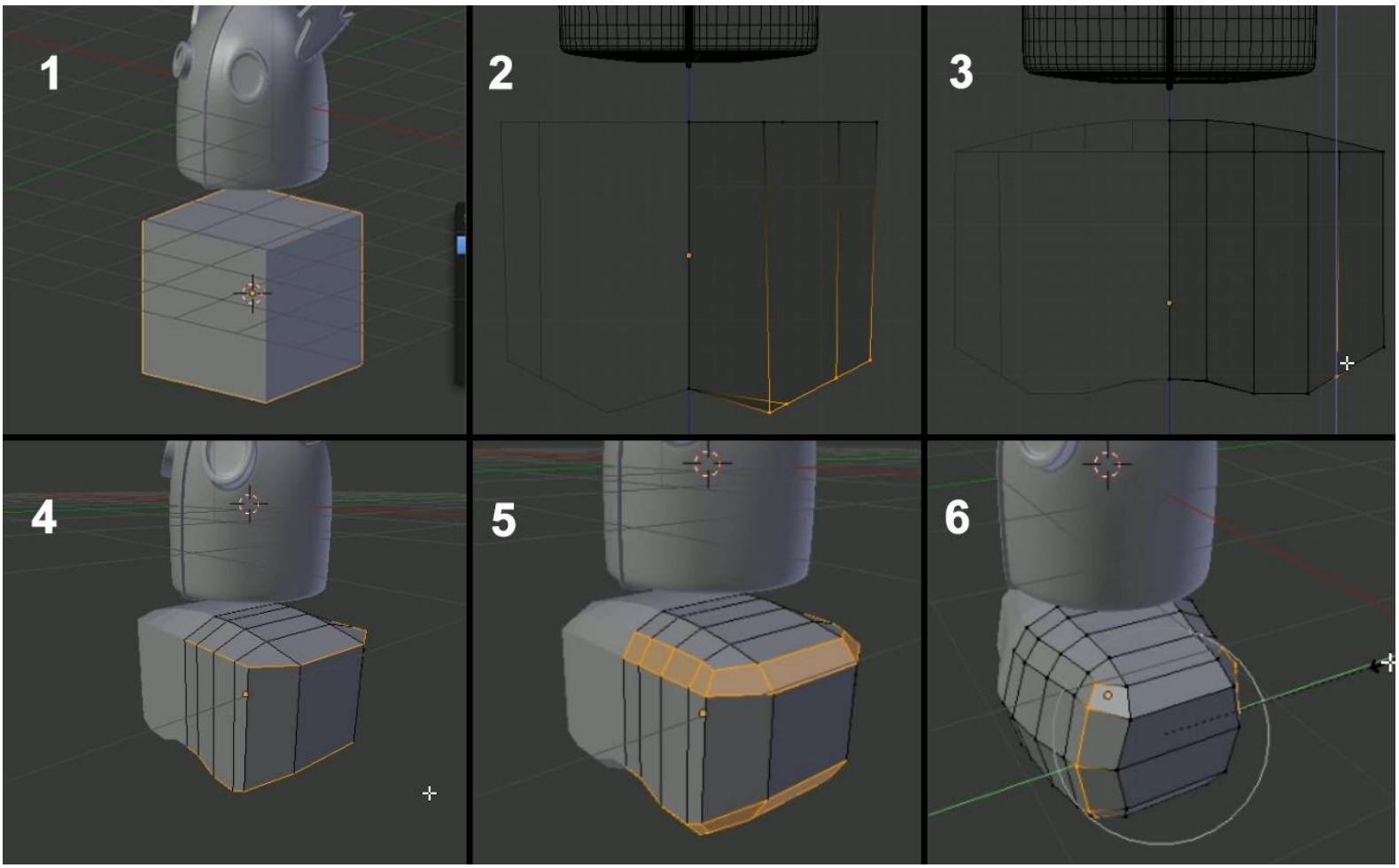
The finished thunderbolt with a view 2 subdivision surface.

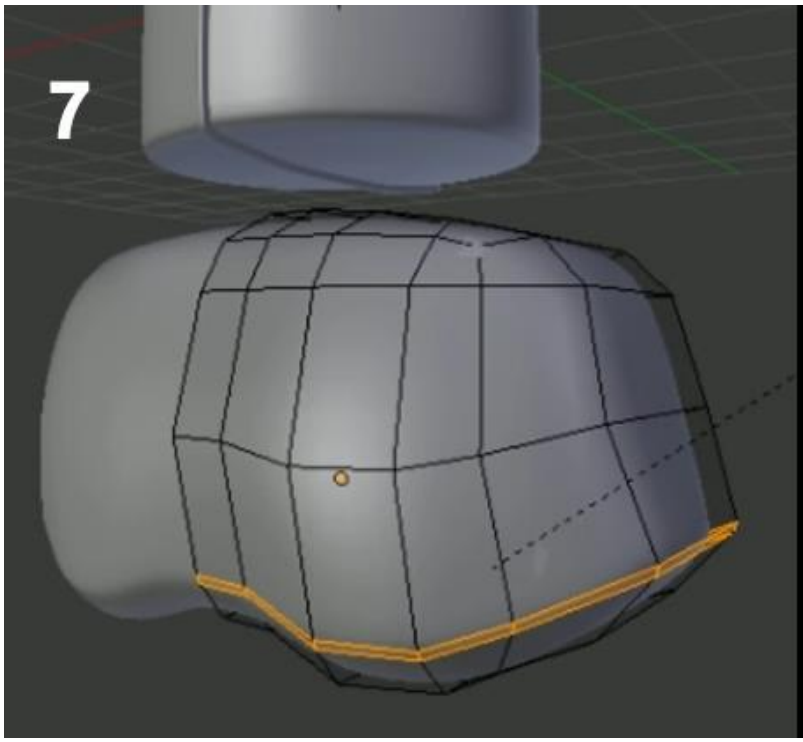


Modeling the eyes



The modeling of the chest

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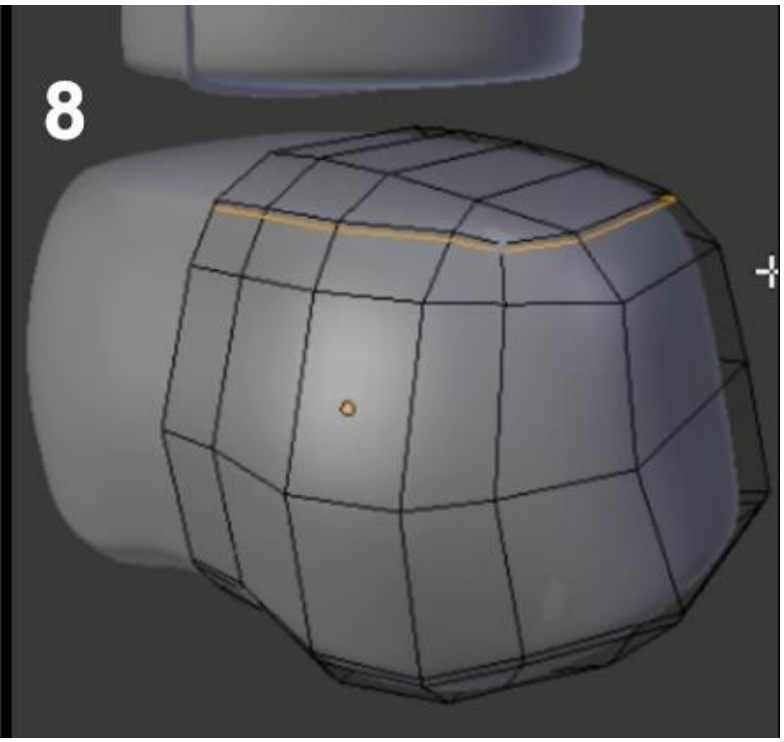
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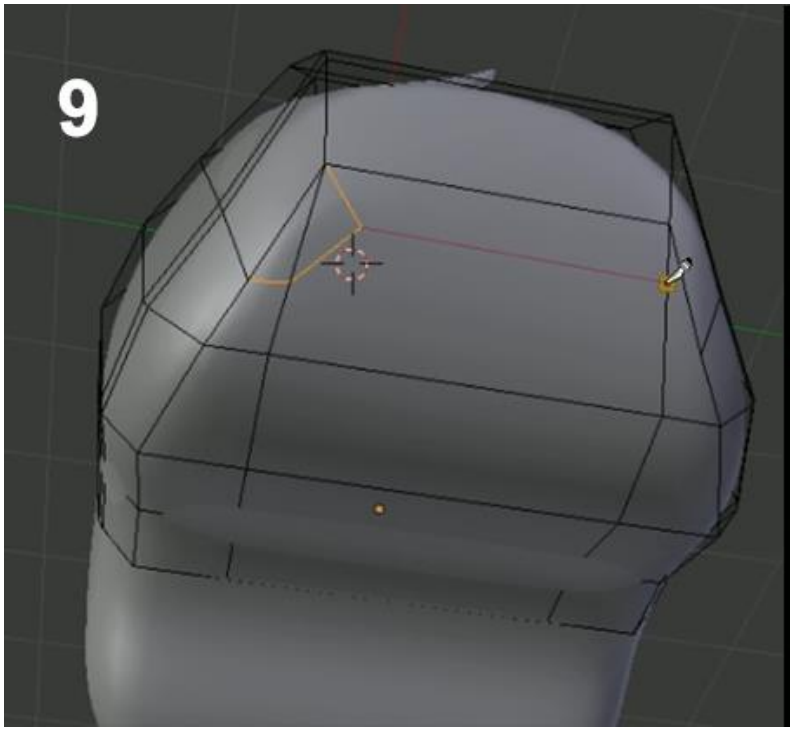
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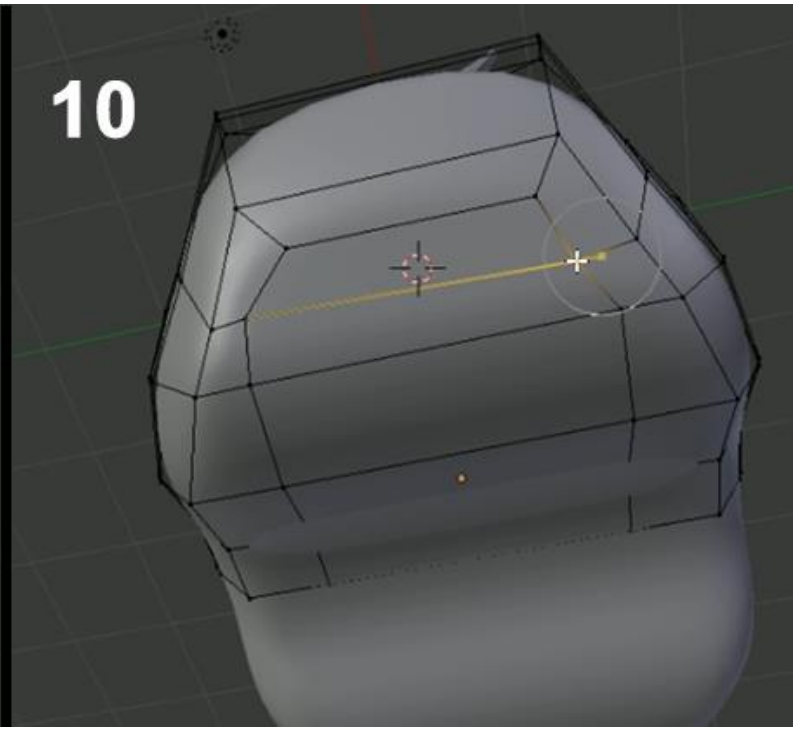
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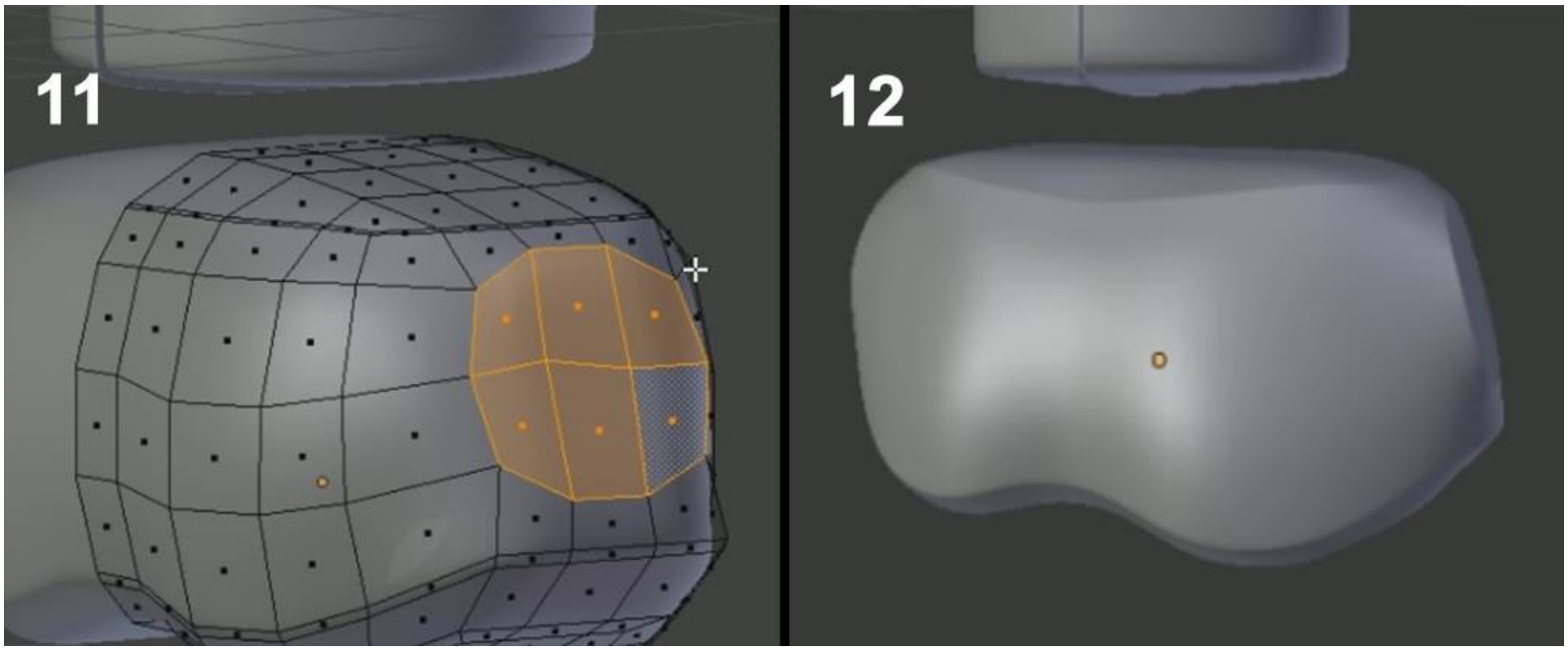
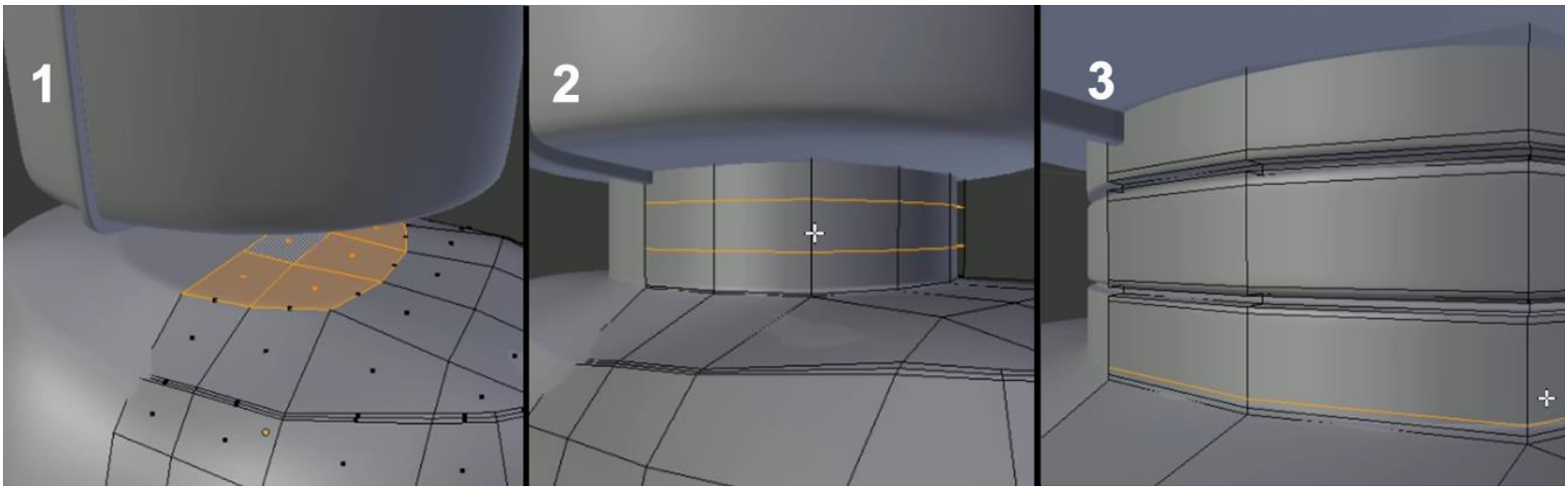
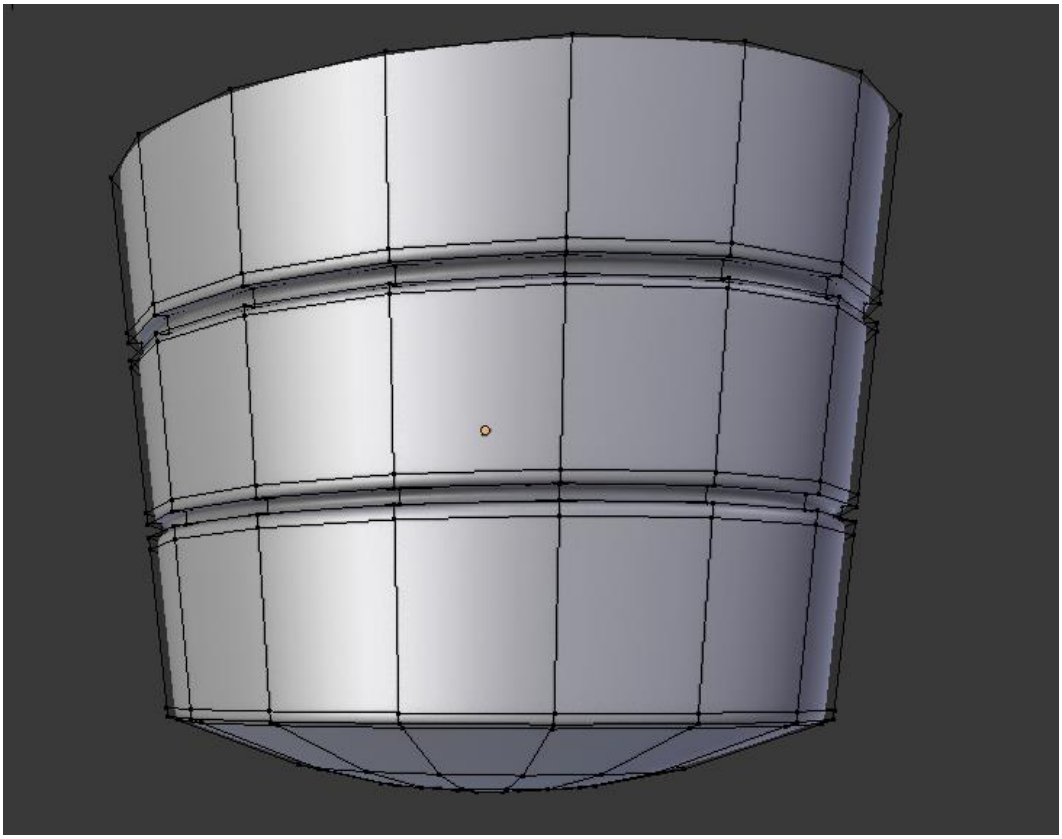


The modeling of the neck

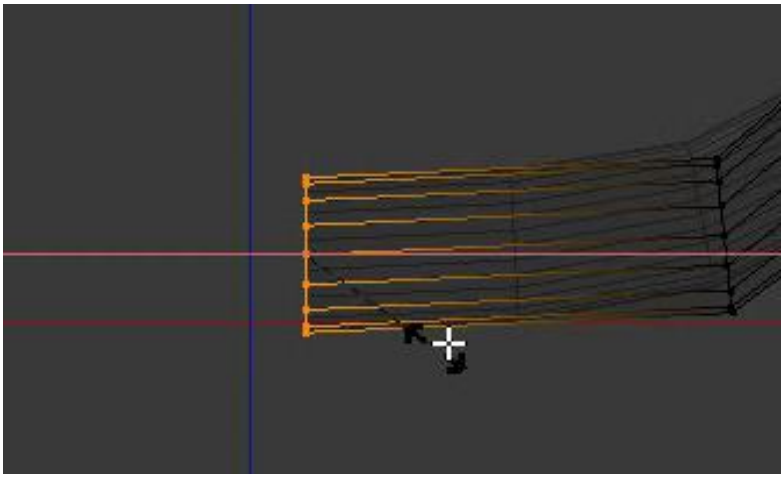


Modeling the torso

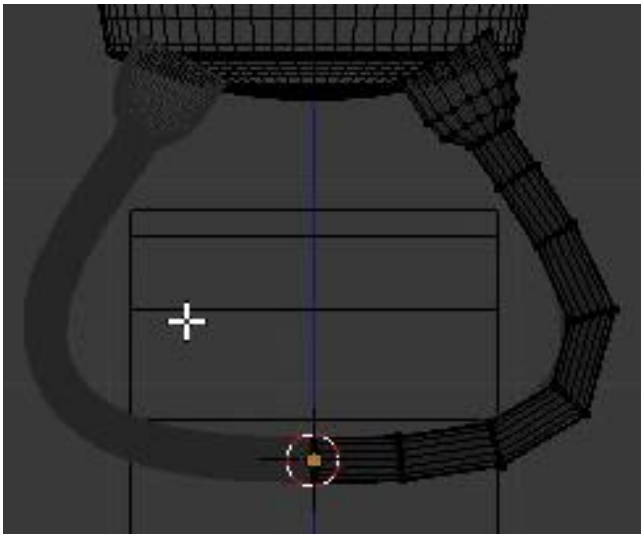


The modeling of the buttons

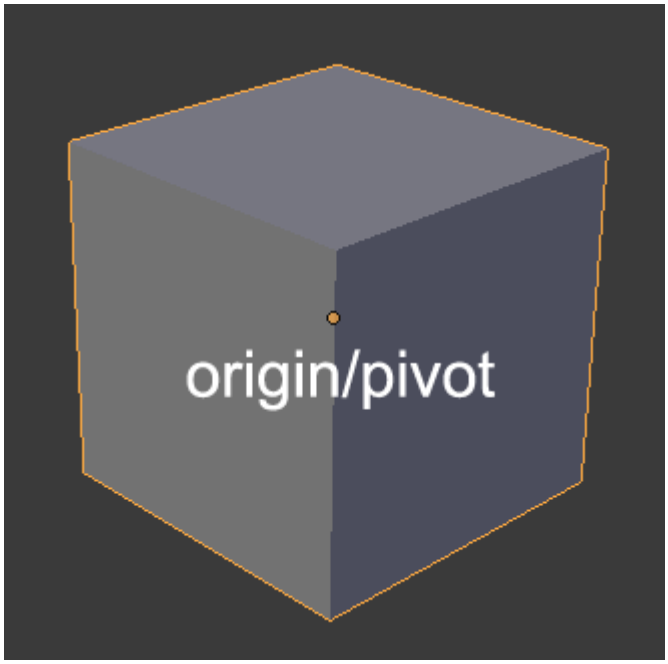
Modeling the fork



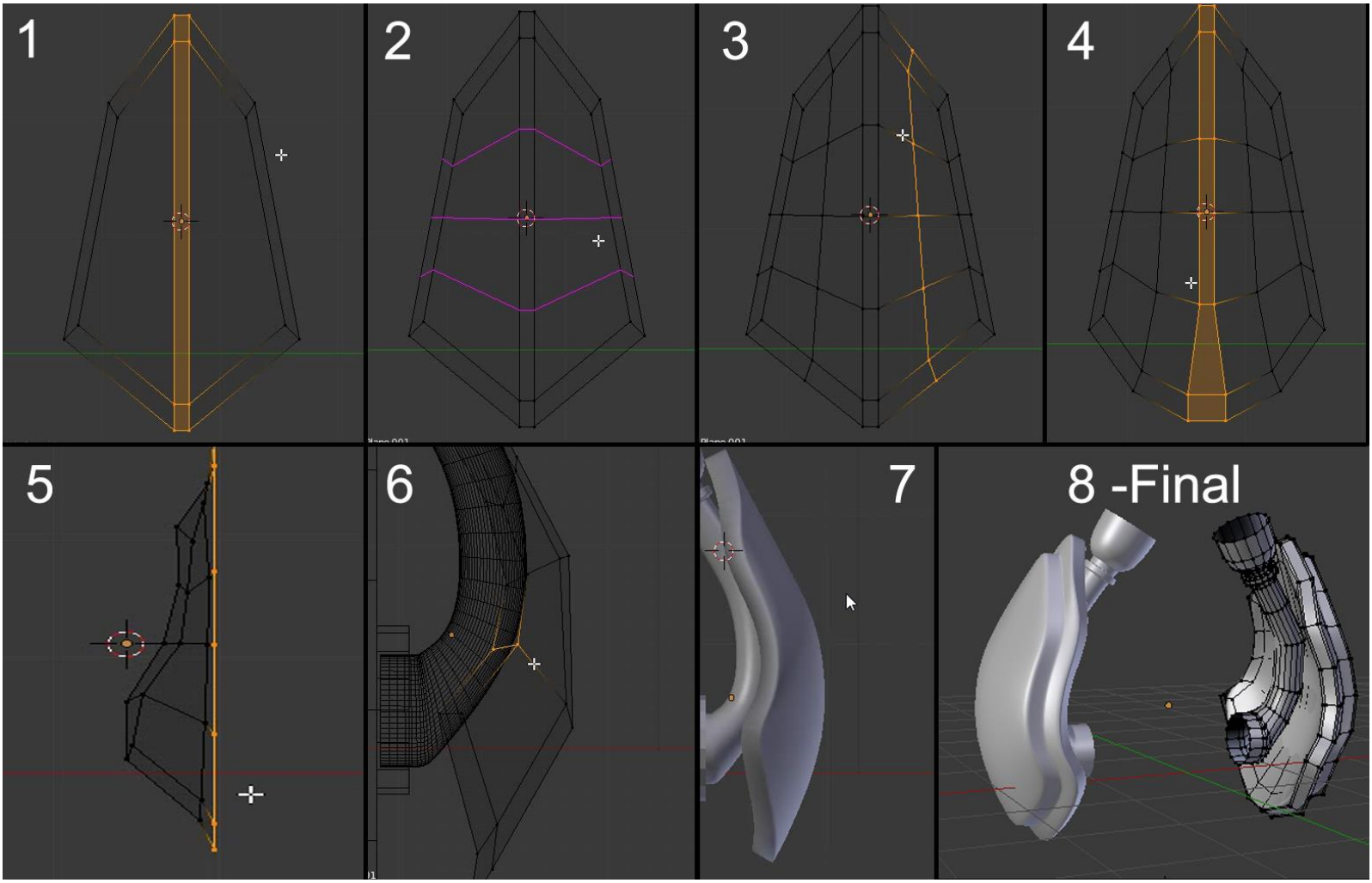
Flat the last (inner) edge loop.



The fork in the Edit Mode, with its mirror modifier and the temporary wheel.

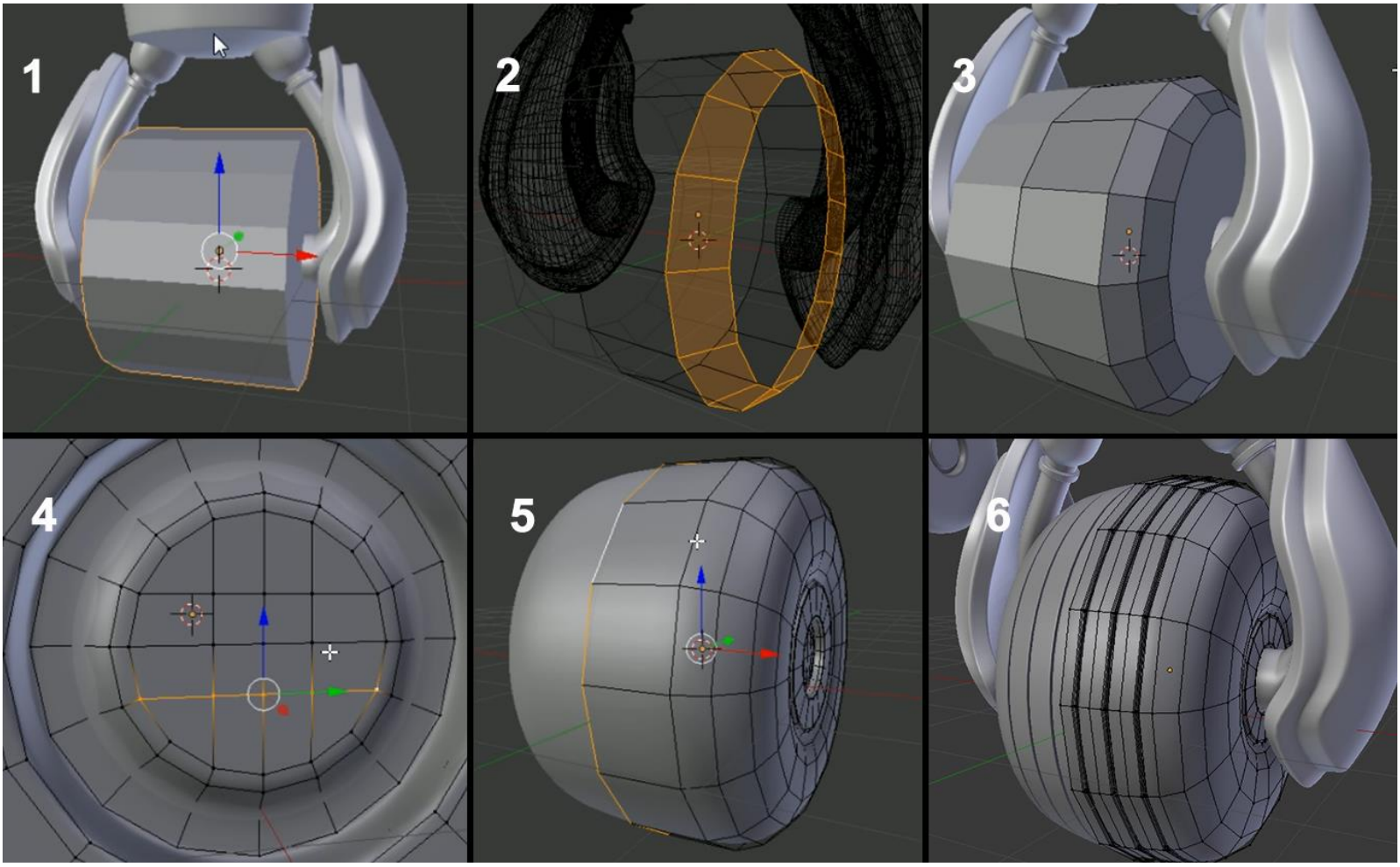


Modeling protections for the fork

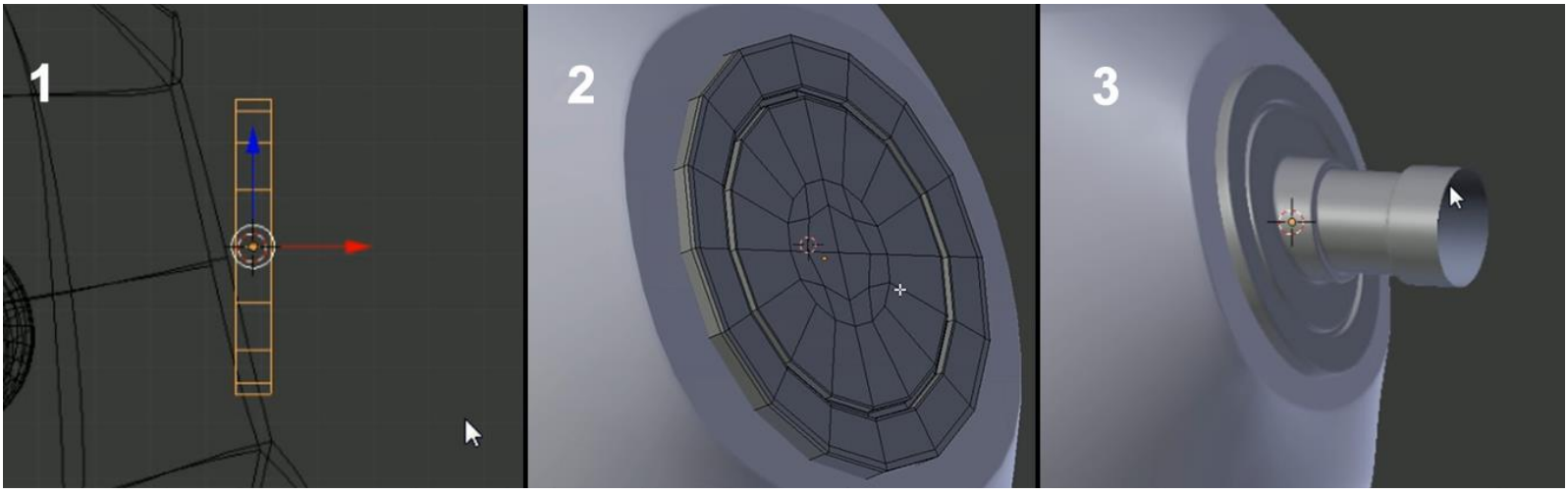


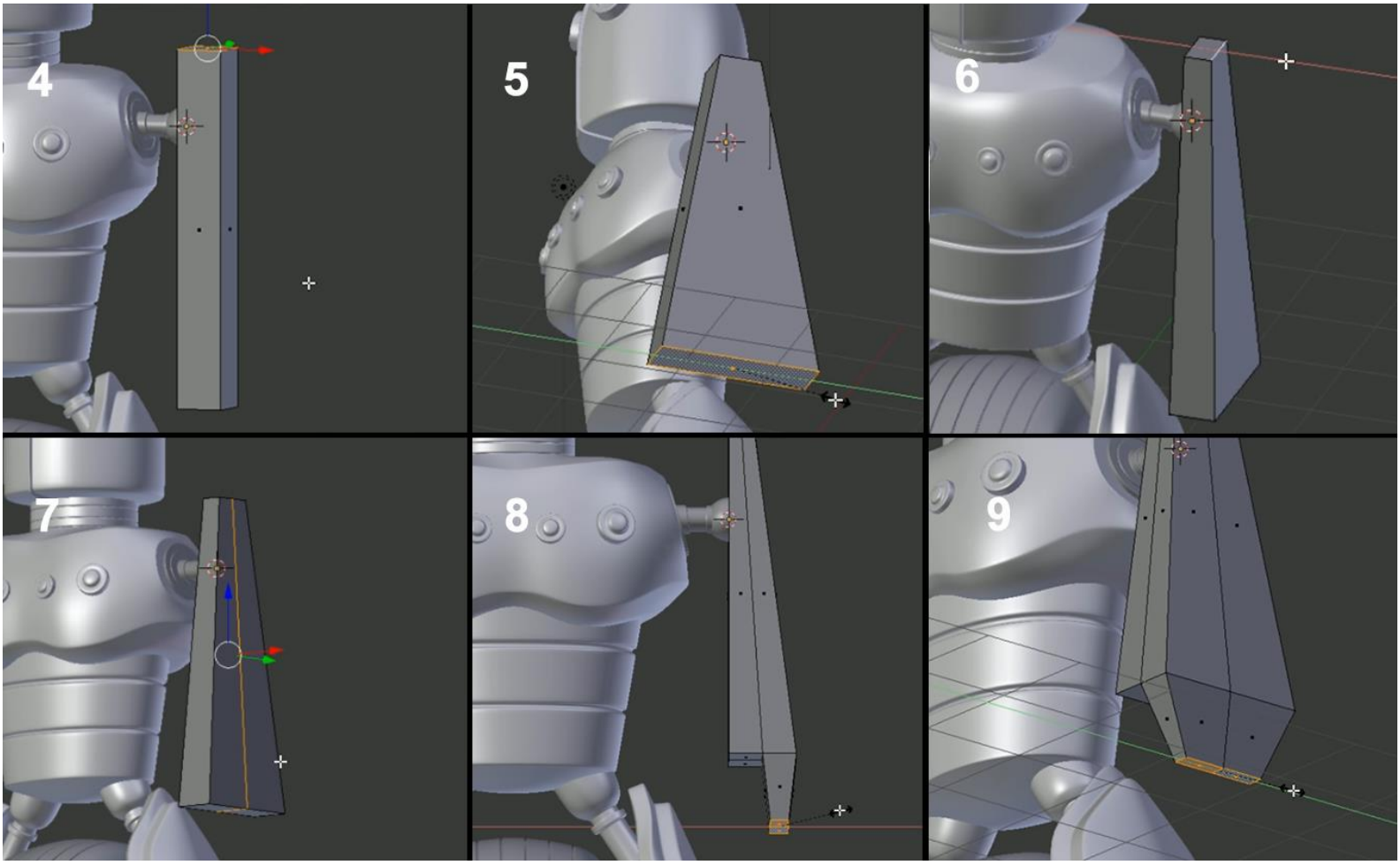
The process of modeling the protections and the final result with the fork.

The modeling of the main wheel



The modeling of the arm

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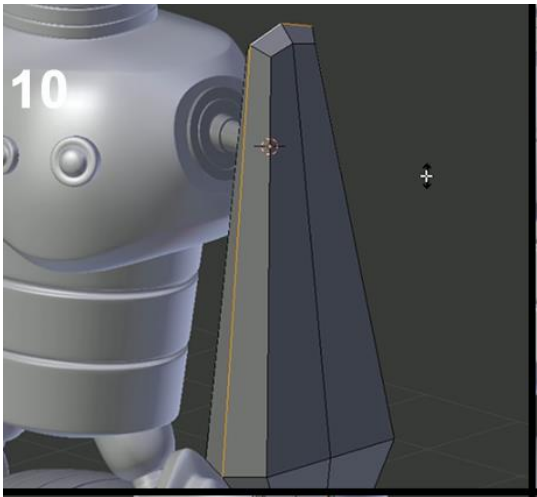
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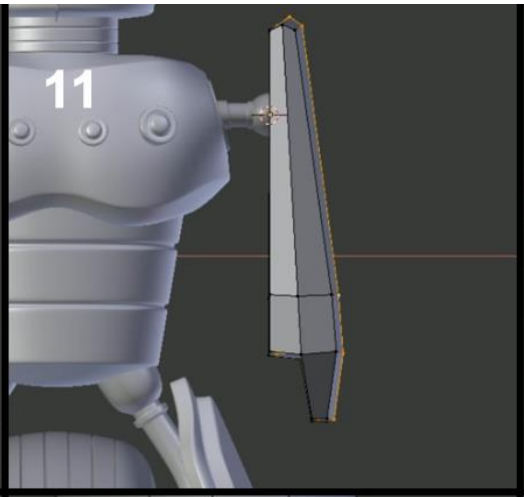
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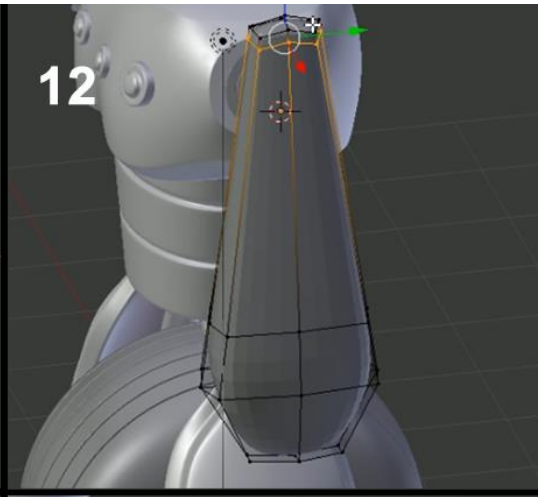
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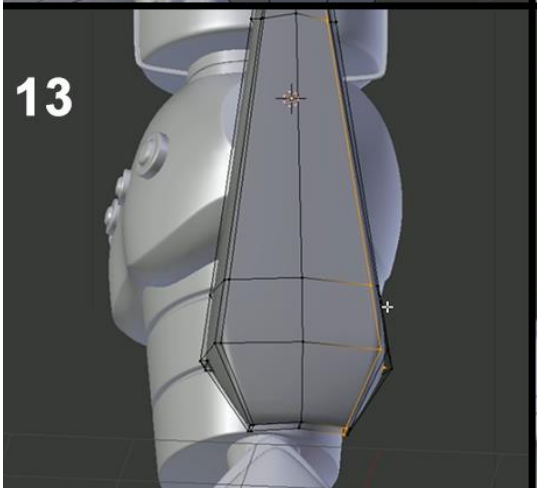
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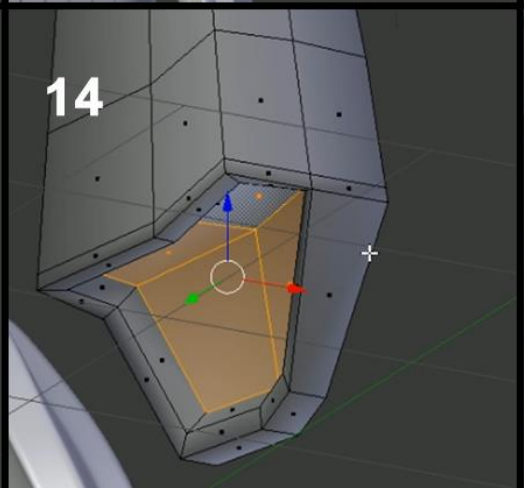
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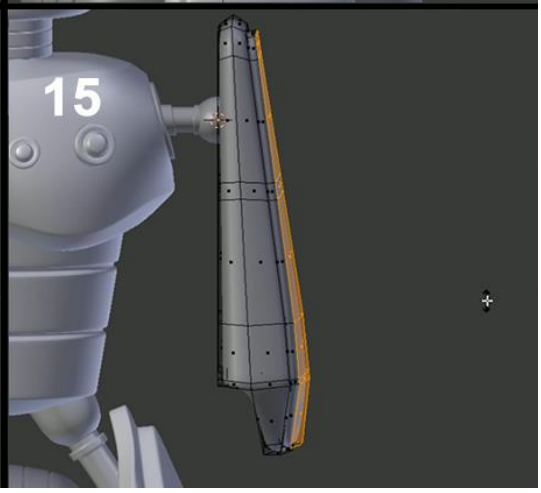
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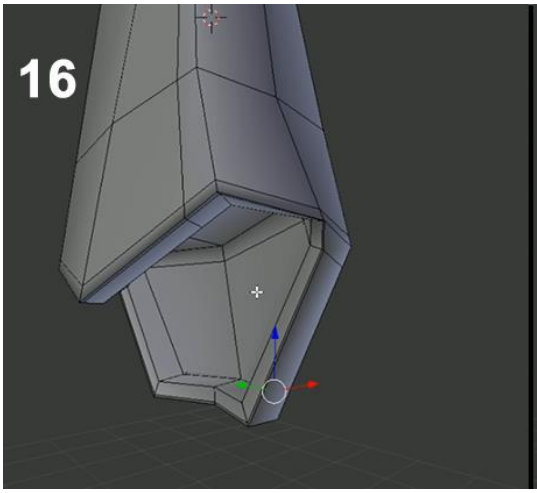
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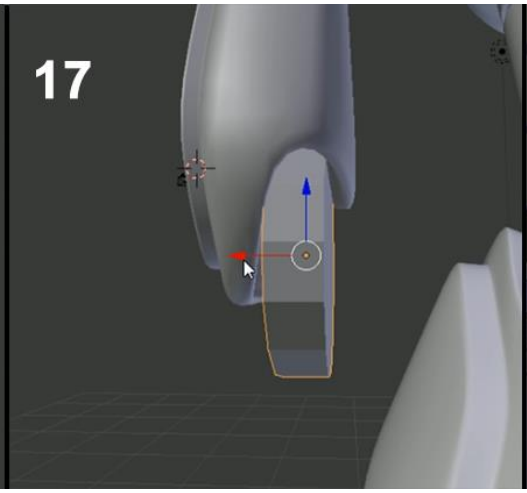
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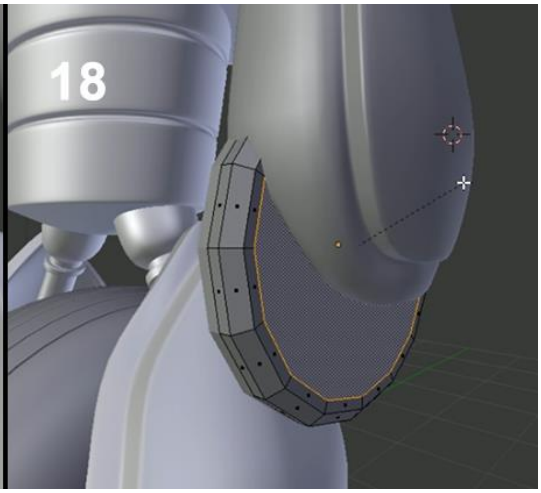
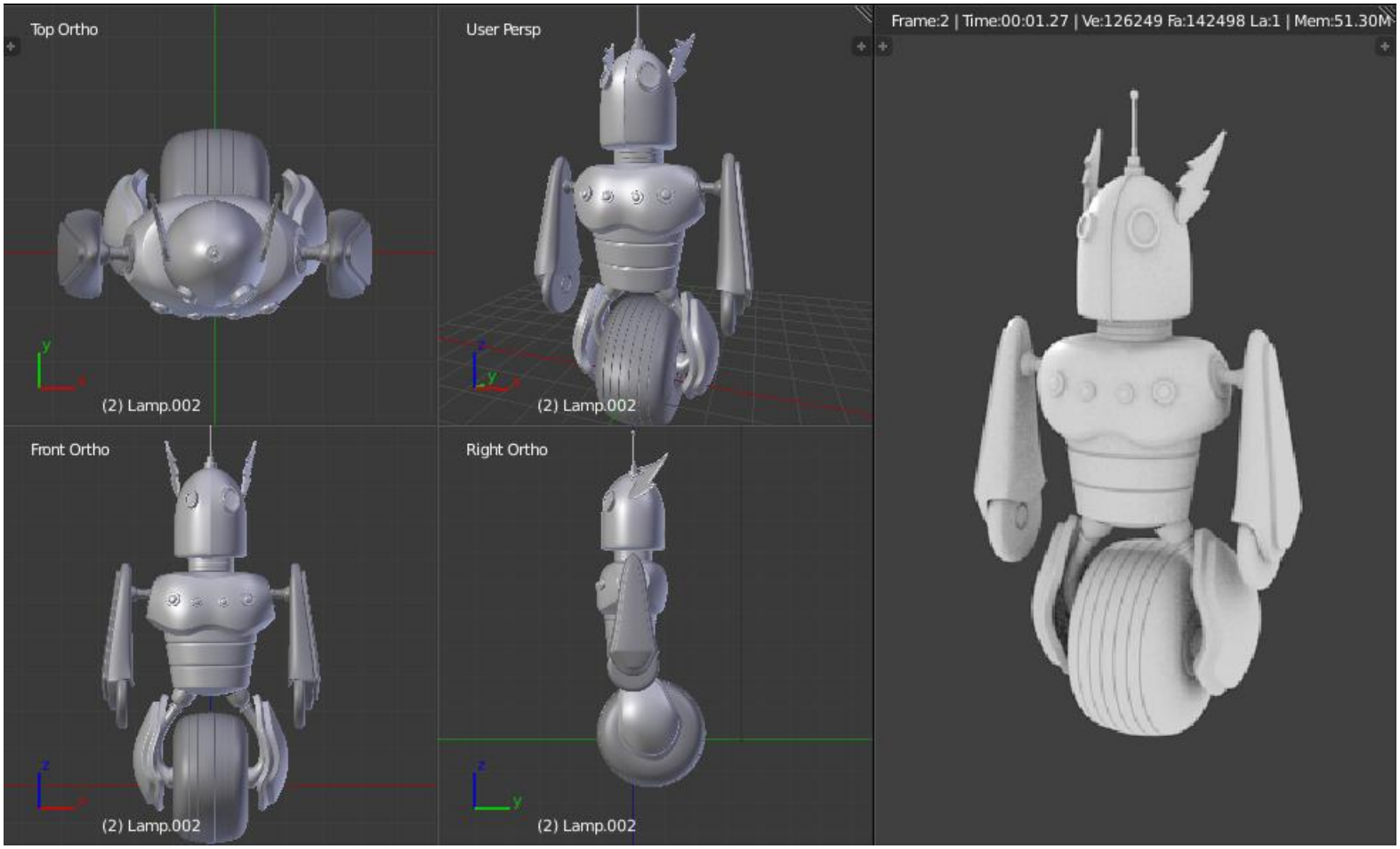
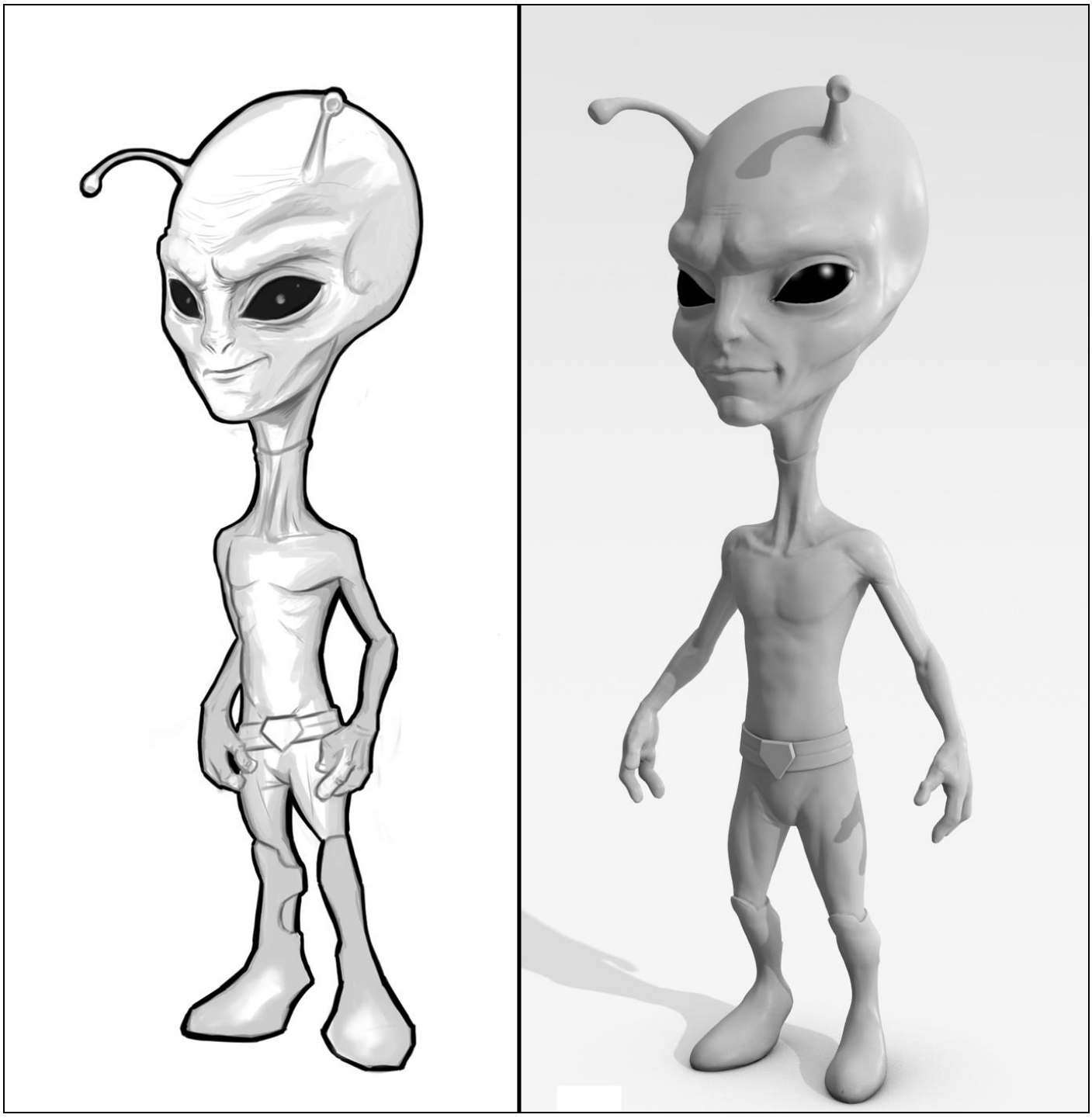

18

Using Blender Internal to render our Robot



3

Alien Character – Base Mesh Creation and Sculpting

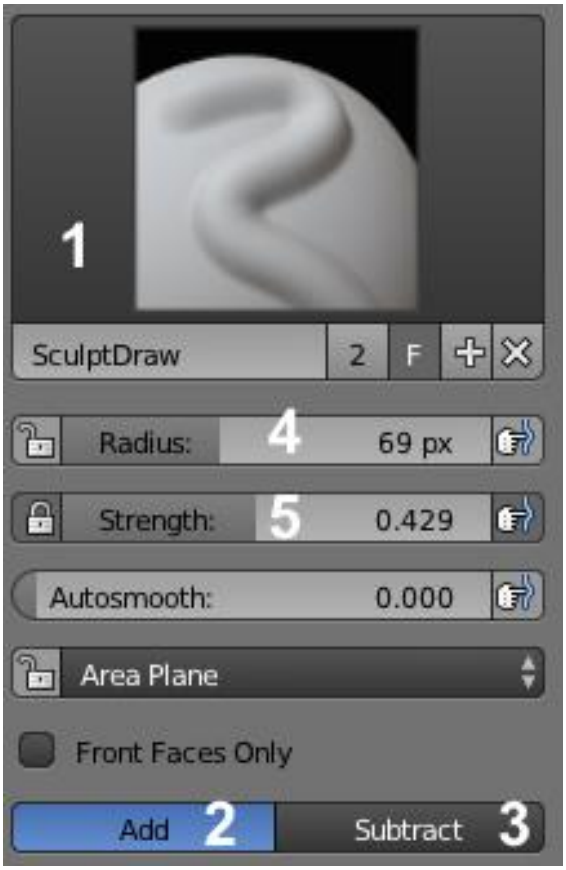


Choosing sculpting over poly modeling

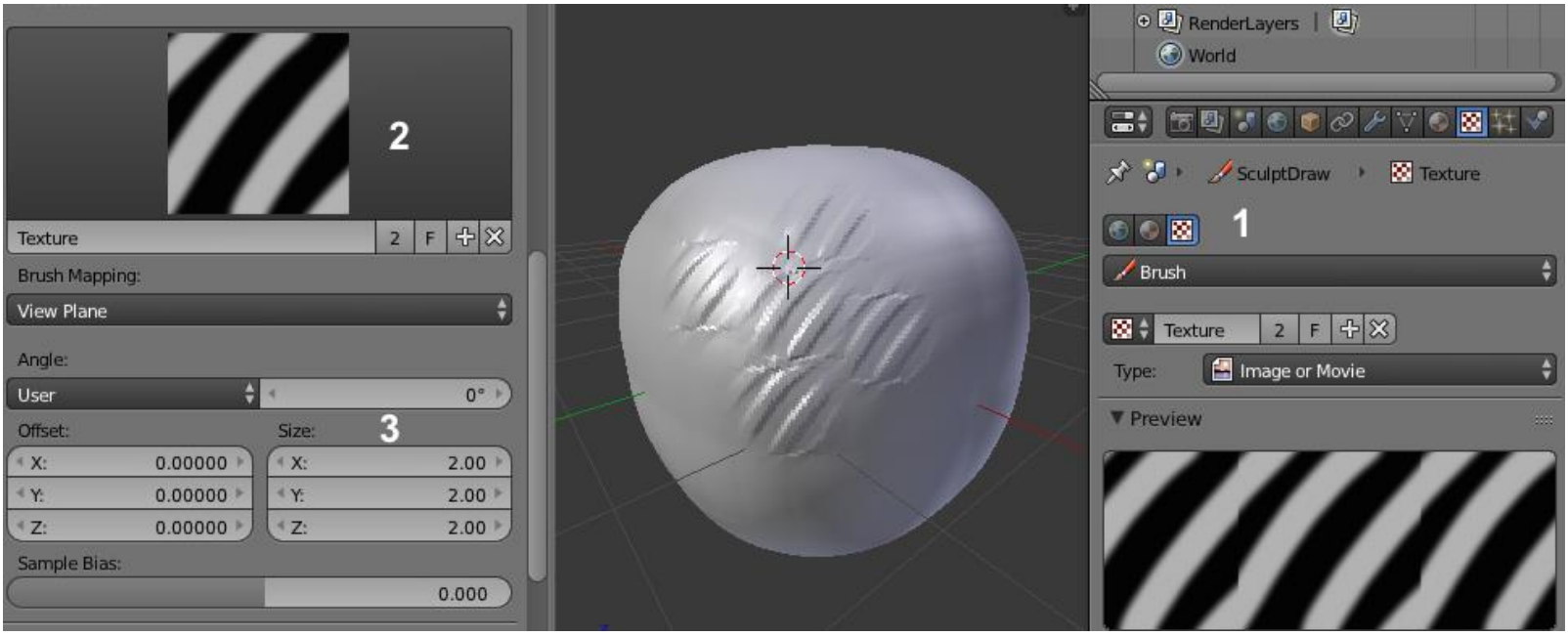
Using a pen tablet

A pen tablet with its stylus

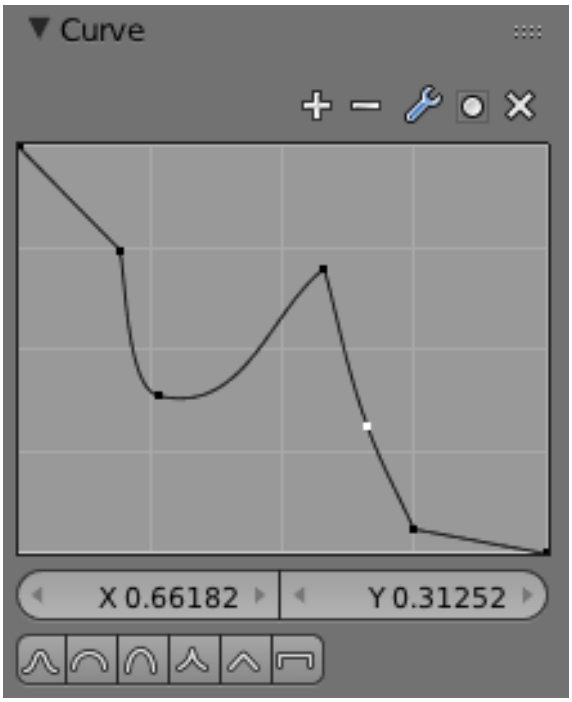
Anatomy of a brush



Brush options



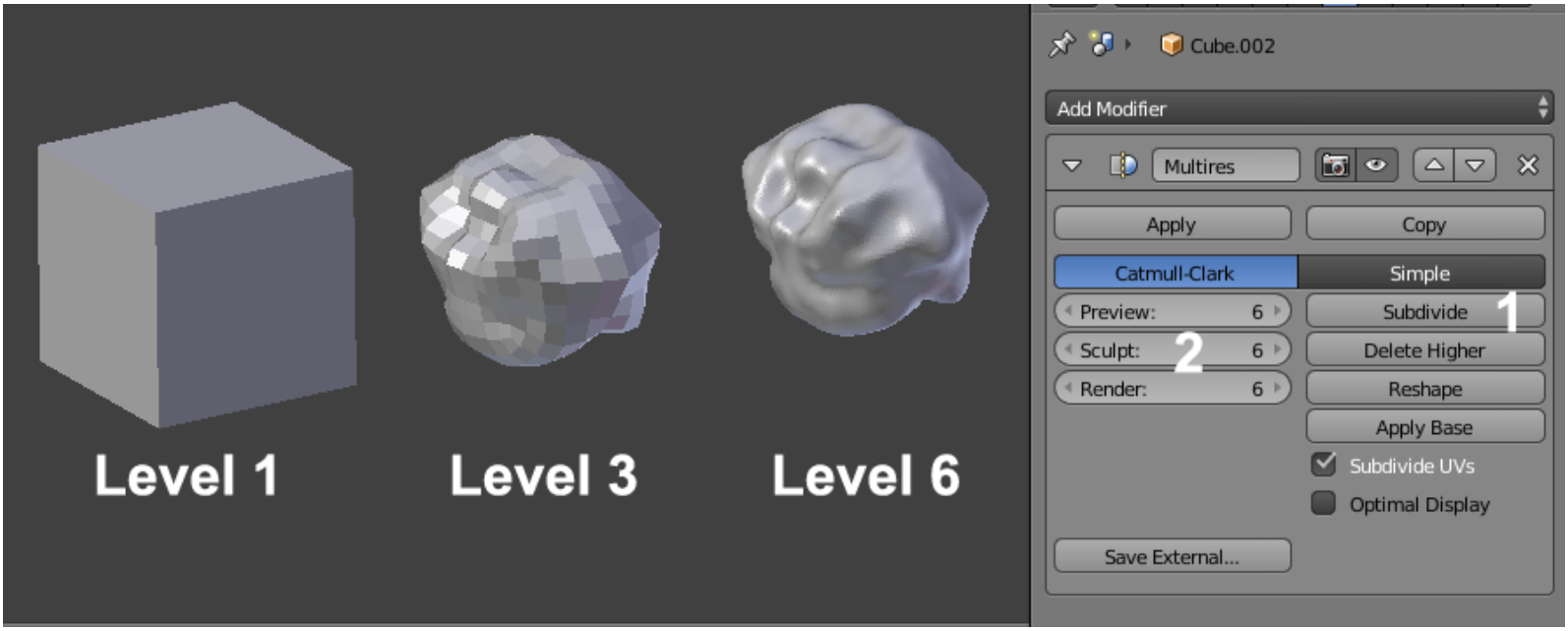
Adding a Texture (alpha) to our brush



A modified curve of a brush.

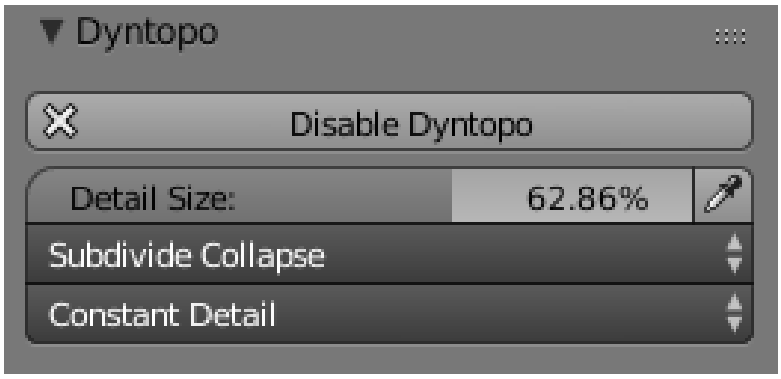
Dyntopo versus the Multires modifier

First touch with the Multiresolution modifier

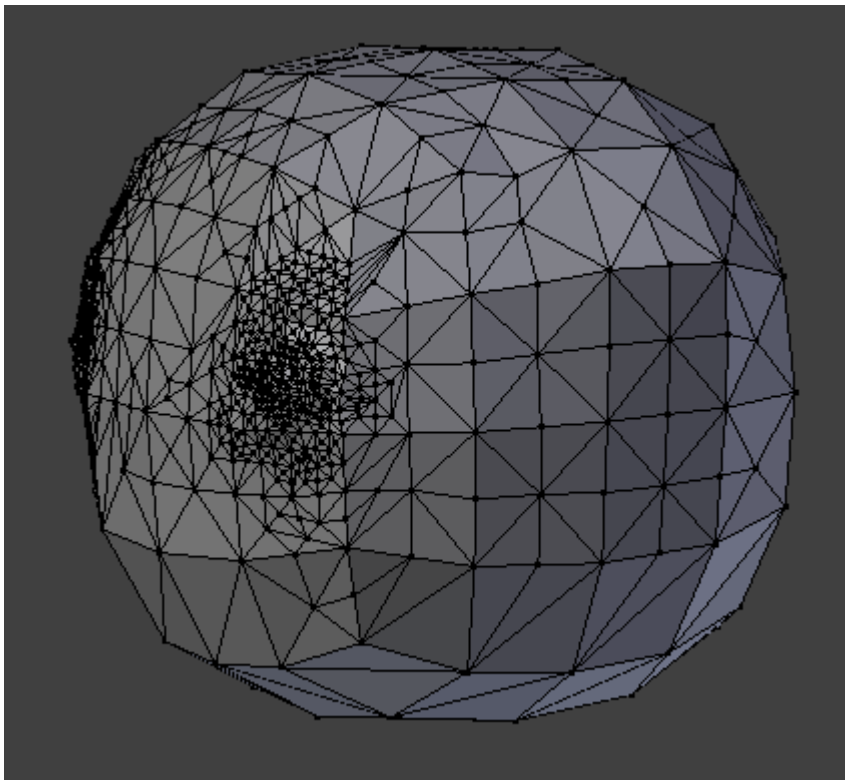


The Multiresolution modifier with an example of three different levels of subdivisions

First touch with Dyntopo

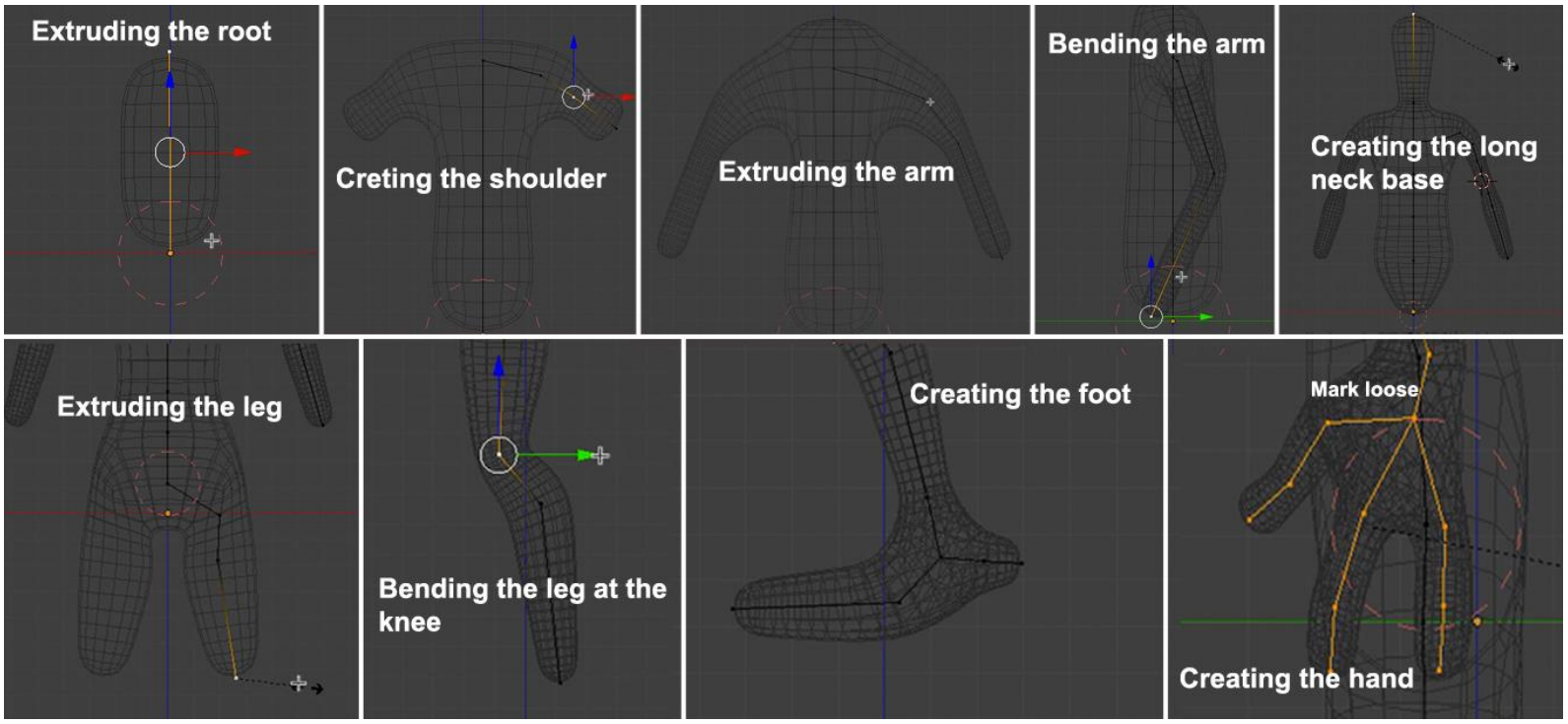


The Dyntopo settings

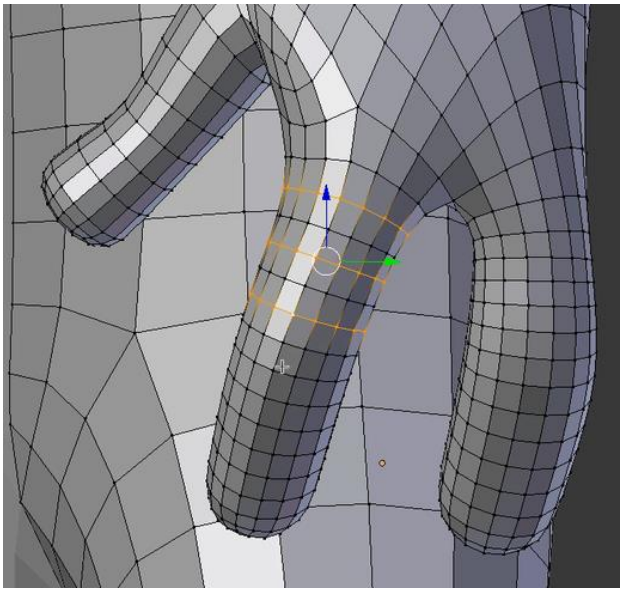


A Dyntopo mesh with different levels of sculpted details.

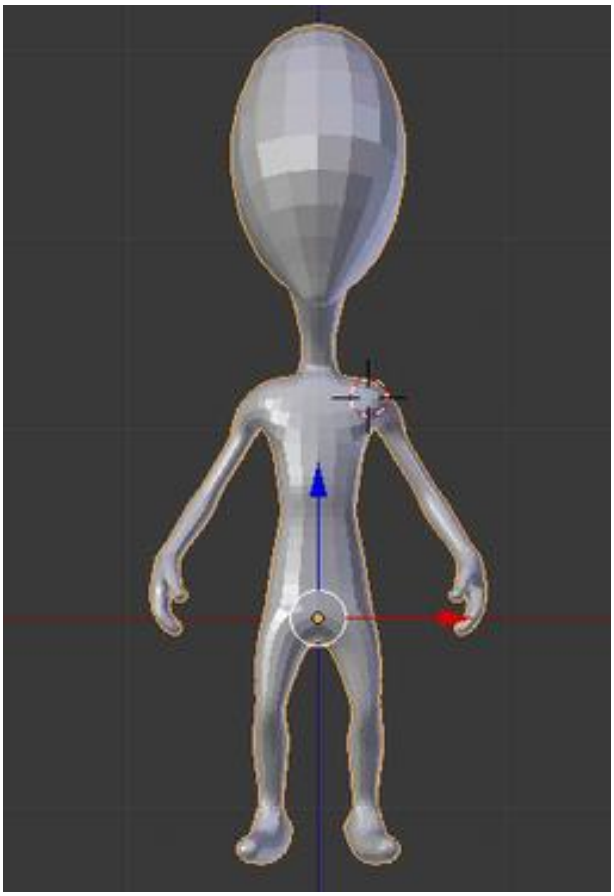
Creating a base mesh with the Skin modifier



The steps of the base mesh creation with the Skin modifier.

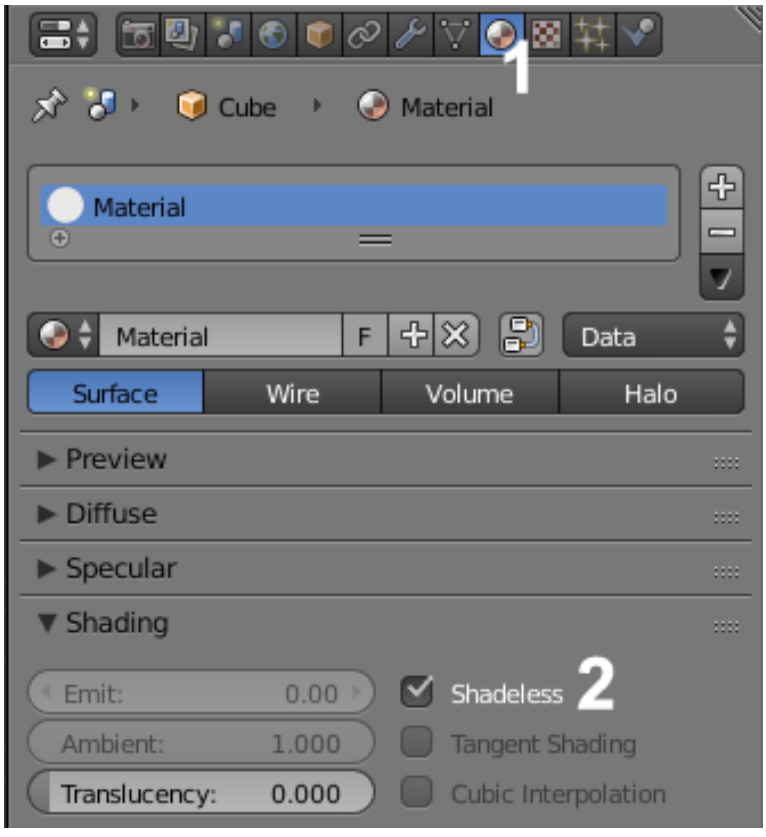


Removing some edge loops of the dense parts.

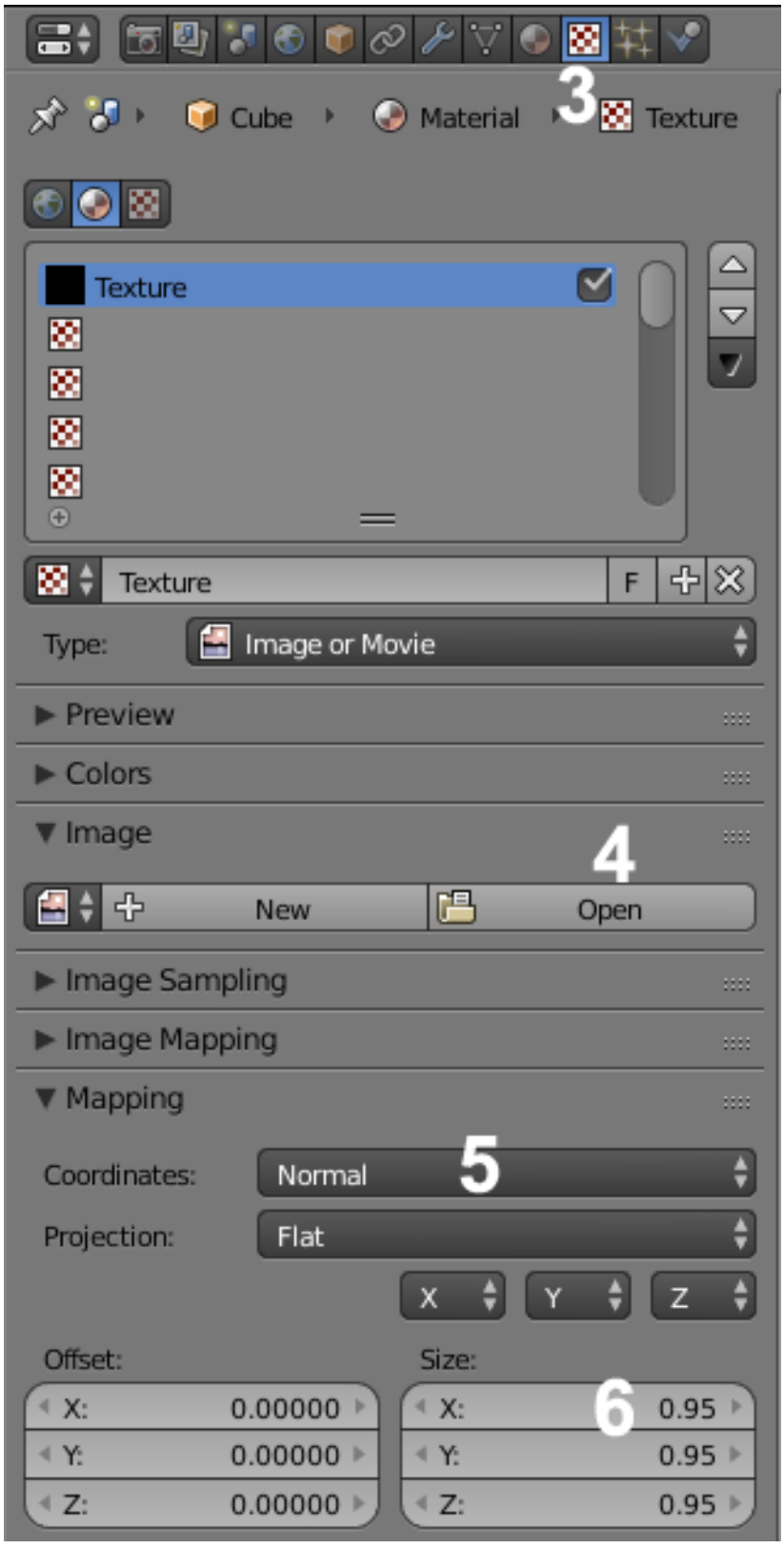


The final base mesh

Visual preparation



Creation of a new material with the Shadeless option.



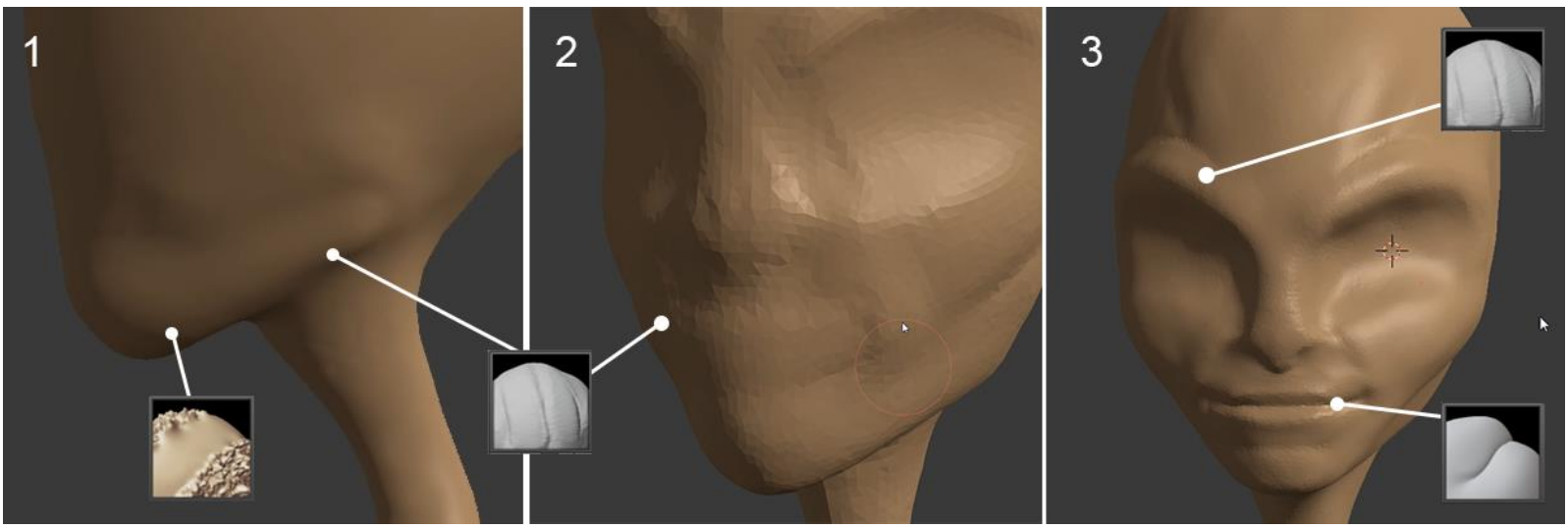
Setting the Matcap image texture for our material.

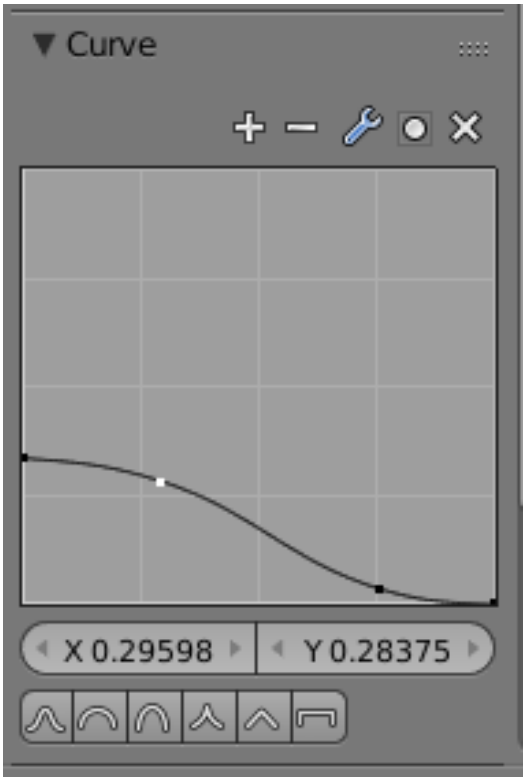
Setting the GLSL display mode in the right panel of the viewport (N)

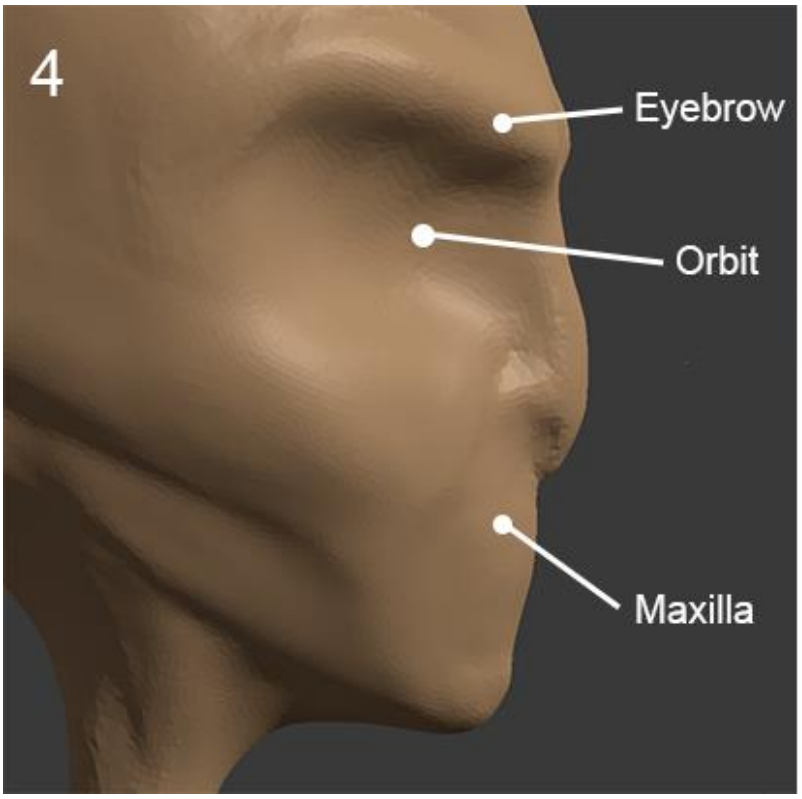
An introduction to Artistic Anatomy

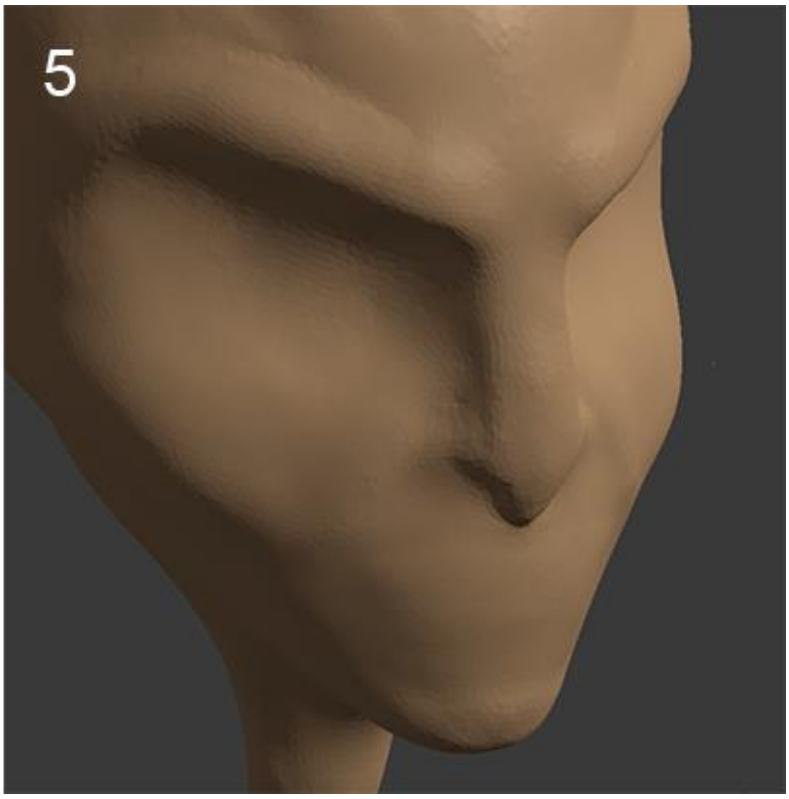
Sculpting the body

The head




Curve
X 0.29598
Y 0.28375


4
Eyebrow
Orbit
Maxilla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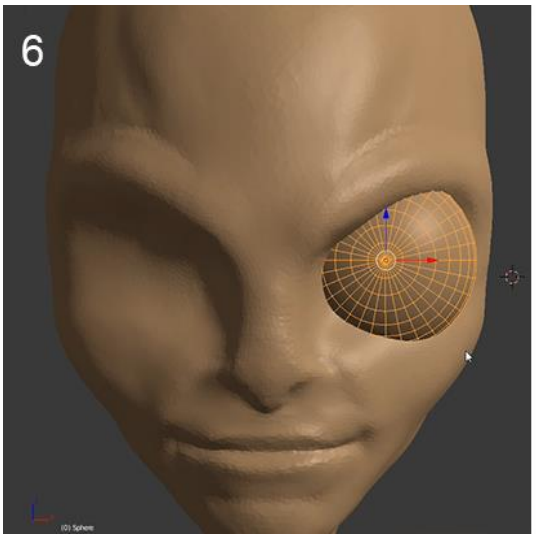
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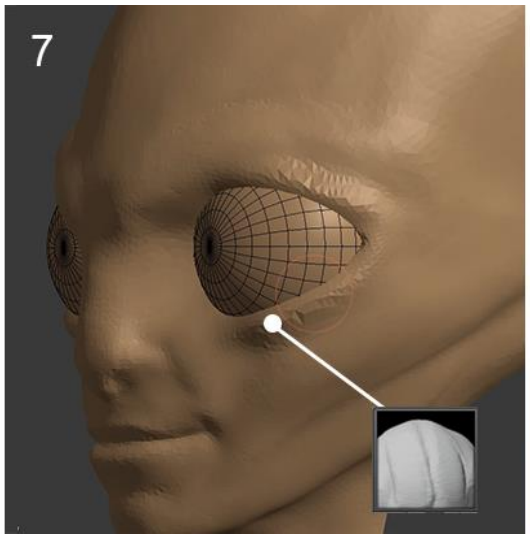
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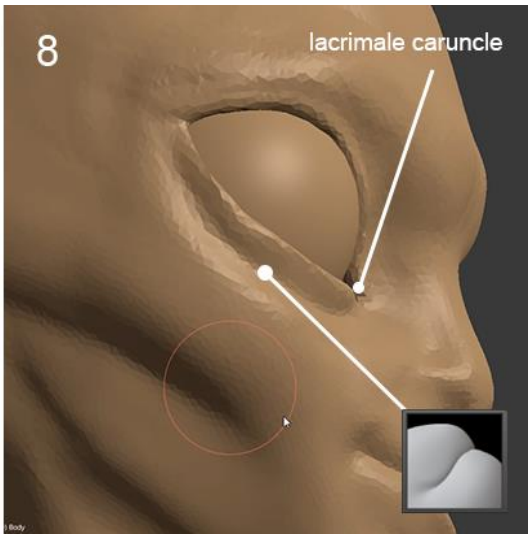
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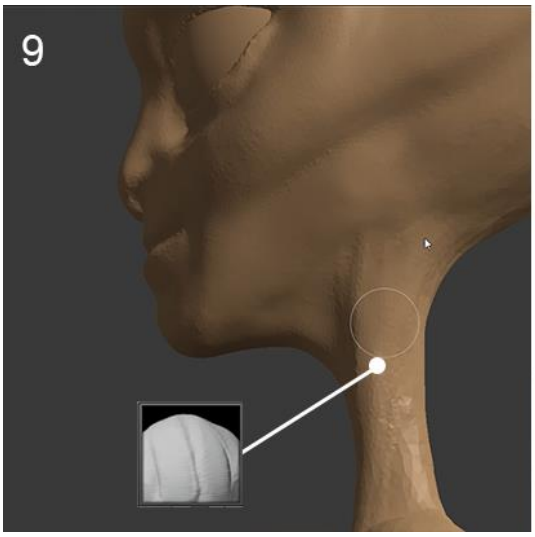
lacrimale caruncle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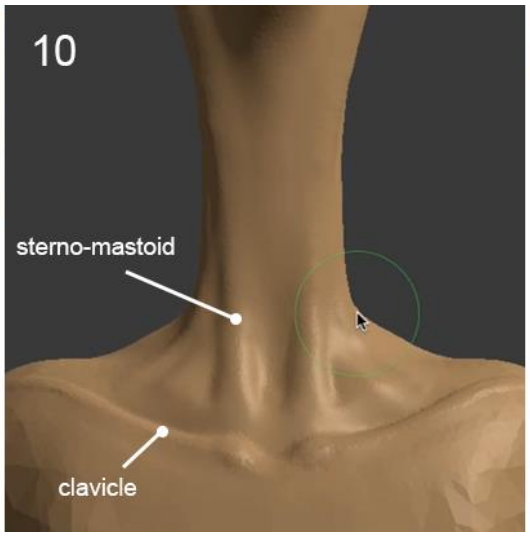
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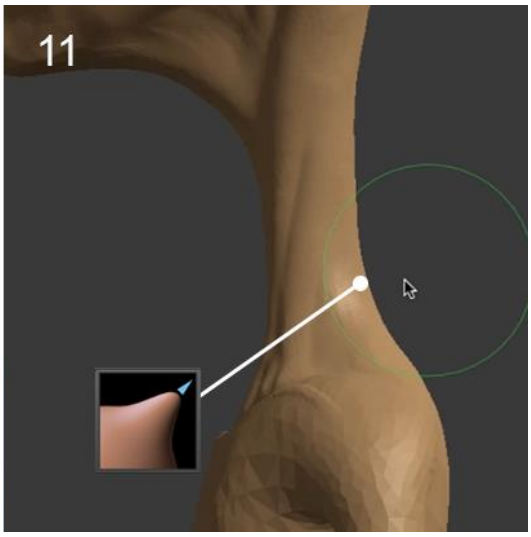
sterno-mastoid
clavicle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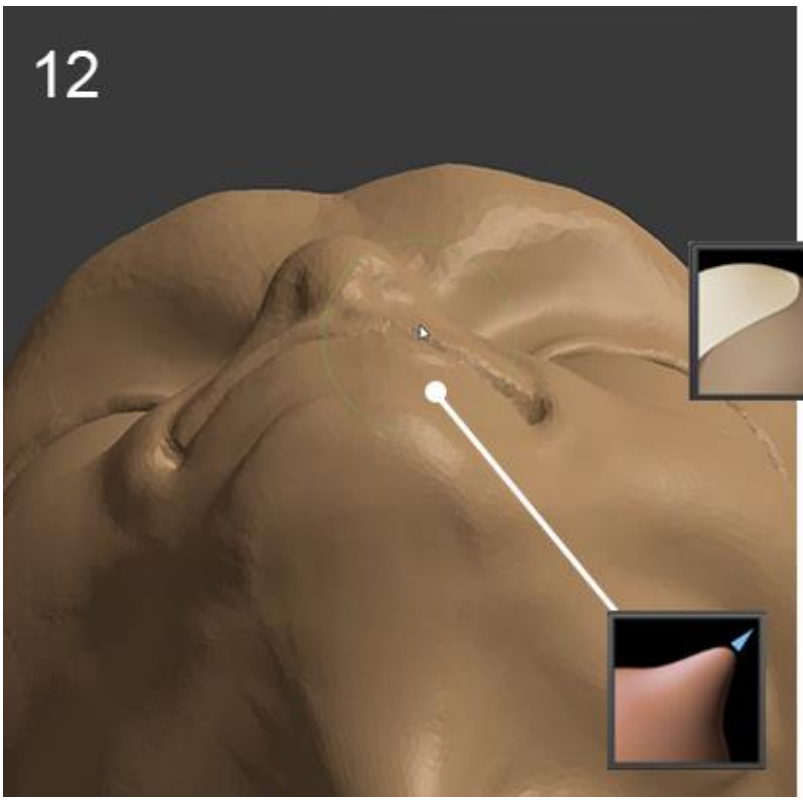
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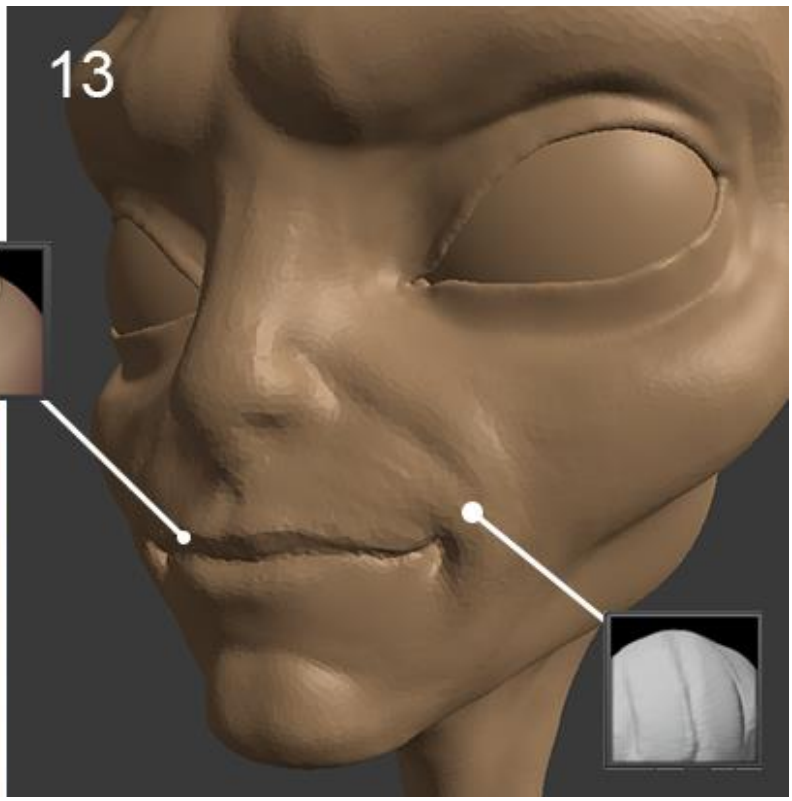
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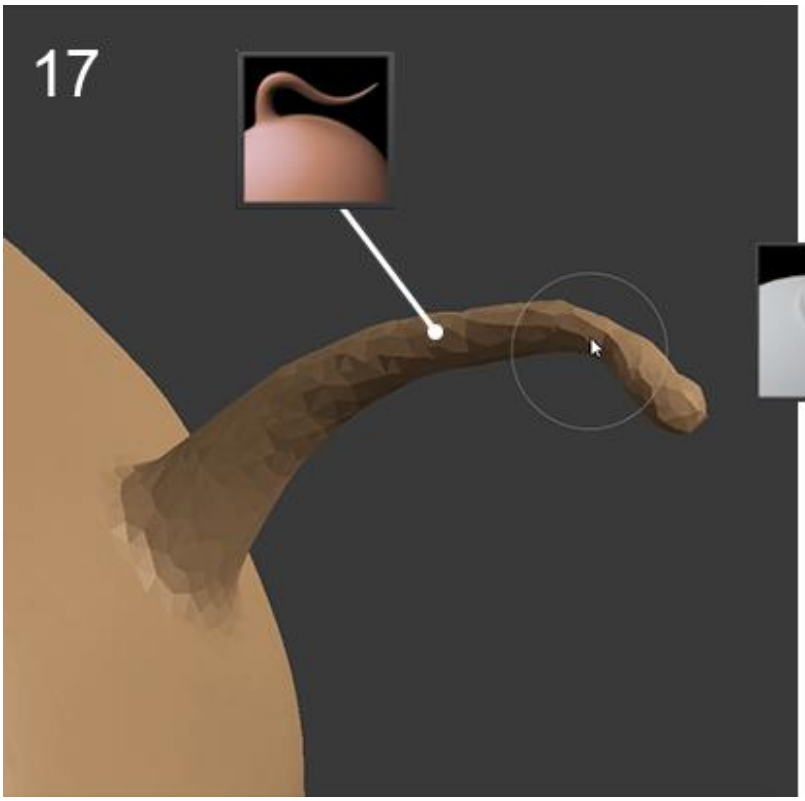
14


15


16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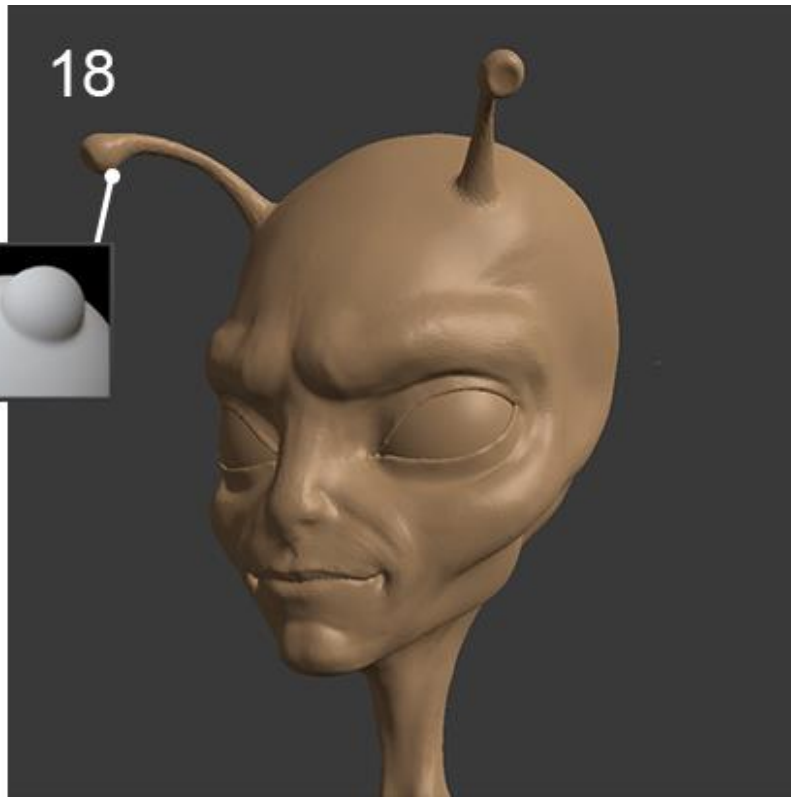
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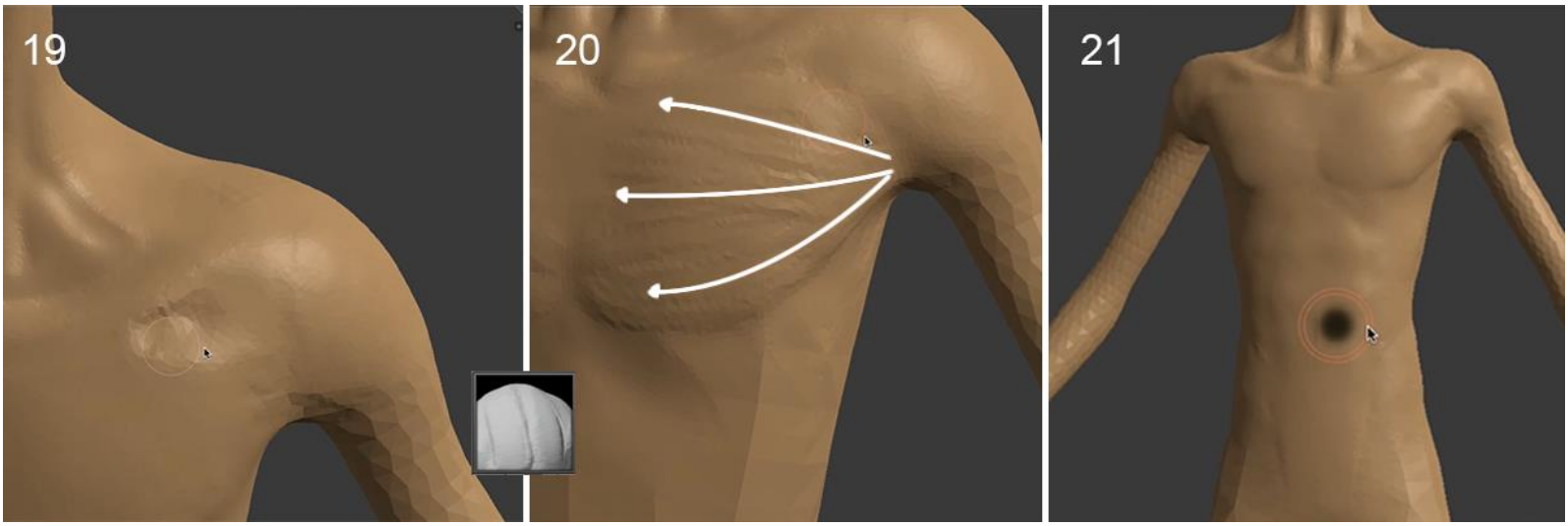
The torso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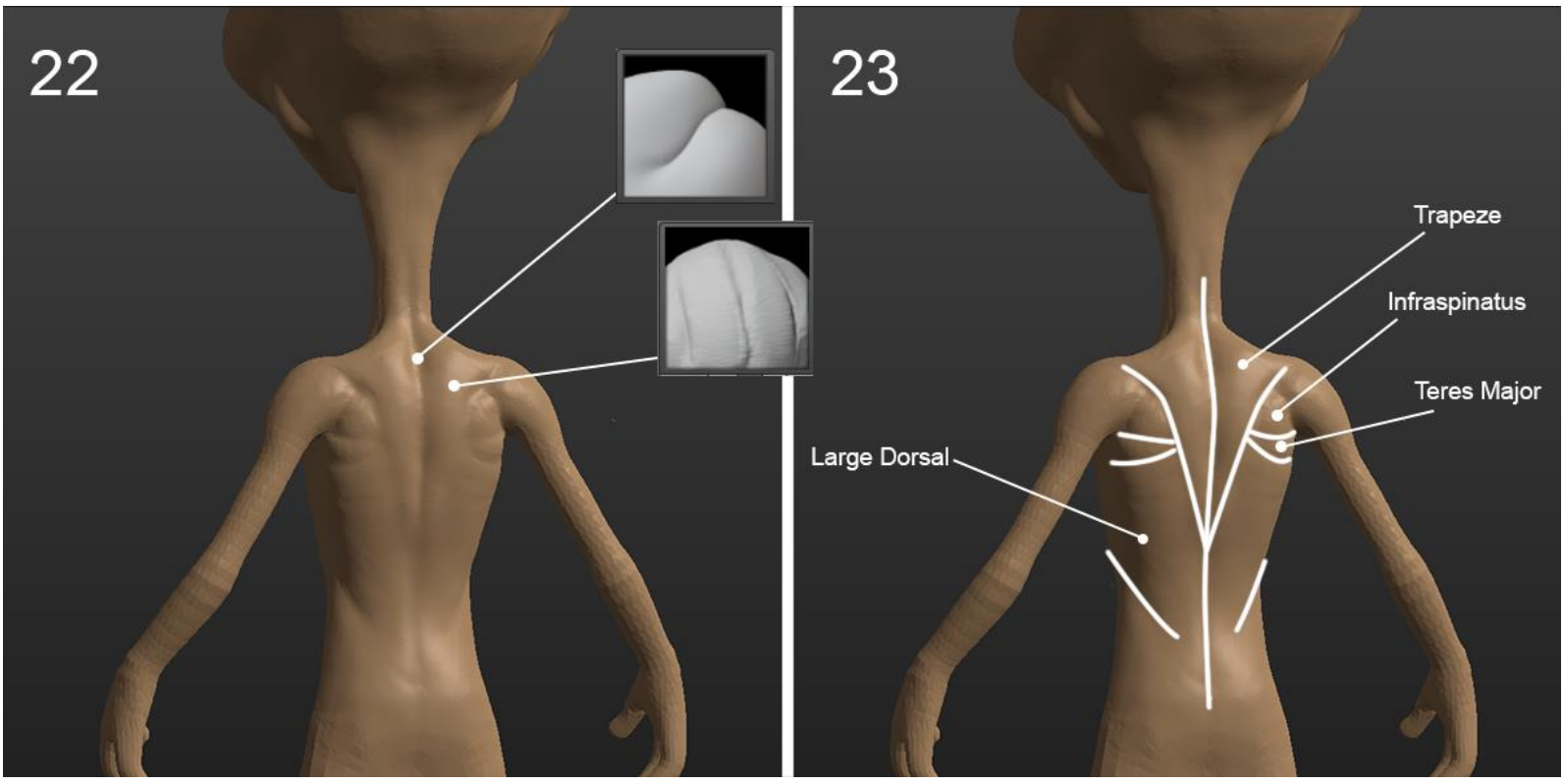
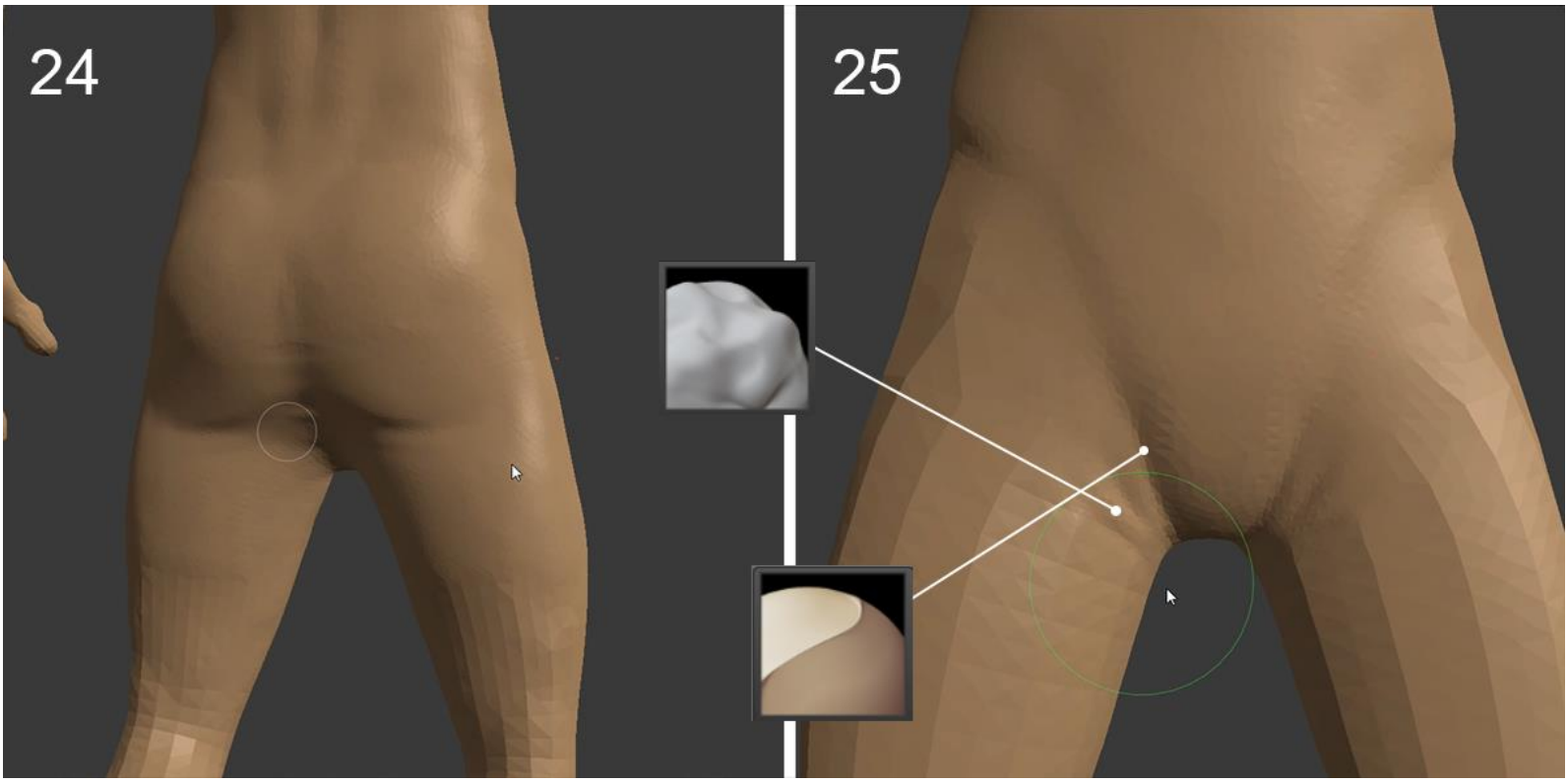
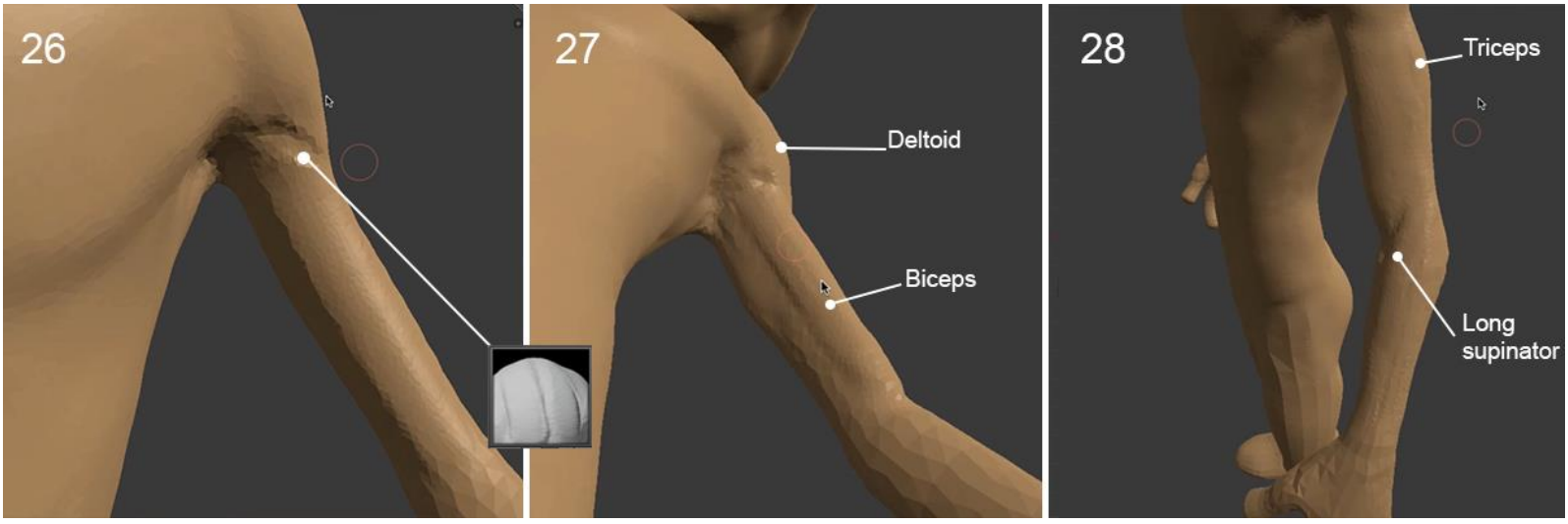
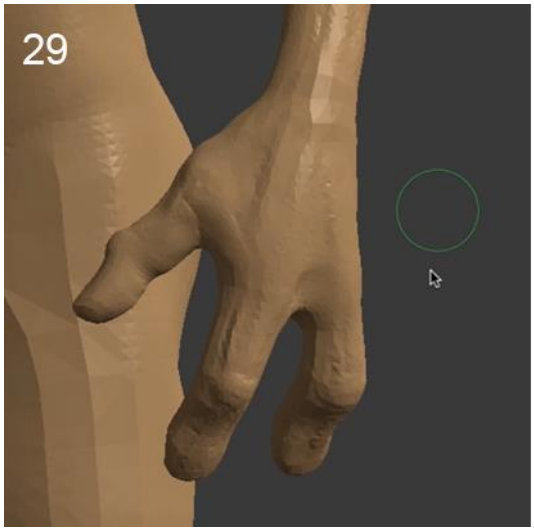
21

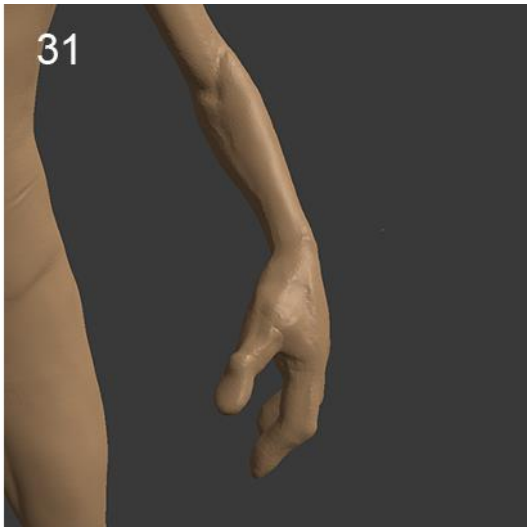

22
23
Trapeze
Infraspinatus
Teres Major
Large Dorsal



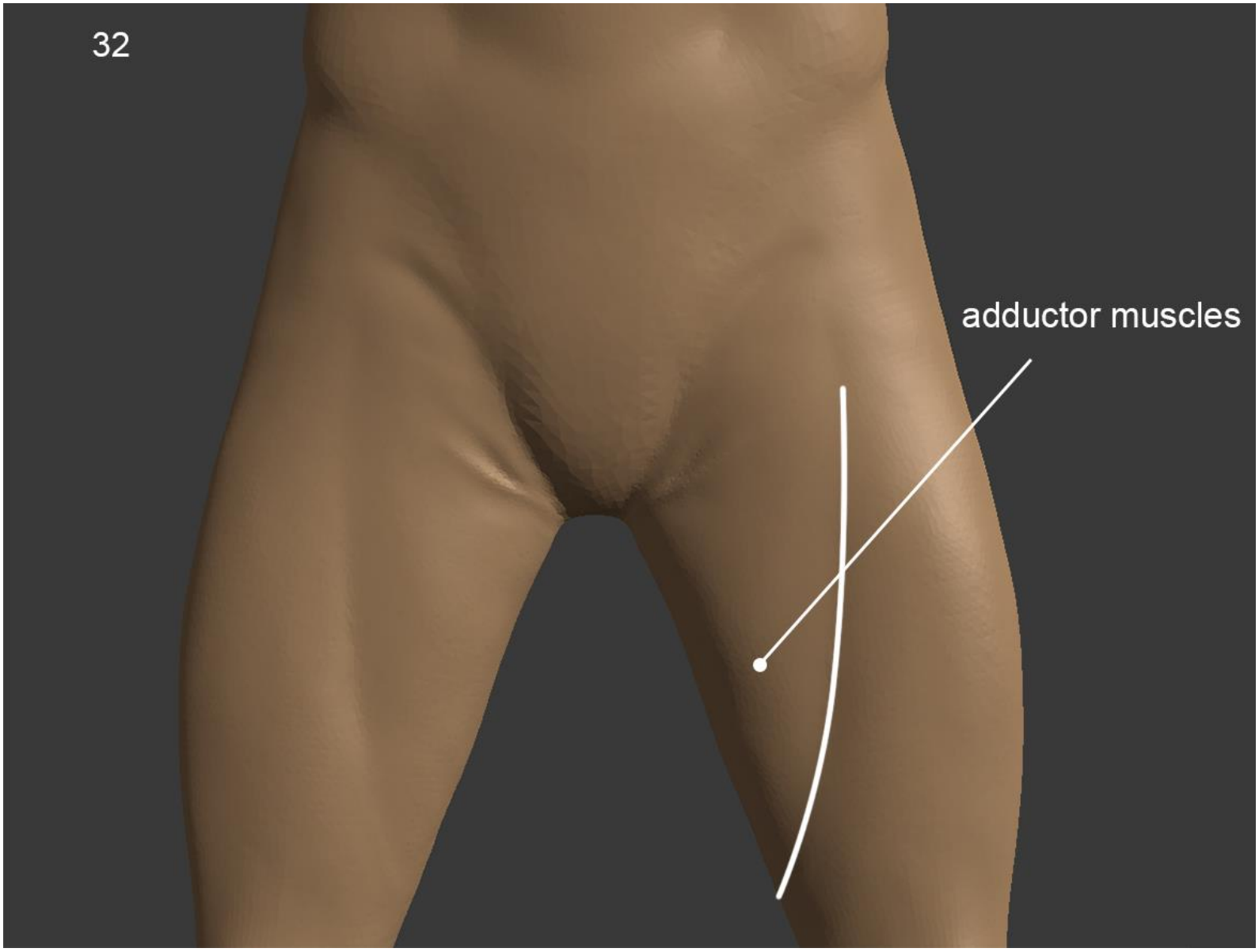
The arms

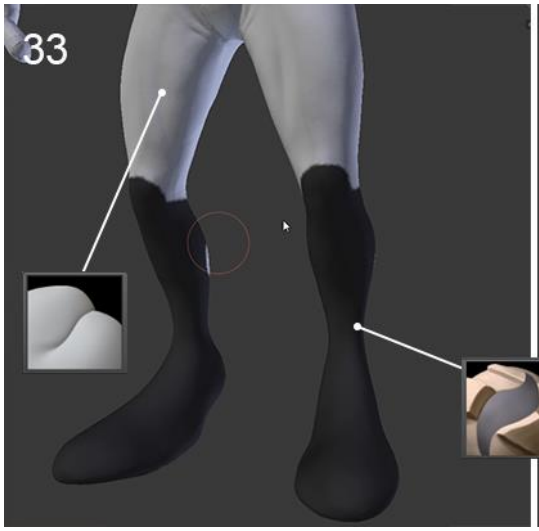






The legs

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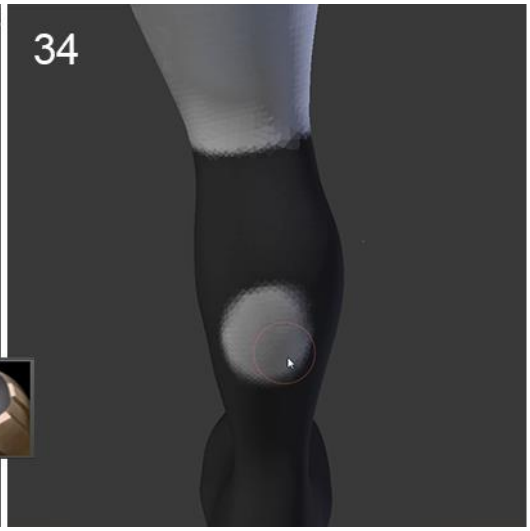
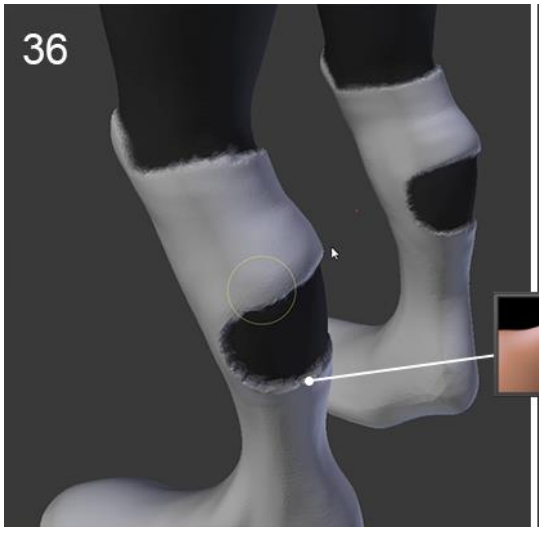

34


35
Inverted Mask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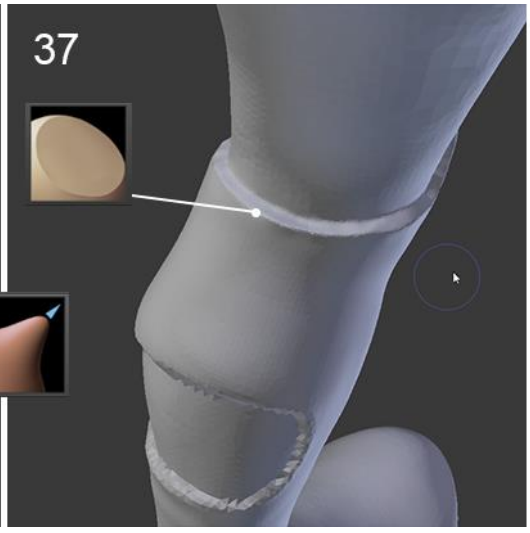
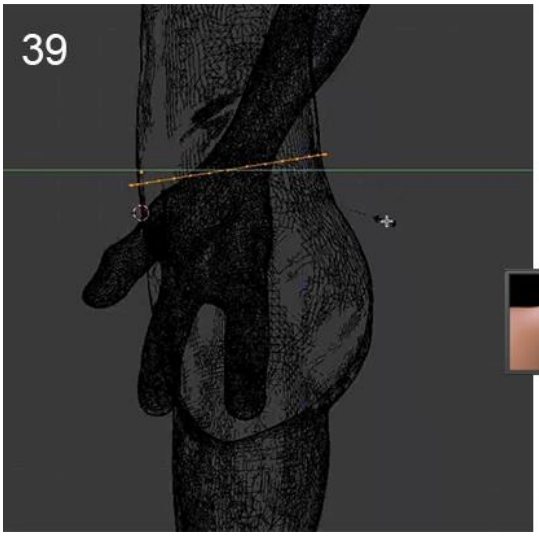
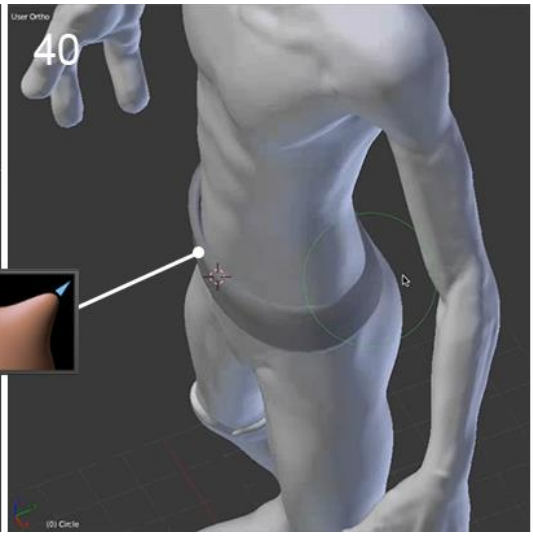
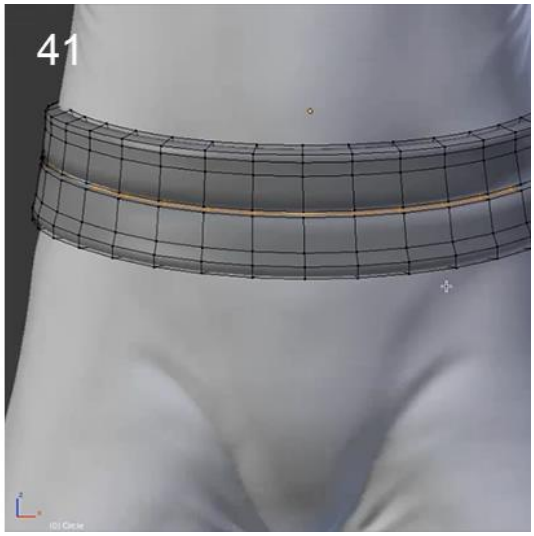

37

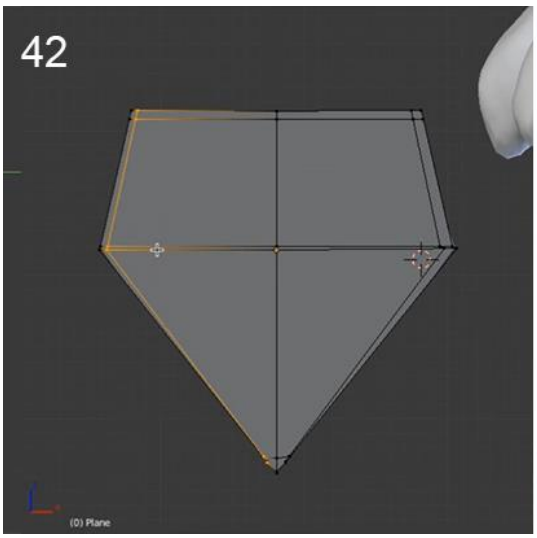

38

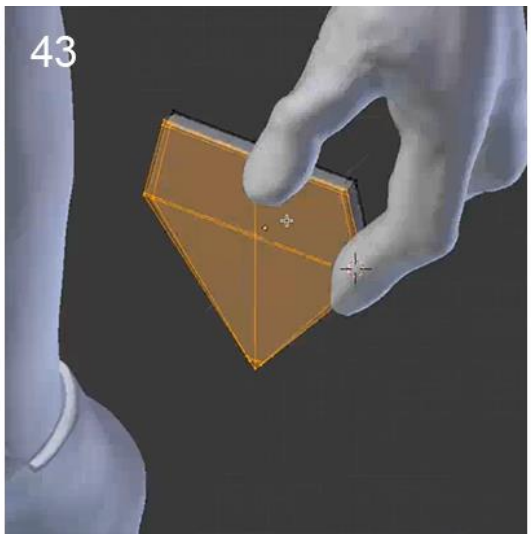
The belt

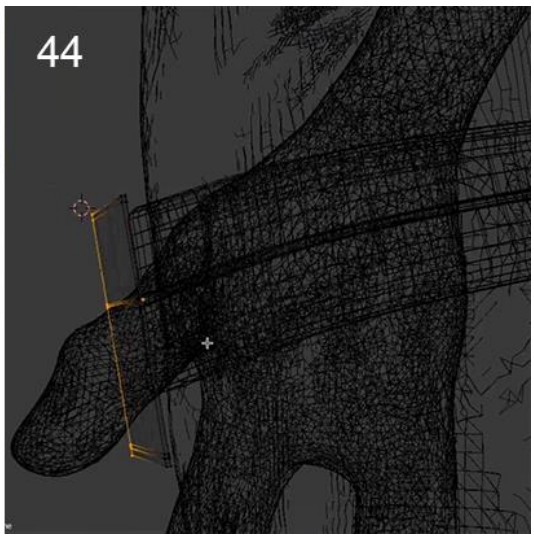












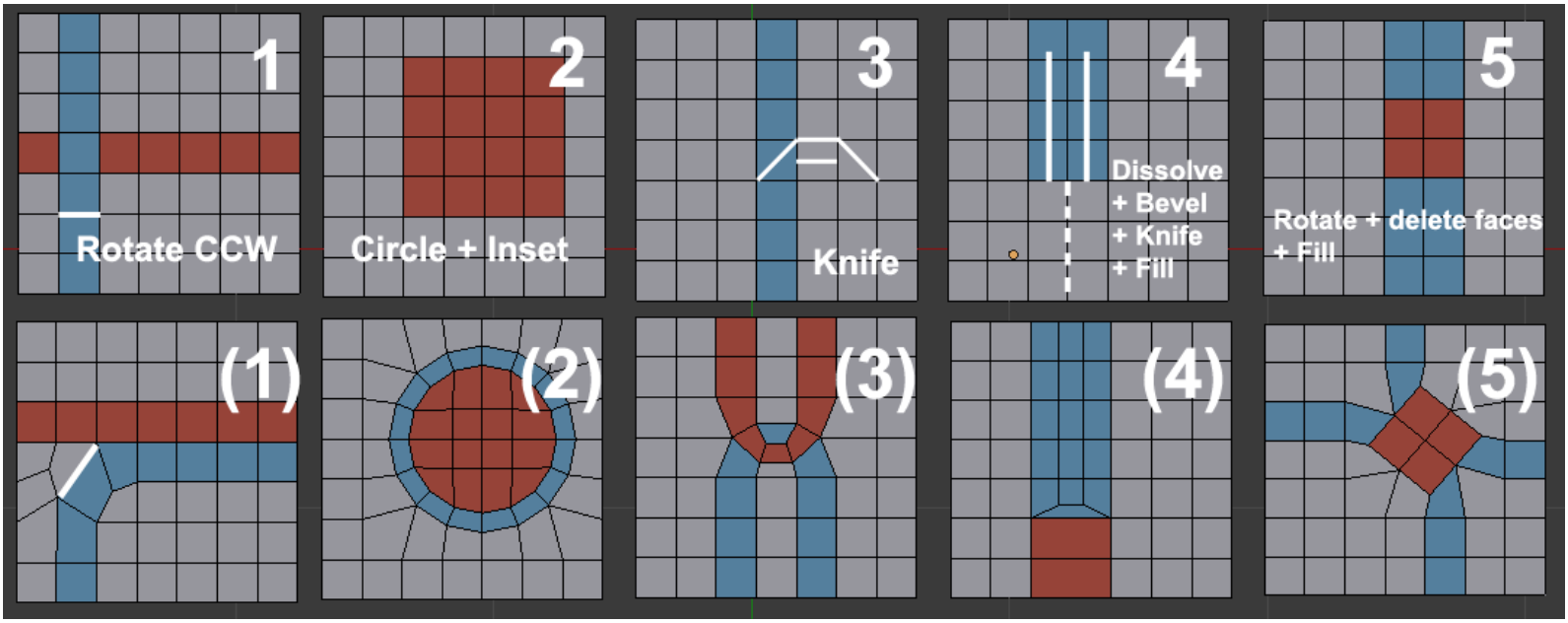
A render of the final alien sculpt with Blender Internal Renderer

4

Alien Character – Creating a Proper Topology and Transfer the Sculpt Details

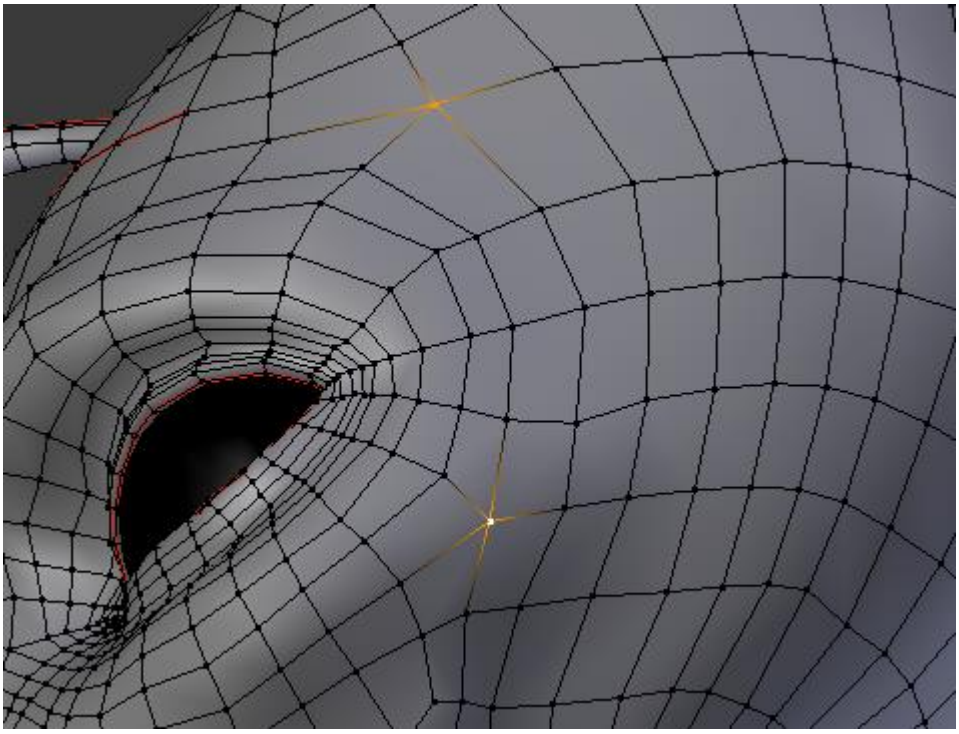
Why making a retopology?

Possibilities of arranging polygons



Five topology cases you may encounter

Errors to avoid during creation of retopology

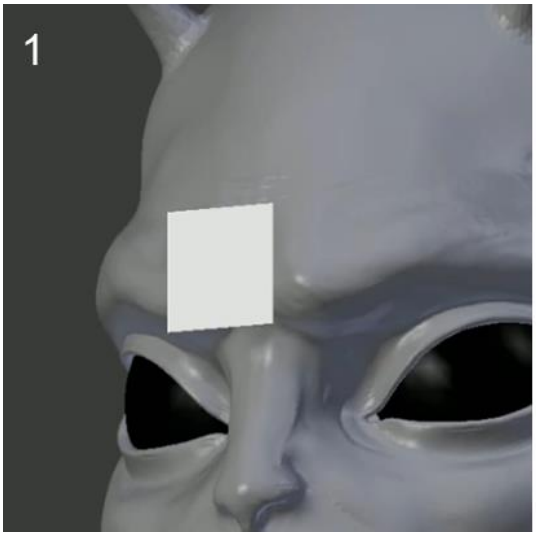


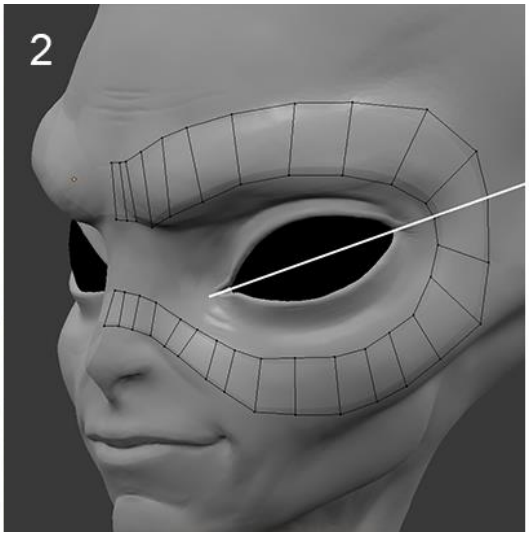
Example of two selected poles

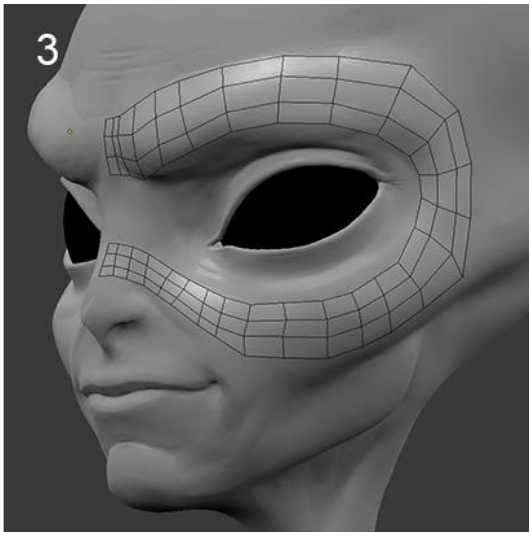
Making the retopology of the alien character

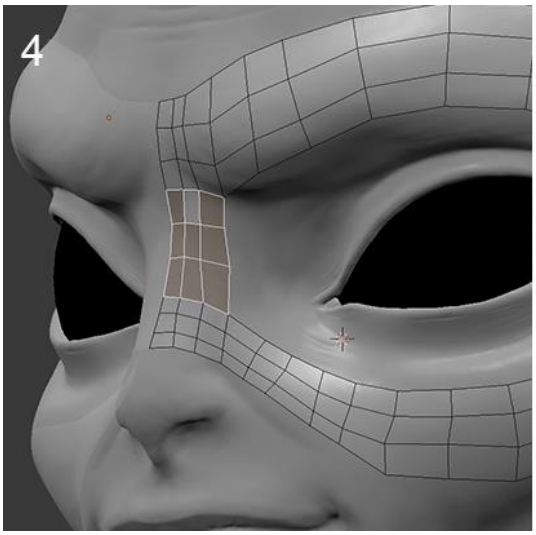
Preparing the environment

The head





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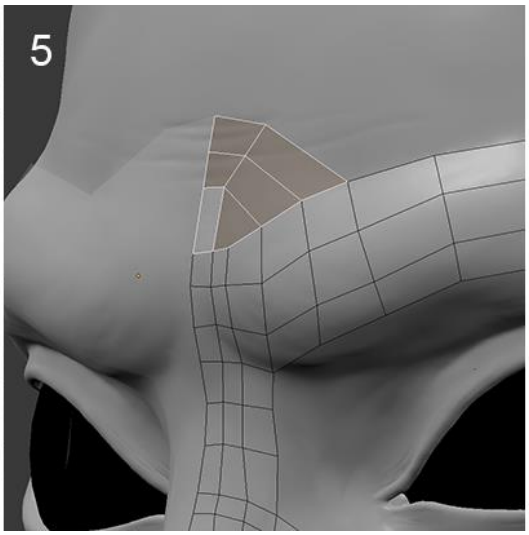
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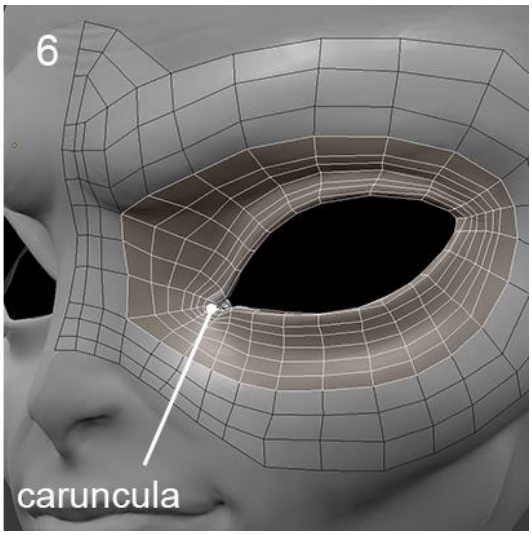
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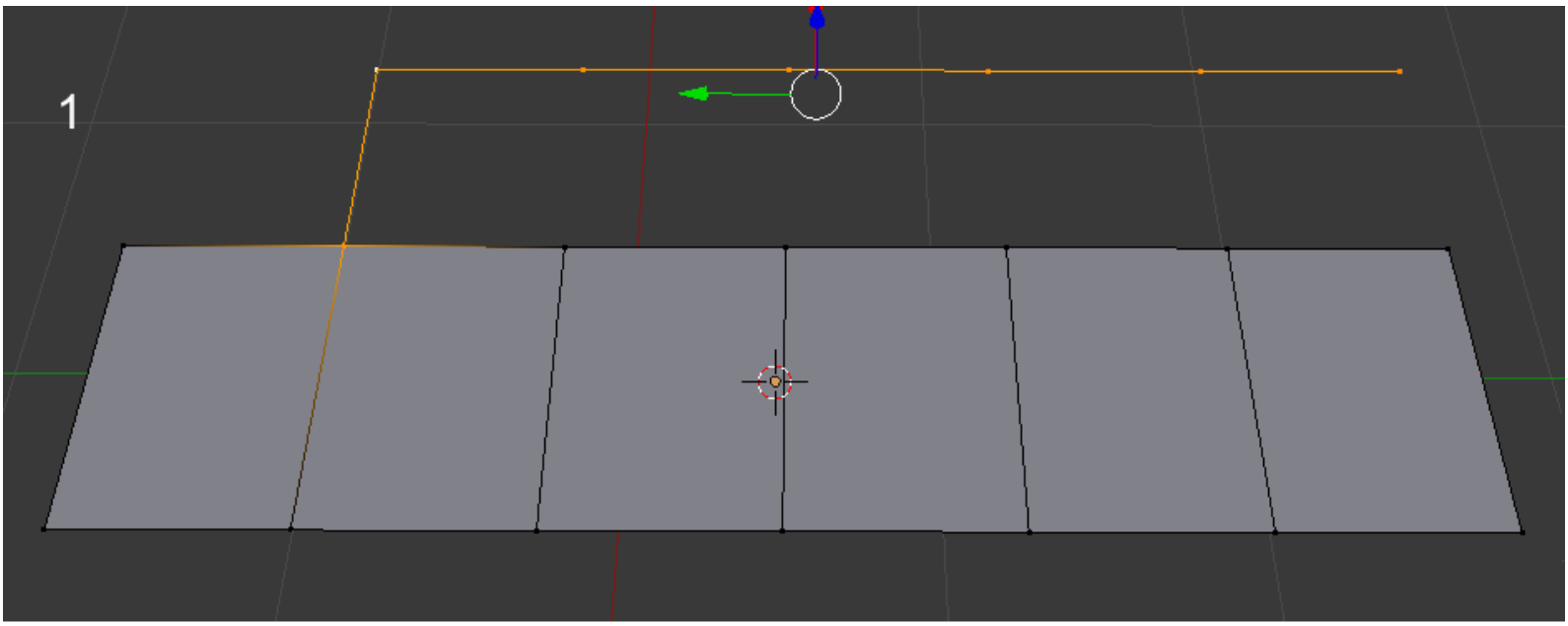
caruncula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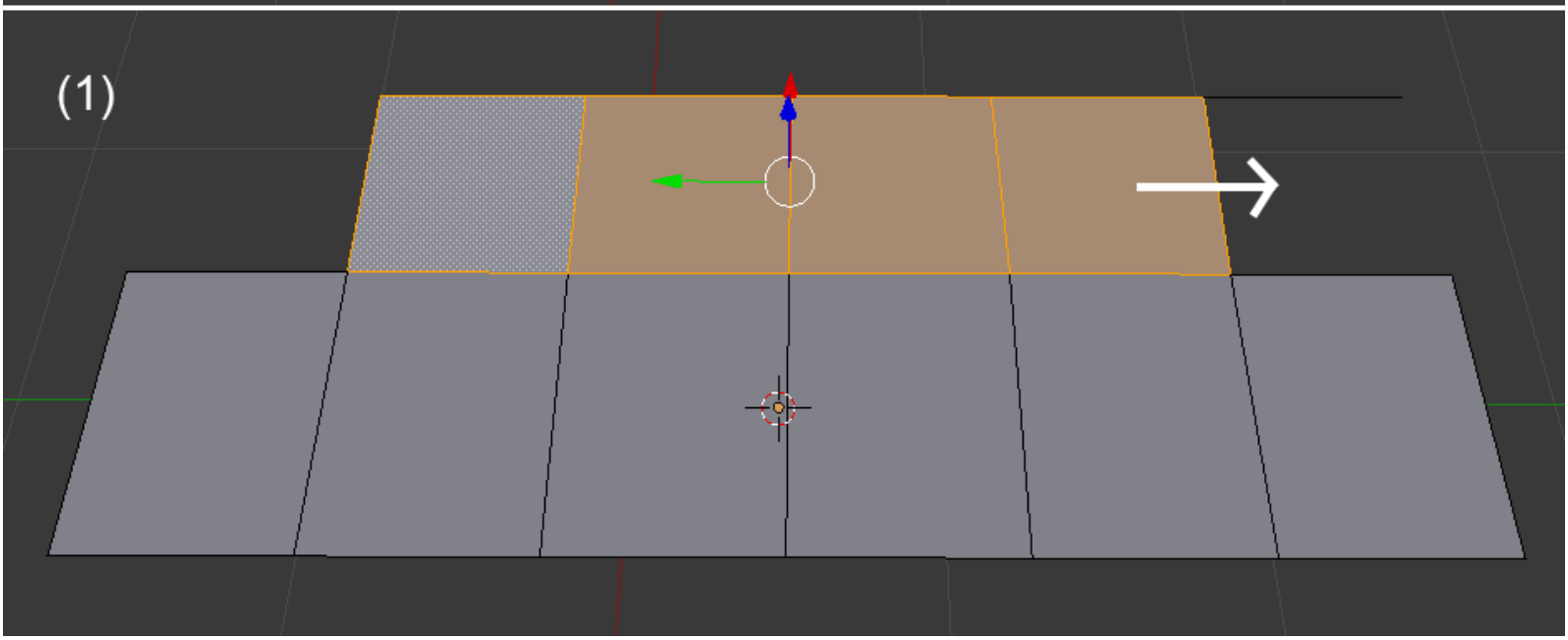
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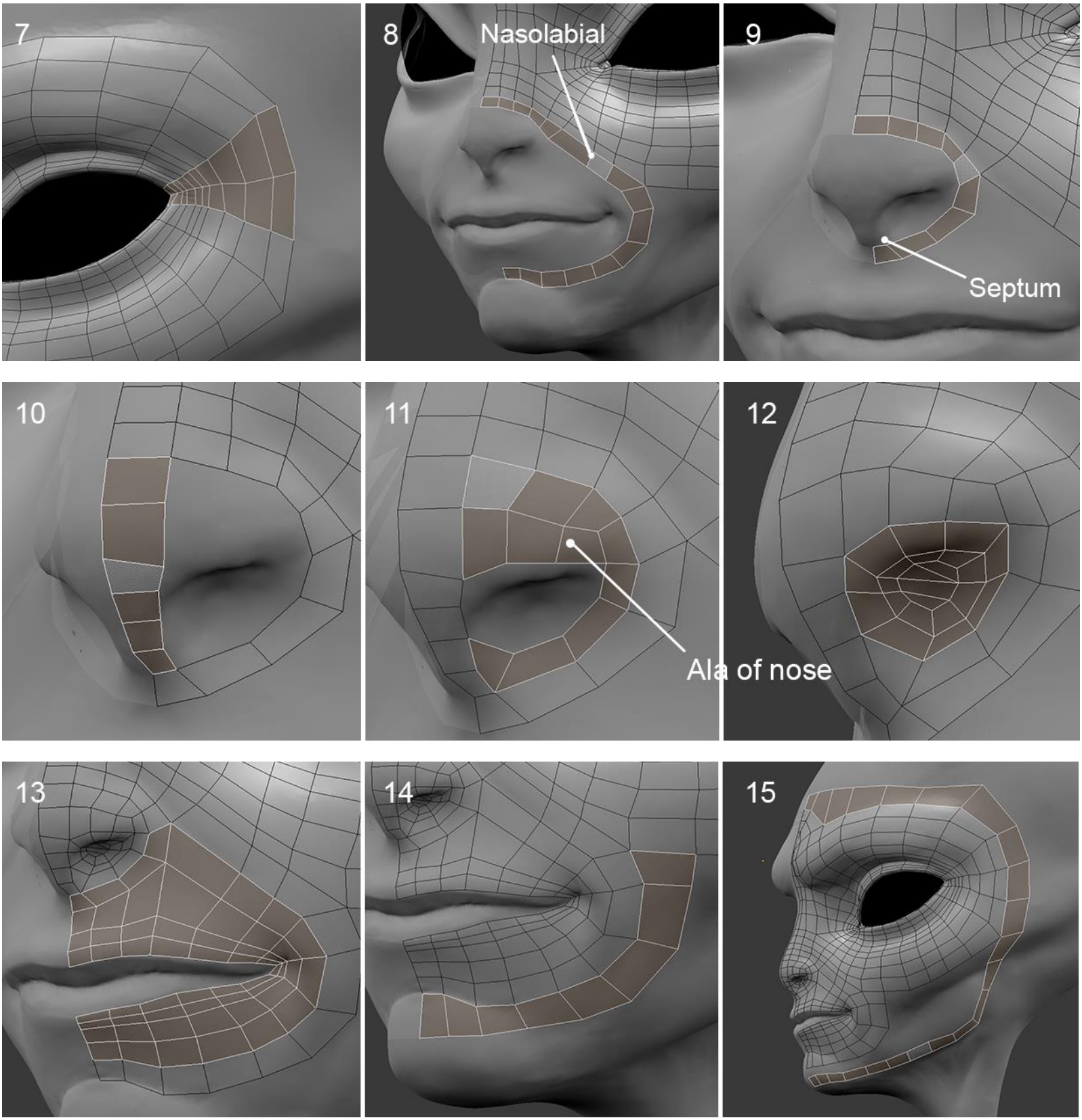
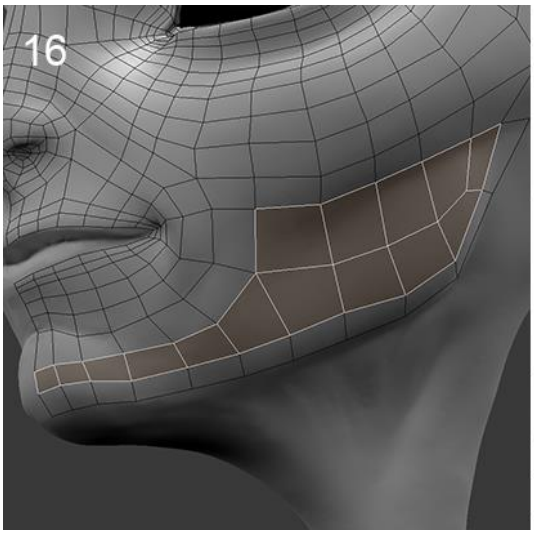

7
8
Nasolabial
9
Septum
10
11
Ala of nose
12
13
14
15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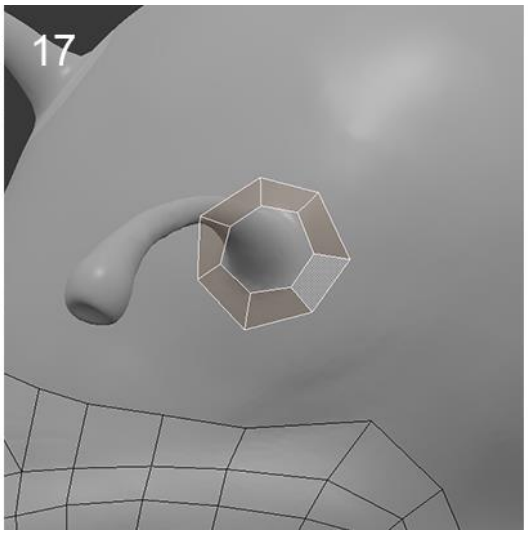
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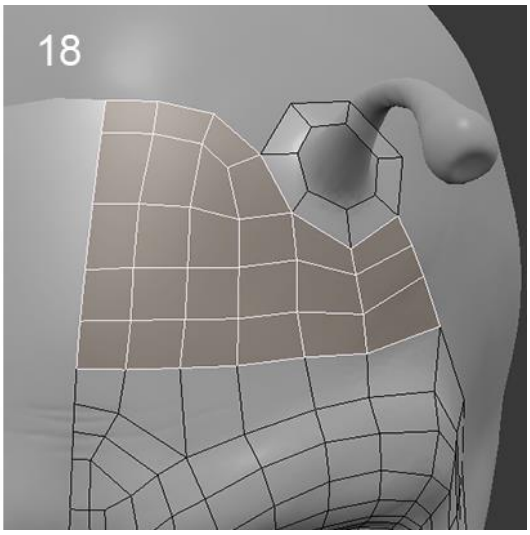
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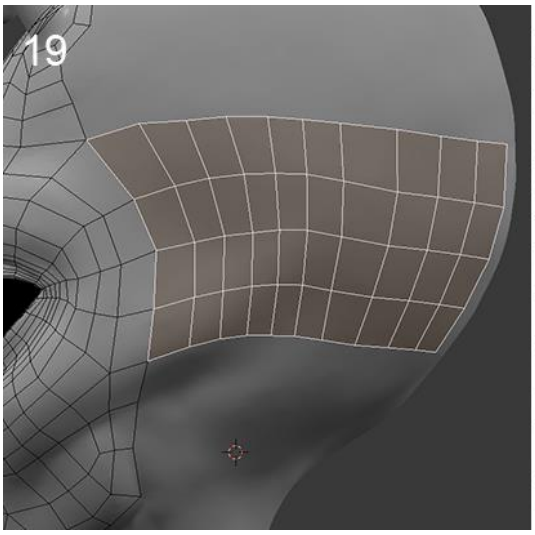
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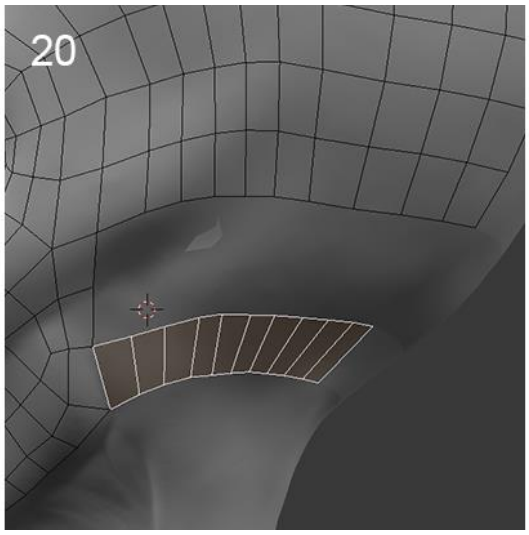
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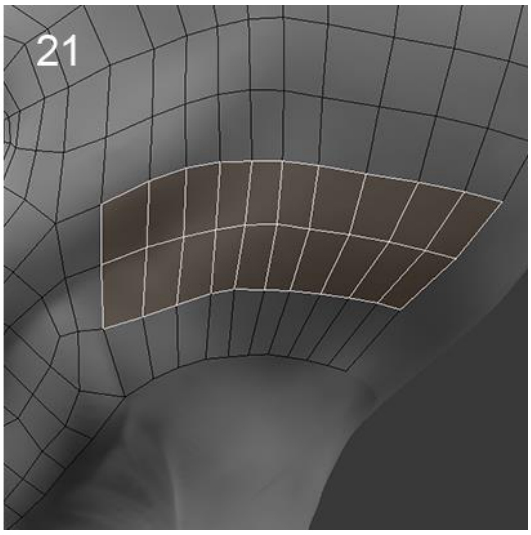
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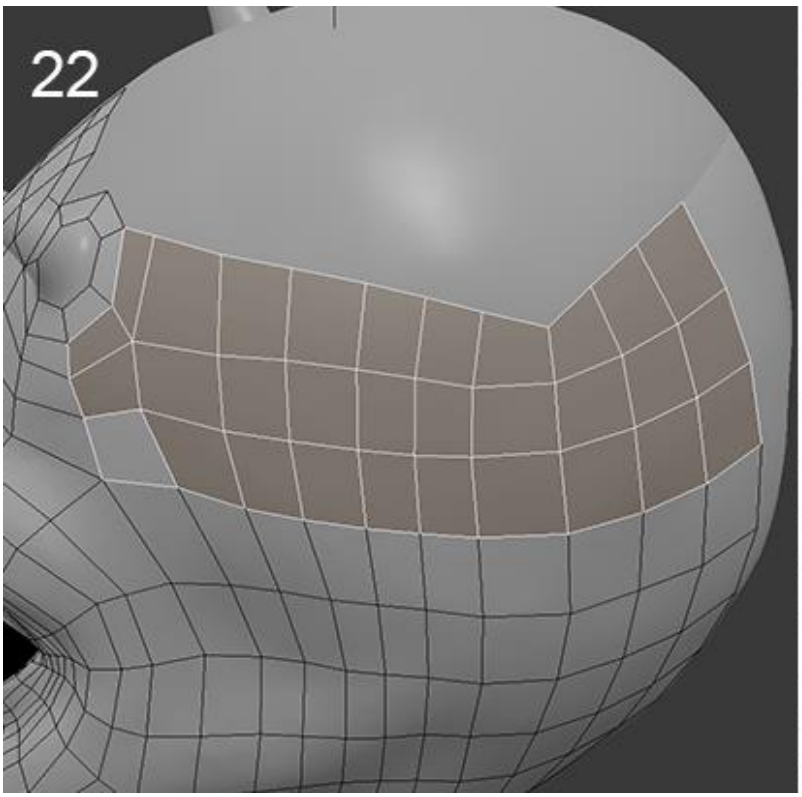
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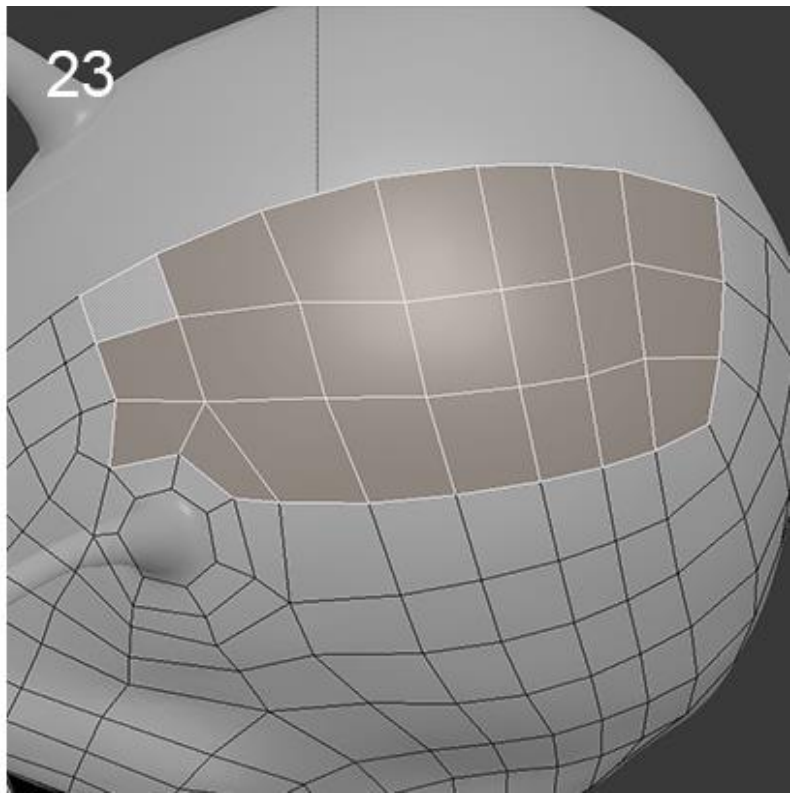
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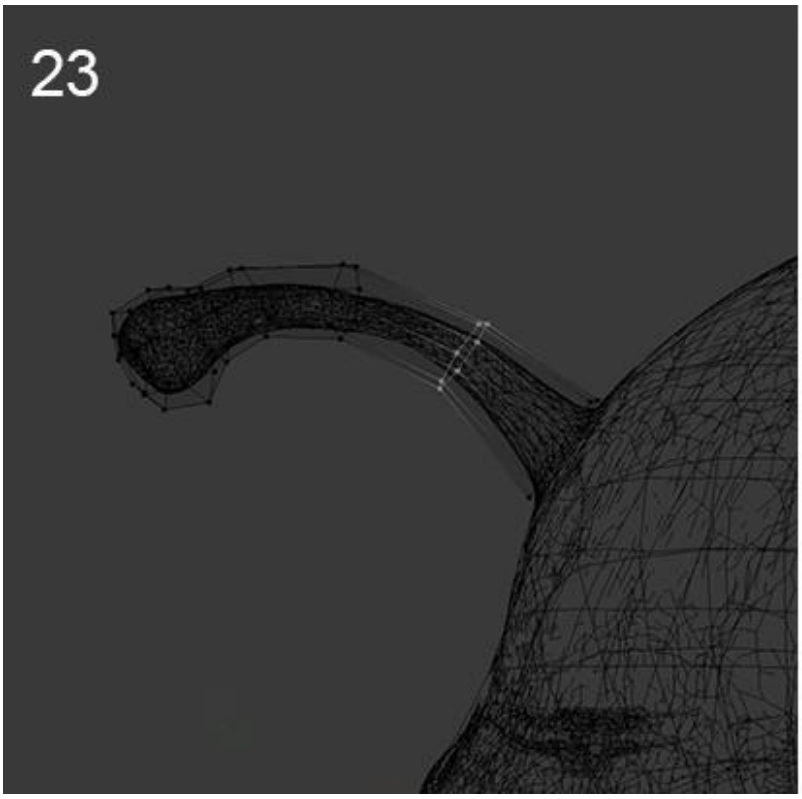
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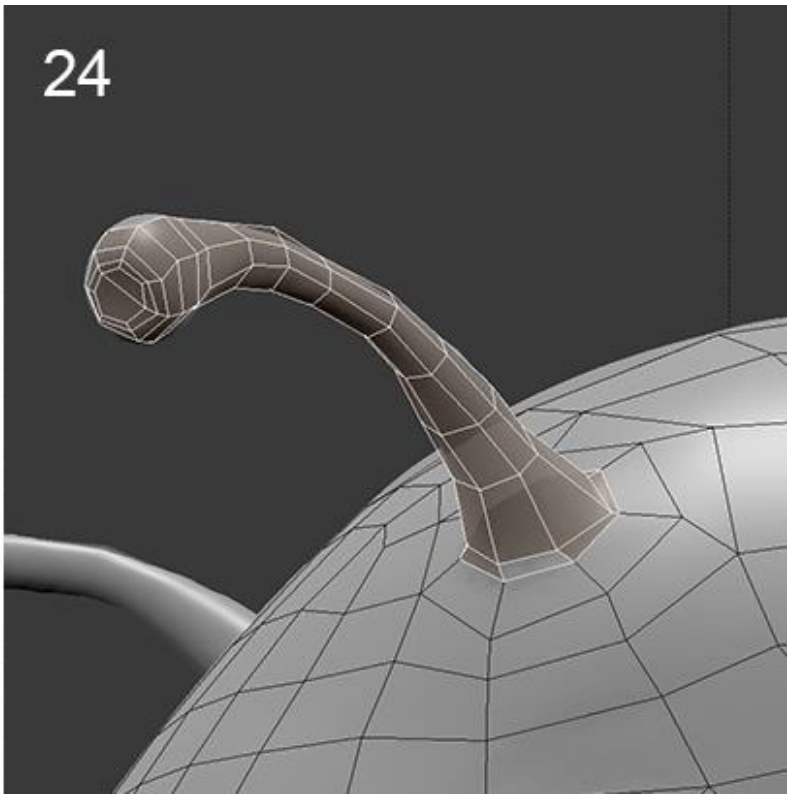
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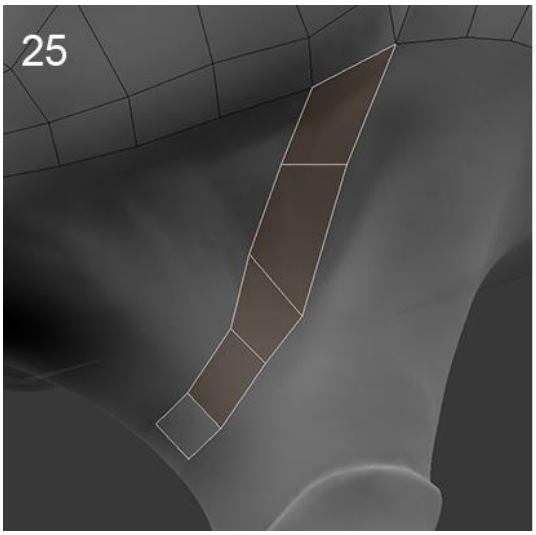
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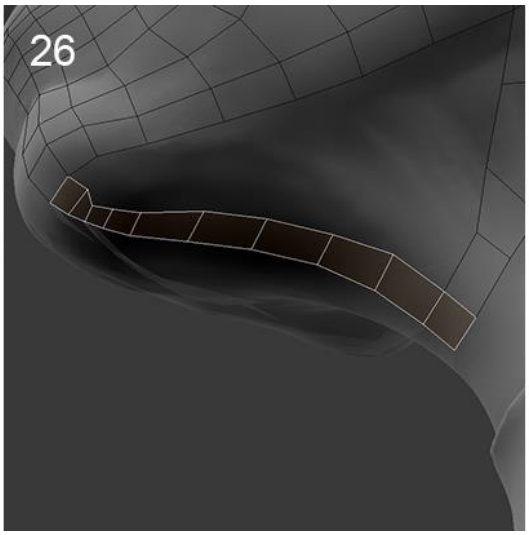
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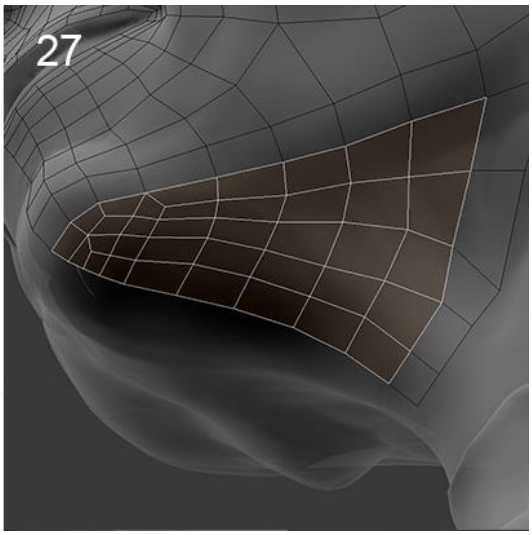
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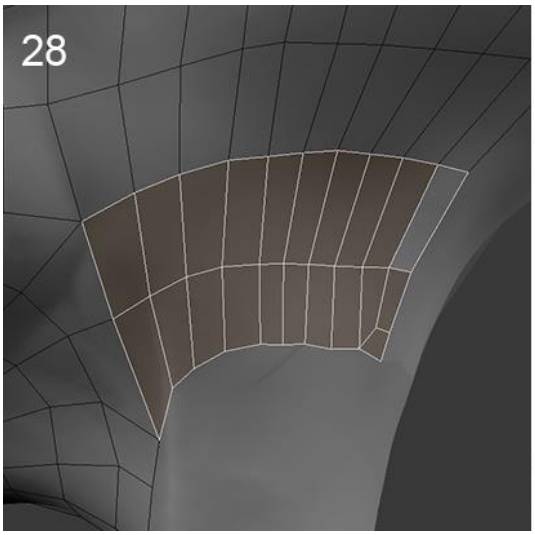
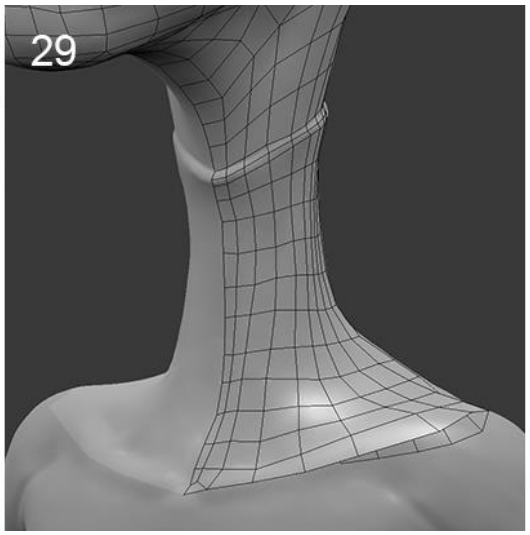
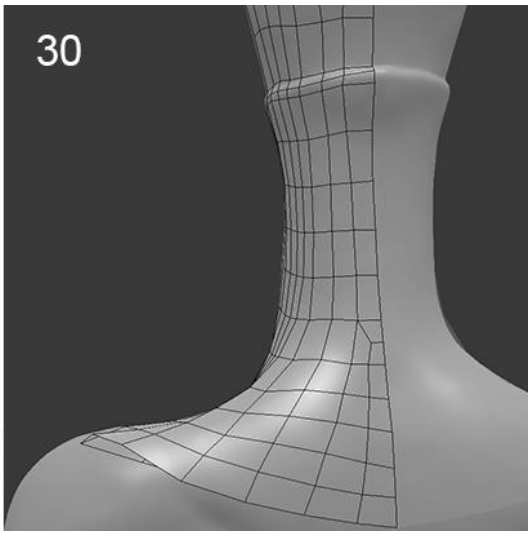
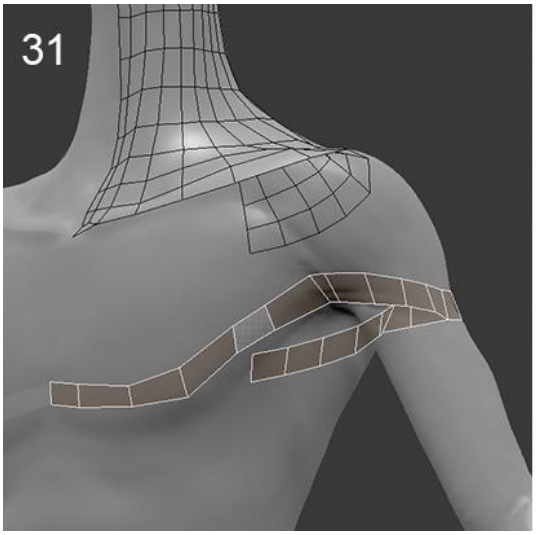
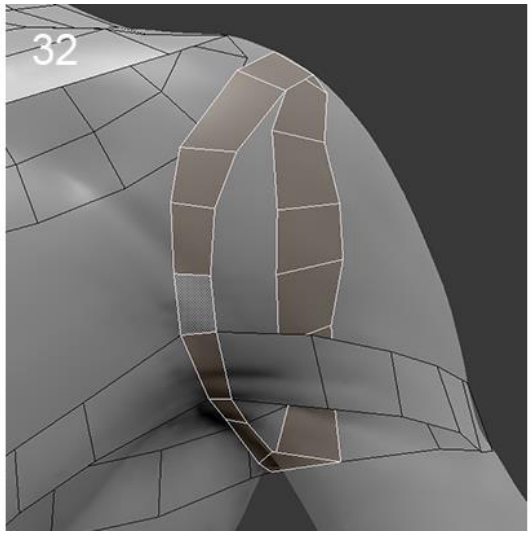
The neck and the torso

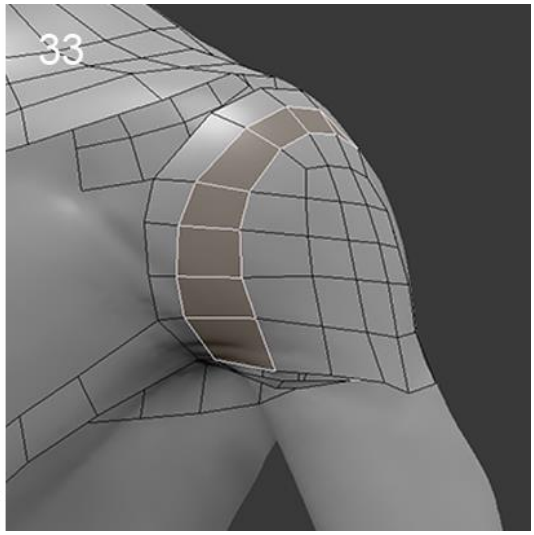


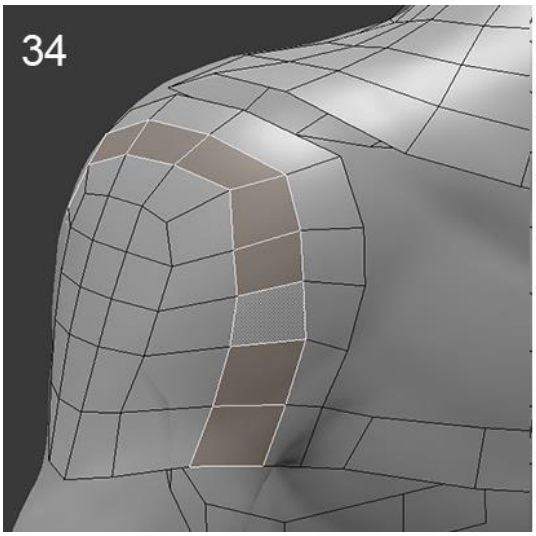


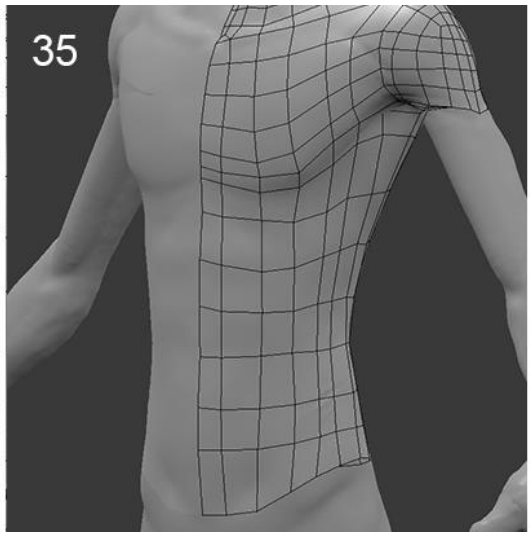


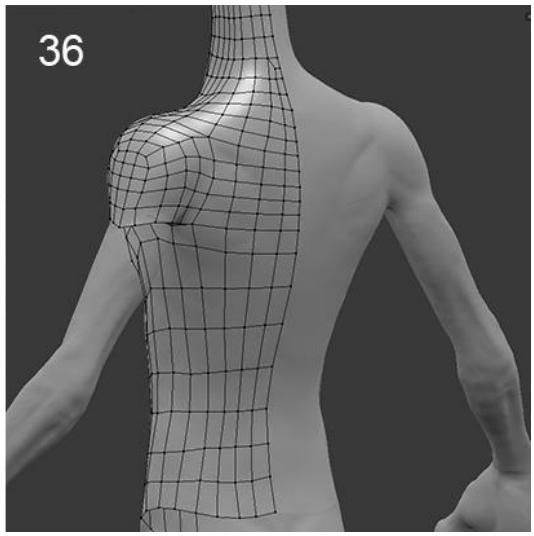


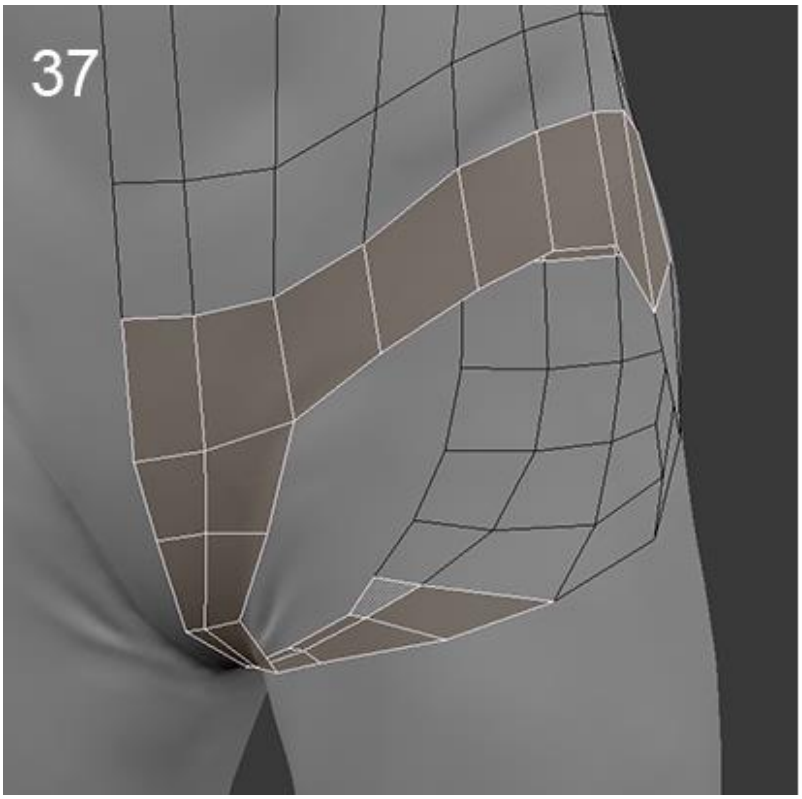


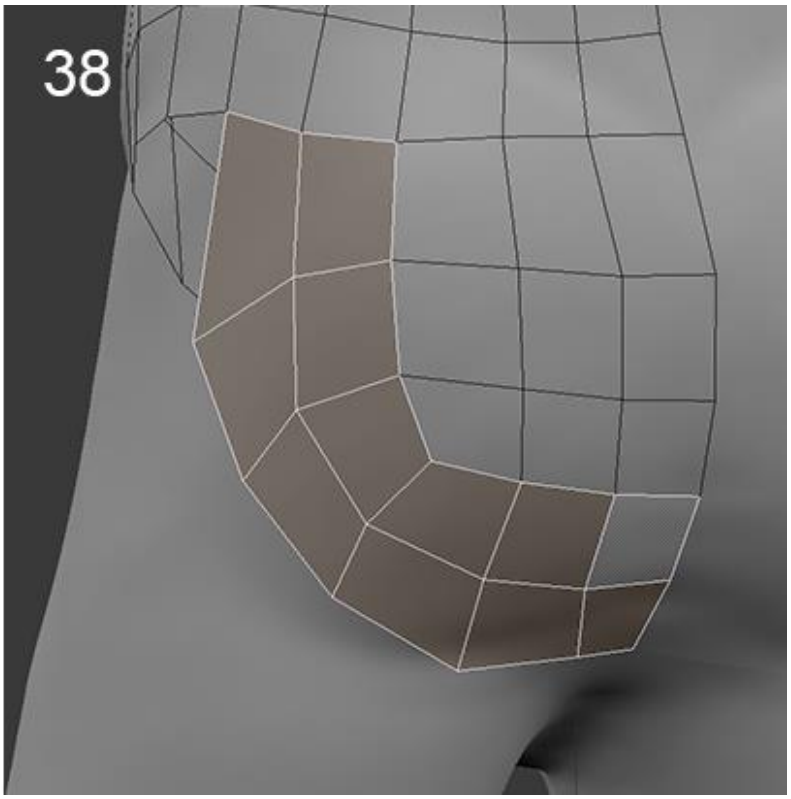




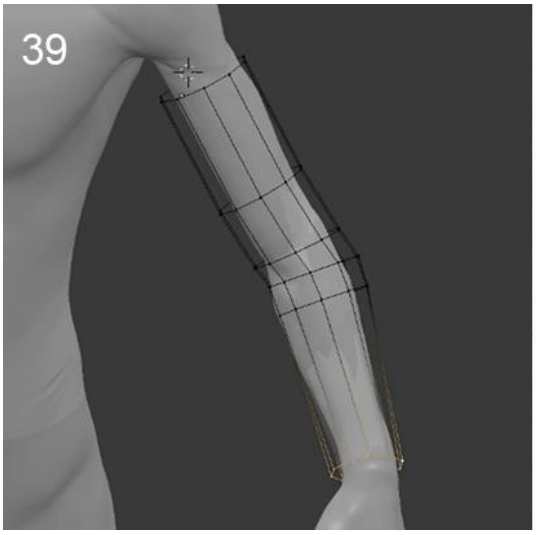


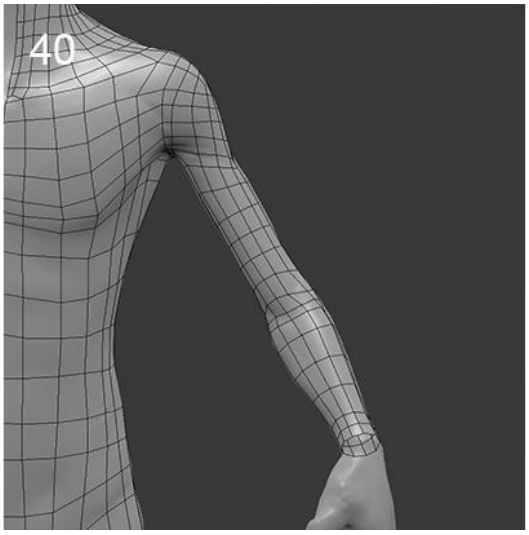


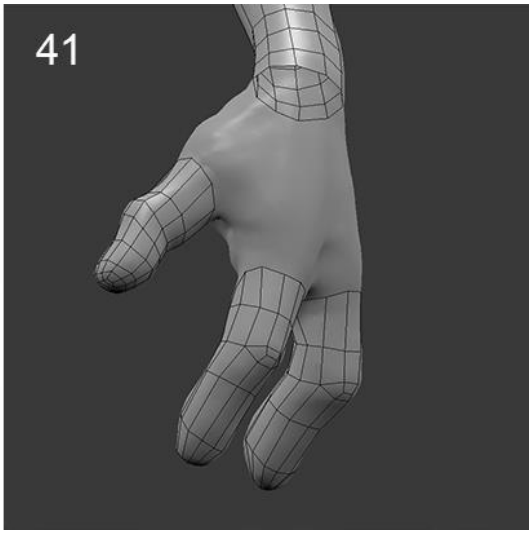


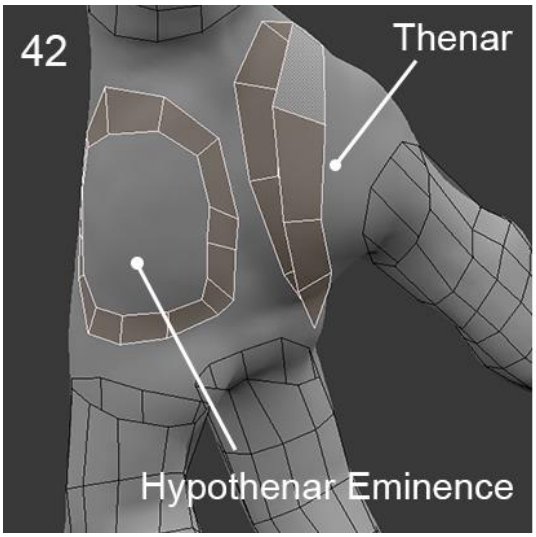


The arms and the hands





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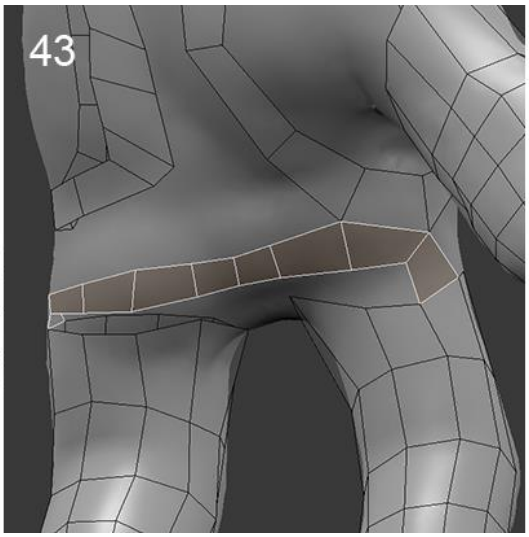
Hypothenar Eminence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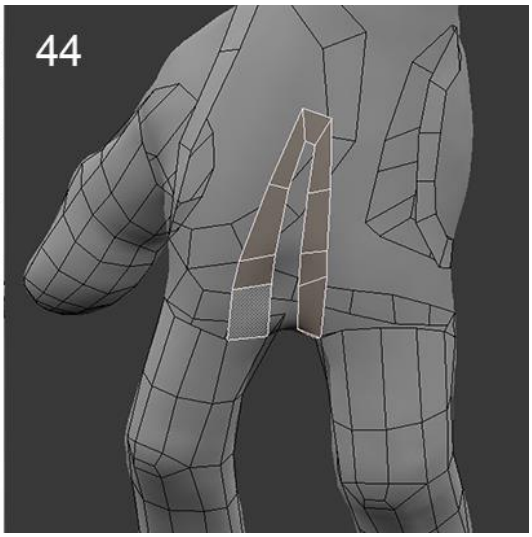
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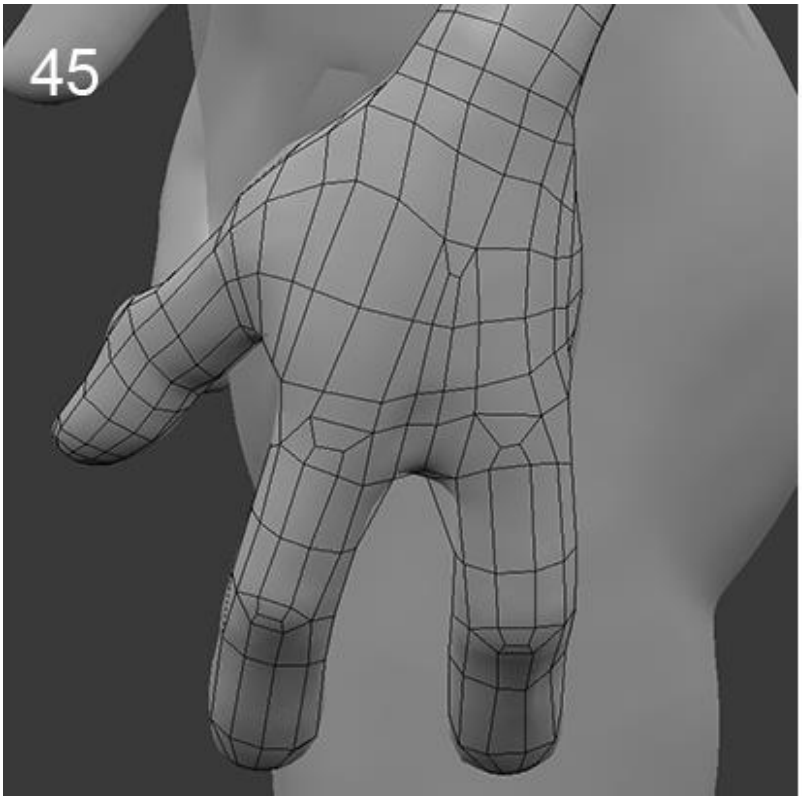
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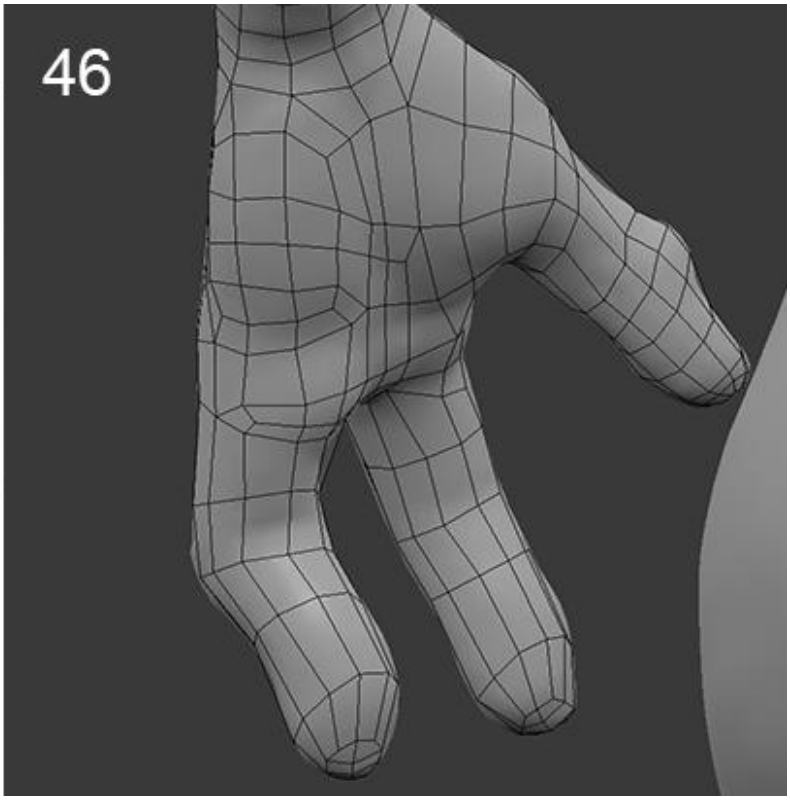
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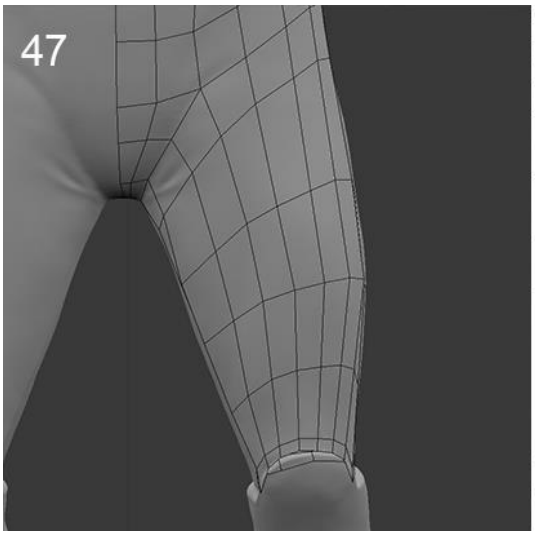
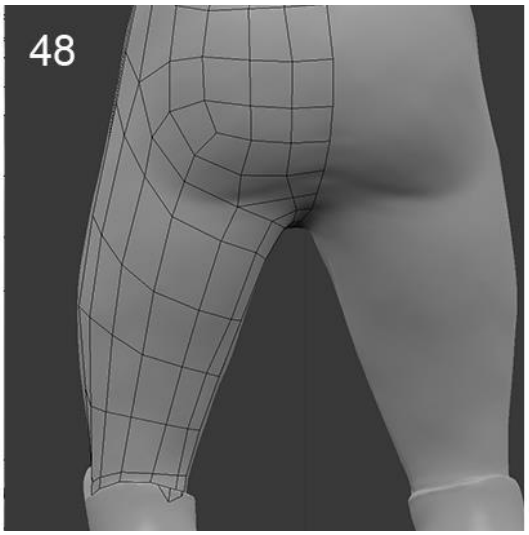
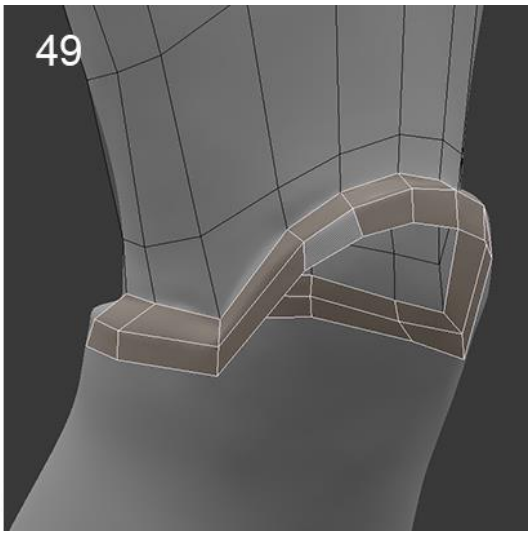
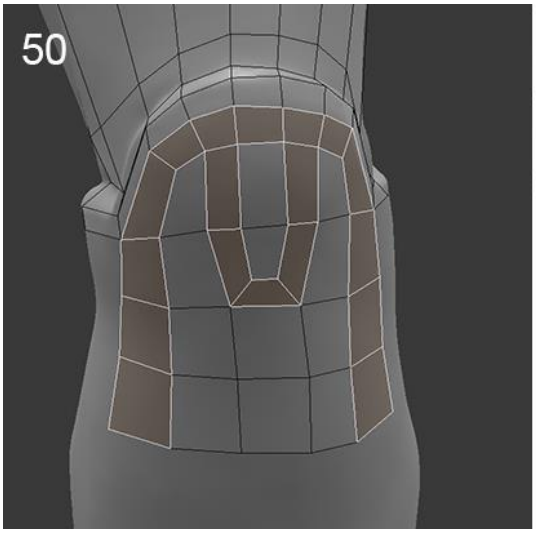
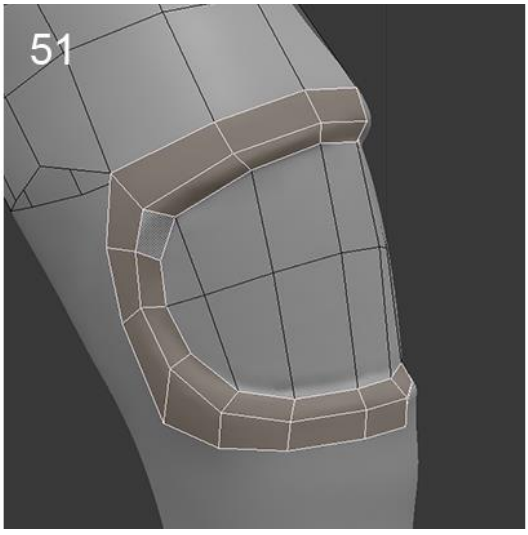
The legs

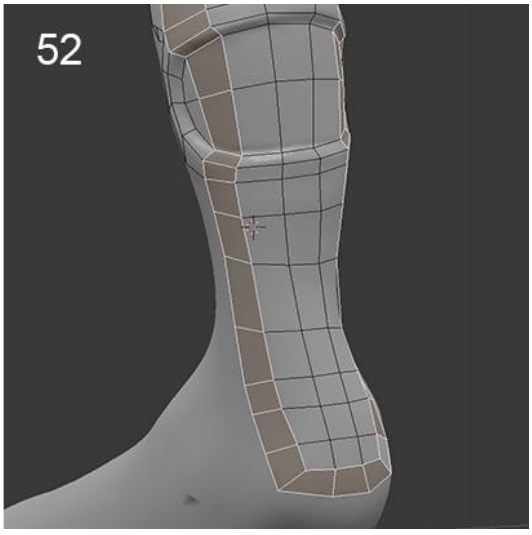


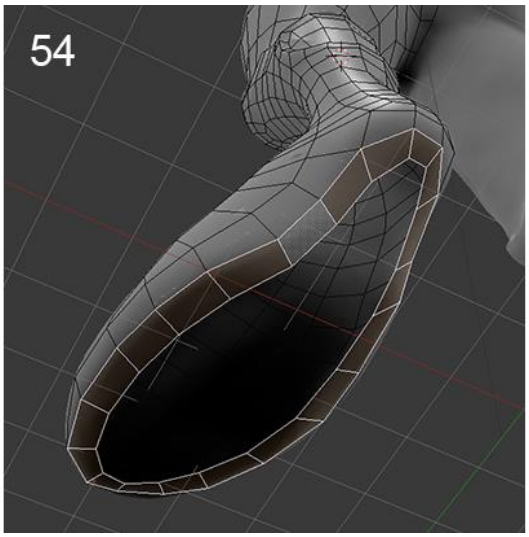


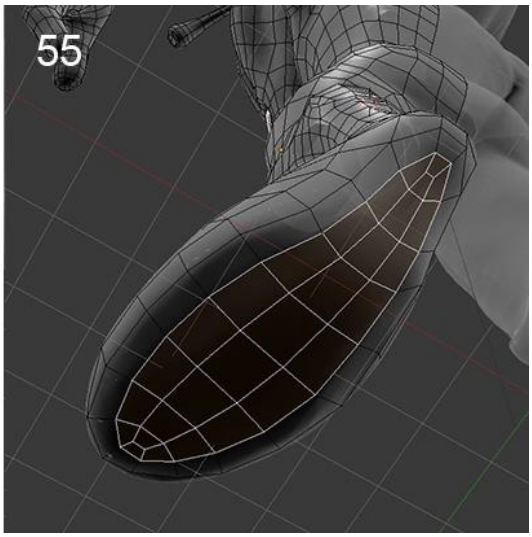












A presentation of each important face-loops of the alien

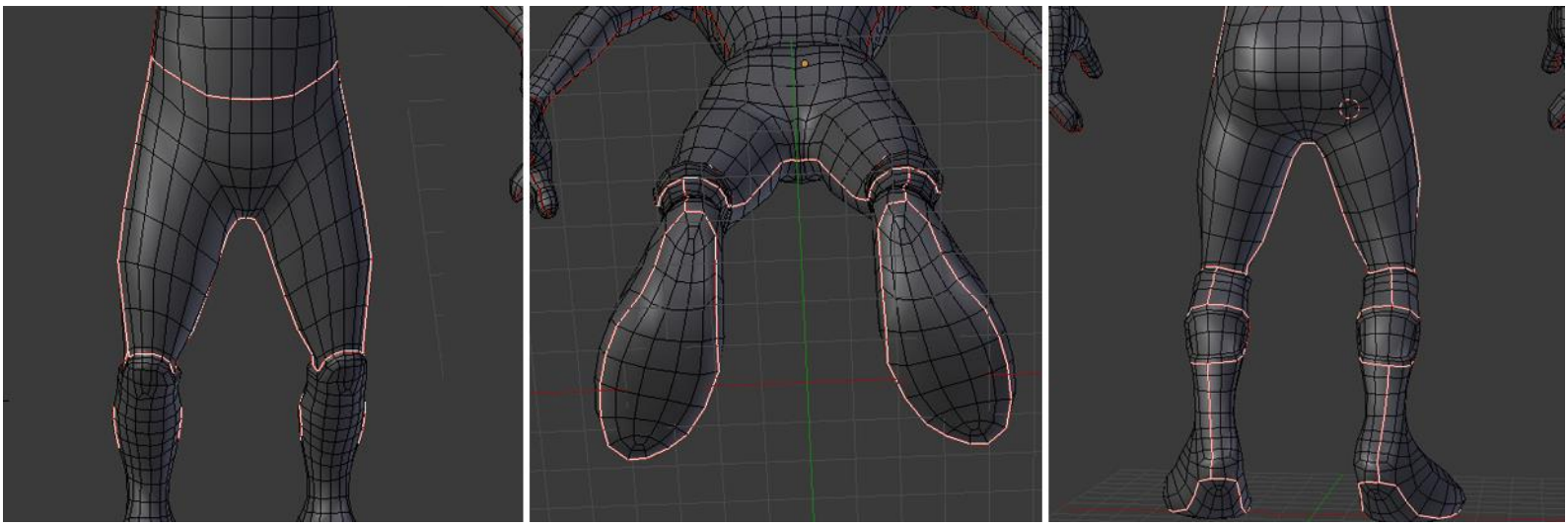
Unwrapping UVs

Understanding UV's

Placement of the seams

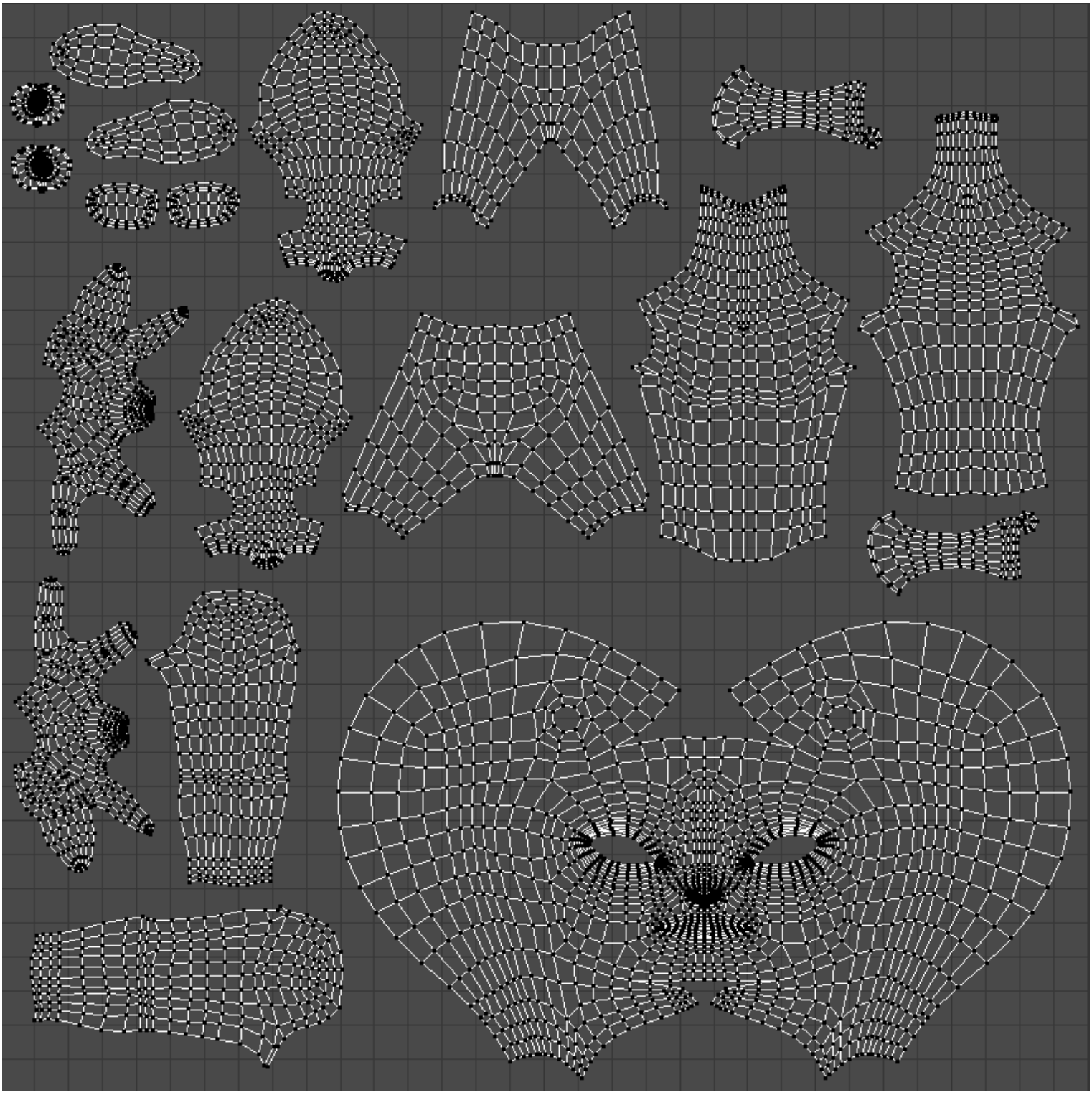
The head seams

The upper body seams



The lower body seams

Placement and adjustment of the islands

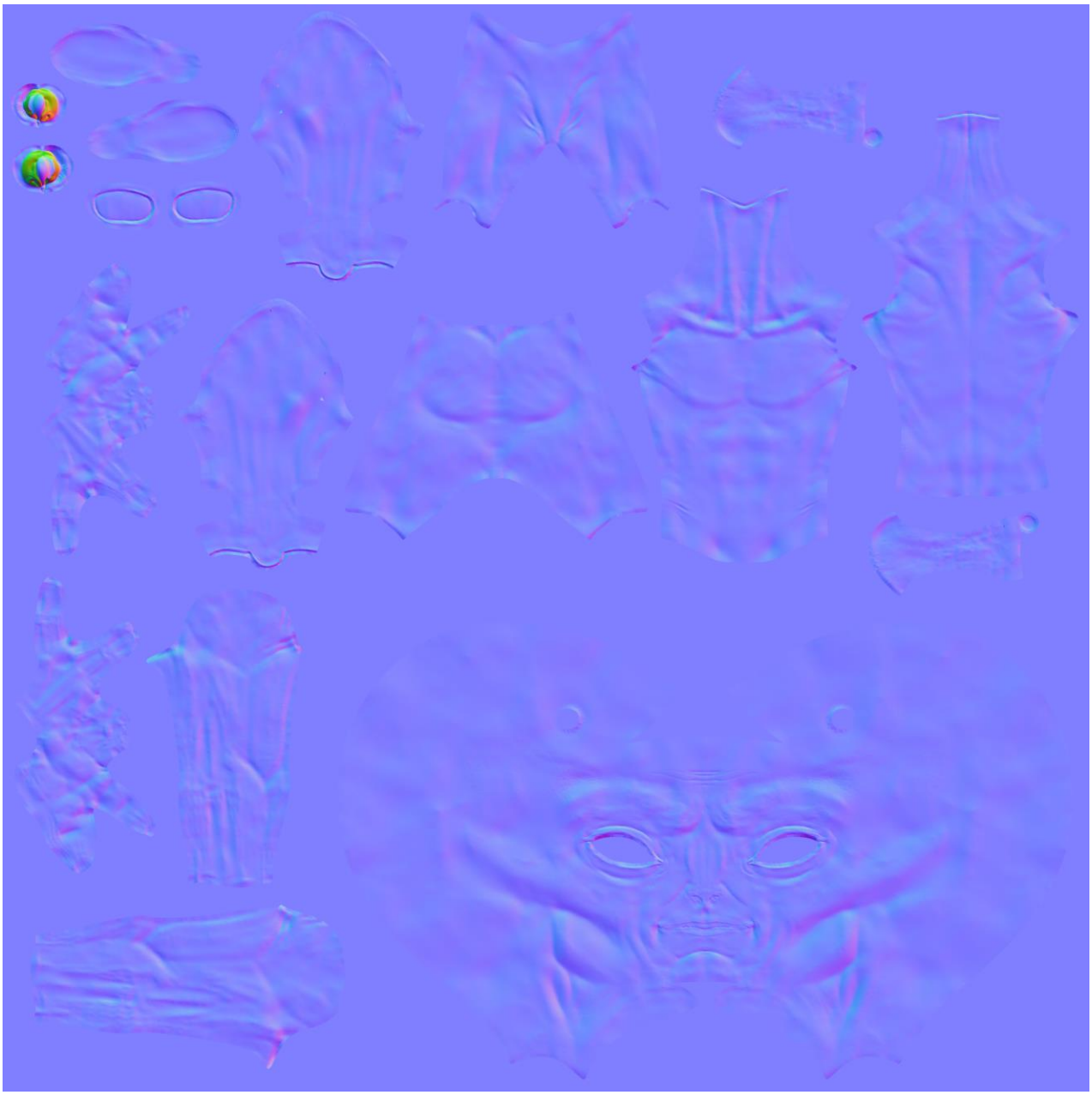


The final UV island placement

Baking of textures

What is a normal map?

Making of the bake

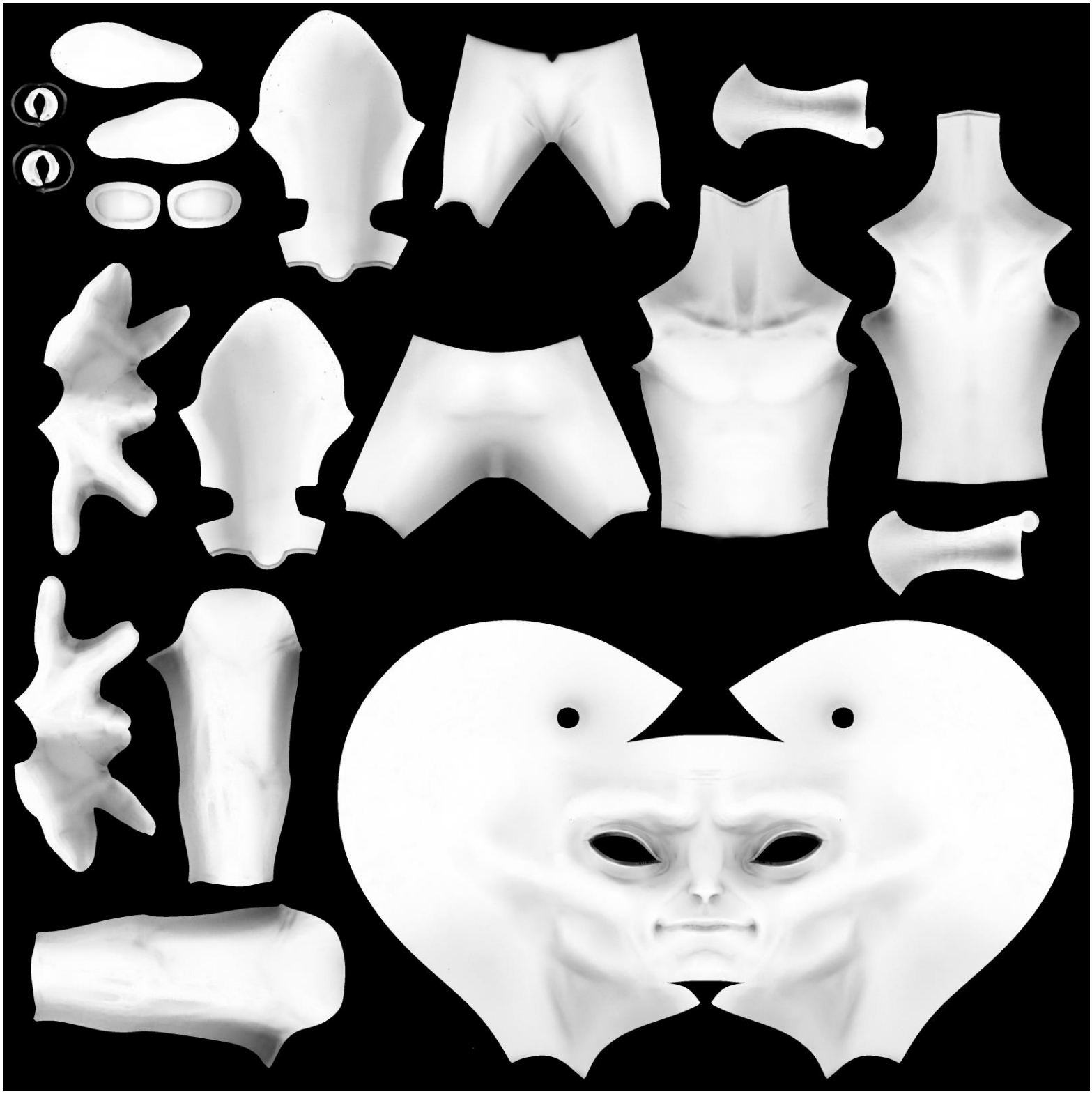


The baked normal map of our alien

Baking of an ambient occlusion

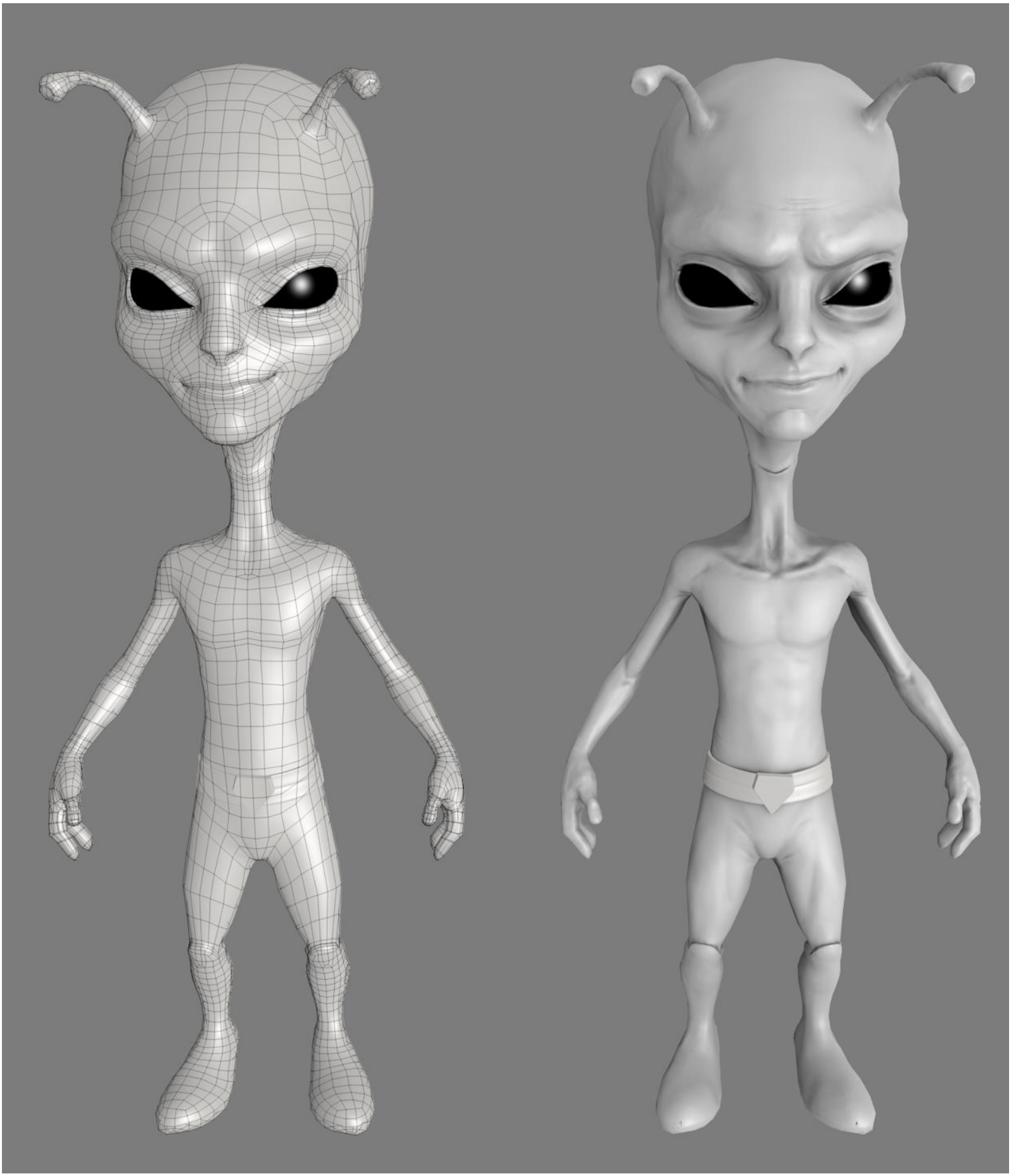
Understanding the ambient occlusion map

Creation of the bake



The baked ambient occlusion map of our alien

Displaying the ambient occlusion in the viewport



The alien with a proper topology (shown on the left-hand side) and with its normal map and ambient occlusion (on the right-hand side)

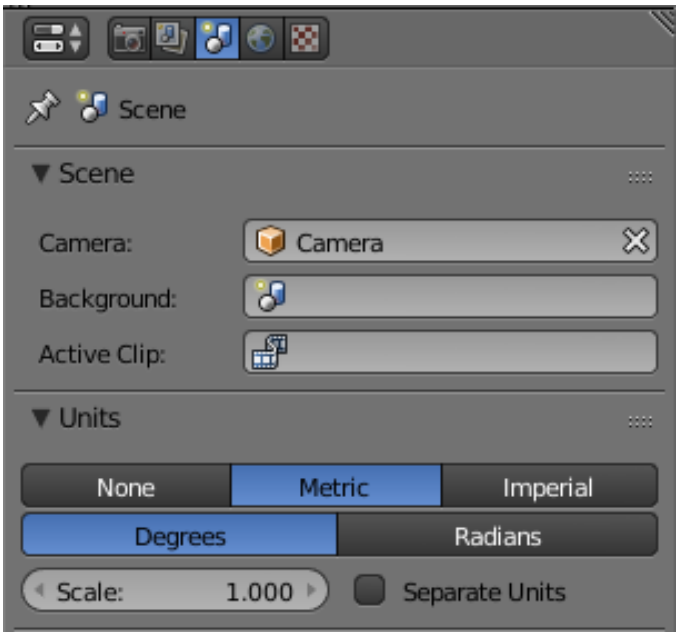
5

Haunted House – Modeling Of the Scene

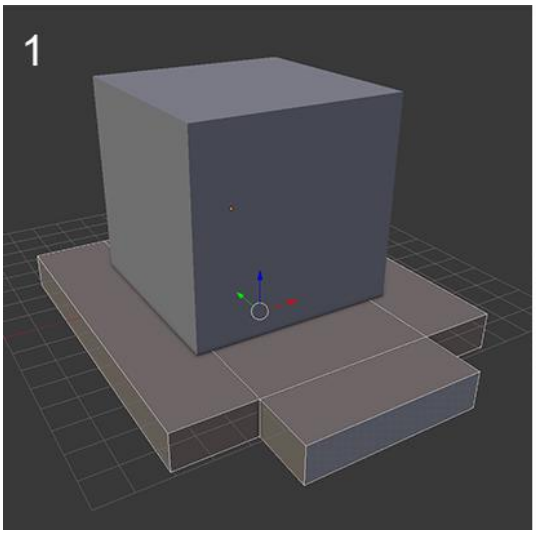
The final haunted house

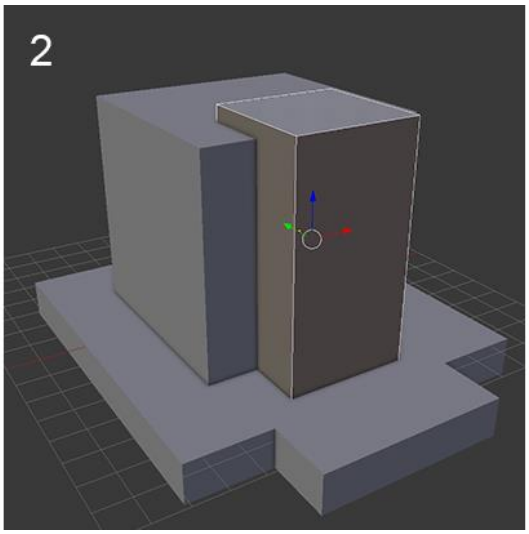
Blocking the house

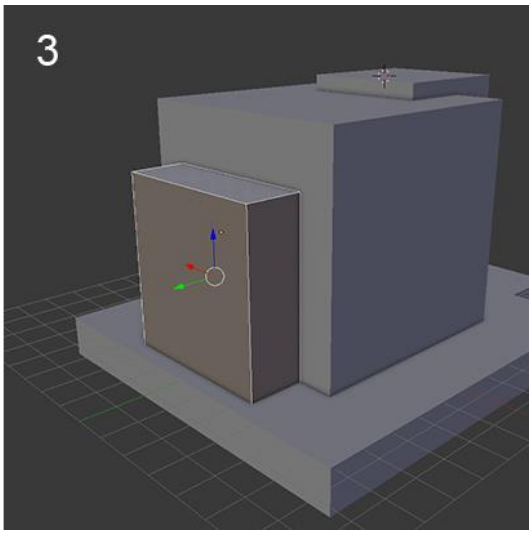
Working on scale

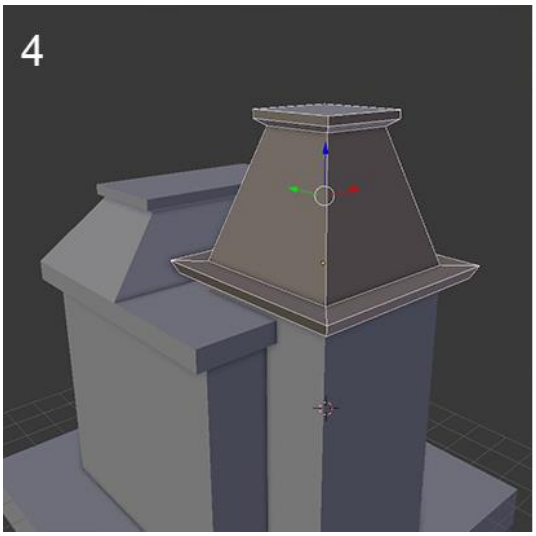


Blocking the bases of the house





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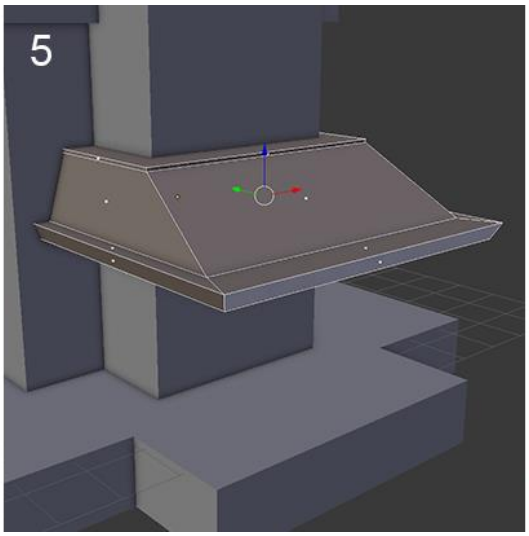
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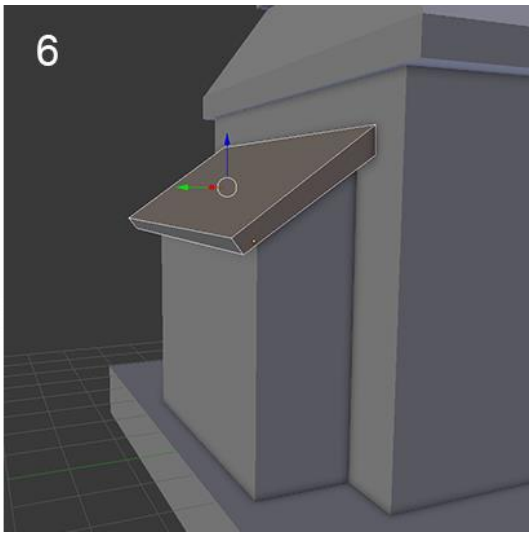
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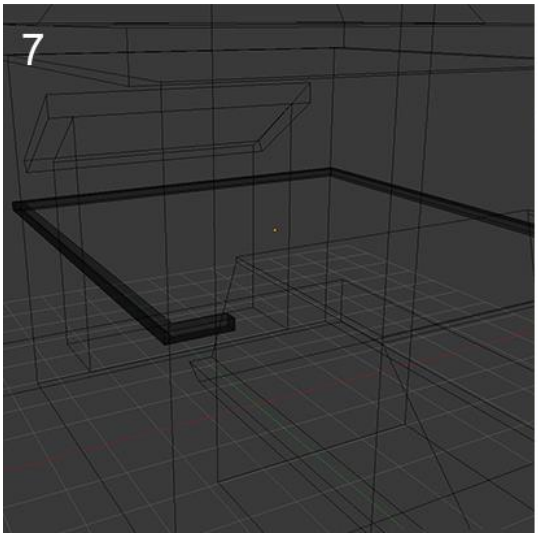
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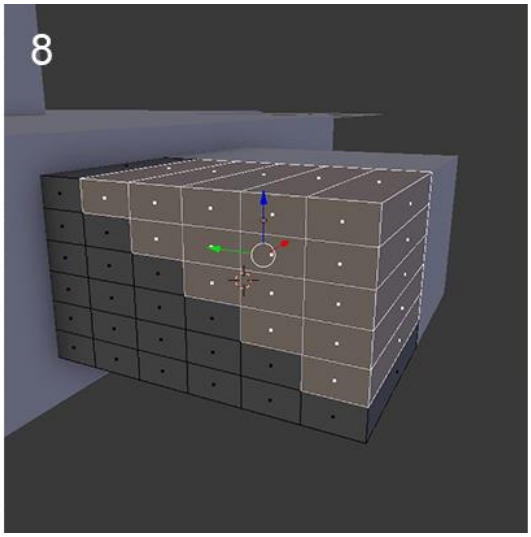
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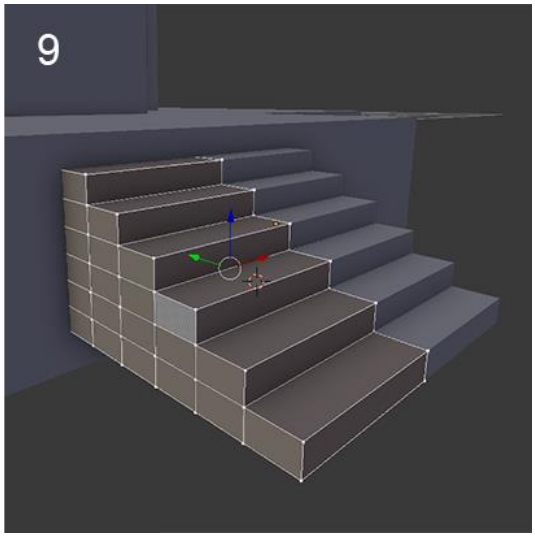
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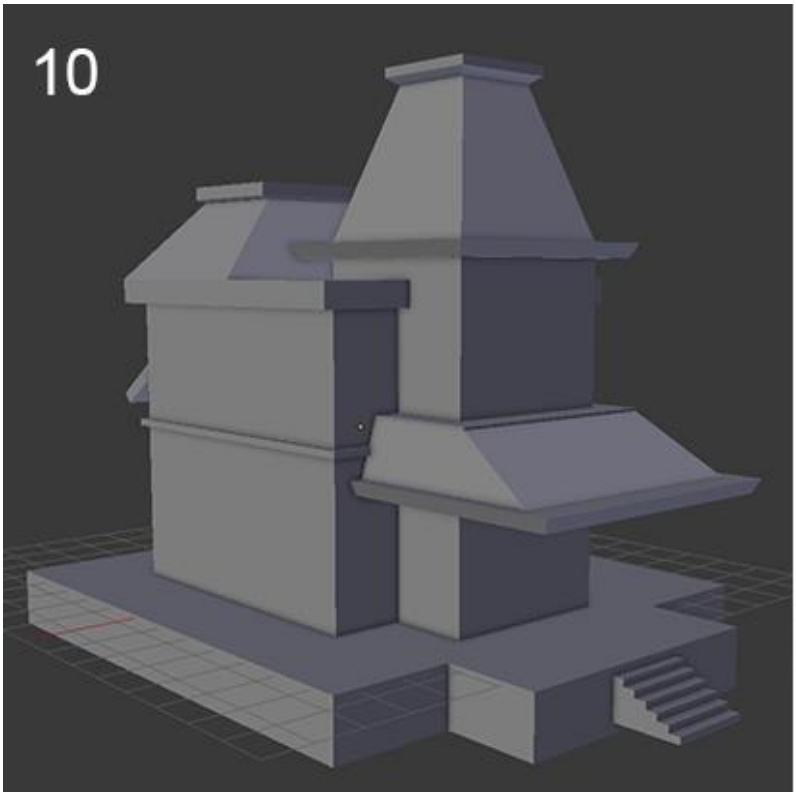
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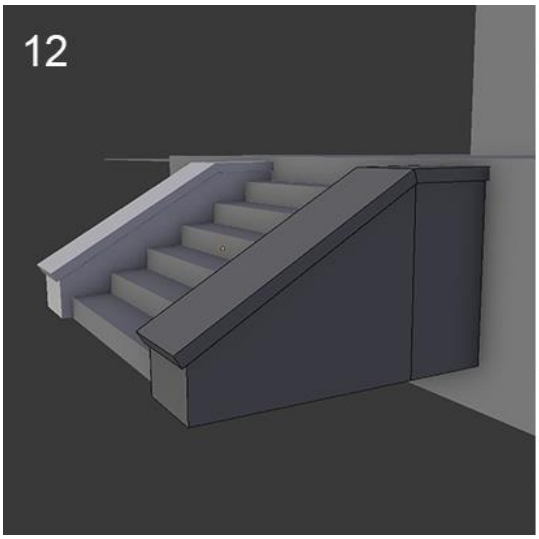
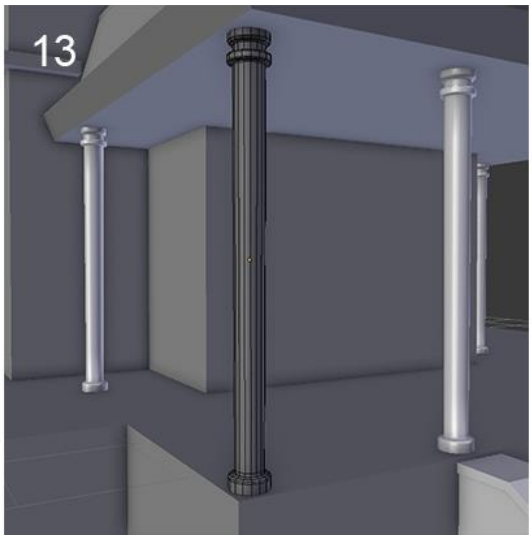
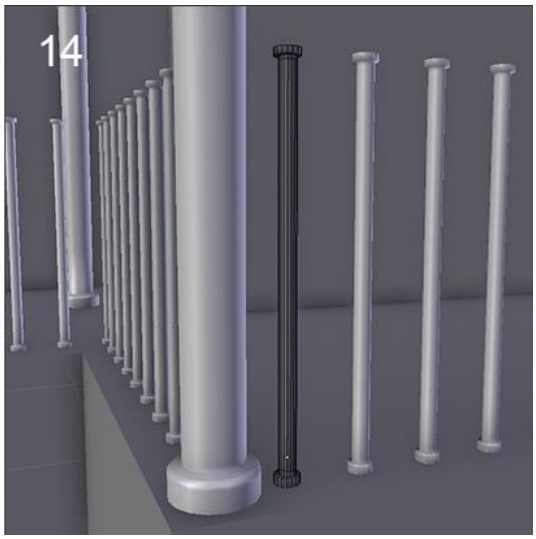
11

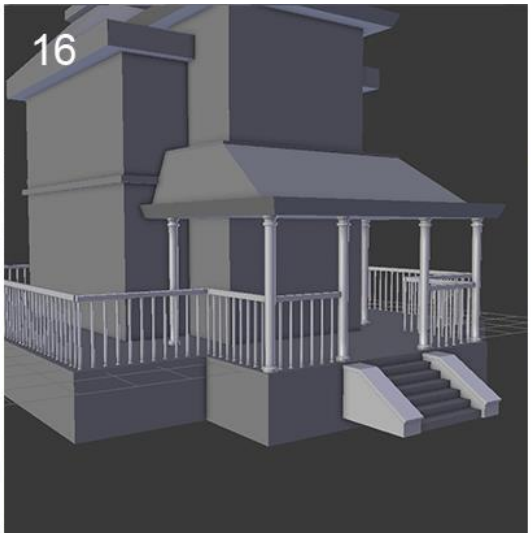
Refining the blocking

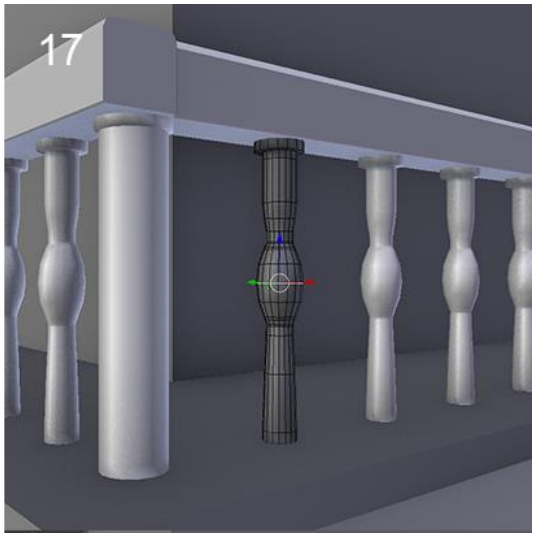
Adding instantiated objects

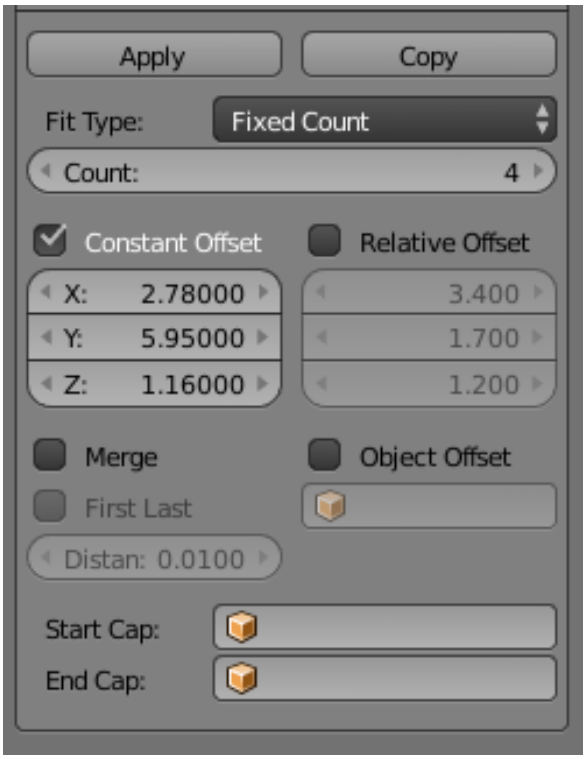








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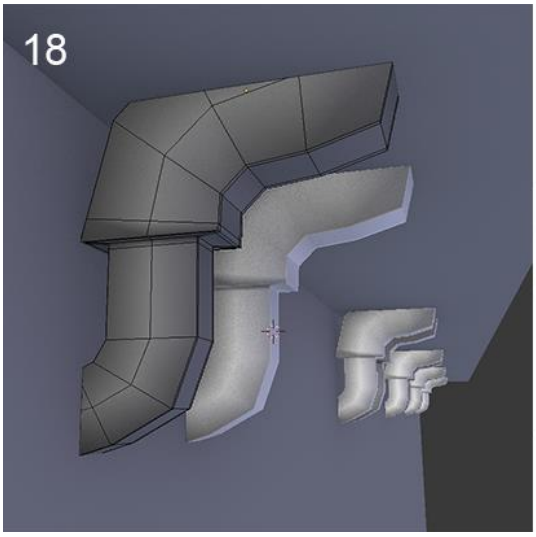
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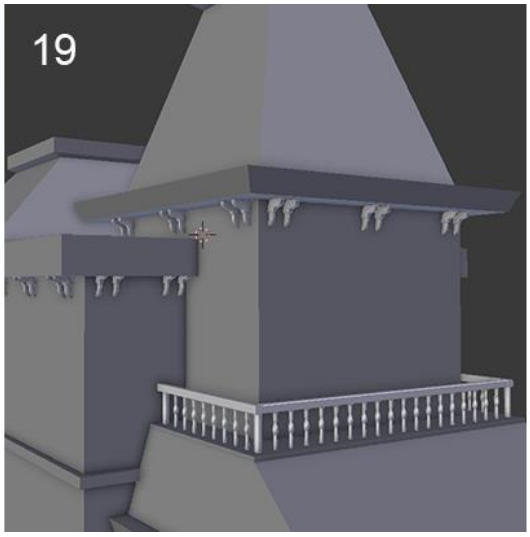
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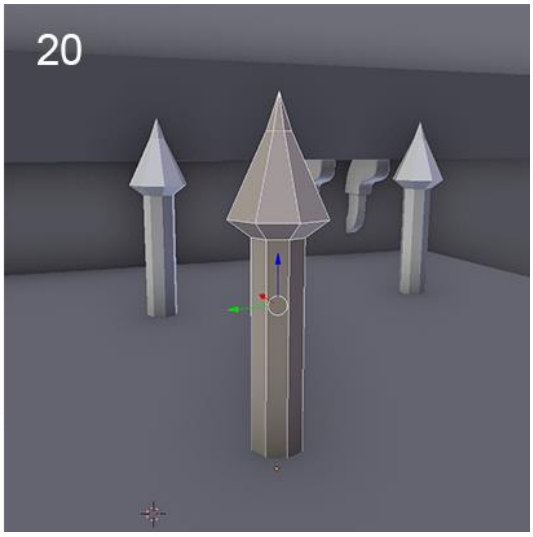
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21


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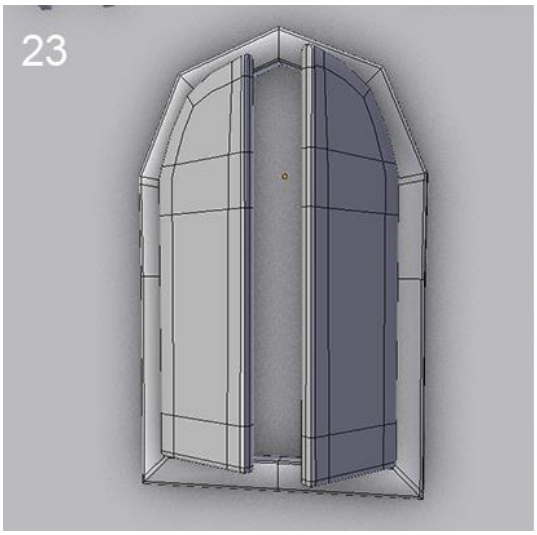
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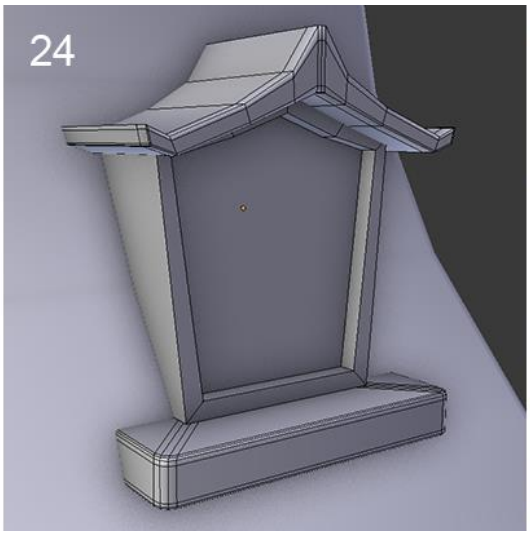
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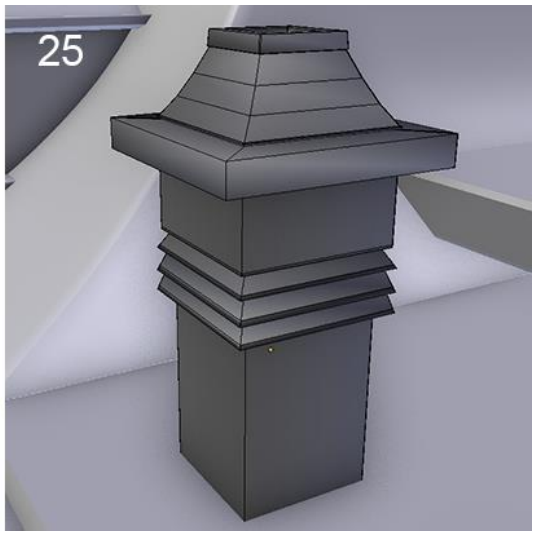
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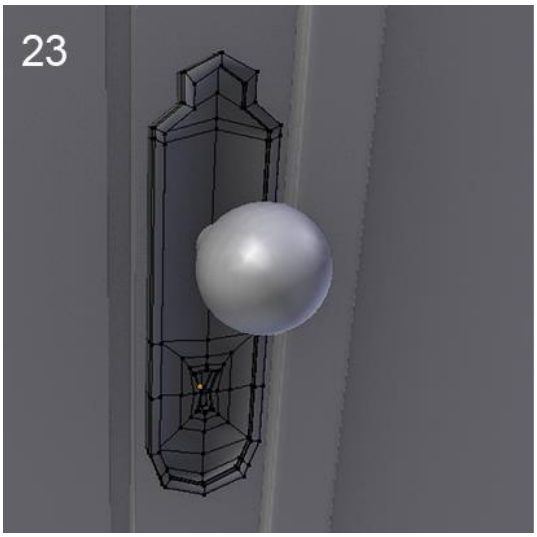
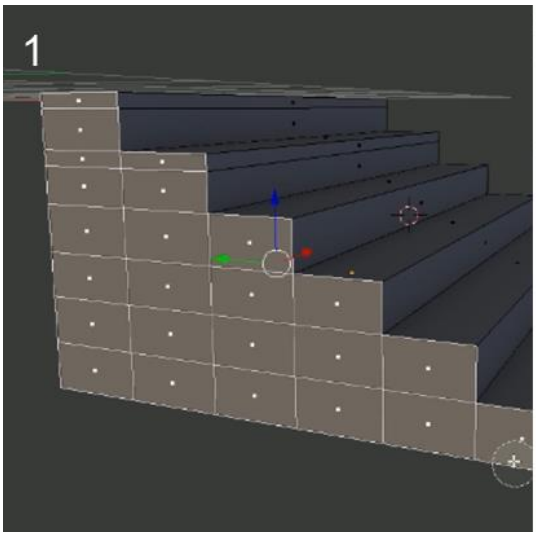
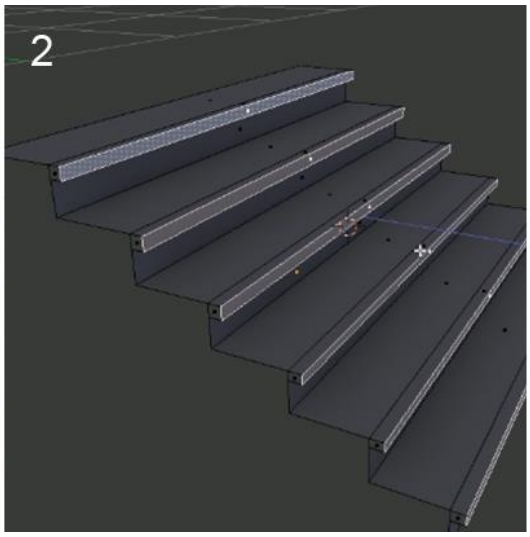
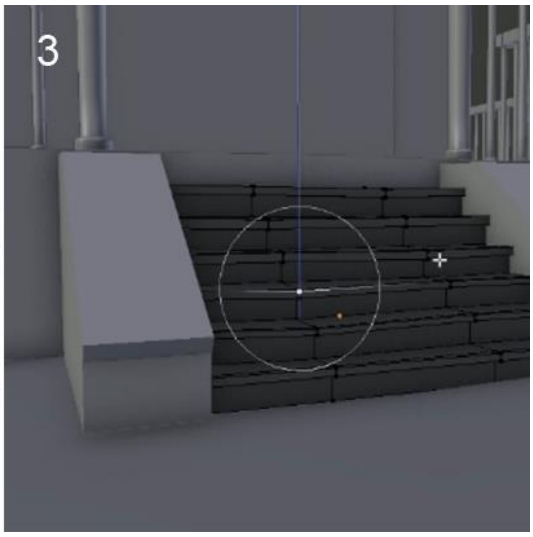
Reworking the blocking objects

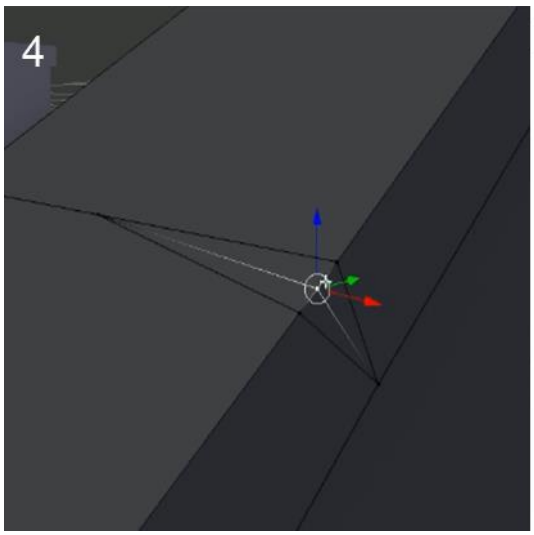


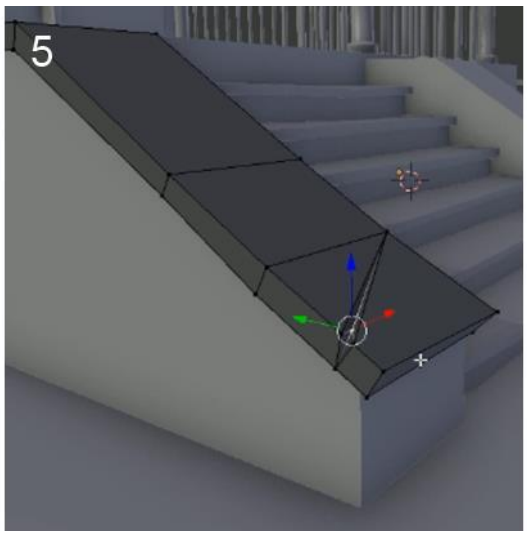
Breaking and ageing the elements

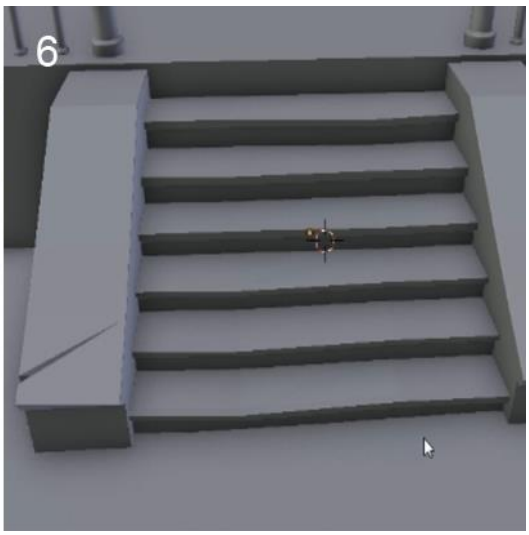




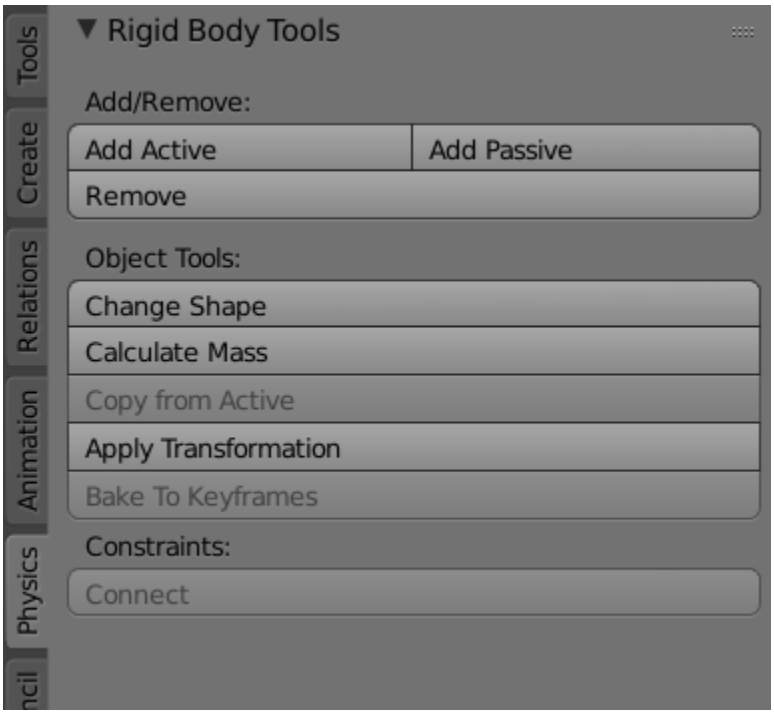




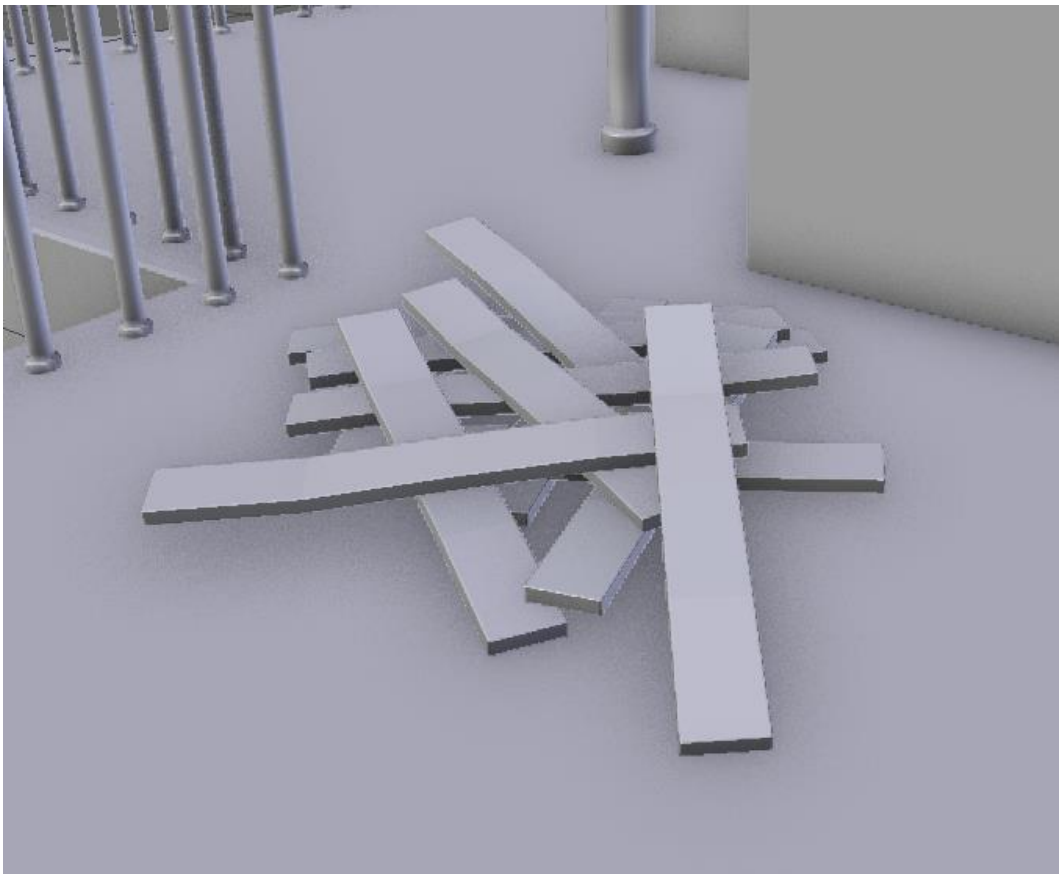




Creation of the simulation of a stack of planks



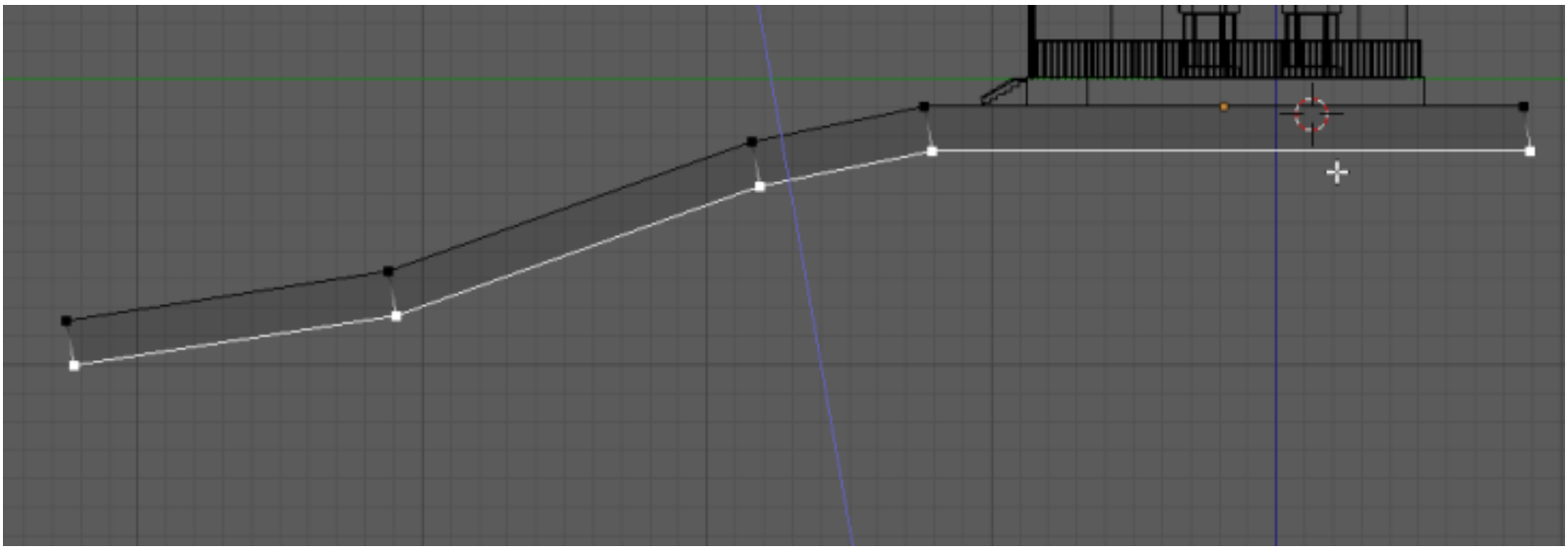
The Physics tab



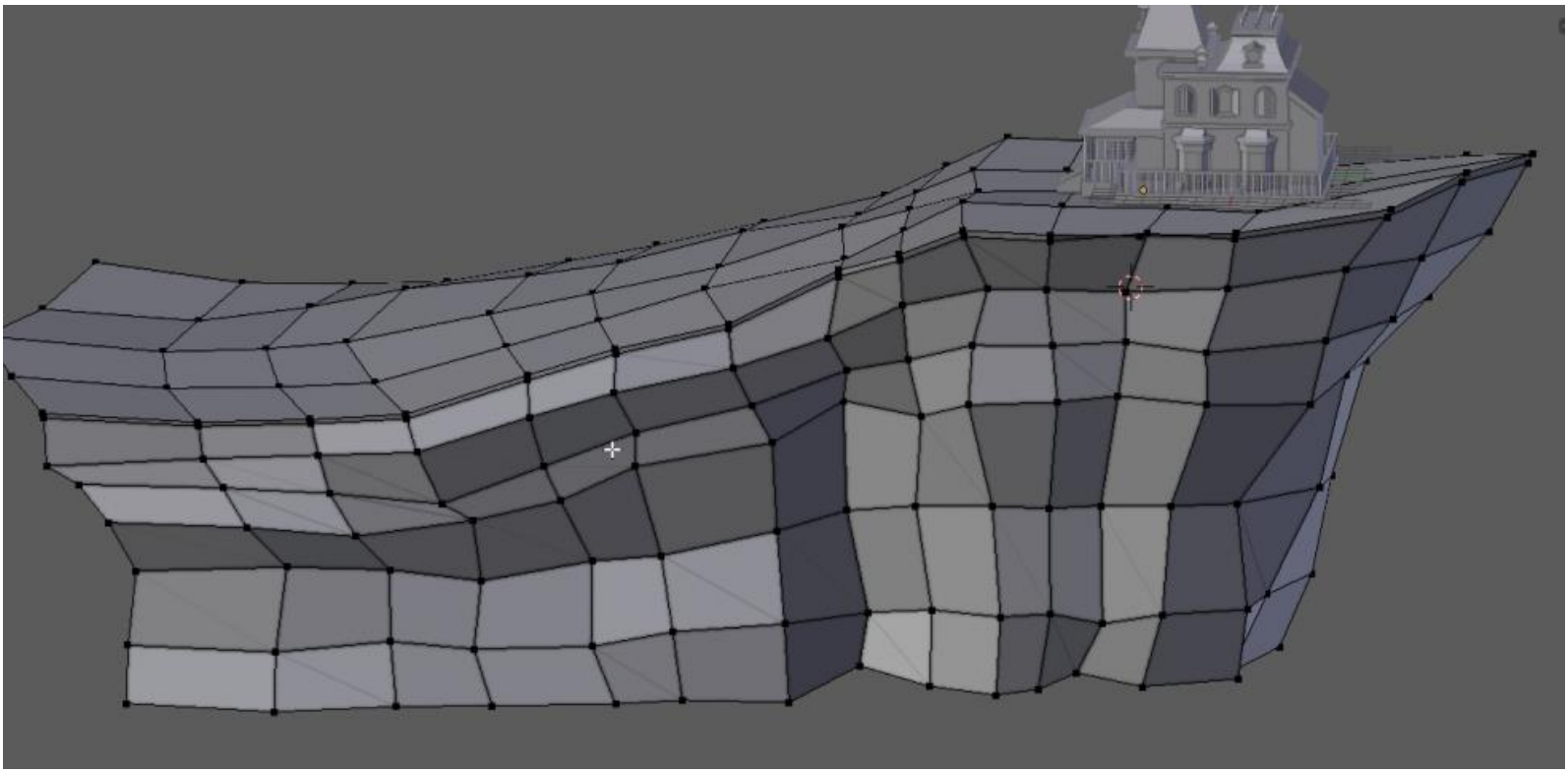
The final stack of wooden planks

Modeling the environment (8 pages)

Modeling the cliff

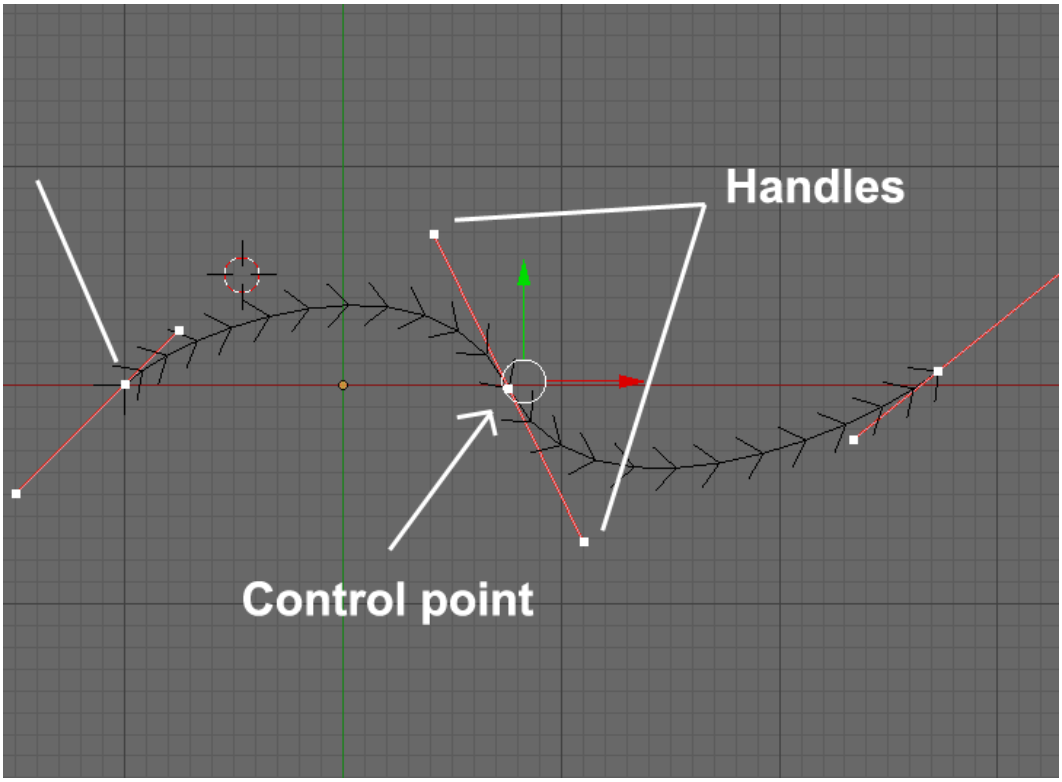


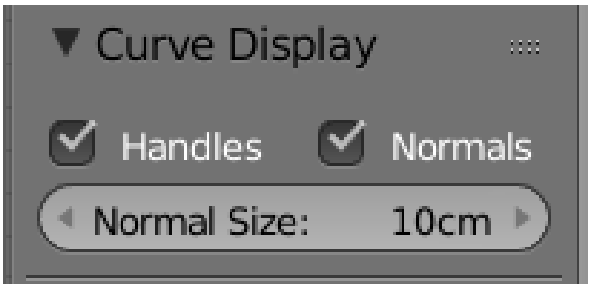
Starting the cliff modeling.



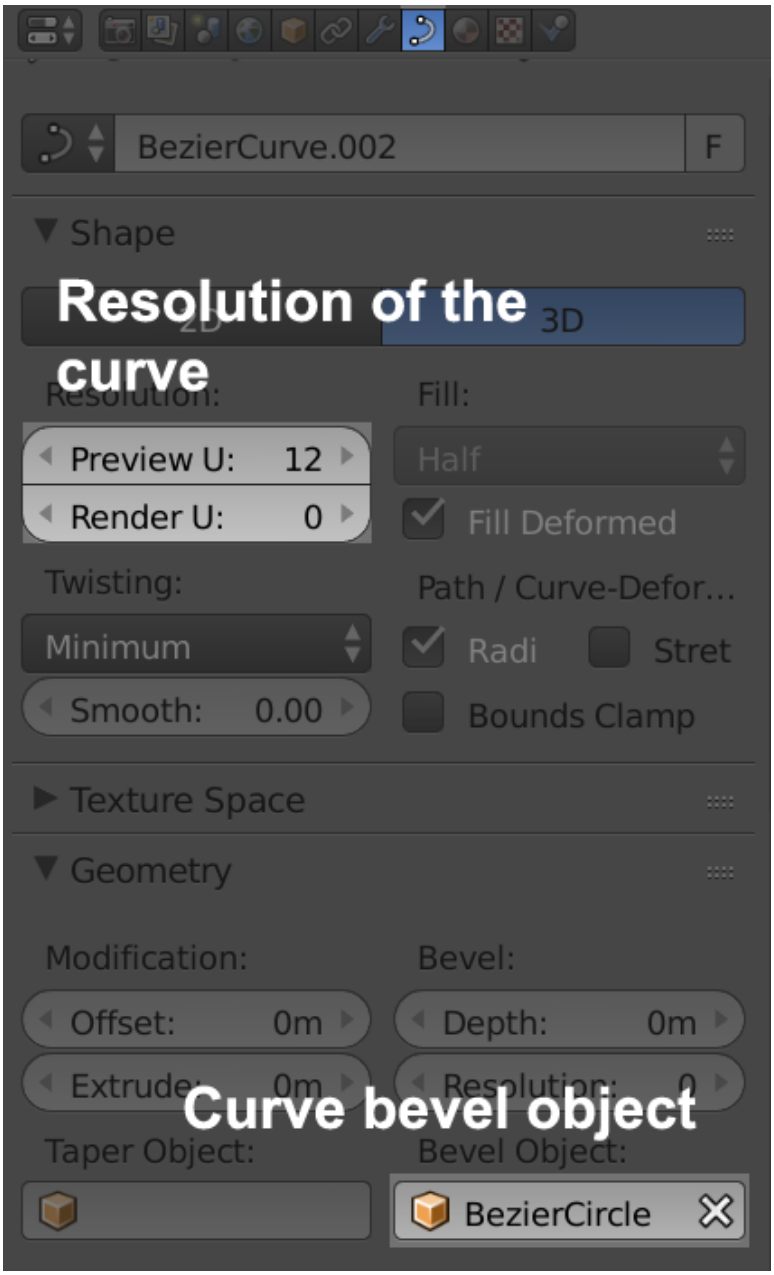
The final cliff

Modeling a tree with curves

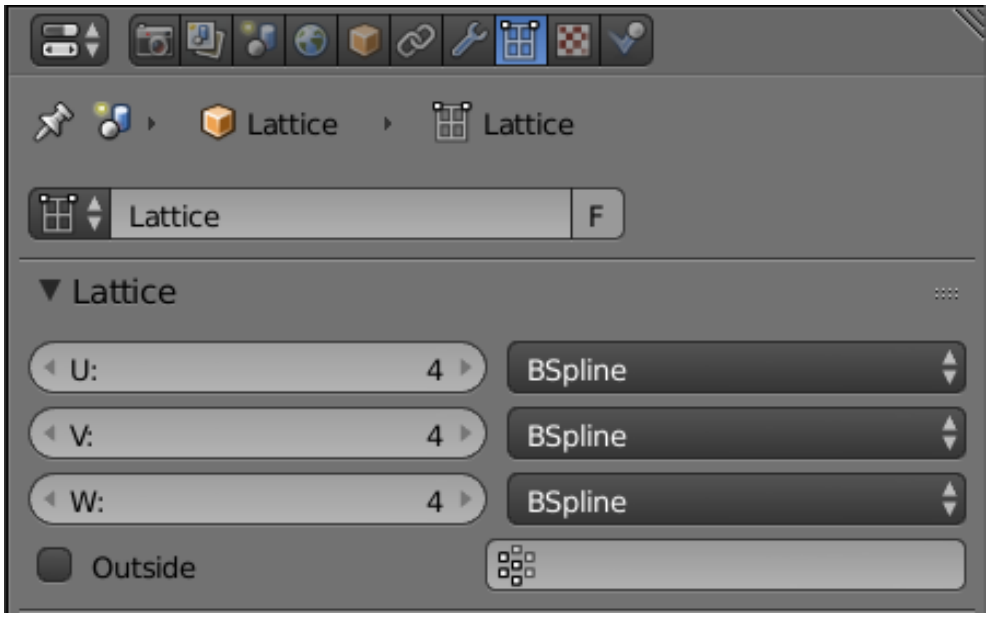




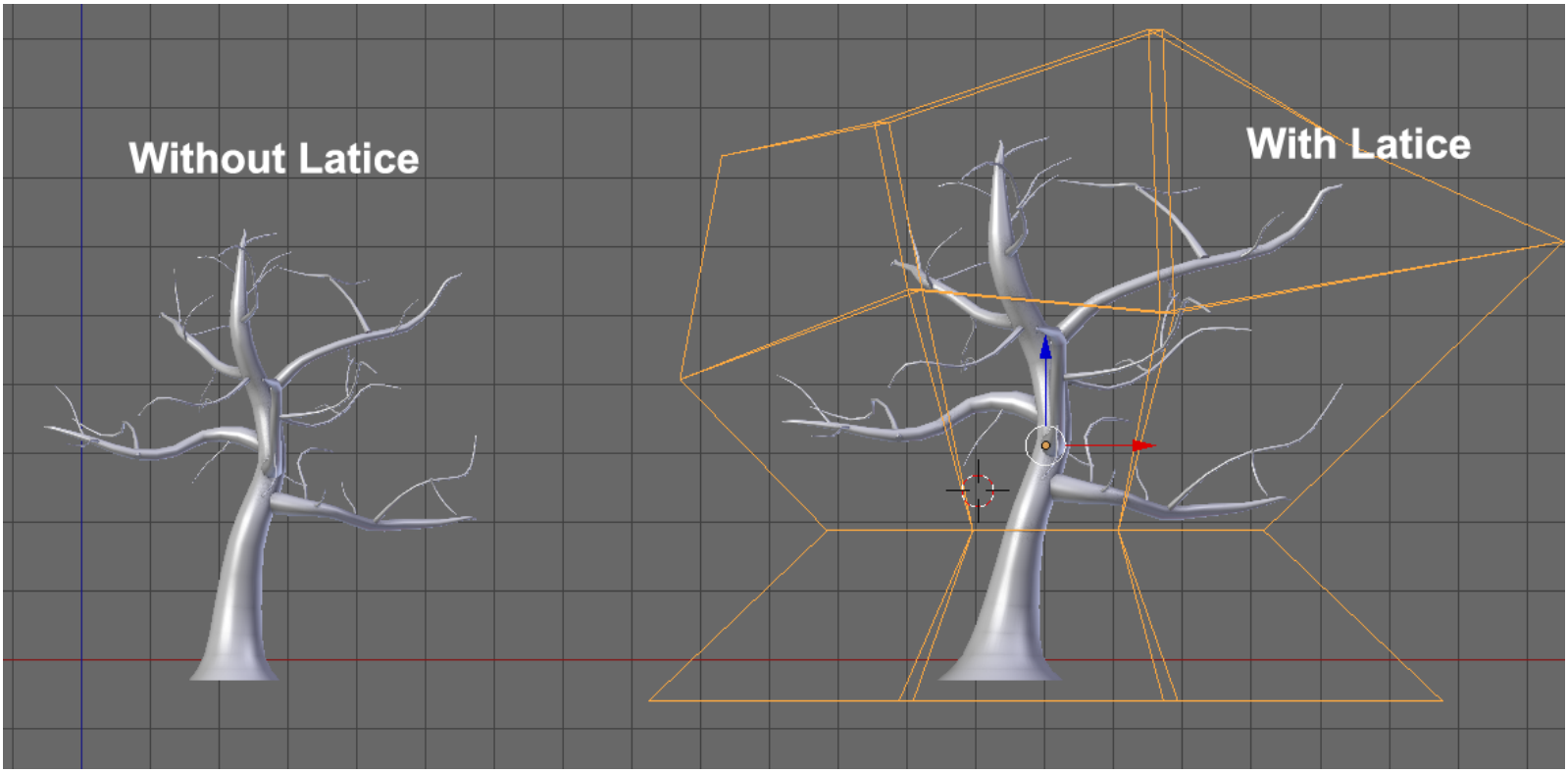
The Curve display options in the N panel.



The curves option in the Properties editor

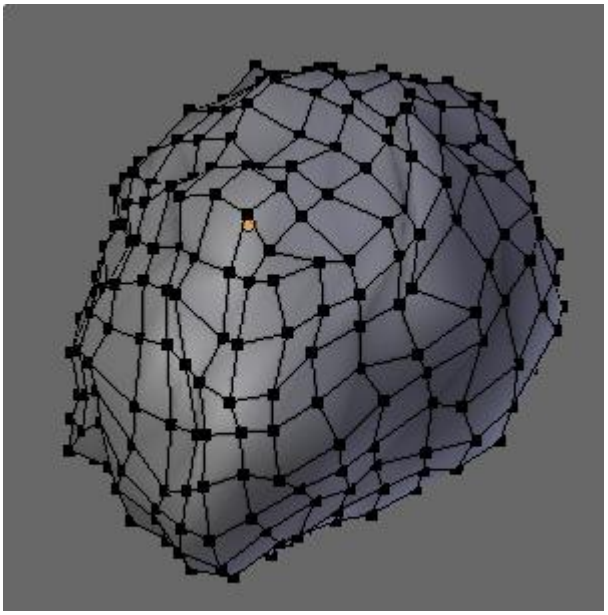


The options in the Properties editor.

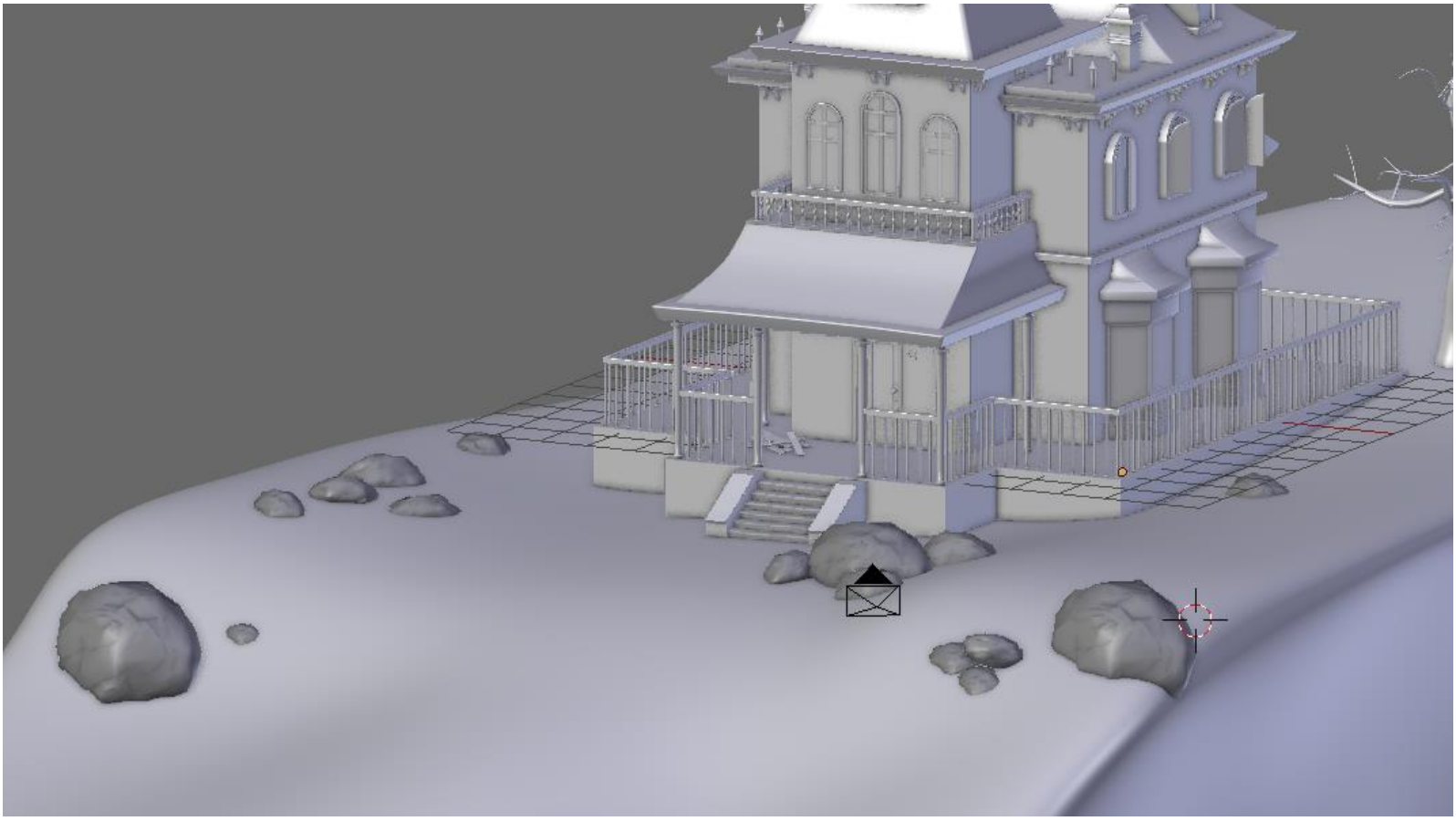


The final tree with its lattice

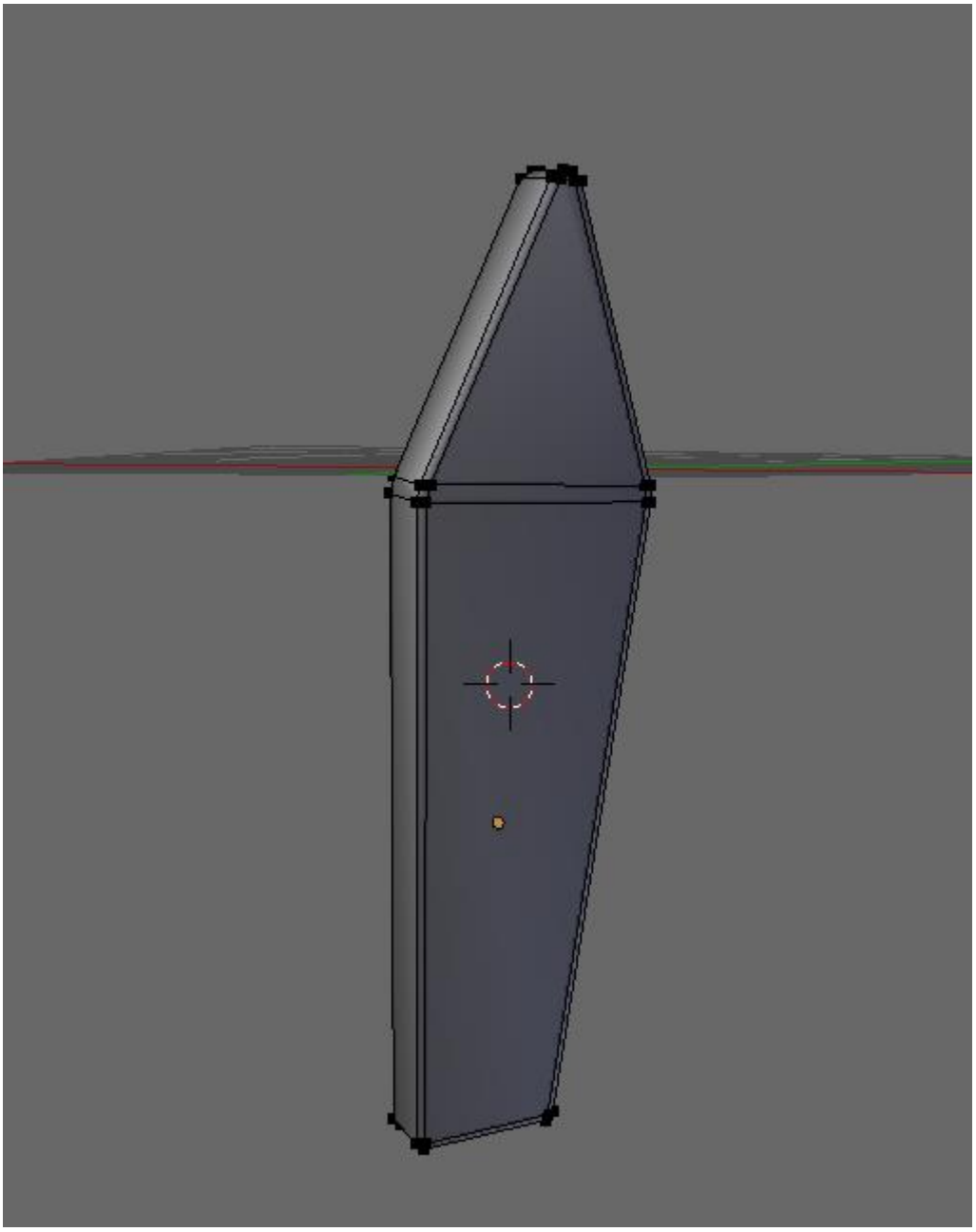
Enhancing the scene with a barrier, rocks and a cart



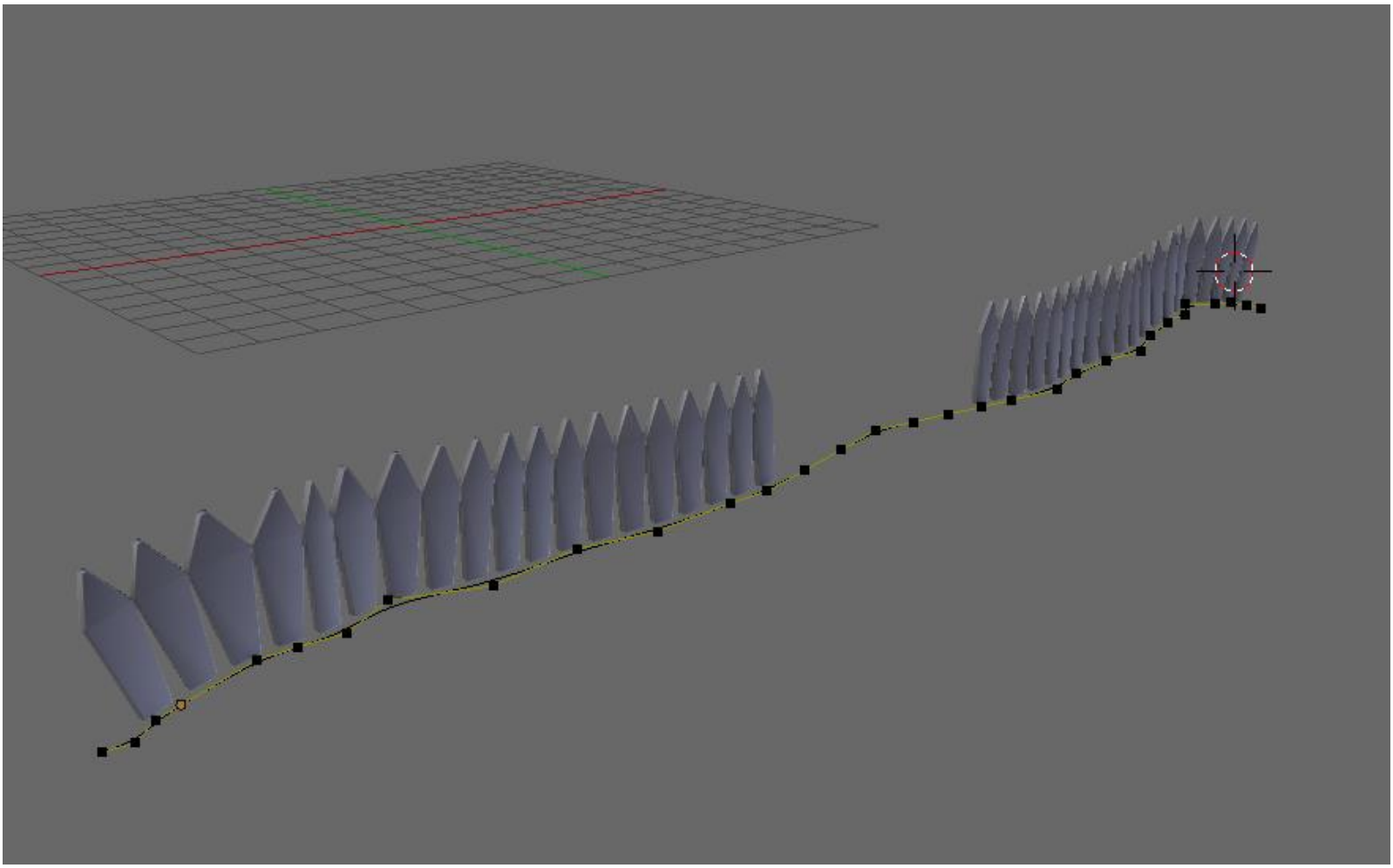
A single rock



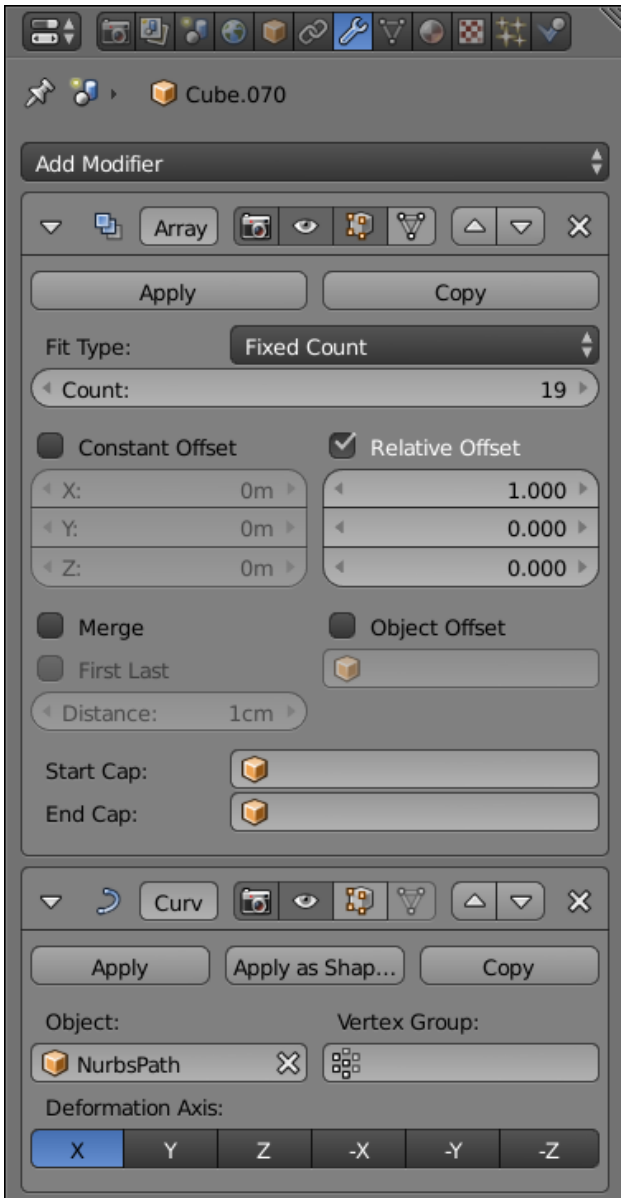
The rocks are now placed all around the house.



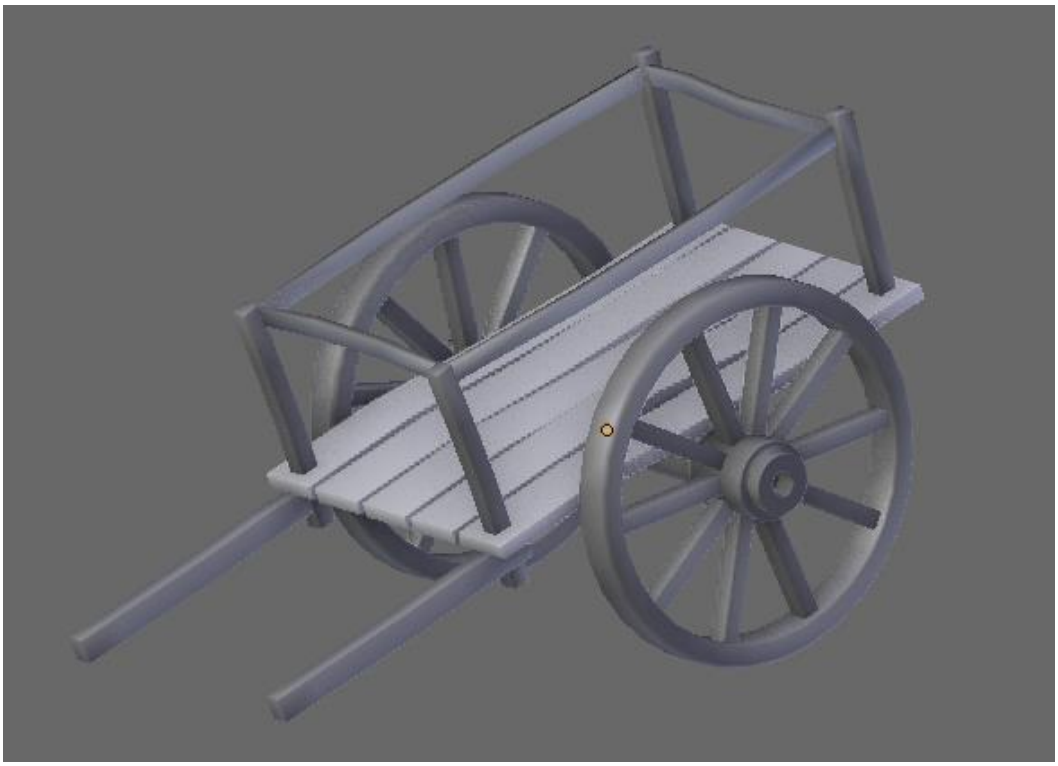
The barrier plank



The final barriers with their curve



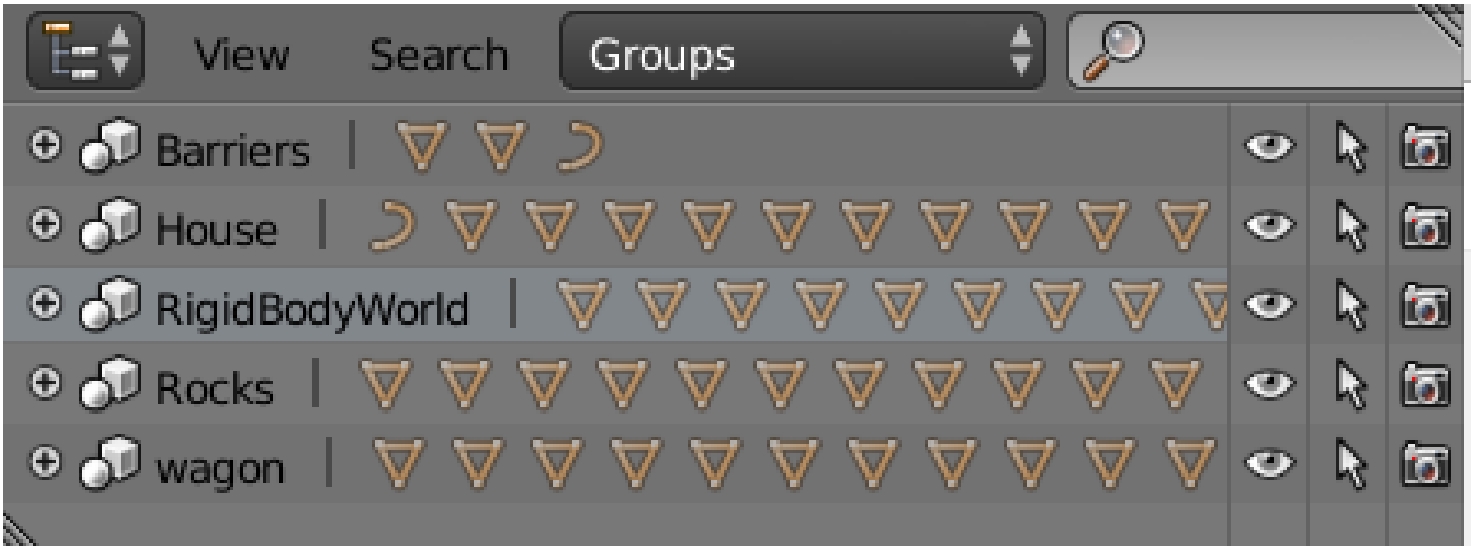
The barriers modifiers



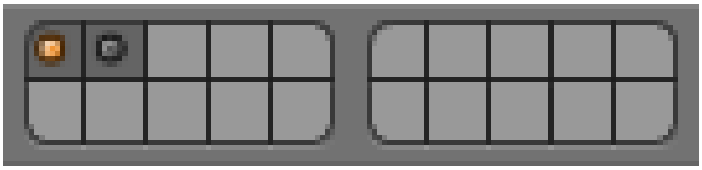
The final cart

Organizing the scene

Grouping objects



Working with layers



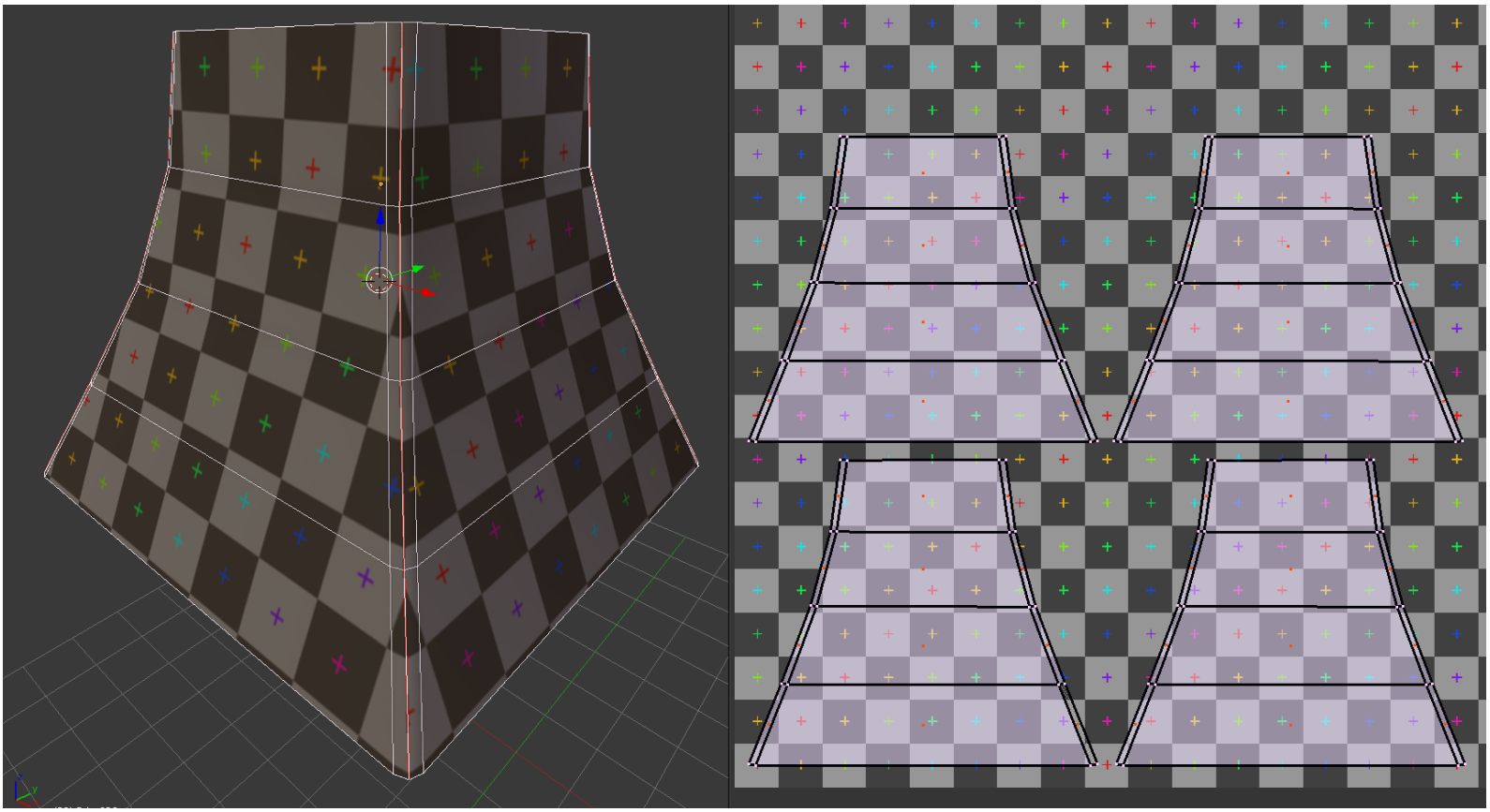
The layer one is selected, but we can see that there are objects on layer two

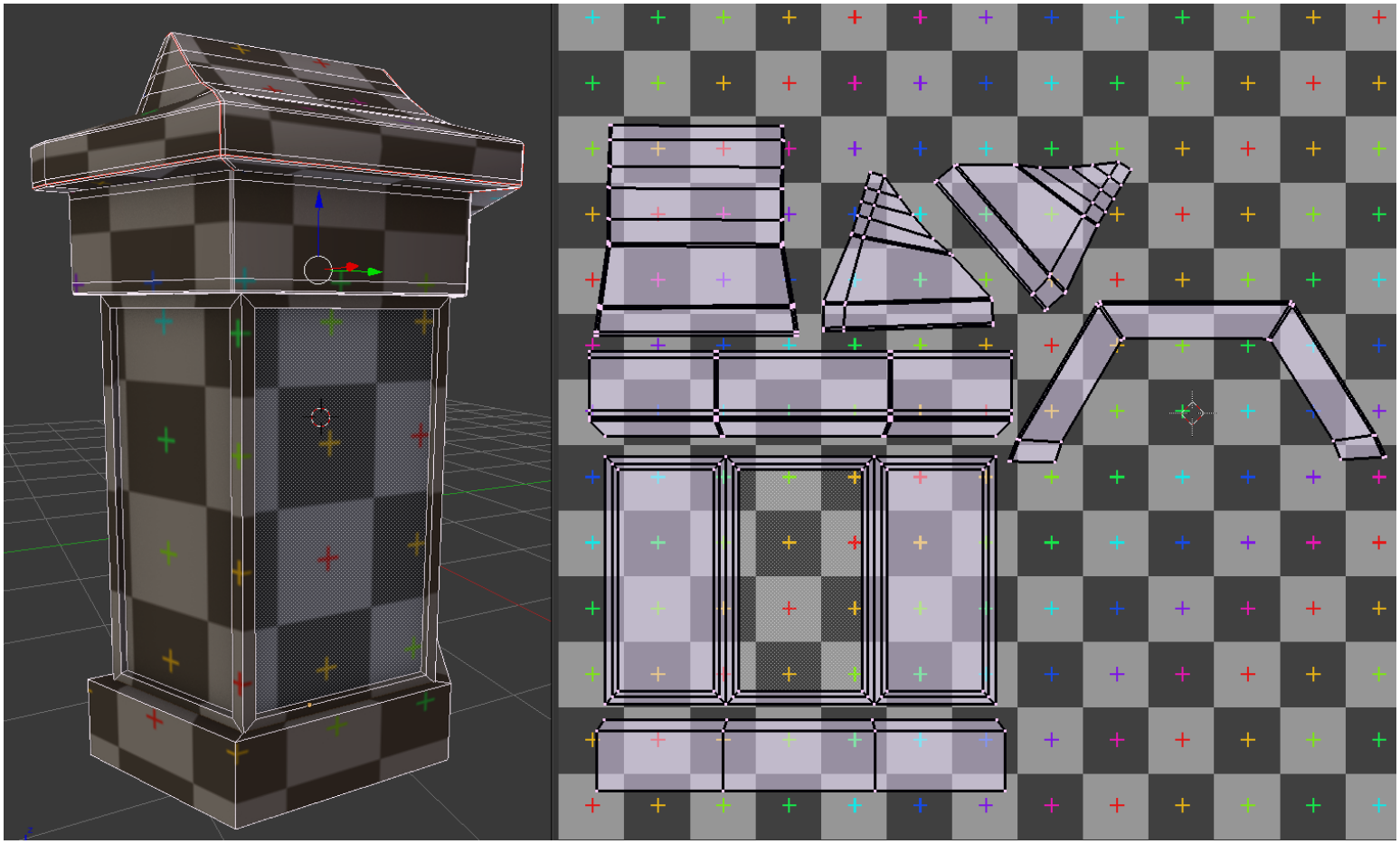
6

Haunted House – Putting colors on it

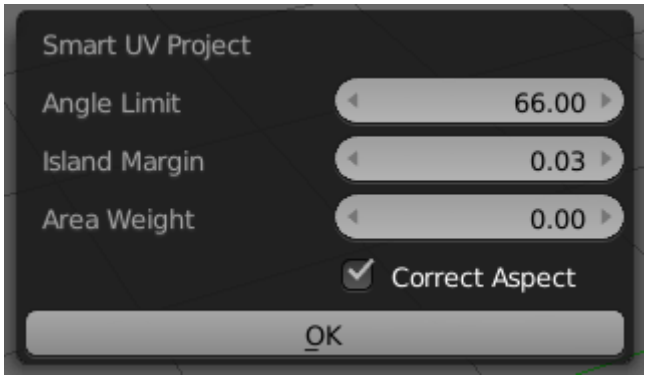
Unwrapping UVs

Unwrapping the rest of the house

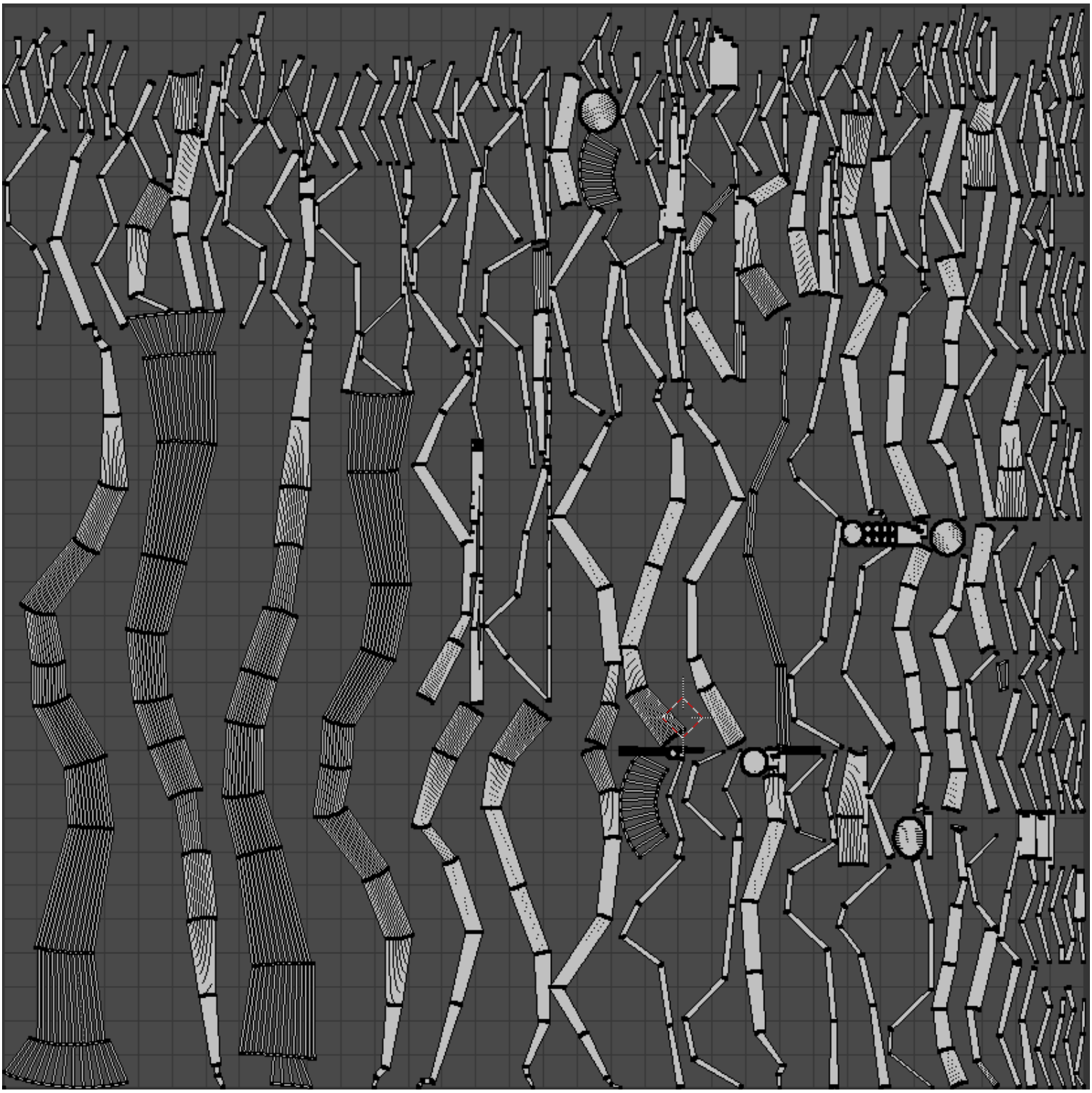




The tree with the Smart UV project

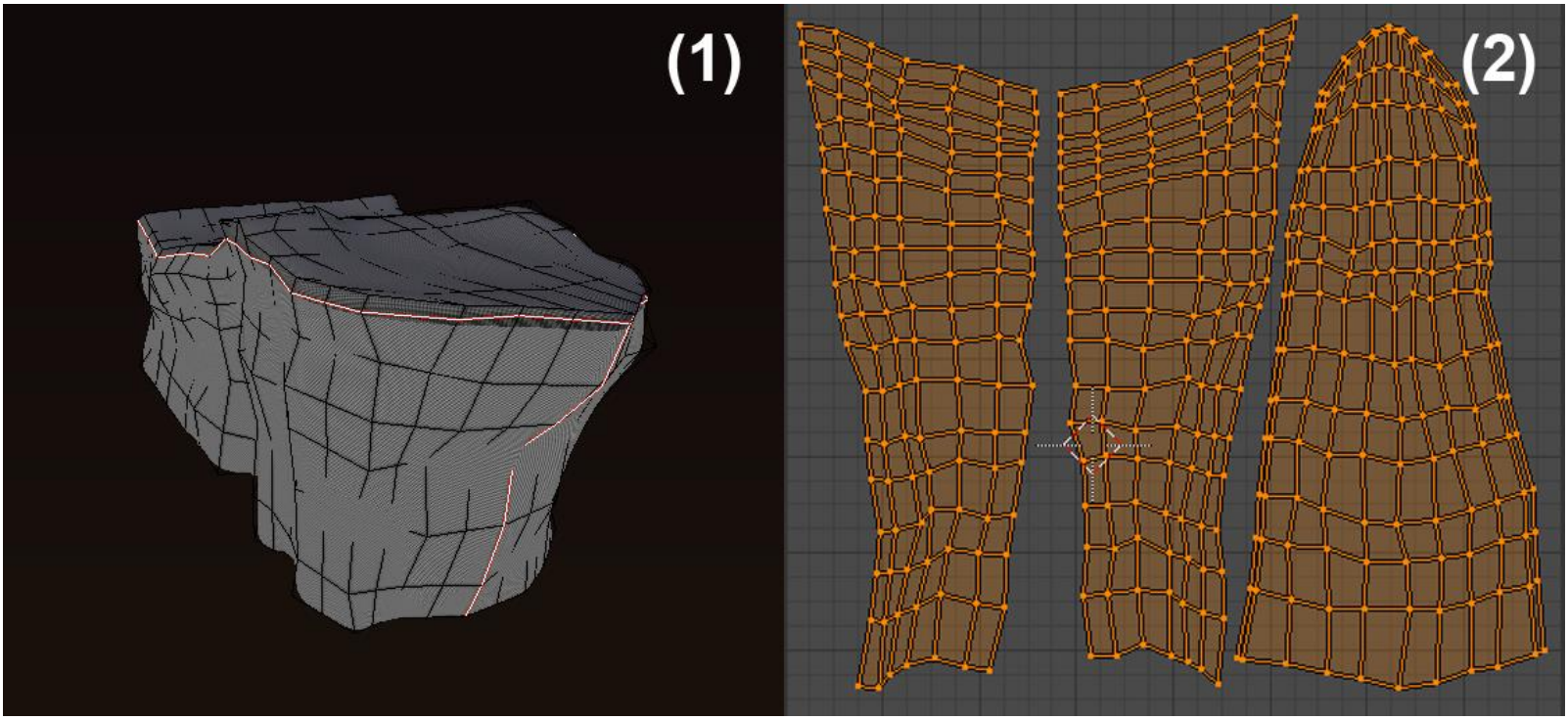


The Smart UV Project options



The Smart UVs of the tree

Unwrapping the rest of the environment



The seams and the UVs of the cliff

Tiling UVs

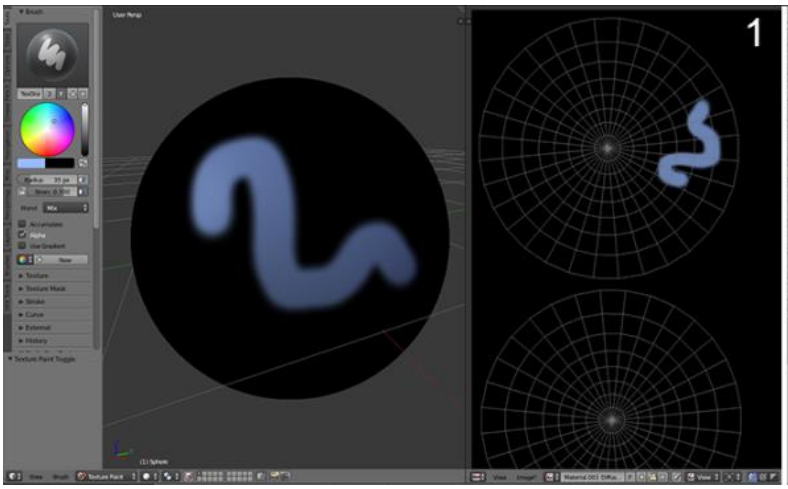
The UV layers

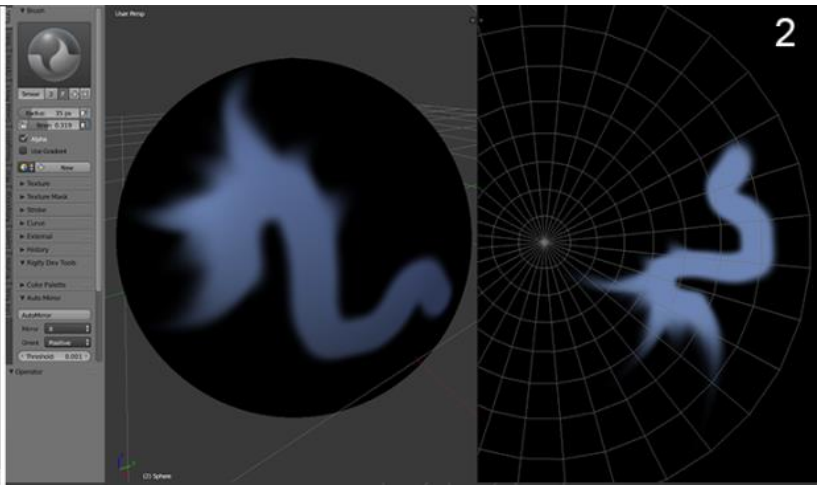
Adding colors

Basics of the Texture Paint tool

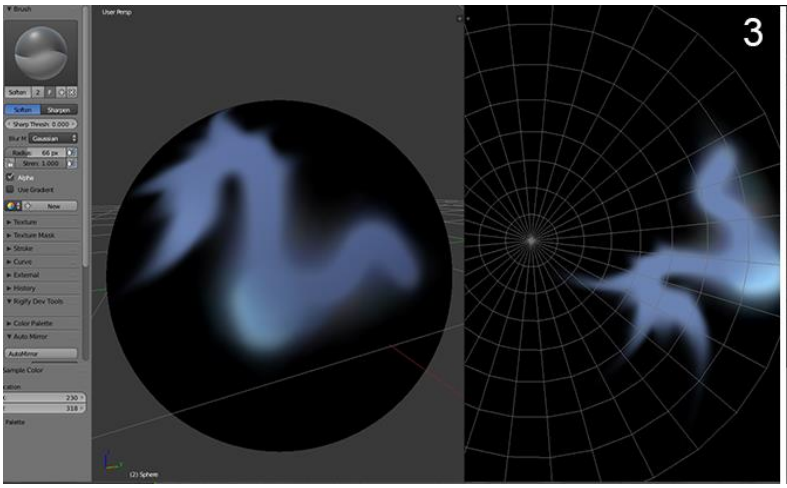
Discovering the brushes

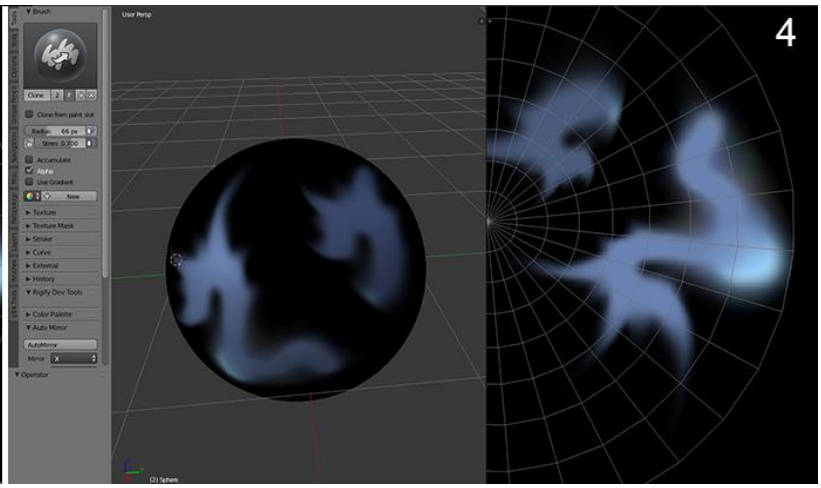
The Smear brush



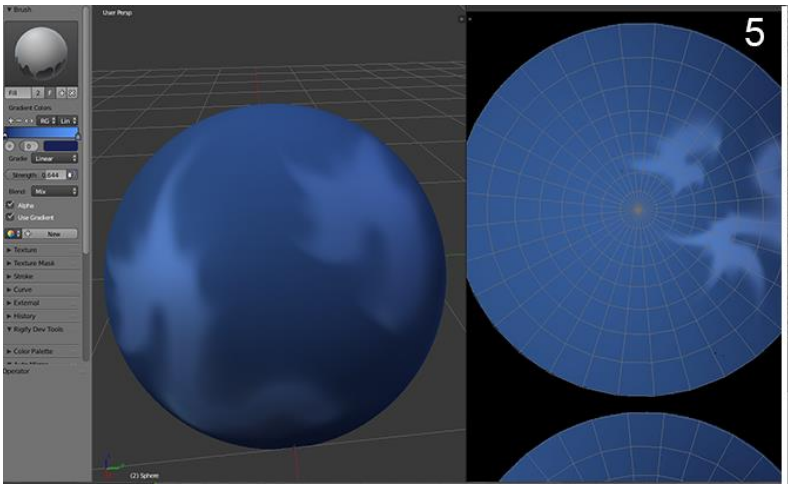


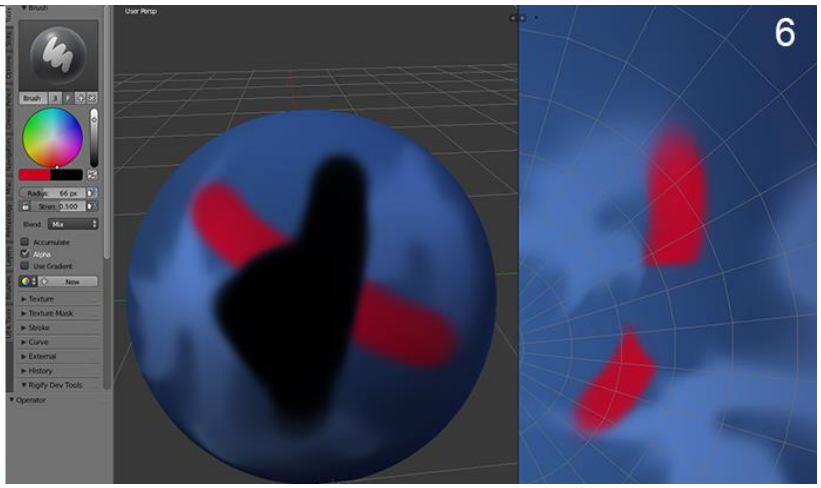
The Clone brush



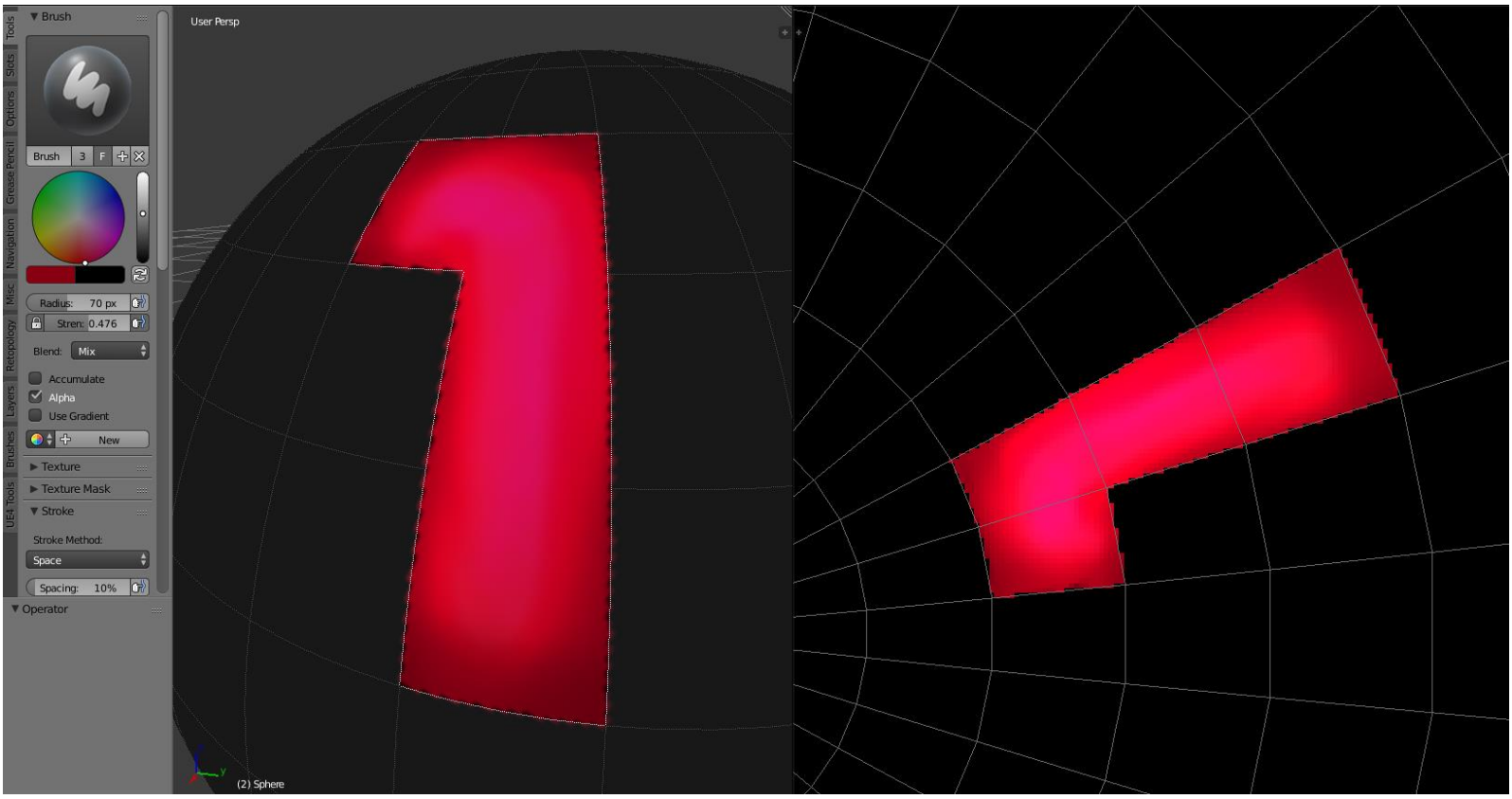


The Mask brush



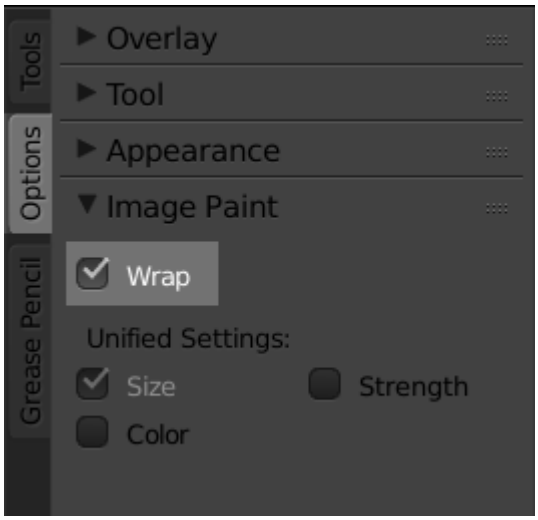


Delimiting the zones of painting according to the geometry



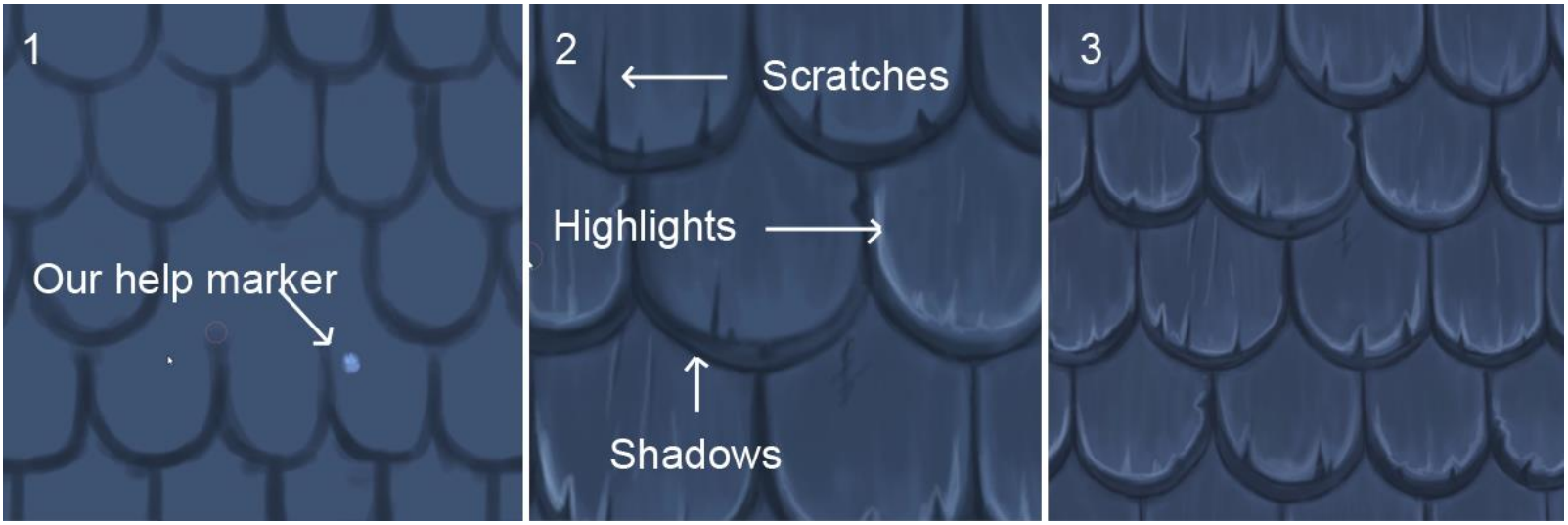
Tiled Textures

The settings of our workspace



The option in the tab

Painting the roof-tiled texture



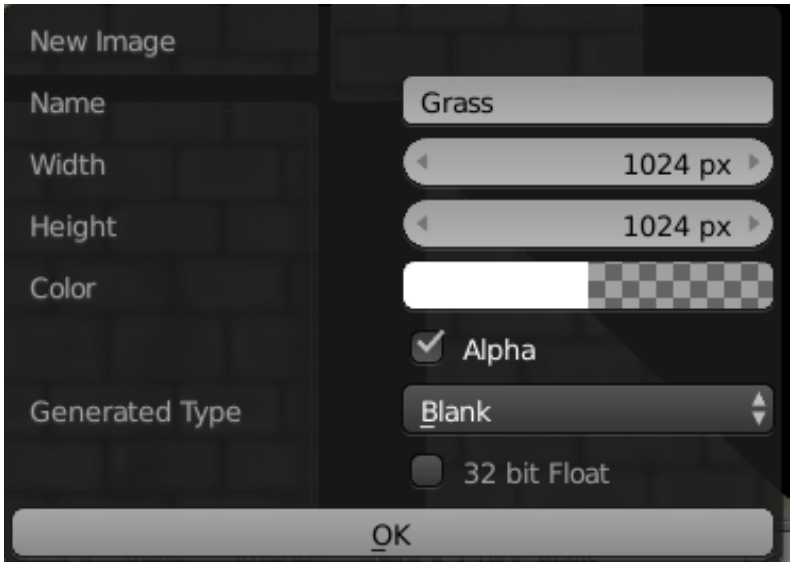
Steps for the roof tile texture creation

Quick tips for other kind of hand painted tiled textures

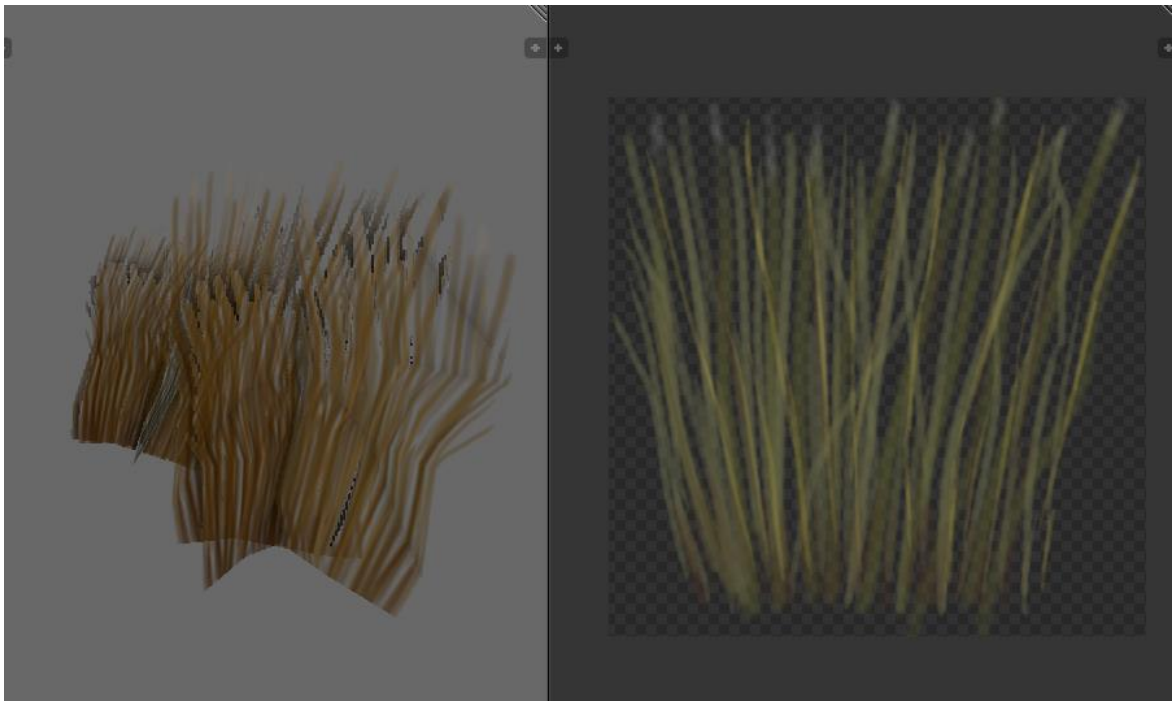
Example of other tiled textures painted in the UV Image editor

Creation of transparent textures

The grass texture

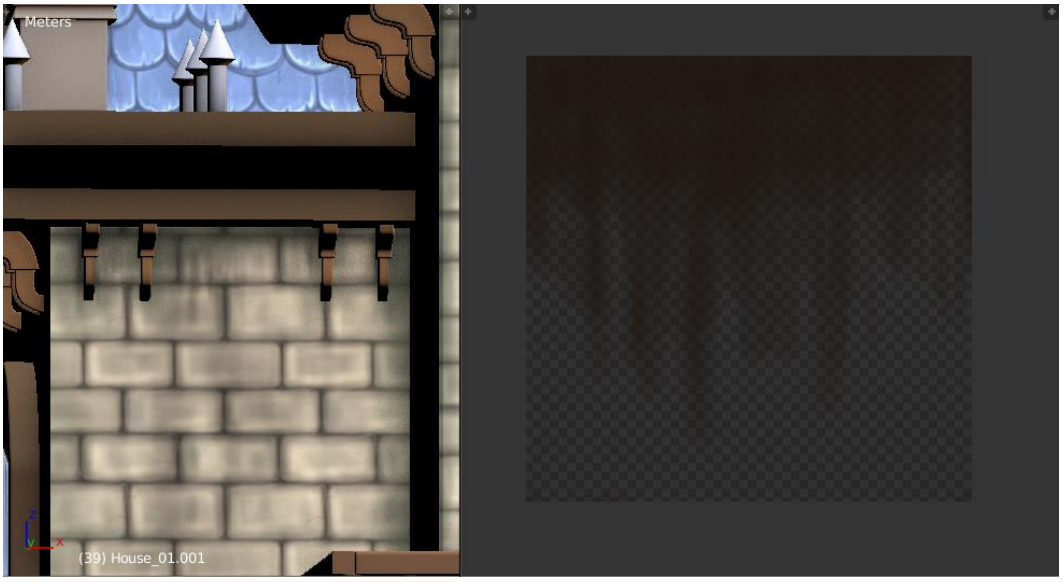


The grass texture settings



The final grass texture in the viewport (left) and in the UV Image editor (right)

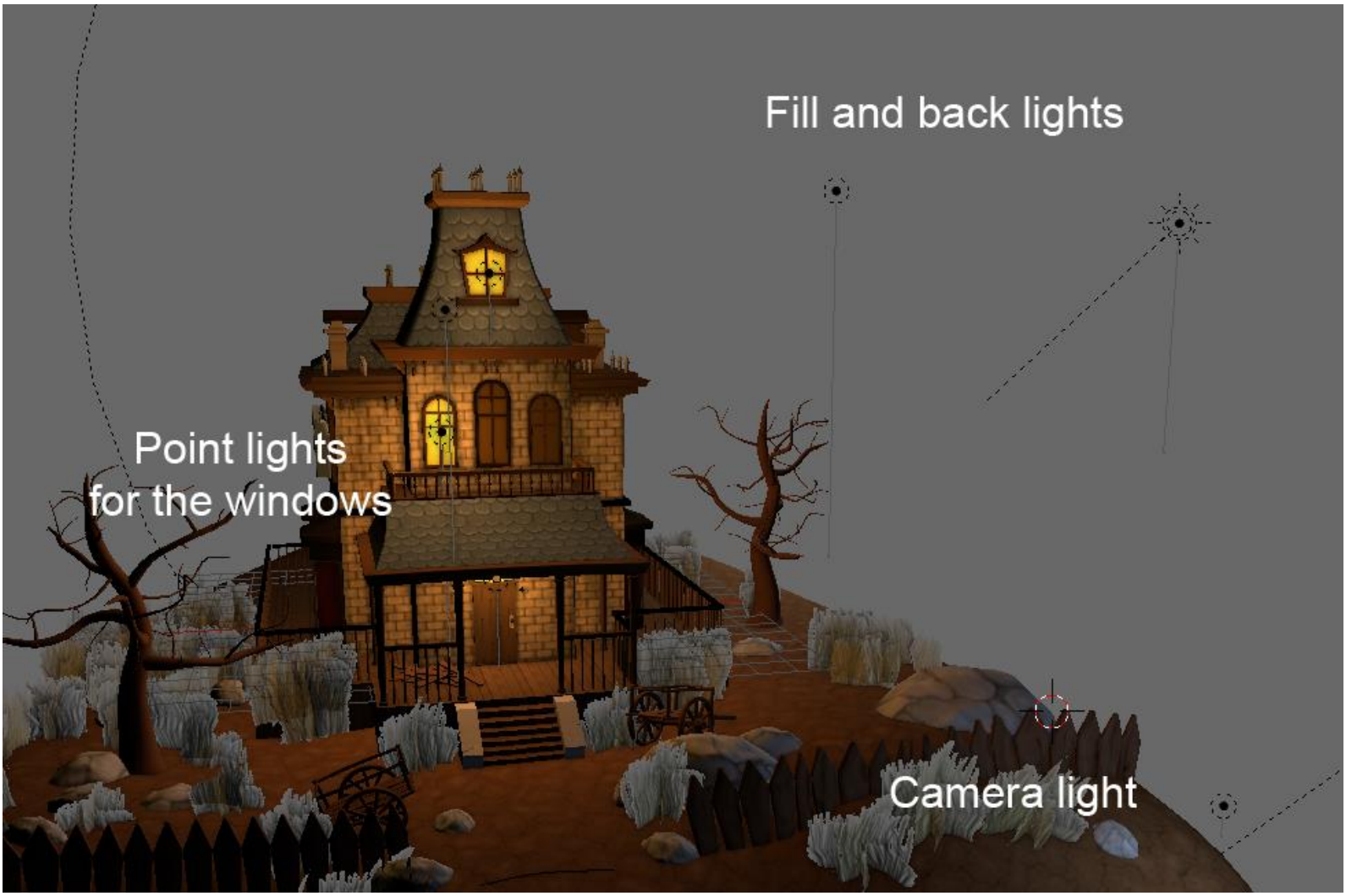
The grunge texture



The grunge placed on the house in the viewport (on the left) and the grunge in the UV Image editor (on the right)

Doing a quick render with Blender Internal

Setting lights



The final light placement

Setting the environment (sky and mist)

The world settings

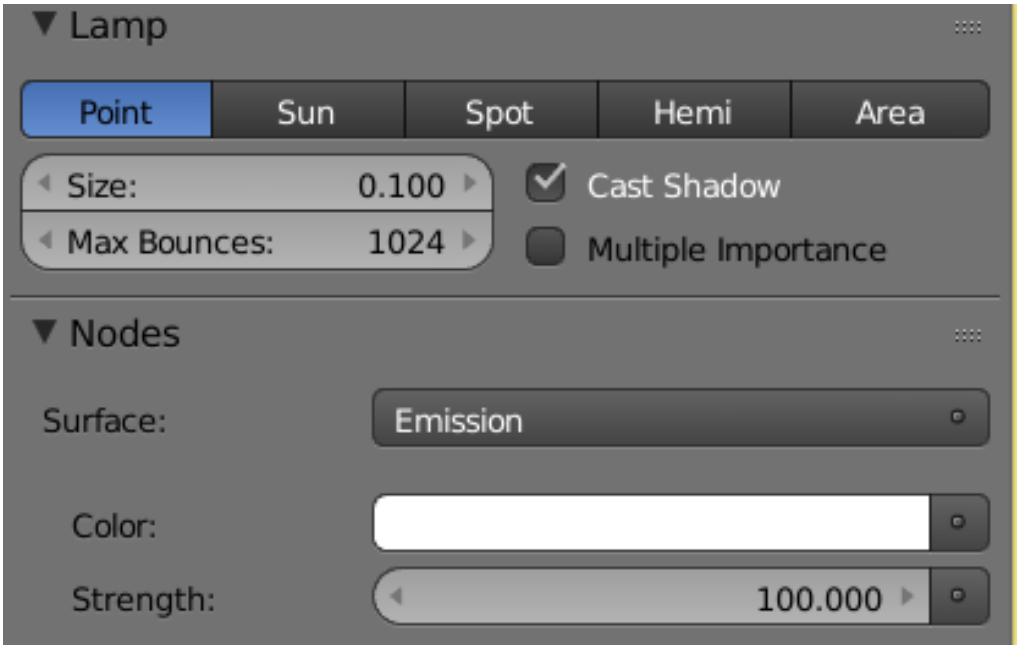
7

Haunted House – Adding Materials and Lights in Cycles

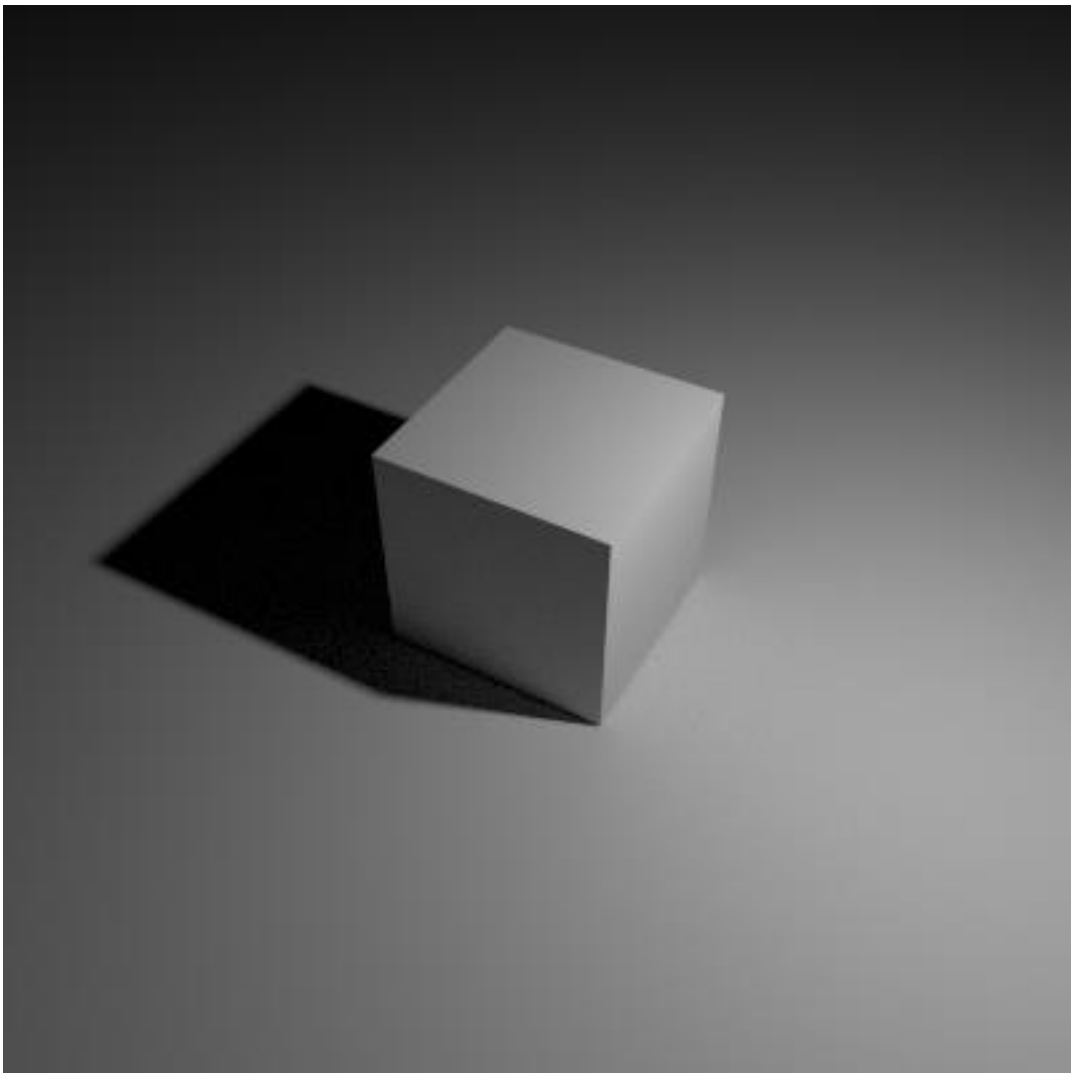
Lighting

Creating a testing material

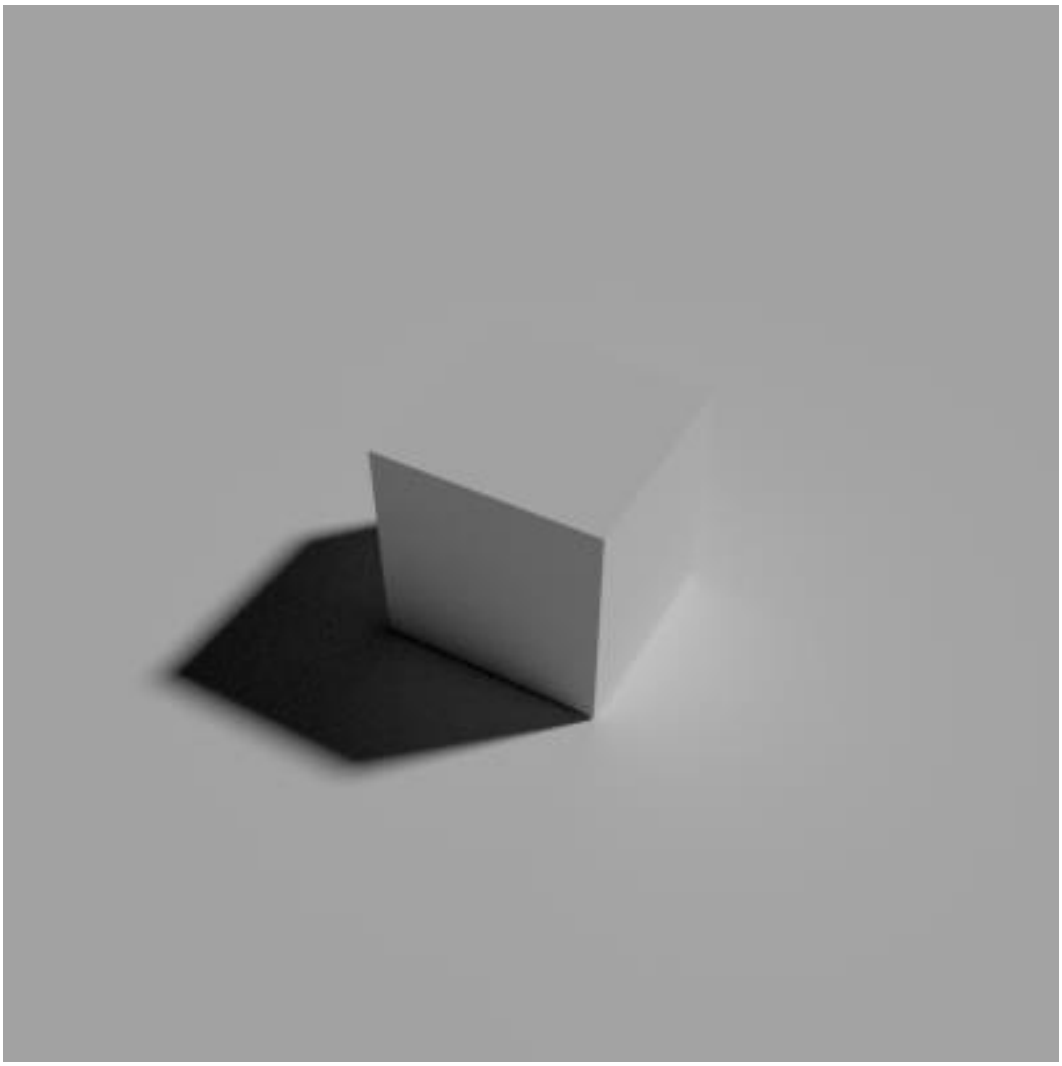
Understanding the different types of light



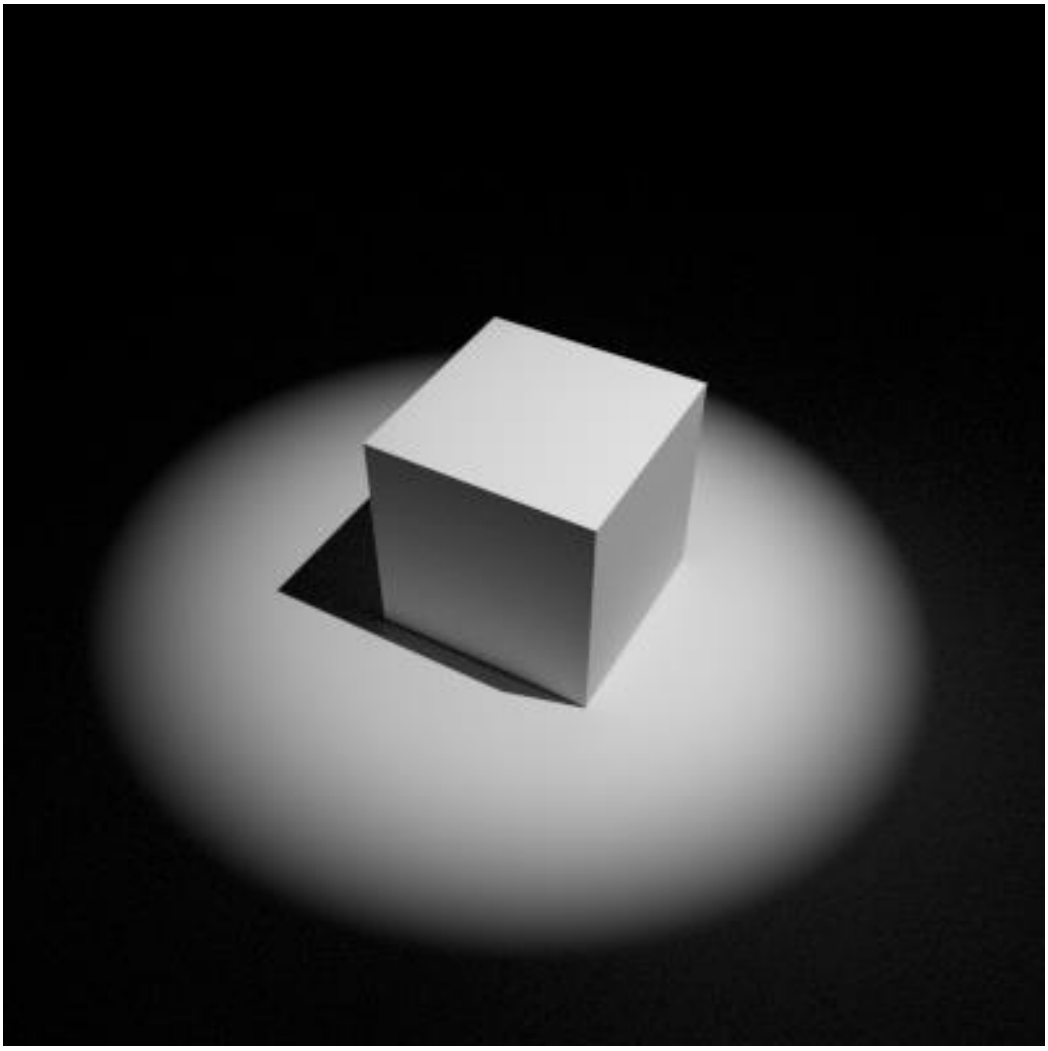
The shared light options



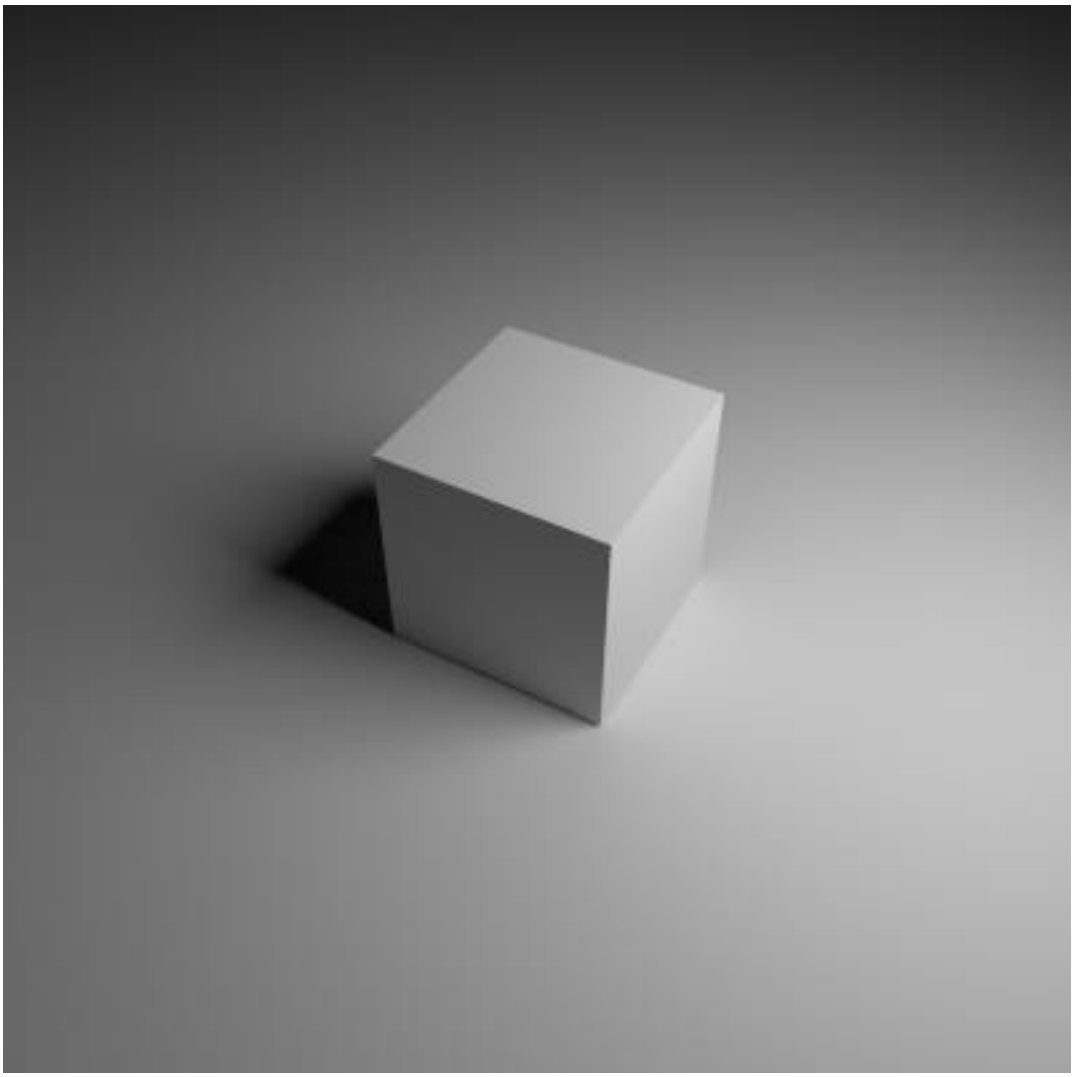
A point light with a strength of 500 and a size of 0.1



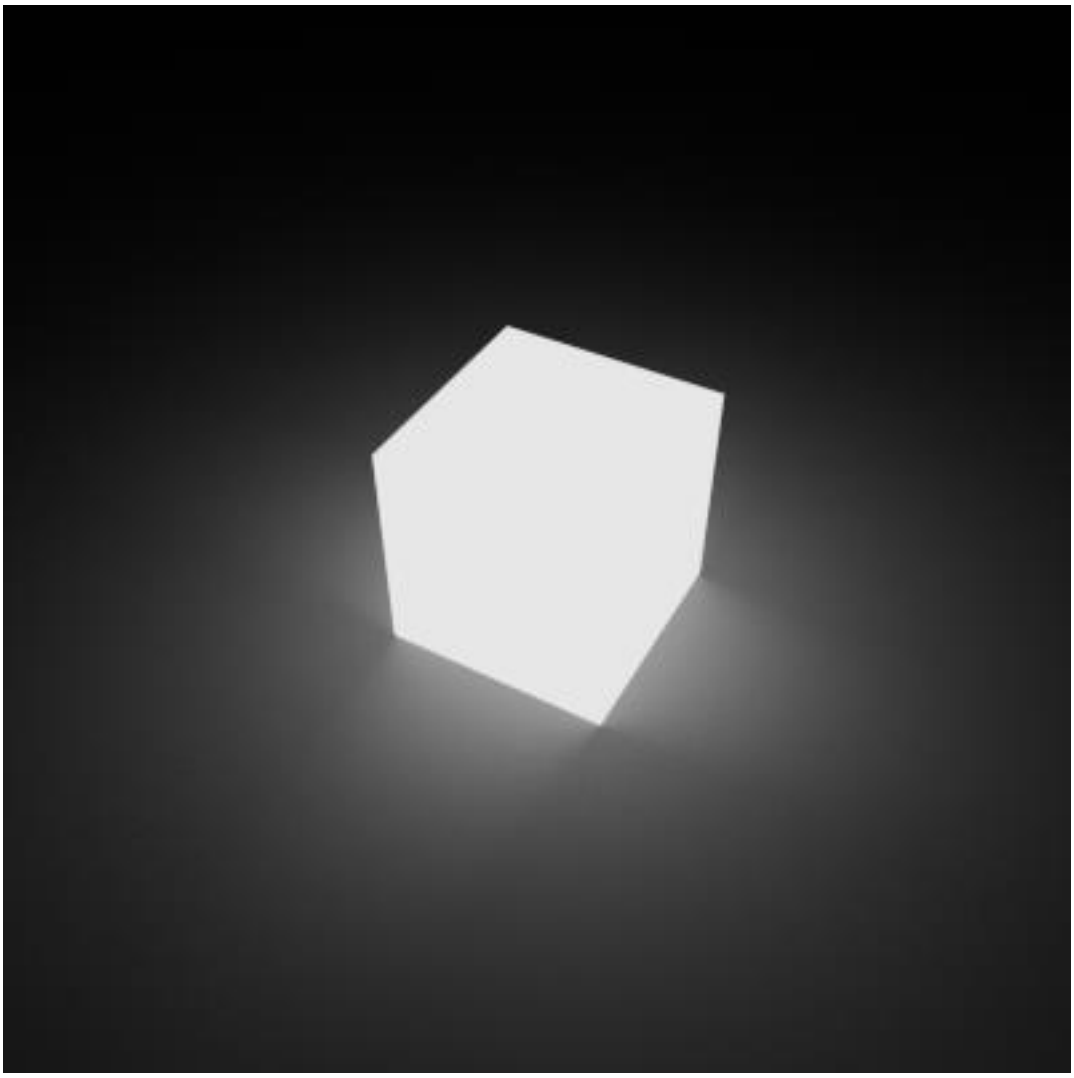
A 45-degree angle on Y and Z sun light with a strength of 2 and a size of 0.05



A 45-degree angle on Y spot light with a strength of 5000, a size of 0.5, a shape size of 30 degree, and a blend of 0.8

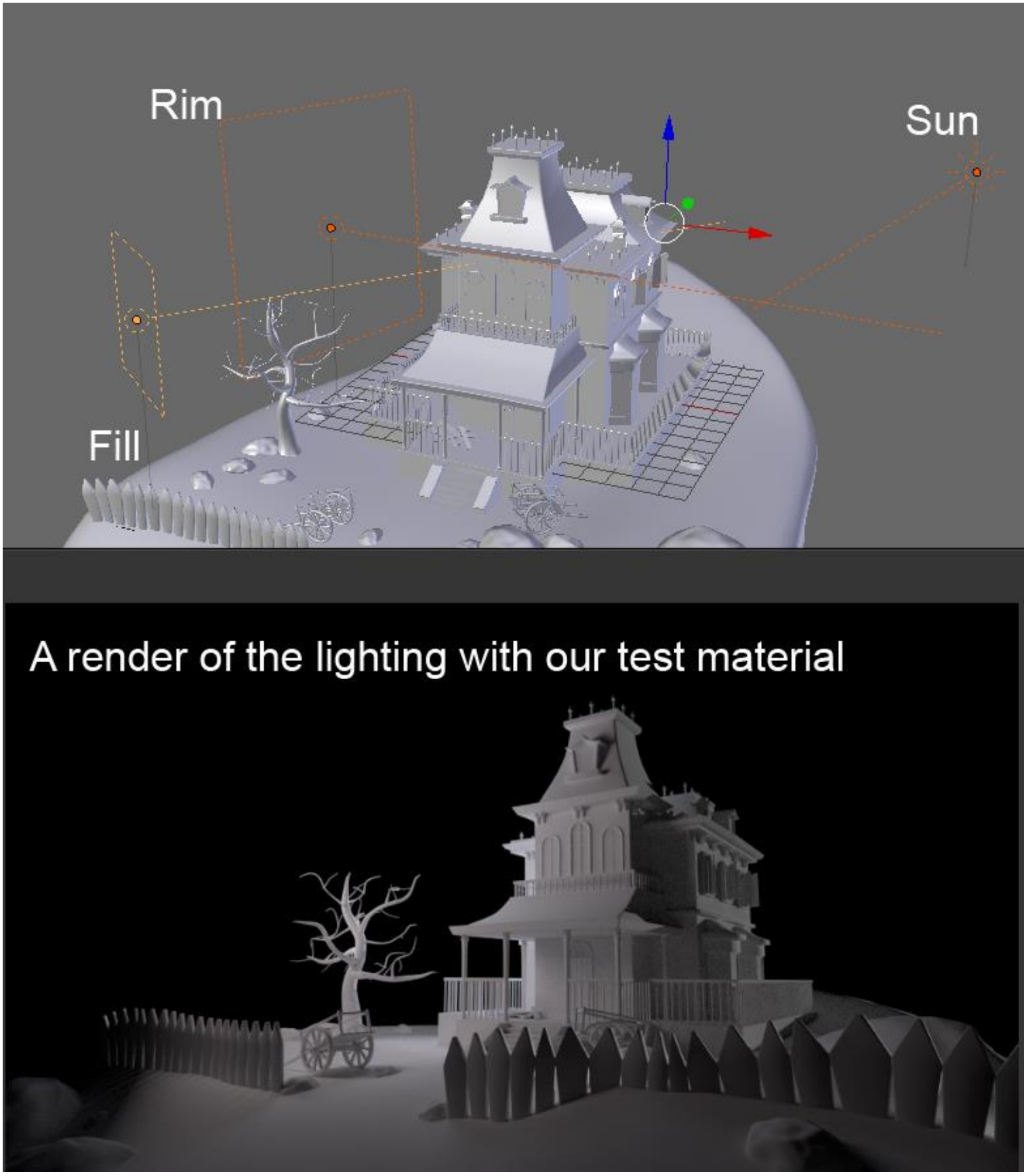


An area light with a strength of 500 and a square size of 5



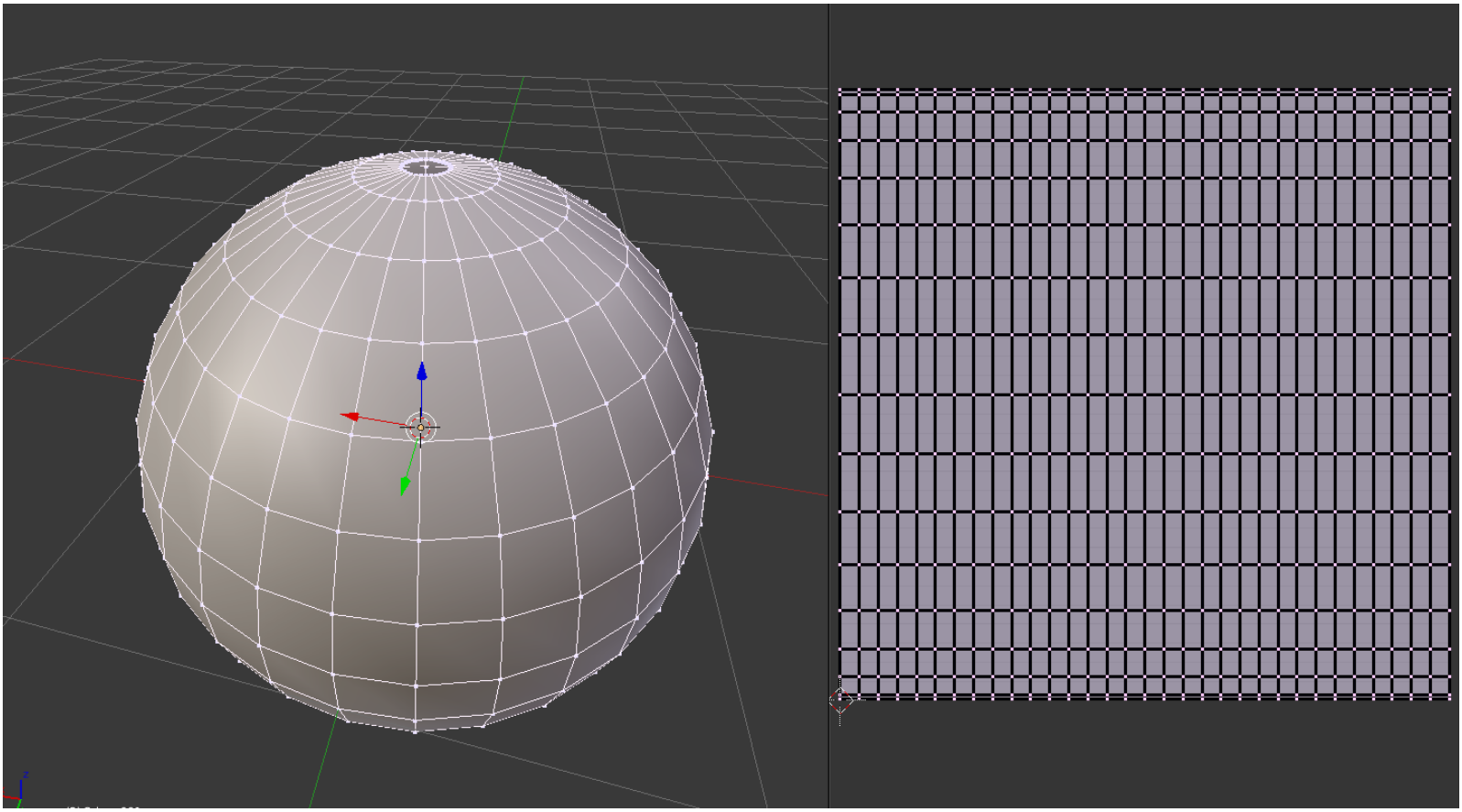
The cube with an emission shader

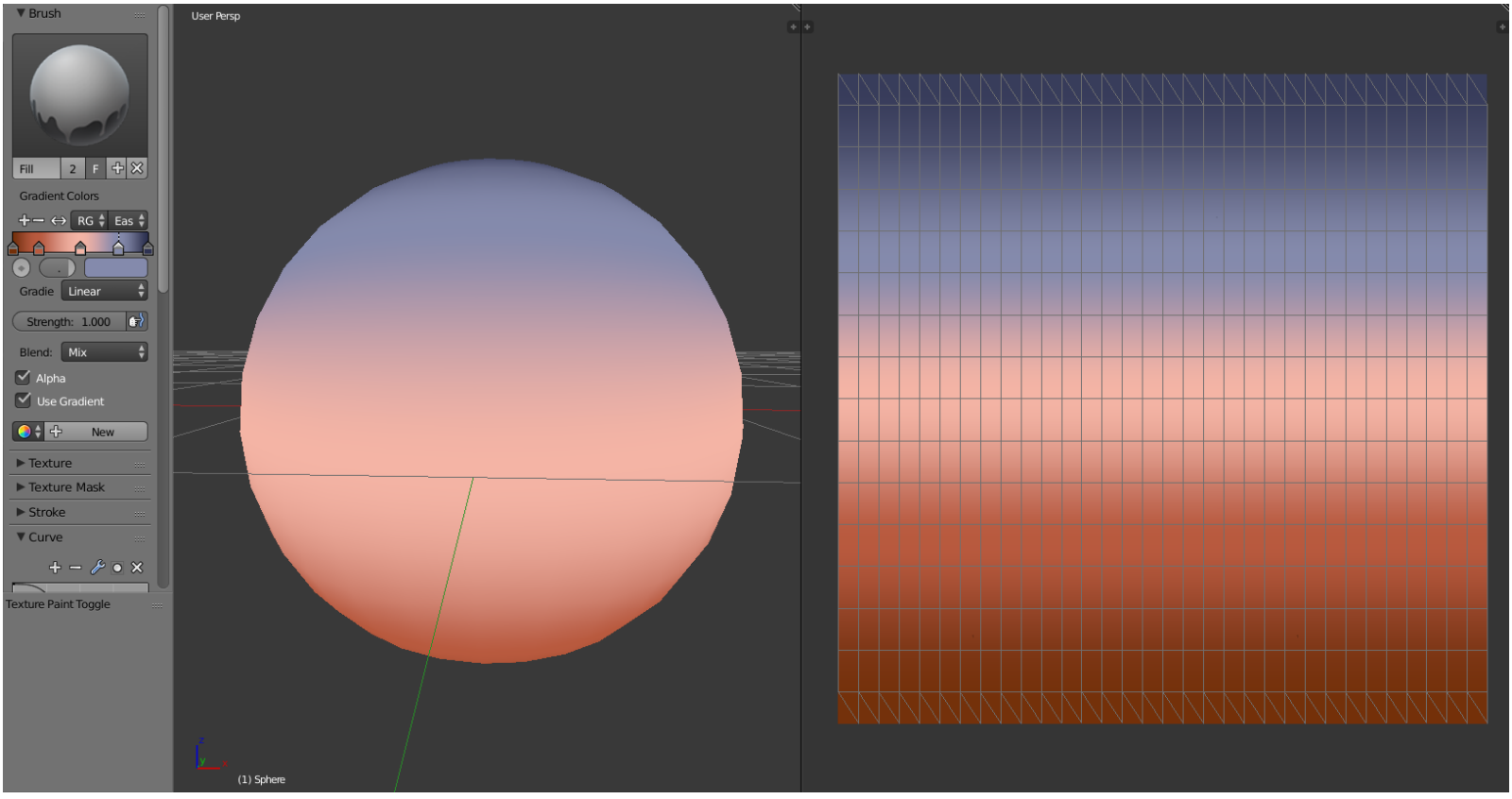
Light our scene

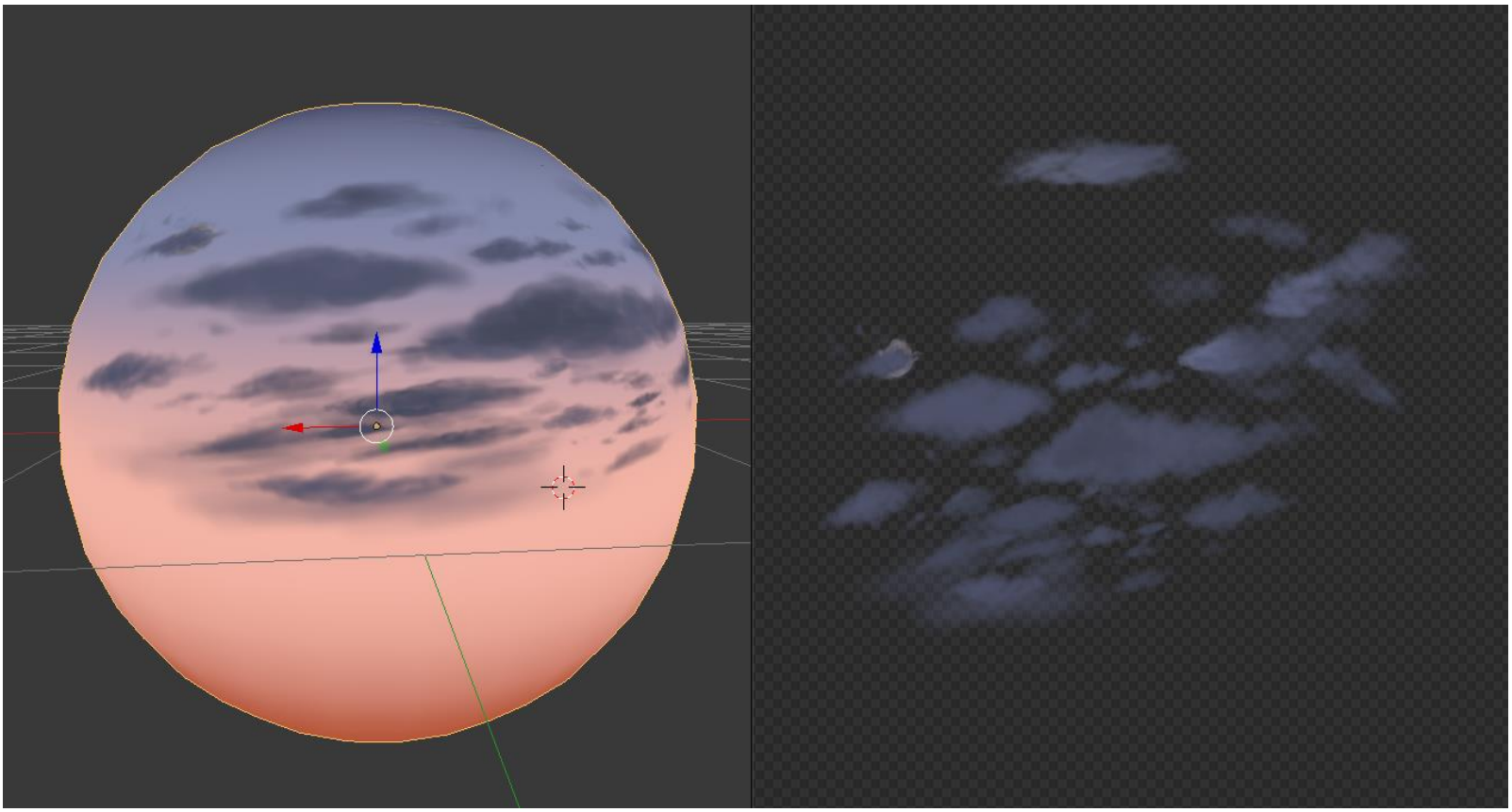


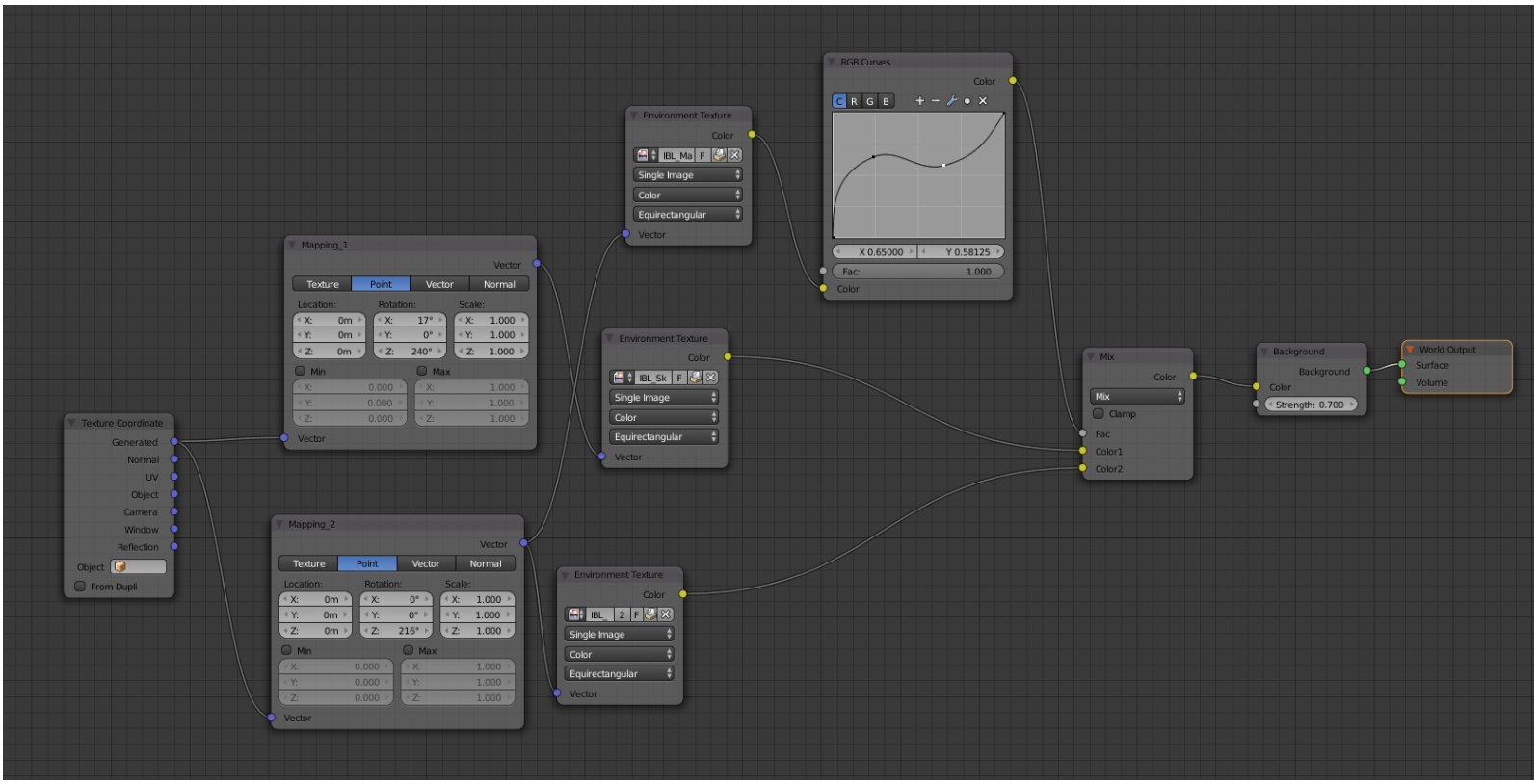
The lighting of the haunted house scene

Painting and using an Image Base Lighting





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Vector
Mapping_1
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Texture Point Vector Normal
Location: Rotation: Scale:
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Y: 0m Y: 0° Y: 1.000
Z: 0m Z: 240° Z: 1.000
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Texture Coordinate
Generated
Normal
UV
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Camera
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Reflection
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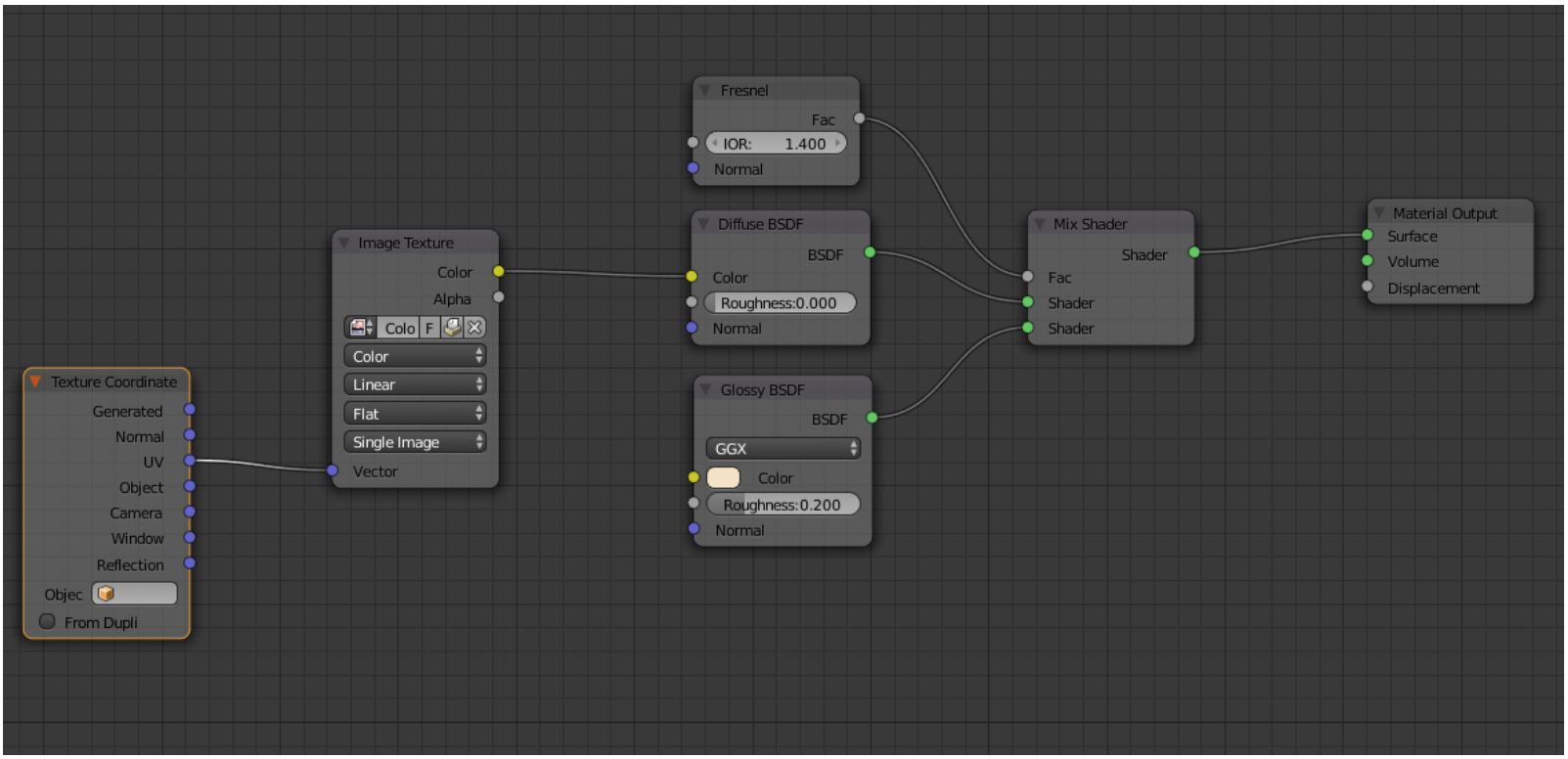
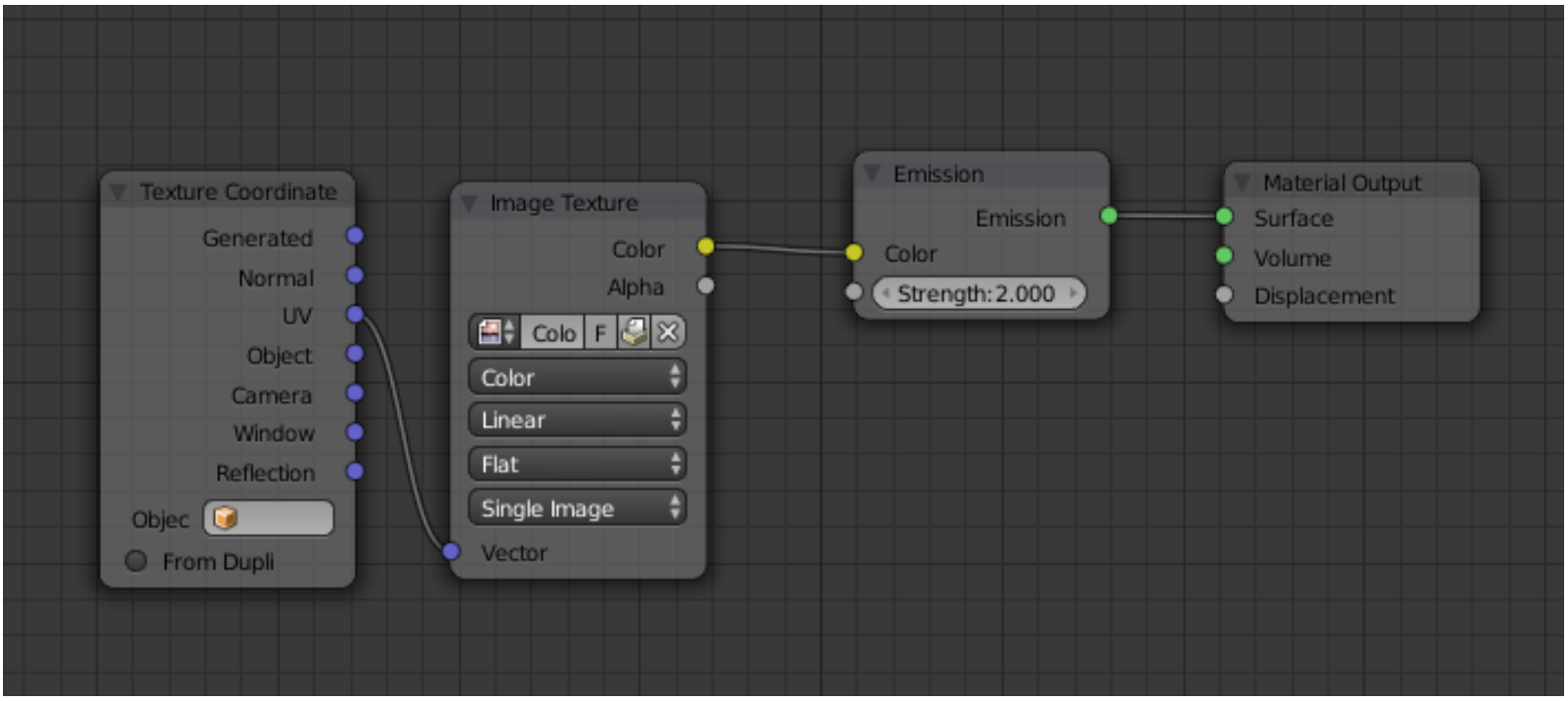
Z: 0m Z: 216° Z: 1.000
Min Max
Vector
Environment Texture
Color
IBL 2 F
Single Image
Color
Equirectangular
Vector

Creating materials with nodes

Creating the materials of the house, the rocks and the tree

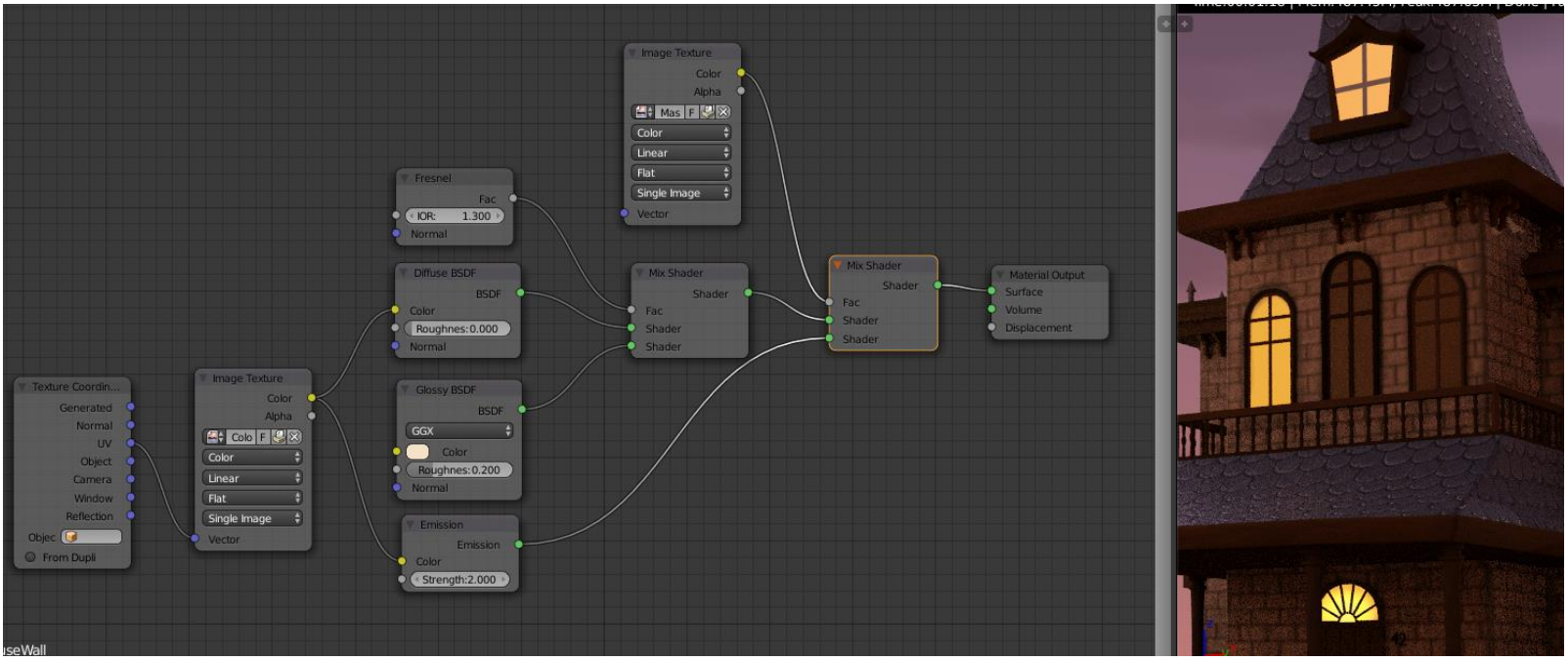


The base of our wall shader



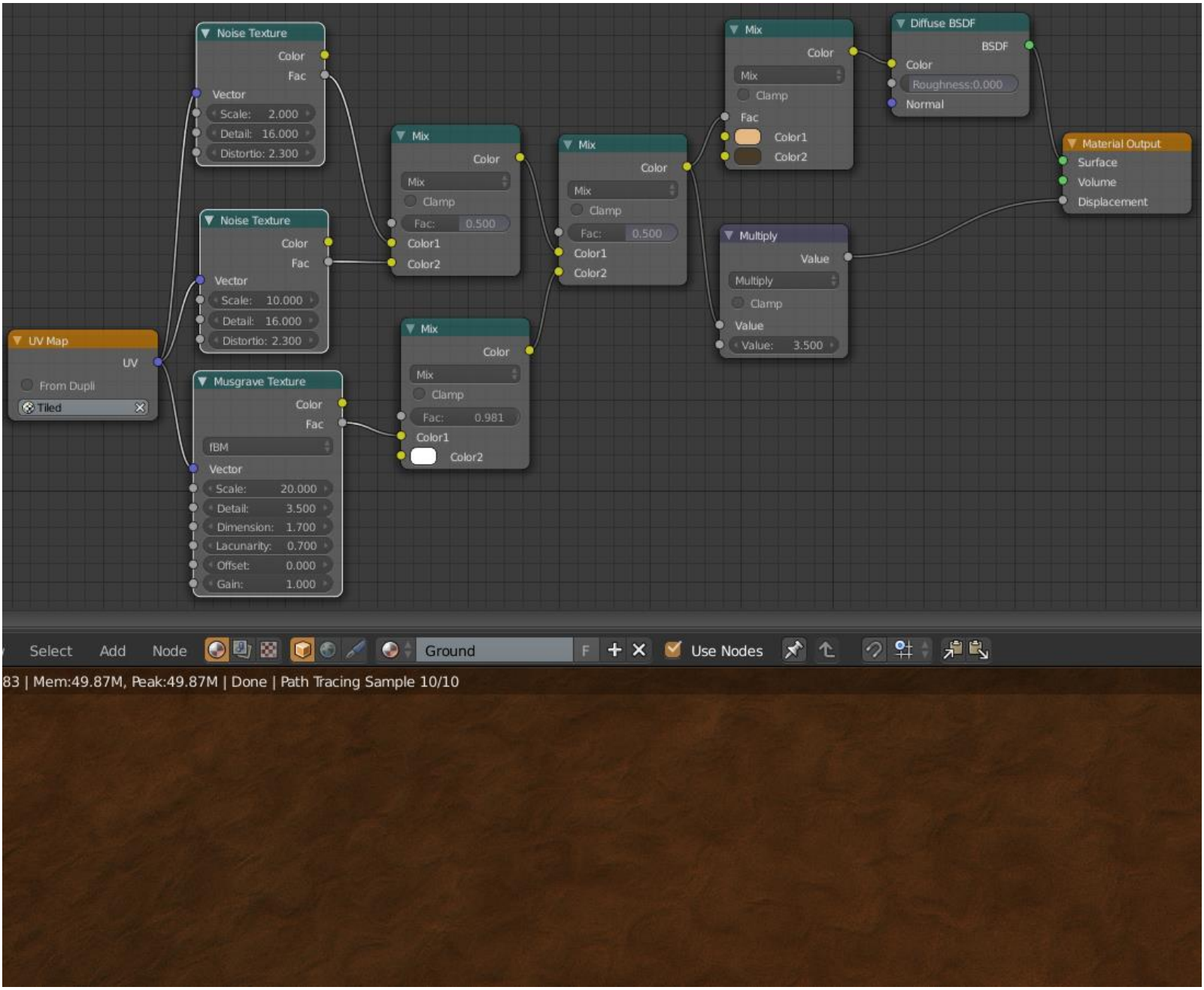
The top window shader

Adding a mask for the windows



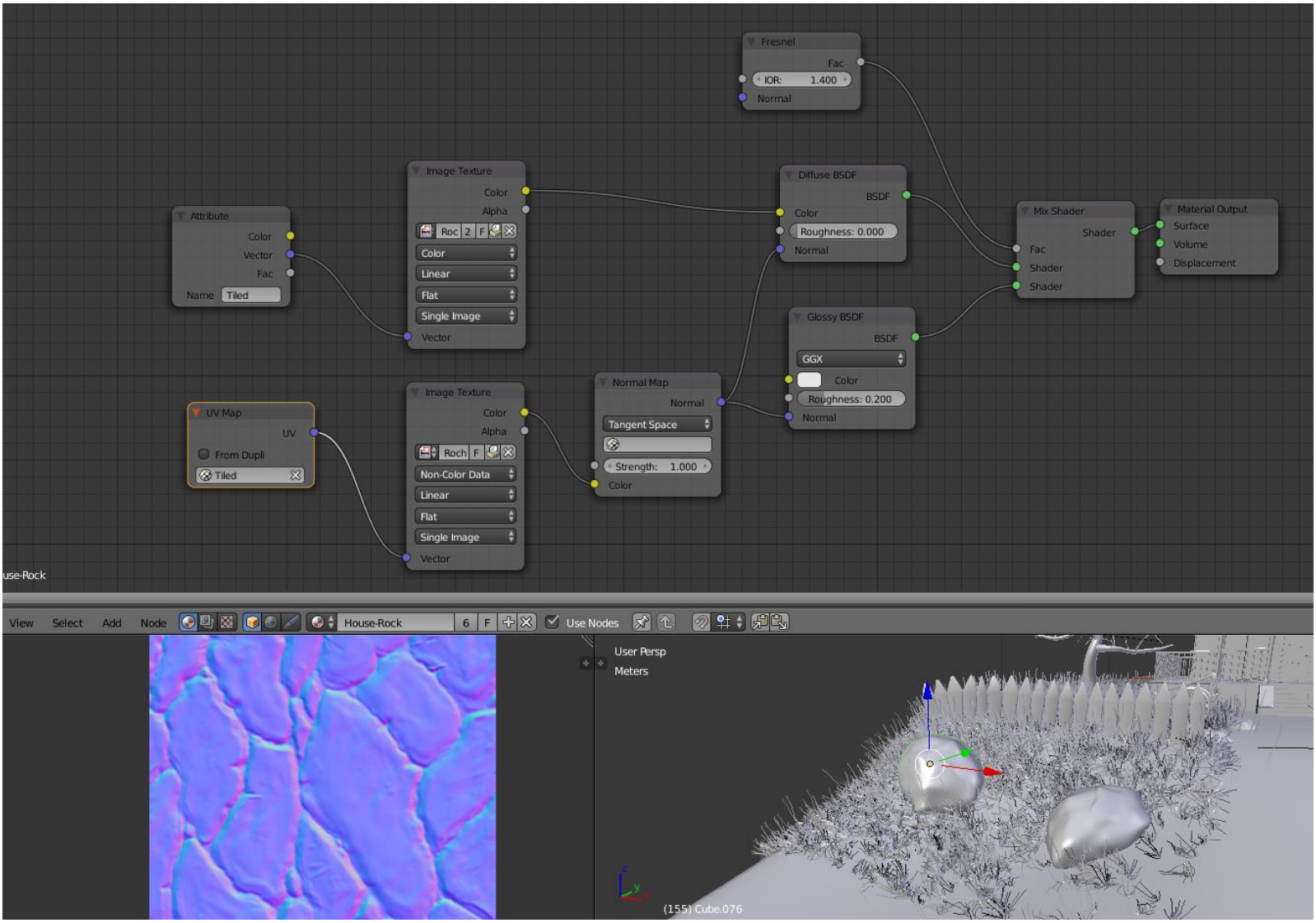
The wall material with the mask on the left-hand side and the result in the real-time rendered 3D view.

Using procedural textures



The ground material with the procedural texture made with a noise and Musgrave combination on the left-hand side and, the result in the real time rendered 3D view.

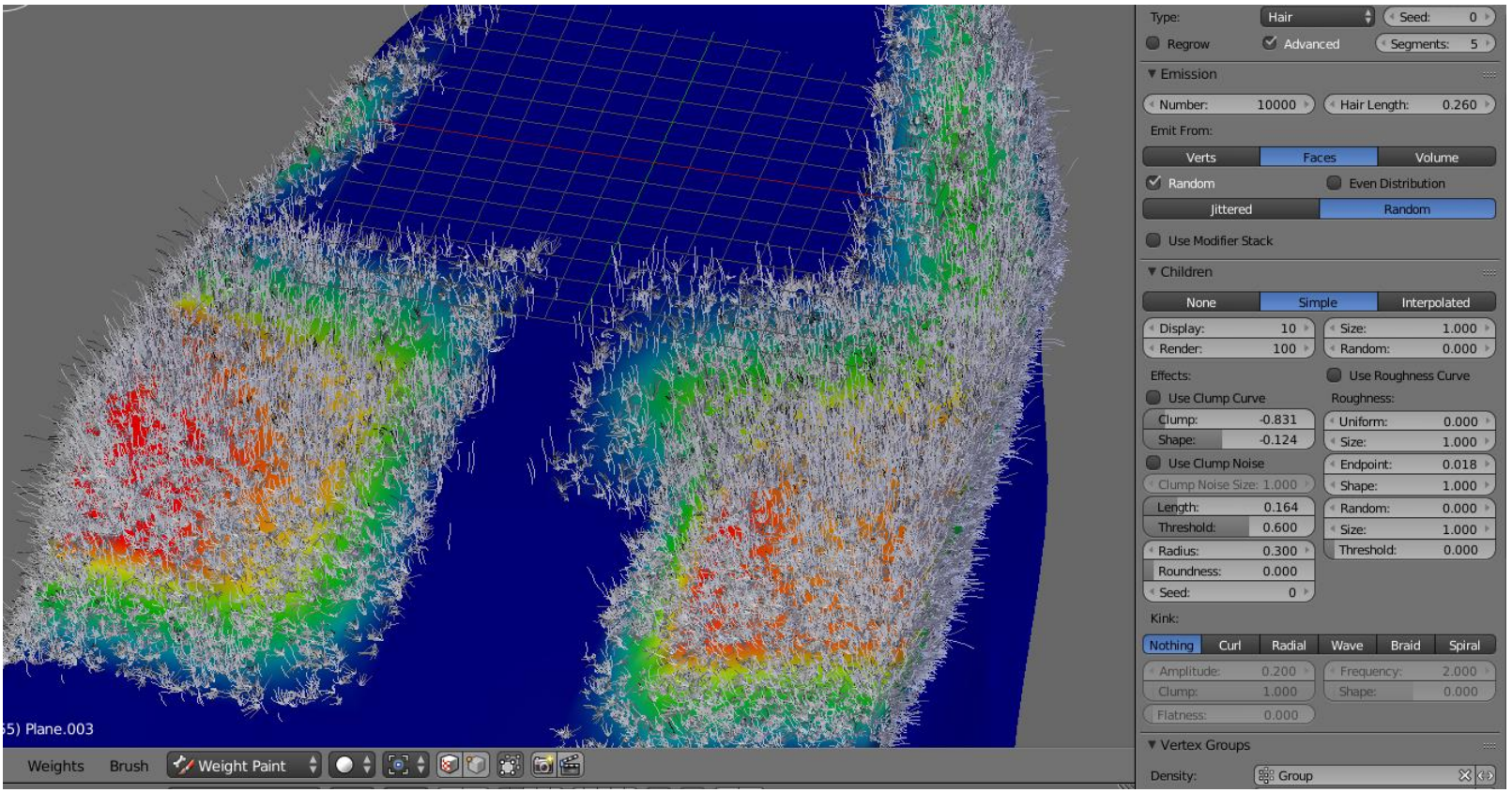
Making and applying Normal Maps in Cycles



The normal map of the rock (low left corner) and its material in the nodal editor (top)

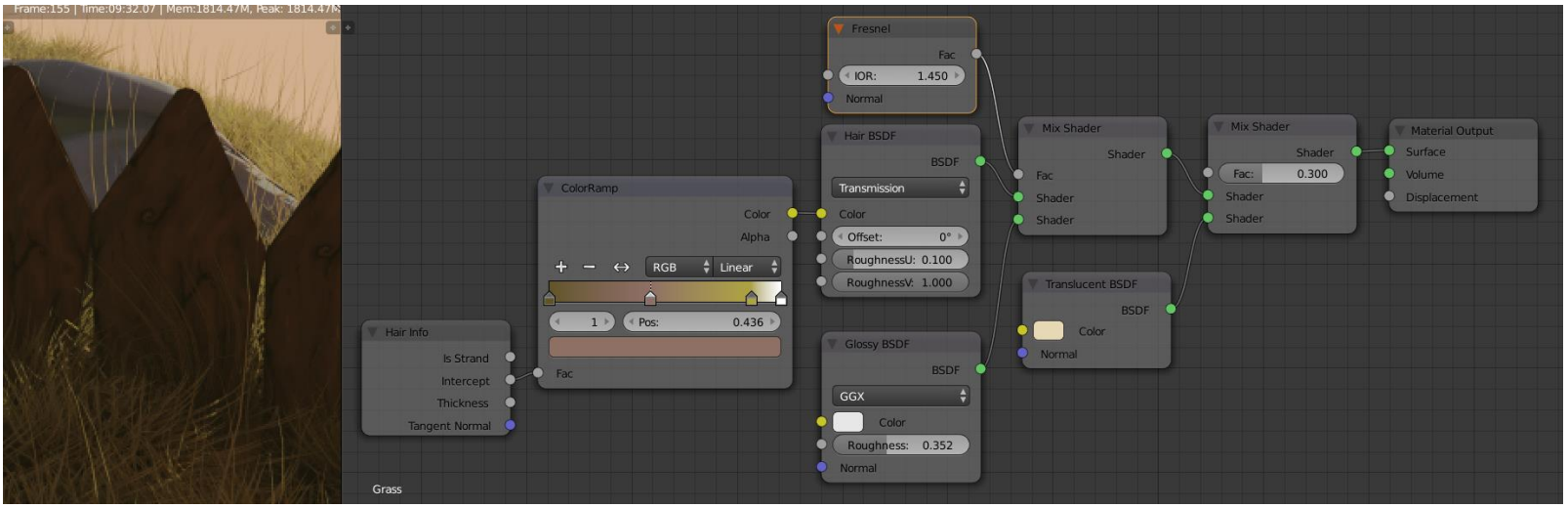
Creating realistic grass

Generating the grass with particles



The settings of the grass

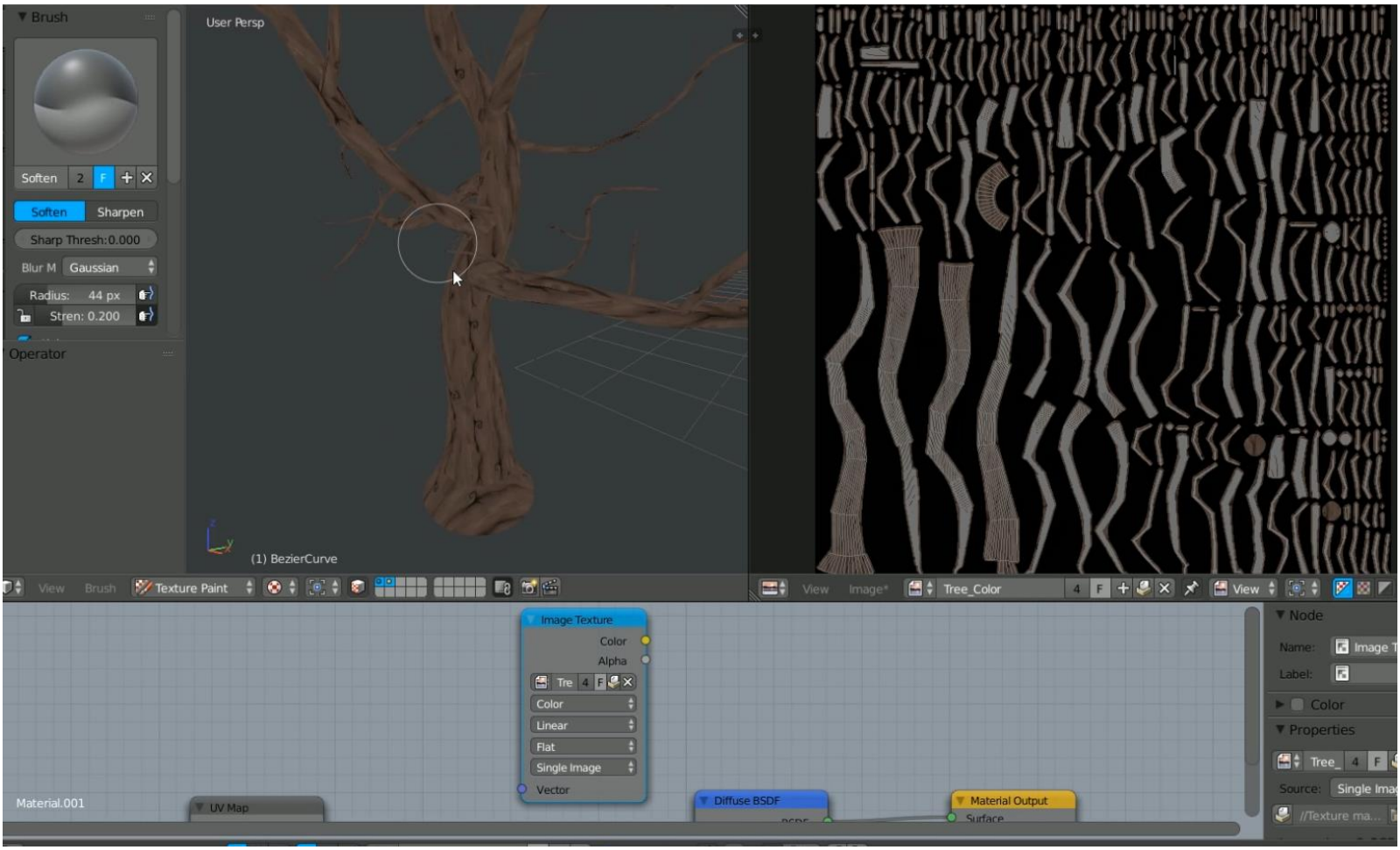
Creating the grass shader



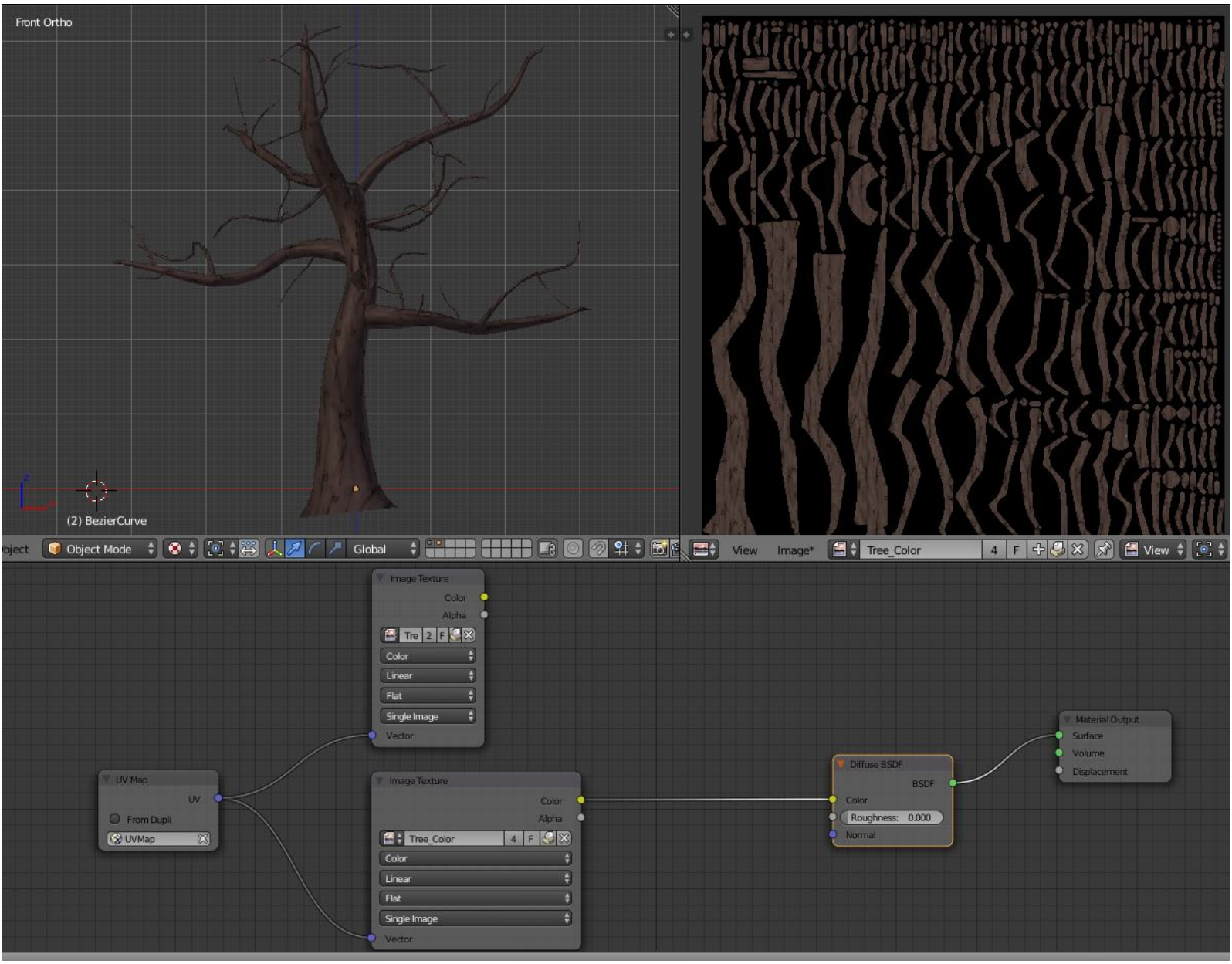
The grass shader (to the right) and the result (to the left)

Backing textures in Cycles

Baking the tree



Hiding the seams on the color bake



The combined bake of the tree

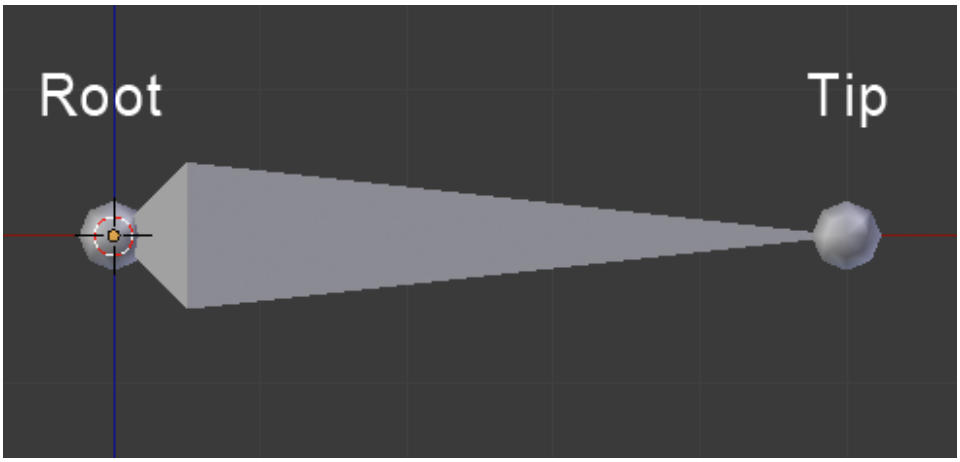
Composite the mist pass

The final Cycles render of the Haunted House project

8

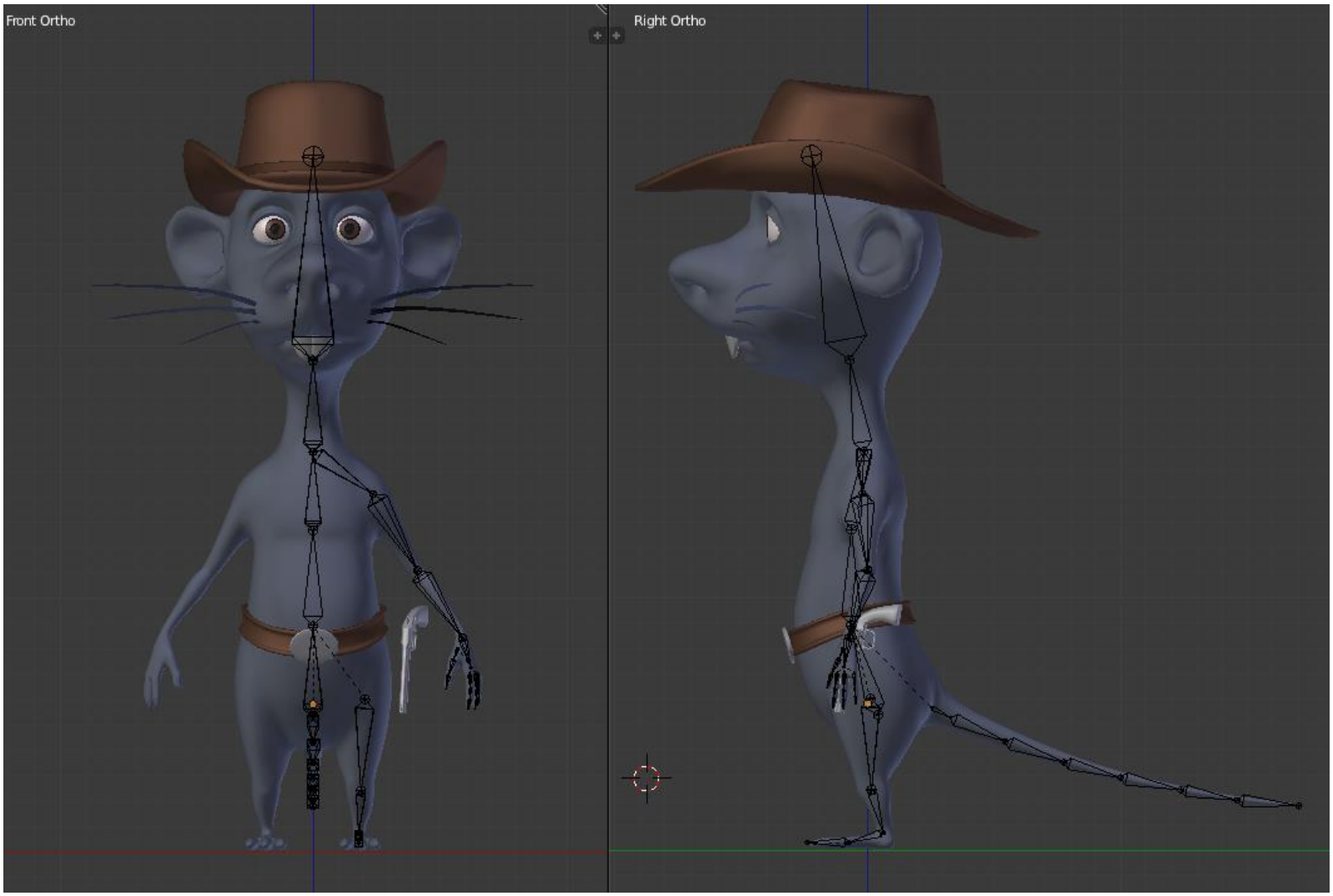
The Rat Cowboy – Learning To Rig a Character for Animation

An introduction to the rigging process

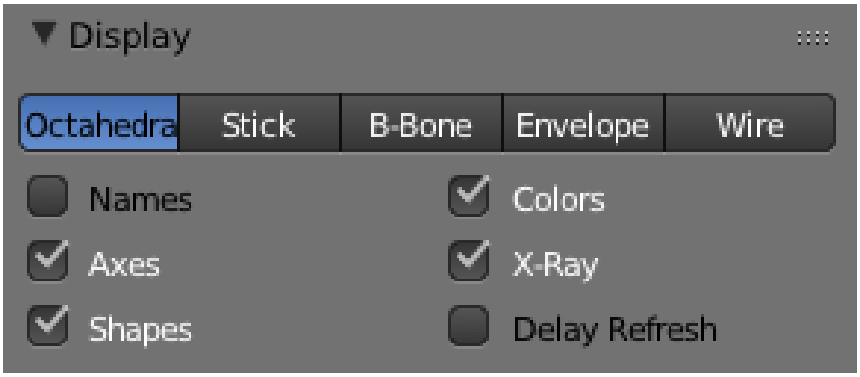


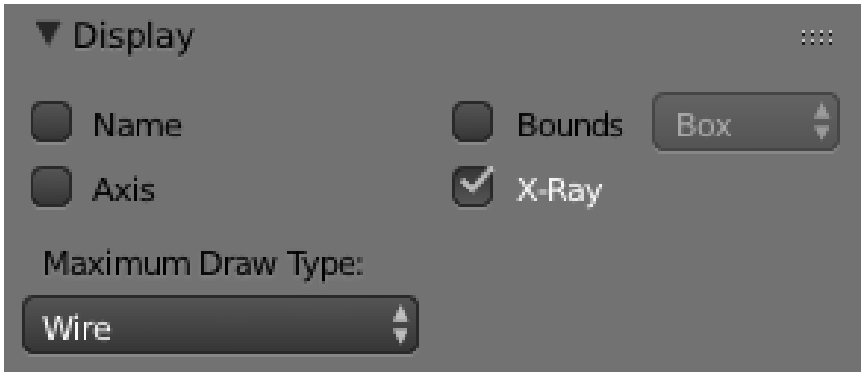
Rigging the Rat Cowboy

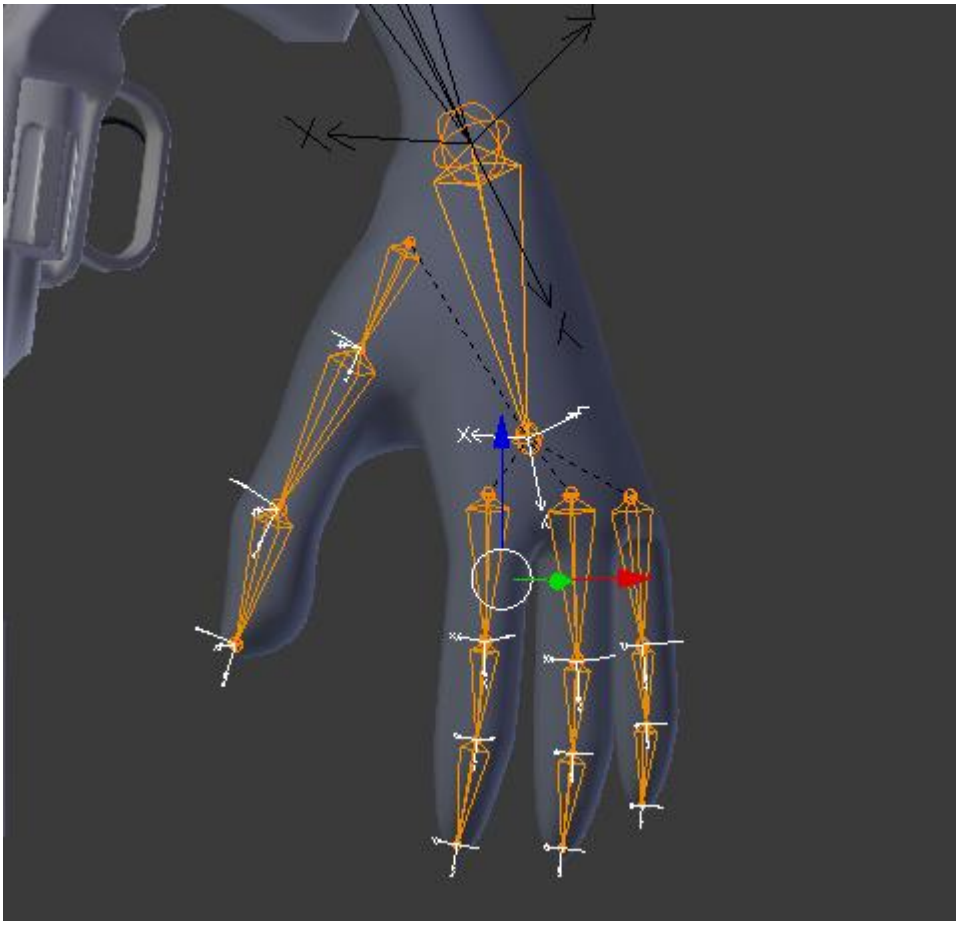
Placing the deforming bones



Placement of the deforming bones

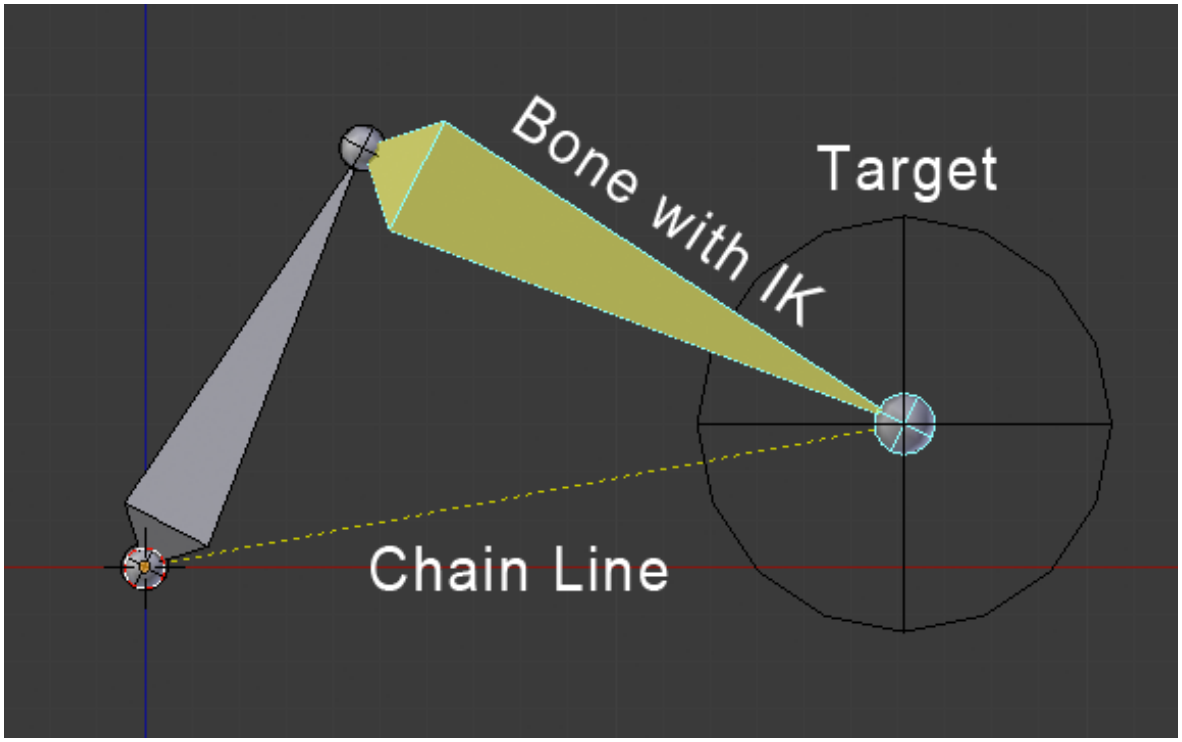


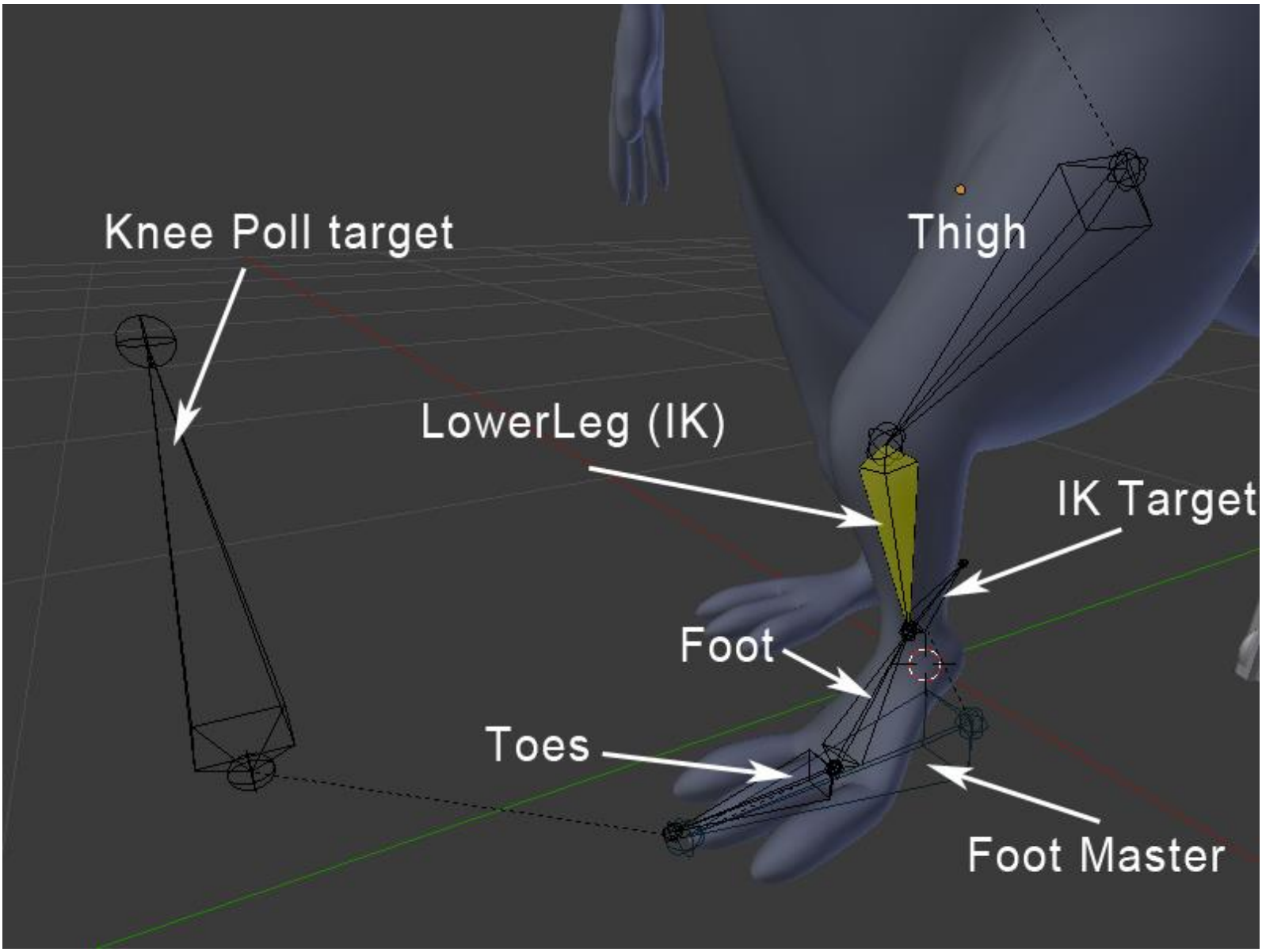




Placement of the deforming bones of the hand with a correct roll

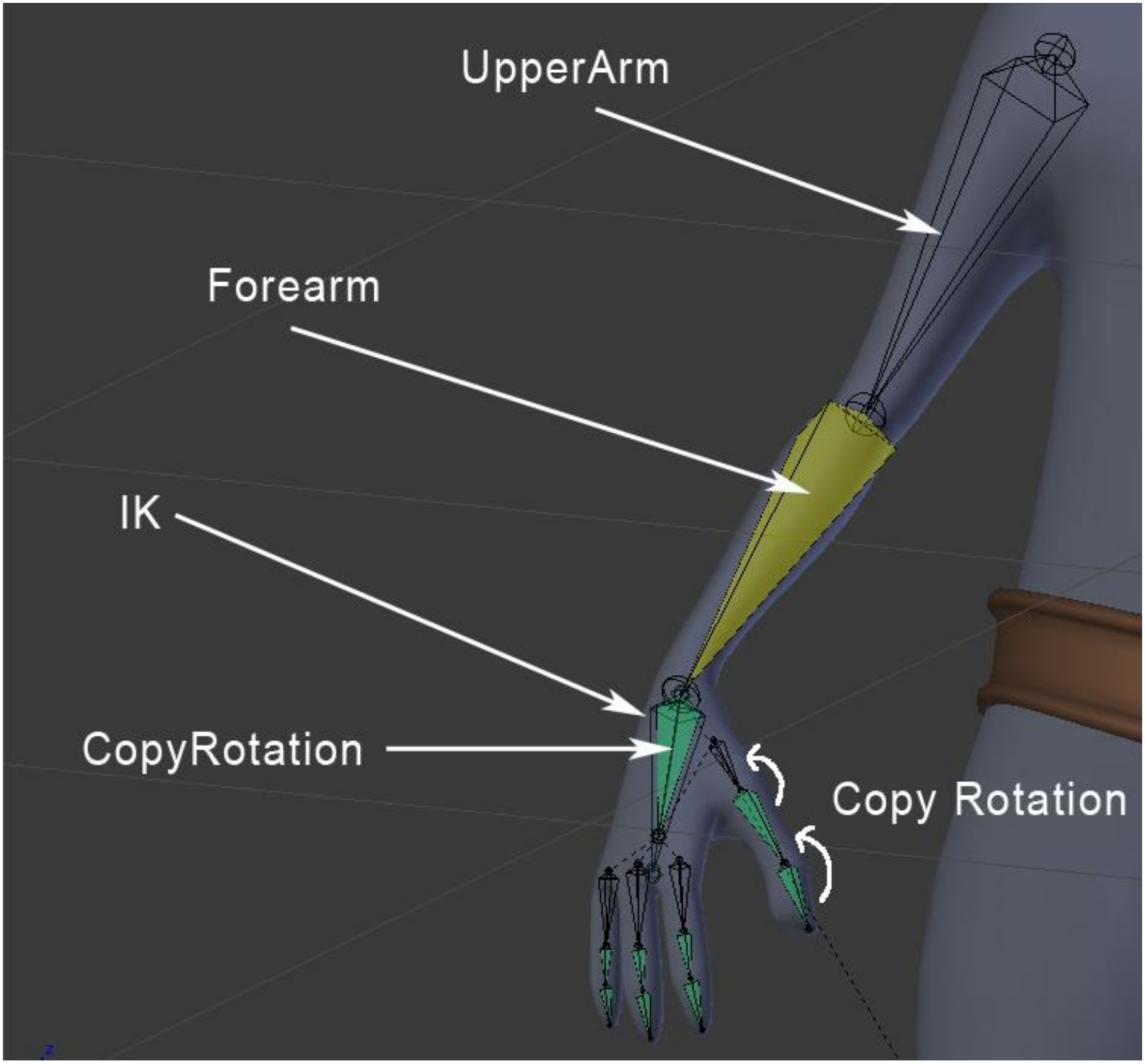
The leg and the foot



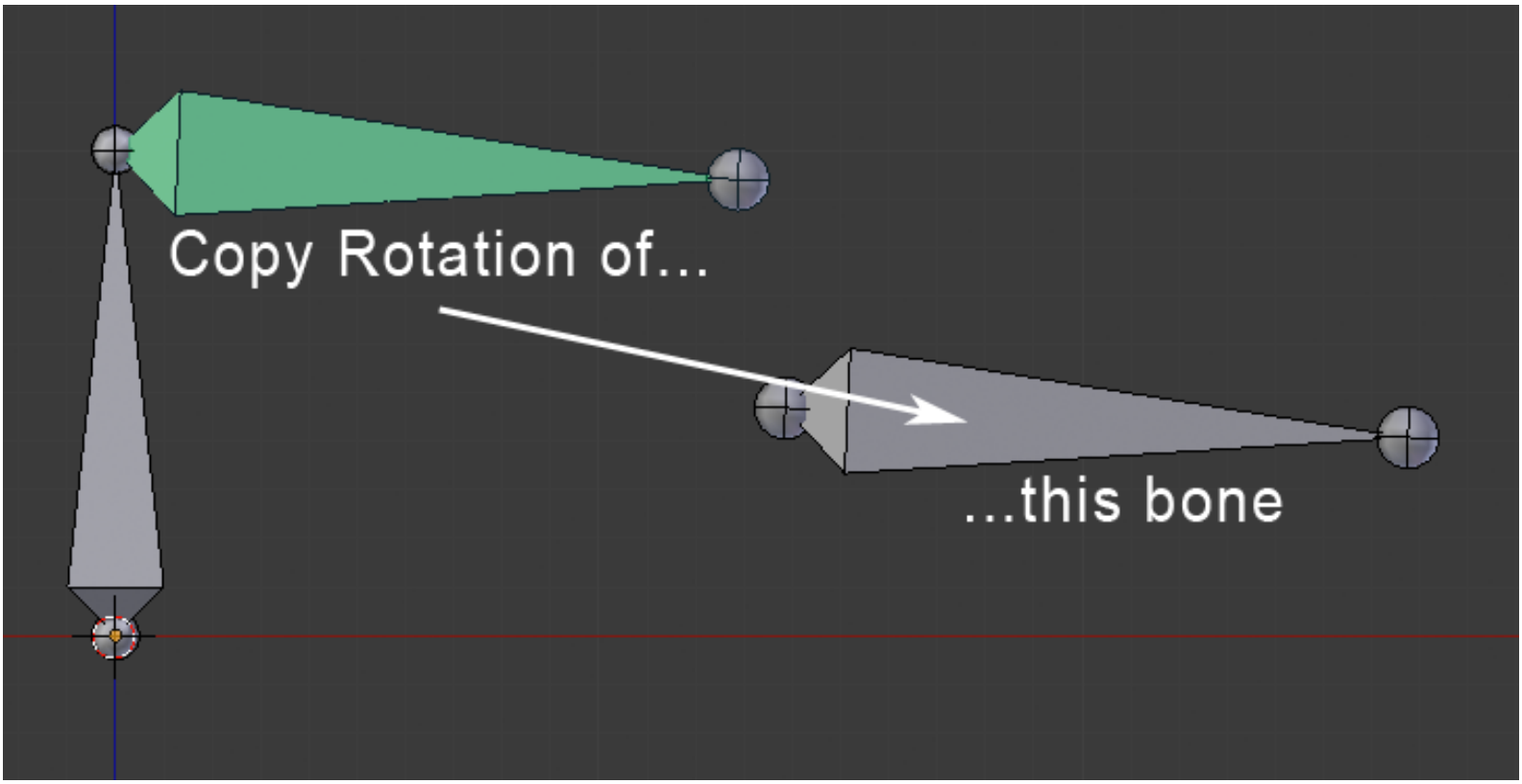


The rigging of the foot and the leg

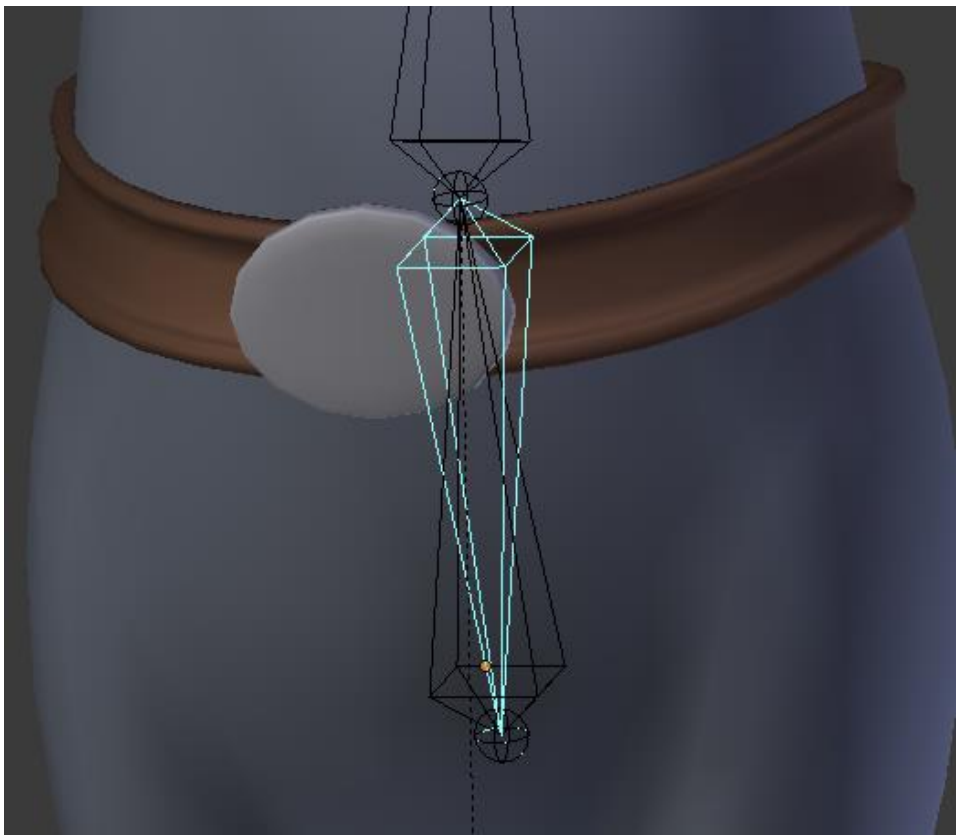
The arm and the hand



The rigging of the arm and the hand

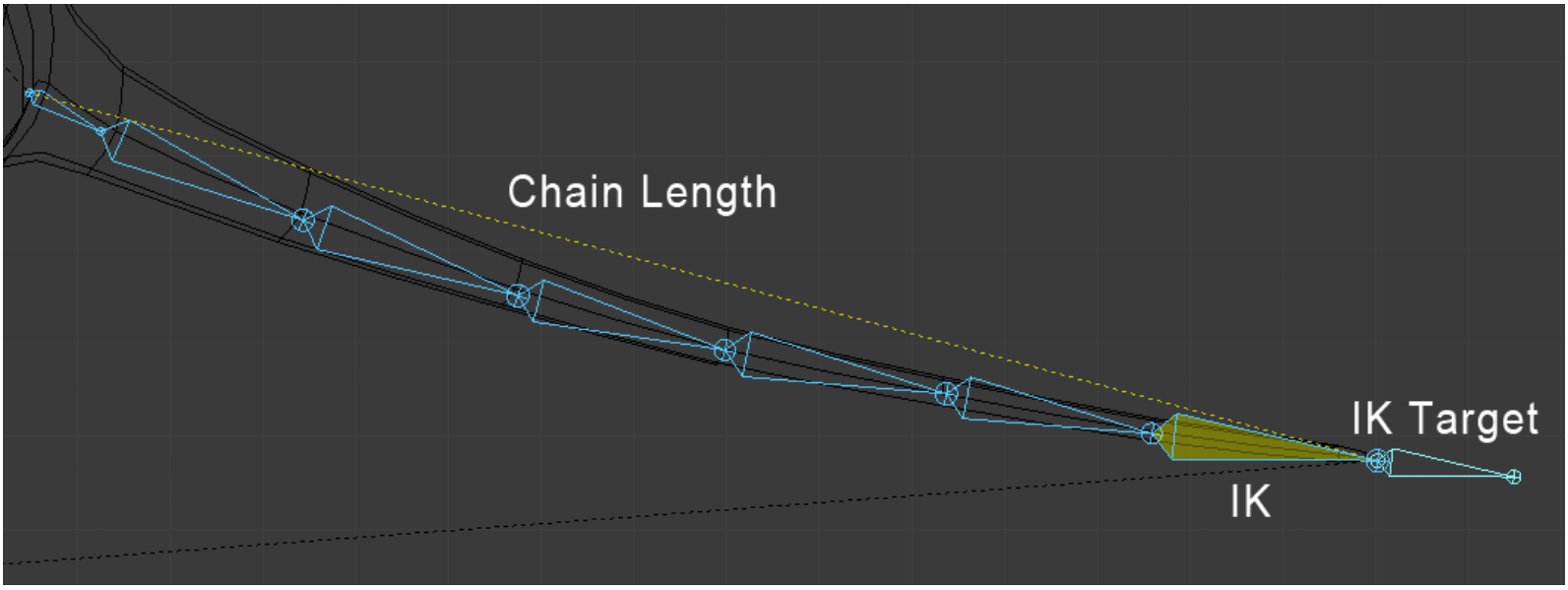


The hips



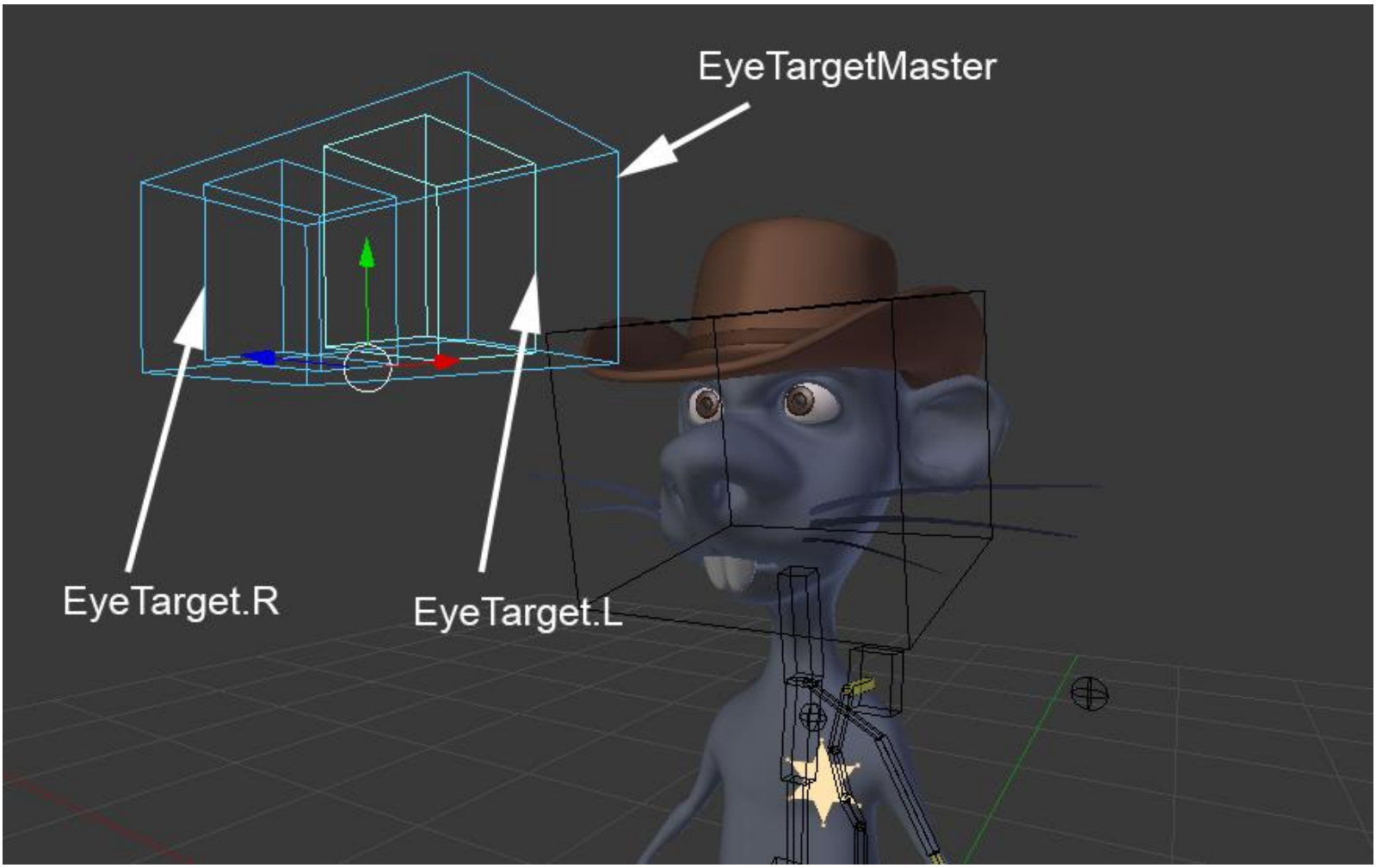
The rigging of the hips with the reversed bone

The tail

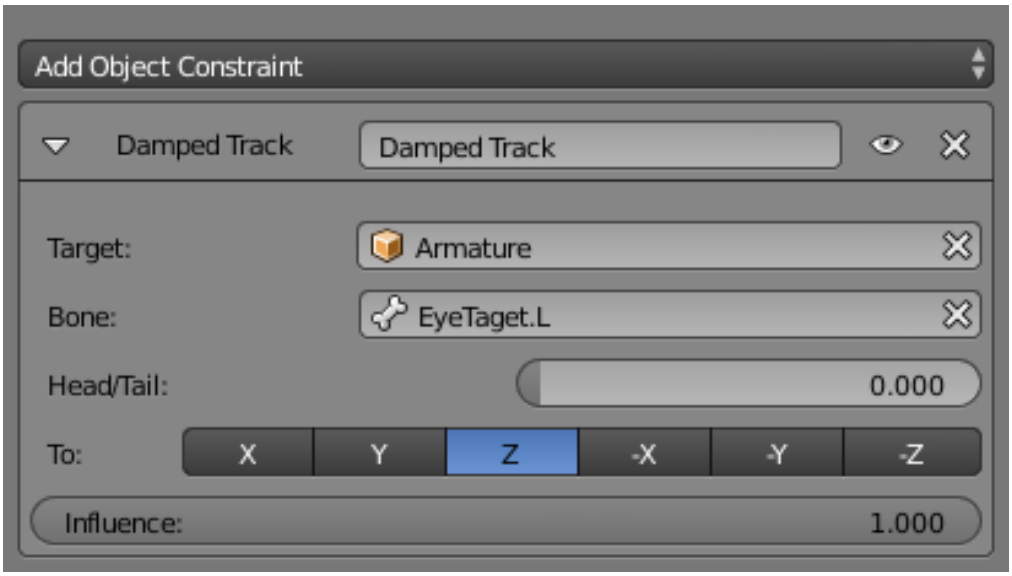


The rigging of the tail with a chain length of 7

The head and the eyes



The eyes' controllers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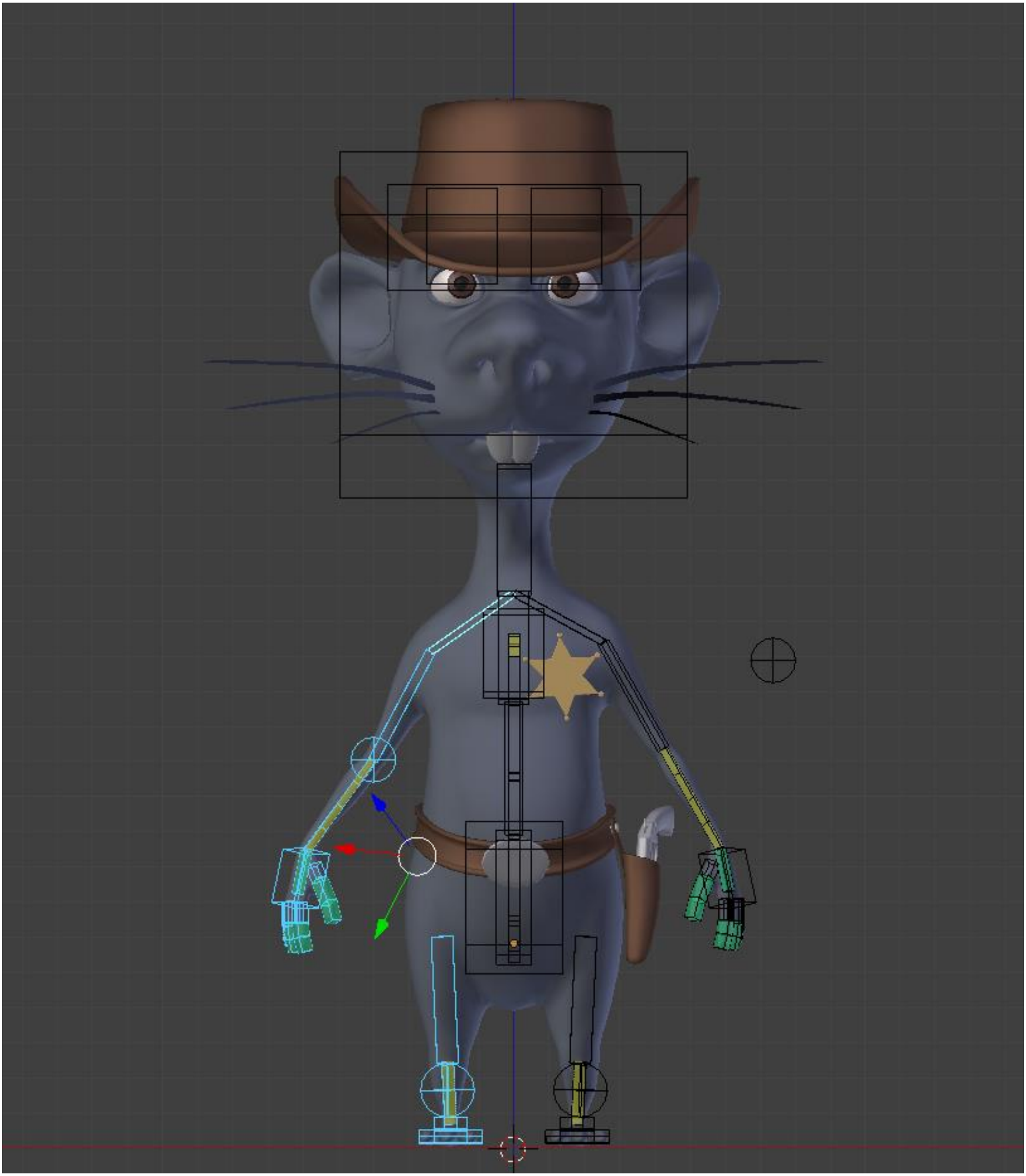
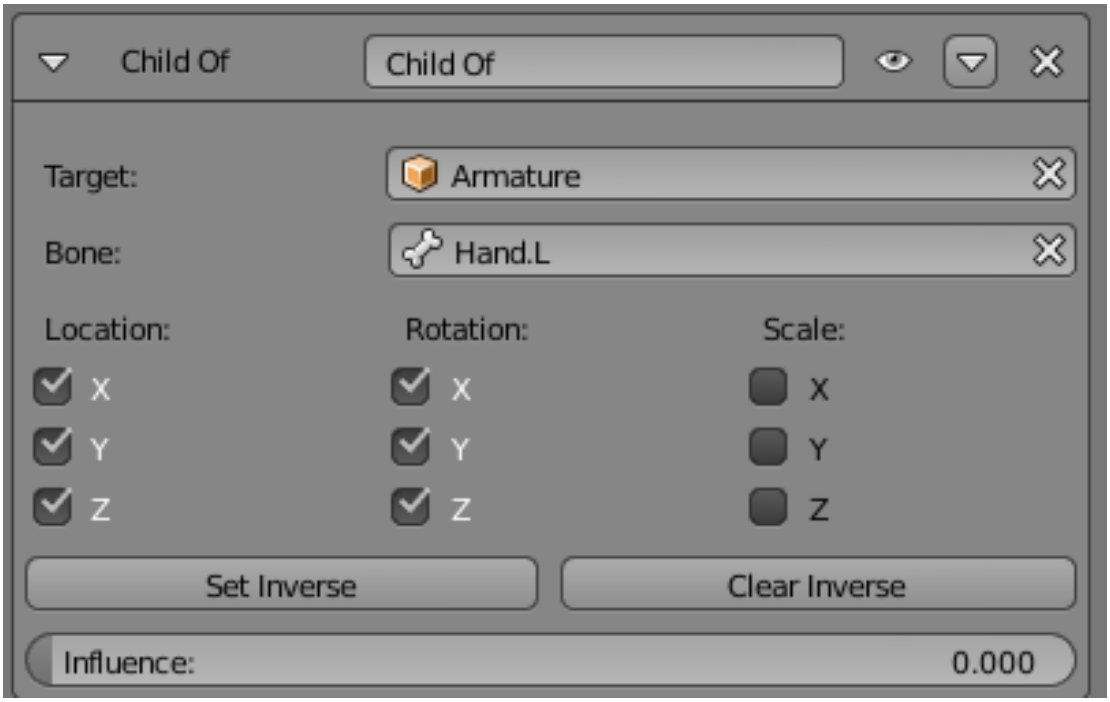
Damped Track
Damped Track
Target:
Armature
Bone:
EyeTaget.L
Head/Tail:
0.000
To:
X
Y
Z
-X
-Y
-Z
Influence:
1.000

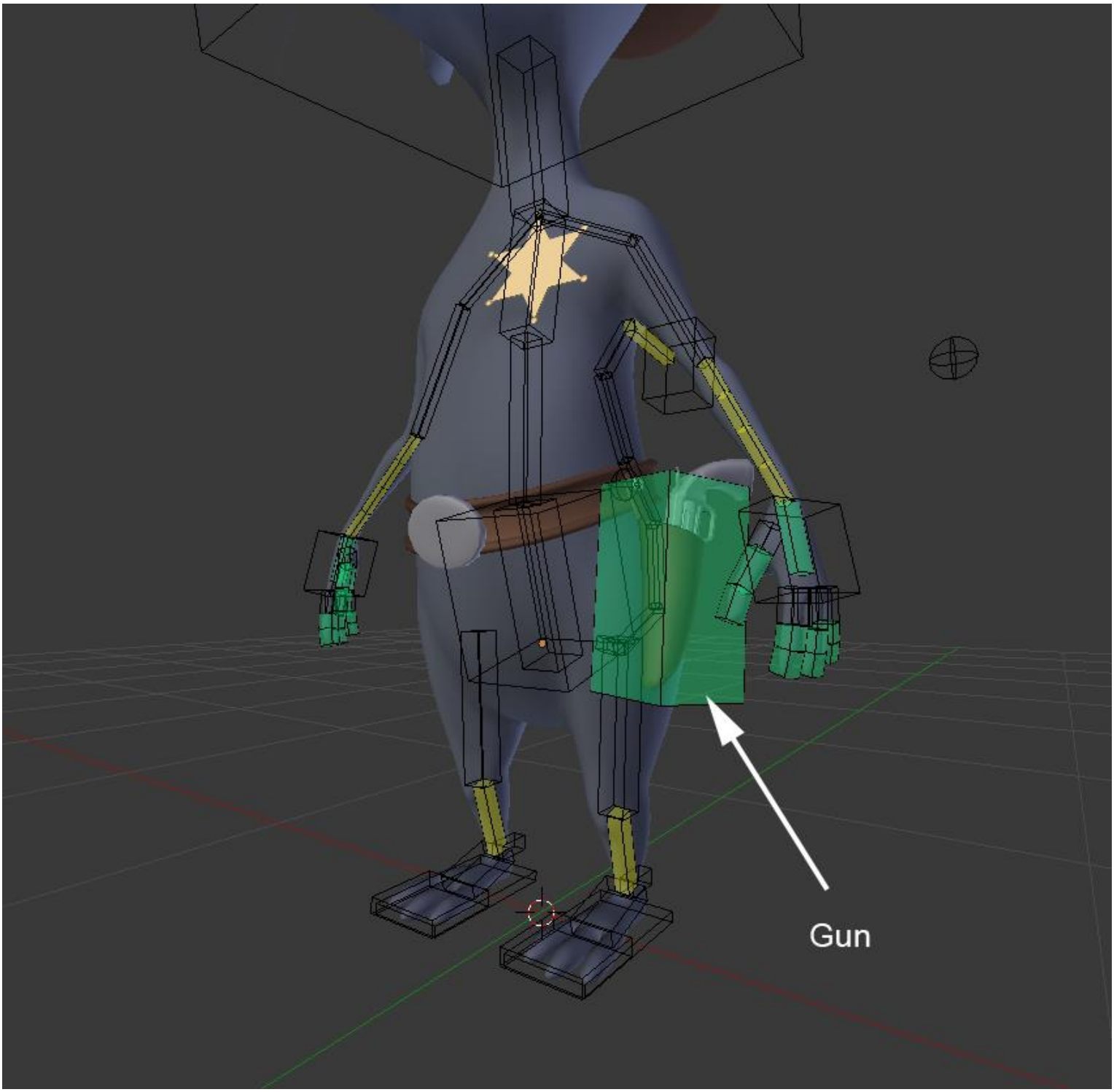
Mirroring the rig



Mirroring the bones with their constraints from the left to the right side

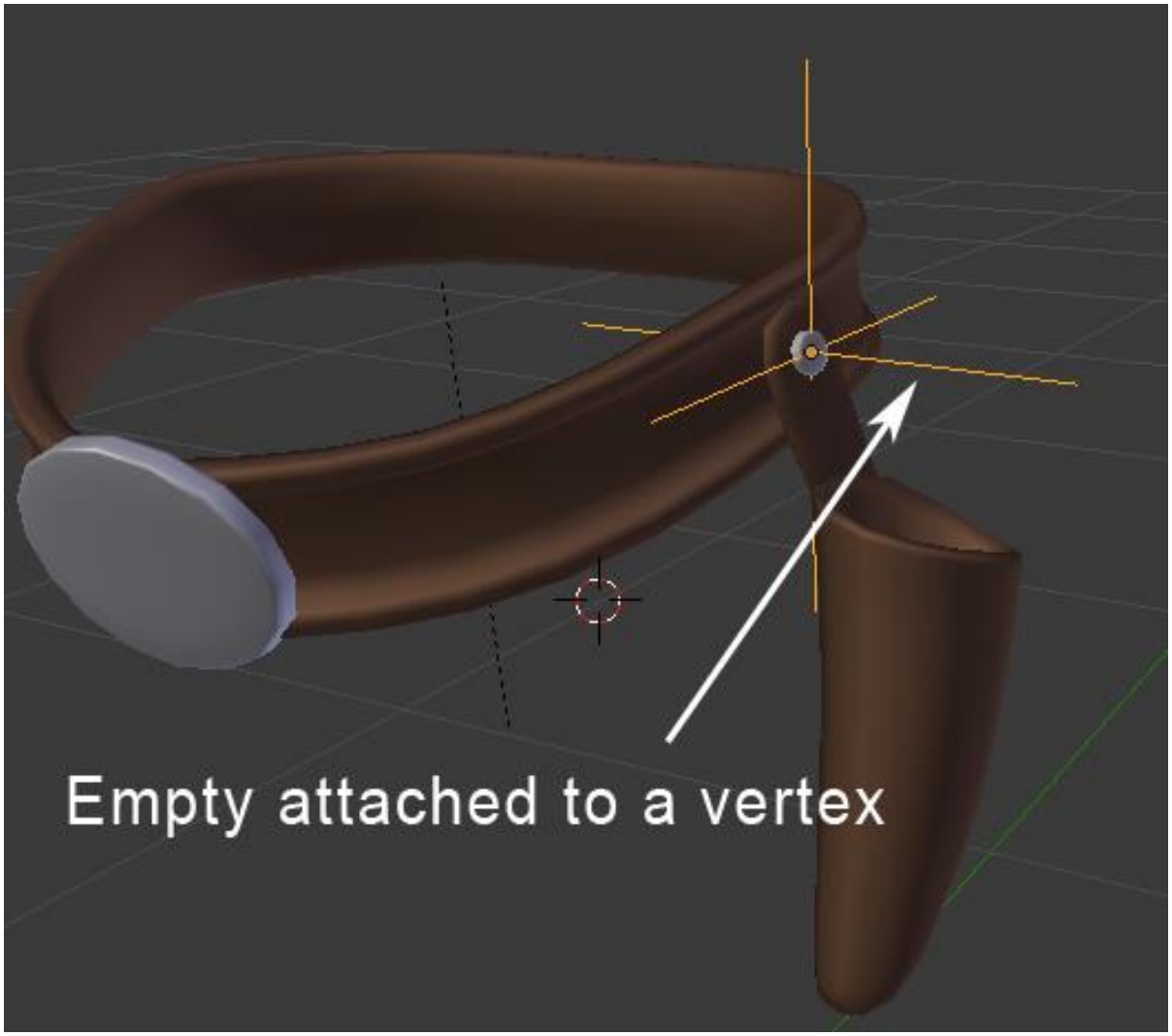
Rigging the gun





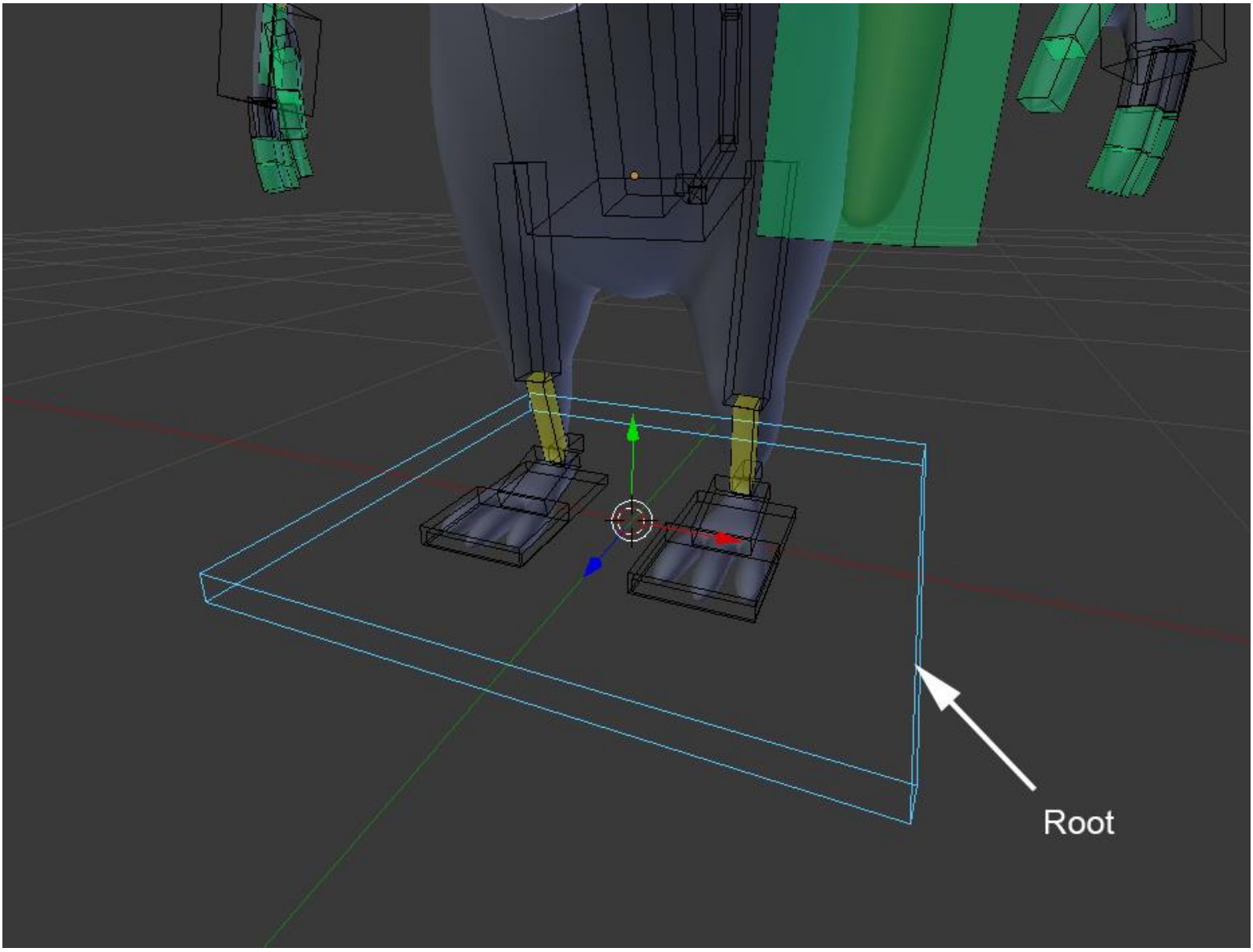
The gun bone

Rigging the holster



The rigging of the holster

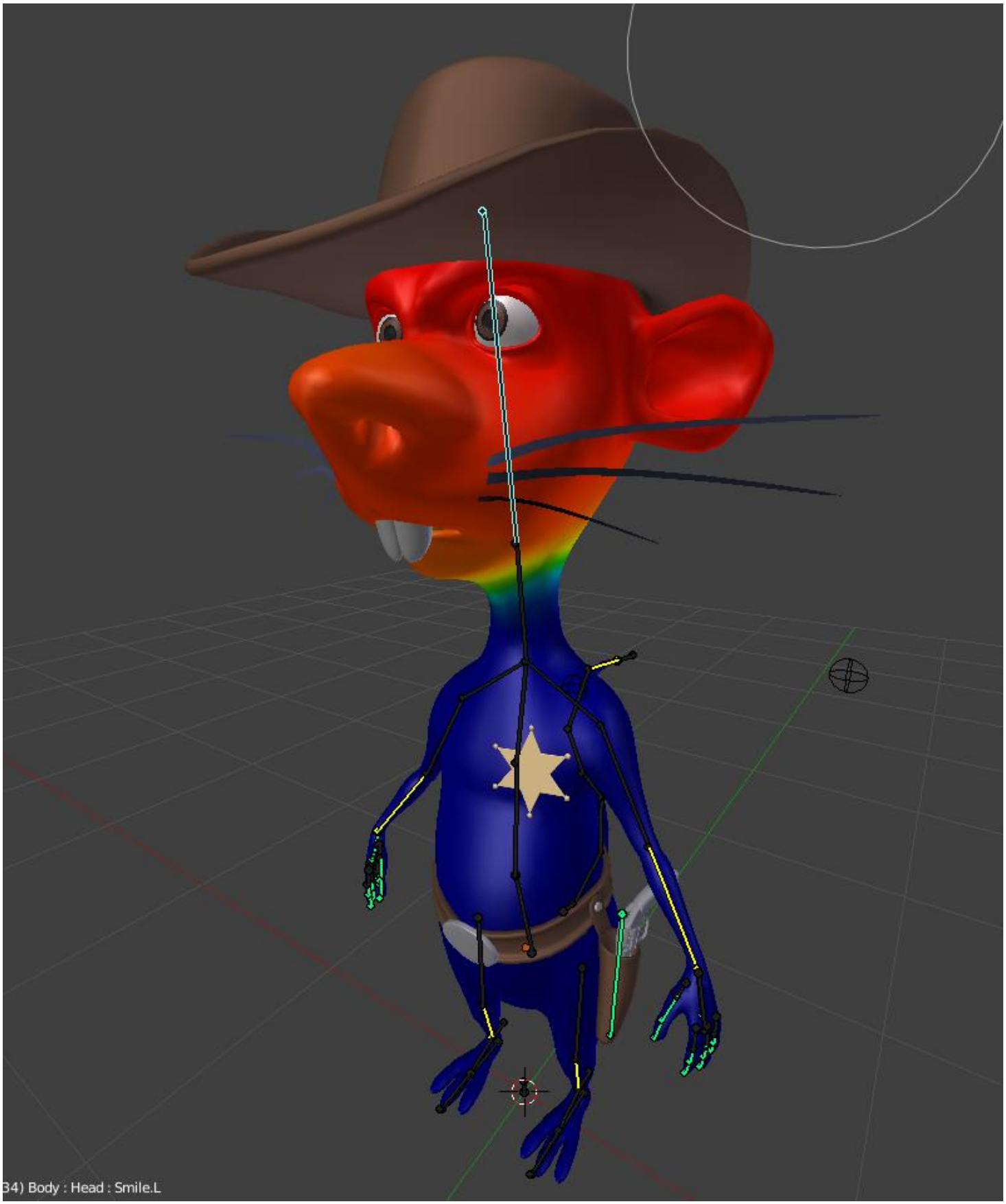
Adding a Root Bone



The root bone at the center of the world

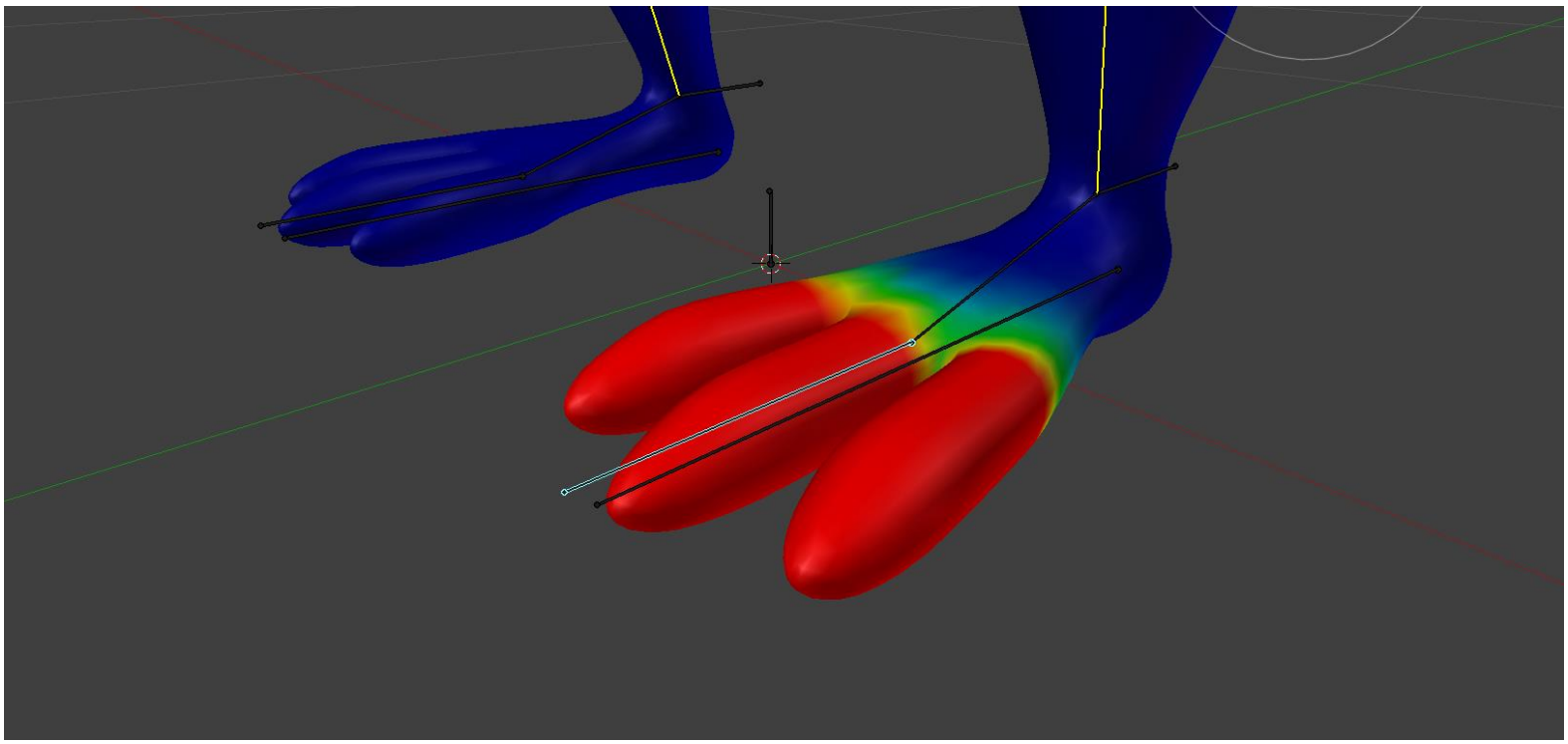
Skinning

The Weight Paint Tools



The weight paint of the Rat Cowboy (here the head influence is shown)

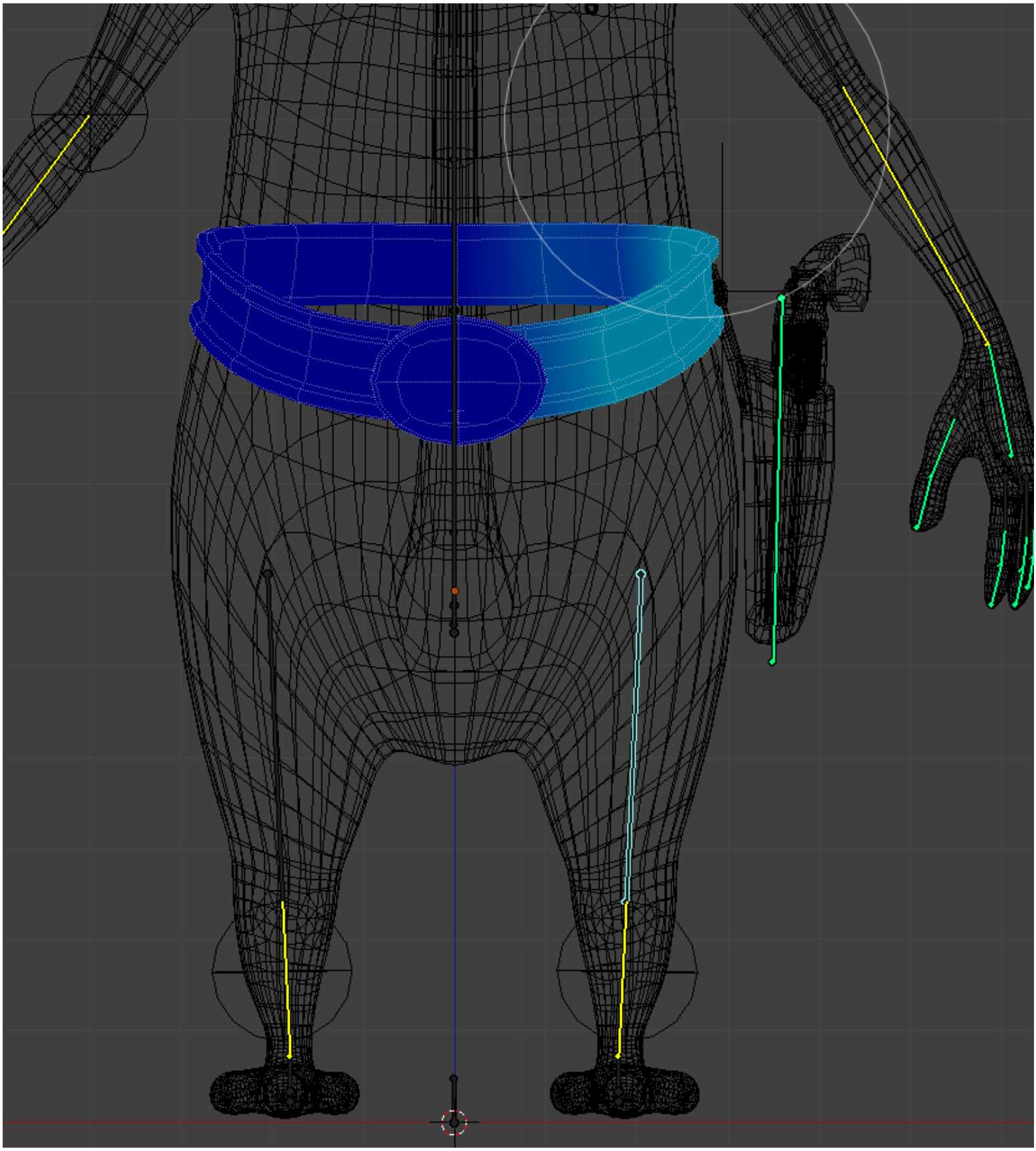
Manually assign weight to vertices



Correcting the weight paint of the toes

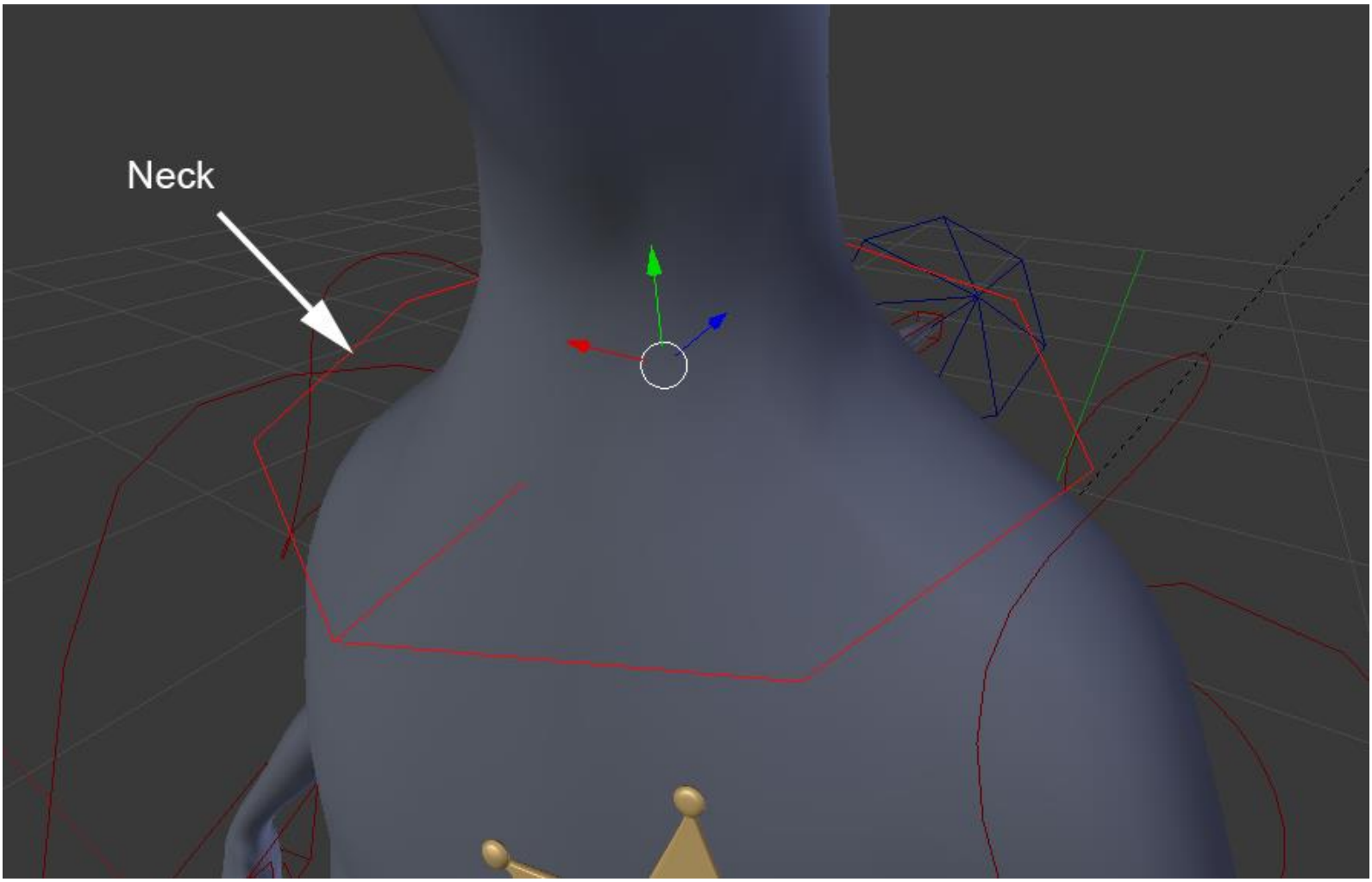
Correcting the foot deformation

Correcting the belt deformation



The weight of the left-hand side of the belt

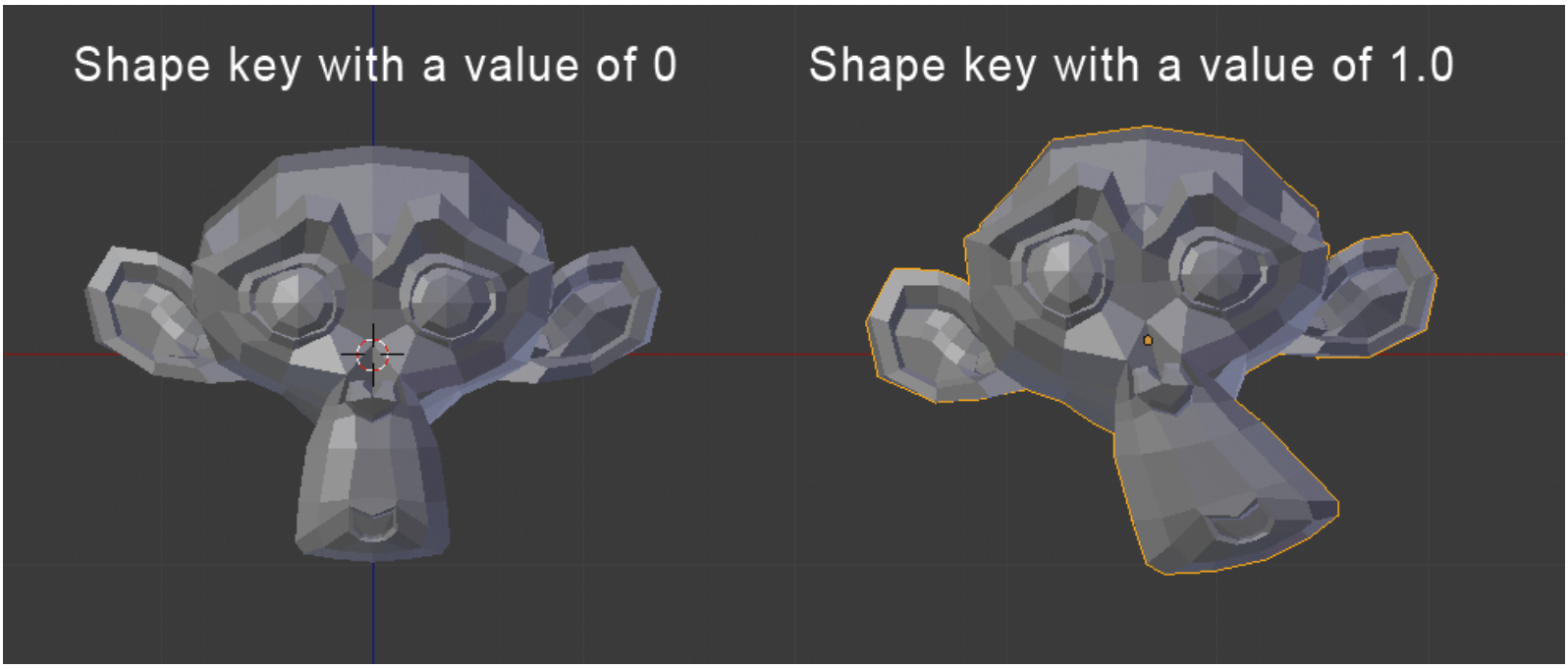
The Custom Shapes



The custom shape of the neck bone

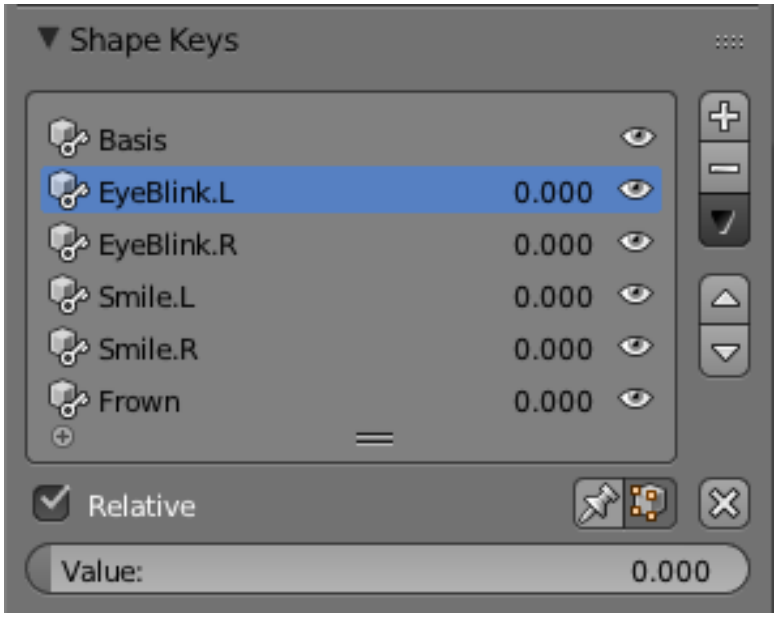
The shape keys

What is it?



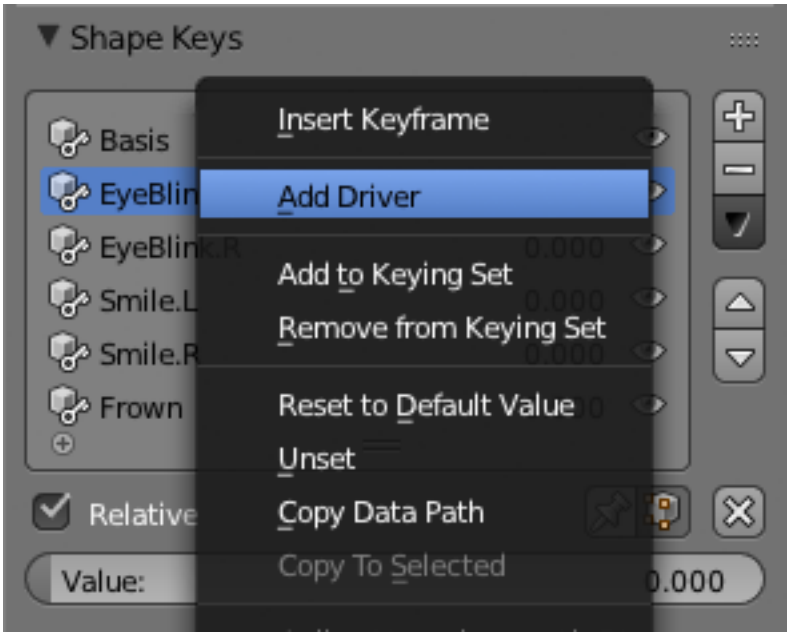
Example of a shape key with Suzane

Creating basic shapes

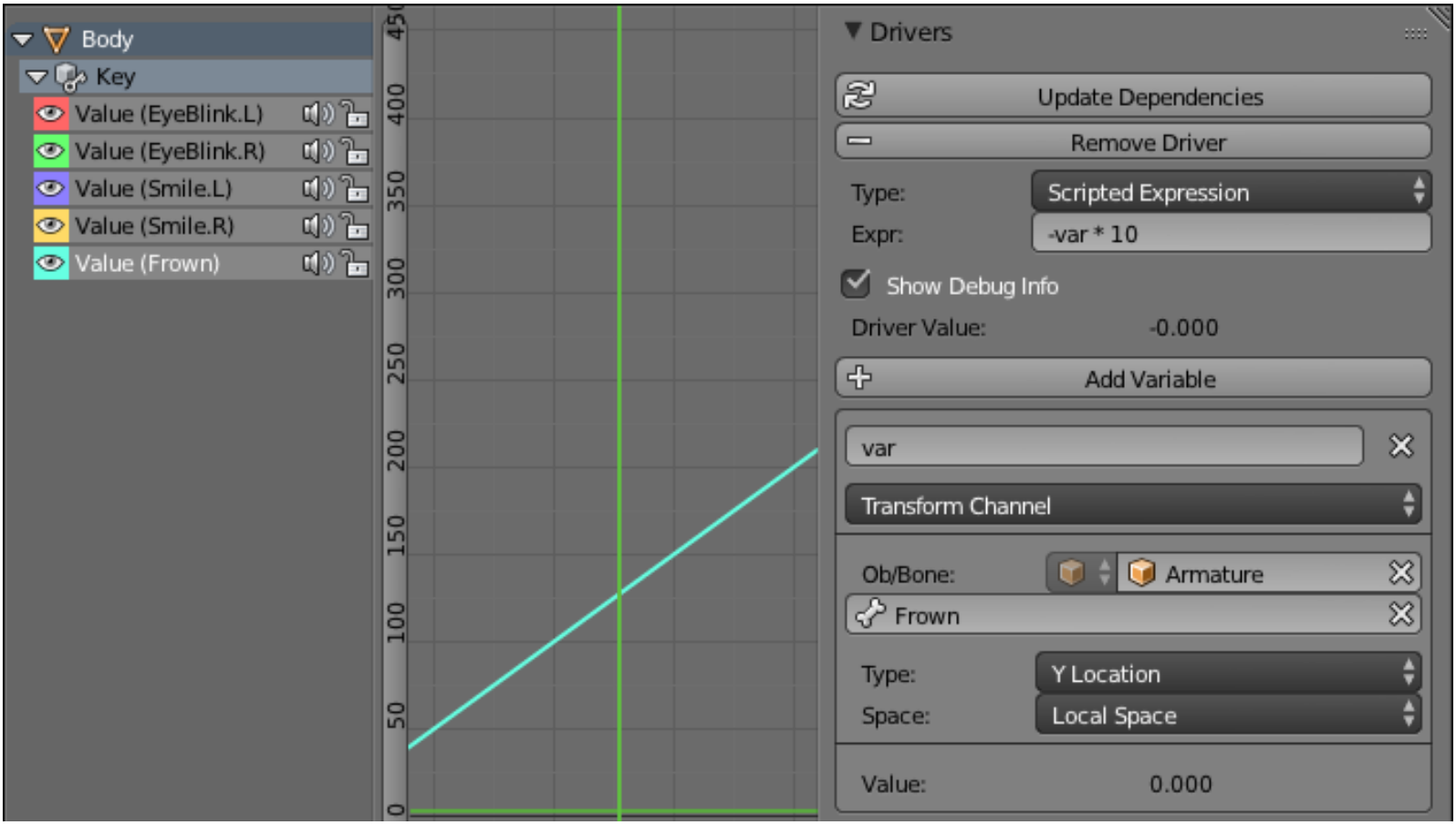


Our facial shape keys

Driving a shape key



Adding a driver to a shape key



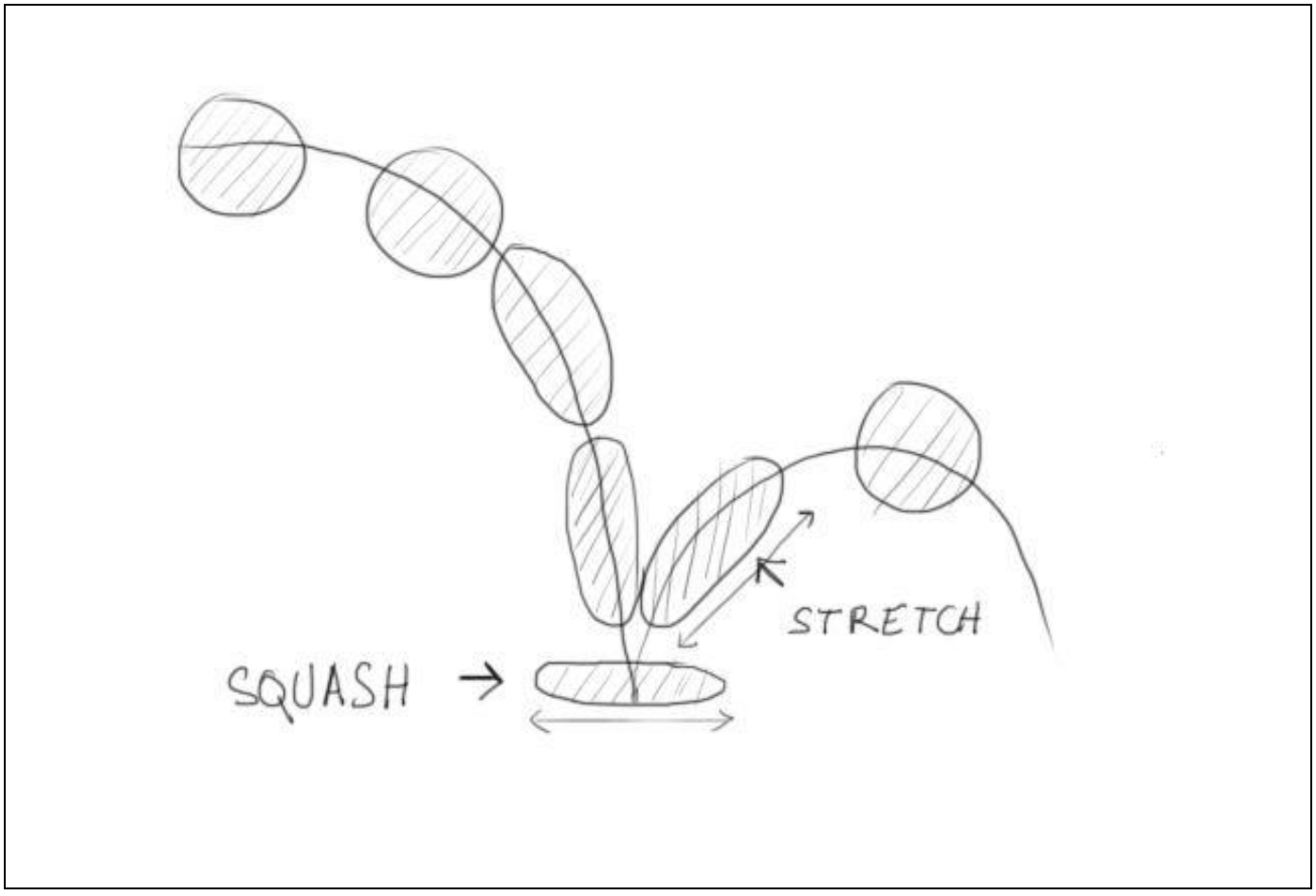
The setup of the Frown driver in Graph Editor

9

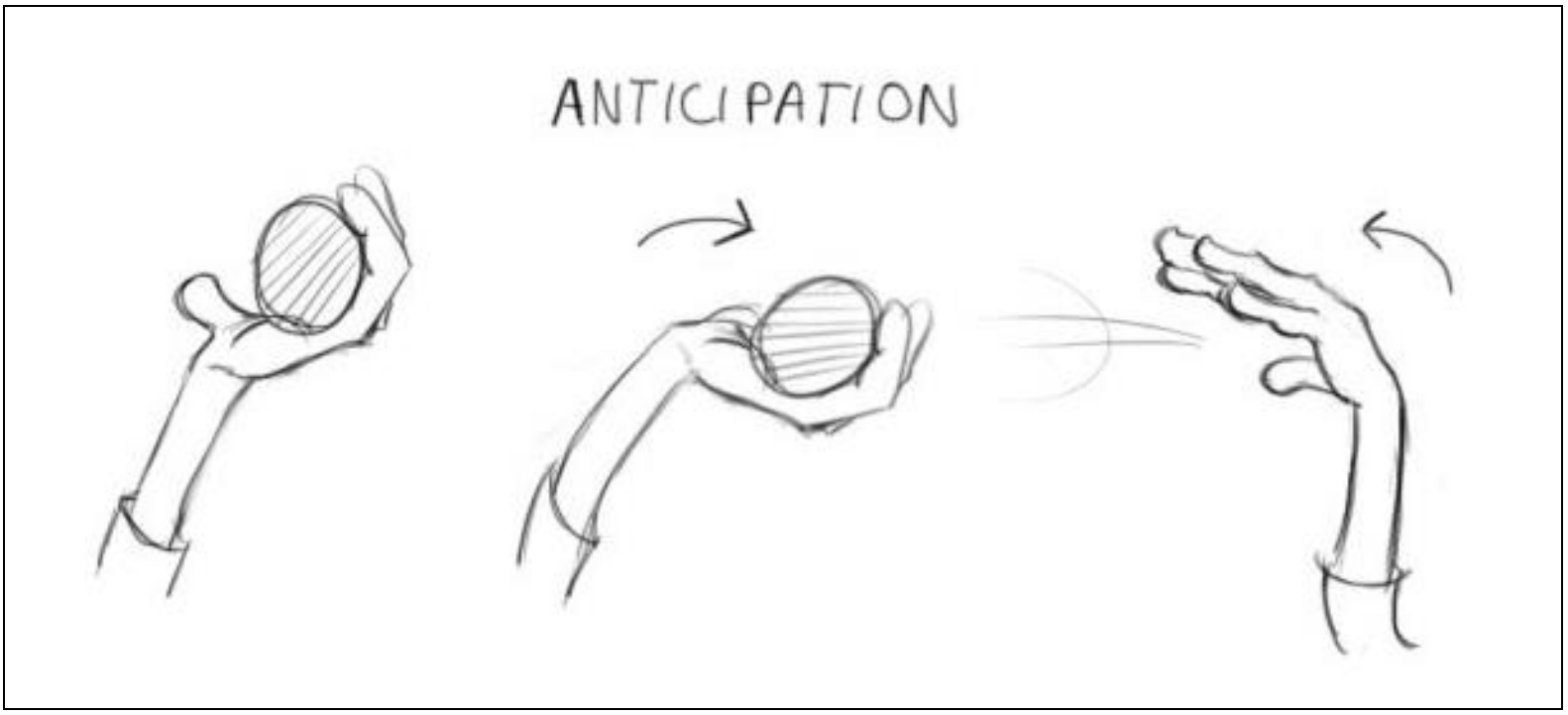
The Rat Cowboy – Animate a Full Sequence

Principles of animation

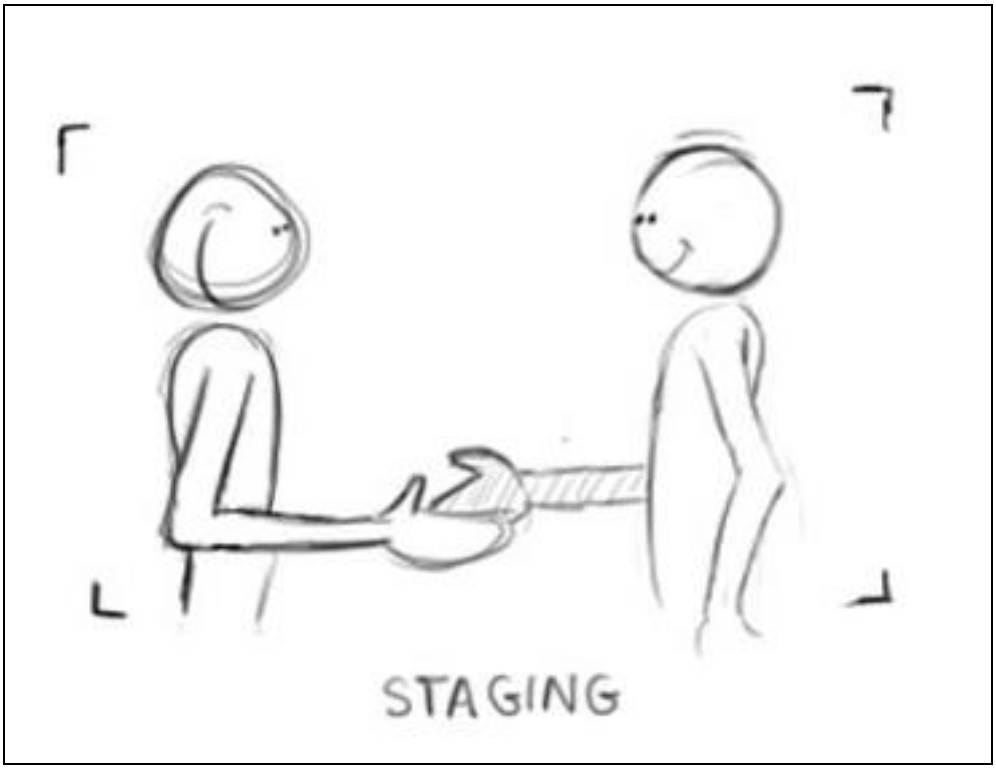
Squash and Stretch



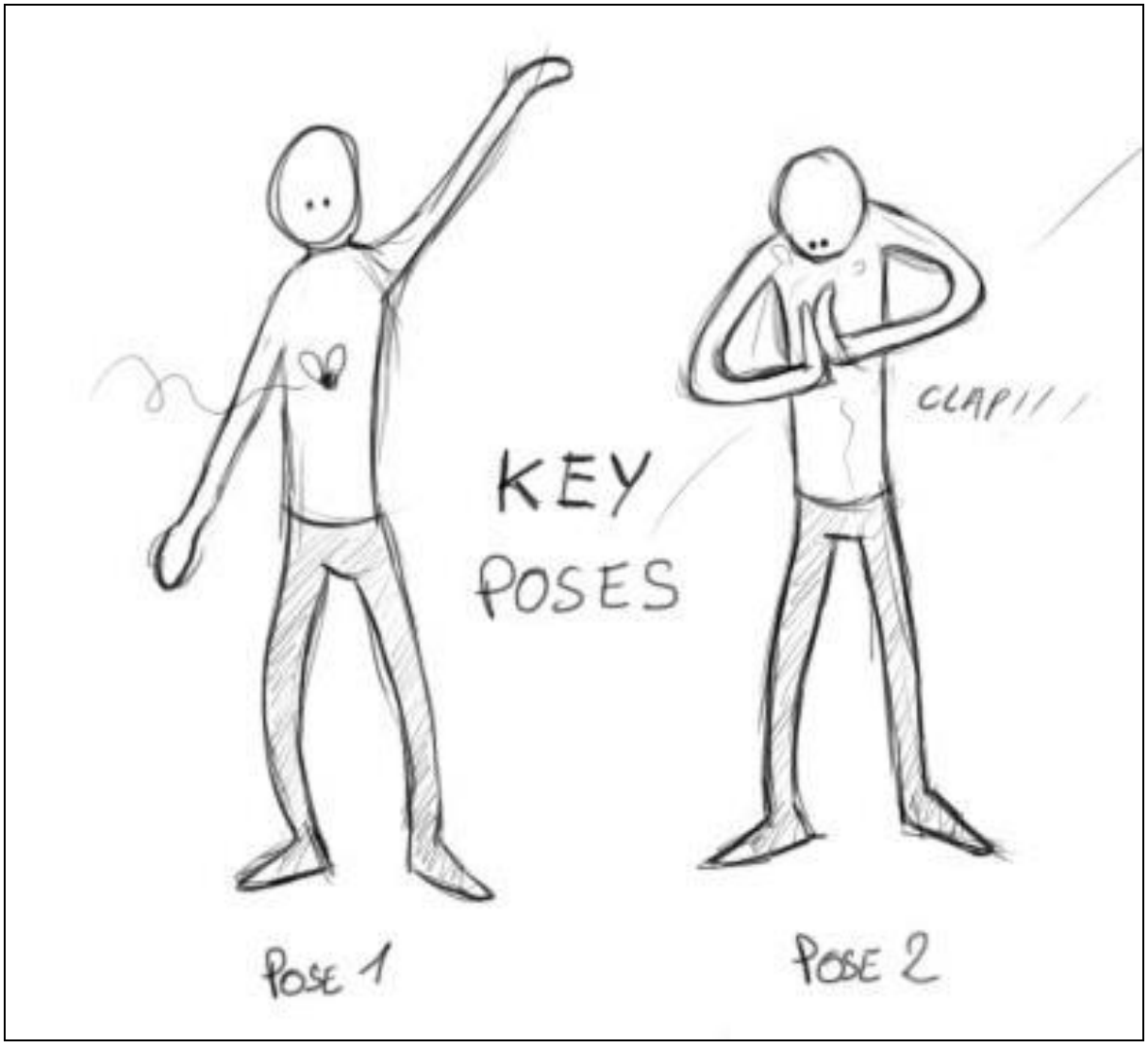
Anticipation



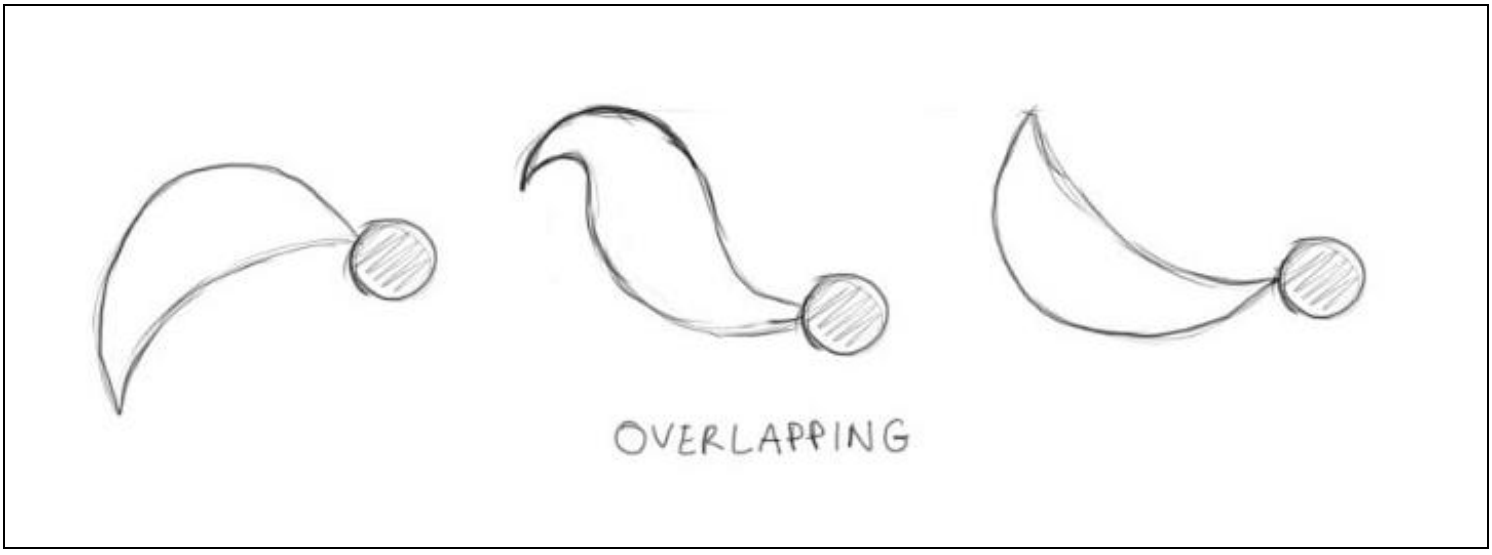
Staging



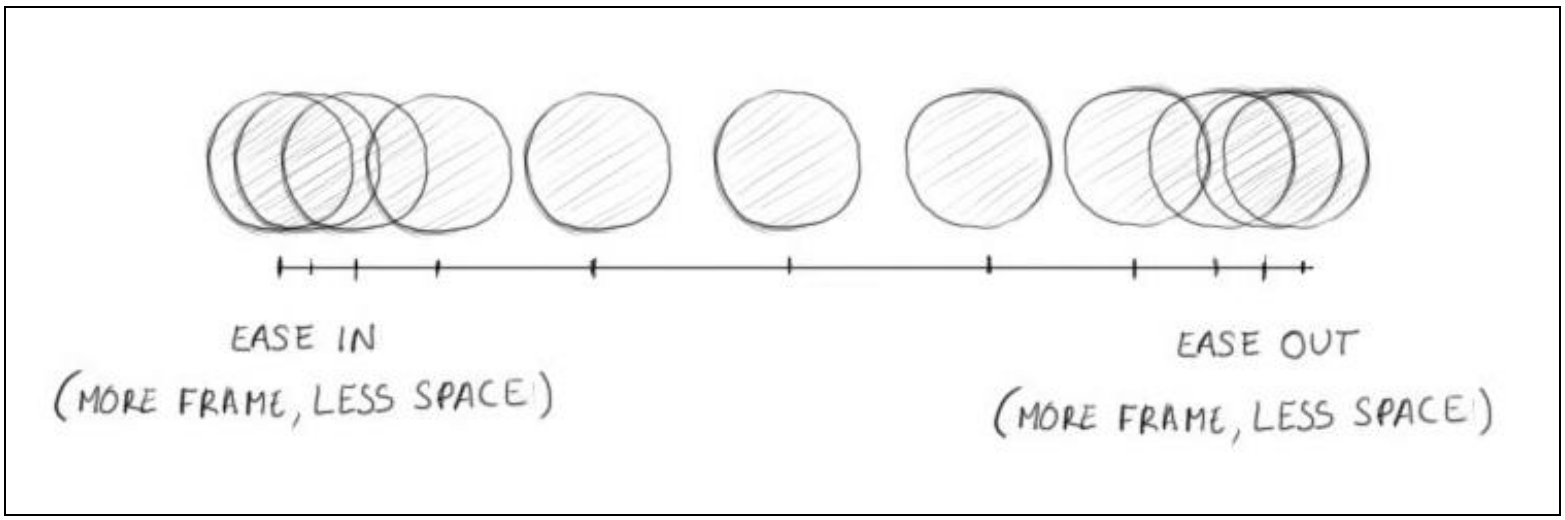
Straight Ahead Action and Pose to Pose



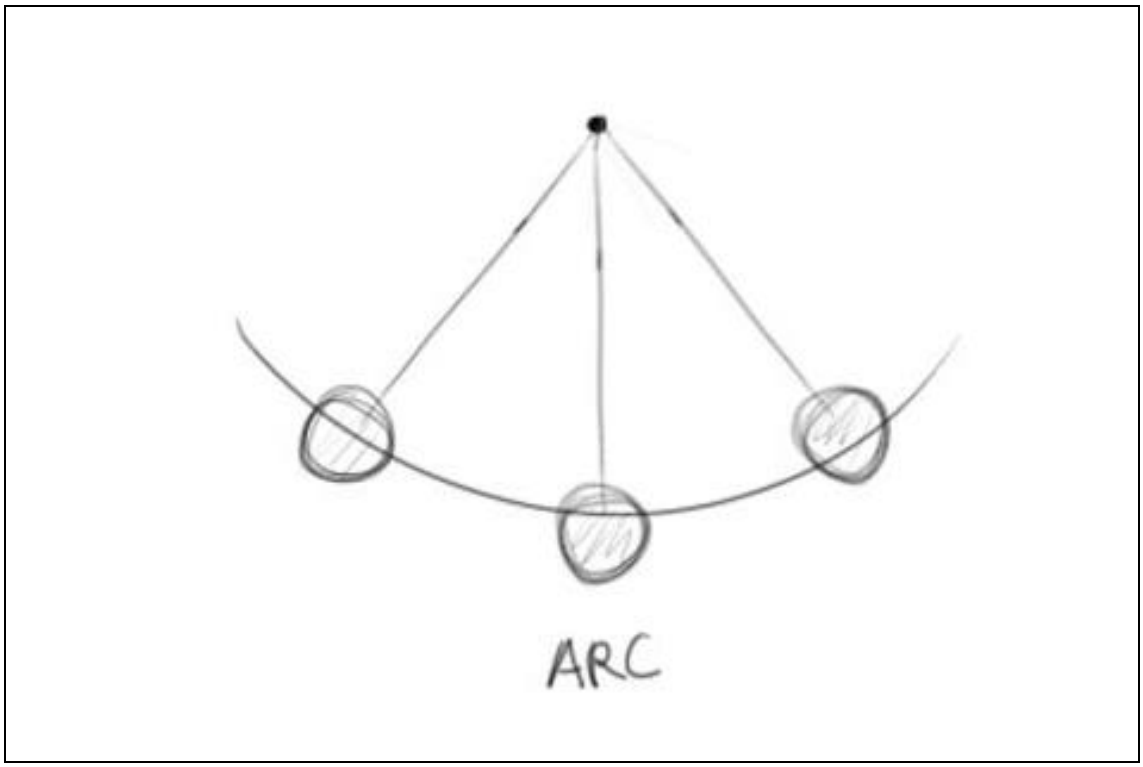
Follow Through and Overlapping Action



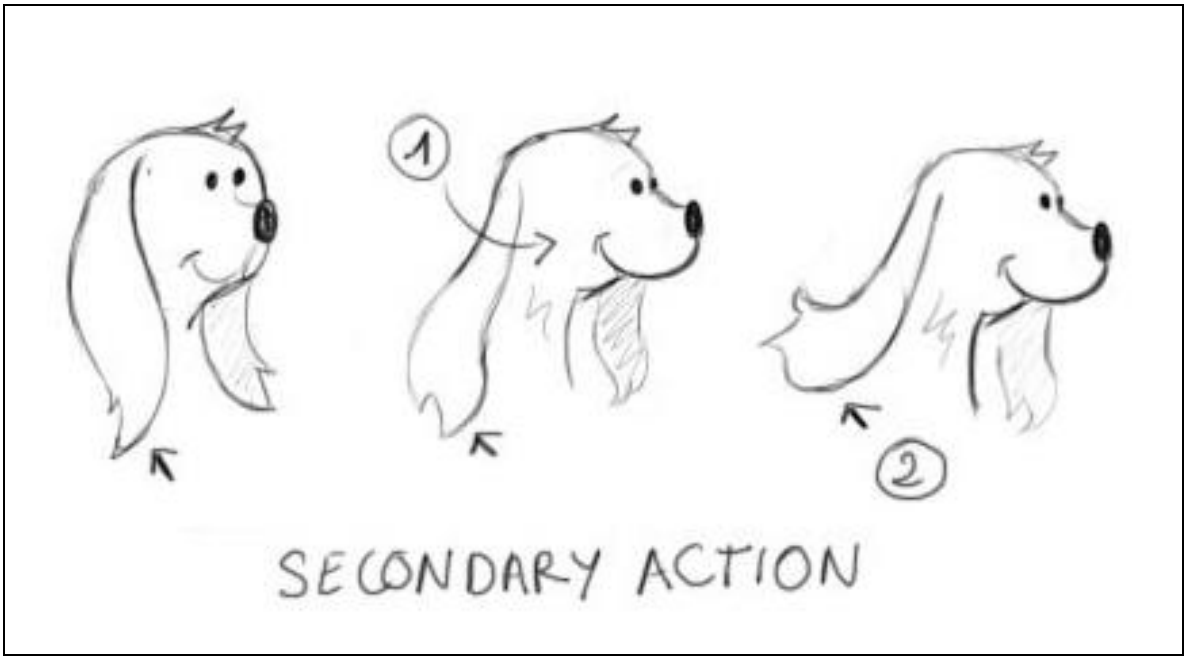
Slow In and Slow Out



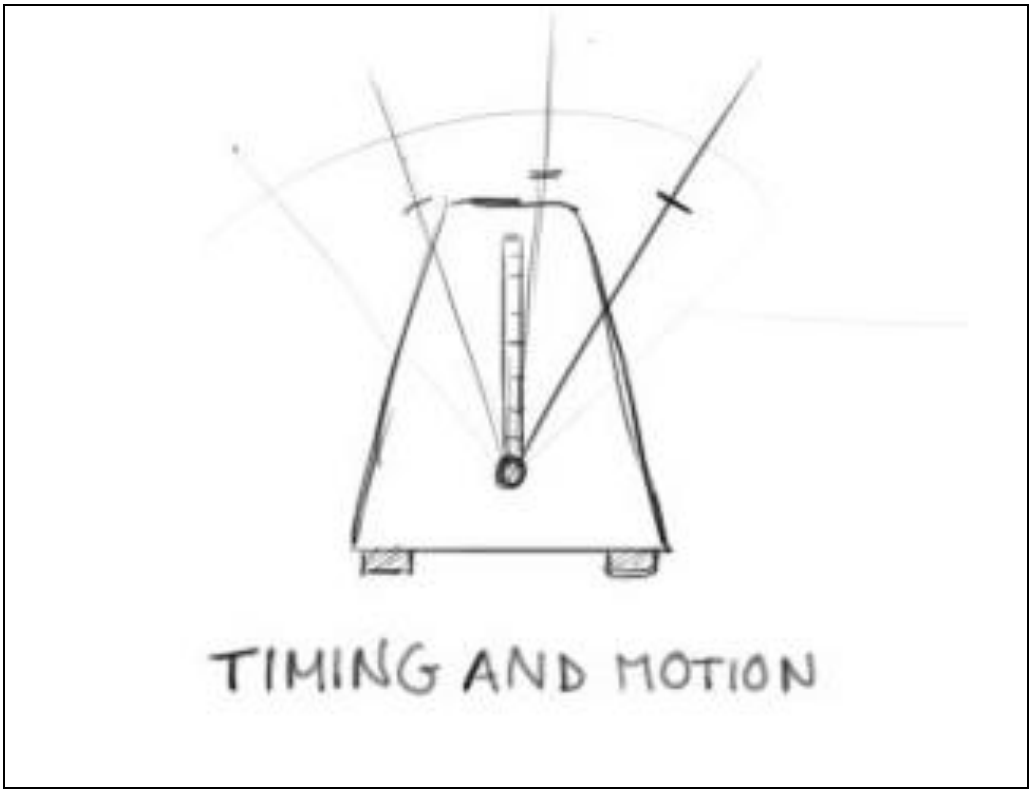
Arcs



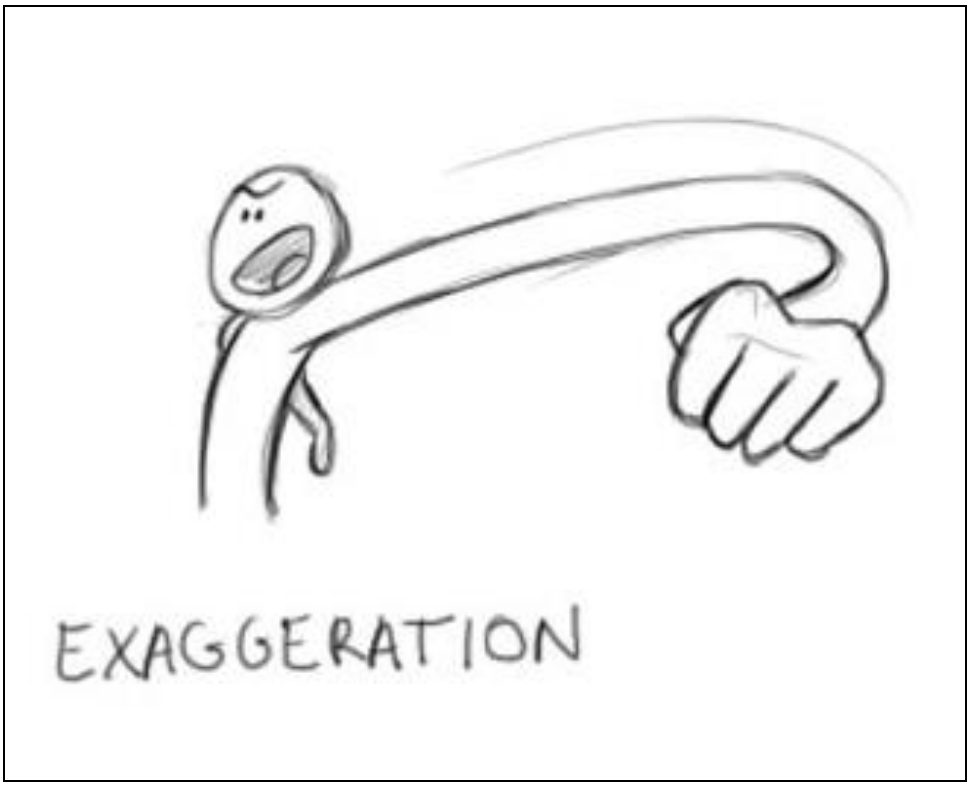
Secondary Action



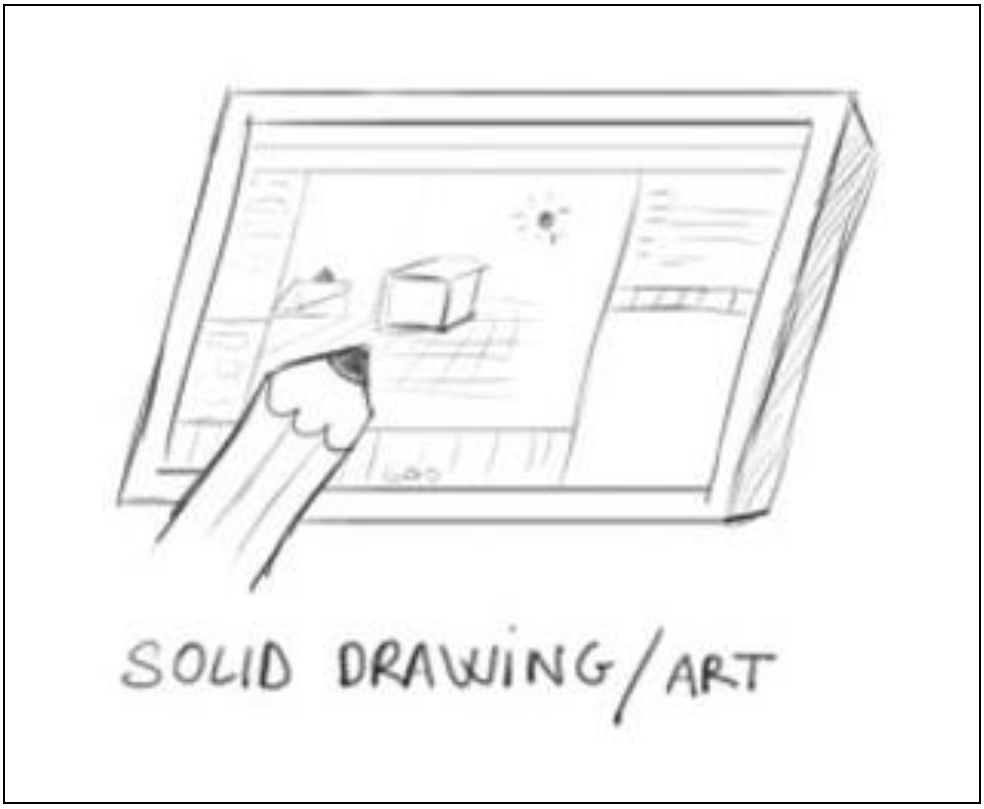
Timing



Exaggeration



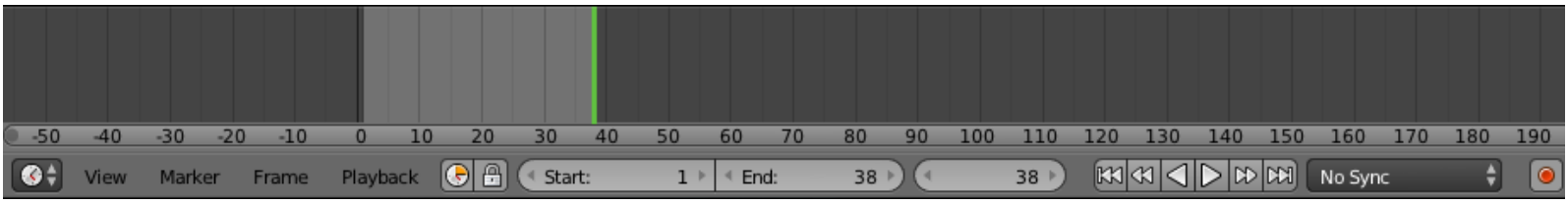
Solid drawing



Appeal

Animation tools in Blender

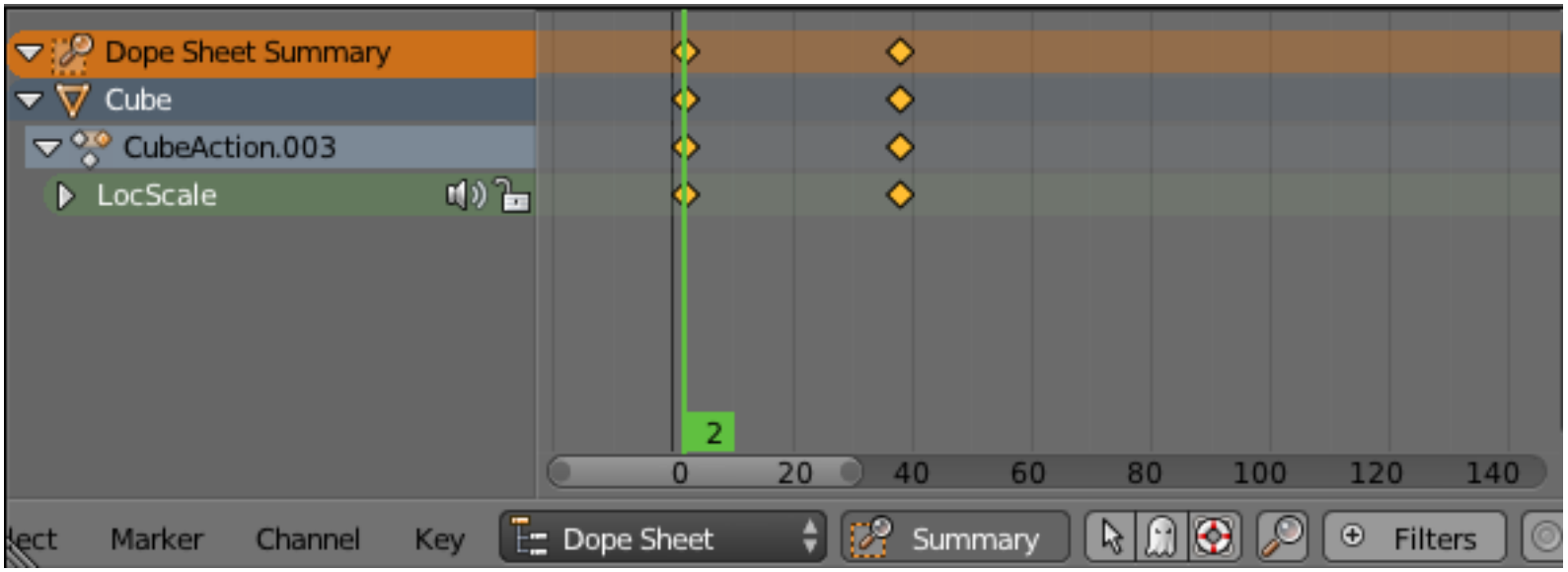
The timeline



The timeline

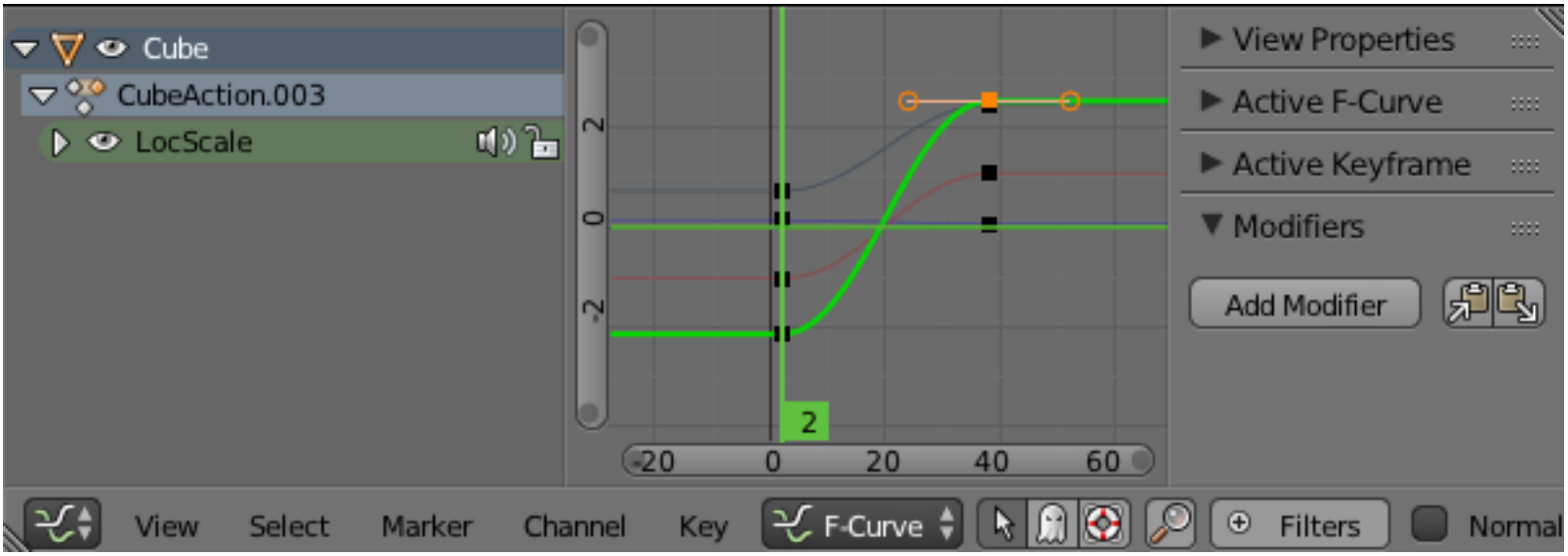
What is a keyframe?

The Dope Sheet



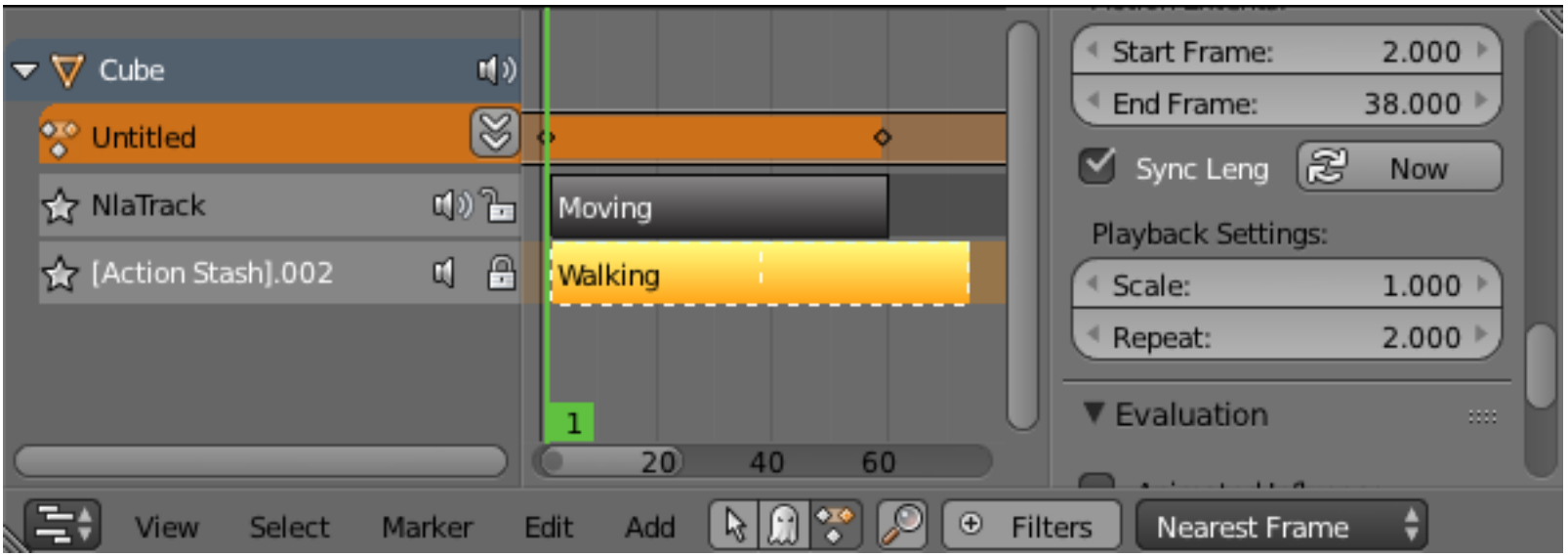
The Dope Sheet editor

The Graph editor



The Graph editor

The Non-Linear Action editor



The NLA editor

Preparation of the animation

Writing a short script

Title : Rat Coybow

Outdoor Day

Sequence 1 :

Shot 01 : Long shot of the background. The character moves forward and the camera makes a lateral tracking shot. The character stops walking in front of the camera. He frowns and seems to observe something away.

Shot 02: Medium shot of the cheese placed on a trap.

Shot 03 : Full shot on the side. We see the position of the rat and the trap.

Shot 04 : Close up of the eyes of the rat.

Shot 05 : Close up of the cheese. slight zoom.

Shot 06 : Close up of the hand preparing to take the gun located above the holster.

Shot 07 : Close up of the cheese with the trap.

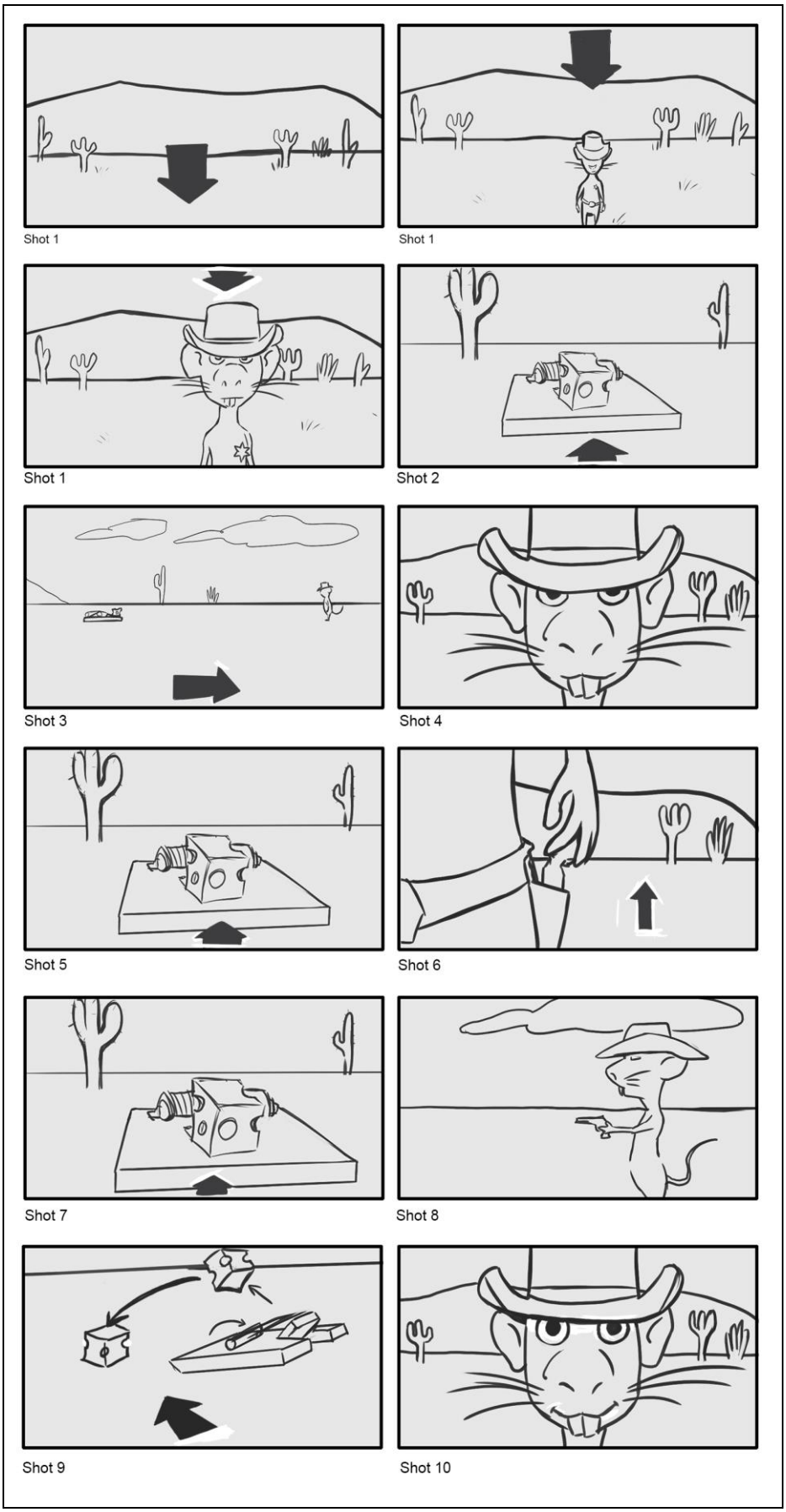
Shot 08 : Italian shot on the side. The rat waits a moment and shots with his gun.

Shot 09 : Full shot. The cheese is projected behind the trap that closes. Tracking shot focus on the rolling cheese.

Shot 11 : Close up of the eyes of the rat. He is smiling.

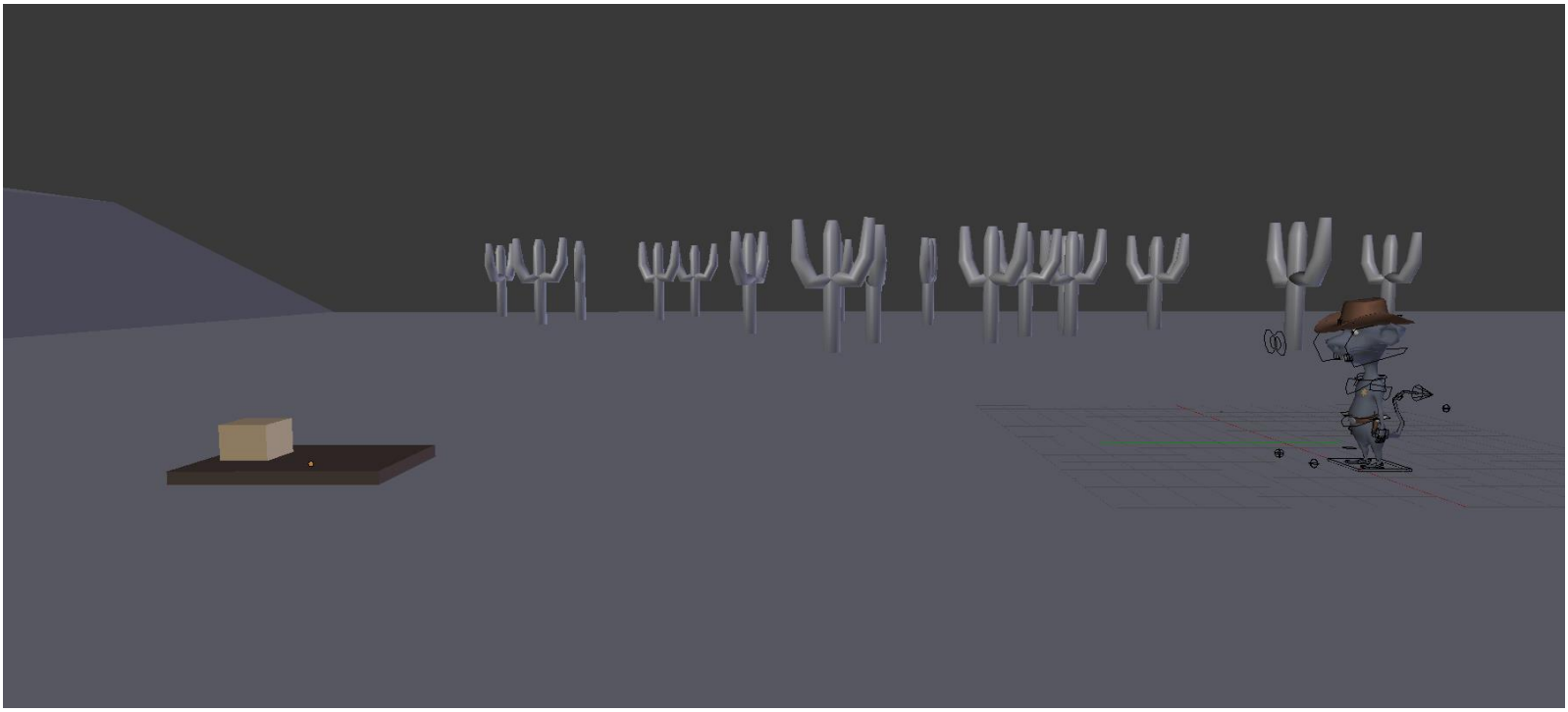
The storyboard

Making a Storyboard



Storyboard

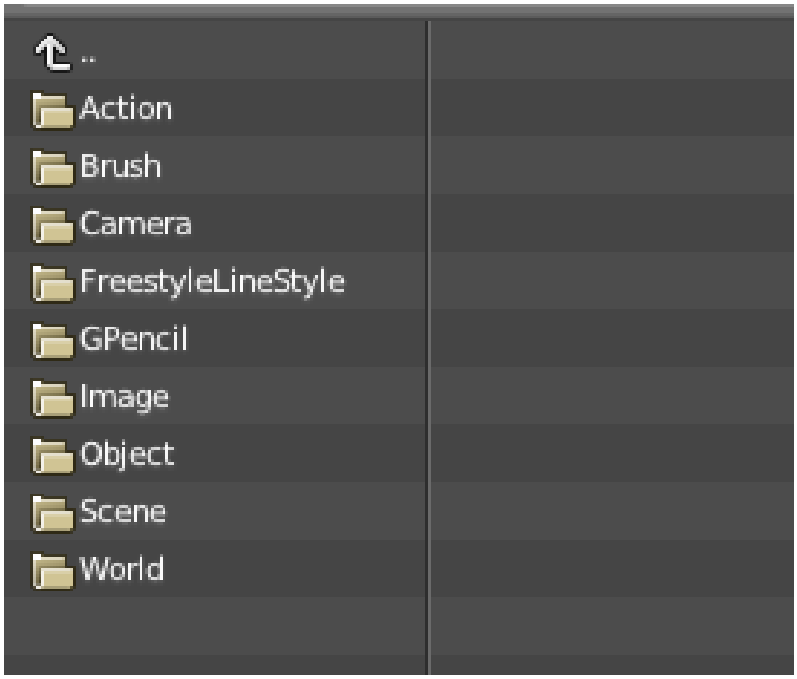
Finding the final camera placements and the timing through a layout



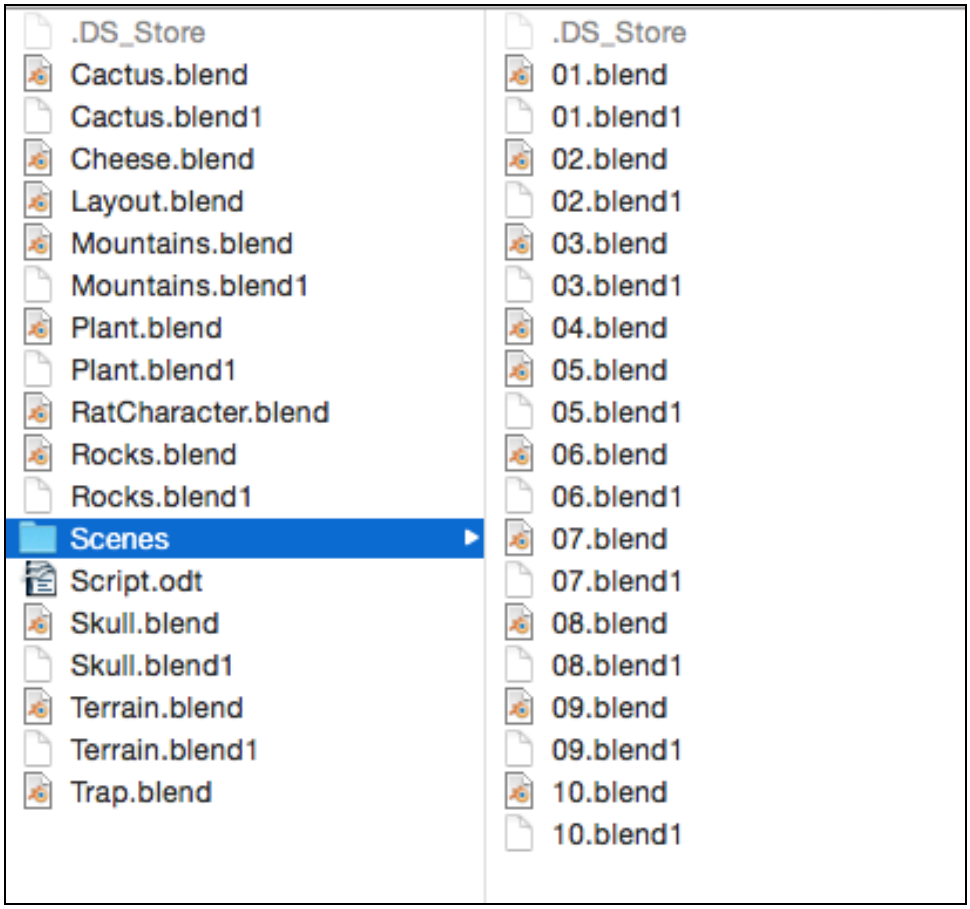
Screenshot of the layout shot 03 with the rough modeling

Animation references

Organization



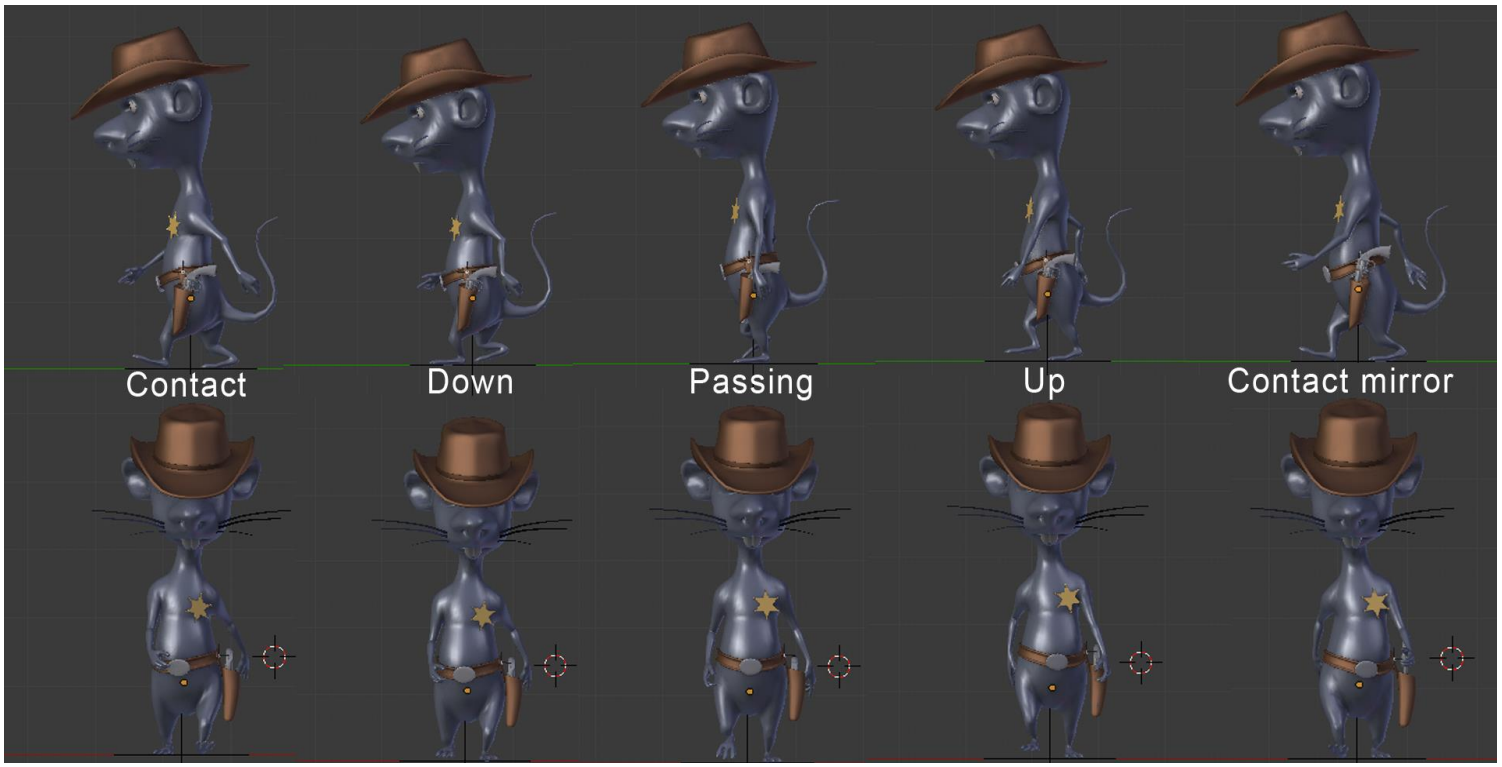
The structure of a blend file



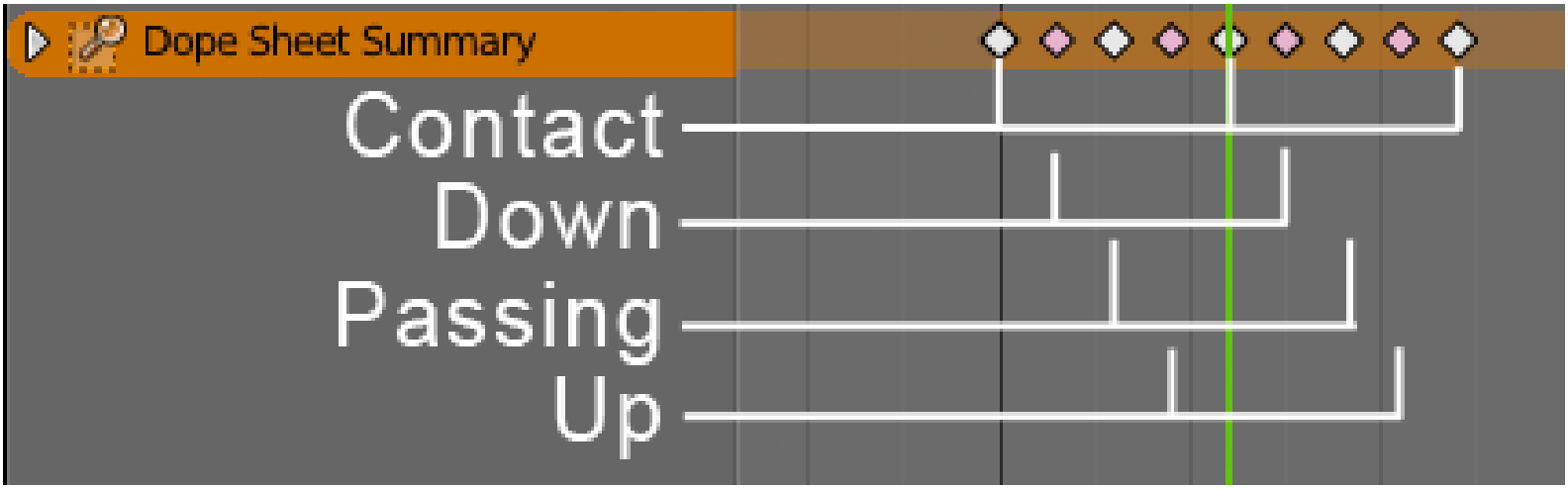
The architecture of our project

Animating the scene

The walk cycle

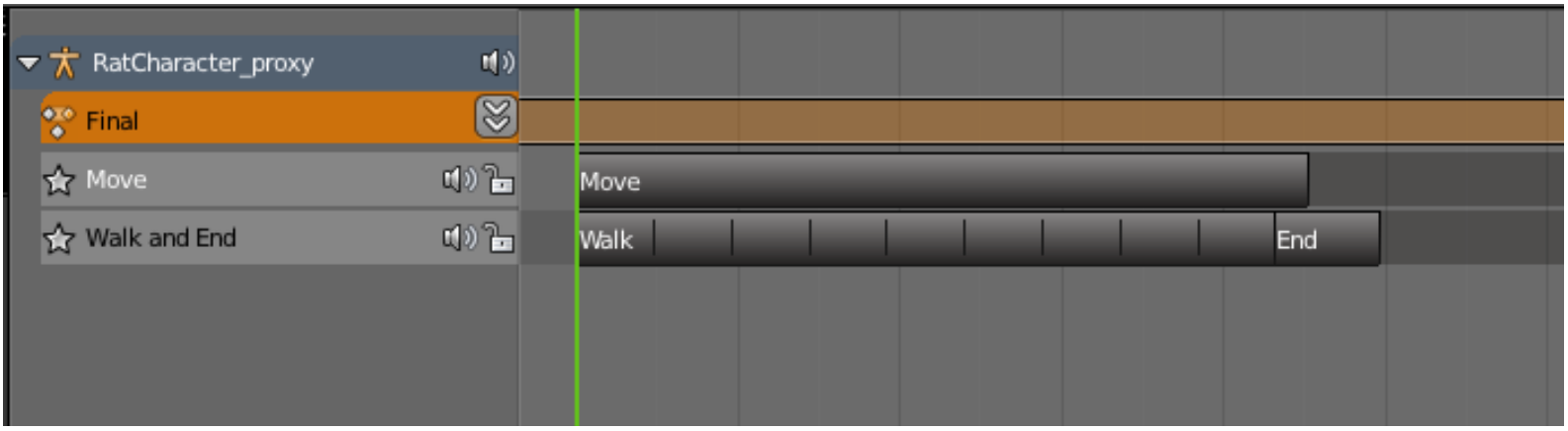


Walk cycle poses



The Dope Sheet for our walk cycle

Mixing Actions



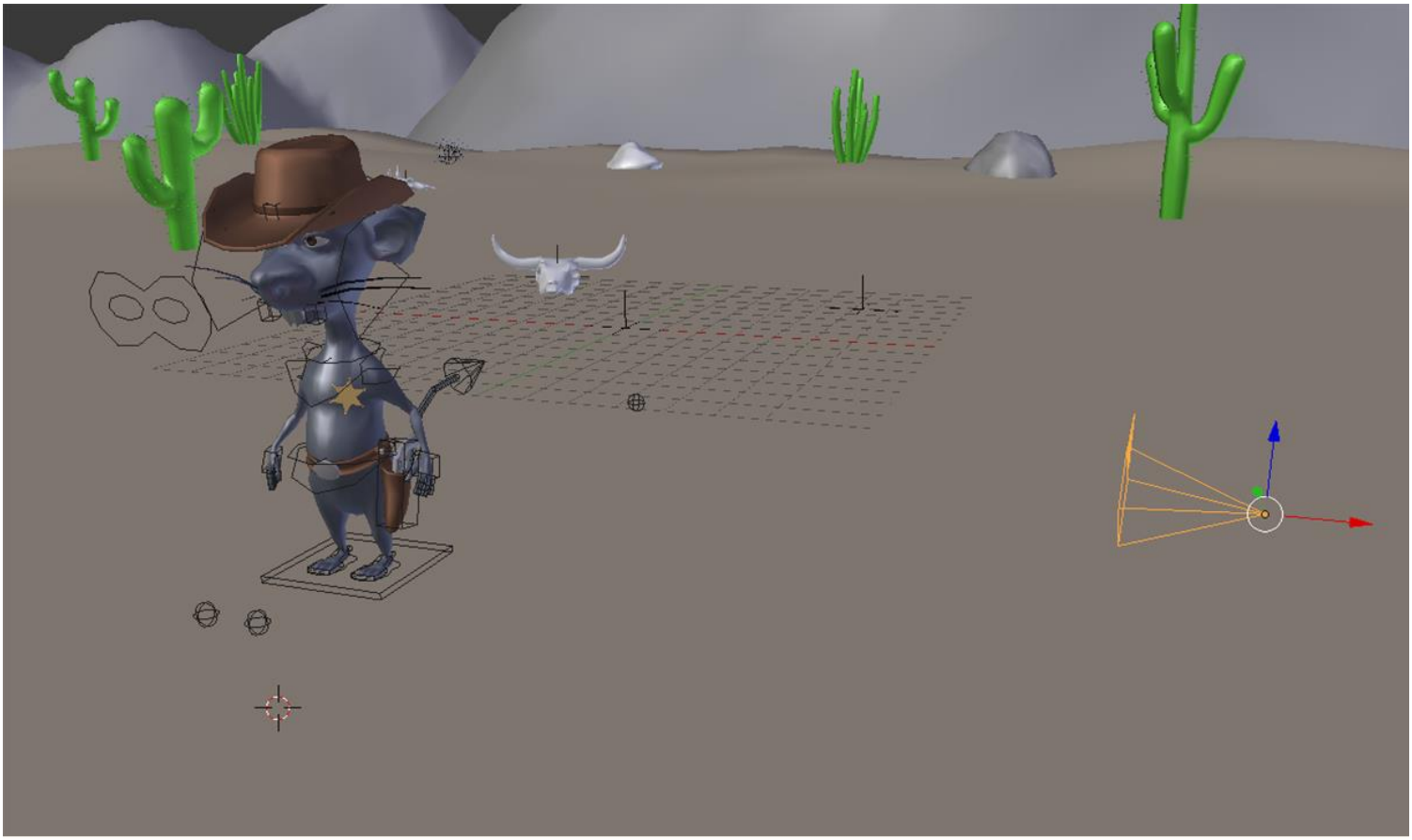
The NLA with our three actions mixed together in the Final action.

One frame of the End action

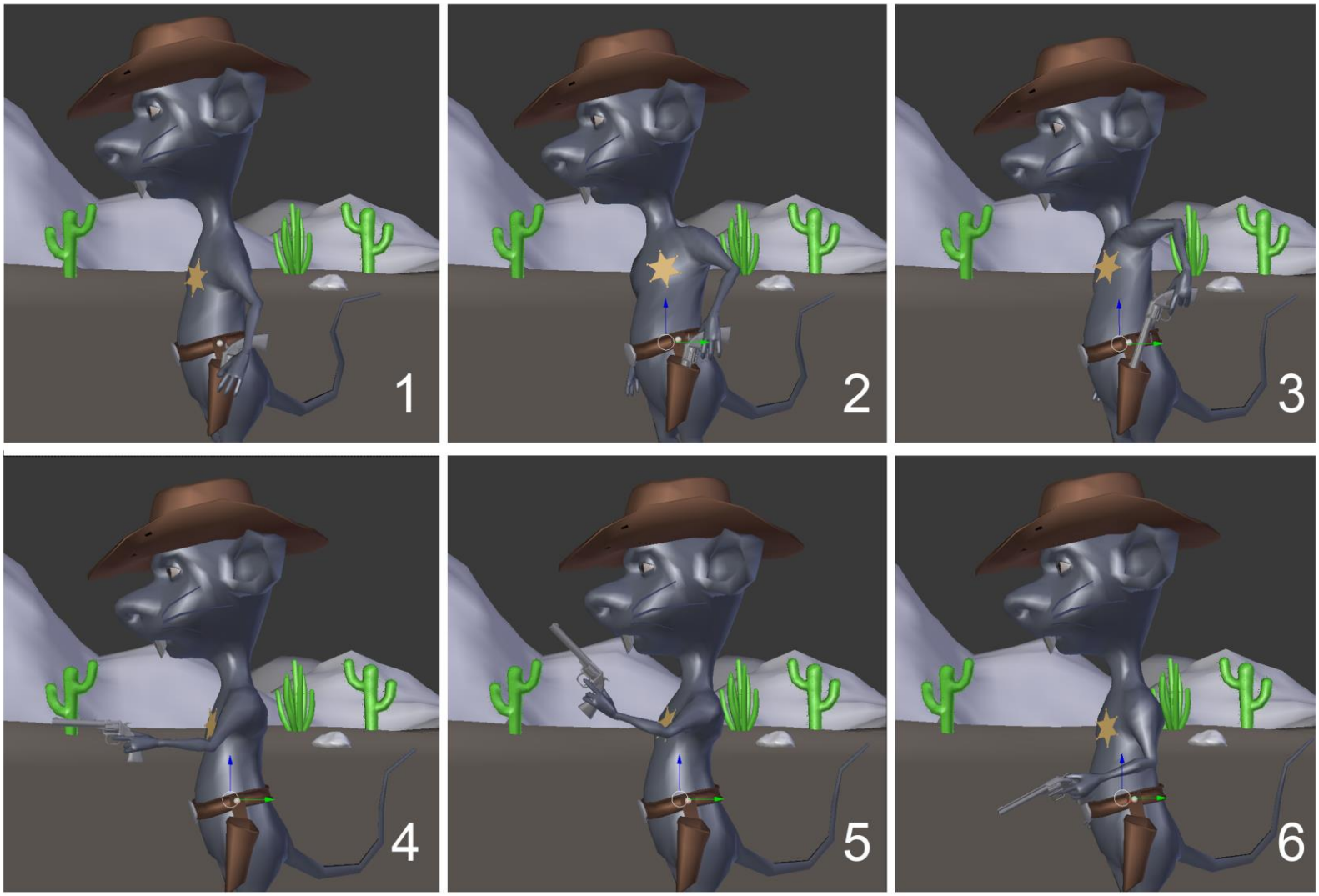
Animation of a close shot

The close shot

Animation of the gunshot

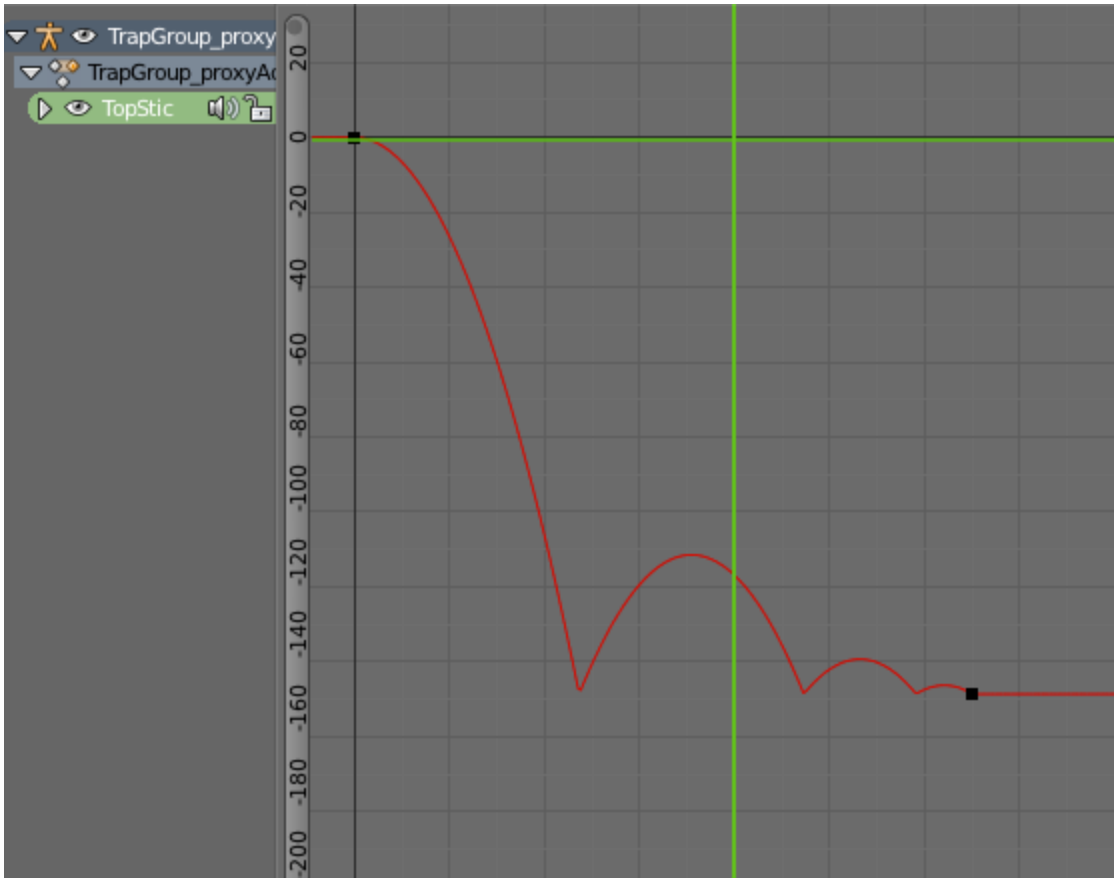


The gun shot

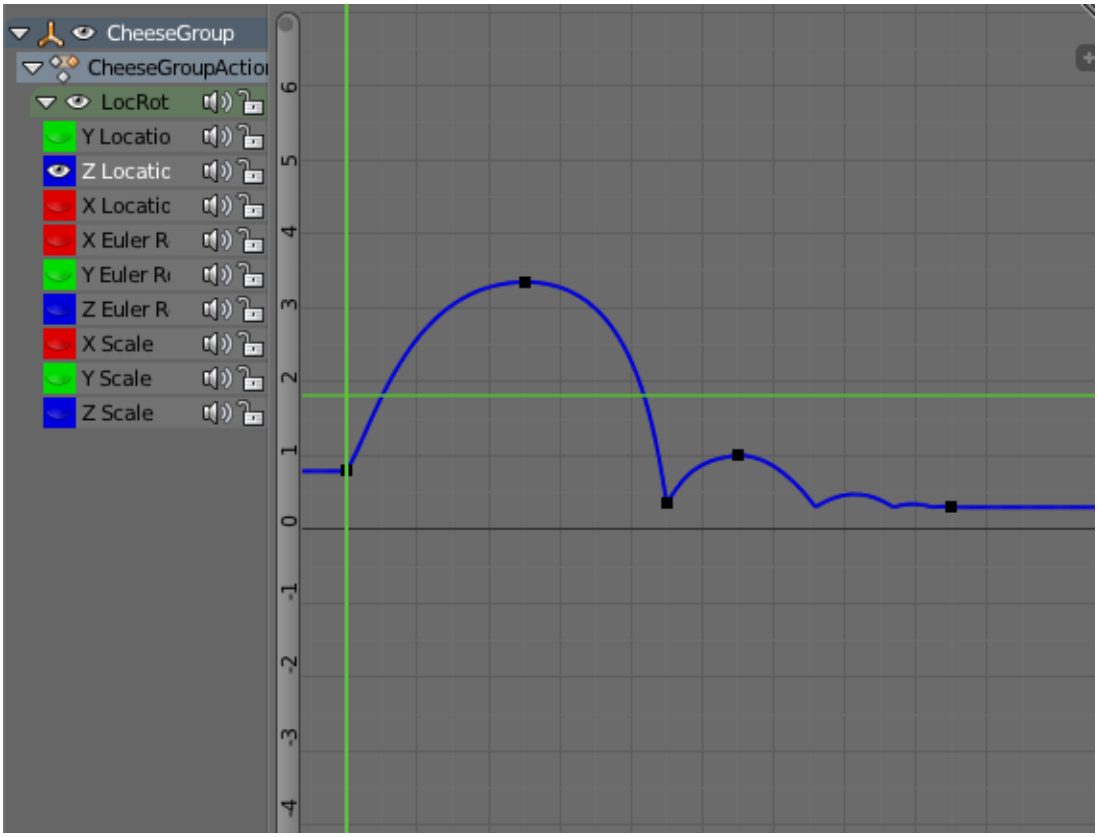


Animation of the gun shot

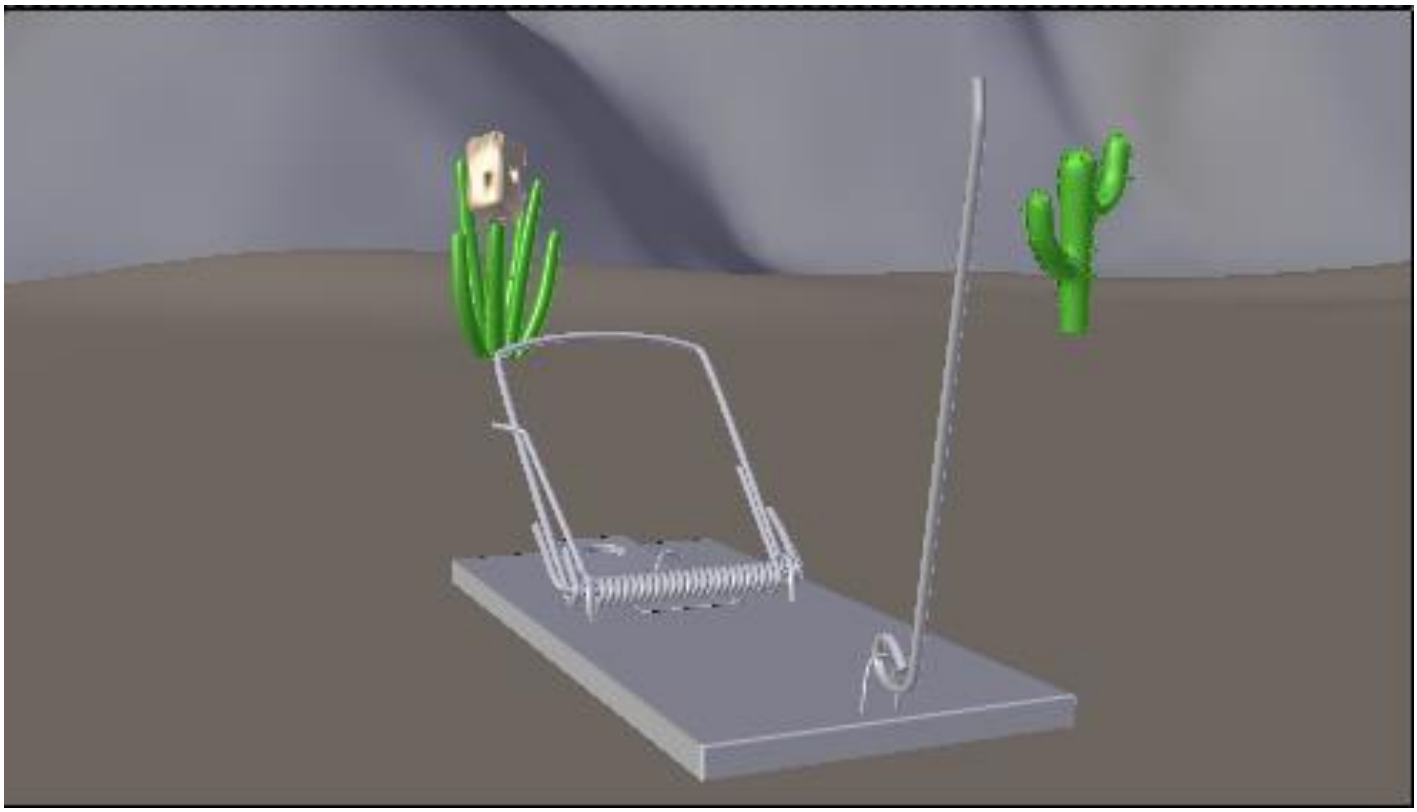
Animation of the trap



The TopStick X rotation curve

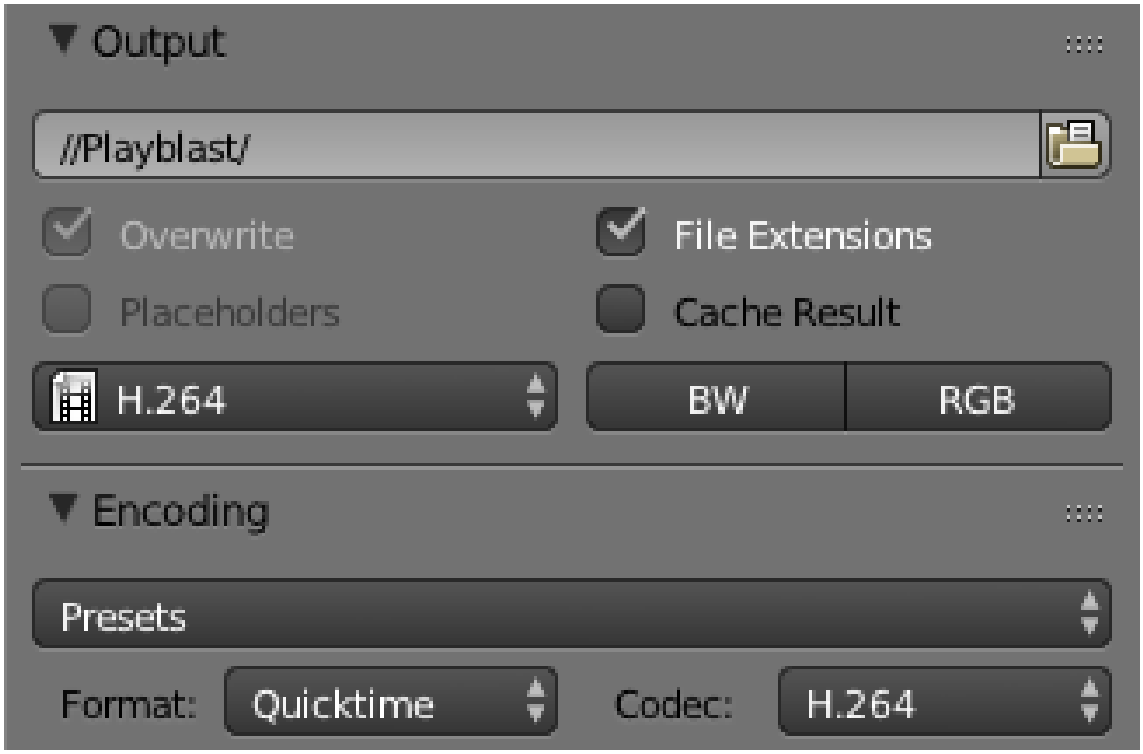


The cheese Z location curve



Frame 4 of the 09 shot.

Render a quick preview of a shot



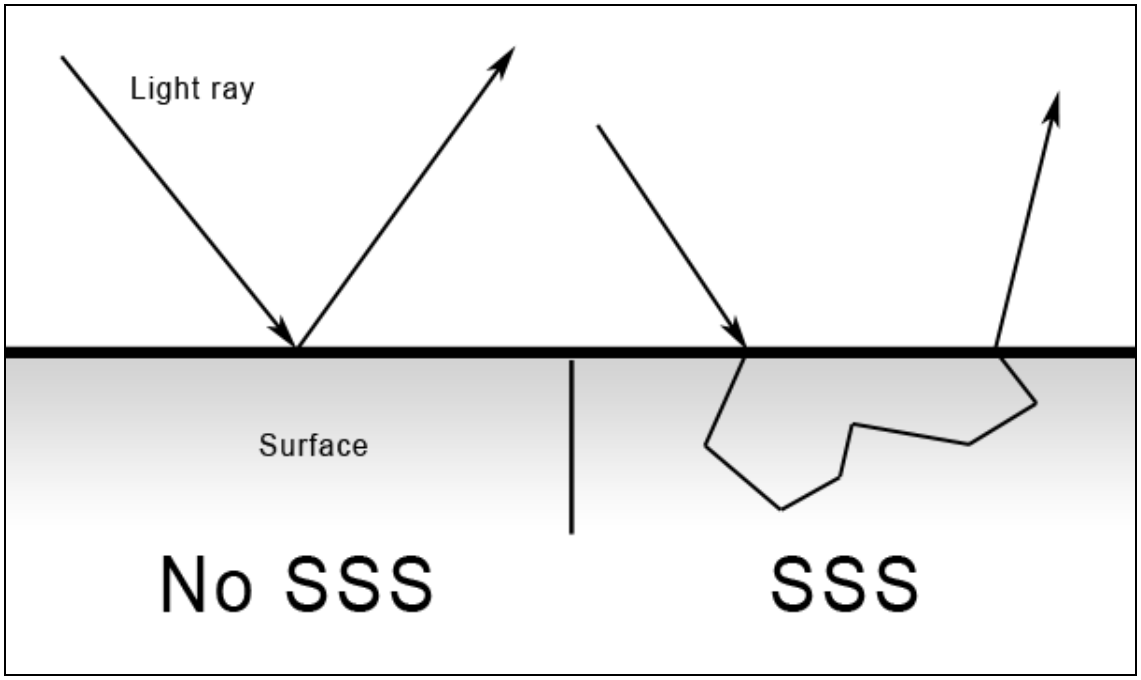
The Output option for the Playblast rendering

10

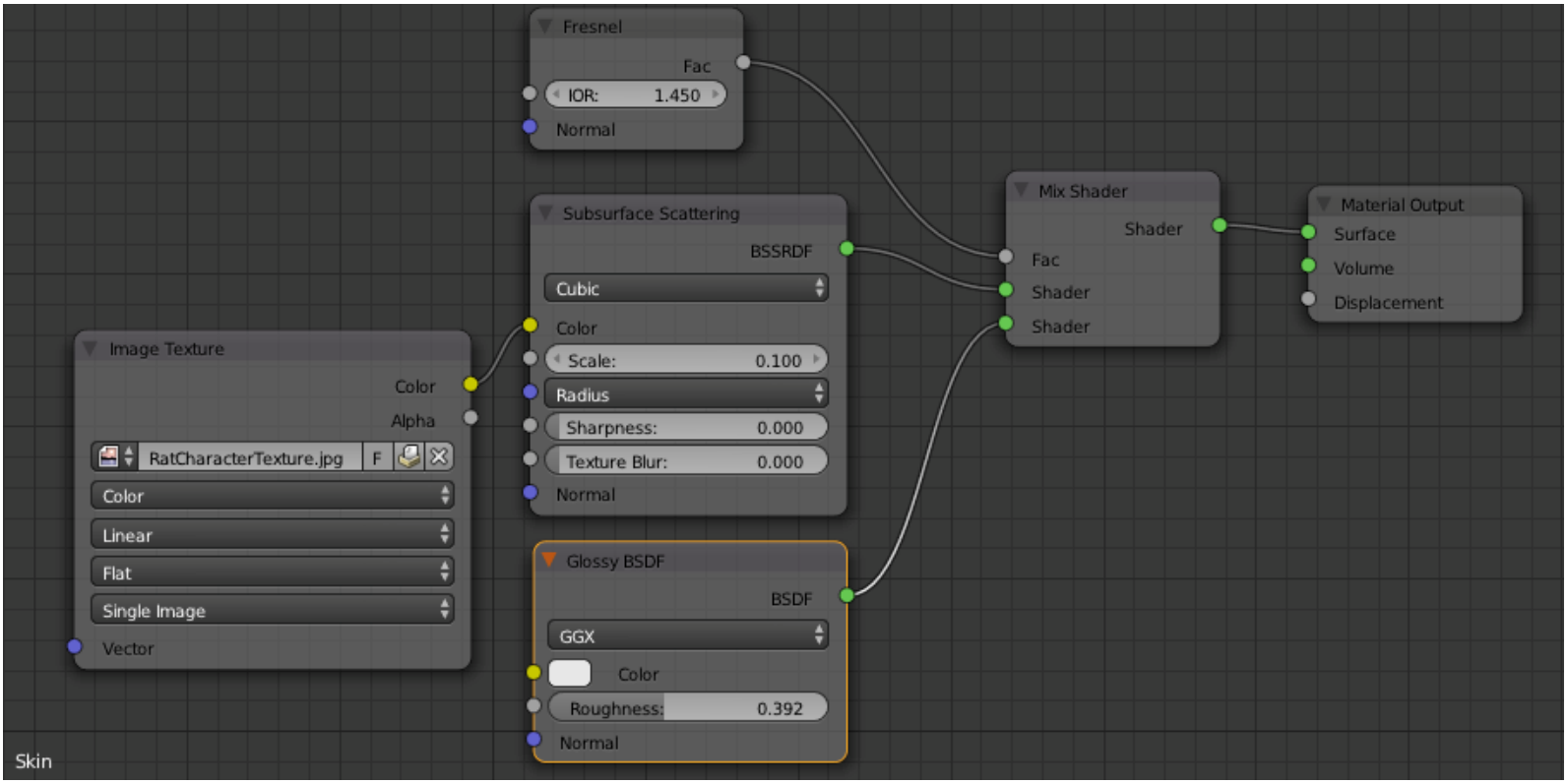
The Rat Cowboy – Rendering, Compositing, and Editing

Creating advanced materials in Cycles

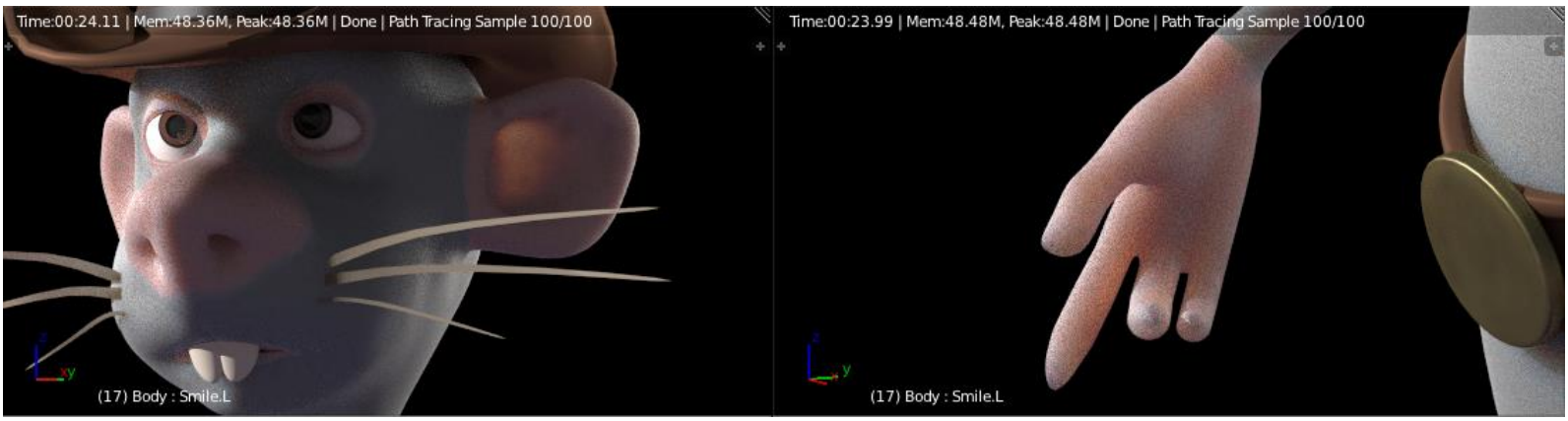
Skin material with Subsurface Scattering



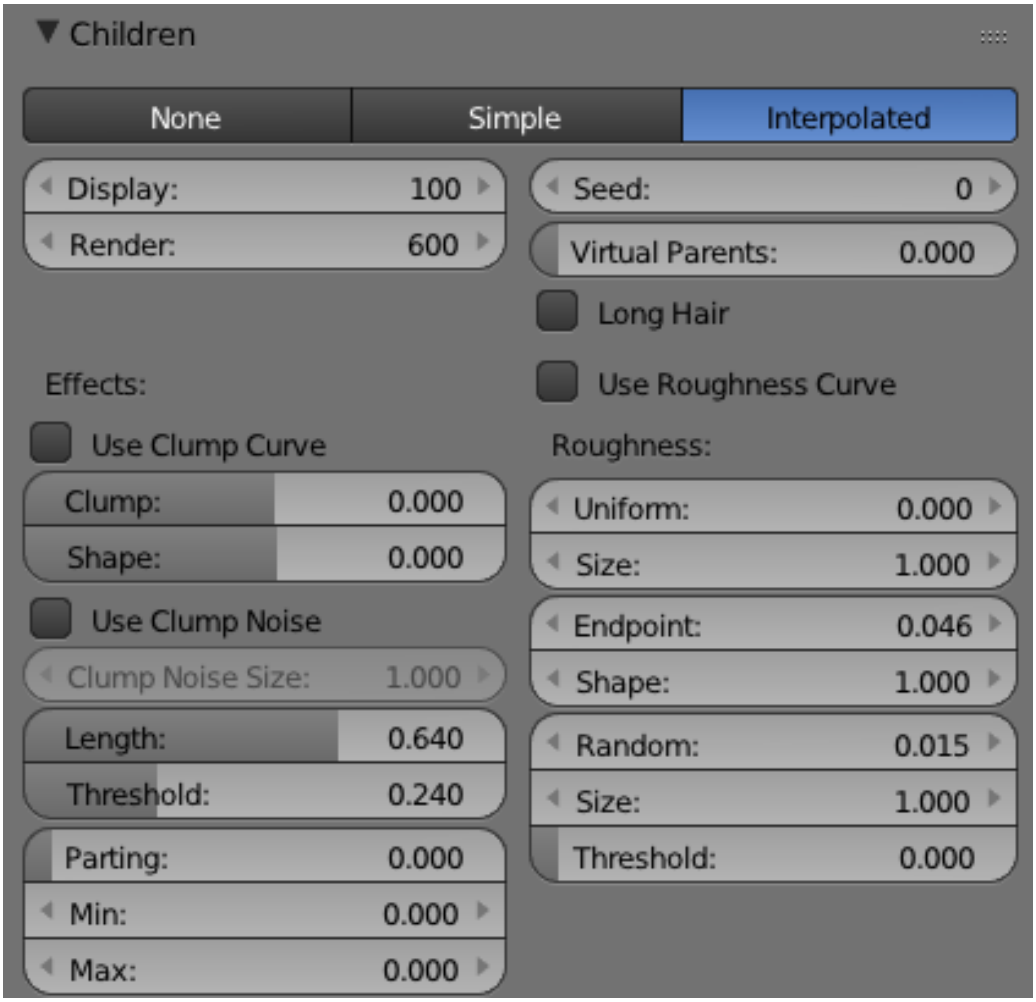
The way light rays react on SSS surfaces



The skin material nodes

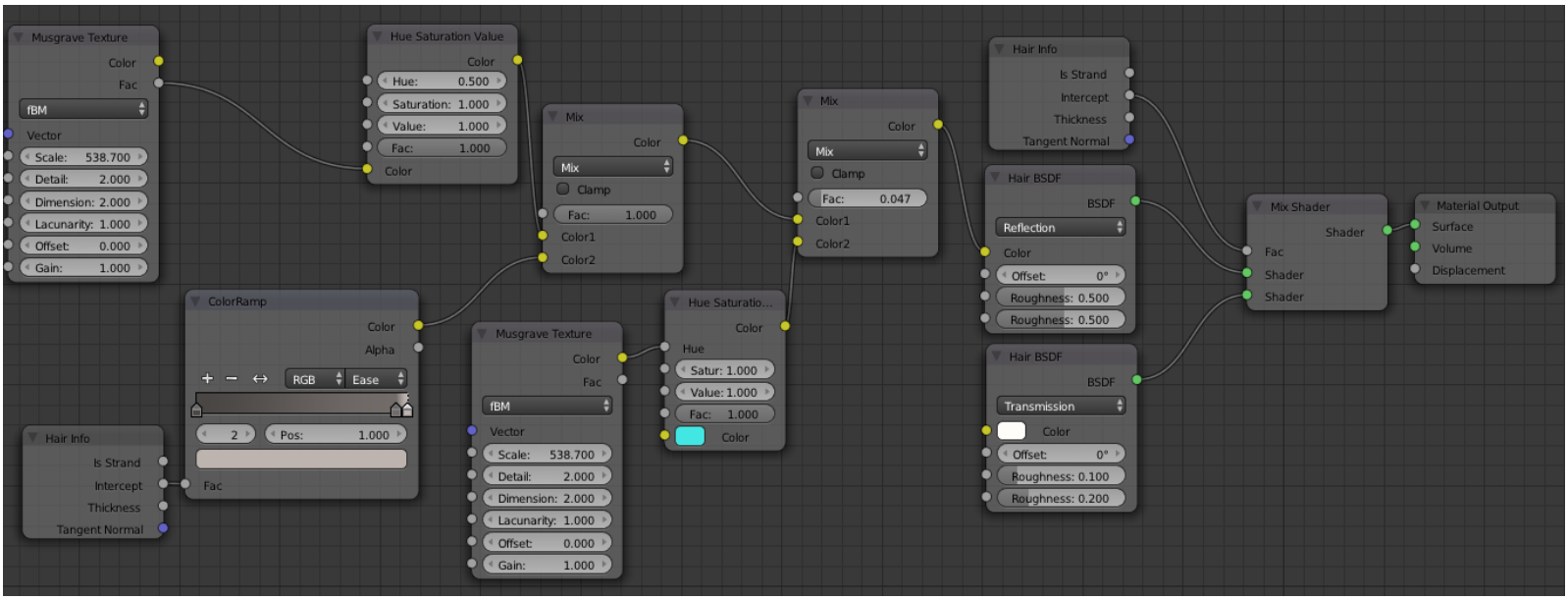


The fur of the rat



The children settings of the Basic_Fur system.

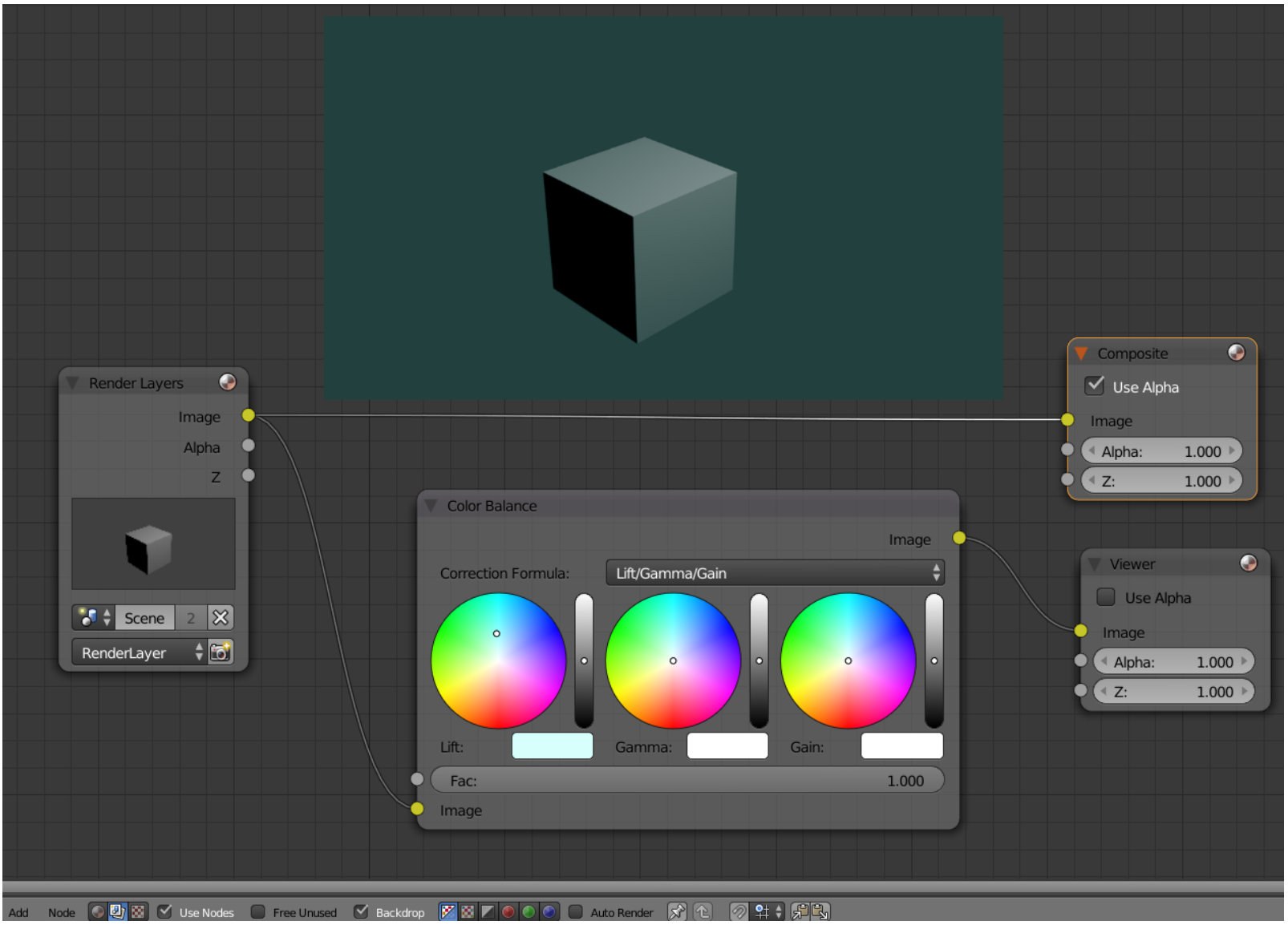
The Particle Edit Mode



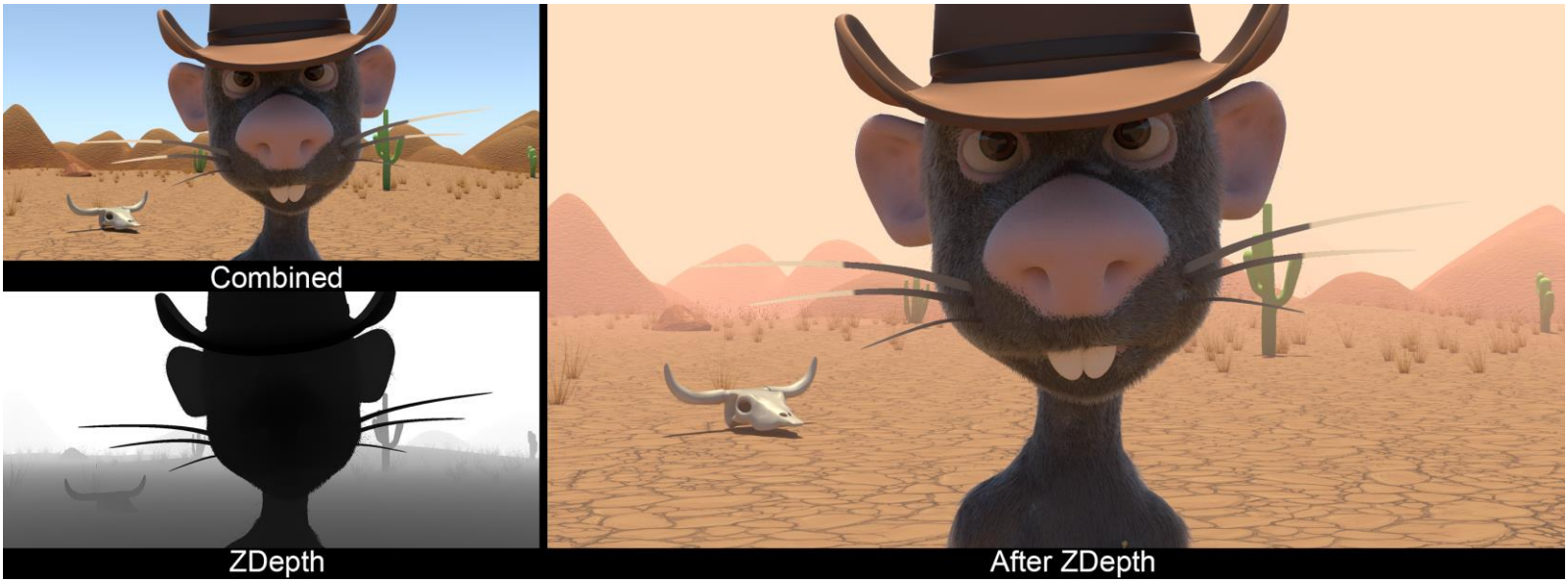
The fur material in the Node editor

Enhance a picture with compositing

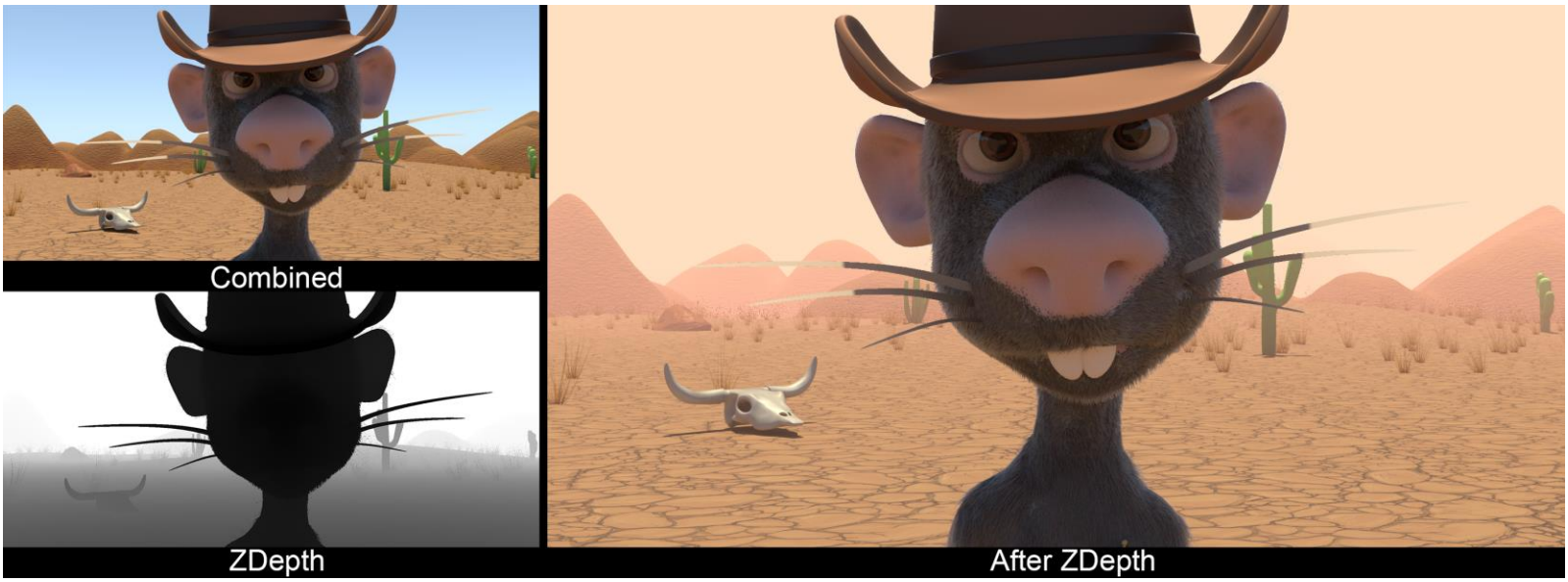
Introduction to nodal compositing



Depth Pass

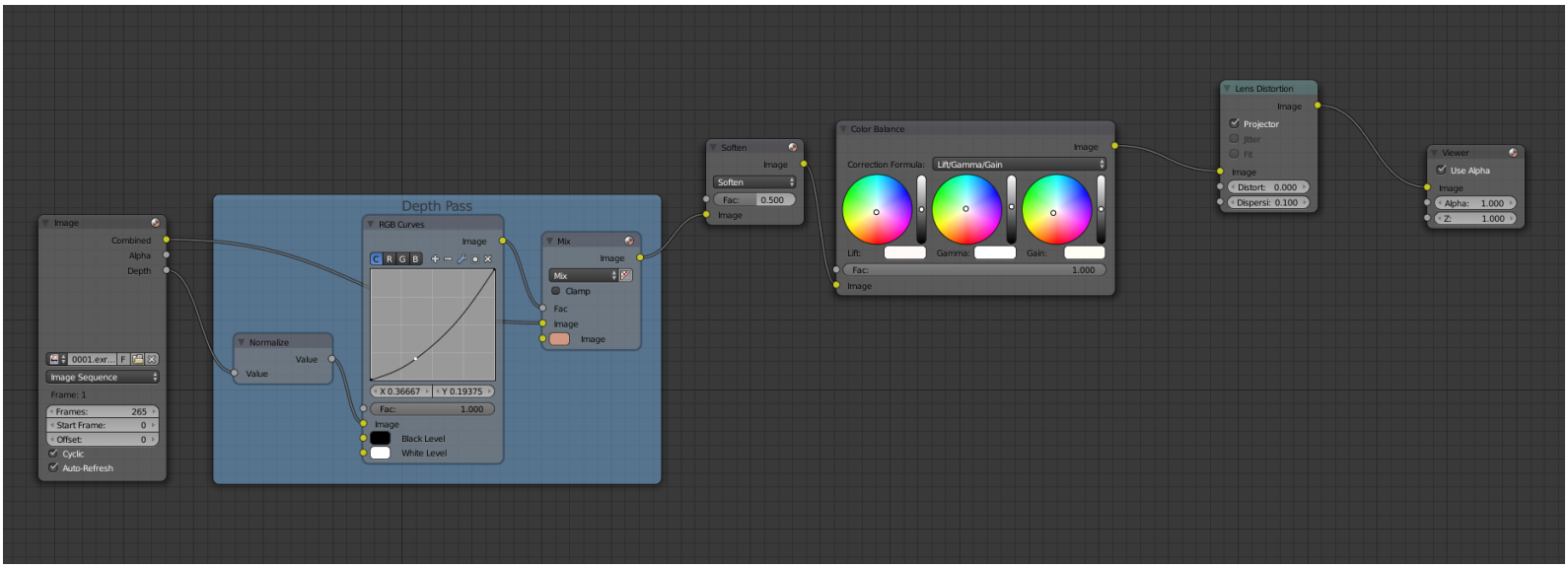


A render before and after the ZDepth pass



Color correction of the shot

Adding effects

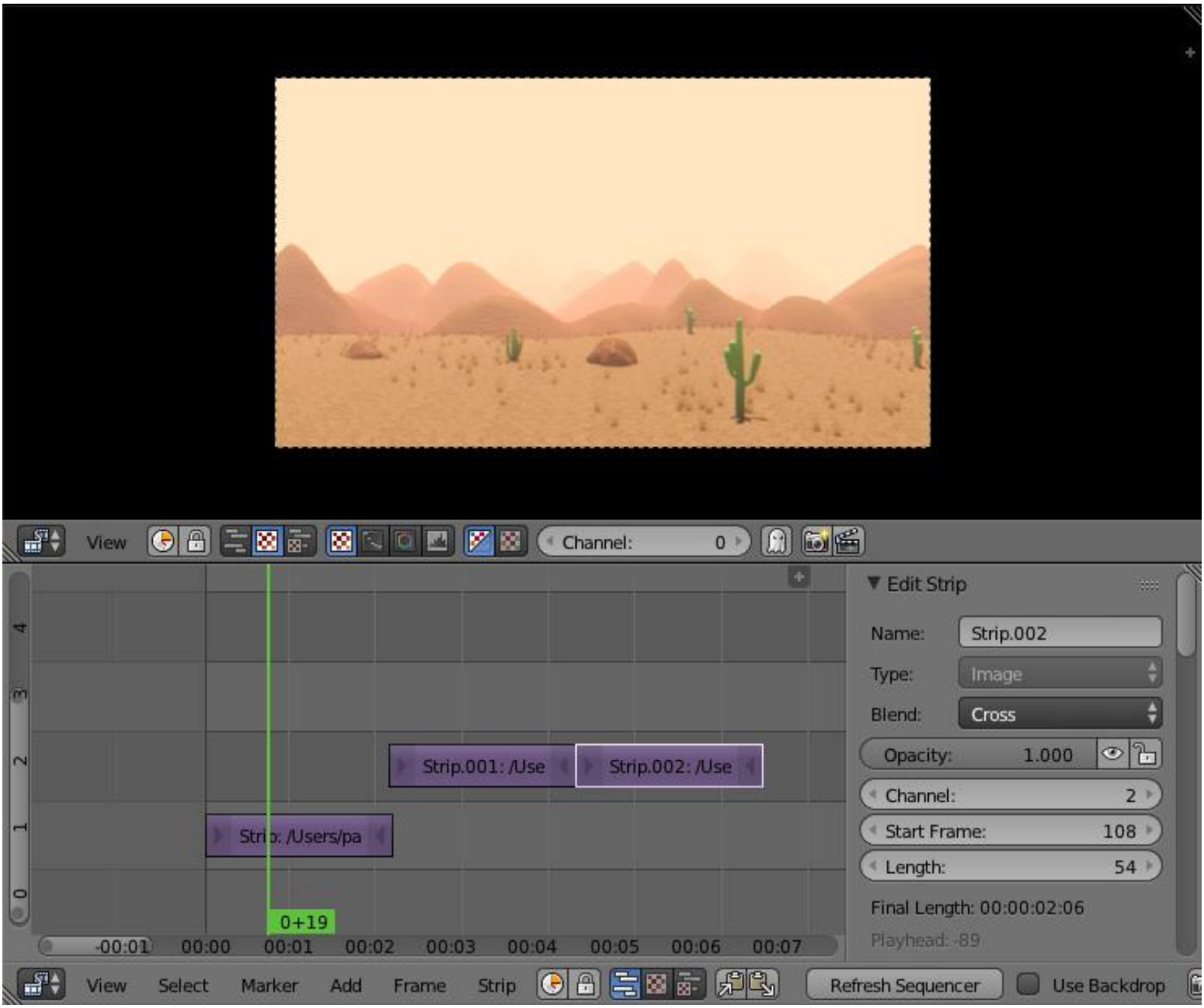


The nodes of compositing

A render with final compositing

Compositing rendering phase

Editing the sequence with the VSE



Two VSE, one is set to the Image Preview (top), the other to the Sequencer (bottom)