

# Ground Truthing and Virtual Field Trips

## Part 2

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# Software requirements

For this tutorial you will need the following software installed:

- Meshroom [Windows / Linux]
  - (<https://alicevision.org/#meshroom>)
- Blender 2.8 or above [Windows / Mac / Linux]
  - (<https://www.blender.org/download/releases/2-80/>)
- Unity Hub [Windows / Mac / Linux]
  - (<https://unity3d.com/get-unity/download>)
- Unity (version 2019.2.12f1) & Unity account [Windows / Mac / Linux]
  - (<https://unity3d.com/get-unity/download/archive>)
- AltspaceVR (via Windows Store or Steam) and an AltspaceVR account
  - (<https://altvr.com/>)

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[Download Blender 2.83](#)

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macOS, Linux, and other versions ▾

### Fully Featured

Whether you are an animator, modeler, VFX, game developer, 3D Printing, you name it. Blender's got you covered.

[Check out the features >](#)

### Free & Open Source

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### Be Part of It

Blender's main strength is its huge community. Made by hundreds of contributors from around the world.

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## New in Blender 2.83

With over 1250 bugfixes, and further critical fixes due throughout the next two years as part of the Long Term Support program, Blender 2.83 LTS provides the performance and stability needed for major projects. New features include VR support, OpenVDB import, OptiX viewport denoising and a powerful new physics-enabled Cloth Brush.

But wait, there's more. Check out what's [new in 2.83](#)

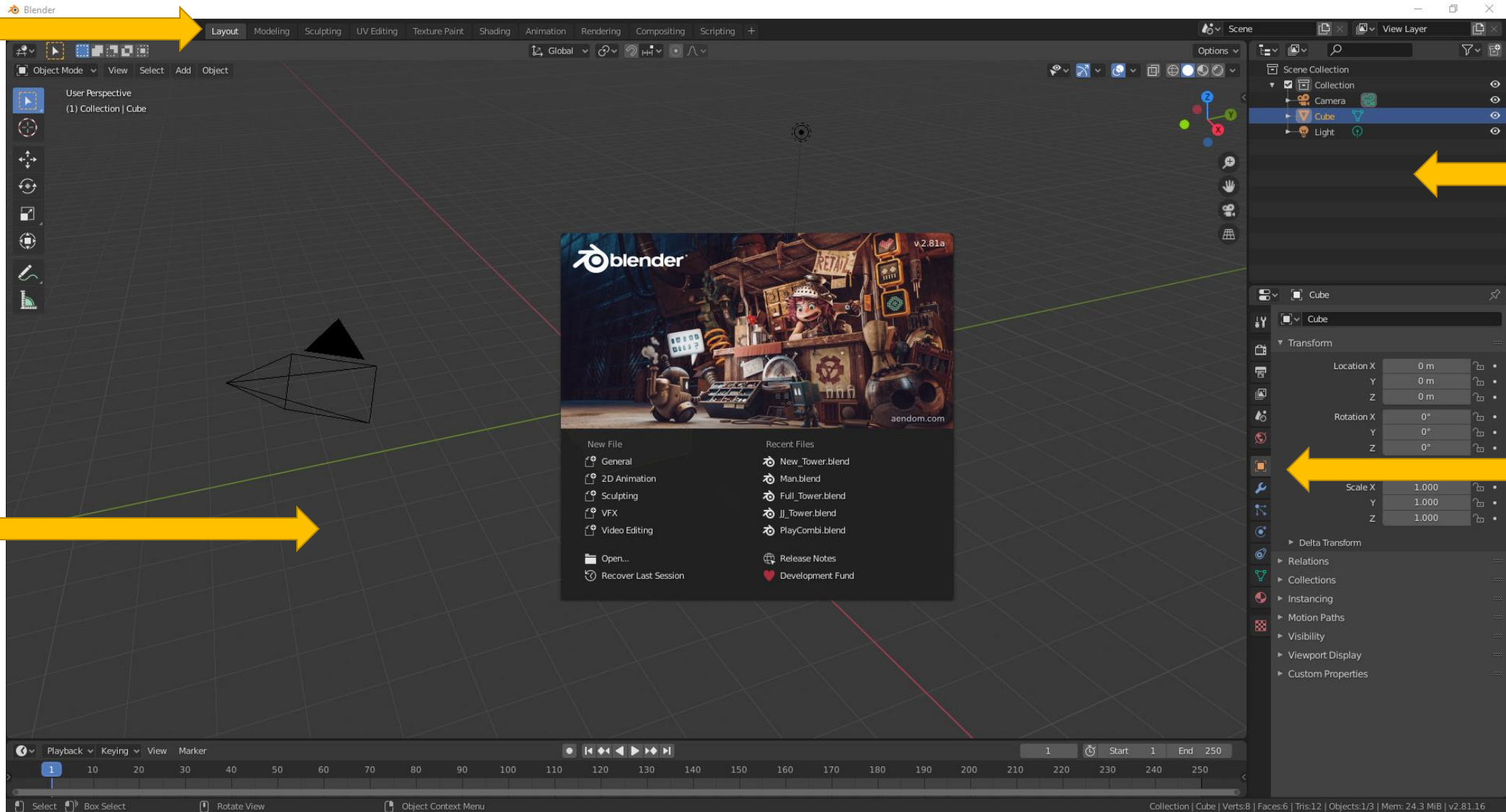
[See all Blender features >](#)

Download Blender: <https://www.blender.org/download/>

# Using Blender – The User Interface

The default workspace we will be using is called “Layout”

The “3D Viewport” is where you construct your scene



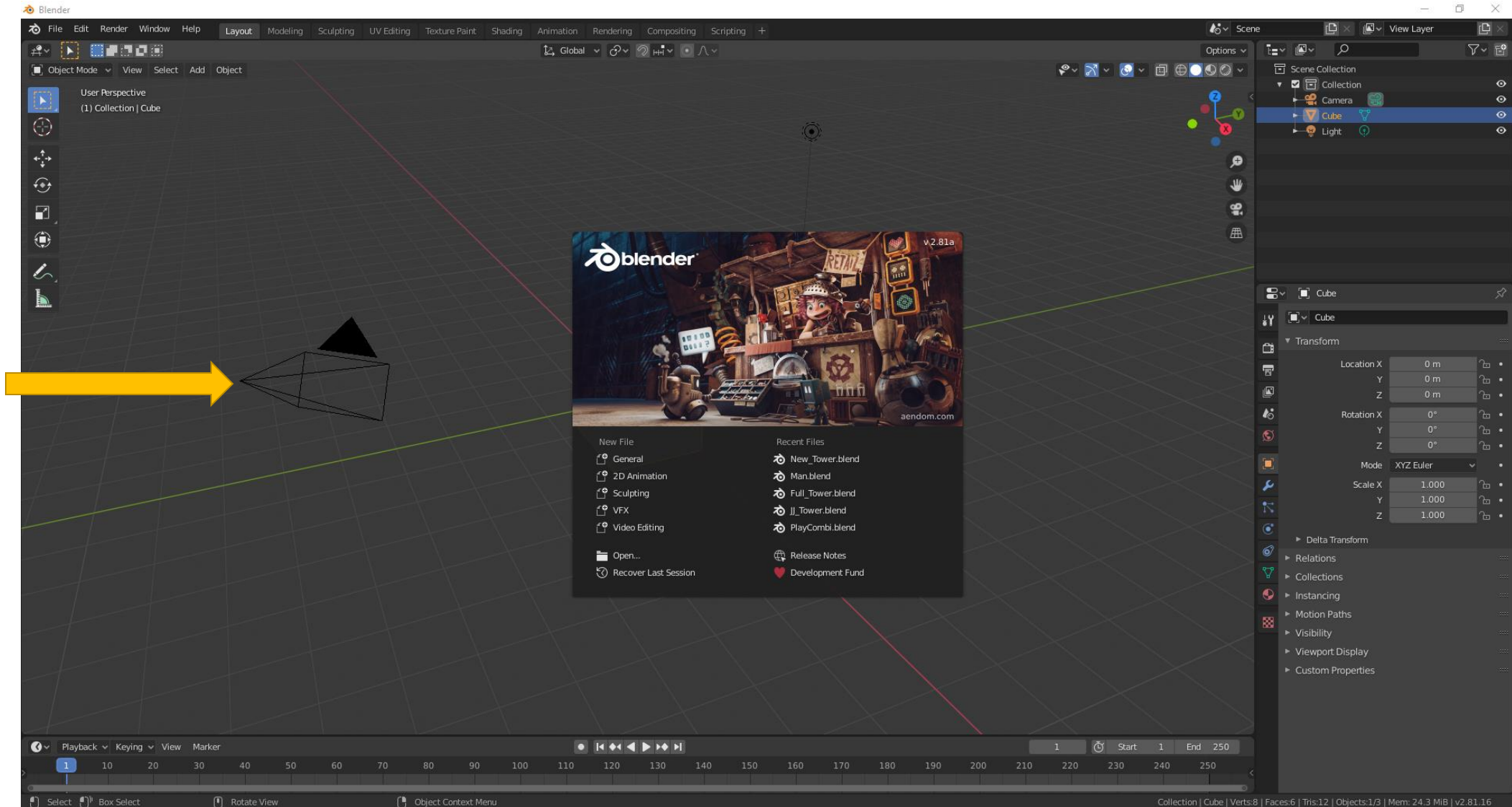
The “Scene Collection” is for managing the objects in your scene

The “Properties Editor” is changing the properties of an object



# Using Blender – The basics (set up a blank project)

1. Left click on the “Camera” object to select it and press your “delete” key - we don’t need the camera for this tutorial



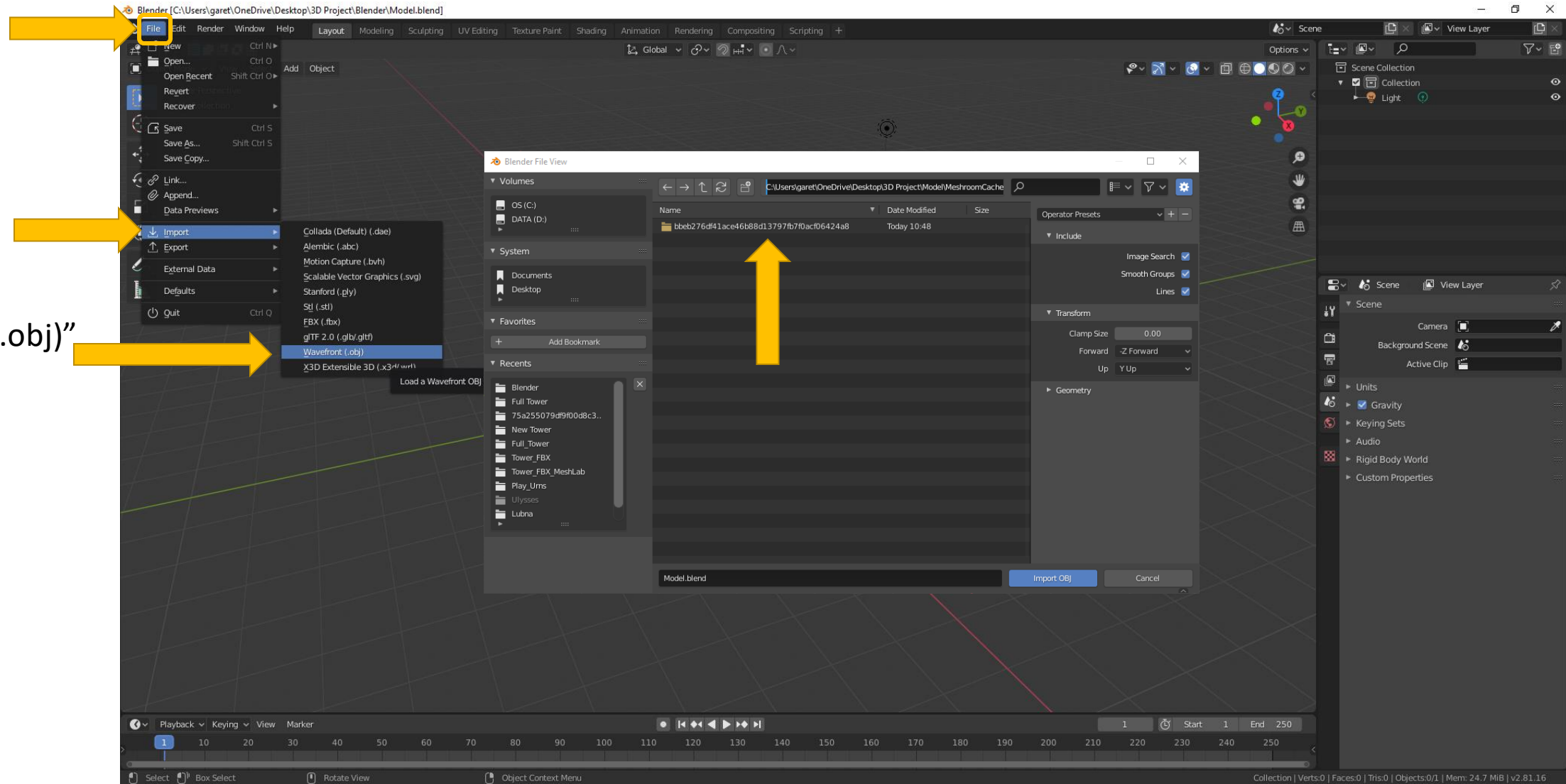
2. Right Click on the “Cube” object in the Scene Collection and press “delete” - this is just another way to remove an object from the scene

# Using Blender – The basics (import the model)

1. Open “File”

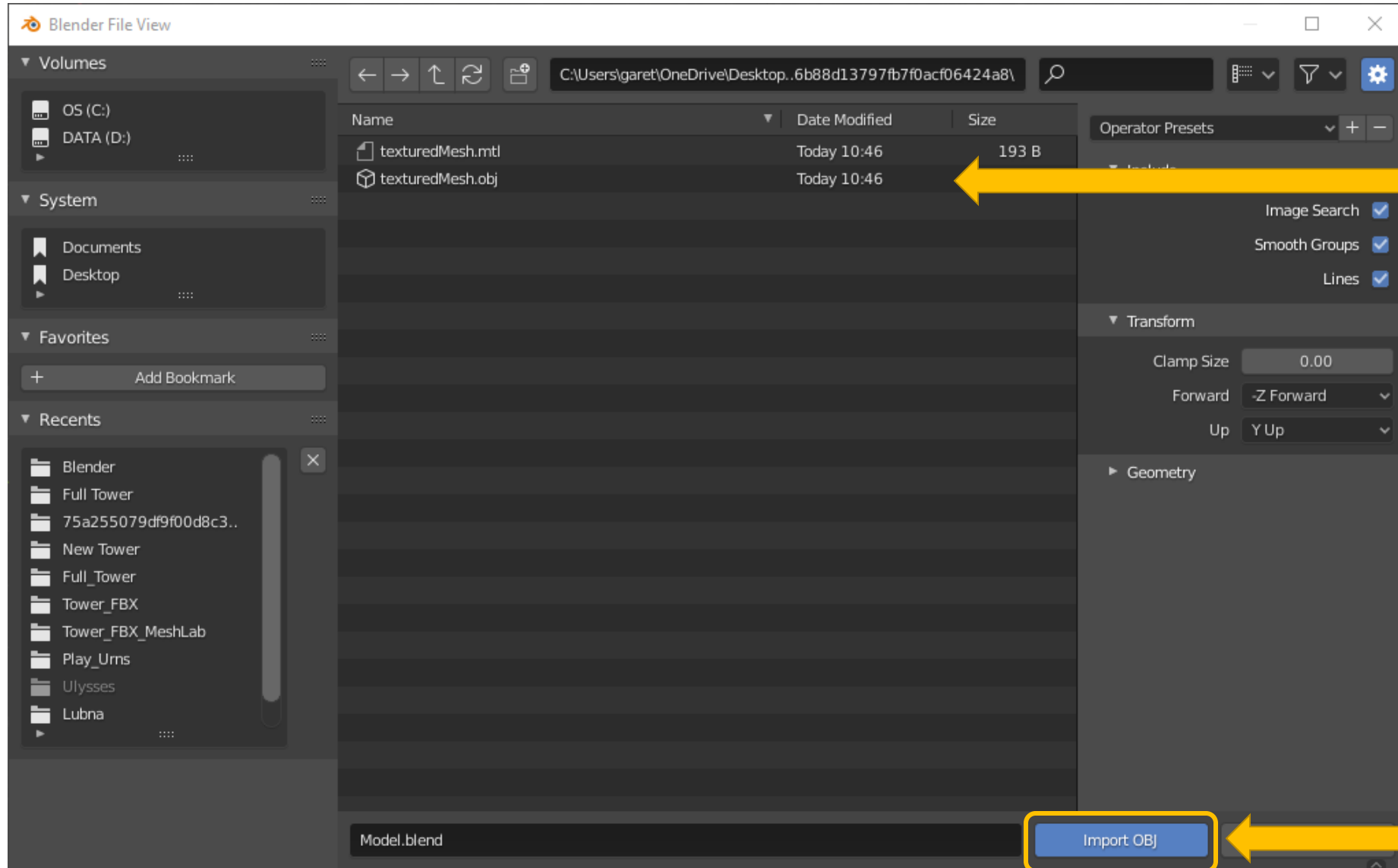
2. “Import”

3. “Wavefront (.obj)”



Find the Meshroom model by navigating to the “3D Project folder”: **3D Project\Model\MeshroomCache\Texturing** - you will find a folder named with a long string of alphanumeric characters. Inside here is the **.obj** file you are looking for.

# Using Blender – The basics (import the model)

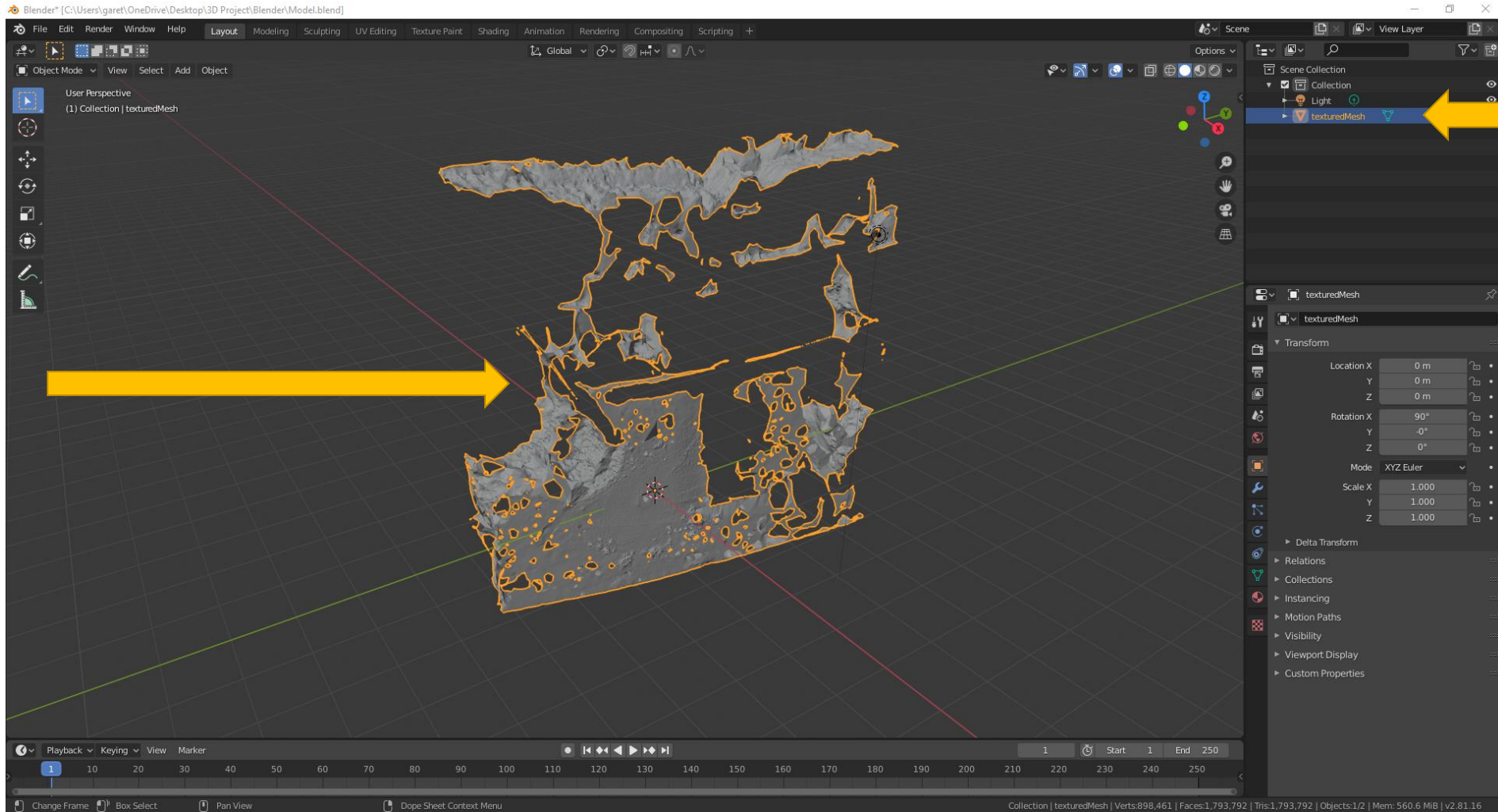


1. Select the texturedMesh.obj file

2. Click "Import OBJ"

# Using Blender – The basics (import the model)

The model will appear in the main window



The model will also be listed in the Scene Collection as “texturedMesh”



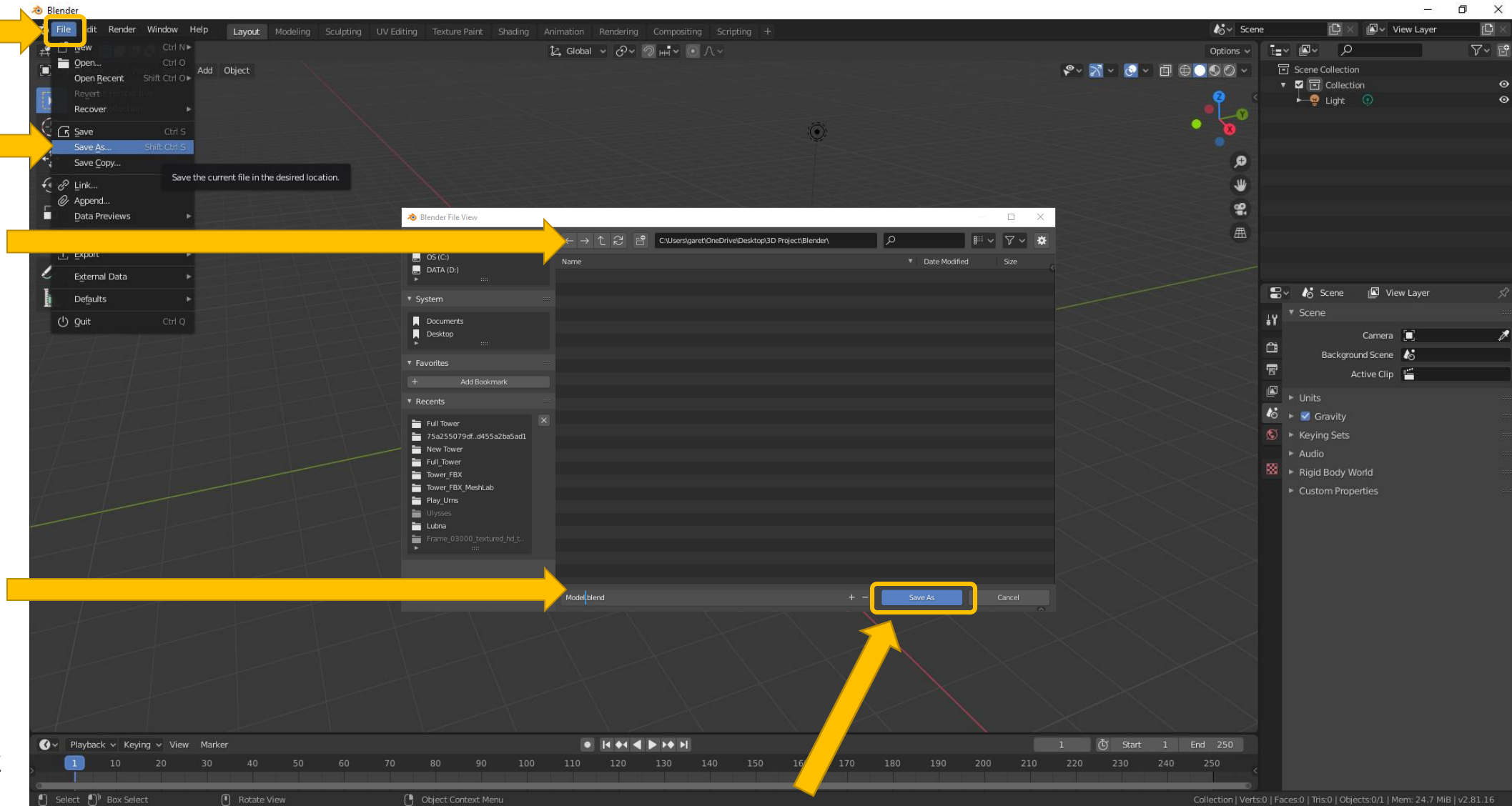
# Using Blender – The basics (save the project)

1. Click “File” and “Save As...”

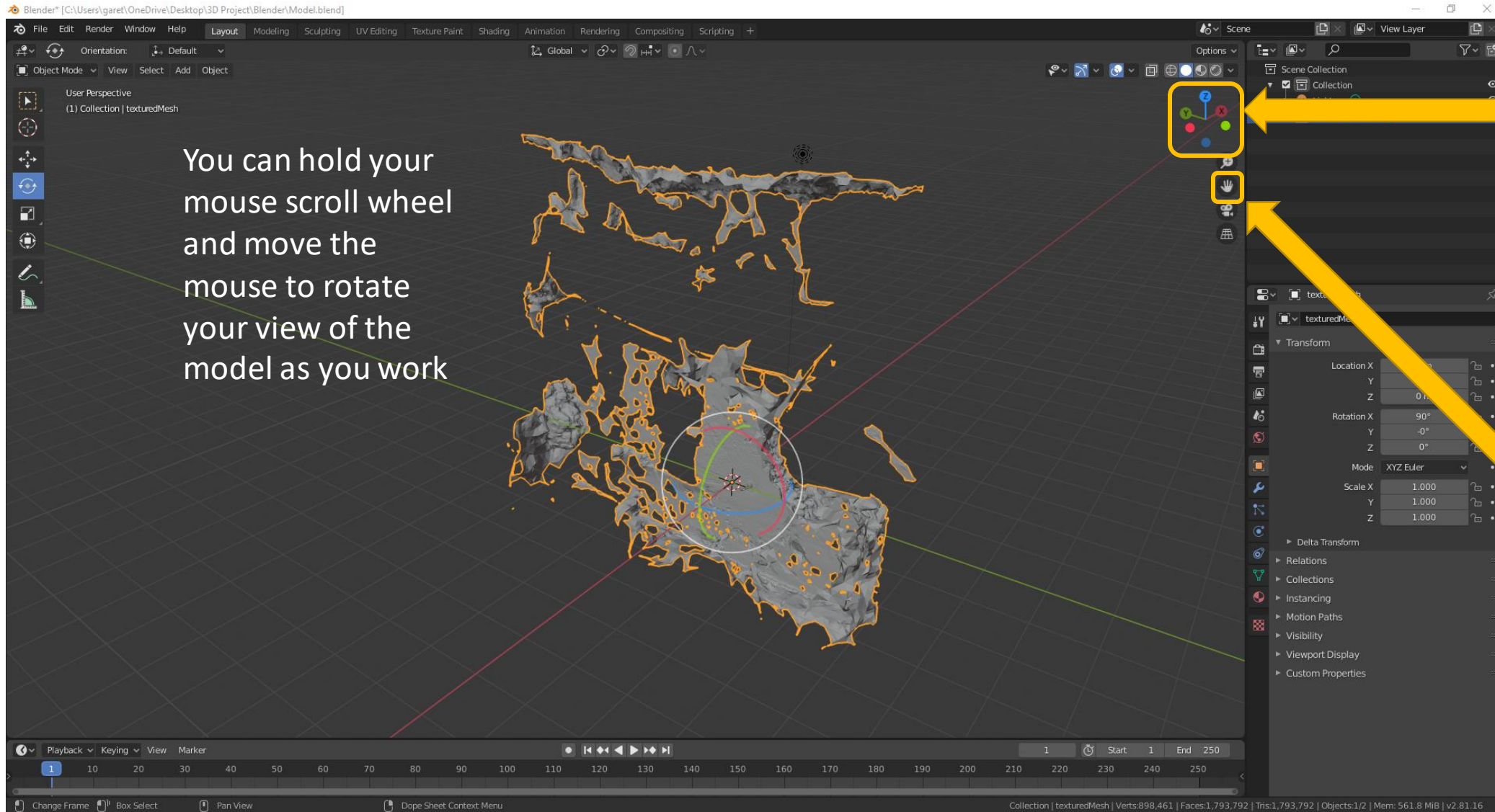
2. A window will open, and you can save the Blender project to the “Blender” folder in the “3D Project” folder

3. Rename the project to “Model” and click “Save As”

Keep saving your project as you work by clicking “save”!



# Using Blender – The basics (changing view position)



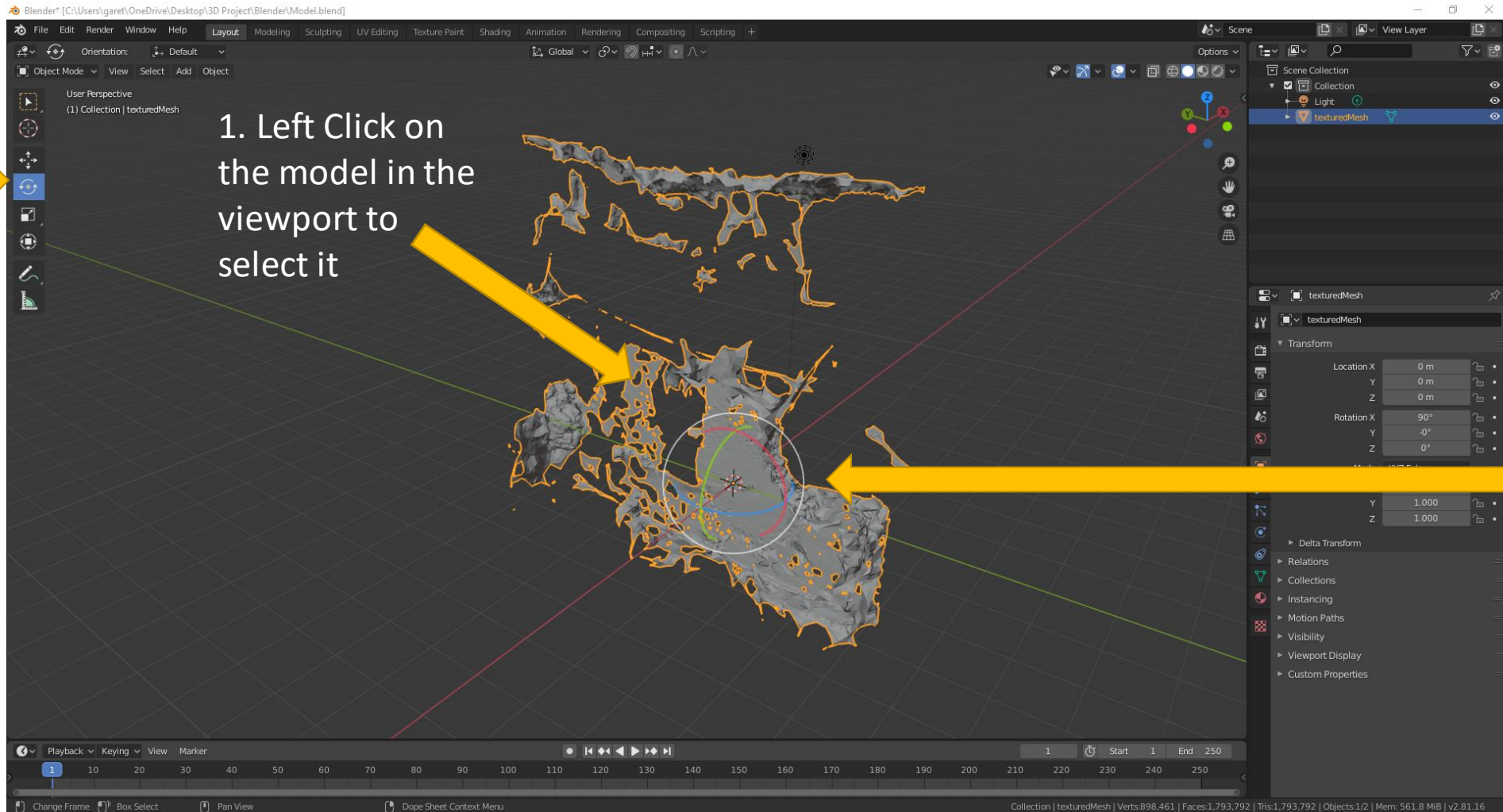
You can hold your mouse scroll wheel and move the mouse to rotate your view of the model as you work

The orientation of your view can also be selected by pressing either x,y, or z on the direction 'gizmo'

The "hand" icon can also be used to move the camera by holding down the left mouse button and moving the mouse

# Using Blender – The basics (changing model position)

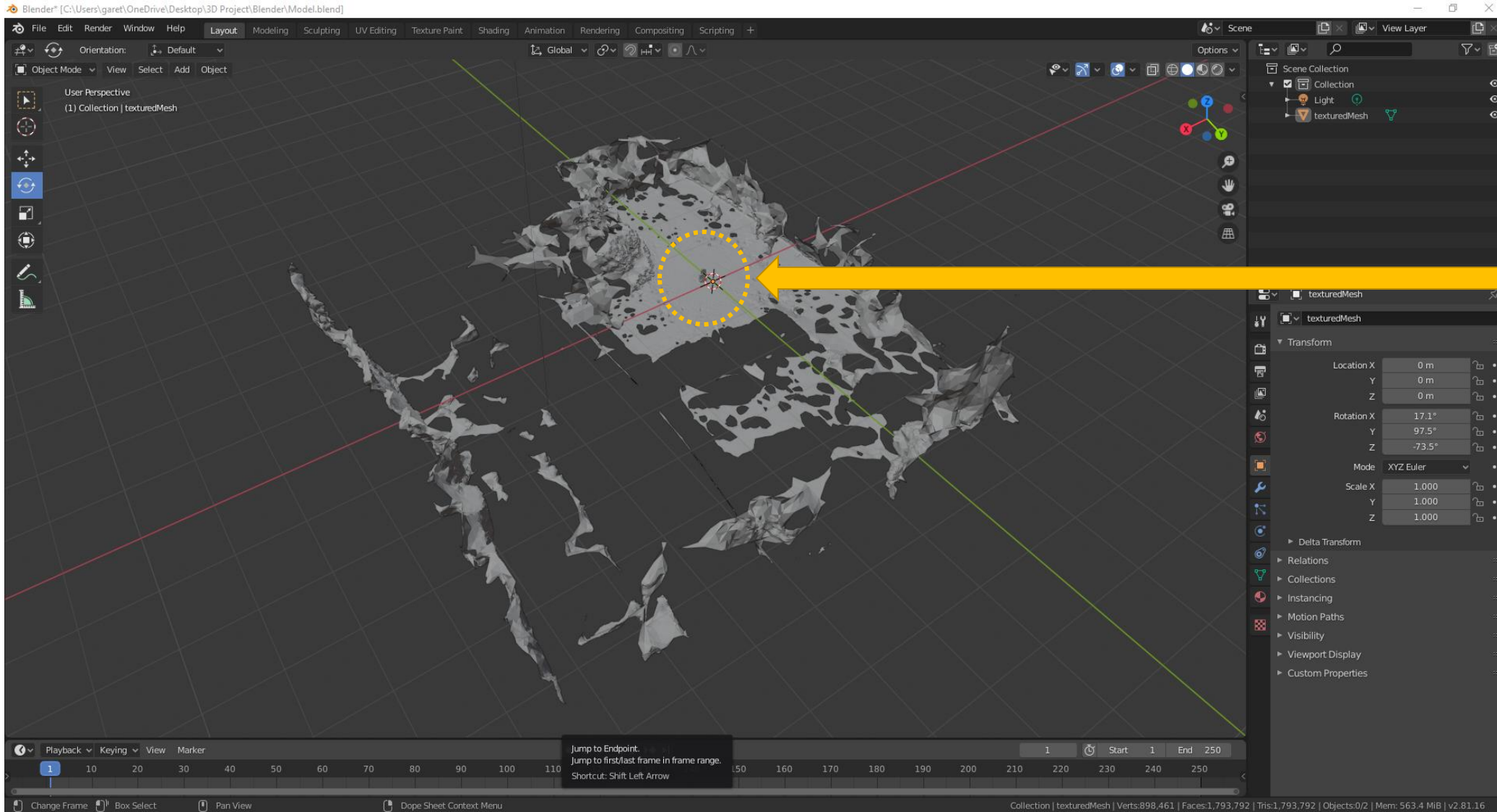
2. Select the rotate function



NOTE: It is important that you rotate your model to change its orientation relative to Blender's own coordinate system. You want to align its ground plane to sit on the red and green axes with the blue 'z' axis as the up direction (see the gizmo in the top right).



# Using Blender – The basics (model layout)

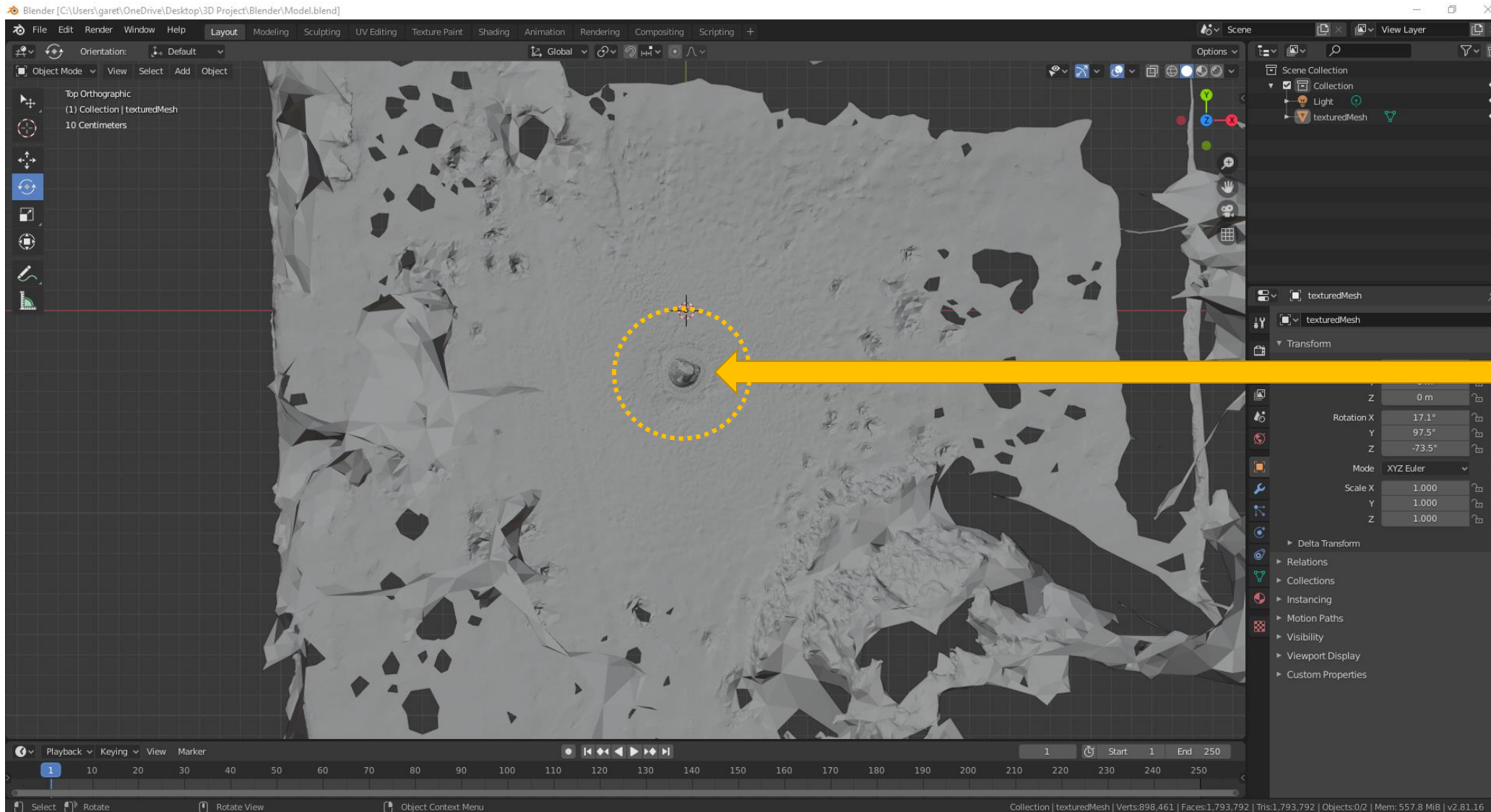


This is the piece of the model we are interested in keeping

Everything else is can be removed



# Using Blender – Trimming the model down



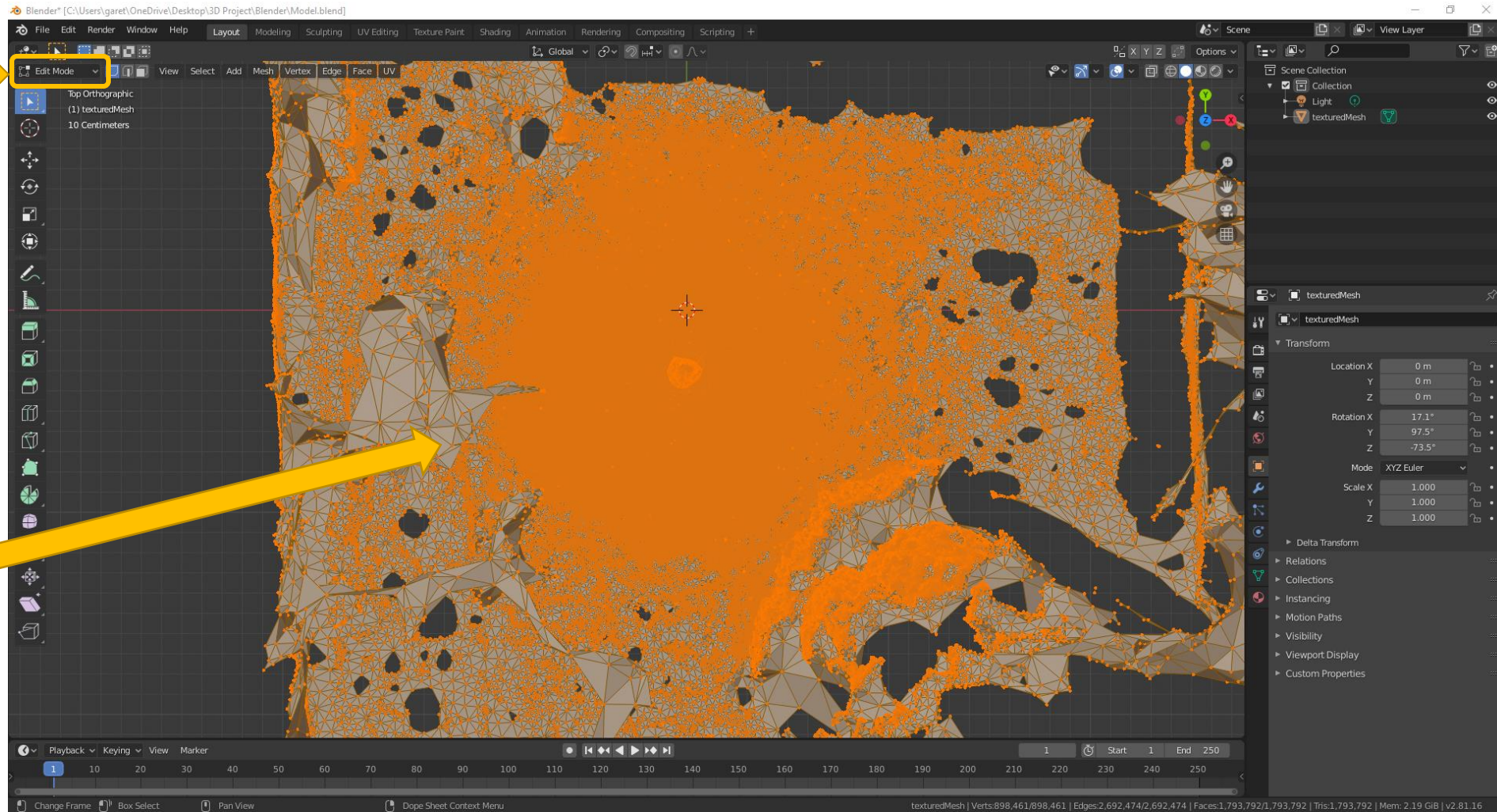
Position the camera view over the area of the you are interested in keeping

Using the gizmo in the top right of the viewport can help get a good top-down view by clicking the blue 'z' axis.

# Using Blender – Trimming the model down

1. Change this dropdown menu to “Edit Mode”

Parts of the model may turn orange - this means that they have been selected for editing

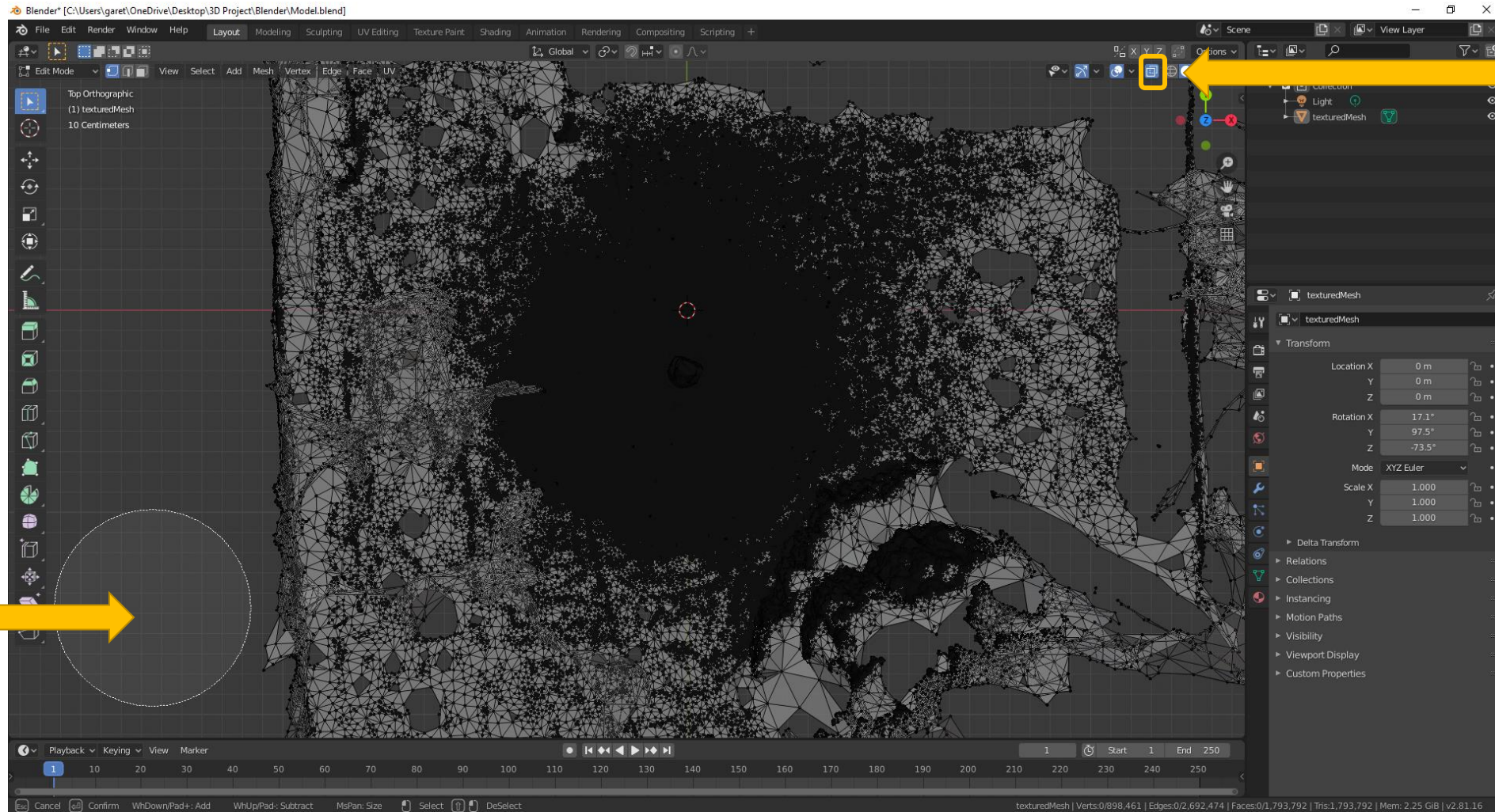


2. Press “Alt” + “A” on your keyboard to deselect the model



# Using Blender – Trimming the model down

2. Press “C” on your keyboard to change the cursor to a circle select shape - the scroll wheel will change the size of the circle



1. Press the “X-Ray” button in the top right of the window - this ensures that all faces in the selection area in the next step will be selected, not just the ones closest to your view



# Using Blender – Trimming the model down

1. Move the circle shaped cursor over the area of the model you want to keep and “left-click” to select it.

2. If you are unhappy with the selection, press “esc” and then “Alt” + “A” to deselect the model and start again

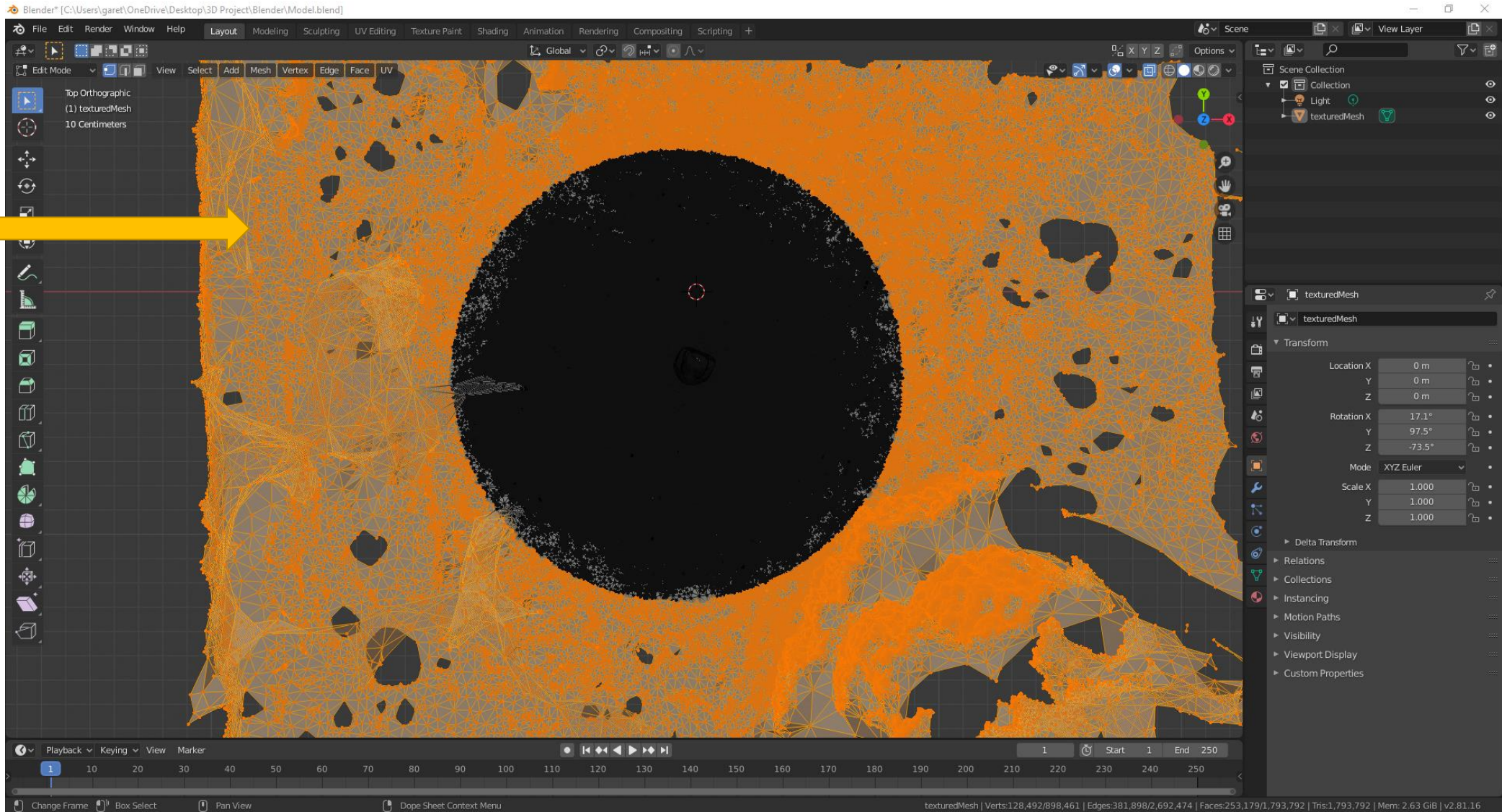


3. Once you are happy with the selection press the “esc” key to return your cursor to a pointer.



# Using Blender – Trimming the model down

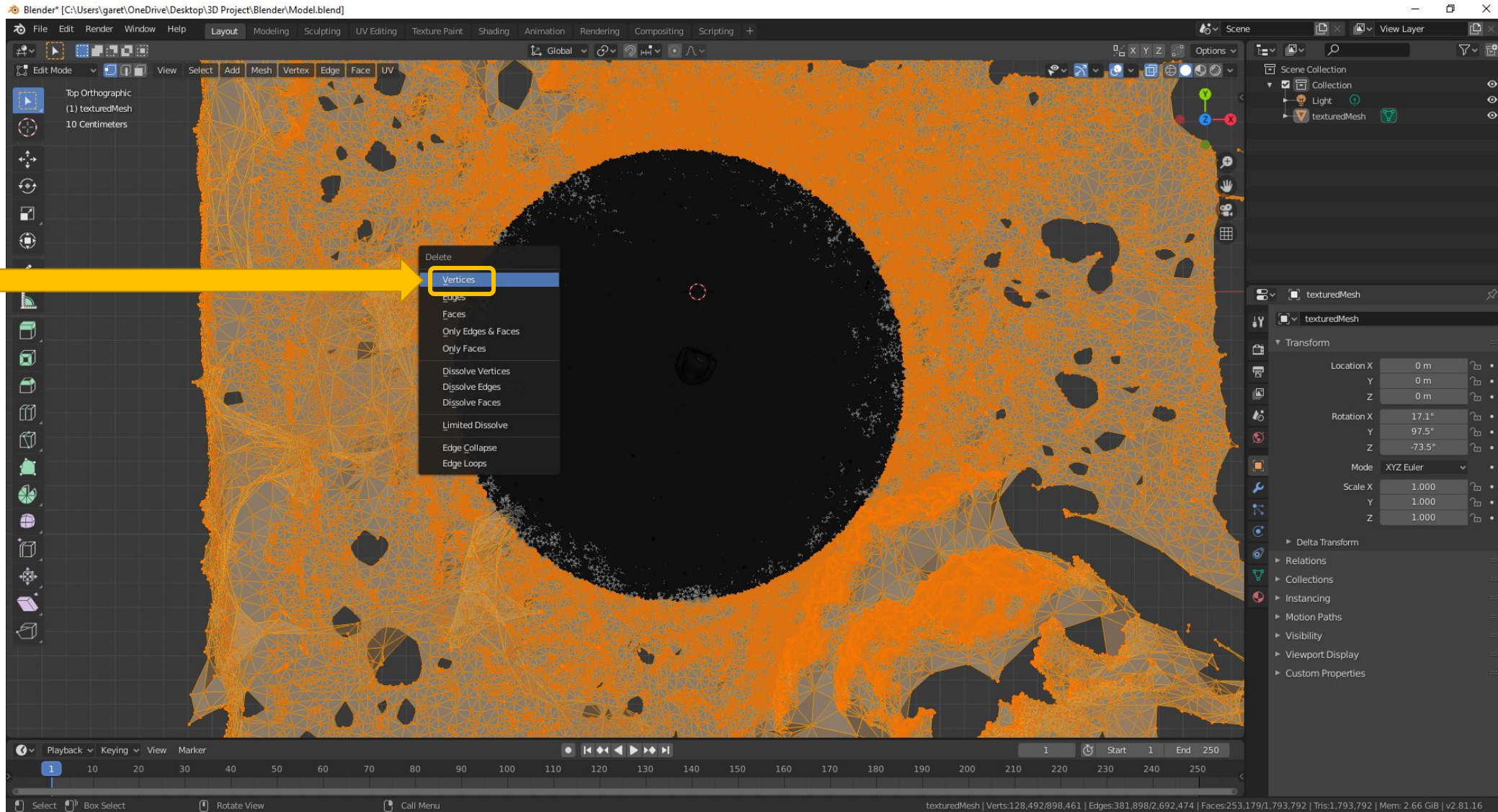
Press “ctrl” + “I” to invert the selection





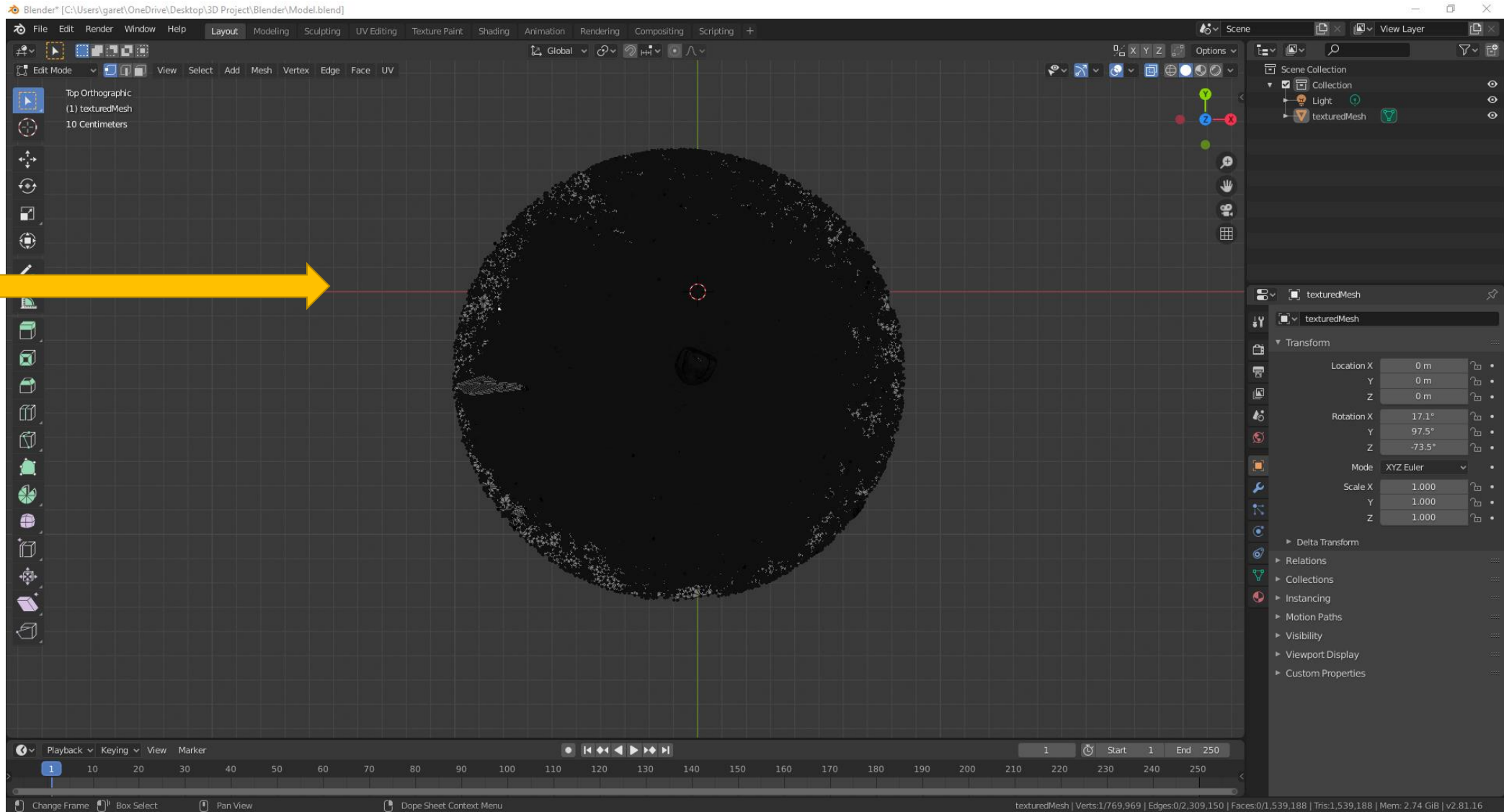
# Using Blender – Trimming the model down

Press “DEL” and then select “Vertices” to delete and remove the selection



# Using Blender – Trimming the model down

All the extra material will now be gone!



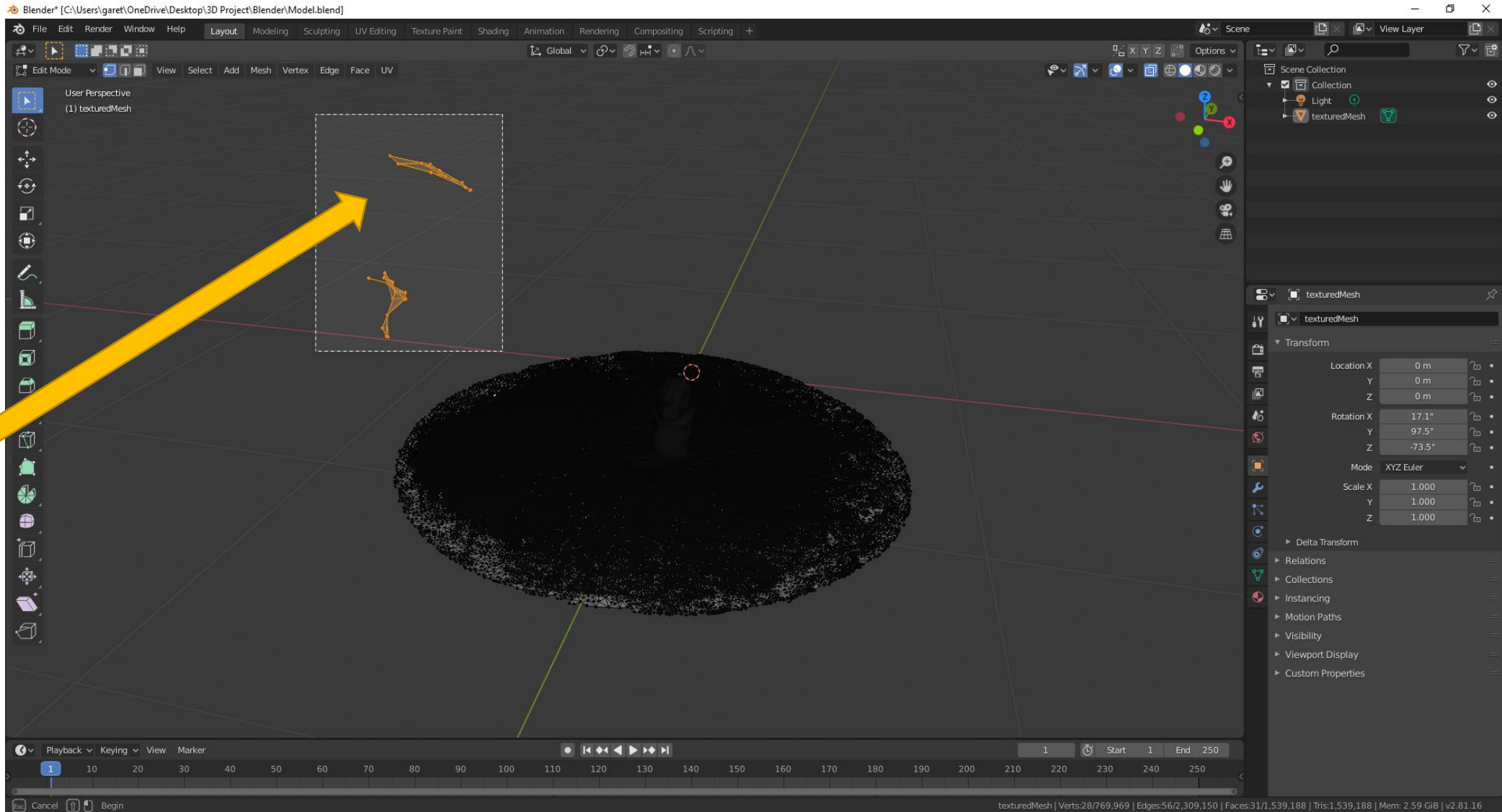


# Using Blender – Extra trimming

You may have a few remnants to remove.

1. You can select them with a box selection by left clicking and dragging the mouse across the intended area of the screen.

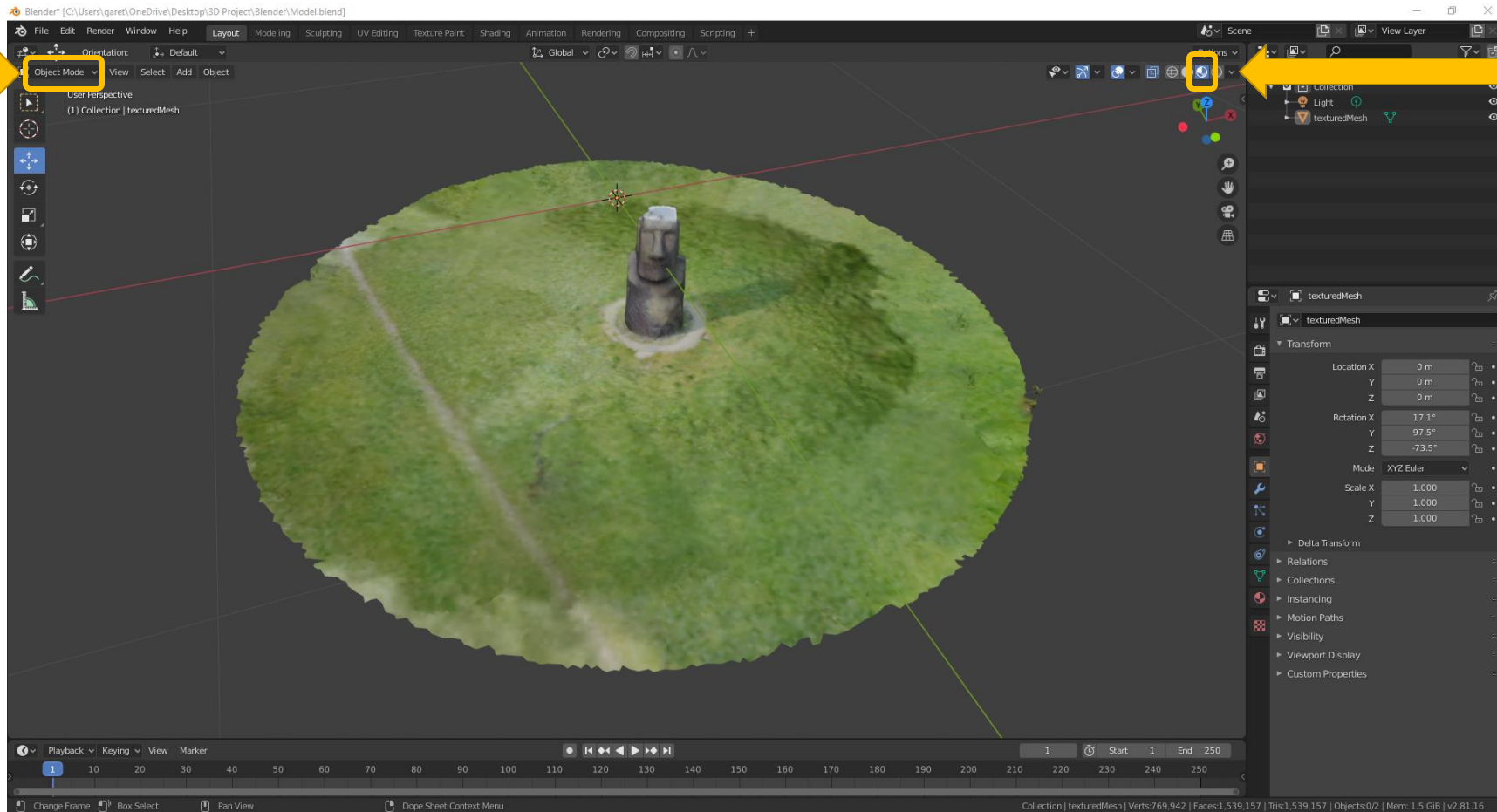
2. Press “DEL” and then select “Vertices” as before to delete the selection





# Using Blender – Viewing the trimmed model

1. Change back to “Object Mode” and move your camera back to a good position

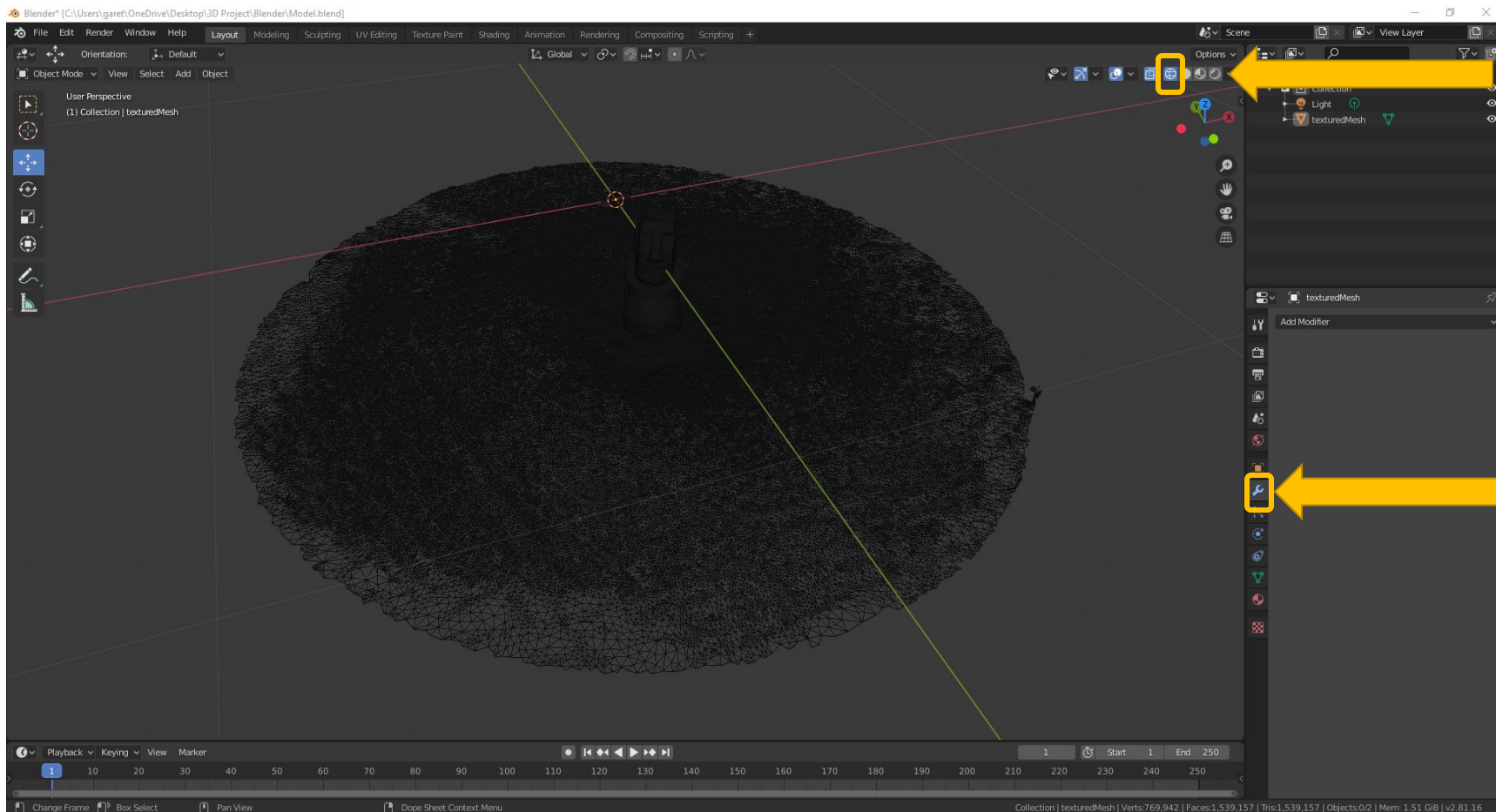


2. If you change the “Viewport Shading” to “Material Preview” you should be able to see your finished model!

This is intense for most PCs to render, so change “Viewport Shading” back to “Solid Mode” when you are done

# Using Blender – Decimation

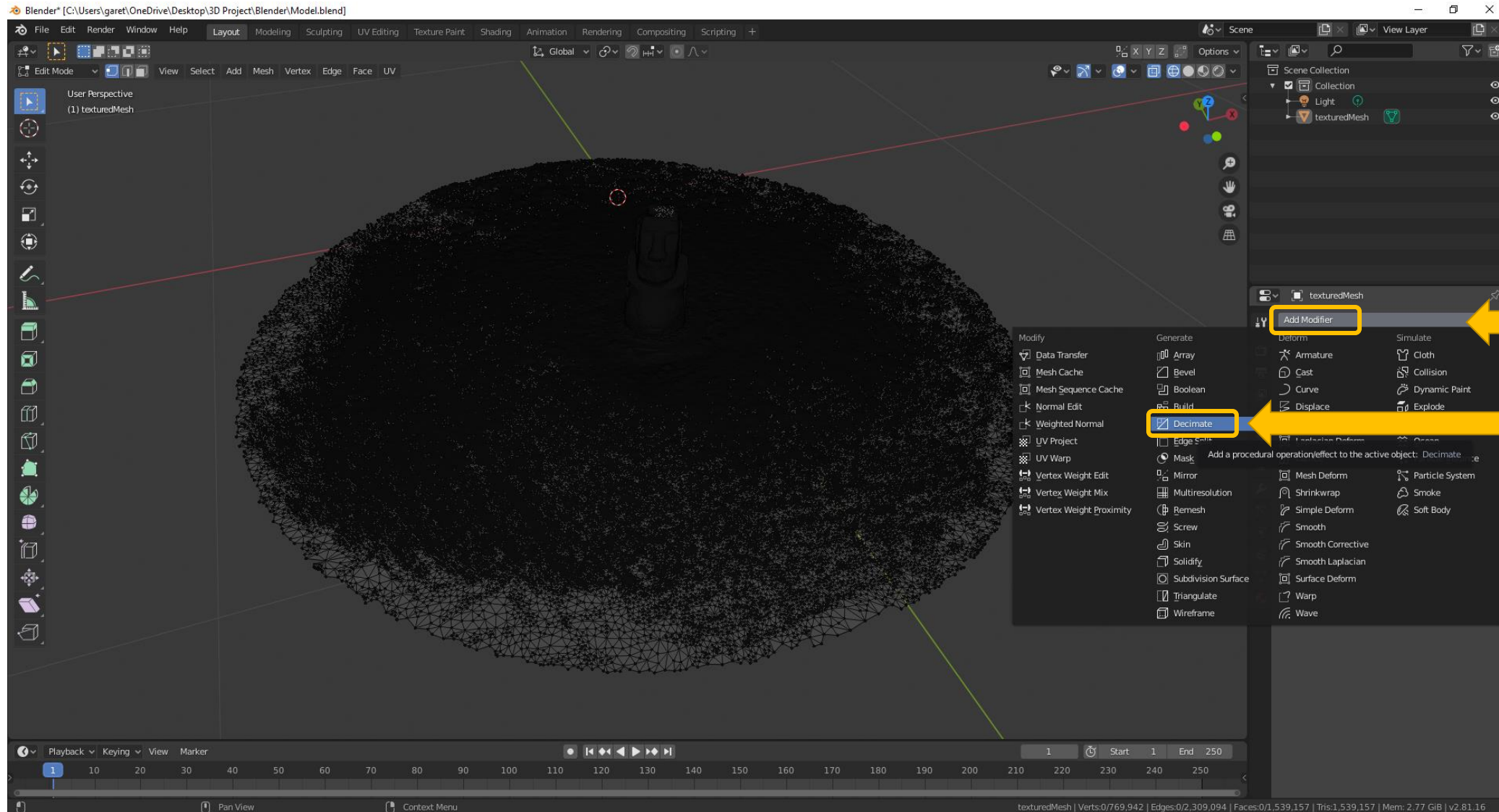
The model may be too highly detailed to use in Social VR. We can reduce the level of detail using a process of decimation which can reduced the number of triangles or “faces” constituting the model. This reduces file size and makes is easier for a computer to “render” or display the model.



1. With “Viewport Shading”  
set to “Wireframe” mode

2. Select “Modifier  
Properties”

# Using Blender – Decimation

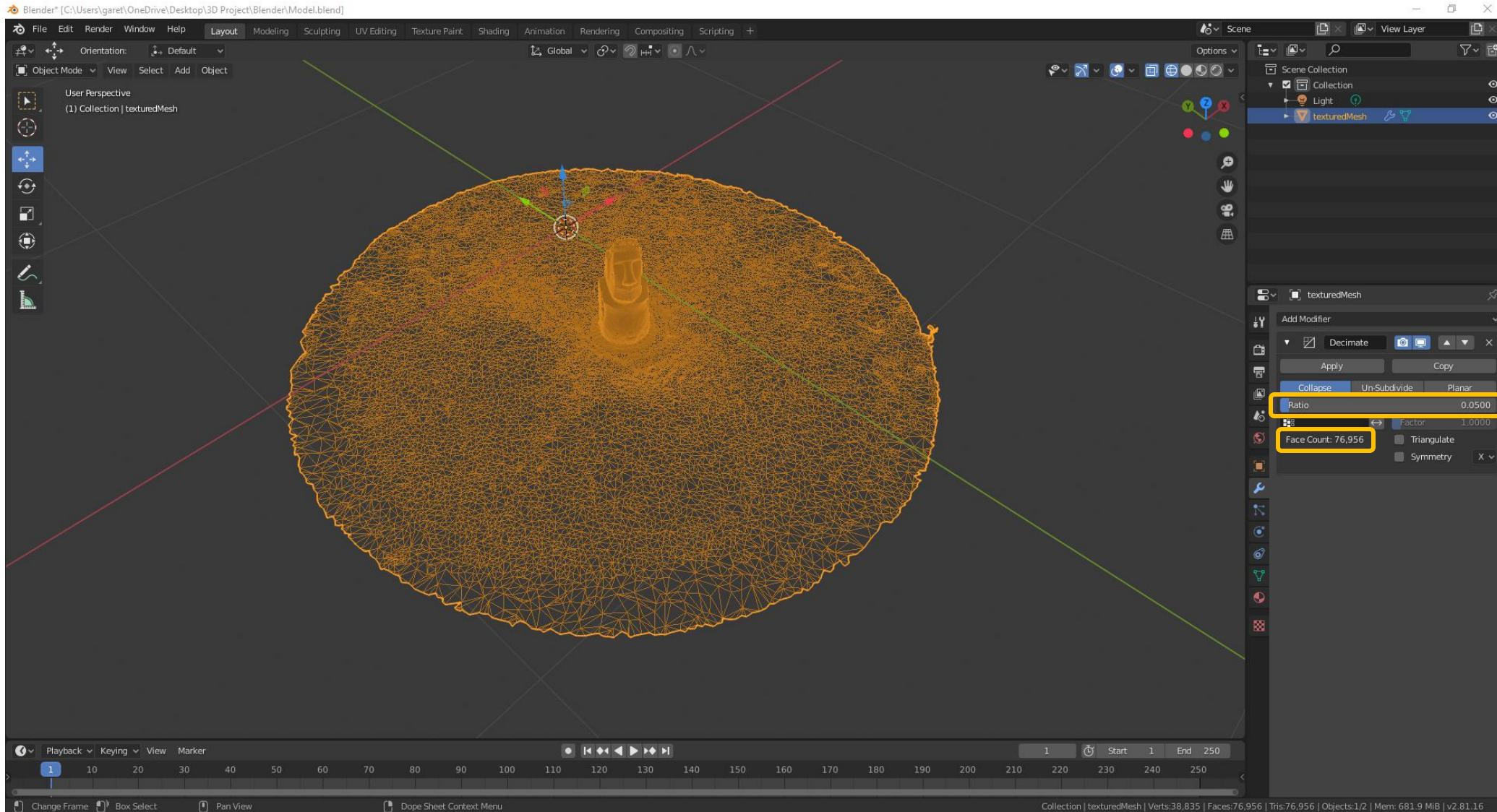


1. Select  
"Add Modifier"

2. Choose  
"Decimate"  
from the pop-  
up window



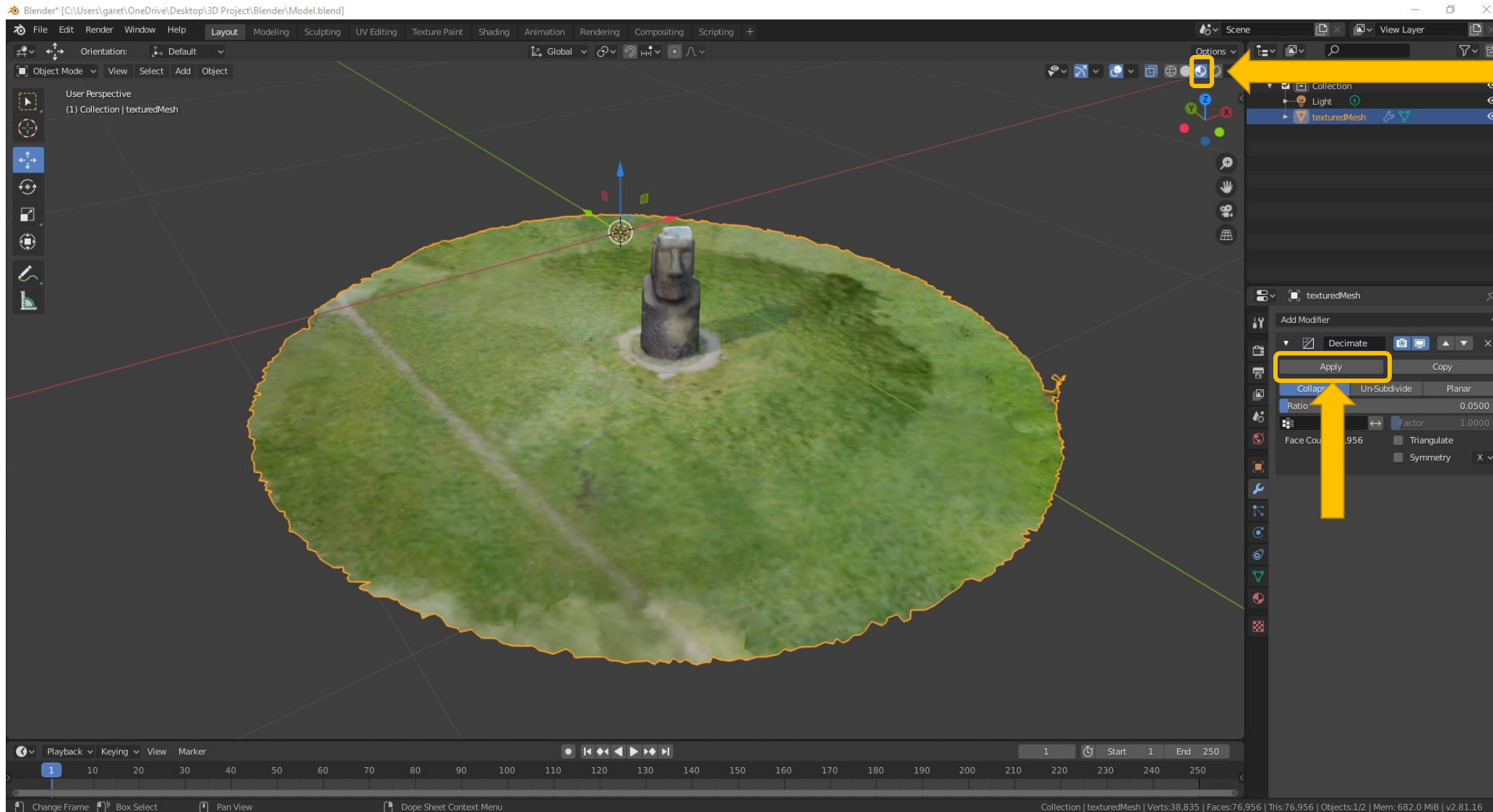
# Using Blender – Decimation



By turning the “Ratio” down to 0.05 the “Face Count” is reduced significantly – in this case from 1.5 million faces, down to only 77k – making the model much easier to work with.



# Using Blender – Decimation



By reviewing the “Material Preview” you can view the model has retained sufficient detail.

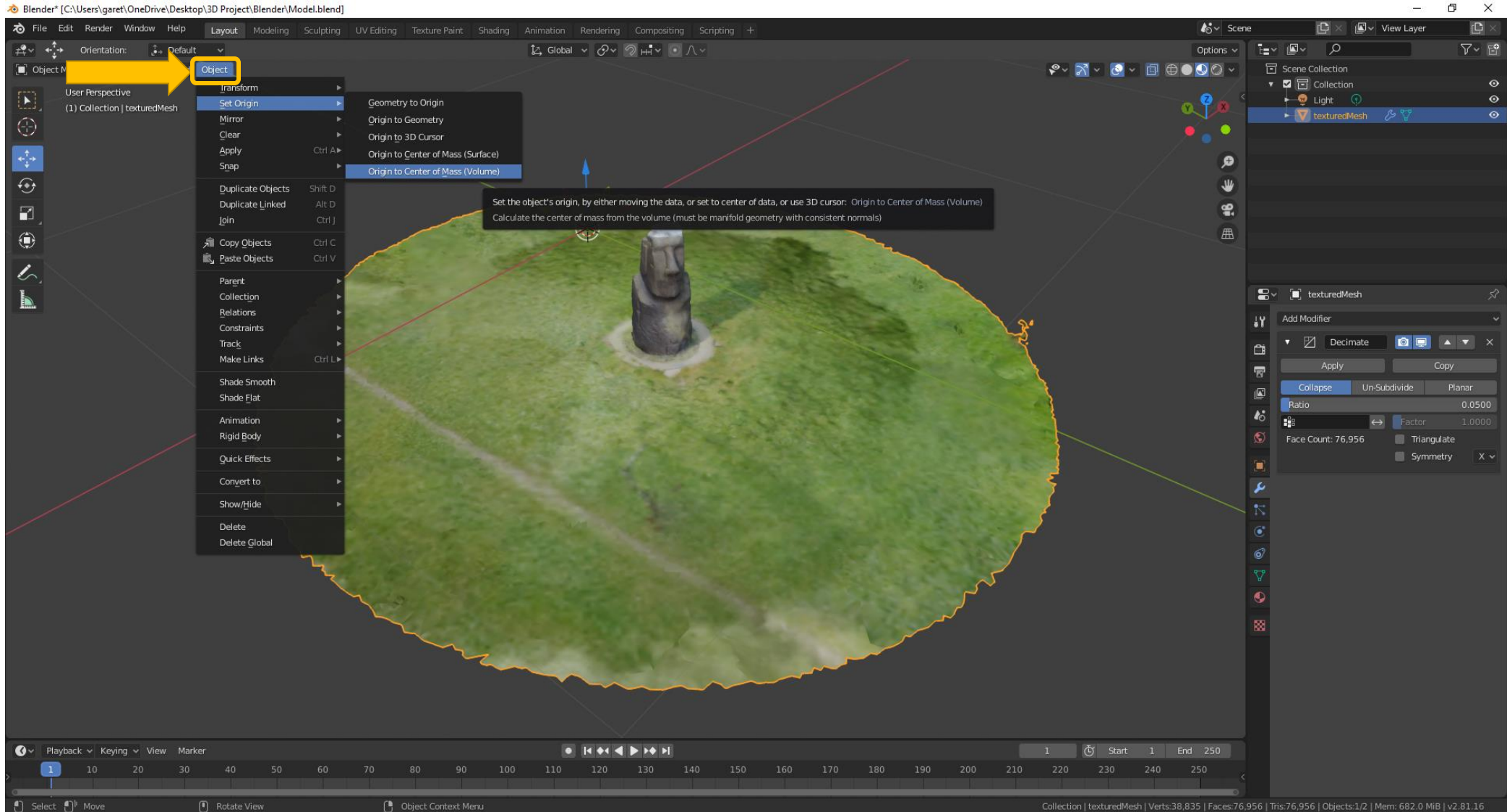
The aim is to let the detail in the texture substitute for the triangles you’ve removed.

Experiment with the ratio.

**Click “Apply” when you are happy with the result.**

# Using Blender – Set the model origin

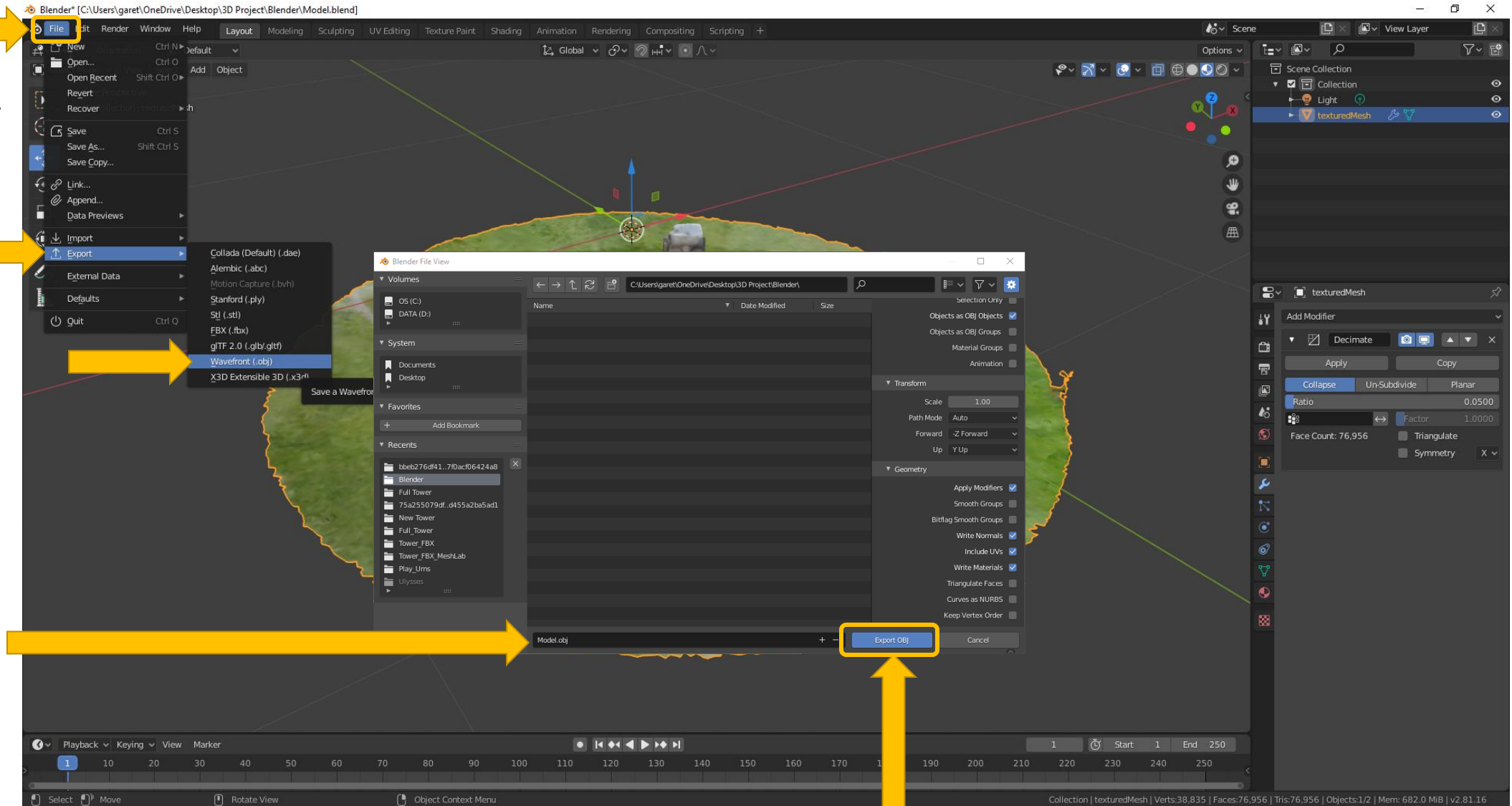
The final step is to set the object's origin by clicking "Object" => "Set Origin" => "Origin to Centre of Mass (Volume)"



# Using Blender – Exporting the final model

1. Click on “File” =>  
“Export” =>  
“Wavefront (.obj)”

2. A pop-up  
window will then  
open and you can  
select the save  
location to the “3D  
Project” =>  
“Blender” folder as  
“Model”



3. Click “Export OBJ”





# End of Part 2



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