

Sculpting & Texturing in Blender for use in Vue

The general purpose in making various objects in Blender is to create assets for use in E-on Vue. One very useful operation is to be able to create, sculpt and texturize an object and then export the Blender object to Vue or only create and sculpt the object in Blender then texturize it once it has been exported to Vue.

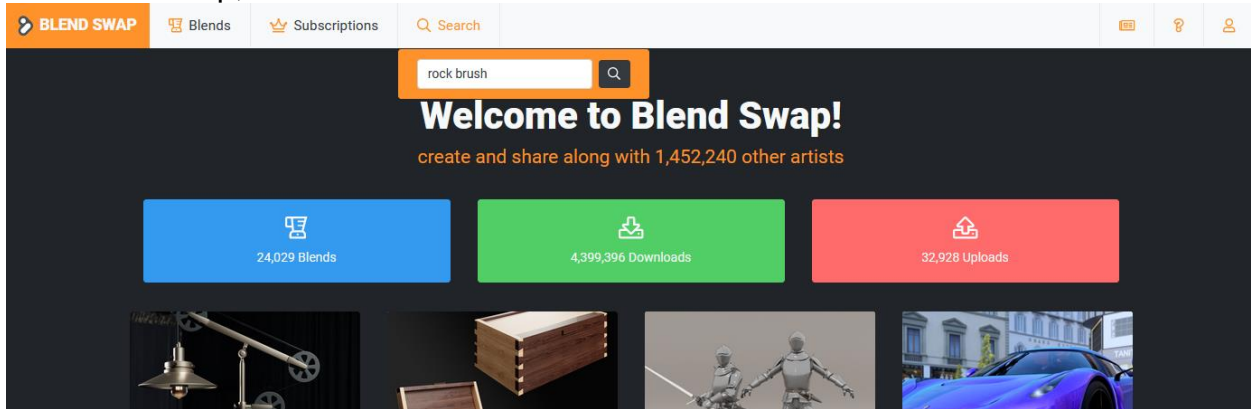
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Obtaining Sculpting Brushes

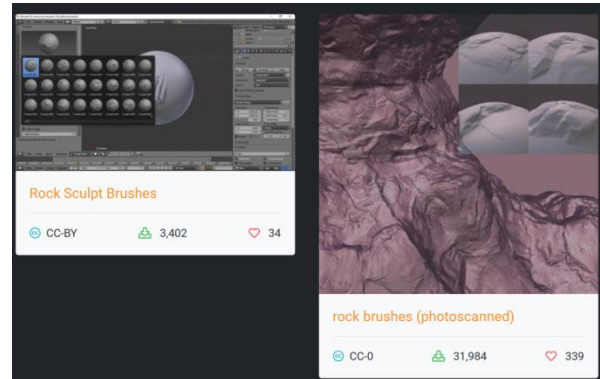
The sculpting brushes for the sculpting of the object are found at BlendSwap. (need an account here to download).

- At Blend Swap, in the Search box enter **rock brush**.

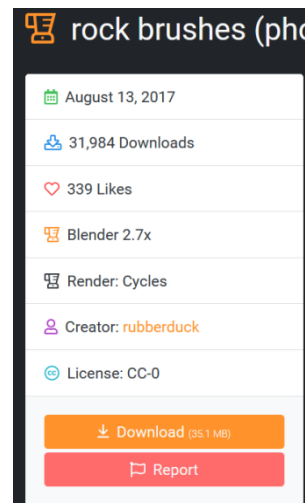


This will bring up a couple of brush packs.

- Select the rock brushes (photoscanned) one. The CC-0 means they are free to use.

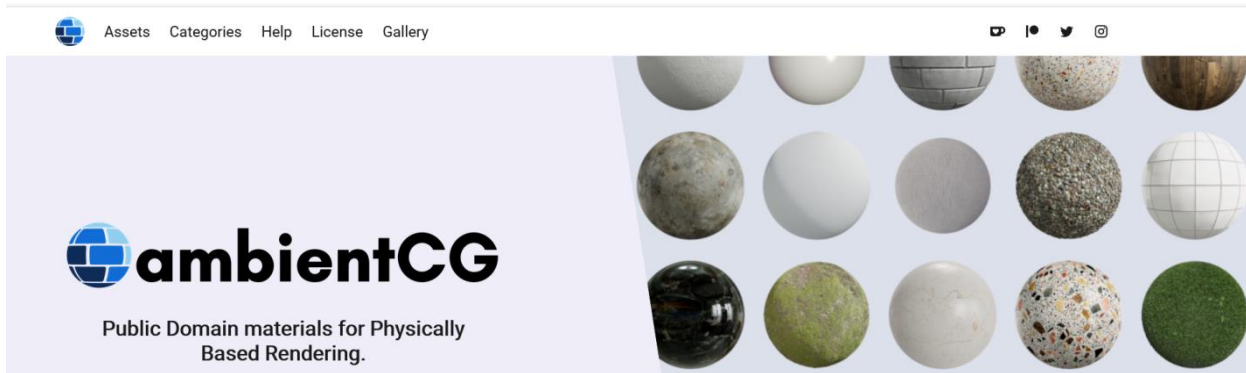


- If you are logged in to BlendSwap, you will see the download window open.
- Download the rock brushes file to your downloads folder.
- Now unzip the file and save it to the **Blender Content** folder under the folder named **Brushes**.

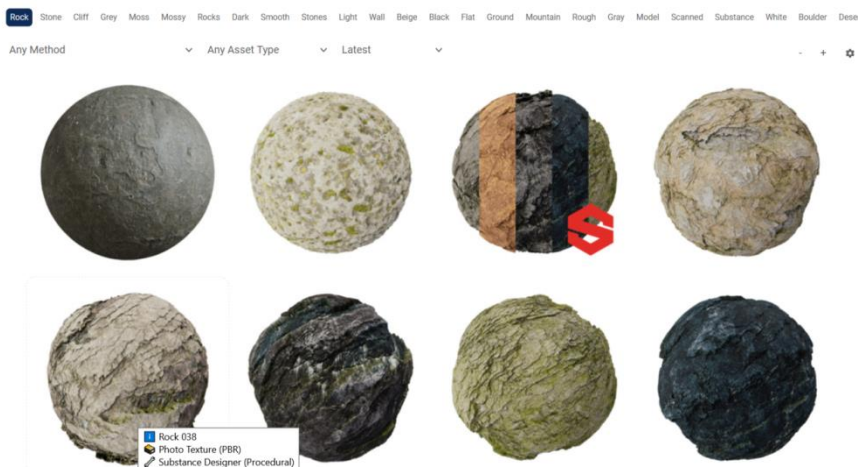


Obtaining Object Textures

Next step is to download a texture to use on the sculpted object. For this we will go to a site called **AmbientCG.com**. There are many sites where you can get free PBR (Physically Based Rendering) materials.



- At the main site, click on **Assets**. Then in the Search Query, type: **rock**.
- From the displayed rocks, (first page) we'll select the Rock038. Select the 4K .jpg version.




- Download this .zip file into the Downloads folder and unzip it. Move the unzipped folder to the **D:/Dropbox/Dropbox/Textures/PBR** folder.

Creating the Object for Sculpting

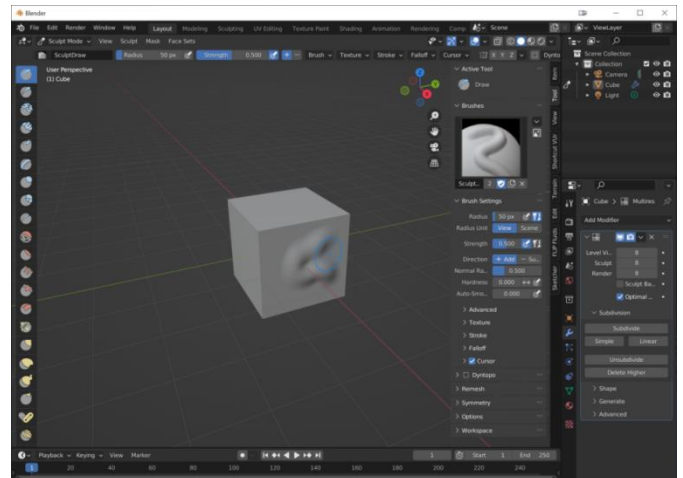
1) Multiresolution method

Now we are ready to begin the construction in Blender.

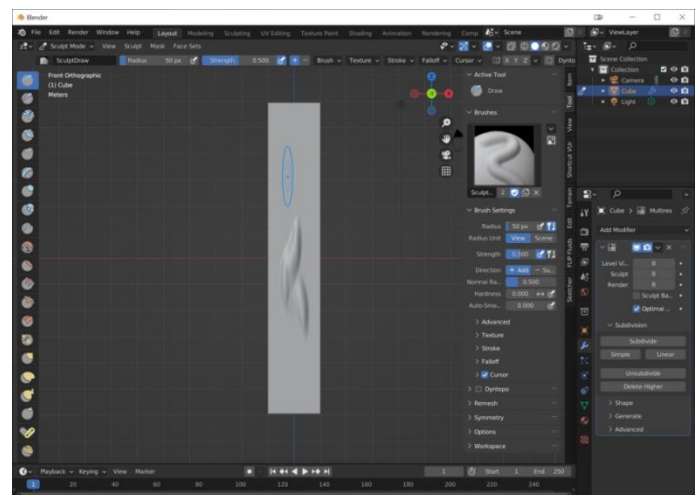
- Open Blender in the **General** view and erase the cube, camera and light.
- Select **Add/Mesh/Plane**.
- Rotate the plane about the X axis by 90° : **r/x/90 enter**.
- Resize the plane 5 times its size: **s/5 enter**.
- Press 1 for front view and move the plane up to x axis line. Pan down to center it.
- Click the **Modifier Properties** icon:  and then on **Add Modifier**.
- From the displayed list, select **Multiresolution**. (Blender 2.93) Click **Simple** 8 times. The Level Viewport, Sculpt and Render will all go to 8 levels of subdivision.

One of the issues for random sculpting of surfaces is that if the object has been stretched the sculpting tool is stretched too.

Take a cube in blender: (in 3.2 now). The sculpting tool is round on its body:






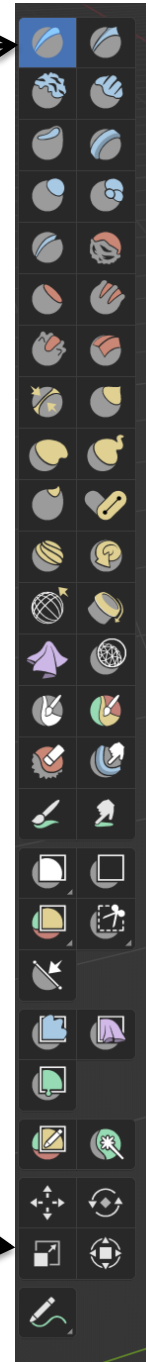
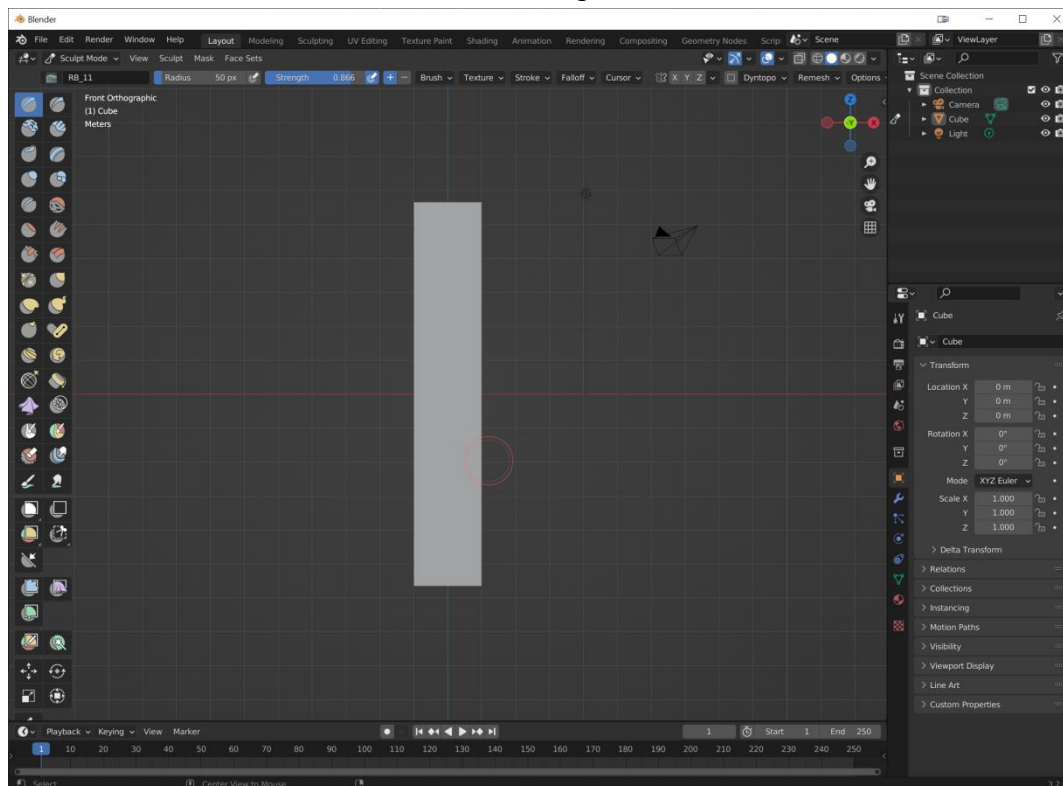
But if the cube is stretched in the X direction, the sculpting tool would be stretched too:



I would really like to have my sculpting tool stay round so it seems I'll have to try another way. Restart Blender and keep the default cube.

2) Using Sculpt mode

- The best way to sculpt the object is to go to Sculpt mode directly. So with the default cube selected, go directly into Sculpt mode.
- Readjust the left - **Sculpt Tools** toolbar wider resulting in two rows of tools being displayed instead of just one:
- In the right-side, upper-most area, change the viewport shading from the default-**Solid** mode:  to **Wireframe** mode: 
- You will see the outline of the single cube. Next step is to make this cube into a huge number of smaller cubes; that is to increase its resolution.
- Below the Viewport shading menu is the **Dyntopo –Remesh and Options** menu: 
- Expand the **Remesh** dropdown menu. Set the Voxel Size from .1 to .01 (for good high resolution) and click on **Remesh** at the bottom of the menu.
- A close-up of the cube will now show the mesh grid is quite fine, meaning subdivided to high resolution.
- Change back from Wireframe view to Solid view.
- Using the **Scale** transformer in Sculpt mode, stretch the box in the up-down direction. The draw cursor will no longer be stretched.




- Now to have access to the complete group of rock-surface brushes, you can append the brushes using the method shown below:

Loading the Sculpting Brushes

- In Blender click on **File/Append...**
- Locate the **Blender Content/Brushes** folder and click on the **rock-brushes-photoscanned** file.
- Click on the file: **rock_brushes.blend** to open it. Then click on the **Brush** folder to open it.
- Press **A** to select all the brush files and then click the **Append** button at the bottom.

The various sculpting brushes should now be loaded.

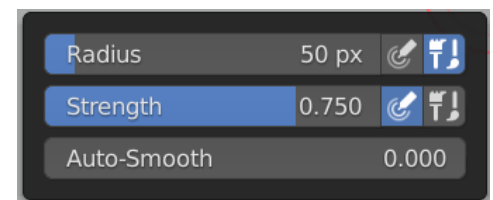
- Change from **Object** mode to **Sculpt** mode.
- In the left toolbar make sure the top **Draw** tool is selected (default)
- At the right-side toolbar select the top; Active tool icon:  and/or press **N** to open the display rightside menu and select the **Tool** menu. In either case the Draw tool opens and the Brushes section is displayed.
- Now when you click on the **Draw** image in either location, the appended brushes should be shown. Scroll up and down in the list, there are many brushes (RB 01 to RB 32)



Applying the Sculpting tools

- Click on any one of the sculpting tool images, above, and move the cursor to the plane.

Notice that the mouse is now changed to a circle that defines the initial size of the sculpt that will be applied. Right-clicking the mouse will show the ability to vary the radius of the sculpt area and the strength of the tool.




- With the circle on the plane, left-click and hold the mouse. Initially there is nothing shown but if you hold the left mouse button and drag the mouse, the current brush pattern will appear. The pattern starts quite small but enlarges as you drag the mouse.
- As you drag the mouse sideways it also rotates the sculpt pattern.
- At any time you can release the left mouse button to place the current sculpt pattern and then press the left mouse button again to place another one.
- At any time once you have released the left mouse button, you can return to the tool image and click it to select a different tool pattern.

You can continue applying different patterns on the plane or even on top of existing patterns until the plane is fully sculpted to your satisfaction. Then change back to **Object** mode.



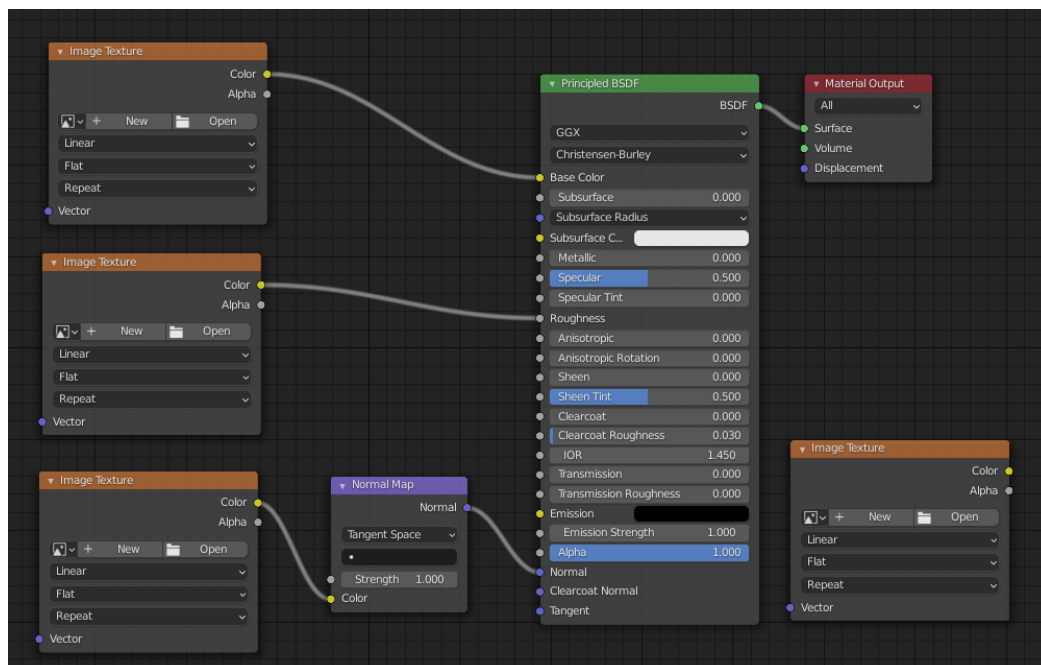
Applying a rock texture to the Object

So we have a rocky surfaced object now sculpted but we need to apply some kind of rocky texture to make it look more realistic. To do this we will split the display area and add in the **Shader Editor**.



- Move the cursor to the left edge, just a hair below the main menu. The cursor should change to a cross-hair.
- When it does, left-click and drag the mouse to the right to open another display area. Initially it will be the same (Layout) type of window.
- At the extreme upper-left of the window, click the down-arrow on this icon:  then select **Shader Editor** from the list. (currently blank)
- Place mouse in the Shader Editor and press N to close the right-side menu window.
- On the right window click the plane to be sure it is selected (orange border)
- Click on **New** at the top to begin adding default nodes for a new material. These will include the **Principled BSDF** and the **Material Output** nodes. The title has changed to **Material.001**. The mouse scroll wheel can allow for zooming in or out of the nodes.

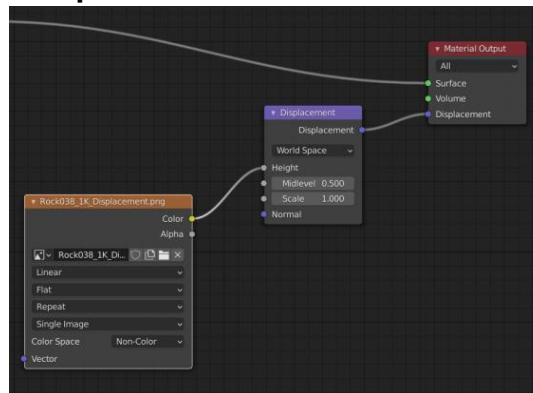
Adding Nodes

- In the shader, click **Add** and in the **Search** text box begin to enter the word “**image**”. After a couple of letters the context menu will show many node names, **Image Texture** will be among them. Select that one.
- The **Image Texture** node will be added. We will need four of these, so use **SHIFT-D** to duplicate the node four times. Place three of them on the left of the BSDF and one on the right side.
- The Image Texture - Color outputs will be connected to different inputs on the BSDF. Top; to **Base Color**. Middle to **Roughness** and bottom to **Normal** (right side we’ll do later)
- For the bottom we’ll need a Normal Map node in between so click Add, then in Search type “**nor..**” then select Normal Map (not just Normal) from the list.
- Select and drag the Normal Map node and drop it right on the connection from the lowest Image Texture node to the BSDF. It will automatically connect properly.






Loading Texture files into Nodes

- In the top Image Texture node click on Open. In the file browser that is displayed locate the previously saved rock038_4K folder. Open the folder and select the file **Rock038_4k_Color.jpg** file.
- On the second Image Texture node do the same for the **Roughness** file. (check Recent list for faster access)
- On the lowest Image Texture node do the same for the **Normal** file.
- The **Color Space** midway down the node stays at **sRGB**. For the middle and lower nodes we'll set them to **Non-Color**
- For a more realistic model view, in the right; **Layout panel**, set the view from Solid view:  to Rendered view:  the colours of the texture look much more realistic.
- Move the **Material Output** node a bit further to the right
- Connect the right Image Texture Color output to the Material Output's Displacement input.
- Add a new node, this time add a **Displacement** node and drop it onto the connection.
- In the right Image Texture node, click **Open** and locate the texture's **Displacement** file:
- Now move the Image Texture's **Color** output to the **Height** input of the Displacement node. Also set its **Color Space** to **Non-Color**.



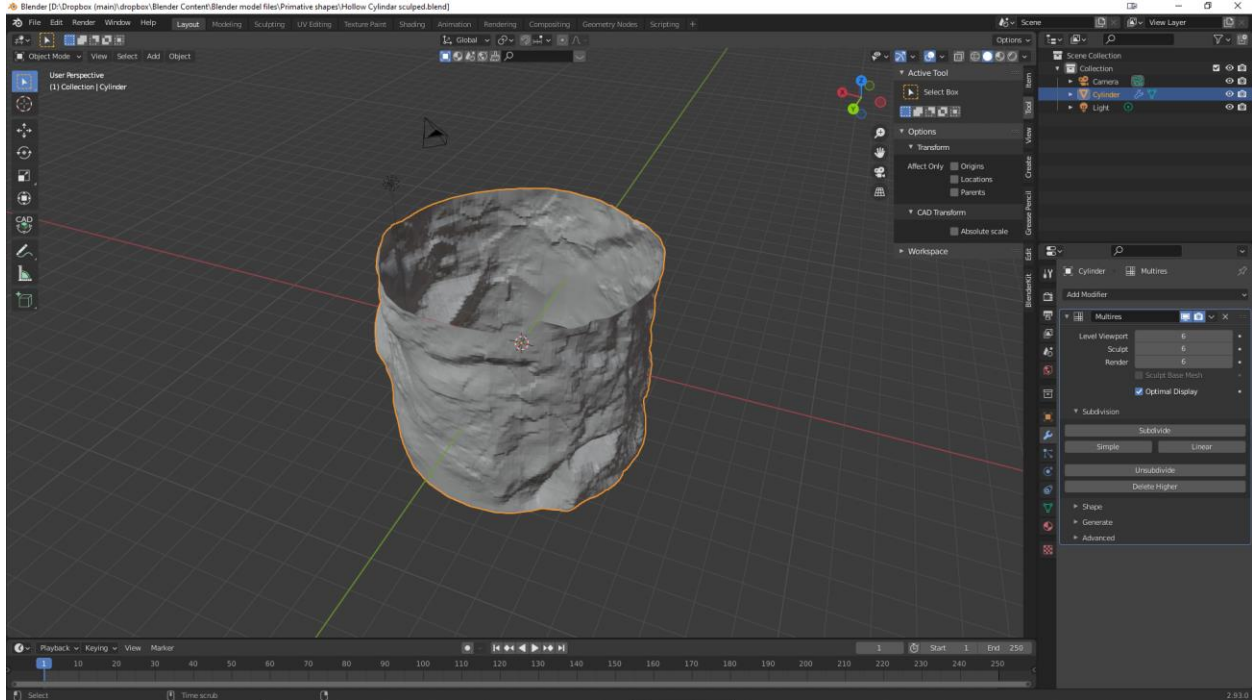
The realism of the rocky face will be enhanced by adding some displacement to the texture.

- In the Displacement node, set it from **Object Space** to **World Space**.
- Finally, make sure the plane is selected and click on the **Material Properties** icon in the right, layout window: 
- Under the >Preview, >Surface, >Volume section is the >**Settings** section, open this dart. Under the **Surface** section of the Settings Section is Displacement. Make sure this section is set to **Displacement and Bump**.
- Changing the **Scale** of the **displacement node** should change the amount of displacement that will be applied to the rocky face
- Now you need to go to Render Preview:  in order for the displacement effect to be seen
- This section is supposed to enhance the surface of the object by controlling the scale of the displacement applied. This can be seen when the viewport shading is set to **Render Preview**:  but does not translate to the exported output from Blender for Vue. If this is desired, use [Alternate Texturing in Vue](#), below.

Part 2: Create a Sculpted Cave in Blender


In the attempt to create a cave in Blender for use in Vue, we can sculpt an open cylinder to accomplish this.

Almost the same process can be used to create an open-ended cave in Blender. It can be done with a hollow cylinder, capped at one end, and then sculpted to create a cave.



We begin with a simple cylinder mesh instead of a plane mesh.

Multiple Vertices Method

- In Object mode, select add/mesh/cylinder
- Using the lower-left **Add Cylinder** window, set the **Vertices** to 500.
- Go **Edit** mode and set the selection to **Face** selection:
- Tip the cylinder to expose one end and click on it to select it.
- Press **X** to show the delete window and select **Faces** from the list to erase a face from one end of the cylinder. Press **1** to view the cylinder from the side.
- Still in **Edit** mode, at the left-side toolbar, select the **Loop Cut** icon: 
- Move the cursor to the side of the cylinder till a horizontal cut line appears in yellow, then click the left mouse button.
- The **Loop Cut and Slide** window will open to the lower-left. Set the **Number of Cuts** to 500 as well, and press Enter. (may take a few seconds)








Multiresolution Method

The earlier **Multiresolution** modifier does not work as well on cylinder so we simply made a great many vertices by the above process. Now we are ready to sculpt the cylinder in the same way we sculpted the plane in the earlier part of this tutorial.

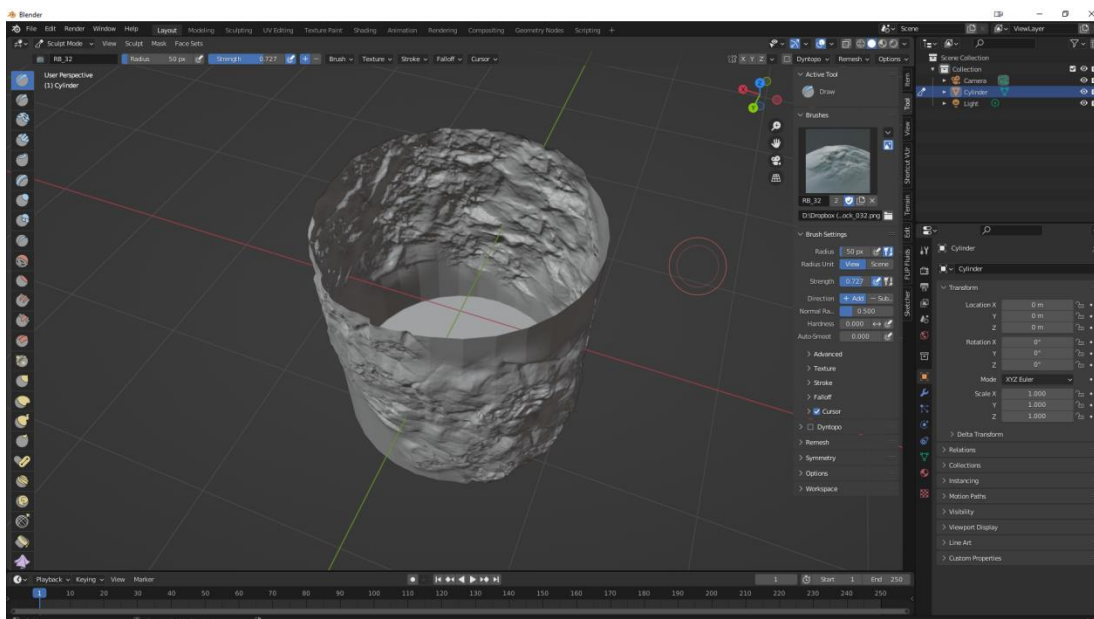
Sculpt Mode Method

The final method to get a sculpted, open-ended cylinder is using the Sculpt mode.

- Delete the default cube and add a cylinder using **Add/Mesh/Cylinder**.
- Add extra vertices to the cylinder if you want.
- Switch to Sculpt mode from Object mode
- Change the **Remesh-Voxel** size from .1 m to .01m and then click on **Remesh**
- Press 1 or 3 to view the cylinder directly from the front or side
- Switch to **Edit** mode. (should be in vertex select mode by default)   
- Turn on X-ray toggle: 
- Draw a box to just touch on the top of the cylinder, the vertices will turn orange to show that they are selected.
- Press **X** to open the **Delete** listing and press **Enter** to accept the default; Vertices.
- The top of the cylinder will be removed.
- Switch back to Sculpt mode, turn off X-ray view and be sure to be in **Solid** view mode: 

Applying the Sculpting Brushes

- Be sure to append the sculpting brushes as shown in part 1.
- Switch to **Sculpt** mode if not already there.
- Press **N** to open the right-side menu and select the **Tool** tab.
- With the left menu set to the top; **Draw** tool, click on the **Brushes** graphic at the right to show and select the appended brushes available for sculpting.
- Select one of the brushes (it will now appear as the brush graphic) and move the cursor (now a red circle) over the cylinder.
- Press the left mouse button to apply the current brush to the cylinder.
- Moving the mouse away from it's start point increases the sculpt brush size, moving it towards it's start point reduces the size and moving it in a circular fashion rotates the brush pattern CW or CCW.
- At any time you can select a different brush to apply a different pattern to the cylinder.
- You can apply the brushes from the outside or to the inside to apply the reverse effects to the cylinder wall.
- Use the mouse to rotate the cylinder while applying brush patterns over the whole cylinder

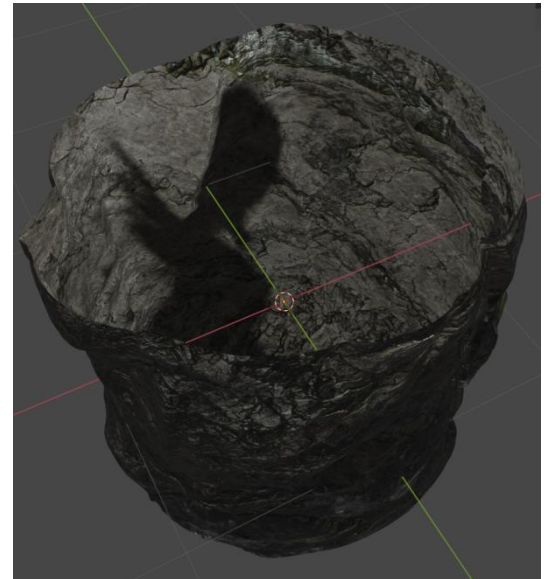
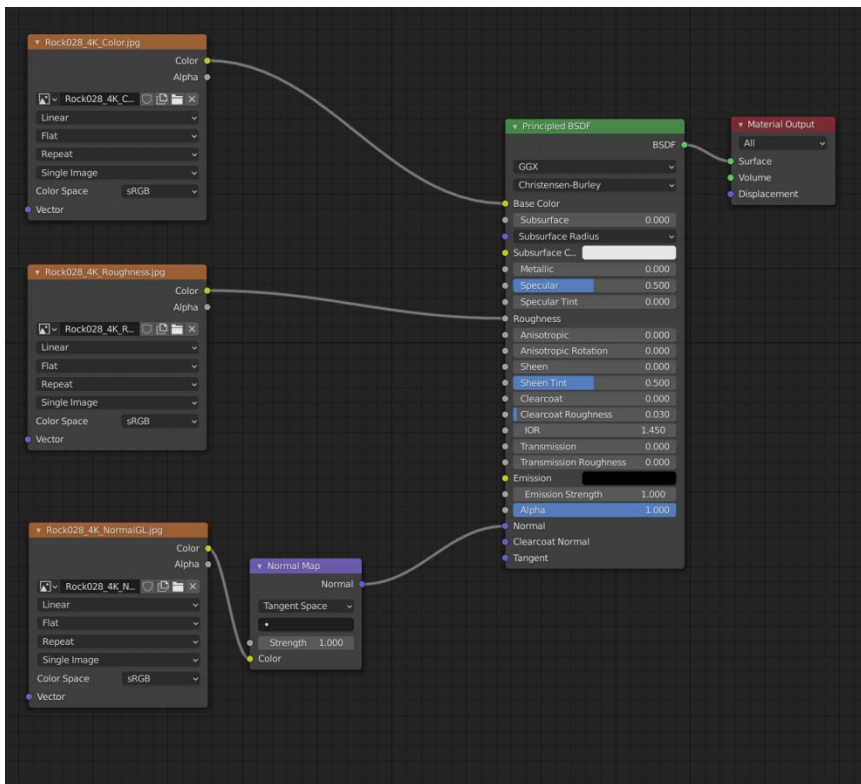


Exporting to Vue

Once the general shape of the cave has been made the object can be saved in Blender and then Exported out of Blender on FBX or OBJ format for importing into Vue. (FBX seems to create a couple of other cameras that have to be removed).

The current cave shape can also be given a texture in Blender and outputted to Vue. In this case the Displacement texture will not be added. Or the cave can be sent to Vue in its raw form and the texture applied there, in Vue using its materials.

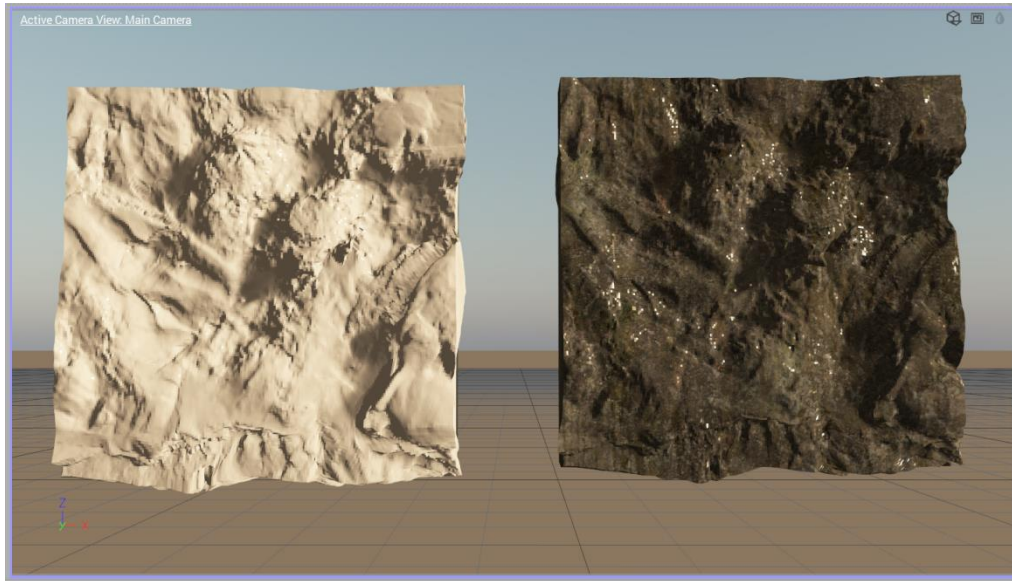
If we want to apply textures in Blender, follow the earlier example for the Rock Face wall. Use a colour, Roughness and Normal image texture nodes as shown below:



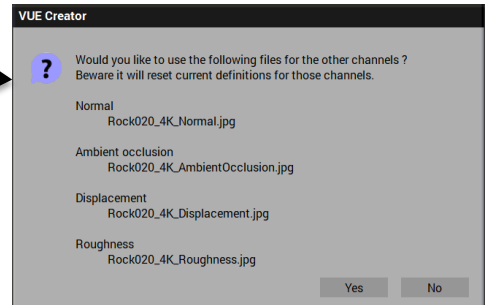
Alternate Texturing in Vue

All the texture files that are used in Blender can also be applied to an exported object once it is in Vue including the **Displacement** file.

The two Blender-created rocky faces below were imported by Vue. The right one textured by Blender and the left one un-textured. The texture files used were: **Rock020_4K-JPG**. (found in **Textures/PBR materials** folder)

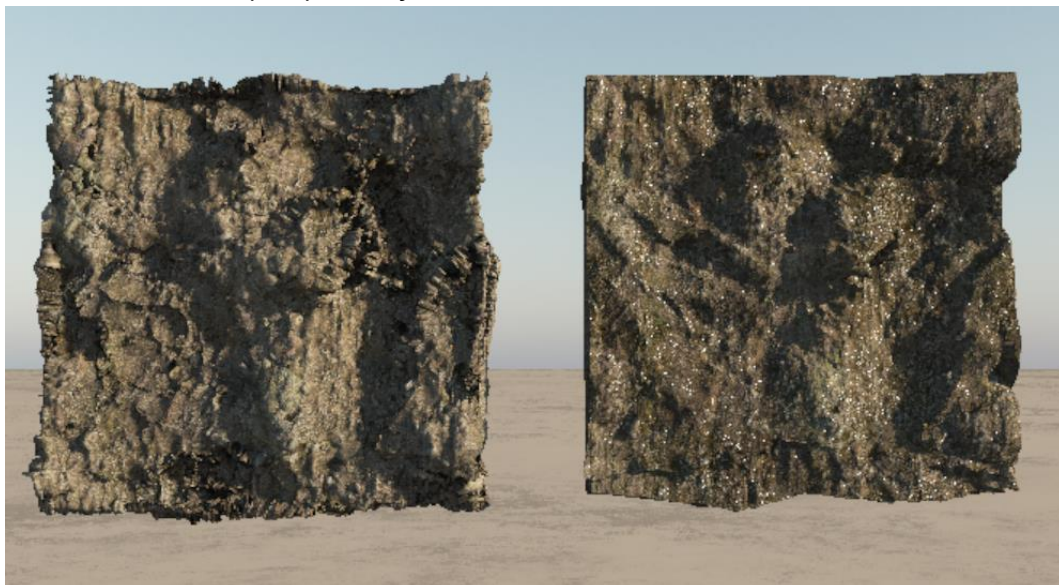


The left object was set to **PBR material** and **colour** loaded in the **Advanced Material Editor**. Vue automatically asks if these other files should be added:

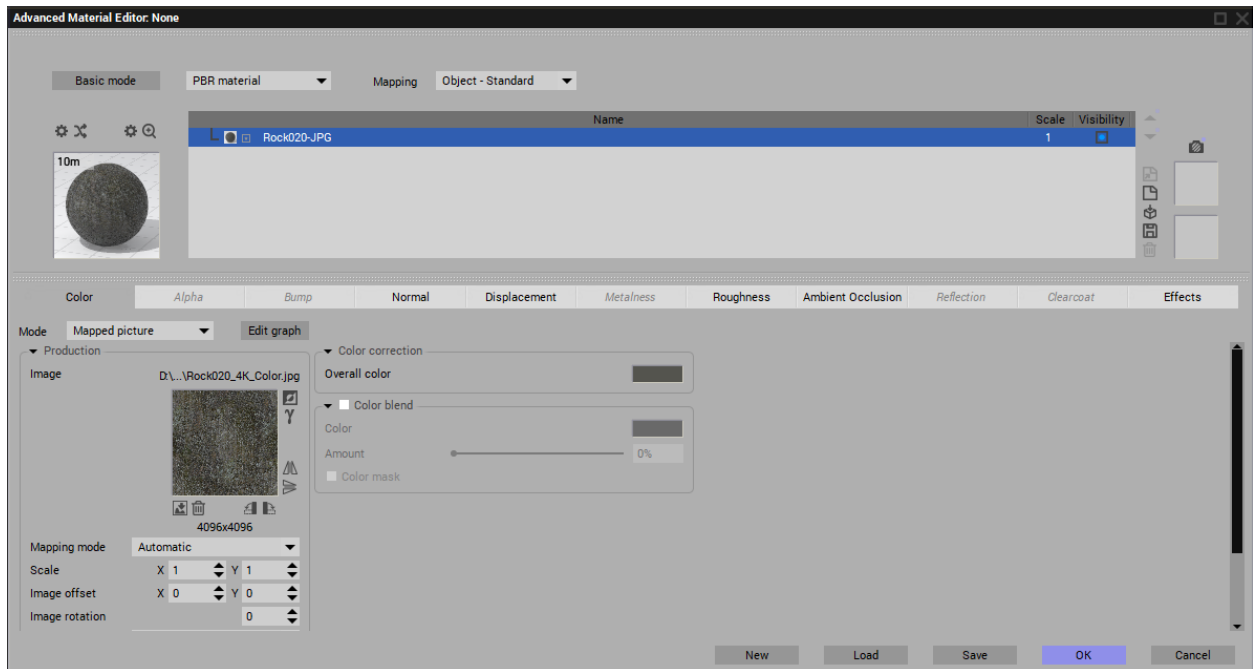


Answering **Yes** automatically loads those files into the appropriate channels in Vue's **Advanced Material Editor**.

The result of the Blender – textured (right) and the Vue – textured (left) rocky faces.



As in Blender's BSDF node-based texturing, there are many fine adjustments to the imported material channels that can be exercised in Vue under the Advanced Material Editor.



Now a bit more **Displacement** was added to the Vue-textured rocky face:



This displacement effect is only viewable in the Active Camera view in Vue. It cannot be seen in any of the other views. It will appear in the rendered view.