Ngons

Contents

[What are Ngons? 1](#_Toc187675590)

[The Knife Cut Tool 4](#_Toc187675591)

[How to Find Ngons 4](#_Toc187675592)

[Turn Ngons to Quads 7](#_Toc187675593)

[Inverse Selection 8](#_Toc187675594)

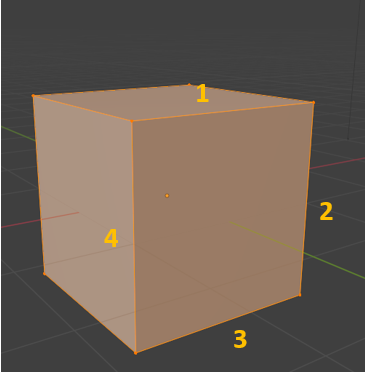
[Cleanup 13](#_Toc187675595)

[Changing a Triangle to a Quad 15](#_Toc187675596)

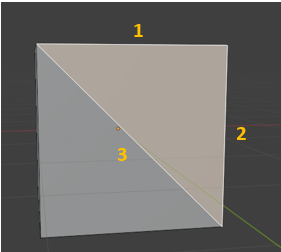
[To Fill 17](#_Toc187675597)

# What are Ngons?

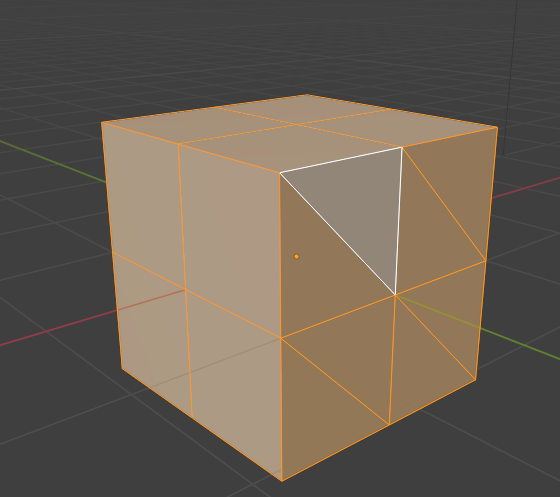
Ngons are any surfaces that do not have 4 edges. If you take a cube, you will find that its face has exactly 4 edges.



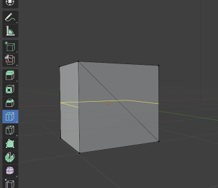
If you split up a face like this, using something like the knife tool, you no longer have 4 edges. Now you have 2 triangles, and triangles have 3 sides. Once you have turned a face into a 3 sides surface, you can have unintended consequences.



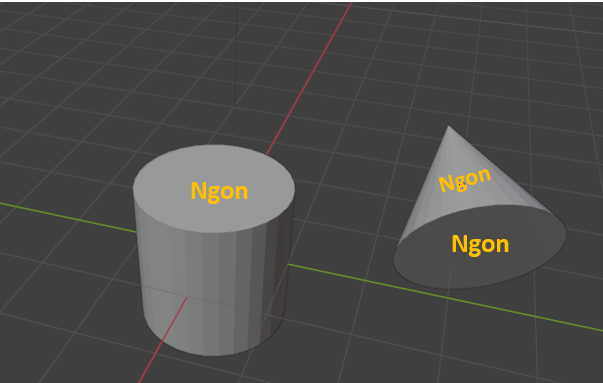
Now if you right click and select to subdivide this box, this is what happens. Blender attempts to do what it can with this side, but it isn’t quite right.



Now if you try and use the Loop cut tool, you will find that Blender will skip this Ngon side all together.

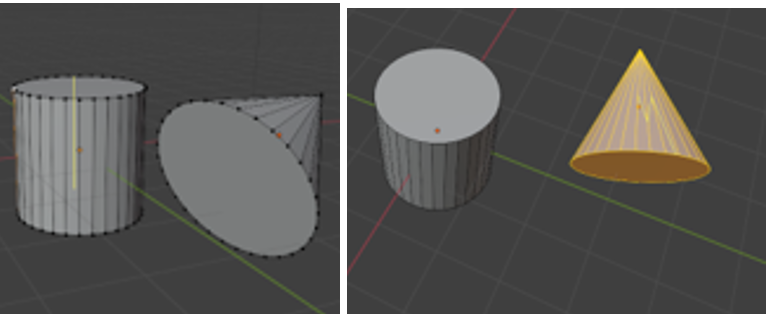


Blender will also throw Ngons at you on some of its default object. Take for example either a cylinder, or a cone. You will find that the end of the cylinder is an Ngon, and the entire Cone object is an Ngon because even the sides of the cones is made up of 3 sided triangles.



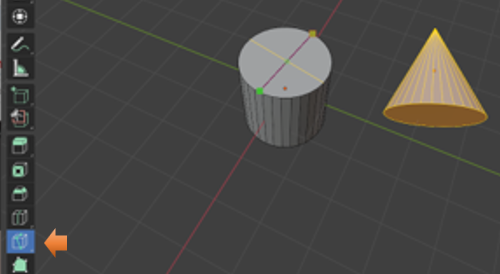
And if you try to Loop cut an object and expect to have these Ngons, be included in these loop cuts, you will be sorely disappointed.

You will see again it will try to make a cut, but the loop cut will not encircle the entire object, like it should. And just look at the zig-zag loop cut attempt on the side of a cone.



# The Knife Cut Tool

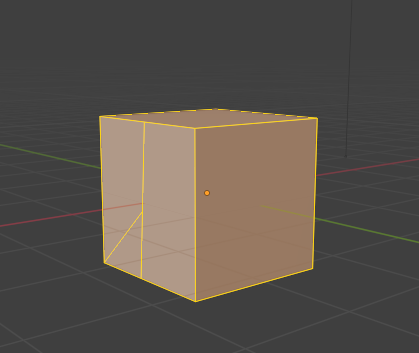
With the knife tool, we can make customary cuts, and these cuts will go through a Ngon, as well as any 4- sided surface. The only thing is with a circle, we have only created more of these Ngons.



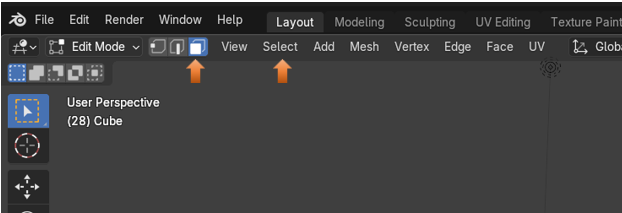
# How to Find Ngons

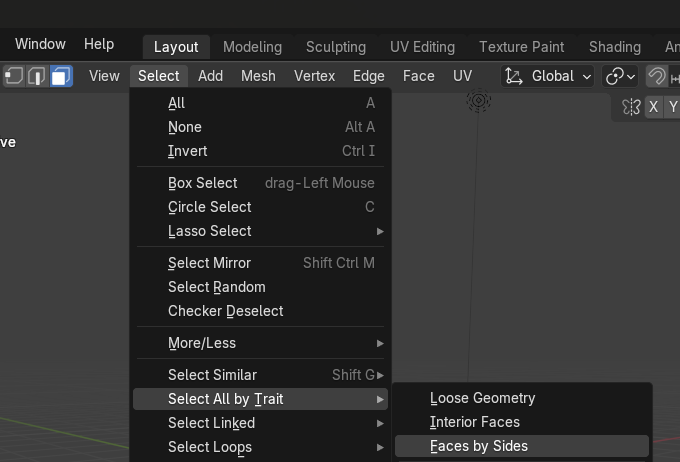
Sometimes we may be going along slicing and dicing and create Ngons without realizing it. So, we may want to find these Ngons and try to rectify them. Blender does provide an easy way for us to do this.

Ok, for this one, let’s start off with a cube, with a few knife cuts in it.



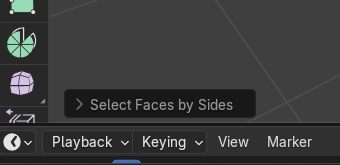
Go to the Select Menu option, in the Sub Menu above the viewport. Go to Face Mode for this.



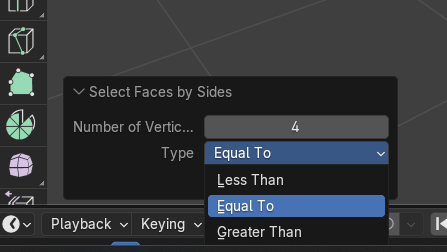


At the bottom of the screen, you will see the Last Operation dialog box. It should default to Equal

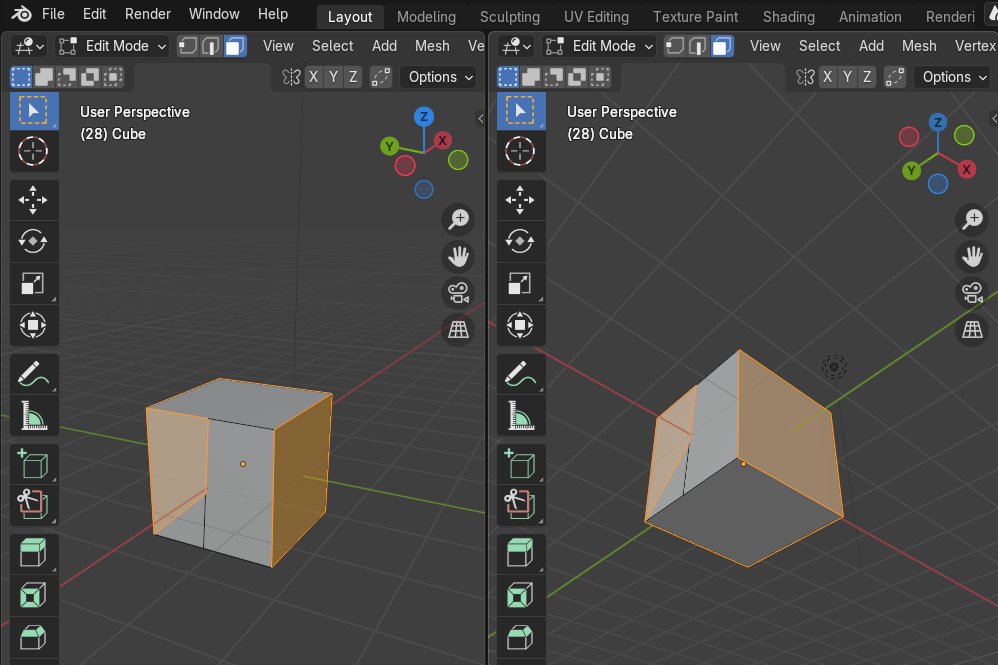
To.



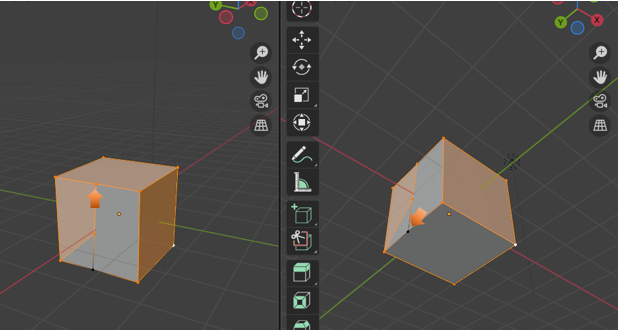
You have all of this option now to choose from. But if it is set up to select equal to 4 (the default option), it will select all of the quads. The surfaces that are left unselected will be your Ngons.



Notice that the top and bottom surfaces are also not selected as quads. This is because they are not.



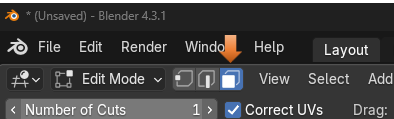
You can go into your vertex mode to see why these faces could not be accepted as quads. Because of your knife cut, you have created an additional edge, which you can see by having an extra vertex in the center of the top and bottom edge of this sliced face.



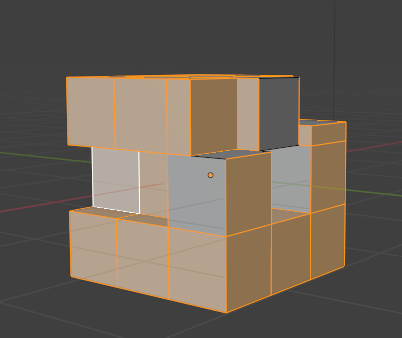
# Turn Ngons to Quads

Ngons are good enough to go for the most part unless you are having shading issues. Then you might want to try and turn your Ngons first to Triangles, and then to Quads.

Go into face mode

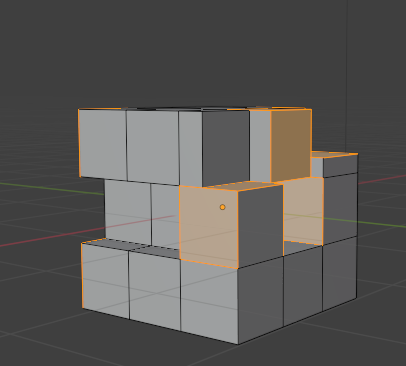


Now we want to try and [find all the Ngons](#_How_to_Find). Once you have your quads selected, you need to inverse it to see only your Ngons.

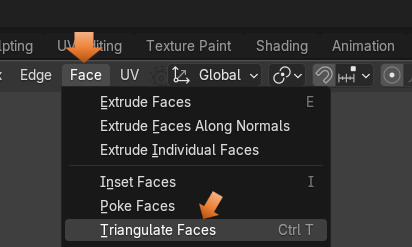


# Inverse Selection

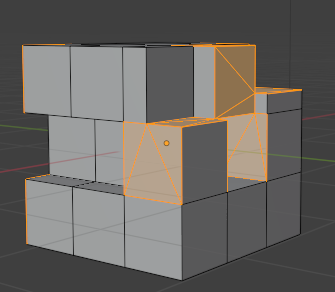
Hit Ctrl- I to inverse the selection



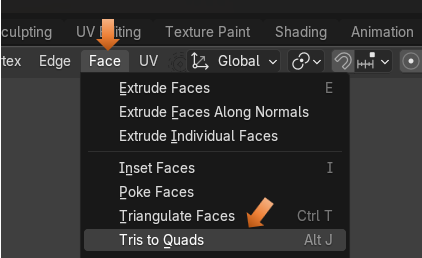
Go to the Sub Menu and Select the Face Menu. You want to first Triangulate Faces.



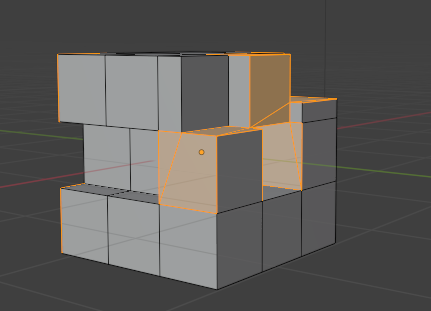
You will notice this will slice up everything into triangles.



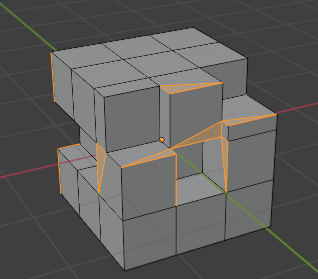
Now from that same Face Menu, you want to select Tris to Quads.



Now you notice things a sliced up a bit differently.

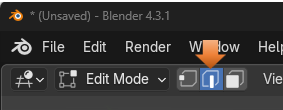


You can fine tune things from this point. Since it will not be perfect.

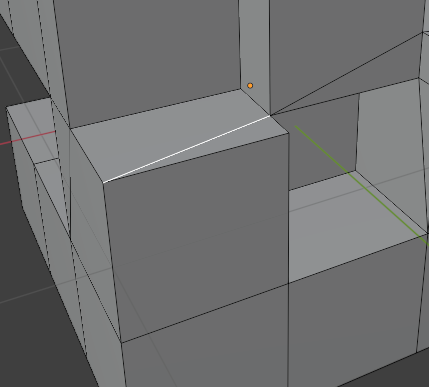


You can dissolve that inner triangle edge to make the face a whole square.

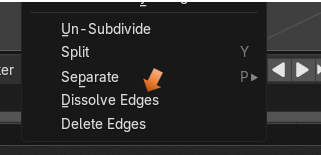
Go to edge mode.

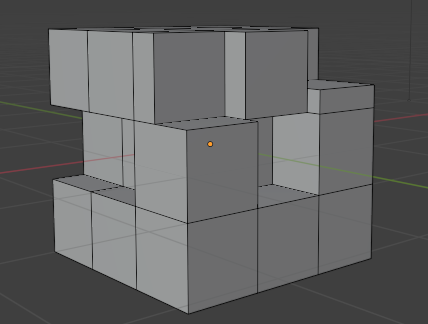


Select that inner edge that is forming the triangle in the 4-sided face.

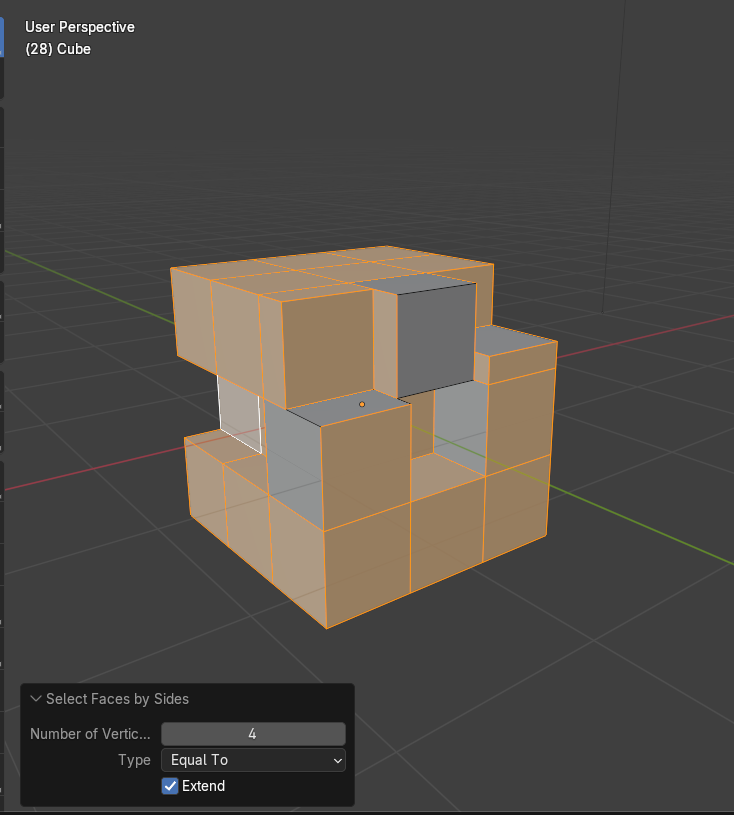


Right click on that edge and choose to dissolve Edges from the context menu at the bottom of the list.





But when you run your [Select by Trait test](#_How_to_Find), you will still see a problem



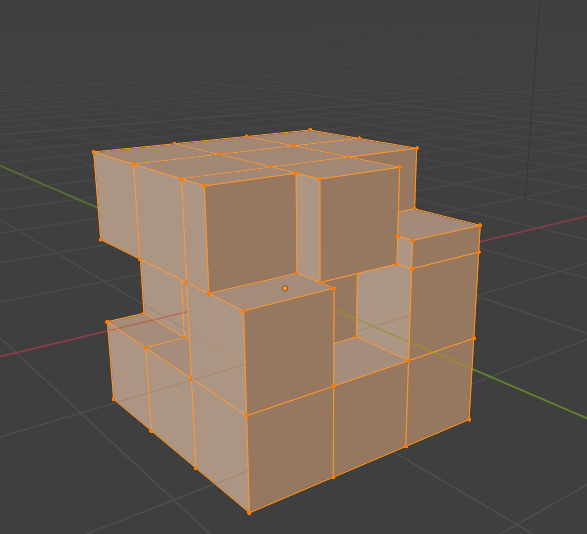
# Cleanup

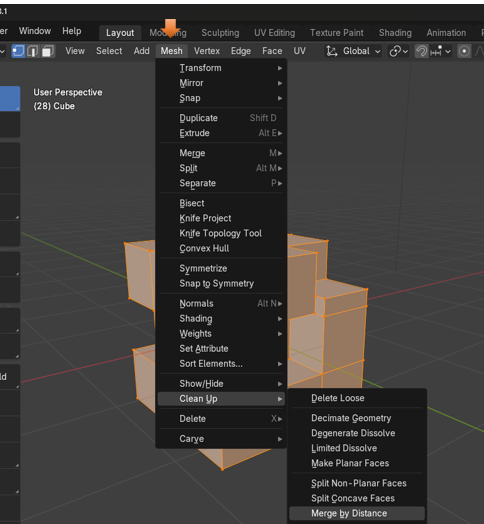
Not done yet, because you need to clean up extra vertices.

Important! Make sure you are in Vertex mode before you start this process.

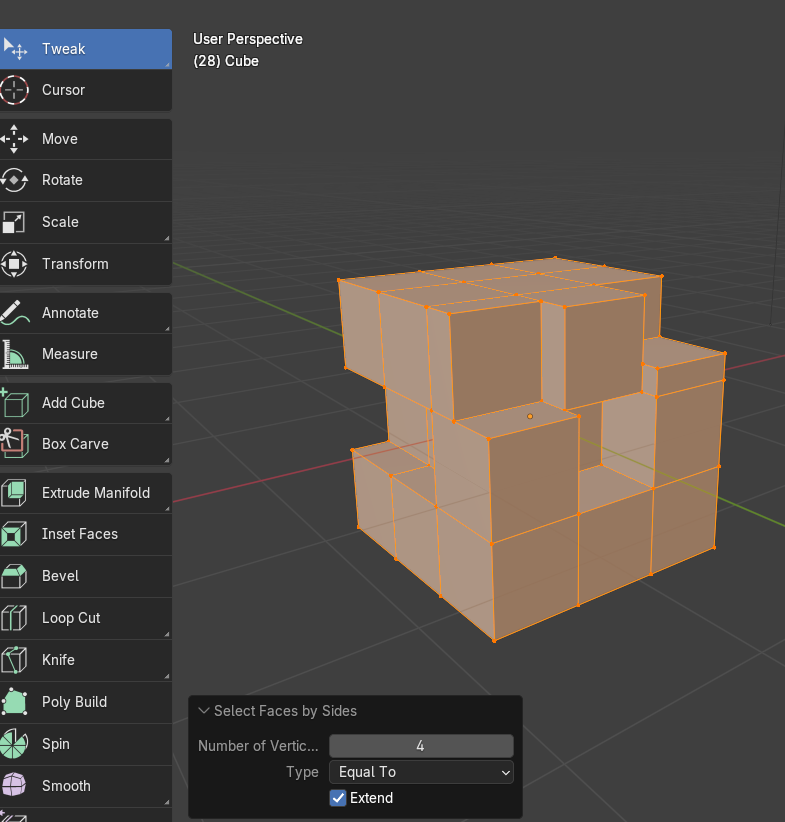


Select All. Hit the A key to select the entire cube.



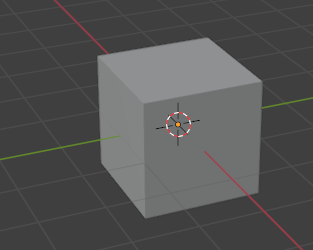


Now running your [Select by Trait test](#_How_to_Find), you will no longer see a problem. Now all of the object has turned orange. So, it is all Quads.

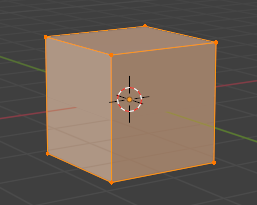


# Changing a Triangle to a Quad

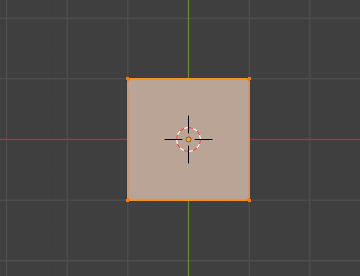
Start with your cube in Object mode.



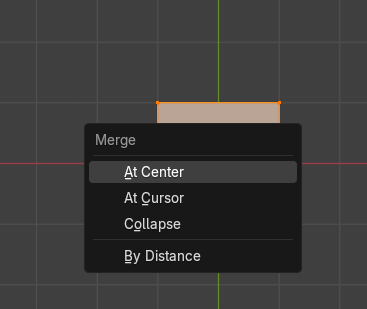
Take that into Edit mode



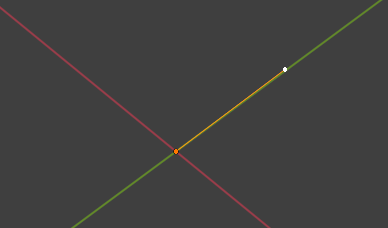
Hit 7 and go into top view



Press the A key, then hit the M key and select merge at center.

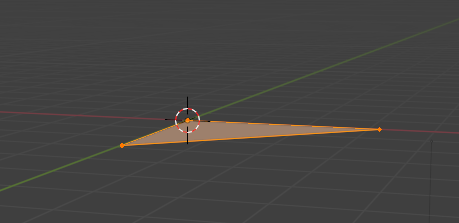


Here we are beginning to create a right triangle from our single vertex using the Extrude tool.

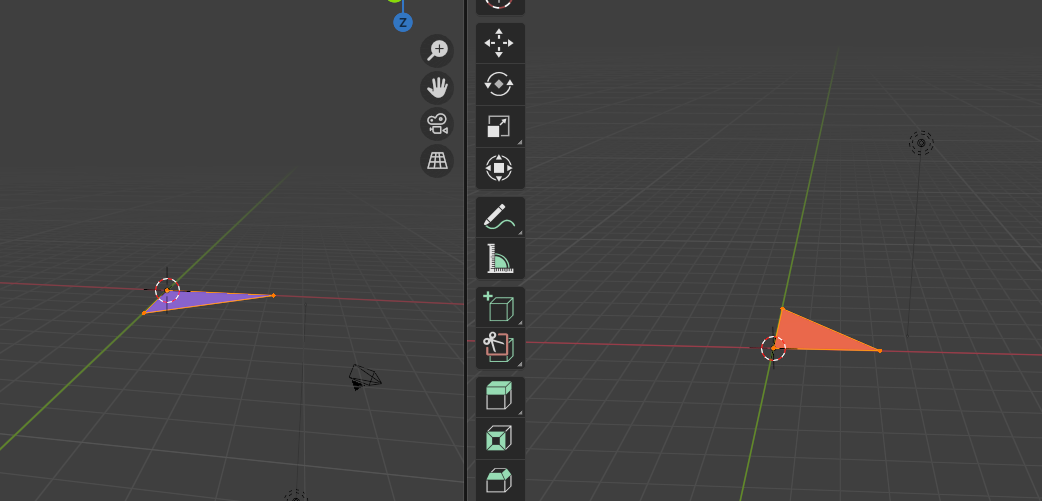


# To Fill

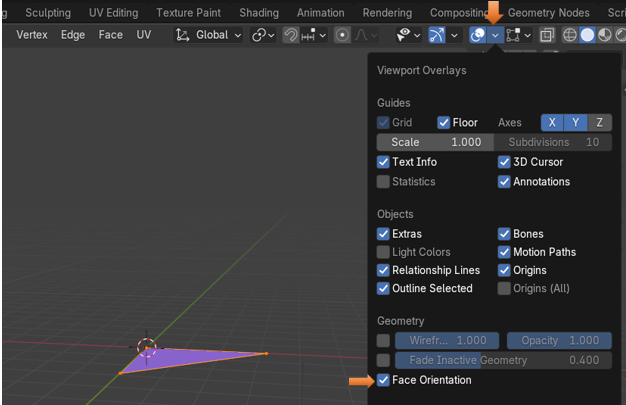
After creating the shape with the extrude tool, and the single vertex, select A, and then F to fill it.



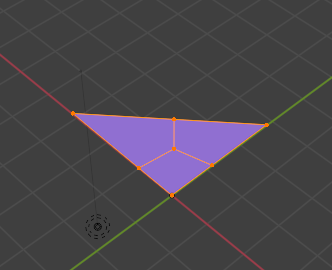
Sometimes they come in backwards. So, you want the blue side facing up. That is the front or outside, and the red is the bottom or inside of an object.



Go to Face Orientation to turn it on or off with the check box



Use the Knife tool to make cuts in these types of objects that you create free hand with a single vertex and the extrude tool.



Well, that is about it, on Ngons. So, if you are having an issue with these things, just apply a few of these tricks to keep yourself out of Ngon trouble. Just uncheck that box to come out of it.