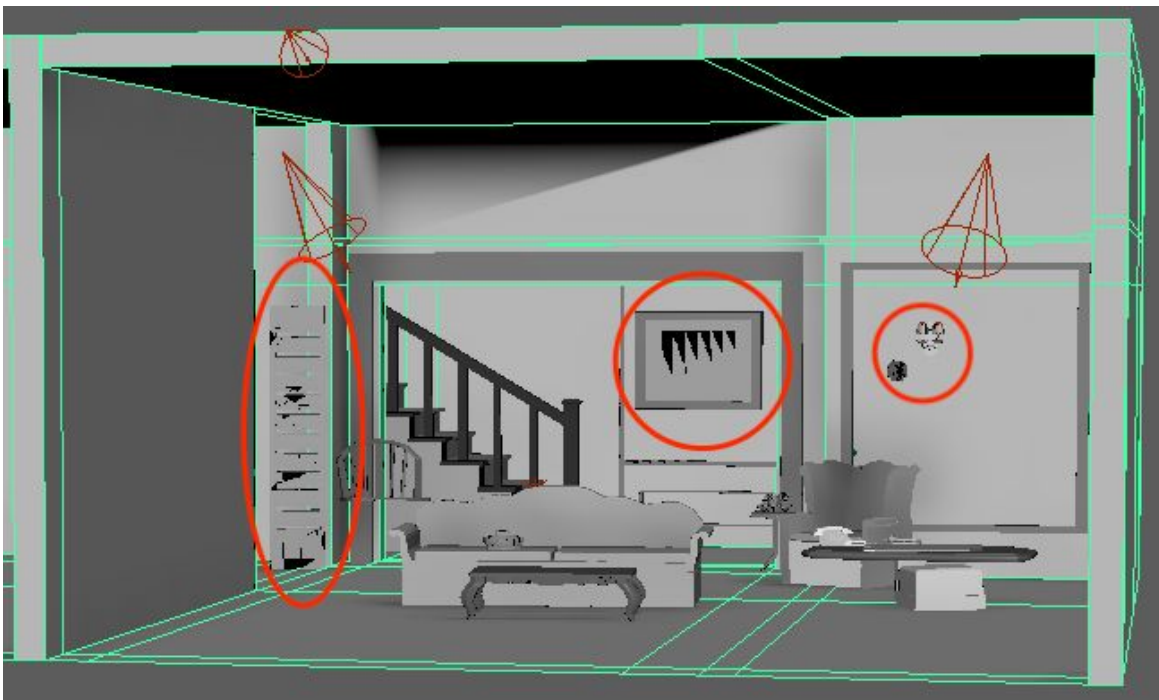


Flickering During a Render; Interpenetrating Geometry

What is Interpenetrating Geometry?

Interpenetrating Geometry is when a model has two faces directly on top of or directly intersecting one another. This can cause a longer render time, flickering within a render, problems with applying textures, and possible lighting issues.



Possible Fixes for Interpenetrating Geometry

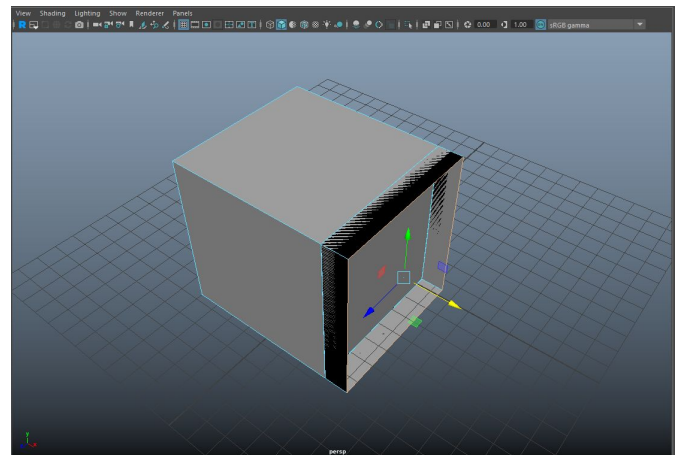
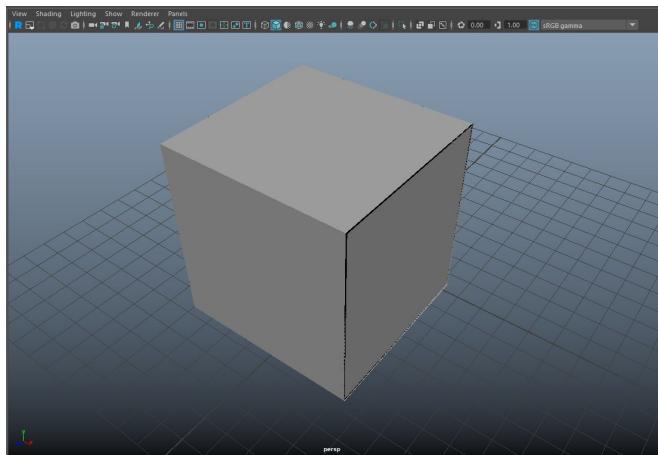
There are different ways to fix interpenetrating geometry. Some of these techniques include: Deleting afflicted faces, quad drawing, and remodeling. These

techniques have some pros and cons to them and it's important to determine the best course of action.

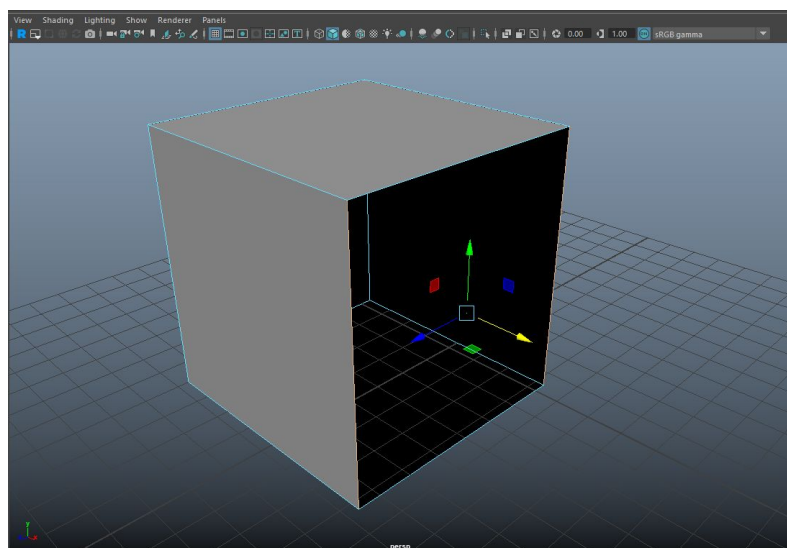
Deleting Afflicted Faces

Deleting the afflicted faces means to look at the asset and determine what faces are causing the render issue. Once you find them, you can delete them completely and re-bridge the exposed edges. This is useful for minor fixes within an asset. If there are more than a few problem areas, I would suggest quad drawing (next suggestion).

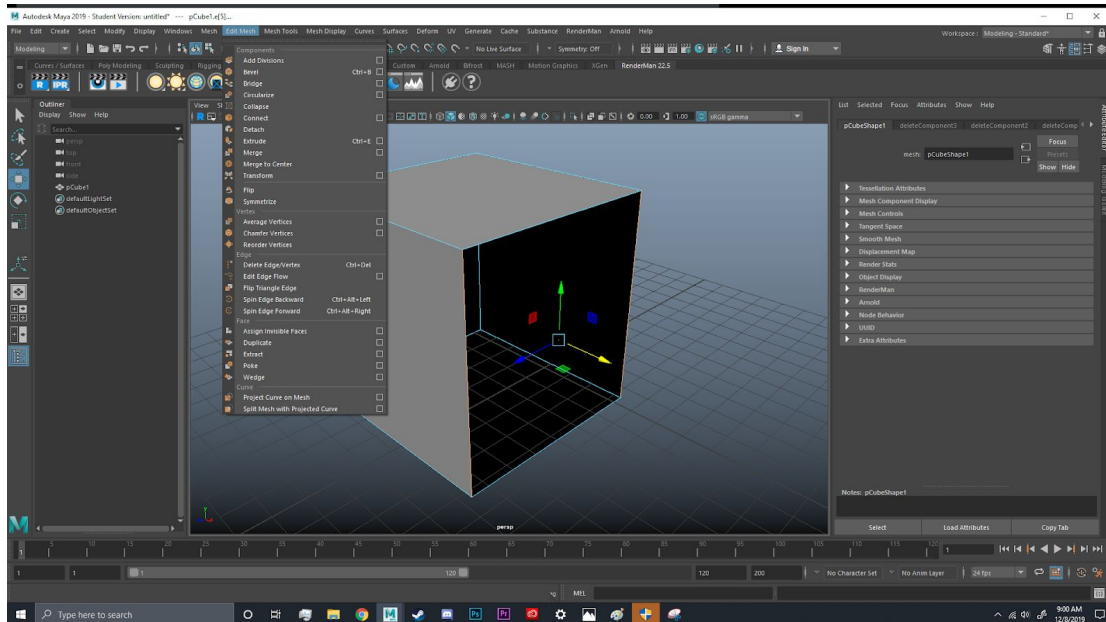
These images show some flickering along the edges of this cube.



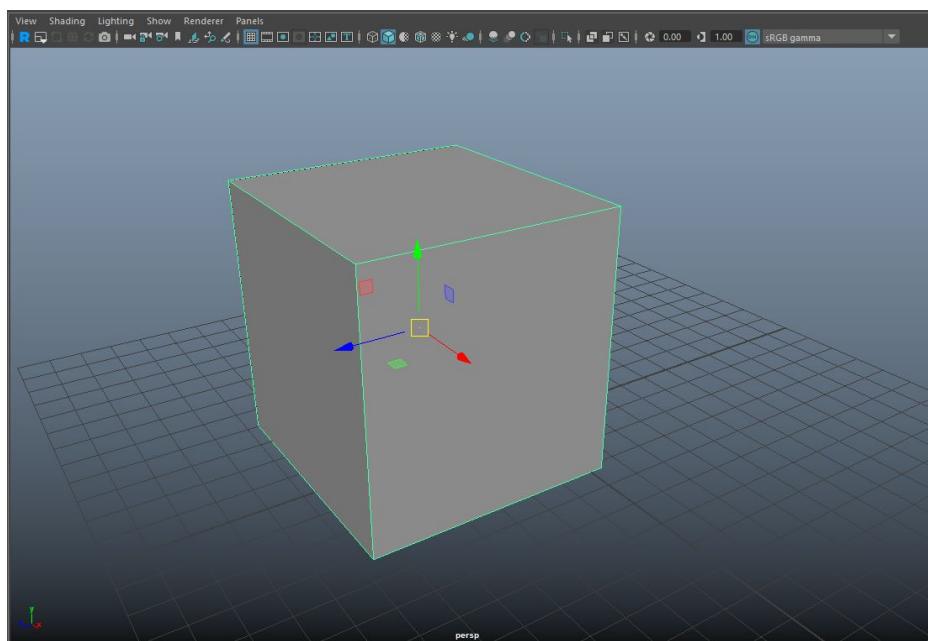
Deleting the front face, then selecting and moving the outer edges, reveals geometry sitting on top of each other. Select these extra faces and delete them.



Finally, select two opposite edges on the open area. In the modeling menu go to Edit Mesh → Bridge.



The hole should be filled and all vertices and edges should be connected.

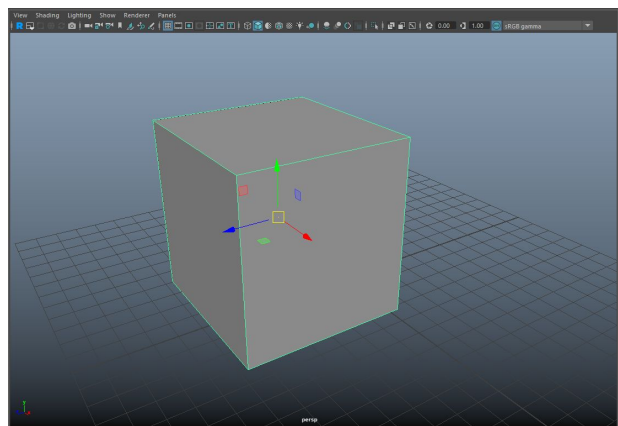
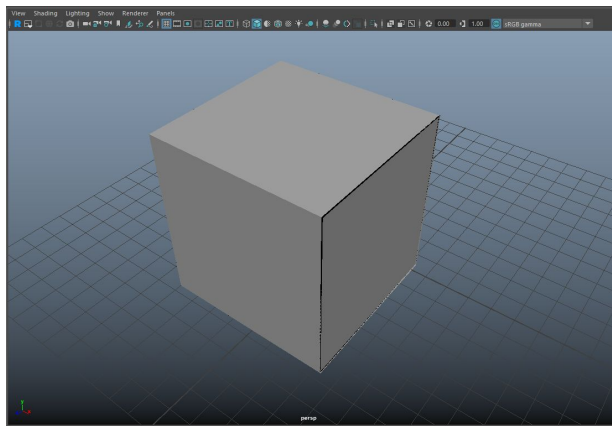


Quad Drawing

Quad drawing is a tool used to retopologizing meshes. This tool allows you to create clean meshes, while keeping the shape of your original model. The only real con to this technique is that it will take some time to retopologize the entire asset, especially taking into account how elaborate it is), however it is an easy way to assure a clean asset.

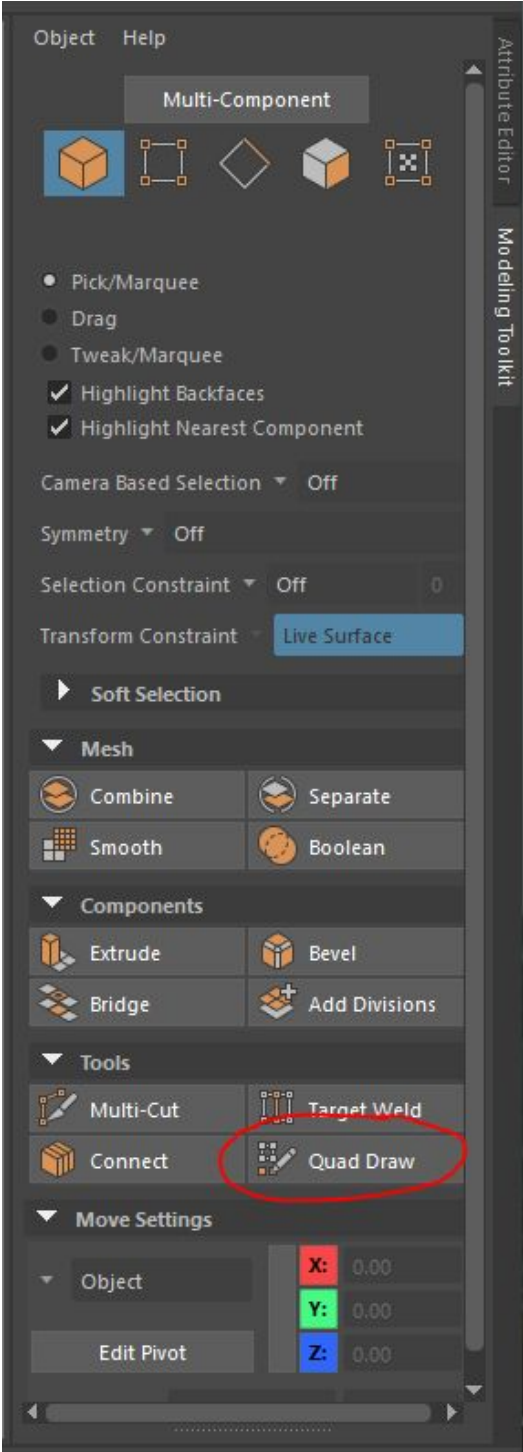
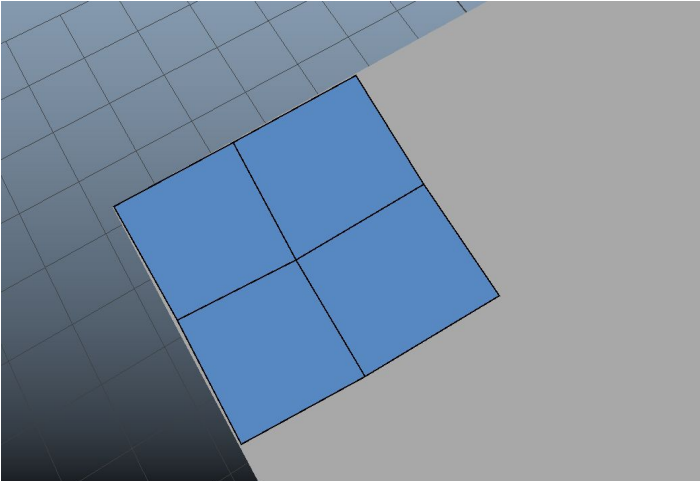
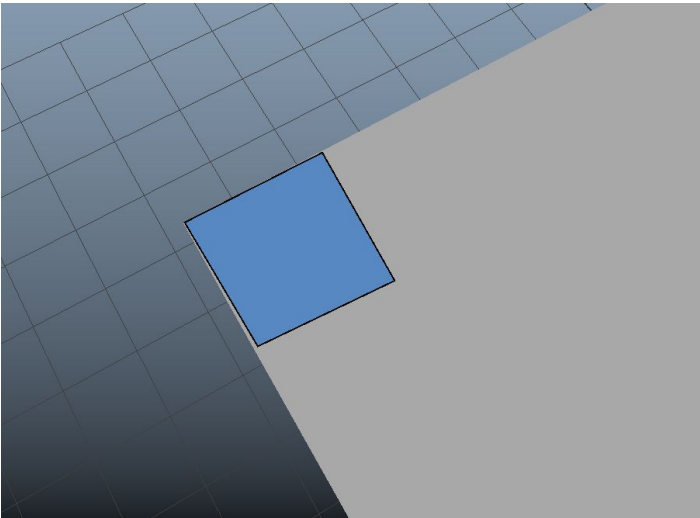
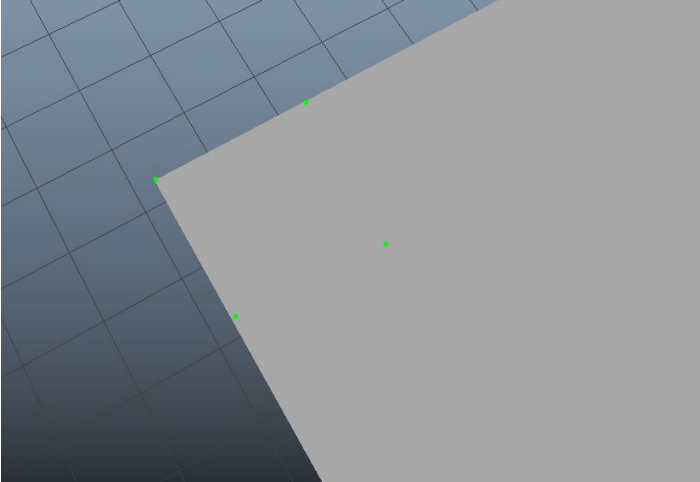
Let's take the same cube. The same edges have interpenetrating geometry and need to be fixed. To use the quad draw tool, the model must be in "live mode".

To do this select your model on object mode. Then click the plain magnet icon.



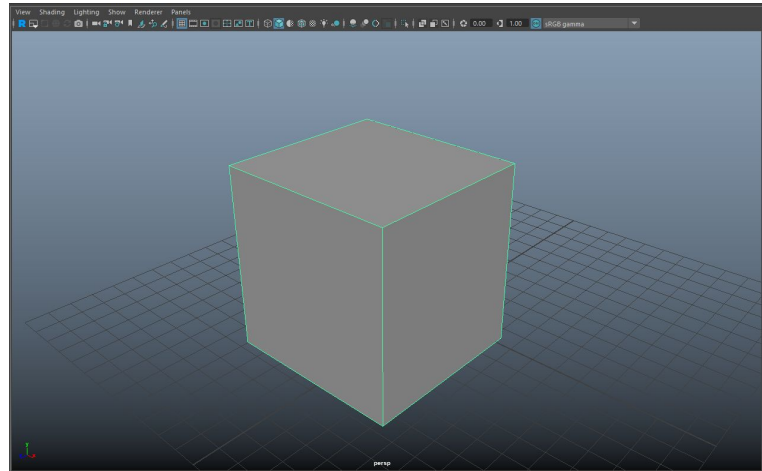
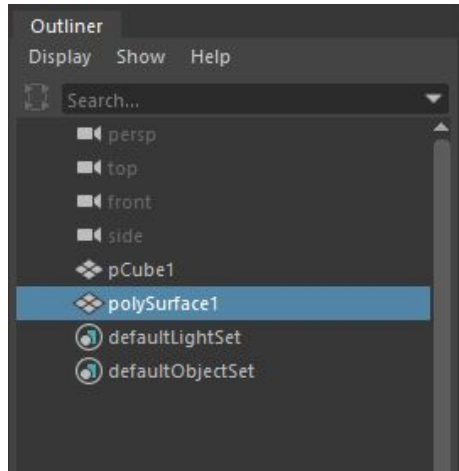
Next in the modeling tab on the side and **click the "Quad Draw" tool**. This will now allow you to model faces on top of your original model. There is also a handy drop down menu labeled, "Keyboard/Mouse Shortcuts". This dropdown menu has many shortcuts/ instructions on how to use the Quad Draw tool.

Clicking with the LMB on the model will create a single vertex, from there you can create a square mesh by clicking in between four vertices while pressing shift. Then you can extrude the quad surfaces.



For simplicity sake I used 6 faces, however, if an asset has a large flat surface, it's a good idea to break it up with geometry. After retopologizing, turn off quad draw AND live mode.

Delete the old model and keep the new topologized asset in the outliner (in this case keep polySurface1 and delete pCube1).



Some main actions you should know are.

- LMB = Click to create dots
- LMB = Drag to move dots
- Ctrl + Shift+ LMB = delete dots
- Shift + LMB (in the middle of four vertices) = Click creates a quad surface
- Shift + LMB = Drag relaxes the new mesh
- Tab + LMB = Click and drag an edge to extrude it out
- Tab + MMB = Click and drag multiple edges in a row to extrude it out

Remodeling

When an asset is being too difficult to retopologize using quad draw, I would remodel the asset completely. Using a messy model will not only affect render time, textures, and lighting, but it can cause many other problems as well. Sometimes the better options is to start fresh and that's ok! Just be aware of the time you have and keep

models as clean as possible. This will save yourself headaches and avoid problems in the future.

Conclusion

The safest route in avoiding issues is quad drawing an asset. It provides clean topology, as well as making sure there are no unnecessary faces interacting with others in a model. This not only prevents flickering within a model, but also cuts down on render time.