



---

## How To CAD Spiral Bevel Gears

---

You will learn to:

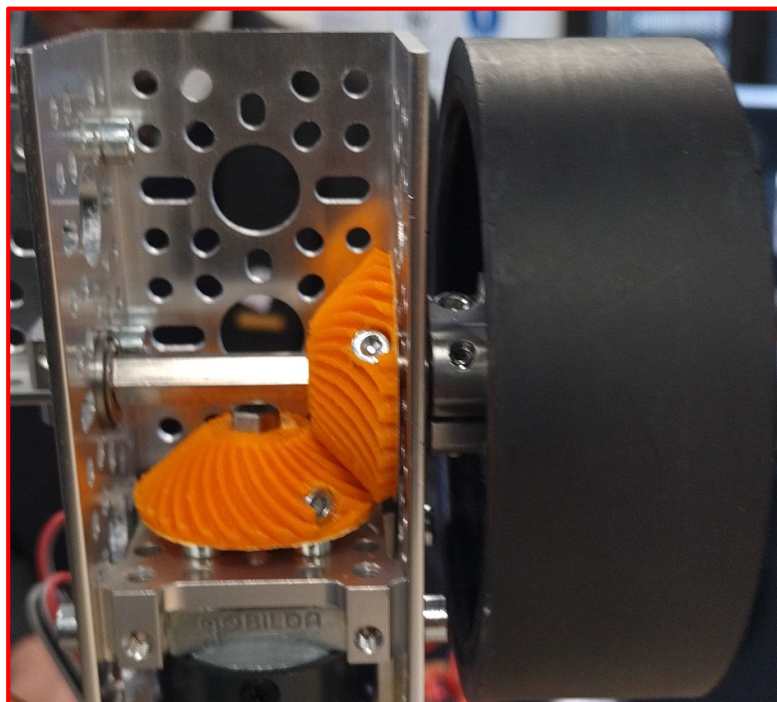
- ✎ Modify features in the timeline via the GF Gear Generator to make Spiral Bevel Gears
- ✎ Use the Loft Tool to connect profiles
- ✎ Use the Include tool in sketches

Please download the **GF Gear Generator add-on** before you proceed. It is **assumed that you know how to make bevels using it.**

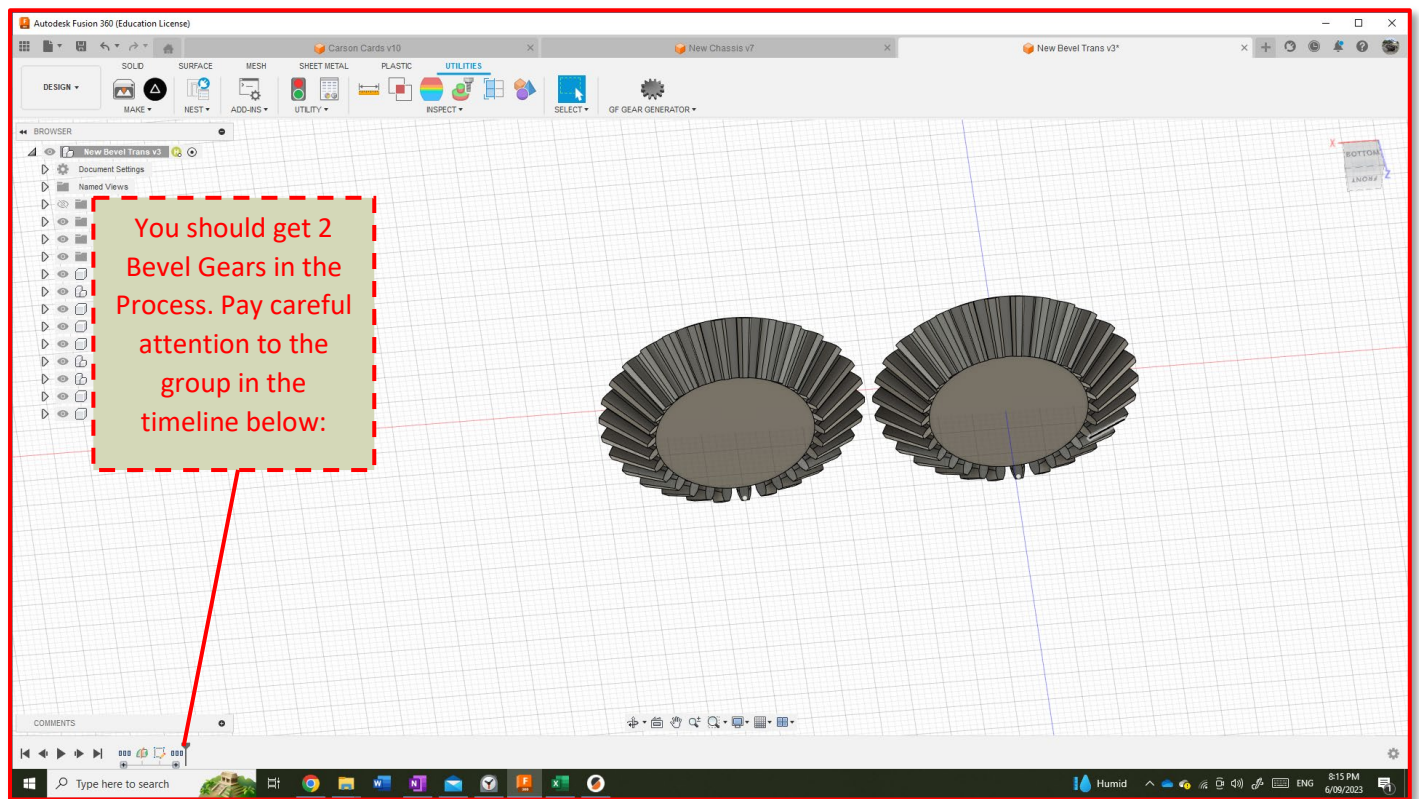
Bevel Gears are Awesome. But how do we make **reliable, smooth ones**? We can 3D print some of them using the GF Gear generator add-on. However, just using **straight cut bevels** will result in some... **unhappy accidents**. The **lower Surface Area** doesn't allow for the **stress** in high-load applications (such as gears) to be **distributed** effectively. This means that it breaks more often.

Also, as the **teeth engage gradually**, the meshing is much **quieter**, and the power transmission is **smoother**. The spiral nature of the profile **stops it from sliding**, and keeps it aligned well. This **reduces vibrations**, and overall makes a quieter component.

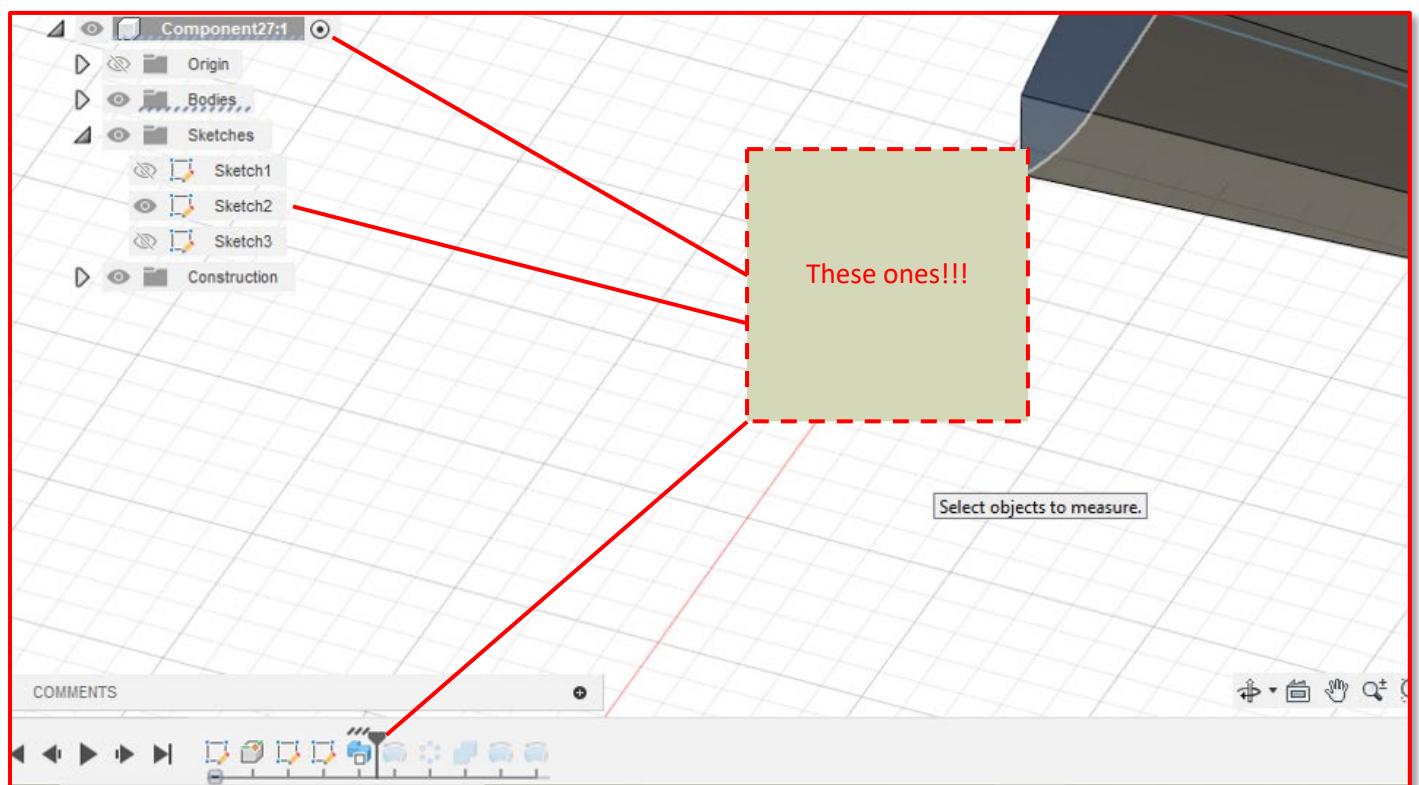
Not convinced about the benefits of Spirally Bevels??? See it in action:



Right, so how do you make one of these? First, make a standard bevel gear using the GF Gear Generator addon.

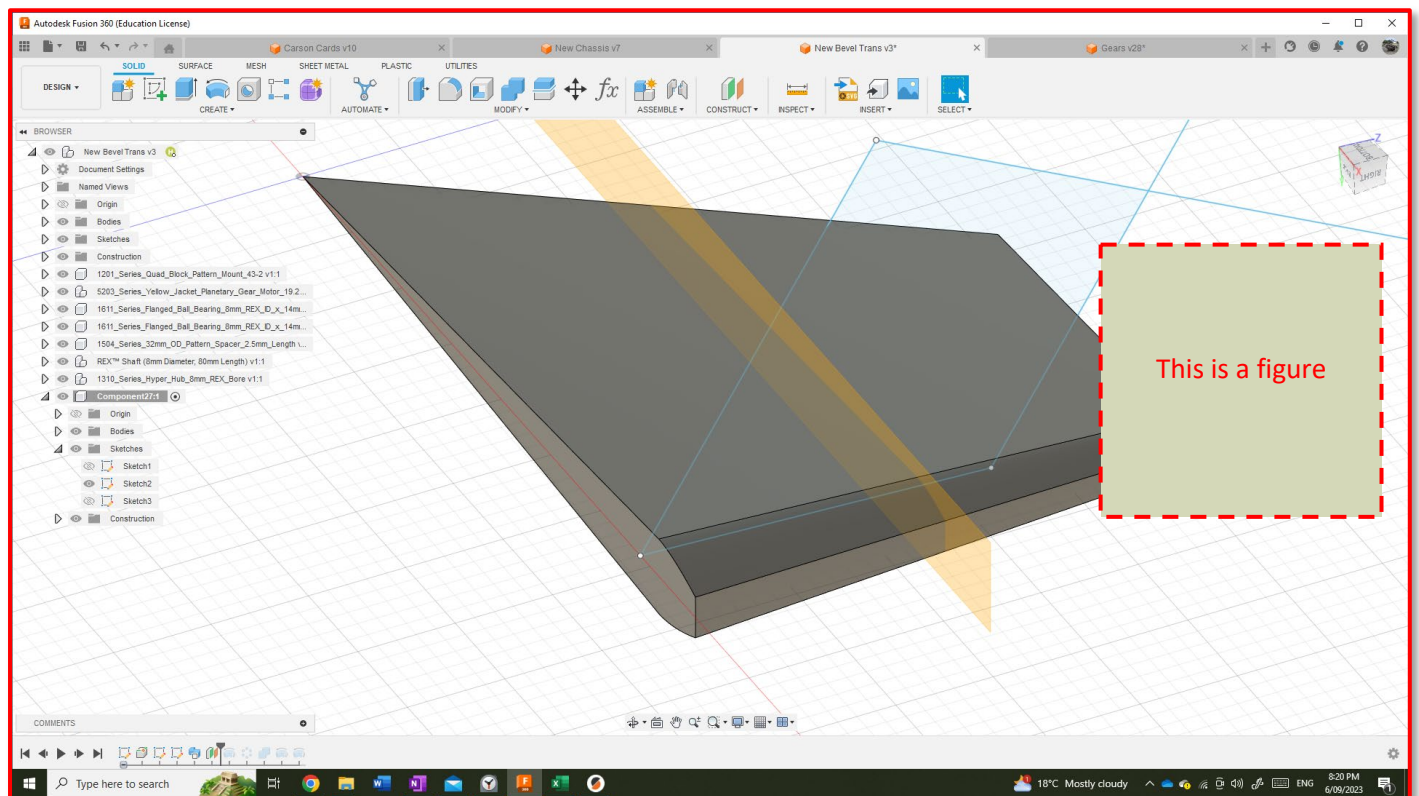


Then, expand the new tool group in the timeline and drag the tool to the loft feature. Make sure to have the bevel gear component selected! Unhide the second sketch, as this is the important one.

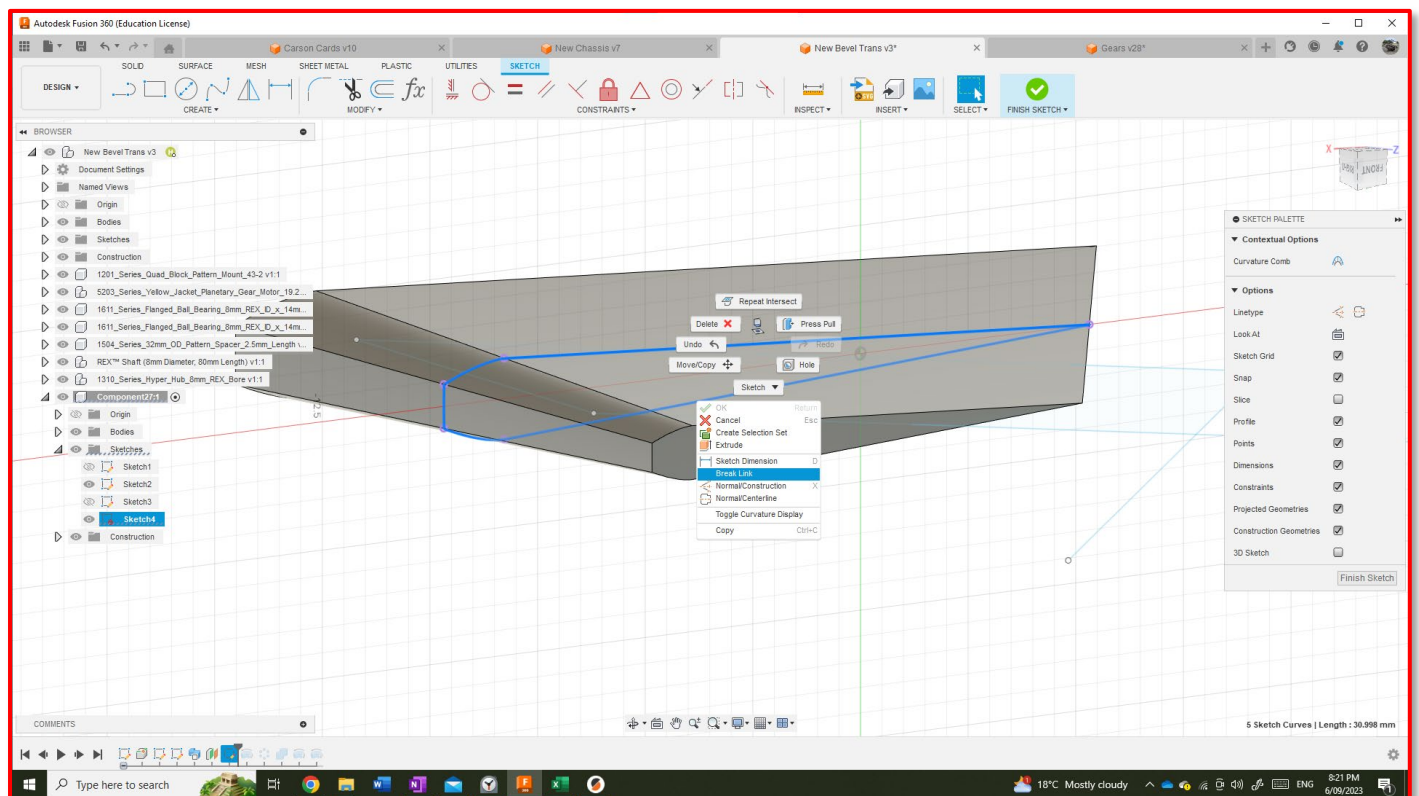




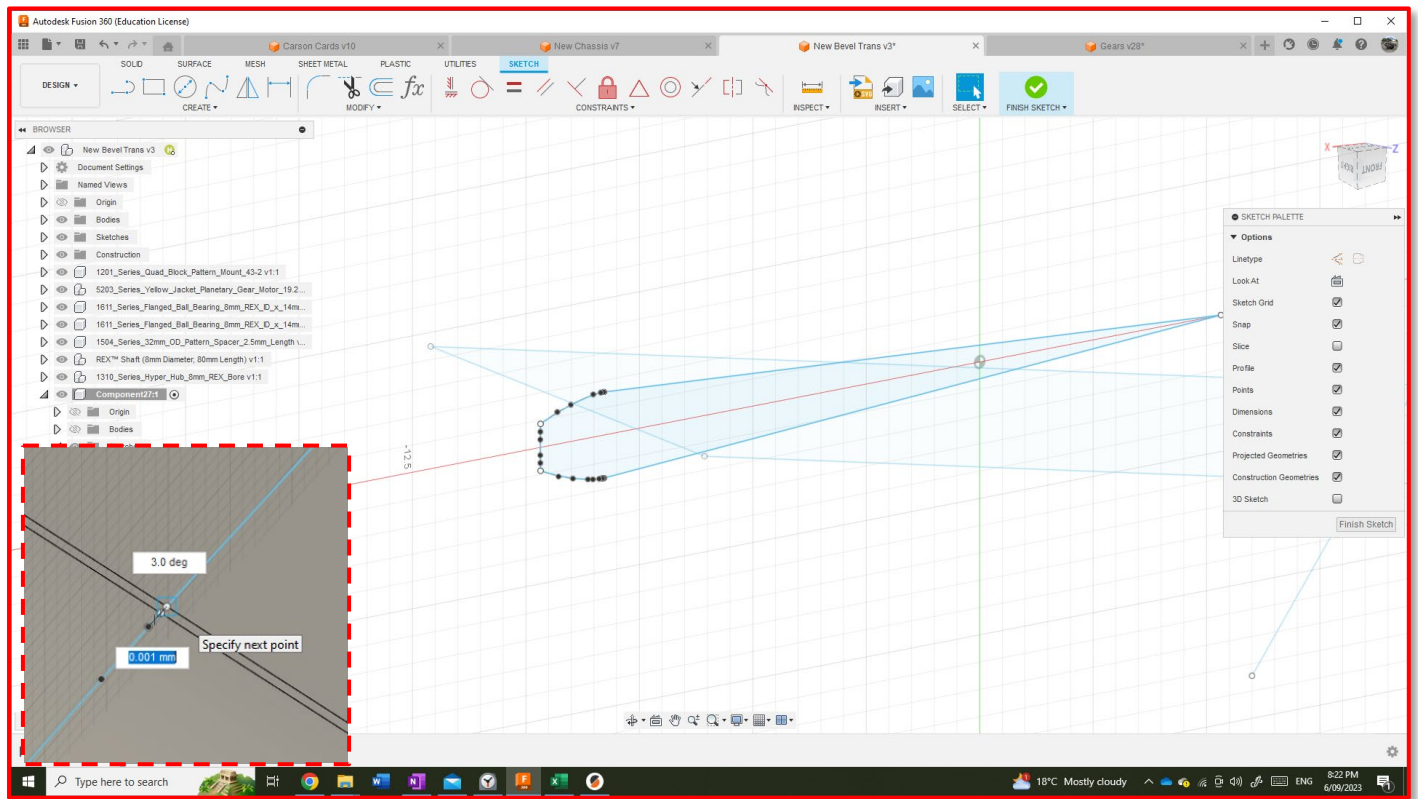
Right, now that that's set up, make a midplane between the 2 faces of the gear profile. This is done under the construct tool group in the solid toolbar.



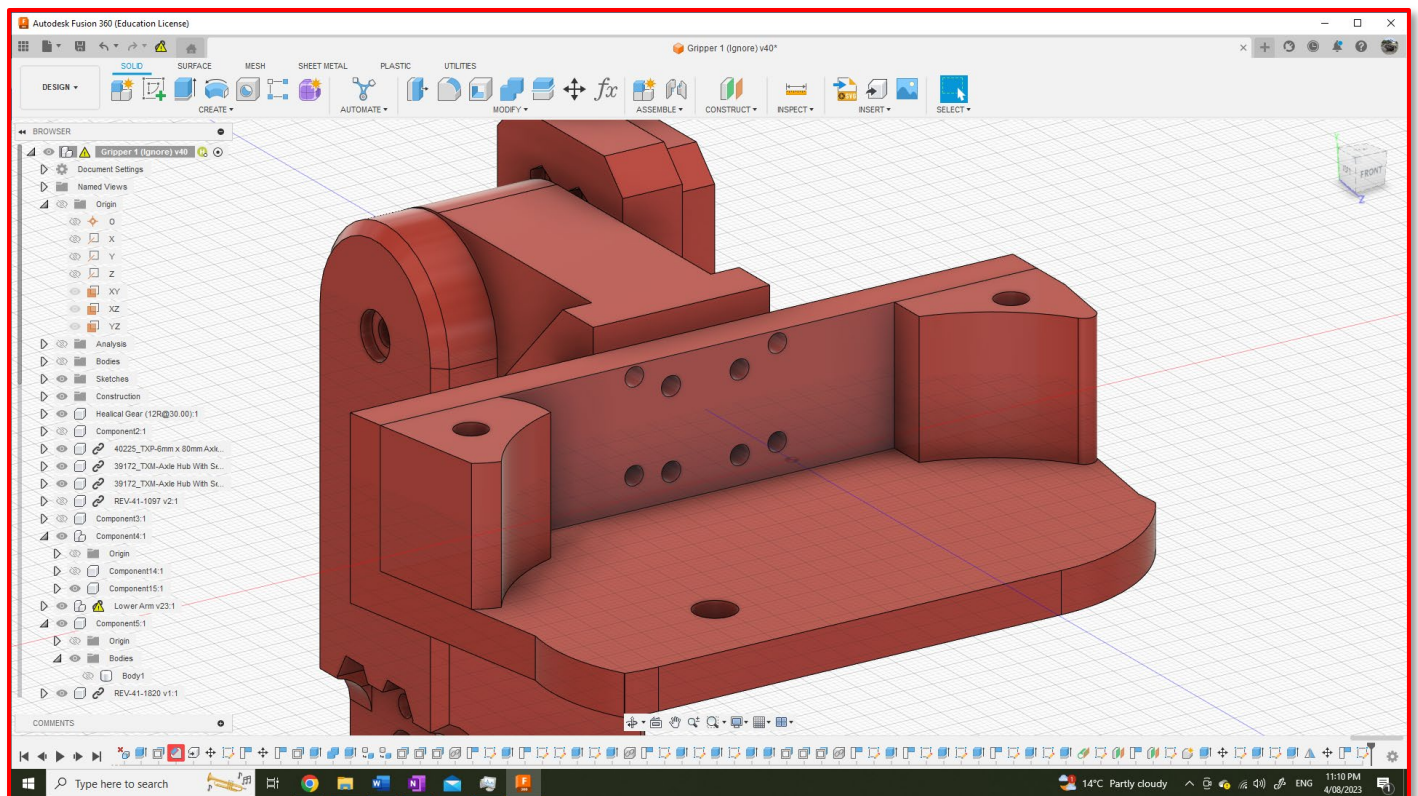
Awesome, next we've gotta make a sketch on that plane and use the 'include' tool. This sketch is going to serve as the midpoint in the loft tool. Then, break the link between the projection made to turn it into a manipulable object.



Now, there's this small inconvenience in fusion where sometimes it doesn't select everything to break the link for. Zoom into the profile to make sure all lines are connected, and if not, patch them up with the line tool. The end product should look like the below, where the sketch is highlighted light blue

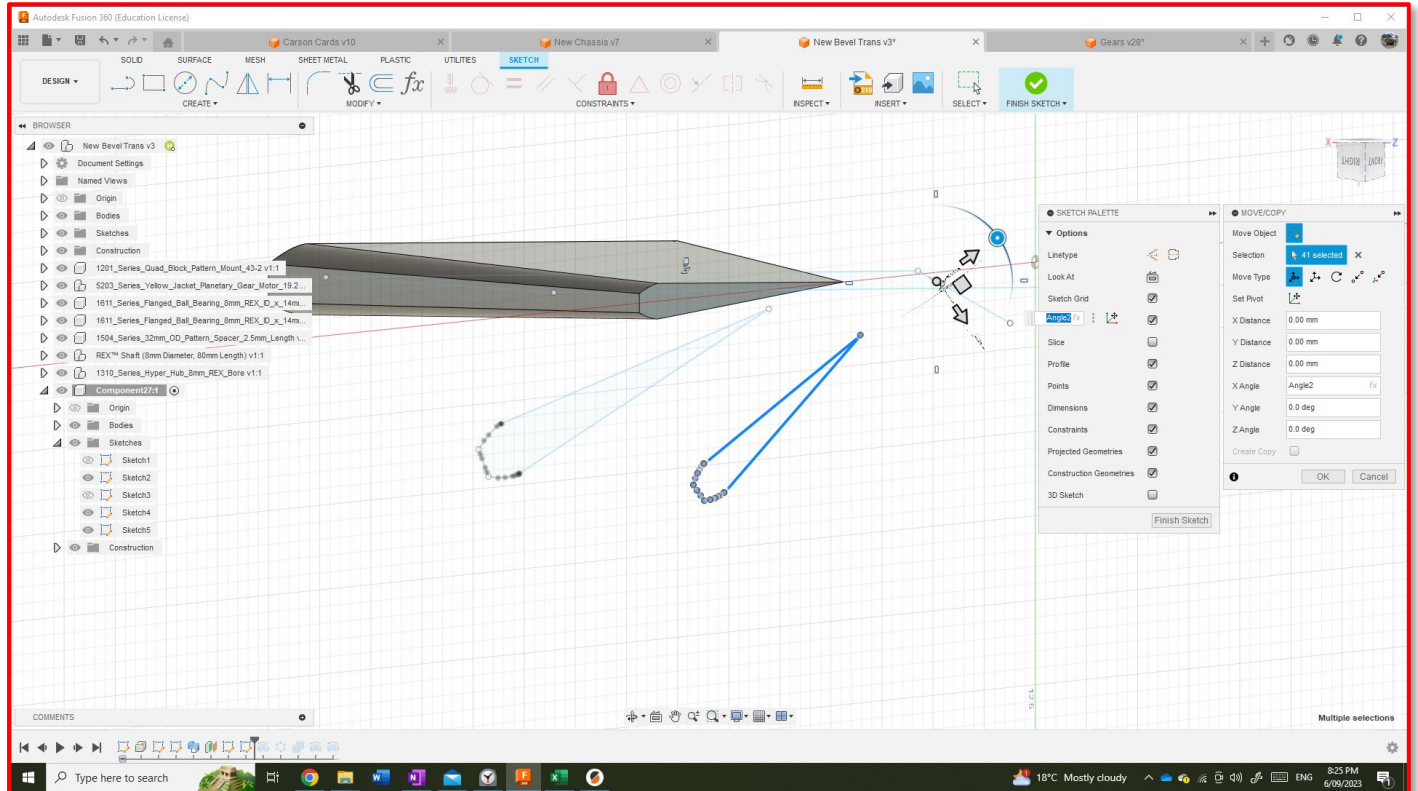


Next, create another sketch on the top of the body and project the top face. Break the link for this projection as well.

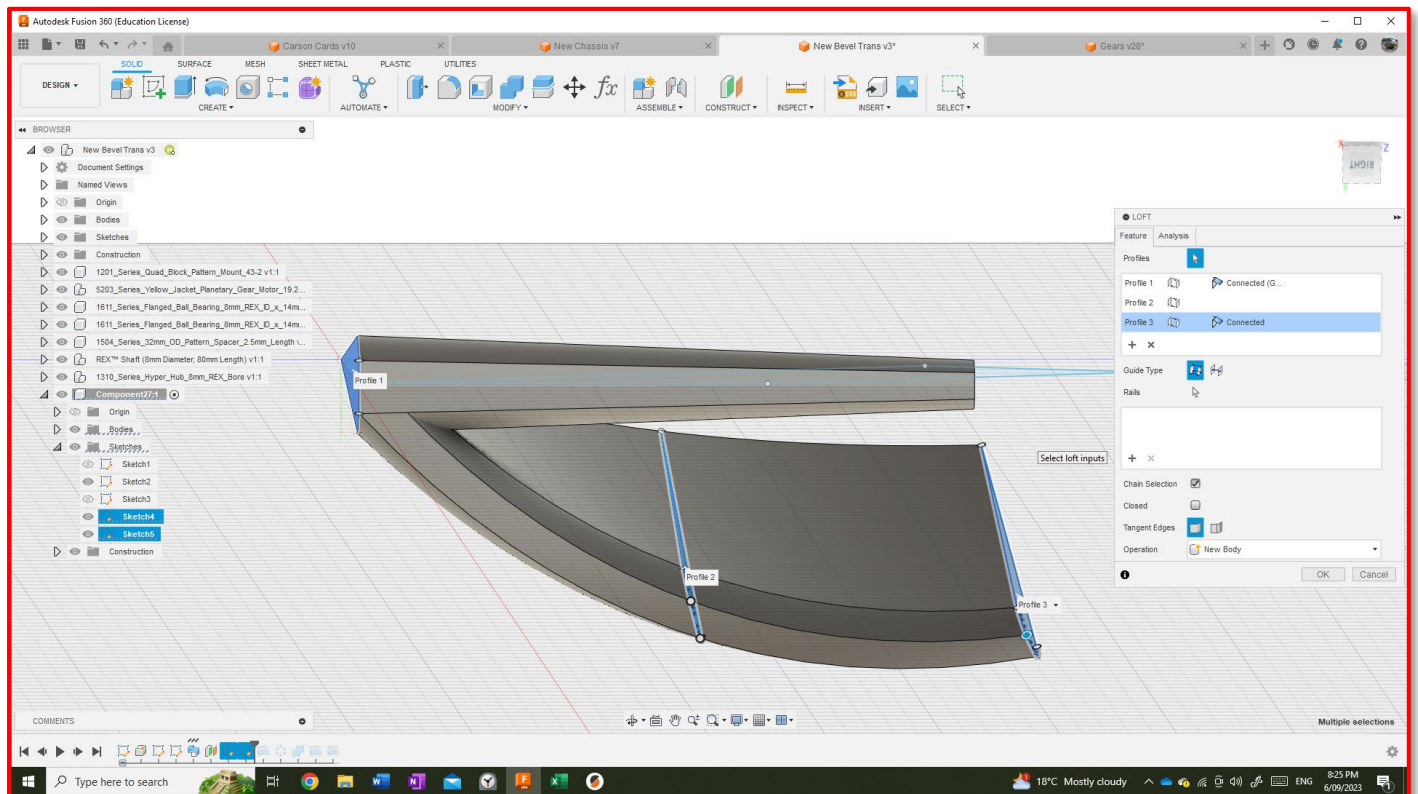




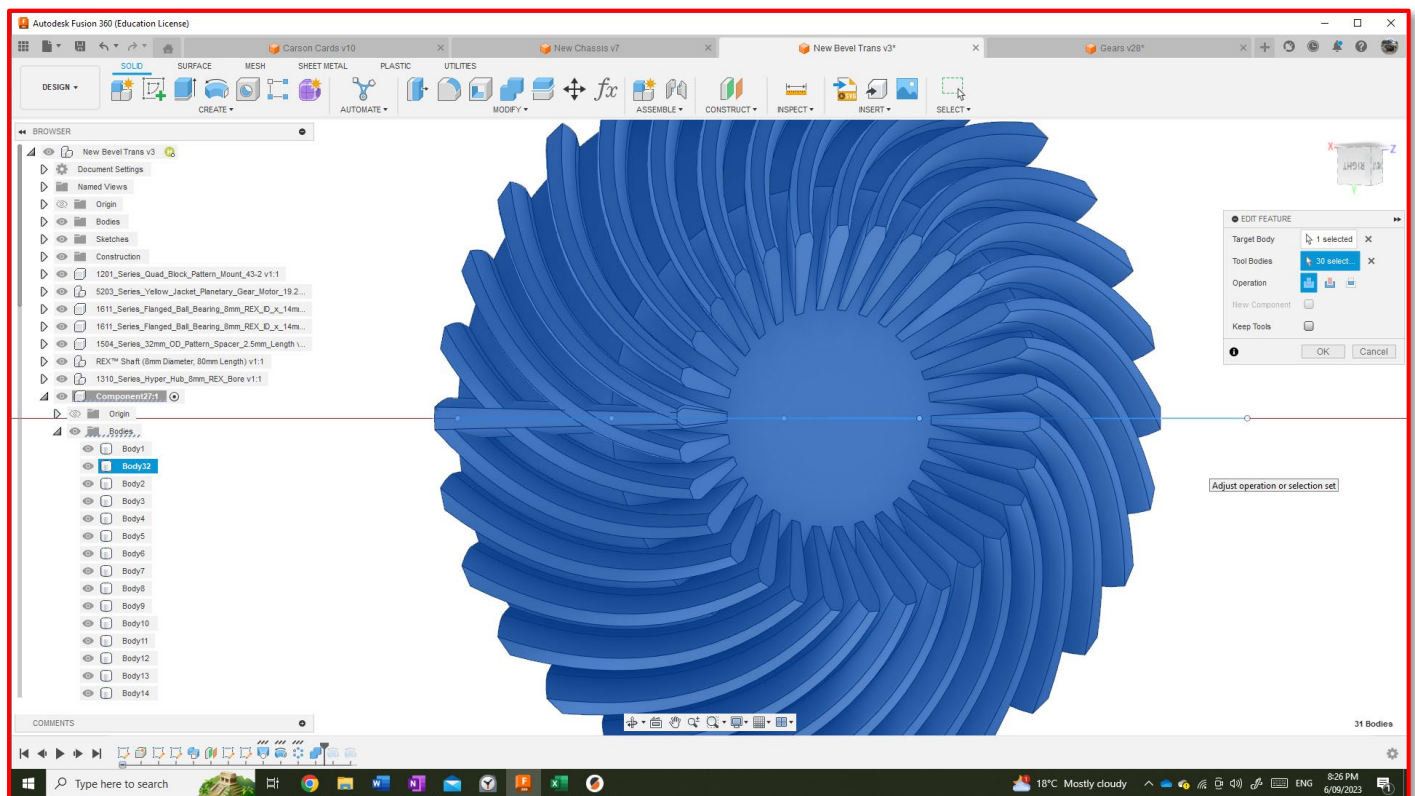
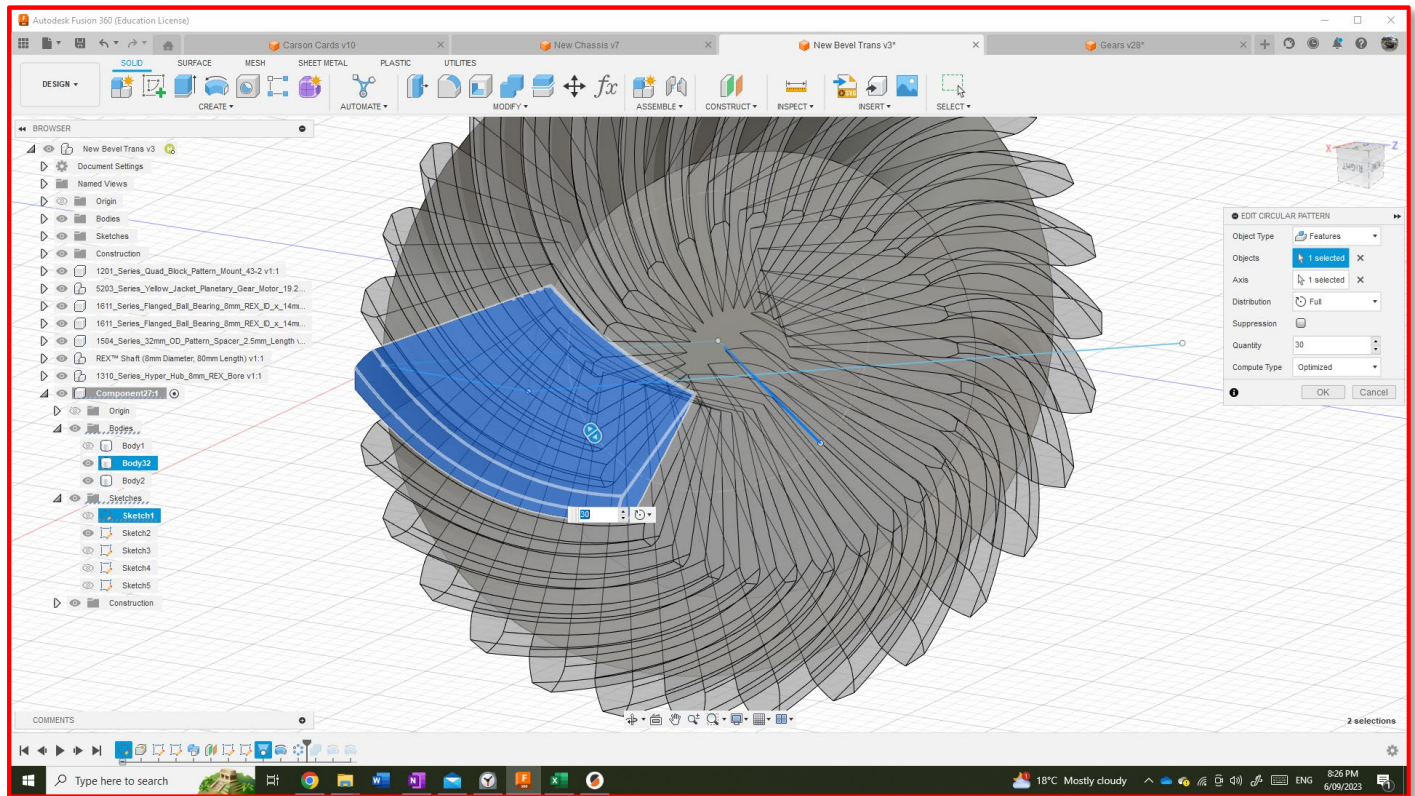
After that, these profiles must be rotated relative to the origin of the bevel gear. This origin is found in the second sketch. It is the longest n



Next, use the loft tool to connect these profiles together. This will serve as the basis of a single tooth within this gear.



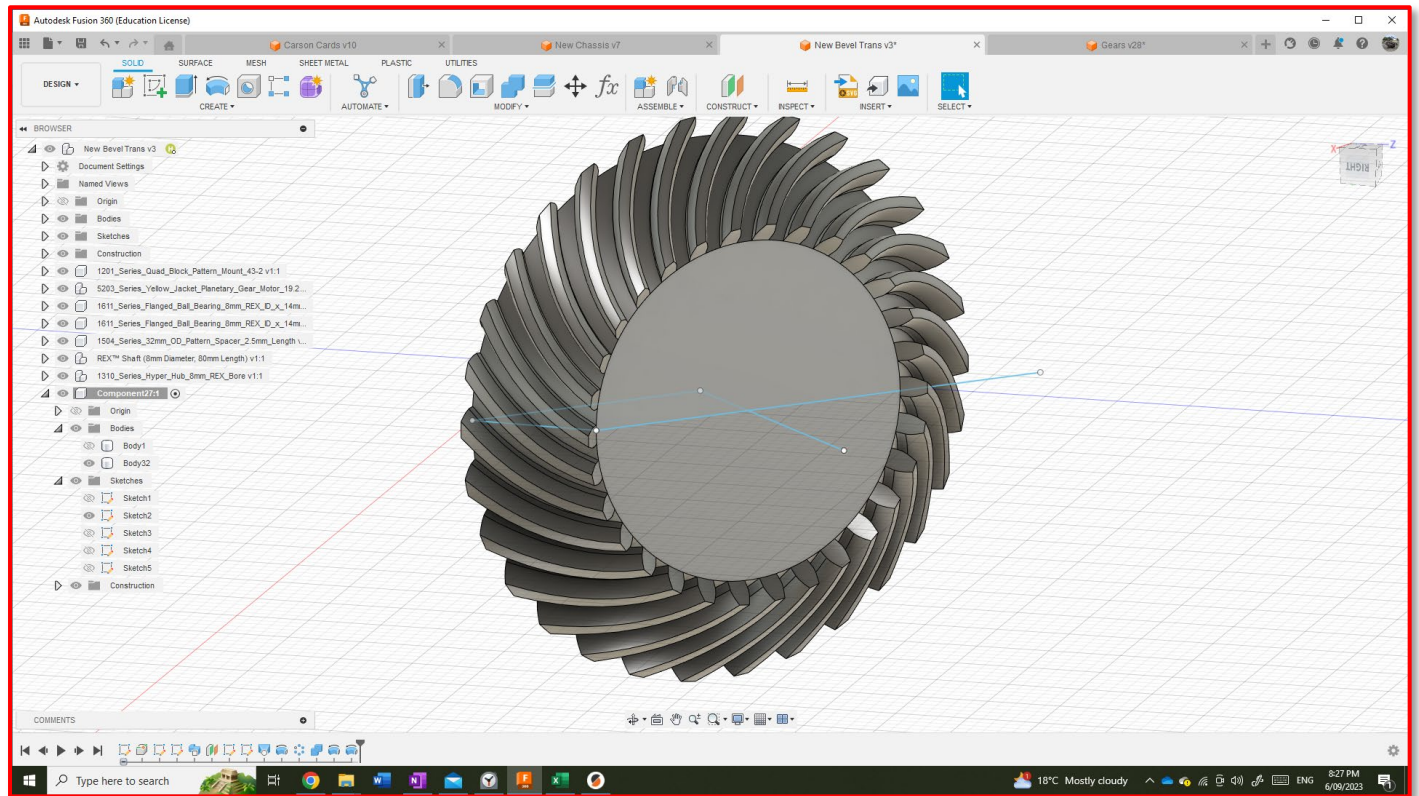
That's the hard part done. Now, we have to modify the circular pattern and combine tools so that it does this to our spiral gears. To do this, use the timeline, double click, and edit the object such that it is the spiral profile.





And that's the spiral bevel gear complete!

To get the mirror version to pair it with, use the mirror tool.



# The COMBAT WOMBATS

#23335 | QASMT

## First Tech Challenge Specialists

- Mehul Babu
- Shainthra Birabaharan
- Benjamin Crespy-Worth
- Nevaan Dias
- Daniel Laine
- Hugo Lawler
- Bhasu Madala
- Juan Santhosh
- Jack White

