

3D Car Reflection

The fourth project for E&D I was to create a 3D car replica of a toy car using Onshape. Picking any car style we desired, we first used graph paper to draw out a front, side, and bottom view of the car and labeled them with the proper measurements of the toy car. We then created a 3D drawing of our cars. We then used OnShape; we uploaded our sketches onto the website and carved out our car by sketching and extruding shapes from a block of the same volume of our car. Once finished with creating our car on Onshape, we'll print it using the 3D cutter.

The steps were as follows:

Design

- Measure the sides of the car we chose to get its exact measurements
- Sketch the front, side, and bottom views of the car, making sure the measurements are proportional for each sketch
- Draw a 3D version of the car on paper

Capture/Archive

- Scan/photograph the drawings
- Upload the iterations onto Onshape

Digital Design

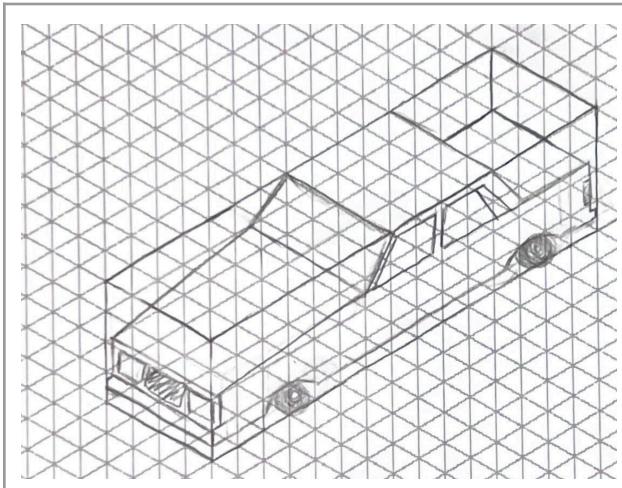
- Create a 3D block with the same volume as the car
- Upload the sketches onto their respective sides of the block
- Trace out the car using sketch
- Extrude the unnecessary pieces of the car

Fabricate

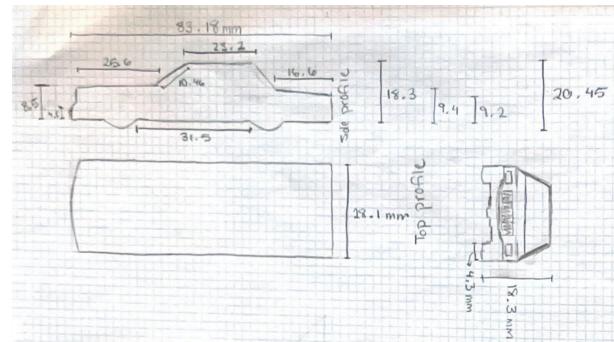
- We had to put our stl car file from OnShape into Ultimaker Cura to slice and generate a gcode file. Slicing the file allowed us to change the supports, adhesion, and material thickness to have success on the 3D printer.

The design process:

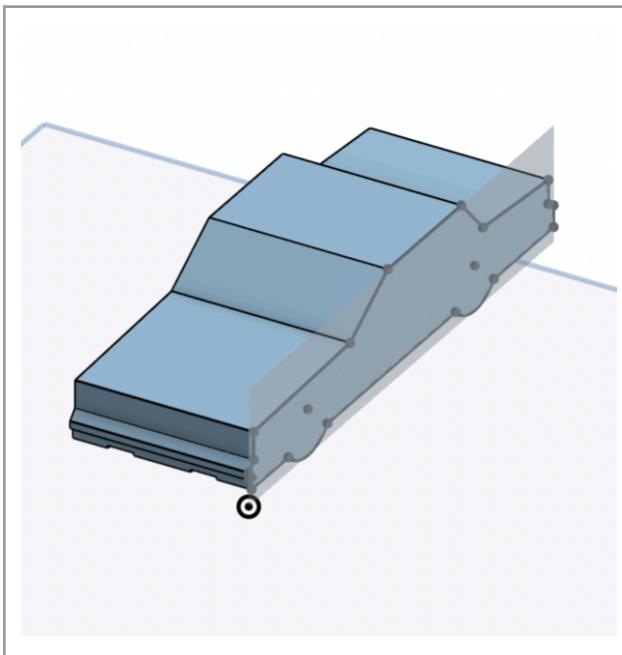
For the design process, I chose a car similar to the one my dad has had since he was 18. I started by measuring out the sides/pieces of my car, then sketched the front, side, and bottom views of the car and labeled them with their respective measurements. Next, I drew a 3D version of the car. Figuring out how to properly proportion the car to make it look realistic was the most difficult part of the drawing process. After finishing my sketches I uploaded the sketches onto Onshape and pasted them onto the respective sides of a 3D block that had the same volume as the car. I then traced out the whole car using “sketch” and then extruded unnecessary sections of the car in order to create the outline of a car. I then did a smaller extent of extruding in order to make the impression of windows, headlights, taillights, and a license plate. Once done with that I created a CAD drawing. Then I exported my onshape as an stl file and uploaded it onto Ultimaker Cura, sliced it to generate a gcode, and 3D printed it.



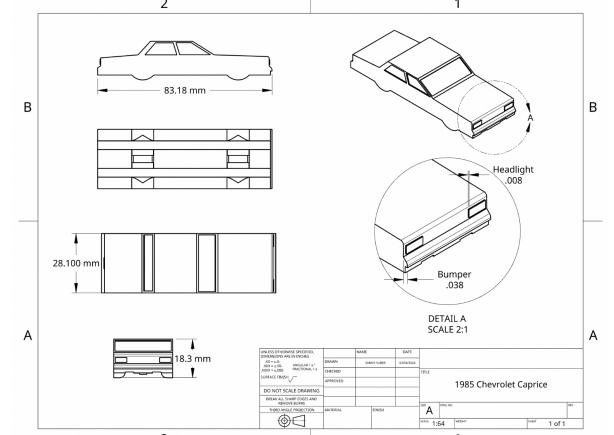
3D Drawing



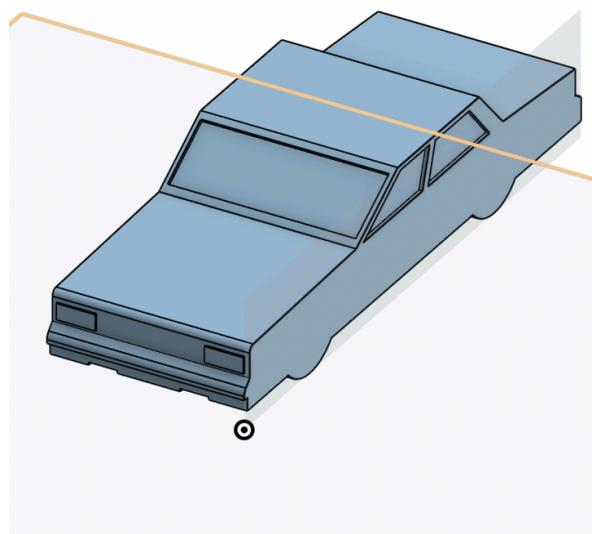
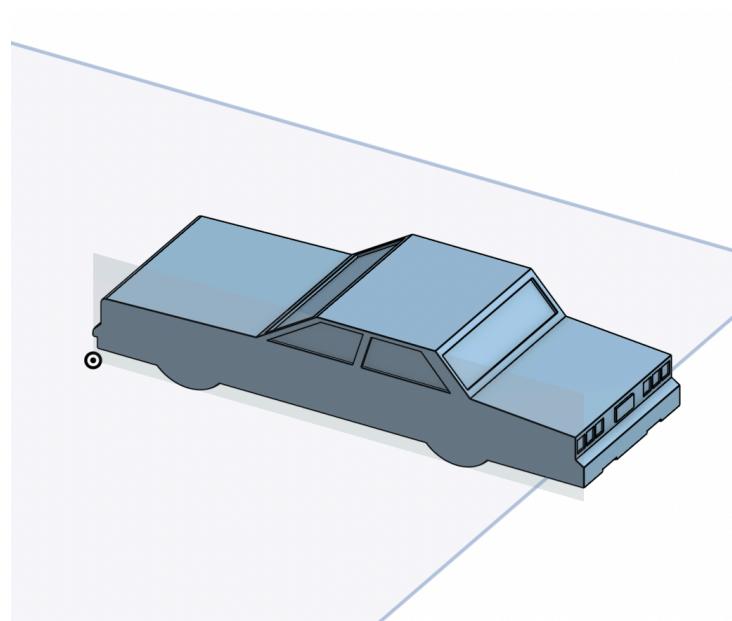
Side, Bottom, and Front views of the Car



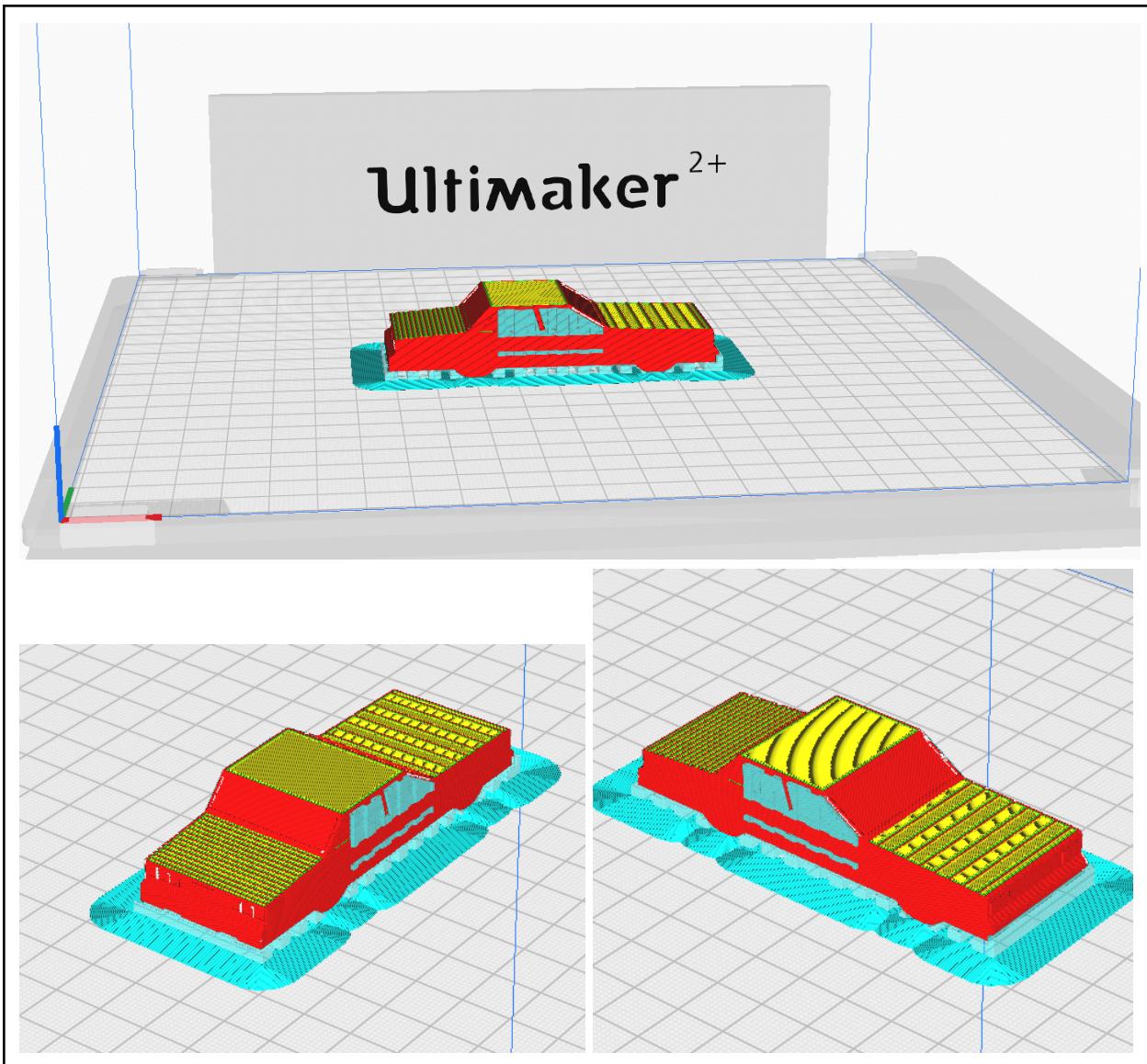
Car without details



Final Drawing



FINAL Car on OnShape



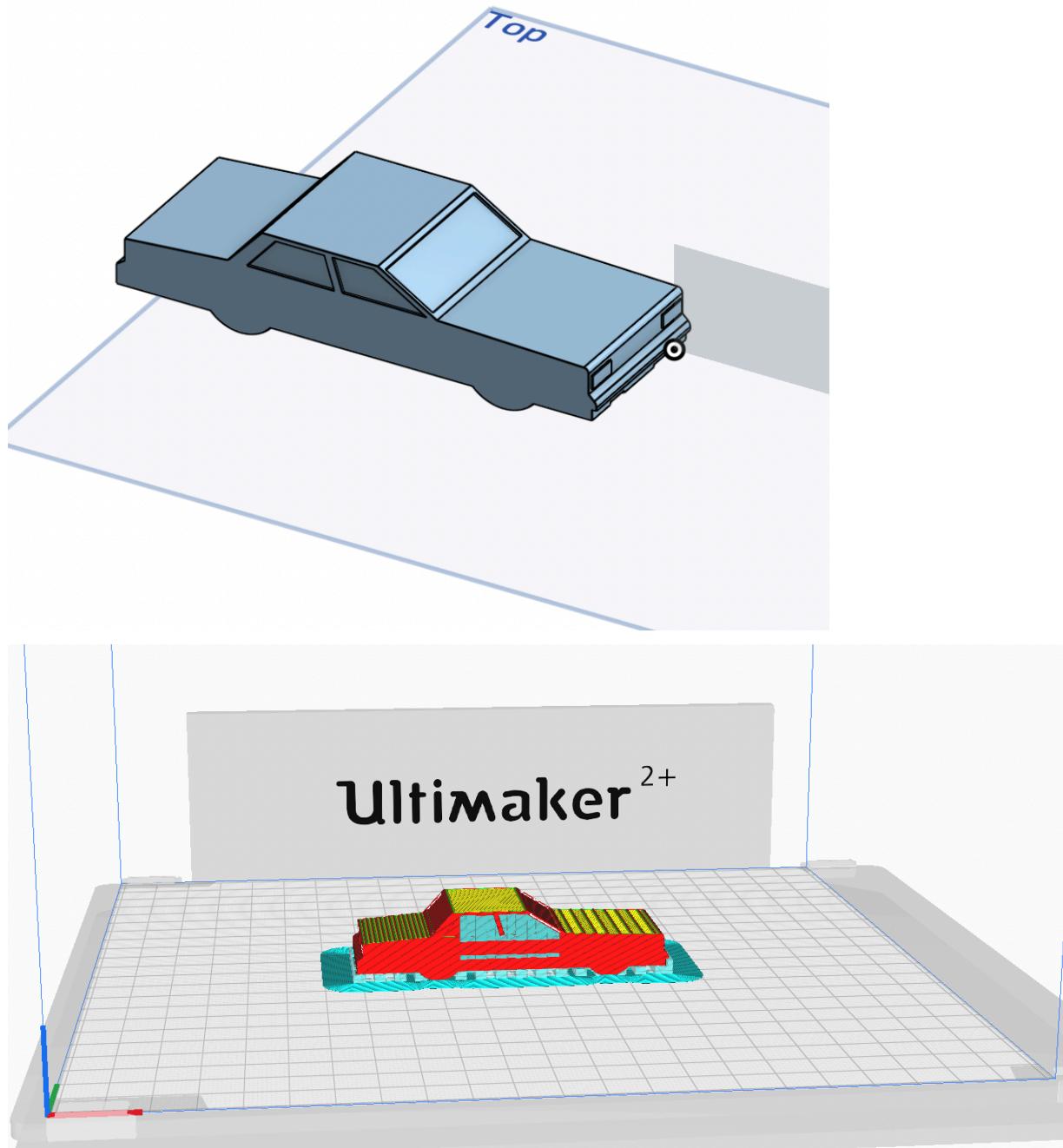
Car on UltiMaker Cura

GitHub archive

After completing my design, I uploaded each iteration and the final design on GitHub. You can find the repository for this project here: <https://github.com/shuber25/ED1/tree/main/3Dcar>

Fabrication

I exported my onshape as an stl and then put it into UltiMaker Cura, and then sliced the image in order to 3D print my car



Challenge:

I found it challenging to draw the 3D version of my car on a sheet of paper. It took a bit of time and a lot of erasing and re-proportioning.

Setbacks and Solution:

One set-back I encountered was that my sketches weren't matching up with the volume of my block I created for my car. It turned out that the size of the pictures of the sketches was off and I had to adjust the size of the image in photos.





Finished 3D Car