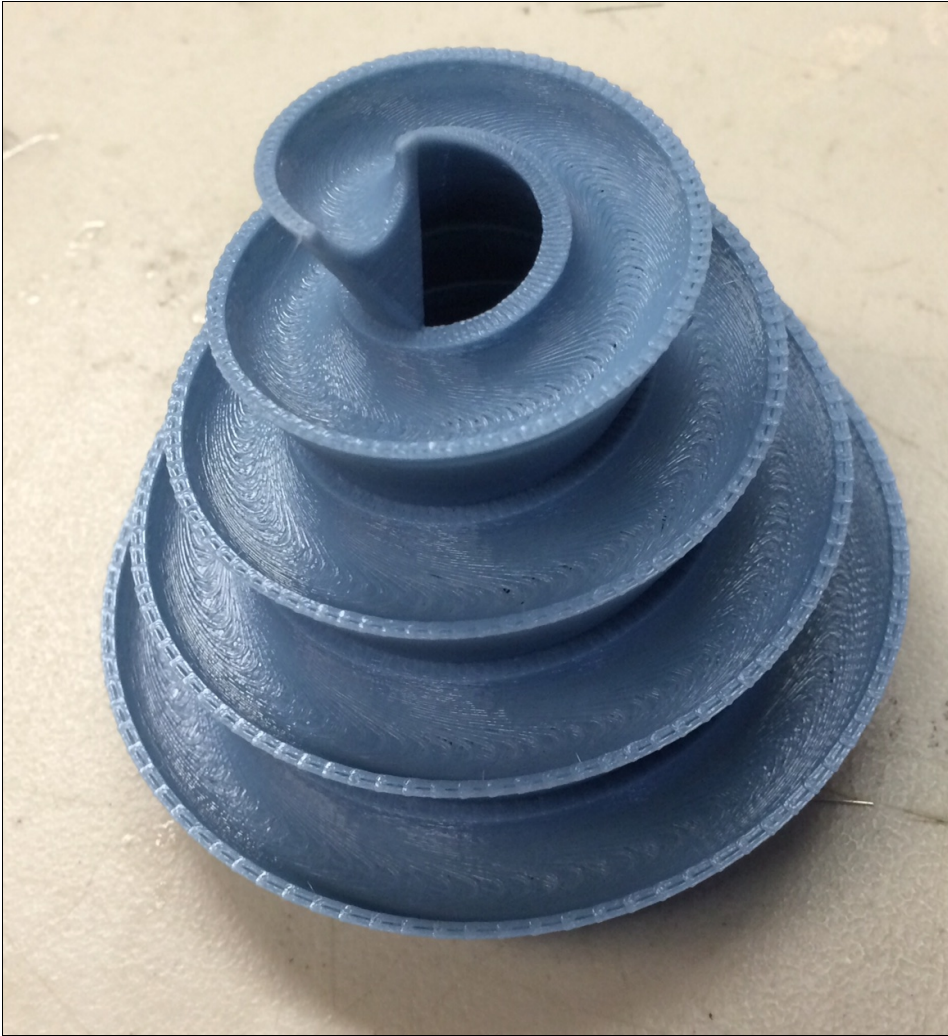


## 3D Modeling and Printing: Sweep

MARBLE RUN

NAVIGATION



1. Launch AutoCAD.

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2. Create a new drawing that is set up for 3D space. Change your units to millimeters. Set FACETRES to 10. Set DELOBJ to 0. Change View to Shaded with edges.

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3. Create a HELIX by using the HELIX command. Based on a marble with a diameter of 10mm, make:

- bottom radius=50

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- top radius=10

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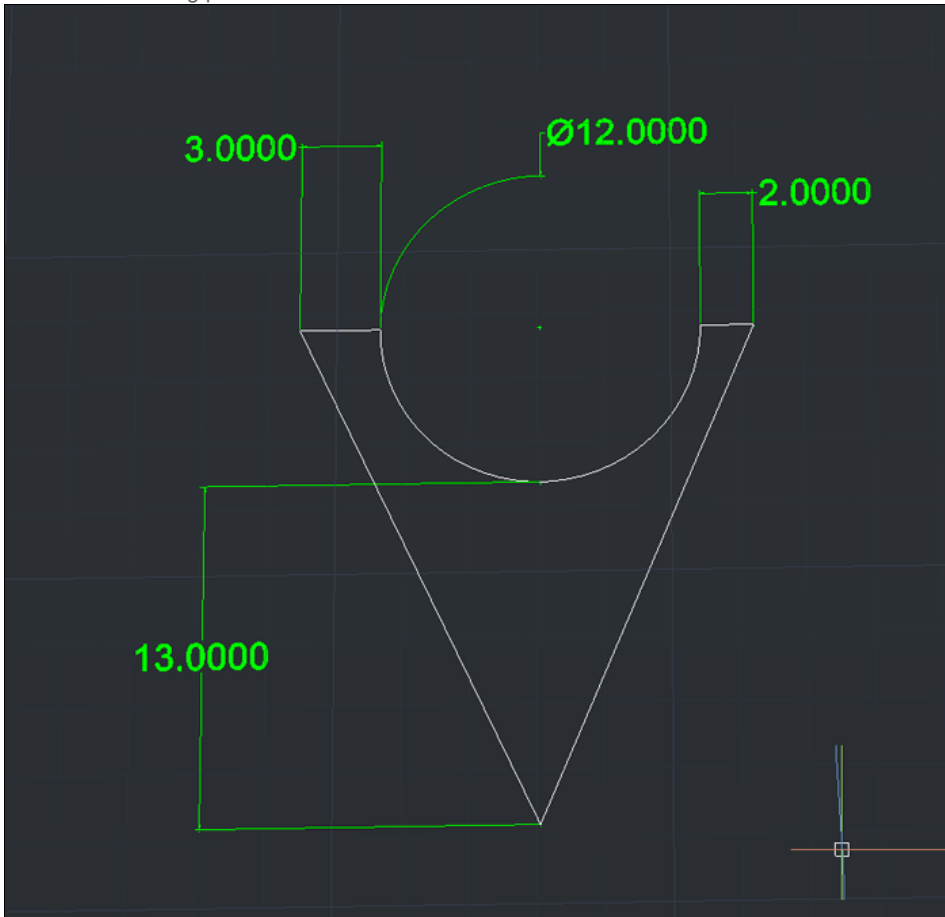
- Turn Height=18 (180% of marble diameter)

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- Height of spiral=80

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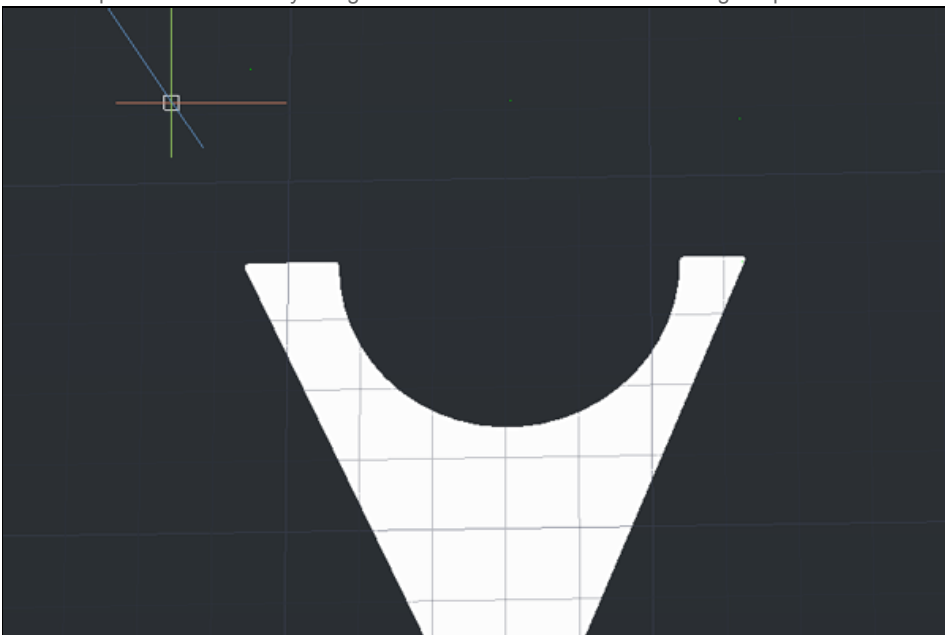
4. Create the following profile:



Based on a marble's diameter:

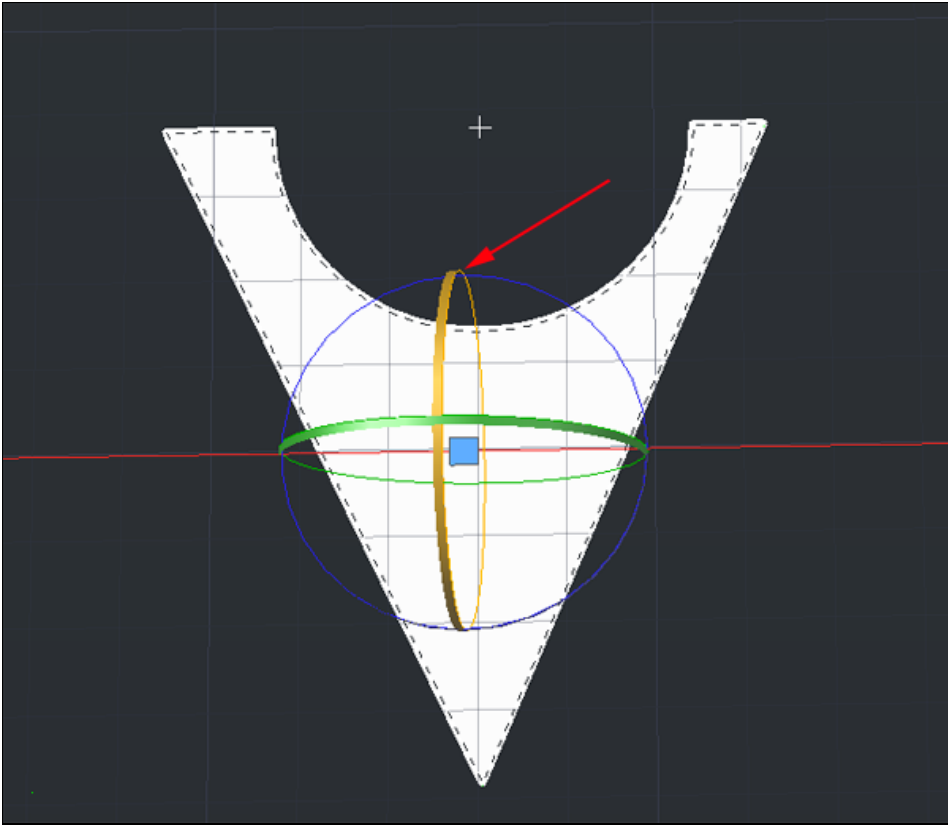
- The Diameter=120%
- 
- The height from the bottom of the circle to the bottom of the triangle=130%
- 

5. Make the profile a REGION by using the REGION command and selecting the profile:

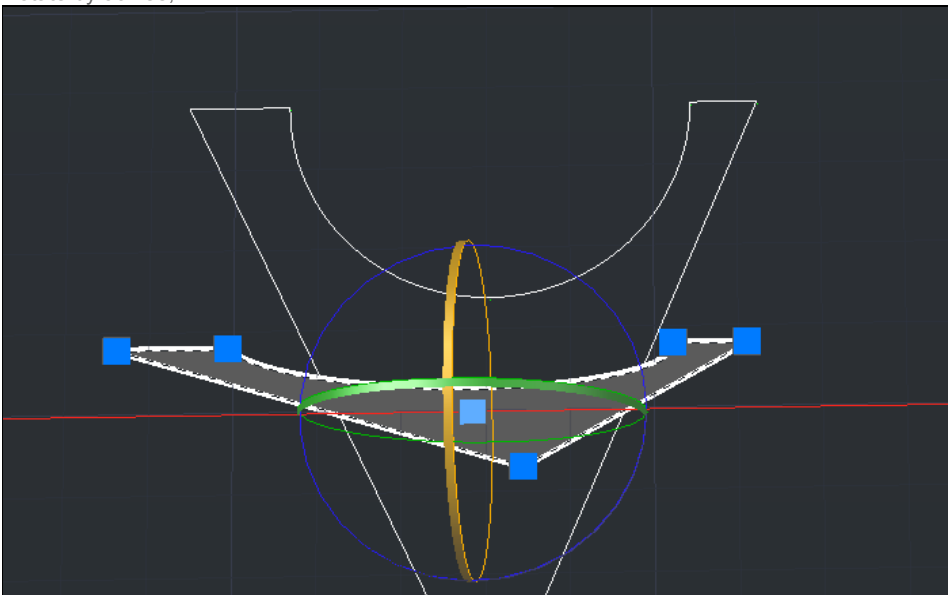




6. Call 3DRotate and select the red axis:

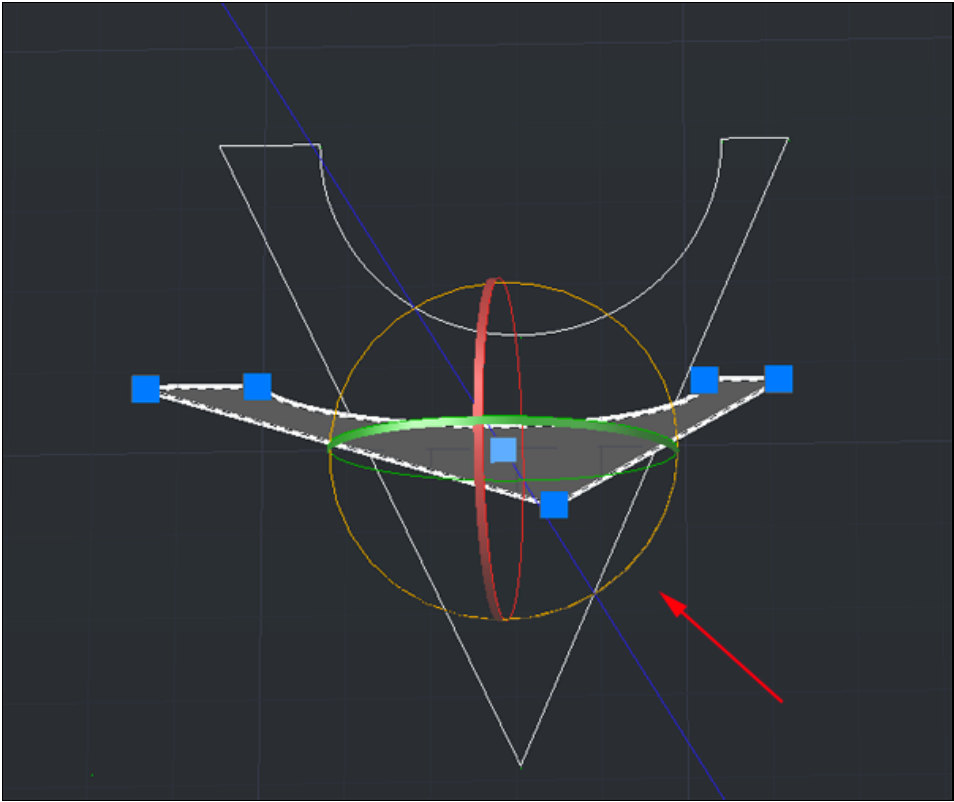


7. Rotate by 90°ree::





8. Select the blue axis:



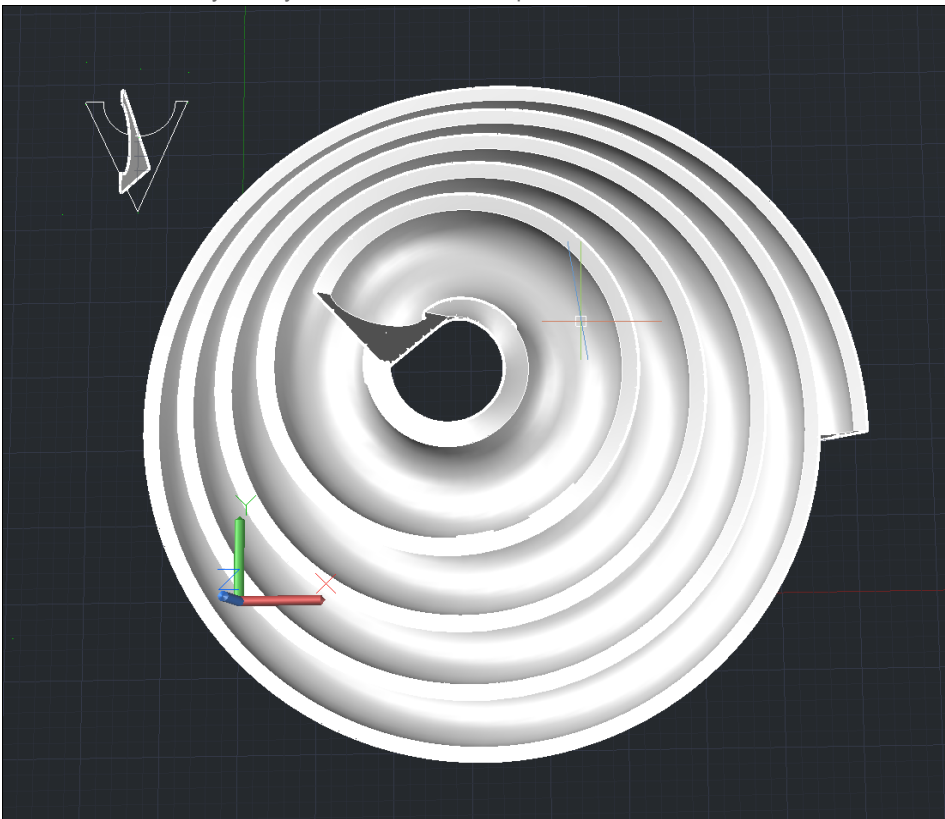
9. Rotate by  $-90^\circ$ ree::



10. Call SWEEP. Select the profile then click on the top of the helix:



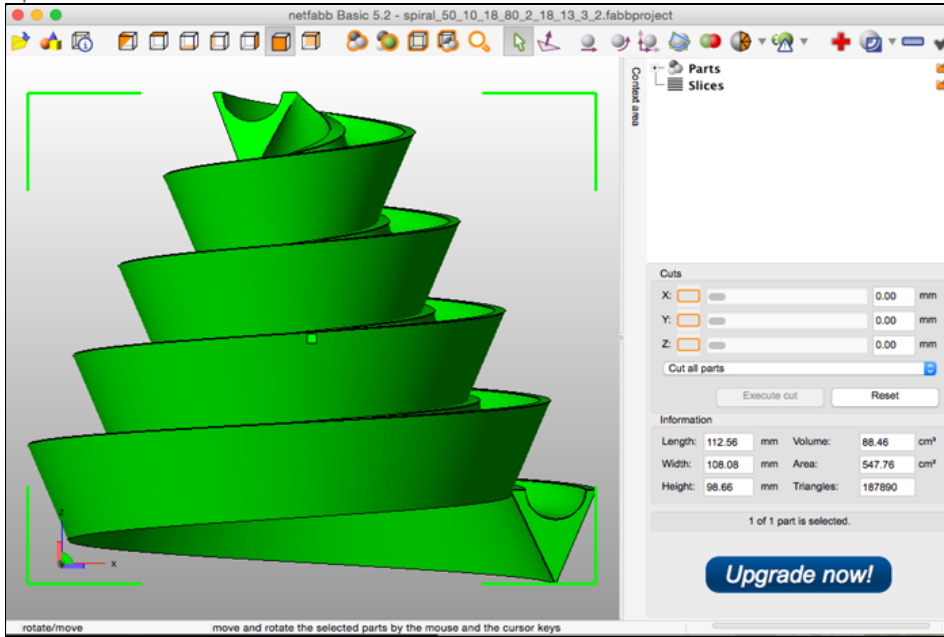
11. If your result does not resemble the image below, try again by clicking on a different segment of the helix. If it still doesn't work, you may have to rotate the the profile:



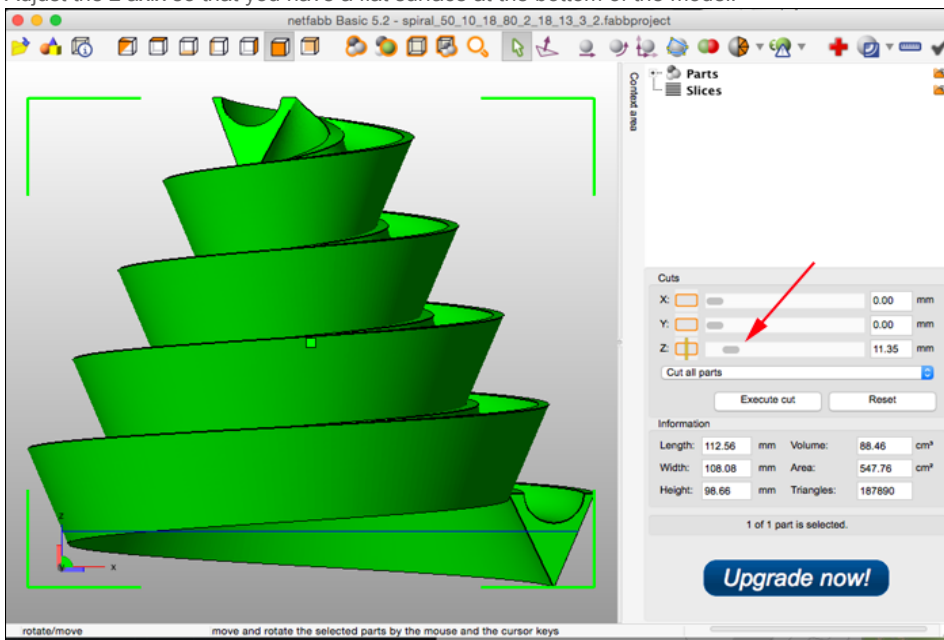
12. Save your work.

13. Export the track.

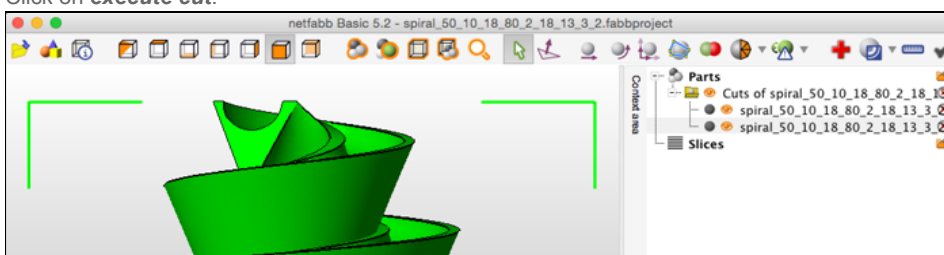
14. Open the stl file in Netfabb:

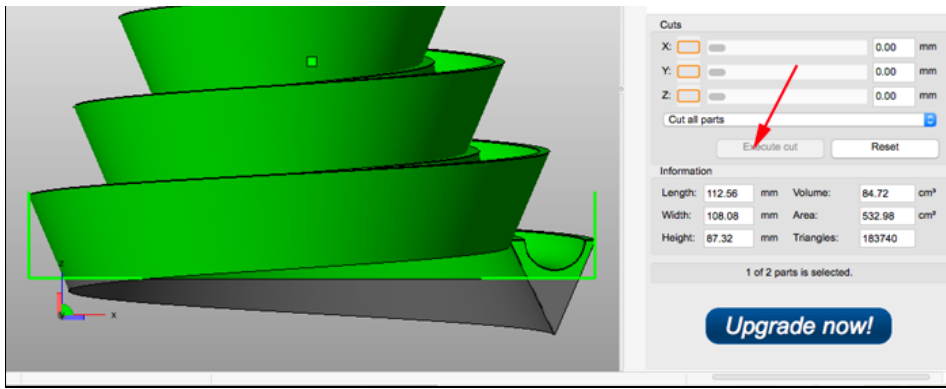


15. Adjust the z axis so that you have a flat surface at the bottom of the model:

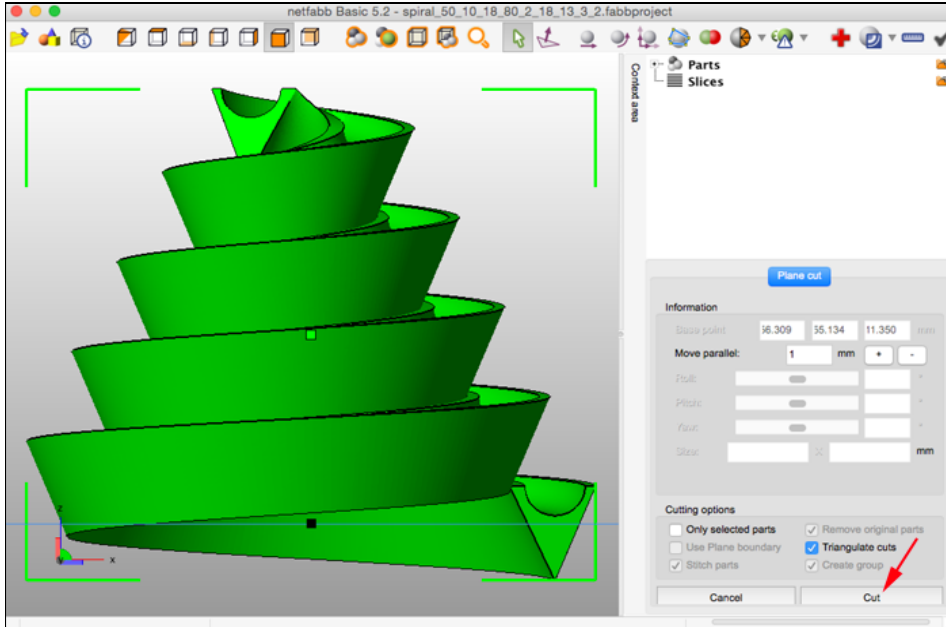


16. Click on *execute cut*.

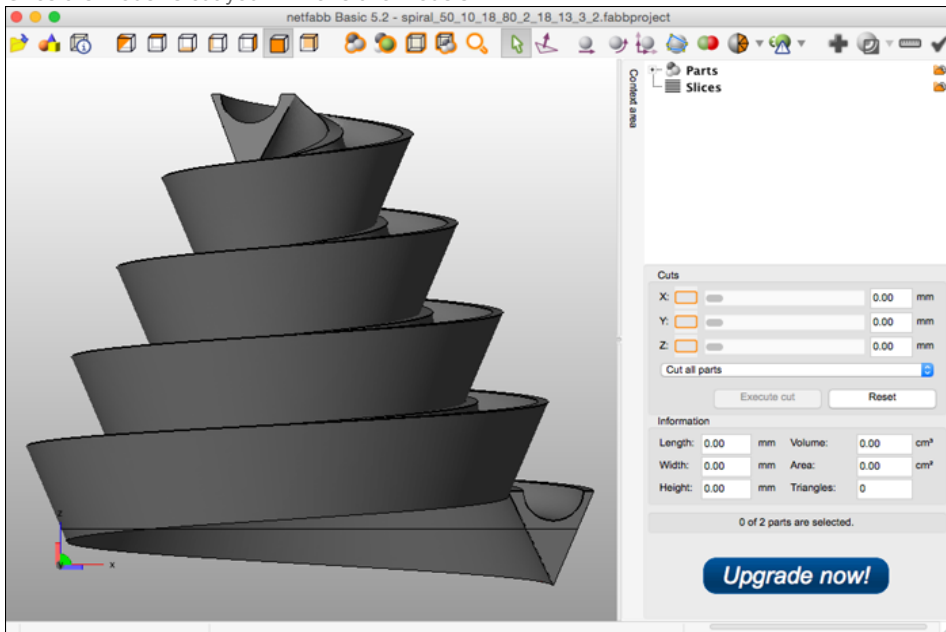




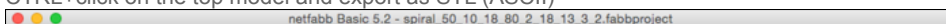
17. Click on **Cut**:

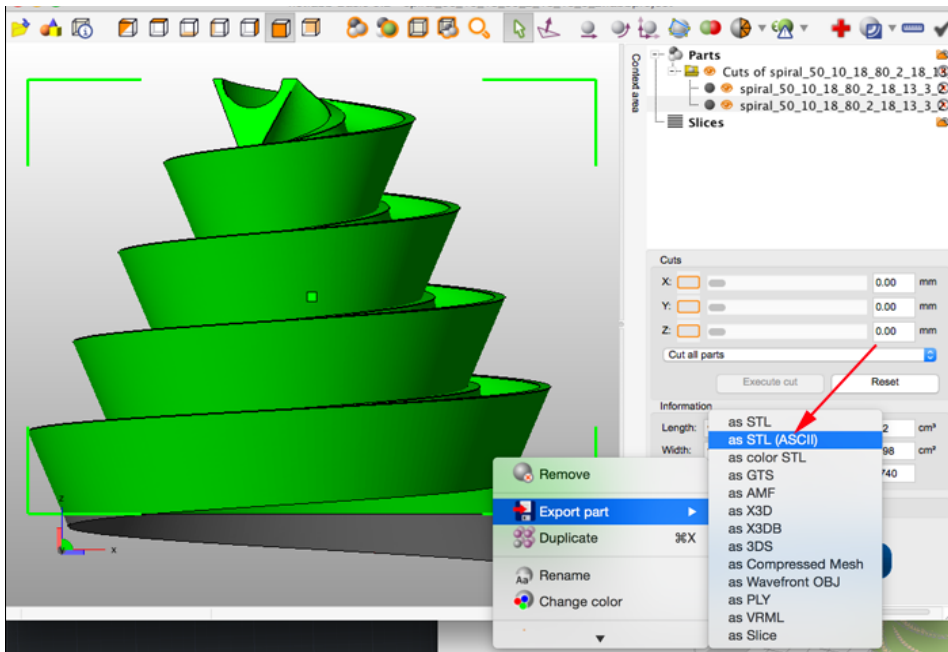


18. Once the model is cut you will have two models:



19. CTRL+click on the top model and export as STL (ASCII)





20. Print with support.



