Manual Archimedes model Assembly Instructions

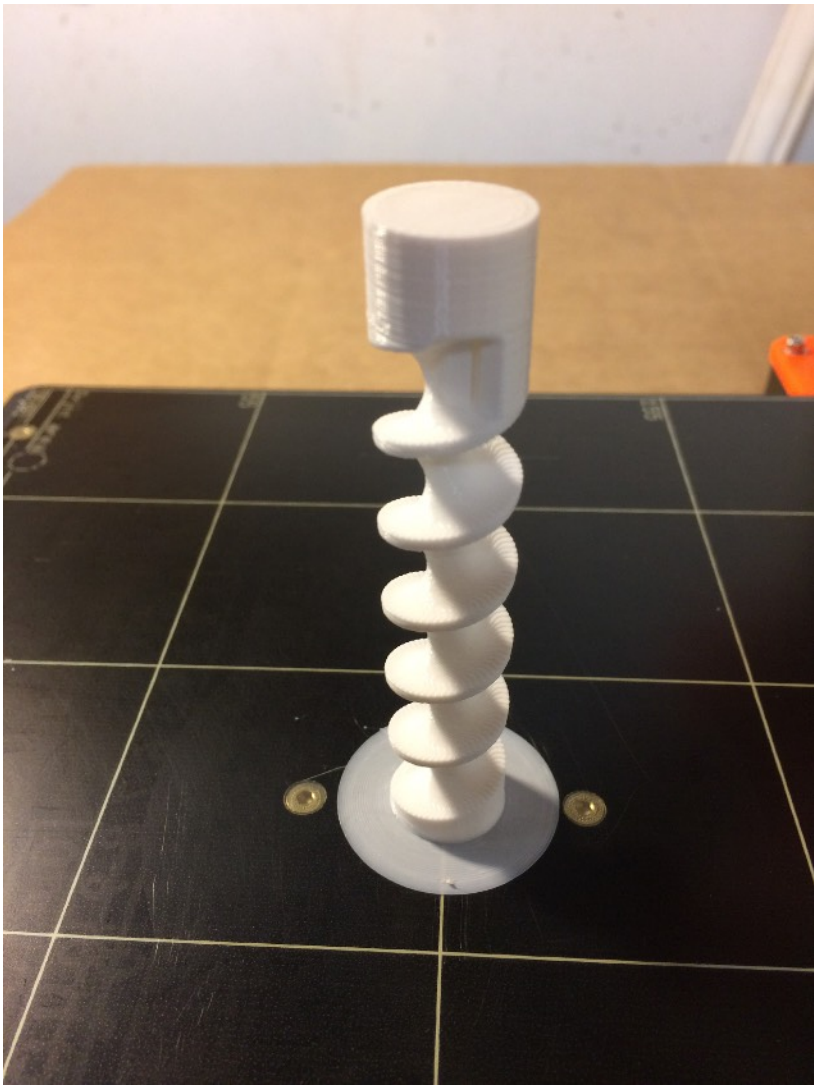
Follow these instructions to print and assemble the hand operated Archimedes model. Depending on your 3D printer you may need a pair of tweezers and some sandpaper to clean the track. You may also want some rubber feet for the bottom, and optionally a 2mm diameter screw to attach the plastic screw to the maze.

Print the Archimedes screw by itself in the vertical orientation, and be sure to include a brim. Because it is tall and narrow, the brim will help hold it in place as it prints, and printing it by itself will help avoid a rough outer surface caused by retraction.

For PLA and a 0.4mm nozzle use these settings:

Layer height: 0.2mm
Print speed: 40mm/sec
Wall thickness: 1.2mm
Top/bottom thickness: 0.8mm
Infill: 15%
Temperature: 210F
Bed temperature: 60F

Be sure to DISABLE supports.

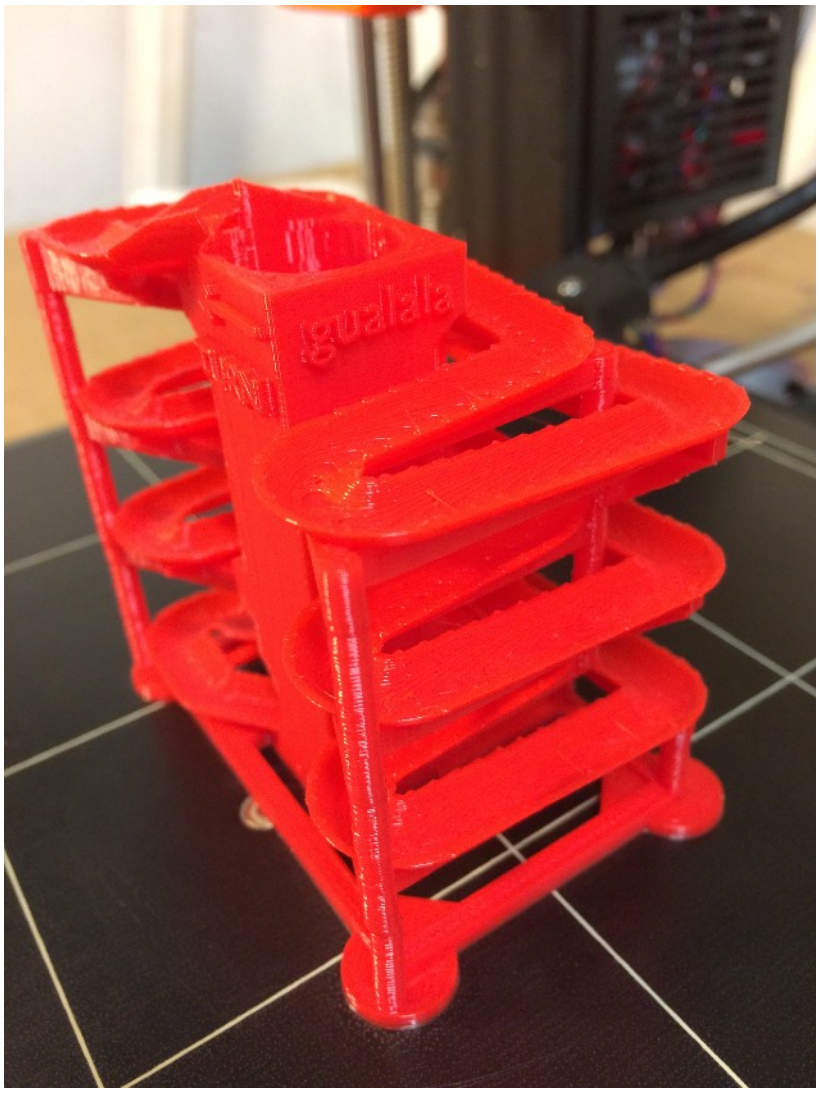


Print the Archimedes maze without a brim. Be sure the cooling fan is operating at its fastest speed after the first layer, to ensure the bridging won't have too much sag.

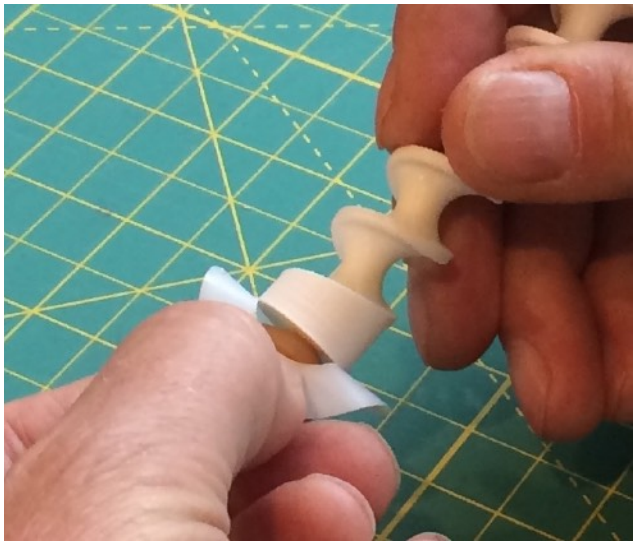
For PLA and a 0.4mm nozzle use these settings:

Layer height: 0.2mm
Print speed: 40mm/sec
Wall thickness: 1.2mm
Top/bottom thickness: 0.8mm
Infill: 15%
Temperature: 210F
Bed temperature: 60F

Be sure to DISABLE supports



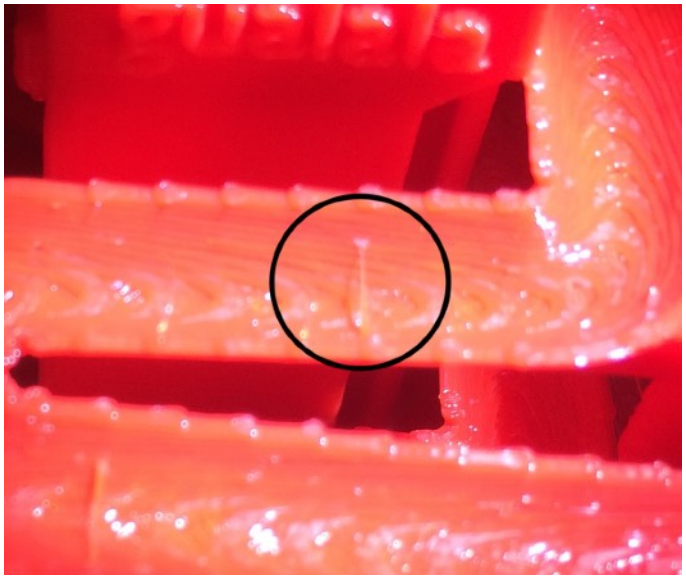
Peel the brim off the screw.



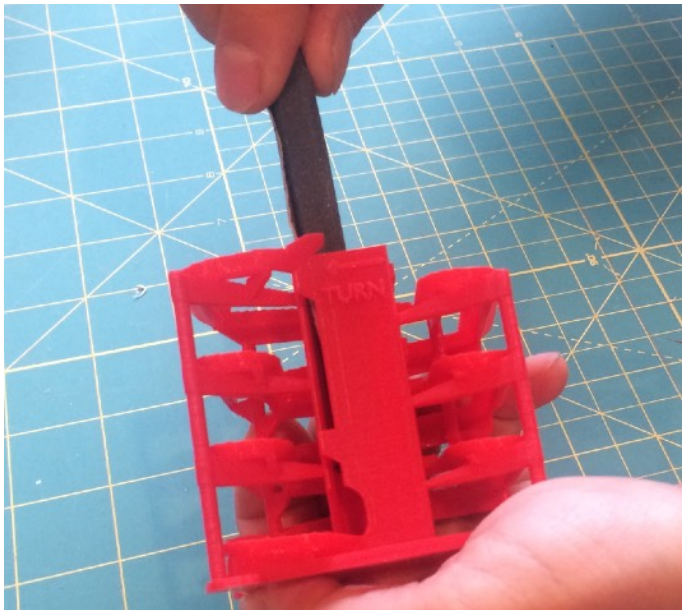
You may need to use a small hobby knife to clean up the edges where the brim attached.

You may also want to sand the outer surfaces of the screw.

In this picture you can see a small piece of plastic that bridges across the ball track in the Maze. These sometimes occur during the printing process. Follow the track looking for these and remove them with tweezers. Any other bits of plastic that obstruct the balls should also be removed.

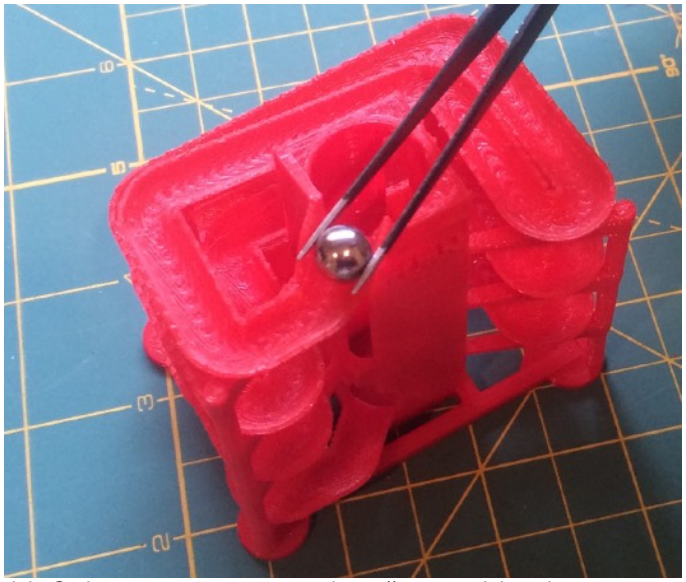


Check that the screw chamber is smooth. Some printers may leave thin filaments or rough edges. If this happens use a rolled up piece of sandpaper to smooth the inside.

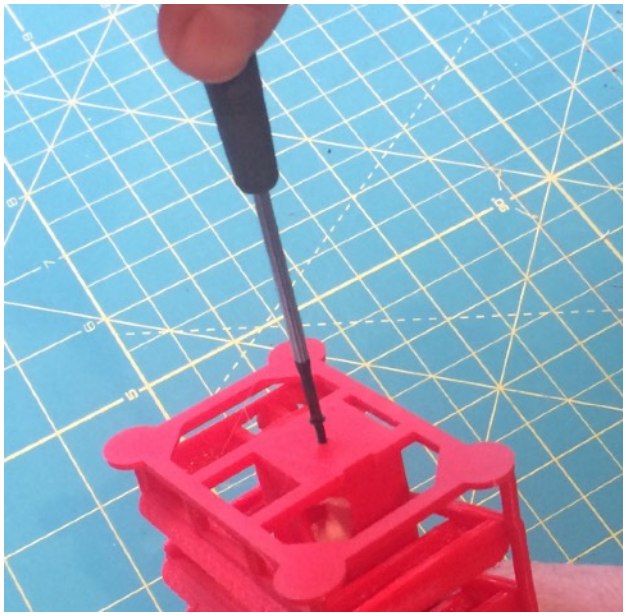


You can test how clear the tracks are by placing balls on the top and watching them roll to the bottom. The balls will get stuck where pieces of filament need to be removed. Once the balls travel down the track a couple times without getting stuck you've got it clean enough to continue with the build.

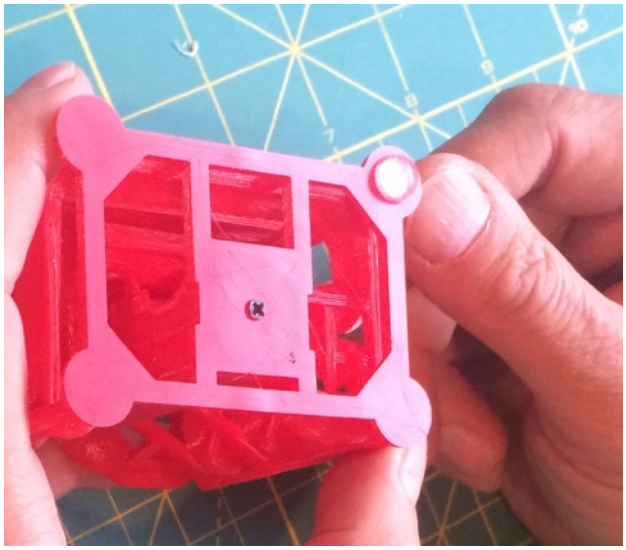
The plastic parts are durable, but you want to treat them gently, especially the maze. Don't squeeze hard when holding it to attach components, and don't drop it.



Insert the Archimedes screw into the maze cylinder, turn the model over, and attach it to the maze using a 2mm diameter screw. Tighten the screw, then loosen it just enough that the plastic screw turns freely. (This step is optional, but it is nice to have the two parts connected).



Attach the rubber feet.



Add the 8mm bearings and turn the screw clockwise to test.

Your done!