



Planetary Gear

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NewtonTheForcerer

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Summary

Planetary Gear Set - easy to print, easy to assemble.

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Planetary Gear Set - easy to print, easy to assemble.

This design is meant to show how a planetary gear set works. Focus for the design was to make it as simple as possible to print and to assemble. Resulting in a design which is printable without support structures, big overhangs etc. To assemble the gear set there is no glue, silicon spray or tooling needed.

Some facts (skip if you just want to print):

- Stationary gear ratio, $i_0 = 1.88$ (1.9)
- Module: 2
- Ring gear teeth: 51
- Sun gear teeth: 27

- Planet teeth: 12
- Number of planets: 3

The gears do have a real involute gearing. For the planet gears it was necessary to add a profile shift of $0.3 \times m$ to avoid undercutting. In order to design the gears, a parametric CAD-File in which you can set all the parameters for the gear was created. The involute gears will then be generated automatically.

Printing:

The model which you can see on the pictures was printed with PETG (red and black) and PLA (blue). As mentioned before there are no support structures needed to print the parts. The shafts have to be placed on the flat side in order to get good results. I used a 30% cubic infill. To speed up the print there shouldn't be any problems with using other infills as well as decreasing the infill percentage.

Assembling:

To assemble the parts, lay the planets and sun gear into the ring gear. Then fix them with the planetary carrier. Put this pre-assembly into the stand and fix it with the shafts. The shafts won't go in easily. This is on purpose since they keep the assembly together, a tight fit is needed.

Have Fun!

Model files



sun_gear.stl



sungearshaft.stl



planetarycarriershaft.stl



planetarycarrier.stl



planet.stl



ring_gear.stl



stand.stl

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