

Spirograph

Printosaurus

VIEW IN BROWSER

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Summary

Spirograph, hypocycloid drawing tool, gear draw or geary mc gear face. Call the fun how you want!

16.50 hrs	10 pcs	0.20 mm	0.40 mm	PLA	189 g	Prusa MK3/S/S+

Toys & Games > Other Toys & Games

Tags: toy tool pencil pen spirograph gear gears mechanical mechanicaltoy fusion360 drawing mathematics technicaldrawing mechanicaltoys ratio drawingtool hypocycloid spirographe

Spirograph

Have fun by drawing with this Spirograph and the various gears!

The round gear guide has 84 teeth on the inside and 108 teeth on the outside. The linear gear guide has a width of a 24 teeth gear and a total of 54 teeth.

There are 6 gears and 2 guides which you can use for the drawing.

With Gear 14, 21, 28 and 42 (even ratios) you have to offset the teeth to get geometrical figures like in the picture. With Gear 53 and 76 (odd ratios) you can but don't have to offset the teeth after a finished rotation.

I recommend you to start with Gear 53 and 76. If you're a real spirograph enthusiast you can print the whole set.

In the guides you'll find tiny holes for pinning it down to your drawing board. Sometimes it gets quite difficult to not move the guide while moving the gear.

Updates

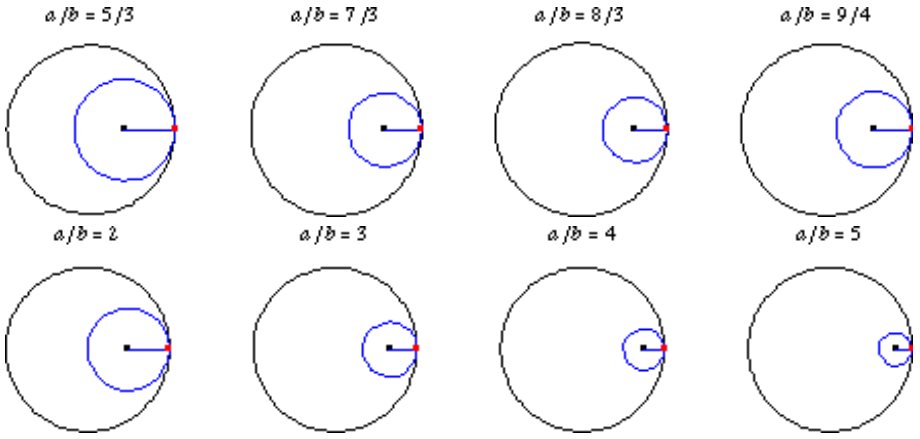
2022-09-19 // Added Gear 53 and Gear 76 (odd ratios)
2022-09-21 // Added Gear Triangle (now it get's wild!)

Ratios

Round gear guide inside : gears

- **Gear 14**
  Ratio 84:14 = 6
- **Gear 21**
  Ratio 84:24 = 4
- **Gear 28**
  Ratio 84:28 = 3
- **Gear Triangle**
  Ratio 84:30 = 2.8
- **Gear 42**
  Ratio 84:42 = 2
- **Gear 53**
  Ratio 84:53 = 1.585
- **Gear 76**
  Ratio 84:76 = 1.105

A visualisation of different ratios:



Feel free to contact if you have any ideas for adding elements to this collection.

Printing

Printed on a Prusa mini+

Printing settings:
Recommended layer height: 0.2mm
Infill: 15-20%

Sanded the top layer to get rid of some blobs.

If you like this model, please post your makes of it right on Printables.

Filaments used:

- Polymaker PolyTerra Savannah Yellow
- Polymaker PolyTerraForest Green
- Polymaker PolyTerraLava Red

If you're interested in the mathematics behind the drawing tool, I can recommend you this source:

https://mathworld.wolfram.com/Hypocycloid.html

Model files

STL-Files 9 files



gear-guide-round-84_108.stl



gear-guide-straight-54.stl



gear-14.stl



gear-21.stl



gear-28.stl



gear-42.stl



gear-53.stl



gear-76.stl



gear-triangle.stl

STEP-Files

9 files

gear-guide-round-84_108.step

gear-guide-straight-54.step

gear-14.step

gear-21.step

gear-28.step

gear-42.step

gear-53.step

gear-76.step

gear-triangle.step

Print files



gear-guide-round-84_108_02mm_pla_mk3s_3h32m.gcode

PLA 0.40 mm 0.20 mm 3.54 hrs 36 g Prusa MK3/S/S+



gears-complete_02mm_pla_mk3s_6h8m.gcode

PLA 0.40 mm 0.20 mm 6.14 hrs 73 g Prusa MK3/S/S+



gear-guide-straight-54_02mm_pla_mk3s_1h14m.gcode

PLA 0.40 mm 0.20 mm 1.23 hrs 13 g Prusa MK3/S/S+

gear-14_02mm_pla_mk3s_12m.gcode

PLA 0.40 mm 0.20 mm 0.20 hrs 1 g Prusa MK3/S/S+

gear-21_02mm_pla_mk3s_21m.gcode

PLA 0.40 mm 0.20 mm 0.35 hrs 2 g Prusa MK3/S/S+



gear-28_02mm_pla_mk3s_31m.gcode

PLA 0.40 mm 0.20 mm 0.51 hrs 5 g Prusa MK3/S/S+



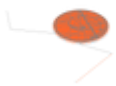
gear-42_02mm_pla_mk3s_57m.gcode

PLA 0.40 mm 0.20 mm 0.94 hrs 11 g Prusa MK3/S/S+



gear-53_02mm_pla_mk3s_1h18m.gcode

PLA 0.40 mm 0.20 mm 1.29 hrs 16 g Prusa MK3/S/S+



gear-76_02mm_pla_mk3s_2h18m.gcode

PLA 0.40 mm 0.20 mm 2.30 hrs 32 g Prusa MK3/S/S+



gear-triangle_02mm_pla_mk3s_34m.gcode

PLA 0.40 mm 0.20 mm 0.57 hrs 5 g Prusa MK3/S/S+

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