

# RapMan in Maths

## Create mathematical objects

Using RapMan





# Maths objects

- RapMan produces 3D objects..... 3D objects are mathematical..... Why not use RapMan in Maths Lessons?
- Although many CAD programs try to avoid the user having to do maths they are behind the scenes doing lots and lots of complex calculations... And they are good at it 😊.
- There are a few CAD programs that allow the user to create objects using scripting or formulae to create or modify objects and most programs are parametric (they use parameters to define size, shape etc)
- One of the programs that does this is OpenSCAD a “free” open source application.
- Another possibility is Mathematica... Very powerful but very expensive.

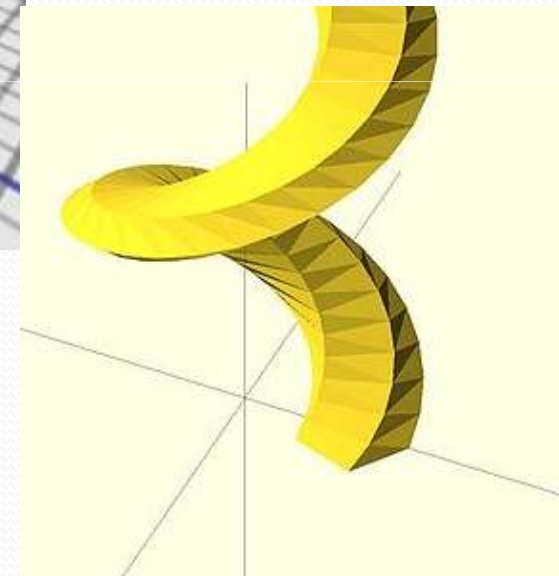
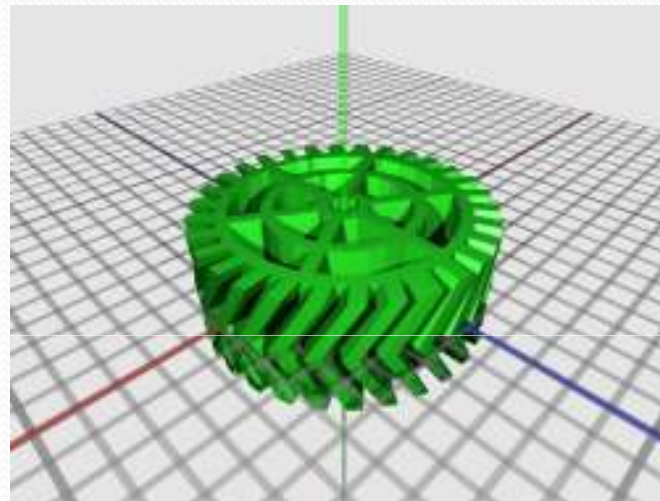


# OpenSCAD

- OpenSCAD is software for creating solid 3D CAD objects. It is free software and available for Linux/UNIX, MS Windows and Apples OS X.
- Unlike most free software for creating 3D models (such as the famous application Blender) it does not focus on the artistic aspects of 3D modelling but instead on the CAD aspects. Thus it might be the application you are looking for when you are planning to create 3D models of machine parts but pretty sure is not what you are looking for when you are more interested in creating computer-animated movies.
- OpenSCAD is not an interactive modeller. Instead it is something like a 3D-compiler that reads in a script file that describes the object and renders the 3D model from this script file (see examples below). This gives you (the designer) full control over the modelling process and enables you to easily change any step in the modelling process or make designs that are defined by configurable parameters.
- OpenSCAD provides two main modelling techniques: First there is constructive solid geometry (aka CSG) and second there is extrusion of 2D outlines. As data exchange format for this 2D outlines Autocad DXF files are used. In addition to 2D paths for extrusion it is also possible to read design parameters from DXF files. Besides DXF files OpenSCAD can read and create 3D models in the STL and OFF file formats.

(From the OpenSCAD website)

# OpenSCAD designs



Pictures from thingiverse and openscad websites

# Other objects

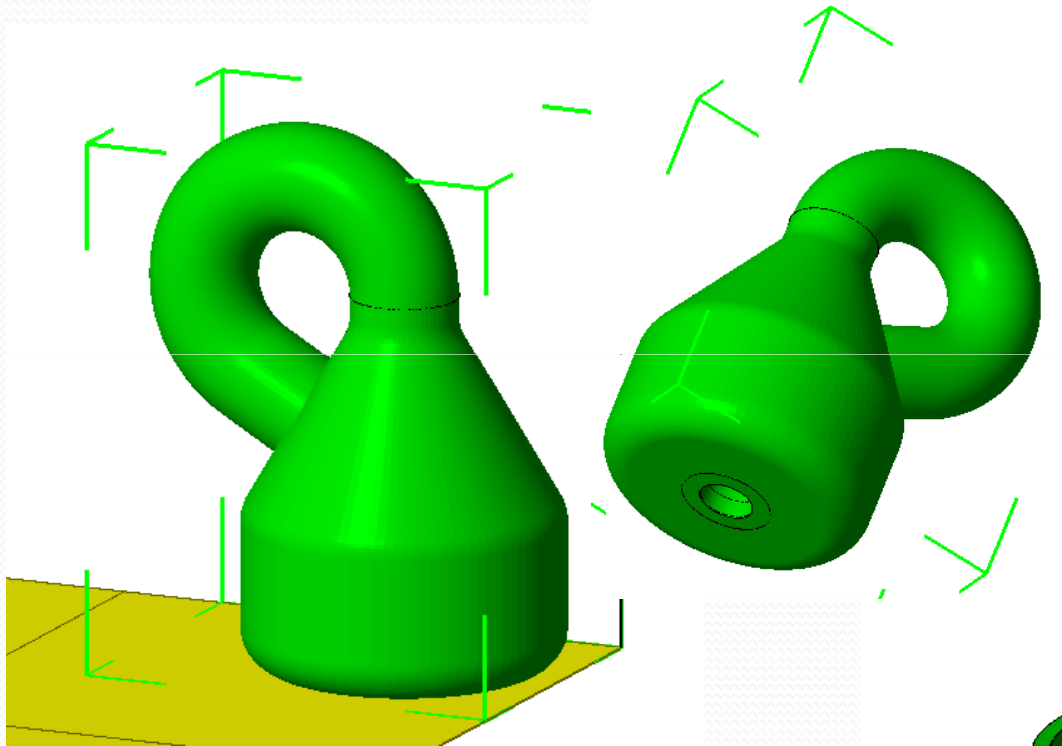
- Most CAD programs can create simple mathematical shape (primitives)... These are from NetFabb.



# More objects...

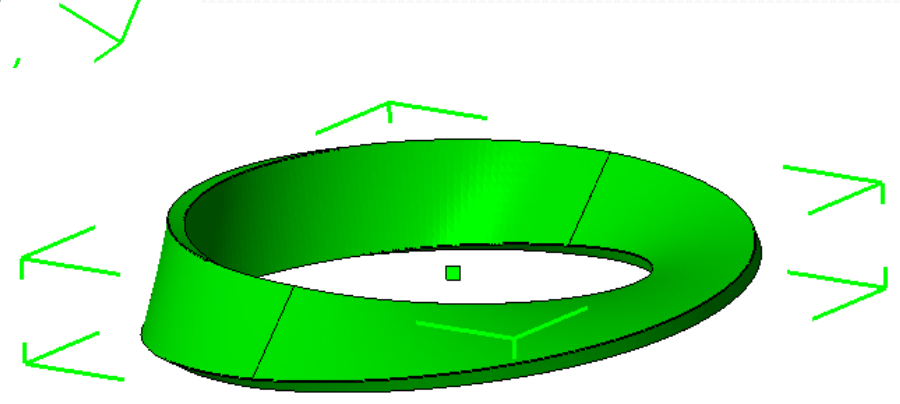


# Or for a real challenge....



Klein bottles ... Where the inside is also the outside !

Or a mobius solid.



Objects provided by Tim Brotherhood PTC Ltd

# RapMan

- RapMan is a low cost 3D printer available from Bits from Bytes [www.bitsfrombytes.com](http://www.bitsfrombytes.com)
- Further assistance can be found on the BfB forum and wiki.

Forum <http://www.bitsfrombytes.com/fora/user/index.php>

Wiki <http://www.bitsfrombytes.com/wiki>

OpenSCAD can be downloaded from <http://openscad.org/>