

How to Print 3D Models

First, we need a file that has 3D model instructions. The 3D printer software can read these files and translate them into a viewable 3D object on the computer. These are called **STL** files (**ST**ereo**L**ithography). There are a couple of ways to get one.

1 - Download from a website:

There are several popular community sites where users can upload their designs and share them with others...

Some include:

- Thingiverse
- TinkerCAD
- Pinshape
- MyMiniFactory
- YouMagine
- GrabCAD
- AutoDesk123d
- Reprables

The screenshot shows the Thingiverse website interface. At the top, there are navigation links: DASHBOARD, EXPLORE, LEARN, and CREATE. A search bar contains the text "Enter a search term". Below the navigation, it says "3880 results for 'robot': THINGS". There are four search result cards visible:

- "3D Hubs Marvin - Key Chain" by 3DHubs, Dec 30, 2013, 1501 likes, 1947 downloads, 42 comments.
- "Elephant" by LFS, Feb 25, 2014, 8109 likes, 9496 downloads, 154 comments.
- "Maker Faire Robot" by MAKE, Jan 4, 2013.
- "T800 Smooth Terminator En..." by machina, Aug 23, 2014.

The detailed view of the "Elephant" model is shown on the right. It features a blue elephant 3D model lying on a grid. Below the model, there are tabs for "Thing Details" and "Thing Files". The "Thing Files" tab is active, showing a table of files:

File Name	Downloads	Size
 LFS_Elephant_Geant.stl Last updated: 02-25-14	39319	5mb
 LFS_Elephant.STL Last updated: 02-27-14	66889	5mb

Just search for something that interests you, and download the **STL** file included with the description.

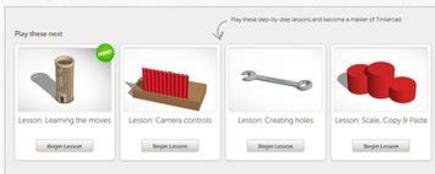
2 - Design your own!

Using a CAD program (Computer-Aided Design), anyone can create their own 3D models. Some programs are more complicated than others and can be very expensive.

Tinkercad.com, however, is a free web-based design tool. It is designed for the novice, yet allows for intricate designs. You must register on the site to use it.

Getting started with **Tinkercad**

1. Take a lesson



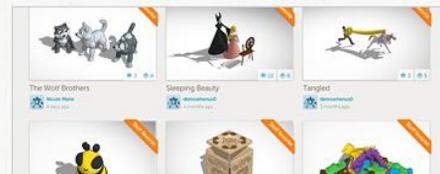
Scroll to the section below for easy step-by-step lessons which will help you master Tinkercad in no time!

2. Copy & Tinker

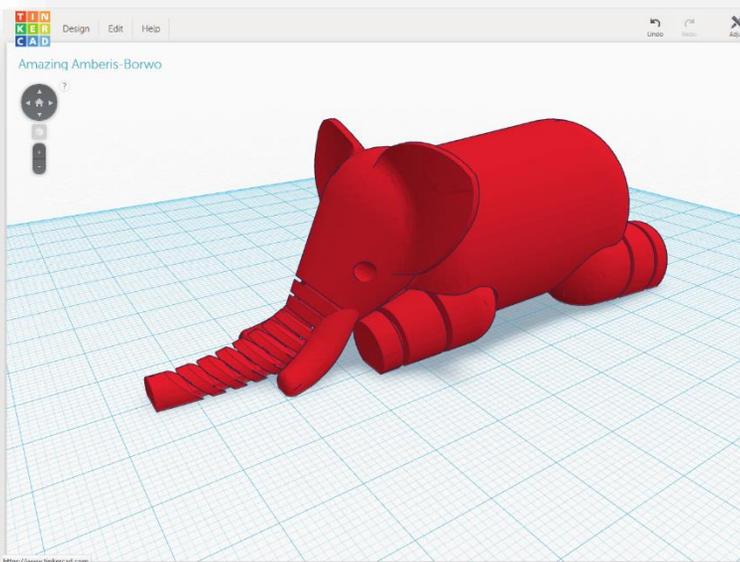


There are over 4 million designs in the **Tinkercad Gallery**. Make one your own by clicking 'Copy & Tinker'.

3. Come back often



Tinkercad makes the 3D design simple! The more you build and create, the more fun you will have.



Once you've created your masterpiece, save it as an **STL** file.

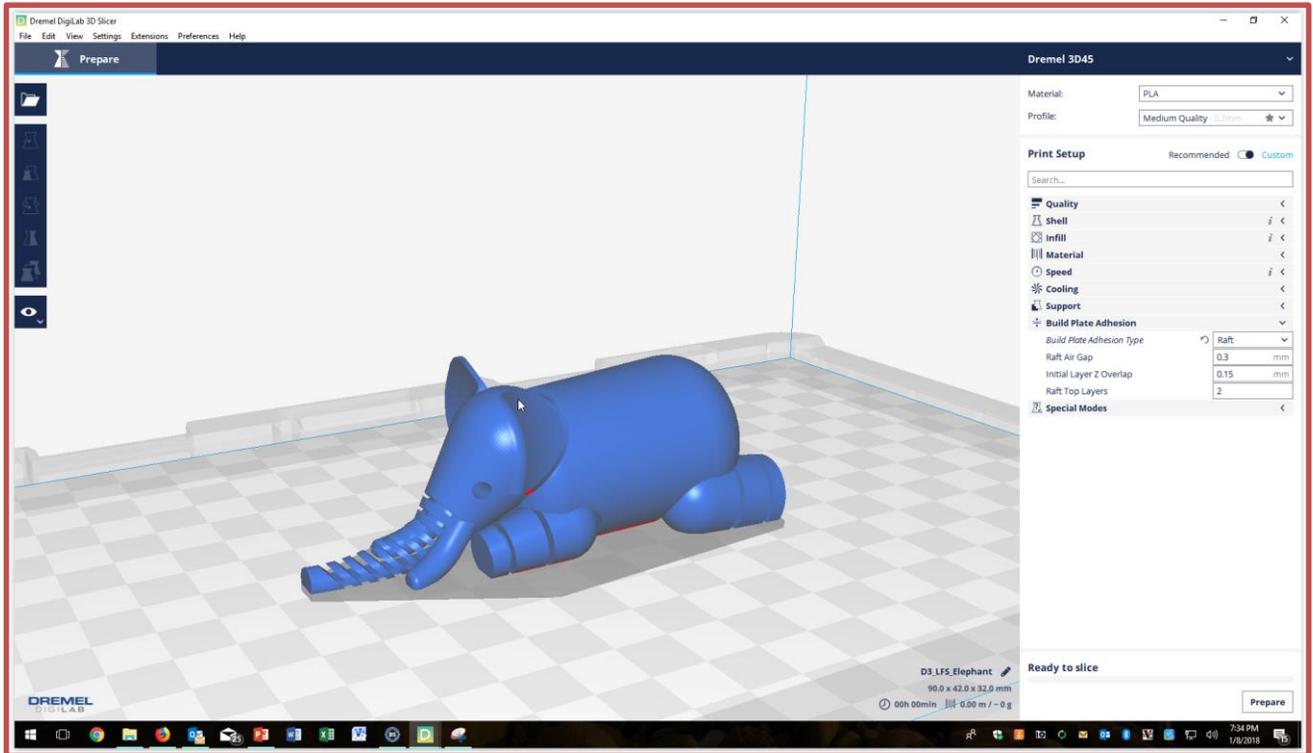
Import it into your 3D printer's software or **send it to NPL and we will print it for you!**

Here is the Dremel 3D Printer software that we use at NPL. Other 3D printers will have different software, of course. Once we import the **STL** file, we can see what the model looks like!

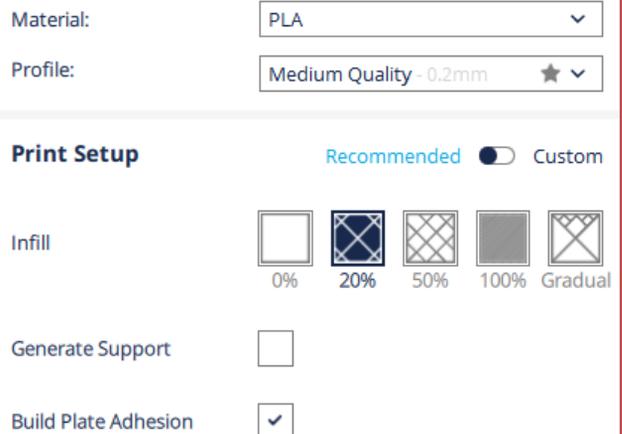
STL file



LFS_Elephant



The software can scale the size of the model, but cannot change the actual design. Build settings such as resolution detail and print strength (from hollow to solid) can also be set.



Our Dremel software gives an estimate of the build time as well as how much plastic filament it will use. From this we can give you a price quote.



The screenshot shows a software interface for a 3D printer. The main title is "D3_LFS_Elephant" with a pencil icon. Below it, the dimensions are "90.0 x 42.0 x 32.0 mm". At the bottom left, there is a clock icon followed by "02h 13min", a vertical bar icon followed by "8.84 m / ~ 26 g / ~ \$ 3.96". On the right side, there is a button that says "Ready to Save to File".

This is based on the build settings as well as the object's size, which can be adjusted in order to save time and material.



Once payment is made to NPL, the file is then sent to our Dremel 3D printer. Feel free to drop in and ask for a demonstration!