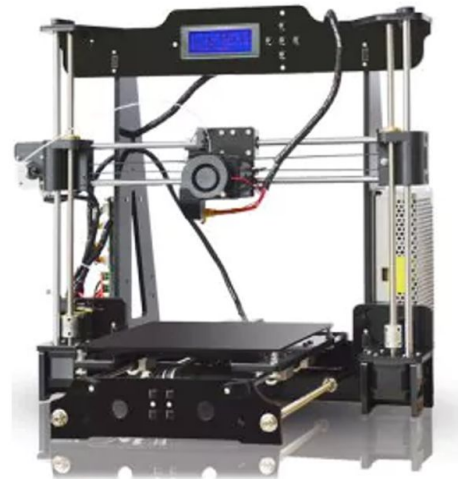


# Blue Crew Robotics

## Tronxy 3D Printer Documentation



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# About Us

In the summer of 2015, a senior at Mt. Blue High School met some students who were a part of a FIRST robotics team in a neighboring school district. Inspired, he gathered a group of friends together and went to an off season meet, Mainely Spirit, hosted by team 2648. After seeing FIRST robotics in action, the five of them were hooked. Over the next few weeks, they created a budget and pitched it to the school's computer technology teacher, who agreed to be the team's mentor. Word spread throughout the school, and now Blue Crew has 18 members and 2 mentors.

Blue Crew is based at the Mt. Blue Campus, and has access to Foster Career and Technical Education Center's vocational education facilities. This gives our team a distinct advantage: at our school we have access to a state-of-the-art composites manufacturing facility, various welding and machine shop tools, multiple 3D printers and a CNC machine, as well as complete access to the Robotics classroom.

What makes Blue Crew different from other teams is how it was founded. While many teams are created by a school as an effort to increase STEM curriculum, Blue Crew is completely student driven, and has been from the beginning. While we do have mentors that are instrumental in the success of our team, as well as the education of our members, Blue Crew takes FIRST's mission to create leaders one step further.

## What is a 3D printer?

A 3D printer is a device that takes input from a computer and creates 3-dimensional objects by melting plastic (called filament) and squeezing (extruding) it out of a nozzle.

## Printing

### Preparing your Computer

In order to tell the printer what you want it to print, you will need a program called "Cura". To start the installation of Cura, download it first from <https://ultimaker.com/en/products/cura-software>. After downloading, open the installer and run the installation wizard to complete the installation. To make sure Cura can run on your computer, we recommend checking the system requirements described below.

### Operating Systems

- Windows Vista or higher, 64 bit. 32 Bit supported up to Cura 2.3.

- Mac OS X 10.7 or higher, 64 bit.
- Ubuntu 14.04 or higher, 64 bit.

## System Requirements

- OpenGL 2 compatible graphics chip, OpenGL 4.1 for 3D Layer view.
- Intel Core 2 or AMD Athlon 64 or newer
- 205 MB available hard disk space

## Getting Objects to Print

### Download Objects from the Internet

The best way to get started in our opinion is to simply download objects from the internet. The website we recommend is <https://www.thingiverse.com/>. Browse or search for an object you want to print, and then download it. It should download an .STL file (Standard Tessellation Language File).

### Create Objects

You can also design your own objects which is what makes 3D printing to great! For beginners we recommend designing your objects using a website called <https://www.tinkercad.com/>. Of course, you can use any CAD (Computer Aided Design) program that can export an .STL file though if you wish.

## Printing the Objects

### Preparing Cura

1. Open Cura (Note: Cura may take a long time to open for the first time.)
2. Click the arrow next to **Custom**
3. Select **Custom FDM Printer**
4. Next to **Printer Name**, type in what you want to call your printer
5. Click **Add Printer**
6. Enter 220mm for **X (Width)**
7. Enter 220mm for **Y (Depth)**
8. Enter 240mm for **Z (Height)**
9. Check **Heated Bed**
10. Change **GCode Flavor** to Marlin
11. Change **Material Size** to 1.75mm
12. Change **Nozzle Size** to 0.4mm
13. Click **Finish**

### Preparing your Print in Cura

1. Go to **File -> Open Files** and select your .STL file

2. Make sure **Material** is set to PLA
3. Select your **Profile** (quality) of your print. For faster prints, choose something like 0.4mm. For more detailed prints, use something like 0.1mm.
4. Select your **Infill**. Infill is how much material is printed inside of an object. More infill creates stronger prints, but takes much longer to print. The average infill is about 20%.
5. If your object has a lot of overhangs (areas that are not directly supported), then check **Generate Support**
6. Check **Build Plate Adhesion**
7. Click **Save to File**
8. Move the file saved to the Microsd Card provided

### Preparing your Printer

1. Ensure that a layer of masking tape has been applied to the printing surface and is free from any holes exposing the print surface beneath.
2. Put the Microsd Card into the 3D printer
3. Plug in your 3D printer
4. Press the **Center Button** on the printer
5. Press the **Down Button** until you reach the **SD Card** menu
6. Press the **Right Button**
7. Press the **Down Button** until **Mount Card**
8. Press the **Right Button**
9. Press the **Top Button** until **Print File**
10. Press the **Right Button**
11. By pressing either the **Up** or **Down Buttons**, find your file
12. Press the **Right Button** on your file
13. Your object should start printing

### Collecting your Print

When your print is finished, wait for about 10 minutes as the plate beneath your object is extremely hot and may burn you. After 10 minutes, take a scraping tool or a knife and gently pry up on your object from the bottom while being cautious not to damage the plate beneath. By hand, try to pry any material on the object that was not in the original file. You can use a knife for this if you have to, but be careful not to damage yourself or the object.

### Support

If you need any help with your 3D printer, please email [contact@bluecrew6153.org](mailto:contact@bluecrew6153.org) and we will email you back as soon as possible.

The whole team thanks you for your support of The Blue Crew Robotics Team. Your help in combination with others is what will allow us to continue to spread STEM (Science, Technology, Engineering, and Mathematics) in Franklin County.