

Deterrence Dispensed
Presents

gettinG your
first

3D-printer

and how to use
it

no prior 3d-printing
knowledge needed

by Jstark1809

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Introduction

3D printing is the process of using a computer controlled

assembly to move a nozzle along the X(left/right),
Y(away

from you/toward you), and Z(up/down) axes, through which filament is forced by extrusion and heat and thus transformed from a solid to a melted form, then layered onto a printer's bed.

The heated nozzle assembly, known as a hot-end, moves along the X and Y axis to place a layer of melted plastic. Immediately after the heated plastic has been laid down, it is

cooled by a fan, or the ambient air temperature. On the Ender

3, the hot-end moves up one layer height after each layer has

been printed, to place a new layer on top of the previous one,

which has now been cooled. This is how fused deposition

modeling(FDM) 3D printers work.

The most cost effective FDM 3D printer currently available,

allowing the majority of our released designs to be printed, is

the Creality Ender 3. As of February 2020, it can be generally

be found to cost approximately \$199 USD.

In this guide you will learn where you should buy the printer,

how to properly assemble it, which upgrades improve it the

most, and how to get the most effective use from it.

BUYING THE PRINTER

To ensure the Creality Ender 3 you are getting has the latest hardware and software revisions added by Creality, you should order your printer from ebay store:

<http://ebay.us/Rw3XdB>

Do not order a Creality Ender 3 Pro !

Get the regular Creality Ender 3 or the Ender-3X !

The reason is that you'll end up with a better 3D-printer if you

buy the Ender 3 and buy upgrades for it rather than getting

the Ender 3 Pro.

Upgrades

To maximize the potential of your Ender 3 , it is highly recommended that you upgrade the printer with various parts, both purchased and printed(with your new printer).

1. Bed springs. <https://amzn.to/3hmYkhc>
2. Glass bed upgrade. <https://amzn.to/2KJrnzH>
3. Nozzles (0.4mm). <https://amzn.to/3aHlE8i>
4. Metal extruder kit. <https://amzn.to/3hmYkhc>
5. Bowden Tubing+Couplers. <https://amzn.to/37UiEnb>

3D-Printed:

1. Filament guide. <https://tinyurl.com/yb6qjdqs>
2. Mainboard fan guard. <https://tinyurl.com/y8qmx5oc>
3. Control Panel Cover. <https://tinyurl.com/y5pxdlh8>
4. Cable clips. <https://tinyurl.com/y65l9sos>
5. Cable channel cover. <https://tinyurl.com/y295jkfj>

Assembling the 3D-Printer

It is extremely important that you assemble your Ender 3

carefully, and that you follow the instructions of the assembly video closely.

To help you with the assembly watch this assembly video tutorial:

<https://www.youtube.com/watch?v=me8Qrwh907Q>

Before you commence with the assembly make sure you

have watched the above video in its entirety as well as this

video that covers the upgrades:

<https://www.youtube.com/watch?v=hKlsJZJ4aJ8>

It is a good idea to watch both the assembly and upgrade

videos multiple times before starting. This helps to ensure a

better understanding of how to assemble the printer, as well

as when to add the upgrades while assembling it.

Make sure that the surface you put your Ender 3 on top of is

level. Additionally, make sure the base of your Ender 3's frame is level when you begin the assembly. Ender 3's have

been known to have a slight wobble when placed on a flat

surface. If your Ender 3 appears wobbly, loosen the frame

bolts on each side, and ensure your frame is square before tightening them again. Continue assembly after this step.

After you've installed your glass bed you will need to move the Z-stop switch a few mm higher or else your nozzle will drive itself into the bed even at maximum spring tension of the bed springs. Just unscrew, move higher, screw back in.

How to use a slicer

Initially you begin a print with a 3D model. To print that model,

it has to be converted to a program language called gcode(.

gcode). This happens using software commonly called a slicer(due to the model being "sliced" into many individual

layers, which are printed on top of each other).

The .gcode file contains all information that your 3D-printer

needs to print the sliced 3D-model. From the beginning of the

print(preheating the hot-end and bed), through the layer by

layer build, to the end(cooling down these same two components using the fans and ambient temperature).

For the Ender 3, I recommend the user-friendly slicer "Cura".

I've put together a package with included instructions to

install a reliable version of Cura with improved functions:

https://jstark1809.keybase.pub/DetDisp_3D_Printing_Guide_Slicer_Package.zip?dl=1

The following steps explain how you will usually generate a .gcode file from the .stl files provided with our releases.

The standard filament to use is PLA(1.75mm diameter).

1. Double click the .stl file or open it in Cura
2. Click the object on the virtual bed. Using the menu context options on the left side of the screen, rotate the object to obtain the proper printing orientation.
3. Choose your profile(e.g. Dynamic Quality 0.16mm)
4. Choose infill Density(For Max strength=100% Infill)
5. Choose hotend/printing bed temp(Hotend:205°C, Bed:60°C)
6. Click Slice. Copy .gcode file to the 3d-printer sd/tf card.

Leveling the Bed

It is absolutely crucial to keep the print bed as level as possible. If it is not leveled well, there is a high potential for

your prints to come out very poorly, or even to fail completely.

Properly leveling the print bed will be the biggest challenge

for you when starting out with your 3D printer. To help you

learn how to level the bed as fast and as easy as possible, this video will assist in understanding the basics: <https://www.youtube.com/watch?v=5eqTmb01cBk>

After you have roughly leveled your bed, with either the paper method or feeler gauges, use the [first provided leveling .gcode file](#) to start a spiral styled print on the bed. As the spiral is getting printed, adjust your print bed on each corner very carefully while the printing is happening, watching how the thickness of the lines change, as well as whether they stick over the entire area of your print bed. After a while, the printer will begin a second layer. Stop the print at this stage, removing the initial layer and beginning again. Continue using the first .gcode until you have successfully put down a uniform spiral that sticks perfectly over the entire area of the print bed, and has an even thickness through the same area.

Now, use the [second leveling .gcode file](#) with 5 squares. Make sure all 5 squares end up with a smooth and uniform texture/surface finish, and that all stick well to the print bed.

If this is not the case, return to the first .gcode file, and adjust

the distance between the nozzle and the bed(changing how much the lines are squished) , as well as ensuring the line thickness is truly even throughout the spiral.

Printing Tips

1. If your nozzle ever scrapes across your build plate, you should replace it. Watch this video to understand how to replace the nozzle: <https://youtu.be/FRzsGttNMyk?t=360>
2. Before you level the print bed and before major prints, always make sure to clean your upgraded glass print bed with alcohol wipes. Afterwards, wipe the print bed with tap water to remove any residue from the alcohol wipes.
3. After a print finishes, let the print bed cool off to have an easier time removing the print. Cautiously use a razor blade, along with the Creality supplied spatula/scrapper, to shimmy the print from the glass bed.
4. If you want to have an easier time when putting in your microSD/TF card into the printer, get a SD card to microSD/TF card adapter with a long white ribbon cable. This will also prevent breaking the microSD/TF card slot of the printer over

time.

5. Get a craft/exacto knife. It will come in very handy when removing printing imperfections (small blobs, stringing nibs).

6. When instructions in the readme call for supports to be used when slicing, a slot drive/flat head screwdriver can be cautiously used to assist in support removal.

7. Remember to apply silicone/PTFE grease onto the z-axis lead screw every few weeks.