

Ajax Public Library: 3D Printer Tutorial

At Home

Watch "[Part 1: Thingiverse](#)" of the Library's 3D Tutorial Playlist before proceeding.

1. Find an object you want to print at Thingiverse.com. Make sure the object is in .STL format, and verify the object is in one part or multiple parts. Your 3D object must be printable in a 2-hour time frame.
2. Download your .STL file to a portable USB drive.
3. Book a future appointment by calling the Library at 905-683-4000 ext. 8813. Explain that you have completed the online 3D printer workshop, and would like to do a 3D print of your own. Staff will assist you in booking an available time slot.
4. Make sure you bring both your portable USB drive and your Library card when you come for your 3D print session!

At the Library

1. Have your Library card scanned at the Service Desk to verify that you have successfully completed the 3D Printer Quiz, and pay \$3 for your session.
2. Sign the 3D Terms and Conditions Agreement. You will only need to sign this the first time you print independently.
3. Ask for the 3D printer tools and filament.

Before Printing

Watch "[Part 2: Filament](#)" of the Library's 3D Tutorial Playlist before proceeding.

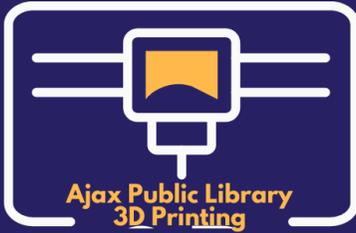
1. Clean the print bed.
2. Make sure the blue USB cable (from the toolbox) is connected to the 3D printer and the computer.
3. Add enough blue tape (from the toolbox) to the print bed. Do not overlap, make sure it is completely flat on the print bed, and make sure you have enough for your 3D object that you wish to print. Do not place tape on the left side of the print bed. See Figure A.
4. Turn on the 3D printer.
5. Prepare the filament spool. Cut the end of the filament to ensure it has a clean nub. If the filament nub is melted and uneven or textured it may cause clogging in the extruder. See Figure B.



◀ Figure A

Figure B ▶





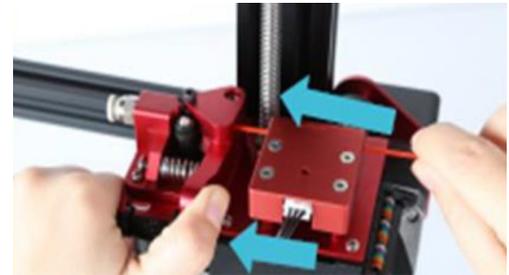
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Before Printing Continued

6. Insert filament. If needed, press the back arrow button on the top right to get to the main menu. From the main menu on the touchscreen, tap “Settings” and then “Refuel” (Figure C).



◀ Figure C
Figure D ▶



7. Slowly feed the new filament through the filament sensor until it reaches the tension spring pinch points. Tap “Feed”; the machine will ask if you want to heat up to 195 degrees, tap “Yes”. The printer slowly pushes the filament between the two pinch gears of the tension spring (Figure D).
8. Once the temperature reaches 195 degrees, and once the filament has gone past the pinched gears, press and hold the tension spring lever and insert the filament all the way into the extruder motor. Keep pressing the tension spring until you feel that the filament can no longer be pushed into the tube.
9. Tap “Feed” again (Figure E). At this point you will see filament extrude from the nozzle point. This can be removed with the pliers. Once there is a steady stream of your desired filament colour, the filament feeding process is complete.

Figure E ▶



Start Printing

Watch “[Part 3: Cura](#)” of the Library’s 3D Tutorial Playlist before proceeding.

1. Open Cura on the computer. The left tab should say “Creality CR-10S Pro”, the middle tab should say “Generic PLA”, and the right tab will update as needed.
2. Load your .STL file.
3. Right-click and hold down your mouse to see your object from different angles. Use the middle mouse wheel to bring the object closer to you.
4. Click the “Slice” button to see how long it will take your object to print.
5. Does your object need scaling (shrinking)? If so, click on your object and choose the scaling button (Figure F and G).

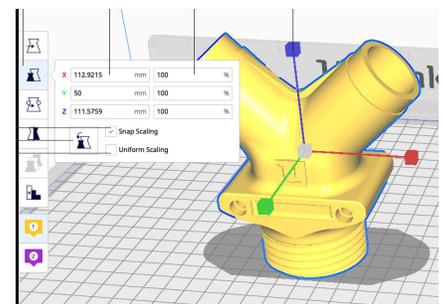
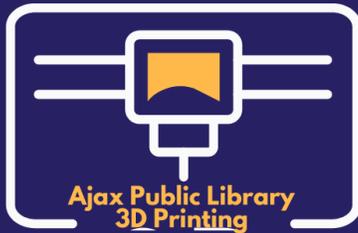


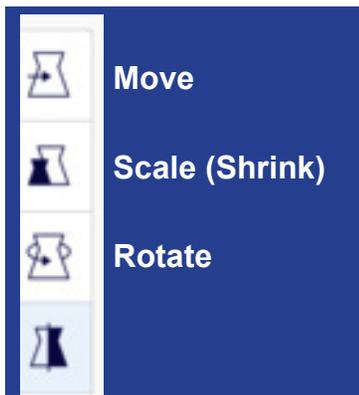
Figure F ▲



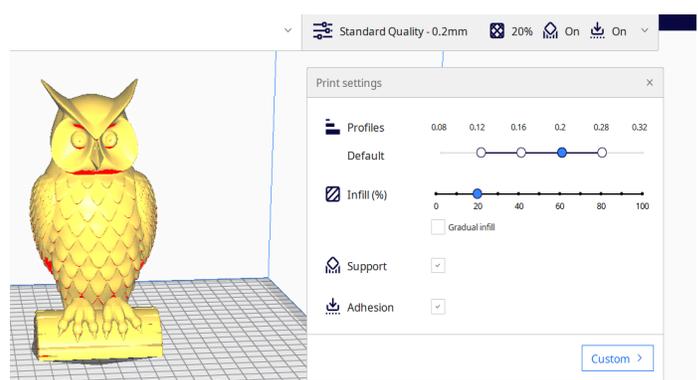
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Start Printing Continued

6. If you need to move your object, click on your object and choose the move button (Figure G).
7. If you need to rotate your object, click on your object and choose the rotate button (Figure G).
8. Does your object need support and adhesion? When you right-click and drag your mouse around, if you see red anywhere on your object, you need to click "Support". Click on the top right tab and choose "Support" (Figure H).
9. Add adhesion to your object (Figure H). Adhesion surrounds the object you are printing at its base, and establish a smooth flow of filament. The adhesion base can be removed after printing.
10. When all of the above is complete, click the "Slice" button and then click the "Print to USB" button. If the button says "Save to Disk", change it so that it says "Print to USB".



◀ Figure G
Figure H ▶



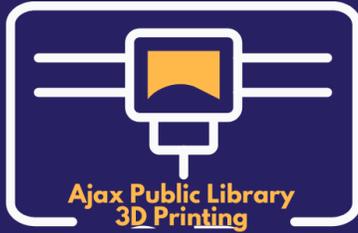
During Printing

1. Please remain at the 3D printer at all times during printing.
2. If you need to pause or stop during print, press the "Pause" or "Stop" buttons.
3. If you cannot see the "Pause" or "Stop" buttons, take Cura out of fullscreen mode.

After Printing

Watch "[Part 4: After Printing](#)" of the Library's 3D Tutorial Playlist before proceeding.

1. The 3D printer will automatically start to cool.
2. Remove filament by tapping on "Settings" on the main menu, then tapping "Refuel" and "Retreat". The extruder will take a few minutes to heat up. Once the progress bar indicates that it has reached a temperature of 195 degrees, it is safe to remove the filament.
3. Once the extruder is back up to 195 degrees, press and hold the tension spring, then gently pull the filament out of the extruder.
4. After the filament has been removed, on the machine press the "Back" button twice, then "Temp", then "Cooling". When it says "Cool Down", your object can be removed.
5. Please remove the blue tape and clean the print bed.
6. Turn off the 3D printer.
7. Close Cura on the computer and log out.
8. Make sure all tools and the blue USB cable are returned to the Service Desk.



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Additional Notes

1. Time limits (2 hour print-time maximum) have 30 minutes both before and after built into appointments for a 3-hour total appointment.
2. Users must be over the age of 10; any user aged 10 or younger must have a parent or caregiver present during the entire session.
3. All participants must remain with the 3D printer at all times.
4. Please avoid touching the print head and the bed during printing. These surfaces get very hot.
5. Please do not adjust the 4 round wheels under the print bed!
6. Only .STL files from [Thingiverse.com](https://www.thingiverse.com) are to be used for 3D printing.

The Library does not guarantee a successful print job. Unless the print fails to finish, customers are expected to pay the full cost of the completed print, regardless of quality. We will do our best to help you create a successful print. Please connect with Library staff for additional assistance or any questions in advance of your appointment.

Print Independently: Take the Quiz!

If you wish to do your own 3D printing, please take the 3D Printer Quiz, and email your completed quiz, name, email address, phone number, and Library card number to libraryinfo@ajaxlibrary.ca. You will be notified of your results; you must pass the quiz in order to 3D print independently.

Questions?

Email: libraryinfo@ajaxlibrary.ca

Phone: 905-683-4000

We look forward to seeing your creativity!