PURPOSE

Vaughan Public Libraries engages the community by inspiring interest in the maker movement and by offering access to new and emerging technologies such as 3D printers. These <u>Terms of Use</u> establish how and under what circumstances customers may use the Library's 3D printers.

TERMS OF USE

1. The Library's 3D printers are available to customers to make three-dimensional objects in plastic using a design that is uploaded from a digital computer file.

    The Library's 3D printers may be used only for lawful purposes. The public will not be permitted to use the Library's 3D printers to create material that is:
    - Prohibited by local, provincial or federal law.
    - Unsafe, harmful, dangerous or poses an immediate threat to the well-being of others. The printer should never be used for anything that touches food. It is not food-grade plastic and does not print a smooth surface. Cups, plates, utensils, etc. can be printed for prototyping purposes, but should not be used to consume food or drink.
    - Obscene or otherwise inappropriate for the Library environment.
    - In violation of another's intellectual property rights. For example, the printers will not be used to reproduce material that is subject to copyright, patent or trademark protection.

2. The Library reserves the right to refuse any 3D print request.

3. 3D printing at the Library is currently free. A fee may be charged in the future to cover the printing costs.

4. Items printed from the Library's 3D printers that are not claimed within 7 days will become the property of the Library. Items must be picked up by the individual who printed them.

5. Only designated Library staff and customers who have completed 3D Printer Certification will have hands-on, independent access to the 3D printer. This includes training on:
    - How to prepare a 3D design file for print
    - How to use the equipment properly and safely
    - Reviewing the rules and guidelines to using the 3D printer

PROCEDURES

The procedure for printing from the Library's 3D printers is as follows:

1. Eligibility:
    - Customers must have a valid Vaughan Public Libraries card.
    - Customers must complete a 3D Printer Certification Course demonstrating knowledge of the basics of using the printer in order to use it independently.

2. Design creation**:**
    - The 3D printer can be used with basic knowledge of Computer Assisted Drawing (CAD). Creating a new design requires an advanced knowledge of 3D modeling software products. Video tutorials that accompany CAD programs can be of assistance.
    - Any 3D drafting software may be used to create a design as long as the file can be saved in .stl, .obj, or .thing file format.

- The Library has computers that can be used with online software such as Tinkercad to create a design. Makerbot Desktop and Meshmixer have been installed on the public desktops and laptops for design creation and to ready the design for printing.
- Digital designs also are available from various file-sharing databases such as Thingiverse.com.
- You can digitize your own object and 3D print it to a larger or smaller scale
- This is a trial and error service. Considerations prior to printing may include but are not limited to: whether the object overhangs and needs supports; complexity of the design; if the base is large enough for the model; or even if PLA is a suitable material for the object. Patrons may desire to rework their file if the object does not print properly initially. Reprints are charged at the regular rate.

3. Submitting a design for printing:
- Persons wanting to use the 3D printer shall bring their file (in .stl, .obj, or .thing file format) (no larger than 25MB) to the Library during open hours. In order to print, the patron will need to have completed VPL's 3D Printer Certification.
- The 3D printer has a print area of 25.2 L x 19.9 W x 15.0 H cm [9.9 x 7.8 x 5.9 in] with a build volume of 7,522 cubic centimeters [456 cubic inches].
- PLA filament is available in the following colors: red, yellow, blue, green, black, and white. Objects may only be printed in one color.
- If there is high demand, the Library will schedule only one print per day per person or entity.
- The files will be readied for printing in MakerBot Desktop. The Library will view all files in MakerBot Desktop or other authorized software before printing.
- Wait/pickup time: Items may be picked up at the Library. It is sometimes difficult to estimate exact print times due to 3D printing being a beta technology. Library staff will make an educated guess about the length of a job upon request. It is the responsibility of the patron to oversee that their print job is going as planned and alert staff if troubleshooting is required.

4. Please note that procedures governing the use of the Library's 3D printers are subject to change.

DEFINITIONS

3D printing: the process of making a physical object from a digital model. 3D printing, also called additive manufacturing, means making things layer by layer according to a 3D design file. This differs from traditional manufacturing such as machining, which often involves subtracting a material in order to achieve a certain shape.

3D Printer: A 3D printer uses melted plastic to produce objects designed on a computer. The MakerBot Replicator makes solid, three dimensional objects out of melted MakerBot PLA Filament. 3D design files are translated into instructions for the MakerBot Replicator and sent to the machine via USB. Then the printer heats the PLA Filament and squeezes it out through a nozzle to make a solid object layer by layer. This method is called Fused Filament Fabrication. (FFF)

CAD: Computer Aided Design. CAD is the use of computer systems to assist in the creation, modification, analysis, or optimization of a design.

PLA: Polylactic acid (PLA) is a bio-degradable polymer with a low melting point (between 180°C to 220°C) that can be produced from lactic acid, which can be fermented from crops such as maize.