3D INTERMEDIATE JEWELRY

WHAT IS 3D PRINTING?

A 3D printer works essentially like a traditional printer except it prints in plastic layers to make 3-dimensional designs. 3D printers can print in several different materials including plastic, limestone, and even wood, ceramic and metal. Elmhurst Public Library uses a **MakerBot 5th Generation Replicator** which uses a PLA filament: a corn-based plastic. 3D printing has been around as early as the 1990's but has exploded in popularity due to technology advances and lowered costs. Although many 3D printers themselves can cost hundreds, if not thousands of dollars, the materials are relatively inexpensive after the initial purchase.

Why 3D print?

Many different types of people use 3D printers for different things. Several news stories have covered incredible 3D printing projects like parents creating prosthesis for their children or the development of 3D printed cars, but there are plenty of uses for everyone. Some reasons you may use a 3D printer include:

♦ Replacing a broken cabinet handle

♦ Making fun gifts

♦ Printing the case for a prototype electronic component

♦ And maybe most importantly learning to use 3D printing software is a valuable skill

Ways to Print

The easiest way to start printing is to use a design created and uploaded on the Internet. Several websites have large libraries of user-uploaded designs which can be printed freely.   **Thingiverse.**com is one of the largest and easiest to use.
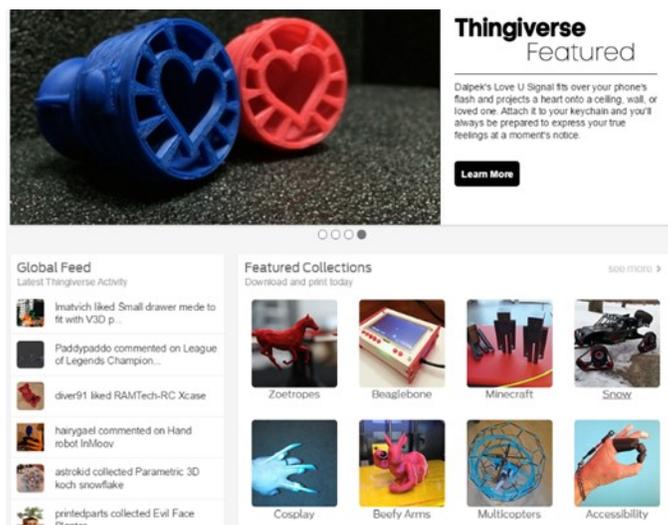
PRINTING AT EPL

To print at EPL you will need to submit your print through:

http://elmhurstpubliclibrary.org/about-us/building-information/3d-print-request/3d-form/

Please note that there are a few limitations to printing:

- 8-hour print limit
- Maximum size:
- 25.2 L x 19.9 W x 15.0 H cm
- 9.9 x 7.8 x 5.9 in
- .10 per gram, with a one dollar minimum (Elmhurst Public Library cardholders only)
- Printing is done by Library staff and is attended to on a first come, first served basis
- Priority printing given to Library programs and events
- Email will be sent once the print job is complete
- Item may be picked-up at the Circulation Desk
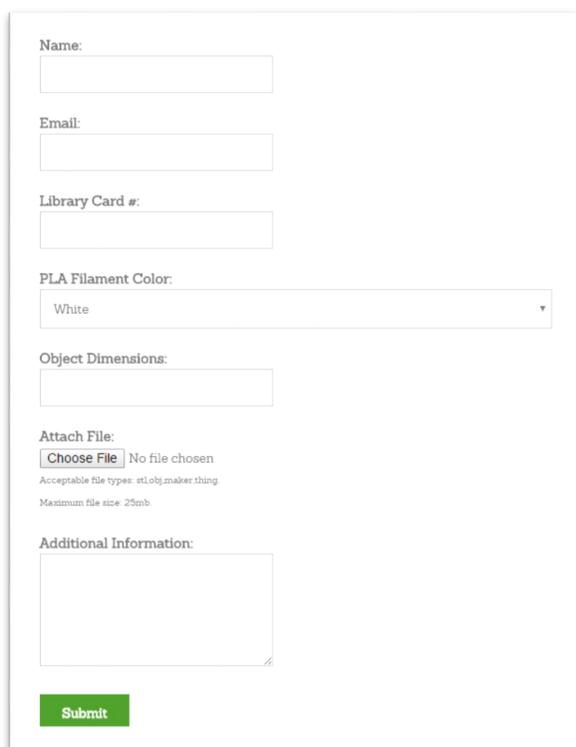
Name:

Email:

Library Card #:

PLA Filament Color:

White

Object Dimensions:

Attach File:
Choose File   No file chosen
Acceptable file types: stl,obj,maker,thing.
Maximum file size: 25mb.

Additional Information:

Submit

Files should be submitted as .obj, .stl, or .MakerBot

If you have any questions about how to submit, exporting your file or anything else feel free to contact us at maker@elmhurst.org.

DESIGN YOUR OWN

Using 3D Printing as a Creation Tool

Create your own 3D designs with this FREE software

Tinkercad

- Web-based 3D modeling software
- Includes lesson modules that lead you through 3D design basics
- Great beginner design platform
- Free

Sculptris

- Beginner digital sculpting tool
- Great stepping stone for more advanced digital sculpting software, like ZBrush
- Free

3D Printing Limitations

While 3D printing is extremely cool and useful, there are several limitations on what is possible right now. A few warnings before starting your project may include:

- 3D printing takes time! Printing a larger or more detailed design may take several hours of printing to complete and using some of the 3D printing creation software can be difficult at first.
- Size of prints is limited to the size of the MakerBot's work area and objects that are too large for the base will need to be cut into pieces and prints separately, and then combined after.
- Overly complicated designs may print incorrectly or with minor to major errors in the layers.
- At this point you can only 3D print in one color at a time per print

Other 3D Printing Services

Shapeways www.shapeways.com

Sculpteo   https://www.sculpteo.com

EXERCISE

During this class we will be using Tinkercad to design our own 3D Jewelry.

Today we'll cover:

♦ How to design and size a basic ring.

♦ How to design a chain

♦ Uploading file to be printed through EPL website

Exercise 1—How to design and size a ring

Step 1: Log into Tinkercad
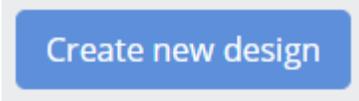
Step 2: Select 'Create new design'

Step 3: Grab either a torus, tube or ring shapes from the 'Basic shapes' on the right side and place on the workplane.

Torus   Tube   Ring
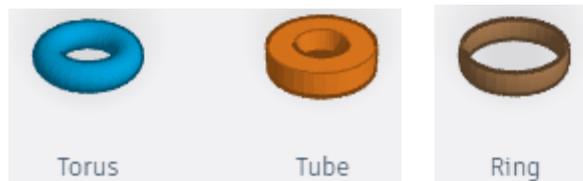
Step 4: Determine your ring size in millimeters.

Helpful website: http://www.ringsizes.co/

Step 5: Create a hole that matches your ring size. Select the striped cylinder hole and drag it to the workplane. Click on any corner to lock in measuring mode. Enter ring inside diameter in mm into both boxes.

Cylinder

Step 6: Click on the ring and grab a corner to size it so that the hole cylinder is in the center of the ring and the hole cuts the design the way you intend. **Pro tip**-If you alter the snap grid to .1mm, the hole will be easier to center. Remember to rotate views and adjust ring material. Hole does not have to be in center!
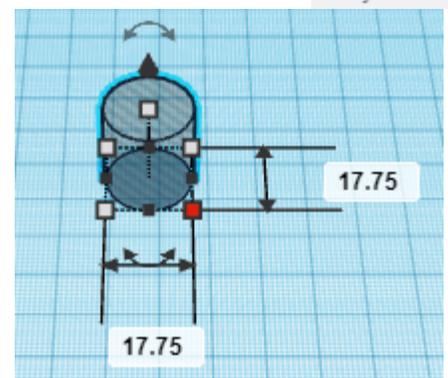
Step 7: Select all (Ctrl + A), and Group (Ctrl + G).

Step 8: Decorate or download as .stl file for printing.

Exercise 2—Basic Chain Making

Step 1: From main Tinkercad screen, select 'Create new design'

Step 2: Drag a tube onto the workplane. Reduce height to 3 mm.

Step 3: Copy (Ctrl + C) and Paste (Ctrl + V) two additional links.

Step 4: Rotate the center link up and move each of the other links out by one click. Rotate views to make sure that none of the links are touching.

Step 5: Select all (Ctrl + A), and Group (Ctrl + G)

Step 6: Copy (Ctrl + C) and Paste (Ctrl + V), rotating to join links without touching to desired chain length. Keep in mind that when the chain is printed, gravity will pull chain to it's full length. Calculating finished length by multiplying link size by number of links will get you closer to actual length.

Step 7: Design clasps if desired.

Step 8: Download design as .stl file to print at the EPL Makery.

Conclusion:

Today we've covered the basics of ring and chain design but there is a lot more to learn; the next step is to dive in! The best way to learn is to experiment and make mistakes. Creative Studio staff members will be available to help troubleshoot or assist you in starting a project. Thanks so much for attending and we hope to see what cool and creative projects you come up with!