3D Model Creation

3D Models can be easily created by combining primitive geometric shapes. Here is a simple exercise you can follow to create a medallion:

Tinkercad.com
User: **makers.coderdojo@gmail.com**
Pwd: cltm2015

Creating the Base:

1. From the side bar, from the "Geometric" group, drag a "cylinder" on to the workplane.
2. Grab the white box on top of the cylinder and drag the height down to **2.0 mm**.
3. Grab the white box on the corner of the cylinder, and drag it until the cylinder is **25 x 25 mm**.
4. Repeat Steps 1 - 3 for a cylinder 4 mm in diameter and 4 mm height.
5. With the small cylinder selected, click on "Hole" in the Inspector window in the upper right corner.
6. Click and drag the smaller cylinder, which will be the hole, into position on the larger cylinder.
7. Click on the workplane and drag a box to enclose both cylinders.
8. Click Group.

STEP 1

STEP 2

STEP 3

STEP 4

STEP 5

STEPS 6-7

STEP 8
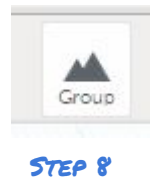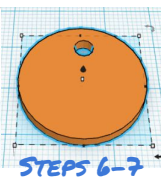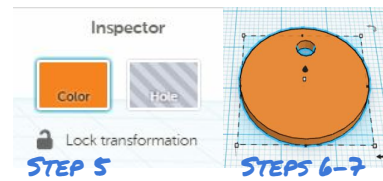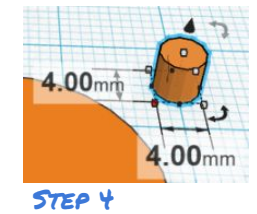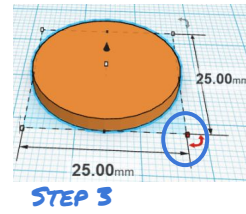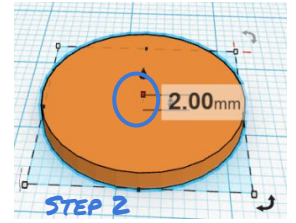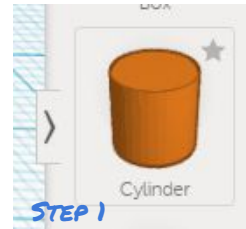
Adding Text:

9. From the sidebar under "Shape Generators", drag "Text" onto the workplane.
10. In the Inspector window, enter your intial(s) and select a font.
11. Drag the letter in position on the base and resize it using the white corner box.
12. Change the height to **4 mm**.

STEP 9

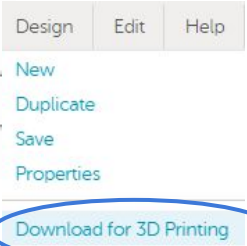STEP 10

STEPS 11-12
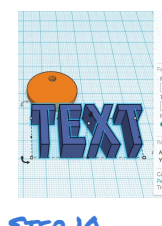
Export the Model:

13. From the top menu bar, select "Design" and then "Properties".
14. Give your project a recognizable name and click "Save Settings".
15. From the top menu bar, select "Design" and then "Download for 3D Printing" and select "STL" as the format..
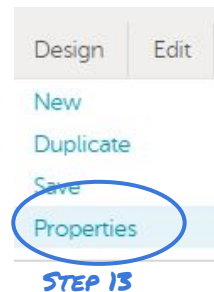
STEP 13

STEP 14

STEP 15

You now have a design that can be 3D printed! Here are some local resources to get a print made:

- Public Library: http://cbcpubliclibrary.net/3d-printing/
- OSU Students: http://guides.library.oregonstate.edu/3Dprinting/3Dprintform
- Local 3D Hubs: https://www.3dhubs.com/corvallis

And some local Maker Resources:

- Corvallis Area Makers: https://www.facebook.com/groups/corvallisareamakers/
- The Co. Corvallis Maker Fair: https://www.facebook.com/corvallismakerfair
- Corvallis Library Maker Program: library.maker@corvallisoregon.gov

3D Printing at the Library?

Libraries are for sharing information. In the 21st Century, information is increasingly digital. You can put a hold on a book. How about requesting a print of an interesting object?

The Library's Corvallis and Philomath Makers Clubs have been learning how to design and print 3D objects!

What is 3D Printing? 3D Printing, or "Additive Manufacture", is the process of creating a three dimensional object by the repetitive deposition of materials on a surface. With the advent of open source projects like Arduino, 3D printing has become affordable enough for hobby use.
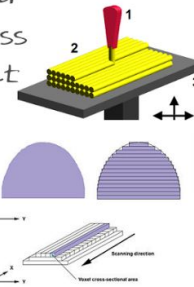
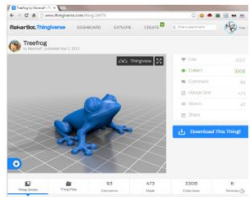**Applications:** 3D Printing's applications are limited only by our imagination!
- Archaeology
- Anatomy
- Medicine
- Math, Science
- Geography
- . . .
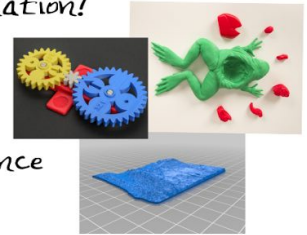
3D Models:

While various 3D modeling software output a number of different file types, STL (Sterolithography) is the file format common to all 3D printers.

G Code? Software call the "slicer" reduces the STL file to G-Code, a numerical machine control language from the 1950s. The object is built slice-by-slice in successive vertical (Z) layers.

3D Model Sources:

Thingaverse.com:
Thingaverse is one of many 3D model sharing sites. You can like or collect models, document your prints, or modify and share other users' projects. Creative Commons licensing typically requires only that you attribute your source.
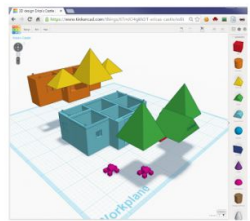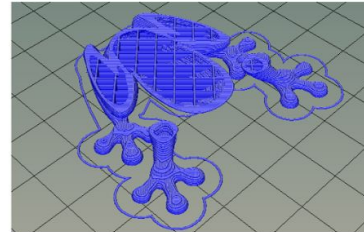
Tinkercad.com:
Tinkercad is a web-based 3D modeling tool that allows you to create objects from primitive geometries like circles and squares. STL models can be imported and modified. Designs can be shared or exported for 3D printing.

Laser Scans: 3D Models can be created from laser scans which generate point clouds of the object's surface. Physical objects like rare archaeological finds can be scanned and shared freely. We have been using a Microsoft Kinect!

Print!

Acrylonitrile butadiene styrene (ABS) or Polylactic acid (PLA) filament is heated to the melting point (~200C) and extruded through a 0.4mm nozzle. A print can take from 10 minutes (frog) to many hours (house).

Local 3D Resources:

http://cbcpubliclibrary.net/3d-printing

https://www.3dhubs.com/corvallis

https://www.facebook.com/groups/corvallisareamakers