

Design a Key chain attachment – 3D printed

TEAM MEMBERS: _____

TEAM NAME: _____

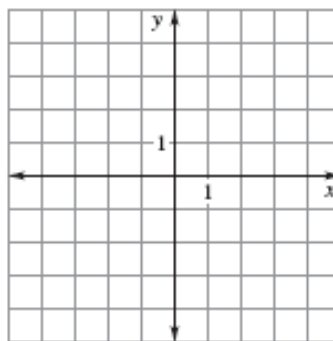
Sketch a drawing of keychain below with the dimensions using the printout of the attachment.
It has to be a **FUNCTION – LINEAR, QUADRATIC , CUBIC AND ITS INVERSE**

What is expected:

1. Turn in the packet.

2. Turn in a 2D rendering.

3. Turn in a 3D printed keychain attachment.



1 - Knowing what you know now, how would you improve upon your design to make it work better on the next try?

2 - What material would you use in another design that you did not use today, and WHY?
It can be a material that was not offered

Your reflections on the project? (short essay at most 10 lines and preferably in bullet points)

(What was your group attempting to achieve with this design?)

What could you have done to make the design better?

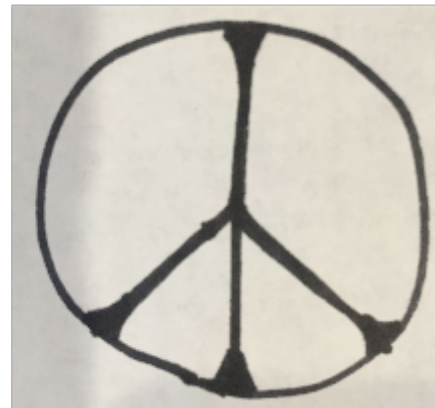
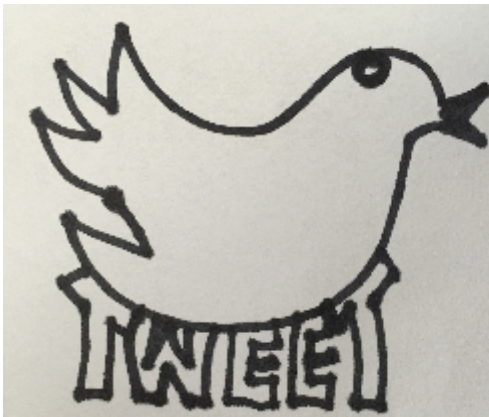
What did this activity teach you about inverses?

2D sharpie drawing to 3D object: bit.ly/2Dto3Dprint

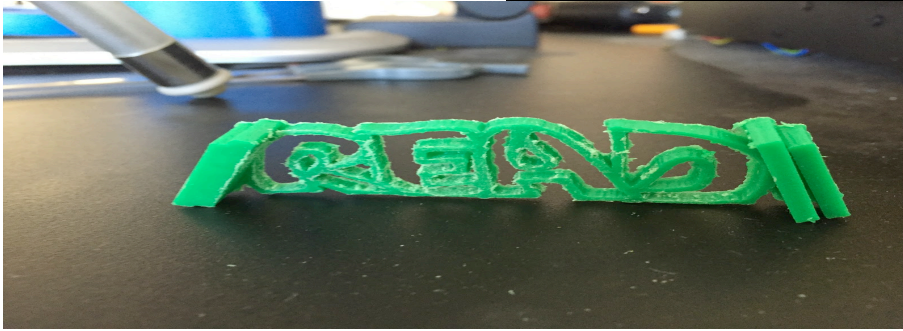
Sharpie Drawing to 3D Object

This file at bit.ly/2Dto3Dprint

1. If you haven't used Tinkercad before, watch this tutorial: <https://youtu.be/MwjWT-EvKSU>. There are also a lot of other tutorials on the Tinkercad site [at this link](#) to help you get more familiar with the software.
2. Draw a simple picture on an index card or plain sheet of paper with a Sharpie marker. Use thick lines and make sure that your entire picture is connected. You don't want *any* separate pieces. If you want it to be able to stand up, make the bottom flat. For example, the one on the left might stand up, the one on the right won't:

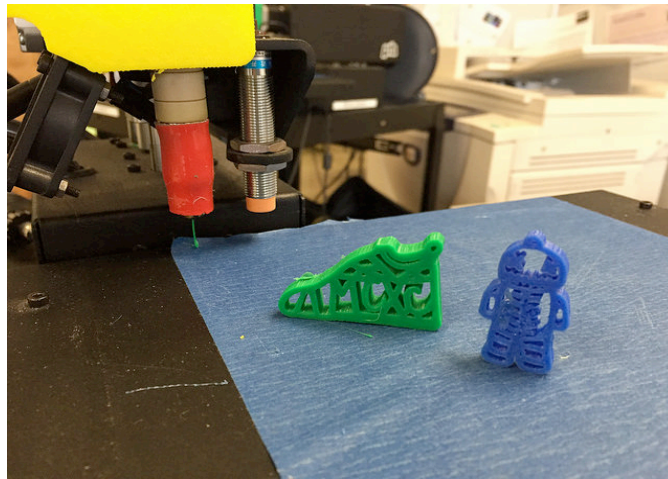


3. Take a photo of the drawing with your camera or phone in an area with lots of light.
4. Upload the file to a computer with internet access.
5. Go to <http://image.online-convert.com/convert-to-svg>. Upload the file and convert it to an .svg file that 3D modelling software can read. You can leave everything at the default settings. Download the new .svg file to your computer.
6. Open Tinkercad.com. Create a free account or login to your existing account.
7. Create a new project by clicking the **New Project** icon under collections.
8. Click **Create new design**.
9. Find the **Import** tab on the right. Choose your .svg file. at the top of the right column menu. Select **Choose File** and find your .svg file. Select **Import**. Reduce the scale to about 25 % to make the file small enough to import.
10. If the imported object is too large to fit in the design area, scale it down. To scale the length and width proportionally, hold down the Shift key and drag from the corner. Make the length no longer than 46 mm. Separately scale the height to about 3 - 5 mm. (Drag the **Ruler**, available under **Helpers**, into the workplane to make the measurements of your object appear when you click on it. You can then either drag to resize or type in new numbers.)
11. If you want to use Tinkercad to modify or add to your drawing, you can do that now. For example, here is a file in which the READ was drawn with a sharpie and imported, and the books were added (using boxes) in Tinkercad:



If you would like to make your object a pendant or earring, add a “tube” a loop.

12. Save your design by going up to the **Design** menu and selecting **Save**.
13. Change the name of your design by selecting **Properties** on the **Design** menu. Name your file in the format YourLastName_YourFirstName_ObjectName_Color. For example: Lofton_Jane_READSign.
14. Export your model from Tinkercad by selecting the **Design** dropdown menu and choosing **Download for 3D Printing**, and then select **STL** format and save it to your desktop.
15. To have your design printed at the Mira Costa Library, make sure you have change the name of the file to your name and make sure it has the .stl extension. Then, go to this link - bit.ly/uploadMCHSfiles - in your browser and upload your file. This will send it to a Google folder so it can be printed on the Mira Costa Library 3D printer.
16. [Let Ms. Lofton](#) know that you have a file ready to be printed.



Adapted with thanks from <http://makerhome.blogspot.com/2013/12/day-109-sharpie-print.html> by Mathgrrl, Laura Taalman.