Fab Lab Design Brief
Laser Cut Stamp Making

Mr. Brandon Prentice
Intermediate Unit 1
3rd - 5th Grade

Summary

This lesson teaches the basic principles of what exactly a laser cutter can do! Students will use a computer to design a stamp to be engraved onto rubber material. The class is shown how to use basic software features to laser etch a stamp that would be used to dip in ink. The students lastly design and assemble the handles which are either laser cut from wood or 3D printed from plastic. **Estimated Time: Four (1 hour) Days**

Standards

Standards for Technological Literacy:

1. STL8.3-5.D - Requirements for a design include such factors as the desired elements and features of a product or system or the limits that are placed on the design.
2. STL10.3-5.E - The process of designing involves presenting some possible solutions in visual form and then selecting the best solution(s) from many.
3. STL12.3-5.D - Follow step-by-step directions to assemble a product.
4. STL12.3-5.E - Select and safely use tools, products, and systems for specific tasks.

State Academic Standards for Science, Technology and Engineering Education:

1. PA.3.4.3.C2 – Explain why the design process requires creativity and consideration of all ideas.
2. PA.3.4.3.E6 – Explain how manufacturing systems design and produce products in quantity.
3. PA.3.4.4.D1 - Investigate how things are made and how they can be improved.
4. PA.3.4.5.C2 - Describe how design, as a dynamic process of steps, can be performed in different sequences and repeated.

Objectives

1) Students will understand the different features of design software and how it can be easily used to their needs.
2) Students will apply the ability to and manipulate geometry to produce a 3D model.
3) Students will analyze the different material and software setup features to carry out tasks.

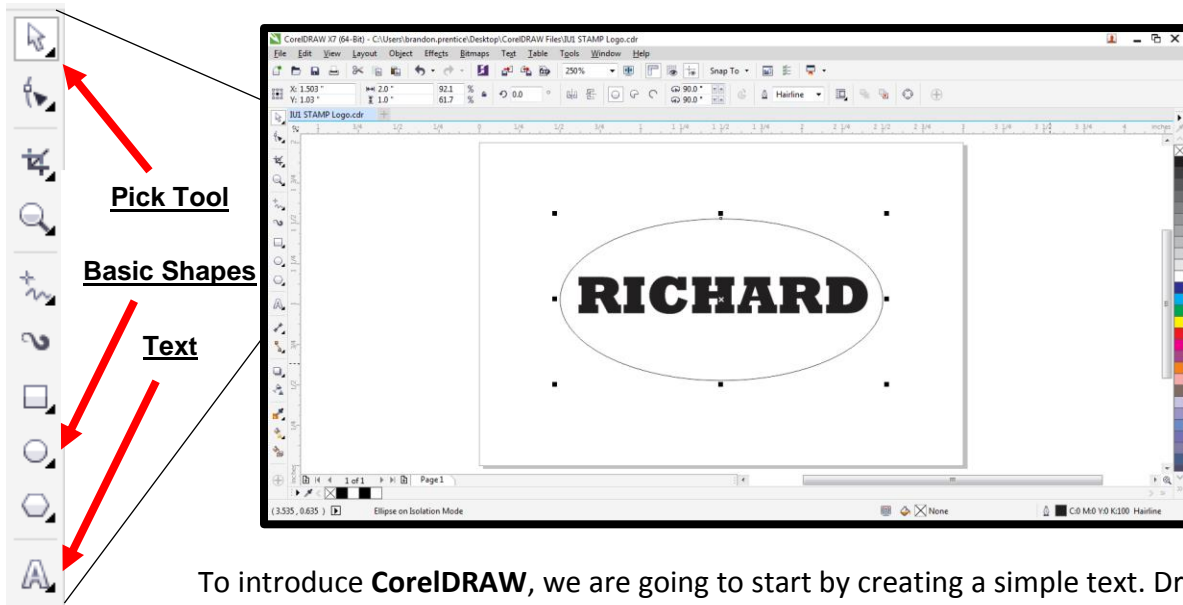# Laser Cut Stamp Project

Name: _____ **Date:** _____

Create your very own rubber stamp! Learn to put your name on the computer to then be laser engraved onto rubber and then create your own handle. Just follow these easy step-by-step instructions below.

Day 1: Rubber Stamp Engraving

Pick Tool

Basic Shapes

Text

To introduce **CorelDRAW**, we are going to start by creating a simple text. Draw out a 2 inches wide, 1 inch tall oval and type your first name (in all capital letters). Once completed, remember to "mirror" your name how it is shown here:
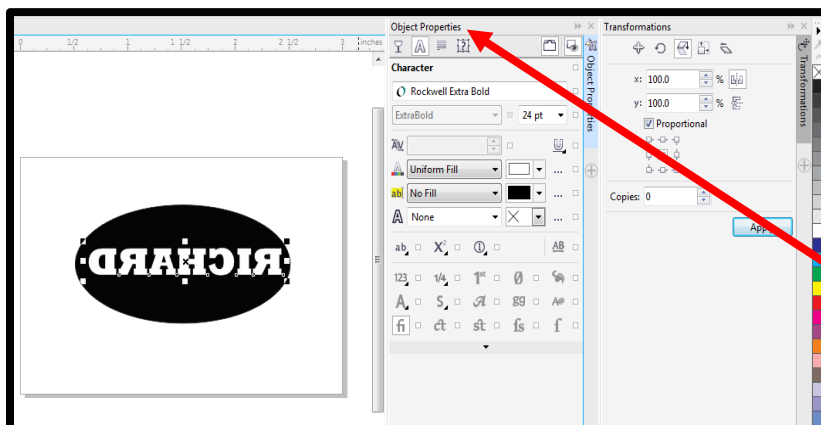
Step 1. Select Text

Step 2. Press Alt + F9

Step 3. Press [icon] and then "Apply"

Note: Under "Object Properties," change TEXT to white fill and OVAL to black fill, "Hairline" stroke.

Days 2&3: Handle Design

The handle can be designed one of two ways which is chosen by the teacher. Use Google SketchUp/CURA if it is to be 3D printed or use the same CorelDRAW software from earlier for laser cutting 1/8" plywood.

Laser Cutting

Students will need three total pieces drawn. One is the base that is the same exact size as the stamp itself. The other two pieces can be any shape as long as they are identical with one difference; the center slot located as shown below:
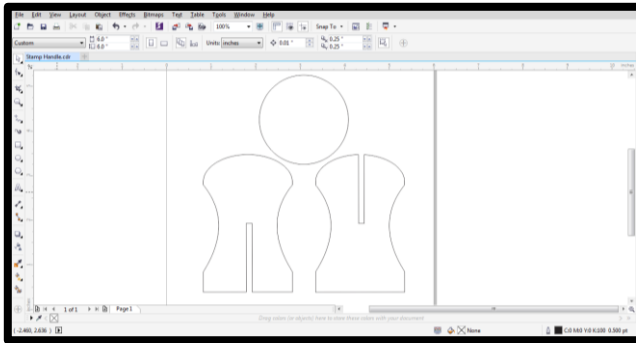
3D Printing

Students will need to have a basic understanding of a 3D modeling software like Google SketchUp to make a .STL or .DAE file. Once done, it will need to be uploaded to CURA to generate a .GCODE file.
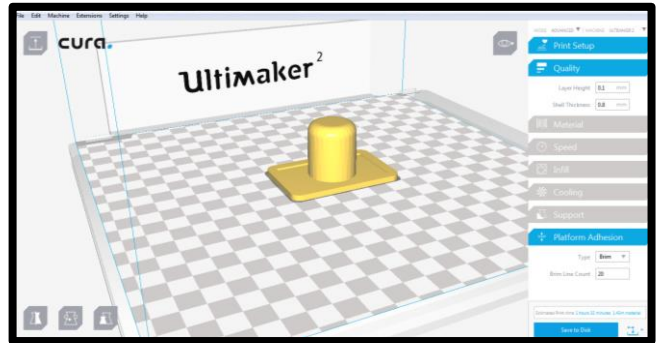
Day 4: Assembly

Use hot glue or wood glue to join any woods together and then use a hot glue gun to stick the engraved rubber stamp to the plywood piece.

**If 3D printed, use a superglue approved or brought in by the lab manager.

Resources:

[Laser Engravable Rubber](#)

1/8" x 12" x 24" Craft Plywood

Laser Cut Stamp Rubric

Name: _____ Date: _____

Students are to use the following rubric to target expectations and achievement to complete the laser cut stamp design.

Points	7 - 8	5 - 6	3 - 4	1 - 2	Score
Required Elements	The stamp module has all the features that were required.	Most of the required features are included for the stamp module.	The stamp module was missing a few features.	Most of the required features are missing.	
Creativity	The student's stamp was designed very well.	The student's design was designed typical.	The student's stamp was designed below average.	The student's stamp was designed very poorly.	
Appearance	The appearance of the design is exceptionally attractive	The designs are mostly attractive and neat.	The designs are not well thought out or organized.	The appearance of the designs are messy and unpractical.	
Construction	Construction is very symmetrical and square. Everything lines up.	Construction is solid and mostly square. Most components line up.	Not very solid. Out of square in places. Parts don't line up.	Construction is poor. Nothing lines up or is square. Joints are not solid.	
Stamp Handle	The handle is properly installed and connected well.	Some minor mistakes and interference with the handle	The handle was not Installed well or properly.	The handle was installed poorly or isn't connected.	

Total Score: **/40**