APPL 110
Laser Cutter Certification – Practice Project

After completing the online Laser Cutter training and earning 100% on the final quiz, you must complete a training practice task. This guide will walk you through the official APPL110 practice project for completing your Laser Cutter certification.

Project: APPL 110 Star

To laser cut and etch a calibration star that will help you identify the laser cutter's output for vector cut, vector etch, and raster etch settings.

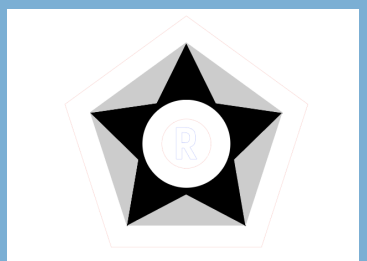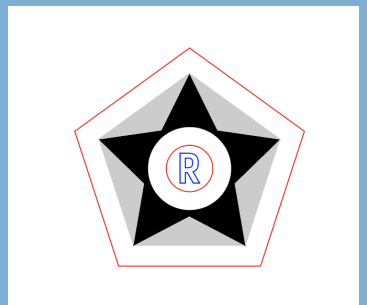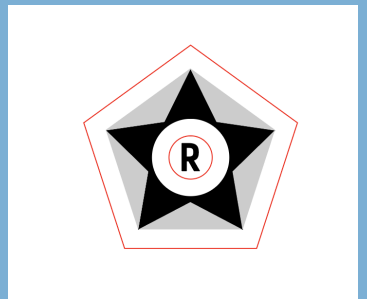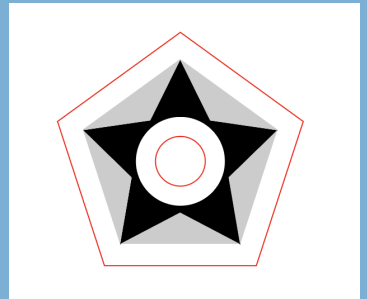**Step 1:** Download the design file for this practice project here: **https://www.thingiverse.com/thing:4569130**

Step 2: Open the file in Adobe Illustrator - it uses the Murray Hall laser cutter template, so the document is already in RGB color mode.

Step 3: Add a new text element by using the Text tool (icon: T.) Put your first initial in the center ring - this will be cut out and become a scrap 'coin.'

Make sure to click 'Create Outlines' when the text is the way you want it. This converts the text to a shape so that it stays the same, even if the laser cutter computer doesn't have the font you used.

Step 4: Review each element of your design and check the stroke/color settings for each one.

There should be three colors in your design that you will need to determine settings for: 1 raster element with shades of black (gray pentagon, black star) and 2 vector elements (the red outlines, which you want to cut, and the blue text, which you want to etch.) When you've got the correct settings, it will look something like the picture to the right.

Step 6: Each element of your design will be controlled by a different RGB color that the laser cutter sees: RGB red, RGB blue, and RGB black. The raster elements in the example are controlled by one setting for RGB black, but are different shades so will automatically etch at different depths according to their gradients.

Double-check that the two vector elements (outlines and text outline) are set as two different RGB colors, and change the stroke thickness to be .072pts (aka .001in). In the example, the shape outlines are RGB red and the text outline is RGB blue, but you can use any of the approved laser cutter RGB colors.

Step 7: Determine the initial power/speed settings by consulting the power/speed boards for your material. You ***must*** use scrap material for this practice project, and you ***must*** use cardboard as your material. Make sure you write these settings down to remember them later. See digital versions of the power/speed boards here: **https://beam.unc.edu/files/2019/04/LaserCut_Ebook_V1.pdf**

Step 8: *(optional)* If you have a PC, you can download the ULS software and check the time estimate for your project before you get to the makerspace. Find instructions here:
https://beam.unc.edu/files/2019/01/LaserCutter_SoftwareSOP_01012019.pdf

Step 9: At this point, you're ready to head to a BeAM to use the laser cutter. To check which BeAM makerspaces have laser cutters, head to the BeAM website Locations page here: **https://beam.unc.edu/locations/**

Step 10: Once you check into the makerspace, ask a staff member to add yourname to the laser cutter queue and make sure to get all 3 of your checks from BeAM staff to get on the machine as fast as possible.

Step 11: BeAM staff will call your name when it's your turn to use the laser cutter. For a refresher on operating the laser cutter, check out the BeAM Laser Cutter Quick Guide here:
https://beam.unc.edu/files/2020/06/LaserCutterQuickGuide.pdf

Step 12: After you run your job on the laser cutter, show your finished practice project to BeAM staff and they will update your record in the BeAM database. Make sure to clean up and reset the laser cutter for the next user.