

Laser Cutter Badge: Glowforge Pro

Age: Grades 9 and up.

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LEVEL 1

Objectives:

- To learn the basic functions of the laser cutter.
- To engrave and cut an object using the Glowforge software

1. Identify parts of the laser cutter and their functions

1a. Front



1. **Lid**—Clear hinged top of the device. Gently lift for inside access.
2. **Lid Camera**—Displays material on the Glowforge Web App
3. **Laser Tube**—Emits Laser
4. **Laser Arm**—Moves laser along x-axis
5. **Rail**— Moves the printer head along the y-axis.
6. **Printer head**— Moves along the laser arm and rail to create your design

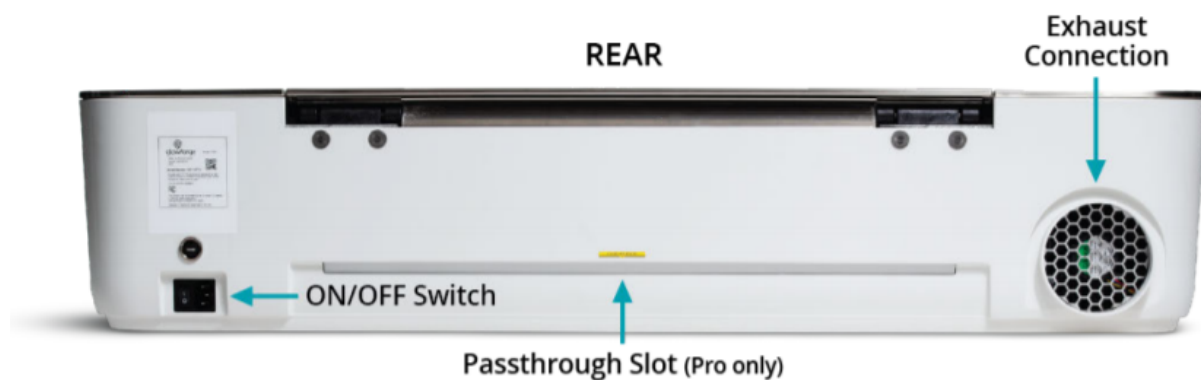
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- 7. **Button**— Press the button once it begins glowing to start your print.
- 8. **Crumb tray**— Catches particles from laser cutting. Only staff members should remove the crumb tray.
- 9. **Front Door**— Can be lowered to remove crumb tray
- 10. **Passthrough Slot (Front)**— Allows long pieces of material to be fed through for larger projects

1b. Rear






- 1. **ON/OFF Switch**— Used to activate the Glowforge Pro.
- 2. **Exhaust Connection**— Fumes are sucked into the fan and are fed into the air filter.
- 3. **Passthrough Slot (Rear)**— Cut or engraved materials exit here for the passthrough feature.

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1c. Air Filter

-  **ON/OFF Switch**— Used to activate the air filter.
-  **Power Cord**— Powers the air filter.
-  **Compact Filter Knob**— Turn to adjust the power to the power filter.



2. Safety Guidelines

- Make sure the air filter is powered on and the ventilation tube is attached to the Glowforge.
- ALWAYS make sure you've chosen the correct material in the Glowforge App. Choosing the wrong material could result in your print catching fire.
- Always print with both the top lid and front door closed.
- Do not reach inside the Glowforge Pro while it is in operation.
- Operate the printer on a solid surface.
- Do not attempt to move the Glowforge Pro.
- Do not attempt to remove the crumb tray or open the front door without a staff member present.

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3. Turning on the Glowforge

- There is a black power button on the back right of the machine. Hit the button to turn the Glowforge on.
- Power on the air filter by hitting the red power button on the filter's left side.
- Activate the air filter by turning the filter knob on the right side of the filter.

4. Your First Design

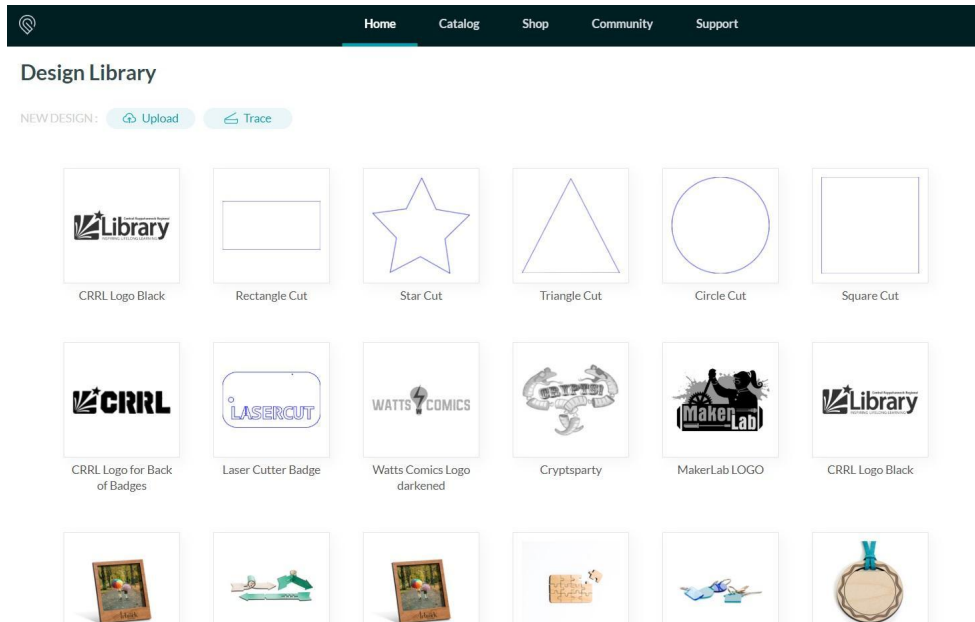
4a. Uploading an image

1. Go to <https://app.glowforge.com/> and have a staff member login for you.
2. The home screen will appear with a design library. Here you can upload your print using the upload button, or use one of the existing designs.
 - a. JPEG or PNG for engraving only.
 - b. SVG or PDF for engraving and cutting
3. Today we'll be using an image file to make our print.
4. Click the upload button and upload any image of your choosing or select the CRRL Library Logo.

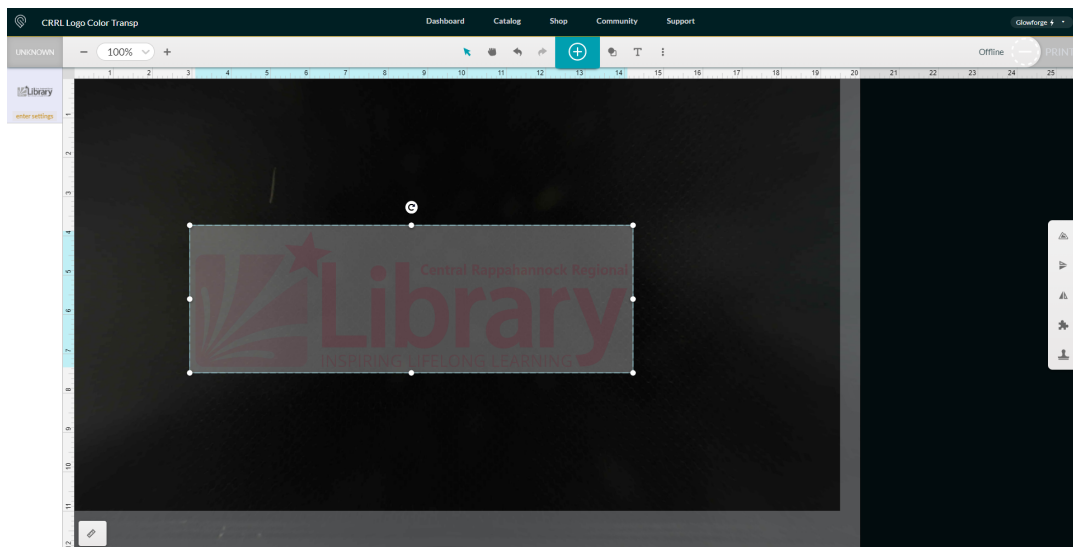
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5. Select the image you'll be engraving by double clicking it.
6. The Glowforge's camera will display a view of the machine's crumb tray. Your design will appear and then can be resized and repositioned.



7.  (Optional) Add text using the text controls at the top of the display.

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4b. Cutting

1. You can cut around your design using two tools.



- a. **Shape Tools-** The shape tools allow you to draw a shape around your design.



- b. **Outline Tool-** The outline tool will appear on the right of the screen when your design is selected. The outline tool will generate an outline around your graphic, which can then be used to cut.

2. Select one of the two cut tools to generate your cut.
3. In the left sidebar, make sure that your design is set to engrave, and your shape or outline is set to cut.



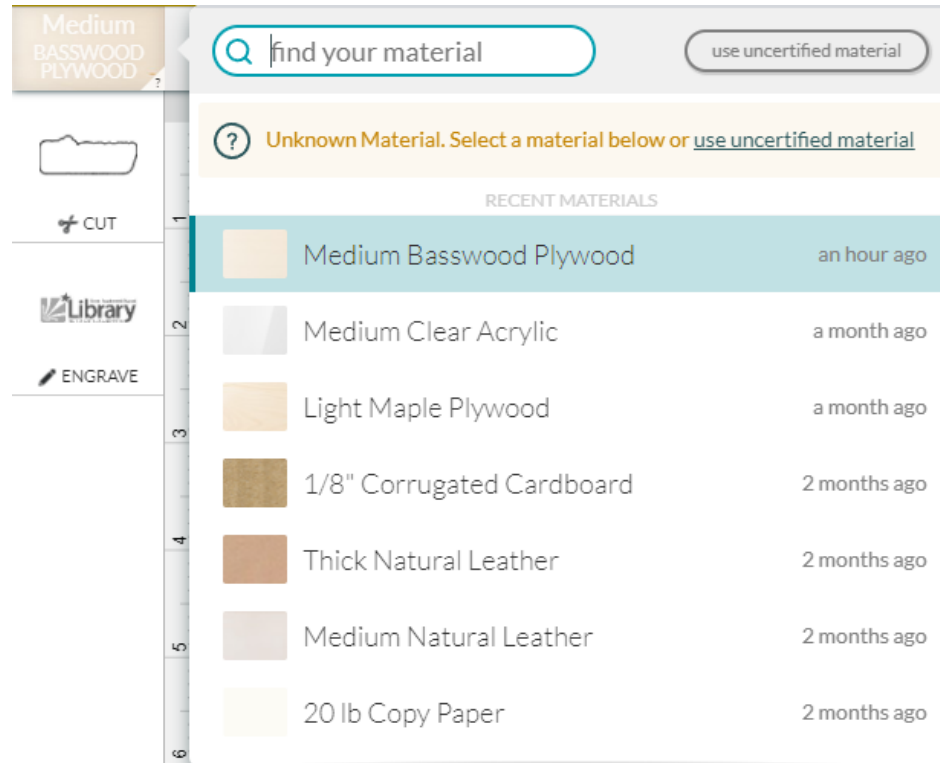
4c. Placing your material inside the Glowforge

1. Open the lid and place your material inside the Glowforge.
2. Maximum material size is 12" x 20.4". Maximum material thickness is 0.5" with the crumb tray installed and 2" thick with the crumb tray removed.
3. Position your image onto the material by clicking and dragging. You can resize your image by dragging the corners.
4. Resize your image so it is less than 3 inches long.
5. Make sure not to delete your file. This will permanently remove it from the design.
6. Press the select material button in the top left corner.

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7. Select your Material from the dropdown menu. If you do not see your desired material, search for it in the drop down menu.

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Acceptable Materials

For Cutting and Engraving

- Wood
- Fabric
- Leather
- Paper
- Plexiglass (Acrylic)
- Delrin
- Mylar
- Rubber
- Corian

For Engraving Only

- Glass
- Coated Metal
- Marble
- Aluminum
- Titanium
- Some Phones, Tablets, and Laptops

Unsuitable Materials

- Plywood
- Food
- Gold
- Silver
- Brass
- Bronze
- PVA
- Vinyl

5. Your First Print

1. Press the print button in the upper right corner of the app. The glowforge will then begin to ready its engraving.



2. The button on the bottom right side of the machine will begin to glow. Press it to begin your engraving.
3. The laser cutter will begin engraving and should complete in a matter of minutes.

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6. Removing Your Print

1. Wait until the Glowforge's fan stops
2. Open the lid and remove your print.
3. When finished, turn off the Glowforge and air filter.

7. Sign the MakerLab Agreement

8. Receive the Laser Cutter Badge

Congratulations! You are now ready to operate the Glowforge laser cutter independently and to demonstrate the functions of the cutter to IdeaSpace visitors! **To use the laser cutter independently, you must bring your own materials.**

Learn More on Your Own

LASER CUTTING DESIGN SOFTWARE

- Glowforge Community Website: <https://community.glowforge.com/>
- [Glowforge Premium Designs](#)
- Tinkercad: tinkercad.com
- Inkscape: [Learn Inkscape for creating SVGs](#)
- [Adobe Illustrator 2021](#)
- [Laser Cutting: Design for Fabrication](#)