

Laser Cutter Badge: Glowforge Pro

Age: Grades 9 and up.

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LEVEL 2

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

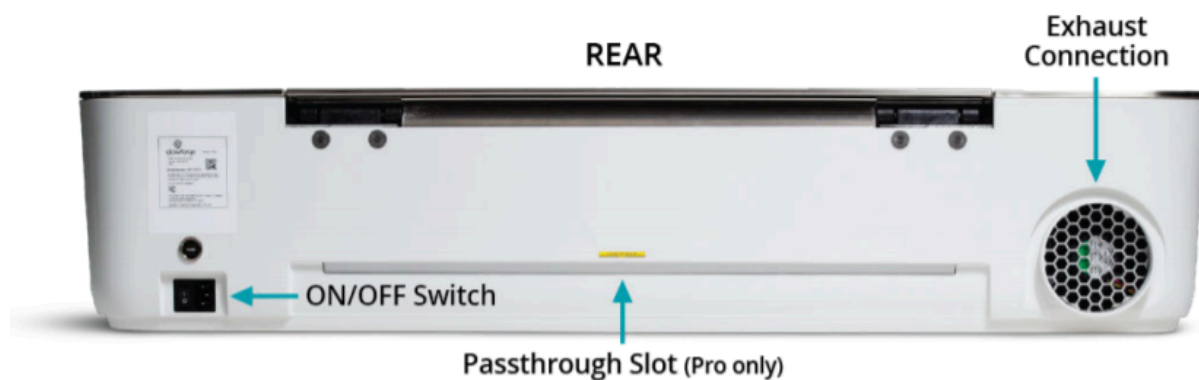
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4. **Laser Arm**—Moves laser along x-axis
5. **Rail**— Moves the printer head along the y-axis.
6. **Printer head**— Moves along the laser arm and rail to create your design
7. **Button**— Press the button once it begins glowing to start your print.
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 passed out the exhaust ducts in the wall.
3. **Passthrough Slot (Rear)**— Cut or engraved materials exit here for the passthrough feature.

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2. Safety Guidelines

- Make sure you hear the Glowforge exhaust fan after you press the glowing button.
- 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.
- Check with a staff member any time you need to use an unknown material that does not have a preset in the app.
- Immediately get a staff member if a fire breaks out
- Failure to follow these guidelines could result in the loss of your Glowforge privileges.

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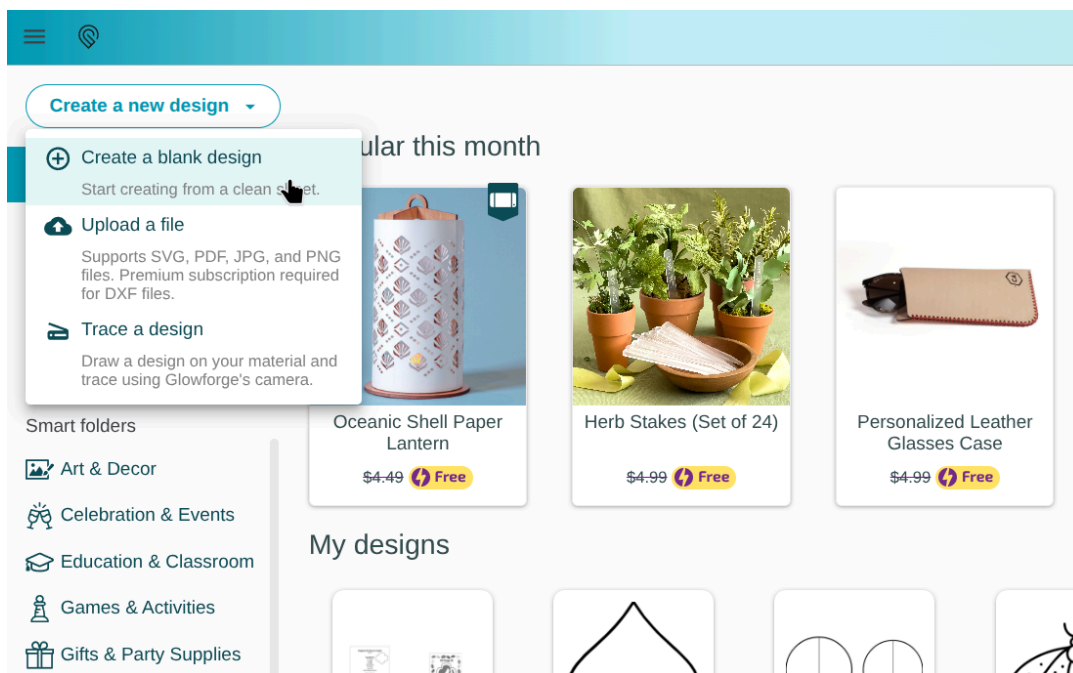
3. Turning on the Glowforge

- There is a black power switch on the back right of the machine. Flip the switch to turn the Glowforge on.

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 from the Glowforge Premium Design Library.
4. Click the "create a new design" button in the top left, then select "create a blank design" from the dropdown menu.



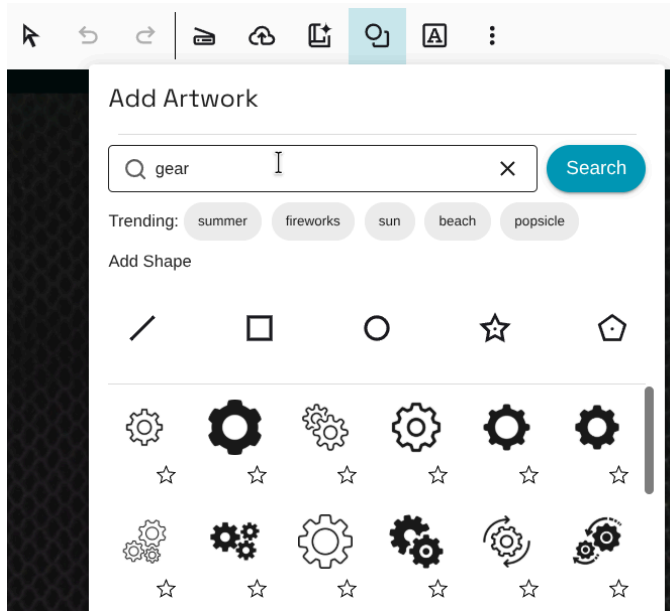
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5. Select the button in the toolbar at the top of the screen. This will open the Glowforge Premium Graphics library. Search for a design, and when you find the one you like, click on it to add it to the workspace.



6. (Optional) Add text using the Insert Text controls in the toolbar.

4b. Choosing Your Glowforge

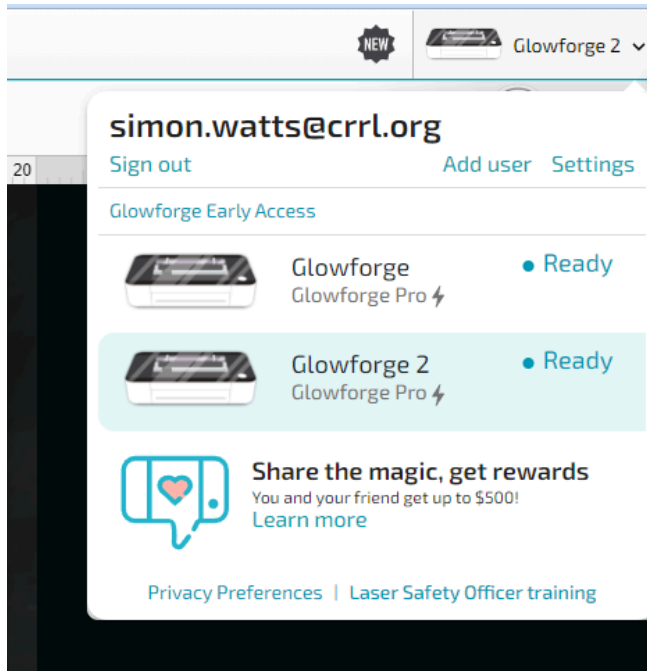
1. Since we have two Glowforge Laser Printers, you need to choose the correct machine before running a print job. If you are not sure which Glowforge you are using, ask a staff member.

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2. Click on the image of the Glowforge in the top right corner of the screen.
3. From the drop down menu, select either “Glowforge” or “Glowforge 2” depending on which machine you have reserved.

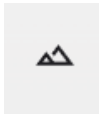


4c. Cutting

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



- a. **Add Artwork** - in addition to inserting art, you can also use this tool to add shapes and lines.



- 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.

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3. In the left sidebar, make sure that your design is set to engrave, and your shape or outline is set to cut. You can click and drag the layers around to change the order in which the Glowforge performs them. Ideally engraving is done before cutting and should be moved above.



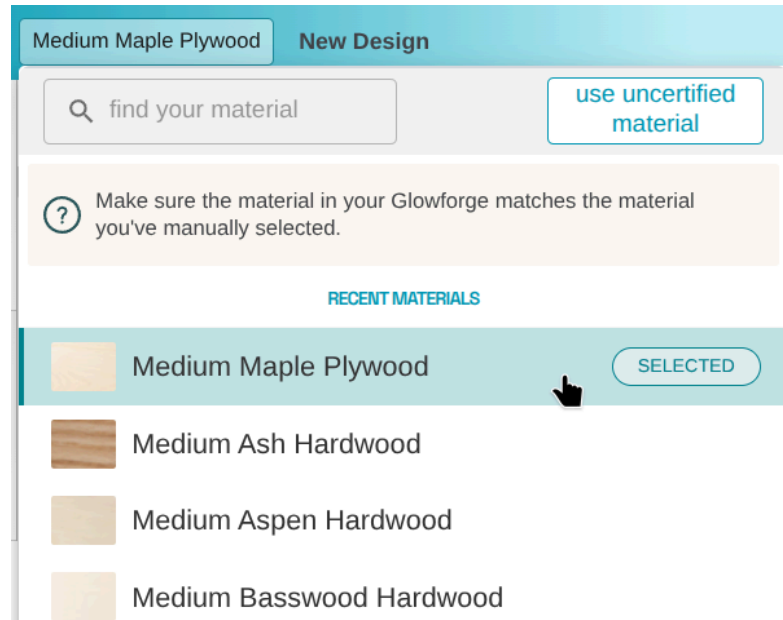
4d. Placing your material inside the Glowforge

1. Open the lid and place your material inside the Glowforge.
2. Maximum cutting area is 11" x 19". 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 and drag it so that it fits over the image of your material.
5. Press the select material button in the top left corner.

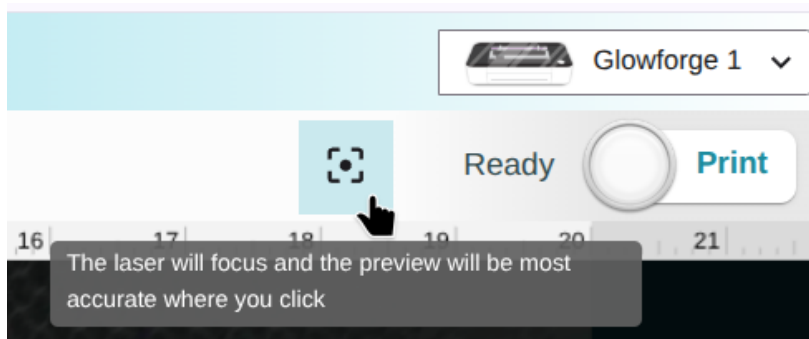
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6. Select your Material from the dropdown menu. If you do not see your desired material, search for it in the drop down menu.
7. In order to have the most accurate view of your material, set the focus by clicking the button directly to the left of the Print button:



Set the focus crosshair on your material and click once. The Glowforge print head will move over the material and focus. The bed image will update accordingly. You may find that some of your assets have shifted after the focus, in which case you will need to reposition them.

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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

- Treated plywood
- Felt
- Food
- Gold
- Silver
- Brass
- Bronze
- PVA
- Polycarbonate
- Vinyl
- Chalk foamboard

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 job.



2. The button on the right side of the machine will begin to pulse white. Press it to begin your print job.

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3. The laser cutter will begin engraving, then move on to cutting. It should complete in a matter of minutes.

6. Removing Your Print

1. Wait until the Glowforge's fan stops
2. Open the lid and remove your print.
3. Remove any excess material and crumbs.

7. Sign the MakerLab Agreement

8. Receive the Laser Cutter Badge

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

Learn More on Your Own

LASER CUTTING DESIGN SOFTWARE

- Glowforge Community Website: community.glowforge.com/
- Tinkercad: tinkercad.com
- Learn Inkscape for creating SVGs:
community.glowforge.com/t/tutorial-on-using-inkscape-for-glowforge/15236
- Adobe Illustrator: adobe.com/learn/illustrator