



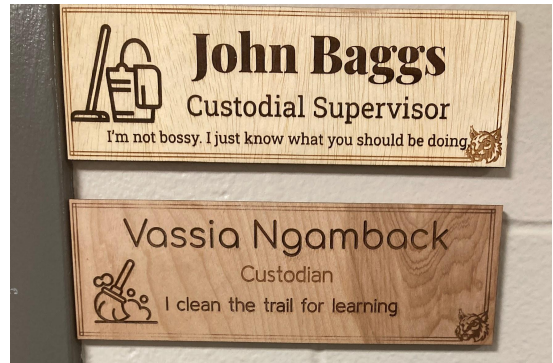
Using a Glowforge Lasercutter in the Classroom

Just being able to afford a laser cutter for your makerspace is a challenge, but getting the funds to purchase one is really just the beginning of the journey. These are great, safe machines but implementing them into an active middle or high school classroom in a way that is meaningful and sustainable can be pretty challenging. The goal of this workshop is to share the learning we have gained from our five years of experience using them in our Creation Studio. Our studio has Glowforge Pro machines, but we also regularly work with Epilogue machines and are confident that regardless of the type of lasercutter you have or are acquiring STEM4Learning can help assure that the implementation is successful. Although we know a lot about basic maintenance, set-up, and safe operation of these machines, we are not trained technicians, so if you have a machine in need of anything other than simple repairs, such work is not in our wheelhouse.

We do not have machines for this workshop to bring to your site, so it only works if you have already purchased and have had the machines delivered unless you would like to bring a team of teachers to the Creation Studio in Willison, Vermont. Depending on your interests and needs, we can share the basics - even helping you set up a new machine, and then can move into the various options for creating vector and raster images, importing them into the glowforge, and determining the best settings for every project. With most students we focus on software that is web-based and accessible on Chromebooks, including the Google option of Slides and Draw, Adobe Express, and special online vector generation tools like cuttle.xyz and vectr.com. For advanced work we also can offer support using Adobe Illustrator but we rarely use that with our students due to the cost and lack of Chromebook accessibility although it is a fantastic tool.

Here are a few ways we've used Glowforge in our Makerspace

- Etching and shaping acrylic for an alternative to the Cricut engraving we typically use in our LED Edgelit projects
- Cutting the cardboard elements for our parallel circuit operation games - much more precise, cleaner, and safer than cutting with x-acto knives
- Engraving the sides of wood projects as an alternative to the Cricut stickers (time is always a challenge with this option unless vector designs can be created)
- Designing and creating signs for walls and doors - sometimes these are personal projects but our most successful implementation was having students choose a teacher and design one for their classroom door - a great SEL project on many levels.
- Scoring the template for the holes in our Tic Tac Toe games - much quicker and more accurate than anything we could do with a pencil and ruler
- Creating nametags for backpacks - a great lesson to have middle school students do for younger elementary students.
- Using some of the cuttle.xyz labs or boxes.py variable projects to both create some great projects and teach about variables and measurement.



We love the Glowforge and lasercutting technology and do find that it is a great tool for creating high quality projects consistently with students. We have found that it can simply become a production rather than a design tool, with students unwilling to make the commitment it takes to do more than just find something online and make it - which is why many of our projects simply use the lasercutter as one element of a much larger project rather than a one-stop shop that leads to a creation. We will talk about this as part of the workshop as we think it is perhaps the most important element of our learning about how to implement the tool in our Creation Studio and learning that we love to share.