

Project Name: Edge-lit Acrylic

Specialized tools/technology used:	Experience level required:
laser cutter or CNC router 2D modeling software (e.g. Gravit)	beginner/intermediate
basic electronics: LEDs Soldering iron	beginner

Grade Level (of this example): 4-12

Content Standards (of this example):
Various - see Possible Content Explorations

Summary of Project:

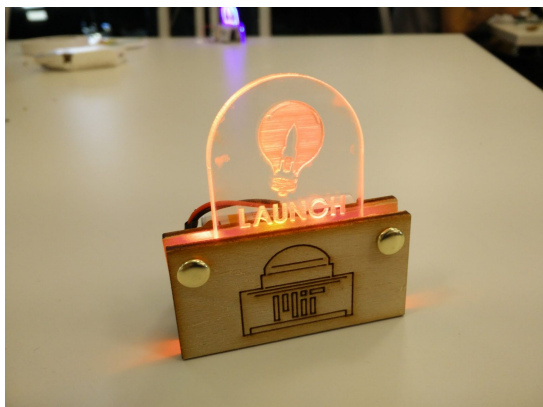
Students can work individually or in pairs/small groups to design an image that will be engraved on an acrylic plate and lit through the edge with LEDs that are soldered into a simple circuit. Students will also build a simple display stand to hold the acrylic and the circuit - materials can vary. Examples shown below are housed in stands made of laser-cut birch and 3D printed PLA.

Maker Skills Intros

As a kit-building activity, this project can be used as an introduction to electronics.

If instructors pre-fabricate the plaques and pieces of the mount, electronics novices in the 4th-9th grade age range will take 90-120 minutes to learn soldering, configure their circuit and display pieces, and complete their Edge-lit Acrylic piece.

Examples of finished product:



Possible content explorations

STEM

- **Physics** - Inject some playfulness into your study of electromagnetic waves by lighting your glow plate with red, green, and blue LEDs - turn them on and off in different combinations, observe and play with the colored shadows they cast
- **Physics** - Incorporate a [homemade battery activity](#) to power the LEDs and have students design an appropriate shell for the battery guts
- **Engineering** - enhance the basic circuit to serve a specific purpose (light-triggered night-light, etc.)

Social Studies

- **Industrial Revolution** - have students design assembly process for mass production (maybe they'll be sold as a student fundraiser, etc.)
- **Globalization/Industrial Revolution +STEM (Math)** - have students complete a [hand-etched version](#) of the sign once, and then a digitally-fabricated version. Have them calculate the efficiency of production as an intro activity in a starter unit about automated labor (recommended for high school)

ELA

- **Futurism/Dystopia/Humanity vs. nature** - students can design a glow plate to illustrate a thesis on a work with these themes (*Brave New World*, *Frankenstein*, *Ready Player One*, etc.) Use as a supplement or replacement for a thesis or debate.

Suggested resources

- There are many build tutorials online, including video examples - search for "edge-lit acrylic." Things to notice:
 - While you'll see many [lamps built with long ribbons of EL wire](#), smaller, simpler pieces can be completed much more cheaply with [individual LEDs](#).
 - This project can be completed [by hand with a Dremel](#) or similar tool.