

Festive Flashlights

Shared by: Edgerton Center K12 Maker Team

Specialized tools and materials used:	Experience level required:
Craft Materials: Jumbo popsicle sticks, aluminum foil, clear tape/glue, cardstock (white or light-colored for the figure), small binder clips, coin cell batteries (size 2032 works best), color-changing or single-color LEDs, copper tape with conductive adhesive (¼ inch/6.35mm width tape works well)	Beginner
Tools: Scissors, vinyl/craft cutter (such as Cricut or Silhouette) or x-acto knife, cutting mat, ruler	Beginner/Intermediate
Optional: Black/dark fine-tip markers for decorating figures, printer (if cutting parts by hand)	Beginner

Grade Level and Subject (of this example): 4rd Grade Biology

Topic/Content Standards (for this example): Circuit principles (insulators and conductors, series circuits, component functions), hand fabrication, graphic design, troubleshooting



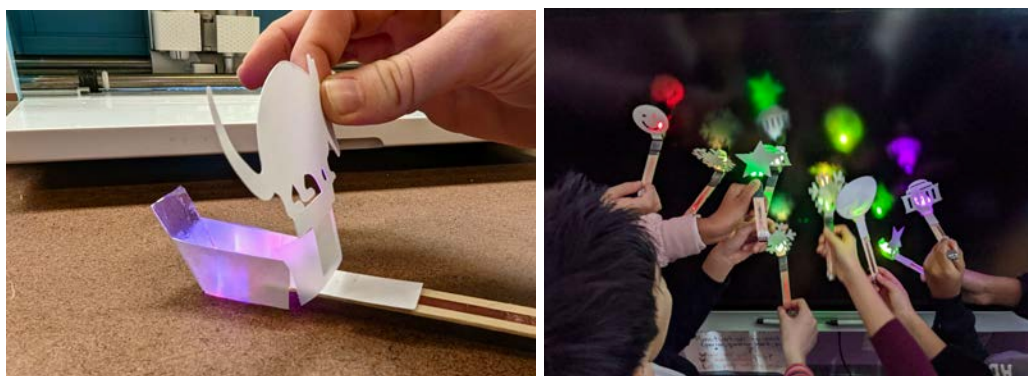
Summary of Project:

In this electronics project, students will make an LED flashlight, featuring a reflector and an expressive symbol out of easy-to-find materials. The example above depicts an animal native to the Southwestern US, created as part of a 4th Grade Biology unit on local flora and fauna. No prior experience with circuits or graphic design is required for this project - just this one-page [instruction sheet](#). Depending on whether students are cutting shapes by hand or using a craft cutter, this build should take approximately 1 hour.

Students will begin by creating the flashlight body from copper tape and a popsicle stick. They will connect the LED by placing it on the popsicle stick so that the leads of the LED are touching the copper tape on either side of the stick. On the opposite end of the popsicle stick from the LED, students will attach the battery with a binder clip. Flip the handle of the binder clip down to complete the circuit and light the LED!

Students then construct a reflector and attach a figure roughly 3 ½ in. (89mm) tall and 2 ½ (64mm) wide. This piece can be cut out of cardstock, or thinner material for a backlit effect. Students can experiment with the distance between the aluminum foil and the LED to get the ideal light. Once set, the reflector should be secured to the flashlight.

Students may work individually or collaboratively to complete this project, but each student should ideally create their own flashlight. The flashlights can be presented in a group walkabout, giving students an opportunity to explore one another's creations. These could also be featured at community events as *shining* examples of maker skills in the classroom!



Suggested resources

- One-page [instruction sheet](#)
- Edgerton Center [Festive Flashlights Instructable](#) - step-by-step guide

Possible Content explorations

World Language: create an image or symbol representing a culturally significant holiday, food, item, article of clothing, etc.

Math: Fractals, geometry, trigonometry

Science: Physics: exploration of light and shadow, biology: flora and fauna found in an ecosystem, chemistry: atoms and molecules

ELA: illuminate a symbol/item that did (or could have) made a difference in a character's journey

Social Studies: depict a significant local architectural feature or style (contemporary or historical)