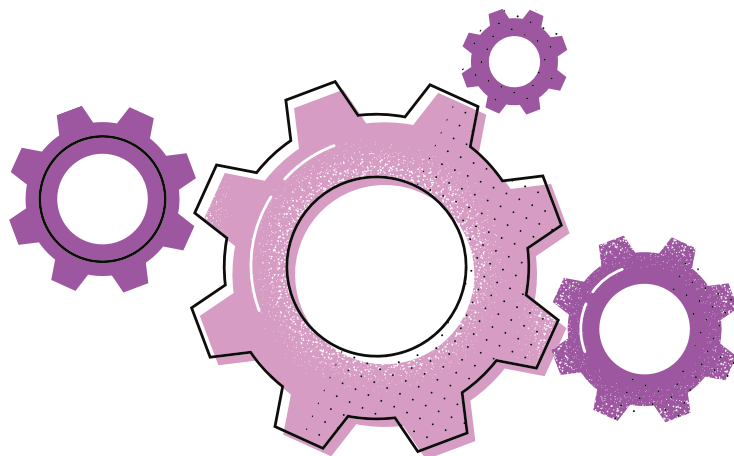


Northern Illinois University

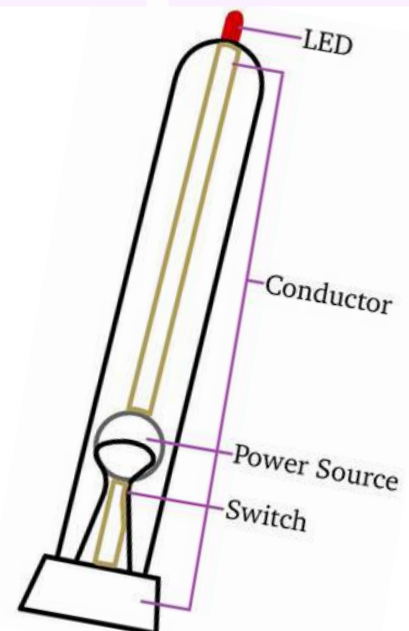
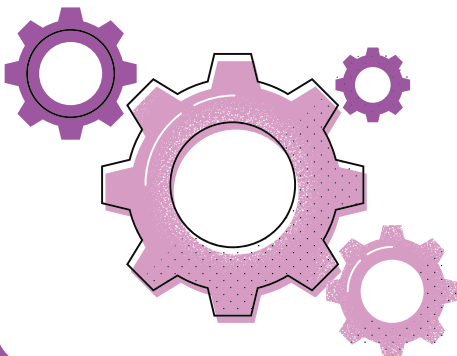
Society of Women Engineers
Outreach Playbook



Popsicle Stick Flashlights

Metrics:

Grade Level	Number of Student Participants	Duration (hours)	Number of SWE Volunteers	Partner Orgs (if any)
6th - 8th	100 Student Participants	2 hour event	4 SWE Volunteers & 2 Middle School Volunteers	N/A
While our target audience was 6th - 8th we did have some student participates ranging from K - 8th	This activity was possible to do with this amount of students due to the open house style event	Open house style of event that lasted 2 hours - for the project it took most students around 5 minutes	Our 4 SWE volunteers helped students complete the activity and talk to students about what engineering	



Outline & Script

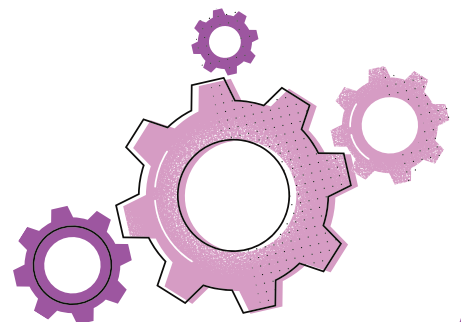
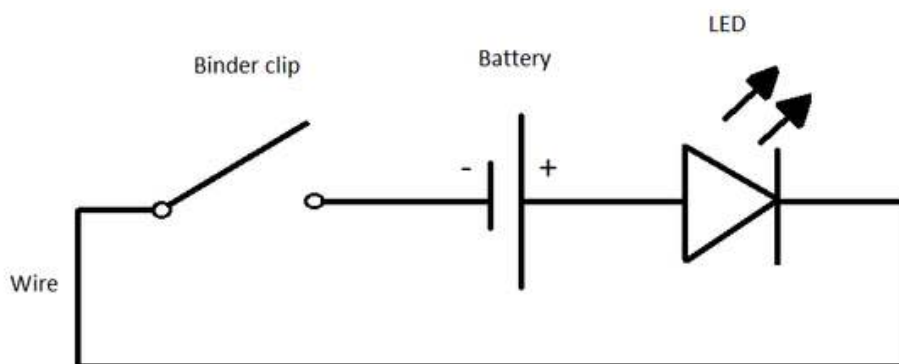
- 1) Define different parts of a circuit ex: switch, wire, positive & negative sides of the battery
- 2) How the copper wire tape is connecting everything together
- 3) That in this activity the binder clip acts as the switch, compare to a light switch in their house
- 4) Provide diagram of the simple circuit before constructing the flashlight

Activity overview

For our event this activity was perfect! It was able to be completed in 5-10 minutes by the students and allowed the students an opportunity to learn about circuits in a fun, interactive way.

The students were able to enjoy making their flashlights and were able to pick out their LED Light Bulb color which helped the “fun” aspect of the activity. The students got to learn about what aspects are needed in a simple circuit and after learning about the components needed to make the flashlight they were able to make their own! This activity was a great way to introduce the different types of engineering and career options there are within engineering

The real-life connection that we related the activity to was how the binder clip acts as the switch in this circuit similar to how the light switches in their house or school does the same thing for the lights that are connected to it



Lessons Learned

This activity requires some prep work including cutting the copper wire tape to size and unwrapping the batteries before hand. If the copper tape is cut too short to fully go on each side of the popsicle stick the circuit does not connect and when you turn the switch on, shutting the binder clip, the light does not turn on.

It worked well to have a station set up where the students could pick up their supplies, picking out what colored light bulb does take some time as it's an important decision to make for the flashlight.

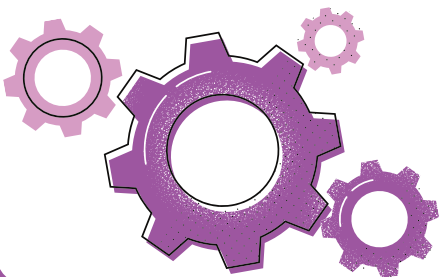
We had six volunteers helping the students put together their flashlights but offered flyers with instructions for the older kids to try it themselves. When an issue occurred with a flashlight not working we talked it through with the students and asked for their thoughts on why it was not working correctly and helped lead them to the solution.

Accessibility Adaptations

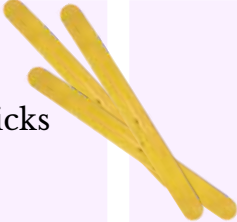



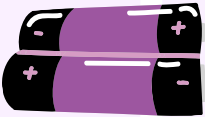
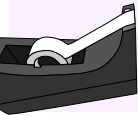


This is a budget friendly activity that does not require access to the internet. A slightly cheaper alternative would be to use notecards or paper in place of popsicles sticks and by using only white LED light bulbs

This activity could also be more budget friendly if done in a smaller quantity that detailed in the playbook.

This activity could also be done virtually if the students would be able to pick up supply packages before hand.



Materials & Cost

Item	Quantity	Where to Buy	Total Cost
 Popsicle Sticks	150	Walmart - https://www.walmart.com/ip/Go-Create-Wooden-Craft-Sticks-150-Natural-Wood-Craft-Sticks/19525318	\$3.32
 Copper Tape	1 roll = 21.8 yards	Amazon - https://www.amazon.com/dp/B01MR5DSCM/ref=cm_sw_r_oth_api_i_J0CXQWJ7JXDZRB68T0BS	\$6.88 (without shipping)
  LED Light Bulbs	100	Amazon - https://www.amazon.com/dp/B01AU14W5U/ref=cm_sw_r_oth_api_i_CPE9ZJMAQFXKBP05K9TW?_encoding=UTF8&psc=1	\$7.99 (without shipping)
 Batteries	100 (two 50 count packages)	Amazon - https://www.amazon.com/dp/B078GC5K81/ref=cm_sw_r_oth_api_i_Z6Y3KZ7TEIF4DBAHTCTF?_encoding=UTF8&psc=1	\$14.99 per 50 count package
 Clear Tape	2	Walmart - https://www.walmart.com/ip/Pen-Gear-Invisible-Stationary-Tape-75-in-x-1300-in-Matte-Finish/341782718	\$1.24
  Binder Clips	108 (nine 12 count packages)	Walmart - https://www.walmart.com/ip/Pen-Gear-Metal-Binder-Clips-Black-12-Count/712495491	\$1.52 per pack of 12