



**CALIFORNIA STATE SCIENCE FAIR
2017 PROJECT SUMMARY**

Name(s) Ayana R. Wilmot	Project Number J1024
Project Title LED Gloves: A Communication Solution for the Hearing Impaired in the Dark	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The purpose of this project was to come up with a way for people who are hearing impaired to be able to communicate in the dark using American Sign Language (ASL).</p> <p>Methods/Materials Black gloves, black sewing thread, conductive thread, 30 LilyPad LEDs with built in resistors, 10 coin cell battery holders with switches, 10 coin cell batteries. I sewed a prototype glove as a proof of concept and to refine my sewing technique. For the final gloves, I sewed five parallel circuits on each glove. I used sewing thread to attach the battery holder and 3 LEDs to one finger (each one slightly above a finger joint) of the left glove. I used conductive thread to connect the 3 LEDs with the battery holder. I repeated the process for each of the fingers on the left glove. Then I repeated the procedure on the right glove and checked that every circuit worked when the battery was inserted and the switch was turned on. I used 15 red LEDs on the right hand and 15 blue LEDs on the left hand. I compared pictures of my hands making ASL signs in a normal room with my gloves making ASL signs in a dark room. I used the gloves to sign letters and simple phrases at an intermediate sign language class.</p> <p>Results The gloves were tested at home as well as at an intermediate sign language class with 19 participants. 10 letters and 3 phrases ("Hello, how are you?", "What is your name?", "Thank You") were tested. The rate of accurate identification varied based on the letter and the phrase signed, as well as how familiar the participant was with ASL. The average accuracy percentage was 70.4% for the letters and 68.3% for the phrases tested but one hearing impaired participant was able to correctly identify 100% of the letters and phrases signed.</p> <p>Conclusions/Discussion The gloves did work and can be used to sign ASL. They worked best for signs where you can see all or part of the knuckles. Future improvement plans include sticking adhesive reflective strips on the palm of the glove and the inside of the fingers, so you can see the pattern on both sides, instead of just the back. I plan to sew a white LilyPad LED on the center part of the wrist of the glove. The light would reflect off the strips and make them visible in the dark. I will then re-test these gloves at the same intermediate sign language class as well as a wider audience at the special school for the hearing impaired in San Jose.</p>	
Summary Statement LED Gloves project could be used to allow people who are hearing impaired to communicate in the dark.	
Help Received I sewed all the circuits on the final gloves myself after my grandma, Mollie Wilmot, taught me how to sew when I was working on my prototype. Michele Maloney, Instructor at the Oster School Deaf Program in San Jose, allowed me to test my gloves in her sign language class.	