

As the internet and apps era has taken hold, younger people — often in their early twenties or late teens — have been achieving some incredible things, such as building hit mobile games or selling their startups to corporations for large sums of money. Lately, young teens participating in science fairs have also achieved some incredible things, such as this 15-year-old girl who created a flashlight powered by the body heat of one's hand.

A 15-year-old high school junior from Victoria, British Columbia, Ann Makosinski, created a hollow flashlight powered by the holder's body heat for the Google Science Fair. The invention made her one of 15 finalists, who will travel to Mountain View, California for a prize ceremony held this coming September. Google will choose one winner each out of three age groups, then from that will decide on the final winner, who will receive a grand prize of $50,000 and a trip to the Galapagos Islands.

Makosinski said she's been quite interested in harvesting unused energy in the surrounding environment, which led her to discover Peltier tiles. Peltier devices, as people who get super into heat sinks know, produce electricity when one side of the tile is heated while the other side is cooled. This, in turn, led Makosinski to attempt to use Peltier tiles to provide enough power to an LED for it to generate enough light. She found it did provide enough power, but it didn't provide enough voltage. Rather than give up, she reworked the circuit to allow for transformers, which would help increase the voltage. After buying — as well as building — circuits that didn't get the job done, she eventually came across one that claimed to provide the necessary voltage. She bought it, and it worked.

The flashlight she built employ an aluminum tube slipped inside of a PVC pipe. The pipe was cut away in a certain area so the person's hand would come into contact with the built-in Peltier tiles. The flashlight worked, but due to the temperature reliance of Peltier tiles, the flashlights worked better in colder temperatures (tested at 41 degrees Fahrenheit). The flashlight still worked in warmer temperatures (50 degrees, for instance), but the colder the surrounding temperature, the more the hand's body heat can help the Peltier generate electricity. The flashlight maintained a sufficient level of light for over 20 minutes, definitely enough time to find the candles in the dark when the power goes out.

In total, Makosinski built the flashlight for $26, which is definitely a fine price for a flashlight that doesn't require batteries, but she believes if mass produced, it could become even cheaper. If Makosinski wins the Science Fair in September, she'll certainly be able to make a lot of flashlights.