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No-Hands Switch Project

While brainstorming about what type of switch to create for this assignment, I thought of many ideas: I considered using everything from earrings to my permanent retainers as conductors, and even thought about how to make aluminium foil false eyelashes to make a switch that would turn on simply by blinking. However, I tend towards the practical, so instead of thinking about what interesting materials or body motions I could use, I started thinking about what function my switch could, and should, serve.

This function-focused line of thinking led me to consider what types of switches would be good for a situation in which individuals are unable to use their hands, whether in an emergency or as a result of a disability*. Thus, I thought of creating a *simple pedal-like switch*, by which individuals could turn on a light by moving their foot, whether seated or standing. To the right is a photo I took after first thinking of the idea. It shows the initial basic concept / design.



When I finally got to work building it, I designed it as follows. I covered a piece of cardboard with aluminium foil such that if a person's foot/shoe were on it, the heel would rest on a piece of aluminium foil, but the front of the shoe (ball of the foot) would not. On the right and left of the cardboard there would also be strips of aluminium foil. See pictures left and below.



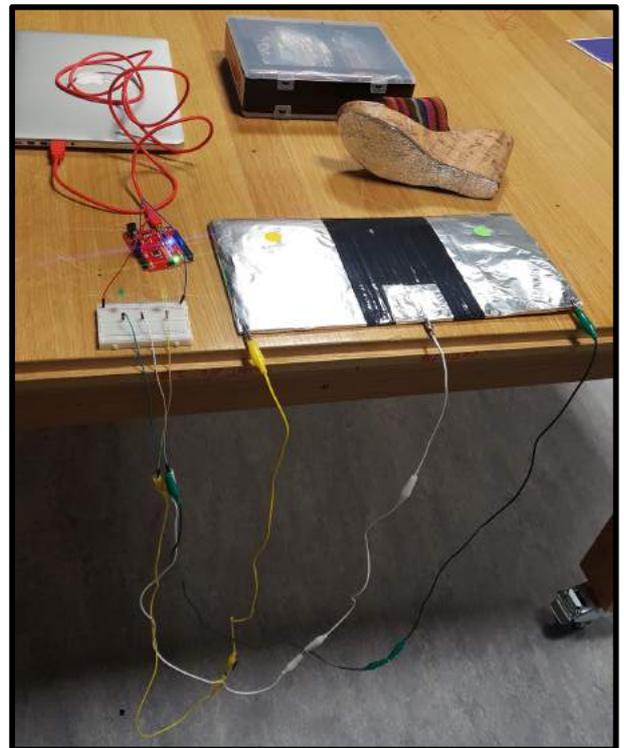
*Such a device could be useful in a variety of situations:

- During a bank robbery, bank tellers are often watched and warned by the robber to make sure they do not press any security / alarm buttons with their hands. However, with a foot switch, they could alert someone for help without the robber noticing.
- A student without use of his or her arms would obviously be unable to "raise his/her hand" in the traditional sense. While a buzzer / beeper would be too noisy, a simple foot tap could turn on a small light that would alert the teacher that the student's "hand" was raised.

Creating the circuit was relatively straightforward: I used three different wires – white, green, and yellow – that were all connected to power (I attached alligator cables to all so that they would be long enough so that the “pedal” – the cardboard piece – could be on the ground, but the LED lights/bus board could be on a table). I attached the white wire to the aluminium foil on the heel, the yellow wire to the left side of the aluminium foil, and the green wire to the right side of the aluminium foil. Lastly, aluminium foil was attached to the bottom of the shoe (see picture to the right).



Thus, the pedal works as follows: when an individual's foot is facing forward, no lights turn on. However, if the foot is angled to the left (towards the yellow dot/wire), the yellow LED light turns on. If the foot is angled to the right (towards the green dot/wire), the green LED light turns on.



The complete project/set up can be seen in the picture to the right (although in practice the cardboard “pedal” will be on the ground as it is in the picture above). The project was very enjoyable to make, and although I went the more practical route this time, I hope to make something more creative in the future as I continue to learn more about electricity and circuits.