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Can a machine that is big, bulky, very expensive, and very important in the use of spectroscopy be created using off the shelf parts for far less money? There have been many different ways that researchers have been able to create a low-cost LED based spectrometer that is light-weight, cheap, and easy to use. I will create a prototype that works, using Arduino and LEDs. Therefore it is completely possible to create a low cost LED-based spectrometer that works just as well as its traditional counterpart.

To create this device, there are a number of steps involved. First, a circuit diagram has to be created in order to understand how the device is to be created, what parts are needed and how they are going to fit and work together. Once that is understood, the parts are ordered and put together. Once that is complete, there is a need for a program to be created so that the microcontroller could understand how to use the LEDs and the photodetector to become a working spectrometer. Once all of these steps are completed the spectrometer will be up and running.

This project is significant and innovative because traditional spectrometers are bulky, hard to use, and very expensive. To be able to create a device that works the same, and creates the same accuracy with results for much less, and for it to be easily replicated for use in schools and in research laboratories is extraordinary. This allows for the widespread use of spectroscopy in many different areas for many different uses. Therefore, this will allow high school students to get the feel of spectroscopy, for laboratories in countries without much money to use one, and for professors to use them in their labs.