<u>**Quick Summary of Available Electrical Components – Module 3 Design Challenge**</u>

In addition to components you have already used (the turbidity sensor, LEDs, and the piezofilm) the following items are available:

The Active Buzzer

The active buzzer is either on or off.

Note: These buzzers come with a sticker on them, as shown below. The sticker does not inhibit the device's functioning. PLEASE LEAVE THE STICKER ON, as it will help us to more easily distinguish between these devices and other ones that look very similar to them.
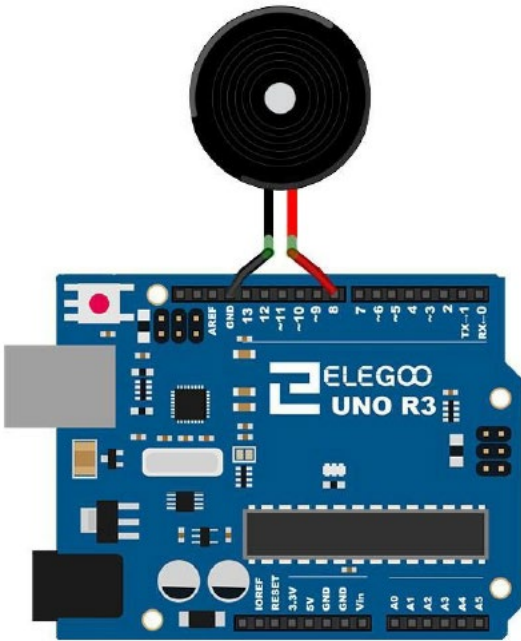
Wiring Diagram:

Note that one leg of the buzzer is shorter than the other. The shorter one should be connected to the ground.
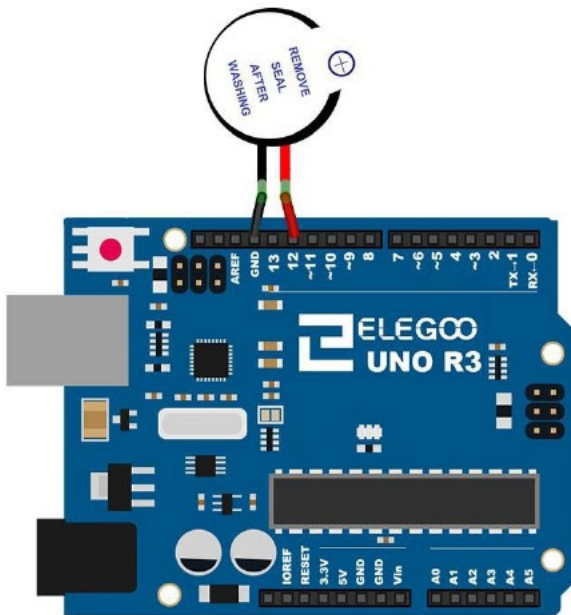
This is a digital device, so use the `writeDigitalPin` command with it.

The Passive Buzzer

The passive buzzer can be controlled to play different tones.

To play a tone, use the following commands

```
playTone(a,"D3",pitch_in_Hz,1)
pause(duration_of_pitch)
```
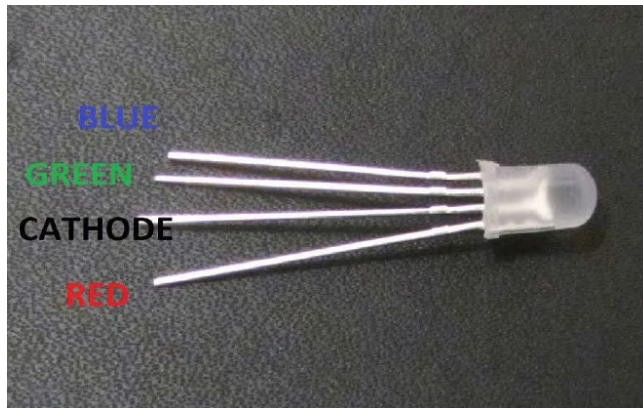
At the end of the "music", use the following command to turn the buzzer off:
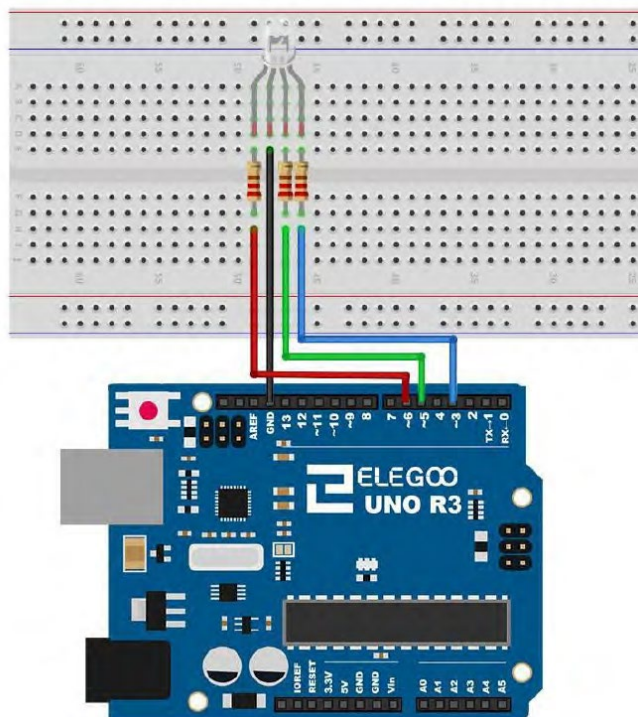
```
playTone(a,"D3",0,0)
```

Note: the playTone command only works with the Arduino on pin D3.

RGB LEDs

You already have worked with a one-color LED, but there are 3-color LEDs!! These are devices that have (as you might guess) 3 different-colored LEDs inside of them – one red, one green, and one blue.


Wiring diagram:

Note that in this diagram, all of the LEDs are connected to PWM pins (the ones with the squiggles, which can allow you to control the intensities of each of the LEDs.) If you wish to do a little research, you may be able to find out how to produce additional colors by blending the three. If you don't want to do color blending, you do not have to use the PWM pins.

Vibrating Mini Motor Disc

There are only two wire leads for the motor, positive and negative. The wire is very small so requires some type of connector or interface for connection to Arduino. Ex: screw terminal or a crimped connector.

Red wire is positive

Blue wire is Negative
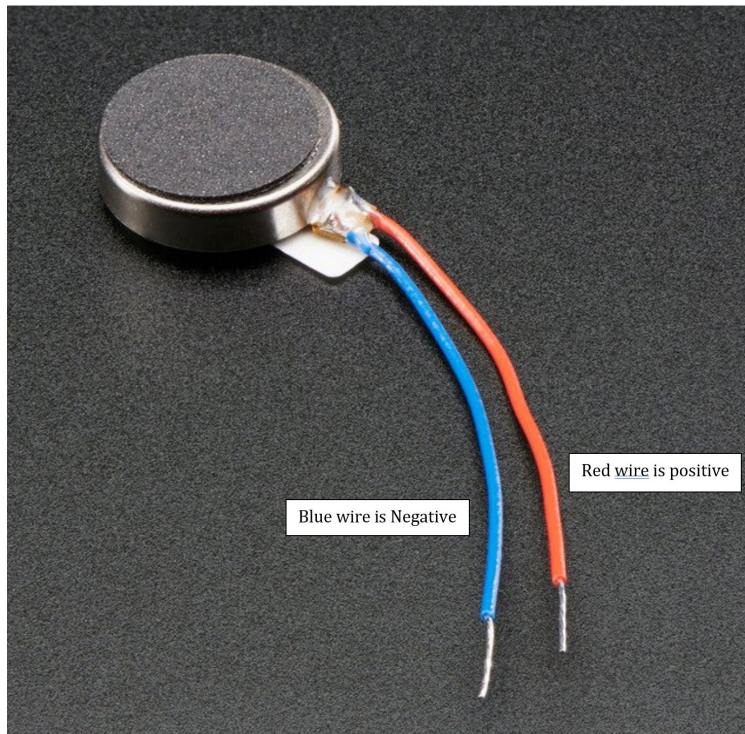
The following figure shows the disk attached to a baseplate with screw terminals.

The [website](#) for the motor says it can vibrate from 2 to 5 voltage, however anywhere from 1 to 3 volts supplies enough voltage to get anywhere from a slow vibration to rapid. Above 3 volts the increase in vibration is less noticeable (decreasing returns).

The motors can be made to vibrate using the following code in Matlab:

```
clear; clc;close all;

a = arduino;
writePWMVoltage(a,'D9',1);
```

The pin can be changed by changing D9 to the corresponding digital pin.

The voltage supplied can be changed by changing the number 1 to a different value.