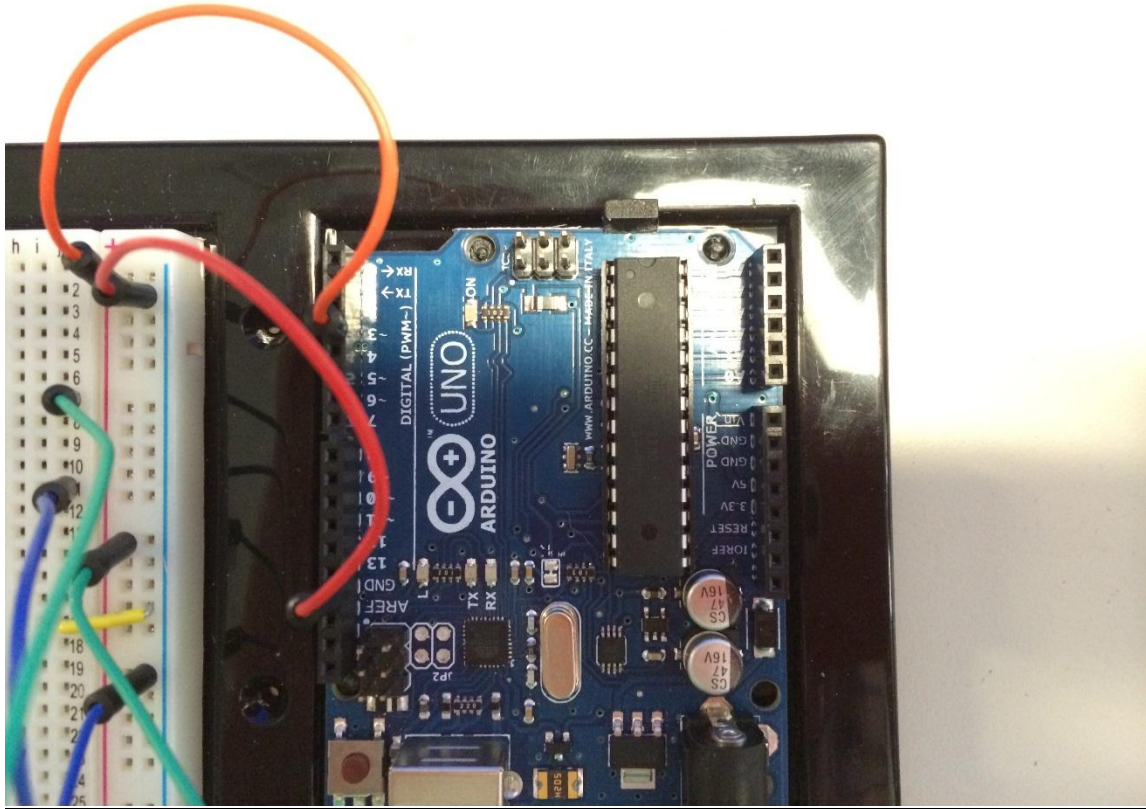## Power

1. Place a jumper wire from the top blue minus (-) column on the right side of the breadboard, and connect it to a ground port on the Arduino.
2. Place another jumper wire from the top positive (+) column to port 3 on the Arduino. (**This is going to the the output from the Arduino to the speaker so that it makes noise. THIS MUST ALWAYS BE IN PORT 3!!!)**

Speaker

1. Place a jumper from J7 to any of the positive ports on the breadboard. Place a jumper from J11 to any of the negative ports on the breadboard.
2. For the big round speakers, place the positive end into F7, and the negative end into F11.
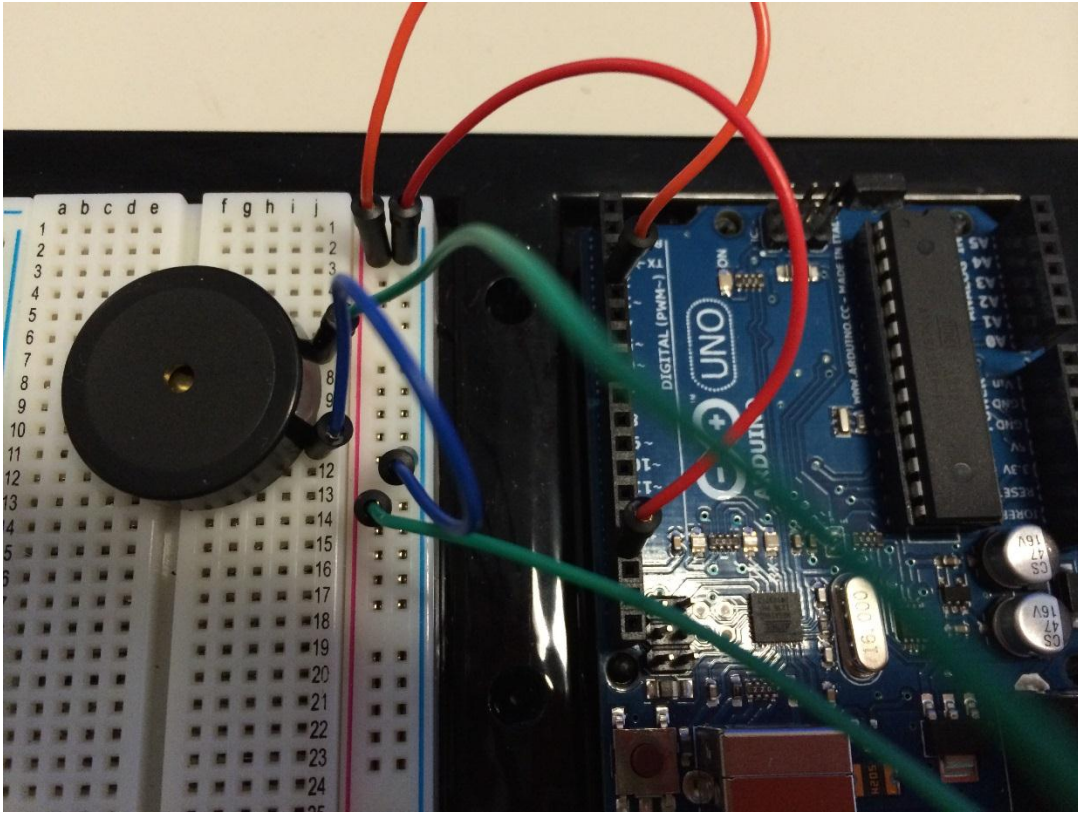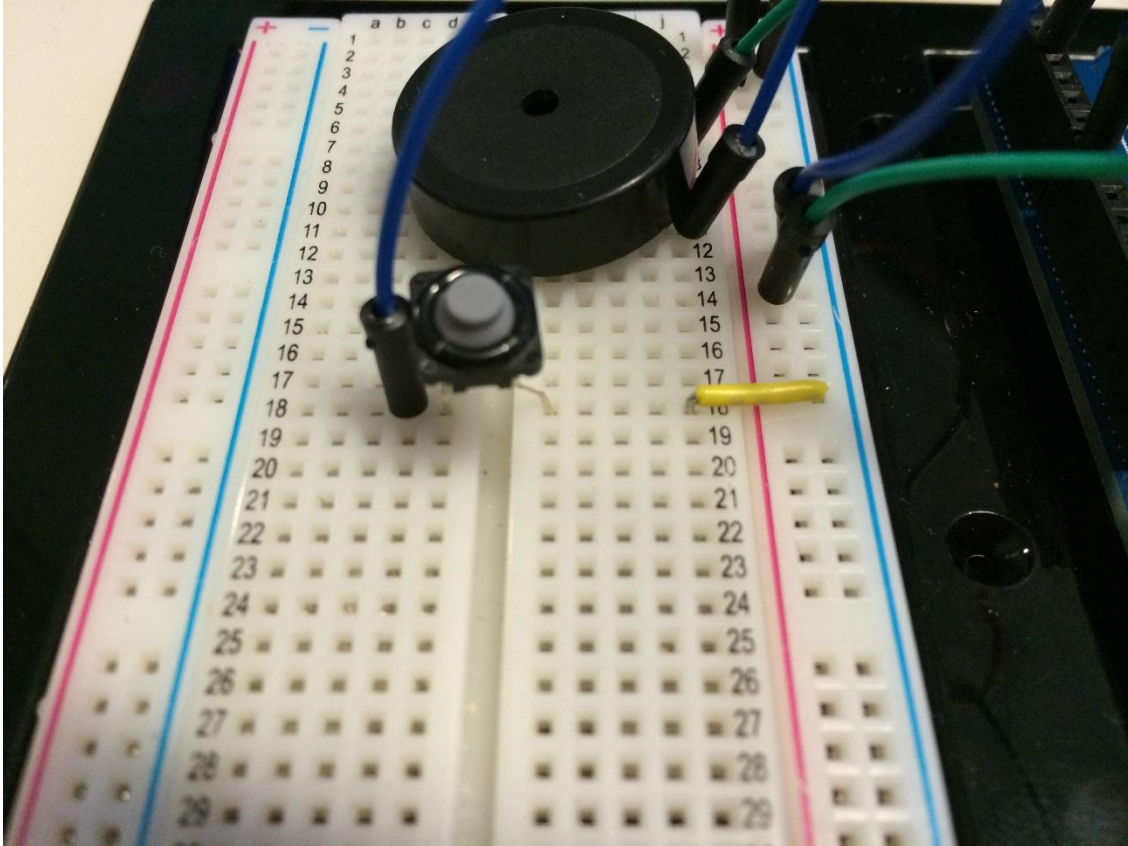
3.

Button

1. Place a yellow "staple" jumper wire from J18 into a negative column port (It can be diagonal so that it fits)
2. Place the button so that the legs are in E18 and F18

3. Place a jumper wire from D18 into and of the other numbered ports on the Arduino. (This one goes to number 8)

4. To add another button, follow the same steps on a different row of the bread board, and place the jumper into a different port on the Arduino

Arduino Code

1. Open the Arduino shortcut in the camper's folder. **MAKE SURE THE SOFTWARE IS NOT UPDATED. CLICK NO!!!! FOR SERIOUSLY YOU GUYS.**
2. Select: FILES>>EXAMPLES>>01. BASICS>> BARE MINIMUM. This will open up a basic skeleton of code that the camper will program inside.
3. Inside the "void setup() {}" the campers will reproduce the following code:
   pinMode (3, OUTPUT); -> This is for the speaker
   pinMode (8, INPUT); -> This is your button; replace the 8 with whatever Arduino port the button is connected to
   digitalWrite (8, HIGH);-> Still the button, replace the 8
4. Inside the "void loop(){}" :
   int inputValue1 = digitalRead(8);
   while(inputValue1 == LOW)
   {
   tone(3,175,20);

```
        inputValue1 = digitalRead(8);
    }
```

This while loop will allow for the press of the button to make a sound.

5. To add another button in the code:
    void setup(){}: Add another set of these, changing the number to whatever Arduino port the new button is placed. Let's say 9 for example:

```
    pinMode (9, INPUT);
    digitalWrite (9, HIGH);
```

void loop() {}: Add another while loop. Change the inputValue number to 2 (and3,4,ect for each added button). Also change the number of the Arduino port.

```
    int inputValue1 = digitalRead(9);
    while(inputValue2 == LOW)
    {
      tone(3,175,20);
      inputValue2 = digitalRead(9);
    }
```

Repeat this for each added button

LED

1. Simply place the positive prong (the longer one) of the LED into one of the positive ports on the breadboard. Do the same for negative. This can be repeated for as many LEDS as desired. No code is necessary for the LEDs to light up.

The whole program should look like this for two buttons (with more added for each additional button):

```
void setup() {

  // put your setup code here, to run once:

pinMode (3, OUTPUT);

pinMode (8,INPUT);

digitalWrite (8, HIGH);

pinMode (9,INPUT);

digitalWrite (9, HIGH);

}


void loop() {

  // put your main code here, to run repeatedly:

  int inputValue1 = digitalRead (8);

  while (inputValue1 == LOW)

  {

    tone (3,75,200);

    inputValue1 = digitalRead (8);

  }

  int inputValue2 = digitalRead (9);

  while (inputValue2 == LOW)

  {

    tone (3,100,300);

    inputValue2 = digitalRead (9);

  }

}
```

TROUBLESHOOTING (ADD MORE AS THE WEEKS PROGRESS!!)

1. Commonly, campers will be missing a semi colon after a line of code. Check this first
2. Often the campers will write the code outside of the squiggly {} brackets.

3. The campers have a hard time seeing the code on the projector, so they may have put the letter I or L in place of the 1.
4. Students may miss a capital letter, for example, they may have put inputvalue instead of inputValue