

Using Buttons

Objective: SWBAT use a push button to turn on and off an LED.

Materials:

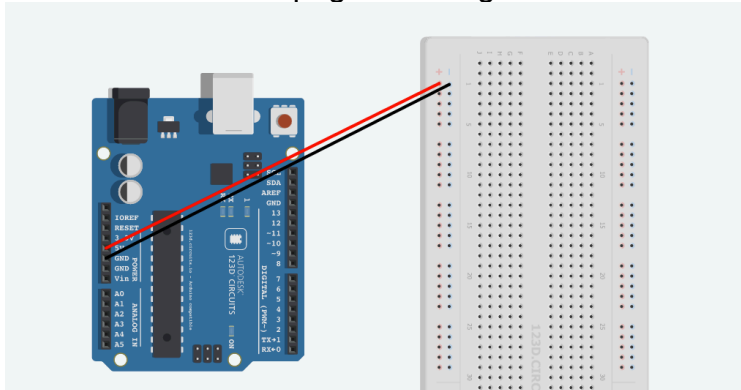
- Arduino Board
- Breadboard
- 330 Ohm Resistor
- Button
- Wires
- LED
- USB Cable
- Computer with Arduino Software Installed
- Goggles

Preparation:

- Ensure that you have a computer with the Arduino software downloaded. See the 'Introduction to Arduino' section (pages 28-29) for more information on how to do this.
- Review safety procedures with students before beginning this activity.

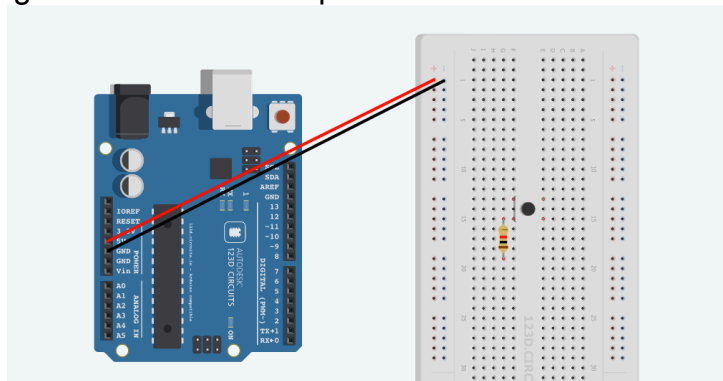
What to do:

- 1) **Attach Power and Ground Cables:** Connect jumper wire from the 5V power port on the Arduino to the first peg in the positive section of the breadboard. Connect jumper wire from the ground port on the Arduino to the first peg in the negative section of the breadboard.



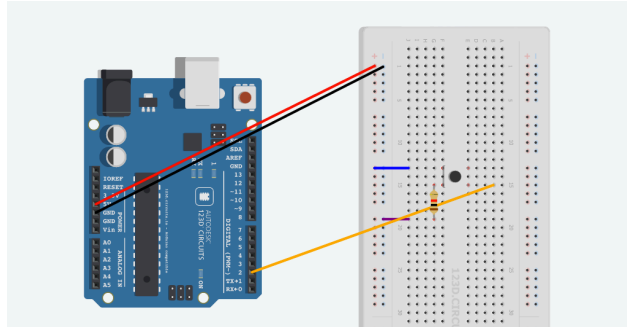
Note: There are two ground ports on the Arduino. During the last project, we used the port on the right-hand side of the board. During this project, you will use that port to insert your LED, so you will need to connect the ground wire to the left-hand ground port.

- 2) **Attach Resistor and Button:** Attach the button anywhere across the middle divider of the breadboard. Attach one peg of the 330 Ohm resistor in the hole directly left of the button and attach the other peg 4 holes below. See picture below for reference.

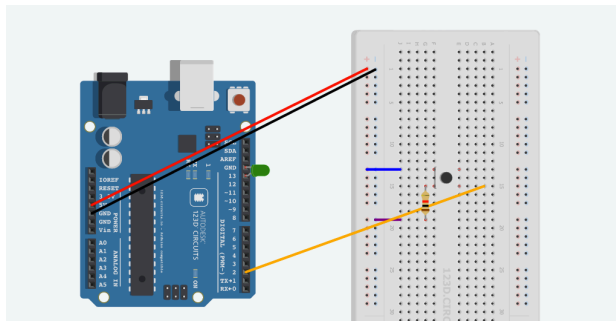


- 3) **Attach Remaining Wires:** To complete the circuit for the button, attach a wire from the positive column to the same row as the top of the button. Attach a second wire from the

negative terminal to the bottom row of the resistor and connect a third wire from the bottom row of the button to port 3 of the Arduino. All as shown below.



- 4) **Insert LED:** Insert the LED with the longer, positive leg in pin 13 and the shorter, negative leg in the ground as shown below.



- 5) **Upload the Code:** Connect your Arduino board to your computer and upload the following code to your device. See the 'Introduction to the Arduino' section (pages 28-29) for more information on how to do this. (This code is also contained on the flash drive included in your kit.)

Blinking.light.ino

```
const int buttonPin = 2; // the number of the pushbutton pin
const int ledPin = 13; // the number of the LED pin

// variables will change:
int buttonState = 0; // variable for reading the pushbutton status

void setup() {
  // initialize the LED pin as an output:
  pinMode(ledPin, OUTPUT);
  // initialize the pushbutton pin as an input:
  pinMode(buttonPin, INPUT);
}

void loop(){
  // read the state of the pushbutton value:
  buttonState = digitalRead(buttonPin);

  // check if the pushbutton is pressed.
  // if it is, the buttonState is HIGH:
  if (buttonState == HIGH) {
    // turn LED on:
    digitalWrite(ledPin, HIGH);
  }
  else {
    // turn LED off:
    digitalWrite(ledPin, LOW);
  }
}
```

- 6) **Observe your Finished Project:** Once the code is uploaded you will be able to control your LED by pushing the button!

Source: Thanks to <http://arduino.cc/en/tutorial/button> for this project idea.