

Arduino Traffic Light

Objective: SWBAT build a traffic light using LEDs, a breadboard and an Arduino Uno.

Materials:

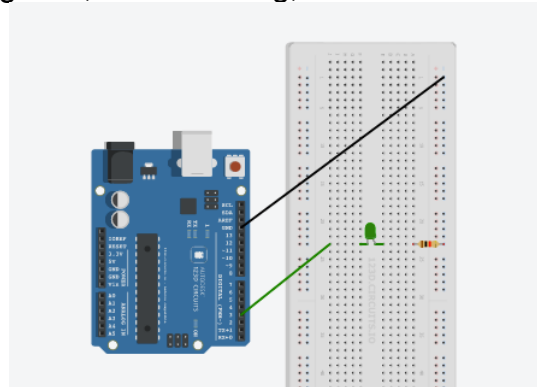
- Arduino Board
- Breadboard
- 1 Red LED
- 1 Yellow LED
- 1 Green LED
- 3 100 Ohm Resistors
- 4 Jumper Wires
- USB Cable
- Computer with Arduino Software Installed
- Goggles

Preparation:

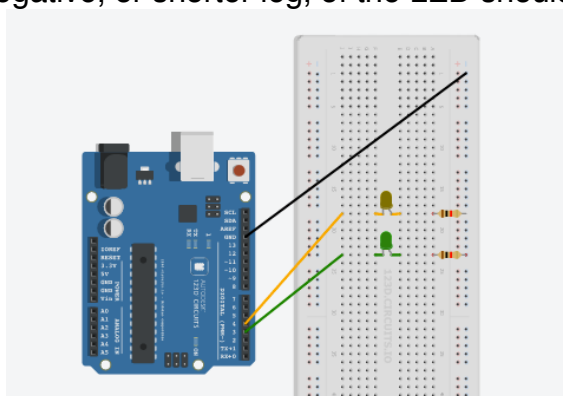
- Ensure that you have a computer with the Arduino software downloaded. See the 'Introduction to Arduino' section (pages 28-29) for more information on how to do this.
- Review safety procedures with students before beginning this activity.

What to do:

- 1) **Wire the Green LED:** Place the green LED, 1 resistor, and 2 jumper wires according to the diagram below. In this diagram the green wire is connected from the same row as the LED to the digital pin 3 on the Arduino and the black wire is connected from the negative column of the breadboard to the ground port of the Arduino. The positive, or longer leg, of the LED should be towards the wire and the negative, or shorter leg, of the LED should be towards the resistor.

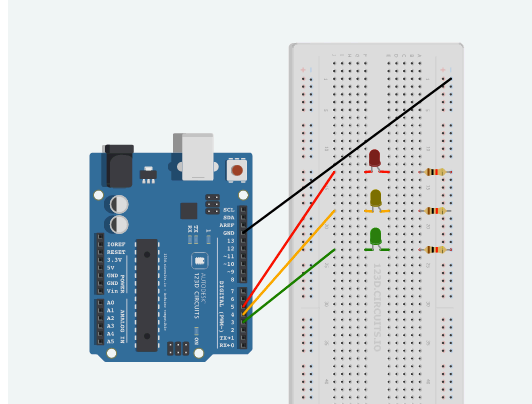


- 2) **Wire the Yellow LED:** Place the yellow LED, 1 resistor, and 2 jumper wires according to the diagram below. In this diagram the yellow wire is connected from the same row as the yellow LED to the digital pin 4 on the Arduino. The positive, or longer leg, of the LED should be towards the wire and the negative, or shorter leg, of the LED should be towards the resistor.



- 3) **Wire the Red LED:** Place the red LED, 1 resistor, and 2 jumper wires according to the diagram below. In this diagram the red wire is connected from the same row as the red LED to the digital pin 5 on the Arduino. The positive, or longer leg, of the LED should be towards the wire and the negative, or shorter leg, of the LED should be towards the resistor.

the digital pin 5 on the Arduino. The positive, or longer leg, of the LED should be towards the wire and the negative, or shorter leg, of the LED should be towards the resistor.



- 4) **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.)

arduino.traffic.light.ino

```
// variables
int GREEN = 3;
int YELLOW = 4;
int RED = 5;
int DELAY_GREEN = 1000;
int DELAY_YELLOW = 1000;
int DELAY_RED = 1000;

// basic functions
void setup()
{
  // setup LED modes
  // we're specifying that we're going to send information to this LED
  pinMode(GREEN, OUTPUT);
  pinMode(YELLOW, OUTPUT);
  pinMode(RED, OUTPUT);
}

void loop()
{
  // High turns things on
  // Low turns things off
  digitalWrite(GREEN, HIGH);
  digitalWrite(YELLOW, LOW);
  digitalWrite(RED, LOW);
  // how long we want the green led on
  delay(DELAY_GREEN);

  digitalWrite(GREEN, LOW);
  digitalWrite(YELLOW, HIGH);
  digitalWrite(RED, LOW);
  // how long we want the yellow led on
  delay(DELAY_YELLOW);

  digitalWrite(GREEN, LOW);
  digitalWrite(YELLOW, LOW);
  digitalWrite(RED, HIGH);
  // how long we want the red led on
  delay(DELAY_RED);
}
```

- 5) **Observe your Finished Project:** Once your code is loaded, watch as the lights change from red to green to yellow.

Source: Thanks to <http://www.arduino.cc> and <http://www.instructables.com/> for this project idea.