LESSON 1: LED BLINKING

INTRODUCTION:

LEDs are small powerful lights that are used in many different applications. In this lesson, you will learn how to use the Arduino Uno board by turning on an LED and making it blink once per second.

COMPONENTS:

- 1x Arduino Uno board
- 1x USB cable
- 1x Resistor (220Ω)
- 1x LED
- Jumper wires
- 1x Breadboard

PRINCIPLE

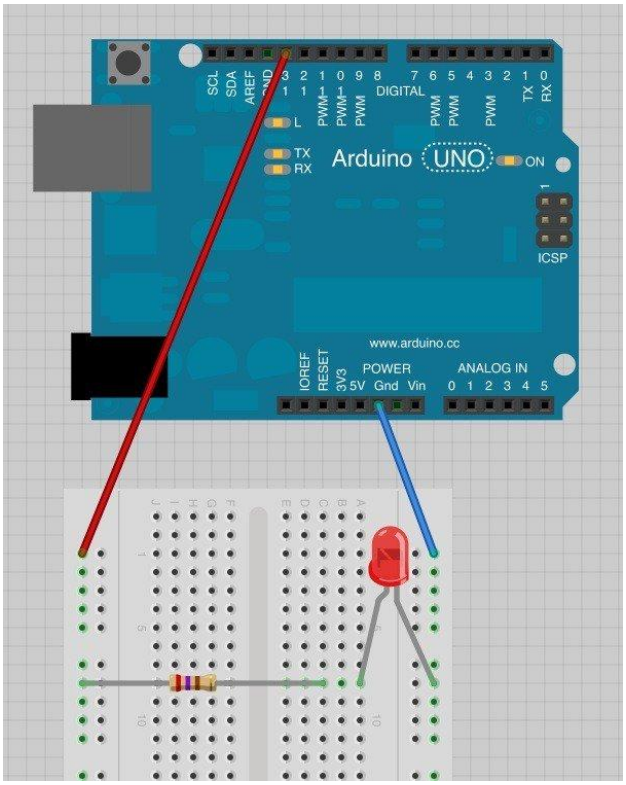
LED

A light-emitting diode (LED) is a semiconductor device which can turn electric energy into light energy via PN junctions. By wavelength, it can be categorized into laser diode, infrared light-emitting diode and visible light-emitting diode which is usually known as light-emitting diode (LED). LEDs are usually red, yellow, green, blue, or color-changing. Color-changing LEDs can change their color with different voltages.

Before building any circuit, you should know the parameters of the components in the circuit, such as their operating voltage, operating circuit, etc. You should connect a current-limiting resistor when an LED is used or else the LED can become burned due to excessive current.

Experimental Procedures:

Step 1: Build the circuit. Connect the red jumper wire from the breadboard to D13 and connect the blue jumper wire to GND.

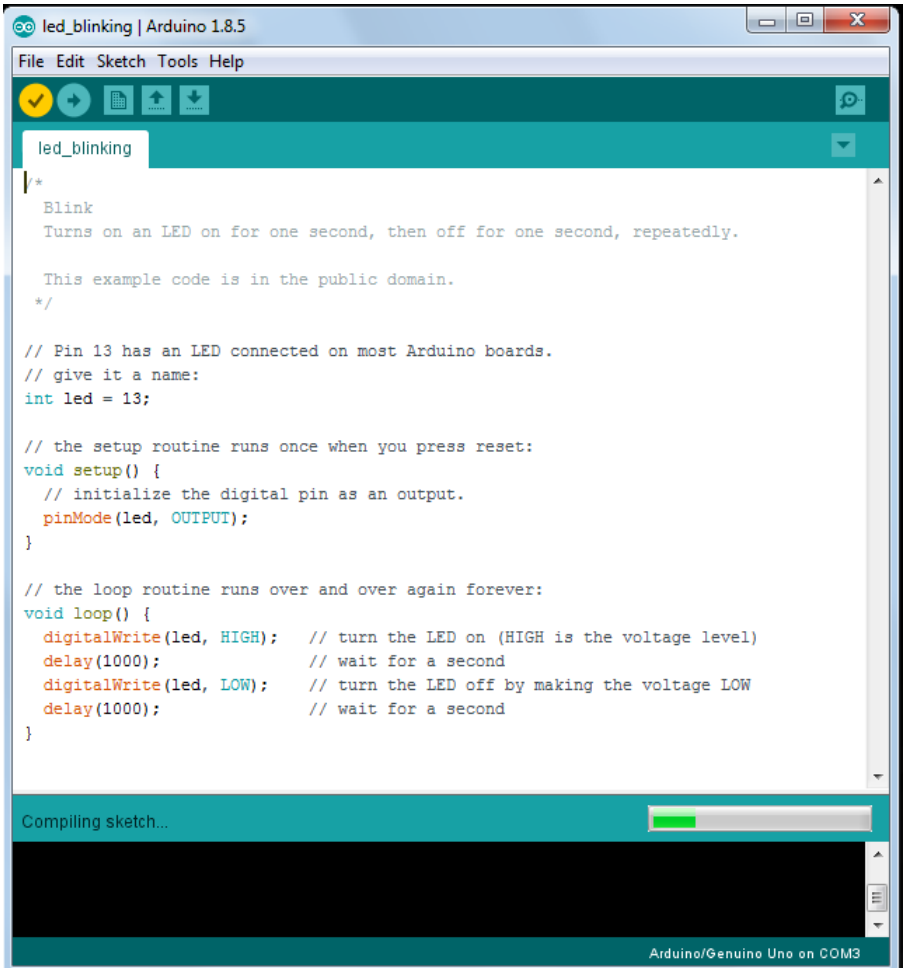


Step 2: Program

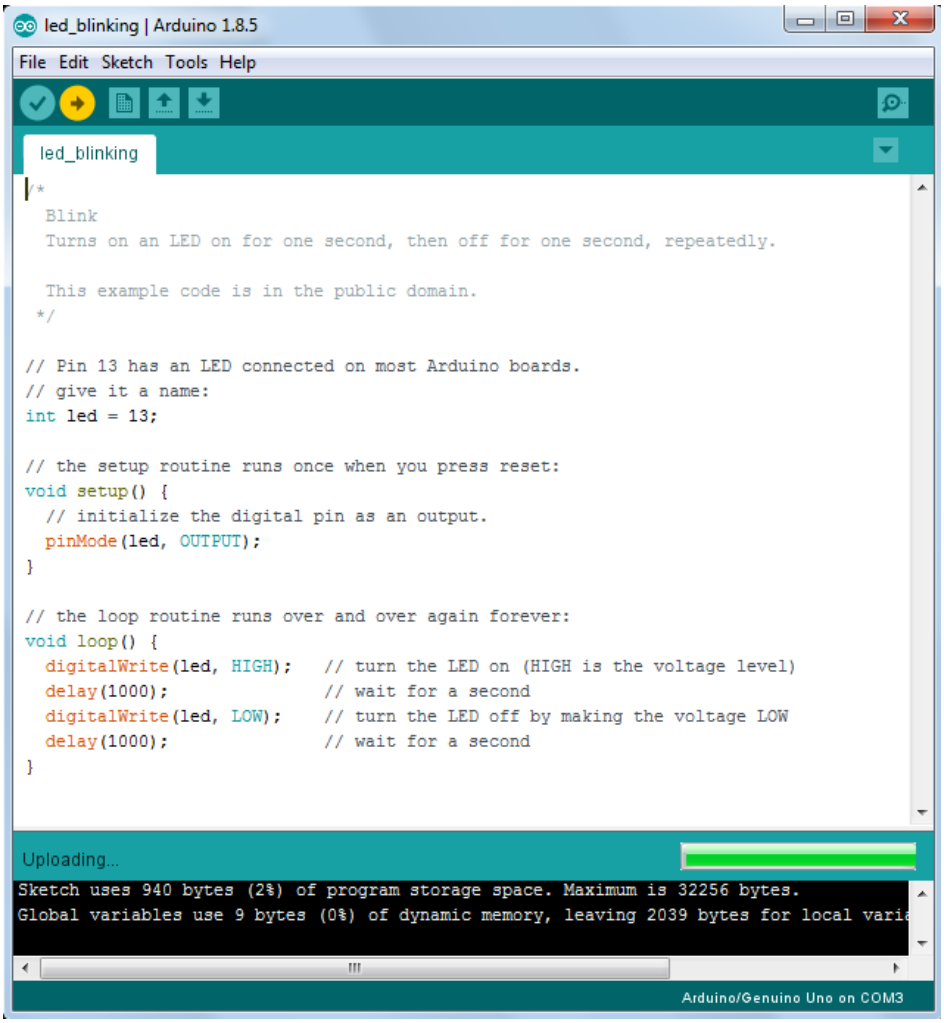
```
/*
  Blink
  Turns on an LED on for one second, then off for one second, repeatedly.

  This example code is in the public domain.
 */

// Pin 13 has an LED connected on most Arduino boards.
// give it a name:
int led = 13;

// the setup routine runs once when you press reset:
void setup() {
  // initialize the digital pin as an output.
```

```
  pinMode(led, OUTPUT);
}

// the loop routine runs over and over again forever:
void loop() {
  digitalWrite(led, HIGH);   // turn the LED on (HIGH is the voltage level)
  delay(1000);               // wait for a second
  digitalWrite(led, LOW);    // turn the LED off by making the voltage LOW
  delay(1000);               // wait for a second
}
```

Step 3: Compile the code



Step 4: Upload the sketch to the Arduino Uno board. You will notice that both the built-in 'L' LED and the external LED should now blink.



RESULTS:

Red LED will blank at 0.5Hz. 1 second light up and 1 second turn off.

EXPERIMENTAL SUMMARY:

Through this experiment, you have learned how to turn on an LED. You can also change the blinking frequency of the LED by changing the num value in the delay function delay (num). For example, if the function is changed to delay (250), you will find that the LED blinks more quickly.