Arduino Project - Hardware

Blinking LED

*Difficulty: Beginner*

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Introduction
The uOttawa Makerspace is home to the latest in microcontroller technology with Arduino Uno and Intel Galileo microcontroller boards. This guide shows students of the Makerspace the appropriate methods to use the Arduino microcontroller boards by the creation of a simple electronics project that teaches students the hardware capacity of the Arduino board. This simple electronic project uses the Arduino Uno to control a blinking LED.

Resources
The items to be used for the project are:

- Arduino UNO microcontroller board (attached with Sparkfun breadboard)
- One LED of any color
- One 330 Ω (ohm) resistor (orange, orange, brown)
- Connecting wires (three)
- Laptop with USB compatibility
- USB Type A male to Type B male cable
- Arduino IDE software

Additional materials for the project are:

- Basics 1 - Circuit image file
- Basics_1 source code (sketch)

Procedure

Prepare the Circuit
- Connect the positive end of the LED to pin 13 of the Arduino board. The positive end of the LED is the one with the longer lead
- Connect the negative end of the LED to the 330 Ω (ohm) resistor
- Connect the negative end of the resistor to the GND pin on the Arduino board
- Ensure the circuit is connected as shown in Figure 1 or use the provided circuit schematic

Note: Make sure to ground the negative end of the circuit otherwise the circuit will not work.
Upload Code

- Start the Arduino IDE for the software side of the project
- Copy and paste the Basics_1 sketch source code (provided in Supporting Materials) in the IDE window
- **Optional:** Browse through the code to understand the functionality of the software
- Click in the Verify button to make sure there are no compile time errors in the code
- Ensure the Arduino is connected via the USB port to the computer
- Click on the Upload button on the IDE to upload the code to the Arduino
- **Optional:** If there is an error message look over the connectivity of the board
- The upload takes some time as it electronically rewrites the Arduino microcontroller

**Note:** The source code must be verified before the code can be uploaded to the Arduino board.
Using the Circuit

- Once the code has been uploaded to the LED on the Arduino board will begin to blink on and off periodically
- Pressing the RESET button on the Arduino will restart the blinking LED again
- Congratulations! You have successfully created your first Arduino circuit, now go ahead and create marvellous circuits!
Supporting Materials

Arduino circuit schematic

Figure 3: Basics 1 Circuit
Arduino sketch (source code) for Basics_1

/*
 *  Arduino : basics
 */

int ledPin = 13;

void setup()
{
  /*initialize pins as outputs.*/
  pinMode(ledPin, OUTPUT);
}

void loop()
{
  digitalWrite(ledPin, HIGH);
  delay(1000);
  digitalWrite(ledPin, LOW);
  delay(1000);
}