Module: Blink an LED

In this first experiment you will be introduced to skills involved in using a microcontroller board. There are three basics components to designing and building circuits and controlling them – i) building the circuit, ii) interfacing the circuit to microcontroller board, and iii) writing the program that controls the behavior of the circuit. The 16 experiments included in the SparkFun Inventers' Kit Guide are a well-designed set of procedures that build up these skill sets. Each experiments teaches you a little more about building successively more complex circuits, more about interfacing to the board, and introduces new programming skills and statements.

BLINK AN LED

I) Learn to build a circuit that interfaces with one of the digital I/O Pins on the microcontroller board.

II) Learn the basic structure of the programming environment used to create programs that are transferred to the Arduino/Redboard

III) Learn how to set up the digital I/O pins in OUTPUT mode so the board generates a signal that will be used to light the LED.

IV) Learn how to use the PinMode, DigitalWrite, and Delay commands
Procedures

Using your favorite browser navigate to SparkFun Inventors' Kit Guide at https://learn.sparkfun.com/tutorials/sik-experiment-guide-for-arduino---v32/. On the right side of the page is a list of the experiments including and Introduction. If you have never used an Arduino or a clone you must read this introduction. Although the computers in the lab have the interface software installed this introduction guides you through installing the software on any of your own computers.

OPEN SOURCE – we have chosen the Arduino platform partly because they are part of the Open Source community. This means that all resources, including the schematics and board layout, are free.

So let’s navigate to experiment 1 using the clickable list.

✓ Find the parts in you kit needed to complete the experiment
✓ READ the SUGGESTED READING where you will learn a little bit about light emitting diodes and how to interface them to a device that supplies a large voltage than they can handle.

**Question 1:** What do they compare LEDs to in the suggested reading?

**Question 2:** What is the purpose to the resistor that is included as part of the interface circuitry.

✓ Run the experiment as using the instructions given.
✓ Read all of the Comments that have been lovingly written and included in the program.
**Question 3:** Draw the schematic of the circuit you built using the figure from the Suggested Reading except now show that the circuit is driven by the output pin 13 instead of a battery. The symbols for a resistor, an LED, the positive terminal of the source at Pin 13, and the symbol for ground.

**Question 4:** What do the *Setup* and *Loop* sections of the code do?

**Question 5:** Vary the numerical parameter passed to the delay function (not the pin number) at intervals of 100 from 1000 to 1. Describe what happens in terms of how your eye perceives the interval between the ON and OFF states of the LED as well as the change (or no change) in the brightness of the LED.

**Question 6:** Discuss your results.