

# Blink

This example shows the simplest thing you can do with an Arduino or Genuino to see physical output: it blinks an LED.

## Hardware Required

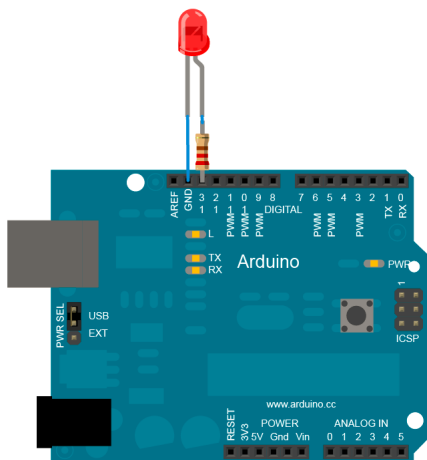
- Arduino or Genuino Board
- LED
- 220 ohm resistor

## Circuit

To build the circuit, connect one end of the resistor to Arduino pin 13. Connect the long leg of the LED (the positive leg, called the anode) to the other end of the resistor. Connect the short leg of the LED (the negative leg, called the cathode) to the Arduino GND, as shown in the diagram and the schematic below.

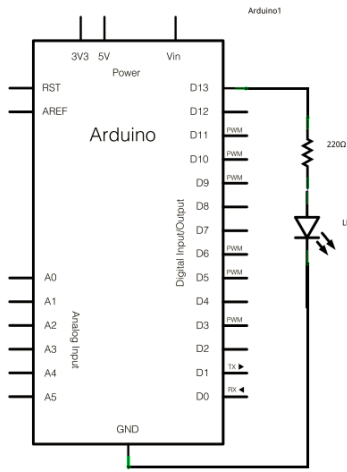
Most Arduino boards already have an LED attached to pin 13 on the board itself. If you run this example with no hardware attached, you should see that LED blink.

The value of the resistor in series with the LED may be of a different value than 220 ohm; the LED will lit up also with values up to 1K ohm.



([http://www.arduino.cc/en/uploads/Tutorial/ExampleCircuit\\_bb.png](http://www.arduino.cc/en/uploads/Tutorial/ExampleCircuit_bb.png))

## Schematic



([http://www.arduino.cc/en/uploads/Tutorial/ExampleCircuit\\_sch.png](http://www.arduino.cc/en/uploads/Tutorial/ExampleCircuit_sch.png))

## Code

After you build the circuit plug your Arduino or Genuino board into your computer, start the Arduino Software (IDE) and enter the code below. You may also load it from the menu File/Examples/01.Basics/Blink . The first thing you do is to initialize pin 13 as an output pin with the line

```
pinMode(13, OUTPUT);
```

In the main loop, you turn the LED on with the line:

```
digitalWrite(13, HIGH);
```

This supplies 5 volts to pin 13. That creates a voltage difference across the pins of the LED, and lights it up. Then you turn it off with the line:

```
digitalWrite(13, LOW);
```

That takes pin 13 back to 0 volts, and turns the LED off. In between the on and the off, you want enough time for a person to see the change, so the `delay()` commands tell the board to do nothing for 1000 milliseconds, or one second. When you use the `delay()` command, nothing else happens for that amount of time. Once you've understood the basic examples, check out the [BlinkWithoutDelay](http://www.arduino.cc/en/Tutorial/BlinkWithoutDelay) (<http://www.arduino.cc/en/Tutorial/BlinkWithoutDelay>) example to learn how to create a delay while doing other things.

Once you've understood this example, check out the [DigitalReadSerial](http://www.arduino.cc/en/Tutorial/DigitalReadSerial) (<http://www.arduino.cc/en/Tutorial/DigitalReadSerial>) example to learn how read a switch connected to the board.

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

  Most Arduinos have an on-board LED you can control. On the Uno and
  Leonardo, it is attached to digital pin 13. If you're unsure what
  pin the on-board LED is connected to on your Arduino model, check
  the documentation at http://www.arduino.cc

  This example code is in the public domain.

  modified 8 May 2014
  by Scott Fitzgerald
  */

// the setup function runs once when you press reset or power the board
void setup() {
  // initialize digital pin 13 as an output.
  pinMode(13, OUTPUT);
}

// the loop function runs over and over again forever
void loop() {
  digitalWrite(13, HIGH);  // turn the LED on (HIGH is the voltage level)
  delay(1000);             // wait for a second
```

```
}
digitalWrite(13, LOW);    // turn the LED off by making the voltage LOW
delay(1000);              // wait for a second
}
```

[Get Code] (<http://www.arduino.cc/en/Tutorial/Blink?action=sourceblock&num=1>)

## See Also

- [setup](http://www.arduino.cc/en/Reference/Setup) (<http://www.arduino.cc/en/Reference/Setup>())
- [loop](http://www.arduino.cc/en/Reference/Loop) (<http://www.arduino.cc/en/Reference/Loop>())
- [pinMode](http://www.arduino.cc/en/Reference/PinMode) (<http://www.arduino.cc/en/Reference/PinMode>())
- [digitalWrite](http://www.arduino.cc/en/Reference/DigitalWrite) (<http://www.arduino.cc/en/Reference/DigitalWrite>())
- [delay](http://www.arduino.cc/en/Reference/Delay) (<http://www.arduino.cc/en/Reference/Delay>())
- [AnalogReadSerial](http://www.arduino.cc/en/Tutorial/AnalogReadSerial) (<http://www.arduino.cc/en/Tutorial/AnalogReadSerial>) - Read a potentiometer, print its state out to the Arduino Serial Monitor.
- [BareMinimum](http://www.arduino.cc/en/Tutorial/BareMinimum) (<http://www.arduino.cc/en/Tutorial/BareMinimum>) - The bare minimum of code needed to start an Arduino sketch.
- [DigitalReadSerial](http://www.arduino.cc/en/Tutorial/DigitalReadSerial) (<http://www.arduino.cc/en/Tutorial/DigitalReadSerial>) - Read a switch, print the state out to the Arduino Serial Monitor.
- [Fade](http://www.arduino.cc/en/Tutorial/Fade) (<http://www.arduino.cc/en/Tutorial/Fade>) - Demonstrates the use of analog output to fade an LED.
- [ReadAnalogVoltage](http://www.arduino.cc/en/Tutorial/ReadAnalogVoltage) (<http://www.arduino.cc/en/Tutorial/ReadAnalogVoltage>) - Reads an analog input and prints the voltage to the serial monitor.

*Last revision 2015/07/28 by SM*

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