

Learn Electronics & Programming with Arduino

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Summary:

The Arduino microcontroller is a small programmable board that can be used to control all sorts of circuits. In this mini-workshop we'll be learning how to make small circuits, connect them to an Arduino Uno, and program their behavior.

Resources & useful links

Materials for this class: <https://github.com/clarissalittler/intro-arduino-workshop>

Built-in tutorials in IDE: File → Examples → Built-in Examples

Built-in tutorials online: <https://www.arduino.cc/en/Tutorial/BuiltInExamples>

Arduino official tutorial list: <https://www.arduino.cc/en/Tutorial/HomePage>

TinkerCAD simulator: <https://www.tinkercad.com/#/?type=circuits>

Arduino IDE download: <https://www.arduino.cc/en/Main/Software>

Best C programming book: https://en.wikipedia.org/wiki/The_C_Programming_Language

Arduino projects on Instructables <http://www.instructables.com/id/Arduino-Projects/>

Arduino projects on official site <https://create.arduino.cc/projecthub>

Getting started at home

To get started working on your own projects at home you'll need to have, at the bare minimum, 1. An Arduino board 2. A serial cable to connect it 3. A computer with the Arduino IDE installed

You'll probably *also* want some kind of kit with electronics components if you don't have one already. There are a number of them for sale through Adafruit: <https://www.adafruit.com/category/17>

Glossary

Voltage The energy differential between two places in a circuit, measured in volts

Current How much charge is moving through the circuit per second, measured in Amperes

Ground A stable reference point for measuring voltage and a sink for current

PWM Pulse-width modulation: a technique for simulating analog output by rapidly turning on and off the digital pin

Digital pins Pins that are either HIGH or LOW. Can be used for both input and output.

Analog pins Pins that can be read to produce a range of values from 0 to 1023.

C Programming Language The underlying language for programming Arduino boards.

Resistor A material that *resists* electrical current, slowing it down like a narrow pipe.

Pot/Potentiometer Acts like a variable strength resistor

IDE Integrated Development Environment, a program that helps you write and run code

Breadboard A board that you can plug electronics components into temporarily to build circuits