

Intro to Arduino, the microcontroller and the programming environment

Arduino microcontroller -circuits are not embedded in the device like the CPX, but rather attached to a breadboard.

Materials: arduino uno, mega, Lilypad

[Sparkfun Intro to Arduino slide show](#)

Circuits - [overview](#)

- path for electricity to flow through
- closed loop containing a source of electrical energy (a battery) and a load, a light bulb, motor, etc
- electrons run around in a loop between power and ground through the components.
- Electrons make up electricity.
- electrons have a tendency to go from a point of greater electrical energy to a point of lesser electrical energy.
- A circuit needs a positive connection (greater energy, or power), a negative connection (lower energy, or ground), and a conductor (wires) through which the electrons flow.
- electrons will travel from power to ground.
- You can insert other components in the path of electrons and use them to control what you want to happen.

Getting started with arduino using an online simulator:

[Circuits by TinkerCAD](#) -

Build your Arduino circuit with the online simulator,

Use blocks to code

Run the simulator to see if your circuit works

download the code you created and upload it to your actual physical Arduino board.

Arduino (programming language)

Software Install / Computer Setup

Overview of an arduino sketch

Example files

Structure of language

Review analog and digital signals

Getting started activities:

Blink 1 LED:

[Blink](#) -good tutorial explaining arduino example “blink”

Blink 2 LEDs simultaneously

Program Button to turn LED on

Read Sensor data

Program potentiometer to dim light

Control a servo motor:

[Using servo motors - good example of explaining arduino code](#) (for loops) -uses arduino example servo - sweep

Program [music with the buzzer](#)

Program a light sensor to turn on LED

DOCUMENT YOUR CODE with explanatory note

Project Resources:

[Beginner projects on Arduino Project Hub](#)

- [Digital clock](#)
- [RGB Mixer](#) -Control the brightness of an RGB LED with Potentiometers, with on/off switch built in.
- [Simple Obstacle detector](#)

Resources for Learning the Arduino Programming Language

- [Arduino Programming LanguageTutorials \(Sparkfun \)](#)
- [Glossary of Terms](#)
- [Arduino Language Reference](#)
- [Arduino Documentation](#)

Decompose problems and break down into smaller components



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