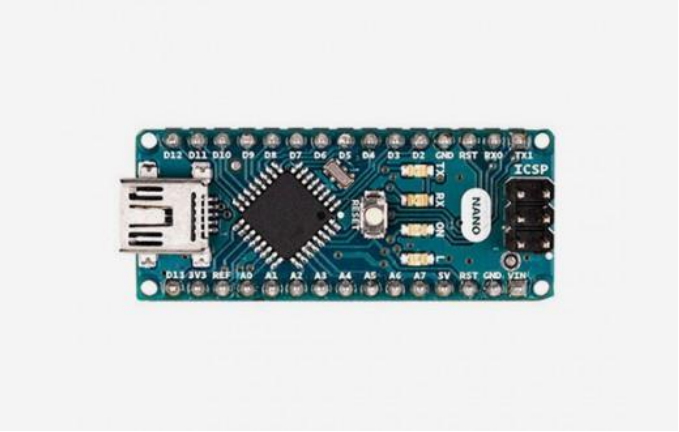
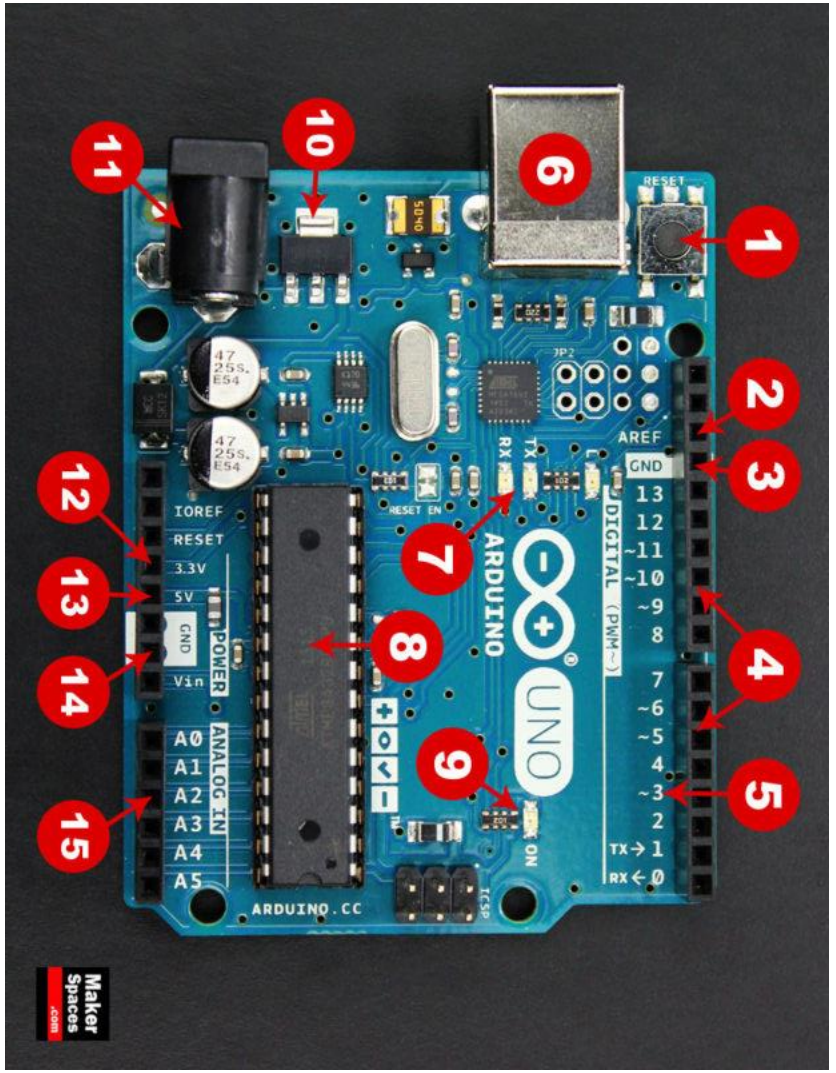
Arduino: Basic Ideas

Basic ideas of Arduino, Familiarize the Arduino board, Setting up the arduino board. Installation of IDE in PC/ laptop for Arduino programming (Sketch)



https://www.arduino.cc/en/Main/Products

Arduino UNO R3



1. Reset Button – This will restart any code that is loaded to the Arduino board

2. AREF – Stands for "Analog Reference" and is used to set an external reference voltage

3. Ground Pin – There are a few ground pins on the Arduino and they all work the same

4. Digital Input/Output – Pins 0-13 can be used for digital input or output

5. PWM – (Pulse Width Modulation) The pins marked with the (~) symbol can simulate analog output

https://www.makerspaces.com/arduino-uno-tutorial-beginners/

Arduino UNO R3

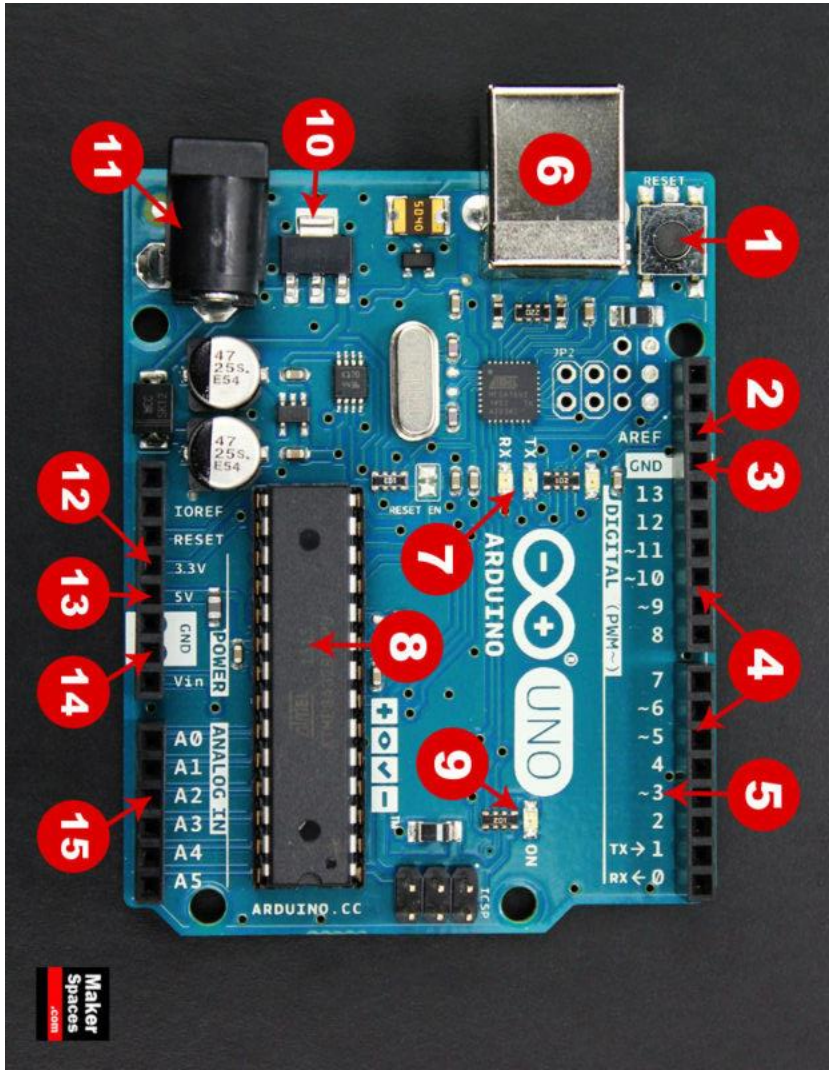
6. USB Connection – Used for powering up your Arduino and uploading sketches

7. TX/RX – Transmit and receive data indication LEDs

8. ATmega Microcontroller – This is the brains and is where the programs are stored (ATmega328P, 16 MHz)

9. Power LED Indicator – This LED lights up anytime the board is plugged in a power source

10. Voltage Regulator – This controls the amount of voltage going into the Arduino board



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Arduino UNO R3

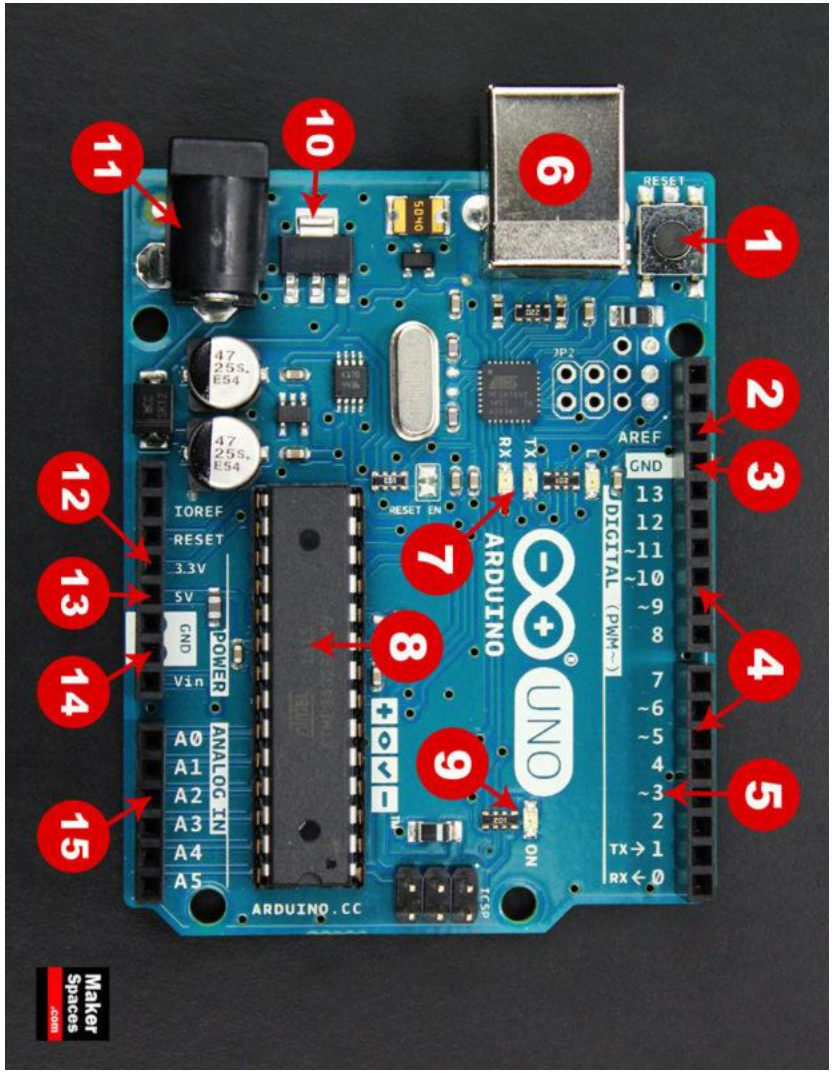
11. DC Power Barrel Jack – This is used for powering your Arduino with a power supply

12. 3.3V Pin – This pin supplies 3.3 volts of power to your projects

13. 5V Pin – This pin supplies 5 volts of power to your projects

14. Ground Pins – There are a few ground pins on the Arduino and they all work the same

15. Analog Pins – These pins can read the signal from an analog sensor and convert it to digital



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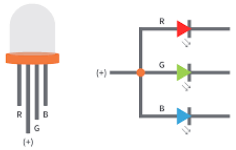
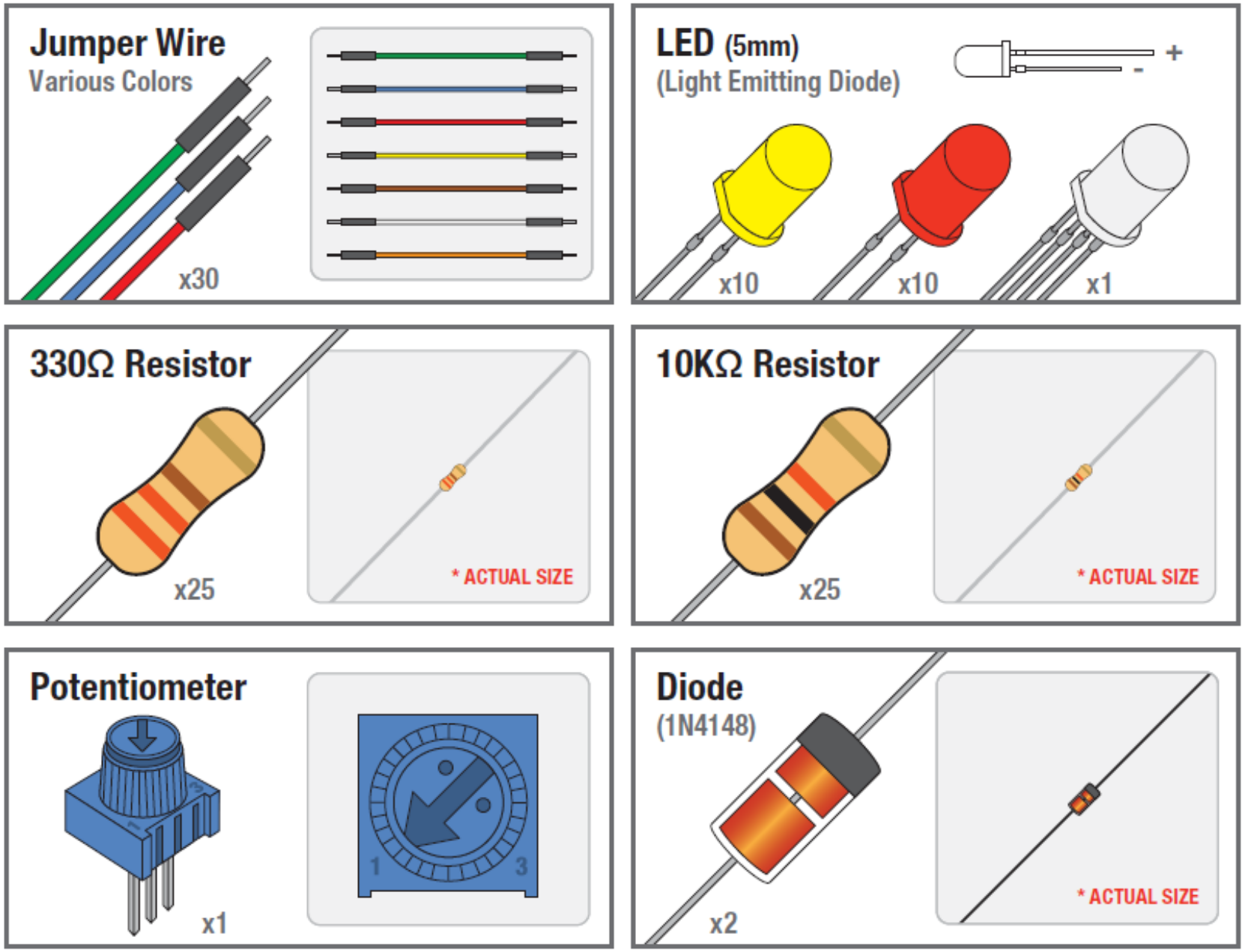
Kit Components

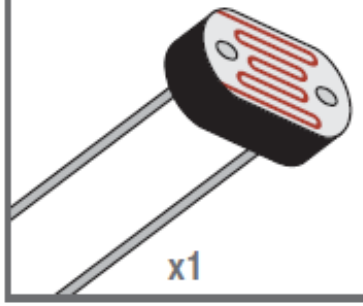
Name	Image	Type	Function	Notes
Push Button		Digital Input	Switch - Closes or opens circuit	Polarized, needs resistor
Trim potentiometer		Analog Input	Variable resistor	Also called a Trimpot.
Photoresistor		Analog Input	Light Dependent Resistor (LDR)	Resistance varies with light.
Relay		Digital Output	Switch driven by a small signal	Used to control larger voltages
Temp Sensor		Analog Input	Temp Dependent Resistor	
Flex Sensor		Analog Input	Bending dependent resistor	
RGB LED		Dig & Analog Output	16,777,216 different colors	

SIK Components



SIK Components

Photo Resistor



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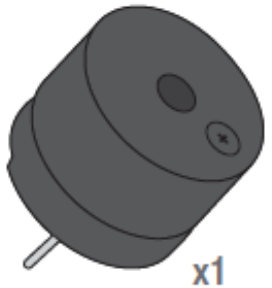
Piezo Element



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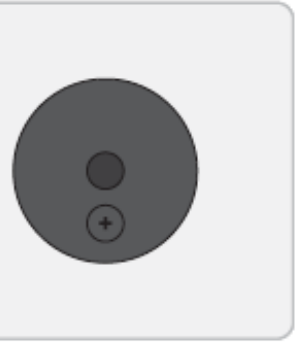
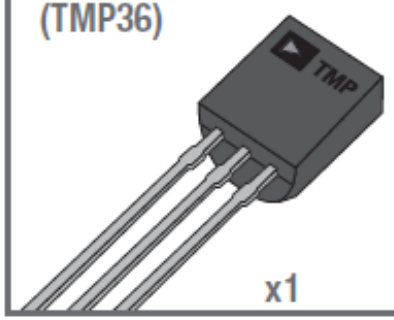


Temp. Sensor
(TMP36)



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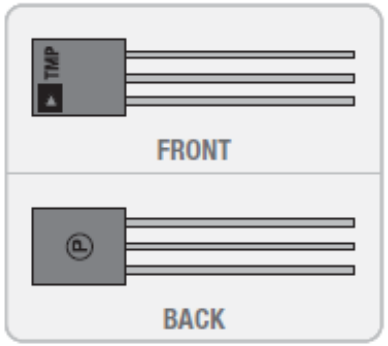
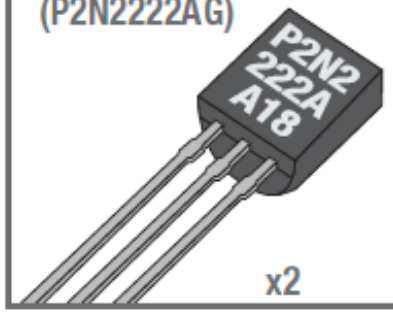


Transistor
(P2N2222AG)



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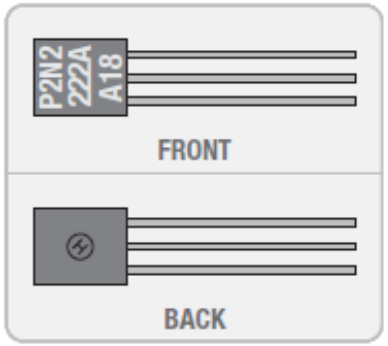
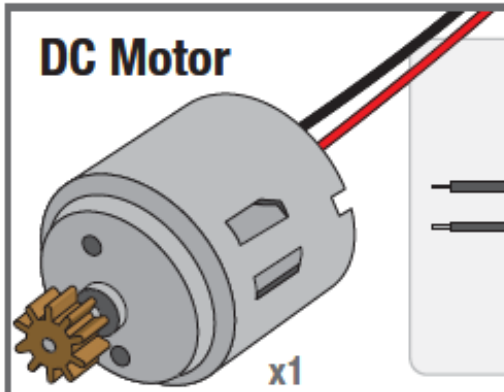


DC Motor



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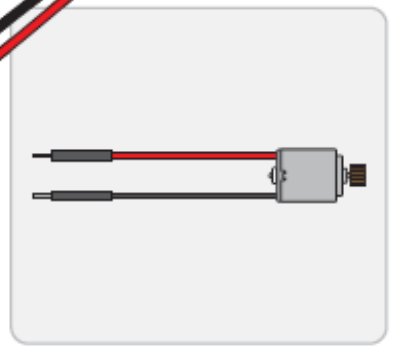
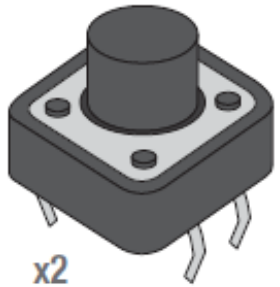


Push Button



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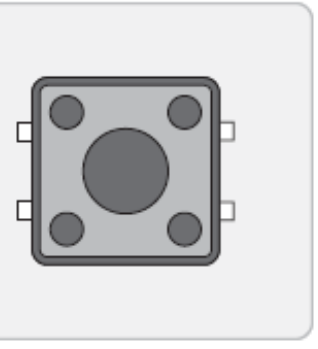
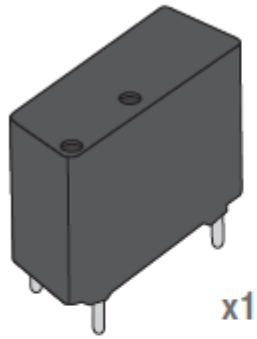


SIK Components

Relay



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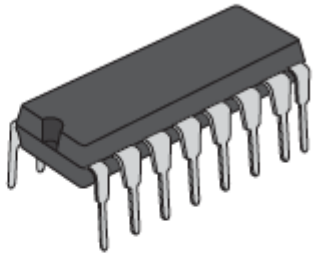
Integrated Circuit

(IC)



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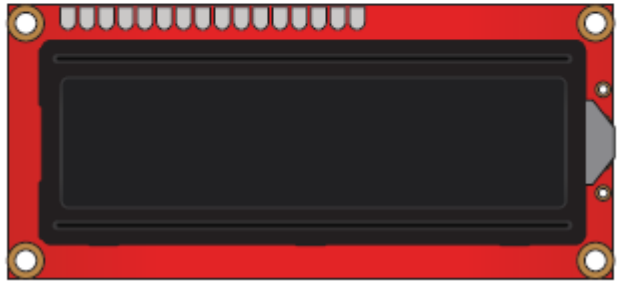
LCD



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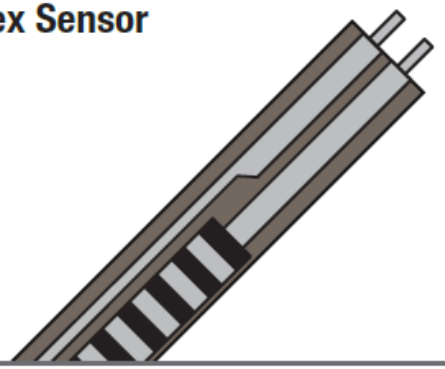
Flex Sensor



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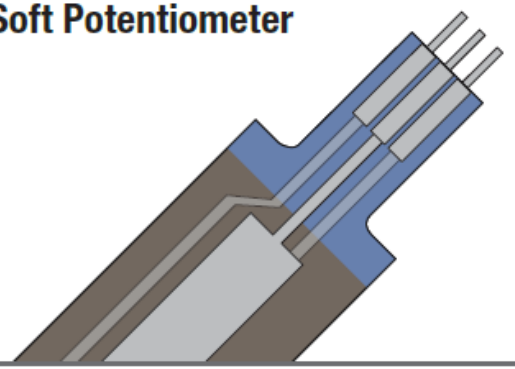
Soft Potentiometer



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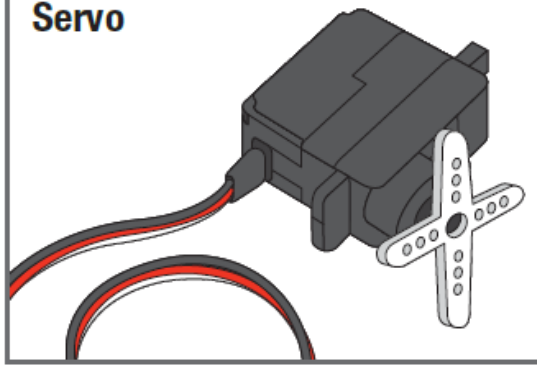
Servo



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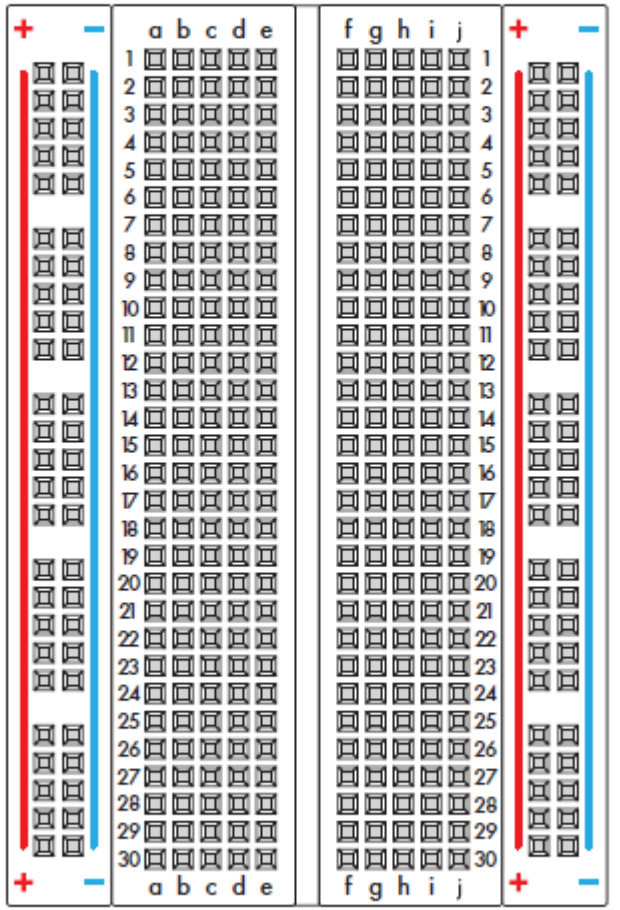
Breadboard

Standard Solderless (Color may vary)



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Platform

Arduino boards are able to read inputs - light on a sensor, a finger on a button, or a Twitter message - and turn it into an output - activating a motor, turning on an LED, publishing something online. You can tell your board what to do by sending a set of instructions to the microcontroller on the board. To do so one uses the Arduino programming language (based on Wiring, an open-source programming framework for microcontrollers), and the Arduino Software (IDE – Integrated Development Environment), based on Processing (an open-source software sketchbook and a language for learning how to code within the context of the visual art).

https://www.arduino.cc/en/Guide/Introduction

Getting Started

- Set up the Arduino Software (IDE) to program your board.
- Two options: (a) Online IDE (Arduino Web Editor) – requires stable internet connection, allows to save sketches in the cloud thus enabling the user to access from any device, have the most up-to-date version of the IDE without the need to install updates or community generated libraries.

(b) Desktop IDE – Windows, Mac OS X, Linux, Portable IDE (Windows ↔ Linux), ChromeOS

Arduino Software (IDE)

https://www.arduino.cc/en/Guide/Environment