Arduino Diagram and Glossary

Brown County Library

Arduino Uno:

Digital Input/Output Pins 0-13 & Analog Output Pins 3,5,6,9,10,11

Digital Grounding Pin

Reset Button

Analog Reference Pin

USB Plug

Serial Programming Connector

Micro-controller

External Power Supply

Reset Pin

3.3 Volt Power Pin

5 Volt Power Pin

Voltage In

Grounding Pins

Analog Input Pins (0-5)
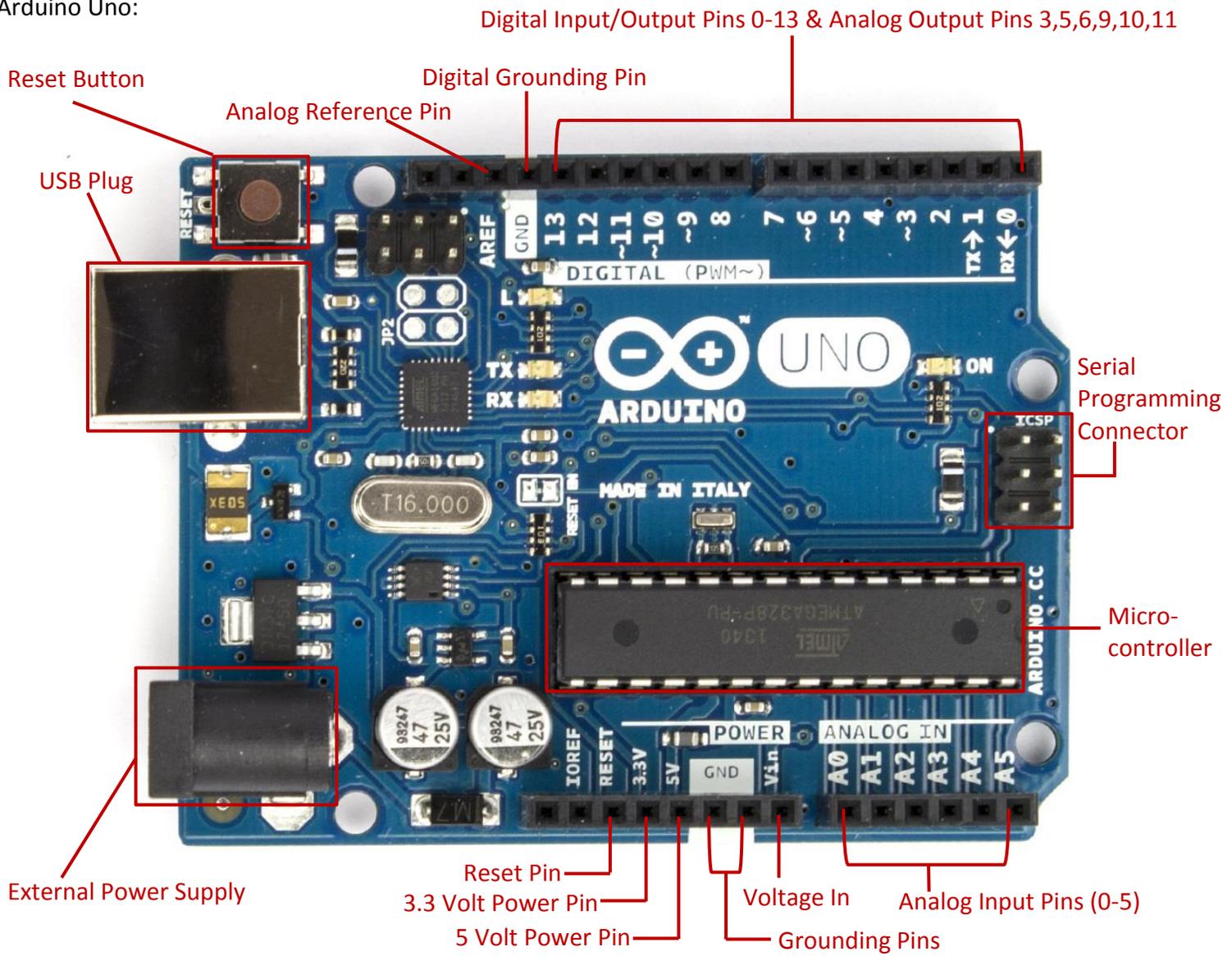
Arduino Glossary

Adjustable (variable) resistor: An electronic component that is used to vary the amount of electrical current that flows through a circuit.

Analog input: pins that take analog values (such as brightness readings from a light sensor) and convert them to a number between 0 and 1023. This allows us to read signals that are sending a continuous signal, such as a light dimmer, and not just on or off.

Analog output: this allows us to control a LED, motor, or other project along a continuous scale, with many options other than just on and off. Think of a dimmable lightbulb that can go from off to very bright and everything in between.

Anode: the positive lead (side) of a diode – see **LED**.

Arduino Uno Board: a microcontroller that can be used to create, design and experiment with electronics – in a nutshell, it is a tiny computer!

Breadboard: a thin plastic board used to hold electronic components (jumper wire, resistors, etc.) that are wired together to build circuits. A breadboard can be used to create more complicated projects with Arduino.
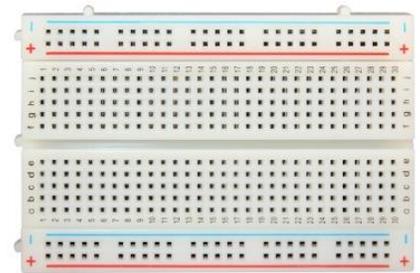
Cathode: the negative lead (side) of a diode – see **LED**.

Circuit: the complete path that an electric current travels along. This path can include a variety of electronic components, such as LEDs, resistors, jumper wires, and more, depending on your project. A circuit is like a circle – it starts at a power source, travels through the other components and then back again. If there is a break anywhere along the circuit, electricity cannot travel along the path and it won't work. Sometimes you will put a deliberate break in the circuit, like a push button, so that power will only flow to your project when you turn it on (complete the circuit).

Digital input: digital inputs allow us to read the state of simple devices, such as a tilt switches, and must have a finite set of possible values. Digital signals have two values: on or off.

Digital output: digital outputs control the connected objects and they must have a finite set of possible values. For example, a digital output can control an LED. With more complicated circuits, it can be used to control motors, make sounds, etc.

Jumper wire (breadboard cables): a short wire used to complete an electric circuit or bypass a break in a circuit.
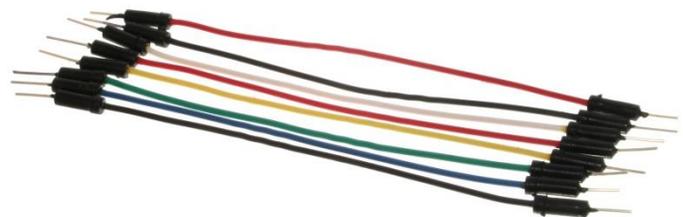
LED: an acronym for "light emitting diode." For our purposes, it is a small electronic component that looks a bit like a lightbulb, but it is more energy efficient and only needs a small amount of power to operate. LEDs have positive and negative leads (or legs) and must be inserted into your circuit correctly. The anode (positive) lead is longer and the cathode is shorter. If the legs are the same length, look at the out casing of the LED – the cathode side often has a flat edge.

+ Anode (positive)

- Cathode (negative)
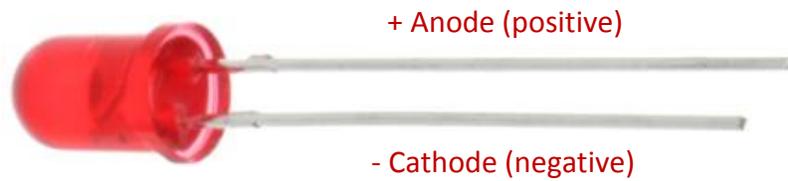
Light dependent resistor: a device that detects light. It senses how much light is in the environment and based upon what you tell it to do, it reacts accordingly. Think of it as a light-activated switch. These are also called photoresistors.
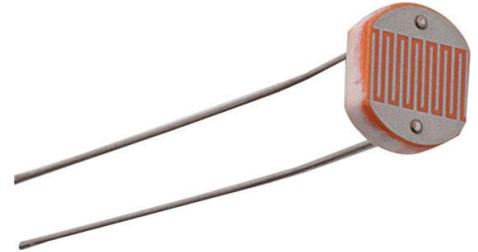
Microcontroller: the part of an Arduino board that interprets and runs the instructions (or sketches) that you provide. A microcontroller gathers information from inputs, processes that information, and then gives instructions to outputs based on what was gathered.

Resistor: a common electronic component that is used to limit and/or control the voltage and current in an electronic circuit, often protecting the circuit from damage. Resistors can have a fixed value of resistance, or they can be made variable or adjustable within a certain range (in which case they may be called rheostats or potentiometers). There are also special resistors such as photoresistors, which measure light, and thermistors, which are sensitive to changes in temperature.

Sketch: a computer program (instructions) that you write and transfer to the Arduino so it will perform the task(s) that you want it to do.

10K resistor: a resistor that provides electrical resistance for up to 10,000 (10k) ohms.

USB cable: an acronym for universal serial bus, this cable can connect an Arduino board to a computer to transfer programs (or sketches) and provide power to the Arduino. An Arduino Uno board uses a standard A-B USB cable.

Arduino Resources

Library Resources:

Arduino on the BCL website: browncountylibrary.org/arduino
Brown County Library catalog: brown.ent.sirsi.net
> Search for "Arduino" as a Words or Phrase search

Access to Lynda.com Online Courses: browncountylibrary.org/lynda
> Access to Lynda is free with your library card! There are thousands of courses – but we recommend the following courses to become familiar with coding with Arduino (which uses a language based on C++): Programming Foundations: Fundamentals, Programming Foundations: Programming for Kids, Learning C++, C++ Essential Training

Buy an Arduino and related components:

Spark Fun: sparkfun.com/categories/103
Adafruit: adafruit.com/category/17
Maker Shed: makershed.com/collections/arduino
Arduino Official Starter Kit: store.arduino.cc/usa/arduino-starter-kit
Jameco Electronics (components): jameco.com

Official Arduino Resources:

Website: arduino.cc
Tutorials: arduino.cc/en/Guide/HomePage
Code Reference: arduino.cc/reference/en
Support Forum: forum.arduino.cc

Project Ideas & How To's:

Instructables: Hundreds of great Arduino project ideas with easy to follow instructions
> instructables.com/howto/arduino/

Jeremy Blum's Arduino Tutorials: Beginner tutorial videos by engineer/hacker Jeremy Blum
> jeremyblum.com/category/arduino-tutorials/

Sparkfun – What is an Arduino?: Sparkfun's introductory tutorial
> learn.sparkfun.com/tutorials/what-is-an-arduino

YouTube.com: Search for "Arduino" to get thousands of videos with tutorials & projects

Learn More About Electricity and Circuits:

Sparkfun Tutorials: These tutorials cover the basics of electricity, circuits, Ohm's law & more.
> learn.sparkfun.com/tutorials/what-is-electricity
> learn.sparkfun.com/tutorials/what-is-a-circuit
> learn.sparkfun.com/tutorials/voltage-current-resistance-and-ohms-law

All About Circuits: Information about electronics for both students and hobbyists
> allaboutcircuits.com

Tinkercad: Test out your projects beforehand by building prototypes in this web-based tool
> tinkercad.com