Arduino Kit Instructions

Brown County Library

WARNING: Please read these instructions entirely before using the Arduino and components found in this kit. Plugging in components incorrectly can result in damage and possible injury. If any components begin to feel warm, unplug power source immediately and re-check your work.

Kit Contents

Item	Polarized* (Y/N)	What is it?	Notes
Arduino Uno		A microcontroller that can be used to create, design and experiment with electronics – in a nutshell, it is a tiny computer!	More info on Arduino in general can be found here on the official Arduino website: arduino.cc/en/Guide/Introduction
Breadboard		A thin plastic board used to hold electronic components (jumper wire, resistors, etc.) that are wired together to build circuits.	A basic overview of how breadboards work can be found here: tinyurl.com/breadboardshowto Here is another (slightly more complex) overview: learn.sparkfun.com/tutorials/how-to-use-a-breadboard
USB Cable		An acronym for universal serial bus, this cable can connect an Arduino board to a computer to transfer programs (sketches) and provide power to the Arduino.	An Arduino Uno board uses a standard A-B USB cable.
Jumper Wires - 10 cm (x5) Jumper Wires - 15cm (x10) Jumper Wires - 20cm (x2)	No	A short wire used to complete an electric circuit or bypass a break in a circuit.	The color of each jumper wire does not matter. These may also be referred to as breadboard wires.
Battery Adapter	Yes	Can be used with a 9 volt battery to power an Arduino project without the need to keep the Arduino plugged in to a computer.	9 volt battery not included in kit. You need to plug jumper wires into the tan end and then into your project. To power your Arduino with a battery, connect the red wire to the Voltage In (Vin) pin and the black wire to ground (GND) pin.
LEDs (2 of each: Red, Green, Yellow)	Yes	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 (negative) is shorter. Remember the cathode plugs in to ground.
RGB LED (common cathode)	Yes	An LED that combines red, green and blue lights to create a wide range of colors. The long legs of common cathode RGB LEDs plug in to ground.	Check your project instructions to verify that it calls for a common cathode RGB LED – there are also common anode RGB LEDs.
Button (x4)	No	An input with 4 legs that plugs in to breadboard.	Pay careful attention to where the legs of the buttons plug in to the breadboard – use the lines were the legs are plugged in to complete your circuit.
Potentiometer (10k ohm)	Yes	A potentiometer is an adjustable knob that can vary the resistance of current.	Can be used to control variety of components, from LEDs to motors.

TMP 36 Sensor	Yes	A temperature sensor.	**This component can overheat if plugged in incorrectly.** Pay VERY close attention to how this component should be plugged in, based on project diagrams.
Piezo Buzzer	No	A sensor that uses piezoelectricity to make noises and sense pressure.	
Photoresistor (a.k.a. Light Dependent Resistor)	No	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.	
Resistors: 220 (x4), 270, 330, 1k, 2k, 10k (x3)	No	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.	Resistance is measured in ohms (Ω). Learn more about resistors here: learn.sparkfun.com/tutorials/resistors

*Polarized components have to be plugged in a certain in order to work (current will only flow in one direction through the component).

Getting Started

1. With Arduino, it is a good idea to start at the beginning. Even if you are familiar with other electronics tools (such as Raspberry Pi) – cover the basics before you start digging into more complex projects.
   o **Warning**: trying to build projects that you do not fully understand could result in damaging components!
2. Download and install the necessary Arduino software:
   o Read this document from the official Arduino website, install the software and upload your first sketch: docs.arduino.cc/hardware/uno-rev3
   o The software is often referred to as the Arduino IDE (Integrated Development Environment).
   o The free Arduino IDE software is not compatible with Chromebooks.
   o The Arduino software is also installed on Brown County Library computers available to the public.
3. A great introductory book is *Getting Started with Arduino: The Open Source Electronics Prototyping Platform* by Massimo Banzi & Michael Shiloh.
   o Find it in the Brown County Library catalog: tinyurl.com/ychlur3p
4. Here is another great introduction to Arduino that is worth perusing:
   o learn.sparkfun.com/tutorials/what-is-an-arduino

Building Projects

- Rebuild Arduino Club projects:
  o All of the instructions and code for Brown County Library Arduino Club projects are found on the Library's Arduino page (listed under **Library Event Code & Diagrams**): browncountylibrary.org/arduino
- Sparkfun's SIK Experiment Guide:
  o Many of the experiments in this guide can be built using this Arduino Kit (but note some of the projects require additional components). Find the guide here: https://learn.sparkfun.com/tutorials/sparkfun-inventors-kit-experiment-guide---v41

- Additional websites to try:
    - Official Arduino Built in Examples and Project Hub: docs.arduino.cc/tutorials/
    - Adafruit Tutorials: learn.adafruit.com/category/learn-arduino
    - Instructables: instructables.com/circuits/arduino

Want to dig into the code?

- Arduino uses coding language that is a modified version of C++.
- Check out the Arduino reference page to find out more about the programming language: arduino.cc/reference
- If you want to learn more about programming and C++ in general, the Brown County Library has books to help! search the Brown County Library catalog for book
    - Search the Brown County Library catalog here: browncountylibrary.org/catalog
    - The subjects "computer programming", "coding" and "C++" are great places to start!

Want to buy your own components?

This kit is meant to be introductory – there are many more components that you can find and buy online! Here are some reputable websites for commercially made Arduino Kits and electronics components.

- **Arduino Official Starter Kit:** store-usa.arduino.cc/collections/kits
- **Sparkfun:** sparkfun.com/categories/103
- **Adafruit:** adafruit.com/category/17
- **Jameco Electronics (components):** jameco.com

Missing and Damaged Parts

Please alert library staff to any lost or damaged components. Do not attempt to use components that you believe are damaged.

Download a digital copy of these instructions here: browncountylibrary.org/arduino

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