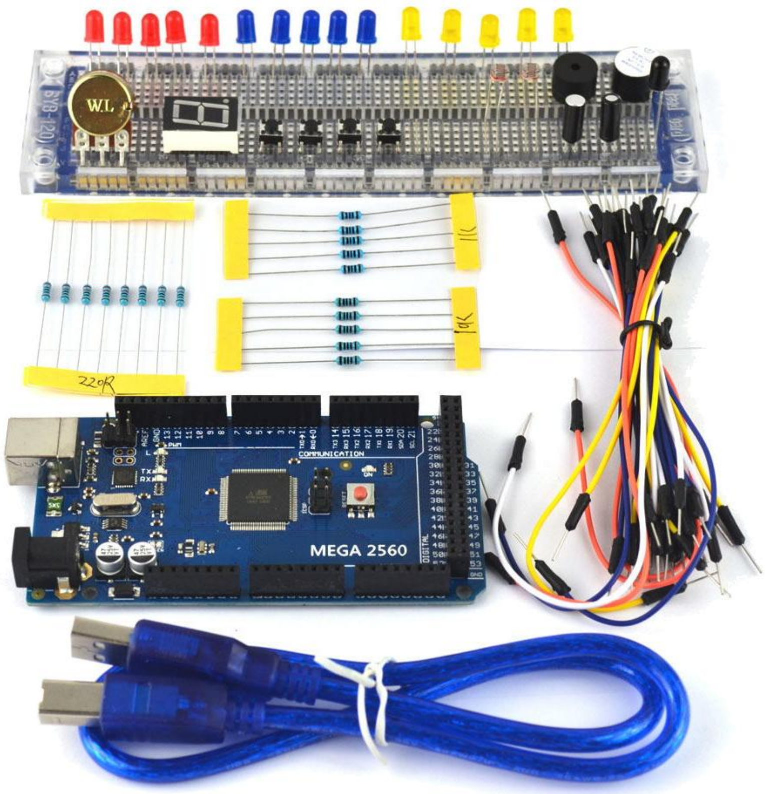
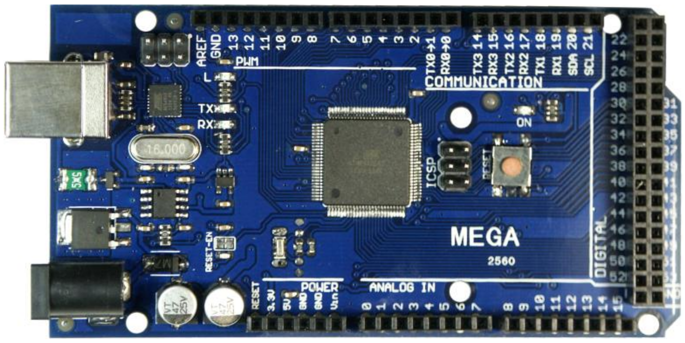


341875
Mega2560 DIY Kit (Contents)
1x 50K Ω Pot
1x 7-seg LED 1x module
1x Buzzer (active)
1x Buzzer (passive)
1x Flame sensor
1x USB cable
2x Ball tilt sensor
2x Photo Resistor
4x Small button switch
5x 10K Ω resistor
5x 1K Ω resistor
5x LED - Blue
5x LED - Red
5x LED - Yellow
830-pin Breadboard
8x 220 Ω resistor
Arduino Mega 2560 compatible board
Dupont connector wires

Inland Mega2560:



Mega2560 (R3) Summary:

Microcontroller	ATmega2560
Operating Voltage	5V
Input Voltage (recommended)	7-12V
Input Voltage (limits)	6-20V
Digital I/O Pins	54 (of which 15 provide PWM output)
Analog Input Pins	16
DC Current per I/O Pin	40 mA
DC Current for 3.3V Pin	50 mA
Flash Memory	256 KB of which 8 KB used by bootloader
SRAM	8 KB
EEPROM	4 KB
Clock Speed	16 MHz
Length	4 inches
Width	2.1 inches
Weight	35 g

See http://arduino.cc for detailed specifications, overviews, schematics, etc. Core functions, code examples, and links to many of the device libraries can be found in the learning section; refer to the manufacturer's site if using other add-on shields or sensors.

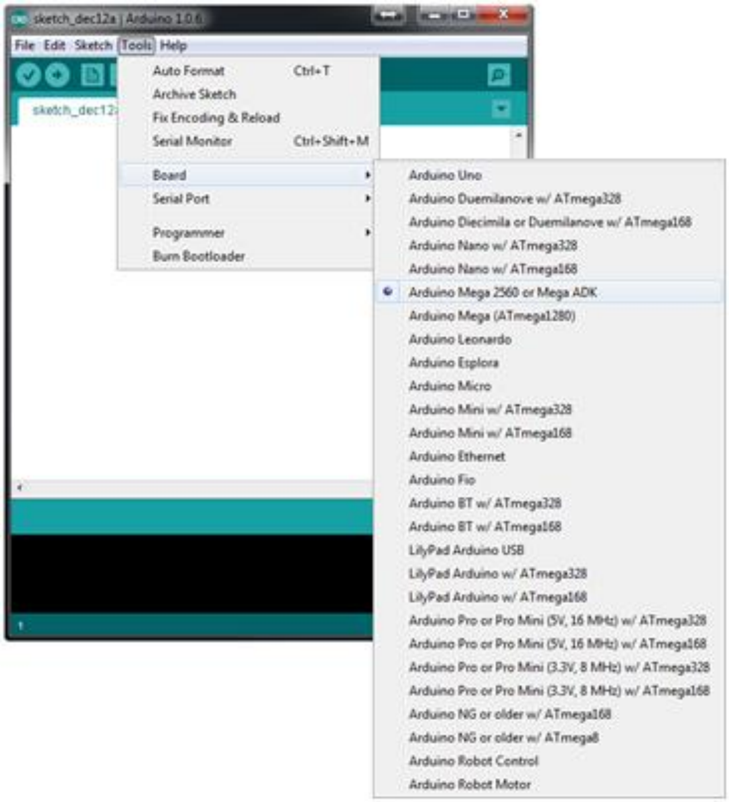
The latest Arduino Integrated Development Environment (IDE) necessary for programming your Mega2560 board can be obtained at http://arduino.cc/en/Main/Software (the **Download** menu choice on Arduino.cc)

Examples for many basic components can be found under the Examples menu. As you install libraries for additional shields, new examples may be available.

Follow the getting started guide found on the arduino.cc web site. Click **Learning**, and select **Getting started**. Click on the link for Windows, Mac OS X, or Linux for more specific directions.

Getting Started:

1. Download the Arduino Environment (IDE) and install or unzip/extract the application directory.
2. Connect the Mega2560 board to one of your computer's USB port.
3. Install the drivers (If the computer does not automatically download and install the necessary USB drivers, point the hardware setup to the "**drivers**" directory of the Arduino IDE application.)
4. Launch the Arduino IDE application
5. Open a sketch example such as "Blink"
6. Select your **Board** from the Tools menu.
7. Select the **Serial Port** used by the board
8. Upload the sketch to the board


sketch_dec12a | Arduino 1.0.6
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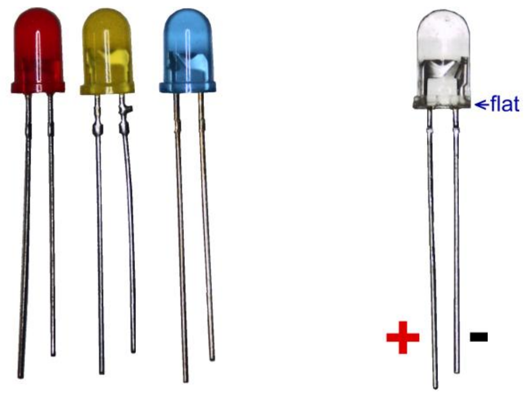
Programmer
Burn Bootloader
Arduino Uno
Arduino Duemilanove w/ ATmega328
Arduino Diecimila or Duemilanove w/ ATmega168
Arduino Nano w/ ATmega328
Arduino Nano w/ ATmega168
● Arduino Mega 2560 or Mega ADK
Arduino Mega (ATmega1280)
Arduino Leonardo
Arduino Esplora
Arduino Micro
Arduino Mini w/ ATmega328
Arduino Mini w/ ATmega168
Arduino Ethernet
Arduino Fio
Arduino BT w/ ATmega328
Arduino BT w/ ATmega168
LilyPad Arduino USB
LilyPad Arduino w/ ATmega328
LilyPad Arduino w/ ATmega168
Arduino Pro or Pro Mini (5V, 16 MHz) w/ ATmega328
Arduino Pro or Pro Mini (5V, 16 MHz) w/ ATmega168
Arduino Pro or Pro Mini (3.3V, 8 MHz) w/ ATmega328
Arduino Pro or Pro Mini (3.3V, 8 MHz) w/ ATmega168
Arduino NG or older w/ ATmega168
Arduino NG or older w/ ATmega8
Arduino Robot Control
Arduino Robot Motor

Sketch (code) Examples are included as part of the IDE. If you install device libraries for other components or shields, additional examples may be included and will show up in the list under the IDE File menu.
(See: http://arduino.cc/en/Tutorial/HomePage for an overview of the core functions and libraries.)

Components:

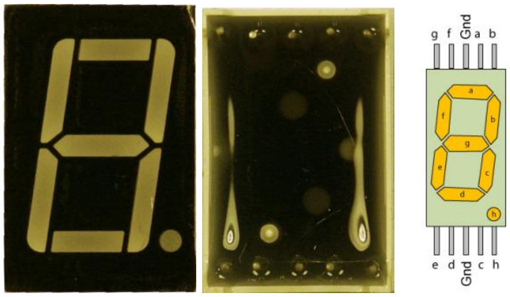
LEDs



LED - Light Emitting Diodes

1) Connect a current-limiting resistor (220 ohm) between the LED's positive pin and the 5v pin. Connect the LED's negative pin directly to your Arduino output pin. -OR-
2) Connect a current-limiting resistor (220 ohm) between the Arduino output pin and the LED's positive pin. Connect the LED's negative pin directly to a Ground (GND) pin.

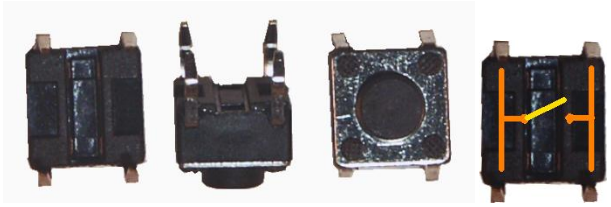
Note: LEDs may have "water clear" or color tinted lens.



(1-bit) **7-segment LED** (TOS5121AS or similar)

Pin 1 is bottom left. Pins 3 and 8 are a common ground. Connect other pins to your Arduino with a current limiting resistor.

Switches



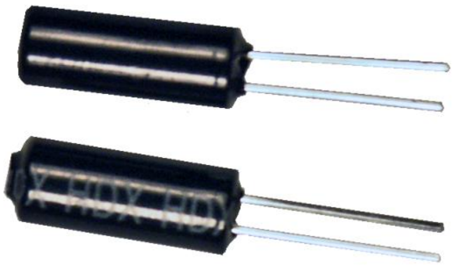
Small button switch - momentary contact, NO

For the switch connection, you can use either pair located on one side. The connection is Normally Open (off) until the button is pushed.

Sensors and modules

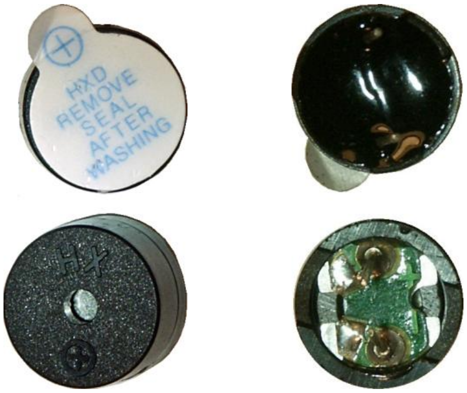
Flame Sensor (YG1006 or similar)

The Flame sensor is a high-speed and highly sensitive NPN Silicon photo transistor based on the YG1006. It can be used to detect fire or other wavelength at 760nm ~ 1100nm light. Response time is 15us, supply voltage is 3.3-5V; output is analog.



Ball Tilt Sensor

This is a very simple switch with a ball inside of the tube. When the sensor is tipped upward past the horizontal, the ball will short the contacts, closing the switch. With the top (away from the pins) is tilted down relative to the horizontal, the switch opens.



Play a tone or melody using the passive buzzer:
http://osepp.com/learning-centre/start-here/101-basic-starter-kit/tutorial-6-using-buzzer-to-play-a-melody/

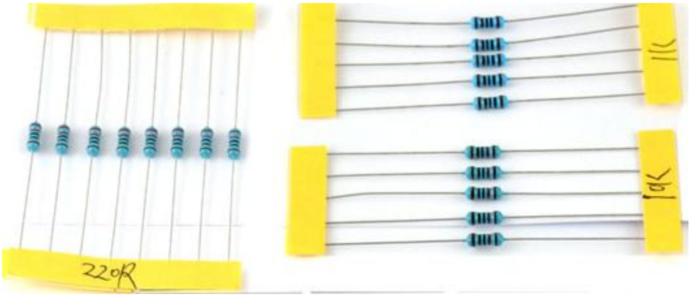
http://www.arduino.cc/en/Tutorial/melody

Passive & Active buzzers
Use as a speaker, buzzer or other audible indicator.

The Active buzzer has a protective tag over the opening, note the + identifies the positive pin of the device, as the rear is covered with epoxy. The active buzzer will generate a tone as soon as power is supplied to the device.

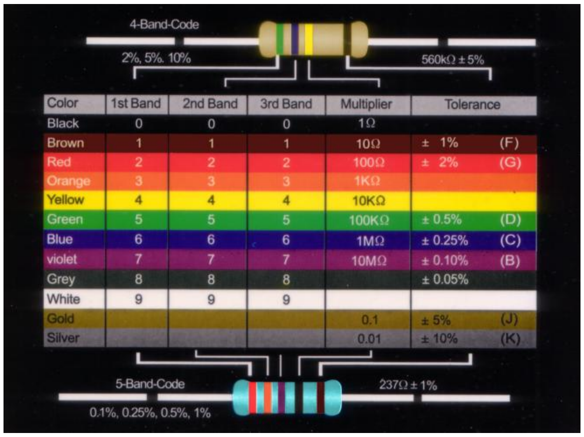
The passive buzzer does not have epoxy on the rear PCB, and the positive and negative connections are visible on the etched board. Passive buzzers must have a modulated signal supplied to the device (like a speaker) and would only generate a "click" if DC voltage is applied.

Resistors



8pcs 220 ohm
5pcs 1K ohm
5pcs 10K ohm

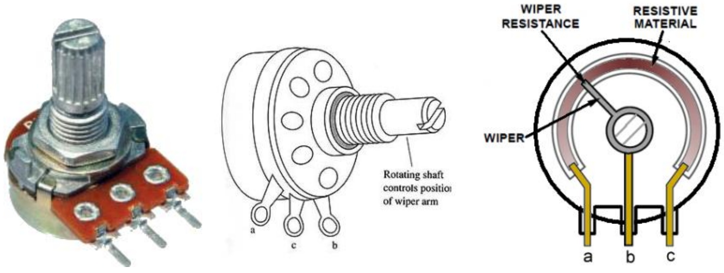
1/4 Watt Resistors



4-Band-Code
2%, 5%. 10%
560kΩ ± 5%
5-Band-Code
0.1%, 0.25%, 0.5%, 1%
237Ω ± 1%

Color	1st Band	2nd Band	3rd Band	Multiplier	Tolerance
Black	0	0	0	1Ω	
Brown	1	1	1	10Ω	± 1% (F)
Red	2	2	2	100Ω	± 2% (G)
Orange	3	3	3	1KΩ	
Yellow	4	4	4	10KΩ	
Green	5	5	5	100KΩ	± 0.5% (D)
Blue	6	6	6	1MΩ	± 0.25% (C)
violet	7	7	7	10MΩ	± 0.10% (B)
Grey	8	8	8		± 0.05%
White	9	9	9		
Gold				0.1	± 5% (J)
Silver				0.01	± 10% (K)

Resistors may come with 4 or 5 identifying color bands.
(When in doubt, use a multimeter to verify the value.)



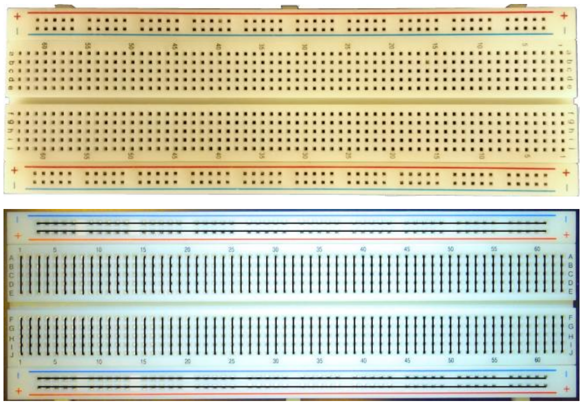
50K Potentiometer

Resistance between outer pins is 50K ohms. Resistance between one outer pin and the center (wiper) pin is 0-50K ohms based on position.

Photo Resistor

Resistance across the pins will be 1 meg ohm or higher in darkness, dropping to 60 ohms or less in bright light.

other



830-pin Breadboard

Power rails run the length of each side and are color coded blue for negative and red for positive. Inside rows of 5 pins each are connected together, but not to each other, and not to the power rails.

Additional Resources:

Several sites have hook-up and information and code examples on a variety of sensors, similar to, and including the ones found in this kit. Some sensors may be loose components or integrated into different board designs. If the documented sensor uses the same electronic component, then any code sketch documented may work with the sensors found in your kit. However, depending on the circuit design, the adjustments or sensitivity range may need to be modified slightly to achieve the desired result. Sites documenting these and other sensors include:

Arduino Playground Examples and additional libraries (code sketches available from the IDE *File, Examples* menu): http://www.arduino.cc/en/Tutorial/HomePage

Arduino Playground Tutorials: http://playground.arduino.cc/Learning/Tutorials

Forum.HobbyComponents.com: http://forum.hobbycomponents.com/viewtopic.php?f=73&t=1320

LinkSprite Wiki - Advanced Sensors Kit for Arduino: http://linksprite.com/wiki/index.php5?title=Advanced_Sensors_Kit_for_Arduino

TkkrLab.nl (Tukkerlab)Wiki: https://tkkrlab.nl/wiki/Arduino_37_sensors

University of Rhode Island (PDF coursework): http://www.ele.uri.edu/courses/ele205/Arduino%20-%20Learning.pdf

Freeduino.org: http://www.freeduino.org/

Arduino for Projects (PDF with 1193 projects): http://duino4projects.com/arduino-projects-pdf/

Lady Ada - Introduction to Arduino- step-by-step lessons: http://www.ladyada.net/learn/arduino/index.html

Tronixstuf Arduino Tutorials: http://tronixstuff.com/tutorials/

Earthshine Electronics Beginners Guide to Arduino: https://docs.google.com/file/d/0Bw_ruMOtRDDgNXI3OTFGZXhIZ2c/edit?usp=sharing

Sheepdog's Guide to Arduino Programming: http://sheepdogguides.com/arduino/FA1main.htm