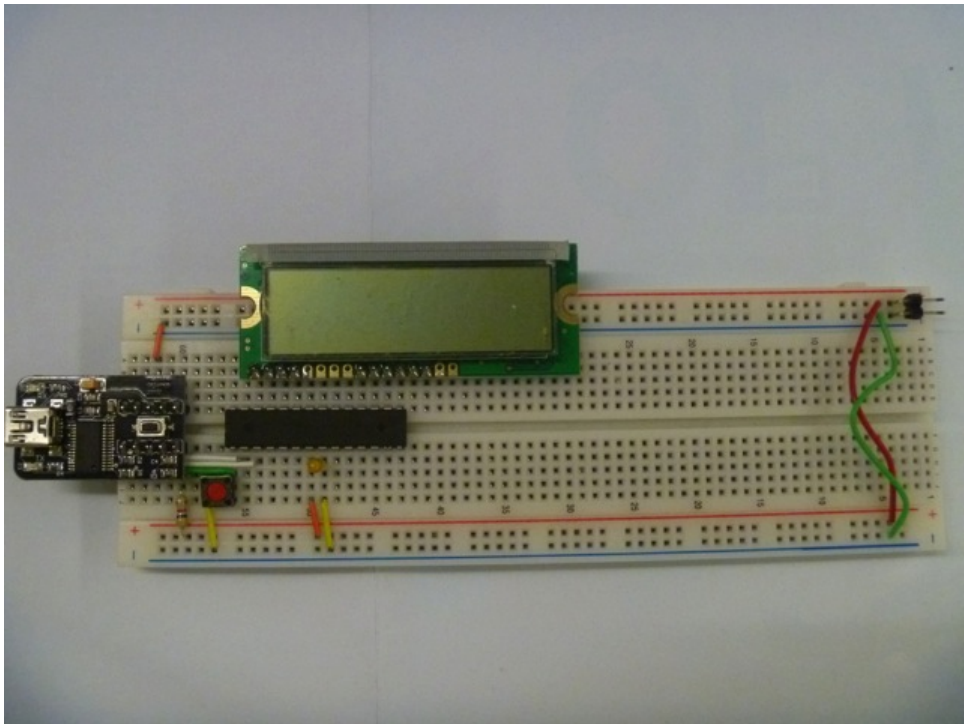
A Few Microcontroller (Arduino) Options:

The kit we use in class was developed by MachineScience, a local non-profit organization which develops robotics curriculum for K-12 and higher ed. The kit is no longer available as MachineScience has moved on to new projects; you can buy the parts and assemble the board yourself, if you wish.



An alternative is to buy a 'genuine' branded Arduino Uno Rev 3 ($20) or an Inland Uno R3 (Arduino Uno clone, $6) at the Cambridge, MA MicroCenter – cross the BU bridge, turn left and walk about 1⁄2 mile to the small shopping center. When you enter, all of the DIY stuff is to the far right of the store. Supplies fluctuate so look online to insure they're in stock. Arduino is an open source project, and the two main chips on the board (the USB IC and the Atmega 328) are both made by Atmel.

http://www.microcenter.com/product/431997/Uno_R3_MainBoard

One of the problems with the Arduino module is that there is no convenient way to wire sensors and output devices to the board. The connectors on the Arduino board are not designed for repeated plugging and unplugging of wires and components, and there is not enough space to reliably wire components in a way that allows easy experimentation and troubleshooting. To fix this, we suggest two options: breadboard or shield. You can buy a breadboard:

$14 at MicroCenter: http://www.microcenter.com/product/404576/9425C
$8 mail order from Adafruit: https://www.adafruit.com/products/239

You then need a way to connect wires from the Arduino to the breadboard. The jumper wire kits, like we use in class, use solid core wire, which are great on a breadboard, but are unwieldy and unstable for bridging over from an Arduino. Flexible jumpers can be purchased from Adafruit or MicroCenter:

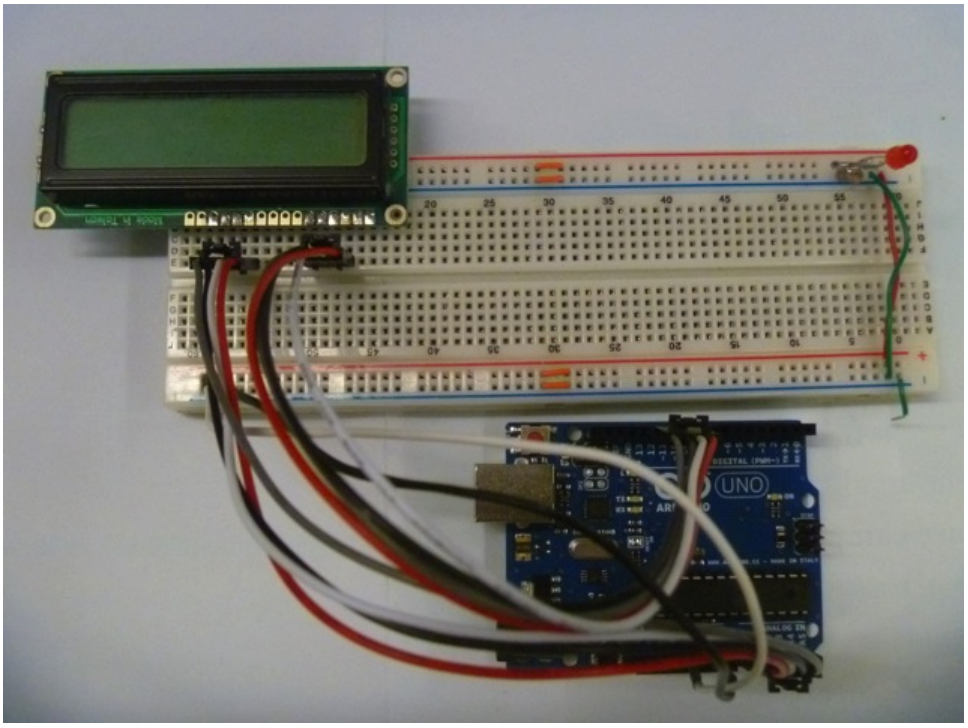
$6 Breadboarding Wire Bundle: https://www.adafruit.com/products/153
$7 Premium Male to Male Wire Jumpers: https://www.adafruit.com/products/759
$5 http://www.microcenter.com/product/443177/M-M_150mm_Jumper_C_Accessory_-_10_Pack

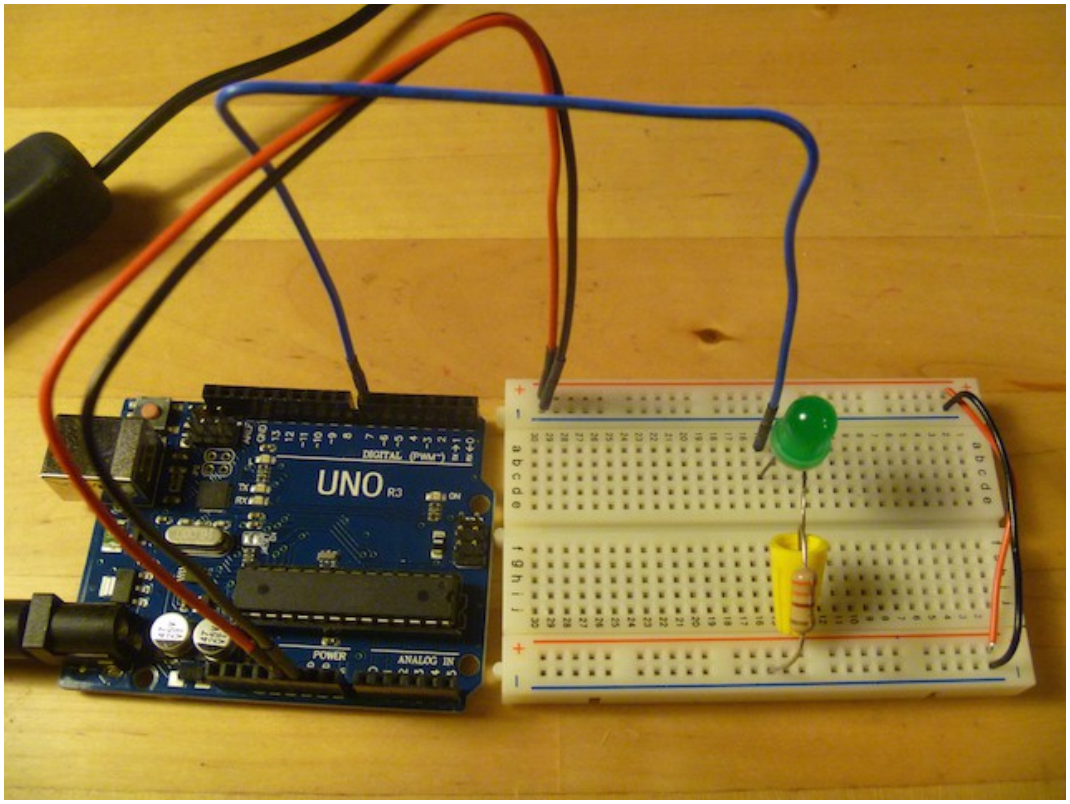
Perhaps even better is this Arduino Uno kit from Microcenter for $18 which contains jumper wires, an Arduino. A readboard, USB cable, and 9 volt battery adaptor.

http://www.microcenter.com/product/458576/Uno_Breadboard_Kit

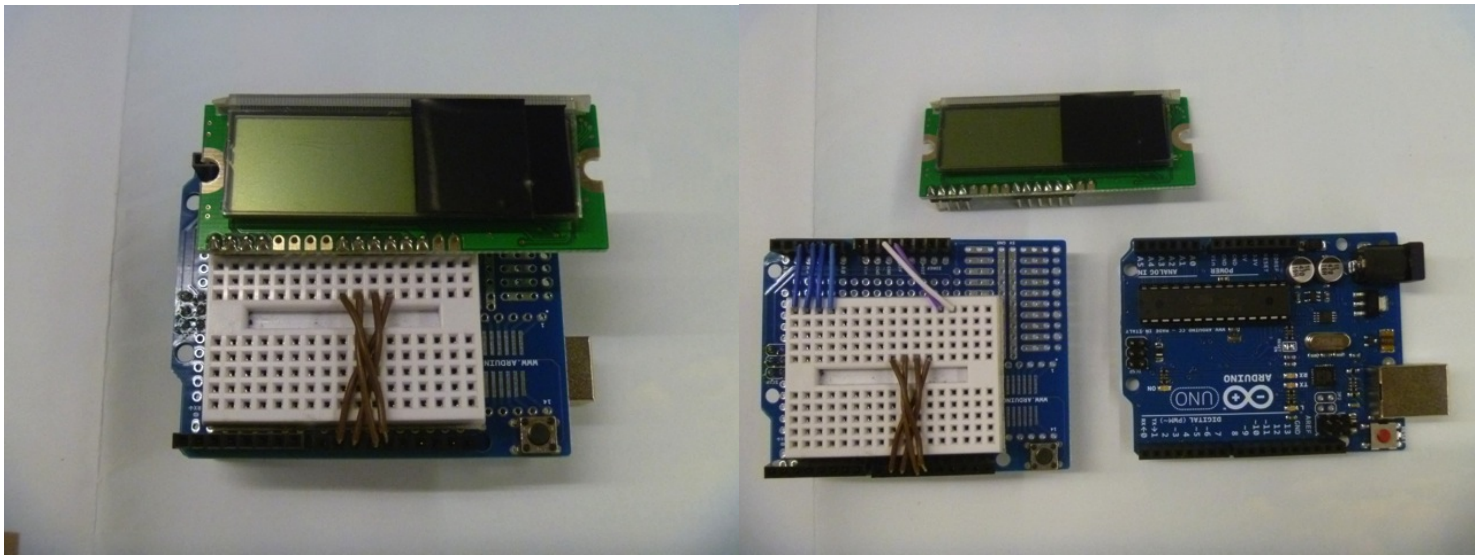
Or to minimize the tangle of wires, you can get this set of wires for $7 from MicroCenter (see picture). Note, however, that the plugs are all female connectors, so you need to buy pins for both ends, the Arduino side and the breadboard side.

http://www.microcenter.com/product/389998/8_4-Pin_Cable_with_12C_Connector_4-Pack
https://www.adafruit.com/products/400





Another option is to buy an Arduino Shield that allows for prototyping. This sits over an Arduino and provides a small breadboard for development. When the circuit is finalized, you remove the breadboard and solder your components directly to the shield for a permanent set up.

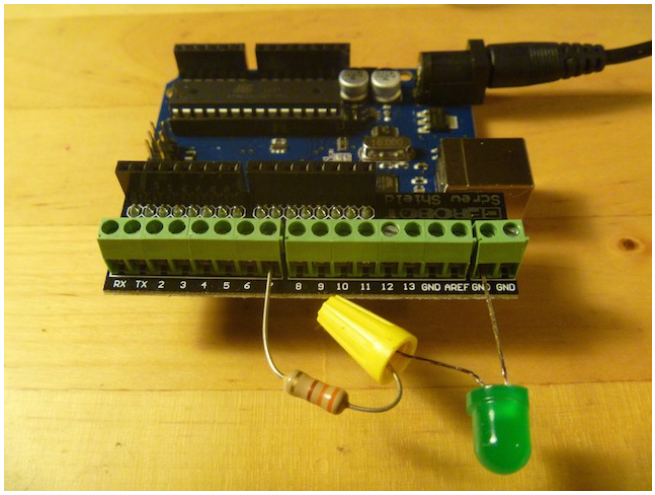


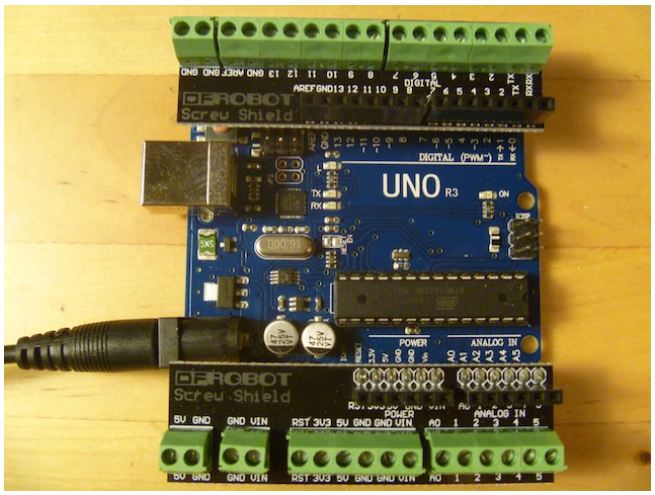
$10 from Adafruit: https://www.adafruit.com/products/2077
$18 from MicroCenter: http://www.microcenter.com/product/389850/Arduino_ProtoShield_Kit
$30 from MicroCenter: http://www.microcenter.com/product/390079/Board_of_Education_Shield_for_Arduino

With all but the last of these, you will still need a breadboard and jumper wires. For a nice compact package, people often buy tiny breadboards like these:

$4 from Adafruit (pictured above with shield): https://www.adafruit.com/products/65

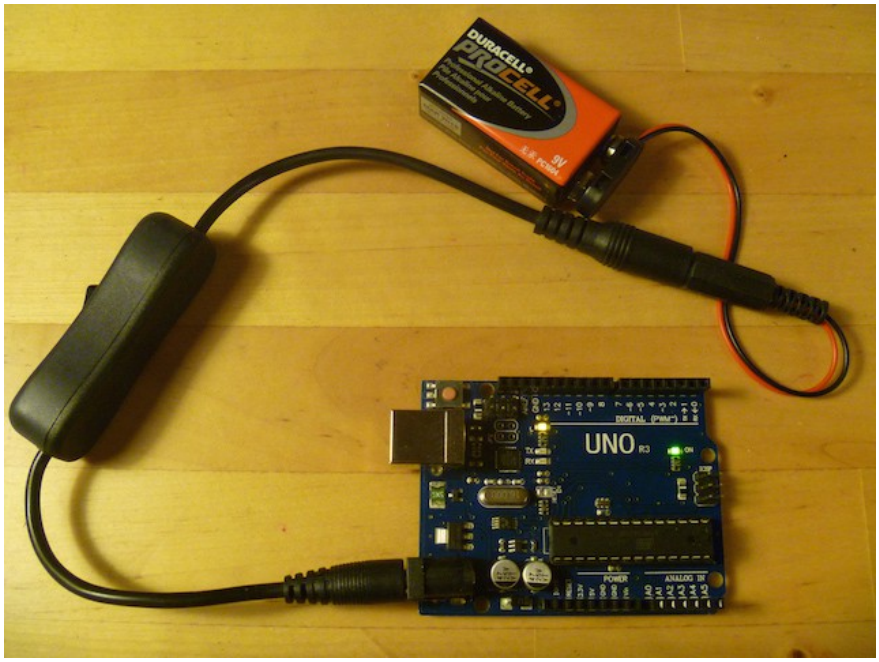
If you are working with just a few wires going to and from your Arduino, DFRobot makes something called the Screw Shield. This shield allows you attach wires to the Arduino using connnectors that tighten with screws. It can be purchased from various online suppliers such as Jameco for about $8.





Power Supply Options:

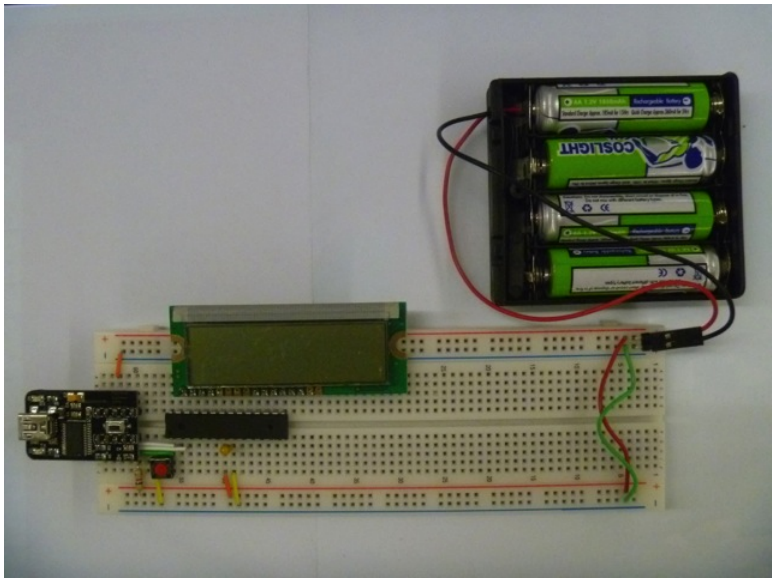
The Arduino Uno has a DC voltage regulator on the board which takes anything from 7-18 volts and creates the 5VDC that the Atmega 328 chip needs, as well as a 3.3VDC supply used by many sensors. Almost any DC wall wart will work if the barrel is the right size. A nice option, however, is to use a 9V battery clip and an inline power switch, both available from Adafruit.



$3.00 9V Battery Clip with 5.5mm/2.1mm Plug http://www.adafruit.com/products/80
$2.50 In-line Power Switch for 2.1mm Barrel Jack http://www.adafruit.com/products/1125

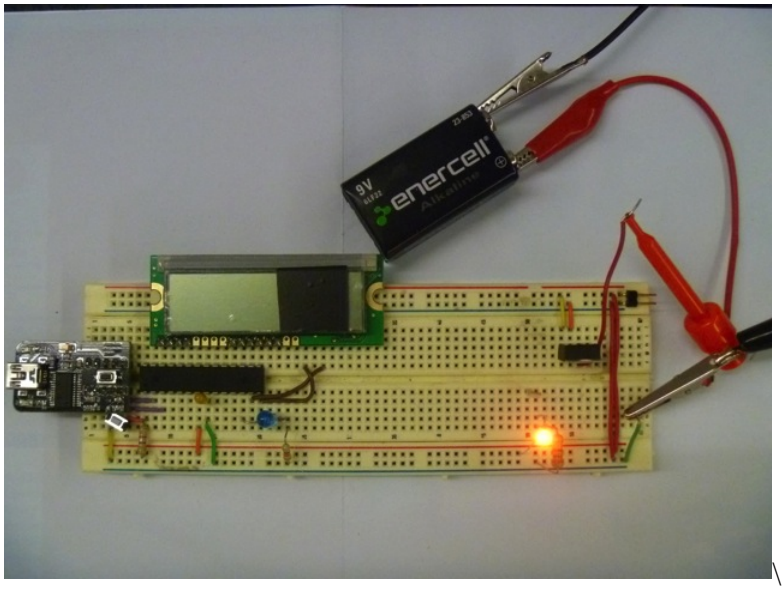
A breadboard Arduino needs a regulated 5 volt power supply. You can use 4 AA NiMH rechargeable batteries (about $10) and a battery case with switch. Unlike alkaline batteries which are 1.5 volts each which would result in a 6 volt total, rechargeable batteries are typically just a bit above 1.2 volts, so 4

of them will do nicely. Radio Shack has a nice battery holder for $3:



http://www.radioshack.com/product/index.jsp?productId=2062253

You can also use a 9 volt battery (or practically any DC wall wart 6 volts or greater) with a 7805 voltage regulator IC. We have plenty of 7805s; they typically cost around $0.50. We also have 9 volt battery clips, and are happy to assist with this option. Again, this is only needed for breadboard Arduinos.



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Lastly, an old cell phone or Zip Drive power supply – make sure the output says +5 VDC. You should also test it with a multimeter to verify that it is 5 volts, varying no more than a tenth of a volt or so. Be sure to label the leads so you know which wire is positive and which is ground.