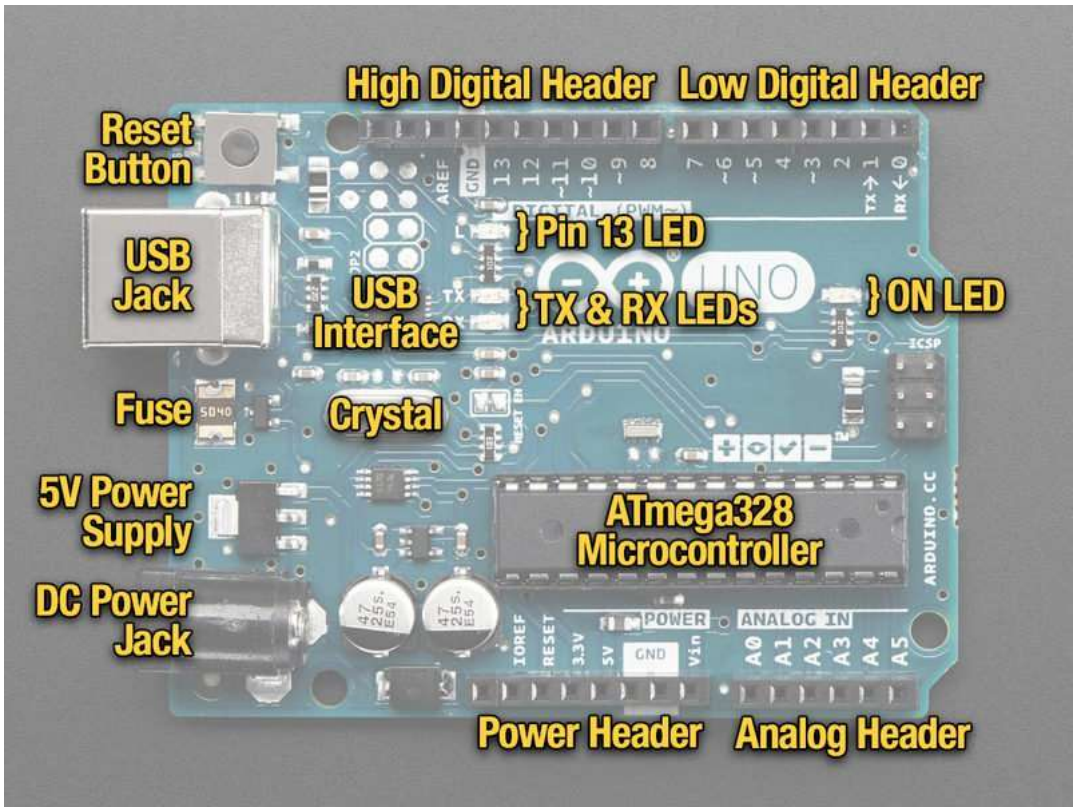

Ladyada's Learn Arduino - Lesson #0

Hi There!

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Contributors

lady ada
Feedback? Corrections?
ARDUINO COMPATIBLES / LEARN ARDUINO ARDUINO COMPATIBLES / ADAFRUIT METRO LADYADA'S LEARN ARDUINO (1 of 3)

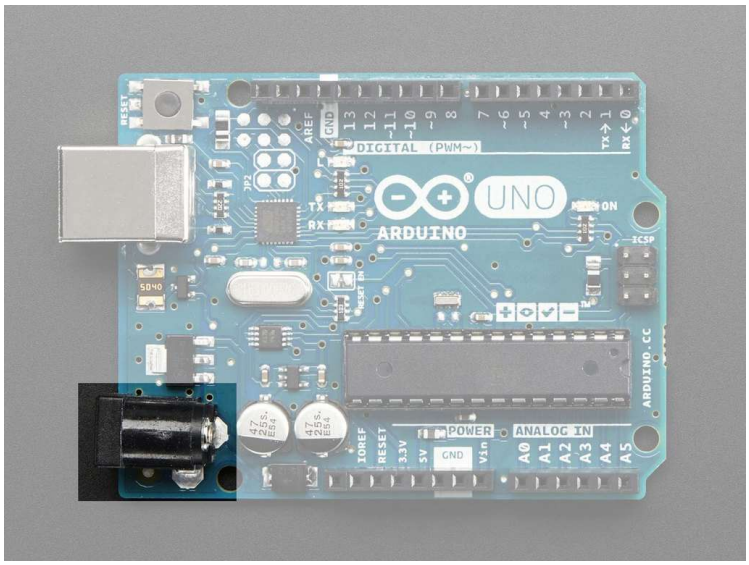
Power Jack & Supply

by lady ada
Don't feel like you have to understand this part fully! Skim it for now, and consider it a resource for you when you want to take a deeper dive into understanding the hardware!

DC Power Jack

There are two ways to power your Arduino: you can use the USB connector to connect to a computer or portable power pack *or* you can plug into a wall adapter. USB can be used to power and program. DC can only be used for power - but it's great for when you want to connect your Arduino and leave it plugged in for a long term project.

This is the DC Power Jack:



The technical specifications for the jack is:

2.1mm inner diameter, 5.5mm outer diameter with Positive Tip

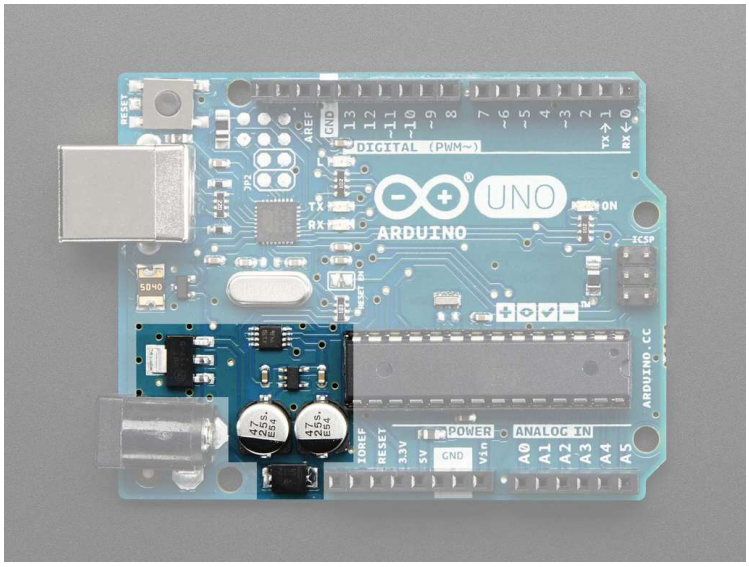
That's just the mechanical size of the plug in case you're looking to match it up. It's an extremely common power plug size, so it isn't too hard to find a matching power plug. Sometimes they're just referred to as "2.1mm DC Plug"

You can use a wall adapter like this:

You can use any adapter that is **Center Positive** and **7 to 12VDC output -** we recommend **9V DC** if possible. Check the following photo for the symbol that indicates Center Positive and for the 9V output text. The Arduino is fairly rugged and can survive plugging in the wrong adapter as long as the voltage isn't higher than 20V but it's 'stressful' to the 'duino and you should aim for 9V!

Onboard Power Supply

The Arduino and Metro is designed for beginners so it has some protection and *regulation* circuitry so that it can use just about any power supply you throw at it. In particular there is a polarity protection diode (to avoid destroying the board if you have a Negative Tip adapter). It also has an **onboard 5V Power Supply:**



Input DC Voltage

The onboard power supply allows you to use **any wall adapter that gives you 7 Volts to 20 Volts and will *regulate (adjust)* that voltage down to a very clean 5 volts**

The tricky thing to remember is you need to have *at least 7 volts* for the power supply to do its thing.

Think of it like a barber. When you go to the hair salon, you have long uneven hair (just like the large, uneven power that is fed into the Arduino). The stylist takes out the scissors and says **OK how long do you want your hair?** and you reply **5 inches long!**

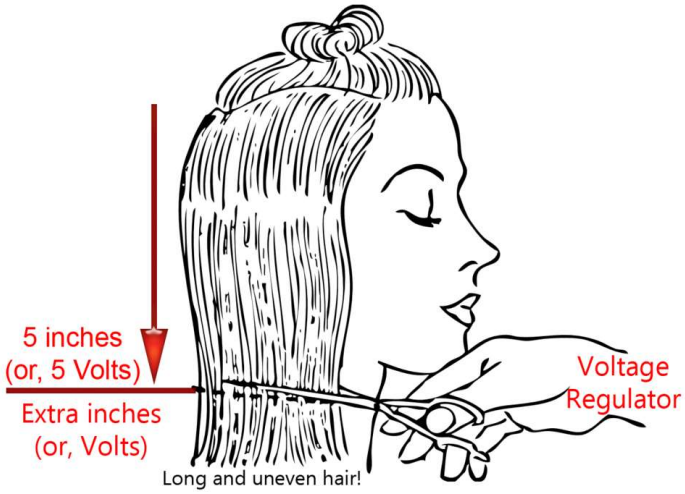


Image from openclipart.com

>snip snip< and your hair is cut straight off, leaving a very clean line

That's pretty much what a voltage regulator does. *Except* that unlike the scissors that can cut even 5.1" long hair down to 5", the regulator needs some extra hair (er, voltage) to work with. To be precise, it needs **2 Volts** above the desired level. In this case, 5 Volts + 2 Volts = 7 V. That's where the 7V minimum comes from.

Now, the 2 Volts minimum isn't a hard and fast rule, it does vary a little from Arduino to Arduino, but basically:

Don't expect to plug in 5 Volts into the DC jack and have your Arduino running at 5 Volts. Rather, the regulator will take 2 Volts off the input and leave you with 3 Volts!

Your Arduino will sorta run but it will be weak and act oddly

Output Current

When powering off of the DC jack, you can pull *at most* 800 milliAmps of current. This is not a guarantee because you also have to make sure that the regulator doesn't overheat. If you're using some other voltage input, the max current you can pull continously is *approximately*

```
1.5 Watt / (Input Voltage - 1 V - 5 V) = in Amps
```

So for 9V, the max for continuous current is 1.5/(9-1-5) = 0.5 Amps

This is just a rough estimate and depends on if the power usage is continuous or just once in a while.

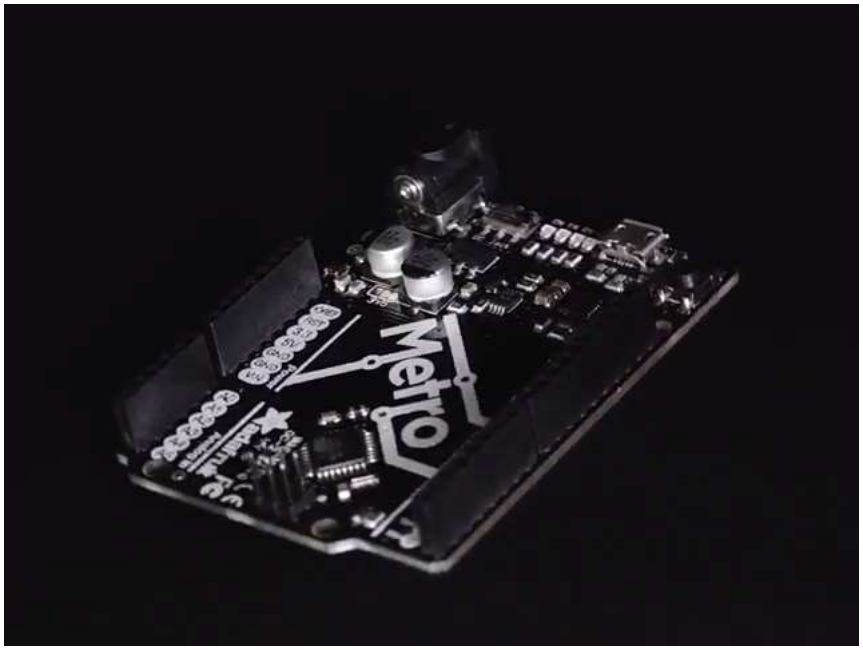
Portable Power

OK so if you're plugging into the wall, that wall adapter is great. But what if you're on the go? You can use batteries! Because the voltage regulator doesn't care what is power it, as long as it's higher than 5V you can use a 9V with a plug adapter in a battery case

Or even just a simple 9V clip (also with a 2.1mm DC plug)

or for very long running projects, a AA battery pack with a 2.1mm DC jack will last for hours and can power a ton of LEDs, motors, and more! Great for use with rechargeable batteries

MICROCONTROLLER USB JACK & INTERFACE
Last updated on 2016-07-14 at 08.41.44 PM Published on 2016-07-14 at 08.39.45 PM



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Ladyada's Learn Arduino - Lesson #2

Venture deep into the Blink sketch...
by lady ada

OK you've gotten your Arduino set up and also figured out how to use the software to send sketches to the board. Powerful stuff! But...just running example sketches is a little boring. What we really want to do is use our own creativity and skill to write new sketches! That's what we'll be doing in this lesson. To start we will venture deep into the Blink sketch, looking at each line and trying to understand what its doing. Then we will start hacking the sketch, and maybe even meet an internationally-famous DJ and design custom hardware for him!
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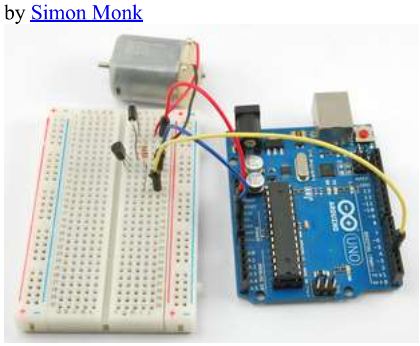
Arduino Lesson 13. DC Motors

Learn Arduino, Lesson 13. DC Motors
by Simon Monk



This is Lesson 13 in the Learn Arduino Adafruit series. In this lesson, you will learn how to control a small DC motor using an Arduino and a transistor.

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Make a portable motorized camera slider with bluetooth control using a mobile device. Perfect for camera phones and GoPro's
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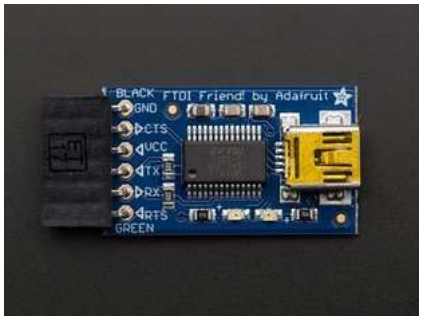
FTDI Friend is a friend, not an enemy
by lady ada



Long gone are the days of parallel ports and serial ports. Now the USB port reigns supreme! But USB is hard, and you just want to transfer your every-day serial data from a microcontroller to computer. What now? Enter the FTDI Friend! Learn how to use the FTDI Friend with a Mac, PC, or Linux machine and much more!
×

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