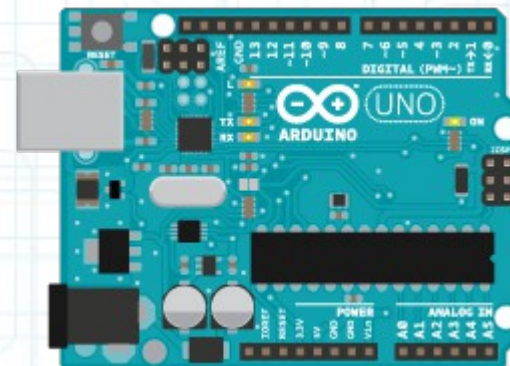


Introduction to Arduino Programming

Arduino is an open-source electronics platform based on easy-to-use hardware and software.

It's intended for anyone making interactive projects.

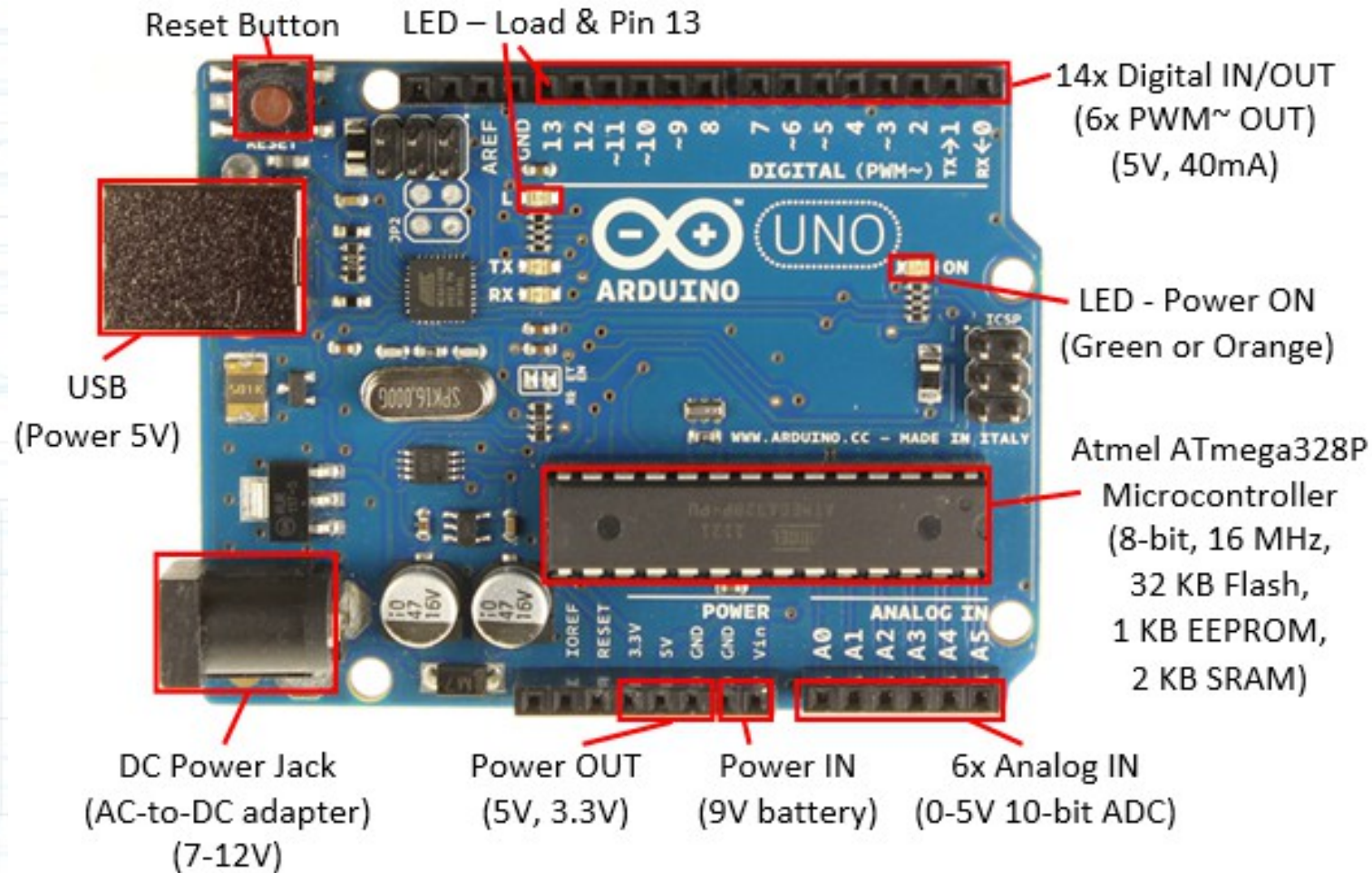


Arduino Projects

Here you can find some of interesting Arduino Projects:

<http://www.instructables.com/id/Arduino-Projects/>

The Arduino UNO board layout



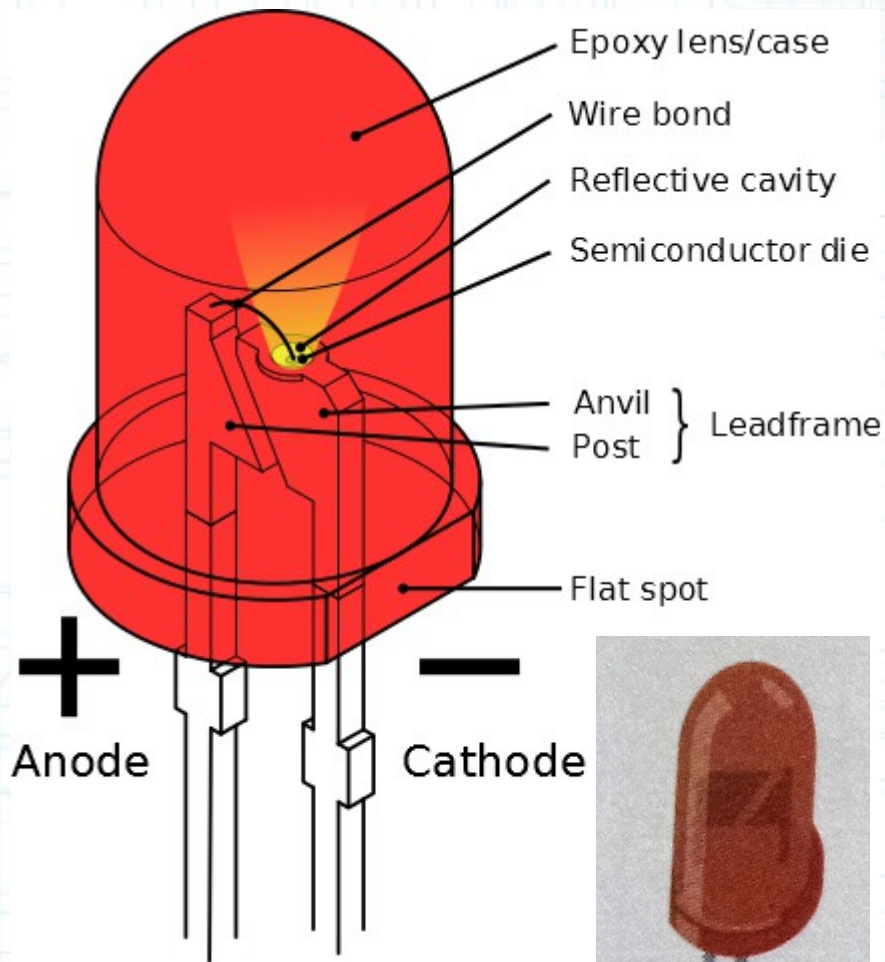
What is a Microcontroller?

A *microcontroller* is a very small computer that has digital electronic devices (peripherals) built into it that helps it control things.

These peripherals allow it to sense the world around it and drive the actions of external devices.

Example of a use: sense a temperature and depending on the value sensed it could either turn on a fan if things were too warm or turn on a heater if things were too cool.

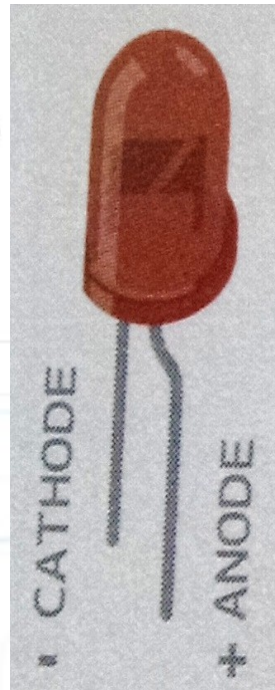
Digital Output : LED



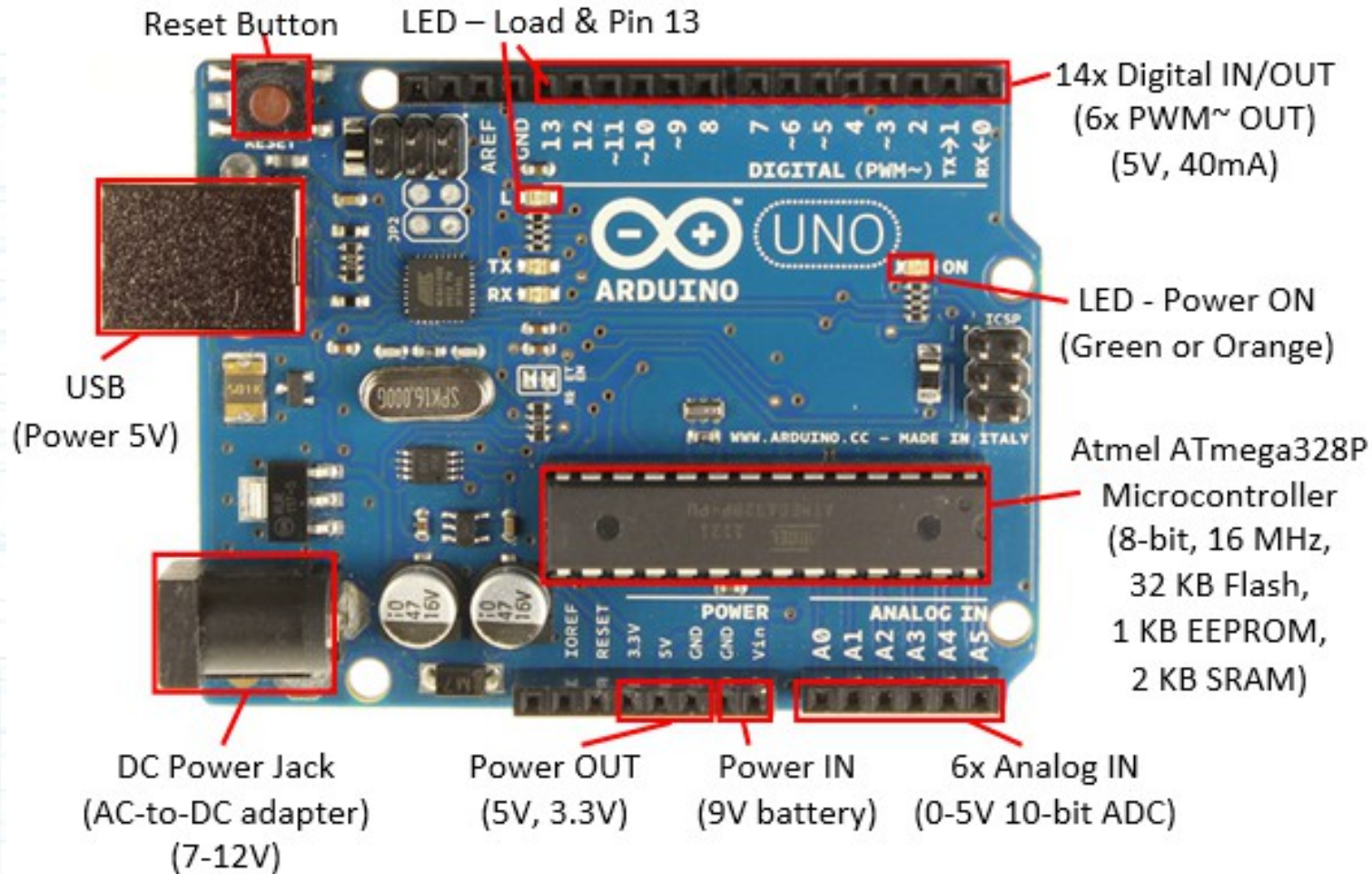
LEDs (Light Emitting Diodes) have been used as indicator lights for decades in things like alarm clocks and entertainment systems, but recently they have started taking over many general lighting tasks since they are durable and very energy efficient.

LED converts electrical energy into light energy.

They are polarized (electricity flows in one direction). The longer leg is anode, connects to the power. The shorter is cathode, connects to the ground.



LEDs on Arduino UNO board



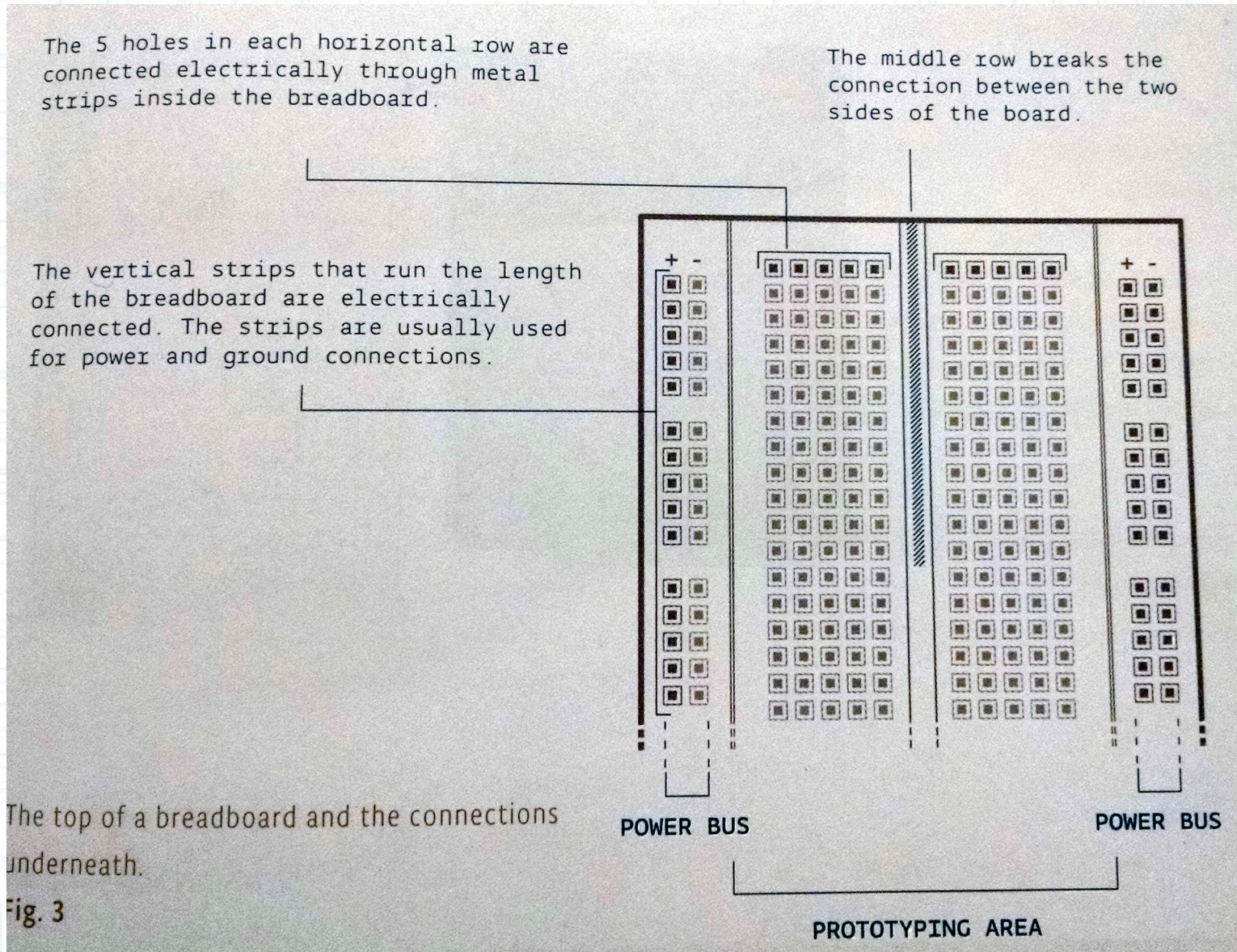
The **Power** LED indicates that the board has power.

The **TX** and **RX** LEDs indicate serial communications traffic. TX is blinking when transmitting, and RX is blinking when receiving.

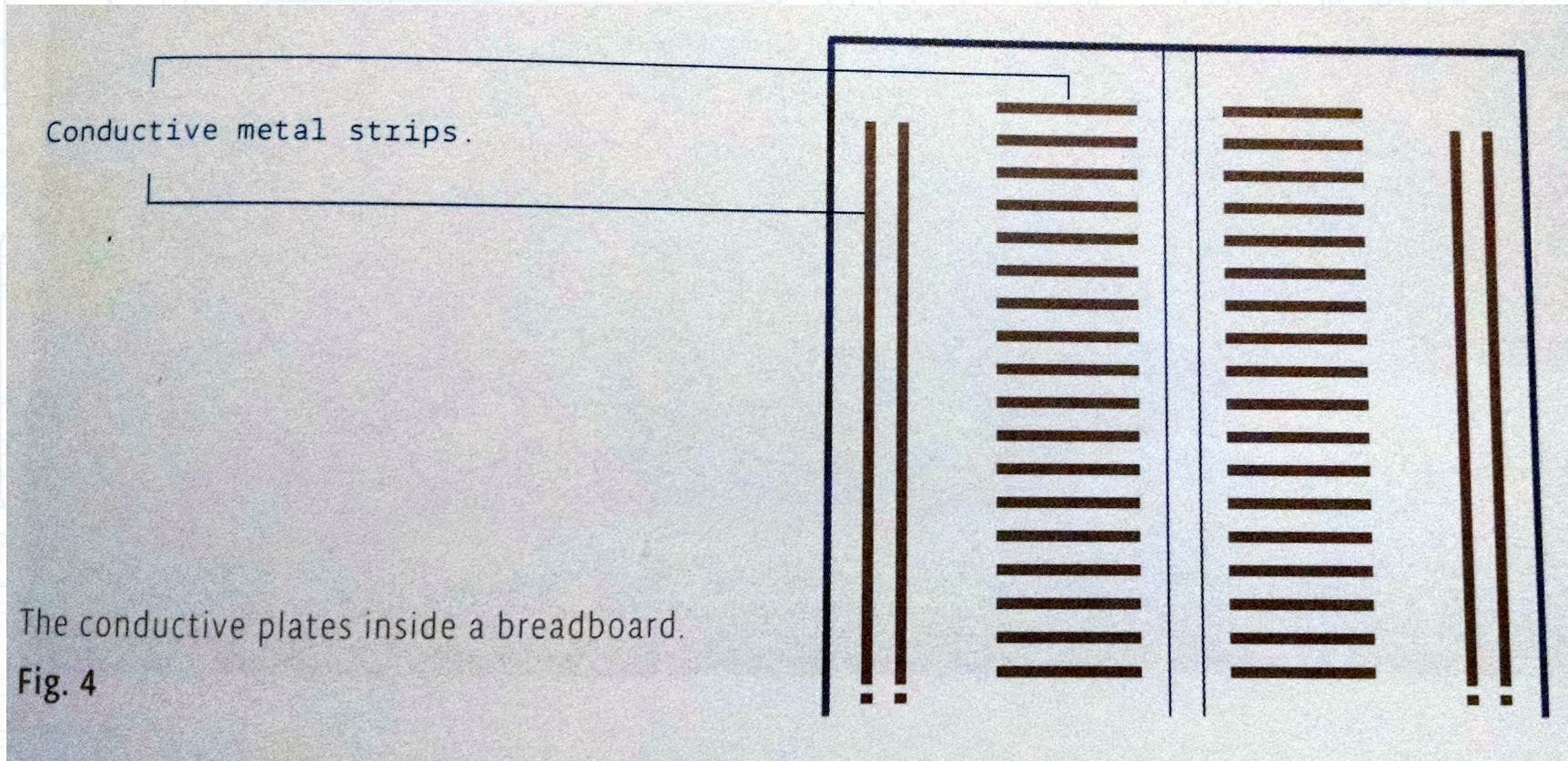
The **Pin 13** LED is connected to the Arduino Digital I/O pin 13 and can be used for a variety of software tests without having to add any external hardware to see the software in action.

Breadboard

Breadboard is the primary place we will be building circuits. We have the solderless one.



Breadboard




How an Arduino Program Works

The Arduino community calls a program a **sketch**.

It has two main functions: **setup** and **loop**.

```
void setup() {  
}
```

*runs once, when the
Arduino is powered on.*



```
void loop() {  
}
```

*runs continuously after
the setup() has
completed.
- here we check for
voltage level on the inputs,
and turn on/off the
outputs.*

