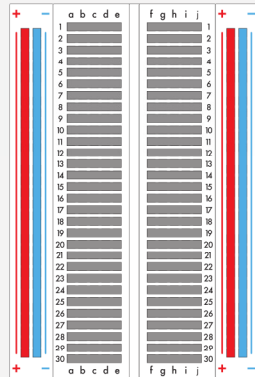


This line divides the board in half, restricting electricity to one half or the other.

Breadboard

- 1 Vertical Connection (+ Power and - Ground) - Power bus // See Diagram Below
- 2 Horizontal Connection (a-e & f-j) // See Diagram Below

How's it all connected?



+ Power:

Each + sign runs power anywhere in the vertical column.

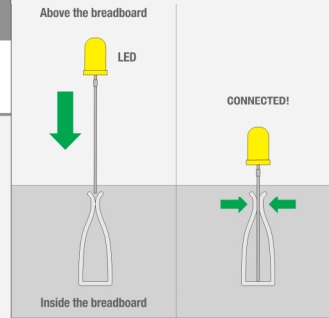
- Ground:

Each - sign runs to ground anywhere in the vertical column.

Horizontal Rows:

Each of these rows numbered 1-30 are comprised of five horizontal sockets. Components placed in the same row will be connected in a circuit when power is running.

Making a Connection:



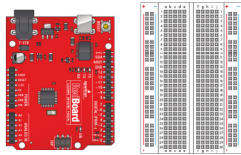
View of the inside >>>

CIRCUIT #1 - Your First Circuit

How It Works:

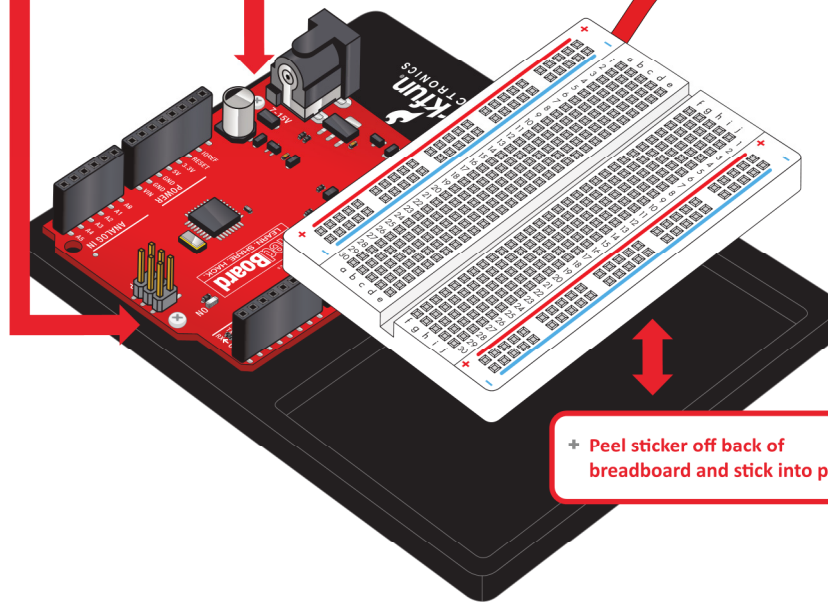
1 ASSEMBLE 2 WRITE 3 UPLOAD

+ Make sure the text on the RedBoard and breadboard are facing up so you can read them.



+ Connect the USB cable.

+ Screw the RedBoard down and into place.



+ Peel sticker off back of breadboard and stick into place.



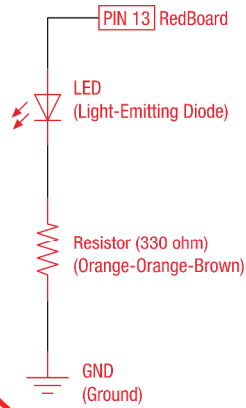
Your RedBoard runs on 5V. This is the power that will be supplied from your computer via USB and will be the driving force behind any components you use in your circuits. By plugging your RedBoard into your computer, you are supplying it with just the right voltage it needs to thrive! 5V can't hurt you, so don't be afraid to touch anything in your circuit. You can also power the RedBoard through the barrel jack. The on-board voltage regulator can handle anything from 7 to 15VDC.

1

Blinking an LED

LEDs (light-emitting diodes) are small, powerful lights that are used in many different applications. To start off the SIK, we will work on blinking an LED. That's right - it's as simple as turning a light on and off. It might not seem like much, but establishing this important baseline will give you a solid foundation as we work toward more complex experiments.

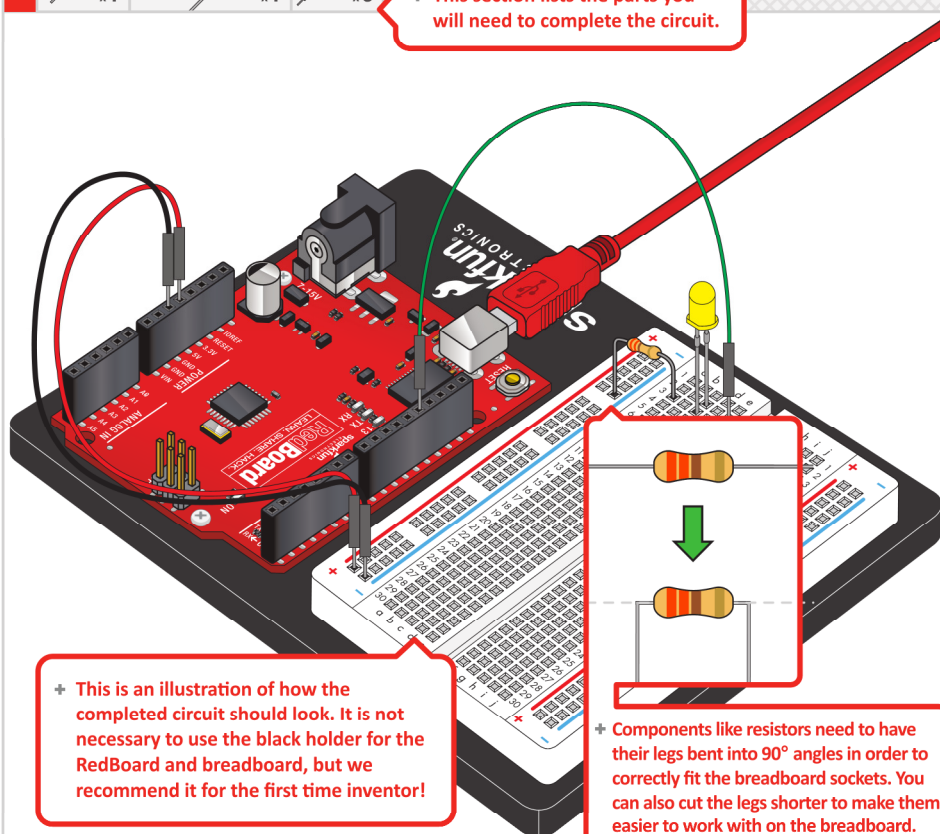
+ Each circuit begins with a brief description of the what you are putting together and the expected result.



+ This is a schematic of your circuit.

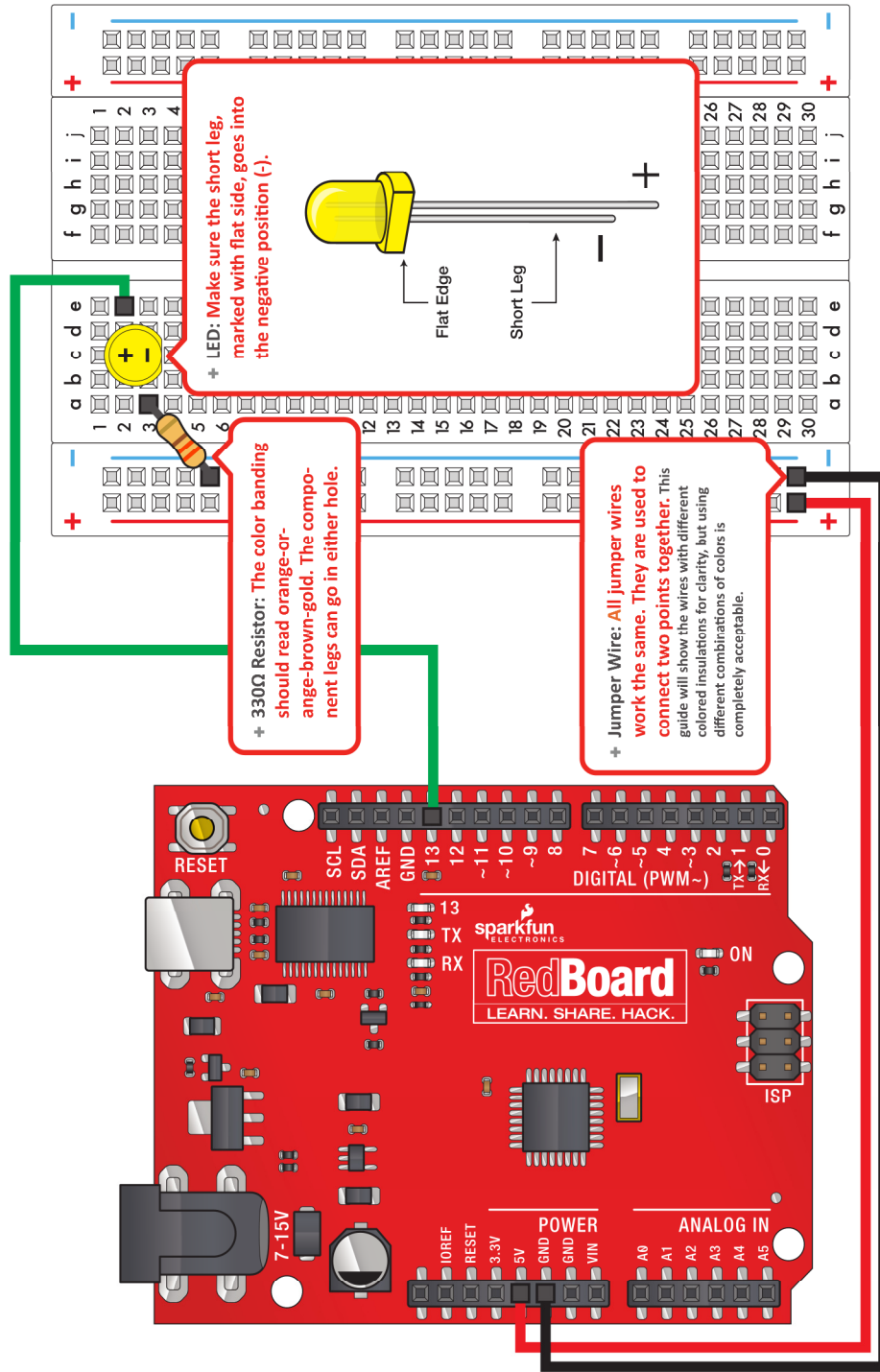


+ This section lists the parts you will need to complete the circuit.



+ This is an illustration of how the completed circuit should look. It is not necessary to use the black holder for the RedBoard and breadboard, but we recommend it for the first time inventor!

+ Components like resistors need to have their legs bent into 90° angles in order to correctly fit the breadboard sockets. You can also cut the legs shorter to make them easier to work with on the breadboard.



Component:	Image Reference:			
LED (5mm)				<p>+ Components like LEDs are inserted into the breadboard sockets c2(long leg) c3(short leg). Steps highlighted with a yellow warning triangle represent a polarized component. Pay special attention to the component's markings indicating how to place it on the breadboard.</p>
330Ω Resistor				<p>+ Resistors are placed in breadboard sockets only. The "-" symbol represents any socket in its vertical column on the Power bus.</p>
Jumper Wire				<p>+ "GND" on the RedBoard should be connected to the row marked "-" on the breadboard.</p>
Jumper Wire				<p>+ "5V" on the RedBoard connects to the row marked "+" on the breadboard.</p>
Jumper Wire				<p>+ "Pin 13" on the RedBoard connects to socket "e2" on the breadboard.</p>
				<p>+ Breadboard: The white background represents a connection to a breadboard socket specified by a letter-number coordinate such as e2. These coordinates are merely suggestions that align with the graphic image.</p>
				<p>+ RedBoard: The red background represents a connection to one of the RedBoard header pins.</p>

1

+ This is where you will find the Arduino code for each circuit.



Open Arduino IDE // File > Examples > SIK Guide > Circuit # 1

Code to Note:

+ Begin to understand how the Arduino code works. See below.

+ Remember to Verify and Upload your code.



`pinMode(13, OUTPUT);`



Before you can use one of the RedBoard's pins, you need to tell the RedBoard whether it is an INPUT or OUTPUT. We use a built-in "function" called `pinMode()` to do this.

`digitalWrite(13, HIGH);`

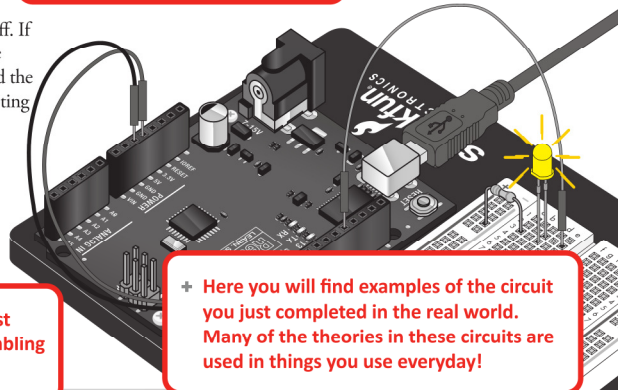


When you're using a pin as an OUTPUT, you can command it to be HIGH (output 5 volts), or LOW (output 0 volts).

What you Should See:

+ See if your circuit is complete and working in this section.

You should see your LED blink on and off. If it isn't, make sure you have assembled the circuit correctly and verified and uploaded the code to your board or see the troubleshooting tips below.



+ This is a section dedicated to the most common mistakes made while assembling the circuit.

+ Here you will find examples of the circuit you just completed in the real world. Many of the theories in these circuits are used in things you use everyday!

Troubleshooting:

LED Not Lighting Up?

LEDs will only work in one direction. Try taking it out and twisting it 180 degrees (no need to worry, installing it backward does no permanent harm).

Program Not Uploading

This happens sometimes, the most likely cause is a confused serial port, you can change this in tools>serial port>

Still No Success?

A broken circuit is no fun, send us an e-mail and we will get back to you as soon as we can: techsupport@sparkfun.com

Real World Application:

Almost all modern flat screen televisions and monitors have LED indicator lights to show they are on or off.

