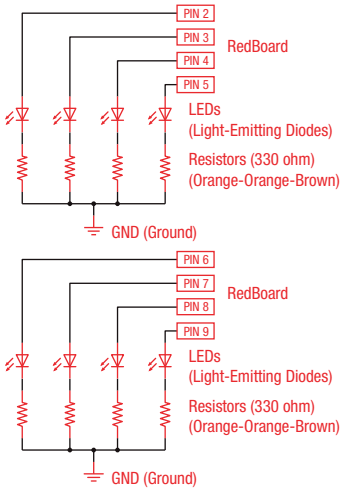
CIRCUIT #4

4



Multiple LEDs

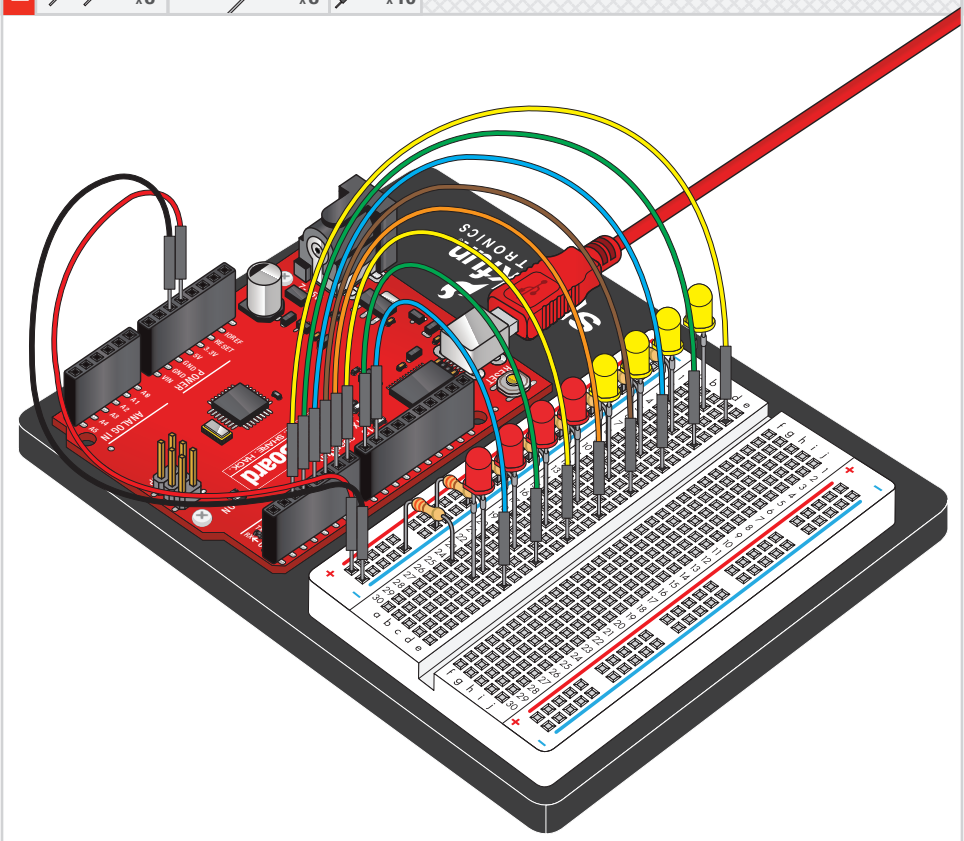
So you have gotten one LED to blink on and off – fantastic! Now it's time to up the stakes a little bit – by connecting EIGHT LEDS AT ONCE. We'll also give our RedBoard a little test by creating various lighting sequences. This circuit is a great setup to start practicing writing your own programs and getting a feel for the way RedBoard works.

Along with controlling the LEDs, you'll learn about a couple programming tricks that keep your code neat and tidy:

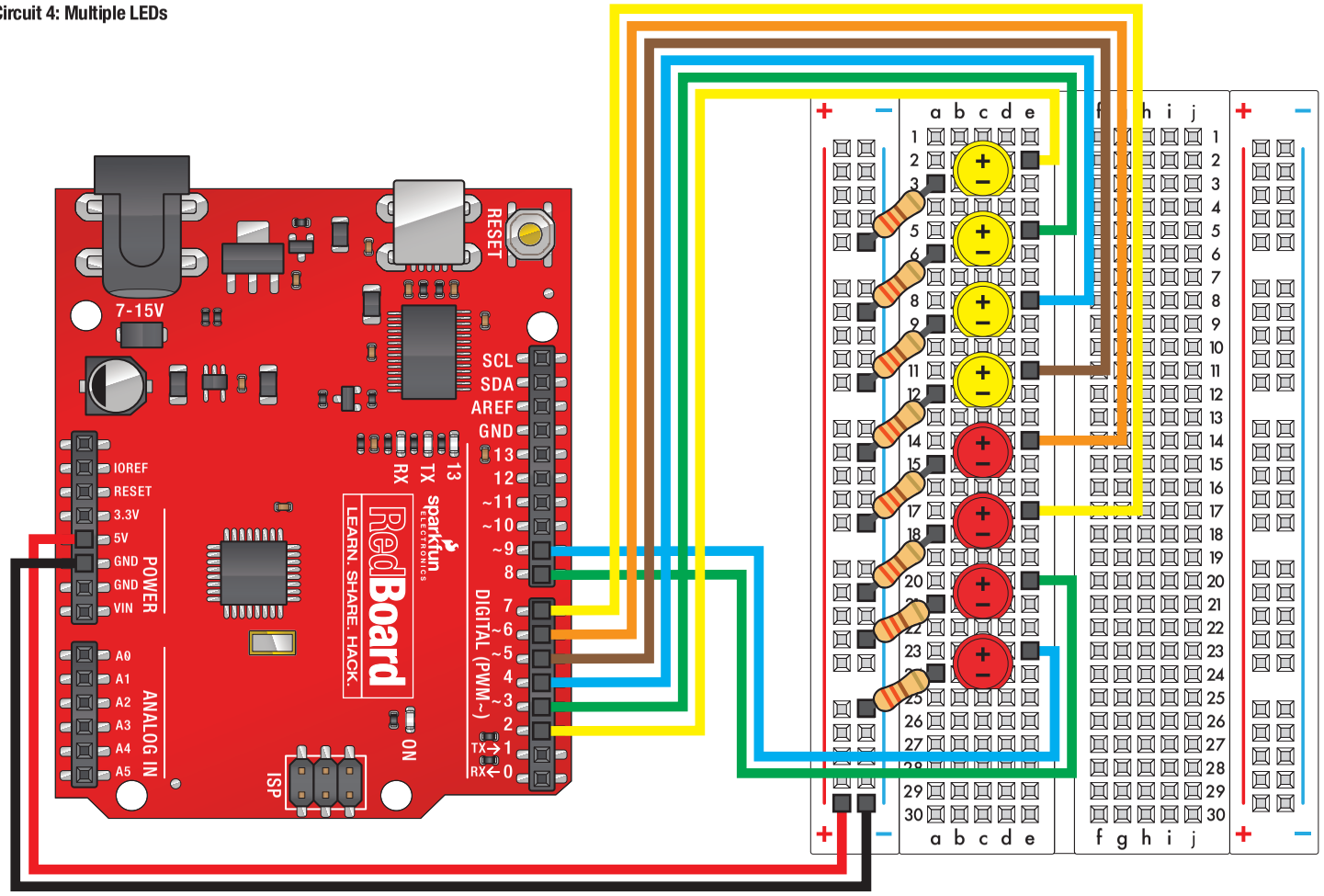
for() loops - used when you want to run a piece of code several times

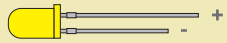
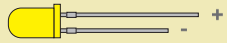
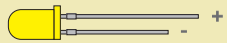
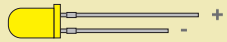
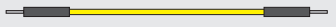
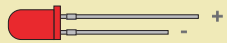
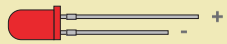
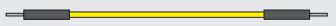
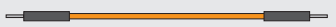
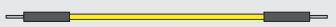
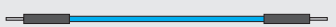
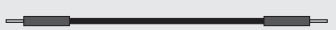
arrays[ ] - used to make managing variables easier by grouping them together

PARTS:



Circuit 4: Multiple LEDs



Component:	Image Reference:			Component:	Image Reference:		
LED (5mm)			c2 (+) – c3 (–)	330Ω Resistor			a18 –
LED (5mm)			c5 (+) – c6 (–)	330Ω Resistor			a21 –
LED (5mm)			c8 (+) – c9 (–)	330Ω Resistor			a24 –
LED (5mm)			c11 (+) – c12 (–)	Jumper Wire		Pin 2	e2
LED (5mm)			c14 (+) – c15 (–)	Jumper Wire		Pin 3	e5
LED (5mm)			c17 (+) – c18 (–)	Jumper Wire		Pin 4	e8
LED (5mm)			c20 (+) – c21 (–)	Jumper Wire		Pin 5	e11
LED (5mm)			c23 (+) – c24 (–)	Jumper Wire		Pin 6	e14
330Ω Resistor			a3 –	Jumper Wire		Pin 7	e17
330Ω Resistor			a6 –	Jumper Wire		Pin 8	e20
330Ω Resistor			a9 –	Jumper Wire		Pin 9	e23
330Ω Resistor			a12 –	Jumper Wire		5V	+
330Ω Resistor			a15 –	Jumper Wire		GND	–

4 Arduino Code:

Open Arduino IDE // File > Examples > SIK Guide > Circuit # 4

Code to Note:

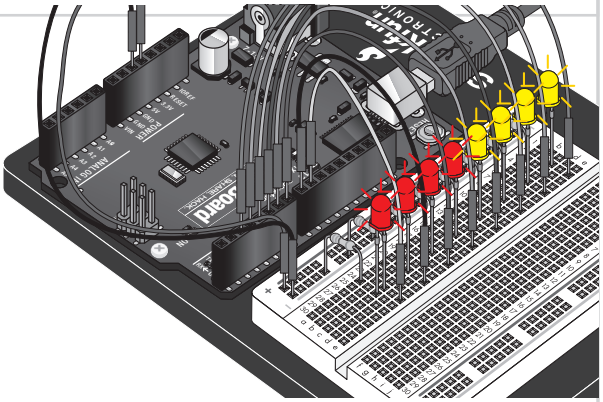
`int ledPins[] = {2,3,4,5,6,7,8,9};` ⇨ When you have to manage a lot of variables, an "array" is a handy way to group them together. Here we're creating an array of integers, called ledPins, with eight elements.

`digitalWrite(ledPins[0], HIGH);` ⇨ You refer to the elements in an array by their position. The first element is at position 0, the second is at position 1, etc. You refer to an element using "ledPins[x]" where x is the position. Here we're making digital pin 2 HIGH, since the array element at position 0 is "2".

`index = random(8);` ⇨ Computers like to do the same things each time they run. But sometimes you want to do things randomly, such as simulating the roll of a dice. The random() function is a great way to do this.
See **http://arduino.cc/en/reference/random** for more information.

What you Should See:

This is similar to circuit number one, but instead of one LED, you should see all the LEDs blink. If they aren't, make sure you have assembled the circuit correctly and verified and uploaded the code to your board or see the troubleshooting tips below.



Troubleshooting:

Some LEDs Fail to Light
It is easy to insert an LED backwards. Check the LEDs that aren't working and ensure they the right way around.

Operating out of sequence
With eight wires it's easy to cross a couple. Double check that the first LED is plugged into pin 2 and each pin there after.

Starting Afresh
Its easy to accidentally misplace a wire without noticing. Pulling everything out and starting with a fresh slate is often easier than trying to track down the problem.

Real World Application:

Scrolling marquee displays are generally used to spread short segments of important information. They are built out of many LEDs.