Getting to know the Lilypad Simple Snap

The Simple Snap has three components:

① Simple Snap Protoboard
② Simple Snap Arduino
③ FTDI Breakout
The Protoboard is used to make the connections to the LEDs using the provided wire. Each “petal” has a male snap connector that corresponds to a female snap on the Arduino board. The snaps carry power from the Arduino to each petal, powering the LEDs.
Simple Snap Arduino

This is the Arduino microprocessor. It carries the code that will run your project. Each numbered “petal” can be programmed to perform a different function. The female snaps on the bottom of the board connect to the ProtoBoard. The on/off switch is on the top of the board along with the connecting pins for the FTDI breakout.
The FTDI Breakout is used to connect the Simple Snap Arduino to a computer or power source using a USB cable. The black connector on the bottom of the board connects to the pins on the top of the Arduino board.
Circuit basics

An electrical circuit is a closed loop that electrons flow through. A circuit has two parts, a voltage source (the battery in this diagram) and a conductor (the wires). Energy flows from the power source the bulb and back to the power source. If any part of this path is broken, the bulb will not light.
Making a circuit

Look closely at the Lilypad Protoboard and LED. You will notice positive and negative symbols on the components, just like the battery in the example circuit.
Making a circuit

To complete the circuit and light up the LED, you must connect the positive side of the LED to the positive petal and the negative to the negative petal, using two different pieces of wire. This simple circuit will light up the LED, but the Arduino can also be programmed...
Working with the LEDs

The numbered petals on the Lilypad can be programmed to turn on and off at different times. Your Arduino has been pre-programmed. Petals 5 and 10 are programmed for a steady ON light. Petals 6 and 11 have been programmed to BLINK on and off on a one second interval. Petal 9 is programmed as a second negative (−) connection.
Making a chain

LEDs will turn on and stay on (petal 5 and -)

You can connect the LEDs to any of these petals and chain multiple LEDs together on the same petal by connecting the negatives and positives together.

LEDs will blink off and on (petal 11 and 9)
Connecting the Arduino

After you have made your circuits with the wire, snap the Arduino to the Protoboard and switch it on. Your LEDs should light.
CAUTION!

If your negative and positive wires touch or cross, your circuit will short and your LED will not light. You can cover your wires with electrical tape to prevent short circuits.
Reprogramming the Arduino

The Arduino has been pre-programmed for you, but you may modify the program if you wish using the FTDI breakout, USB cable, and the Arduino board. You’ll also need a computer with a USB port and the Arduino IDE.  
https://www.arduino.cc/en/Main/Software
The Arduino uses a programming language called Sketch. This is the program that has been preloaded onto your board. The gray comments (starting with //) explain what the code is doing. You may use this as a staring point when writing your own code. Please also see https://www.arduino.cc/en/tutorial/sketch.

```c
//this section sets the variables corresponding to the petal numbers on your Arduino
int ledsteady1 = 5; //e.g we can now use ledsteady1 to refer to petal 5 anywhere in our code
int ledblink1 = 11;
int ledsteady2 = 10;
int ledblink2 = 6;
int ground2 = 9;

void setup() {
  // put your setup code here, to run once:
  //this section sets all of the petals to output
  pinMode(ledsteady1, OUTPUT);
  pinMode(ledblink1, OUTPUT);
  pinMode(ledblink2, OUTPUT);
  pinMode(ledsteady2, OUTPUT);
  pinMode(ground2, OUTPUT);
}

void loop() {
  // put your main code here, to run repeatedly:

digitalWrite(ground2, LOW); //sets petal 9 as a second ground pin
digitalWrite(ledsteady1, HIGH); //sets petal 5 to HIGH or on
digitalWrite(ledsteady2, HIGH); //sets petal 6 to HIGH or on
digitalWrite(ledblink1, LOW); //sets petal 11 to LOW or off
delay(1000); //wait 1000 milliseconds or 1 second
digitalWrite(ledblink1, HIGH); //sets petal 11 to HIGH or on
delay(1000); //wait 1000 milliseconds or 1 second
digitalWrite(ledblink2, LOW); //sets petal 6 to LOW or off
delay(1000); //wait 1000 milliseconds or 1 second
digitalWrite(ledblink2, HIGH); //sets petal 6 to HIGH or on
delay(1000); //wait 1000 milliseconds or 1 second
```
Additional Components

Now that you understand the basics, you can use the additional accessories to enhance your project:

- 1 LilyPad Buzzer
- 1 LilyPad Light Sensor
- 2 LilyPad Tri-Color LED
- 2 LilyPad Button Board
- 1 LilyPad Temperature Sensor
- 1 LilyPad Accelerometer
- 1 LilyPad Slide Switch
- 1 LilyPad Vibe Board
- 1 LilyPad Reed Switch
LilyPad Buzzer

This is a small buzzer for the LilyPad system. Use 2 I/O pins on the LilyPad main board and create different noises based on the different frequency of I/O toggling. Loud enough to hear inside a pocket but not obtrusively loud. See https://www.sparkfun.com/products/8463 for more details.
LilyPad Light Sensor

This is a simple to use light sensor that outputs an analog value from 0 to 5V. With exposure to daylight, this sensor will output 5V. Covering the sensor with your hand, the sensor will output 0V. In a normal indoor lighting situation, the sensor will output from 1 to 2V. See https://www.sparkfun.com/products/8464 for more details.
LilyPad Tri-Color LED

Blink any color you need! Use the Tri-Color LED board as a simple indicator, or by pulsing the red, green, and blue channels, you can create any color. Very bright output. This is a common anode design - to turn on a channel you simply need to ground one of the R/G/B pins to illuminate that channel. See https://www.sparkfun.com/products/8467 for more details.
LilyPad Button Board

We designed this board to give the user a low profile button without any sharp edges. Button closes when you push it and opens when you release (momentary push button). See https://www.sparkfun.com/products/8776 for more details.
LilyPad Temperature Sensor

Detecting temperature changes has never been easier. The MCP9700 is a small thermistor type temperature sensor. This sensor will output 0.5V at 0 degrees C, 0.75V at 25 C, and 10mV per degree C. Doing an analog to digital conversion on the signal line will allow you to establish the local ambient temperature. Detect physical touch based on body heat and ambient conditions with this small sensor. See https://www.sparkfun.com/products/8777 for more details.
LilyPad Accelerometer

This is a three axis accelerometer for the LilyPad system. Based on the ADXL335 MEMS accelerometer from Analog Devices, the LilyPad Accelerometer can detect joint movement as well as inclination and vibration. See https://www.sparkfun.com/products/9267 for more details.
LilyPad Slide Switch

This is a simple slide switch for the LilyPad. Use it as a simple ON/OFF switch, or to control LEDs, buzzers, sensors, etc. See https://www.sparkfun.com/products/9350 for more details.
LilyPad Vibe Board

Apply 5V and be shaken by this small, but powerful vibration motor. Works great as an physical indicator without notifying anyone but the wearer. See https://www.sparkfun.com/products/11008 for more details.
LilyPad Reed Switch

A reed switch is a simple mechanical switch that is activated via a magnet. When the device is exposed to a magnetic field, the two ferrous materials (reeds) inside the switch pull together, and the switch closes. When the magnetic field is removed, the reeds separate and the switch opens. See https://www.sparkfun.com/products/13343 for more details.