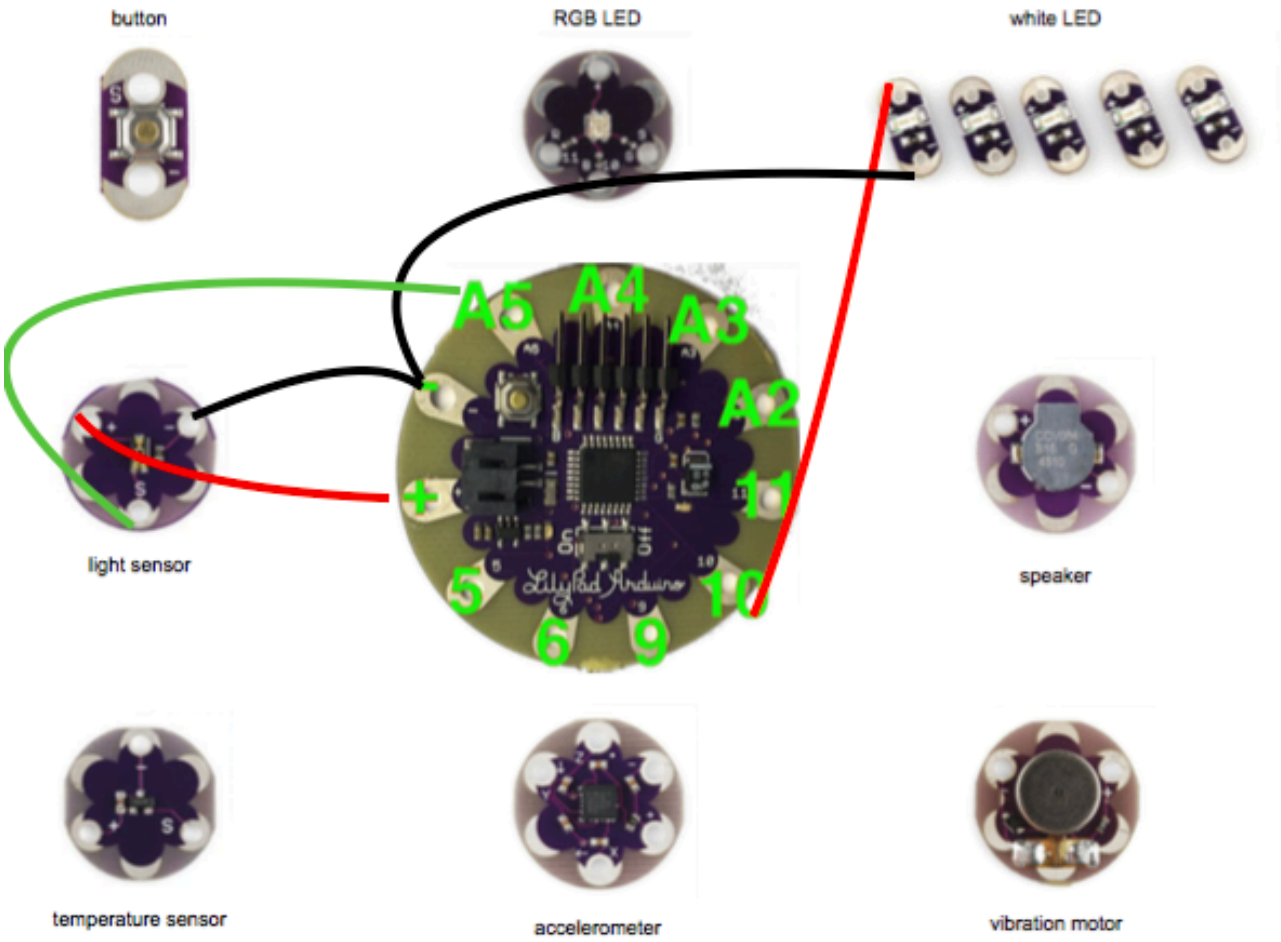
Lily Pad INPUT

Light Sensor

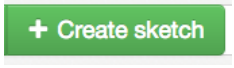
Goal: Make an LED turn on when a light sensor goes dark

Step 1: Make this circuit

white LED: pin 10 → + - → -	light sensor: + → + - → - S → A5



Step 2: Read the sensor

Go to codebender.cc. Click 

.

Name the program light sensor. 

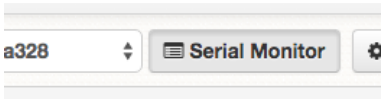
Copy and paste in this code:

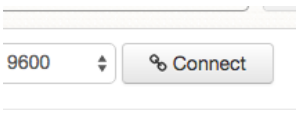
```
int lightSensor = A5;
int led = 10;
void setup()
{
      pinMode(led, OUTPUT);
      pinMode(lightSensor, INPUT);
      Serial.begin(9600);
}

void loop()
{
      int lightLevel = analogRead(lightSensor);
      Serial.println(lightLevel);
}
```

Verify the code. 

Connect the Lily Pad to the computer with the USB cord, and Run. 

You will see nothing happen, but don't worry!

Click Serial Monitor. 

Then click Connect. 

Now do you see lots of numbers zooming by? That's the light sensor reading.
Cover the sensor with your hand and watch the numbers change! Do they go down or up?
Troubleshooting: If you only see the number 1023, that means your light sensor is not connected properly. Look back at the circuit diagram and check your wiring.

(continued on next page)

Step 3: Light up the LED

Add this to your code (just the yellow part).

```
int lightSensor = A5;
int led = 10;
void setup()
{
      pinMode(led, OUTPUT);
      pinMode(lightSensor, INPUT);
      Serial.begin(9600);
}

void loop()
{
      int lightLevel = analogRead(lightSensor);
      Serial.println(lightLevel);
      if(lightLevel < 50) {
            digitalWrite(led, HIGH);
      } else {
            digitalWrite(led, LOW);
      }
}
```

Run your program on the Lily Pad. The LED should go on when you cover up the sensor, and go off when you uncover it.

Save your sketch!

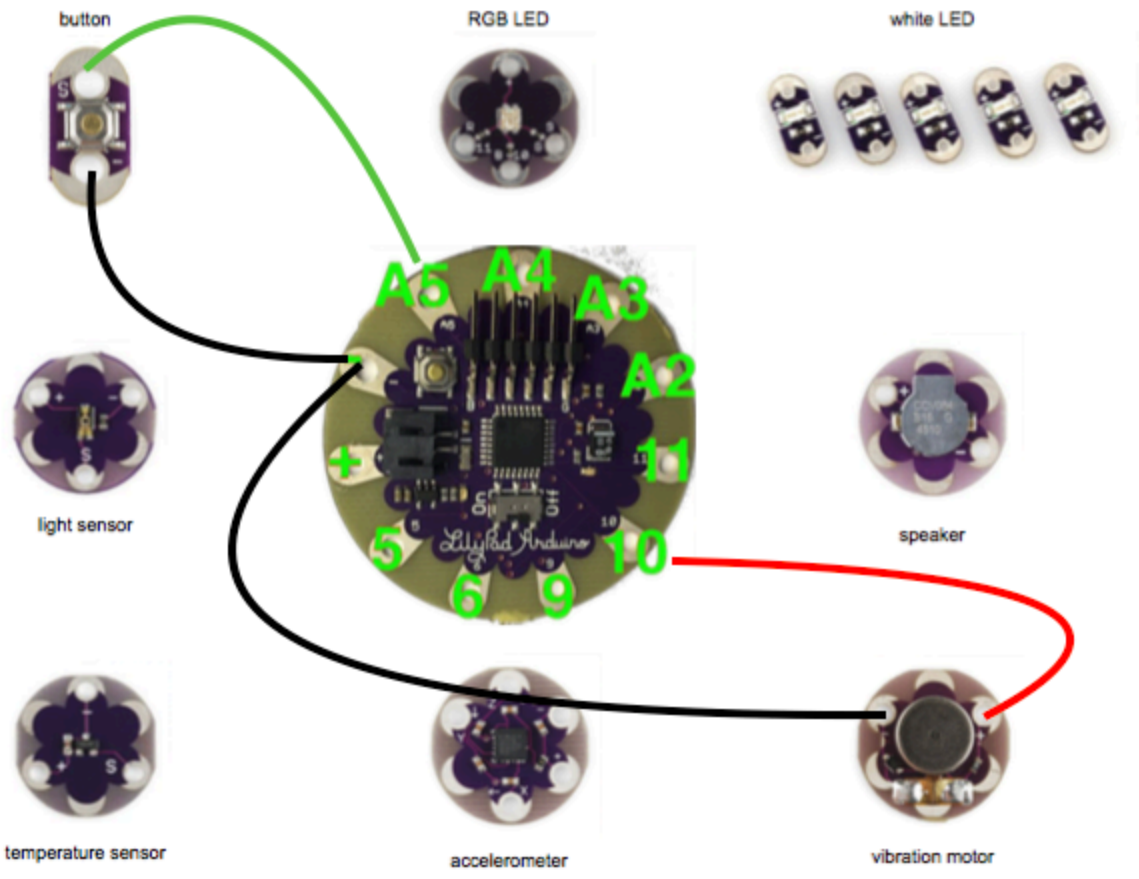
Next page, program a button!

Program a Button

Goal: Make the vibration motor buzz when you press the button

Step 1: Make this circuit

vibration motor: pin 10 → + - → -	button: - → - S → A5



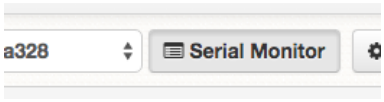
Step 2: Make the button work

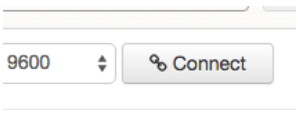
Click the gear to go back home. 

Create a new sketch (program), name it “button code” and paste in this code:

```
int motor = 10;
int button = A5;
void setup()
{
      pinMode(motor, OUTPUT);
      pinMode(button, INPUT_PULLUP);
      Serial.begin(9600);
}

void loop()
{
      int buttonValue = digitalRead(button);
      Serial.println(buttonValue);
}
```

Verify the code.
Run the code. You won’t see (or feel) anything happen yet.

Click Serial Monitor. 

Then click Connect. 

Now you should see the number 1 go flying by.
Press the button and it should change to 0.
So it is 0 when pressed, and 1 when not pressed.
Troubleshooting: If you see the number 1 but it does not change to 0 when you press it, that means your light button is not connected properly. Look back at the circuit diagram and check your wiring.

Step 3: Make the Motor Work

Add this to your code (just the yellow part):

```
int motor = 10;
int button = A5;
void setup()
{
      pinMode(motor, OUTPUT);
      pinMode(button, INPUT_PULLUP);
      Serial.begin(9600);
}

void loop()
{
      int buttonValue = digitalRead(button);
      Serial.println(buttonValue);
      if(buttonValue == LOW){
            digitalWrite(motor, HIGH);
      } else {
            digitalWrite(motor, LOW);
      }
}
```

Run your program on the Lily Pad. The motor should vibrate when you press the button, and stop when you let go.

Save your sketch!