**Set-up arduino for wemos:**

1. Open Arduino and plug in wemos to computer using the USB cable
2. Click Tools > Board > LOLIN(WEMOS) D1 R2 & mini

If this Board **doesn’t** show up on the list, follow these steps:

* 1. Click File > Preferences > Additional Board Managers
     1. Paste the following into the box:

<http://arduino.esp8266.com/stable/package_esp8266com_index.json>

* 1. Click Tools > Boards > Boards Manager
     1. Click Type > Contributed
     2. Find **esp8266 by ESP8266 Community** and click install

1. Click Tools > Upload Speed > 115200
2. Click Tools > Port > COMx, where x is any number greater than 1.
3. Copy paste this code:

void setup() {

pinMode(BUILTIN\_LED, OUTPUT); // set up the LED

}

void loop() {

digitalWrite(BUILTIN\_LED, HIGH); // turn off LED

delay(500); // wait a half second

digitalWrite(BUILTIN\_LED, LOW); // turn on LED

delay(500); // wait a half second

}

1. Upload it to the wemos using this button:  If it manages to upload you should see a light on the wemos flashing every second! The code is turning the light on for 0.5s then off for 0.5s. Everything within the { } brackets is looped / repeated.

**Sign in to Thingspeak:**

1. Thingspeak.com
   1. Username: engf-outreach@bristol.ac.uk
   2. Password: Outreach123
2. Click Channel > New Channel
   1. Give it a name
   2. Create channel
3. API Keys > Write API Key. Copy this

**Create test code**

1. Copy code from below
2. Fill in API Key, Wifi name & password
3. Upload to wemos with  button
4. Once uploaded, click the serial monitor button 
   1. Change baud to 115200
   2. You should see the wifi connect and the value get sent to teamspeak
   3. Every 20 seconds it will send a new value to team speak
   4. Have a look for your value on teamspeak coming in live!
   5. Now you’ve created an IOT device, let’s add a sensor.

**Test Code:**

#include <ESP8266WiFi.h>

// replace with your channel’s thingspeak API key and your SSID and password

String writeApiKey = "write api key here";

const char\* ssid = "wifi name here";

const char\* password = "wifi password here";

const char\* server = "api.thingspeak.com";

int t = 1;

WiFiClient client;

void setup(){

Serial.begin(115200);

delay(10);

WiFi.begin(ssid, password);

Serial.print("Connecting to ");

Serial.println(ssid);

WiFi.begin(ssid, password);

while (WiFi.status() != WL\_CONNECTED){

delay(500);

Serial.print(".");

}

Serial.println("WiFi connected");

}

void loop()

{

if (client.connect(server,80)) {

String postStr = writeApiKey;

postStr +="&field1=";

postStr += String(t);

postStr +="&field2=";

postStr += String(1);

client.print("POST /update HTTP/1.1\n");

client.print("Host: api.thingspeak.com\n");

client.print("Connection: close\n");

client.print("X-THINGSPEAKAPIKEY: "+writeApiKey+"\n");

client.print("Content-Type: application/x-www-form-urlencoded\n");

client.print("Content-Length: ");

client.print(postStr.length());

client.print("\n\n");

client.print(postStr);

Serial.print("Value: ");

Serial.println(t);

Serial.println("Sending data to Thingspeak");

t = t + 1;

}

client.stop();

Serial.println("Waiting 20 secs");

// thingspeak needs at least a 15 sec delay between updates

// 20 seconds to be safe

delay(20000);

}

Useful functions:

Serial.print(“”); - this prints data to the serial monitor

**Wire up your sensor**

**Add more sensors for multiple channels**

**Use processing to visualise the data**