

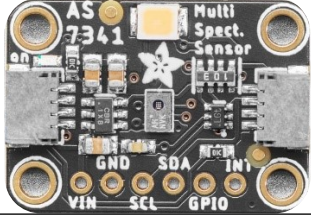
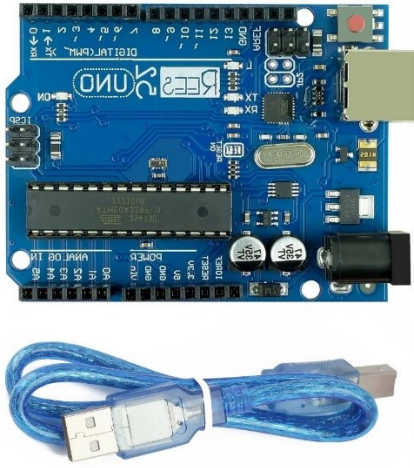

Supplementary Material

S1 – programming code used for data analysis and sensor control.

Arduino code

```
#include <Adafruit_AS7341.h>
Adafruit_AS7341 as7341;
void setup() {
  Serial.begin(115200);
  while (!Serial) {
    delay(1);
  }
  if (!as7341.begin()){
    Serial.println("Could not find AS7341");
    while (1) { delay(10); }
  }
  as7341.setATIME(100);
  as7341.setASTEP(999);
  as7341.setGain(AS7341_GAIN_512X); //Adjust the gain to the allowable values (refer to the
  specifications).
}
void loop() {
  if (!as7341.readAllChannels()){
    Serial.println("Error reading all channels!");
    return;
  }
  Serial.print("F1 415nm : ");
  Serial.println(as7341.getChannel(AS7341_CHANNEL_415nm_F1));
  Serial.print("F2 445nm : ");
  Serial.println(as7341.getChannel(AS7341_CHANNEL_445nm_F2));
  Serial.print("F3 480nm : ");
  Serial.println(as7341.getChannel(AS7341_CHANNEL_480nm_F3));
  Serial.print("F4 515nm : ");
  Serial.println(as7341.getChannel(AS7341_CHANNEL_515nm_F4));
  Serial.print("F5 555nm : ");
  Serial.println(as7341.getChannel(AS7341_CHANNEL_555nm_F5));
  Serial.print("F6 590nm : ");
  Serial.println(as7341.getChannel(AS7341_CHANNEL_590nm_F6));
  Serial.print("F7 630nm : ");
  Serial.println(as7341.getChannel(AS7341_CHANNEL_630nm_F7));
  Serial.print("F8 680nm : ");
  Serial.println(as7341.getChannel(AS7341_CHANNEL_680nm_F8));
  Serial.print("Clear  :");
  Serial.println(as7341.getChannel(AS7341_CHANNEL_CLEAR));
  Serial.print("Near IR  :");
  Serial.println(as7341.getChannel(AS7341_CHANNEL_NIR));
  Serial.println("");
  Serial.println("0 mA LED blink");
  as7341.setLEDCurrent(20); // The number in parentheses determines the LED current, in this
  case, it is 20 mA.
  as7341.enableLED(true);
}
```

S2 – Detailed list of all the components used in the project

Photography of the components	Component name	Cost
 <p>The image shows a small black PCB sensor module. It features a central sensor chip, several surface-mount components, and a white star-shaped logo. Labels on the board include 'AS7341', 'Multi Spect. Sensor', 'GND', 'SDA', 'I2C', 'VIN', 'SCL', and 'GPIO'. There are also four circular mounting holes around the perimeter.</p>	Adafruit AS7341	\$15.95
 <p>The image displays a blue Arduino Uno R3 microcontroller board and a blue USB Type-A to B cable. The board has a USB Type-B port, a DC power jack, and a micro-USB port. The cable is coiled and has a clear plastic sheath.</p>	Arduino Uno + Cable	\$ 13.00
 <p>The image shows a bundle of multi-colored jumper wires. One end has a black plastic housing with five pins (male), and the other end has five female headers. The wires are arranged in a fan shape.</p>	Jumper Wires Male to Female	\$1.00