香港教育大學
The Education University of Hong Kong

The Education University of Hong Kong
2021-2022 Quality Education Fund Thematic Network – Tertiary Institutes
STEM Project Team

SCHOOL: CHRISTIAN AND MISSIONARY ALLIANCE SUN KEI SECONDARY SCHOOL (S4)

TOPIC: WORKSHOP 1 – DEVELOP PORTABLE SPECTROPHOTOMETER WITH DATA LOGGING

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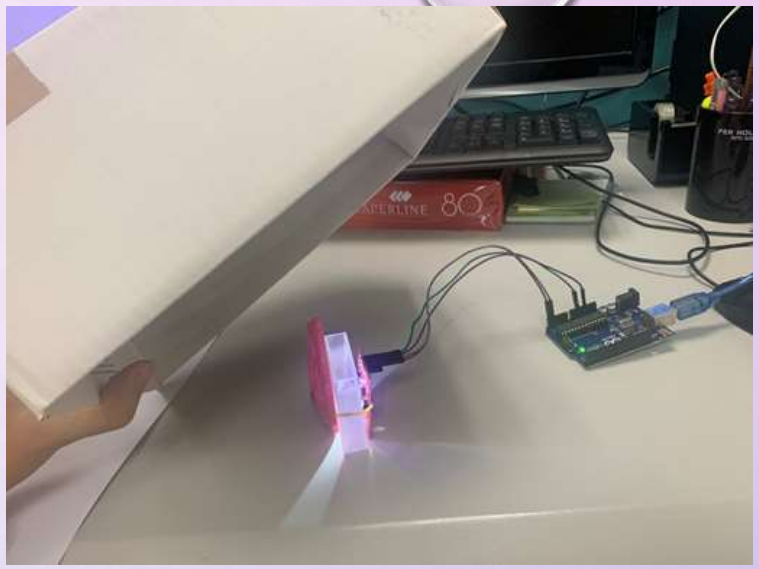
REQUIREMENT LIST:



- - SEN-15050 SPARKFUN TRIAD SPECTROSCOPY SENSOR -AS7265X
- - ARDUINO-UNO (WITH POWER SUPPLY)
- - COMPUTER WITH ARDUINO IDE AND EXCEL
- - SAMPLE HOLDER
- - MIRROR
- - RUBBER BANDS
- - BOX(FOR COVERING THE WHOLE DEVICE FROM ANY OTHER LIGHT SOURCE)
- - SAMPLE WATER FOR DEMONSTRATION(RECOMMEND RELATED TO TEACHING PLAN)





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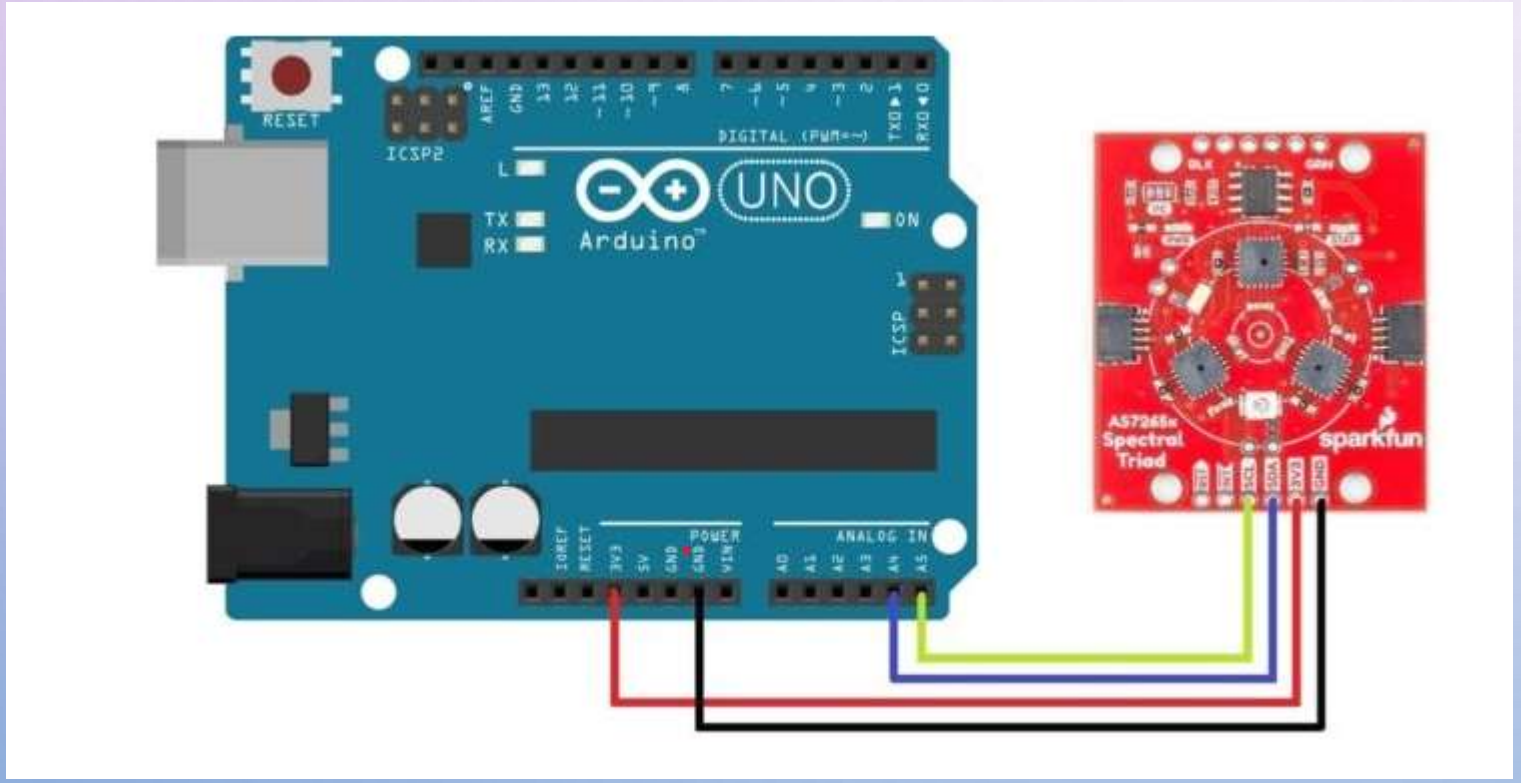
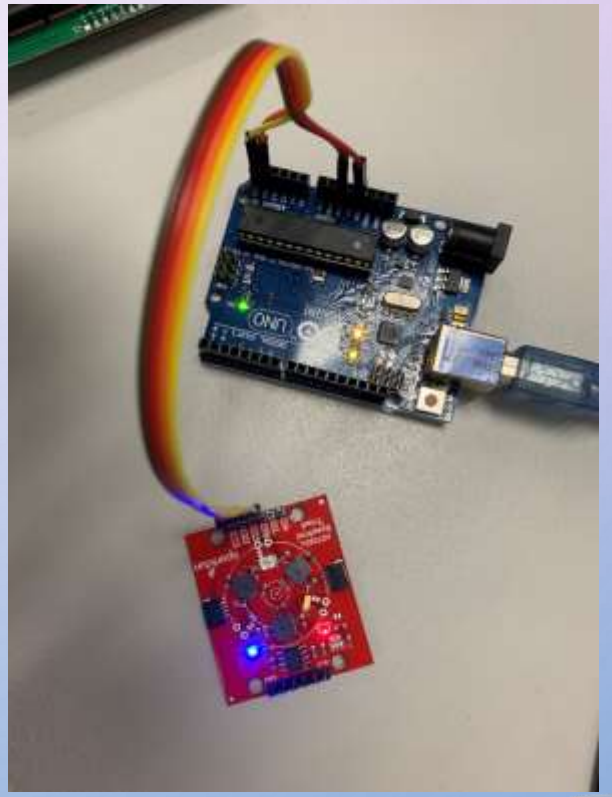
CIRCUIT





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CODING

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BASIC READING WITH LEDS

Example2_BasicReadingsWithLEDs

```
*/

#include "SparkFun_AS7265X.h" //Click here to get the library: http://librarymanager/All#SparkFun_AS7265X
AS7265X sensor;

#include <Wire.h>

void setup()
{
  Serial.begin(115200);
  Serial.println("AS7265x Spectral Triad Example");

  Serial.println("Point the Triad away and press a key to begin with illumination...");
  while (Serial.available() == false)
  {
  }             //Do nothing while we wait for user to press a key
  Serial.read(); //Throw away the user's button

  if (sensor.begin() == false)
  {
    Serial.println("Sensor does not appear to be connected. Please check wiring. Freezing...");
    while (1)
      ;
  }

  sensor.disableIndicator(); //Turn off the blue status LED

  Serial.println("A,B,C,D,E,F,G,H,R,I,S,J,T,U,V,W,K,L");
}

void loop()
{
  sensor.takeMeasurementsWithBulb(); //This is a hard wait while all 18 channels are measured

  Serial.print(sensor.getCalibratedA()); //410nm
  Serial.print(",");
  Serial.print(sensor.getCalibratedB()); //435nm
  Serial.print(",");
  Serial.print(sensor.getCalibratedC()); //460nm
  Serial.print(",");
  Serial.print(sensor.getCalibratedD()); //485nm
  Serial.print(",");
  Serial.print(sensor.getCalibratedE()); //510nm
  Serial.print(",");
  Serial.print(sensor.getCalibratedF()); //535nm
```

Example2_BasicReadingsWithLEDs

```
void loop()
{
  sensor.takeMeasurementsWithBulb(); //This is a hard wait while all 18 channels are measured

  Serial.print(sensor.getCalibratedA()); //410nm
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  Serial.print(sensor.getCalibratedB()); //435nm
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  Serial.print(sensor.getCalibratedC()); //460nm
  Serial.print(",");
  Serial.print(sensor.getCalibratedD()); //485nm
  Serial.print(",");
  Serial.print(sensor.getCalibratedE()); //510nm
  Serial.print(",");
  Serial.print(sensor.getCalibratedF()); //535nm
  Serial.print(",");

  Serial.print(sensor.getCalibratedG()); //560nm
  Serial.print(",");
  Serial.print(sensor.getCalibratedH()); //585nm
  Serial.print(",");
  Serial.print(sensor.getCalibratedR()); //610nm
  Serial.print(",");
  Serial.print(sensor.getCalibratedI()); //645nm
  Serial.print(",");
  Serial.print(sensor.getCalibratedS()); //680nm
  Serial.print(",");
  Serial.print(sensor.getCalibratedJ()); //705nm
  Serial.print(",");

  Serial.print(sensor.getCalibratedT()); //730nm
  Serial.print(",");
  Serial.print(sensor.getCalibratedU()); //760nm
  Serial.print(",");
  Serial.print(sensor.getCalibratedV()); //810nm
  Serial.print(",");
  Serial.print(sensor.getCalibratedW()); //860nm
  Serial.print(",");
  Serial.print(sensor.getCalibratedK()); //900nm
  Serial.print(",");
  Serial.print(sensor.getCalibratedL()); //940nm
  Serial.print(",");

  Serial.println();
}
```
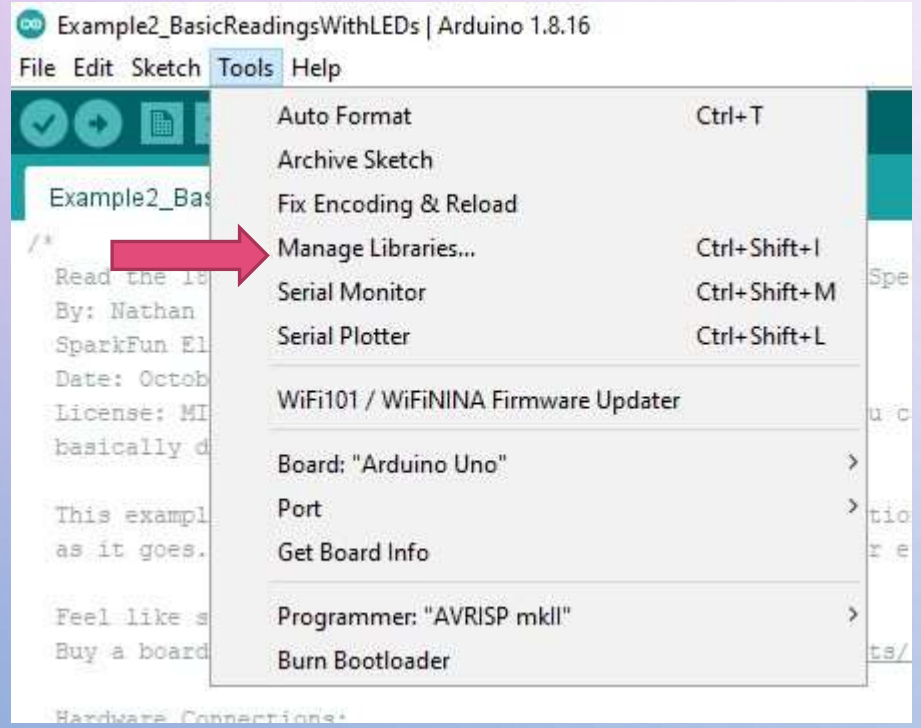
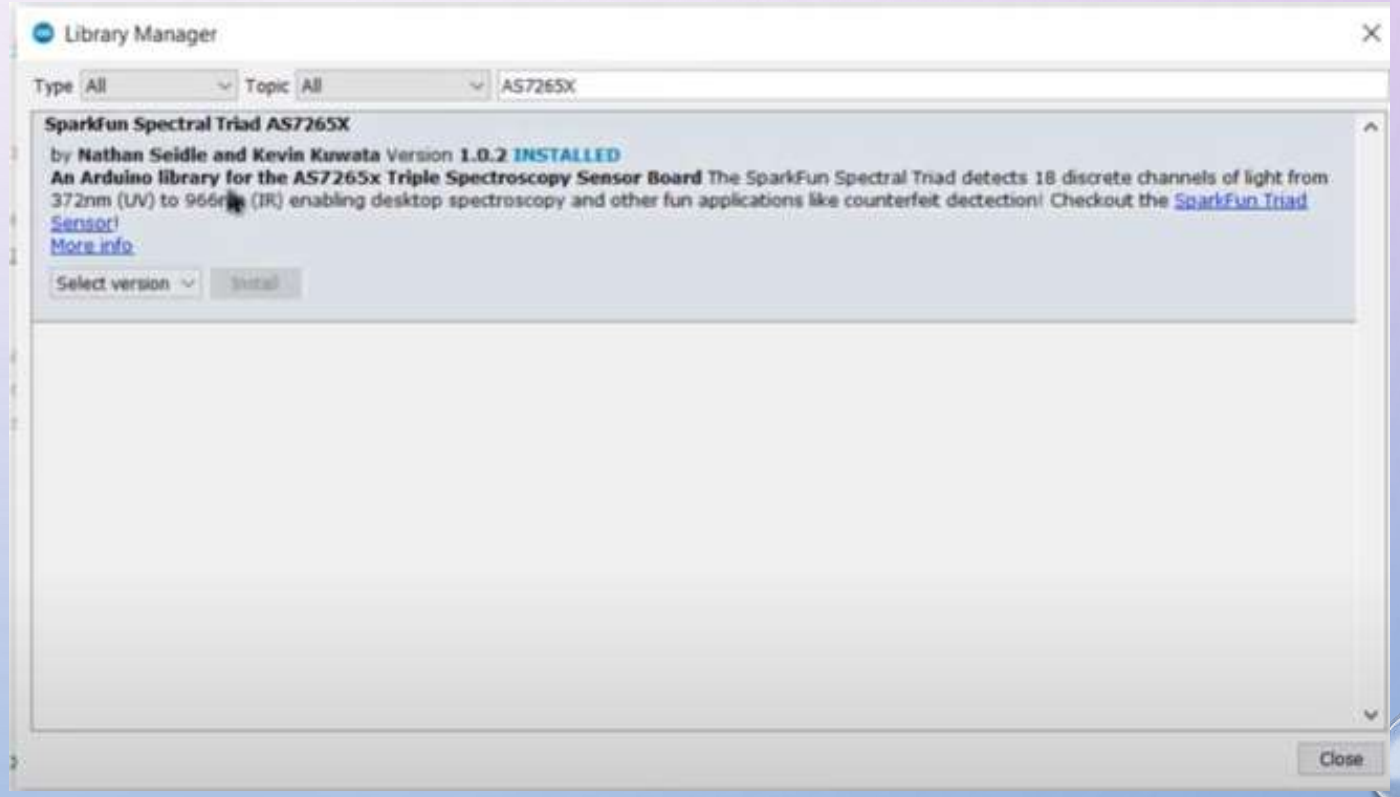

TOOLS>MANAGE LIBRARIES (CTRL+SHIFT+M)
LIBRARY – AS7265X





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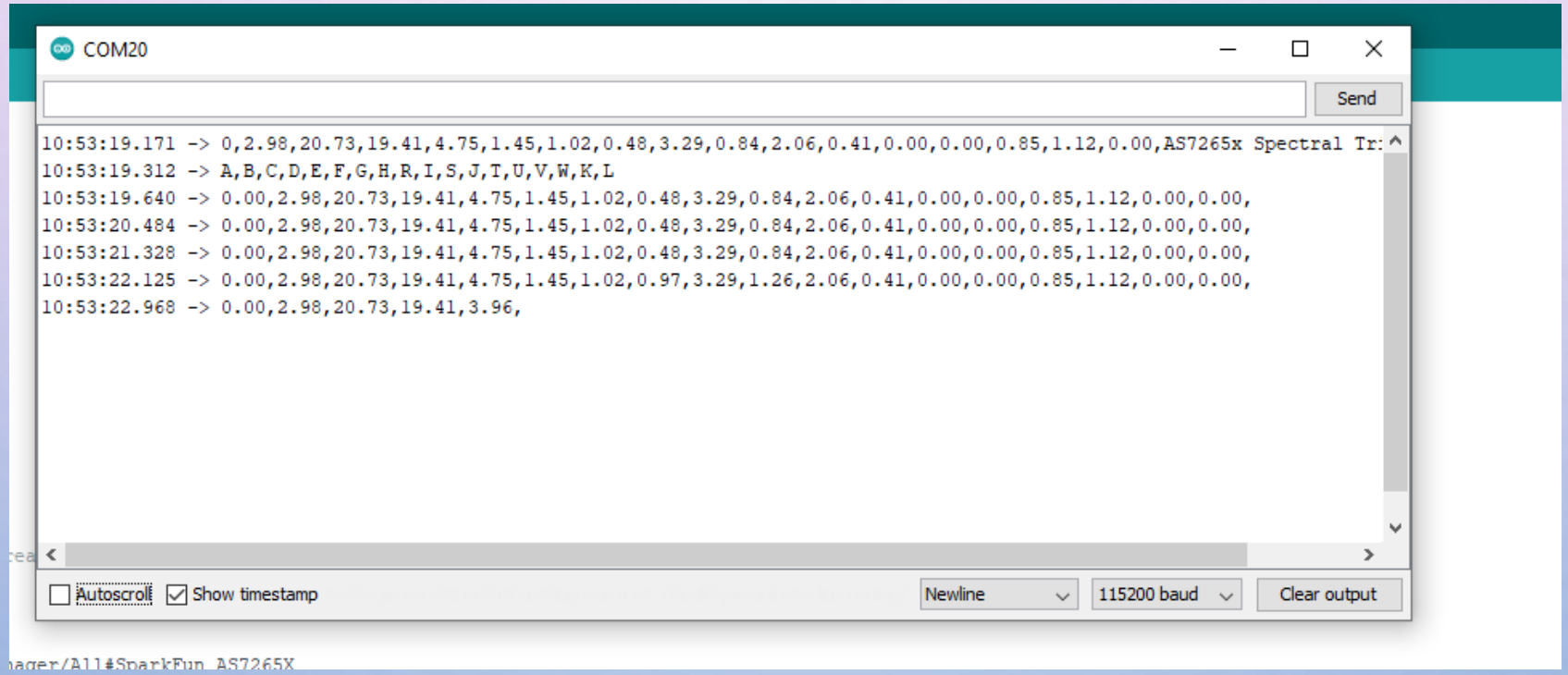
DOWNLOAD AND TEST WITH SERIAL MONITOR (CTRL+SHIFT+M)



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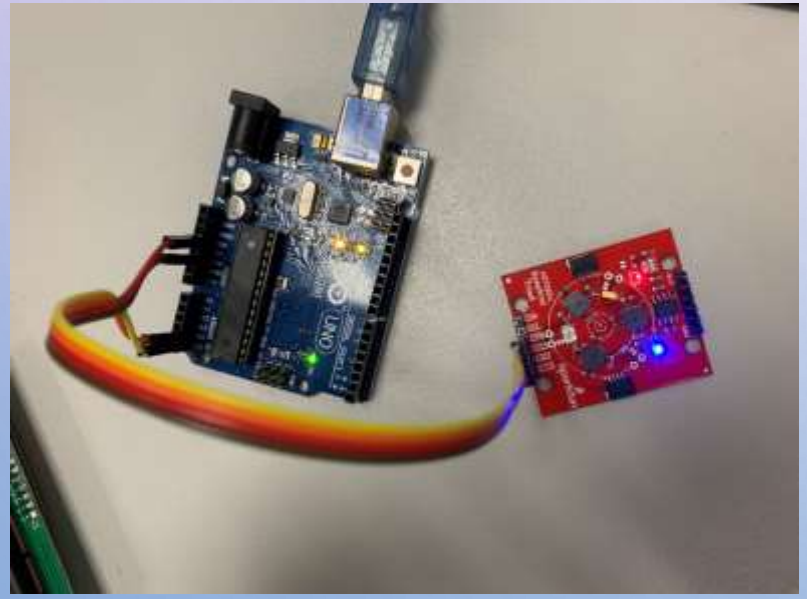
BEFORE DATA COLLECTION

(1) Warm-up(5mins) before using**



(2) Clean before using

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DURING DATA COLLECTION

(3) Mark time and action

	A	B	C	D
1	Time(From)	Time(To)	Event	Remark
2	15:44	15:51	Warm up	
3	15:52	15:55	H2O	15:54:30
4	15:55	15:57:36	Sample 7	15:58:30
5	16:02:20	16:05	Sample 5	16:03:30
6	16:08:36	16:12:40	Sample 3	16:10:30
7	16:15:20	16:18:20	Sample 6	16:16:30
8	16:20:41	16:23:41	Sample 4	16:22:30
9	16:25:40	16:28:40	Sample 2	16:27:30
10	16:29:00	16:32:00	ACR	16:31:30
11	16:33:17	16:36:00	H2O (2)	16:34:30
12				
13				

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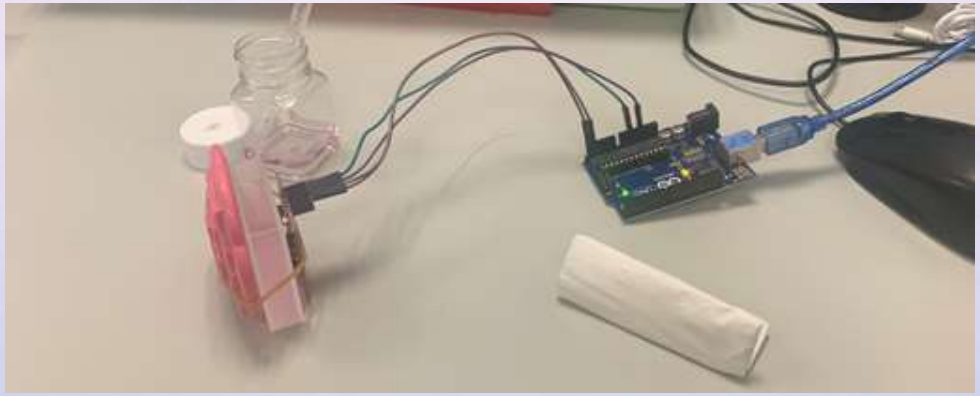
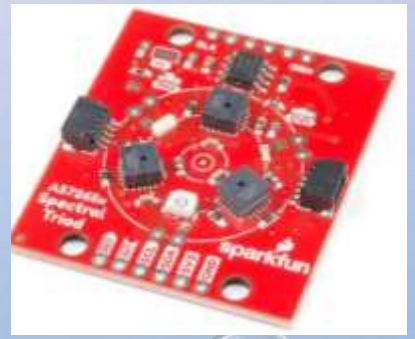
SET-UP





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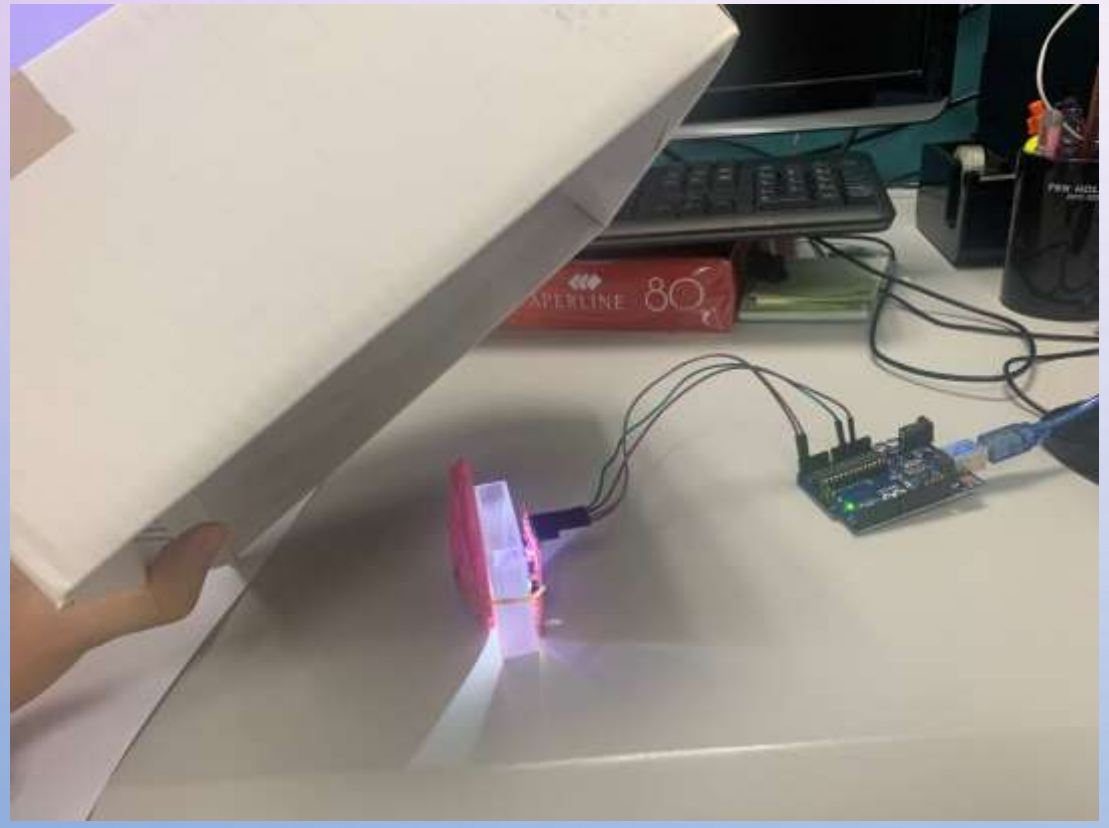
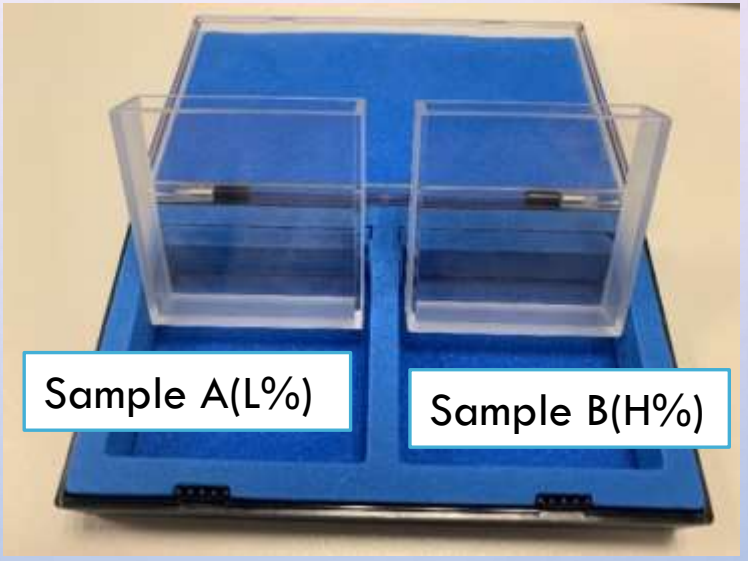
DATA COLLECTION



AT LEAST TAKE 3 SET OF SAMPLE DATA (0%,L%,H%)

e.g. Water(0%) ✚



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AFTER DATA COLLECTION
TAKE DATA (COPY & PASTE)

(4) Copy all data (Copy & paste)