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: TURBIDITY TEST OF DRINKS

科學與環境學系
Department of Science and Environmental Studies

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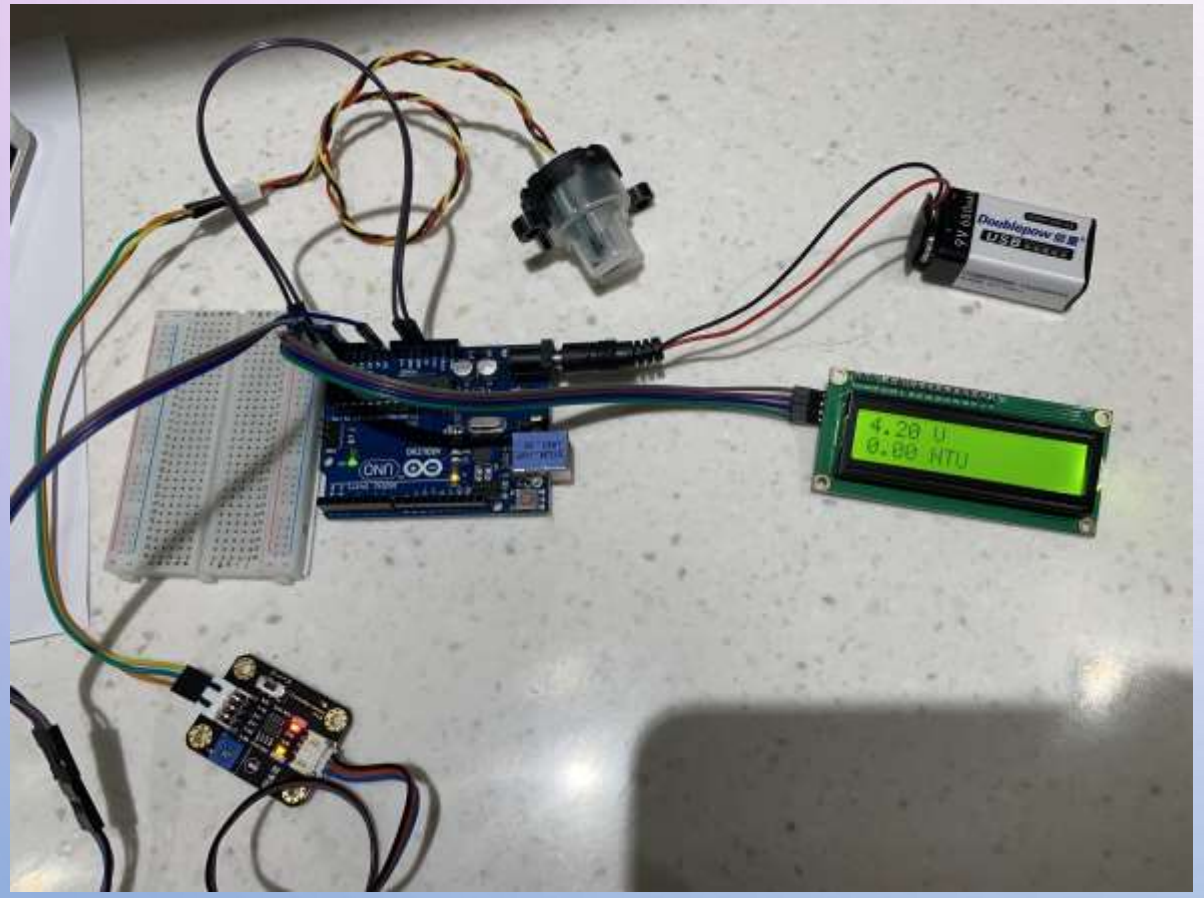

3 TURBIDITY TEST/ CONTENT ANALYSIS

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Department of Science and Environmental Studies

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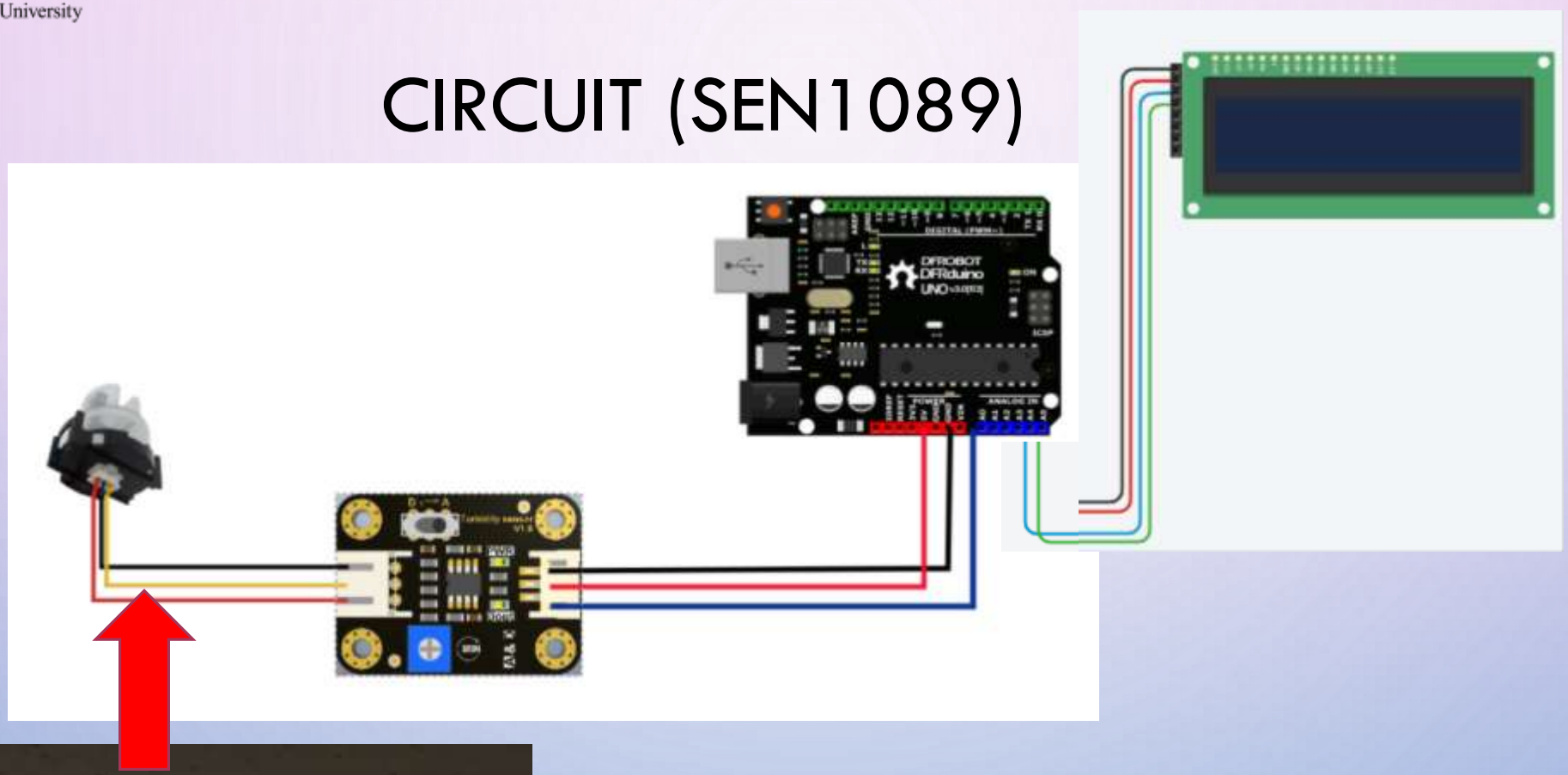
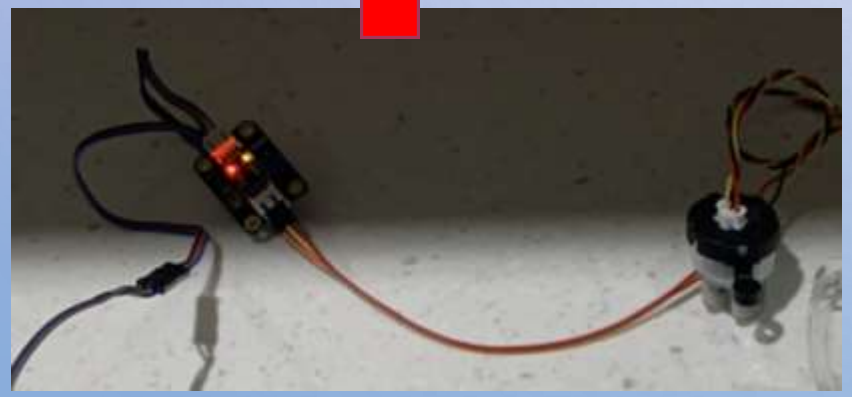
CIRCUIT (SEN1089)





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CODE

turbidity_A_I2C_

```
#include <Wire.h>
#include <LiquidCrystal_I2C.h>

// Set the LCD address to 0x27 for a 16 chars and 2 line display
LiquidCrystal_I2C lcd(0x27, 16, 2);
int sensorPin = A0;
float volt;
float ntu;

void setup()
{
  Serial.begin(9600);
    lcd.init();
    lcd.init();
    //lcd.begin();

  // Turn on the blacklight and print a message.
  lcd.backlight();
}

void loop()
{

    volt = 0;
    for(int i=0; i<800; i++)
    {
        volt += ((float)analogRead(sensorPin)/1023)*5;
    }
    volt = volt/800;
    volt = round_to_dp(volt,1);
  //  if(volt < 2.5){
  if(volt < 0.05){
      ntu = 3000;
    }else{
      ntu = -1120.4*square(volt)+5742.3*volt-4353.8;
    }
    lcd.clear();
    lcd.setCursor(0,0);
    lcd.print(volt);
    lcd.print(" V");

    lcd.setCursor(0,1);
    lcd.print(ntu);
    lcd.print(" NTU");
    delay(10);
}

float round_to_dp( float in_value, int decimal_place )
{
  float multiplier = powf( 10.0f, decimal_place );
  in_value = roundf( in_value * multiplier ) / multiplier;
  return in_value;
}
```

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MORE ABOUT SEN1089

reb87able • 2 years ago • edited

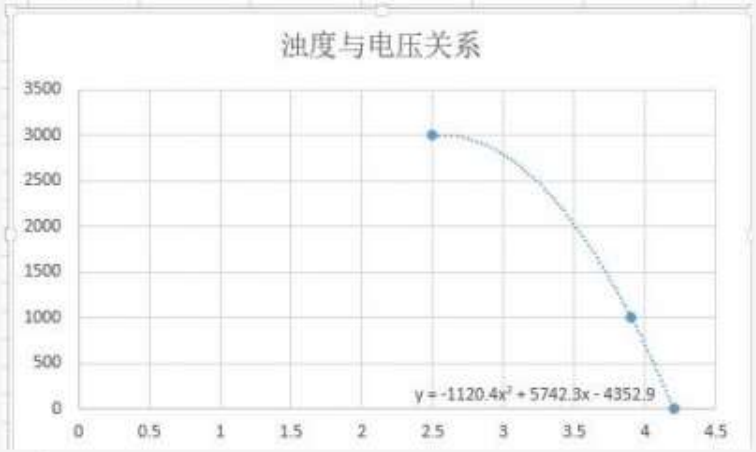
only two simple questions:
1.within this range 0 to 3000, what is the range of a clear (drinking) water?
2.as the standard of turbidity is 0 to 5, how to can i convert this 0-3000 to 0-5?

Thank you

4 | Reply • Share ›

DFRobot Support Mod ↗ reb87able • 2 years ago

1.Because the sensitivity of different sensors is different, I can't get the absolute value about clear water,you can use this sensor to measure the relative turbidity of two solutions.
2. Convert the analog reading (which goes from 0 - 1023) to a voltage (0 - 5V).Please look at the picture below about 0-3000 to 0-5.



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https://www.dfrobot.com/product-1394.html

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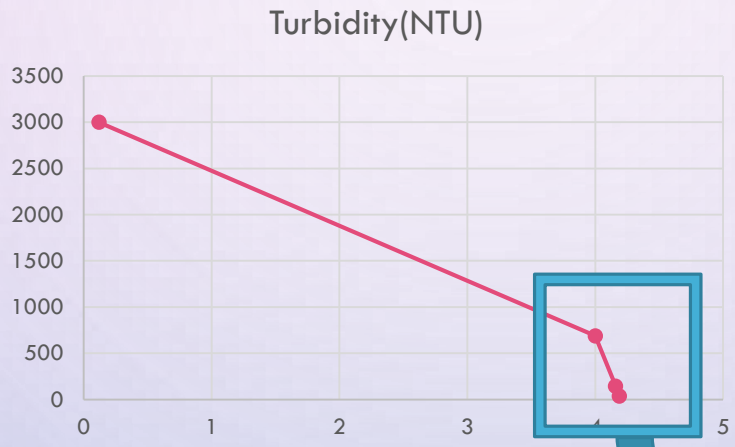
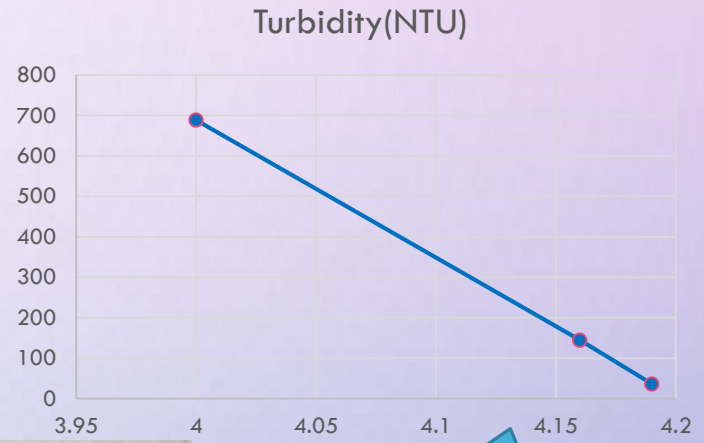
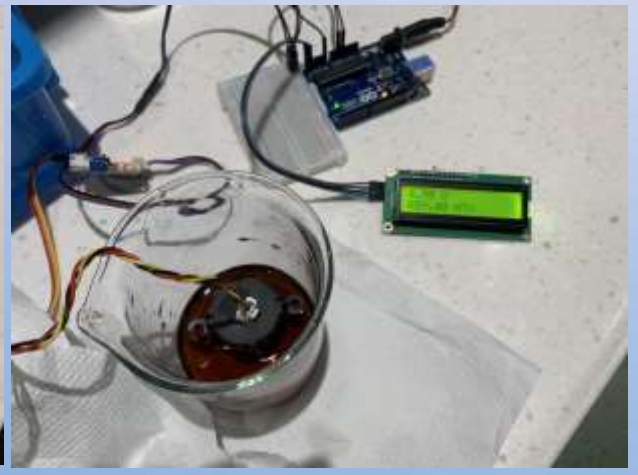
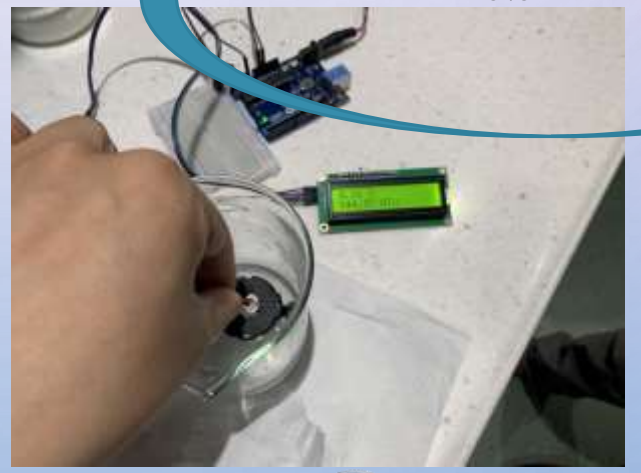
RESULTS (SEN1089)

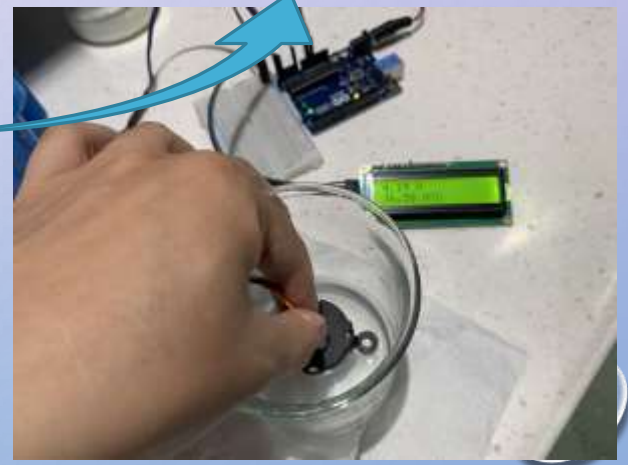
	Votage(V)	Turbidity(NTU)
Water	4.19	36.58
Pocari Sweat	4.16	144.97
Coca Cola	4.00	689
Milk	0.12	3000











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PASCO PS-2002 GRAPHING LOGGER + PASCO PASPORT PS-2122 TURBIDIMETER

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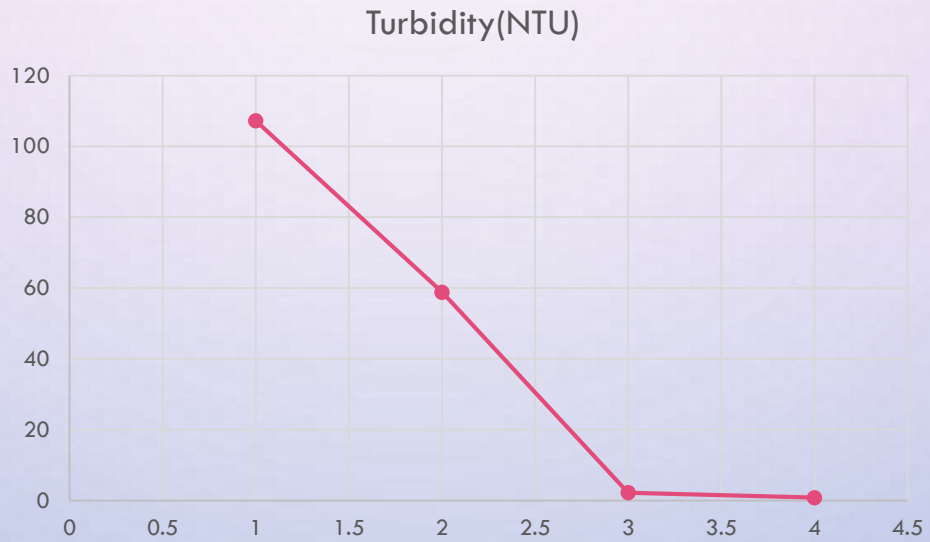
RESULTS (PASCO)

	Turbidity(NTU)
Water (Tap)	0.8
Coca Cola	2.2
Pocari Sweat	58.8
Milk (fresh)	107.2



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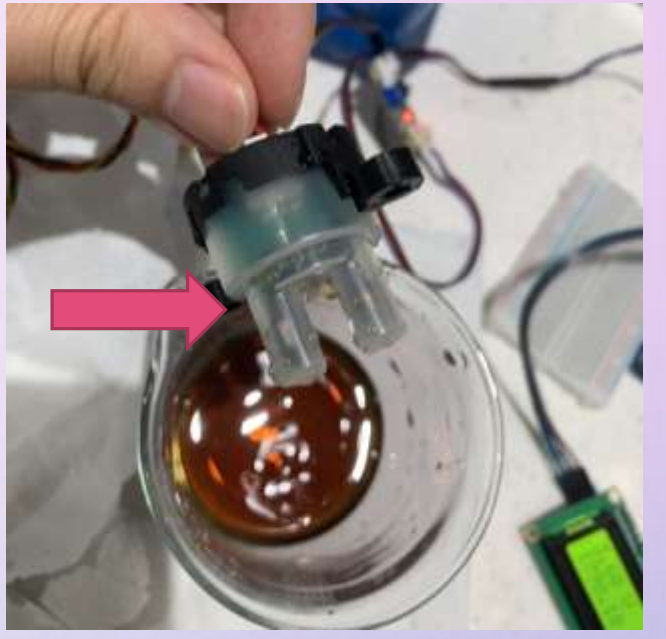
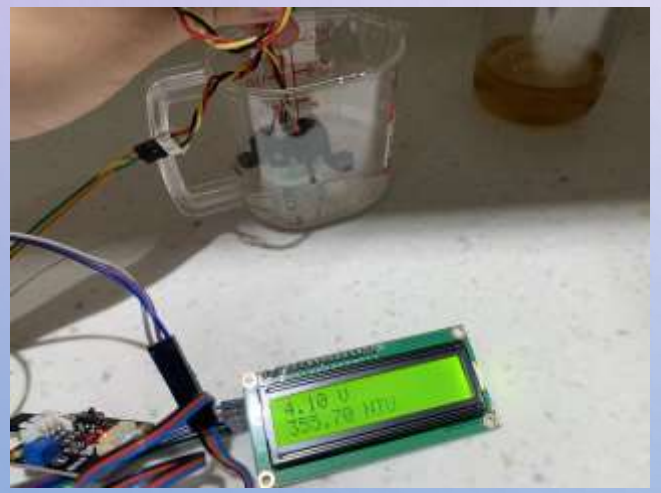
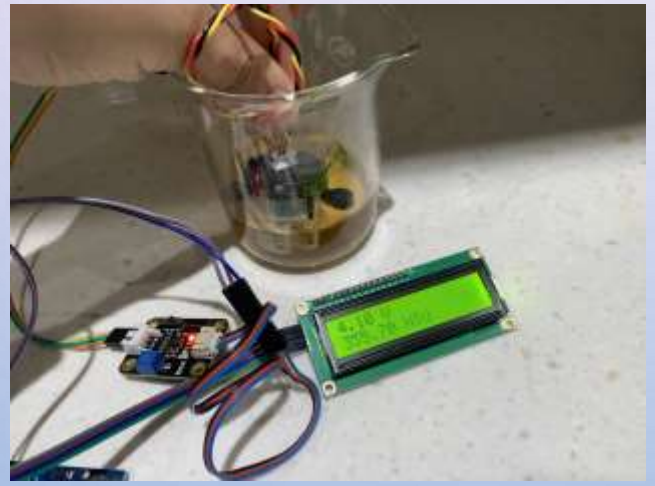
EXTENSION LEARNING: TEST02 RESULTS (SEN1089)



	Water	Tea	Coca Cola
V	4.10	4.10	3.40
NTU	355.70	355.70	2218.20





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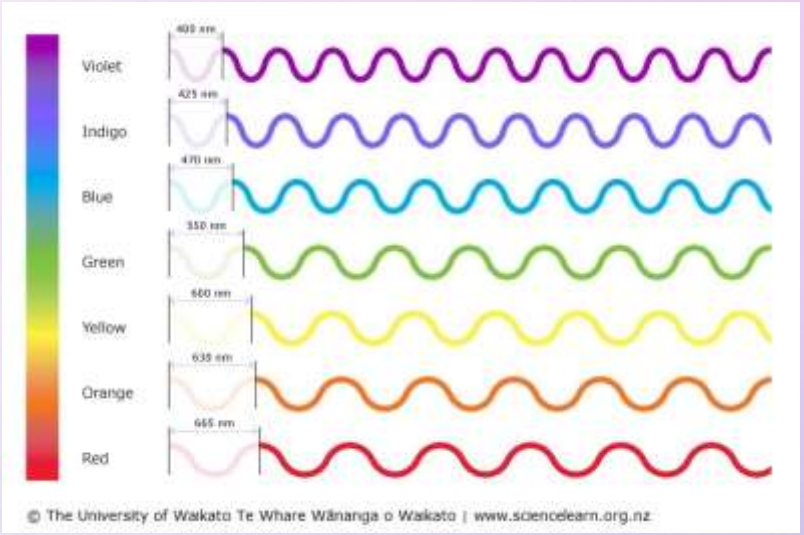
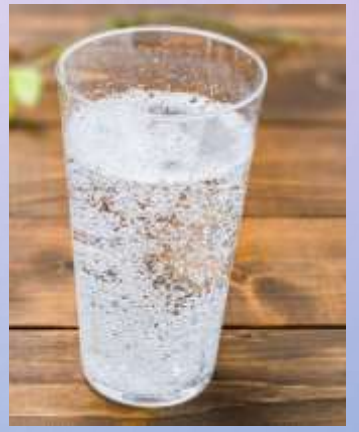
WHY?

Color?
(Wavelengths)



Air bubble?
(Sparkling)



Sugar?
(saturated solution)?

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TEST03: RESULTS (SEN1089)

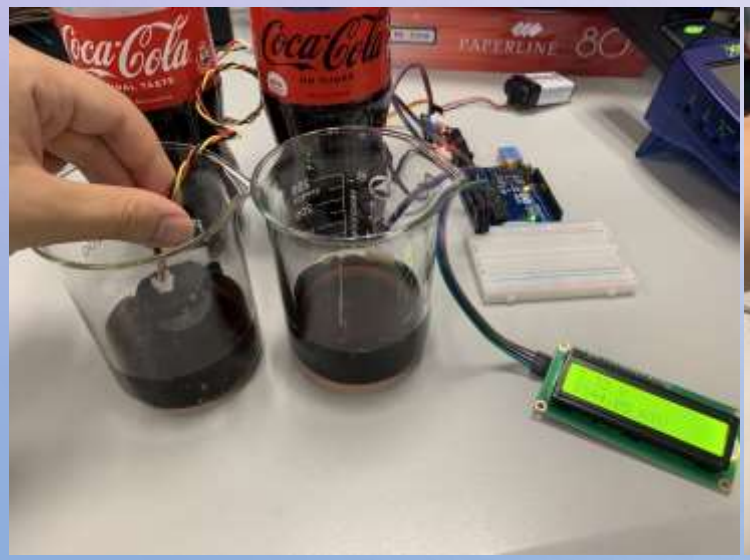
	Coca Cola	Coca Cola (No sugar)	7up
V	3.33	3.30	4.17
NTU	2344.05	2394.63	109.07

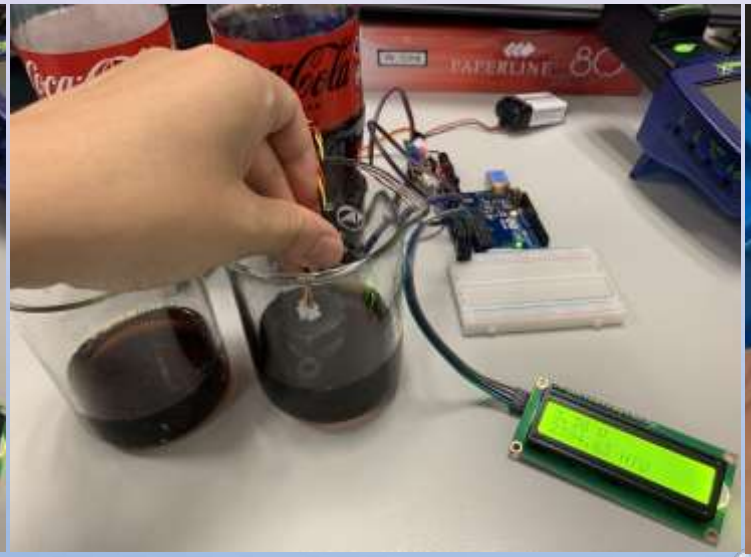
Unstable Reading

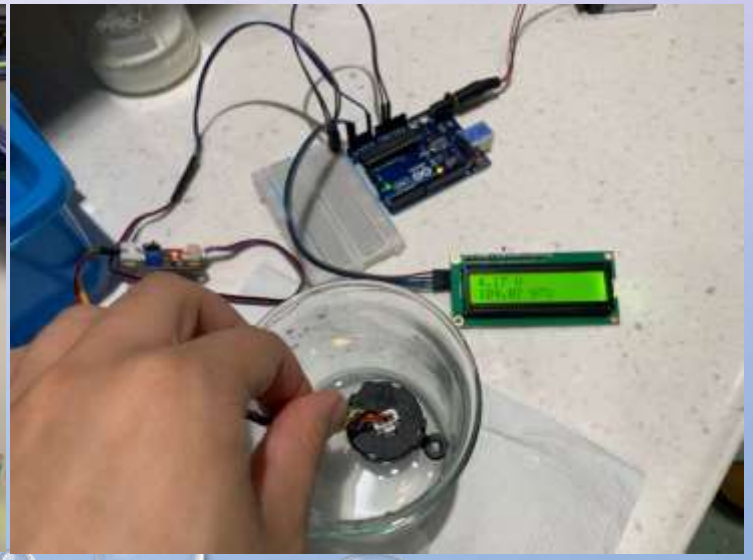
Color? (Wavelengths)

Air bubble? (Sparkling)

Sugar? (saturated solution)?







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REFERENCE: RESULTS (PASCO)

	Turbidity (NTU)
Water (Tap)	0.8
7up	1.8
Coca Cola	2.2
Coca Cola (No sugar)	10.5
Pocari Sweat	58.8
Milk (fresh)	107.2
Milk (Over 24hrs)	318.1

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ISSUE OF USING SEN1089

- Incorrect cable
- Unstable readings
- Only provide relative readings
- Need to re-measure every time
- Shortage in supply