SMART SHELTER

Scientific Inquiry
Micro:bit Program
Math Modelling

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INTRODUCTION:

Build a cooler temporary shelter around our school in Oi Man Estate for

- Construction Site
- Temporary Road Work
- Football Court

Phy. - Scientific Inquiry

Investigate which colour/material has lower heat absorption rate.

I.C.T - Micro:bit

Tracking temperature data with Micro:bit sensor.

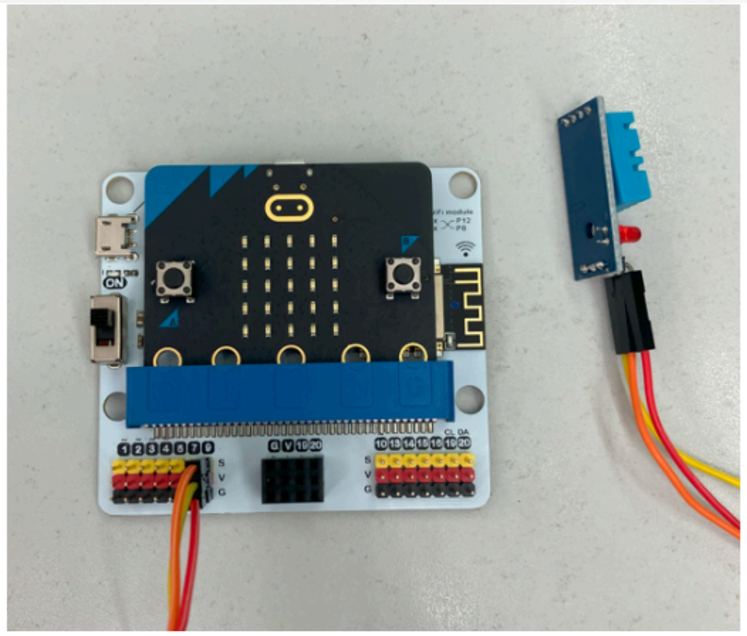
STEM @S3

Math. - Data Analysis

Using best-fit line to model and compare the rate of temperature increase.

Engineering - Build a Model

Build and test the model. Calculations related to the model and the real shelter.



I.C.T. – Micro:bit

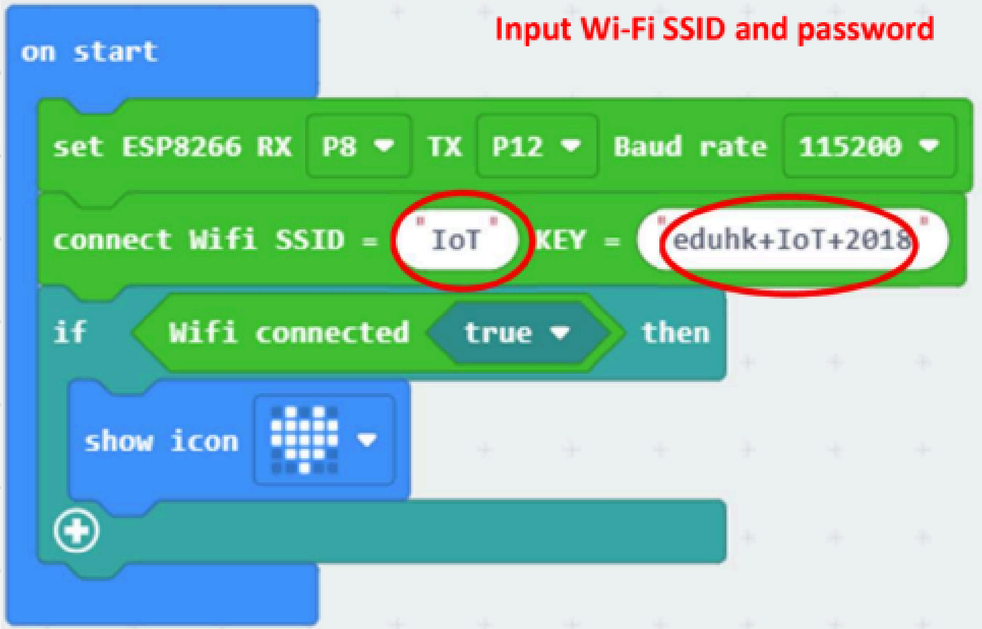
Temperature sensing

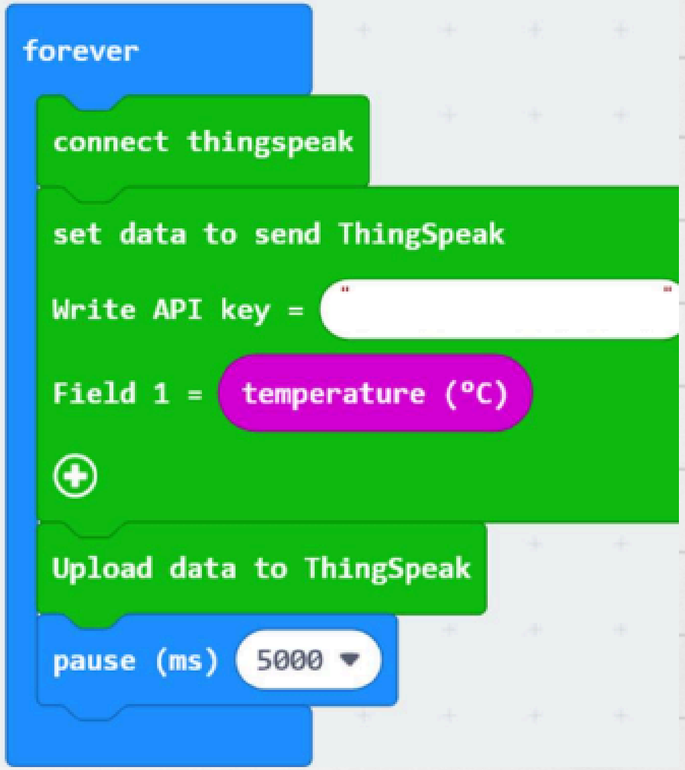
Feb,2024

Teacher Training by EduHK

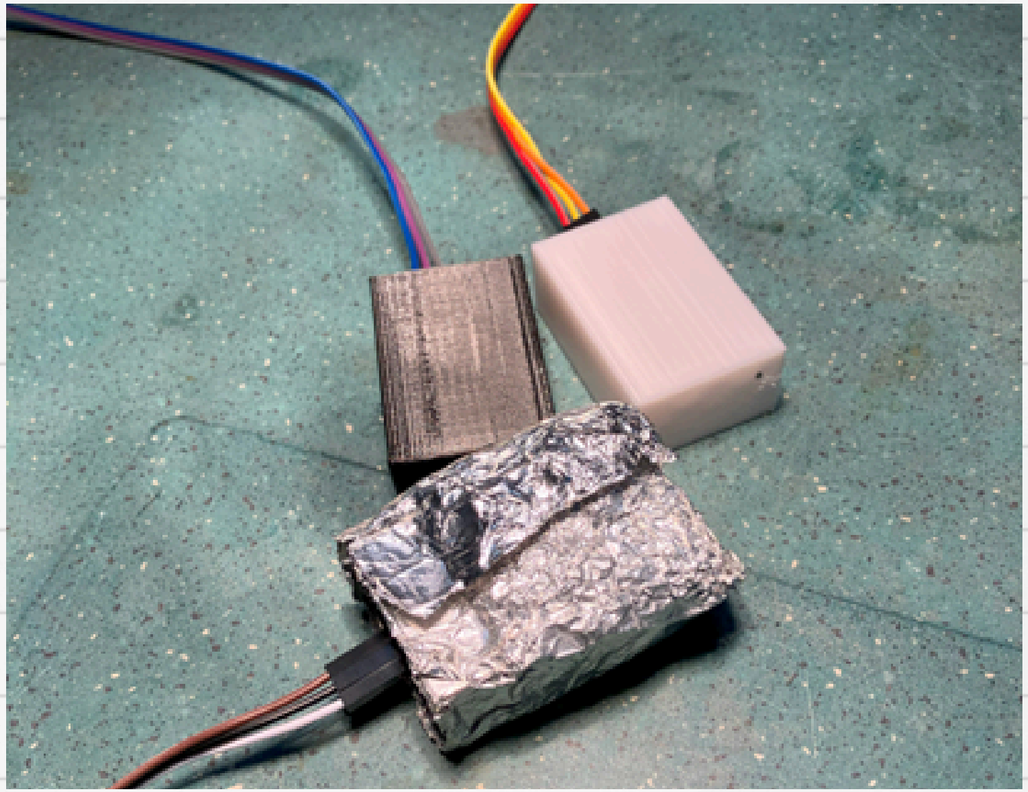
Local storage

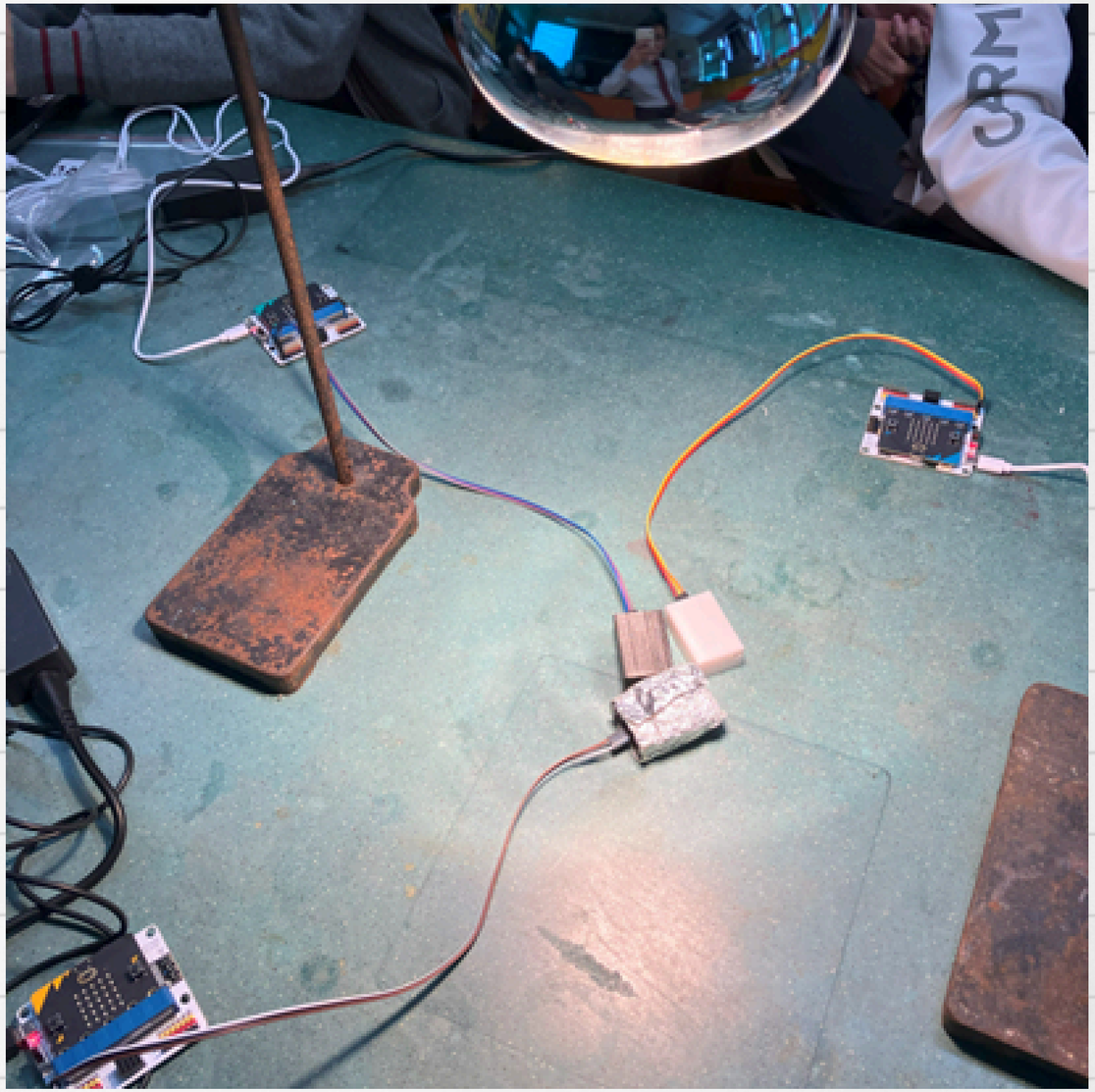
Thingspeak





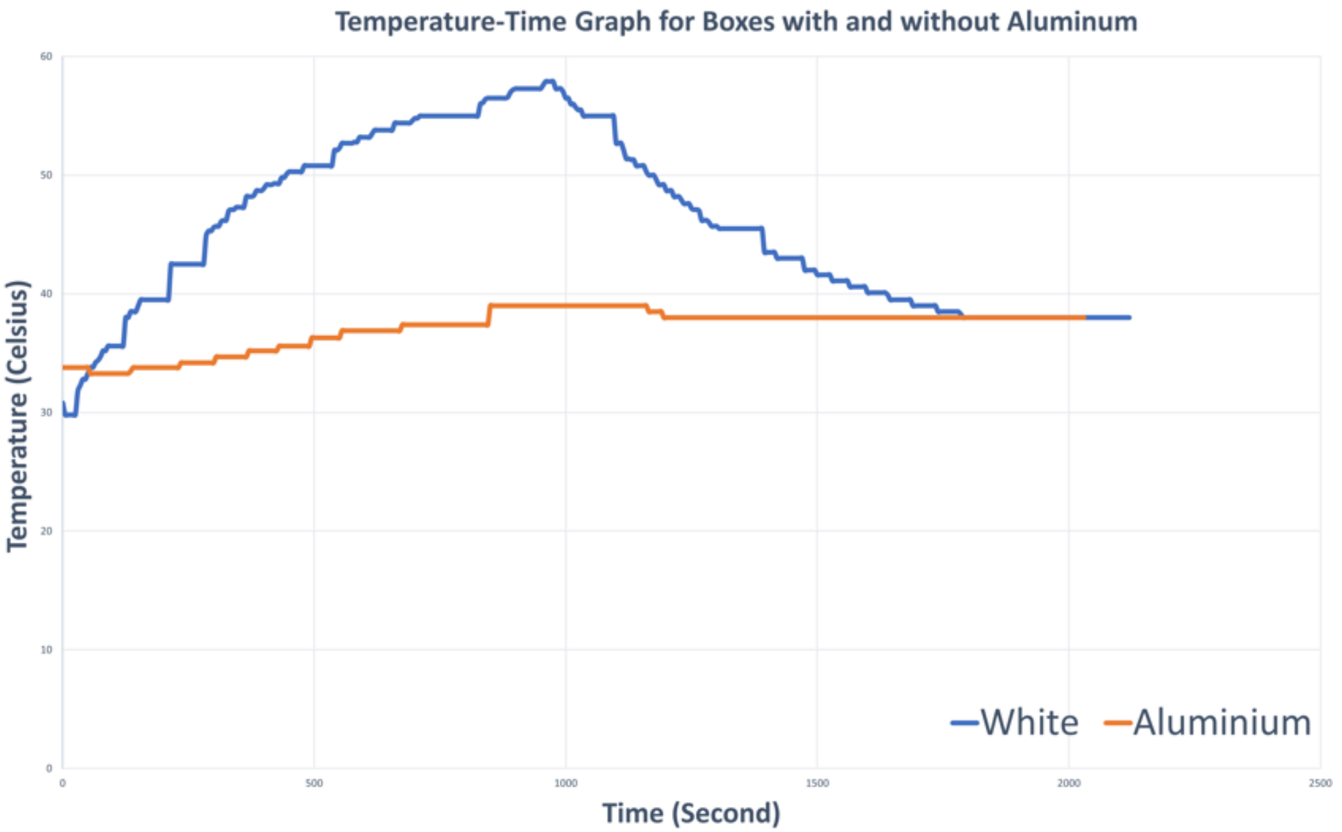
Physics – ICT – Scientific Inquiry Mar,2024





Physics – Math – Scientific Inquiry Mar,2024

Absorption and emission of Radiation



Engineering

- Build a model of Smart shelter
- Maintain temp
- record temp
- any materials
-<$100

May,2024

MATERIALS

Given:

Microbitbit with IoT module

Temperature sensor

Battery pack

What additional materials are required?

PLAN

Sketch your shelter design with size, shape, and materials in mind.

Size limit:

Length and Width: A4

Height: Unlimited

Mark where you'll use insulation, reflective materials, and ventilation.

Decide where to put the temperature sensor.

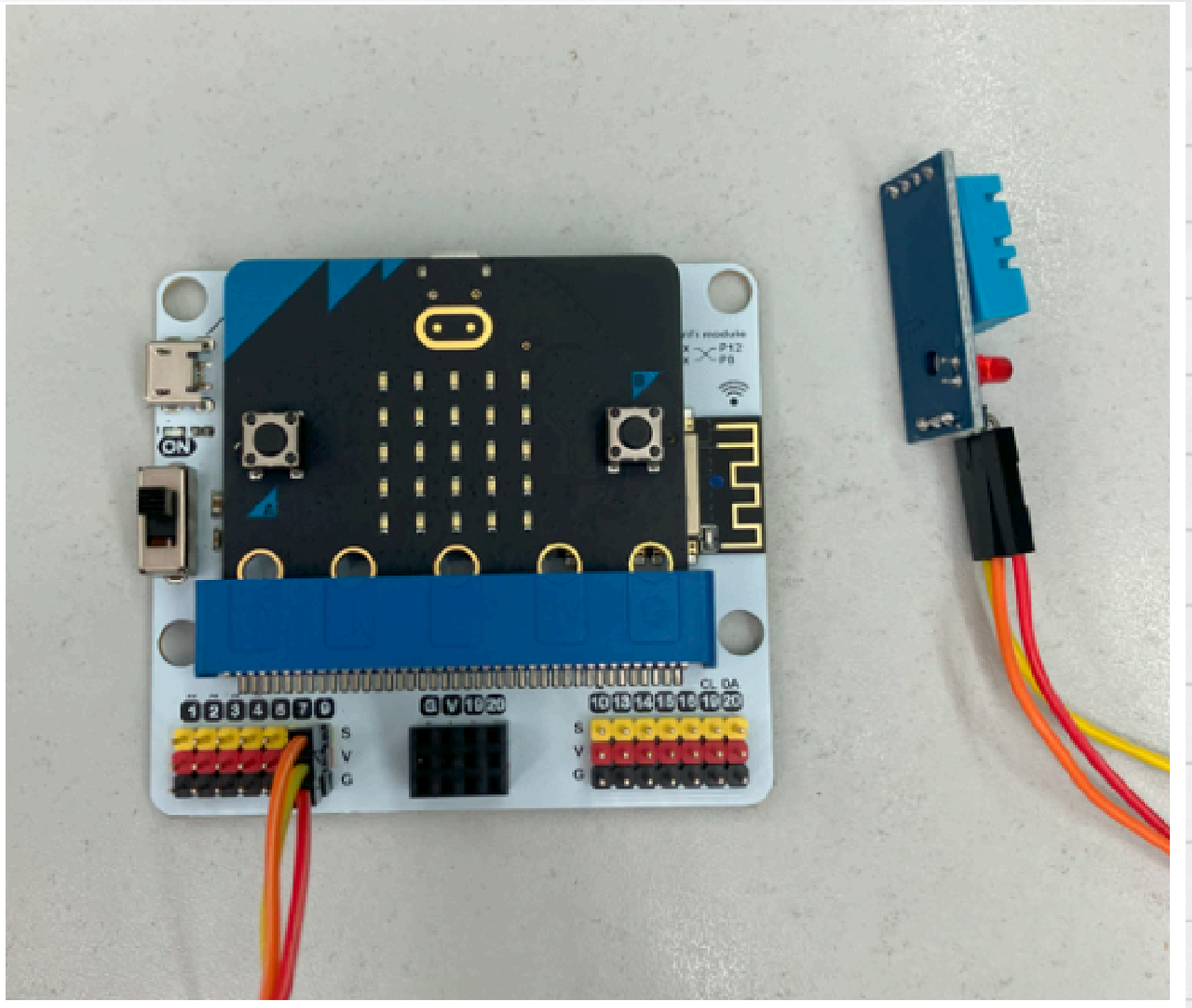
Submit your draft !

Engineering
- Testing
- ~3 hours each day
- ~2 weeks

May,2024

Engineering

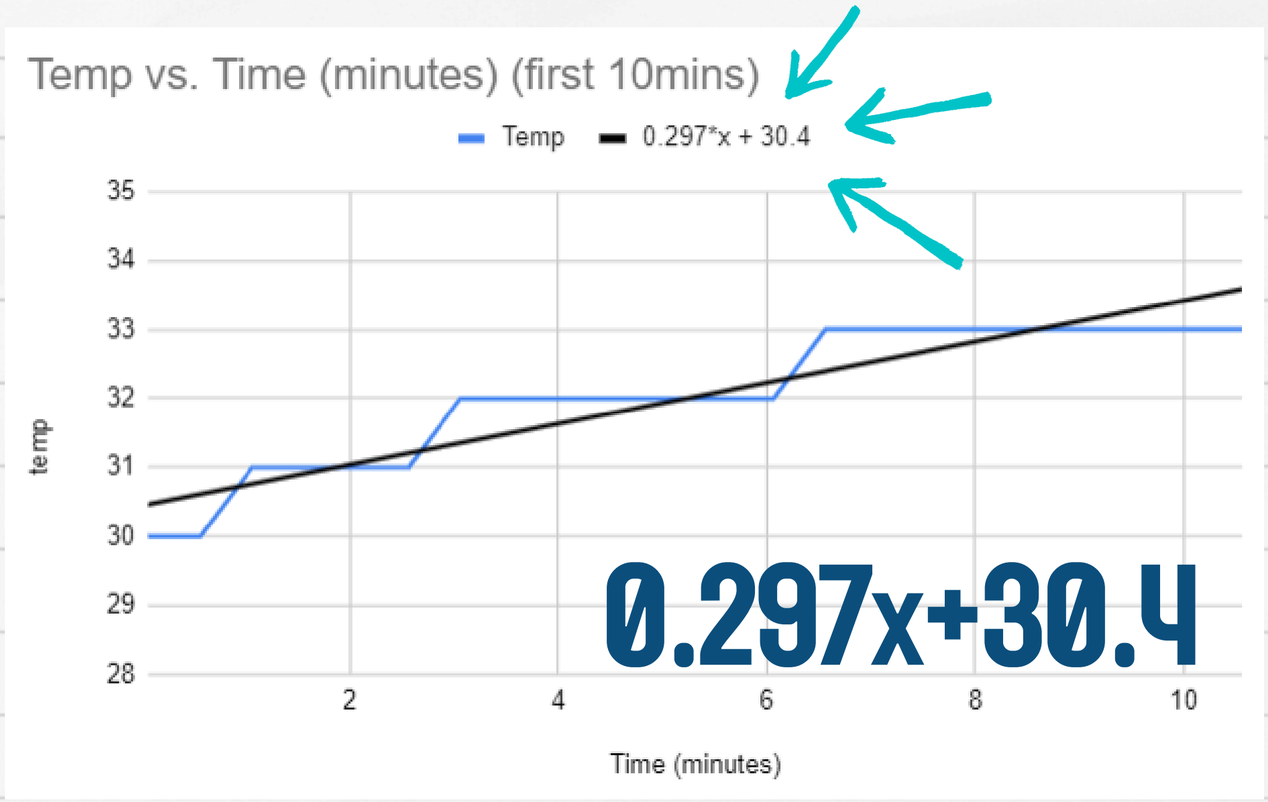
- Testing
- weather
- portable battery

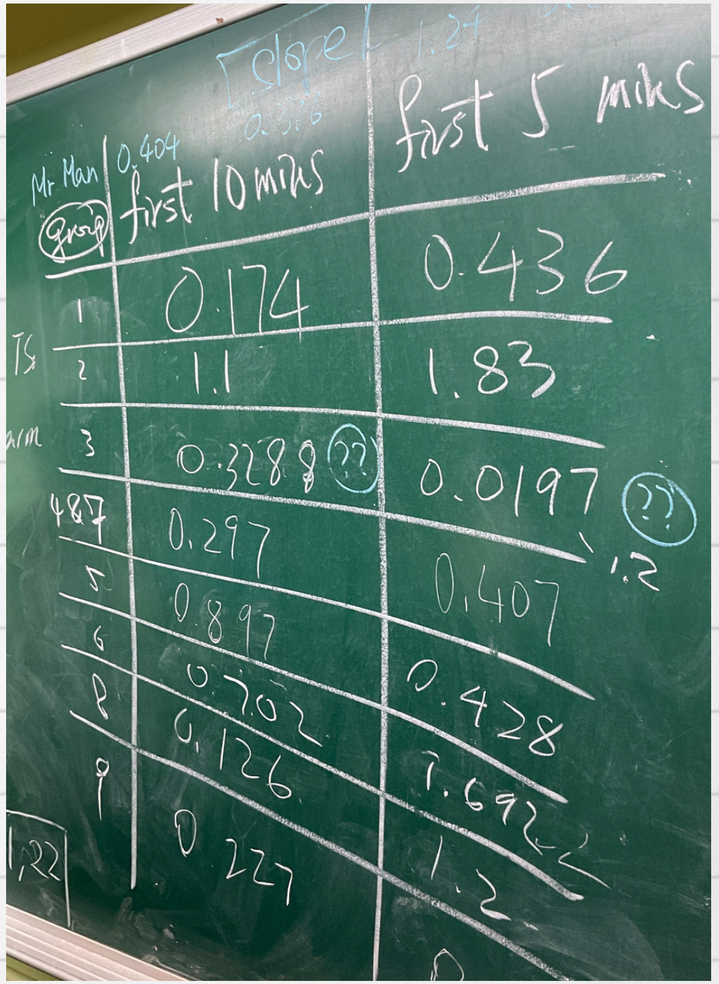


May,2024

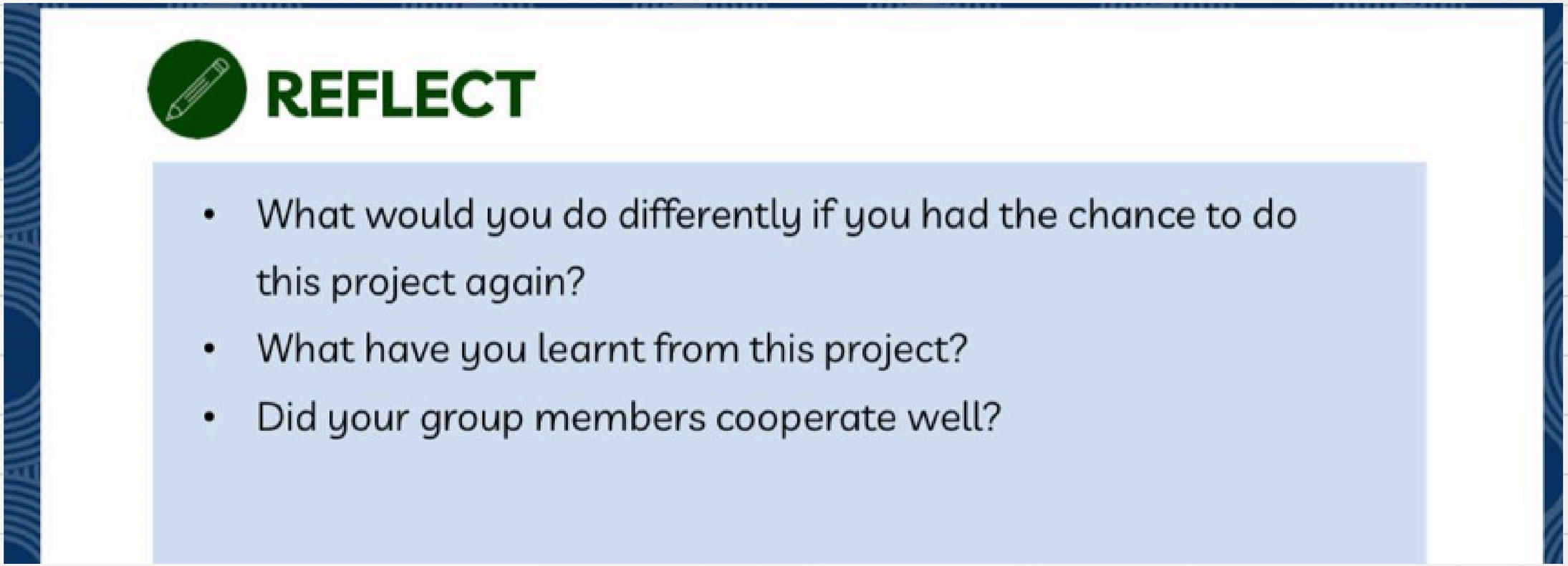
Math. – Data Analysis – google sheet May,2024

e (minutes)	Temp
0.06	30
0.06	30
0.56	30
1.06	31
1.56	31
2.06	31
2.56	31
3.06	32
3.56	32
4.06	32
4.56	32
5.06	32
5.56	32
6.06	32
6.56	33
7.06	33
7.56	33
8.06	33
8.56	33
9.06	33
9.56	33
10.06	33
10.56	33





Digital Logbook for Reflection



Teacher reflection

Schedule

Open-ended

Exam orientated

Appreciation :

EduHK

香港教育大學
The Education University of Hong Kong

FACULTY OF LIBERAL ARTS AND SOCIAL SCIENCES
博文及社會科學學院

2023-2024 Quality Education Fund Thematic Network - Tertiary Institutes

STEAM Education with Self-directed and Progressive Learning of Engineering Design Process for Problem-solving

透過STEAM教育自主及循序漸進學習以工程設計流程解難

物料顏色與散熱速度關係

迦密中學Carmel Secondary School

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CHEN JUN TAO
TANG LI LI

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THANK YOU VERY MUCH!