

Sharing on
enriching junior form students' learning experience
in STEAM-related subjects
with the support from QTN

HO Ka Yee
Homantin Government Secondary School

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STEAM Education

Background

- **Arrangement for junior form students:**
- **In the Curriculum:**
 - no STEAM lessons for junior forms
 - 1 to 2 STEAM books developed for each form
 - conducted in separate lessons by teachers of related subjects
- **As extra-curricular activities:**
 - for selected students and whole forms
 - after-school, post-examination period, etc.
 - both experiential and regular training

STEAM Education

Background

- **joined QTN since September 2022**
- **On-site training workshops for teachers**
 - STEAM Education Team members
 - Interested teachers from STEAM-related subjects
- **Learning and teaching modules / activities**
 - S1: Water purification device
 - S2: Environment-monitoring device
 - S1: Maglev train

Water purification device

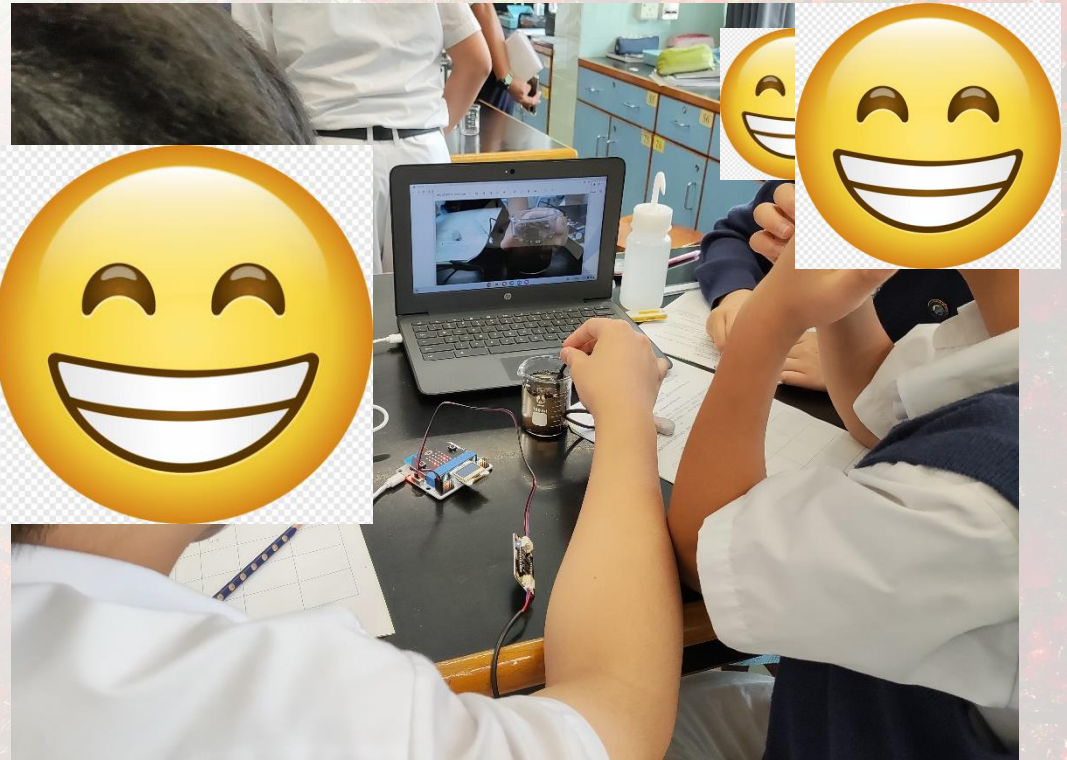
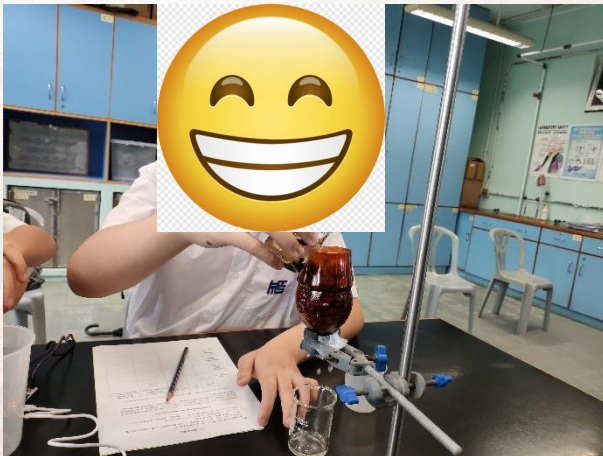
S1 STEAM Book

- **S1 STEAM Book**
 - for all S1 students
 - replacing the original one
 - used in separate lessons by teachers of related subjects
 - April – June 2023
- **Subjects involved:**
 - Computer Literacy: micro:bit
 - Mathematics: percentage change
 - Interested Science: water purification
- **Learning and teaching modules / activities**
 - designing and making a filter column using packing materials provided
 - using TDS probe to measure TDS value of water samples
 - testing whether activated carbon can lower TDS value of water samples

Water purification device

S1 STEAM Book

students testing their filter columns in IS lesson



Water purification device

S1 STEAM Book

online worksheet
completed by
students

Part 2.4 Carrying out investigation

	外觀 Appearance (Descriptions)	氣味 Odour	是否有沉澱物? Any precipitate?	TDS 值 溶解性總固體值 TDS Value (Total Dissolved Solids)	TDS 百分比變化 (寫出計算步驟) Percentage change in TDS (Show your calculation)
泥水 Muddy water	Brown dirty	yes	yes	271	/
你組收集到的 濾液 A Filtrate A collected by your group	Yellow	some	no	270	$(270-271)/271*100\%$ $= -0.37\%$
第 9 組 收集到的 濾液 A Filtrate A collected by group 9	Yellow	no	no	170	$(170-271)/271*100\%$ $= -37.27\%$
你組收集到的 濾液 B Filtrate B collected by your group	Some yellow	yes	no	195	$195/271*100\%$ $= -28.04\%$

Environment-monitoring device

S2 STEAM Workshop

- **S2 STEAM Workshop**
 - for 20 selected S2 students
 - conducted after-school / lunch break
 - May – June 2023
- **Subjects involved:**
 - Interested Science / Computer Literacy
 - Design & Technology
 - Visual Art
- **Learning and teaching modules / activities**
 - making the device and understanding Internet-of-things
 - designing and assembling a wooden case for the device
 - decorating the device

Environment-monitoring device

S2 STEAM Workshop

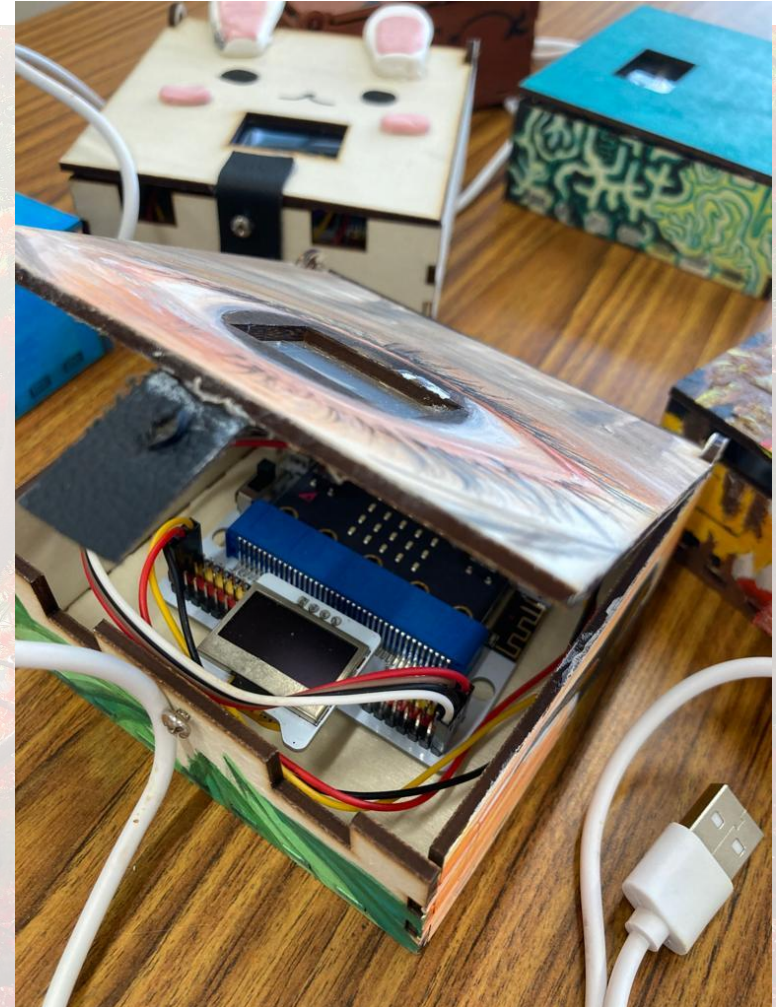


Top left:
making a wooden case
for the device

Top right:
designs of wooden
cases



Bottom left:
design of wooden case



Maglev train

S1 Post-exam activity

- **S1 Post-exam activity**
 - for all S1 students
 - June/July 2023
- **Subjects involved:**
 - Interested Science: conversion of energy, motion (friction)
 - Computer Literacy: micro:bit / IT
 - Mathematics: speed
 - Visual Art: decoration
- **Learning and teaching modules / activities**
 - understanding the development of maglev train in the mainland
 - making and modifying the design of own maglev train
 - measuring the speed of own maglev train with iPad
 - celebrating learning outcome with inter-class competition



Thank you!