

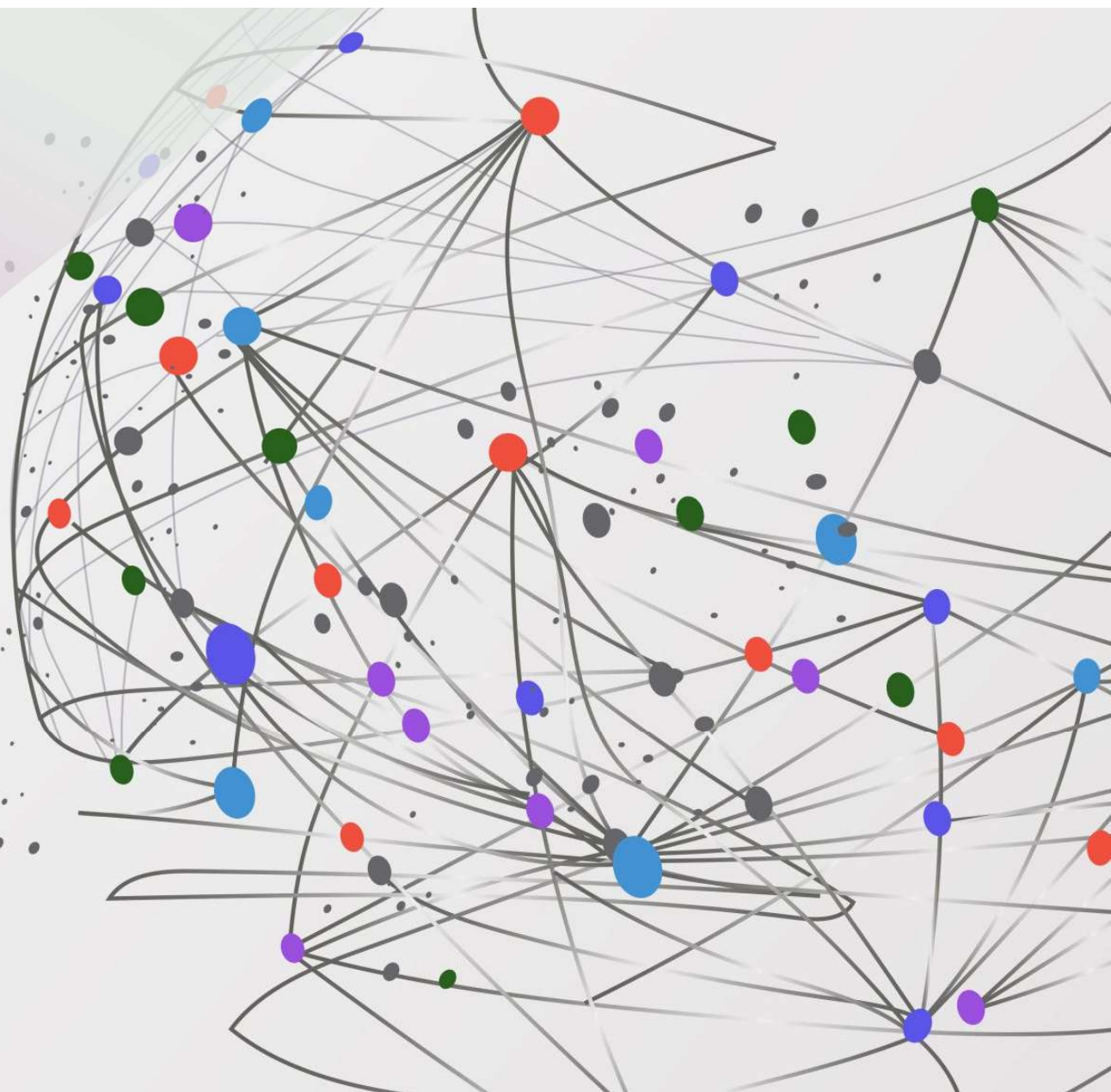
校本 STEM 創客課程分享

Learning & Teaching Expo 2024

2024年12月11日



Pui Tak Canossian College
嘉諾撒培德書院



Pui Tak Canossian College

Canossian Daughters of Charity

Girls' School


200 Peel Rise, Aberdeen, Hong Kong

Mr Lee Kwan Yu 利昆諭主任

- blky@ptcc.edu.hk, 68550536
- STEM & IT in Education Team Coordinator
- Physics Panel Head



Pui Tak Canossian College
嘉諾撒培德書院



聚焦解難、培養創客、讓 **STEAM** 融入至全校的發展細胞中

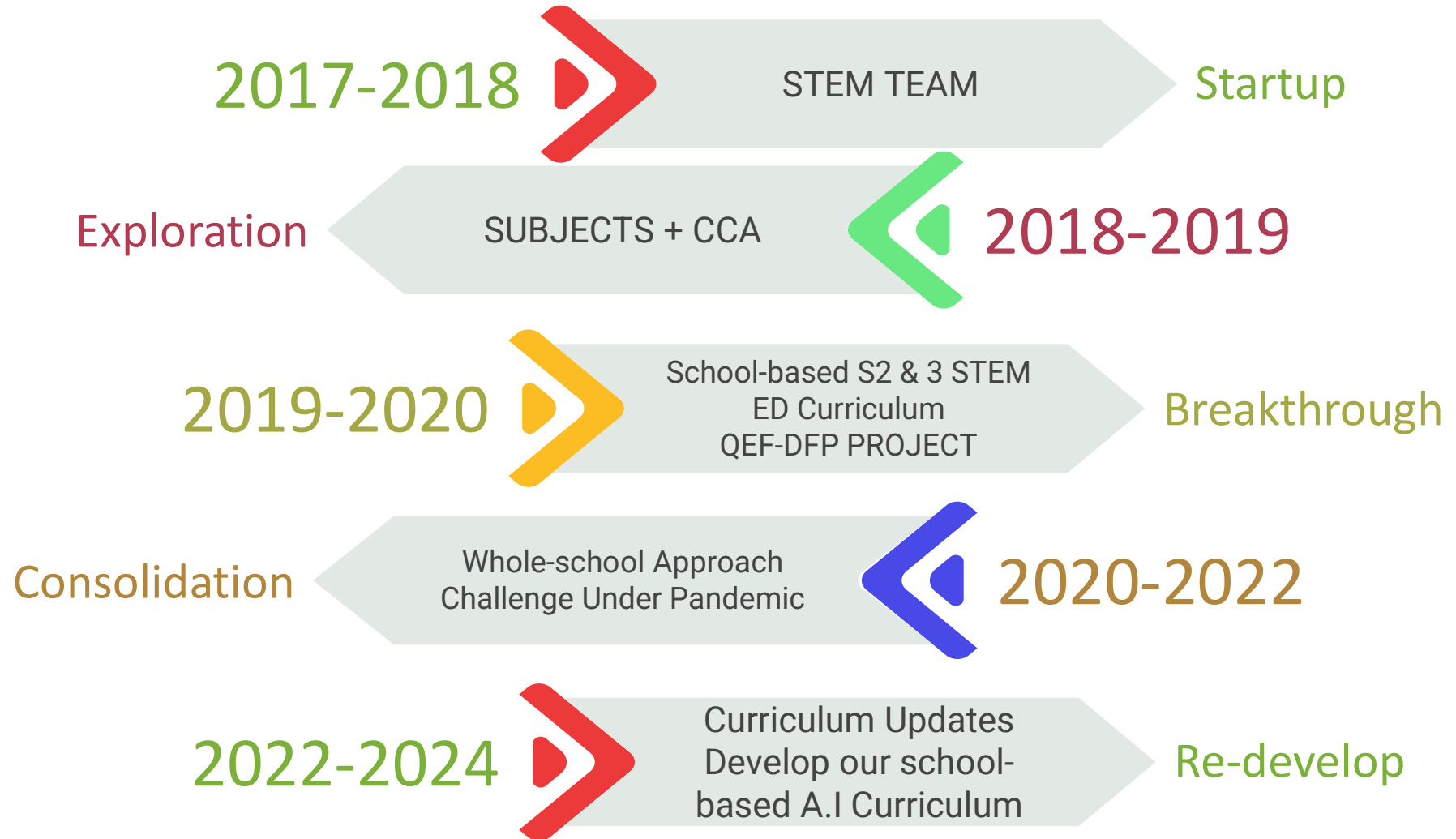
優秀教師選舉2023

「教育管理組」參選報告

Key Takeaways

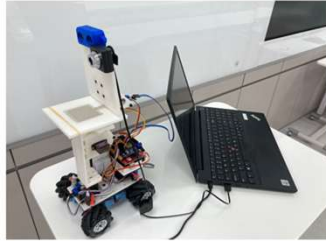
1. STEAM Development in our School; How to develop our school-based curriculum?
2. How to generate various educational ideas? How the ideas evolved from time to time?
3. How to conduct a STEAM lesson? (Objectblocks; Arduino)
4. How to efficiently utilize resources to purchase STEAM-related hardware? (Raspberry Pi)
5. Latest Updates on our STEAM Curriculum (AI and Python)

School-based STEAM Development





智慧學習椅 (AI應用 - Mediapipe)



STEM Class



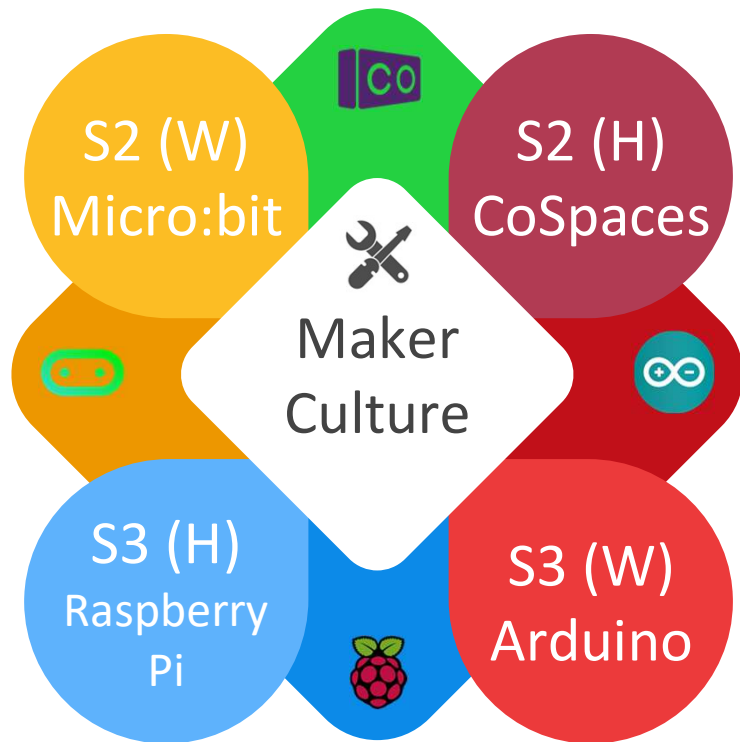
3 Pillars

Competitions

STEM Club




S.2 & 3 Curriculum Overview



Micro:bit
Simple Concepts on Coding & Making

CoSpaces
Game Design
Experience VR & AR

Arduino  **ObjectBlocks**
I-P-S (Cloud)-O + Internet of Things
Train to be a Maker

Raspberry Pi  **Codebooks**
Computer + Python
A center to connect everything

A.I.

- Theory + Experience
- Computer Vision (Extract Features)
- Natural Language Processing
- Generative AI

Information Literacy

Use of AI in Search Engine and Social Media and its Problem

AI Biased





好空氣挑戰賽 3組別19隊伍獲殊榮



嘉諾撒培德書院的隊伍奪得「硬件裝置」金獎。

【本報訊】本港空氣污染情況令人關注，為培養更多精為香港的可持續發展作出貢獻，早前有大學聯同環保團攜手舉辦「好空氣挑戰賽」，參賽中學生透過活動認識氣污染的知識及應對技能，創作自己的參賽作品。頒獎禮及展覽於昨日舉行，由專家組成的評審團在「硬件裝置」、「軟件系統」及「社會及藝術」3個組別中，各出三甲及其他獎項，共19支隊伍獲得優秀殊榮。

Fruitful 2022-2024



“有同學中四已目標到微軟或Google工作”

南區嘉諾撒培德書院着重學生「動手做」 疫情下堅持理念 包裝STEM套件寄同學上網課



嘉諾撒培德書院
黃少玲校長



“希望將STEM知識 應用到醫護界工作之中”

女校生齊玩STEM數年 最享受比賽成功感 大學不選理工科：相信未來所有職業都與創科有關

嘉諾撒培德書院
學生柯曉晴





嘉諾撒培德書院
Pui Tak Canossian College

ENG | 中文

IT in Education Technological Series

Using Microcomputer Sets and Mobile Computer Devices to Develop Students' Problem Solving and Coding Skills (Advanced Level)

12 June 2019
22 February 2019
Pui Tak Canossian College
Mr Ho Cheuk Pun John




嘉諾撒培德書院
Pui Tak Canossian College

ENG | 中文

STEM (ARDUINO, IOT)

IT in Education Technological Series: Using Microcomputer Sets in Internet of Things in STEM Education Related Learning Activities at Junior Secondary Levels (Advanced Level)

12 April, 2021



嘉諾撒培德書院
Pui Tak Canossian College

ENG | 中文

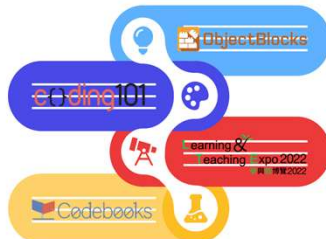
STEM (RASPBERRY PI)


IT in Education Technological Series: Using Single Board Computer in STEM Education and Construct a Maker Culture at Junior Secondary Levels (Advanced Level)

3 August, 2022

The Seamless Articulation Pathway for the Junior to Senior Python Learning (From STEAM to New ICT Curriculum)

無縫銜接的初高中 Python 學習



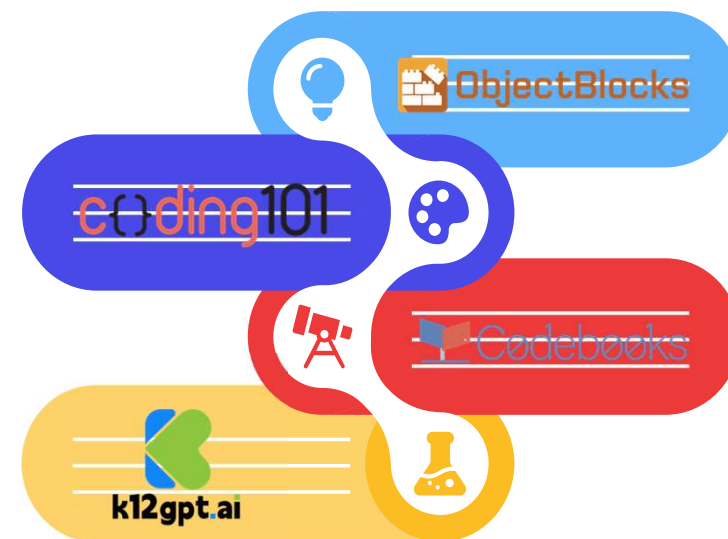
 Pui Tak Canossian College 嘉諾撒培德書院
L&T Expo 2022

Ho Cheuk Pun John
Assistant Principal
7 December 2022

Explore how to bridge the gap between the Junior STEAM Python and the new ICT curriculum learning.

生成式 AI 技術在教育界的實踐與應用 教師分享暨工作坊

生成式 AI 如何革新
教育方法和學習過程



Ho Cheuk Pun John
Assistant Principal
2 May 2024

Pui Tak Canossian College 嘉諾撒培德書院

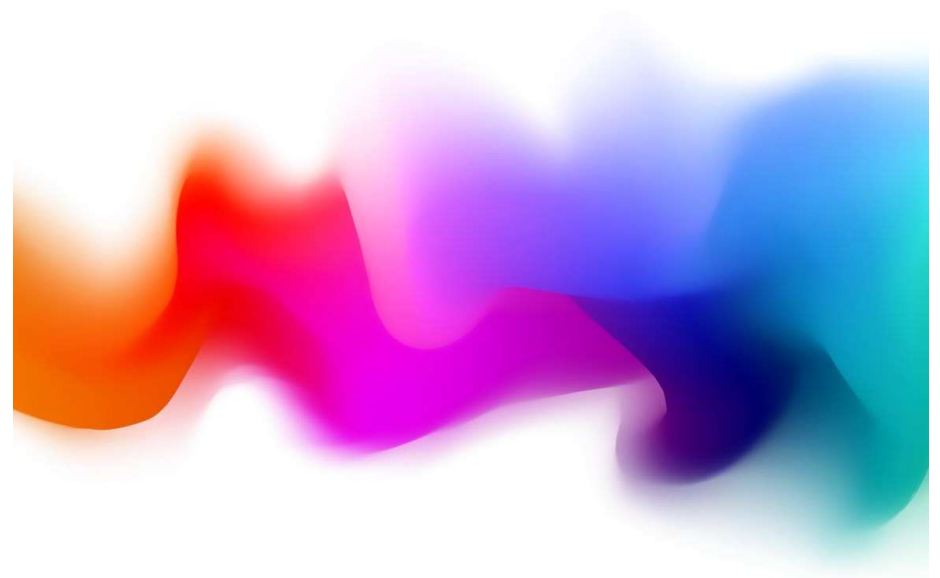


IT in Education Technological Series – How to teach Module on Artificial Intelligence for Junior Secondary Level through various online resources? (Advanced Level)

資訊科技教育科技系列 – 如何使用各種網上資源教授初中人工智能課程單元？(進階)

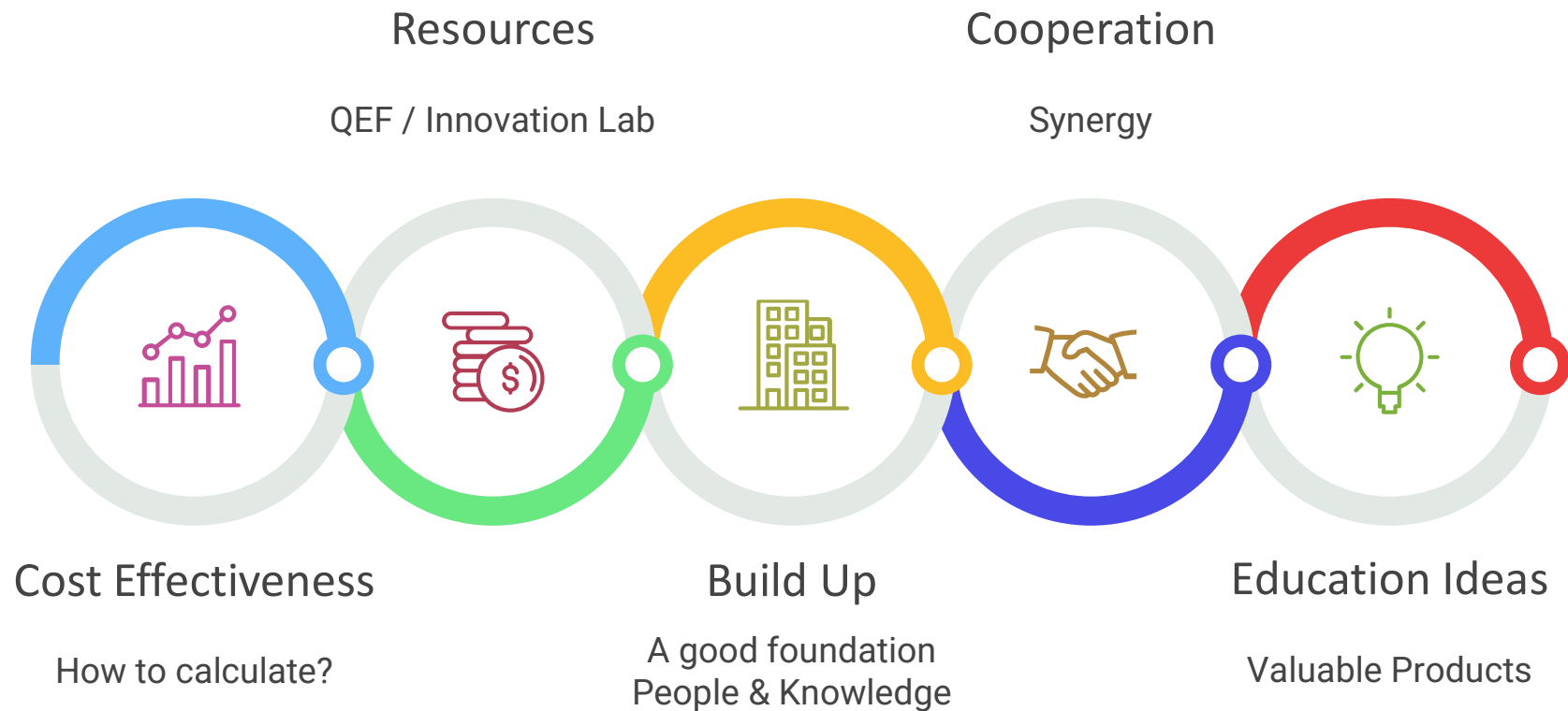
6 June 2024 (14:30 – 17:00)

EDB Ed. Centre E419



Pui Tak Canossian College
嘉諾撒培德書院

Partnership with HK Innovative Company



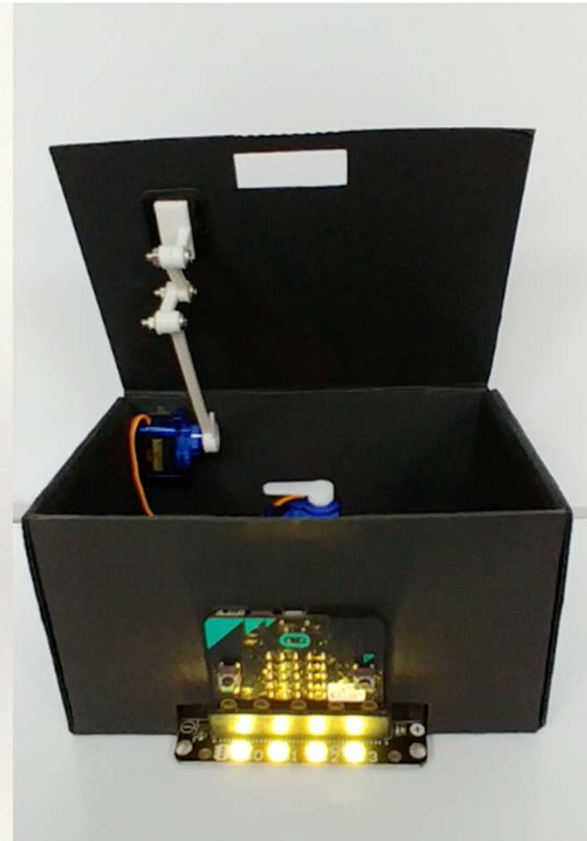
Educational Ideas – Students' Interest & Needs

What are education goals?

2018 - 2019 S.2 LACP

The IDEA

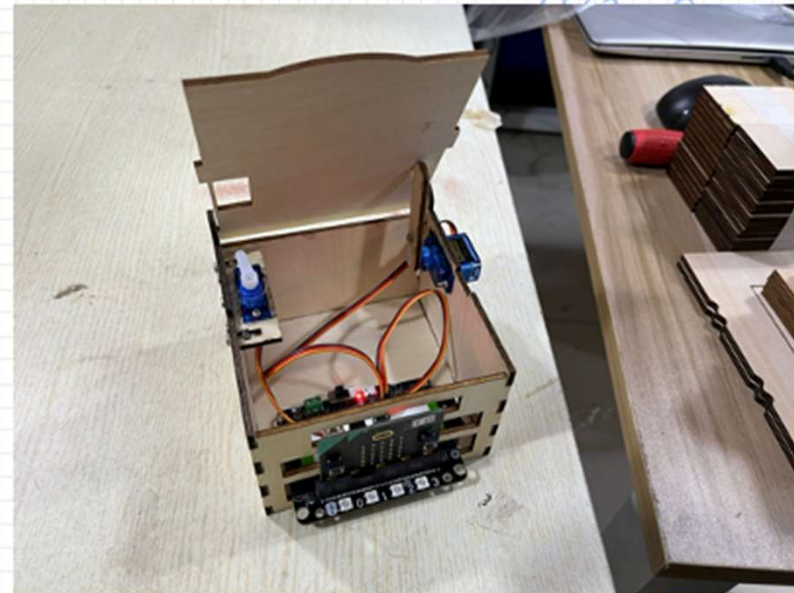
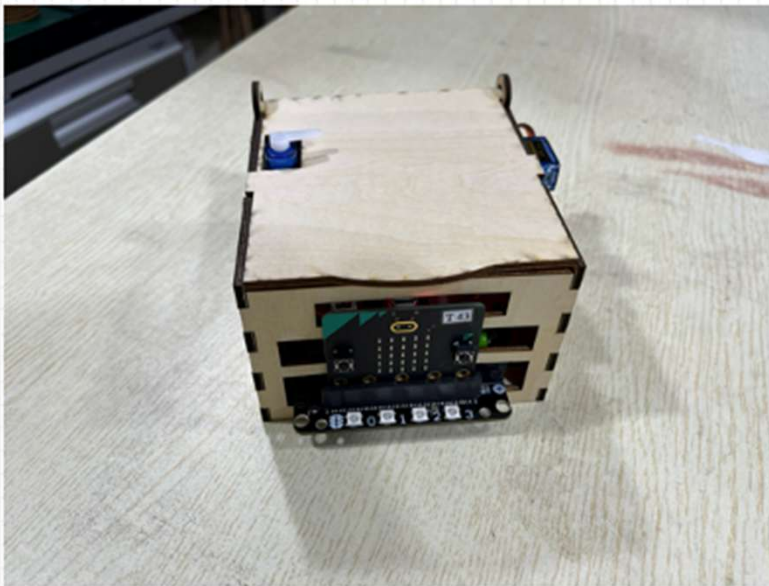
- ❖ The formation of the idea
 - ❖ Inspiration from the sharing of Mr Kwok Tsz Fung (Tin Ka Ping Secondary School)
- ❖ Discussion with STEM Team
 - ❖ Reflection on the experience of 2017 - 2018
- ❖ Help from 3D JollyFab
 - ❖ Hardware & Software Support



Educational Ideas – Students' Interest & Needs

How the ideas evolved?

禮物盒製成品



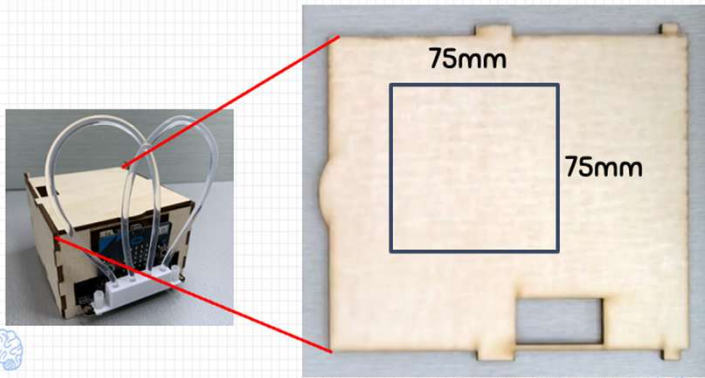
Educational Ideas – Students' Interest & Needs

How to further develop on the foundation?

Creating Graphics for Engraving 創作雕刻圖像 Micro:bit GIFT BOX 禮物盒

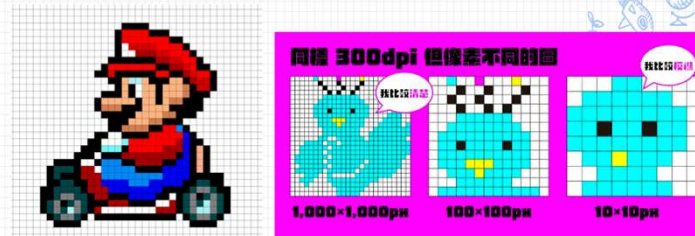
Laser Cutter Engraving - 2

Engraving size 雕刻尺寸



What is Pixel? 何謂像素?

Still remember Pixel Art? 還記得像素藝術嗎?

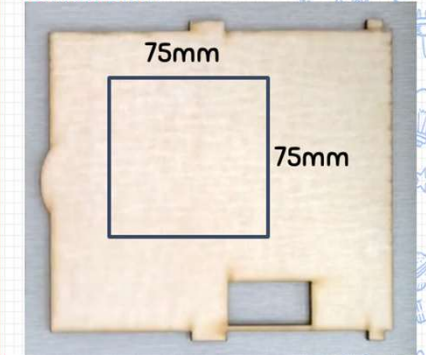


越多的pixel格子越能畫出精緻的畫

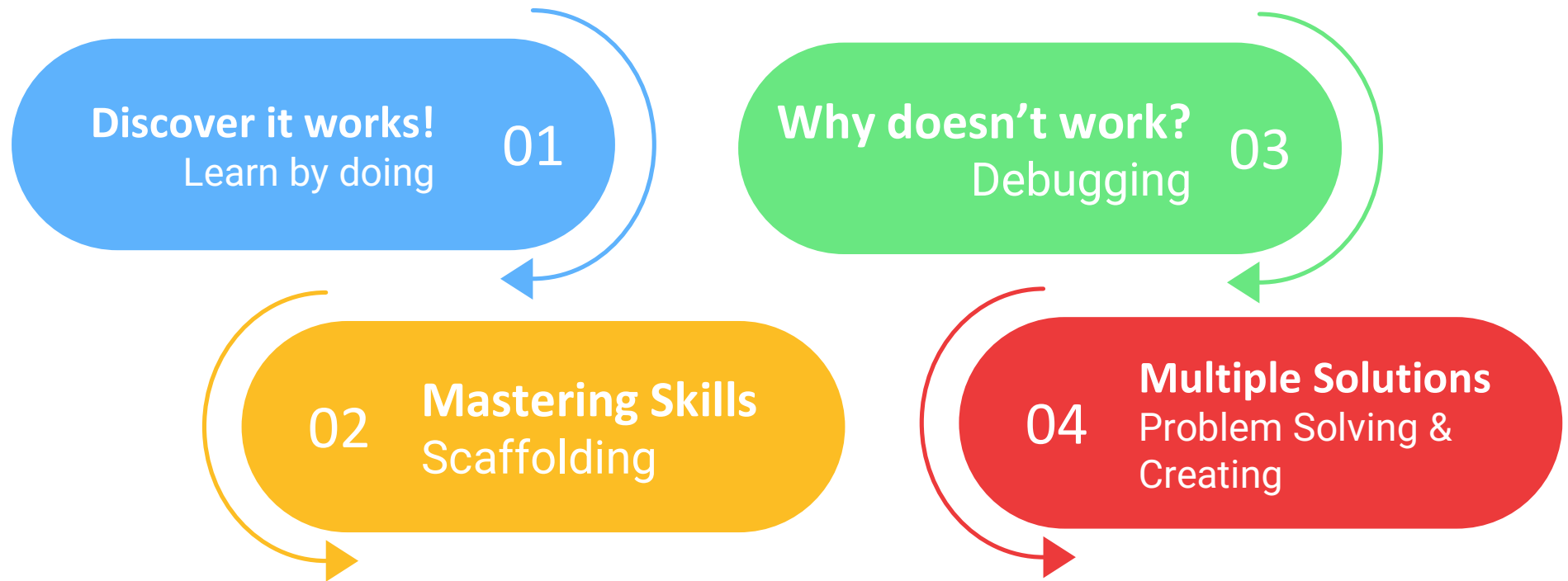
Required Engraving resolution
所需的雕刻像素
250 ppi / dpi



Engraving size 雕刻尺寸
75mm x 75mm



Teaching with the learning STAGES in mind



The background is a textured, light brown color. In the top-left corner, there is a dark brown pipe with two orange-colored fittings. In the top-right corner, there are several interlocking gears in shades of orange and yellow. In the bottom-left corner, there is a large, faint gear. In the bottom-right corner, there is a dark brown pipe with two orange-colored fittings.

LESSON STRUCTURE (50 MINS)

INTRODUCTION

5 minutes

DEMONSTRATION

10 minutes

MATERIALS & TASKS

5 minutes

HANDS ON WORK

20 minutes

WORK SUBMISSION

5 minutes

CONCLUSION

5 minutes

GOOGLE CLASSROOM

3B STEM (全班) 2020-2021 Stream **Classwork** People Marks

[+ Create](#) [Meet](#) [Google Calendar](#) [Class Drive folder](#)

- [Lesson 12 - Two Boards Communication](#) Posted 26 Mar
- [Lesson 13 - Demonstrate IoT application...](#) Edited 22 Mar
- [Lesson 11_01 IoT 01 \(Inspect Your Home ...\)](#) Edited 12 Mar
- [IPO Application 3 \(Potential Meter & Servo ...\)](#) Posted 15 Jan

[IPO Application 2](#) Due 21 Dec 2020, 08:00

Posted 18 Dec 2020 (Edited 15 Jan)

11	17
Handed in	Assigned

(2020-2021) Lesson 07.1-...
Google Slides

ServoMotorTask3B.mov
Video

[View assignment](#)

3B STEM (上:1-14) 2020-20... Stream **Classwork** People Marks

[+ Create](#) [Meet](#) [Google Calendar](#) [Class Drive folder](#)

- [Python Coding \(03\) - Font](#) Edited 22 Mar
- [Python Image Manipulation 02](#) Edited 8 Mar
- [Python Image Manipulation](#) Edited 8 Mar
- [Python Coding Calculation \(02\)](#) Edited 15 Jan
- [Python Coding Introduction \(01\)](#) Edited 15 Jan

[Switch On Raspberry PI & take a photo](#) Edited 15 Jan

No due date

0	0	14
Handed in	Assigned	Marked

(Half Class) Lesson 02 Ca...
Google Slides

[View assignment](#)

- [Create IFTTT Applet](#) Edited 15 Jan

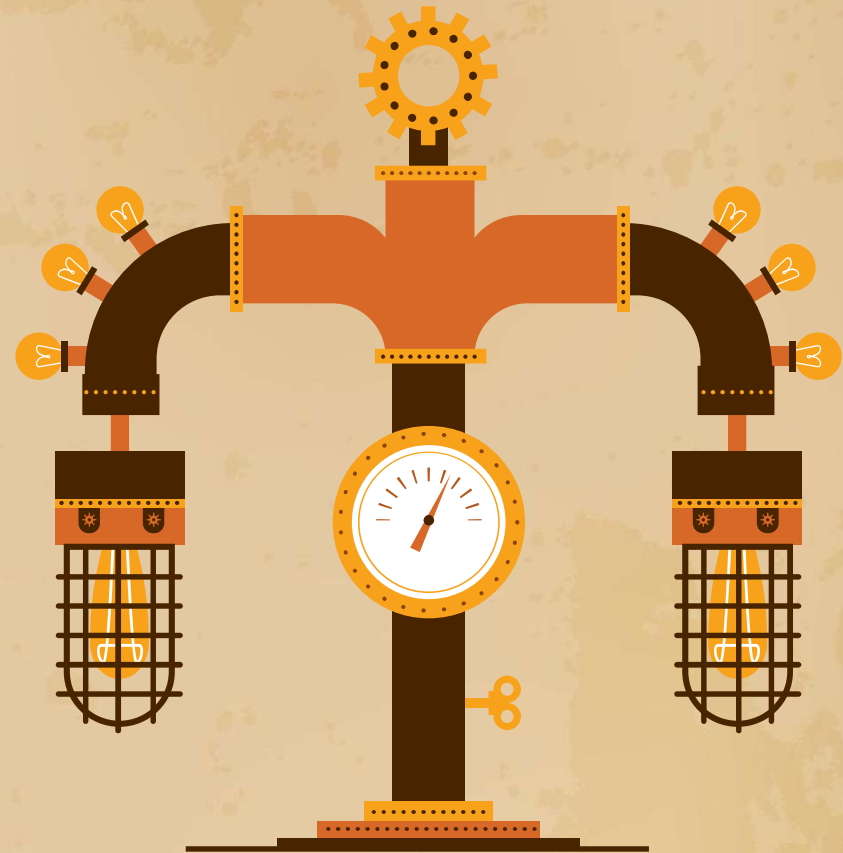


Celebrate Every
Tiny Victory

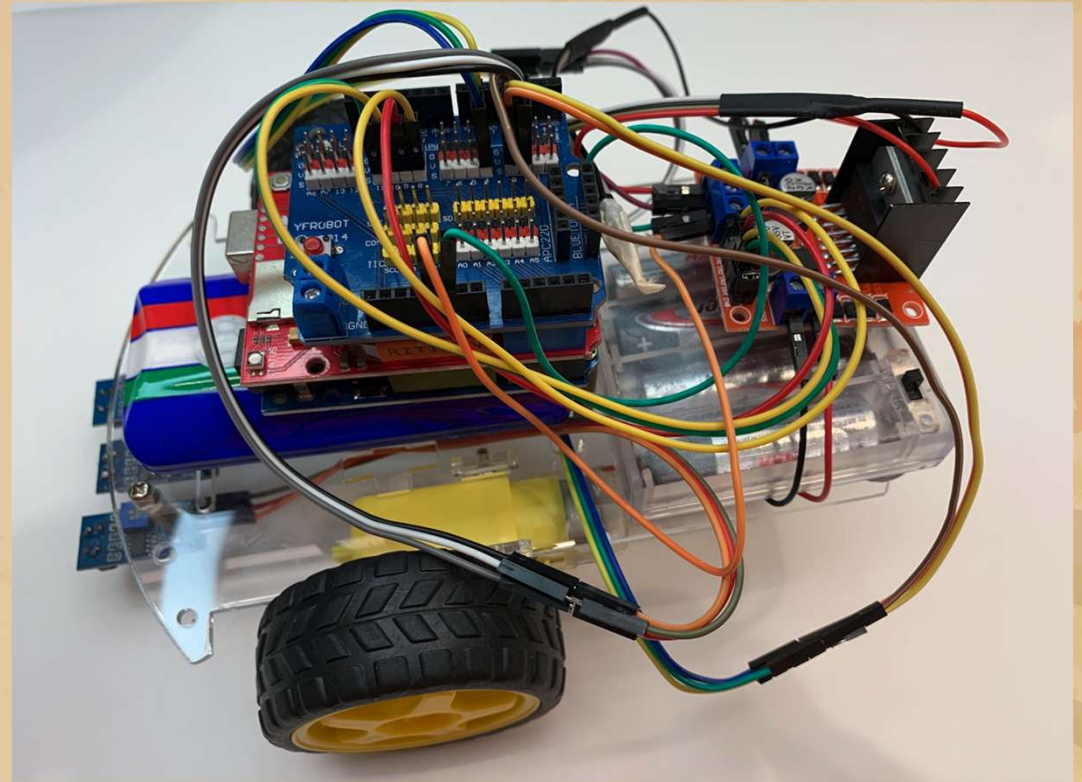
– Manoj Jain

WHY ARDUINO & OBJECTBLOCKS?

- An upgrade from Micro:bit
- Maker Culture
- Extensible
 - Resourceful
 - Parts from Taobao
 - Connect the future studies
- Manageable
 - BYOD (Platform on Tablet)
 - Password Issue
- Internet of Things (IoT) compatible



OBJECTBLOCKS CAR - PARTS FROM TAobao



CREATE YOUR OWN IPO APPLICATION

INPUT輸入

- Button 按鈕
- Potential Meter 電位器
- Temperature Sensor 溫度感應器
- Humidity Sensor 濕度感應器
- Light Sensor 光度感應器
- Obstacle Sensor 障礙物感應器
- Water Level Sensor 水位感應器
- Sound Sensor 聲音感應器
- Ultrasonic Sensor 超音波感應器

OUTPUT輸出

- Servo Motor 伺服馬達
- LED 燈
- Buzzer 蜂鳴器
- 7-Segment Display
- LCD 16x2

IPO application

INPUT
輸入

1. Button 按鈕
2. Potential Meter 電位器
3. 感應器
- 溫度、濕度、光度、障礙物
- 水位、聲音、Ultrasonic測距.....

Process
處理邏輯

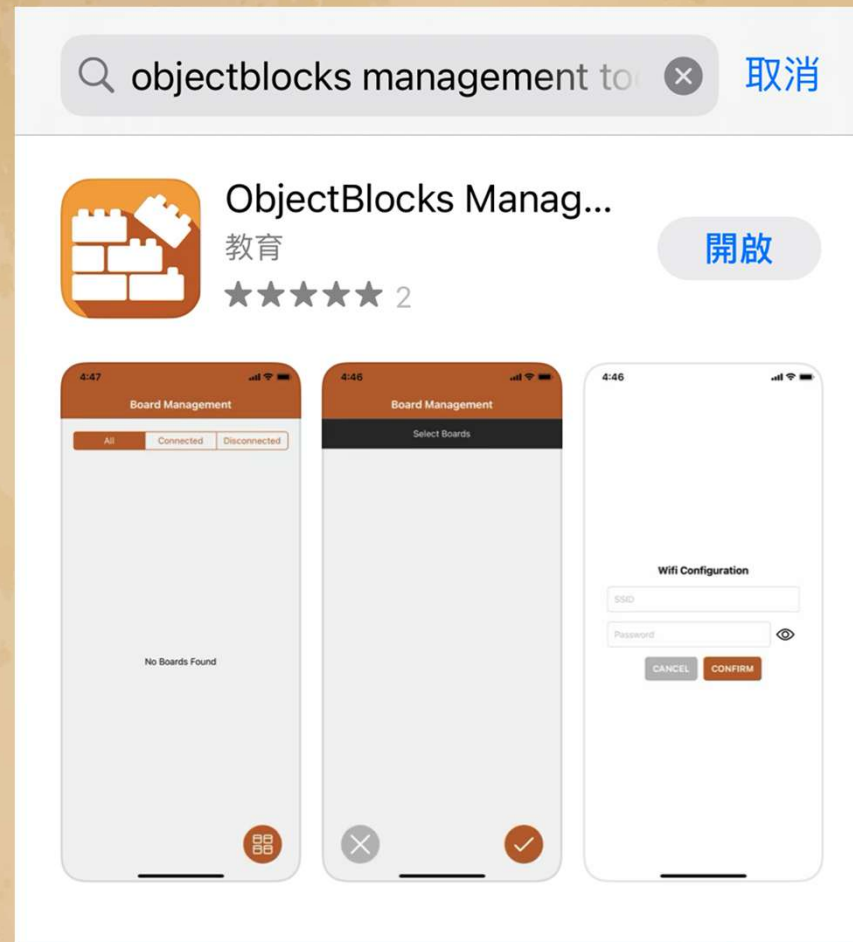
如果
感測溫度
超過
100度
蜂鳴器發
出响聲

OUTPUT
輸出裝置

1. Servo Motor 伺服馬達
2. LED 燈
3. Buzzer 蜂鳴器
4. 7-Segment Display
5. LCD 16x2

水滾提醒器

MANAGEMENT TOOL - HOW IT WORKS?





STEM Lesson 08 (量度任務)

班別: __ (__)

姓名: _____

問題一

量度不同的冷氣機出風口位的溫度:

1) 溫度 (High Cool 8) = 6 度



2) 溫度 (High Cool 5) = 17 度



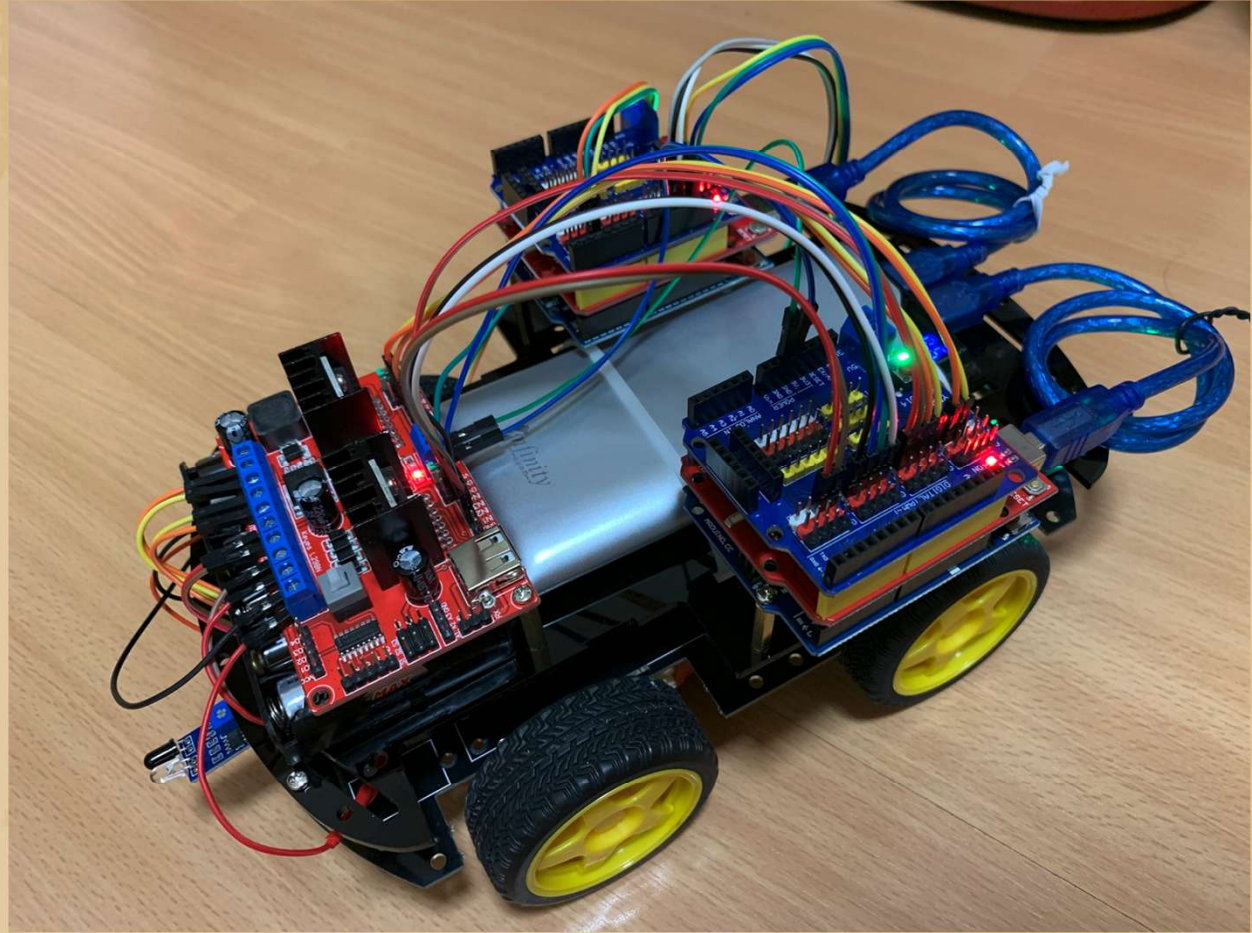
3) 溫度 (Low Cool 9) = 10 度

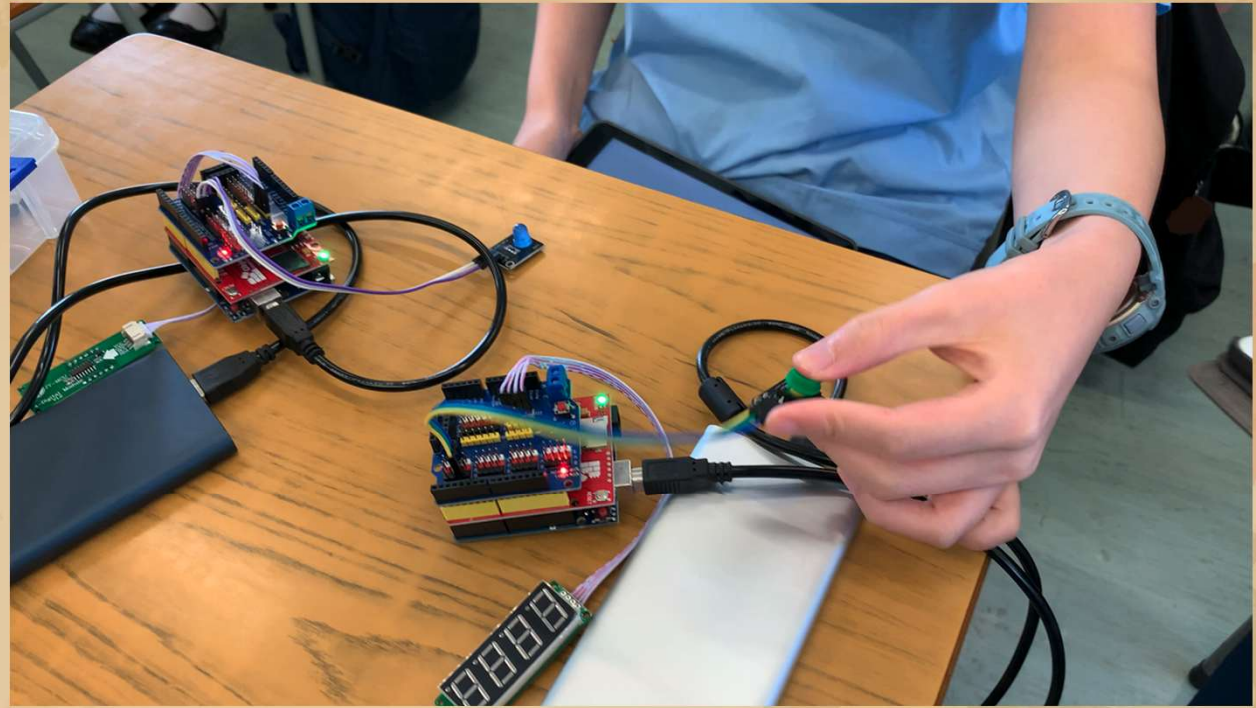
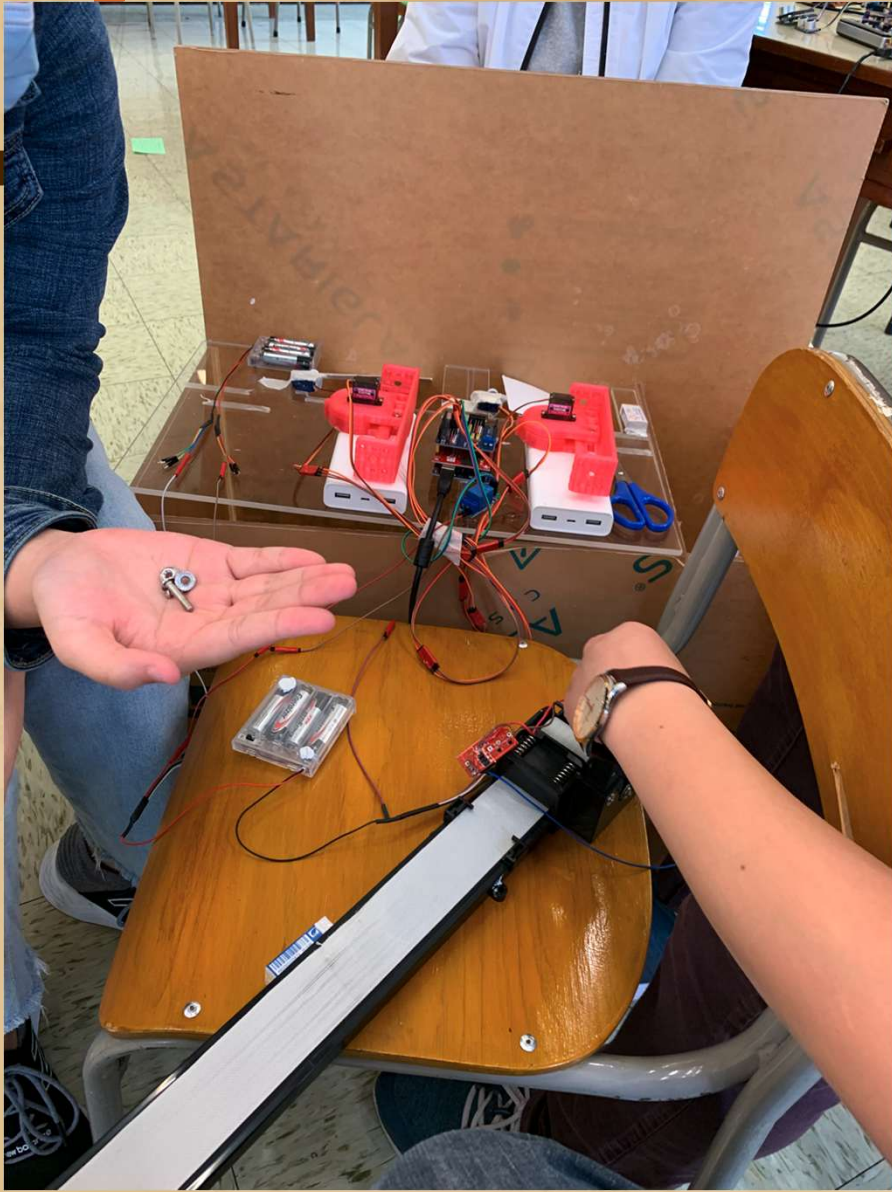


4) 溫度 (Low Cool 6) = 10 度

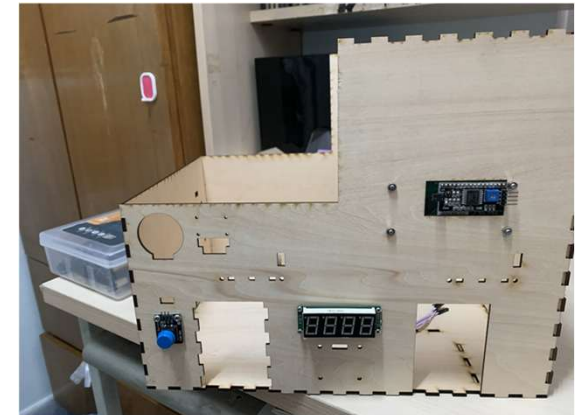
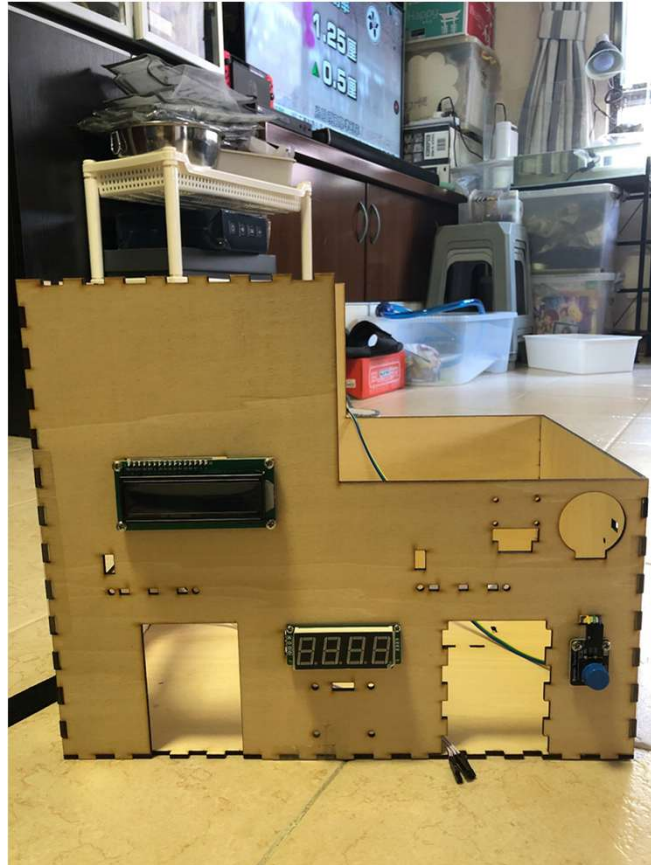








Maker Spirit: Persistent under pandemic



STEAM 教育博覽會 2022 Education Fair

激發創意思維
Inspiring Creativity

推動科技創新
Promoting Innovation

開幕禮暨座談會

2022年11月26日
9:00am
線上直播



詳情及線上平台
steamedufair22.hk

線上博覽會

2022年11月26日至
2023年1月31日

線上學校展覽，主題包括：
自動化設計、人工智能、大數據、
可持續發展 及 智慧生活

線上講座及工作坊，內容包括：
農業科技、資訊系統的應用、
藝術科技 等

S43

嘉諾撒培德書院

中學 Secondary School

智慧生活 Smart Living

人工智能 Artificial Intelligence

自動化設計 Automation Design



這裡包含了所有中二、中三 STEM 教育科內所學的概念，包括：

關於本攤位

關於本攤位

培德智能家居

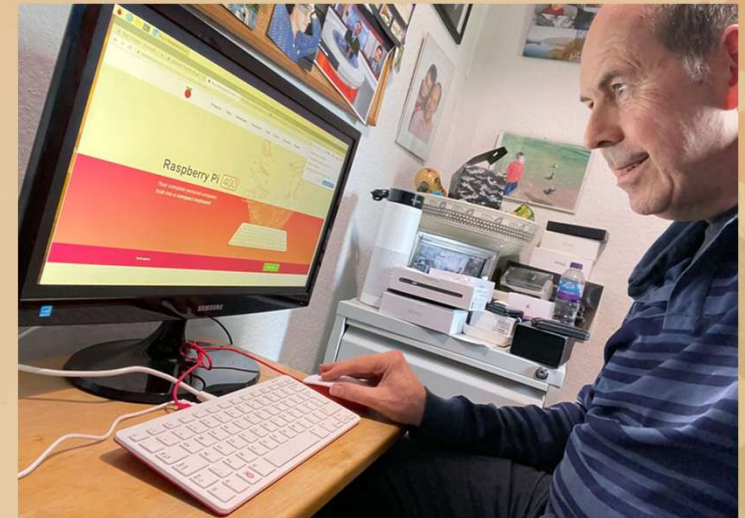
培德智能家居 - 以 Arduino, Objectblocks 和 Raspberry Pi 為基礎所設計的智能家居。除了各種的自動感應設備，小屋更配置了智能送貨區。現在網購盛行，智能送貨區能讓屋主遙距辨識送貨員的身份，且以即時生成的密碼讓他進入送貨區放下物件，達成無障礙交收！



送貨員只要 Scan 門口的 QR Code，再利用即時生成的密碼

What is a raspberry pi?

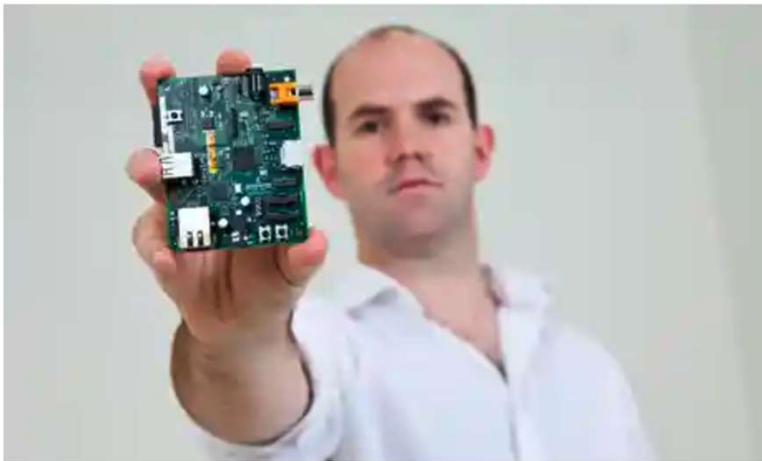
SINGLE BOARD COMPUTER



RASPBERRY PI - FOUNDED BY EBEN UPTON (2012-2-29 ON SELL)

Demand for Raspberry Pi, the British £22 computer, crashes website

Design intended to inspire schoolchildren and adults to program sees overwhelming demand as first versions go on sale



▲ Engineer Eben Upton with an earlier prototype of the Raspberry Pi computer, which is fully programmable and capable of running software such as Firefox. Photograph: Antonio Olmos

A new British computer that costs just £22 went on sale at 6am on Wednesday morning - and immediately sold out, crashing the websites selling it in the process.

The **Raspberry Pi** is intended to inspire a new generation of schoolchildren to learn to program, just as the Sinclair Spectrum and BBC Micro did in the 1980s, which led to the burgeoning UK games sector.

10 years of Raspberry Pi: an interview with founder Eben Upton

Published on 26th March, 2019 by [Alice](#)

Historically we haven't really taught computer science in schools to any great degree, so we were getting our applicants from home computing in the hobbyist world.

As home computing as a hobby declined during the 1990s, our supply of prospective undergraduates dried up. And really, the idea of Raspberry Pi was to see if we could reboot the home computing hobbyist world that used to exist in this country – and if we could reboot that, would it lead to an increase in the number of applicants.

“

We've sold 25 million Raspberry Pi's now so it's a slightly different scale to what we imagined”

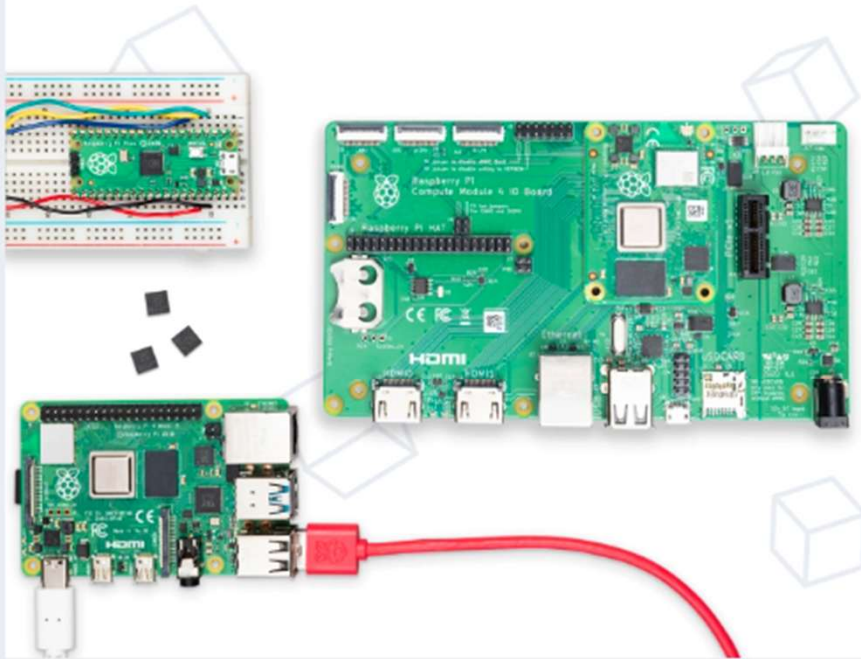
”

QUICK BROWSE - [RASPBERYPYPI.ORG](https://www.raspberrypi.org)



[Learn](#) [Teach](#) [Research](#) [Computers](#) [About us](#)

[Donate](#)

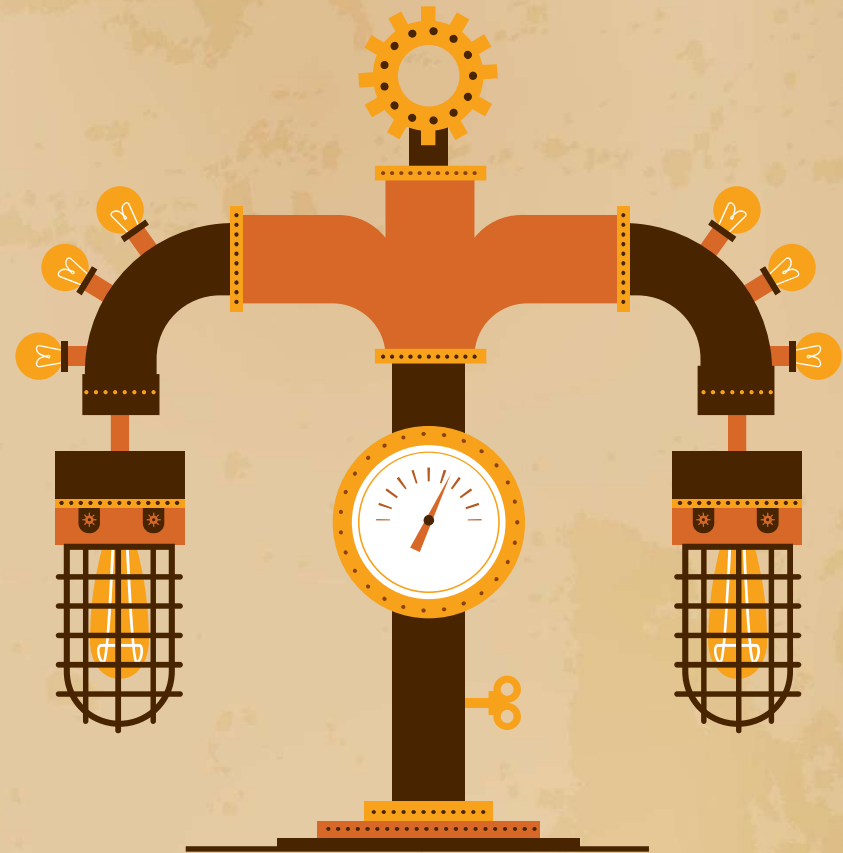


Find out more about our computers for home, industry and education at [raspberrypi.com](https://www.raspberrypi.com)

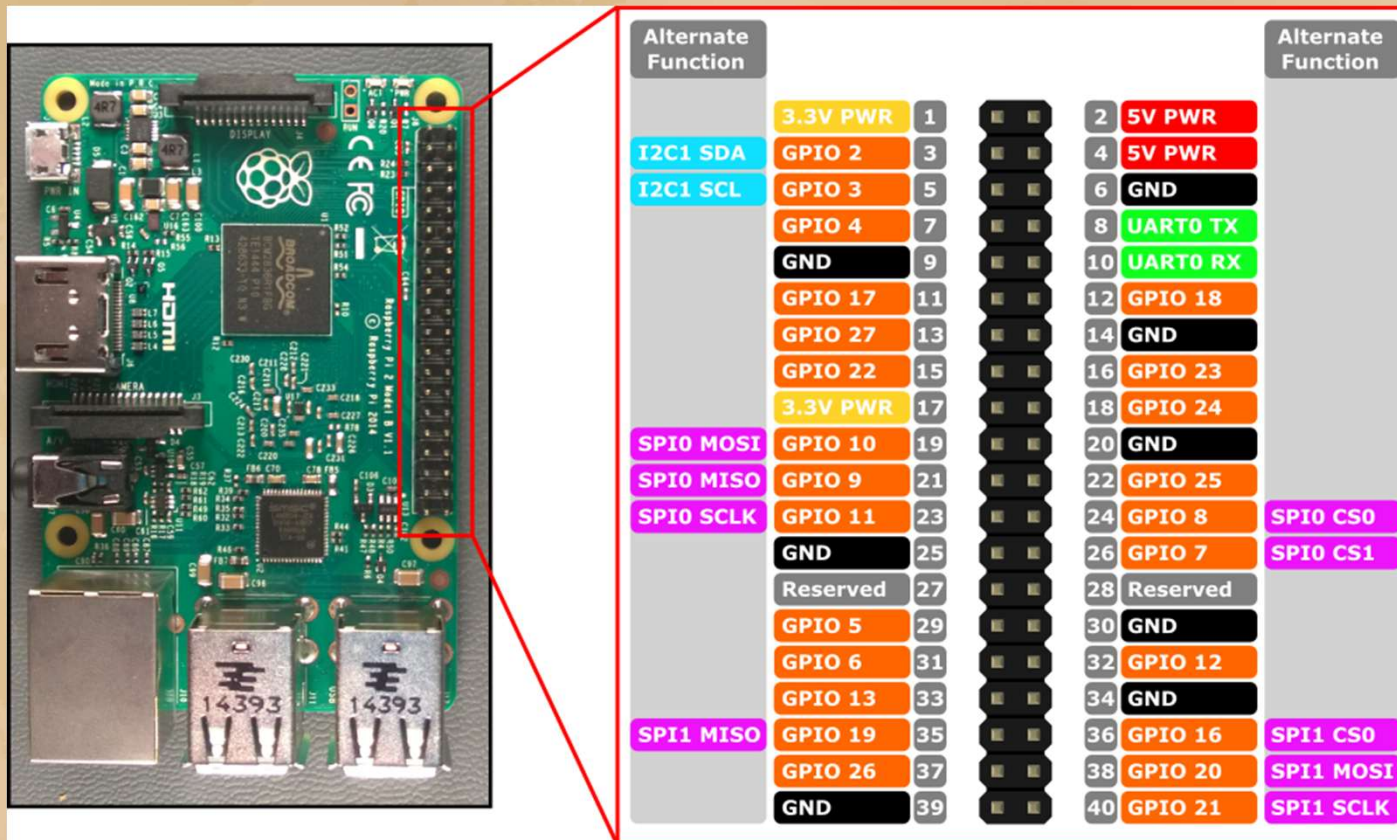
[Visit raspberrypi.com](https://www.raspberrypi.com)

WHY RASPBERRY PI?

- Maker Culture consistency
 - Arduino to Raspberry Pi (Microcomputer set to Computer)
- Computer versus Tablet
 - Student Experience
 - Value of a desktop/laptop computer
 - Road to a software/hardware developer



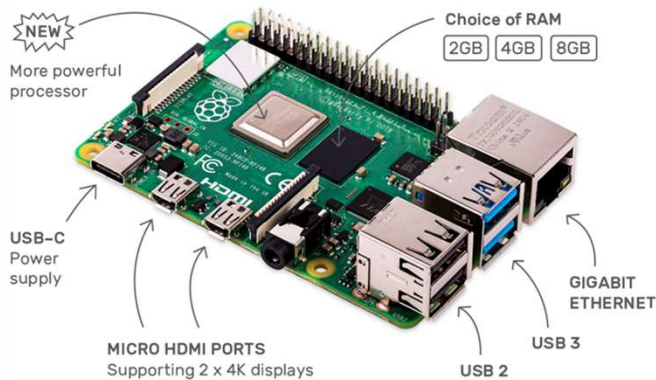
COMPUTER ED CONNECT WITH MAKER CULTURE (40 PIN GPIO)



Alternate Function	Pin	Pin	Alternate Function
	3.3V PWR	1	2 5V PWR
I2C1 SDA	GPIO 2	3	4 5V PWR
I2C1 SCL	GPIO 3	5	6 GND
	GPIO 4	7	8 UART0 TX
	GND	9	10 UART0 RX
	GPIO 17	11	12 GPIO 18
	GPIO 27	13	14 GND
	GPIO 22	15	16 GPIO 23
	3.3V PWR	17	18 GPIO 24
SPI0 MOSI	GPIO 10	19	20 GND
SPI0 MISO	GPIO 9	21	22 GPIO 25
SPI0 SCLK	GPIO 11	23	24 GPIO 8
	GND	25	26 GPIO 7
	Reserved	27	28 Reserved
	GPIO 5	29	30 GND
	GPIO 6	31	32 GPIO 12
	GPIO 13	33	34 GND
SPI1 MISO	GPIO 19	35	36 GPIO 16
	GPIO 26	37	38 GPIO 20
	GND	39	40 GPIO 21
			SPI0 CS0
			SPI0 CS1
			SPI1 CS0
			SPI1 MOSI
			SPI1 SCLK

RASPBERRY PI - MODELS & SPECIFICATIONS [4]

Completely upgraded, re-engineered
Faster, more powerful



You'll recognise the price along with the basic shape and size, so you can simply drop your new Raspberry Pi into your old projects for an upgrade; and as always, we've kept all our software backwards-compatible, so what you create on a Raspberry Pi 4 will work on any older models you own too.

Specifications

- Broadcom BCM2711, Quad core Cortex-A72 (ARM v8) 64-bit SoC @ 1.5GHz
- 2GB, 4GB or 8GB LPDDR4-3200 SDRAM (depending on model)
- 2.4 GHz and 5.0 GHz IEEE 802.11ac wireless, Bluetooth 5.0, BLE
- Gigabit Ethernet
- 2 USB 3.0 ports; 2 USB 2.0 ports.
- Raspberry Pi standard 40 pin GPIO header (fully backwards compatible with previous boards)
- 2 × micro-HDMI ports (up to 4kp60 supported)
- 2-lane MIPI DSI display port
- 2-lane MIPI CSI camera port
- 4-pole stereo audio and composite video port
- H.265 (4kp60 decode), H264 (1080p60 decode, 1080p30 encode)
- OpenGL ES 3.0 graphics
- Micro-SD card slot for loading operating system and data storage
- 5V DC via USB-C connector (minimum 3A*)
- 5V DC via GPIO header (minimum 3A*)
- Power over Ethernet (PoE) enabled (requires separate PoE HAT)
- Operating temperature: 0 – 50 degrees C ambient

* A good quality 2.5A power supply can be used if downstream USB peripherals consume less than 500mA in total.

Raspberry Pi OS

Your Raspberry Pi needs an operating system to work. This is it. Raspberry Pi OS (previously called Raspbian) is our official supported operating system.



Install Raspberry Pi OS using Raspberry Pi Imager

Raspberry Pi Imager is the quick and easy way to install Raspberry Pi OS and other operating systems to a microSD card, ready to use with your Raspberry Pi. [Watch our 45-second video](#) to learn how to install an operating system using Raspberry Pi Imager.

Download and install Raspberry Pi Imager to a computer with an SD card reader. Put the SD card you'll use with your Raspberry Pi into the reader and run Raspberry Pi Imager.

[Download for macOS](#)

[Download for Windows](#)

[Download for Ubuntu for x86](#)



OTHER PARTS



AGI Class 10 UHS-1 TF138 MicroSD Card 16GB
(High Speed Class 10 UHS-1 16GB)

成為第一位評分的人 讚好 0 分享

種類： MicroSD 速度： Read 55MB/s, Write 20MB/s
容量： 16GB

以上項目資料及價格僅供參考，如發現資料有誤，歡迎指正以便我們了解及跟進。



Xiaomi 小米 充電寶 20000mAh 50W PB200S2M

★★★★★ 讚好 0 分享

類型： 外置電 電池容量： 20000mAh

以上項目資料及價格僅供參考，如發現資料有誤，歡迎指正以便我們了解及跟進。



树莓派摄像头模块

- ✓ 500万高清
- ✓ 带包装出货
- ✓ csi接口
- ✓ 25*24*9mm

活动价
¥14

适用于树莓派 Raspberry PI 2代/4代/3B+
支持定制 可开发票⁶



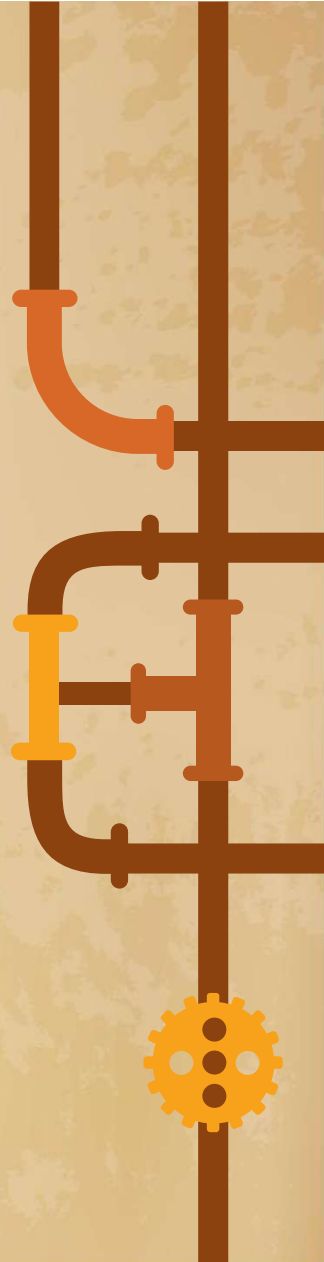
高颜值
滑动磁吸

树莓派4代 铝合金外壳

REMARKS on MONITOR



OTHER POTENTIAL: AI EDUCATION



RASPBERRY PI - AI

Part 2 - How to Run TensorFlow Lite Object Detection Models on the Raspberry Pi (with Optional Coral USB Accelerator)



TensorFlow Lite

USB Accelerator

Introduction

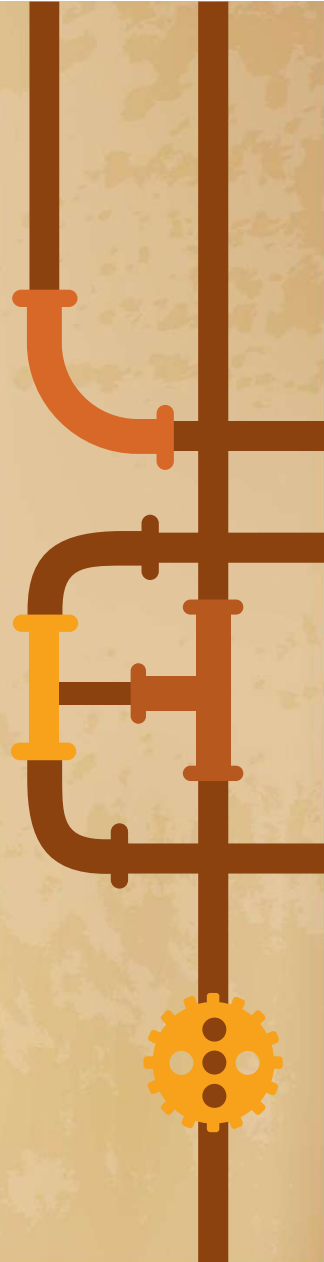
This guide provides step-by-step instructions for how to set up TensorFlow Lite on the Raspberry Pi and use it to run object detection models. It also shows how to set up the Coral USB Accelerator on the Pi and run Edge TPU detection models. It works for the Raspberry Pi 3 and Raspberry Pi 4 running either Raspbian Buster or Raspbian Stretch.

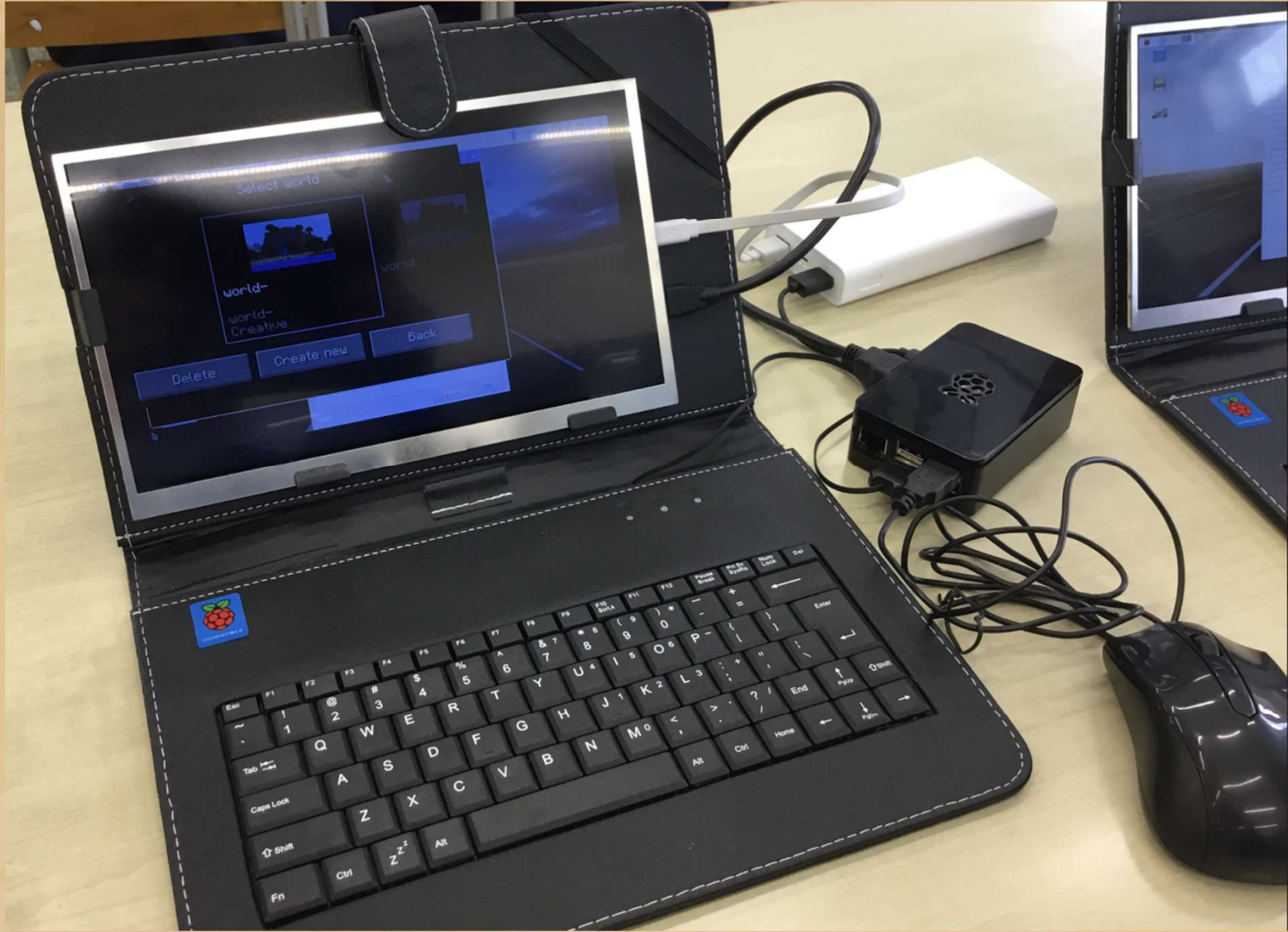
This guide is the second part of my larger TensorFlow Lite tutorial series:

1. [How to Train, Convert, and Run Custom TensorFlow Lite Object Detection Models on Windows 10](#)
2. [How to Run TensorFlow Lite Object Detection Models on the Raspberry Pi \(with Optional Coral USB Accelerator\)](#) <--- You are here!
3. [How to Run TensorFlow Lite Object Detection Models on Android Devices](#)



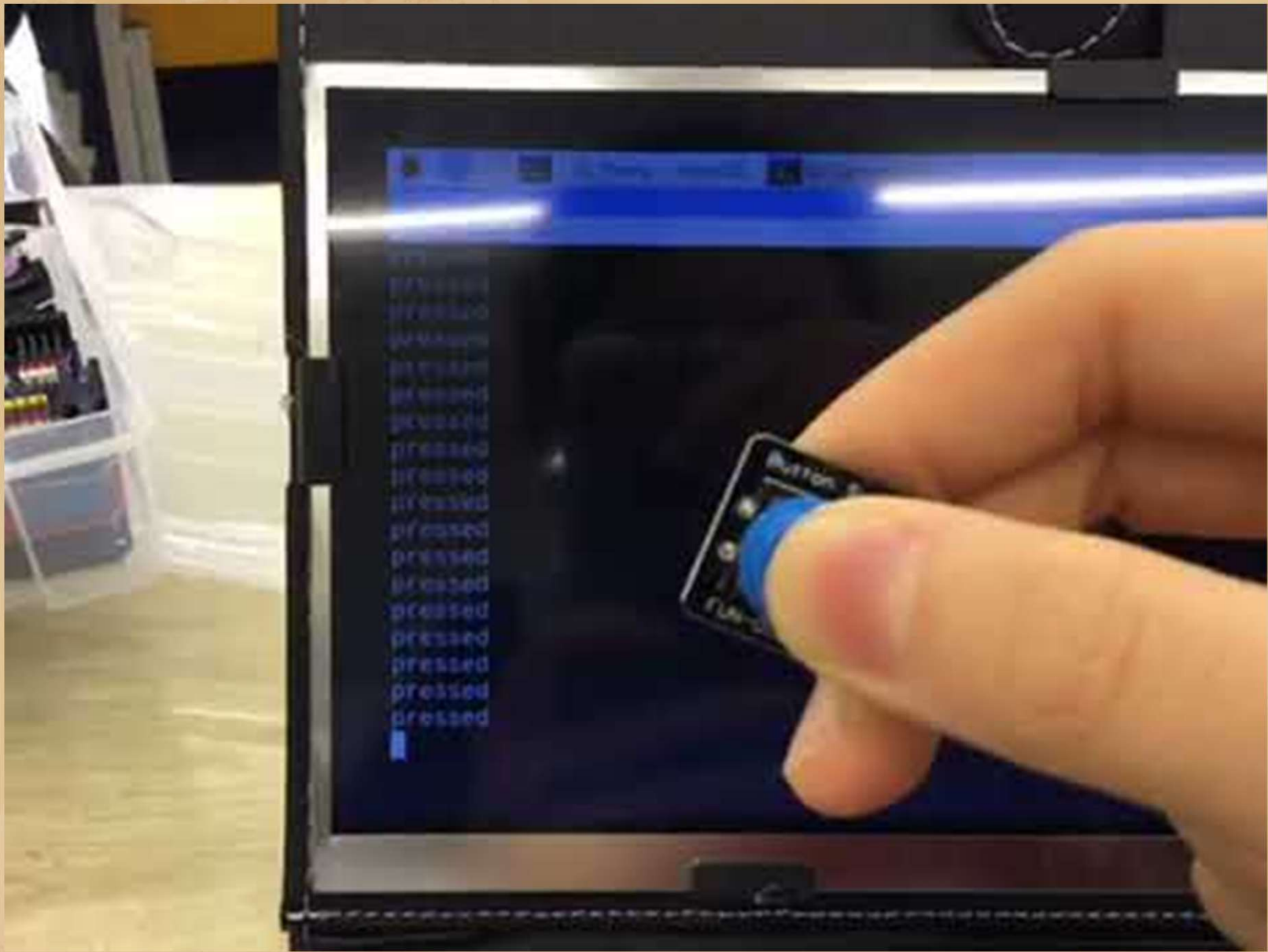
LESSON & ASSIGNMENT PHOTOS & VIDEOS

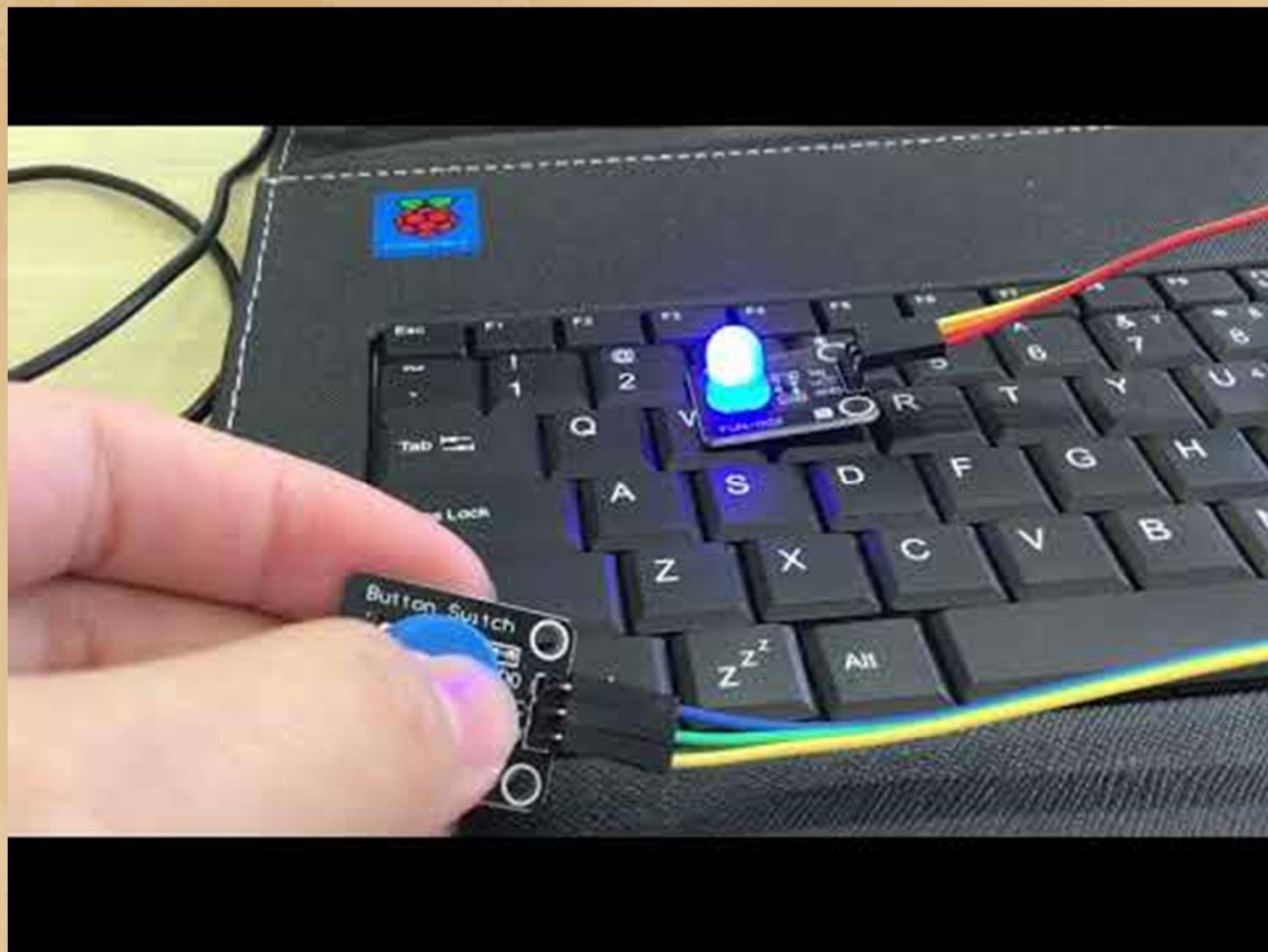
















Raspberry Pi + ObjectBlocks Powered

嘉諾撒培德書院兩學生 研發智能購物系統 幫助長者輕鬆購物

（本報專題）「學校位於香港仔，聚居了不少長者，經常放學途徑商場時，見到不少長者在超級市場的收銀台前大排長龍，也不會選擇使用自助收銀機，當時想，若能夠設計一款容易結賬的購物系統，便可以疏導人流。」就讀嘉諾撒培德書院的中三生蔡慧喬說，近日她與另一中三生韓以趨研發了一套「智能購物系統」，幫助長者輕鬆購物。

只須三個步驟：把貨品放進「智能購物系統」購物籃，在籃子內裝置的平板電腦輸入貨物的數量，再按下結賬便完成購物。這套由蔡慧喬及韓以趨研發的「智能購物系統」，在「創協盃」創意科技機械人大賽電子科技創新設計比賽榮獲高級組冠

軍，以及高級組最佳智能科技應用獎。她倆均認為，參與STEM比賽，認識到把科技應用到生活，提升自己對科技教育的興趣。

幫助長者生活需要

南區人口持續老化，根據香港政府統計處資料顯示，居於南區的65歲以上長者，由2018年的42,900人，至2021年上升至52,400人，數字在同區相比其他年齡層最高。蔡慧喬和韓以趨留意到南區人口老化的情況，顧及到長者平日外出購物，經常花上很長時間排隊付款的不便，部份店舖設置的自助收銀機服務程序繁複令長者卻步。

為方便長者，縮短購物候候時間，將智能購物系統安裝於購物籃或手推車，顧客

只須把貨品放置在設有智能購物系統的籃子上，不用排隊便可以結算付款，吸引長者使用科技。

生活科技活學活用

韓以趨說明智能購物系統時指出，顧客先將貨品放置於購物籃的背景板前，便會由內置的微型電腦Raspberry Pi的AI圖像識別系統，透過小型鏡頭偵測以識別貨品，當AI成功識別貨品後，資料傳送到雲端，運用ObjectBlocks讀取資料，最後使用編程計算需要的價錢，在Dashboard（儀表板）中顯示貨品價錢和貨品數量，消費者可從Dashboard中選擇數量再付款。（下接第15版）



計比賽榮獲高級組冠

03

01

04

05

06



ObjectBlocks Powered



Pui Tak Canossian College

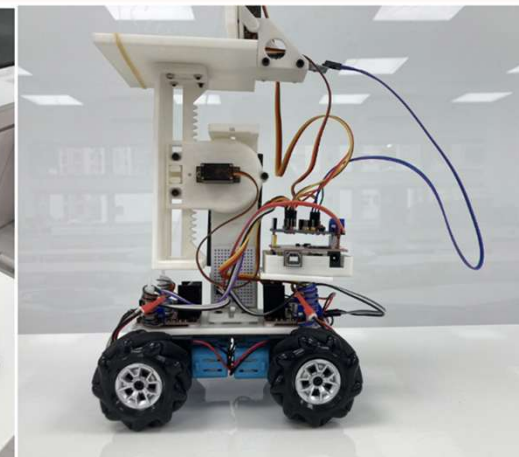
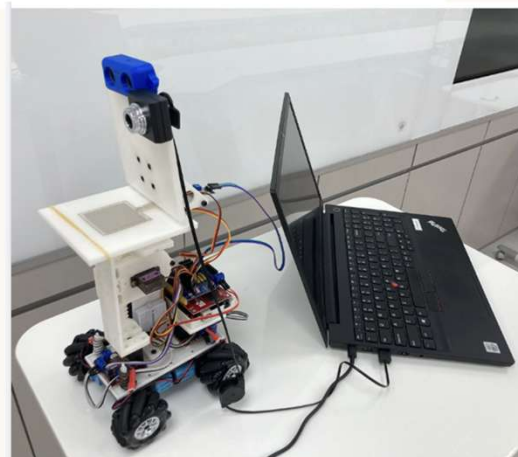
7月25日 · 地球



一如往年，STEM 學會的同學（肖婷、李巧言、王瑞雪）於思科解難挑戰賽中獲取了佳績！由於疫情關係，本屆比賽只設傑出表現獎而不設冠、亞、季軍。同學於眾多的對手中脫穎而出，獲得了頭10名的傑出表現獎。🏆🏆同學的成品 - 「智能學習椅」設計獨特，除了巧妙地運用物聯網技術外，更加入了人工智能元素以幫助同學矯正坐姿、減少患都市病的機會。

大會網址：<https://cicgps.hkace.org.hk/>

同學的參賽影片：<https://www.youtube.com/watch?v=nl3c3ob7D98>





ObjectBlocks Powered



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8月5日 20:33 · 🌐



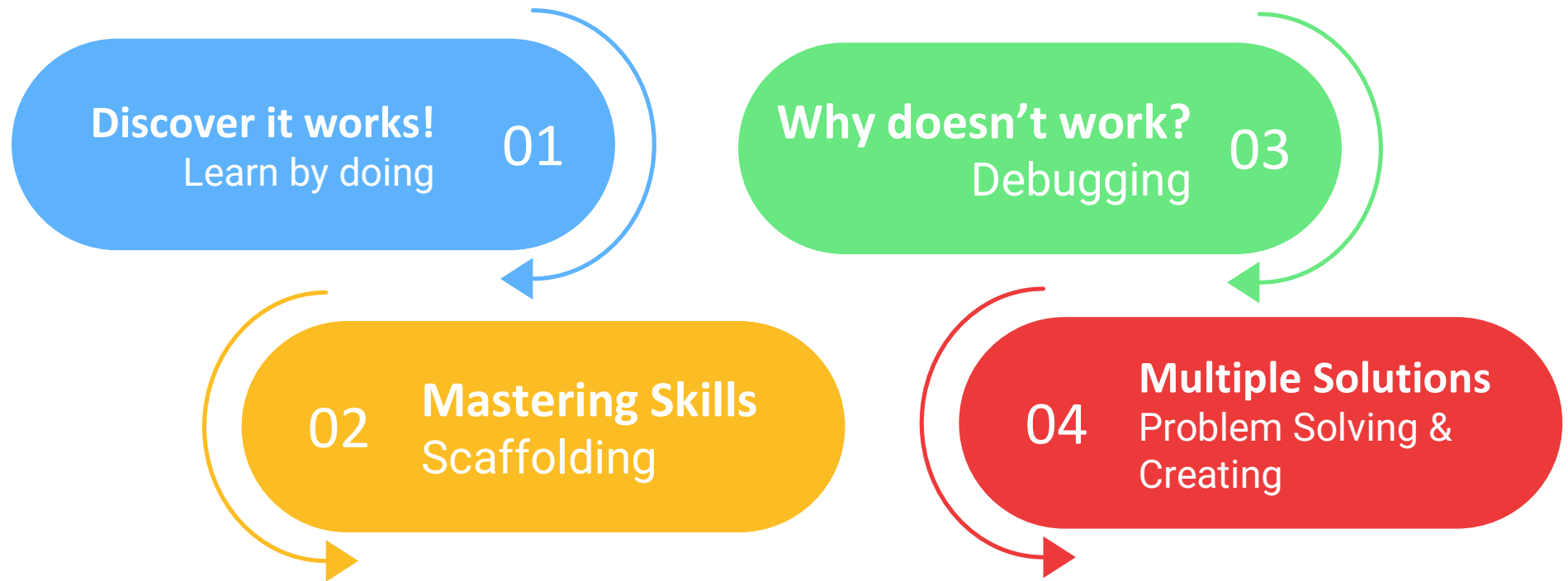
🏆 培德 STEM 獎項停不了！

中四的吳芷澄、謝卓琳、黃希瑤憑作品「Reborn 家用再做紙機」和中五董詠琳、梁彤瑤、柯曉晴的「溫馨小居」在由「香港中文大學工程學院創新科技中心」主辦的「三菱電機綠色科技創意大賽 2022」中獲得了中學組「亞軍」和「季軍」。他們的創意作品、充滿自信的匯報和即場的精彩示範獲得了評審的一致讚賞，並成功突圍而出。👏👏

恭喜各得獎同學！再一次證明，培德確是一個孕育創客的好地方。



Teaching with the learning STAGES in mind



Latest Updates on our STEAM Curriculum





Python學習平台

為老師及初學編寫程式學生
而設計的Python學習平台

立即加入

📖 課題範本 > 第一章：你好，世界

🏠 本地執行 [🌐 公開範本](#)

最後更新 25/05/2022 3:23:10 pm

第一章：你好，世界

更多 ▾

讓我們編寫第一節 Python 程式吧！

什麼是電腦程式？

打開電腦外殼後，你會發現它是由很多電子零件組成，如中央處理器 (CPU)、顯示卡、內存 (RAM)、硬盤 (hard drive) 等。但電腦需要正常運作的話，你還需要安裝各種電腦軟件 (software)。電腦軟件是由電腦程式而成，而電腦程式包括了一系列的指令 (instruction)，電腦會根據這些指令來完成動作或任務。

就像我們不能聽懂所有國家語言一樣，電腦亦不是什麼指令都聽得懂。實際上，電腦指令有一套很嚴謹的規範和格式，一旦不符合這些規範和格式，電腦就無法了解，因此亦無法完成所要求的動作或任務。

剛才說到，電腦程式裏包括一系列指令，而軟件開發人員就學識編寫程式編碼 (programming codes) 下這些指令。程式編碼有很多種，而不同種編碼式編碼有着不同功能和目的。如 Scratch 的主要目的是為初學編碼者而設計，它利用圖像指令，減少編碼程式的難度。而我們將會學到的 Python，多用於後台運算，涉及人工智能 (artificial intelligence)、數據科學 (data science) 等領域，但同時因為它設計上的可讀性 (readability)，很適合初學者學習文字程式語言。

以下是一段 Python 程式，即便從未接觸過 Python 的同學應該都能猜得出這段電腦程式是做什麼的，這個就是 Python 設計上的可讀性。

```
1 students = 120
2 classes = 5
3
4 average_students_per_class = students / classes
5 print("There are average " + str(average_students_per_class) + " in each class.")
```

Build your curriculum (start from scratch or start from something)

The screenshot shows the Codebooks website interface. On the left is a dark blue sidebar with navigation icons and labels: Codebooks, 我的班級, 我的課題, 課題範本, 練習本, 設定, 主頁, and 登出. The main content area is titled '課題範本' and features a search bar with '平台範本' and '全部語言' dropdowns, and a '搜尋' button. Below the search bar, there are several curriculum items listed:

- 第一章：Hello World**
繁體中文 | 平台 | Codebooks | 本地
讓我們編寫第一個 Python 程式吧！
- Lesson 1: Hello World**
English | 平台 | Codebooks | 本地
Let's write our first Python program!
- 第二章：變量**
繁體中文 | 平台 | Codebooks | 本地
這一章我們會解析什麼是變量，變量的特徵和用途，並會講述不同數據類型 (data type)。
- Lesson 2: Variables**
English | 平台 | Codebooks | 本地
In this lesson, we will discuss what variables and their characteristics are, and when to use them in the program.
- 第三章 (第一節)：數字**
繁體中文 | 平台 | Codebooks | 本地
這一節我們會解析 Python 內的數字，以及一些常見的算術操作。

The screenshot shows the 'Lesson 2: Variables' page on Codebooks. The page title is 'Lesson 2: Variables' and it includes a sub-header 'What are Variables?'. The text explains that in mathematics, variables like x, y, or π represent numerical values, while in computer programs, they can store values of different data types like numbers, strings, and booleans. It also states that variables are like boxes for storing and reading values.

Variables are like boxes to which we could store values and from which we could read values.

Let's revisit the program from Lesson 1:

- At line 1, we create a new variable called "name", which stores the text value inputted by the user
- At line 2, we access that text value from the "name" variable and print it out.

These are the two things that you can do with variables: **store a value into variable**, and **read the value from the variable**.

Build from programmers
Not textbook writers

EDUCATION BUREAU CIRCULAR MEMORANDUM NO. 109 /2023

From : Secretary for Education

To : Heads of Government, Aided (including
Special Schools), Caput and Direct
Subsidy Scheme (DSS) Schools

Ref. : EDB/CSD/TE/08-40/01

Date : 19 June 2023

**Curriculum Modules on Innovation and Technology Education -
“Enriched Module on Coding Education for Upper Primary Level” and
“Module on Artificial Intelligence for Junior Secondary Level”**

Summary

The purpose of this circular memorandum is to announce the two captioned modules for adoption by schools to further promote innovation and technology (I&T) education.

Module on Artificial Intelligence for Junior Secondary Level

Learning and Teaching Resources

Description		English Version	Chinese Version
Module on Artificial Intelligence for Junior Secondary Level (Booklet 1) (Last update on 31.07.2023)	Booklet 1, Powerpoint, Worksheet	Details	詳細資料
Module on Artificial Intelligence for Junior Secondary Level (Booklet 2) (Last update on 31.07.2023)	Booklet 2, Powerpoint, Worksheet	Details	詳細資料
Module on Artificial Intelligence for Junior Secondary Level (Booklet 3) (Last update on 31.07.2023)	Booklet 3, Powerpoint, Worksheet	Details	詳細資料

Curriculum Analysis

1. Introduction to AI, AI Basics(I) & (II)
2. AI Ethical Issues
3. Computer Vision (I) & (II) & (III)
4. Computer Speech and Language (I) & (II)
5. AI and Computer Simulations (I), (II)
6. AI in Robotic Reasoning (I) & (II) & (III)
7. AI and Future of Work (I) & (II)
8. Societal Impact of AI (I) & (II)
9. Group Project Design, Development and Presentation (I) & (II)

Booklet 1	7 lessons; 35 minutes each <ul style="list-style-type: none">• Introduction to AI• AI Basics (I)• AI Ethical Principles• Computer Vision (I)• Computer Speech and Language (I)• AI and Computer Simulation (I)• AI in Robotic Reasoning (I)
Booklet 2	8 lessons; 35 minutes each <ul style="list-style-type: none">• AI Basics (II)• AI Ethical Issues• Computer Vision (II)• Computer Speech and Language (II)• AI in Robotic Reasoning (II)• AI and Future of Work (I)• Societal Impact of AI (I)• Group Project Design, Development and Presentations (I)
Booklet 3	6 lessons; 35 minutes each <ul style="list-style-type: none">• Computer Vision (III)• AI and Computer Simulation (II)• AI in Robotic Reasoning (III)• AI and Future of Work (II)• Societal Impact of AI (II)• Group Project Design, Development and Presentations (II)

Curriculum Analysis

1. Introduction to AI, AI Basics(I) & (II)

- *Machine Learning versus Computer Programming*
 - *AI in Robotic Reasoning (Rule-based vs Knowledge-based)*
- *Google Platforms, Colab, Edge Impulse*

2. Computer Vision (I) & (II) & (III)

- *How do computers “see” things? Ideas of CNN; Features Extraction*
 - *AI and Computer Simulation (Simulator & Generative AI)*
- *Google Platforms, Colab, Donkey Car*

3. Computer Speech and Language (I) & (II)

- *Natural Language Processing (NLP)*
- *ChatGPT (Generative Pre-trained Transformer)*
- *Google Colab, k12GPT.ai*

Booklet 1	<p>7 lessons; 35 minutes each</p> <ul style="list-style-type: none"> • Introduction to AI • AI Basics (I) • AI Ethical Principles • Computer Vision (I) • Computer Speech and Language (I) • AI and Computer Simulation (I) • AI in Robotic Reasoning (I)
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Concept Mapping

Simplified Key elements

1. Introduction to AI, AI Basics(I) & (II)

- *Machine Learning versus Computer Programming*
 - *AI in Robotic Reasoning (Rule-based vs Knowledge-based)*
- *Google Platforms, Colab, Edge Impulse*

2. Computer Vision (I) & (II) & (III)

- *How do computers “see” things? Ideas of CNN; Features Extraction*
 - *AI and Computer Simulation (Simulator & Generative AI)*
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3. Computer Speech and Language (I) & (II)

- *Natural Language Processing (NLP)*
- *ChatGPT (Generative Pre-trained Transformer)*
- *Google Colab, k12GPT.ai*

Important AI & Related Concepts

Machine Learning

Supervised Learning

Edge AI / On-device AI

Extract Image Features and Convolution
Neural Network

TensorFlow Lite

GANs (Generative Adversarial Network)

Natural Language Processing (NLP)

Prompt Engineering

Teaching A.I. in a maker culture-centred curriculum



HANDS-ON PRACTICE



EXPERIENCE TO LEARN

Understand my teachers

Worries

Realization and exploration of the potential of Generative AI

- Visual Arts
- Chinese Language
- English Language
- Economics

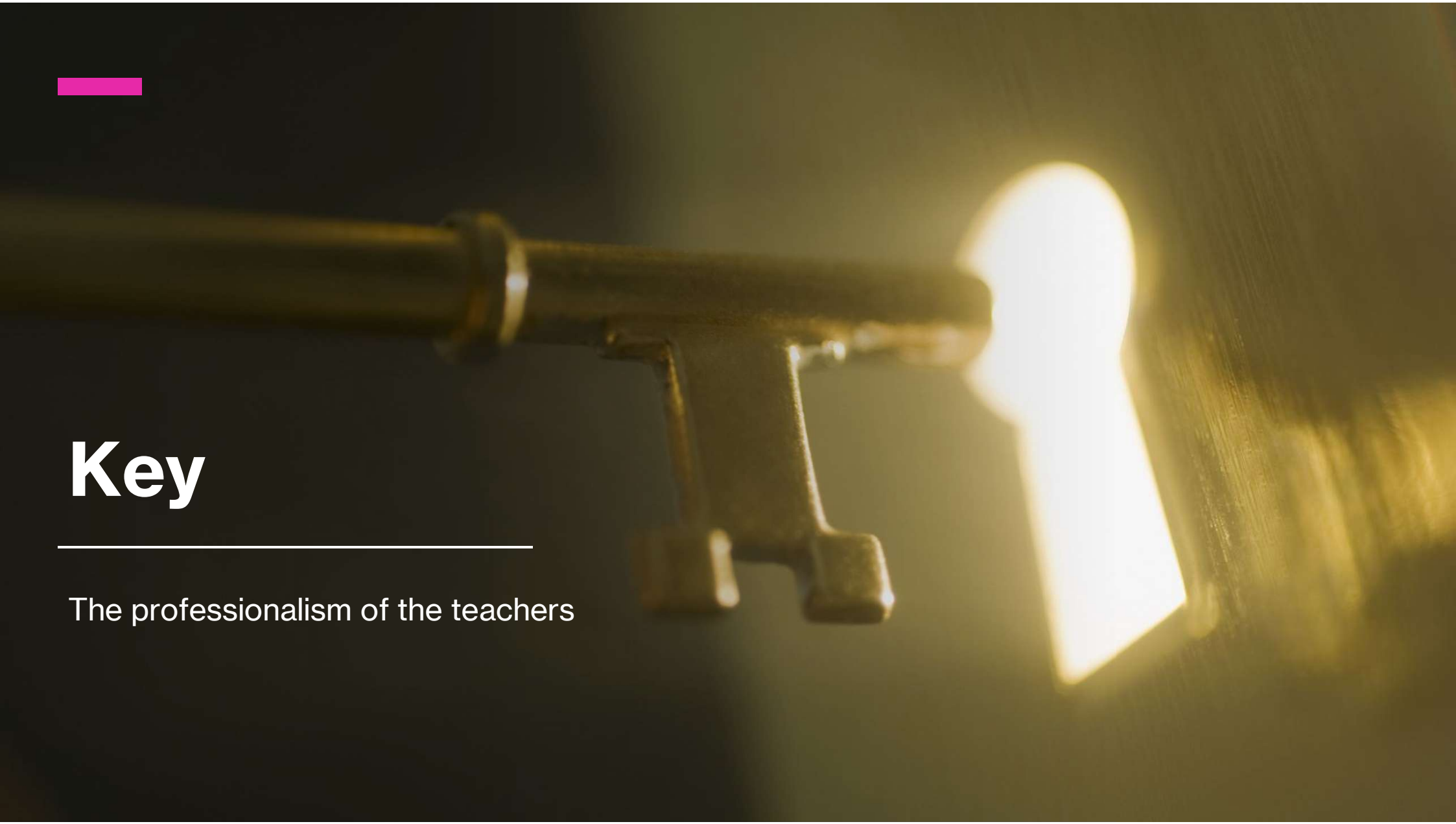
Tools and Platforms

- ChatGPT, POE, Copilot, Midjourney, Stable Diffusion...
- **k12GPT.ai**



Key

The professionalism of the teachers



Major Paradigm Shift

1

- Teacher is the master of knowledge.
- Role: Knowledge Deliverer



Google大神

2

- Teacher is the master of skills.
- Role: Skills Trainer



7 x 24 Tutor

3

- Teacher is a master learner.
- Role: Learning Tour Guide & Companion



Shepherd

k12GPT.ai





聚焦解難、培養創客、讓 STEAM
融入至全校的發展細胞中

Canossian Daughters of Charity

Girls' School

200 Peel Rise, Aberdeen, Hong Kong

Mr Ho Cheuk Pun John 何卓彬助理校長

- hcp@ptcc.edu.hk, 92269851
- Assistant Principal, IT & STEM Coordinator

Mr Lee Kwan Yu 利昆諭主任

- blky@ptcc.edu.hk, 68550536
- STEM & IT in Education Team Coordinator
- Junior Science & Physics Panel Head

優秀教師選舉2023

「教育管理組」參選報告分享



Pui Tak Canossian College
嘉諾撒培德書院