

## 優質教育基金計劃電子白板互動教學

### 1. 自我評鑑計劃成效

以下是各相關科目老師運用電子白板互動教學的例子：

I 利用互動電子白板進行課堂教學

A. 科組名稱：音樂科

1. 課題：西洋管弦樂器

2. 學習目標：認識西洋管弦樂器的名稱及特徵(聲音)

3. 利用電子白板學習



利用電子白板展示課堂簡報



利用電子白板播放西洋管弦樂器的演奏片段



老師運用 Virtual Instruments Junior 音樂程式，利用 CDEFGAB 基本音符演奏各種樂器。

#### 4. 學習成果(電子學習過程中的成品及學生作品)



學生觸控電子白板上的音符，進行演奏，以了解不同樂器的聲音特。

B. 科組名稱：視藝科

1. 課題：人像素描 - 我的偶像

2. 學習目標：

- a) 學習人頭像的臉部五官比例、結構、明暗度
- b) 學習畫出人物立體感，掌握素描質感與細節處理，用重點線條帶出神韻，畫出擁有自我風格的臉部素描。

3. 利用電子白板學習

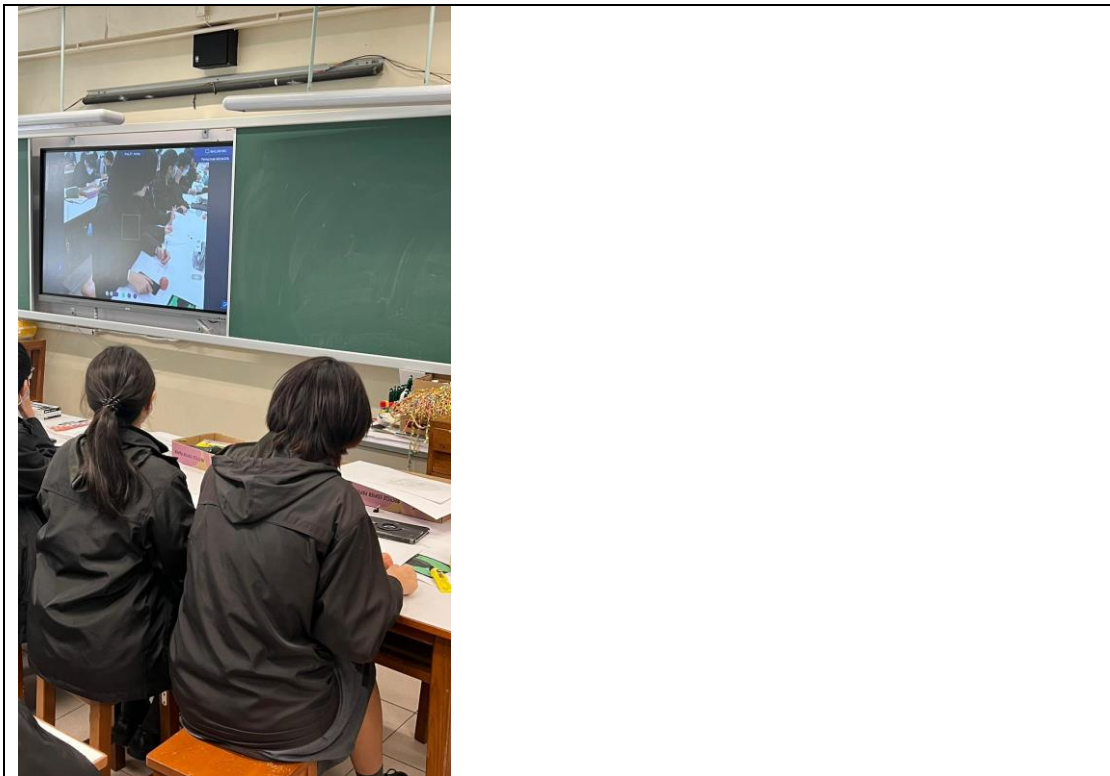


一位女同學用 iPad 找出自己喜歡的偶像，並把畫面分割成正確比例的小正方形，再放大畫在一張四開畫紙上。同時可以利用電子白板投射出來做示範。



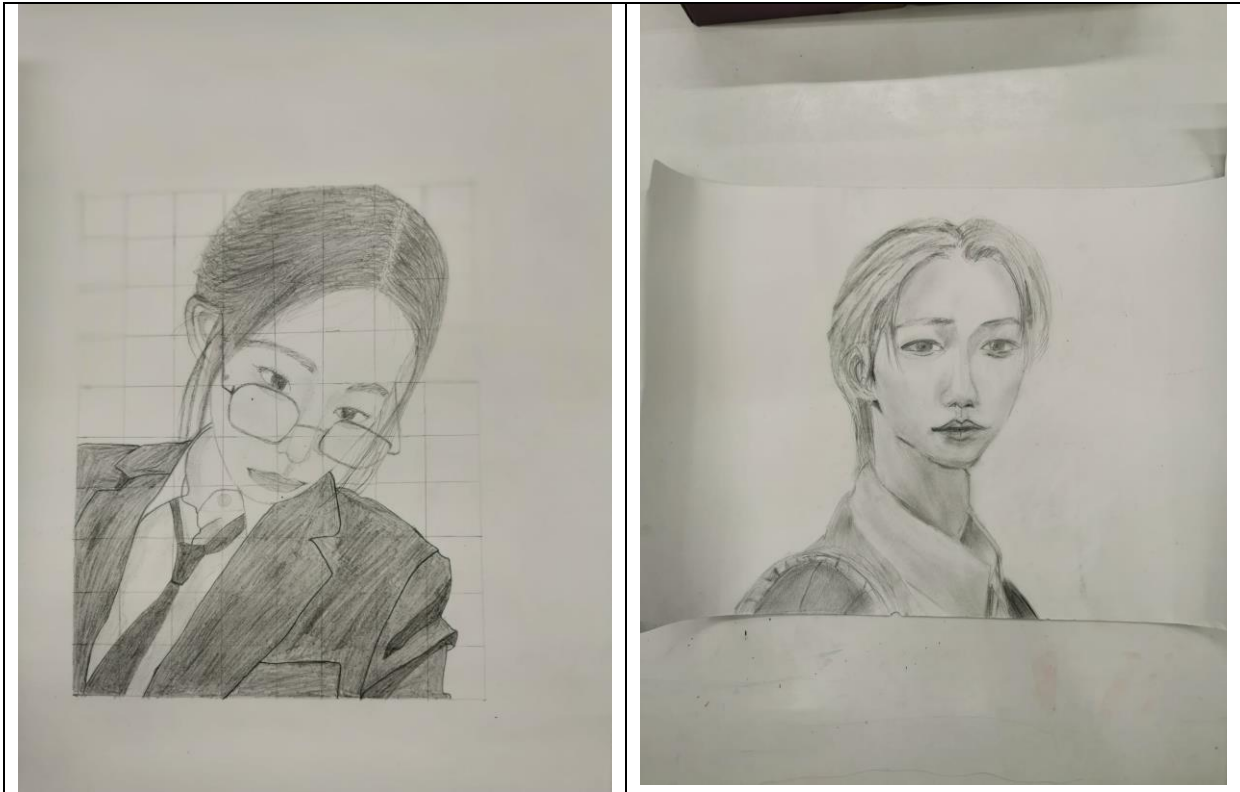


老師利用 iPad 把一名畫得非常出色的男同學的人頭像，投射畫到電子白板上與學生作詳細分析，教導學生欣賞人物素描的準則



老師最後和全班同學就已被篩選出的多張能掌握素描質感與細節，並用重點線條帶出神韻的優秀畫作進行「選秀」(選最好)。

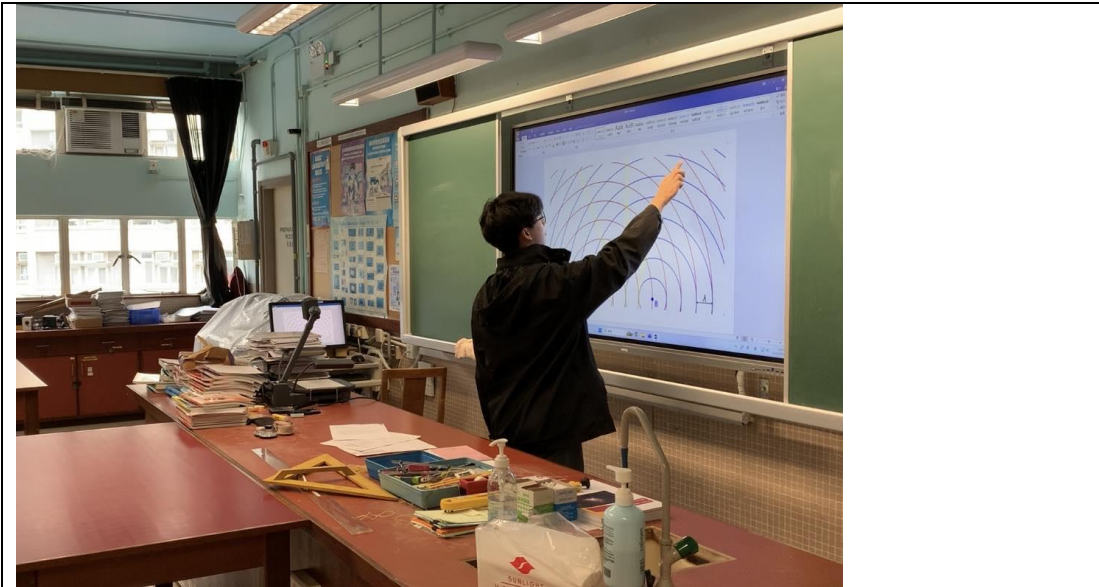
4. 學習成果(電子學習過程中的成品及學生作品)



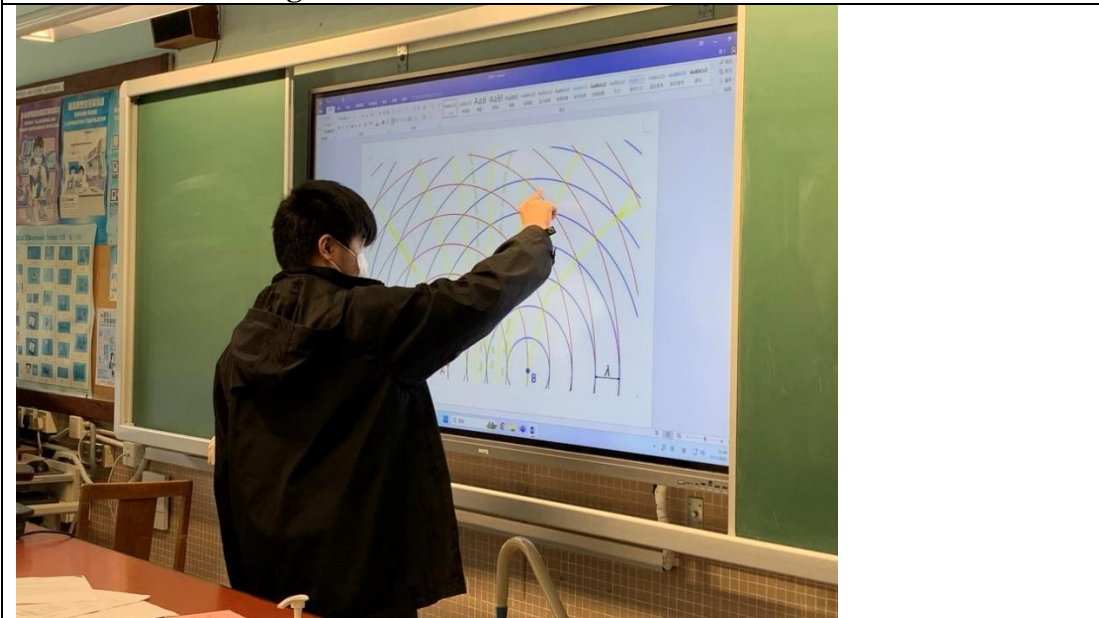
學生作品

**C 科組名稱：PHYSICS**

1. 課題: Interference
2. 學習目標: To know how to find and distinguish nodal line and anti-nodal of Wave Theory.  
To find the path difference so as to determine where constructive and destructive interference are.
3. 利用電子白板學習

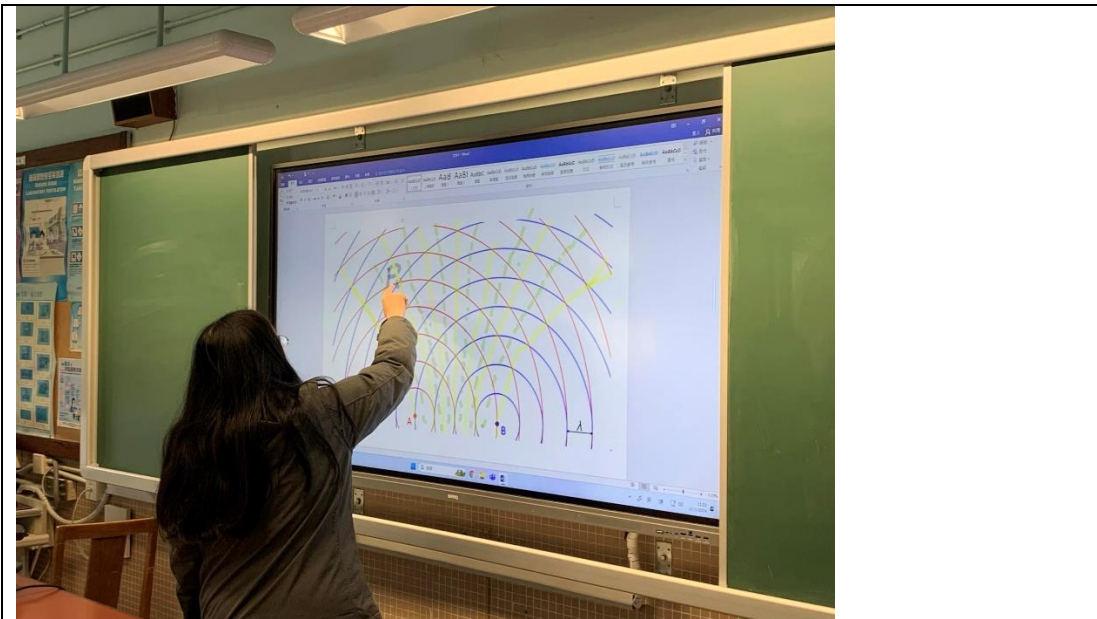


**Student was drawing the anti-nodal lines.**

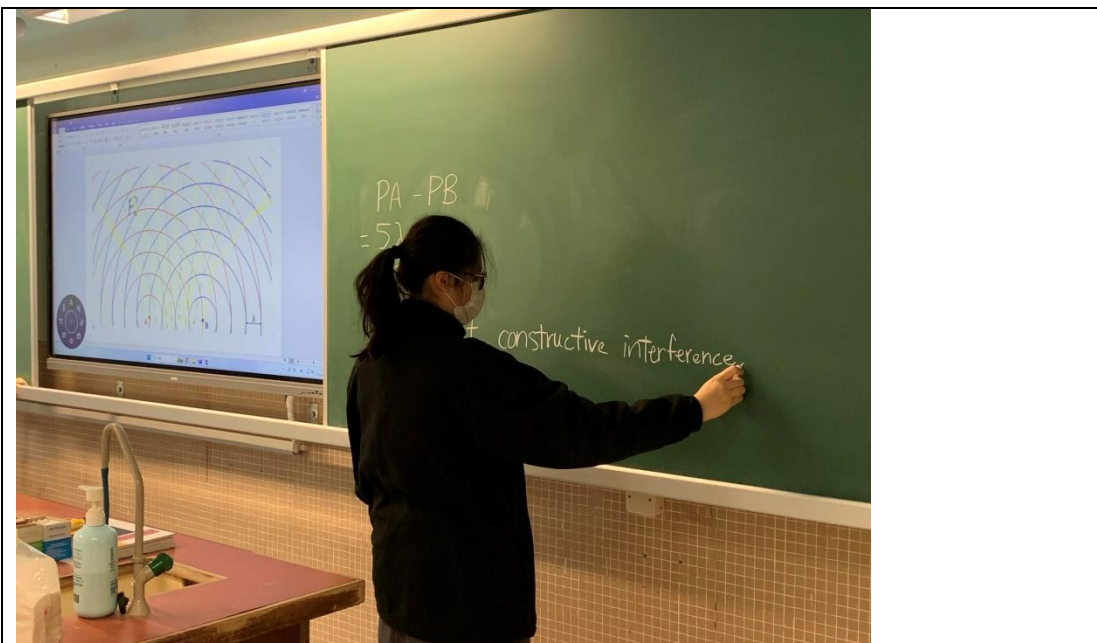


**Another student was drawing the nodal lines.**





**The teacher selected one location and asked the class to find the path difference and determine whether it's constructive or destructive interference.**



**The third student showed the steps of finding path difference and got the conclusion of what kind of the interference was.**

#### **4. 學習成果(電子學習過程中的成品及學生作品)**

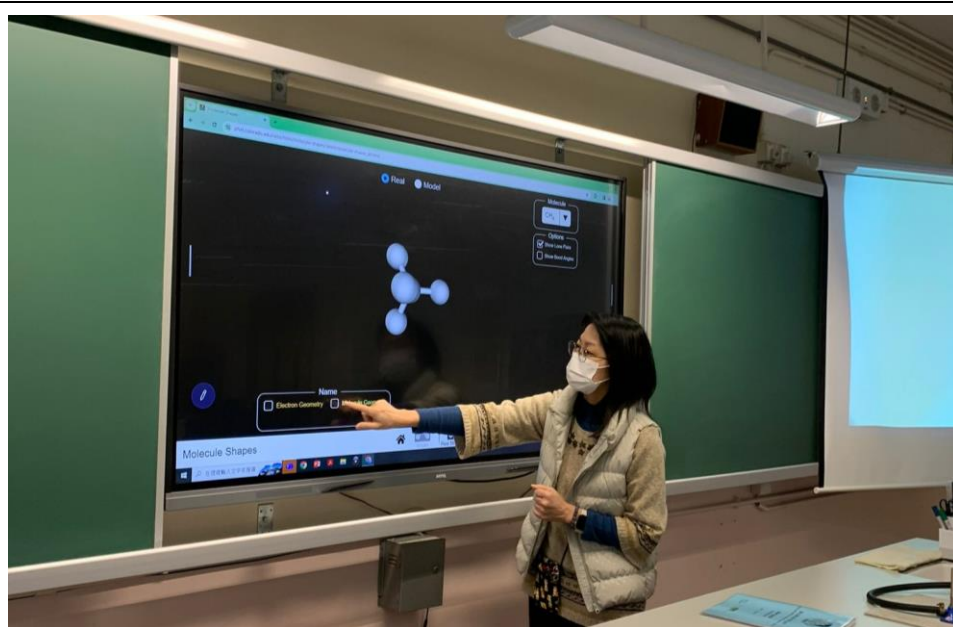
**Make the students much clear about the locations of constructive and destructive interference of the Wave Theory. The good thing of Smartboard is: show the change or observation in whole class, strengthen their visual perceptions.**

D 科組名稱：Chemistry

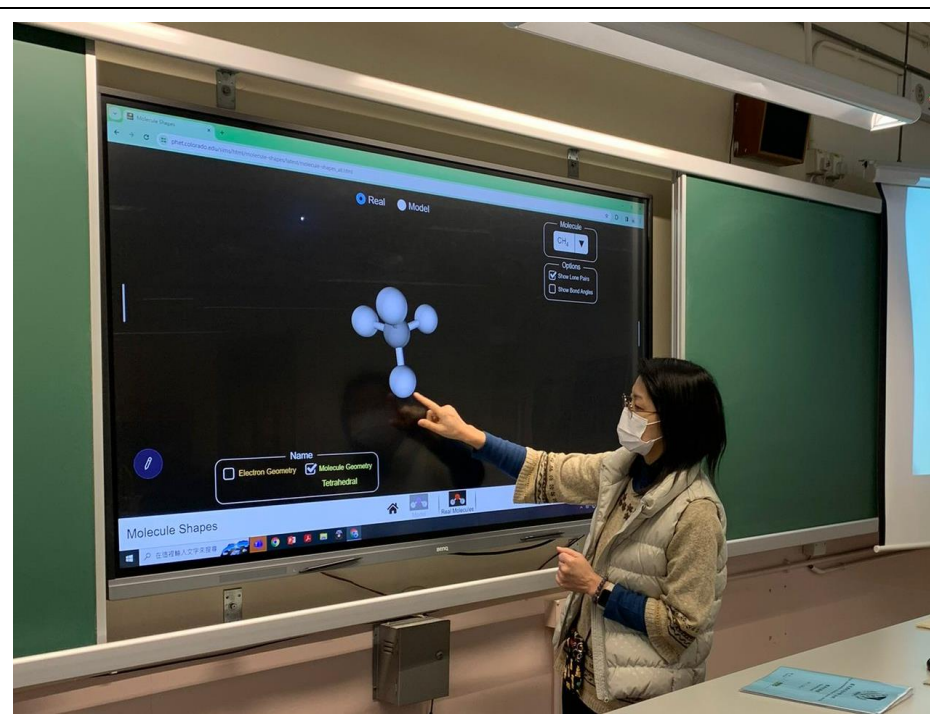
1. 課題：Molecular shapes

2. 學習目標：Students can describe and draw the 3-D diagrams to represent shapes of the molecules:  $\text{CH}_4$ ,  $\text{NH}_3$ ,  $\text{H}_2\text{O}$ ,  $\text{BF}_3$ ,  $\text{PCl}_5$ ,  $\text{SF}_6$ , and etc.

3. 利用電子白板學習



Using PhET, teacher stated the concept of VSEPR theory and demonstrated how to determine the molecular shape.



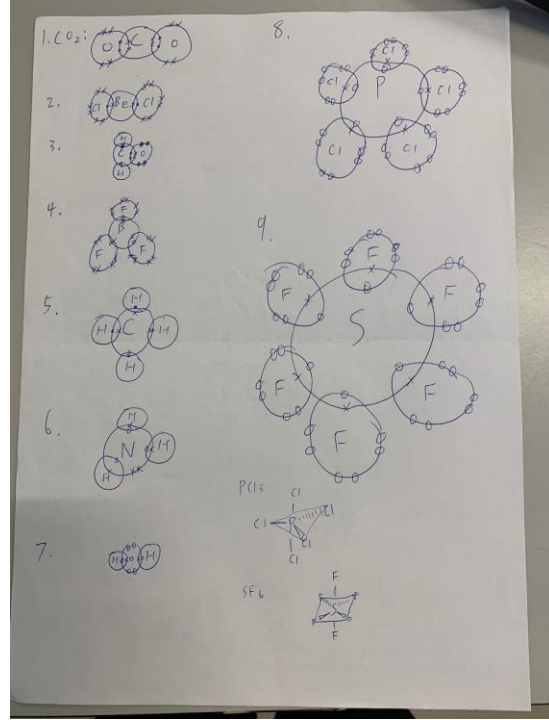
Using the e-board, teacher rotated the molecule to show the 3-dimensional shaping of the molecule.





Students were asked to draw the electron diagrams and the molecular shaping.

#### 4. 學習成果(學生作品)



Chem. Activity/Topic 6.1 & 6.2/P1

**Topic 6 - Microscopic World II**  
**6.1 Simple Molecules with Non-octet Structure & 6.2 Shape of Molecules**

Name: Yang Yu Fung (U) Class: SS(A)

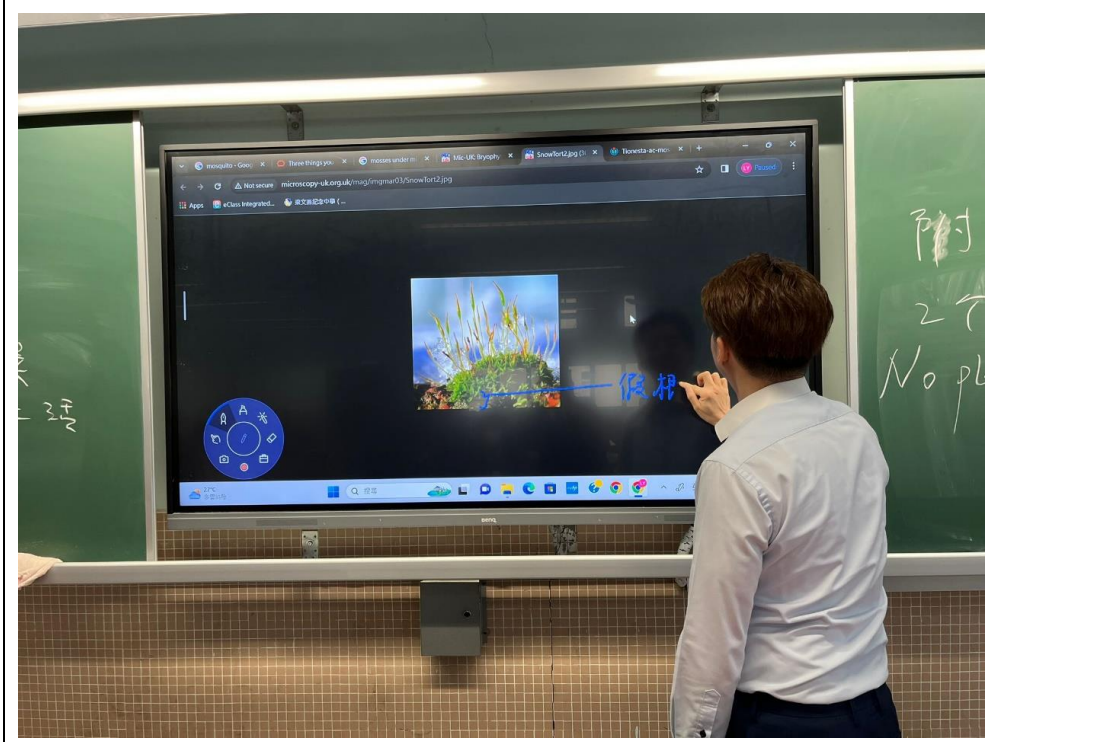
Inflate 6 balloons in similar size, tie them together and observe their shapes.

In the outermost shell of the <b>central atom</b>		Three-dimensional diagrams for the <b>*shape</b> of molecule obeying octet rule ( <b>Atom arrangement</b> )	Three-dimensional diagrams for the <b>*shape</b> of molecule <b>NOT</b> obeying octet rule ( <b>Atom arrangement</b> )
No of bond pairs*	No of lone pairs		
2	0	2 (Linear) CO <sub>2</sub> = C = O (Linear)	BeCl <sub>2</sub> Cl - Be - Cl (Linear)
3	0	3 (Trigonal Planar) CH <sub>2</sub> O H <sub>2</sub> C = O (Trigonal Planar)	BF <sub>3</sub> · F F <sup>-</sup> · B <sup>+</sup> · F (Trigonal Planar)
4	0	4 (Tetrahedral) CH <sub>4</sub> H <sub>4</sub> C (Tetrahedral)	
3	1	4 (Tetrahedral) NH <sub>3</sub> H <sub>3</sub> N (Trigonal pyramidal)	
2	2	4 (Tetrahedral) H <sub>2</sub> O H <sub>2</sub> O (V-shaped)	
5	0	5 (Trigonal bipyramidal) PCl <sub>5</sub> (Trigonal bipyramidal)	PCl <sub>5</sub> Cl - P <sup>+</sup> - Cl Cl <sup>-</sup> (Trigonal bipyramidal)
6	0	6 (Octahedral) SF <sub>6</sub> (Octahedral)	SF <sub>6</sub> F <sup>-</sup> (Octahedral)

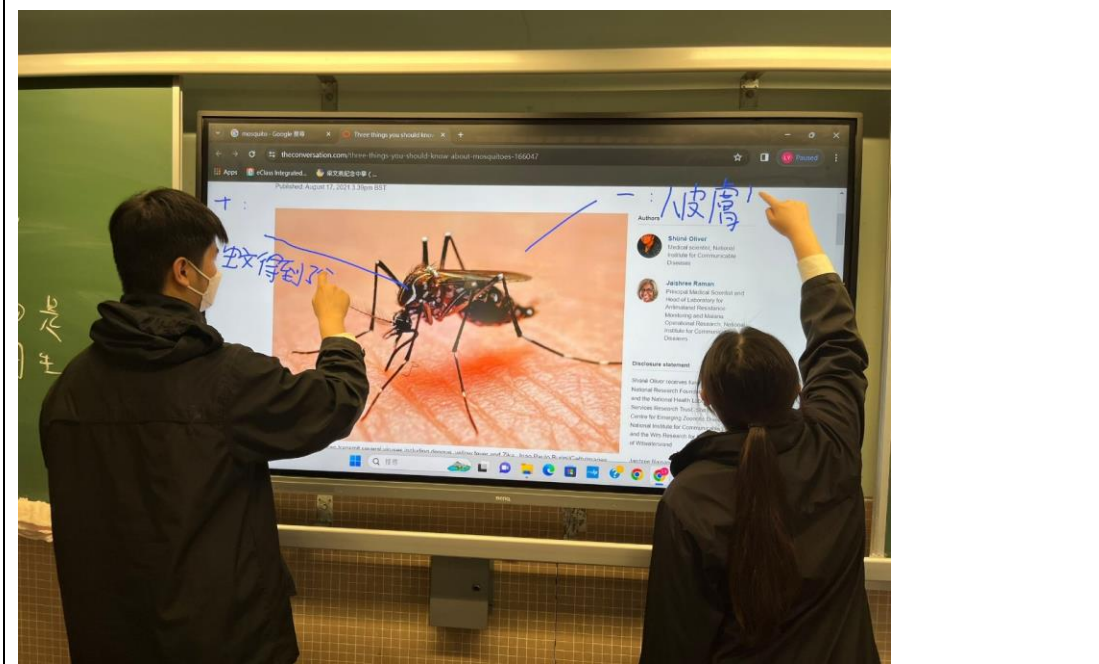
\* The shape of a molecule depends only on the positions of the **bonded atoms**.  
\* Single / double / triple bonds are all counted as **ONE** bond pair.  
(CO<sub>2</sub>, BeCl<sub>2</sub>, CH<sub>2</sub>O, BF<sub>3</sub>, CH<sub>4</sub>, NH<sub>3</sub>, H<sub>2</sub>O, PCl<sub>5</sub>, SF<sub>6</sub>)

E 科組名稱：Biology

1. 課題： Ecology -- Interspecific relationship
2. 學習目標： Understanding relationships between different species
3. 利用電子白板學習



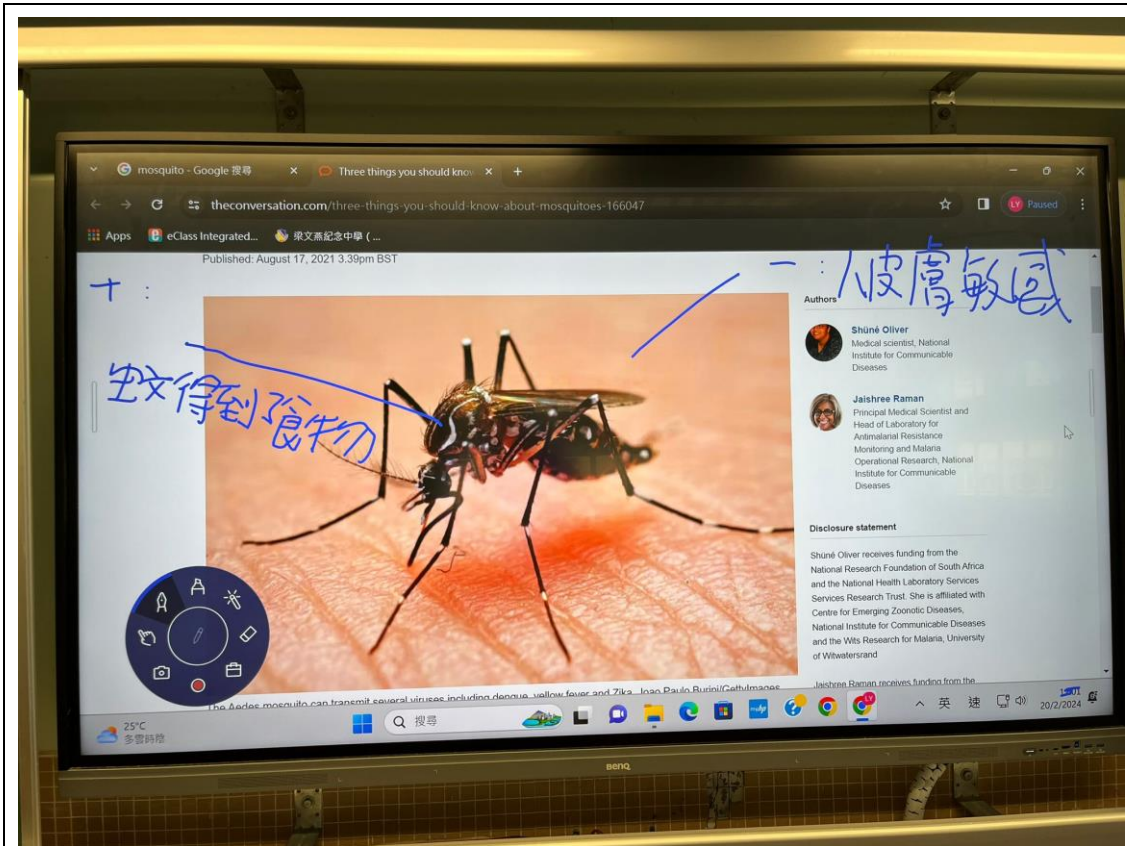
Knowing the size of mosses and how they compete better than lichens for the substratum of a thin soil layer.



Students labelling the benefits/harms of a mosquito/a human in their relationship



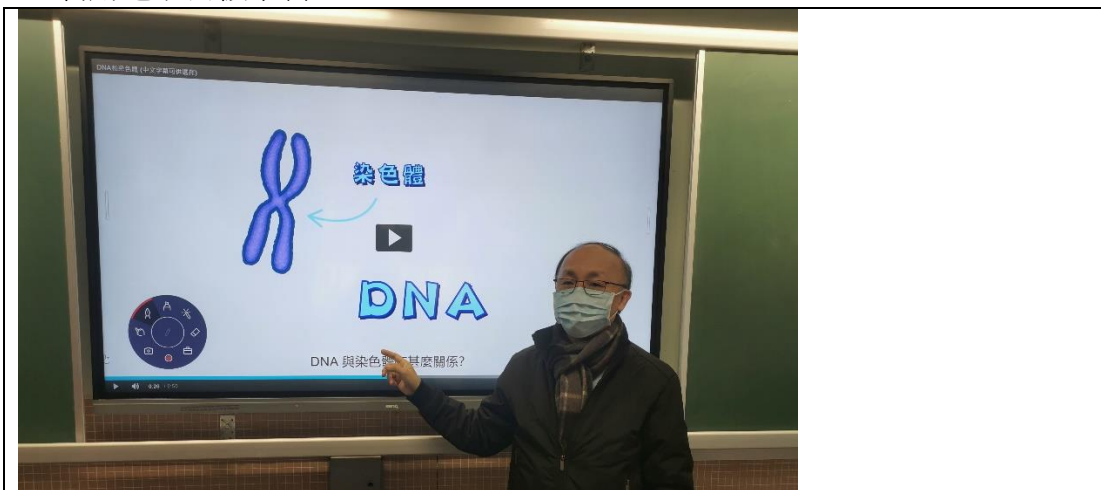
#### 4. 學習成果(學生作品)



The result of their work in the previous picture which showed that students can easily visualize abstract concepts

F 科組名稱：科學科

1. 課題：DNA 與遺傳
2. 學習目標：學習有關 DNA 的結構及其在遺傳上的功用。
3. 利用電子白板學習

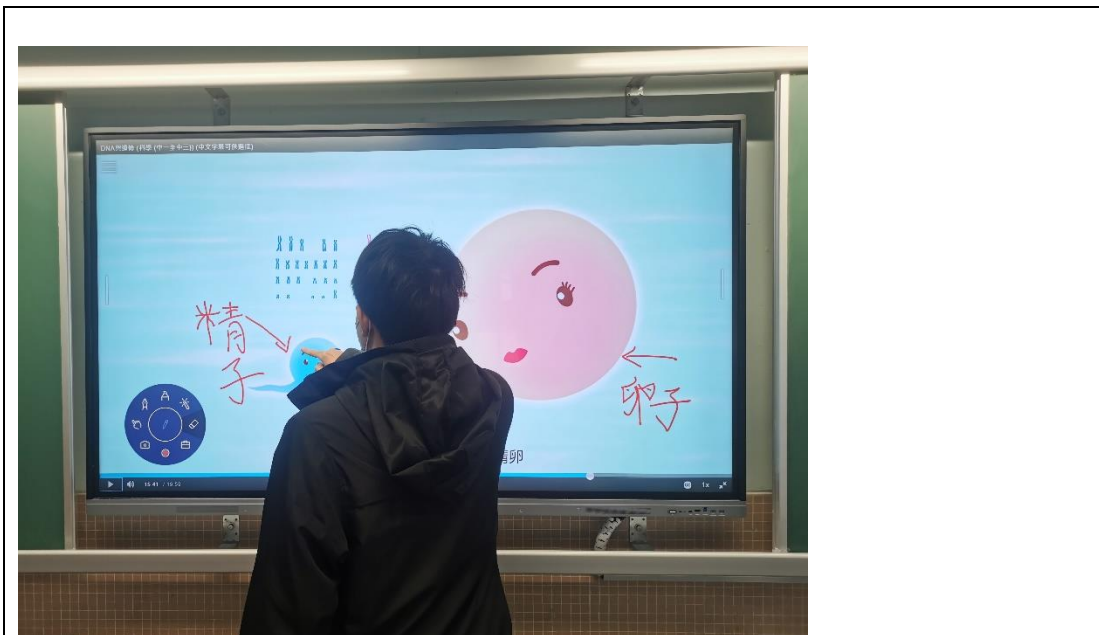


老師利用互動電子白板配合多媒體去描述DNA和染色體的結構和關係，把抽象概念具體呈現，加深學生記憶和理解。





學生利用互動電子白板向同學指出染色體在細胞內所在的位置及數目，並解釋染色體呈現成對形式出現的原因。



學生利用互動電子白板向同學說明父母精子和卵子的受精結合如何跟遺傳過程有關，並具體描述人體染色體的數目。

#### 4. 學習成果(電子學習過程中的成品及學生作品)

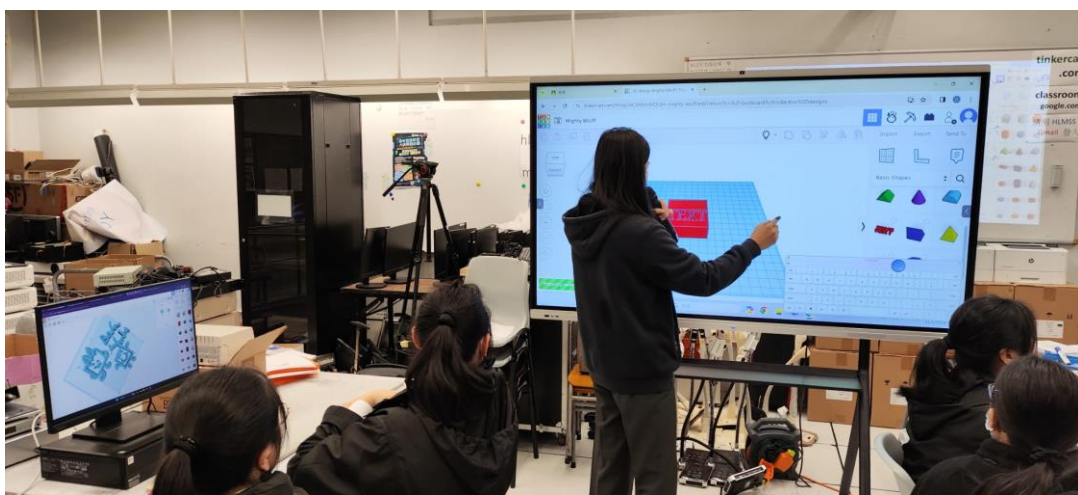
老師可透過互動電子白板配合多媒體上活動資源，讓老師能清晰及圖解化地解釋 DNA 和染色體的結構、位置及其與細胞遺傳的關係。

此外，學生也透過互動電子白板去透過展示人類遺傳過程如何跟精子和卵子所攜帶染色體的數目及其在受精發生後與人類遺傳的關係。

老師能讓學生參與，提升學生學習興趣，亦可即時評估學生能掌握課題內容的情度，以調較學與教的方法。

#### G 科組名稱：STEAM

1. 課題：篆刻製作及 STL 檔案轉換的操作
2. 學習目標：用 Tinkercad 進行篆刻製作及 STL 檔案轉換
3. 利用電子白板學習



相片描述：用電子白板示範使用 Tinkercad 製作篆刻



學生使用 Tinkercad 進行篆刻設計

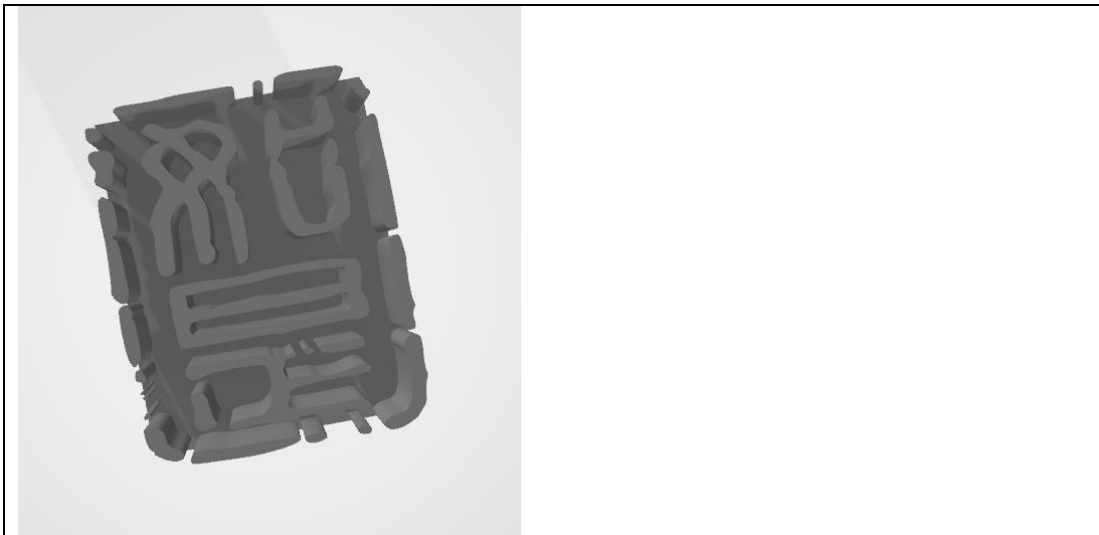


相片描述：學生正學習製作篆刻



相片描述：示範用電子白板將設計匯出為 STL 檔案

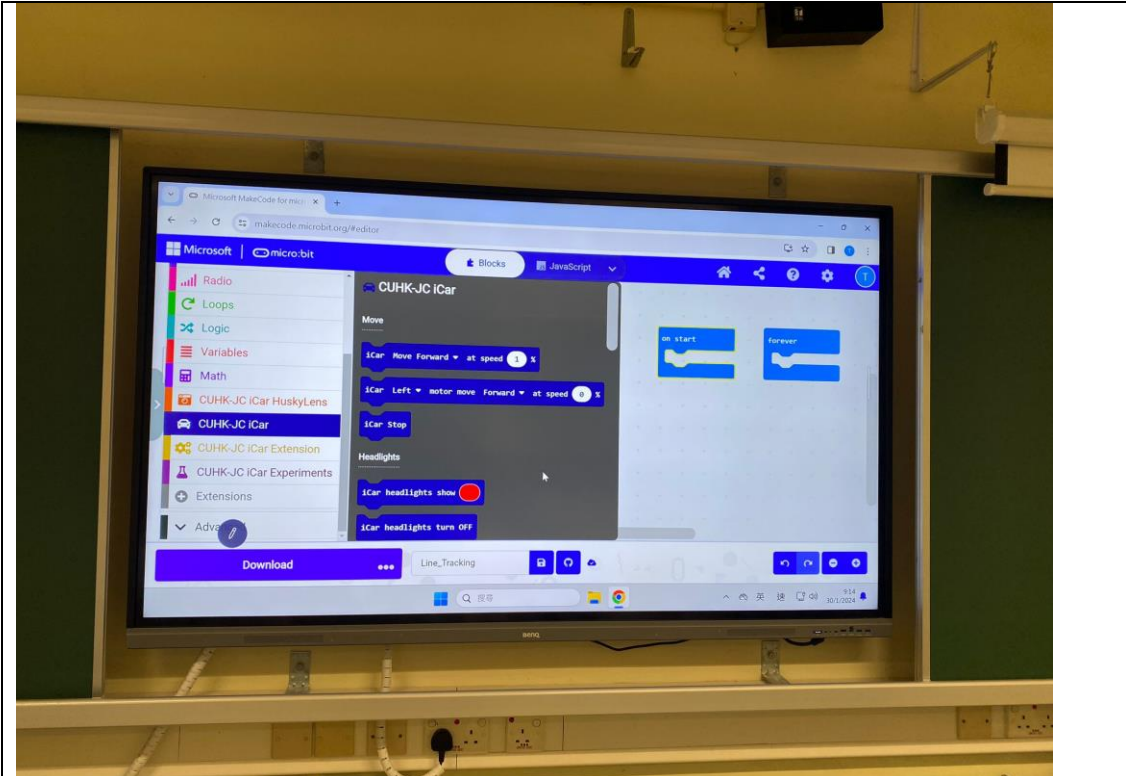
#### 4. 學習成果(電子學習過程中的成品及學生作品)



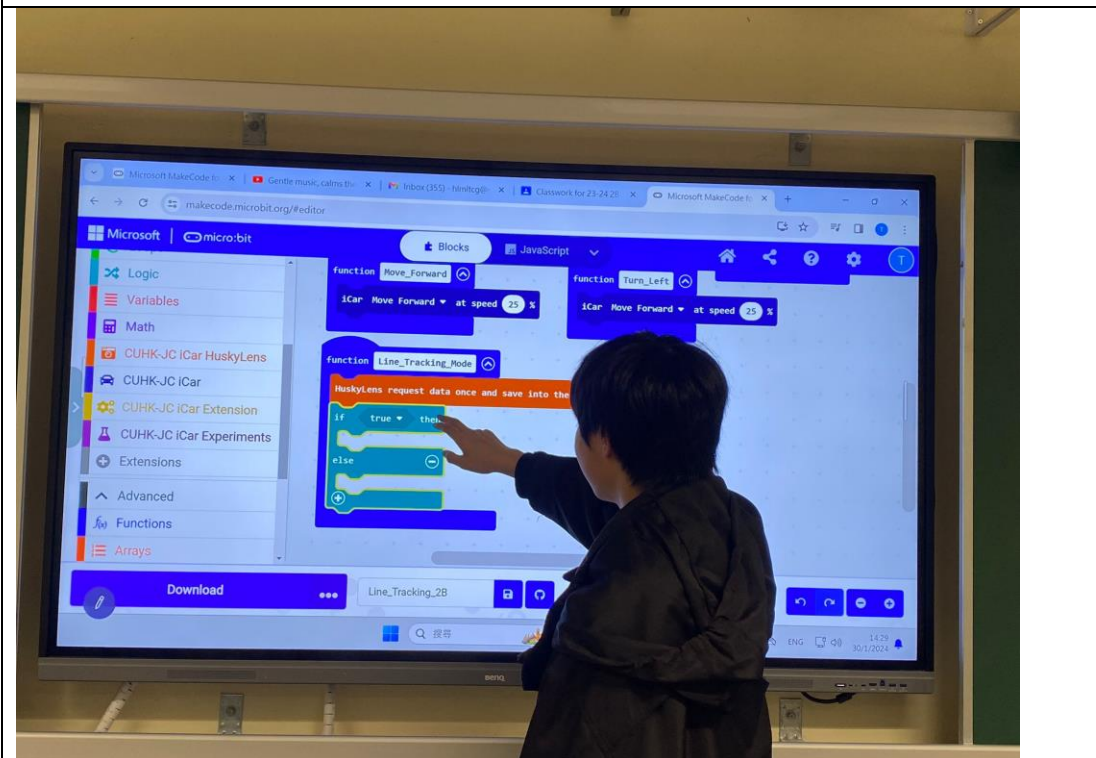


H 科組名稱：Computer Literacy/ICT

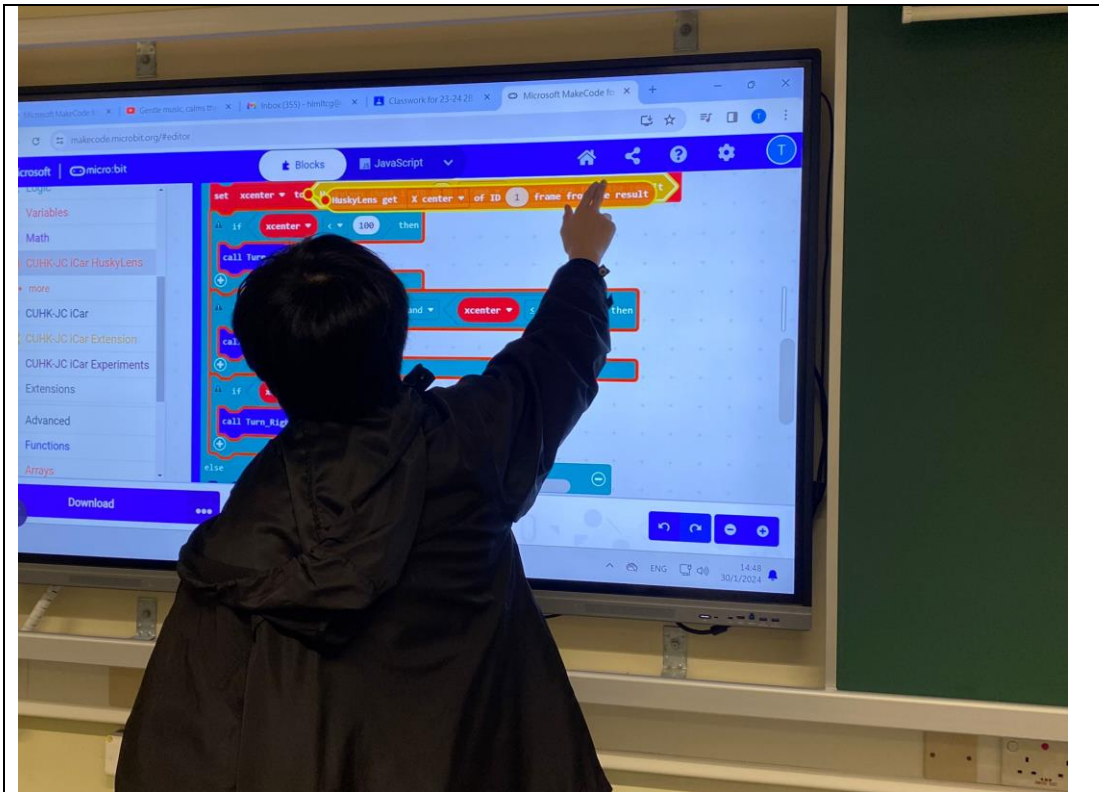
1. 課題：Computer Vision: CUHK-iCar Line Tracking Experiment
2. 學習目標：To build a simple micro:bit program
3. 利用電子白板學習



The teacher used the interactive whiteboard to show the blocks and do the demonstrations.



A student volunteer built a simple micro:bit program using drag-and-drop



A student volunteer debugged the program using drag-and-drop

#### 4. 學習成果(電子學習過程中的成品及學生作品)

```

on start
  HuskyLens initialize I2C until success
  HuskyLens switch algorithm to Line Tracking
  show icon

function Move_Forward
  iCar Move Forward at speed 25 %

function Turn_Left
  iCar Turn Left at speed 25 %

function Turn_Right
  iCar Turn Right at speed 25 %

function Line_Tracking_Mode
  HuskyLens request data once and save into the result
  if HuskyLens check if ID 1 arrow is on screen from the result then
    set xcenter to HuskyLens get X beginning of ID 1 arrow from the result
    if xcenter < 100 then
      call Turn_Left
    if xcenter >= 100 and xcenter <= 220 then
      call Move_Forward
    if xcenter > 220 then
      call Turn_Right
    else
      iCar Stop
  forever
    call Line_Tracking_Mode
  
```