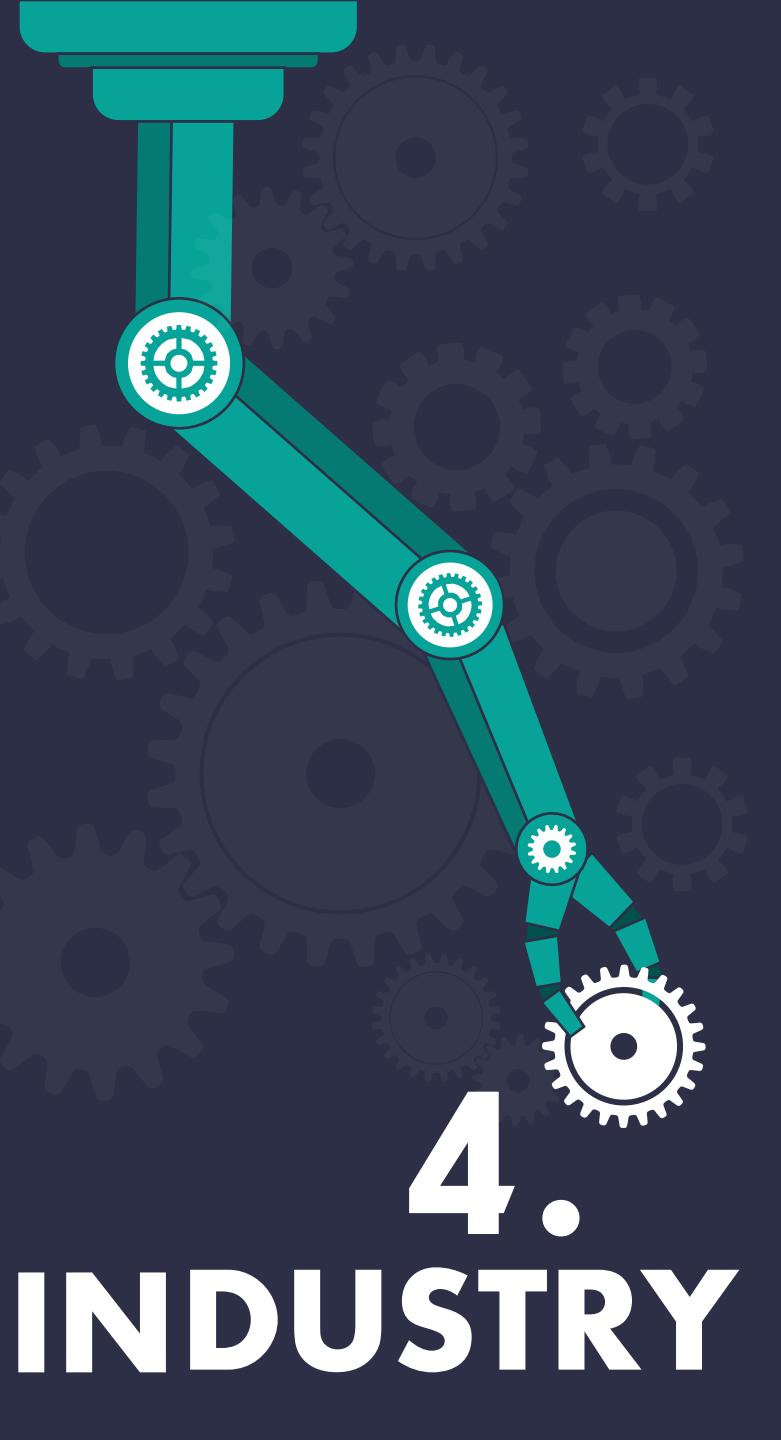


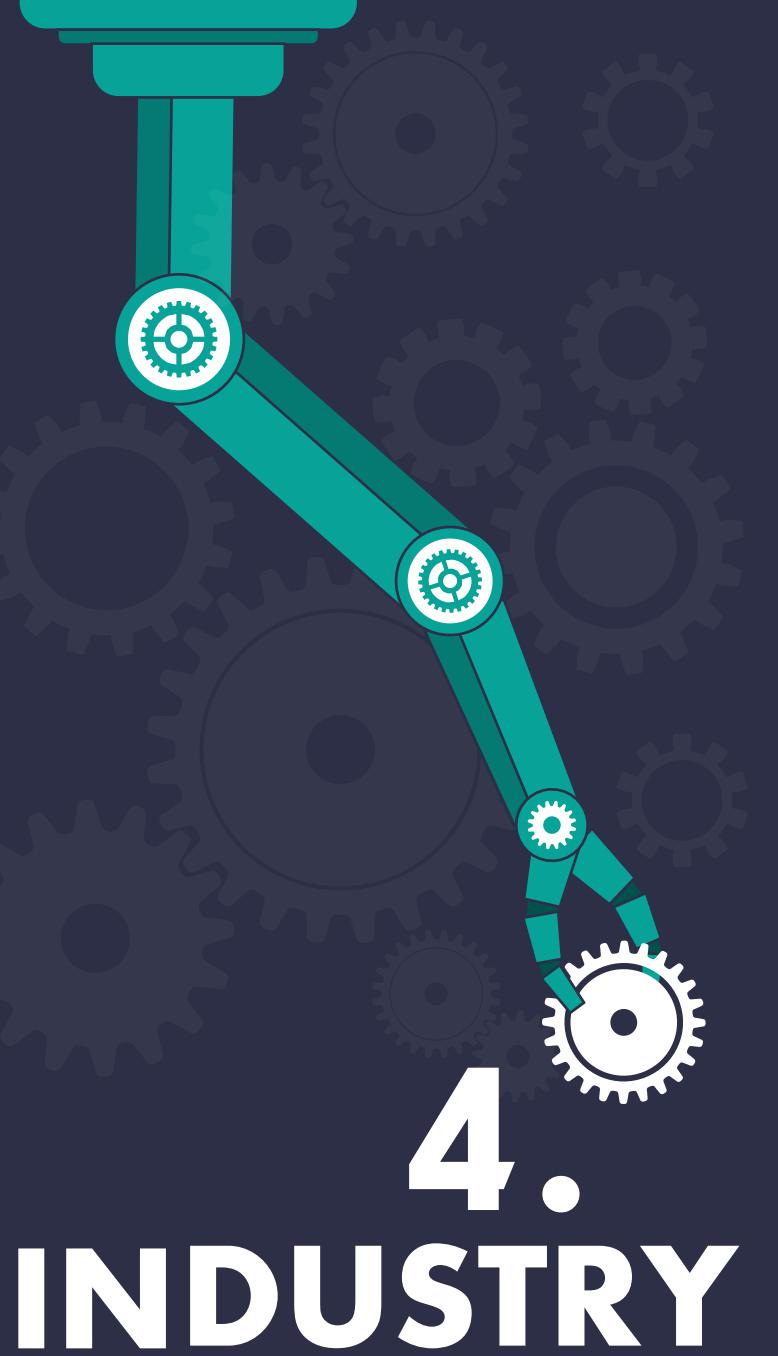
第四單元 機器人動起來(一)

電風扇製作



學習目標

1. 認識日常科技產品的基本運作概念
2. 依據特定步驟製作風扇機構
3. 程式設計工具的基本應用
4. 運用序列化指令完成任務



在這單元我們將學到：

- ◆ 能搭建風扇機構
- ◆ 能知道動力與結構的關係
- ◆ 能使風扇執行轉動功能

活動—小小電風扇

想想看：

手搖風扇和電風扇有什麼**不一樣**

手搖風扇：

- ✓ 搖久手很痠
- ✓ 不能固定風量

電風扇：

- ✓ 節省人力
- ✓ 風量可以固定，不會忽大忽小



活動—小小電風扇

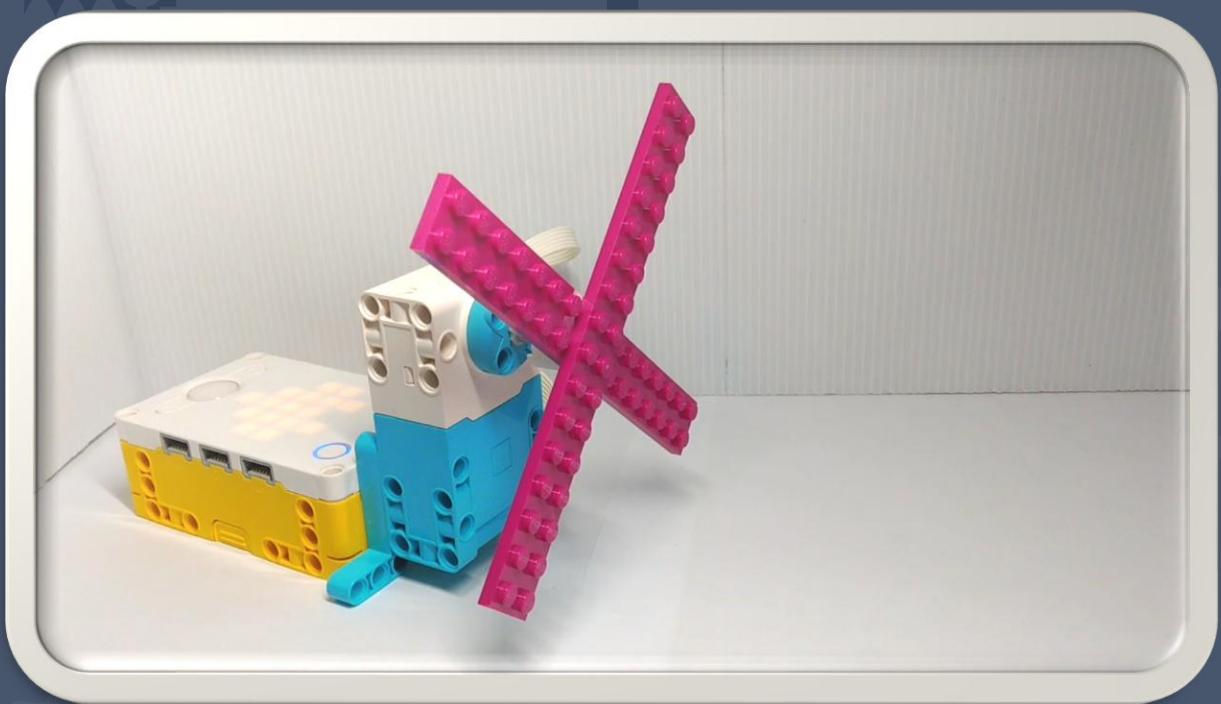
請觀察 

- 電風扇是如何轉動的？
 - ✓ 有**馬達**帶動風扇轉動
 - ✓ 馬達需要**電力**驅動
 - ✓ 電力透過**電線**連接插座，或是裝上**電池**給電。



組立時間·

製作一個簡易小風扇



觀看範例

引導學生觀察風扇如何改變速度

今天加上馬達與電池
一起來製作「電」風扇





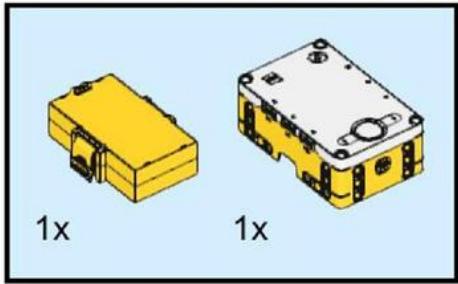
中華機器人科技教育學會

Chinese Association for Robot and Educational Technology

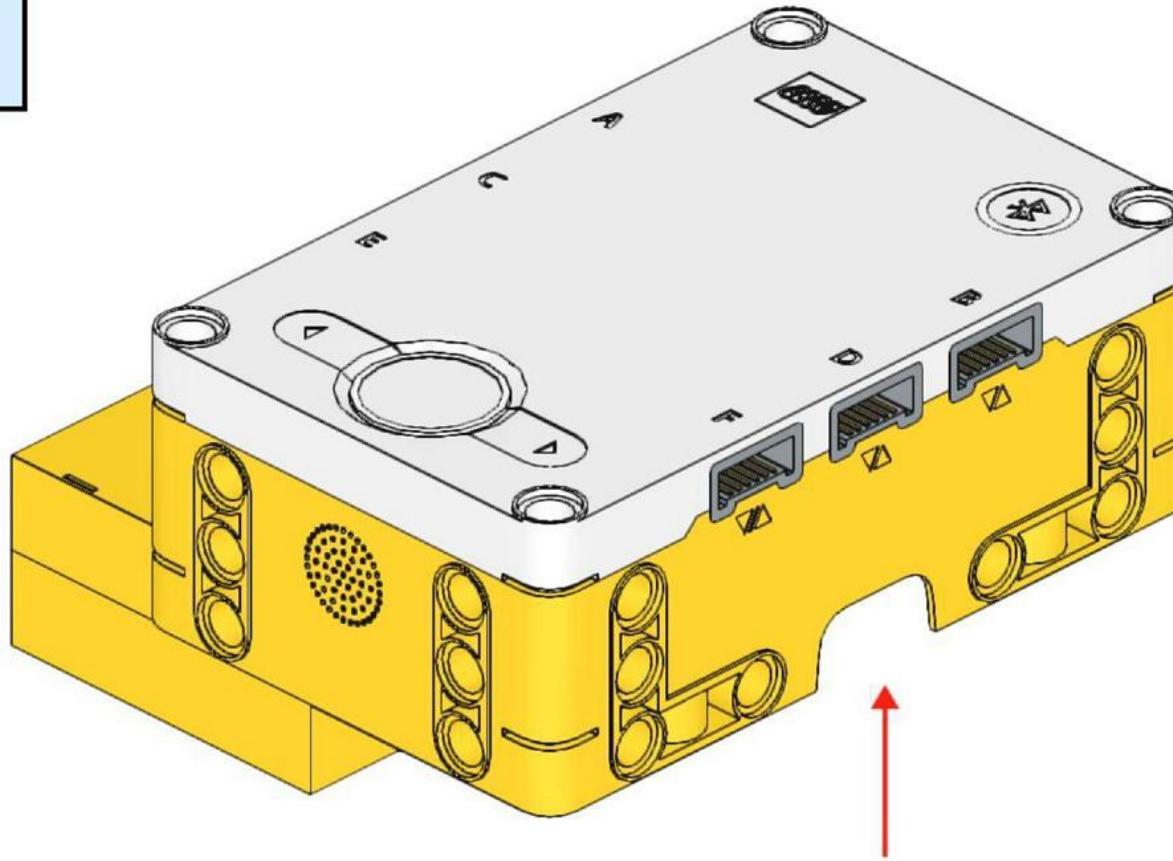


SPIKE

小小電風扇

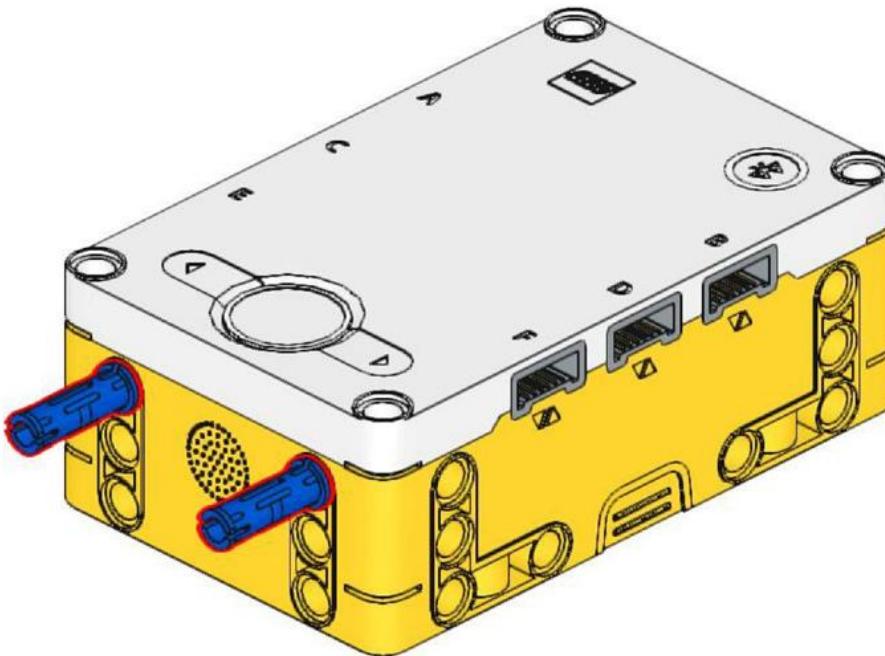


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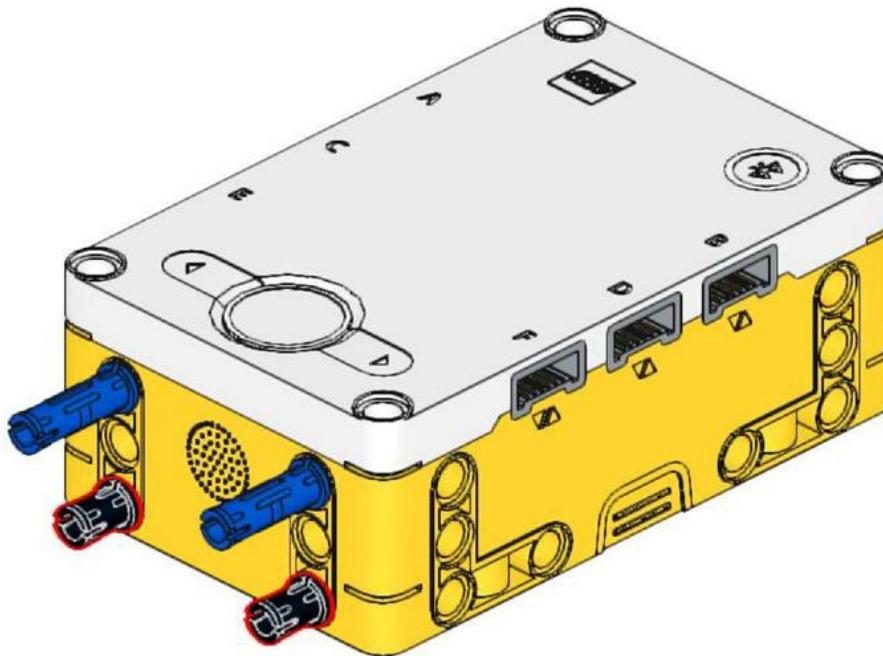


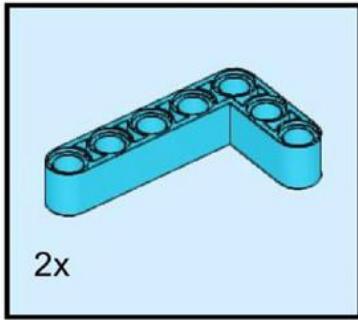
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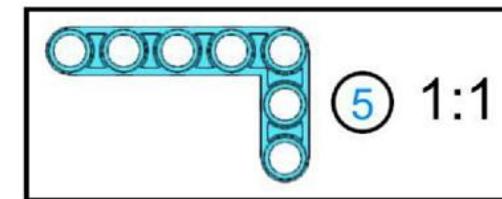
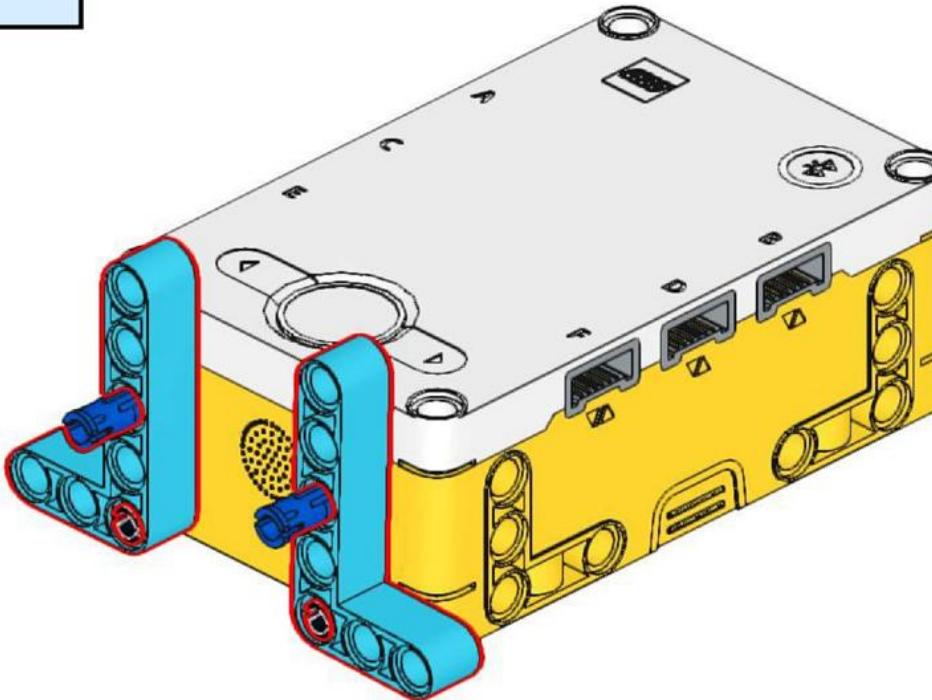


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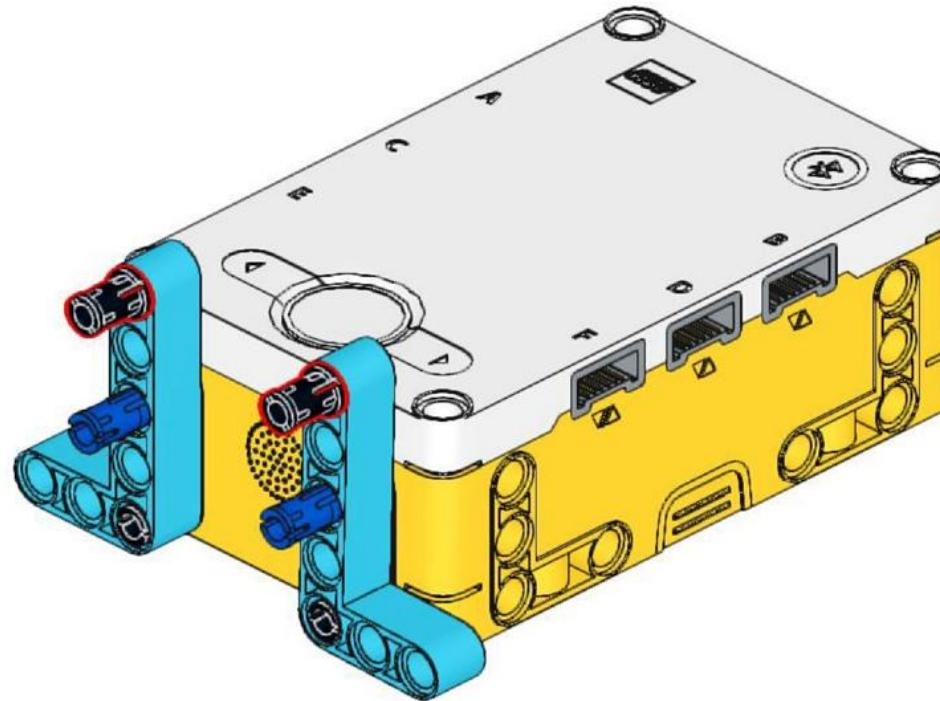


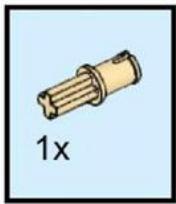
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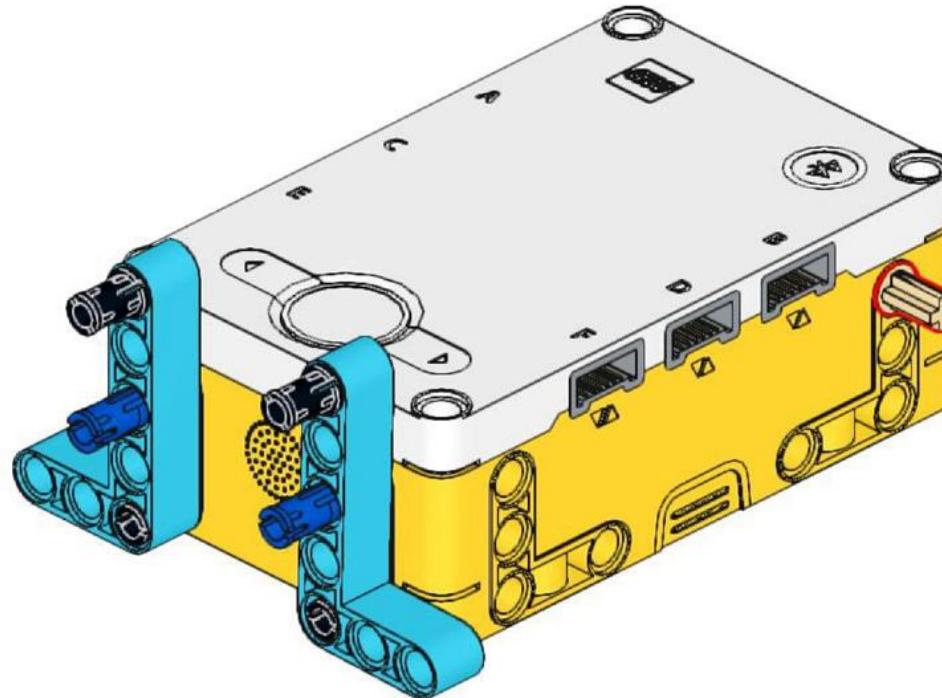
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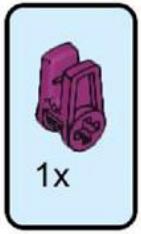




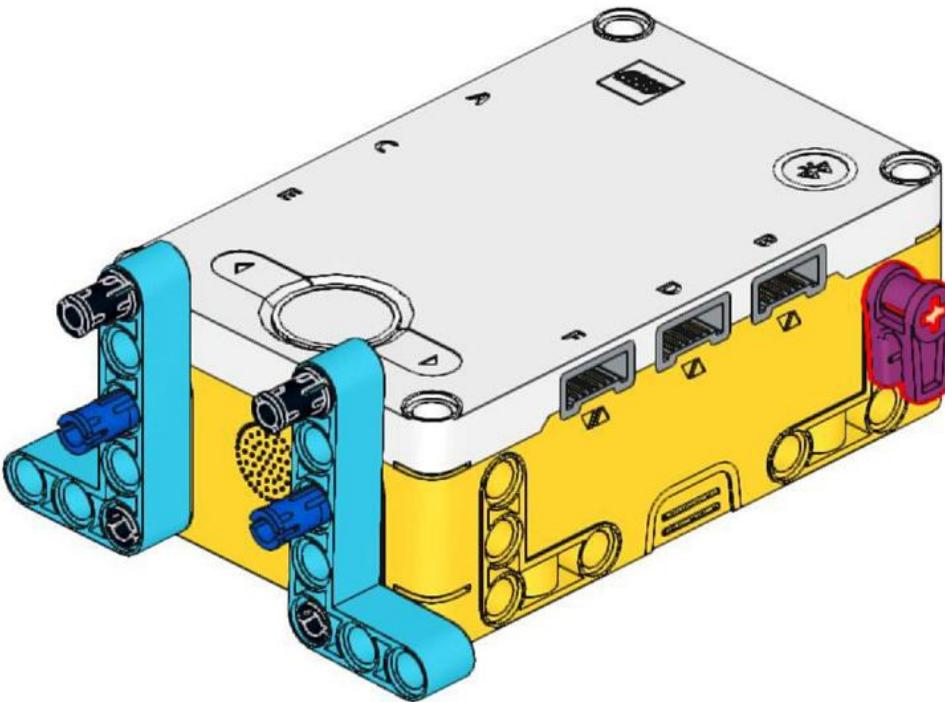
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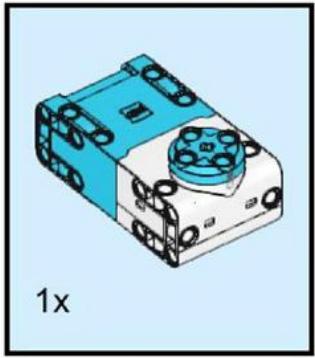
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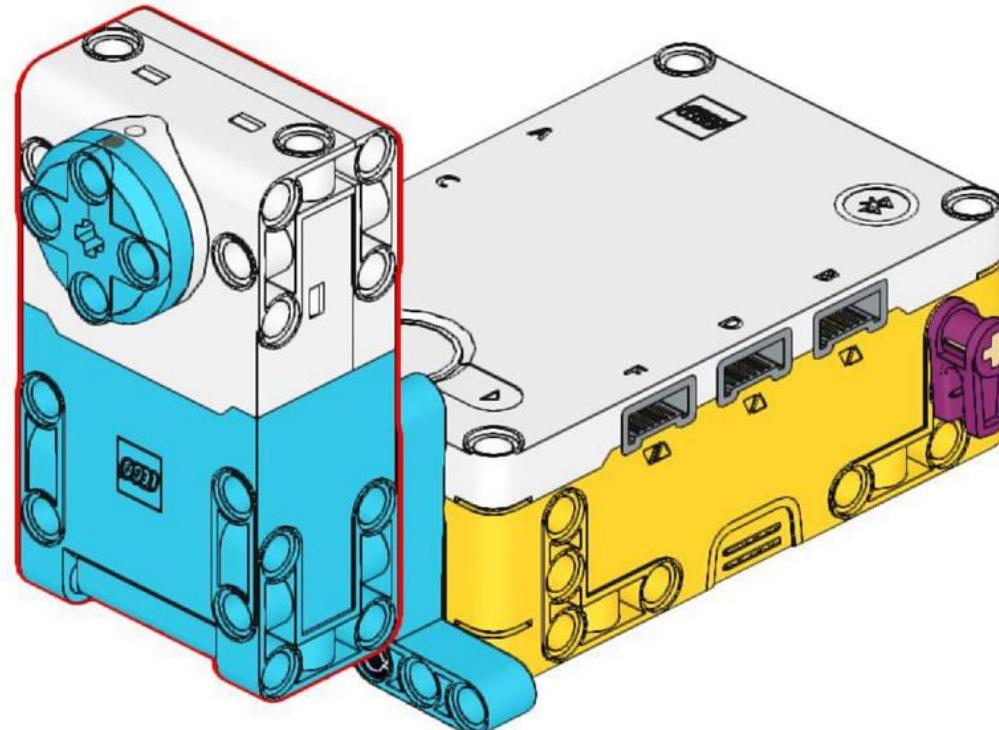
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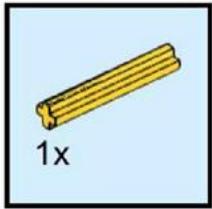




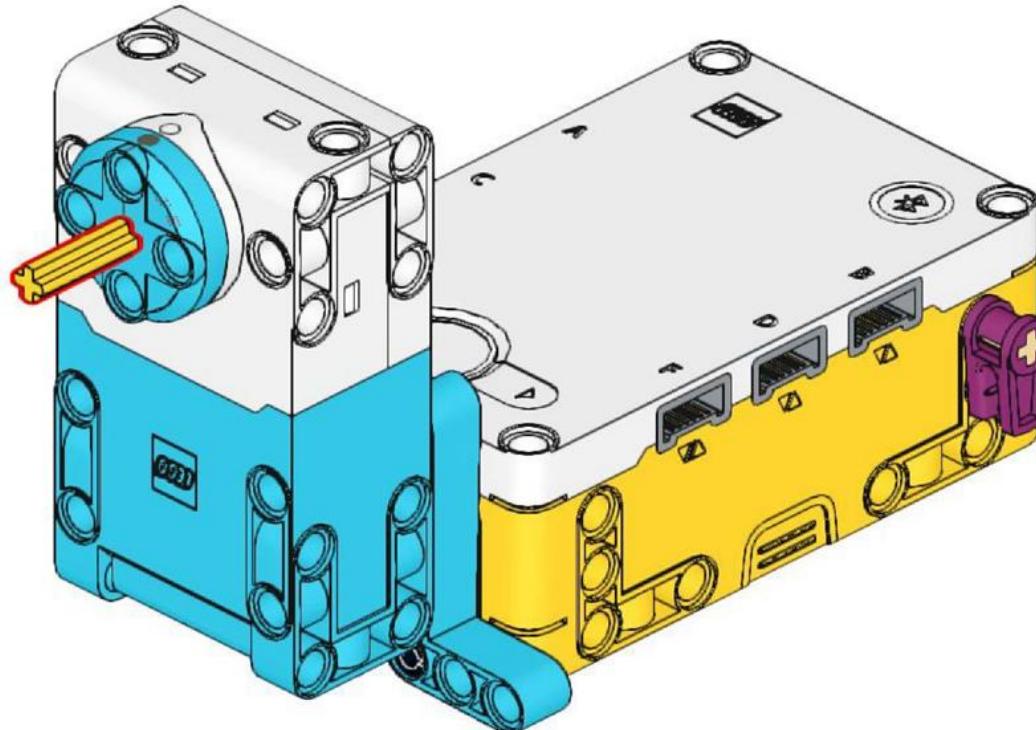
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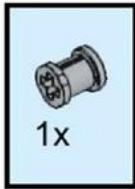




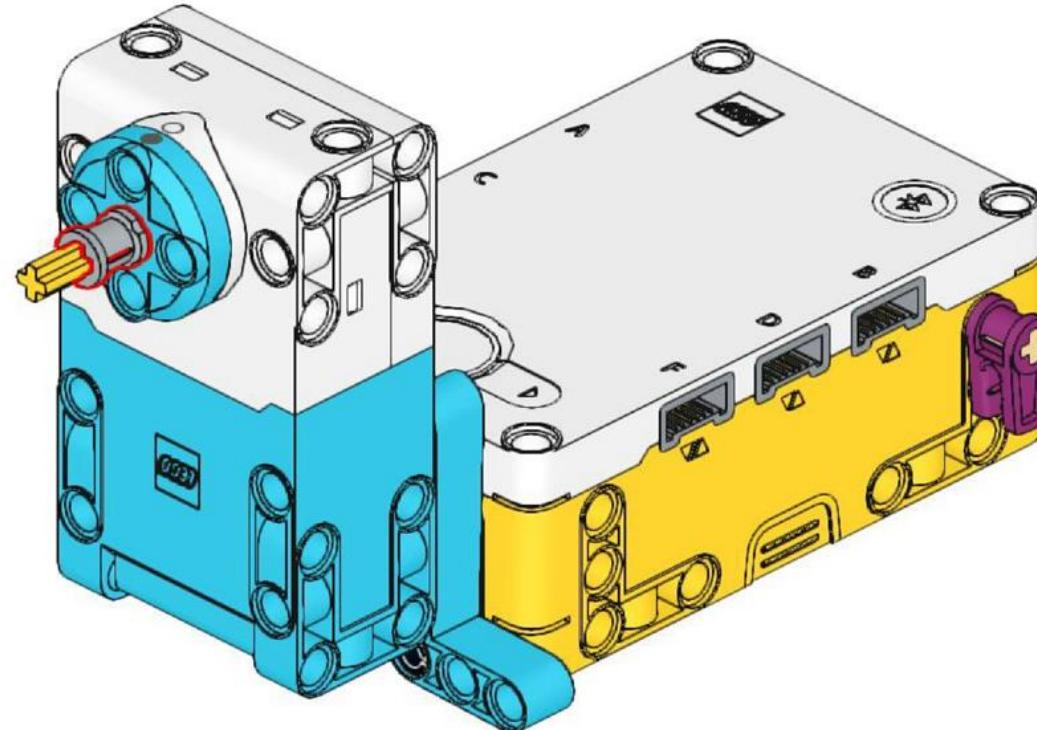
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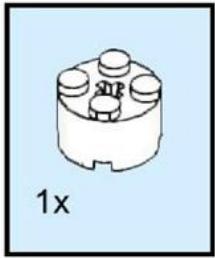


③ 1:1

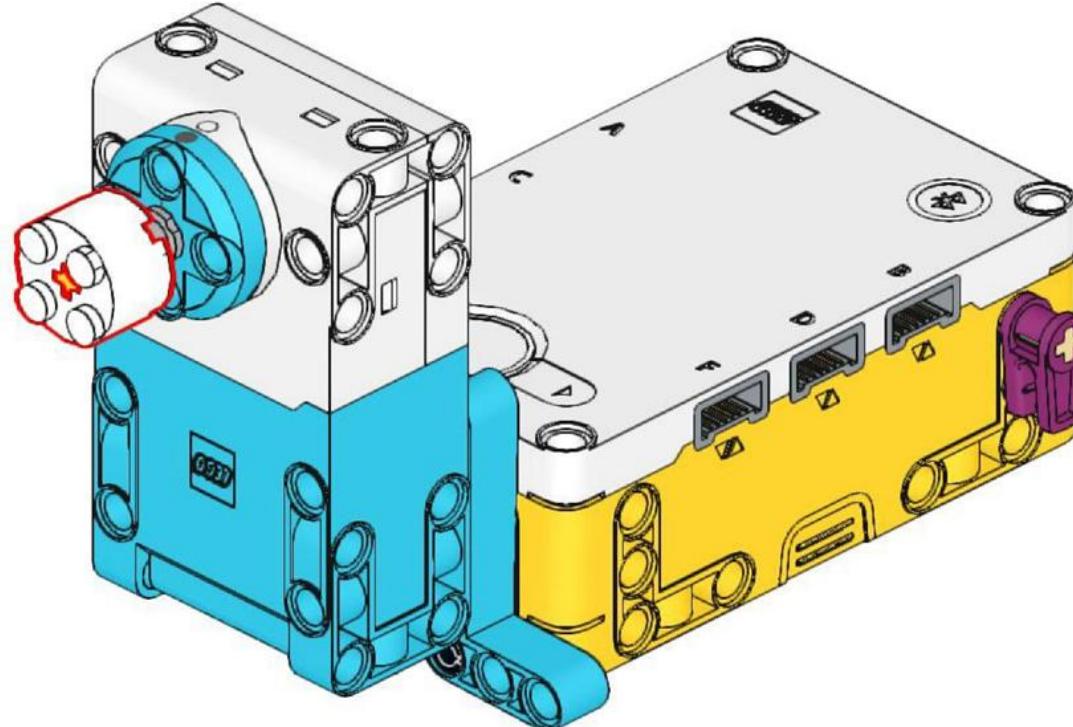


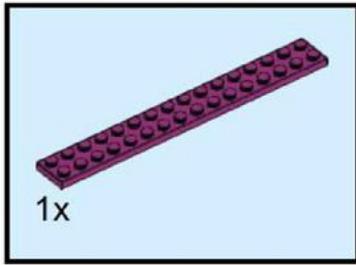
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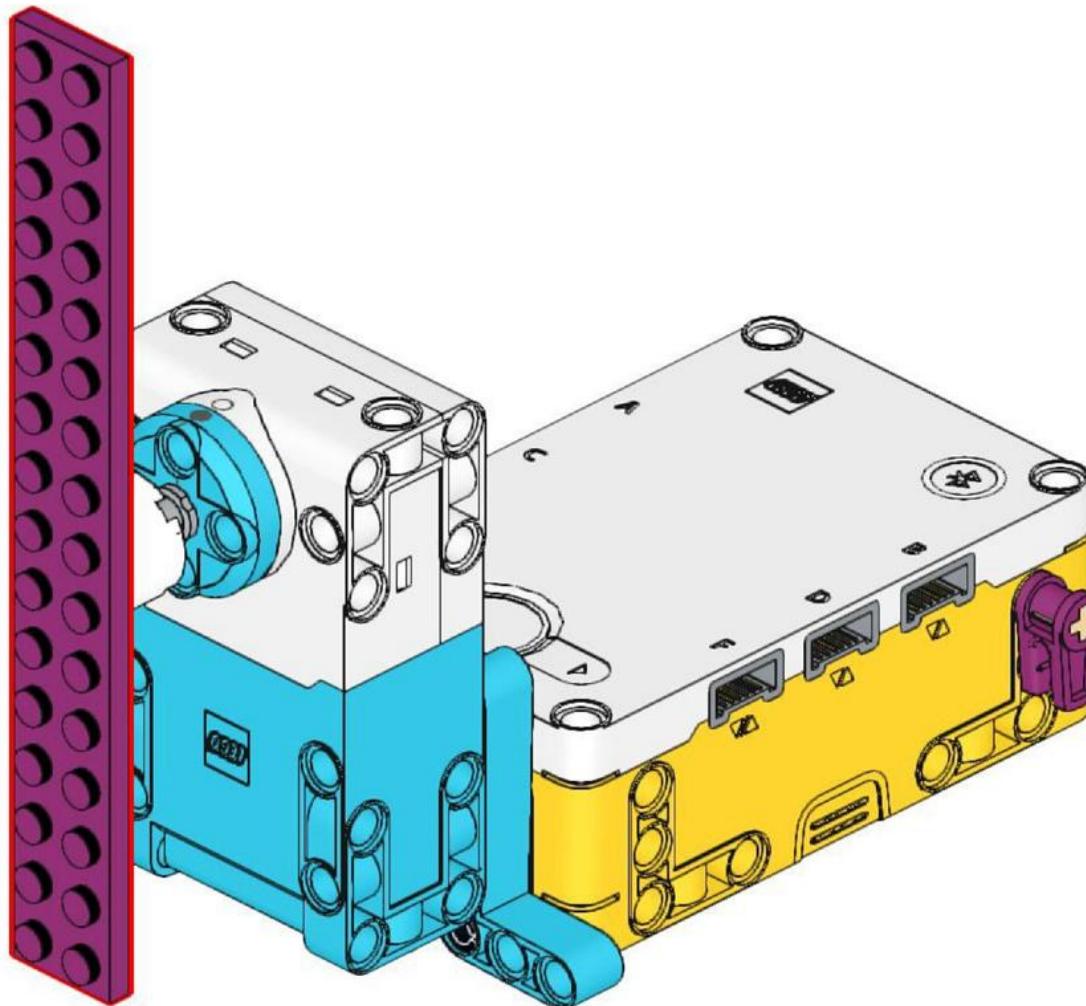


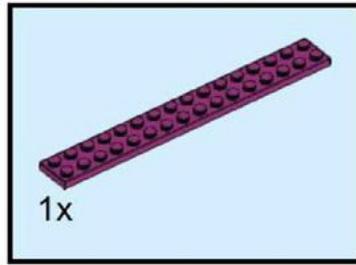
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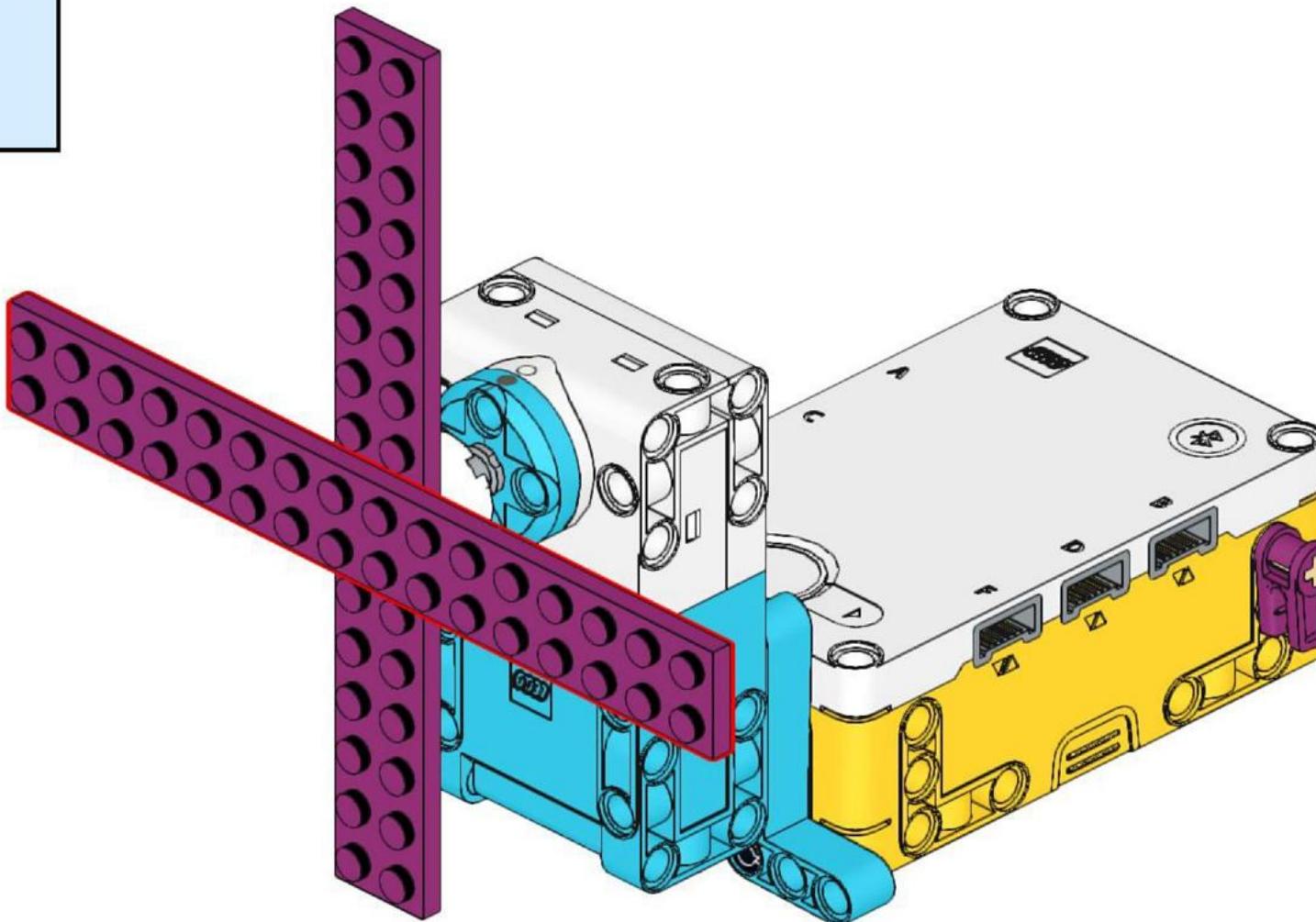


12





13



動力與結構的關係

實驗時間・

分別用兩種零件(黃色十字軸 / 黑色十字插銷)

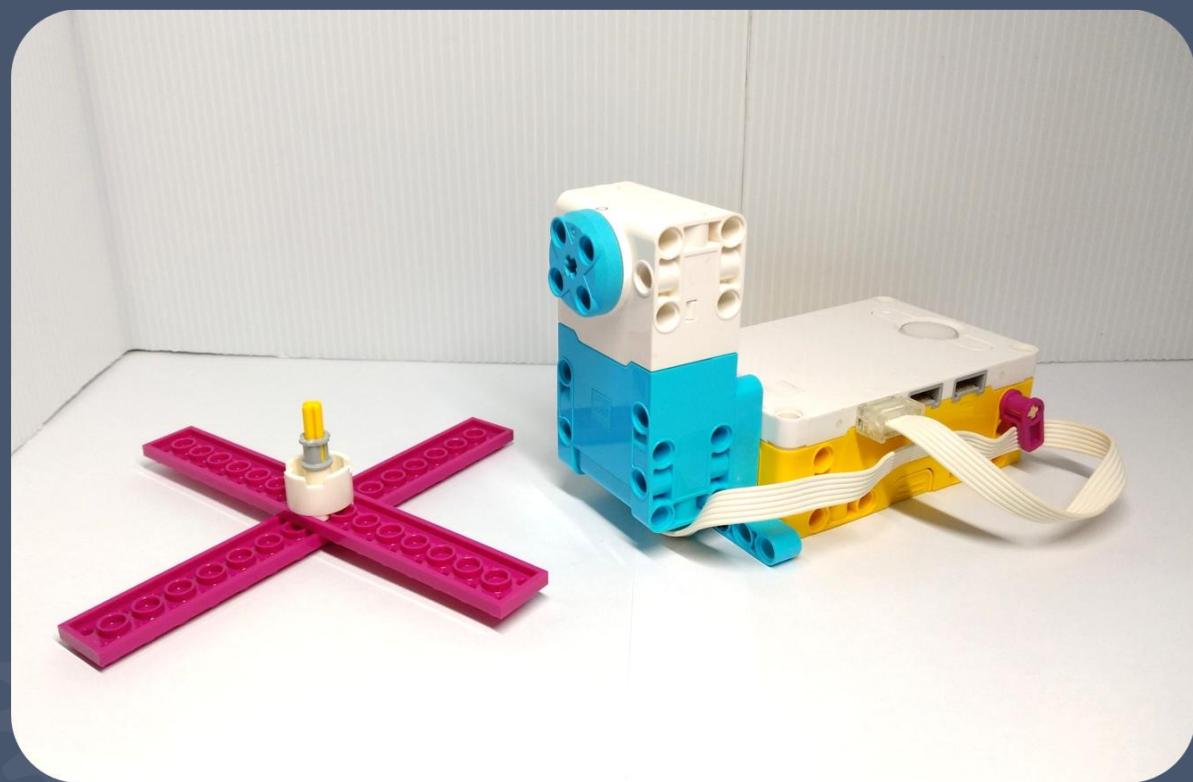
作為風扇軸心用手轉動

觀察有什麼不一樣？

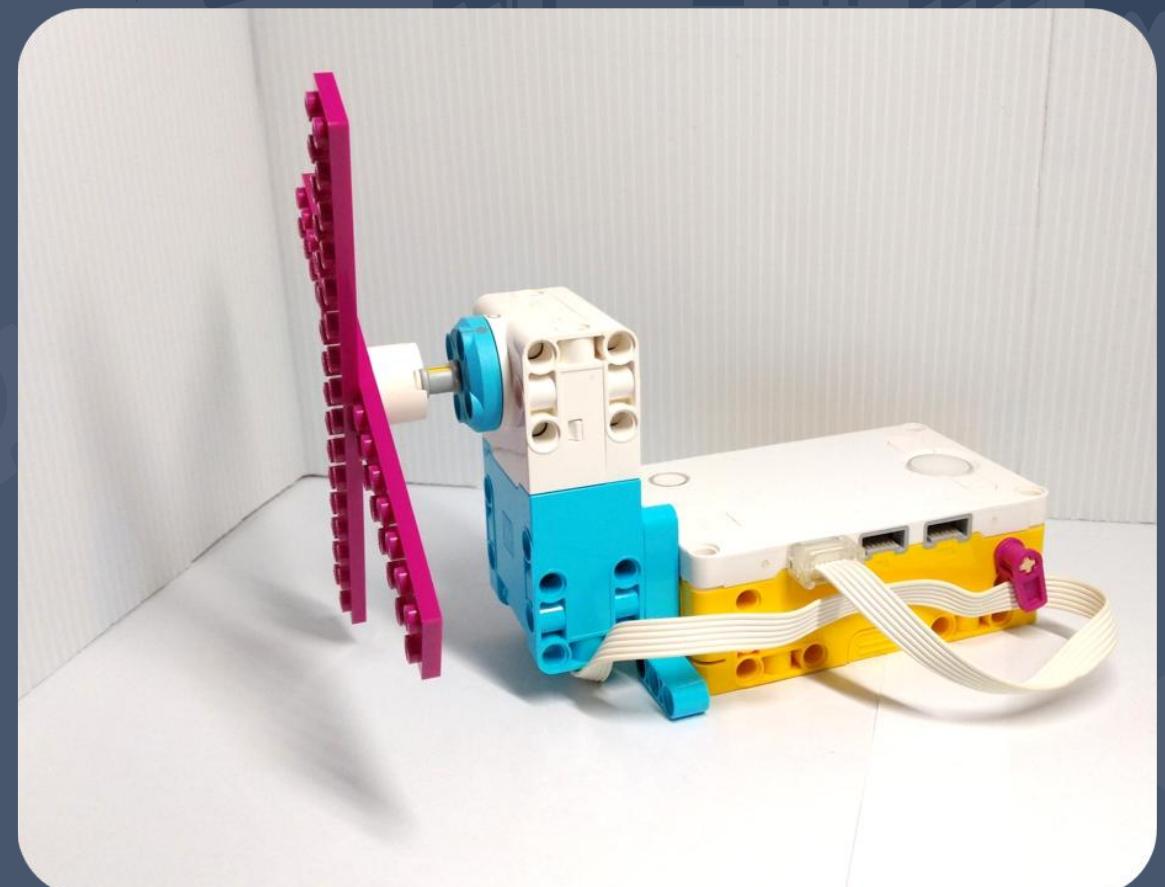


組立時間・

完成簡易小風扇



07

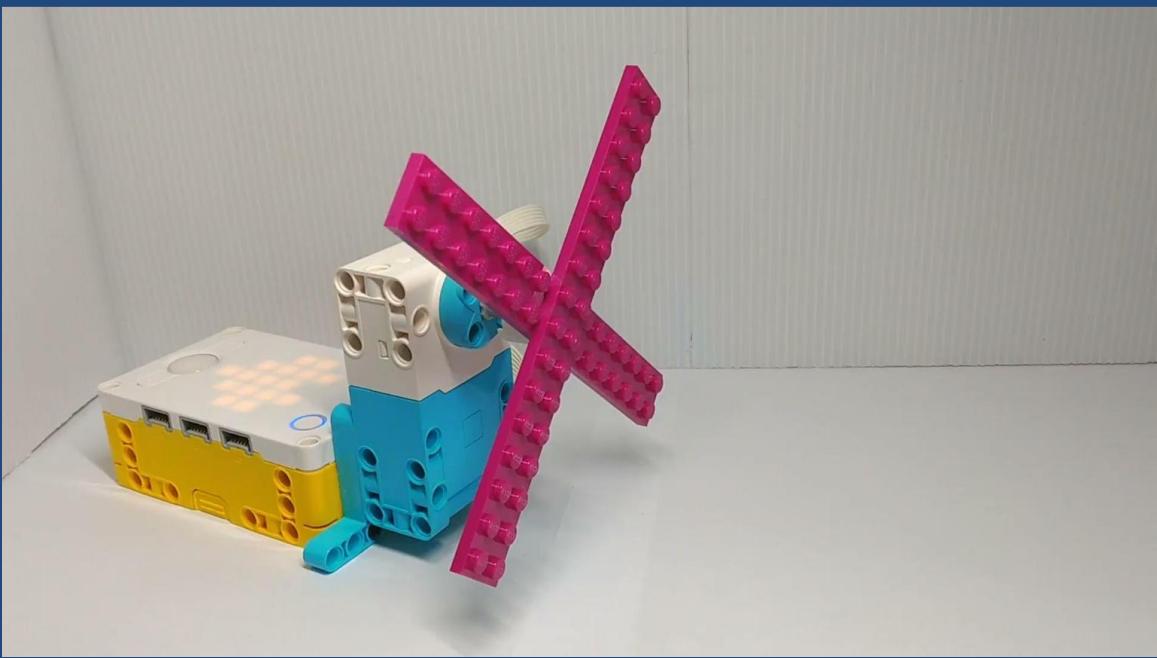


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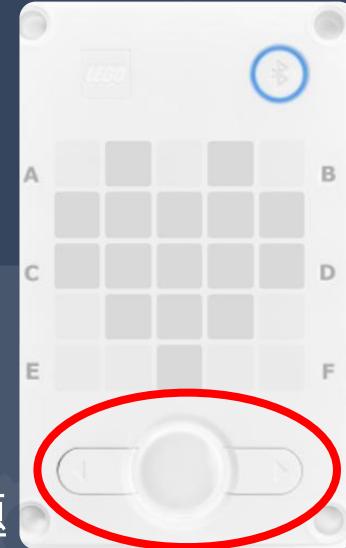
機電控制-愛心模式

透過主機按鈕啟動風扇

觀看操作方式



1. 按中間鍵選擇愛心模式
2. 按左鍵馬達左轉；右鍵右轉
3. 當馬達正在轉動時，按左 / 右鍵
改變轉速，每按一下+或-10%功率。



撰寫程式控制

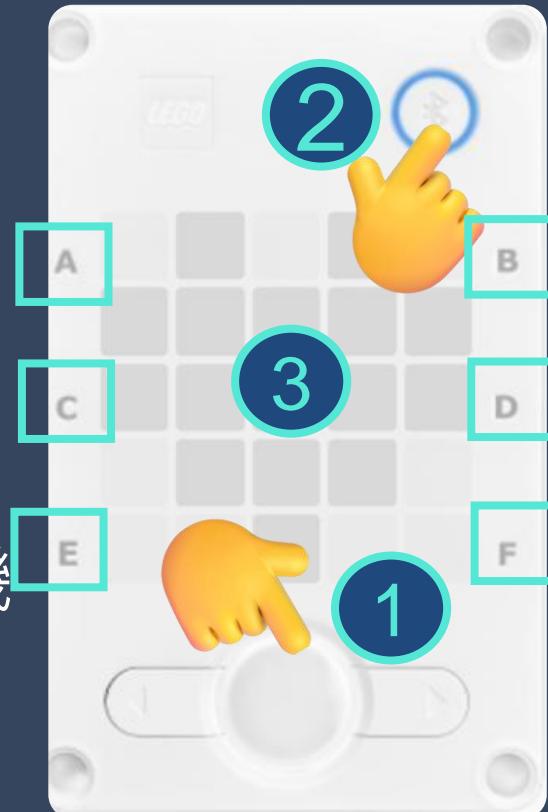
設備連線

- USB傳輸線：筆電 / 桌機



- 藍芽連線：平板、筆電 / 桌機
(桌機需加裝藍芽設備)

主機介紹



- ① 長按開關機
短按程式執行 / 停止
 - ② 藍芽連線按鈕
配對成功後
亮藍圈
 - ③ 程式選項(愛心、0-19)
可存取20筆程式
- A-F輸出/入端
口

撰寫程式控制

主機與設備連線

USB連線



SPIKE Prime



You are connected to:

ET

[BACK TO PROJECT](#)

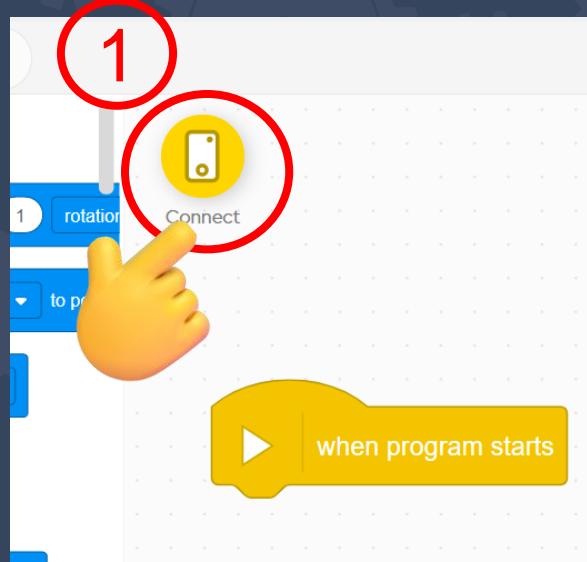
回到程式界面



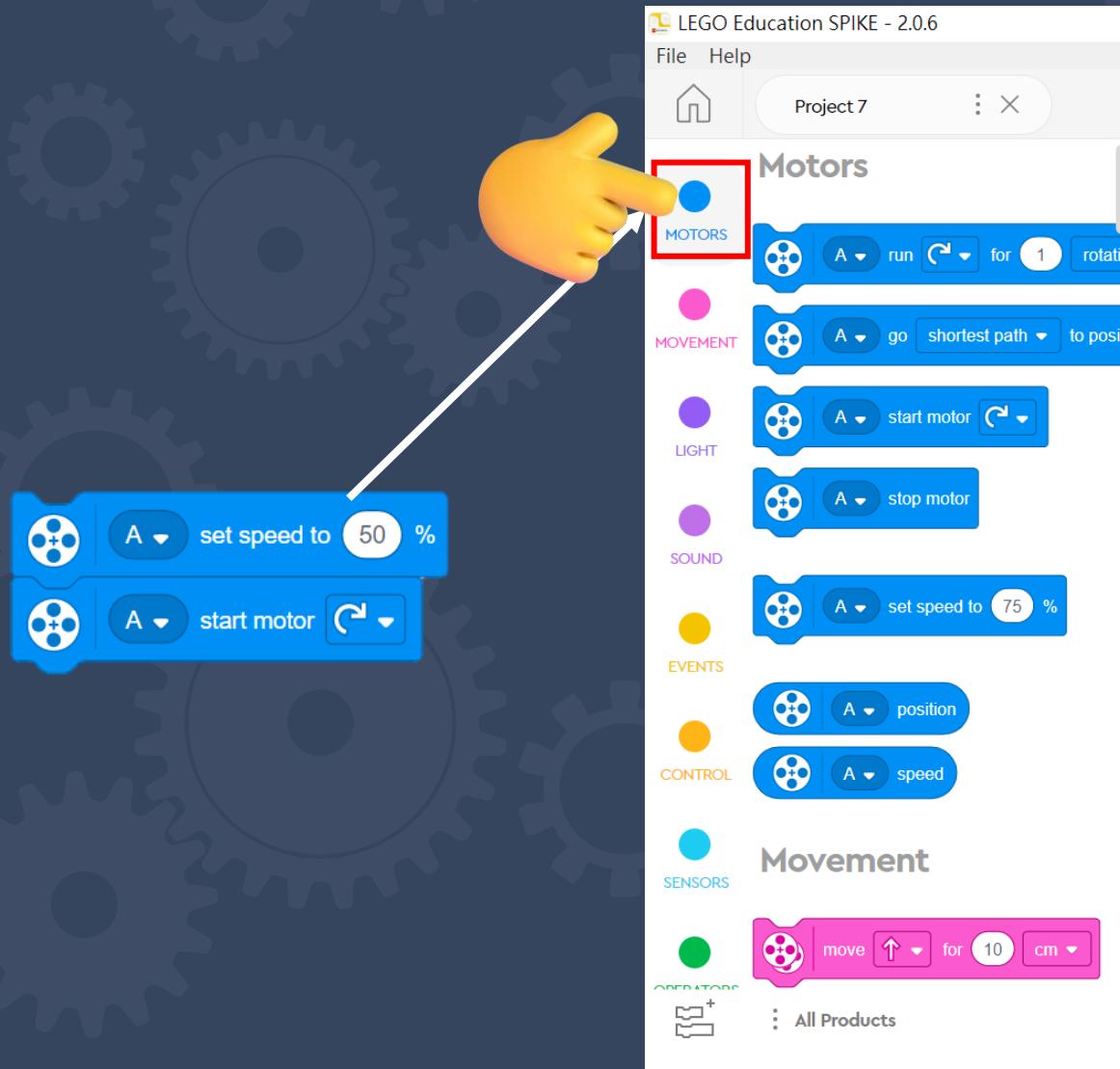
撰寫程式控制

主機與設備連線

？ 藍芽連線

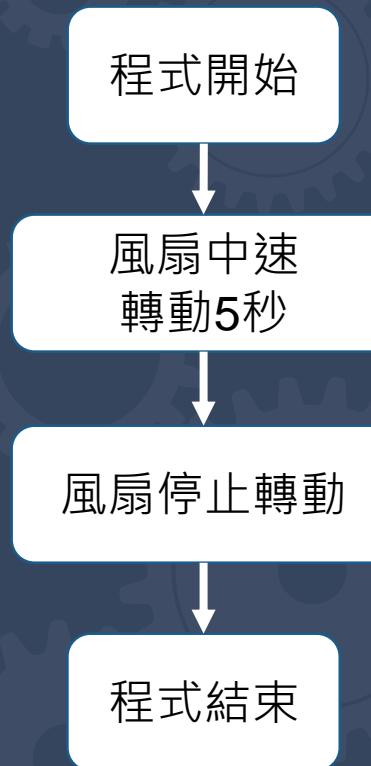


撰寫程式控制

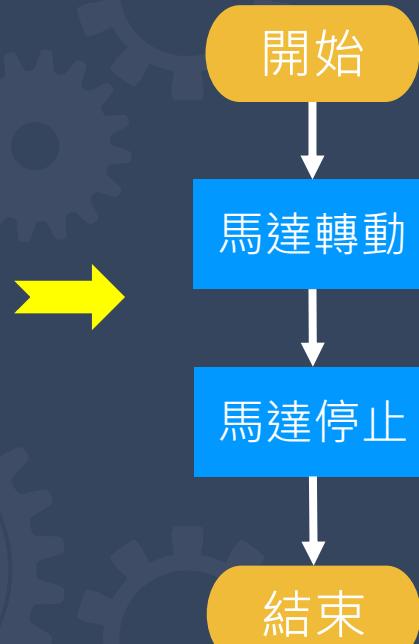


撰寫程式控制

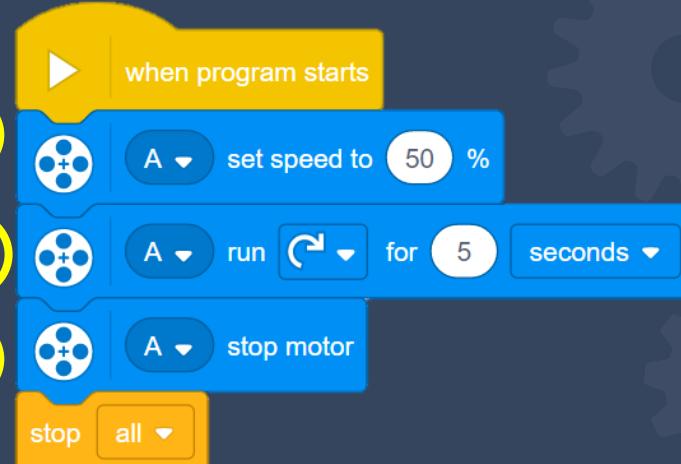
機構動作設計



程式流程圖



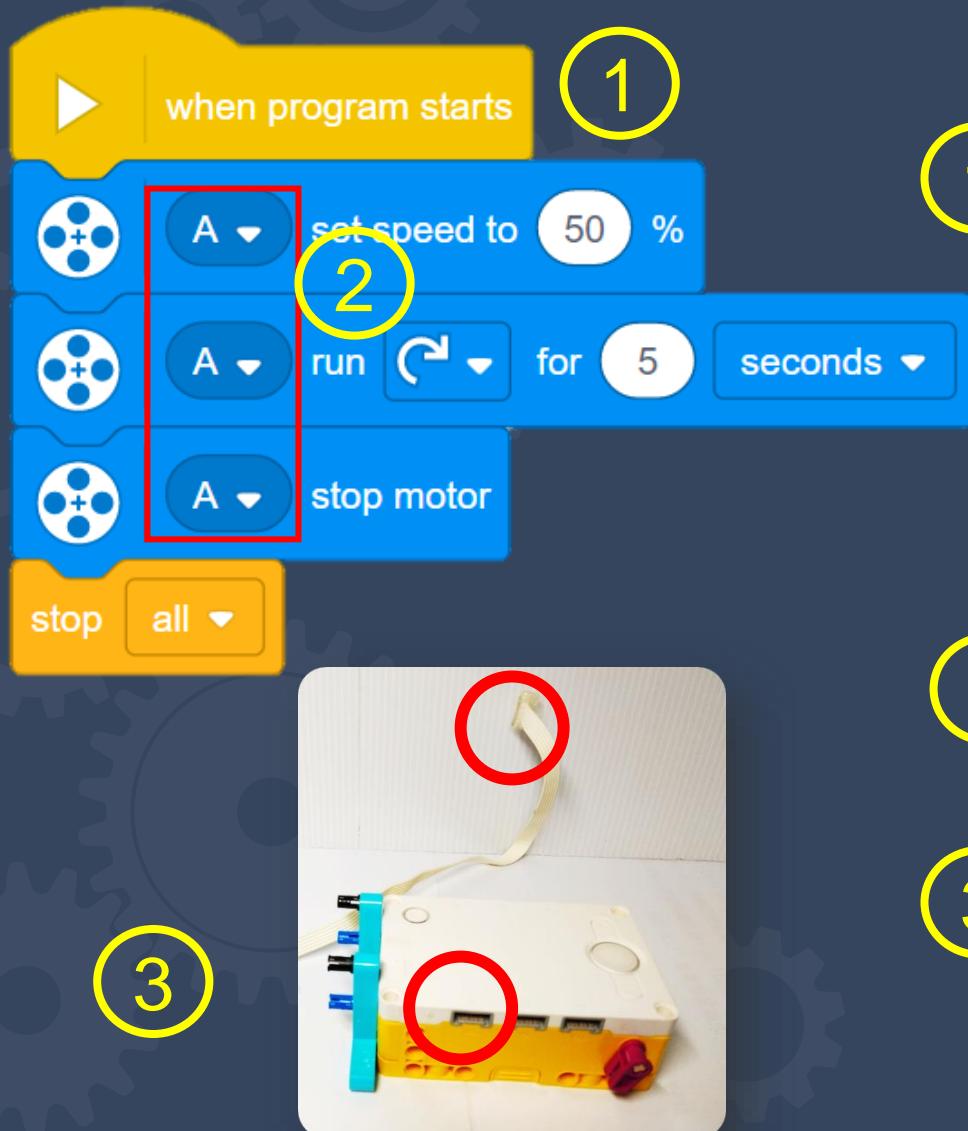
程式寫法



- 1 A端口馬達速度設為50%
- 2 A端口馬達順時針，旋轉5秒
- 3 A端口馬達停止



學生常見問題



- ① 速度功率最大表現值為100%，學生會寫出大於100的數值，需特別說明：100%代表「全速」，火力已全開。因此即使填入200%，表現的狀態仍然是100%。
- ② 數據線實際插入的主機端口，與程式選取的端口不同，機構不作動。
- ③ 忘記插好端口之數據線，導致機構不作動。

活動二 涼涼電風扇

觀察葉片特別的地方

改良風扇葉片

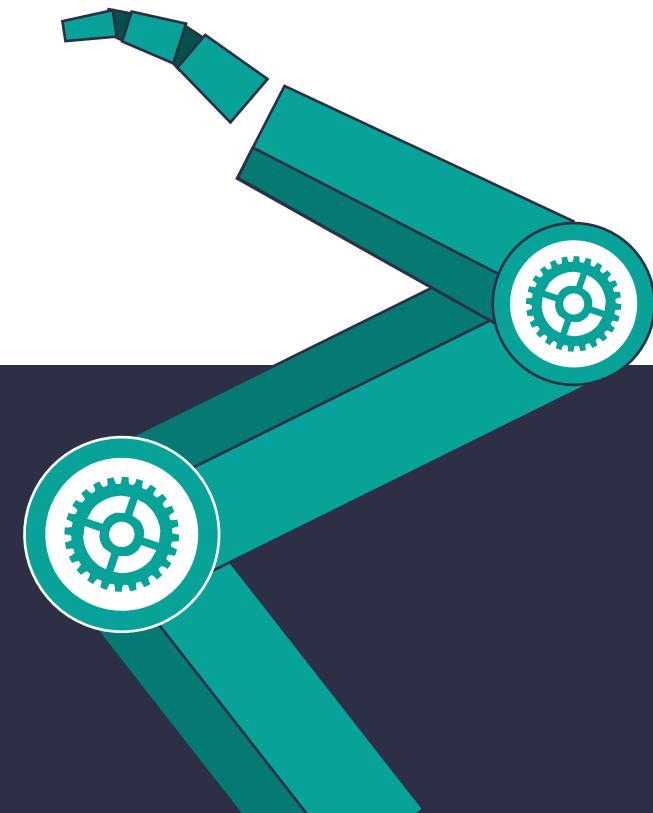
製作一個有涼涼風的電風扇！



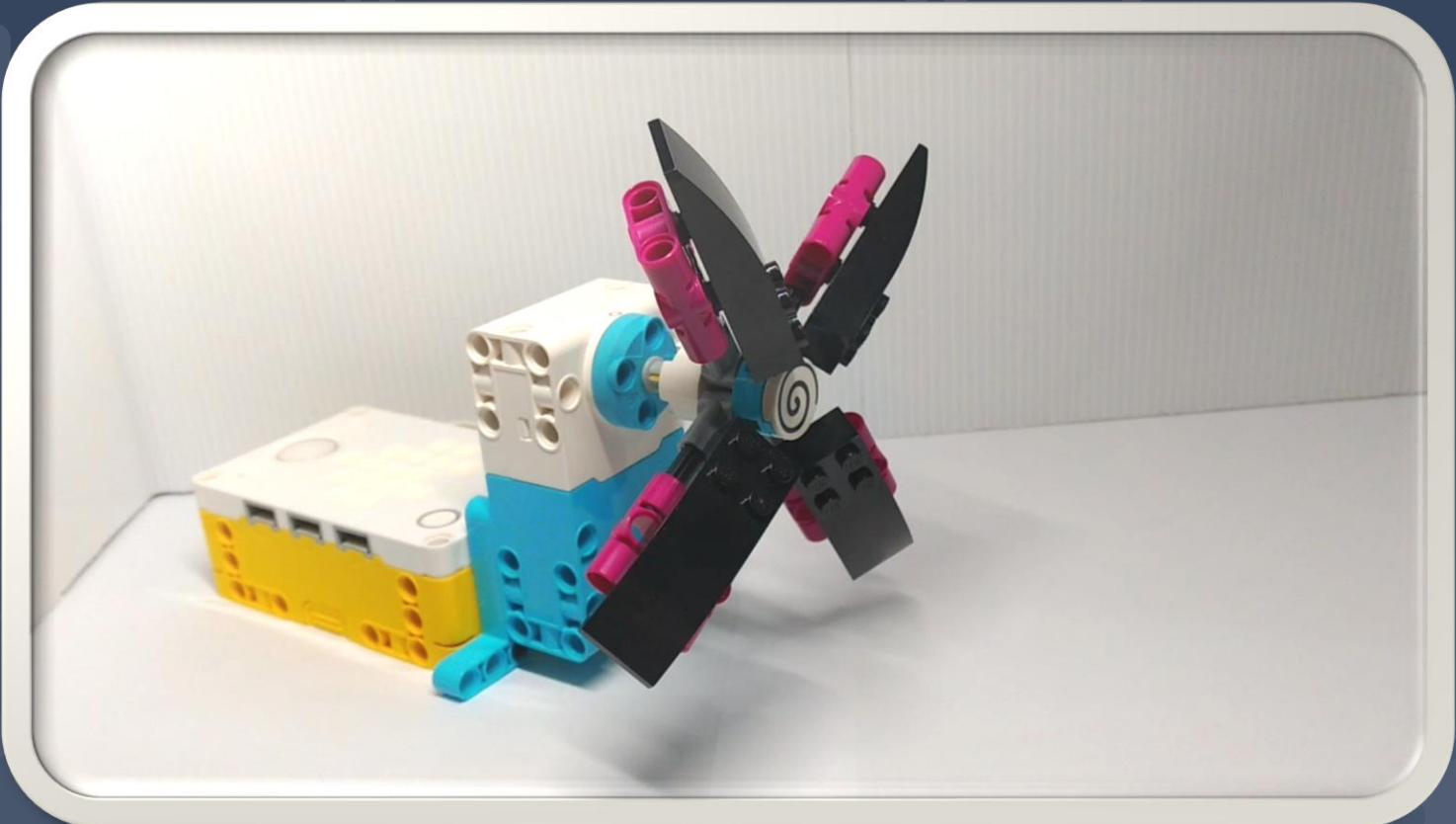
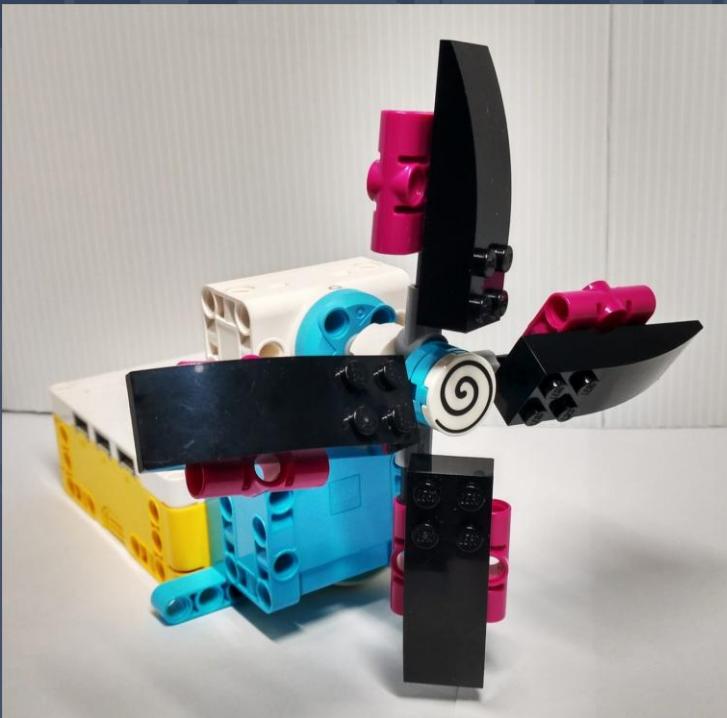
風扇葉片斜角設計原理



葉片的斜角設計，在風扇轉動時能使葉片與空氣產生磨擦，就像我們搧扇子的角度和動作，葉片能推走空氣，我們可以感受到磨擦所產生的「風」。



涼涼風扇參考





中華機器人科技教育學會

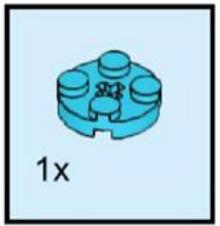
Chinese Association for Robot and Educational Technology



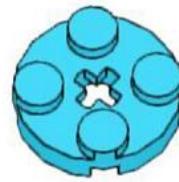
SPIKE 涼涼電風扇

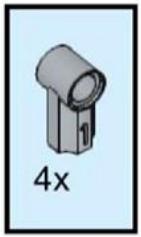


有PDF與圖片檔，依使用之設備選擇查看。



1

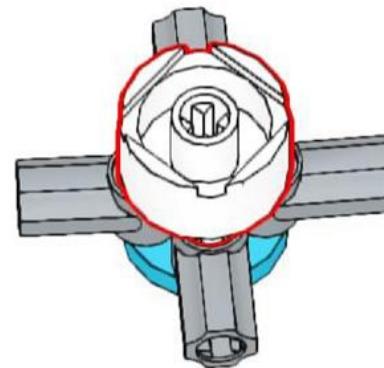
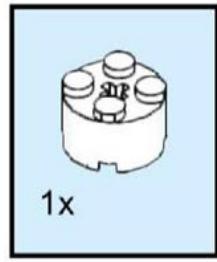




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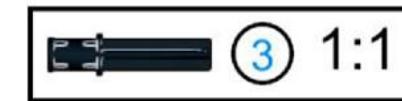
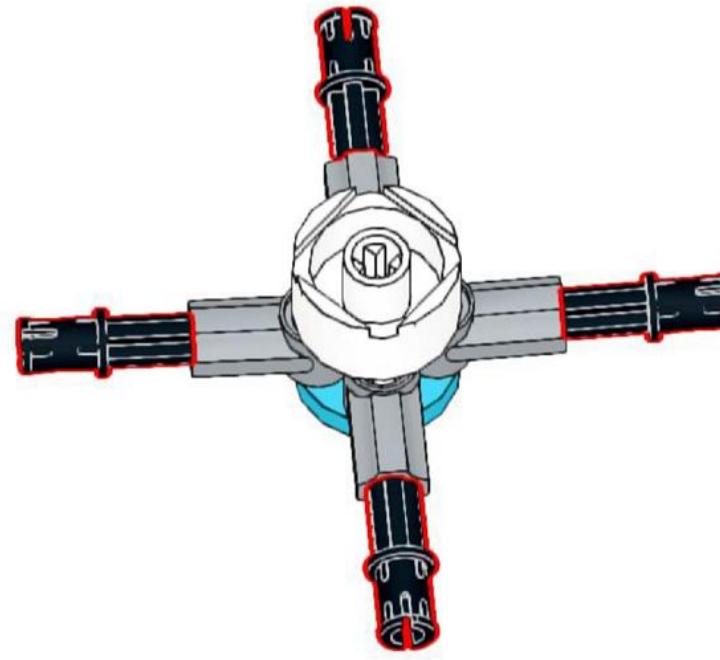


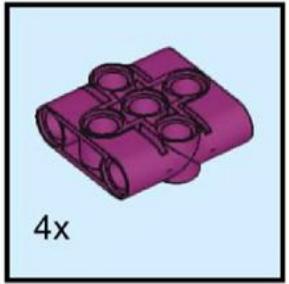
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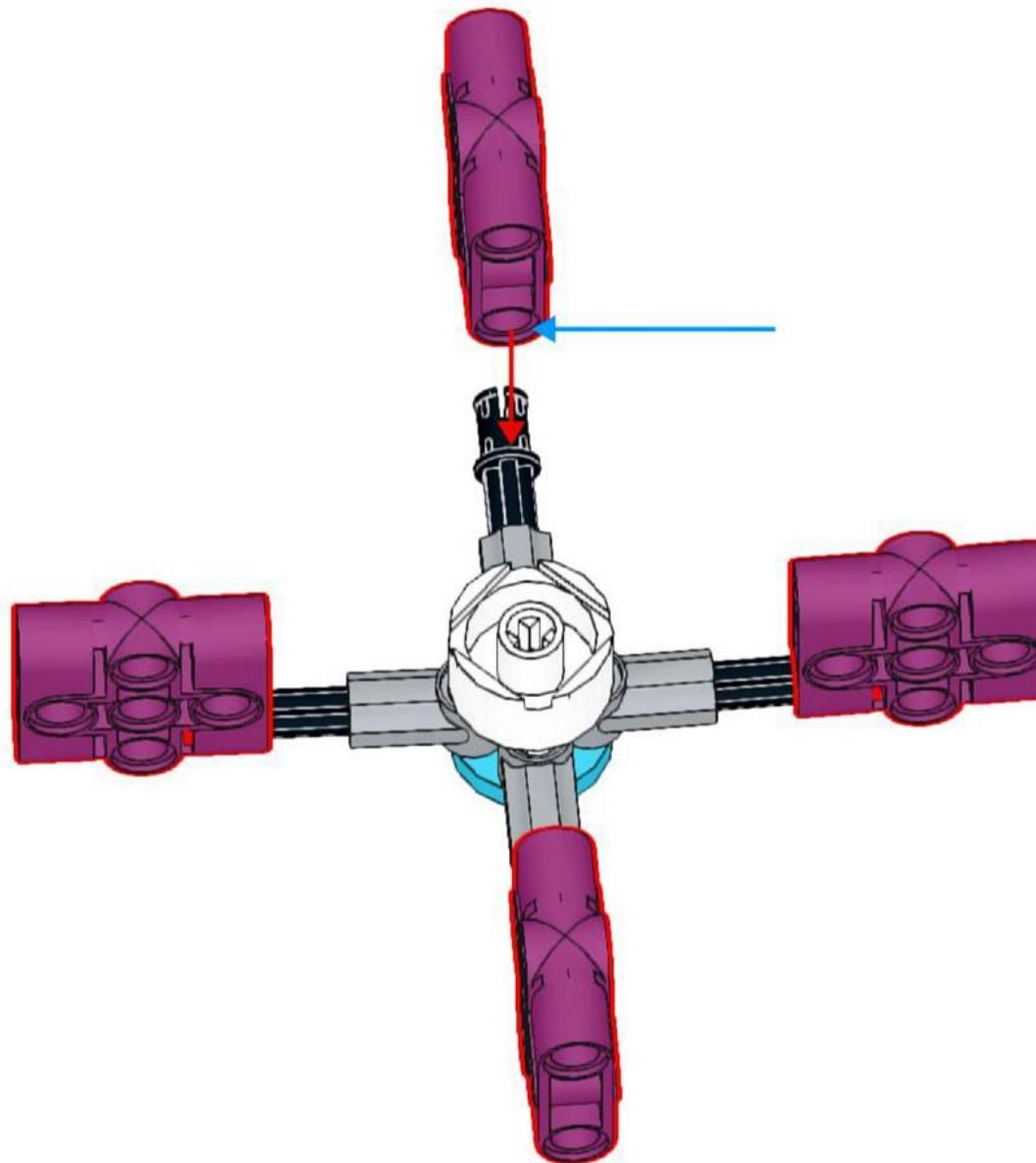


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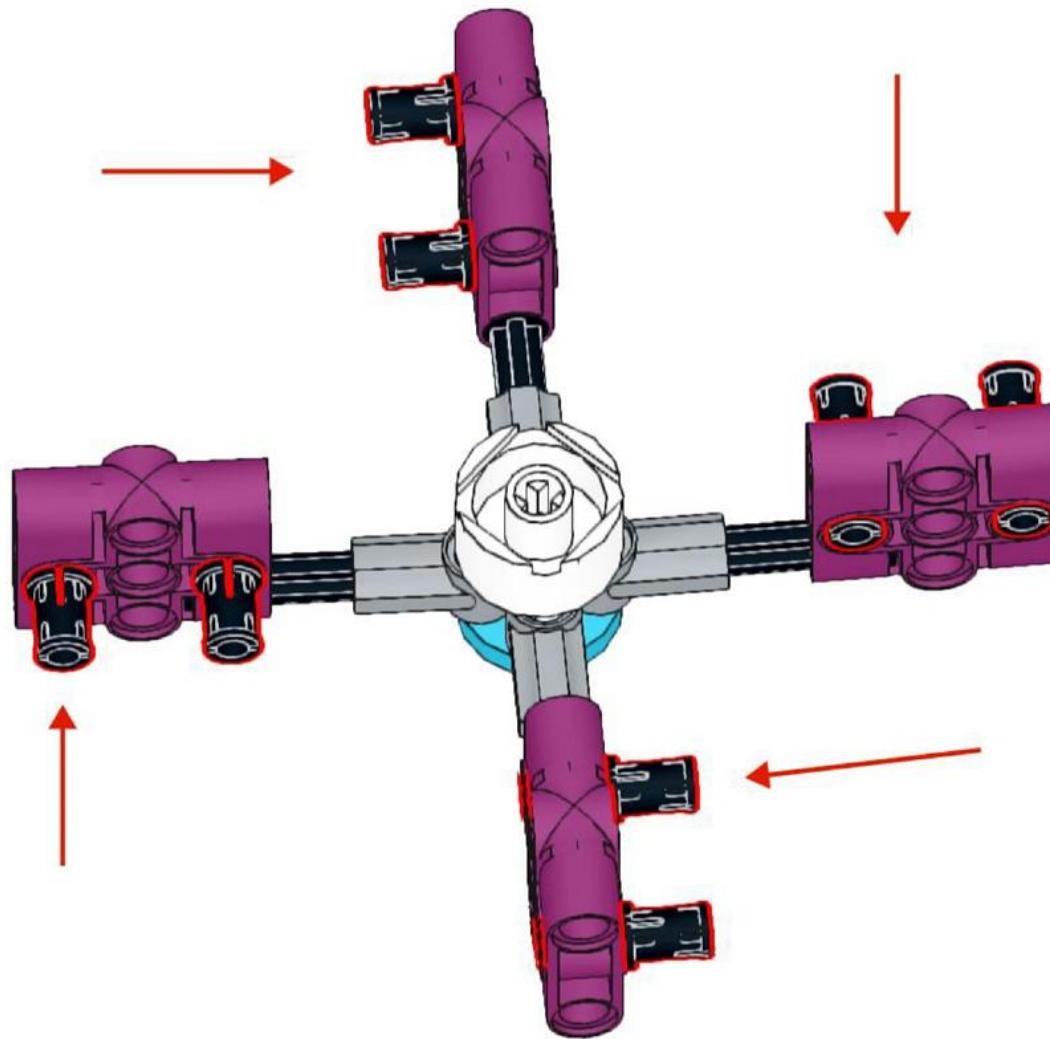


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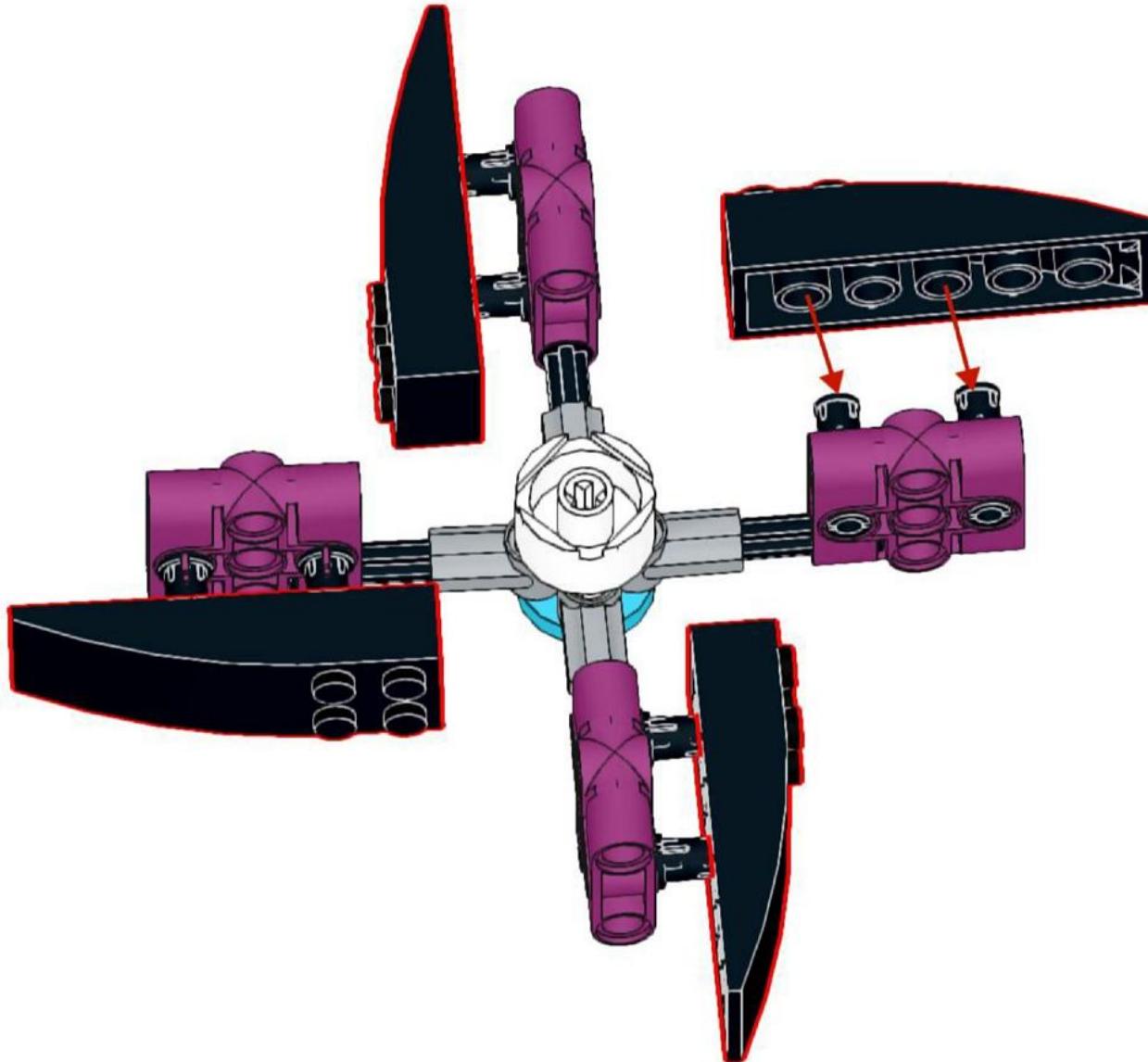


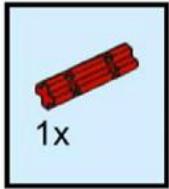
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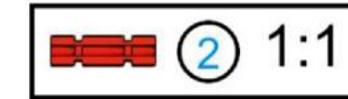
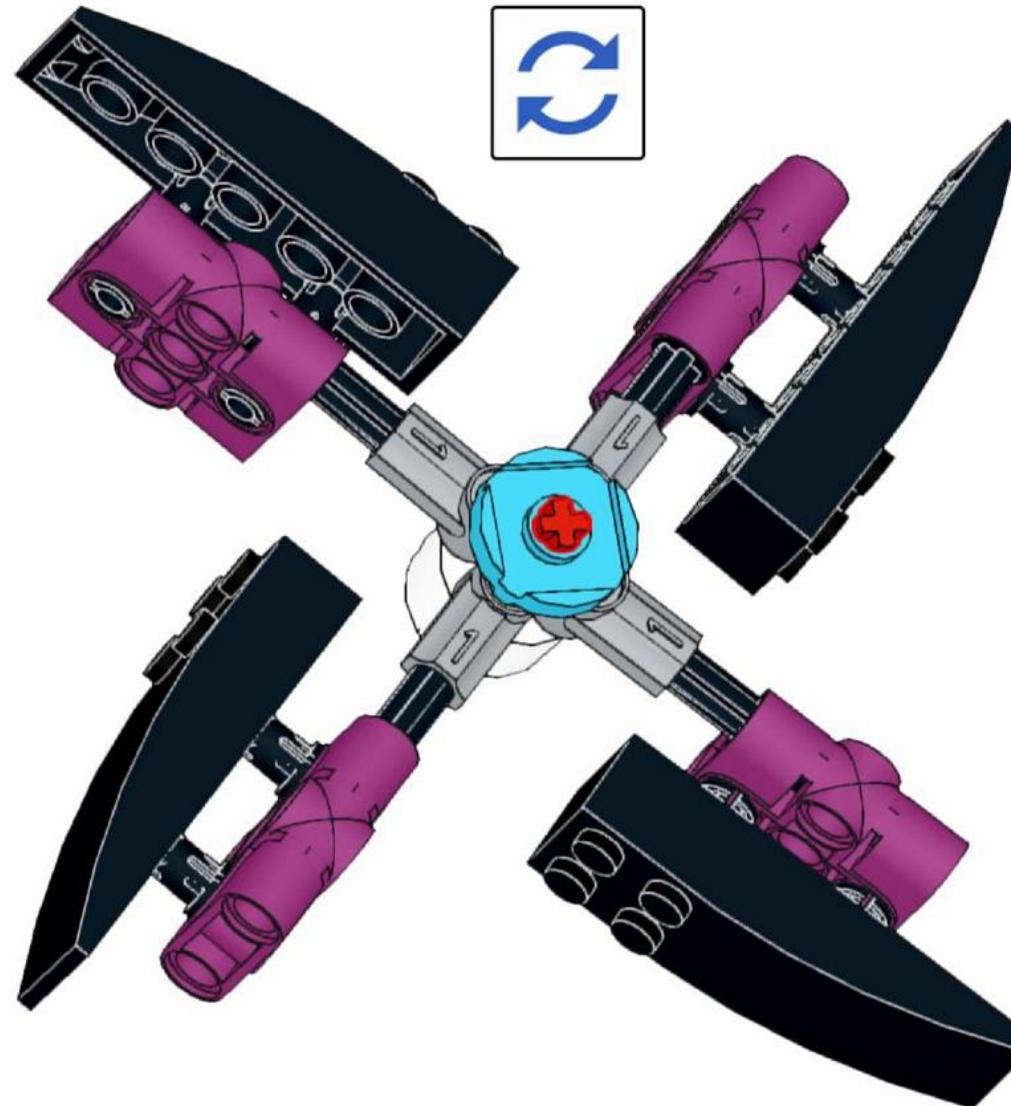


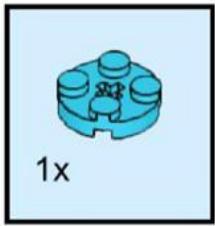
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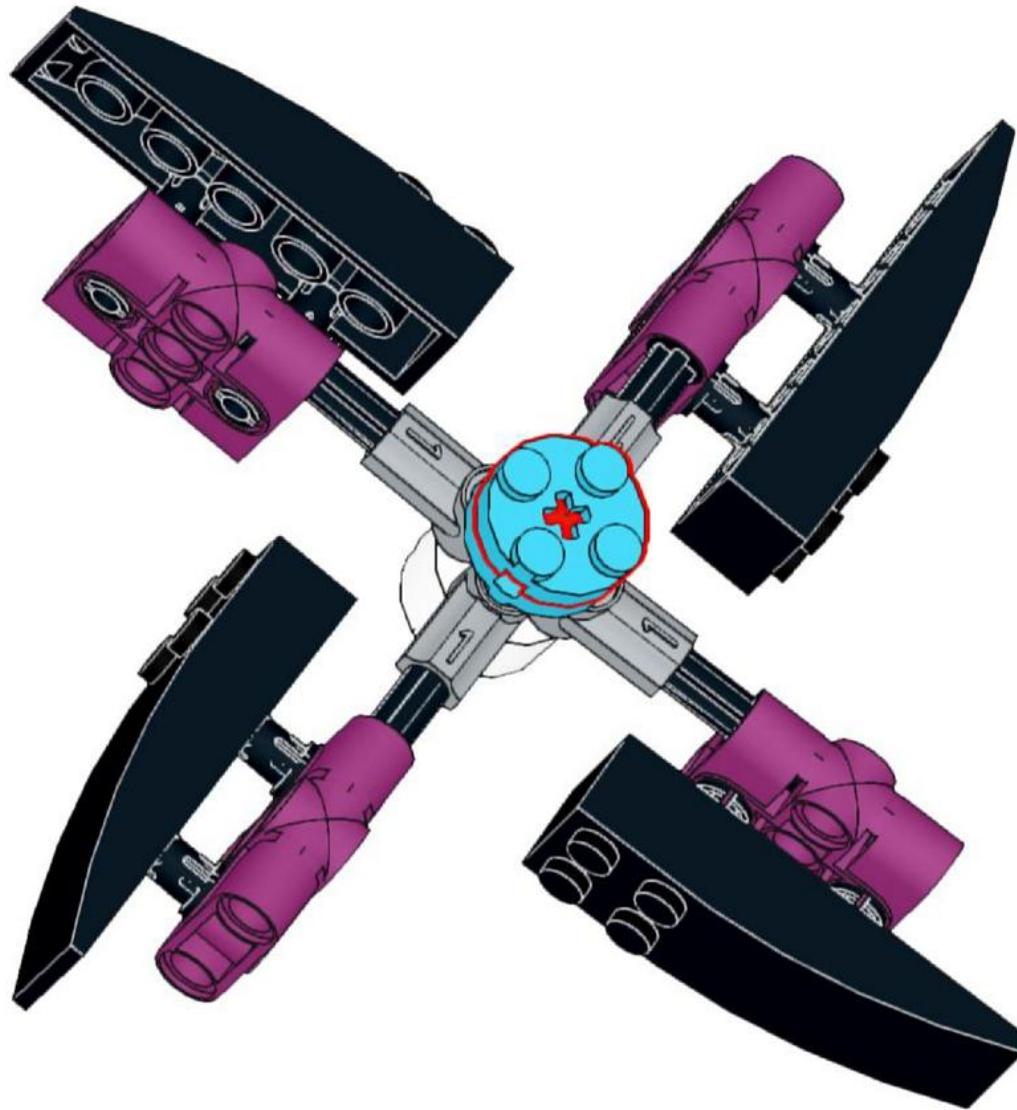


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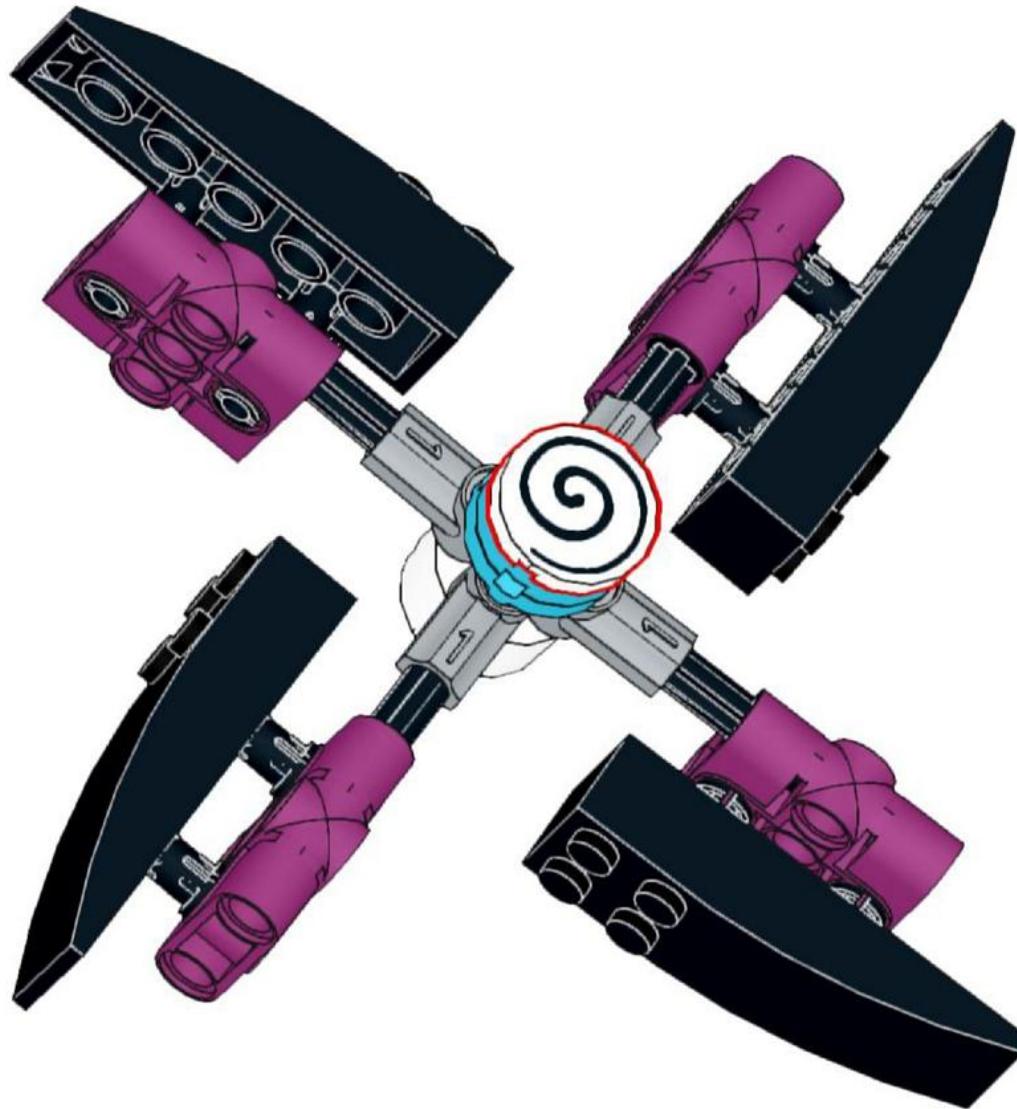


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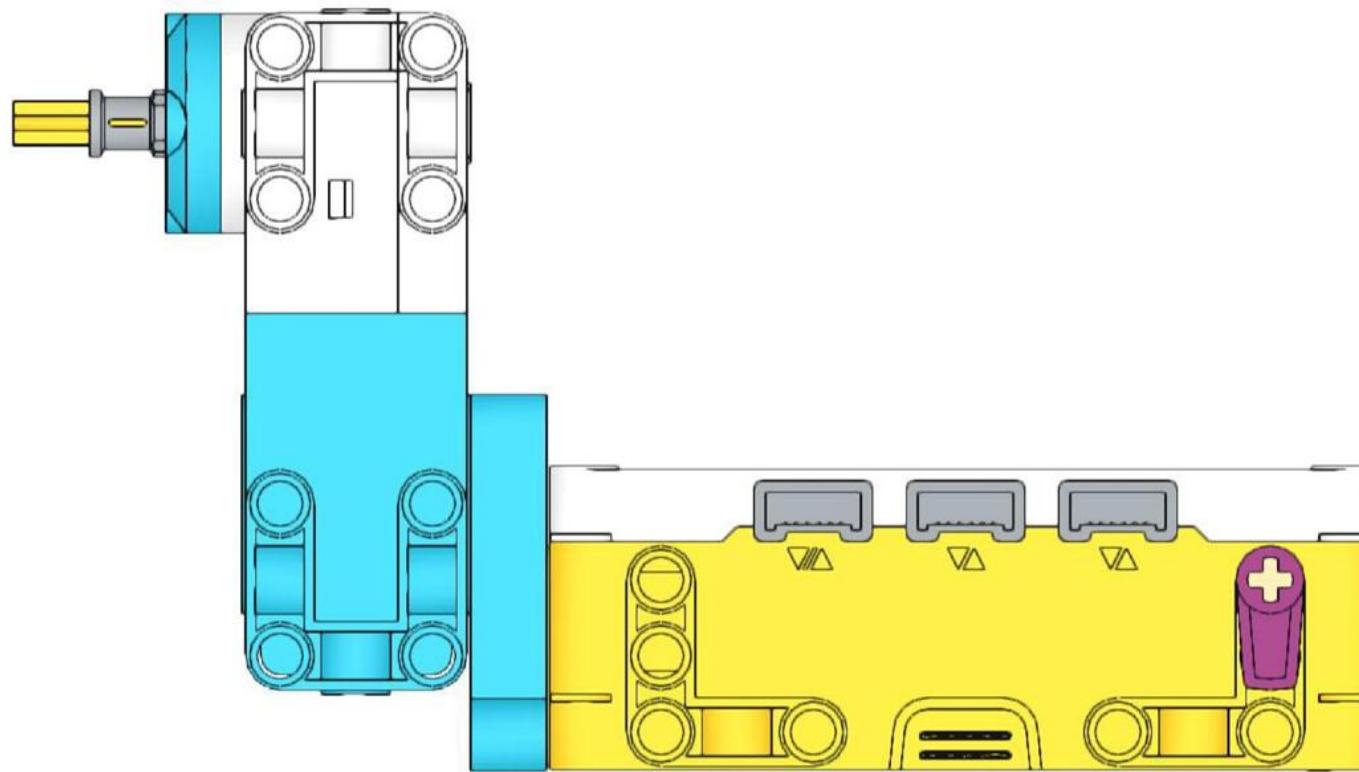




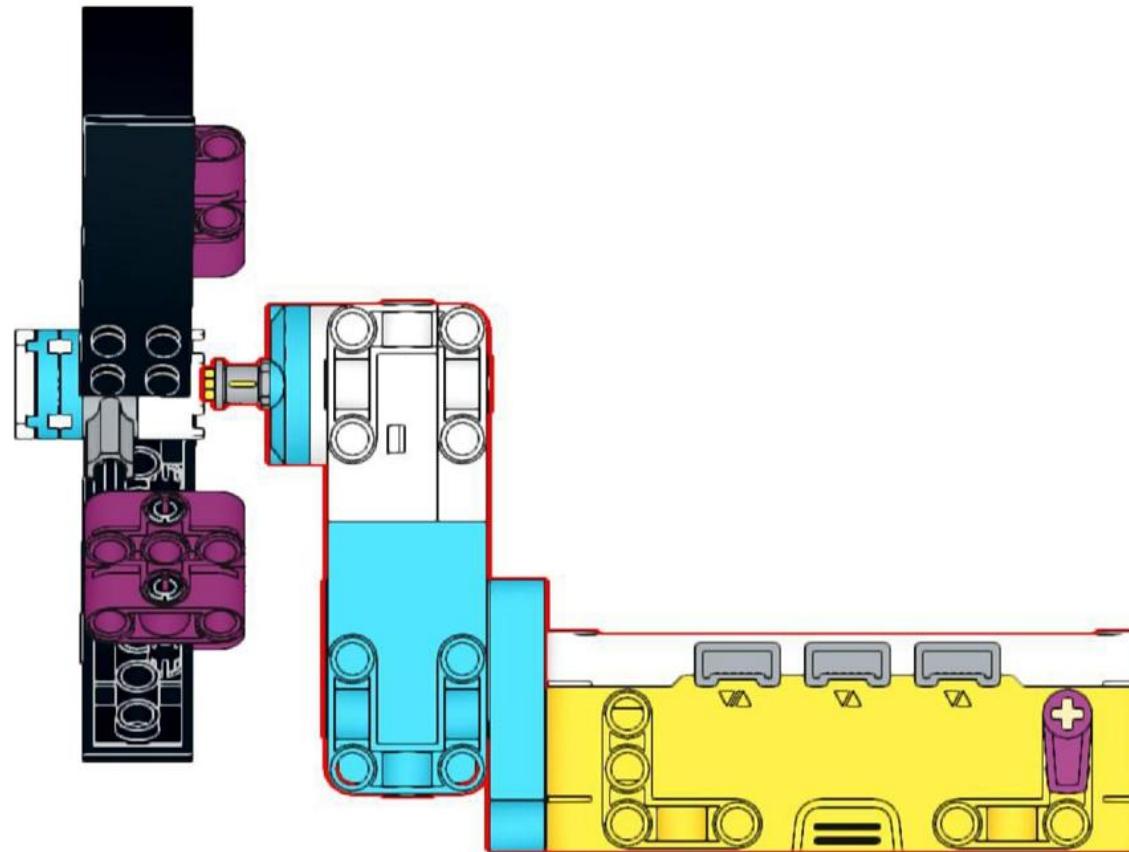
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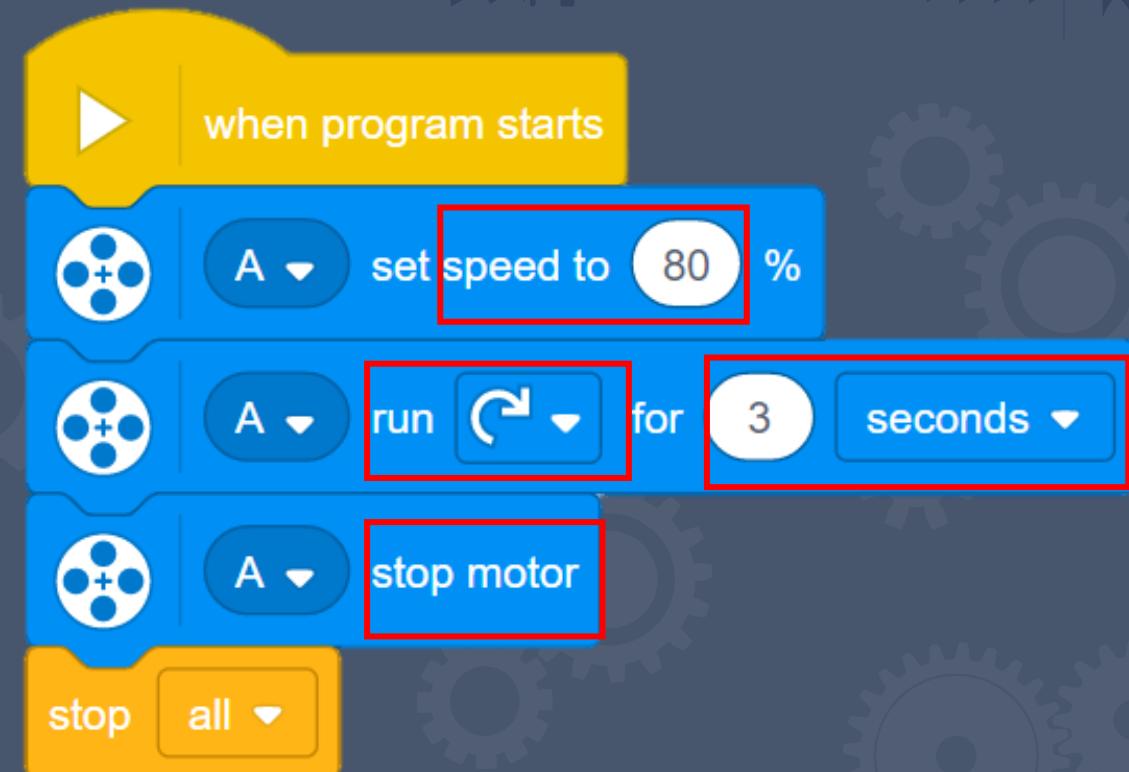
12



挑戰任務一

請設計程式，控制風扇：

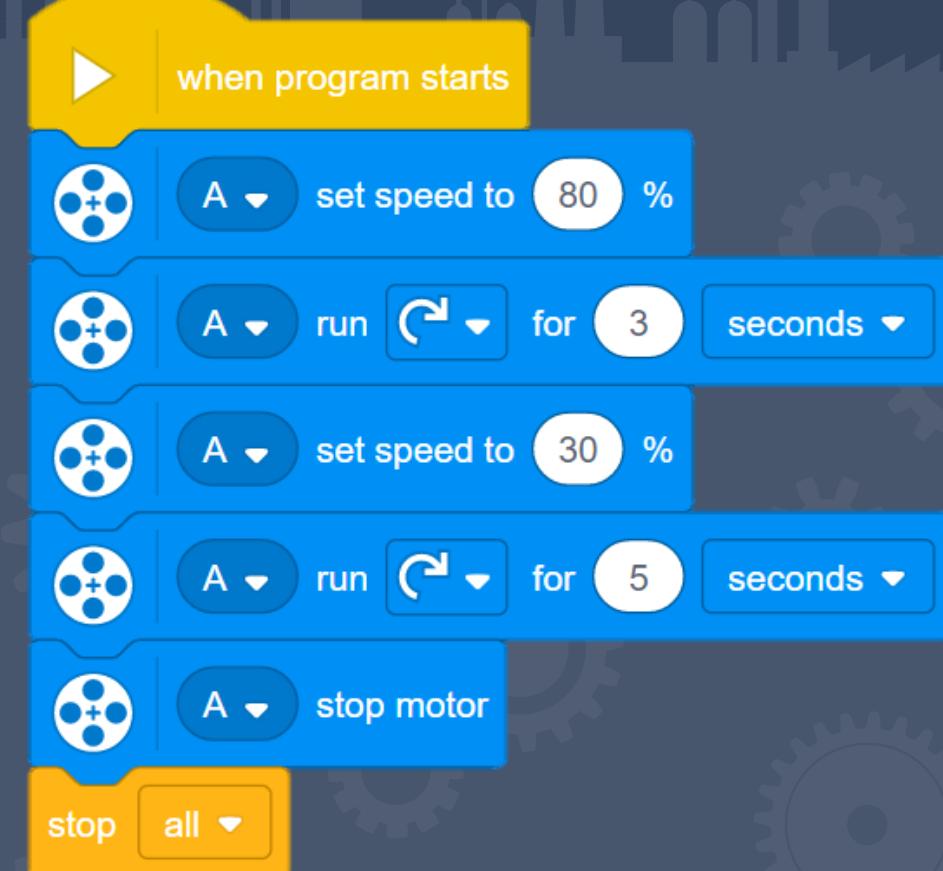
- 快速順時針旋轉3秒後，停止風扇，結束程式。



挑戰任務二

請設計程式，控制風扇：

- 快速順時針旋轉 3 秒後，慢速順時針旋轉 5 秒，停止風扇，結束程式。



創造任務

試試看設計自己的風扇程式，
說說看你的風扇如何轉動。