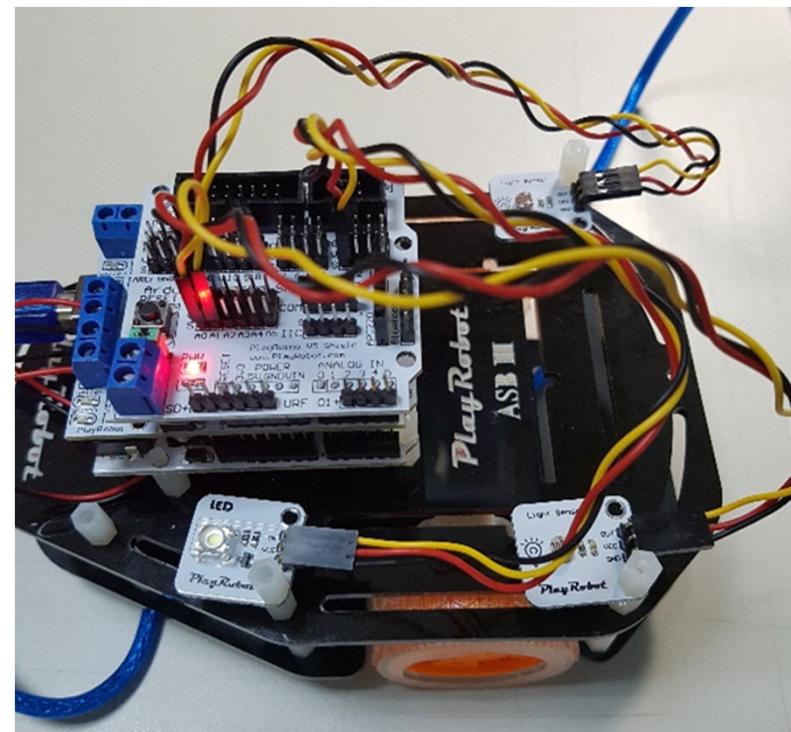


跟著那道光...

Arduino Car

李明昌 老師



大綱

- Arduino 開發板 / Arduino IDE 介紹...[軟體]
- Arduino Car ... [硬體]
- 跟著那道光...
- Q & A



Arduino 開發板



Arduino 特性

- Arduino 秉持著具多樣性、簡易使用的精神，設計出結合了軟硬體且開放原始碼的平台。
- Arduino除了在傳統嵌入式系統上的運用外，可以快速的結合各式感測器，來作偵測或辨識，並可透過控制光、馬達等I/O 裝置及各式驅動器來控制周遭環境。
- 活躍的使用者社群。

Arduino IDE

Arduino IDE

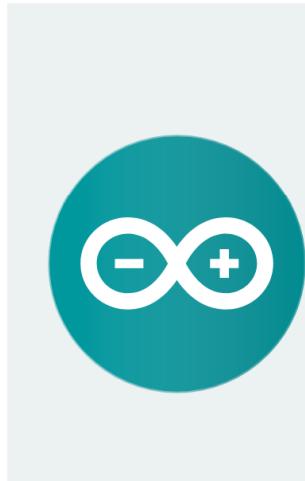
- Arduino利用類似Java，C 語言的 Arduino programming language, 配合使用 Arduino IDE(Integrated Development Environment , 整合開發環境)。
- 基於開放原始碼(open source) , 可以讓您免費下載使用 。

Arduino IDE – 下載

- 下載 <https://www.arduino.cc/> → [SOFTWARE]



Download the Arduino IDE



ARDUINO 1.8.2

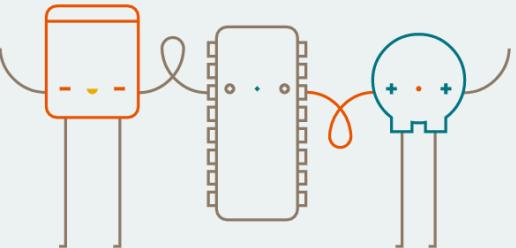
The open-source Arduino Software (IDE) makes it easy to write code and upload it to the board. It runs on Windows, Mac OS X, and Linux. The environment is written in Java and based on Processing and other open-source software. This software can be used with any Arduino board. Refer to the [Getting Started](#) page for Installation instructions.



Arduino IDE – 下載(&安裝)

Support the Arduino Software

Consider supporting the Arduino Software by contributing to its development. (US tax payers, please note this contribution is not tax deductible). [Learn more on how your contribution will be used.](#)



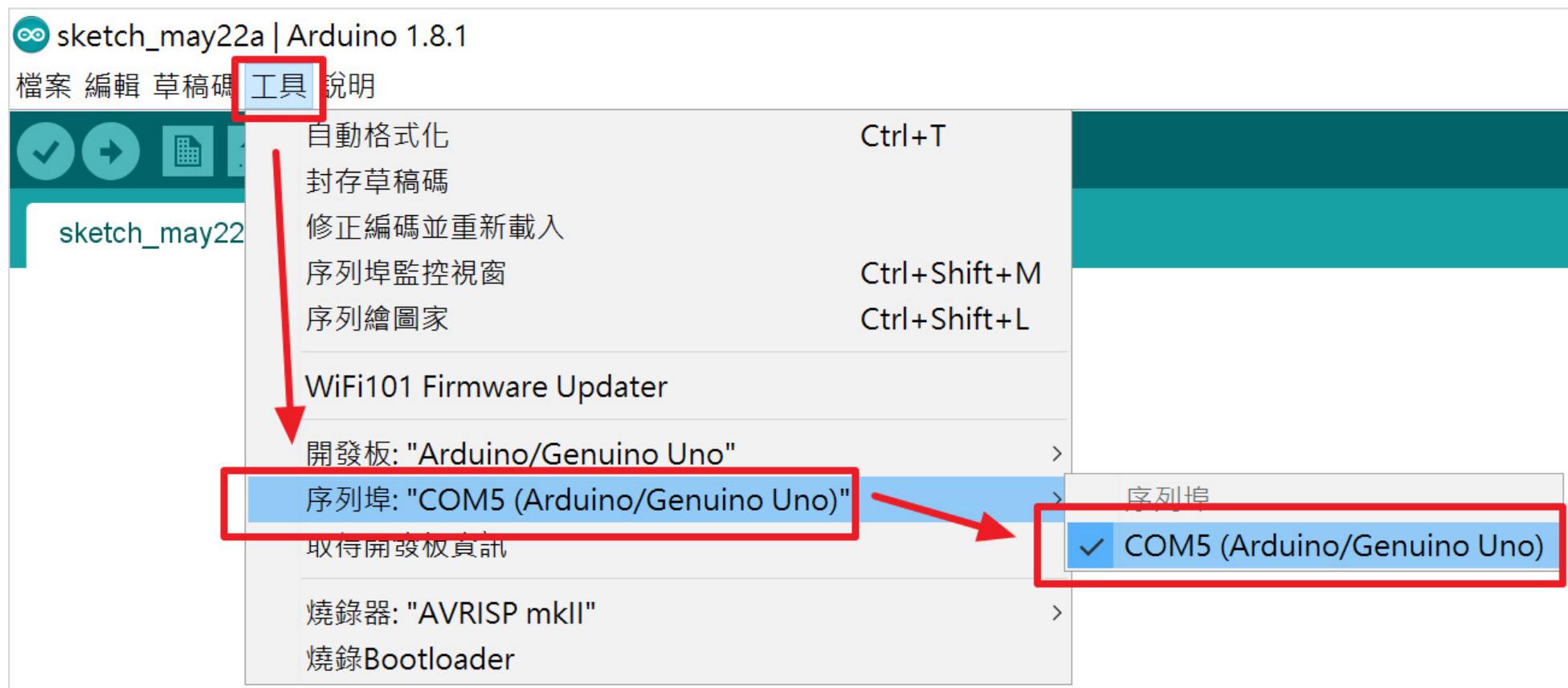
SINCE MARCH 2015, THE ARDUINO IDE HAS BEEN DOWNLOADED **15,770,709** TIMES. (IMPRESSIVE!) NO LONGER JUST FOR ARDUINO AND GENUINO BOARDS, HUNDREDS OF COMPANIES AROUND THE WORLD ARE USING THE IDE TO PROGRAM THEIR DEVICES, INCLUDING COMPATIBLES, CLONES, AND EVEN COUNTERFEITS. HELP ACCELERATE ITS DEVELOPMENT WITH A SMALL CONTRIBUTION! REMEMBER: OPEN SOURCE IS LOVE!

\$3 \$5 \$10 \$25 \$50 OTHER

[JUST DOWNLOAD](#) [CONTRIBUTE & DOWNLOAD](#)

arduino-1.8.2-windows.exe (89.6MB)

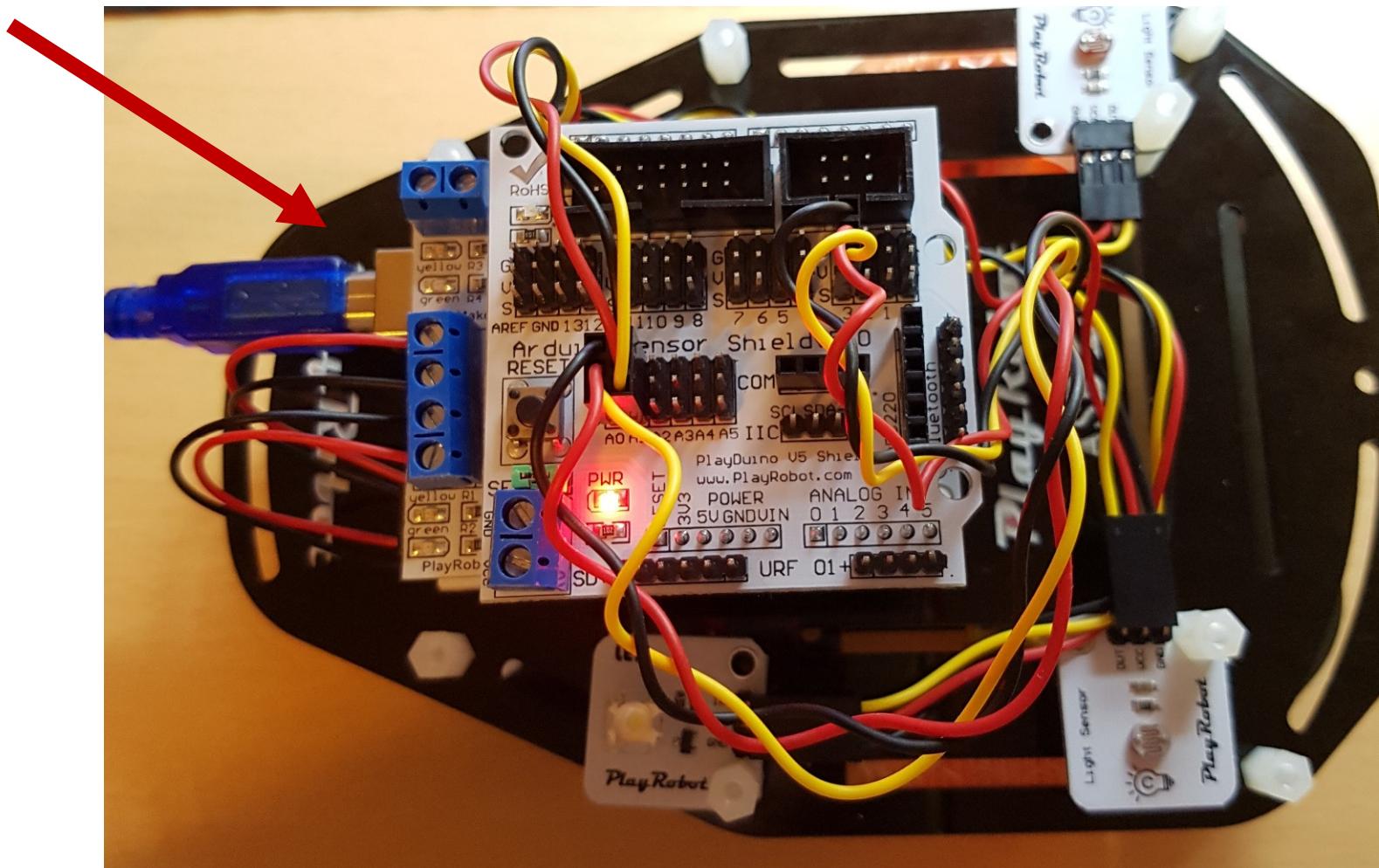
Arduino IDE - 工具 - 序列埠



Arduino 範例1

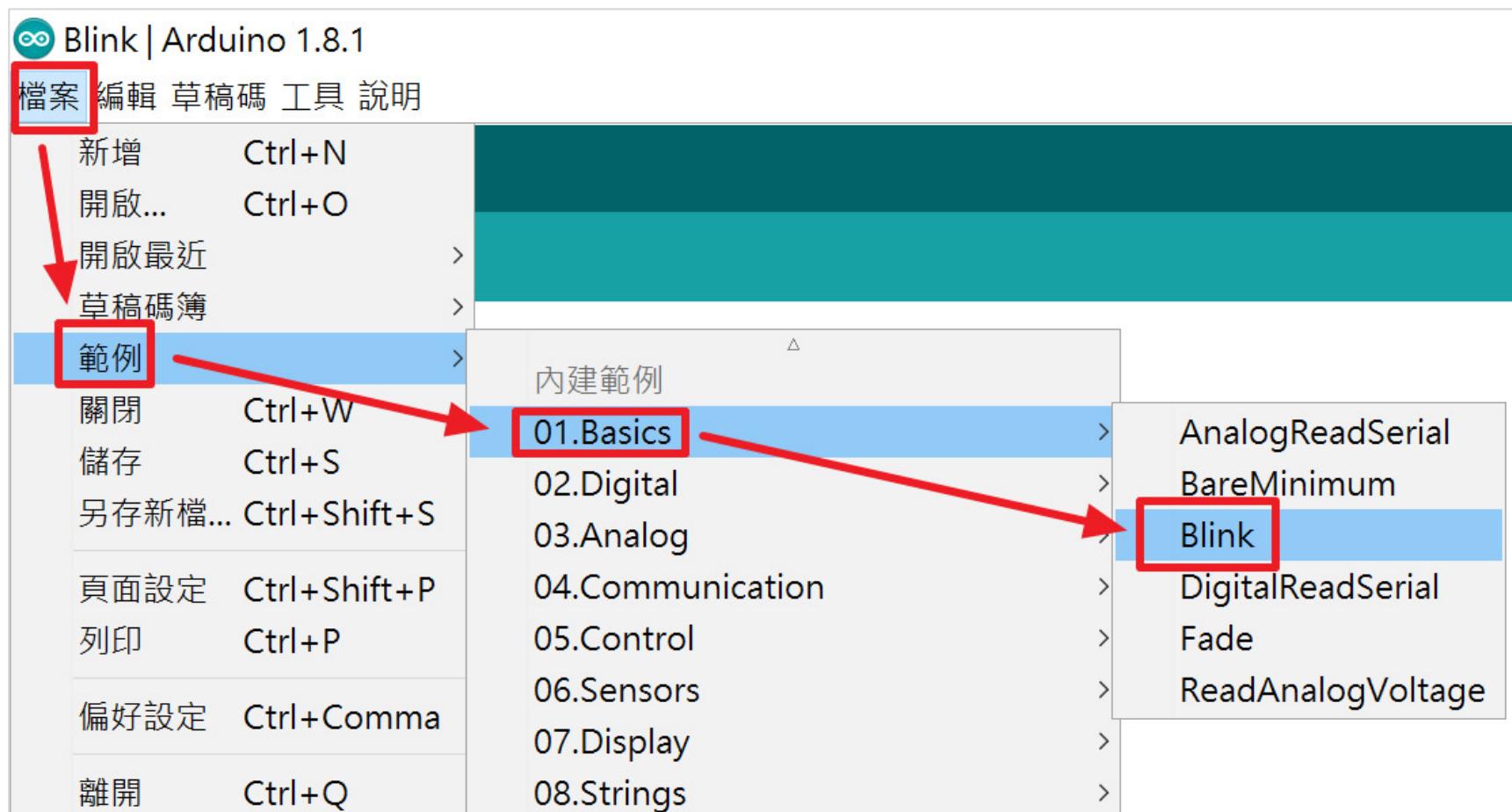
一閃一閃亮晶晶

步驟1 將Arduino連接至電腦



開啟 Blink

■ 檔案 \ 範例 \ 01.Basics \ Blink



Blink 解說



- ✓ : 編譯程式
- → : 上傳至Arduino

- /* ... */ : 多行註解
- // : 單行註解

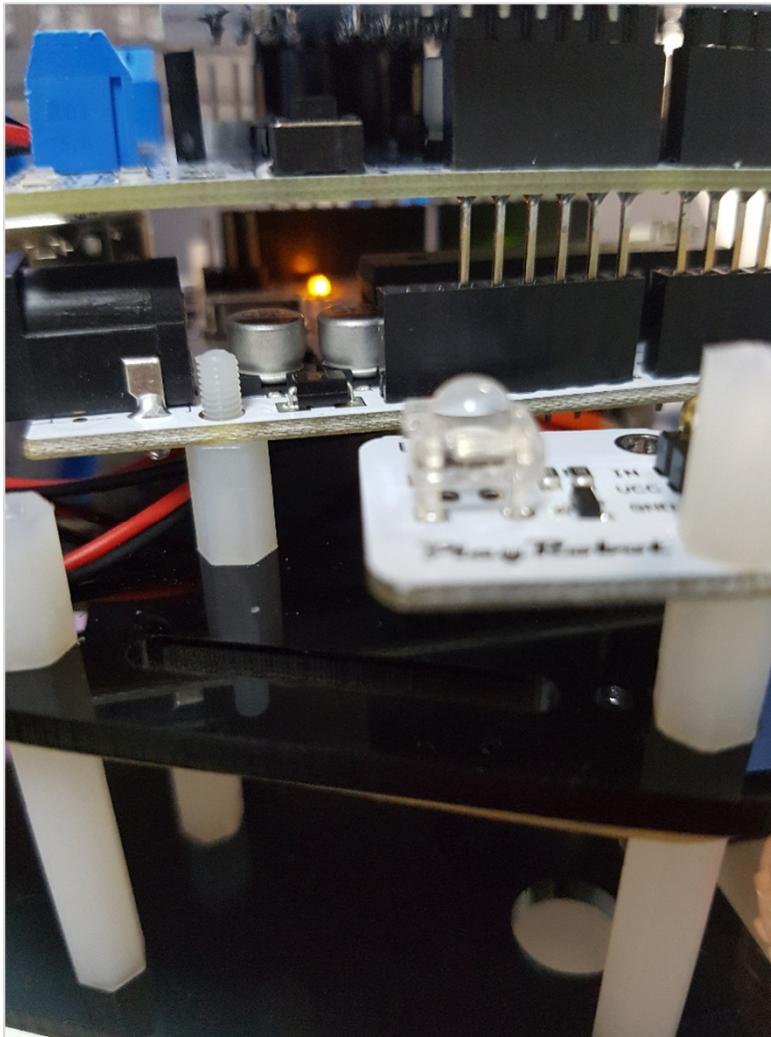
```
// the setup function runs once when you press reset or power the board
void setup() {
    // initialize digital pin LED_BUILTIN as an output.
    pinMode(LED_BUILTIN, OUTPUT);
}
```

初始化

```
// the loop function runs over and over again forever
void loop() {
    digitalWrite(LED_BUILTIN, HIGH);      // turn the LED on (HIGH is the voltage level)
    delay(1000);                      // wait for a second
    digitalWrite(LED_BUILTIN, LOW);       // turn the LED off by making the voltage LOW
    delay(1000);                      // wait for a second
}
```

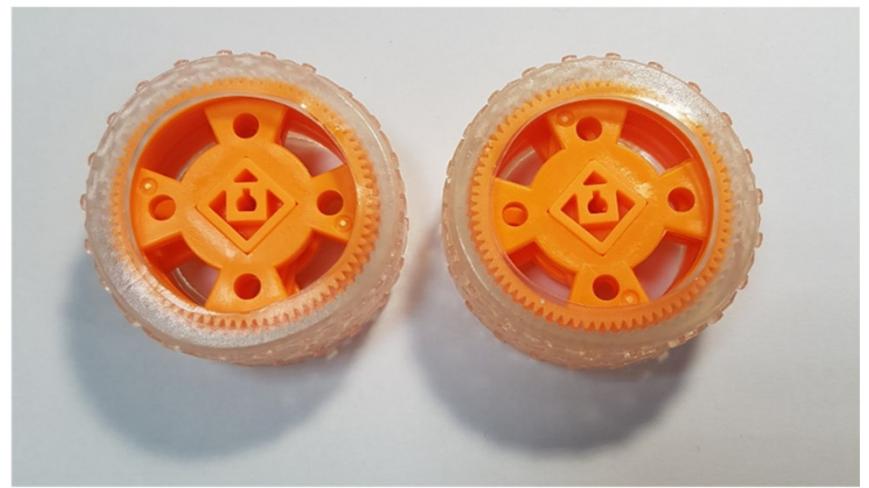
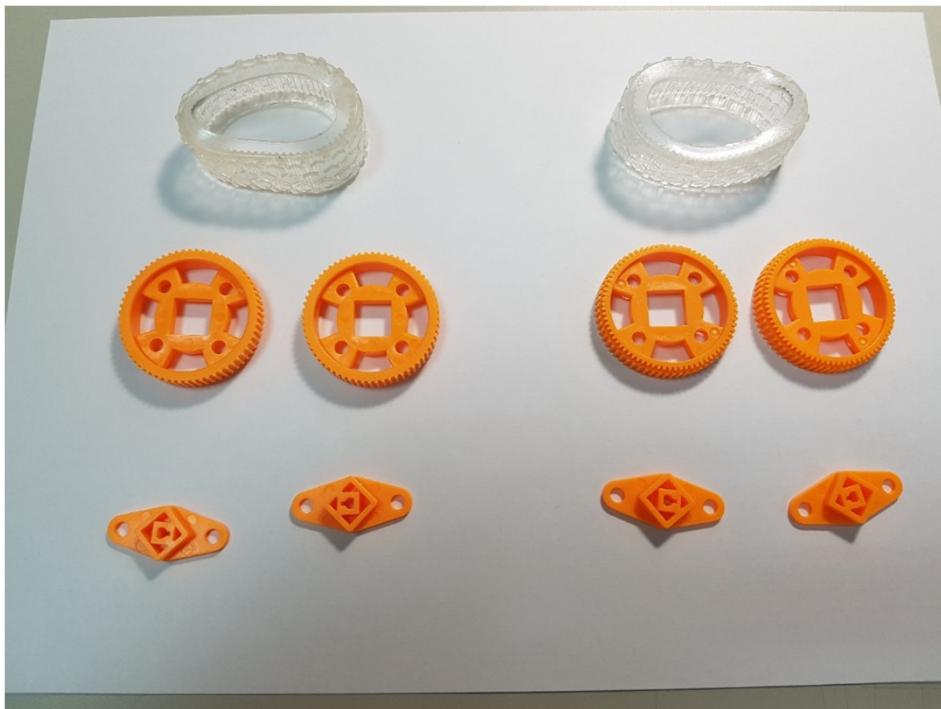
重複執行

Blink 成果 (發現什麼...)

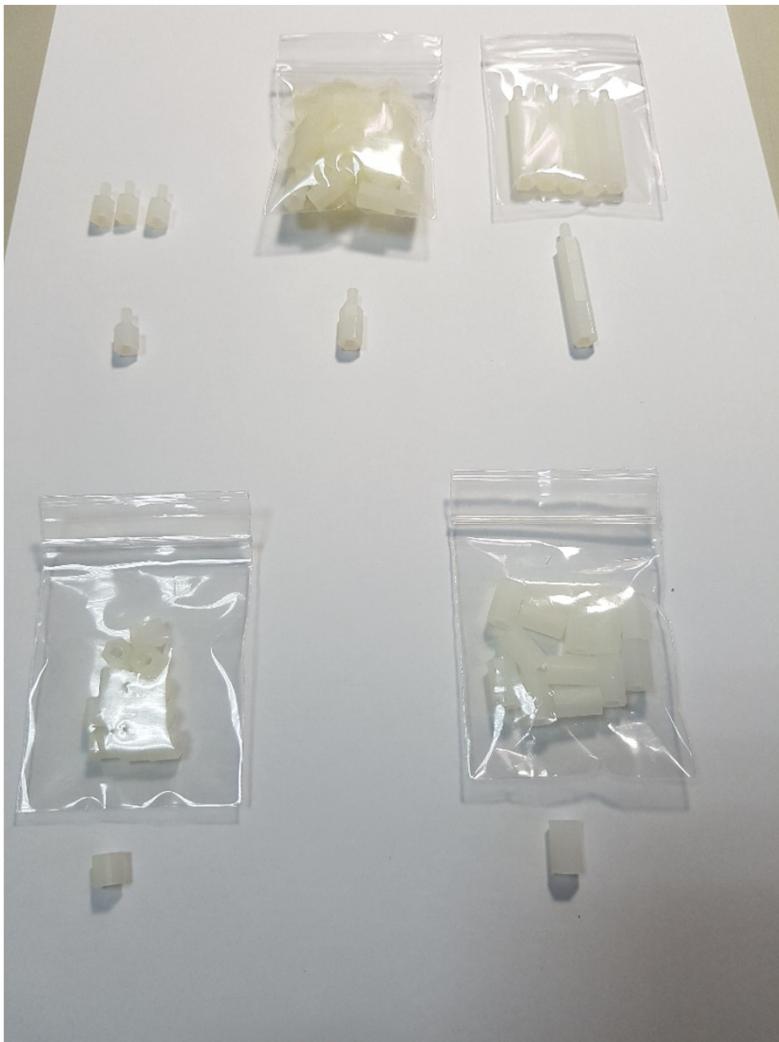


Arduino Car

Car - 輪子



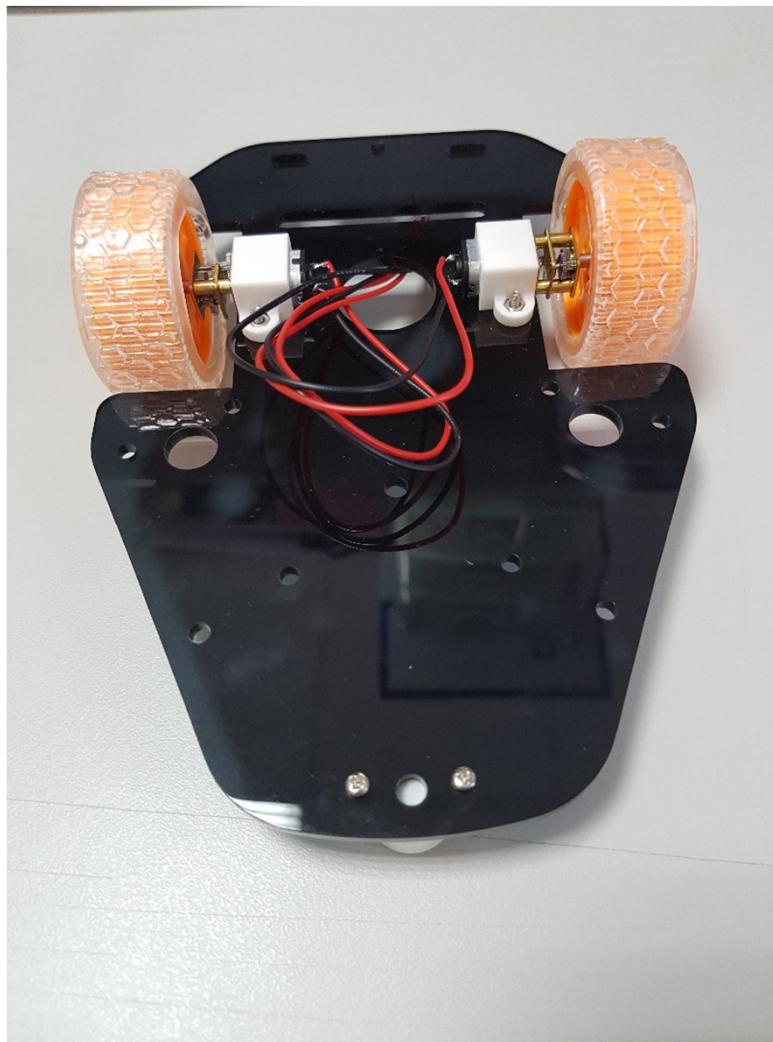
螺柱



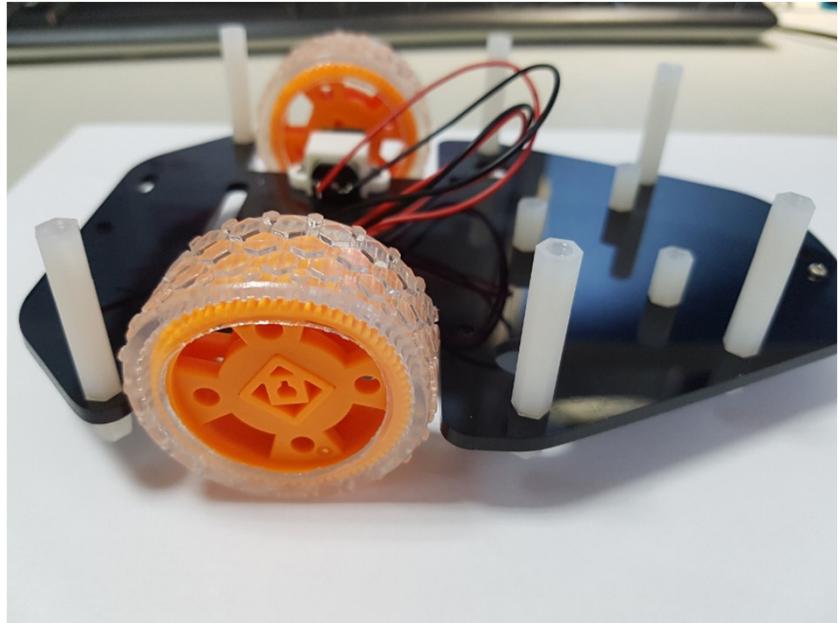
凹凸螺柱
6mm(短) 10mm(中) 30mm(長)

雙凹螺柱
6mm(短) 10mm(中)

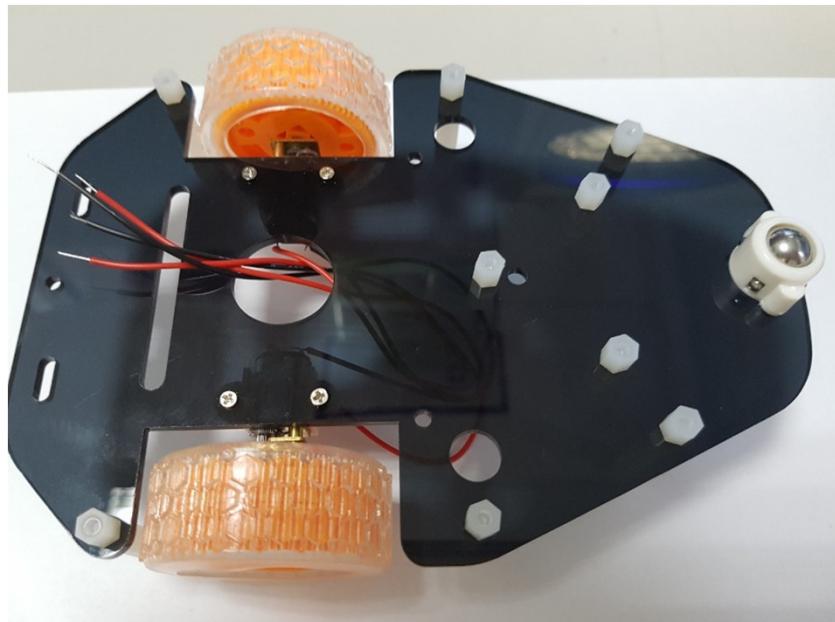
Car – 底座 + 輪子



Car – 底座 + 輪子(續)

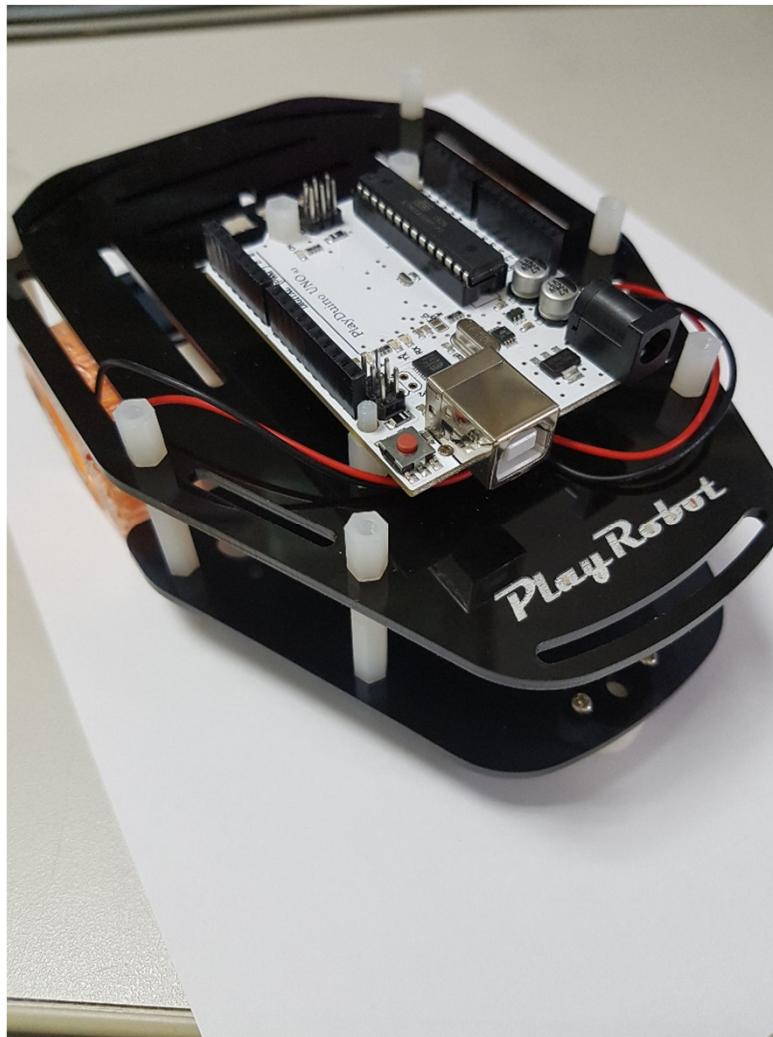


(正面)

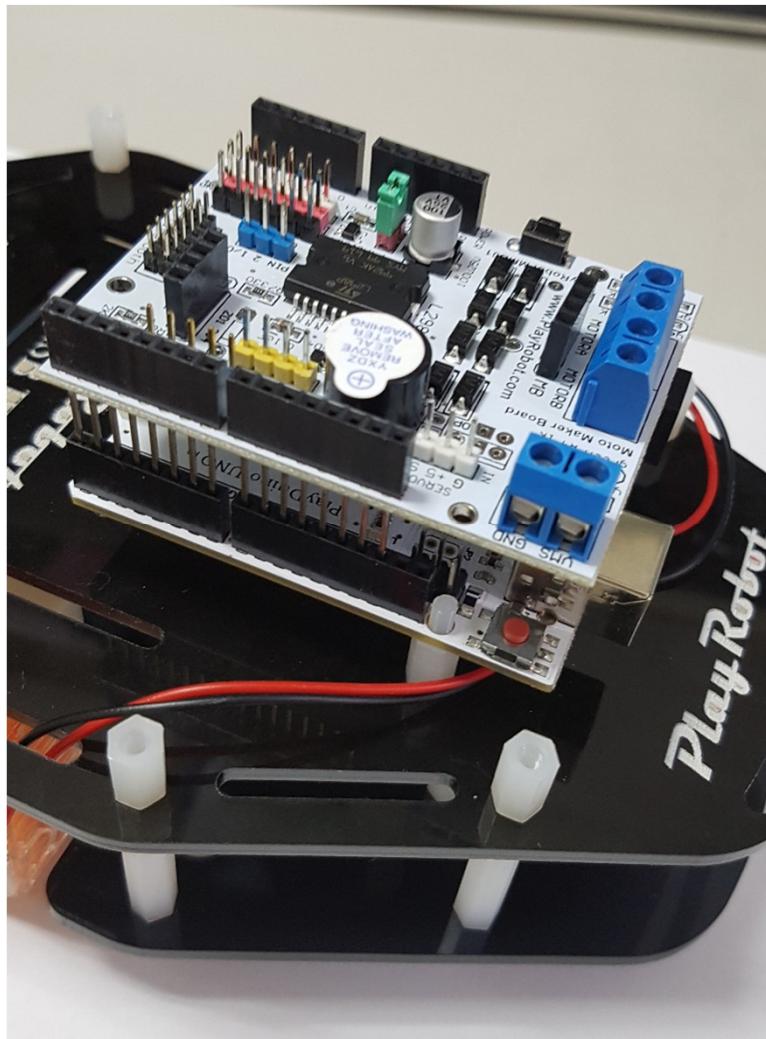


(背面)

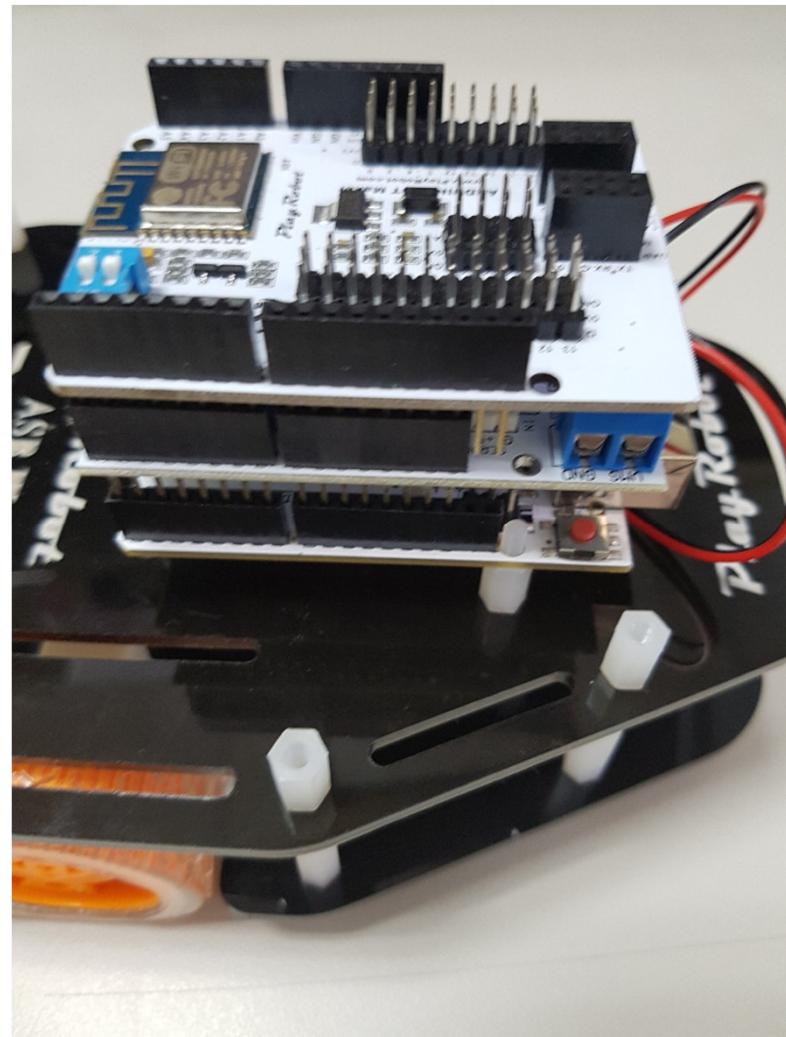
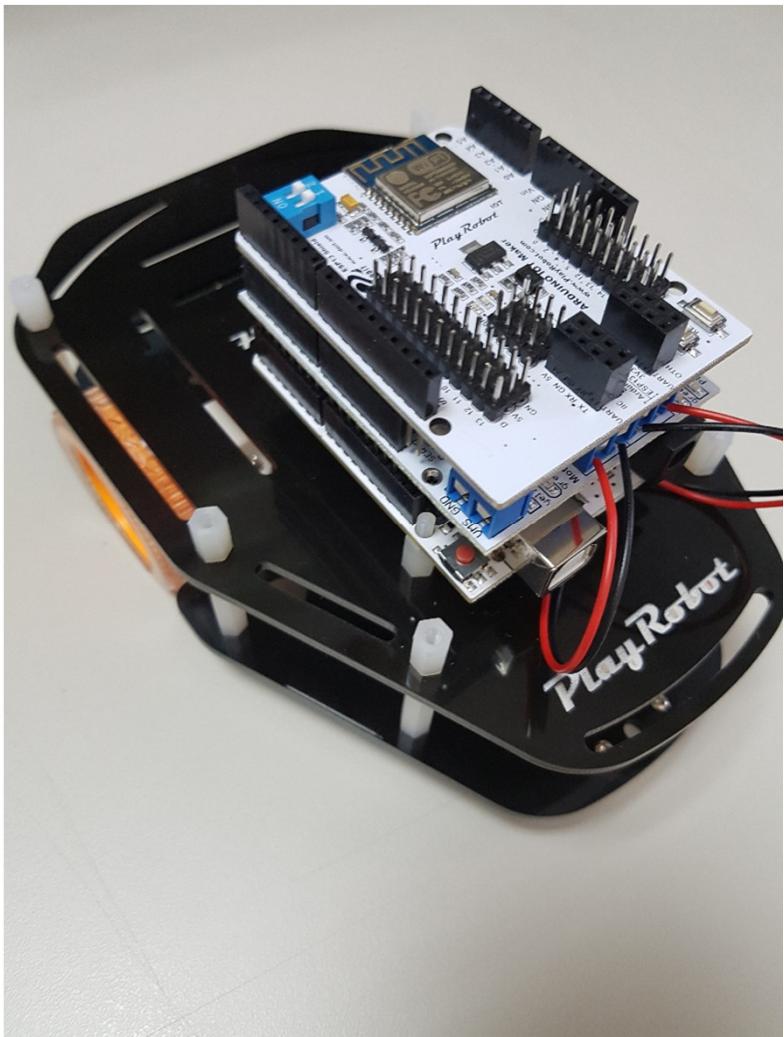
底座 + Arduino



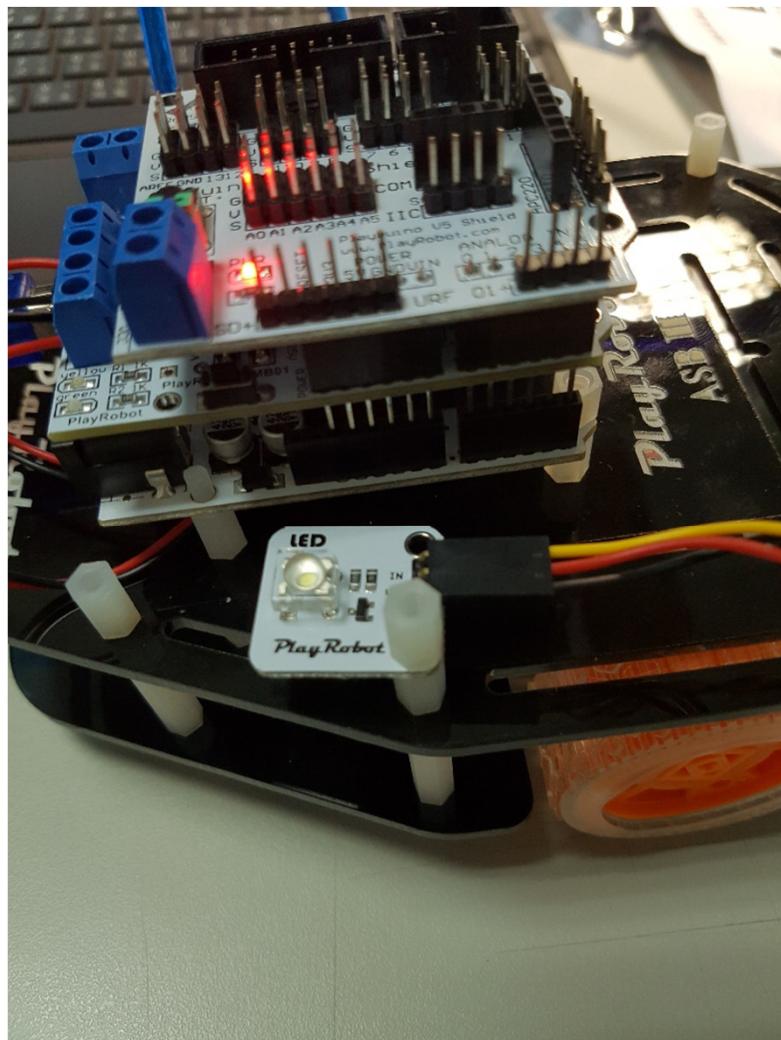
馬達驅動板



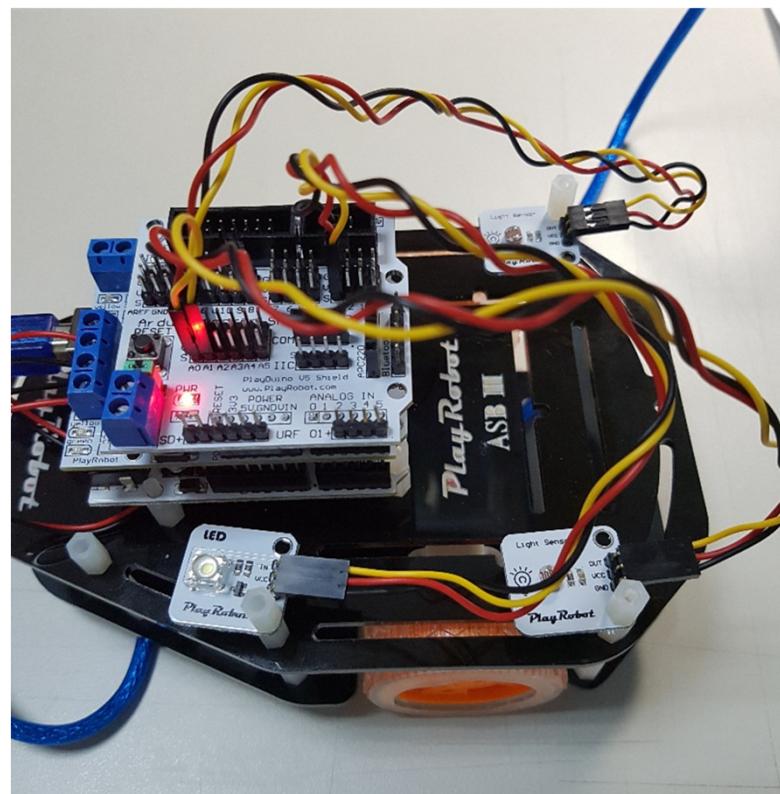
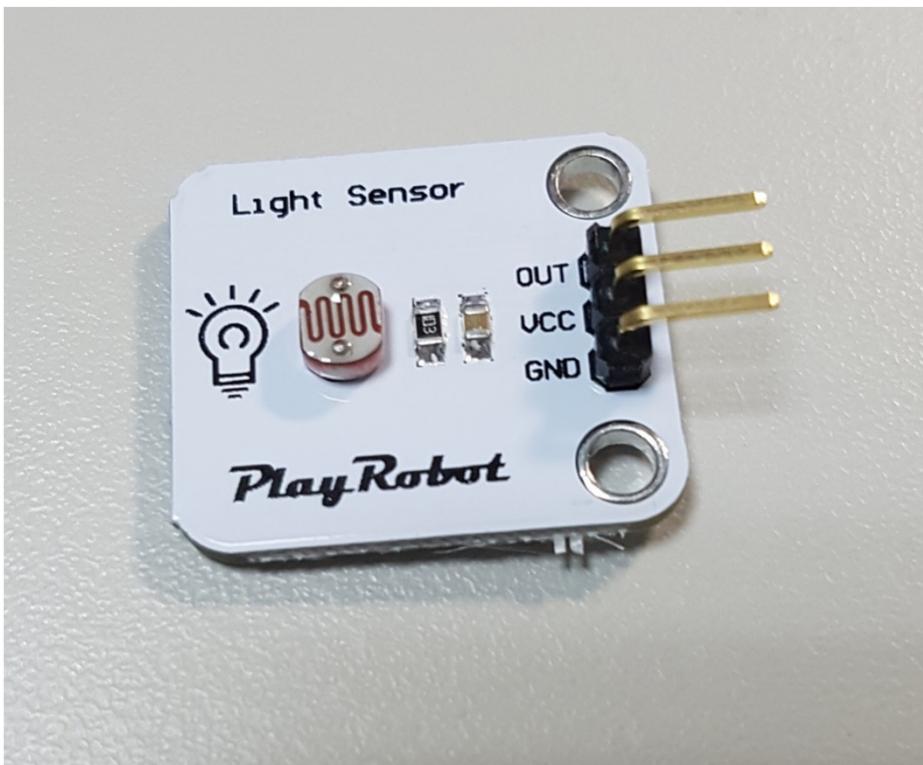
Arduino 擴充板



LED



光敏電阻



Arduino 範例2

Car 測試

```
check_motor §
```

```
// title: Car 測試  
// author: 育達科技大學資訊管理系李明昌老師  
// LINE: rwepa  
// EMAIL: alan9956@gmail.com
```

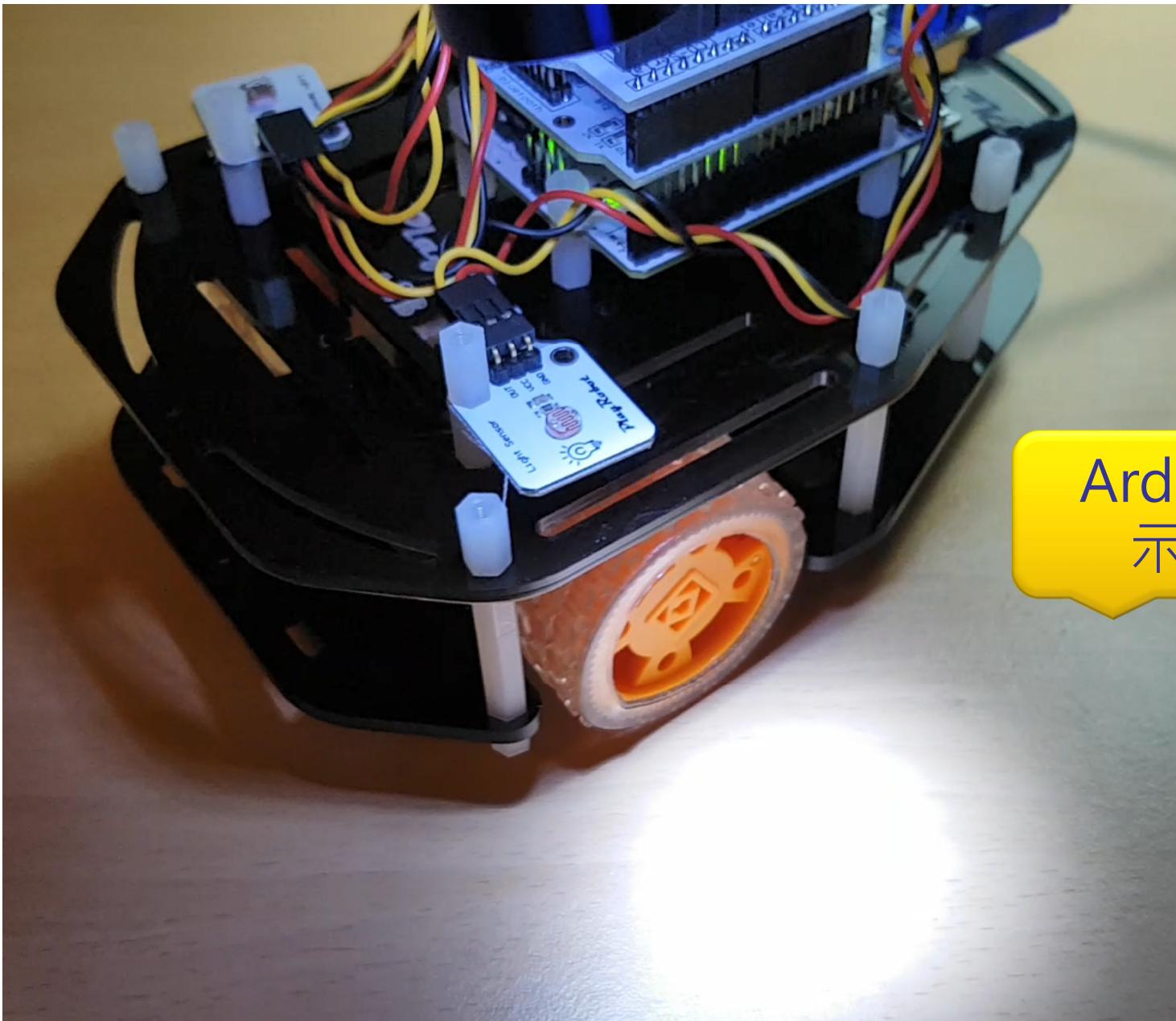
```
void setup()  
{  
    pinMode( 12 , OUTPUT); //控制右輪前後  
    pinMode( 10 , OUTPUT); //控制右輪轉速  
    pinMode( 13 , OUTPUT); //控制左輪前後  
    pinMode( 11 , OUTPUT); //控制左輪轉速  
}
```

```
void loop()  
{  
    digitalWrite( 12 , LOW ); //控制右輪後退  
    digitalWrite( 10 , HIGH ); //右輪轉速最高  
    digitalWrite( 13 , HIGH ); //控制左輪前進  
    digitalWrite( 11 , HIGH ); //控制左輪最高  
}
```

Arduino
示範

Arduino 範例3

Car 跟著那道光...



學習心得

- 育達科技大學資訊管理系暨研究所簡介
- Arduino 開發板 + Arduino IDE
- Arduino Car → 跟著那道光...

謝謝您的聆聽

Q & A



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<http://rwepa.blogspot.tw/>

