

# Jockey Club Project IDEA

Inclusive Digital and Experimental Art

賽馬會科藝共融計劃

Assembly Guide

組裝指南



Arduino Pro Micro



SN7493N



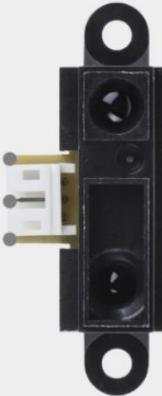
TLC555CP



獨石電容器  
Multi-Layered Ceramic Capacitor



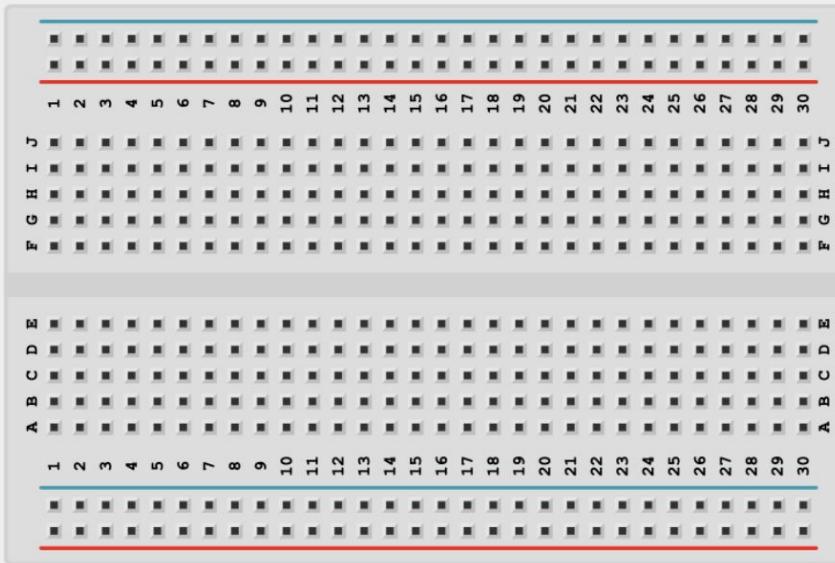
摩打 Motor



紅外線測距感測器  
IR Sensor



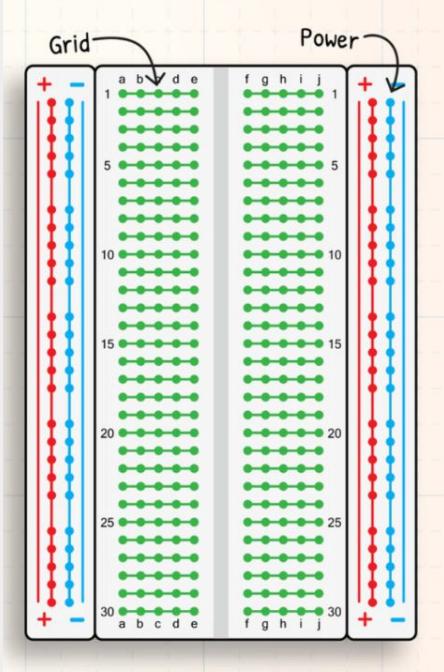
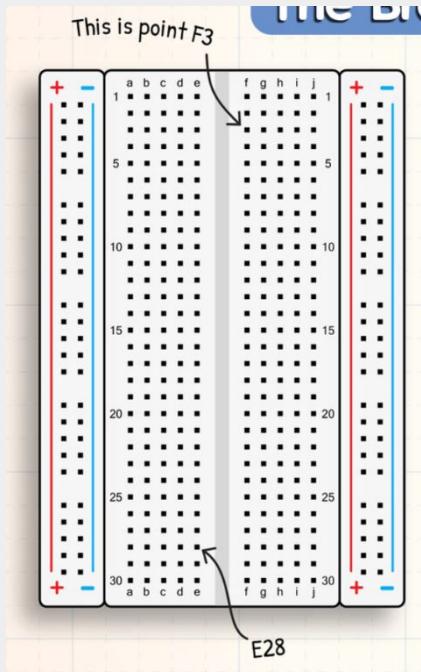
電解鋁電容器  
Aluminum Electrolytic Capacitor



麵包板 Breadboard



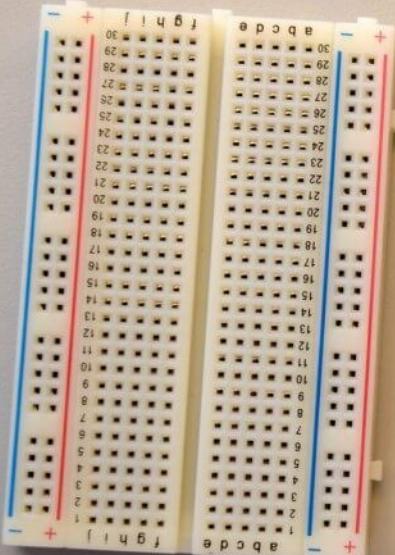
盒裝麵包板跳線  
Jumper Wire Kit



麵包板 (Breadboard) 是一種用於電子電路原型設計的免 焊接工具，它允許使用者插入和拔出電子元件及導線。

麵包板中央的插孔組(通常為每組 5個孔相連)用於連接電阻、LED 等電子元件和跳線，以形成實驗電路。麵包板兩側的兩條長條形插孔(通常標有「+」和「-」紅藍線)用作電源供應，可為整個電路提供正極和接地。

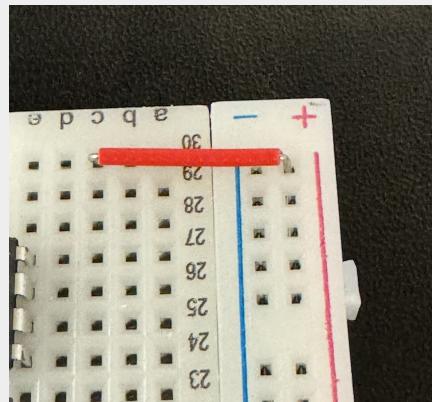
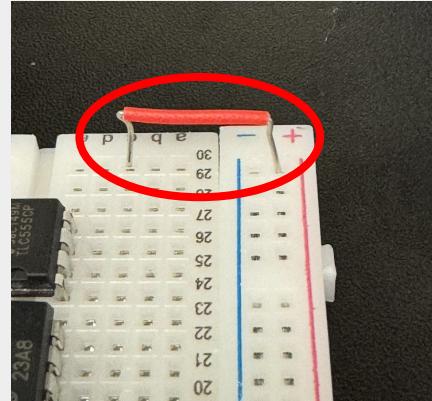
Top of Solderless Breadboard



Bottom of Solderless Breadboard



One of the many Metal Clips



麵包板背面是金屬彈簧片，需確保元件引腳或導線插入插孔。

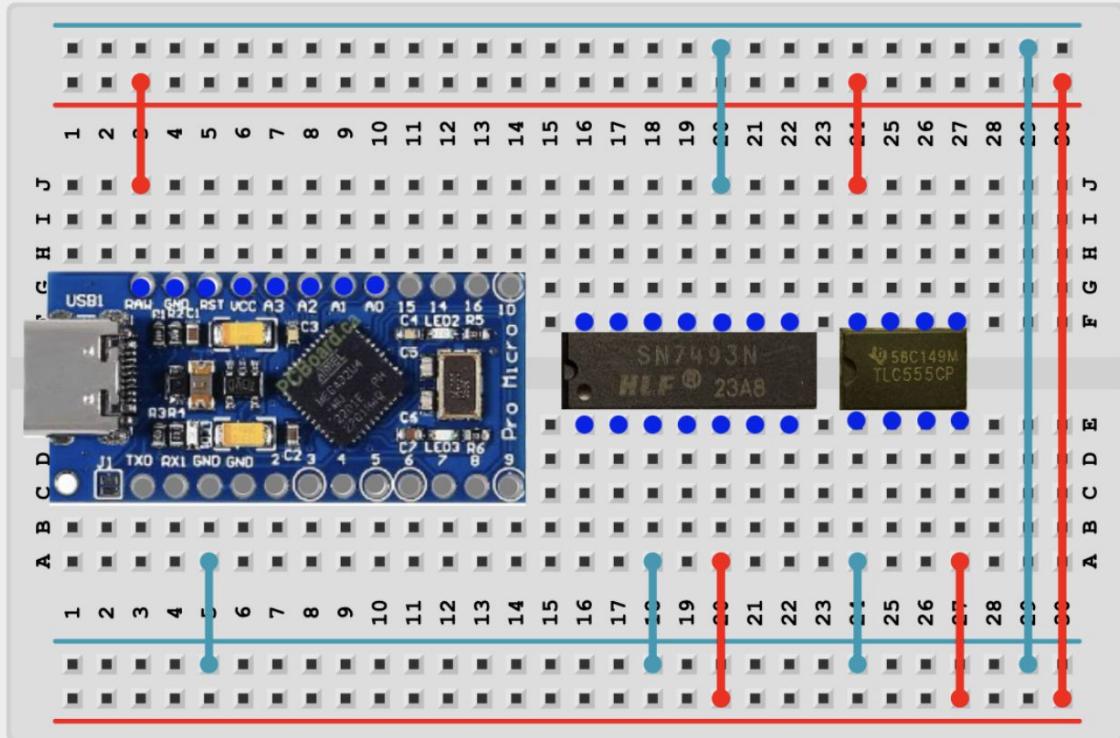
## 導電五金材料：



⚠ 小心五金材料傷手

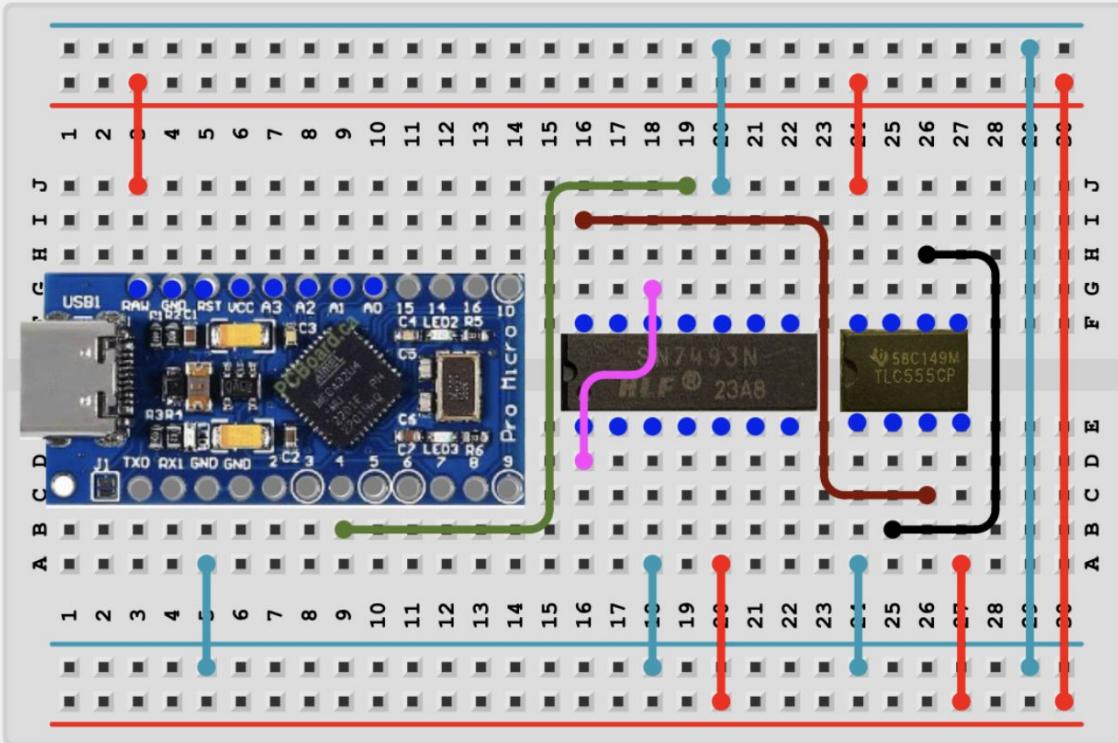
**開始組裝！**

## 步驟 1：用跳線連接“正極”和“負極”



所有電線無論顏色如何，一般都可以傳輸相同的電訊號。但紅色通常用於電源或正極連接，深色用於接地和負極連接。

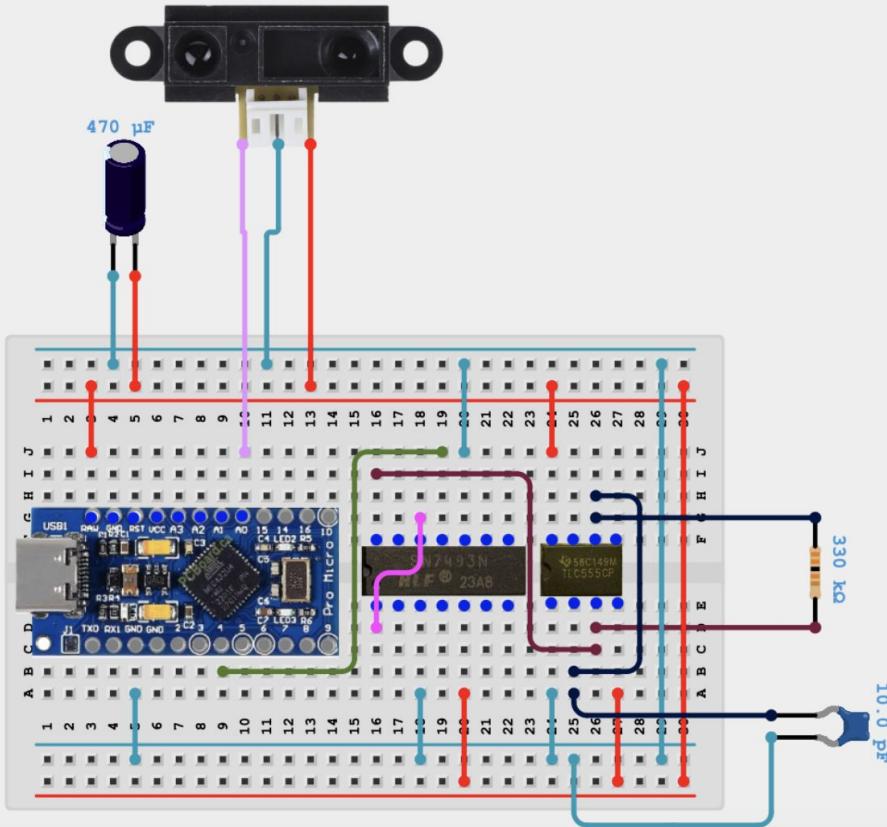
## 步驟 2：連接主要電子元件



使用跳線連接以下插孔：

- D16 → G18
- B9 → J19
- I16 → C26
- B25 → H26

## 步驟 3：連接電容器、電阻和紅外感測器



### 鋁電容器：

- 長 → 正極
- 短 → 負極

### 紅外感測器：

- 黃 → J10
- 紅 → 正極
- 黑 → 負極

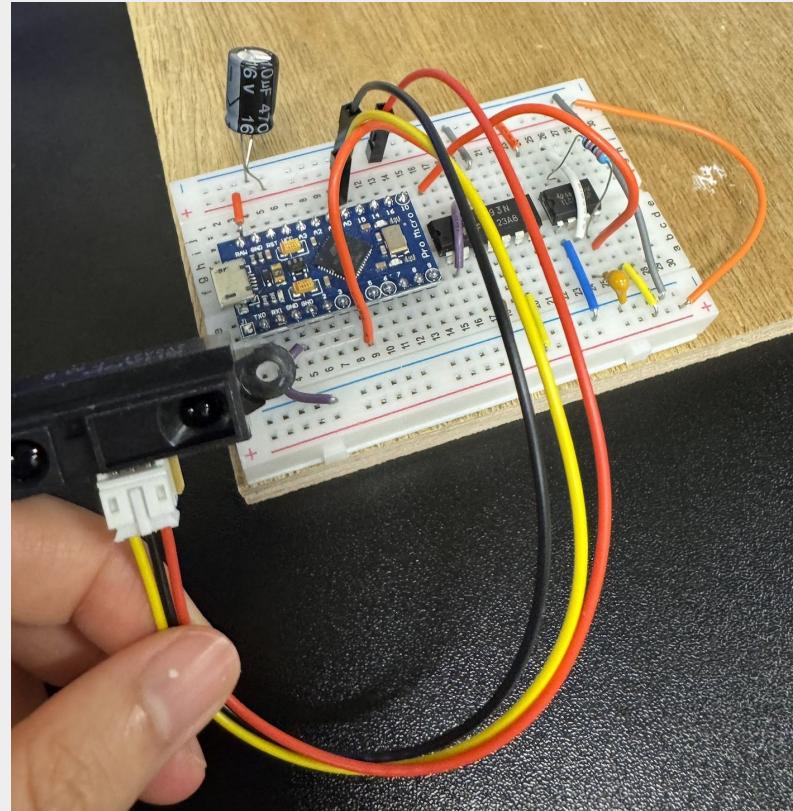
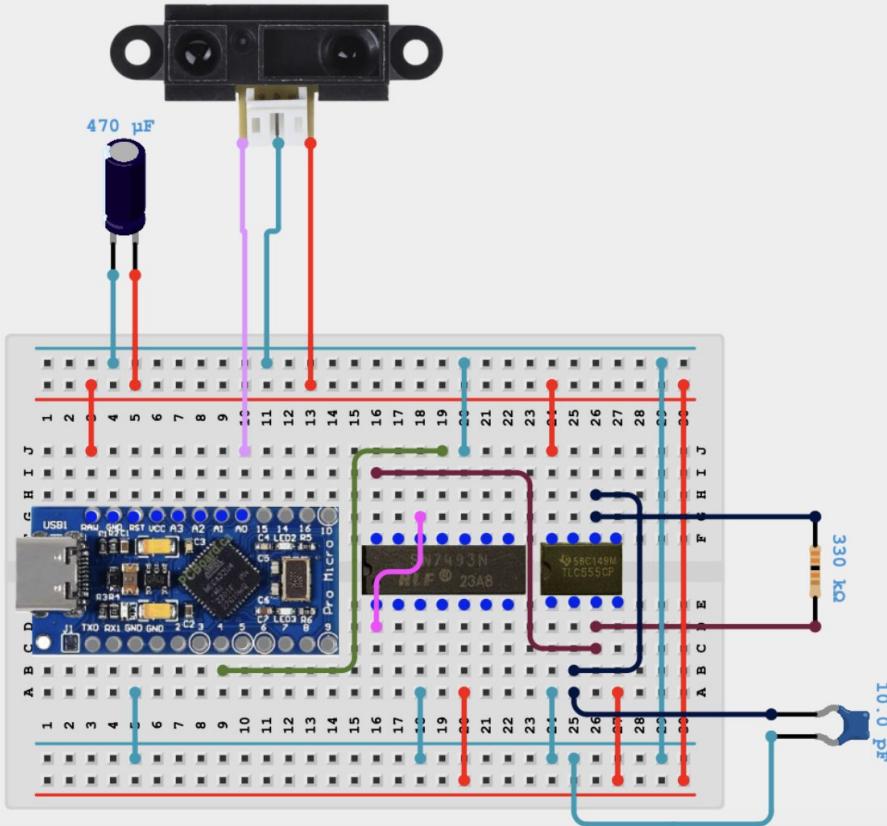
### 330K $\Omega$ 電阻：

- D26 → H26

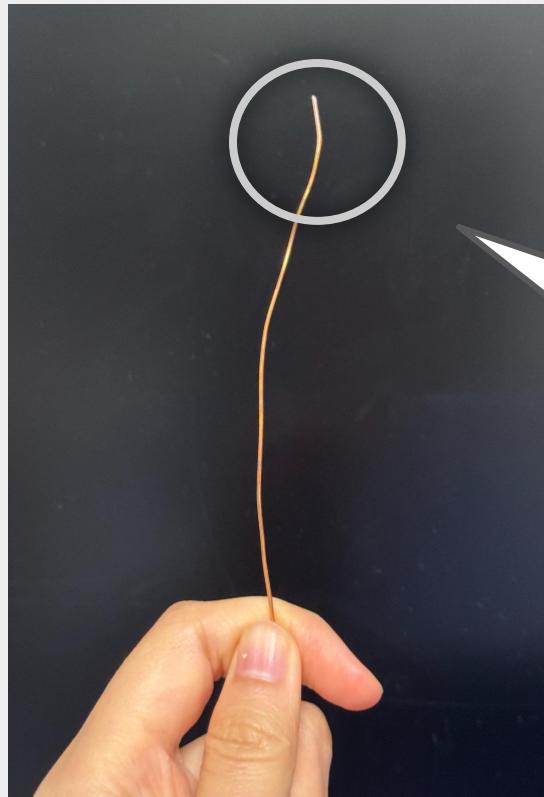
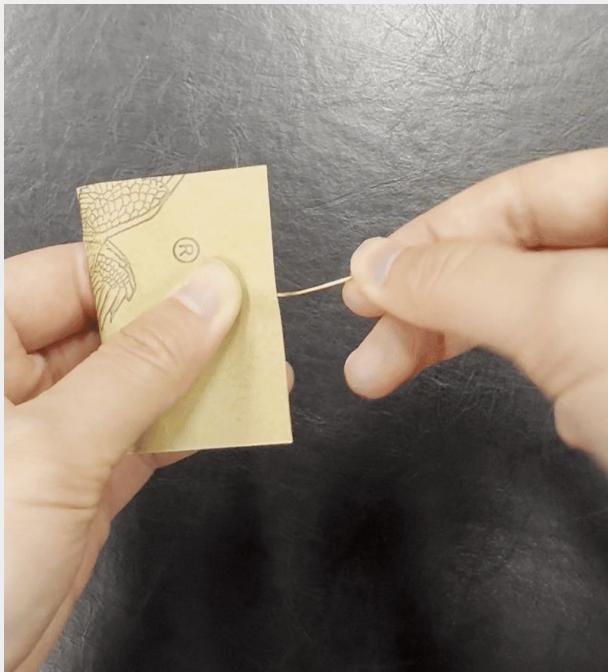
### 獨石電容器：

- A25 → 負極

## 步驟 3：連接電容器、電阻和紅外感測器

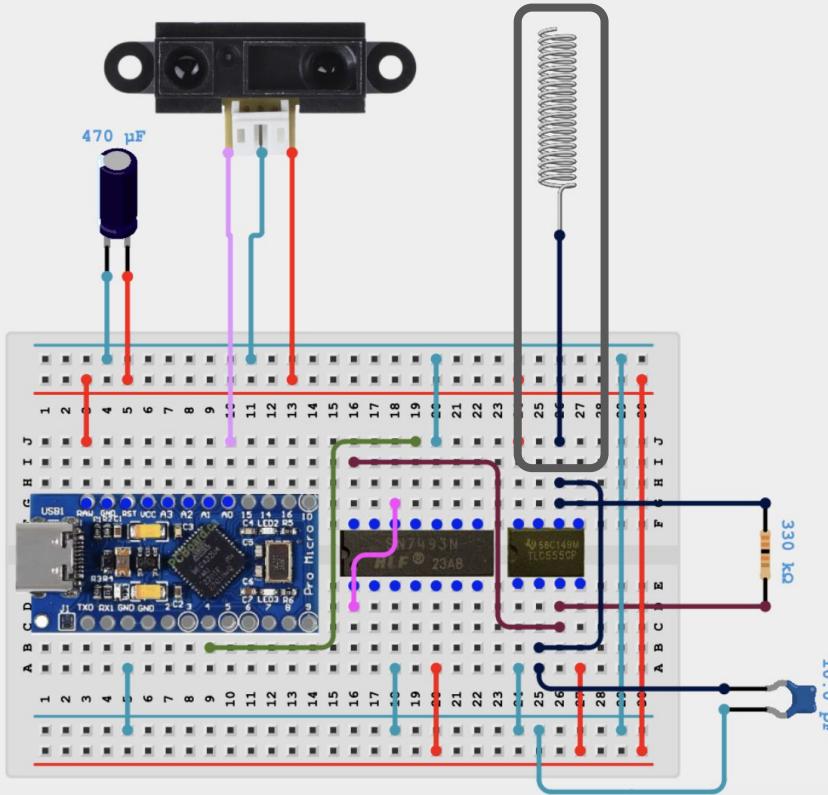
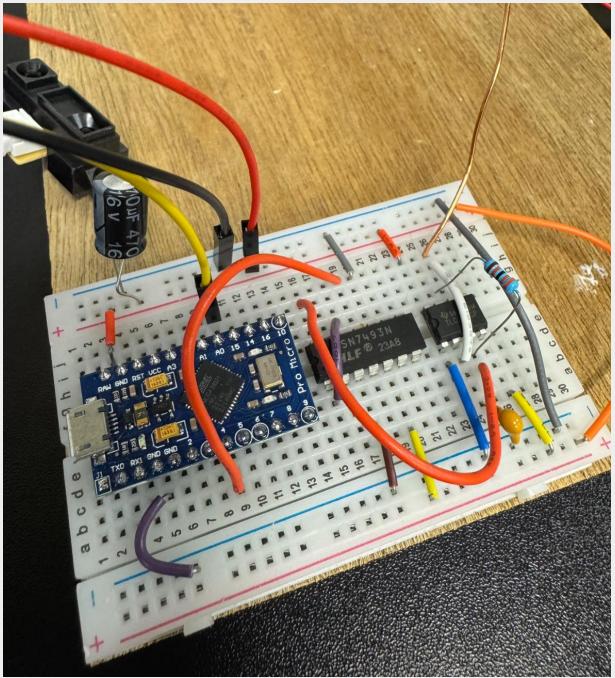


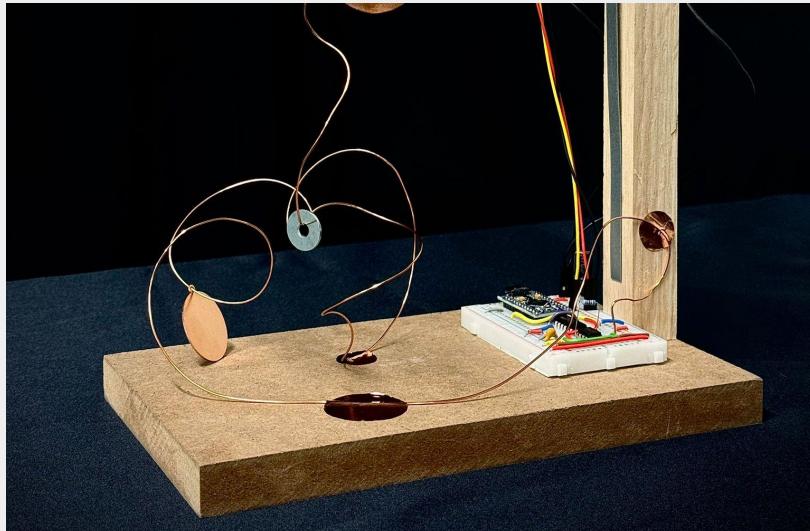
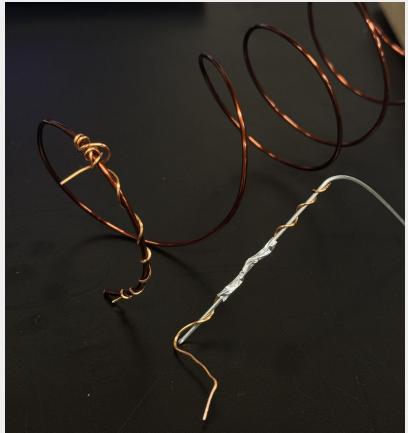
## 步驟 4: 使用砂紙去除銅線上的絕緣層



只需要去除大約  
1.5cm的絕緣層

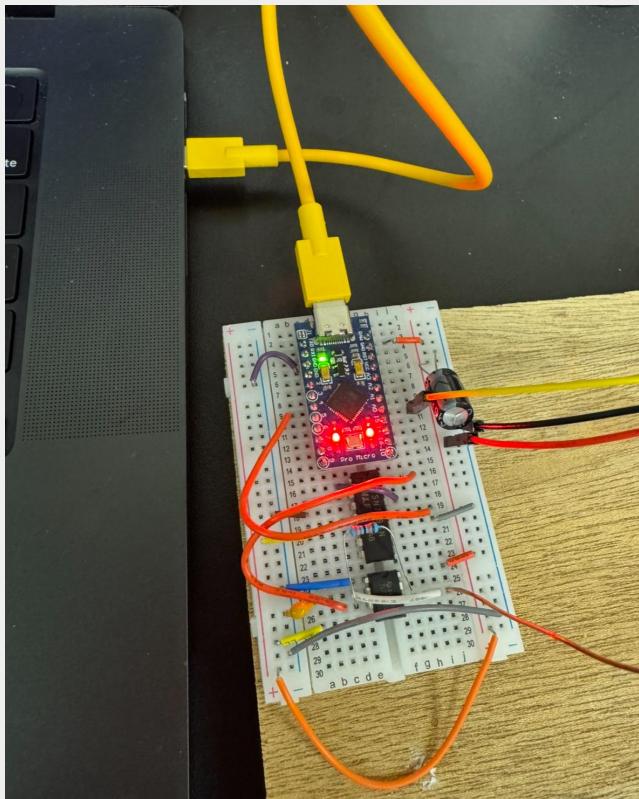
## 步驟 5：將磨好的銅線插入麵包版 J26 位置，作為特雷門琴的天線





- 銅線太幼可能無法立起來，可以使用粗一點的銅線或鐵線做造型，然後用幼銅線把它纏繞起來。(粗的線無法直接插入麵包板裡)
- 銅線另一邊可以插入第1、29、30行，也可以固定在木板上，也可以懸空。

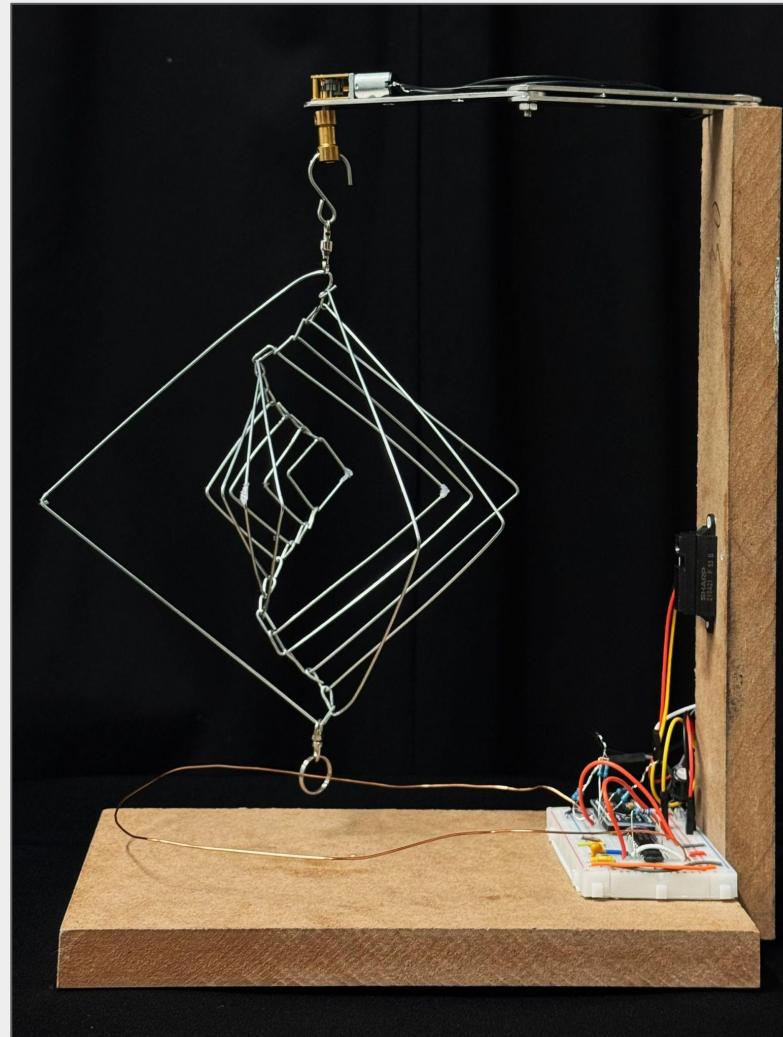
## 步驟 5: 連接電腦



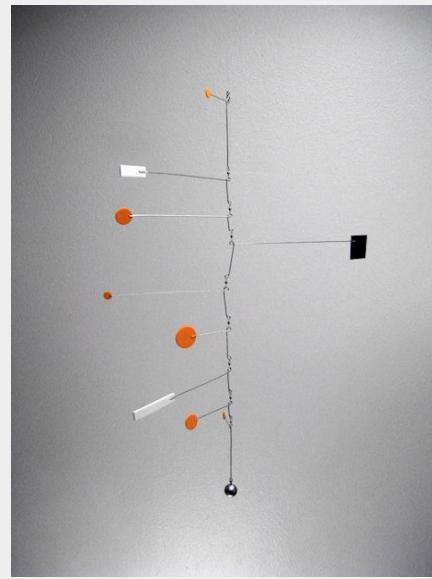
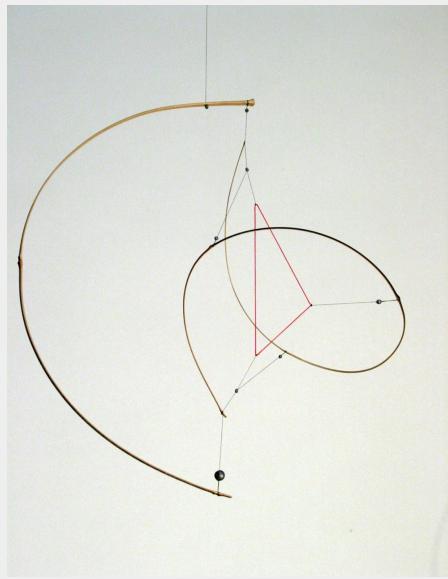
將 Arduino Pro Micro  
連接到電腦後，你會看到  
LED 閃爍。

**完成了基本的組裝，  
現在選擇你喜歡的組合：**

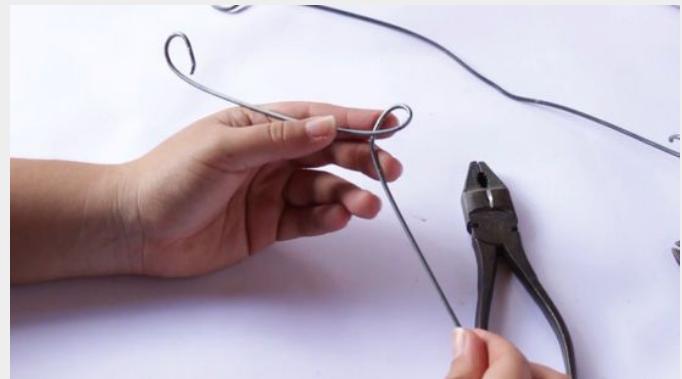
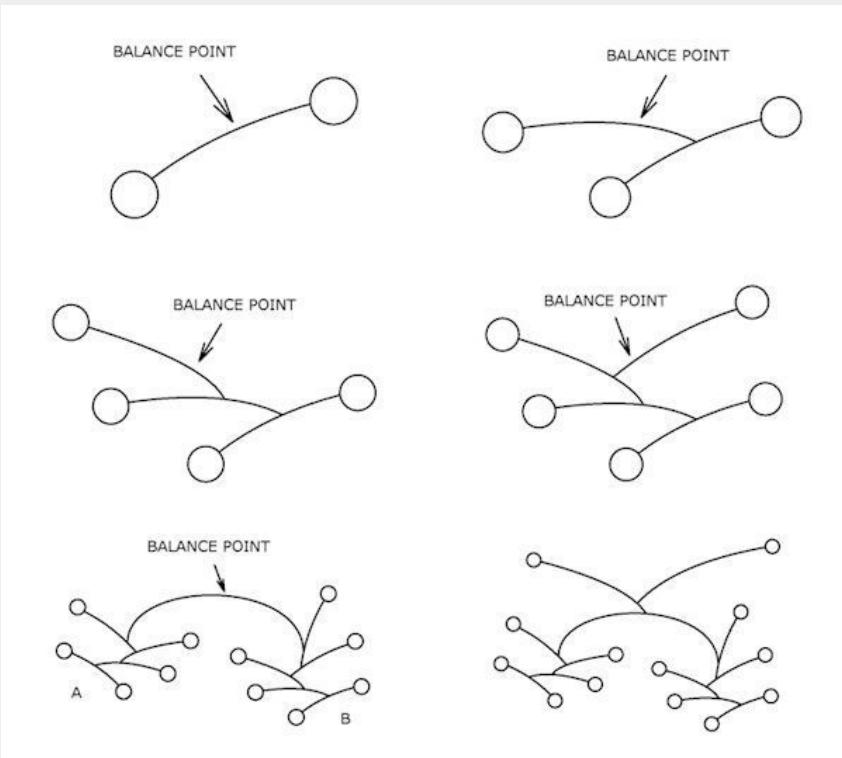
## 組合 1：特雷門琴 + 動態雕塑

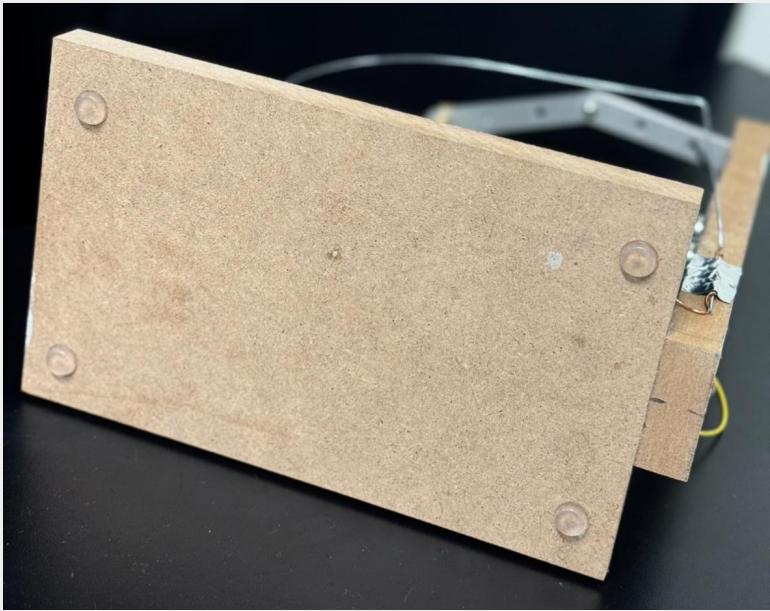


# 用導電的五金材料製作一個抽象風格的雕塑

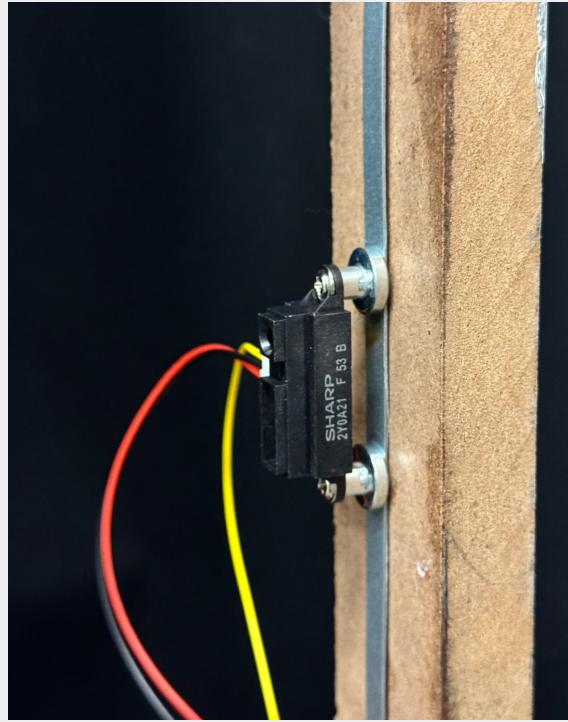


# Mobile Crafting

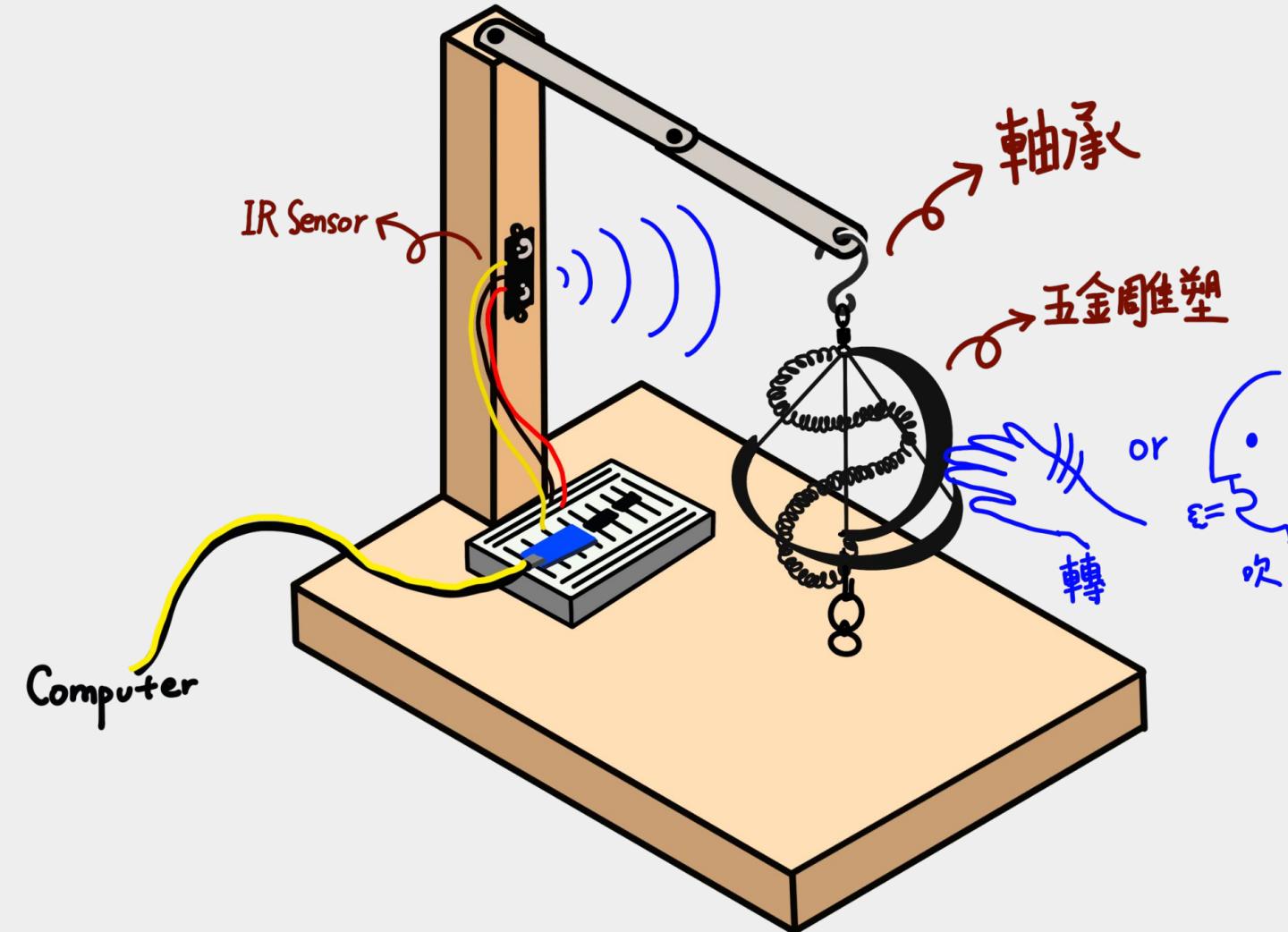




為木板底座貼上防滑膠粒



用螺絲把磁柱固定在紅外感測器上，然後  
把鐵條黏貼在木柱上，最後用磁力固定感  
測器



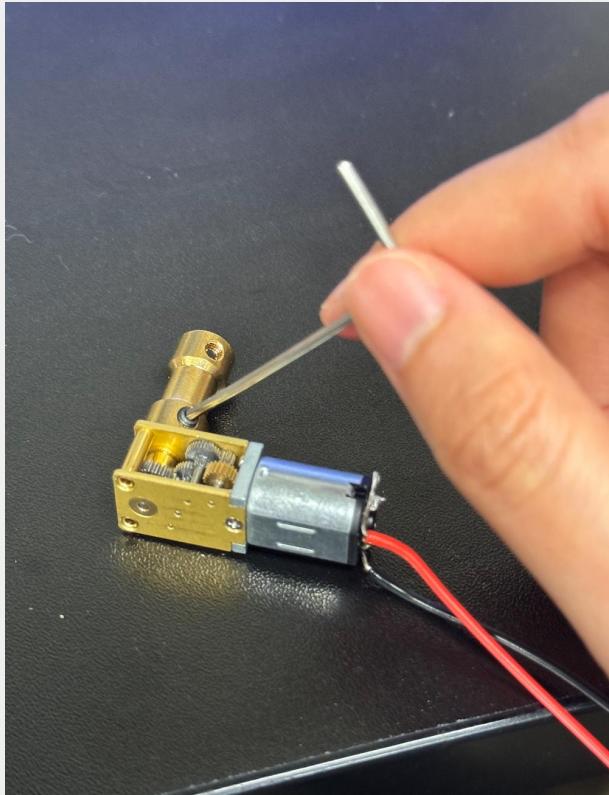
DO:

- \*轉動雕塑:可以用手也可以輕吹
- \*在VCV Rack設計聲音的互動

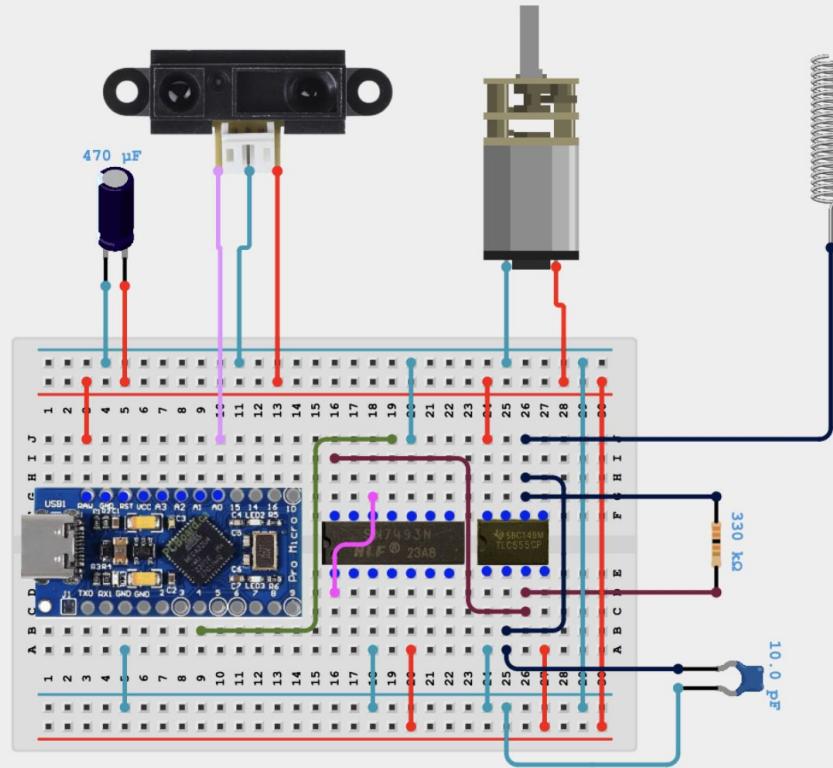
THINK:

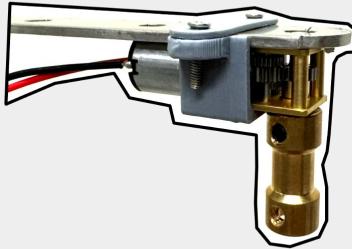
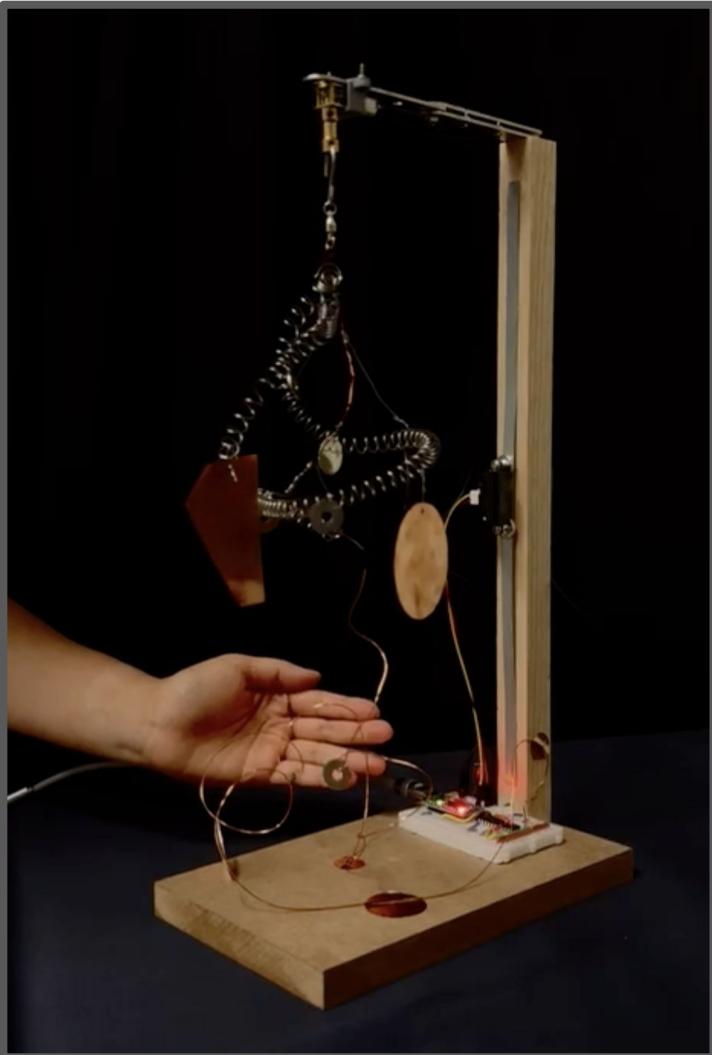
- \*雕塑轉動的時候,聲音有什麼變化?
- \*IR Sensor的最佳位置在哪裡?

## 鎖緊聯軸器



## 連接摩打到麵包板的正負極





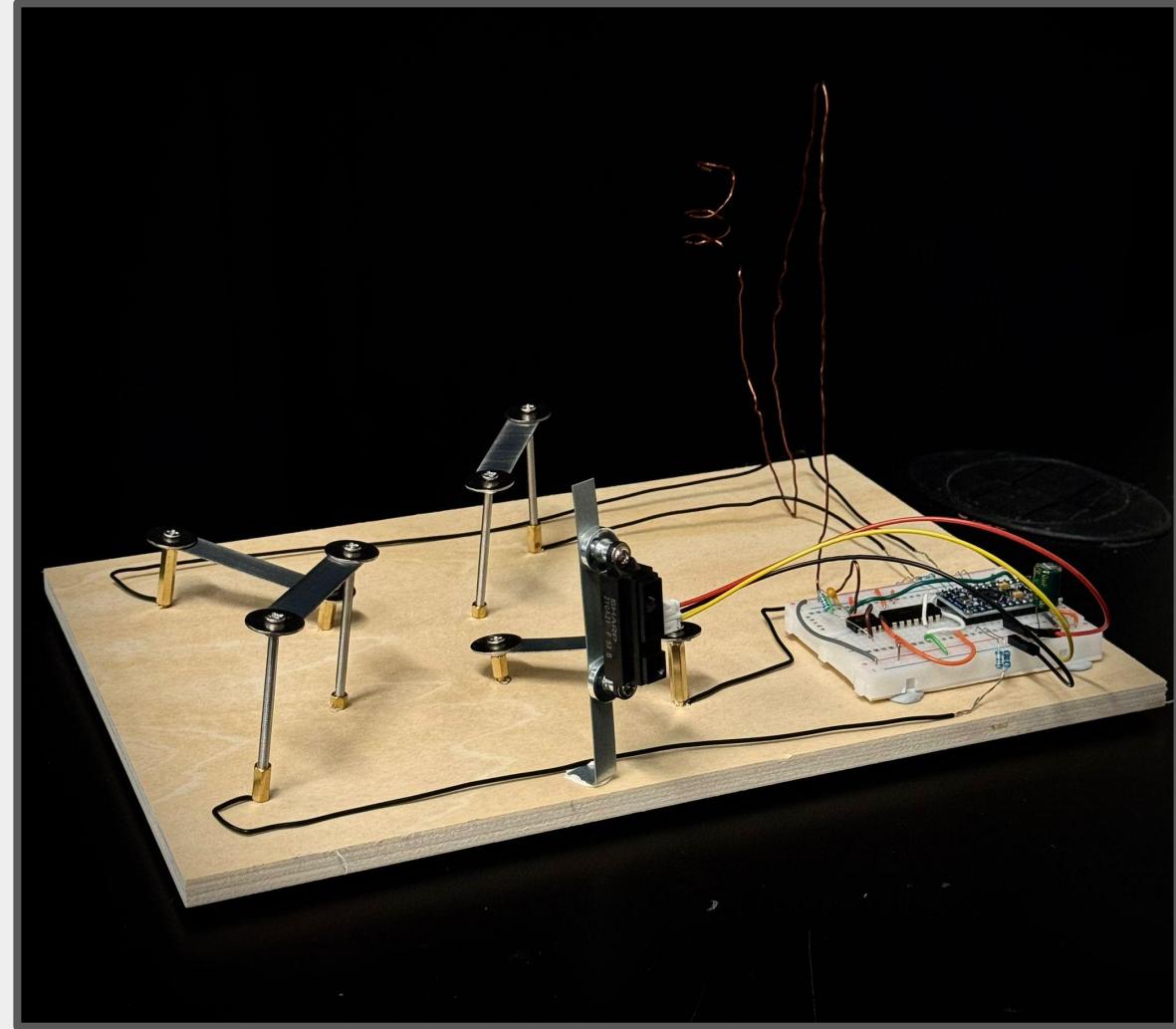
**DO:**

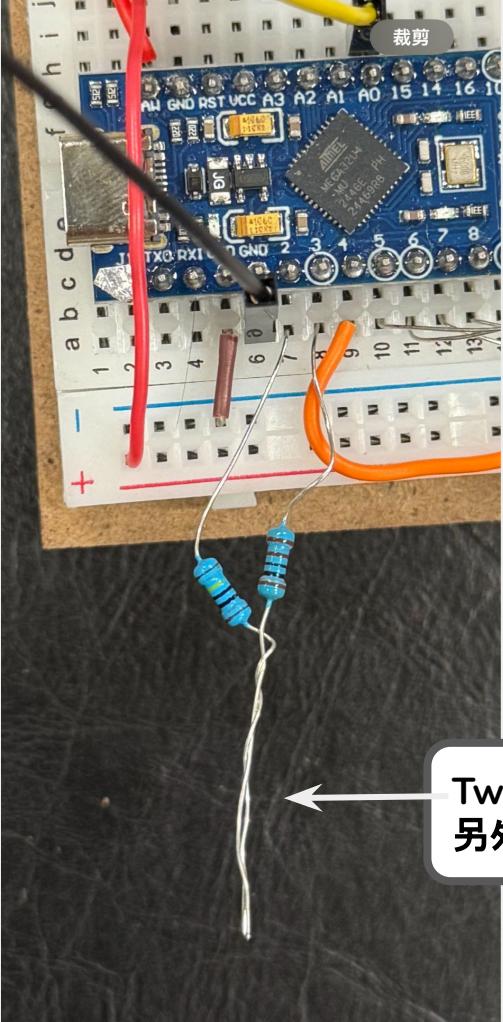
- \*固定摩打
- \*加上天線，用手靠近觀察聲音變化

**THINK:**

- \*天線和雕塑之間有什麼互動？
- \*摩打最佳位置在哪裏？

## 組合 2：特雷門琴 + 犁





將  $1M\Omega$  電阻 插入 a7

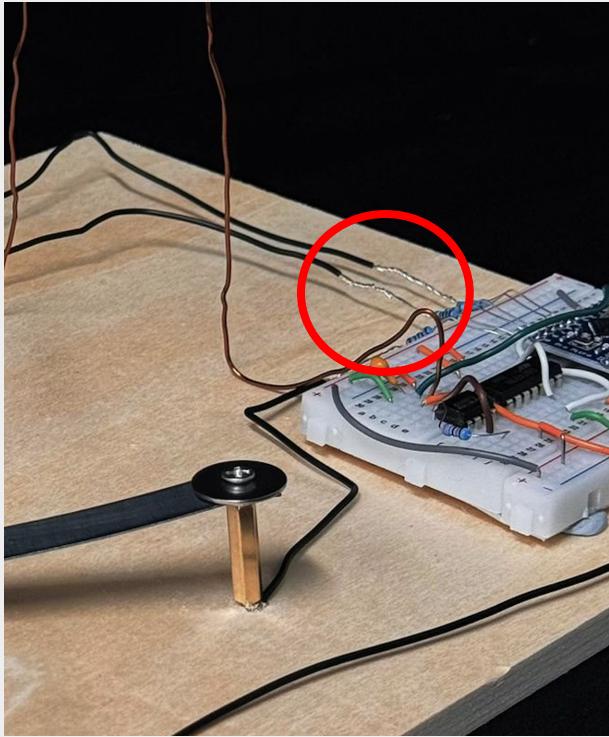


將  $1K\Omega$  電阻 插入 a8



← Twisting (纏繞)兩條電阻的  
另外一端

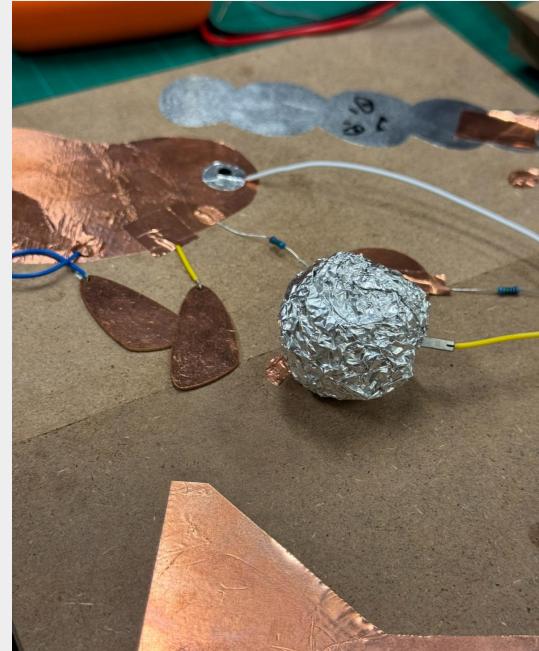
注意分辨 $1M\Omega$ 和 $1K\Omega$ 的電阻喔！位置不可互換！

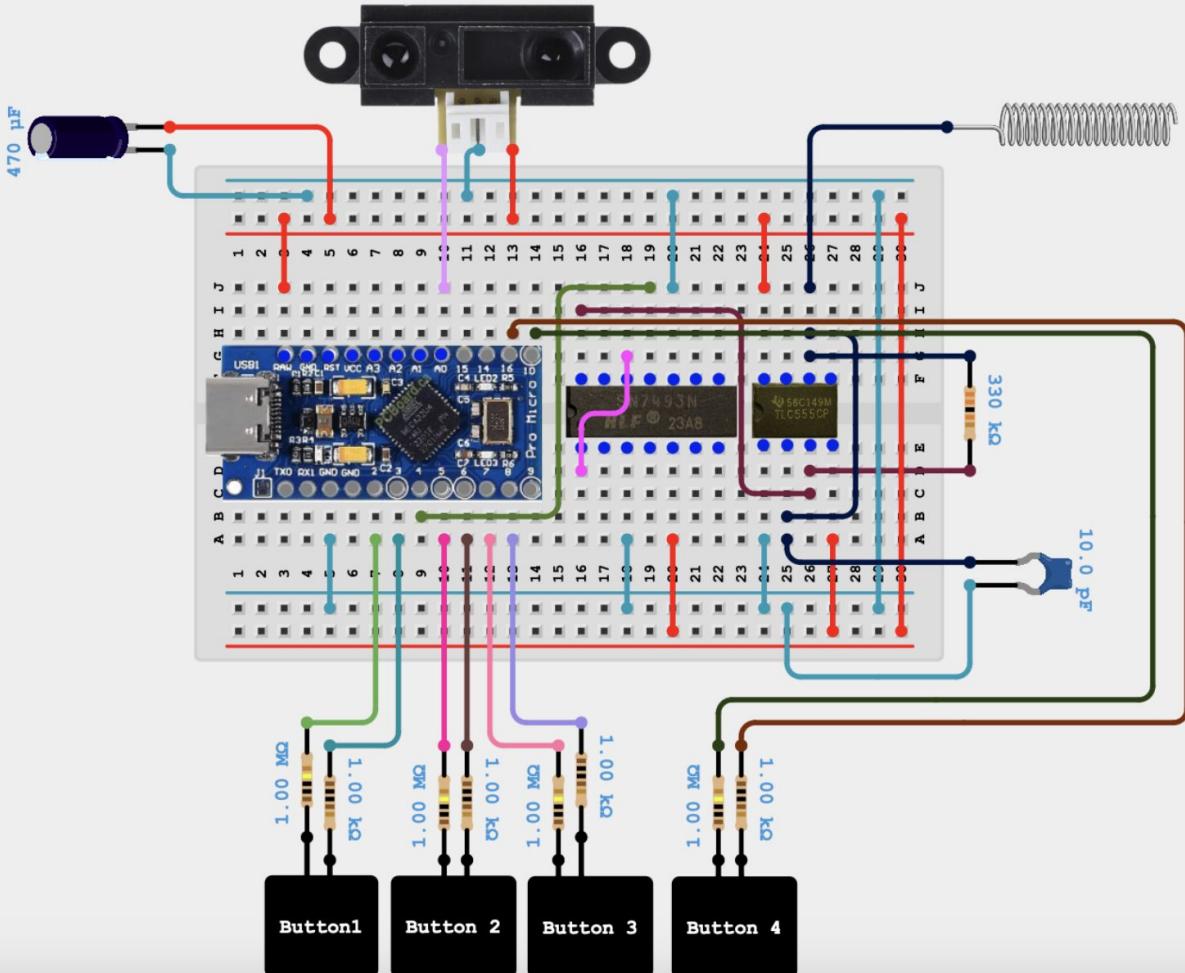


將電阻與電線纏繞



杜邦線的另一邊用導電的物料做掣，注意盡量做大一點





### Button 1:

- $1\text{M}\Omega \rightarrow \text{A}7$
- $1\text{k}\Omega \rightarrow \text{A}8$

### Button 2:

- $1\text{M}\Omega \rightarrow \text{A}10$
- $1\text{k}\Omega \rightarrow \text{A}11$

### Button 3:

- $1\text{M}\Omega \rightarrow \text{A}12$
- $1\text{k}\Omega \rightarrow \text{A}13$

### Button 4:

- $1\text{M}\Omega \rightarrow \text{H}14$
- $1\text{k}\Omega \rightarrow \text{H}13$

其他掣也按照一樣的方法  
連接好，最多可以做 4個掣