

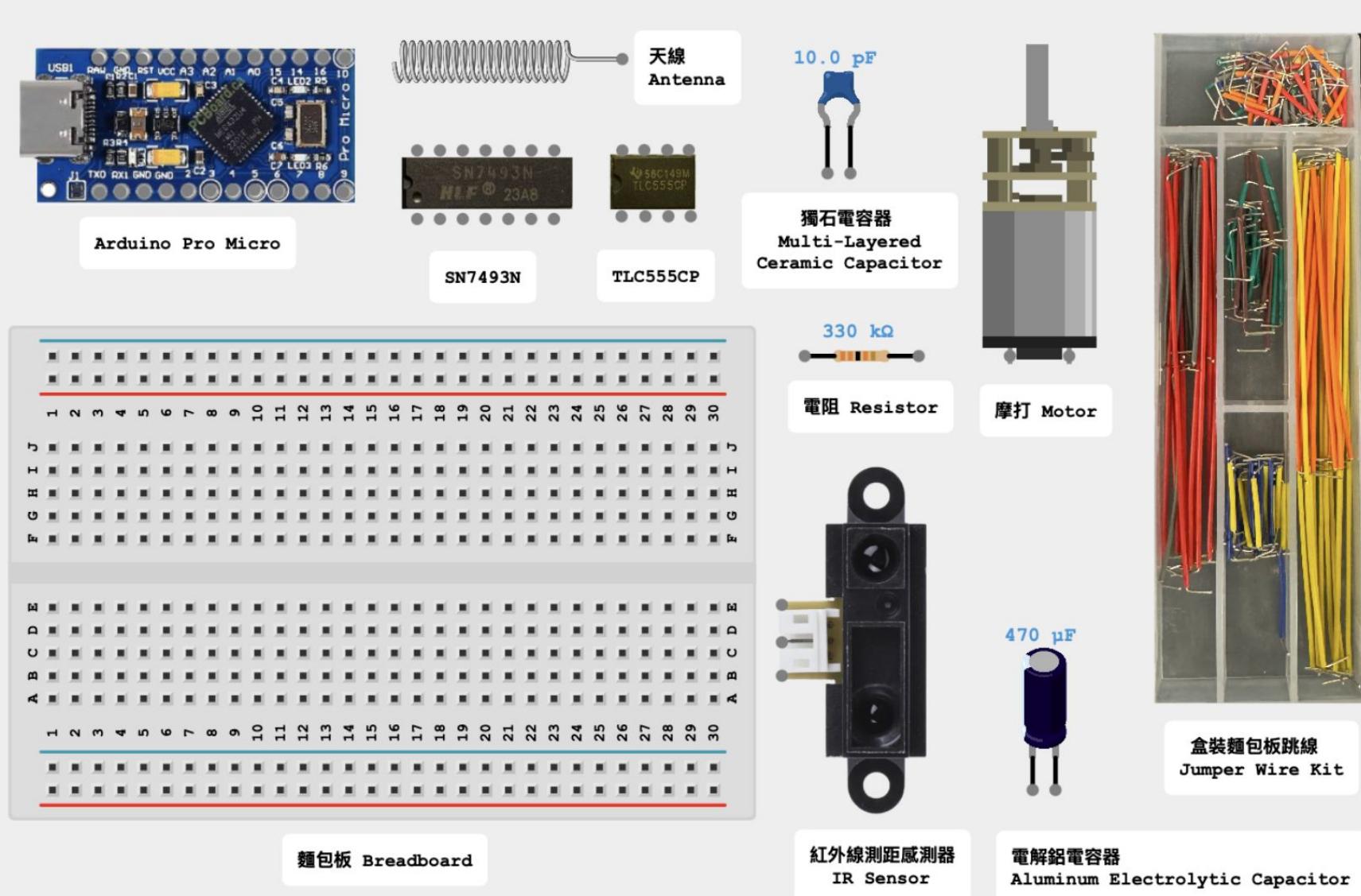
# Jockey Club Project IDEA

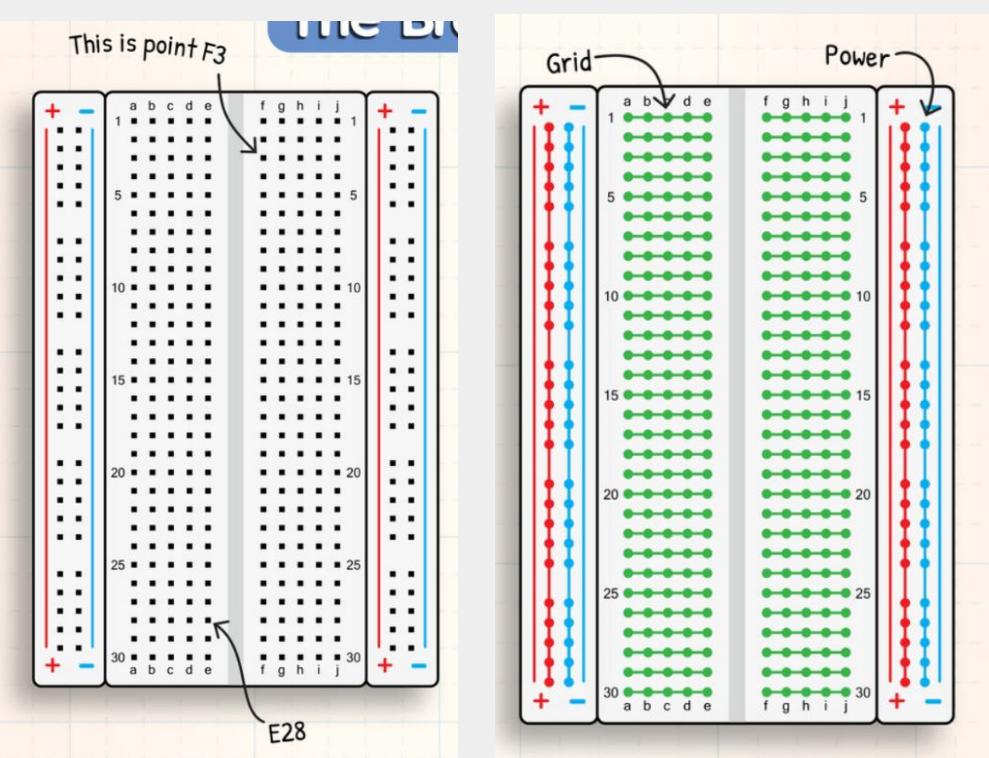
Inclusive Digital and Experimental Art

賽馬會科藝共融計劃

## Assembly Guide

組裝指南

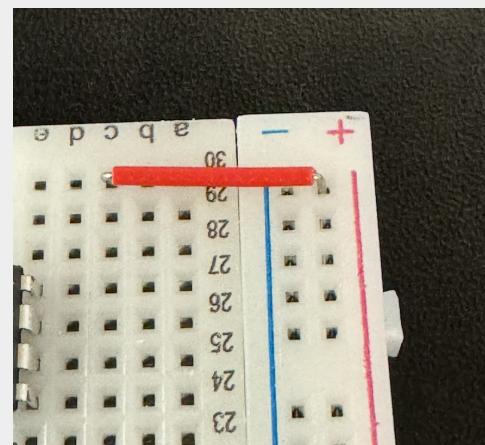
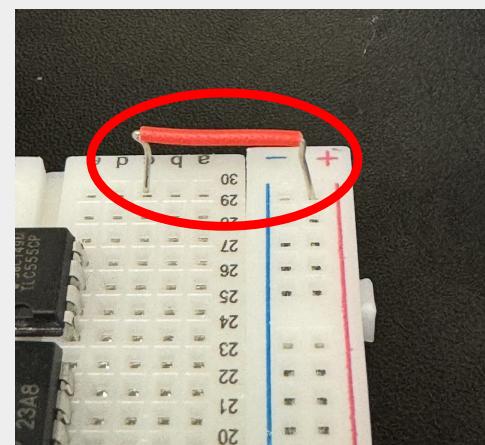
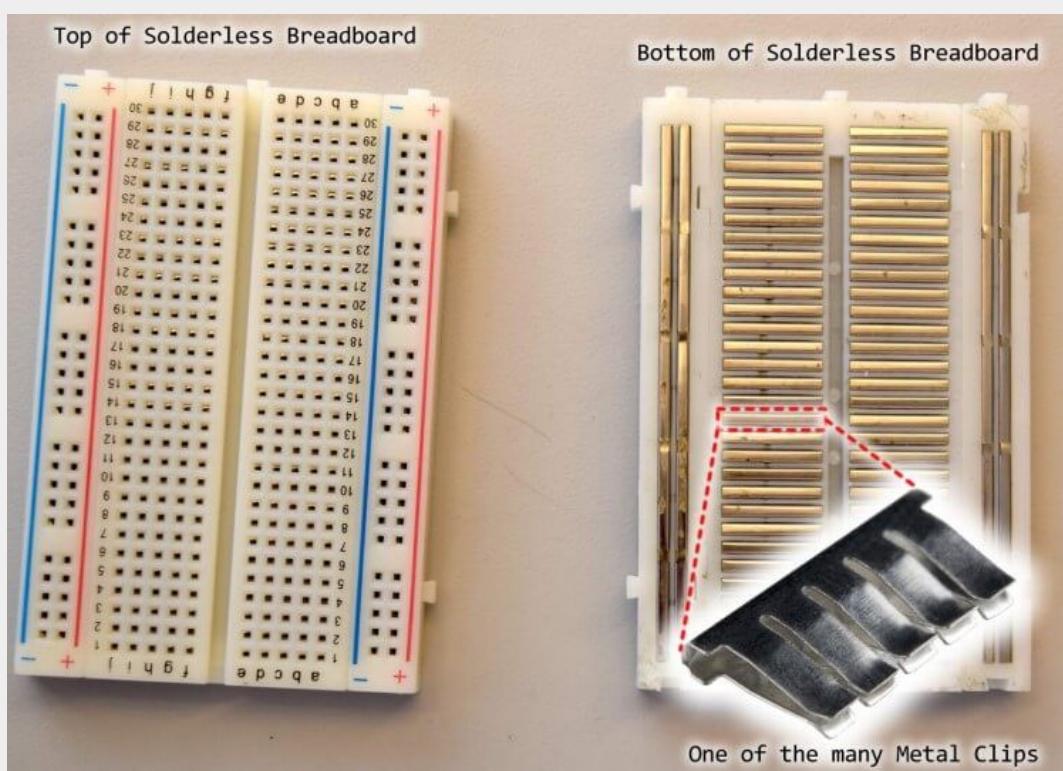




麵包板 (Breadboard) 是一種用於電子電路原型設計的免 焊接工具，它允許使用者插入和拔出電子元件及導線。

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。

<https://cdn.flipsnack.com/widget/v2/widget.html?hash=hil43imxu3>



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。

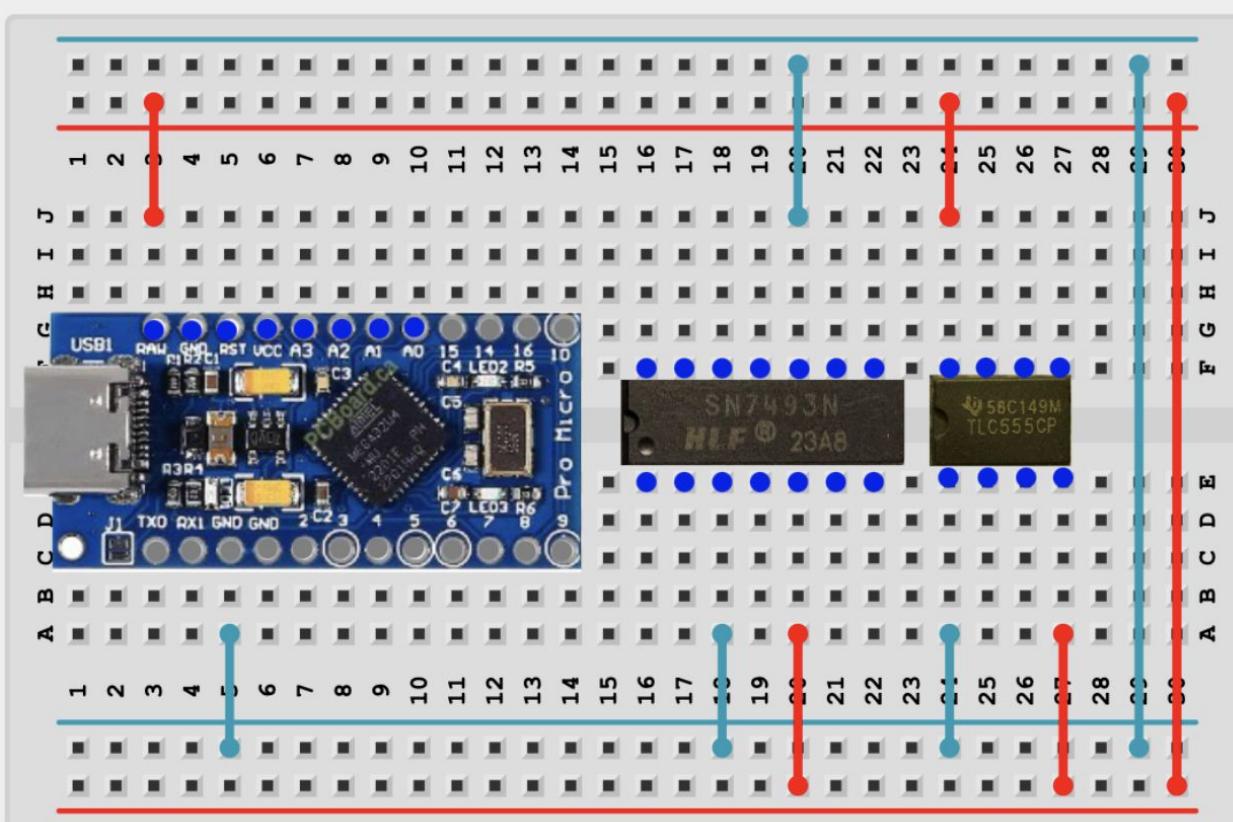
導電五金材料：



⚠ 小心五金材料傷手

**開始組裝！**

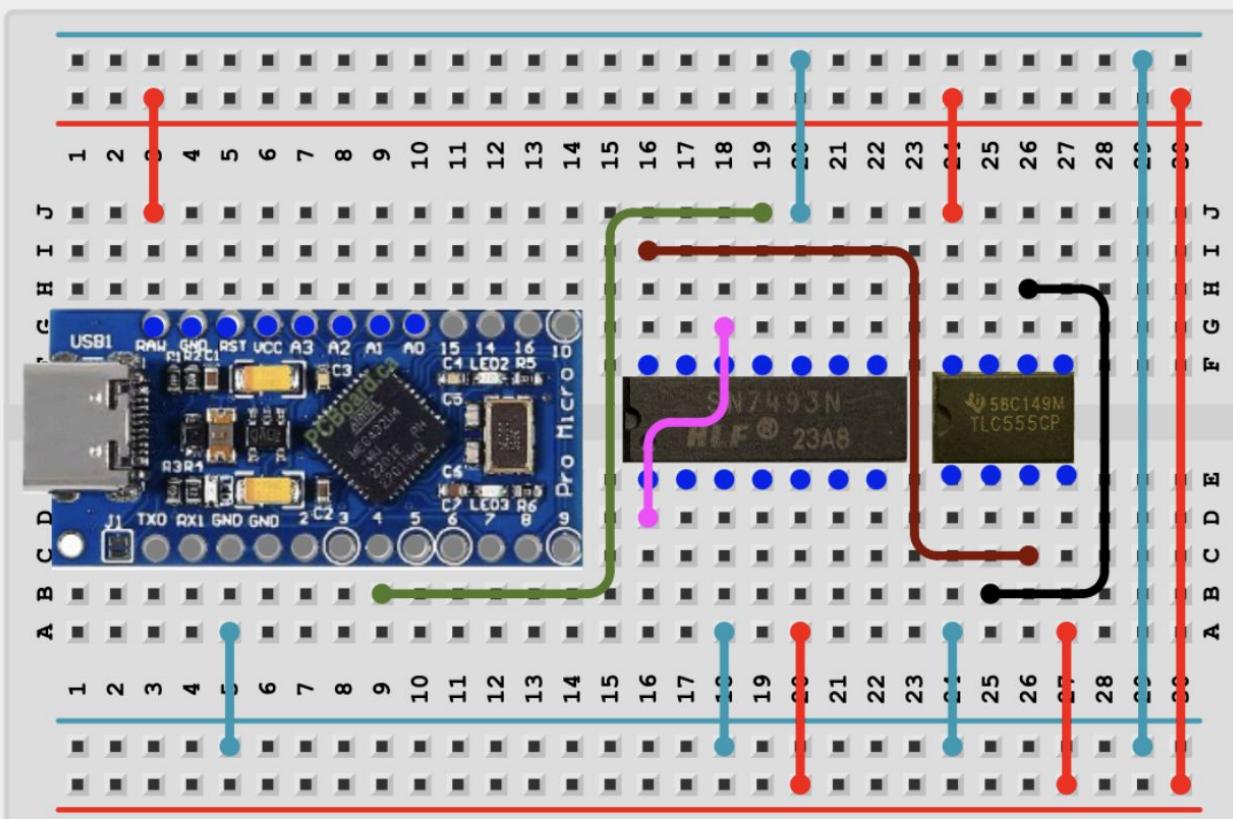
步驟 1：用跳線連接“正極”和“負極”



## 不同顏色的電線有什麼區別？

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。

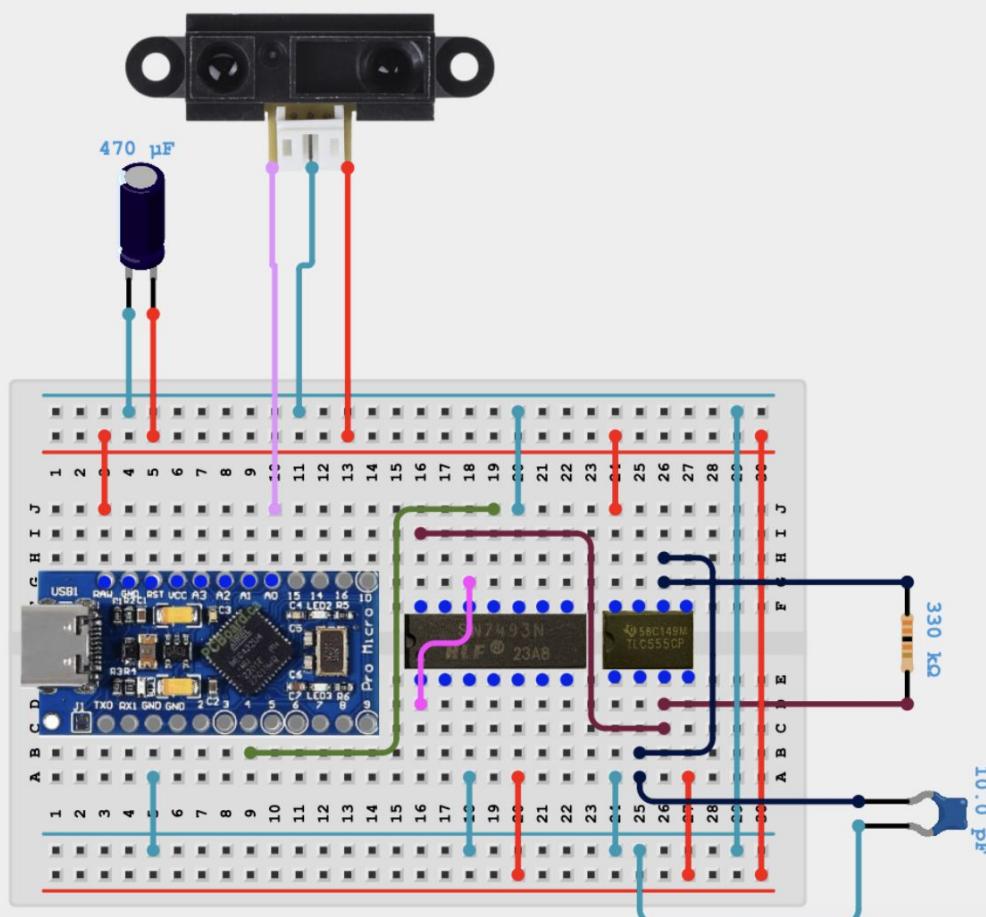
## 步驟 2: 連接主要電子元件



**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

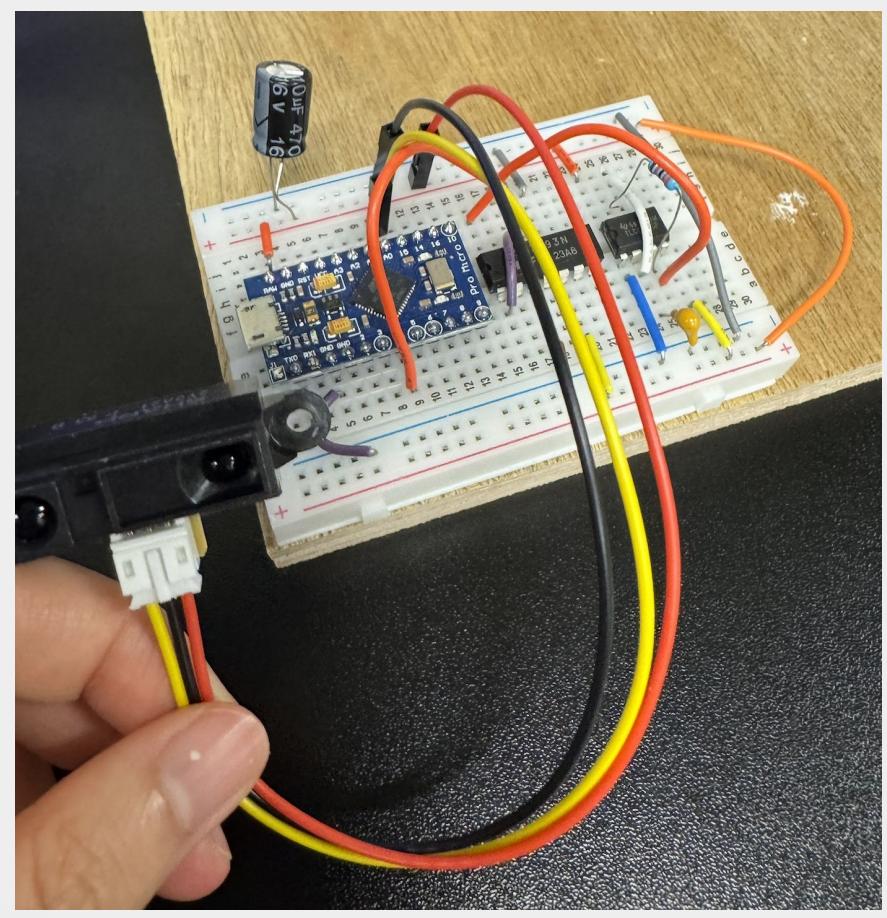
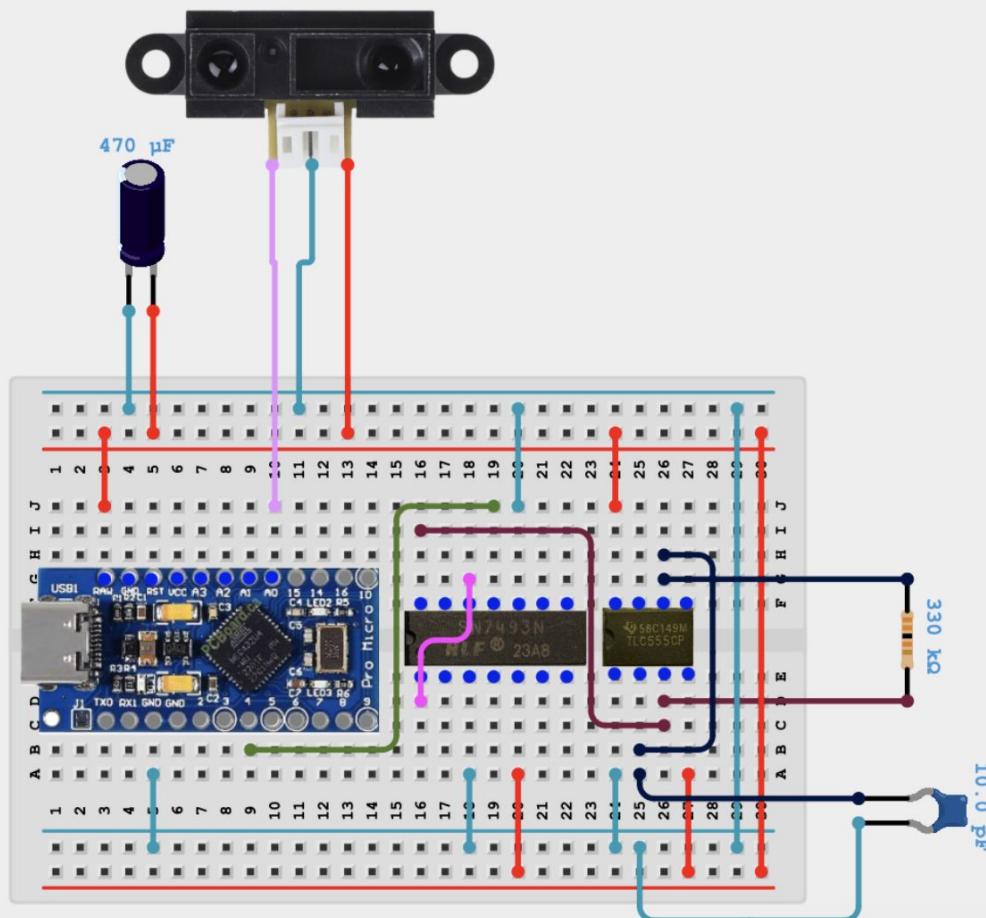
330 $\text{k}\Omega$ 電阻：

- D26 → H26

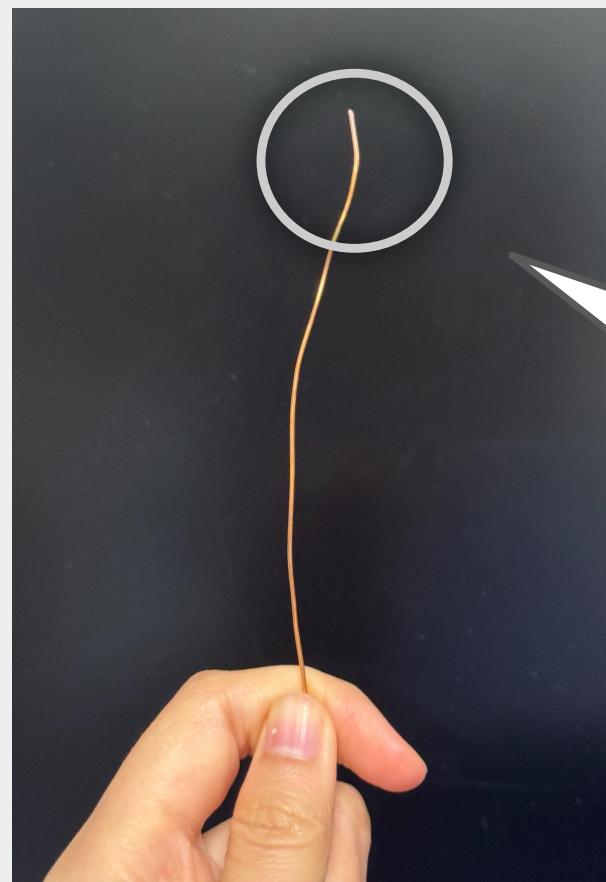
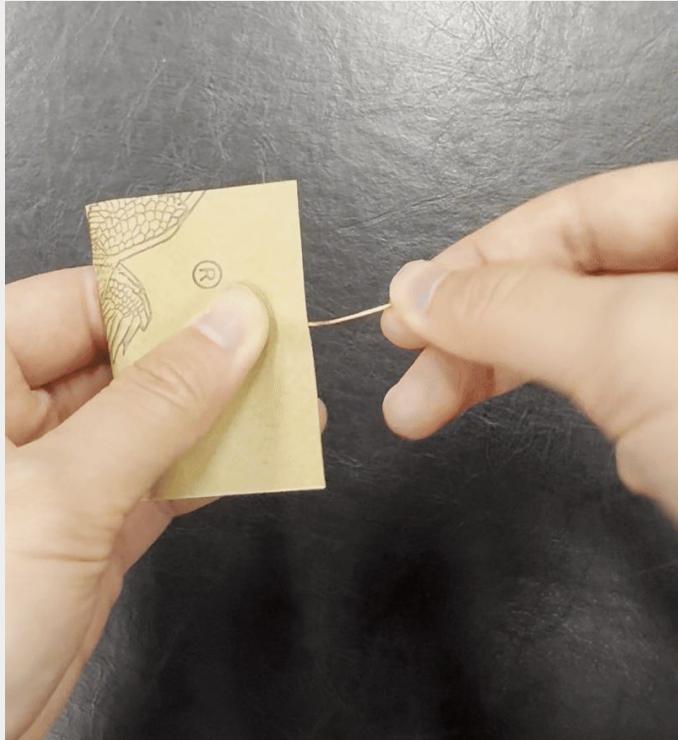
獨石電容器：

- A25 → 負極

### 步驟 3: 連接電容器、電阻和紅外感測器

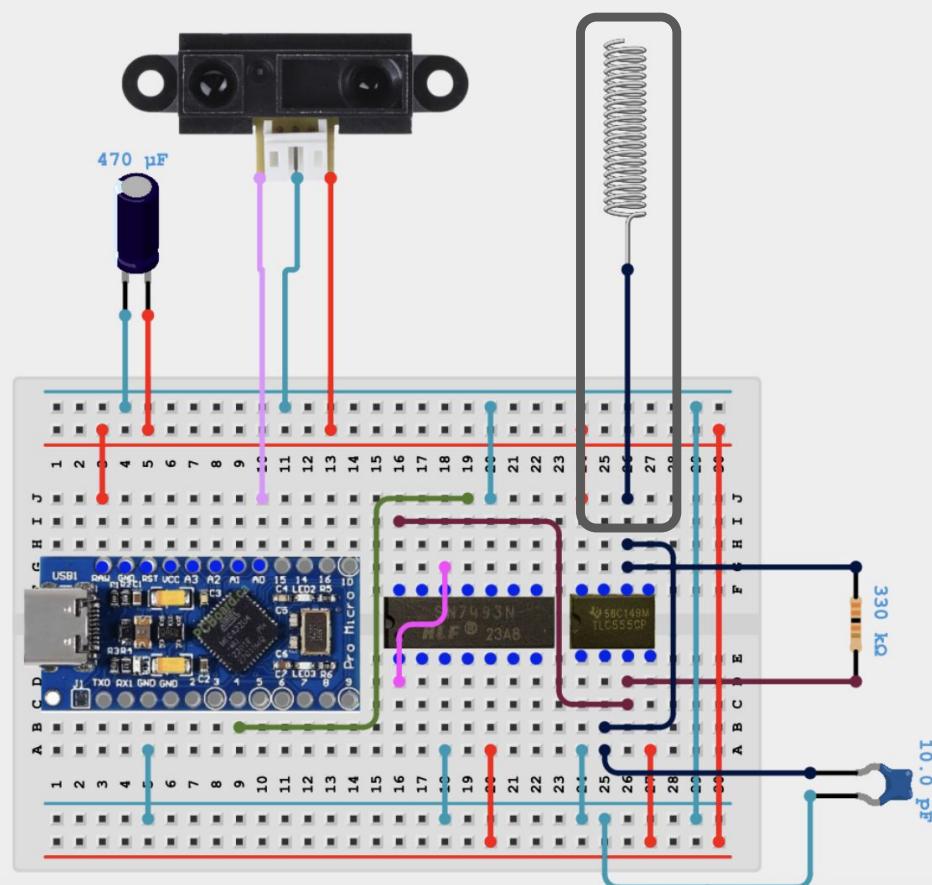
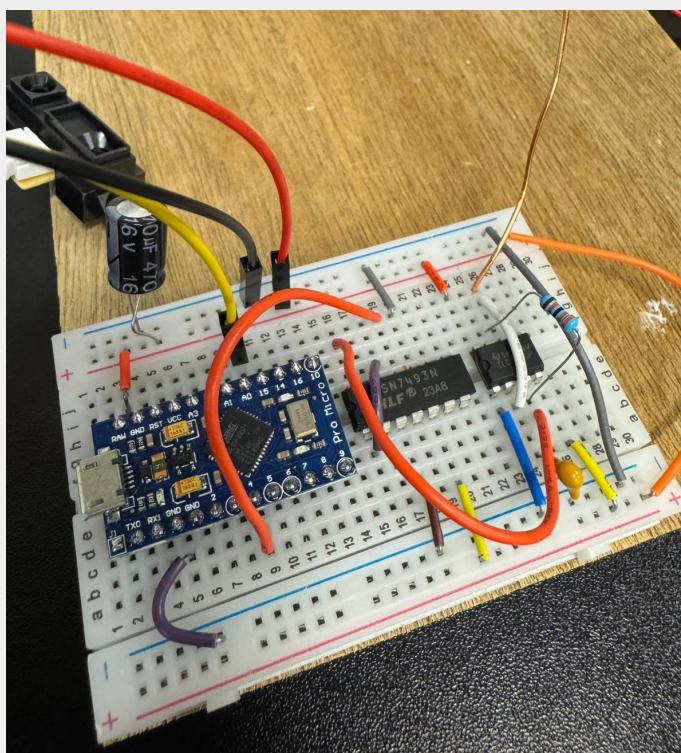


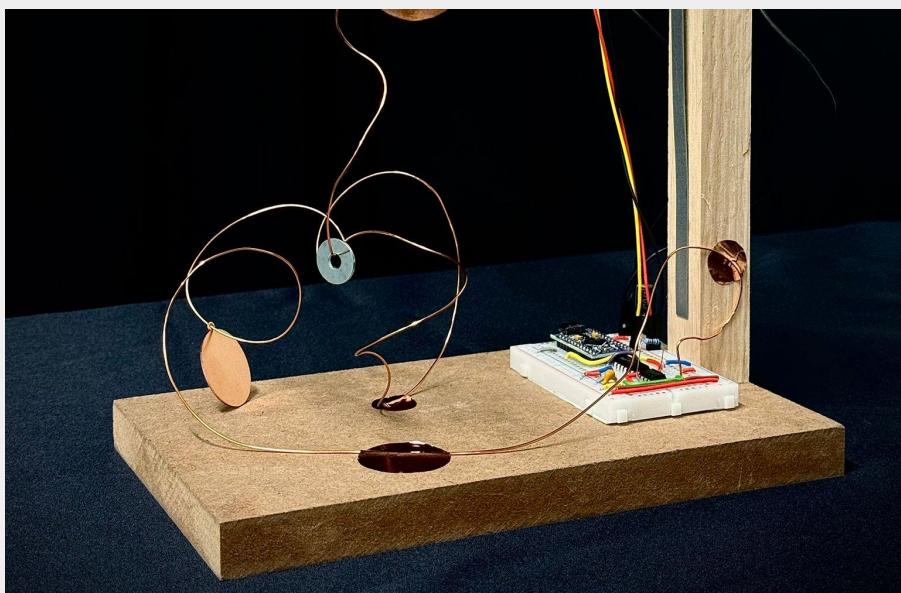
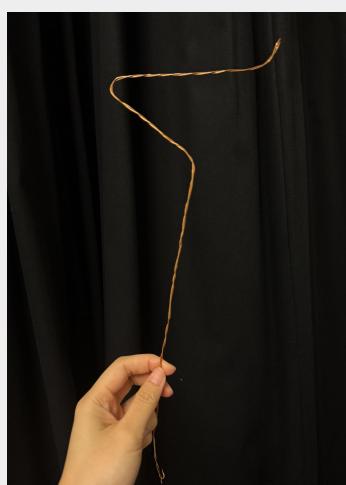
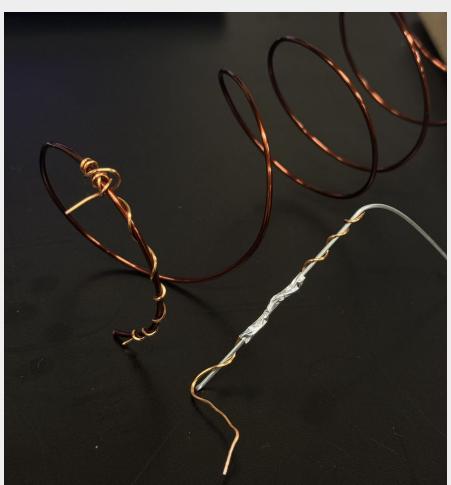
#### 步驟 4: 使用砂紙去除銅線上的絕緣層



**只需要去除大約  
1.5cm的絕緣層**

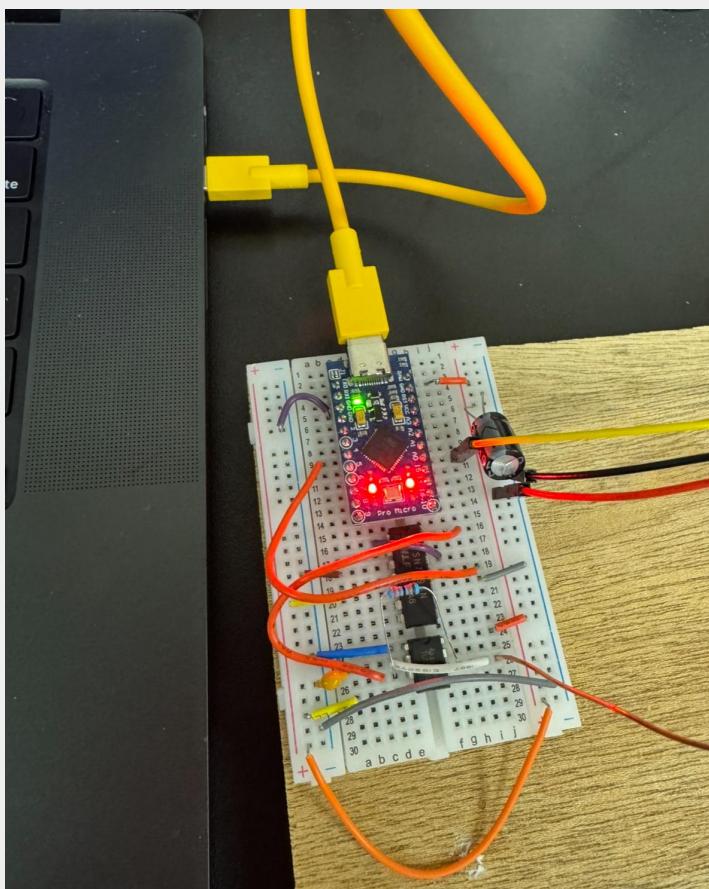
步驟 5：將磨好的銅線插入麵包版 J26 位置，作為特雷門琴的天線





- 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。

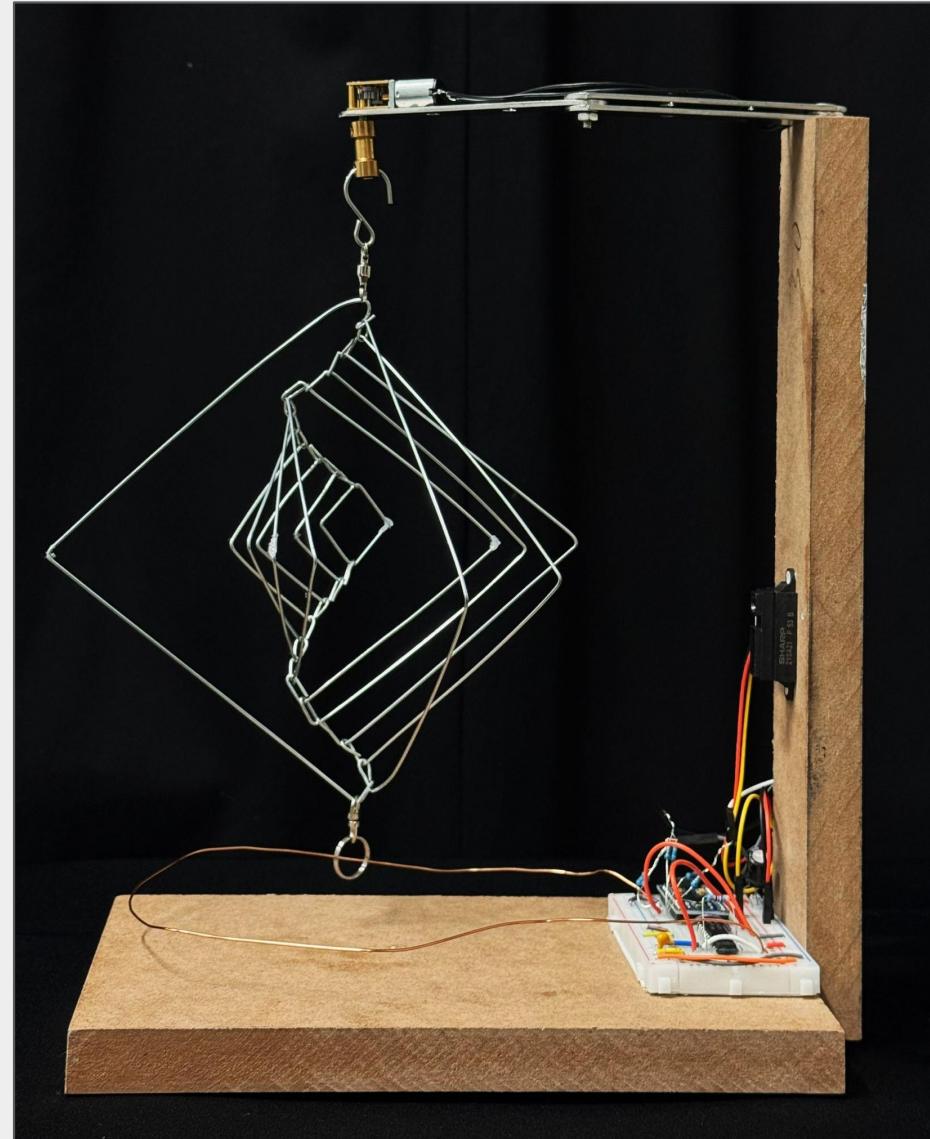
## 步驟 5：連接電腦



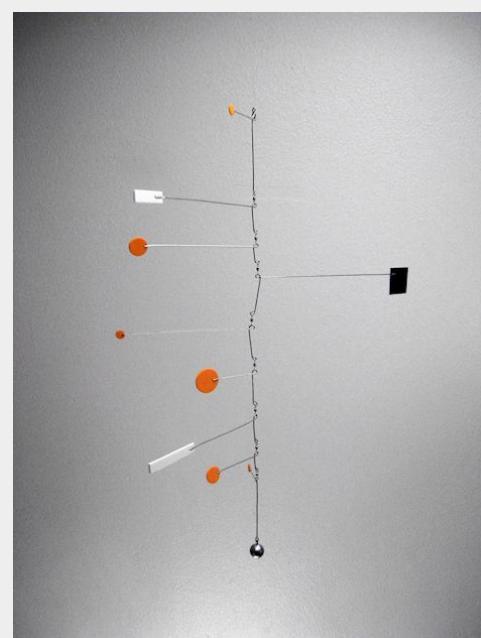
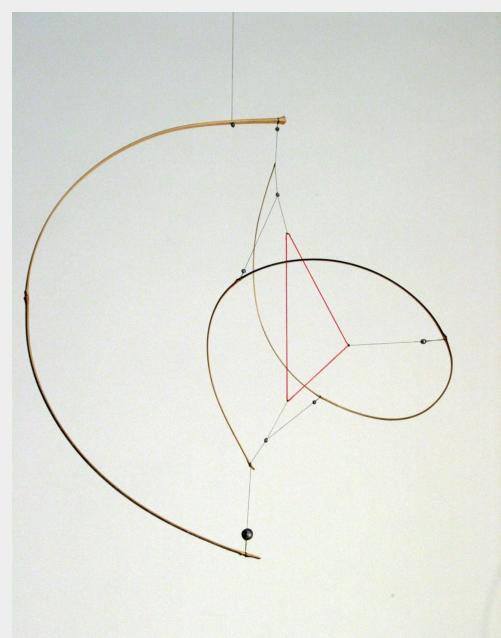
將 Arduino Pro Micro 連接到電腦後，你會看到 LED 閃爍。

**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**

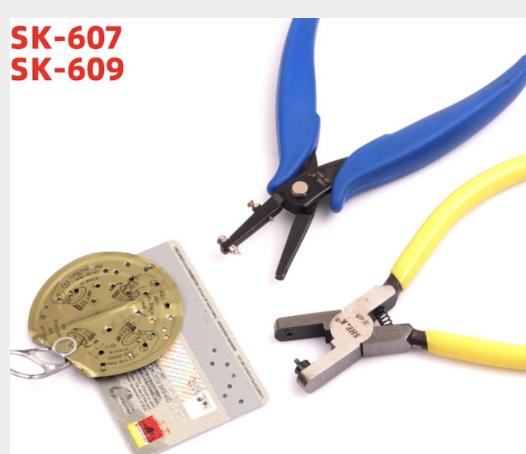


## 用導電的五金材料製作一個抽象風格的雕塑



## 工具介紹

[How to Use Pliers for Jewelry Making | Jewlery 101](#)



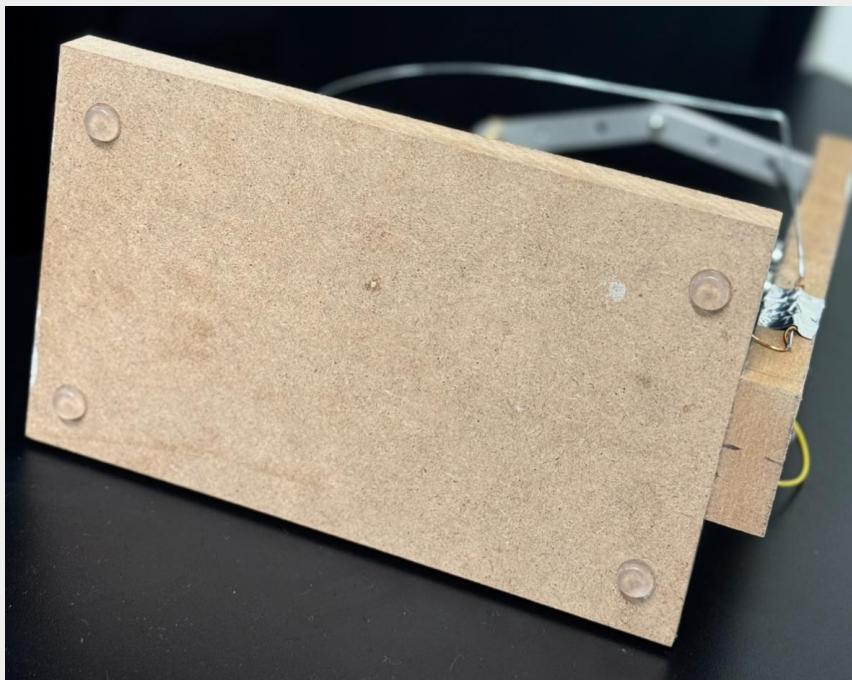
打窿鉗



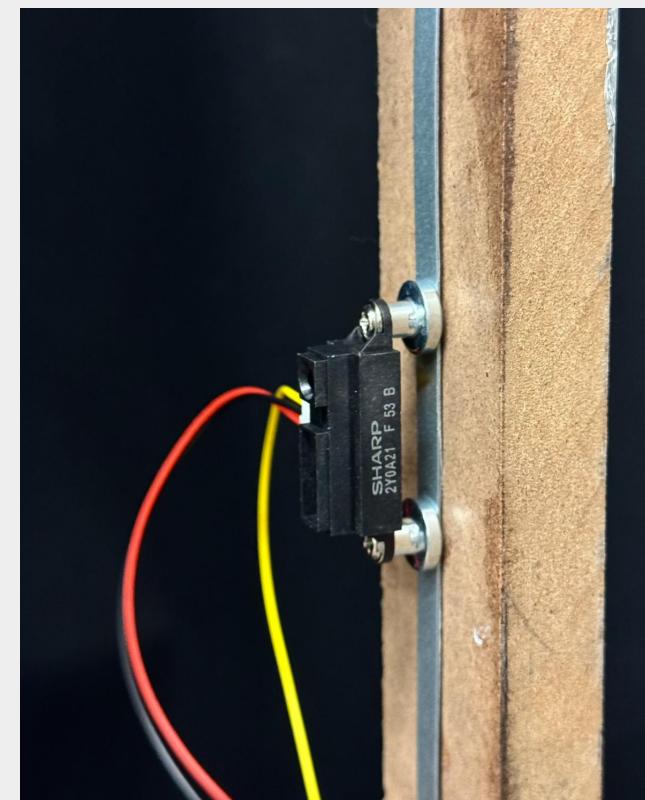
扁咀鉗



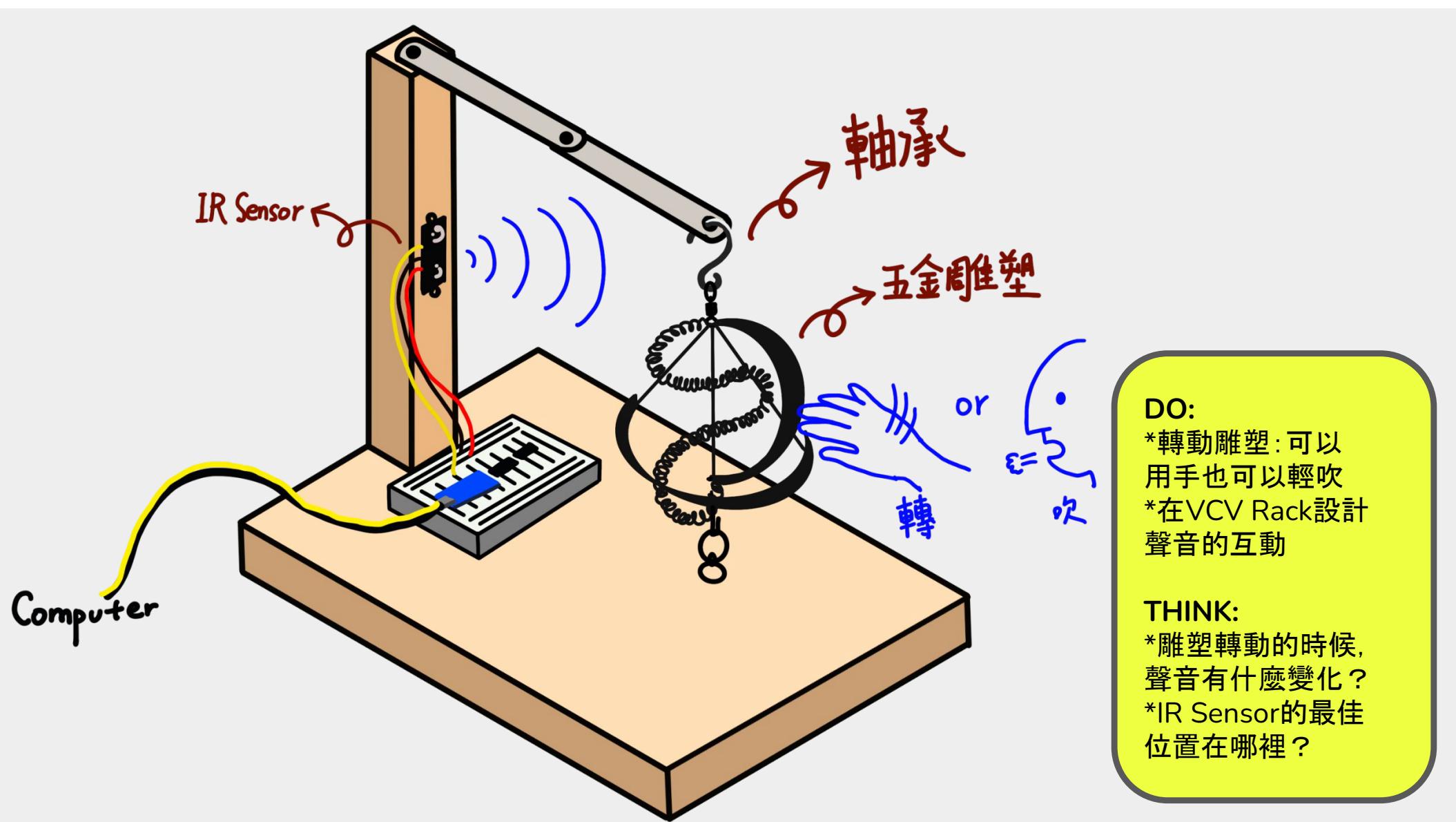
尖咀鉗



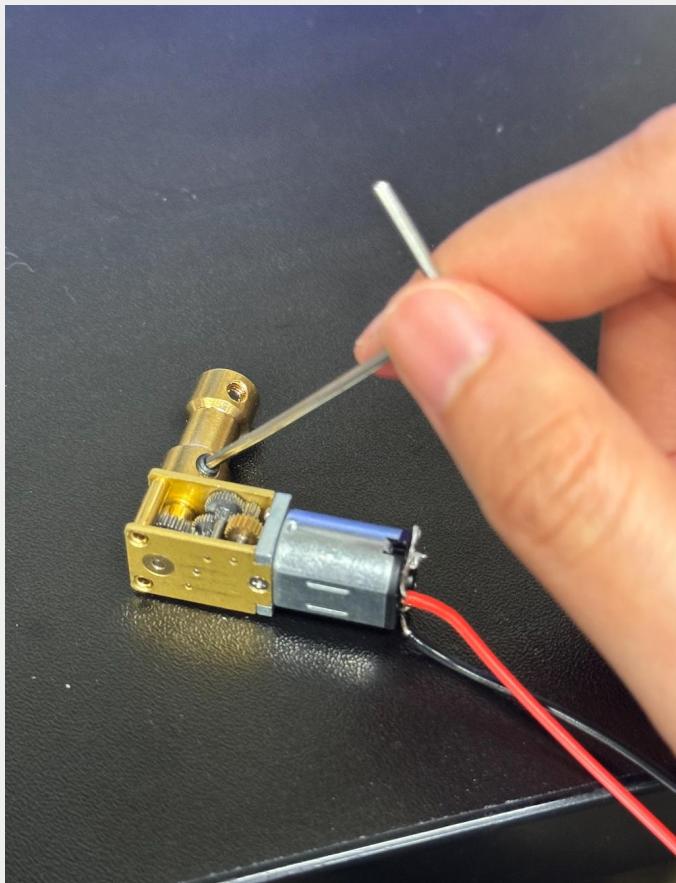
為木板底座貼上防滑膠粒



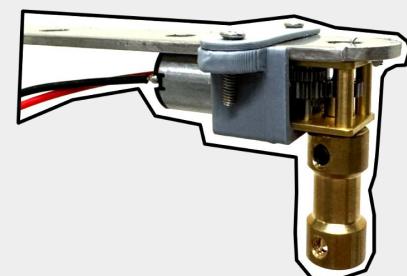
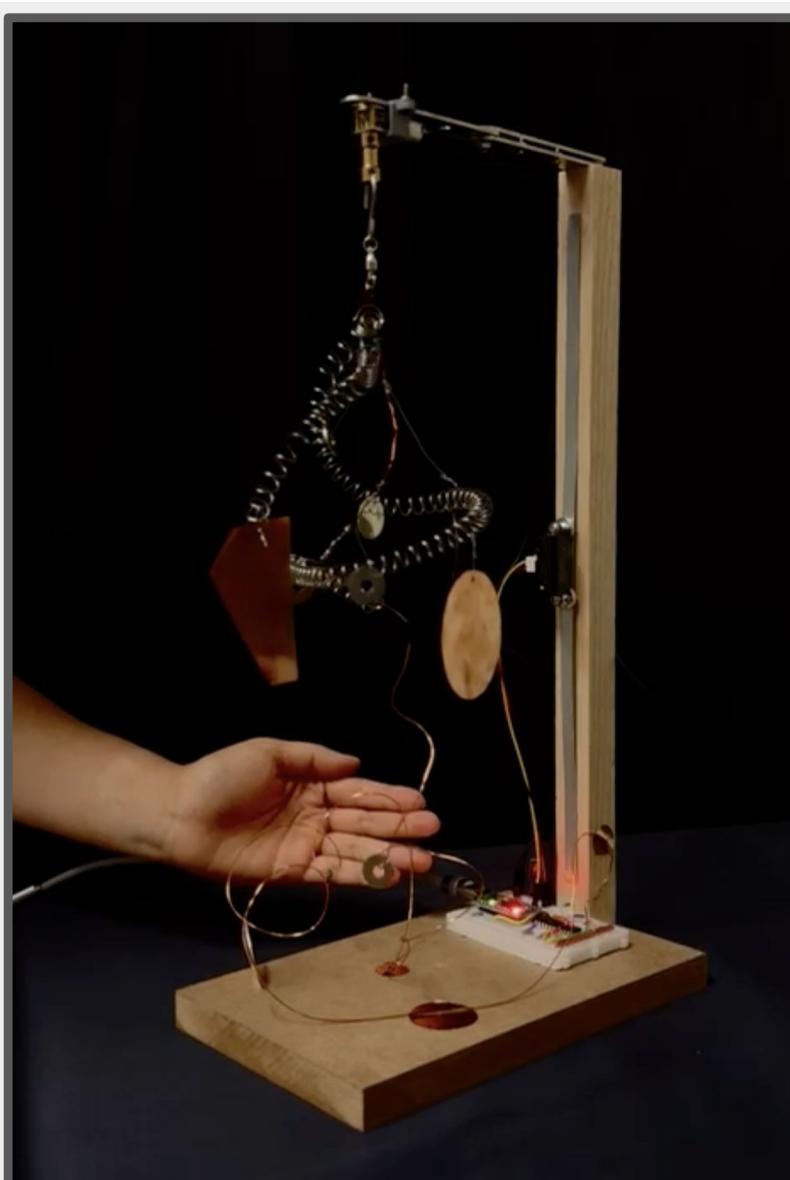
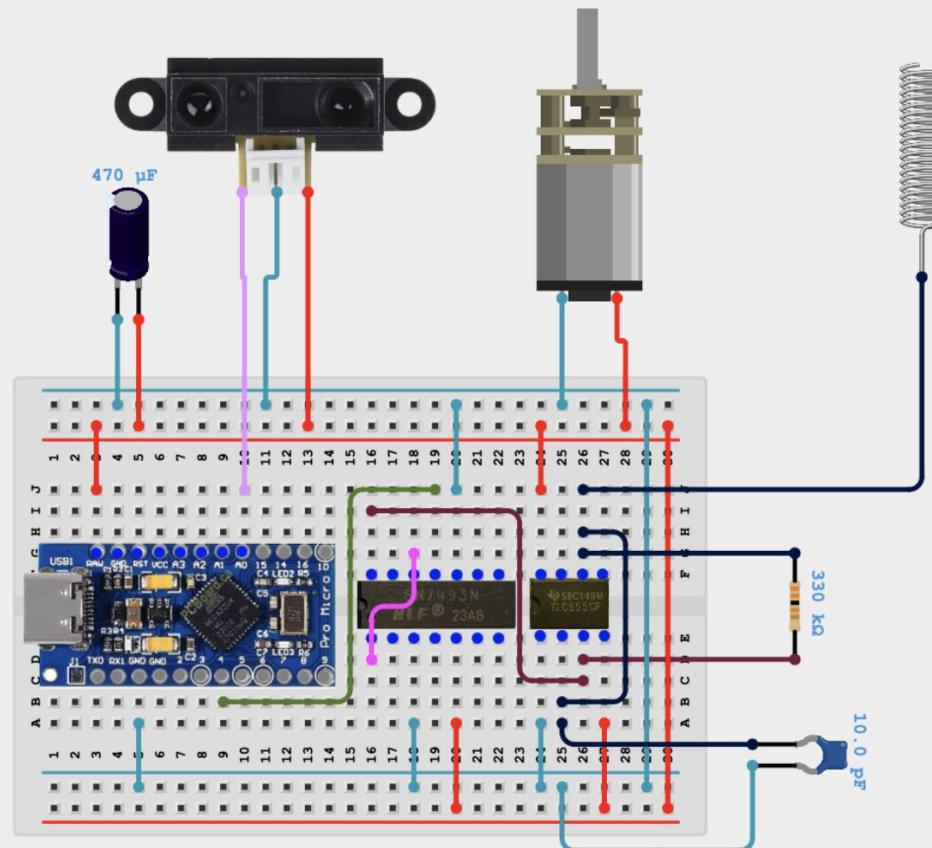
用螺絲把磁柱固定在紅外感測器上，然後把鐵條黏貼在木柱上，最後用磁力固定感測器。(鐵條需要用 wood glue 固定)



## 鎖緊聯軸器



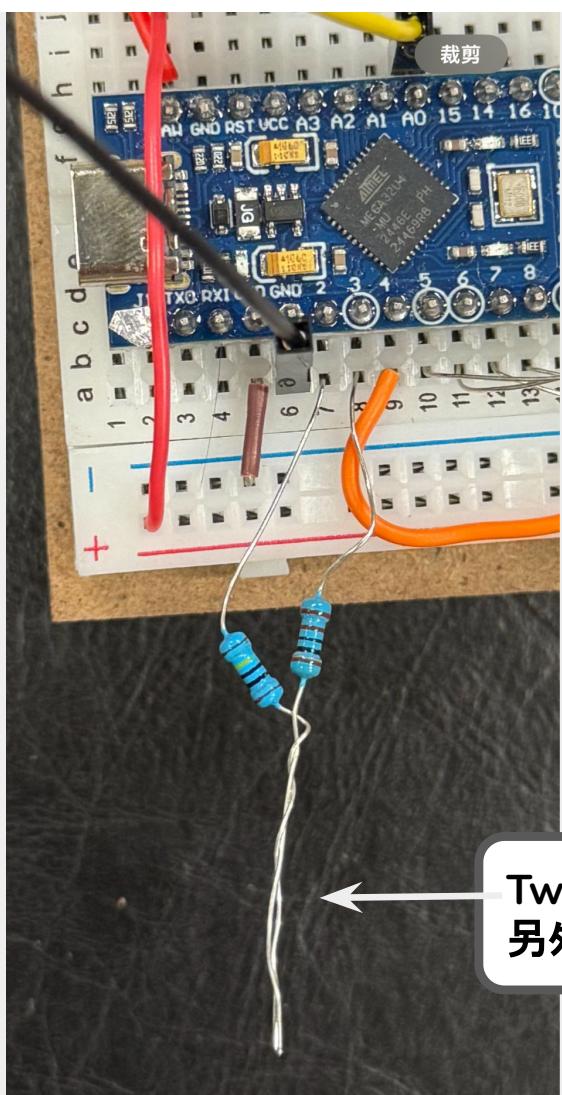
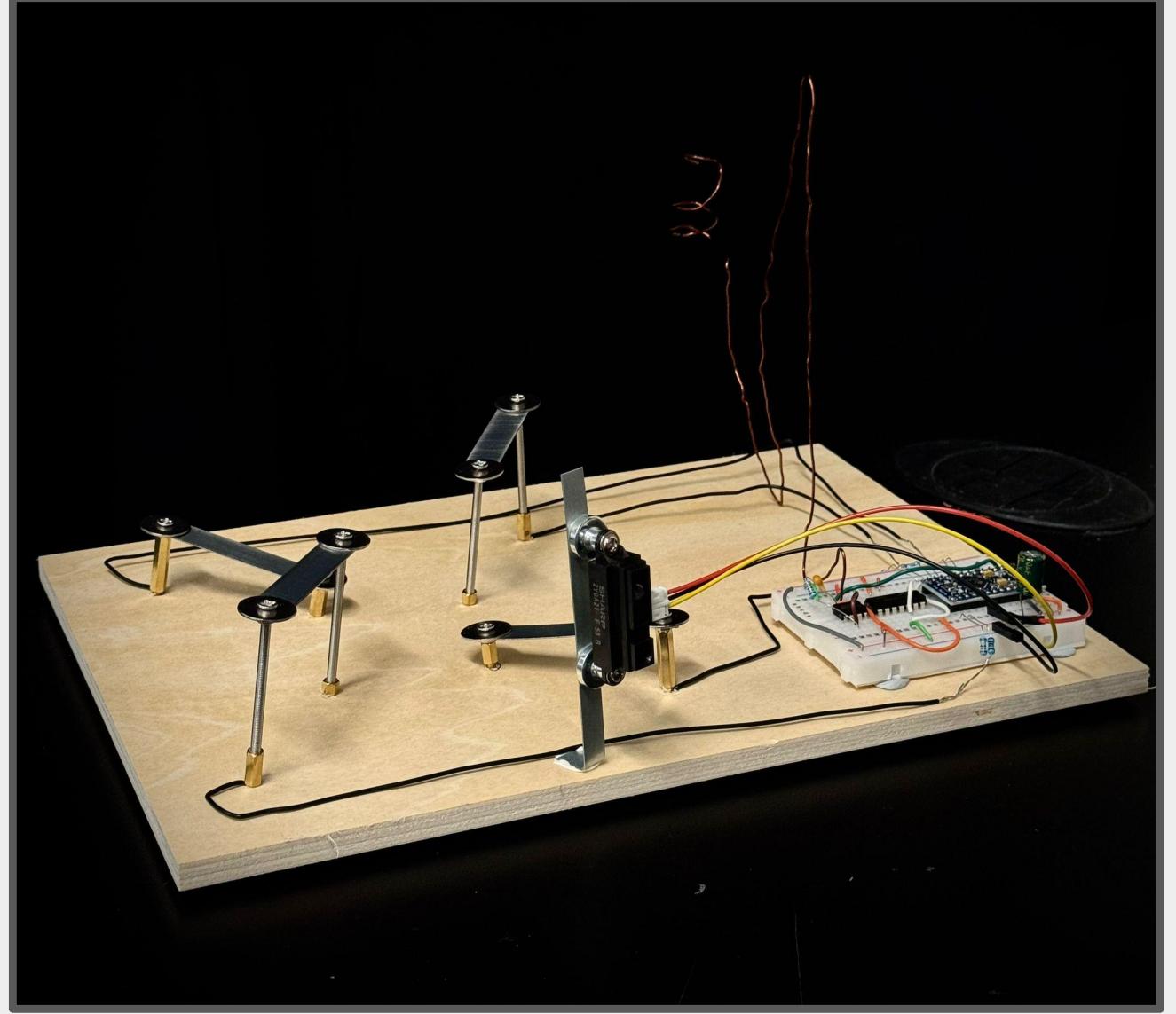
## 連接摩打到麵包板的正負極



**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

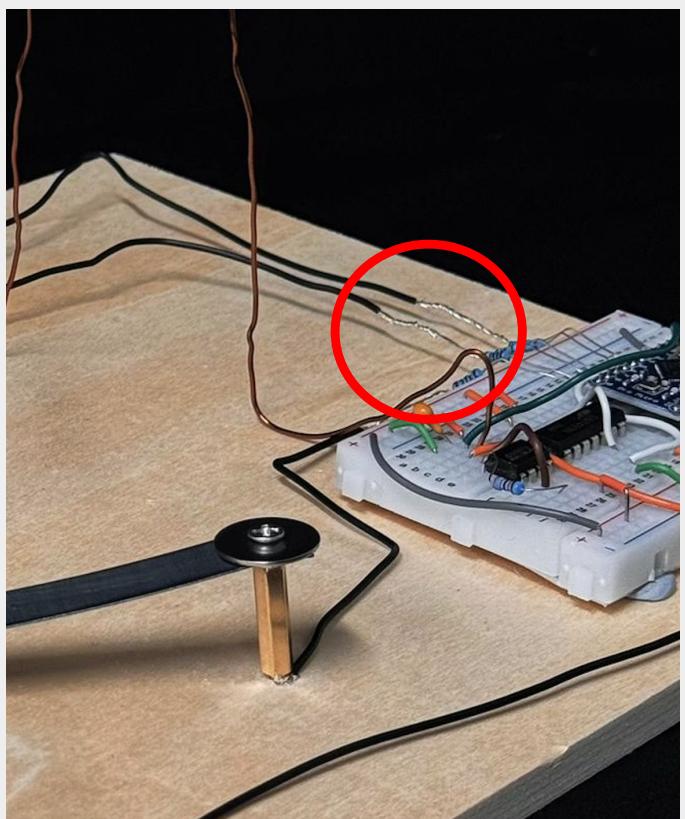


Twisting (纏繞)兩條電阻的  
另外一端

將 1KΩ電阻 插入 a8



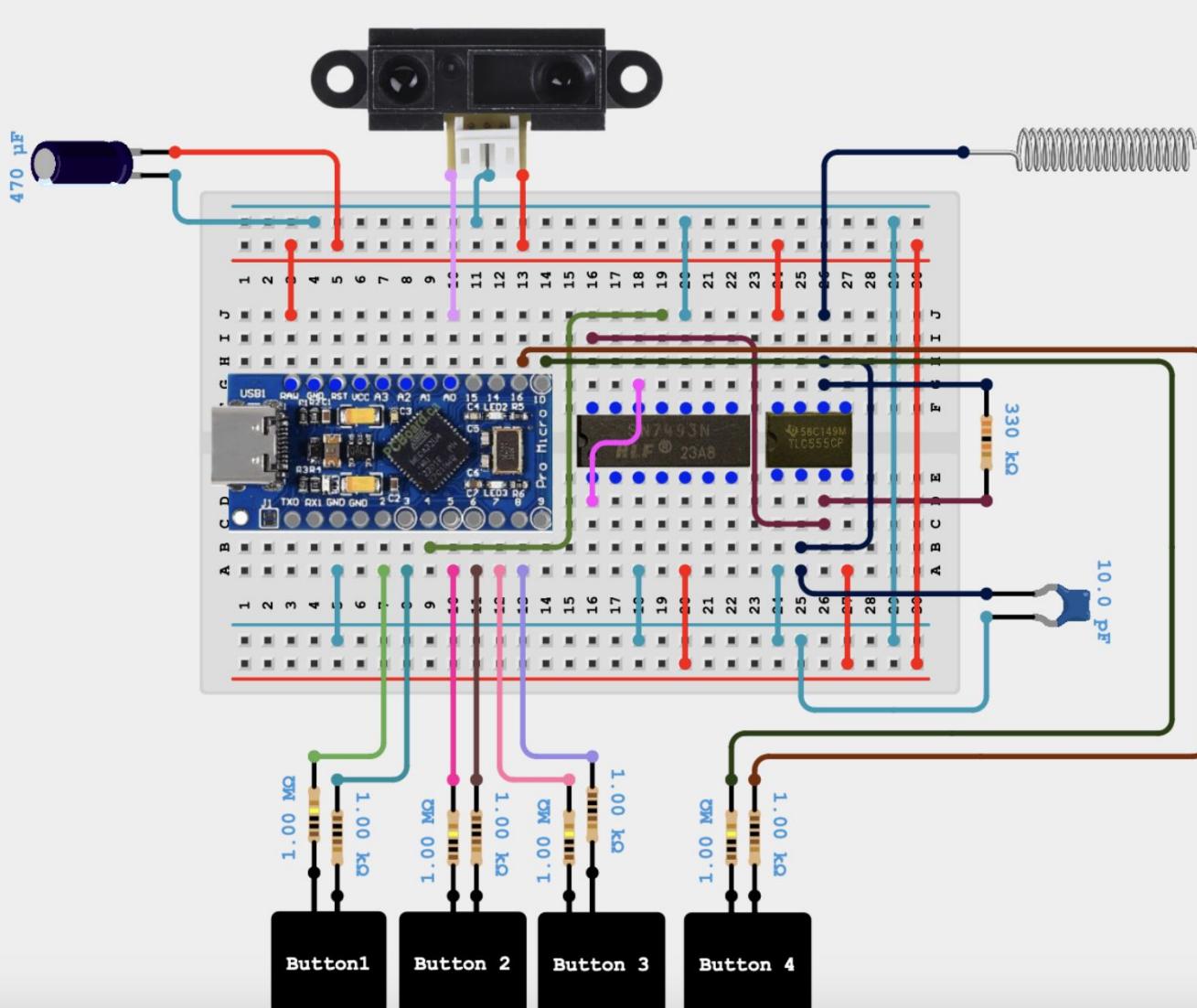
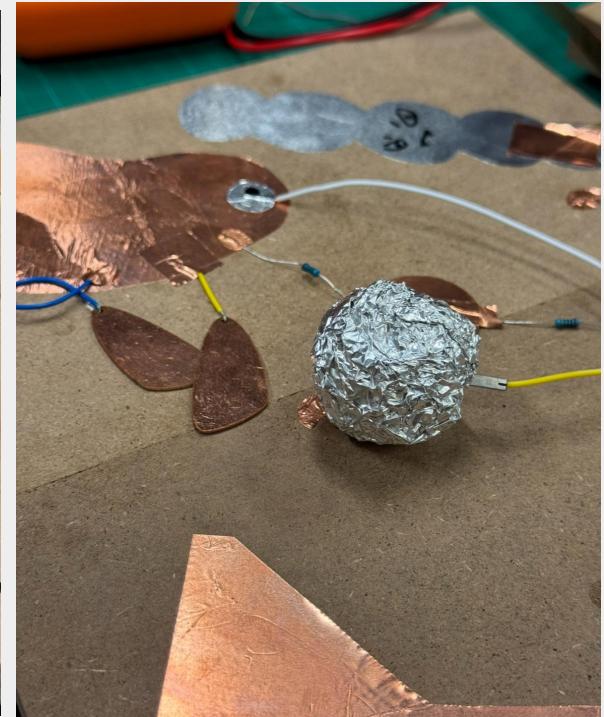
注意分辨1MΩ和1KΩ的電阻喔！位置不可互換！



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:**

- $1\text{M}\Omega \rightarrow \text{A7}$
- $1\text{K}\Omega \rightarrow \text{A8}$

**Button 2:**

- $1\text{M}\Omega \rightarrow \text{A10}$
- $1\text{K}\Omega \rightarrow \text{A11}$

**Button 3:**

- $1\text{M}\Omega \rightarrow \text{A12}$
- $1\text{K}\Omega \rightarrow \text{A13}$

**Button 4:**

- $1\text{M}\Omega \rightarrow \text{H14}$
- $1\text{K}\Omega \rightarrow \text{H13}$

其他掣也按照一樣的方法連接好，最多可以做 4個掣



如果要用短鐵片，需要用  
砂紙磨去 絝緣層