

材料清單：

Arduino nano

TCS3200 顏色傳感器模組

6 顆 5mm RGB LED 4pin 共陰

11 條 杜邦線(母/母)

3 顆 1/4W 18Ω 電阻 DIP

4 顆 十字圓頭螺絲 M3x10mm

4 顆 五彩六角螺帽 M3

使用工具：

電烙鐵

焊錫

十字起子

剝線鉗

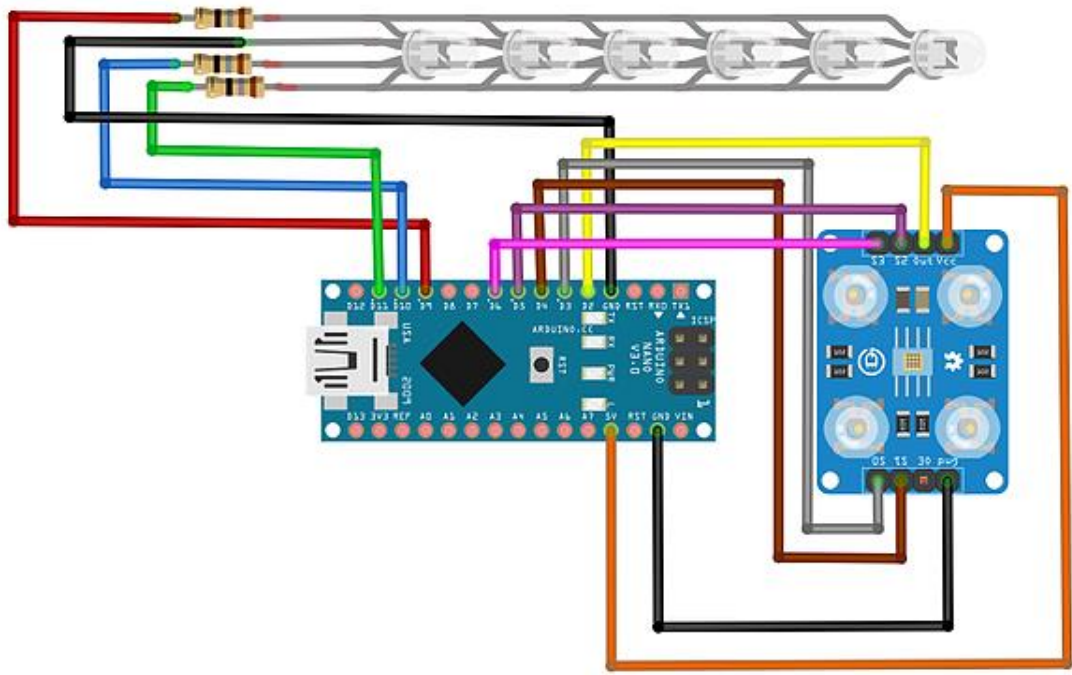
熱熔槍

熱熔膠條

接線圖：

6 顆 RGB LED 是採用並聯的方式，在紅色、藍色與綠色接腳各接一個 18Ω 的電阻，並連接到可輸出 PWM 接腳的 D9、D10、D11。本次專案擔當控制角色的是 Arduino Nano，也可以使用 UNO，會使用 Nano 是因為它體積小能塞進盒子裡。





參考程式：

```
//=====
//TCS3200 pins connected to Arduino
int out = 2;
int s0 = 3;
int s1 = 4;
int s2 = 5;
int s3 = 6;
// LED pins connected to Arduino
int RedLED = 9;
int BlueLED = 10;
int GreenLED = 11;
// Variables
int RedColor = 0;
int GreenColor = 0;
int BlueColor = 0;
void setup() {
  Serial.begin(9600);
  pinMode(s0, OUTPUT);
  pinMode(s1, OUTPUT);
  pinMode(s2, OUTPUT);
  pinMode(s3, OUTPUT);
  pinMode(out, INPUT);
  pinMode(RedLED, OUTPUT);
  pinMode(GreenLED, OUTPUT);
  pinMode(BlueLED, OUTPUT);
  digitalWrite(s0, HIGH);
  digitalWrite(s1, HIGH);
}
void loop() {
  ScanColor();
  Serial.print(" Red: ");
  Serial.print(RedColor);
  Serial.print(" Green: ");
  Serial.print(GreenColor);
  Serial.print(" Blue : ");
  Serial.print(BlueColor);
  if(RedColor>25 && GreenColor>25 && BlueColor>25) {
```

```

Serial.println(" - (Black Color)");
analogWrite(RedLED,0);
analogWrite(GreenColor,0);
analogWrite(BlueColor,0);
}
else if(RedColor<10 && GreenColor<10 && BlueColor<10) {
Serial.println(" - (white Color)");
analogWrite(RedLED,255);
analogWrite(GreenColor,255);
analogWrite(BlueColor,255);
}
else if (RedColor < BlueColor && RedColor < GreenColor) {
Serial.println(" - (Red Color)");
for(int i=0;i<255;i++) {
analogWrite(RedLED,i);
analogWrite(GreenColor,0);
analogWrite(BlueColor,0);
delay(5);
}
for(int i=255;i>0;i--) {
analogWrite(RedLED,i);
analogWrite(GreenColor,0);
analogWrite(BlueColor,0);
delay(5);
}
}
else if (BlueColor < RedColor && BlueColor < GreenColor) {
Serial.println(" - (Blue Color)");
for(int i=0;i<255;i++) {
analogWrite(RedLED,0);
analogWrite(GreenColor,0);
analogWrite(BlueColor,i);
delay(5);
}
for(int i=255;i>0;i--) {
analogWrite(RedLED,0);
analogWrite(GreenColor,0);
analogWrite(BlueColor,i);
}
}

```

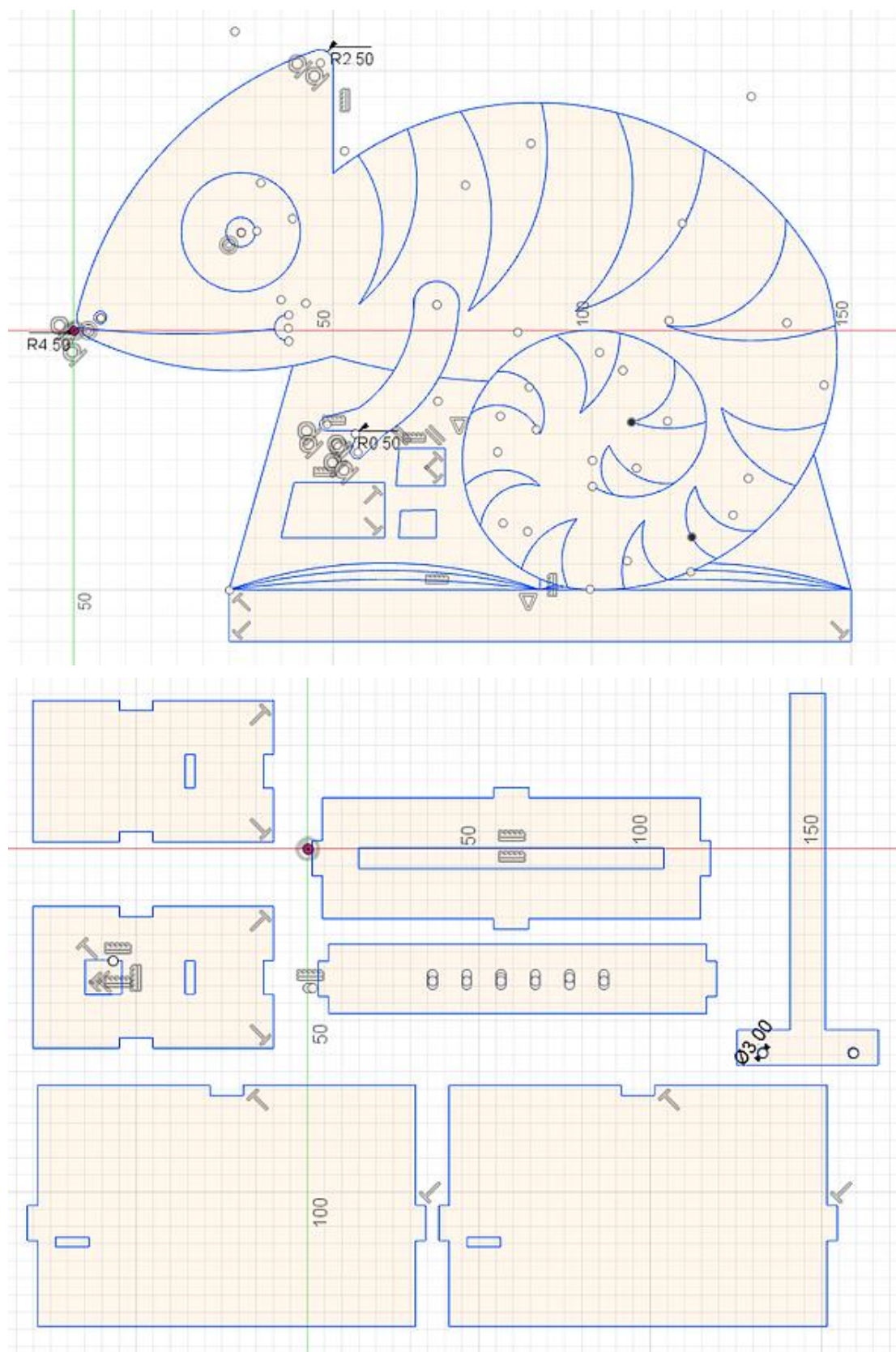
```

delay(5);
}
}
else if (GreenColor < RedColor && GreenColor < BlueColor) {
Serial.println(" - (Green Color)");
for(int i=0;i<255;i++) {
analogWrite(RedLED,0);
analogWrite(GreenColor,i);
analogWrite(BlueColor,0);
delay(5);
}
for(int i=255;i>0;i--) {
analogWrite(RedLED,0);
analogWrite(GreenColor,i);
analogWrite(BlueColor,0);
delay(5);
}
}
}
void ScanColor() {
digitalWrite(s2, LOW);
digitalWrite(s3, LOW);
RedColor = pulseIn(out, digitalRead(out) == HIGH ? LOW : HIGH);
digitalWrite(s2, HIGH);
GreenColor = pulseIn(out, digitalRead(out) == HIGH ? LOW : HIGH);
digitalWrite(s3, HIGH);
BlueColor = pulseIn(out, digitalRead(out) == HIGH ? LOW : HIGH);
}
//=====

```

程式燒錄完成後，就測試看看燈有沒有依照感測的紙張顏色發亮，如果沒有可以檢查一下 LED 燈有沒有接錯。

接下來製作壓克力變色龍與木盒(控制與感測的底座)：



變色龍使用 5mm 厚的壓克力、底座使用 3mm 厚的木板，並用雷切機切割而成。組合好底座後，再用螺絲與螺帽固定顏色感測器，用熱熔槍固定 nano，組裝後的側面外觀如下圖：

