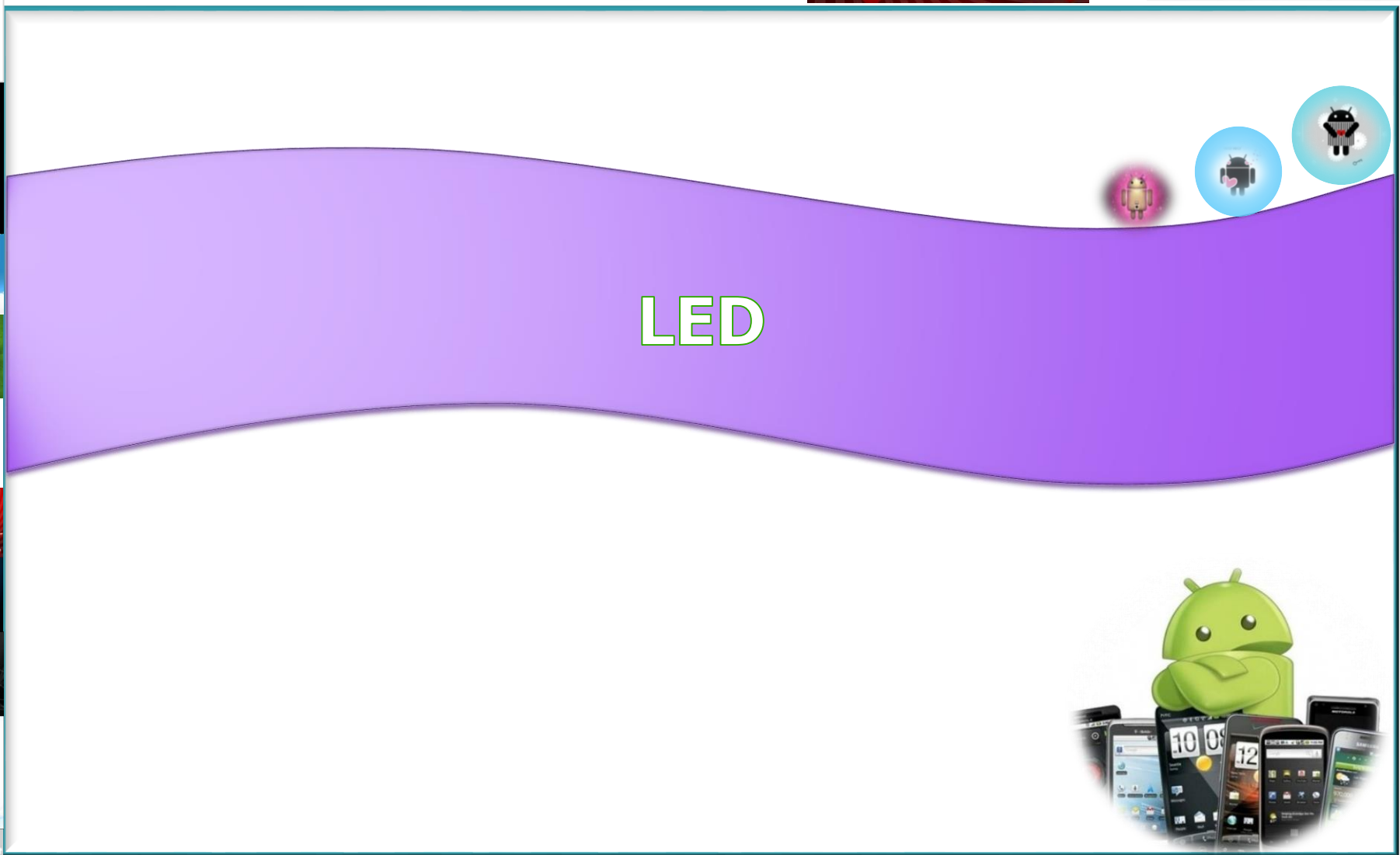
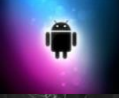
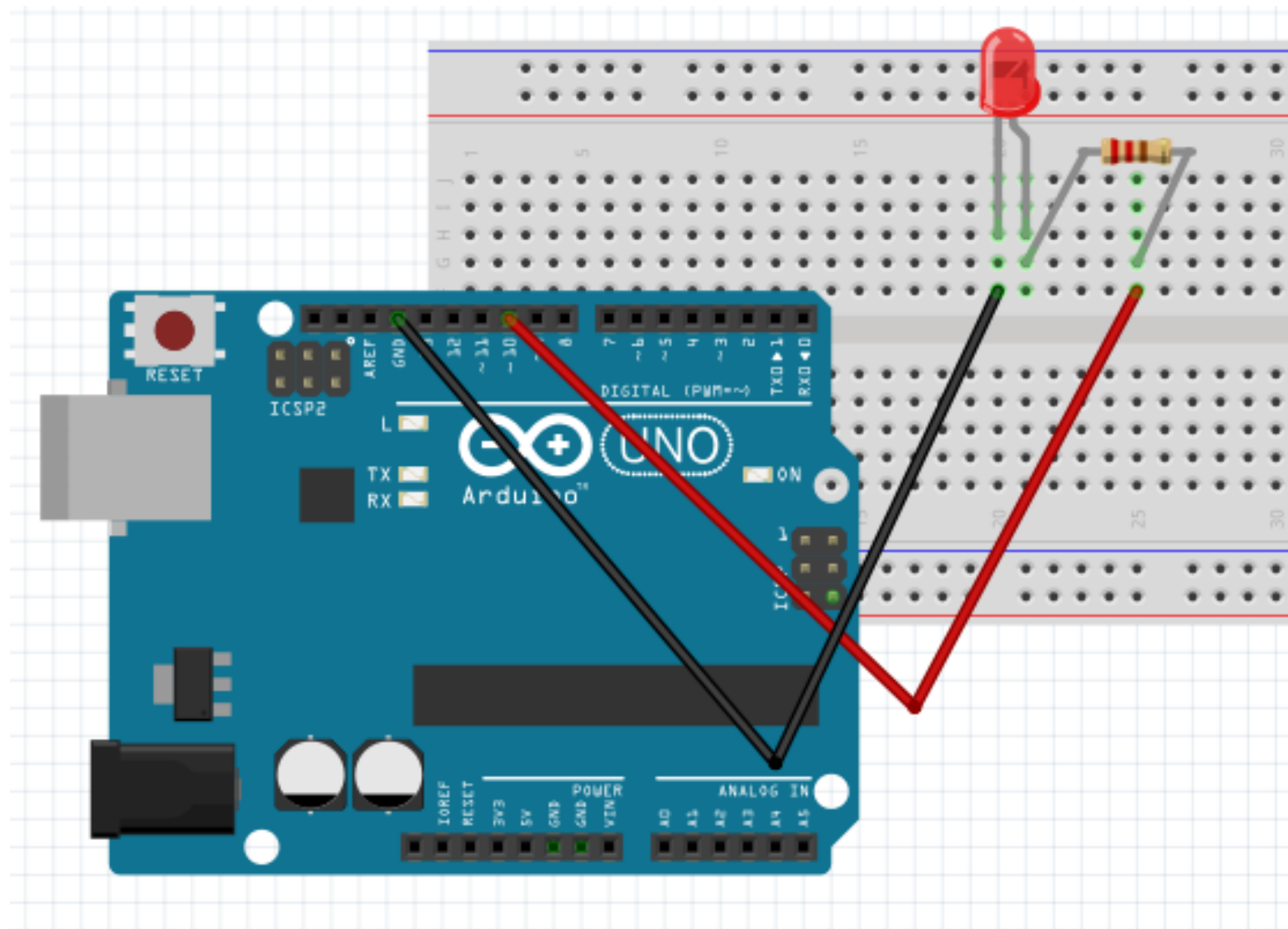






LED01 §

```
1 void setup()
2 {
3   pinMode(10, OUTPUT);
4   digitalWrite(10, HIGH);
5 }
6
7 void loop()
8 {
9   /* add main program code here */
10 }
11
```

LED 켜기

LED 끄기

LED01

```
1 void setup()
2 {
3   pinMode(10, OUTPUT);
4   digitalWrite(10, LOW);
5 }
6
7 void loop()
8 {
9   /* add main program code here */
10 }
```

LED3 §

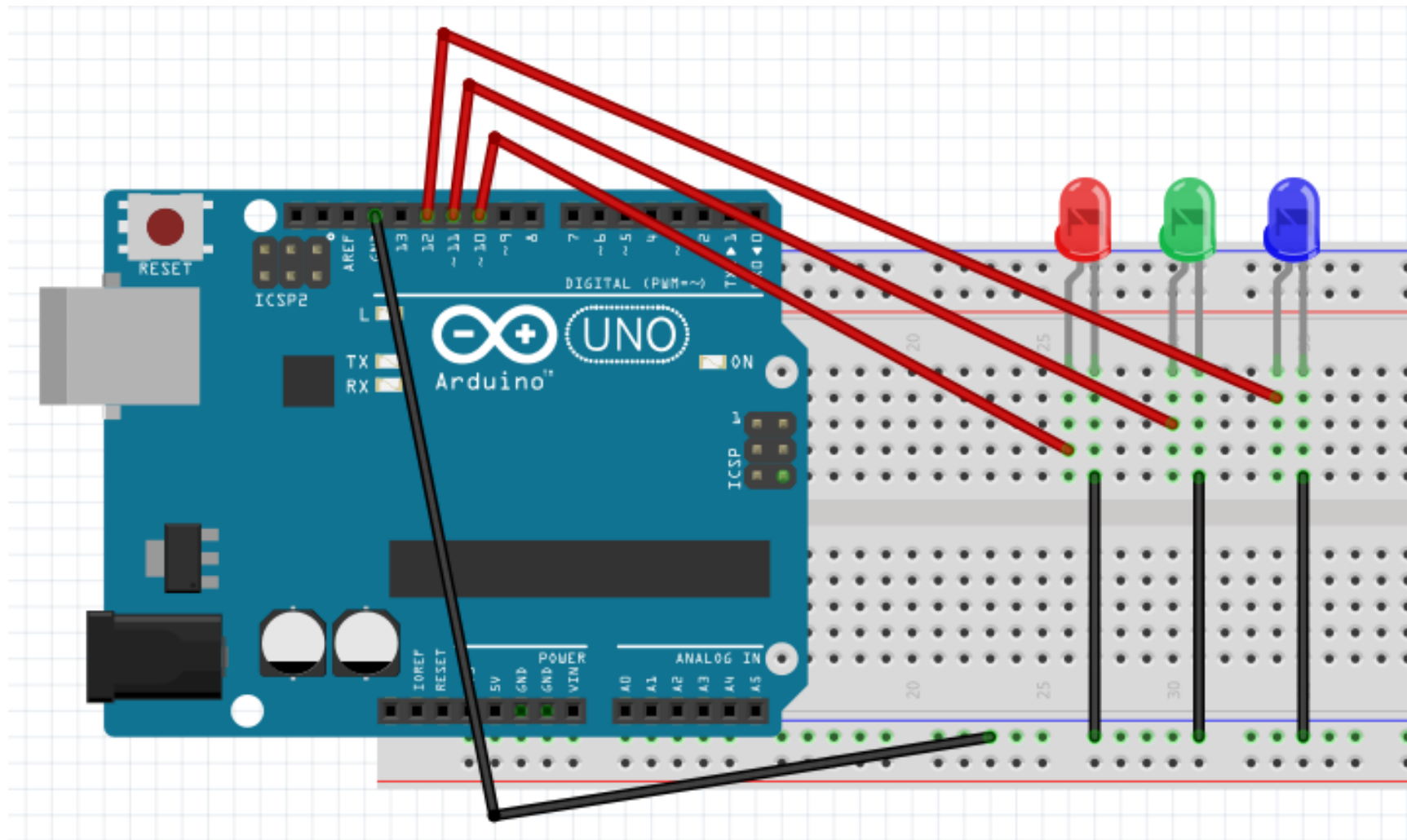
```
1 void setup()
2 {
3   pinMode(10, OUTPUT);
4   //digitalWrite(10, HIGH);
5 }
6
7 void loop()
8 {
9   digitalWrite(10, HIGH);
10  delay(500);
11  digitalWrite(10, LOW);
12  delay(500);
13 }
```

LED 켜기

0.5초 기다리기

LED 끄기

0.5초 기다리기



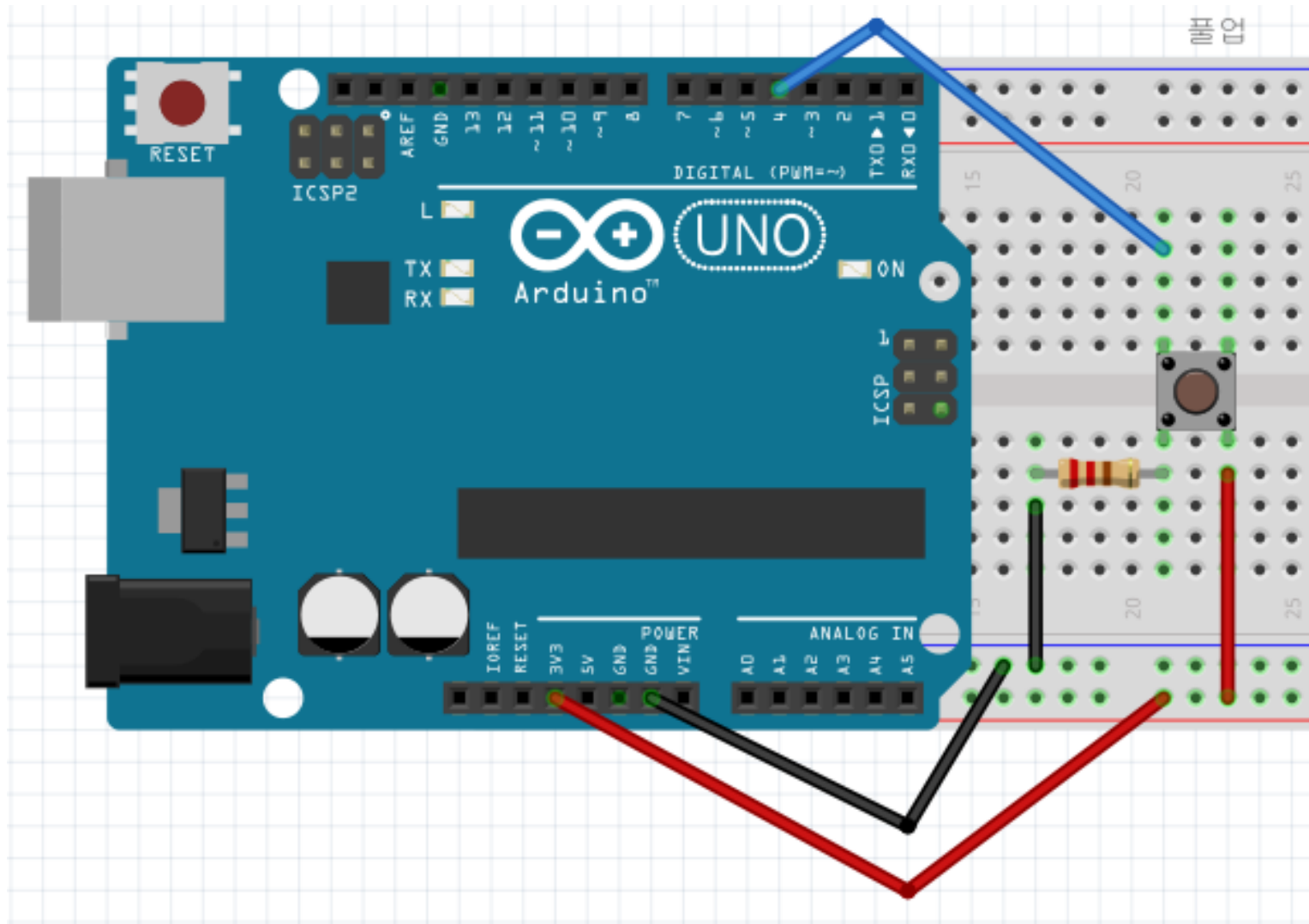
LED10

```
1 void setup()
2 {
3     pinMode(10, OUTPUT);
4     pinMode(11, OUTPUT);
5     pinMode(12, OUTPUT);
6 }
7
8 void loop()
9 {
10    digitalWrite(10, HIGH);
11    digitalWrite(11, LOW);
12    digitalWrite(12, LOW);
13    delay(500);
14    digitalWrite(10, LOW);
15    digitalWrite(11, HIGH);
16    digitalWrite(12, LOW);
17    delay(500);
18    digitalWrite(10, LOW);
19    digitalWrite(11, LOW);
20    digitalWrite(12, HIGH);
21    delay(500);
22 }
```

10/11/12 번으로 출력준비

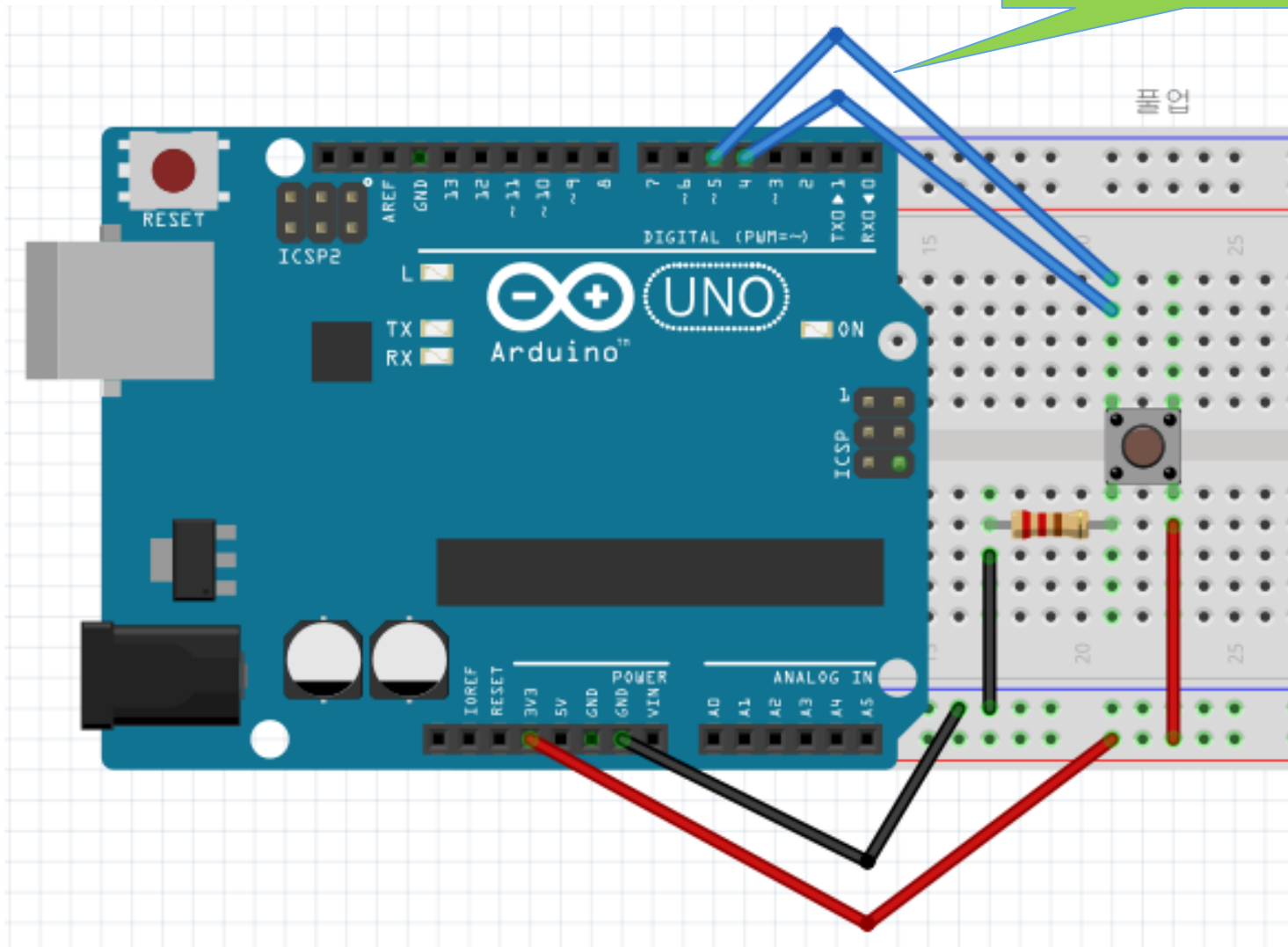
10 켜기, 11/12 끄기

0.5초 기다리기

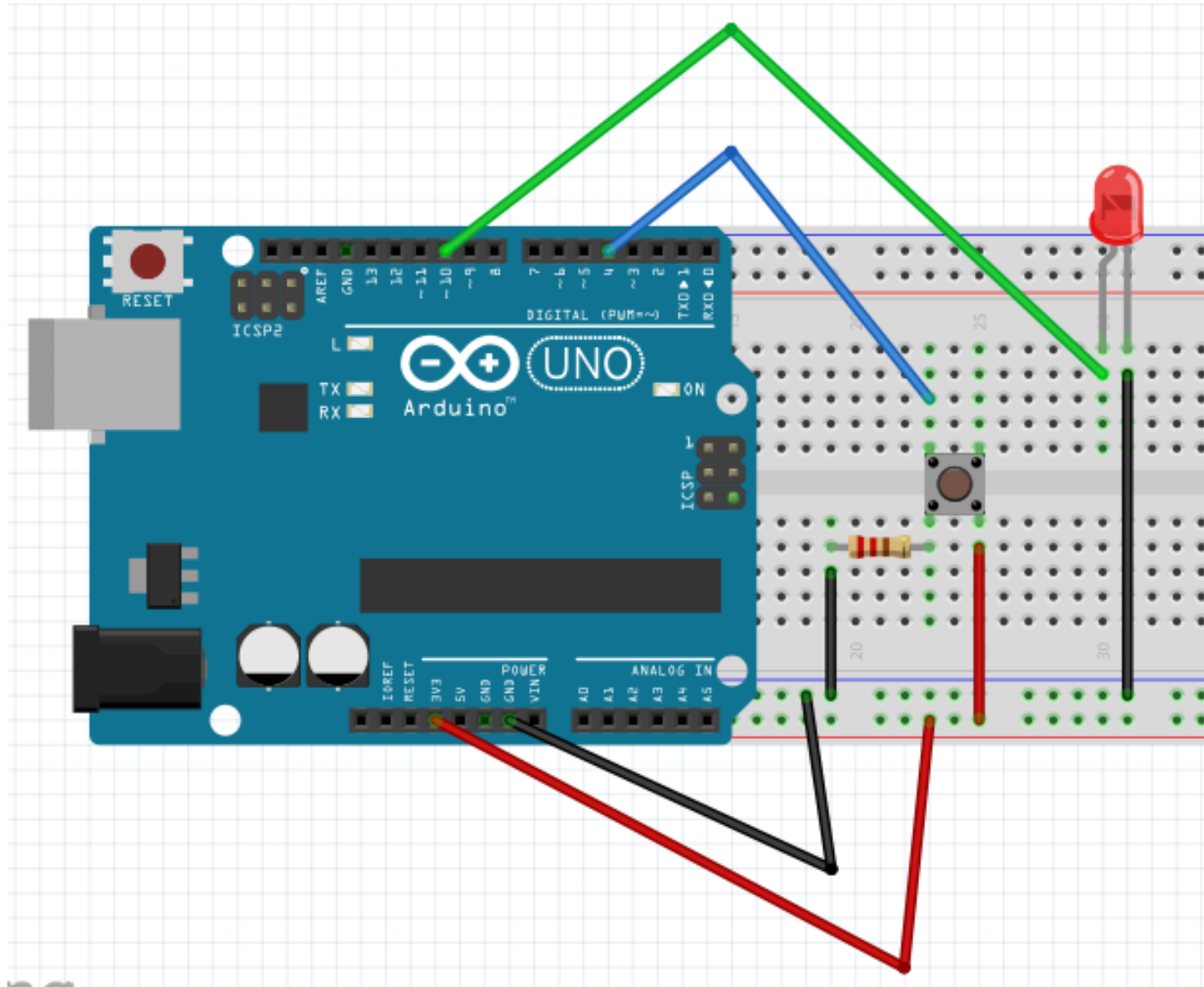


```
1 void setup()
2 {
3   pinMode( 4, INPUT ); // Pull-up
4   pinMode( 5, INPUT ); // Pull-down
5   Serial.begin(9600); // 기본 시리얼 포트는 9600
6 }
7 // 화면 상단에 돌보기를 부르면 상태 모니터링됨
8 void loop()
9 {
10  int nBtn4 = digitalRead(4); //4번 핀으로 부터 입력받는다.
11  int nBtn5 = digitalRead(5);
12  if (nBtn4 == LOW)
13  {
14    Serial.print("4 - LOW ");
15  }
16  else
17  {
18    Serial.print("4 - HIGH ");
19  }
20  if (nBtn5 == HIGH)
21  {
22    Serial.print("5 - HIGH");
23  }
24  else
25  {
26    Serial.print("5 - LOW");
27  }
28  Serial.println(" ");
29 }
```

추가



```
1 void setup()
2 {
3   pinMode( 4, INPUT ); // Pull-up
4   pinMode( 5, INPUT ); // Pull-down
5   Serial.begin(9600); // 기본 시리얼 포트는 9600
6 }
7 // 화면 상단에 돌보기를 부르면 상태 모니터링됨
8 void loop()
9 {
10  int nBtn4 = digitalRead(4); //4번 핀으로 부터 입력받는다.
11  int nBtn5 = digitalRead(5);
12  if (nBtn4 == LOW)
13  {
14    Serial.print("4 - LOW ");
15  }
16  else
17  {
18    Serial.print("4 - HIGH ");
19  }
20  if (nBtn5 == HIGH)
21  {
22    Serial.print("5 - HIGH");
23  }
24  else
25  {
26    Serial.print("5 - LOW");
27  }
28  Serial.println(" ");
29 }
```



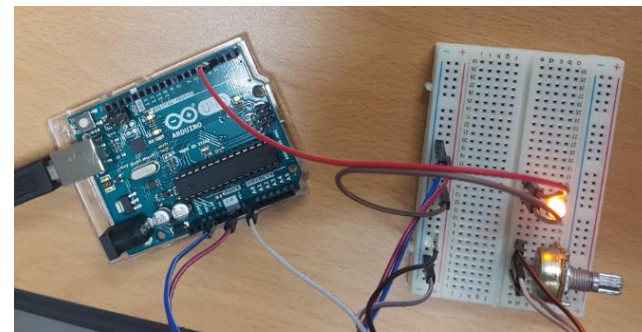
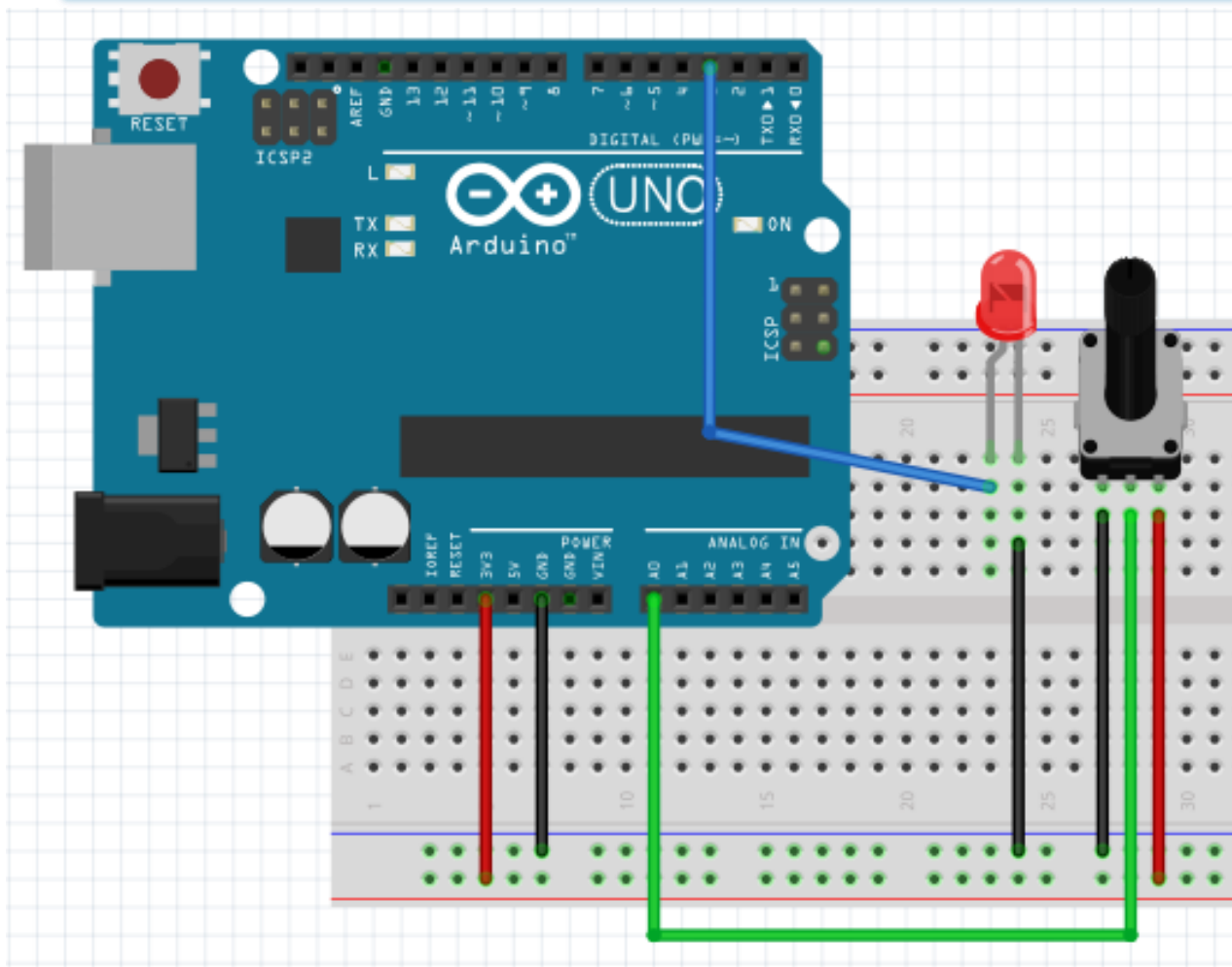
BUTTON02 §

```
1 void setup()
2 {
3   pinMode(10, OUTPUT);
4   pinMode(4, INPUT);
5 }
6
7 void loop()
8 {
9   int nBtn4 = digitalRead(4);
10
11   if (nBtn4 == LOW)
12   {
13     digitalWrite(10, LOW);
14   }
15   else
16   {
17     digitalWrite(10, HIGH);
18   }
19 }
```

4 입력
10 출력

- 4의 신호를 읽어 들여 LOW이면 10으로 LOW 출력, 아니면 10으로 HIGH 출력

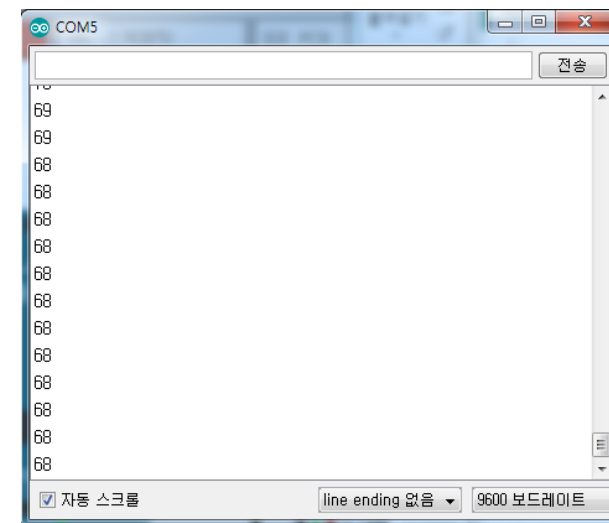
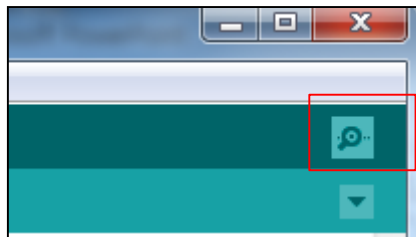
가변저항1



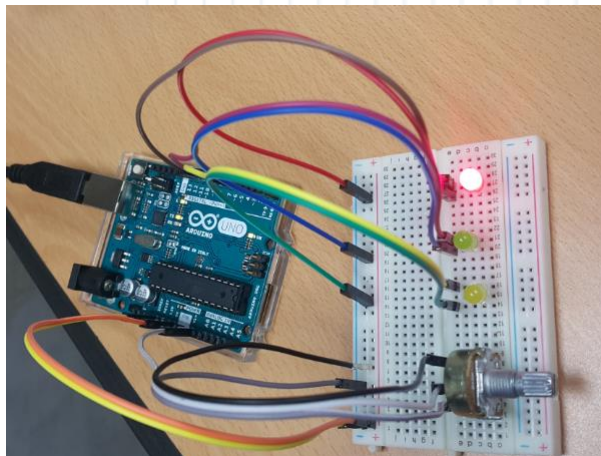
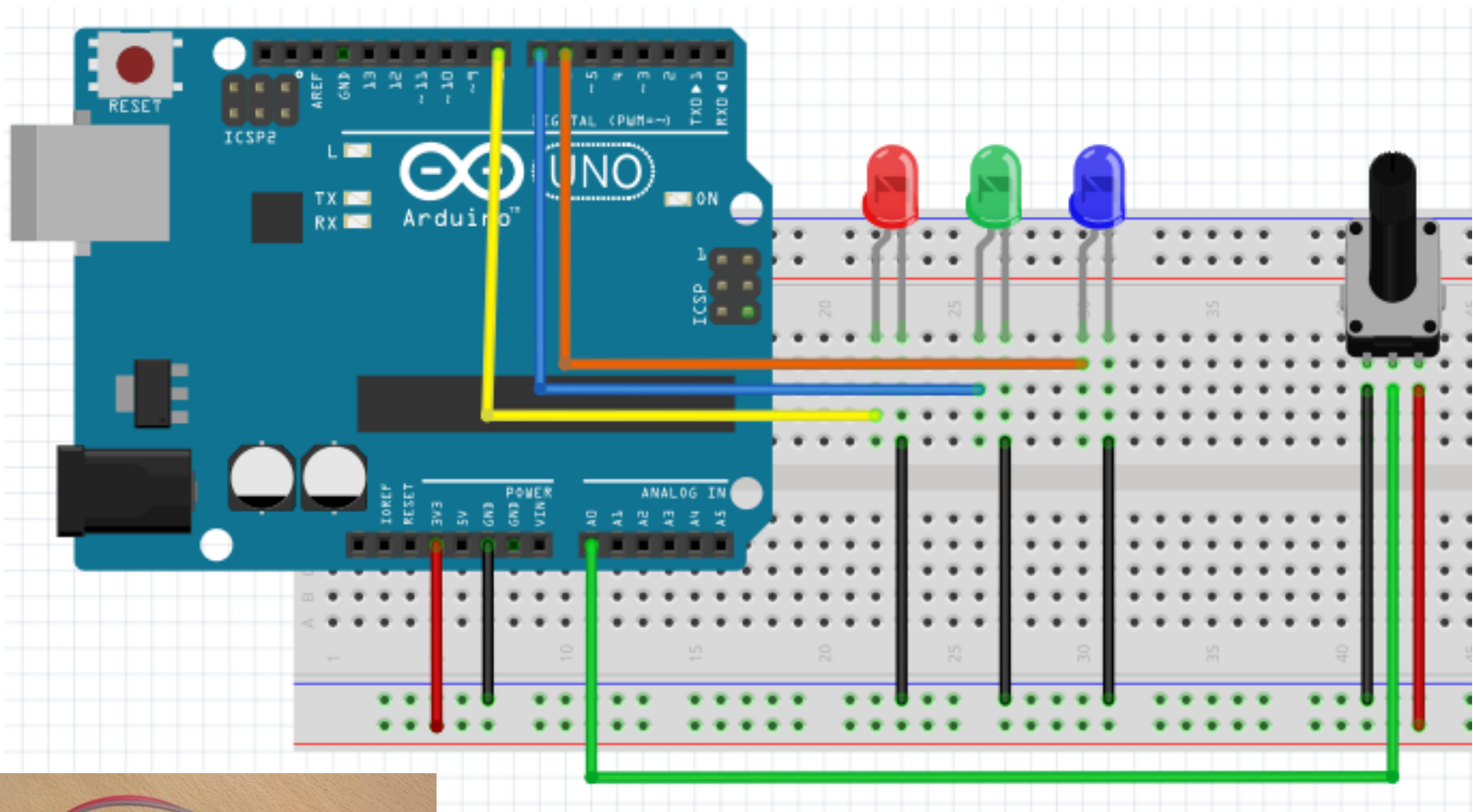
가변저항1

RESIST1

```
1
2 void setup()
3 {
4   Serial.begin(9600);
5 }
6
7 void loop()
8 {
9   int nRead = analogRead(A0); //저항값을 A0에서 읽어옴.
10  analogWrite(3,nRead/3 ); //임시로, 255값으로 변환하기 위해 연산함. 685?정도..나옴, 실제 LED 표시가 어렵기때문에 임시로.
11  Serial.println(nRead);
12 }
```



가변저항2

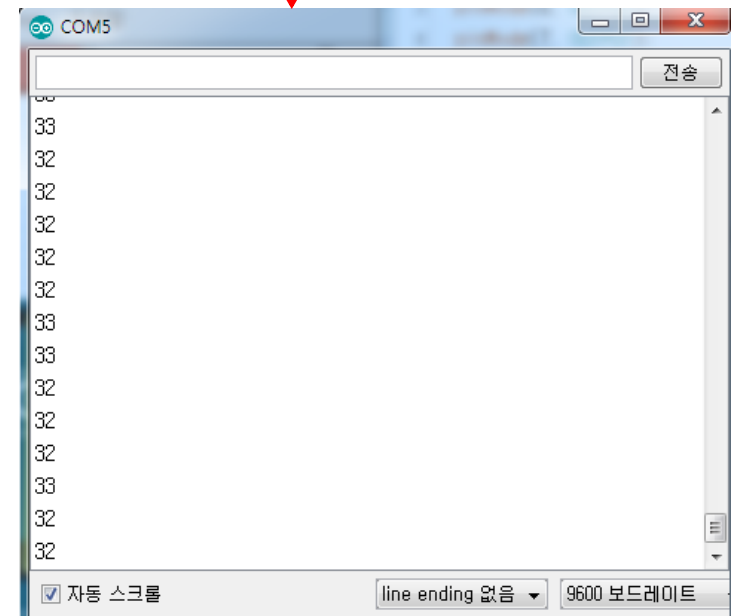
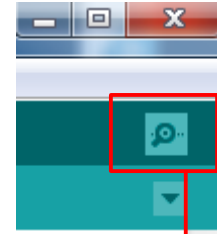


가변저항 2

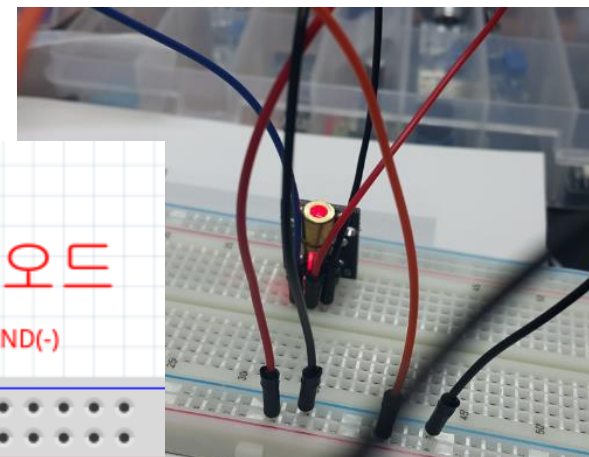
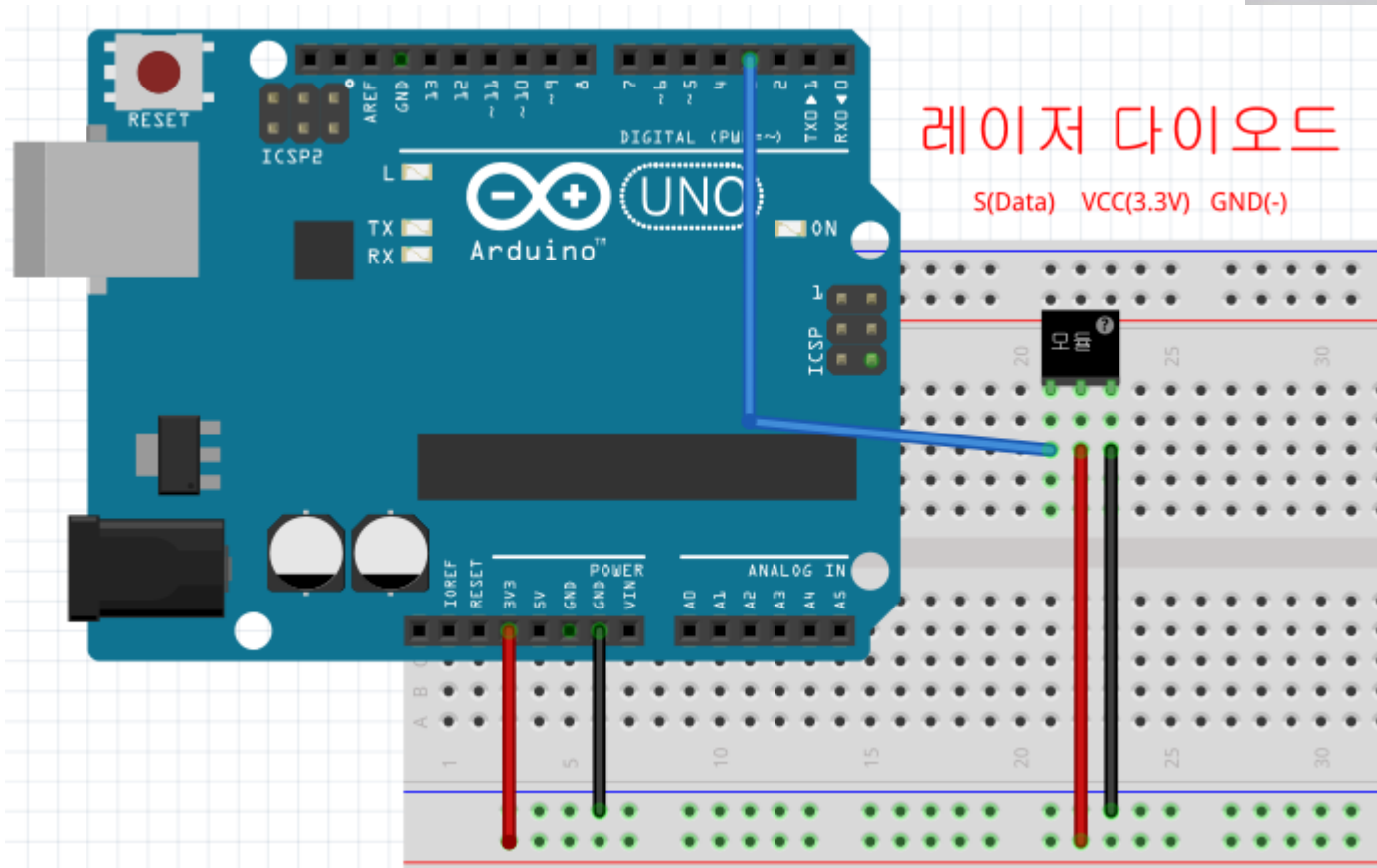
RESIST2

```
1 void setup()
2 {
3   pinMode(6, OUTPUT);
4   pinMode(7, OUTPUT);
5   pinMode(8, OUTPUT);
6   Serial.begin(9600);
7 }
8 void loop()
9 {
10  int nRead = analogRead(A0);
11  Serial.println(nRead);
12  if (nRead < 85)
13  {
14    digitalWrite(6, HIGH);
15    digitalWrite(7, LOW);
16    digitalWrite(8, LOW);
17  }
18  else if (nRead < 170)
19  {
20    digitalWrite(6, LOW);
21    digitalWrite(7, HIGH);
22    digitalWrite(8, LOW);
23  }
24  else
25  {
26    digitalWrite(6, LOW);
27    digitalWrite(7, LOW);
28    digitalWrite(8, HIGH);
29  }
30 }
```

- 85보다 작으면 6 켜기
- 170보다 작으면 7켜기
- 그 외는 8켜기



참고해요!



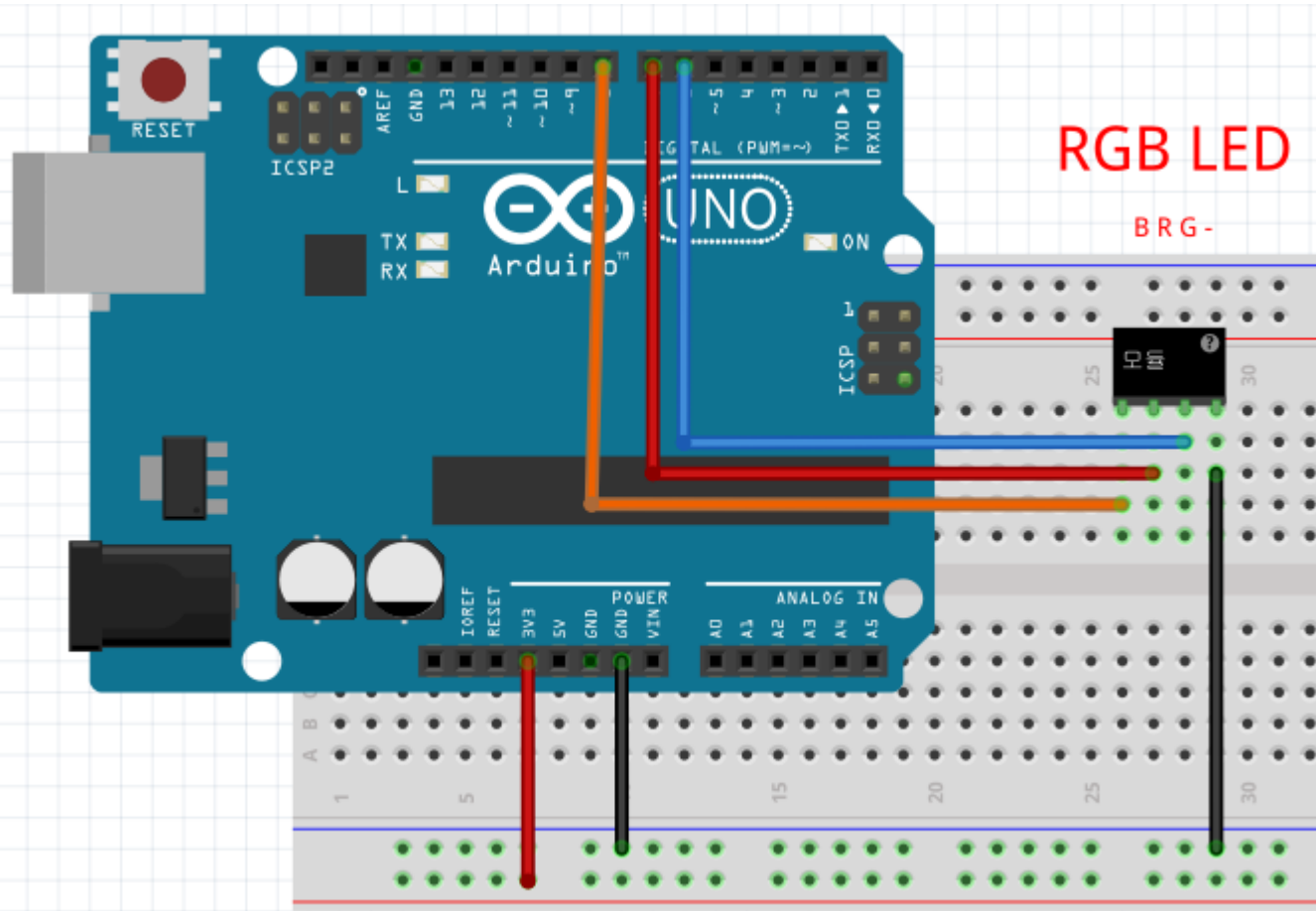
모듈 18

LASER2 §

```
1
2 void setup()
3 {
4   pinMode(4, OUTPUT); //무의미 코드
5 }
6
7 void loop()
8 {
9   for (int i = 0; i < 255; i+=5)
10  {
11    analogWrite(3, i);
12
13    // if (i < 127) digitalWrite(4, LOW );
14    // else          digitalWrite(4, HIGH);
15
16    delay(50);
17  }
18 }
```

- 빛의 세기를 0 ~255까지 변환

참고해요!



모듬 19

```

1
2 int nMax = 0;
3 int nLeds[] = { 6, 7, 8 };
4 int nCurrent = 0;
5
6 void setup()
7 {
8     /*pinMode(6, OUTPUT);
9     pinMode(7, OUTPUT);
10    pinMode(8, OUTPUT);
11    */
12    // 위에 주석 부분으로 해도됨고, 아래 코드를 이용해도 되고.
13    nMax = sizeof(nLeds) / sizeof(int);
14
15    for (int i = 0; i < nMax ; i++)
16    {
17        pinMode(nLeds[i], OUTPUT);
18    }
19 }

```

```

47    */
48    //위에 주석부분을 모두 코딩하기 어렵다..
49    //그래서 아래 코드를 이용해서 해결할 수 있다.
50    digitalWrite(nLeds[nCurrent], LOW);
51
52    nCurrent++;
53    if (nCurrent >= nMax) nCurrent = 0;
54
55    digitalWrite(nLeds[nCurrent], HIGH);
56    delay(500);
57 }

```

```

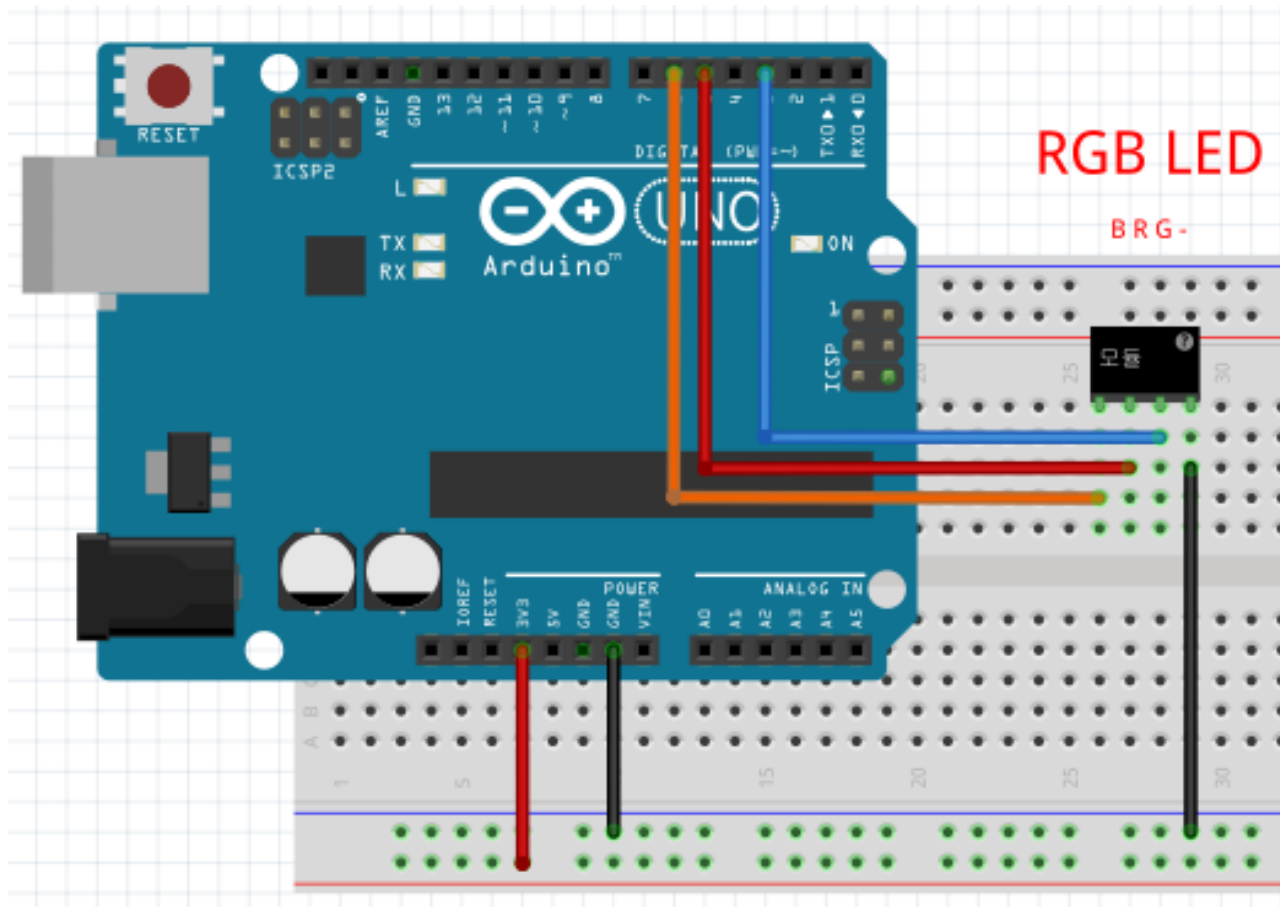
20
21 void loop()
22 {
23     /*
24     digitalWrite(6, HIGH);
25     digitalWrite(7, HIGH);
26     digitalWrite(8, HIGH);
27     delay(500);
28     digitalWrite(6, LOW);
29     digitalWrite(7, LOW);
30     digitalWrite(8, LOW);
31     delay(500);
32     */
33
34     /*
35     digitalWrite(6, HIGH);
36     digitalWrite(7, LOW);
37     digitalWrite(8, LOW);
38     delay(500);
39     digitalWrite(6, LOW);
40     digitalWrite(7, HIGH);
41     digitalWrite(8, LOW);
42     delay(500);
43     digitalWrite(6, LOW);
44     digitalWrite(7, LOW);
45     digitalWrite(8, HIGH);
46     delay(500);
47     */

```

- 모두 점멸하고
6/7/8이 순서
로 출력

참고해요!

모듈 19

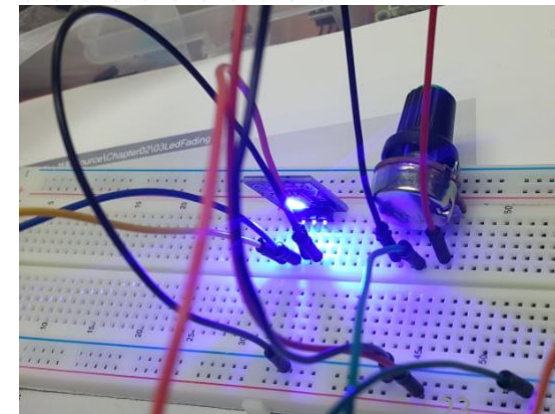
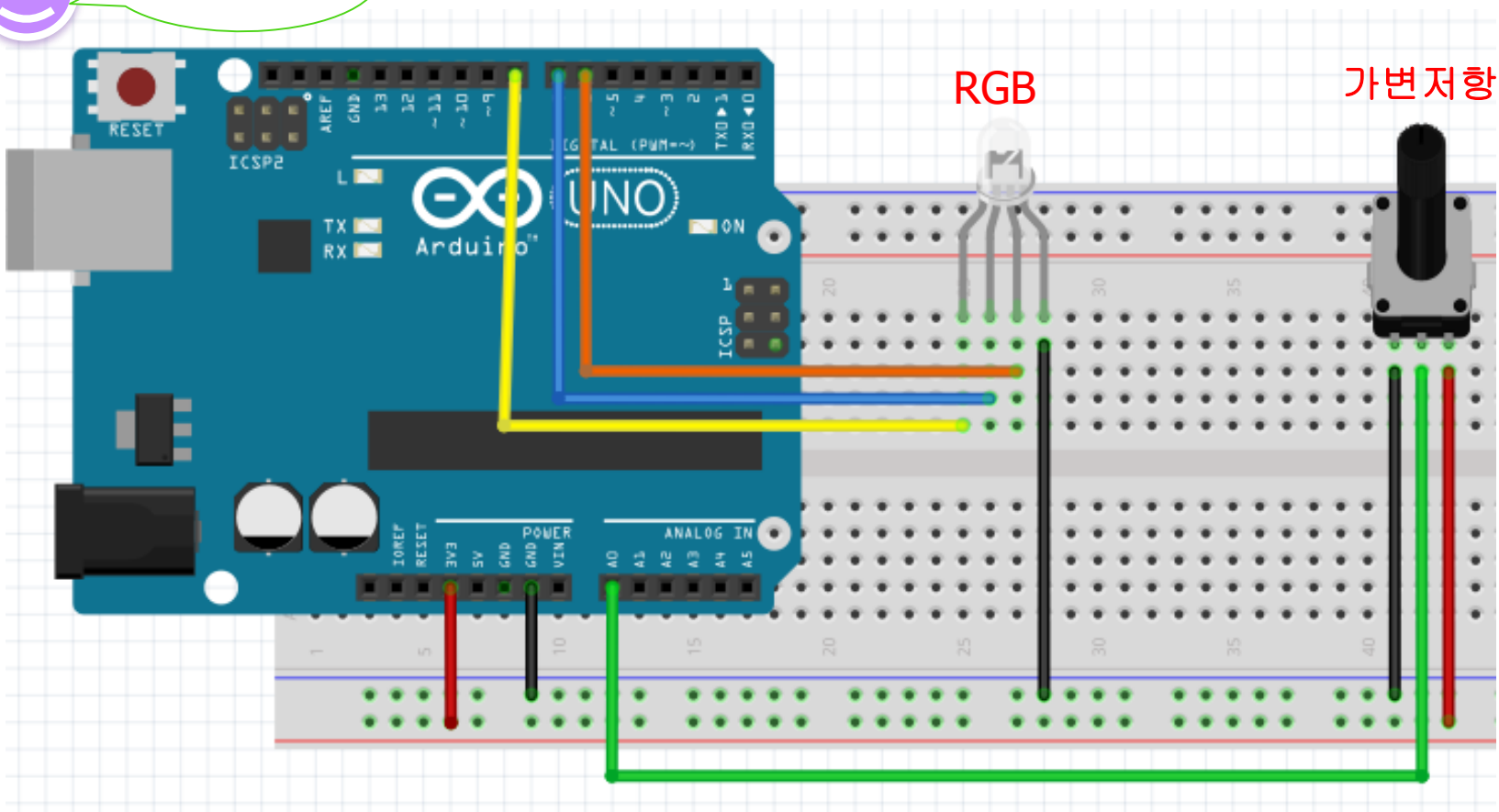


RGB2

```
1 void setup()
2 {
3 }
4 int nG = 3;
5 int nR = 5;
6 int nB = 6;
7 void loop()
8 {
9   for (int g = 0; g < 255; g += 10)
10   {
11     for (int r = 0; r < 255; r += 10)
12     {
13       for (int b = 0; b < 255; b += 10)
14       {
15         analogWrite(nG, g);
16         analogWrite(nR, r);
17         analogWrite(nB, b);
18         delay(100);
19       }
20     }
21   }
22 }
```

- 0.1로 색상 변경

참고하세요!

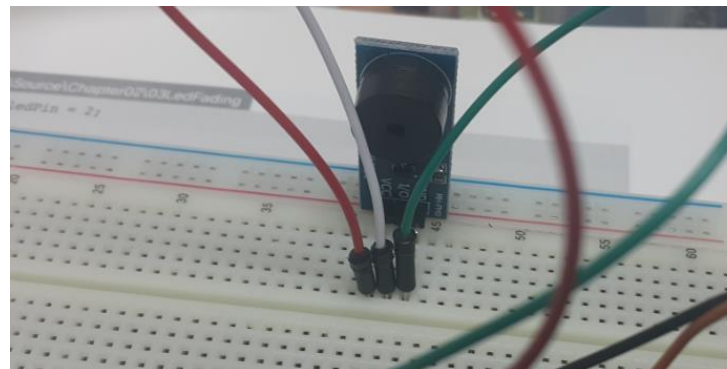
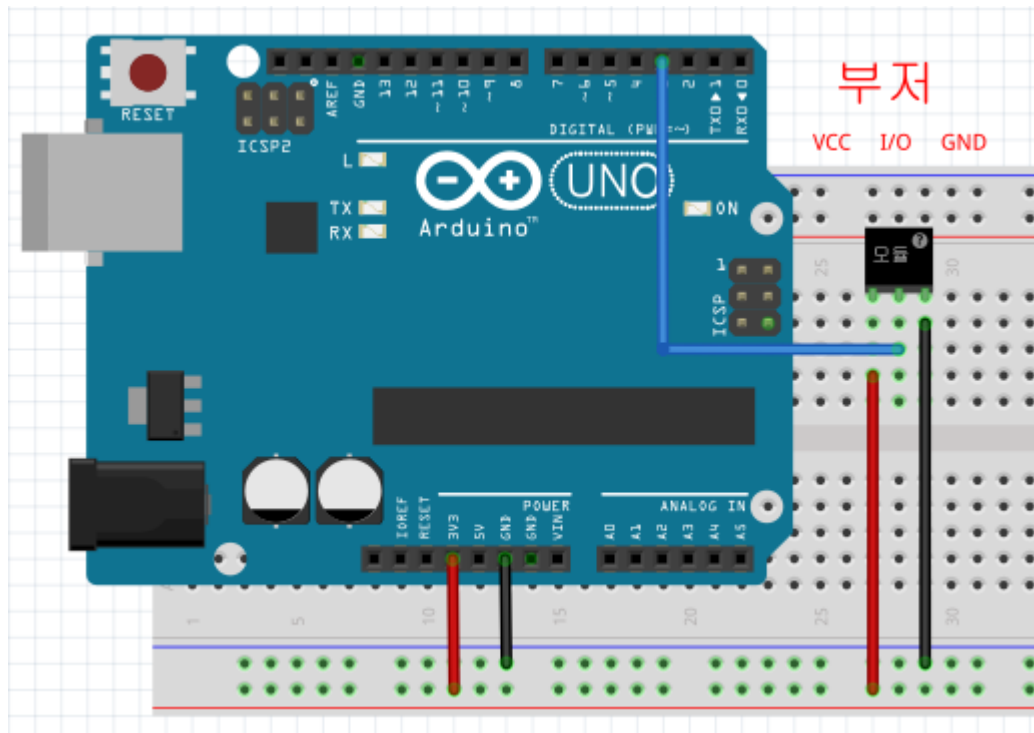


RGB3

```
1 void setup()
2 {
3   pinMode(6, OUTPUT);
4   pinMode(7, OUTPUT);
5   pinMode(8, OUTPUT);
6   Serial.begin(9600);
7 }
8 void loop()
9 {
10  int nRead = analogRead(A0);
11  Serial.println(nRead);
12  if (nRead < 85)
13  {
14    digitalWrite(6, HIGH);
15    digitalWrite(7, LOW);
16    digitalWrite(8, LOW);
17  }
18  else if (nRead < 170)
19  {
20    digitalWrite(6, LOW);
21    digitalWrite(7, HIGH);
22    digitalWrite(8, LOW);
23  }
24  else
25  {
26    digitalWrite(6, LOW);
27    digitalWrite(7, LOW);
28    digitalWrite(8, HIGH);
29  }
30 }
```

- 가변저항 값에 따라 LED 켜기

모듈 17

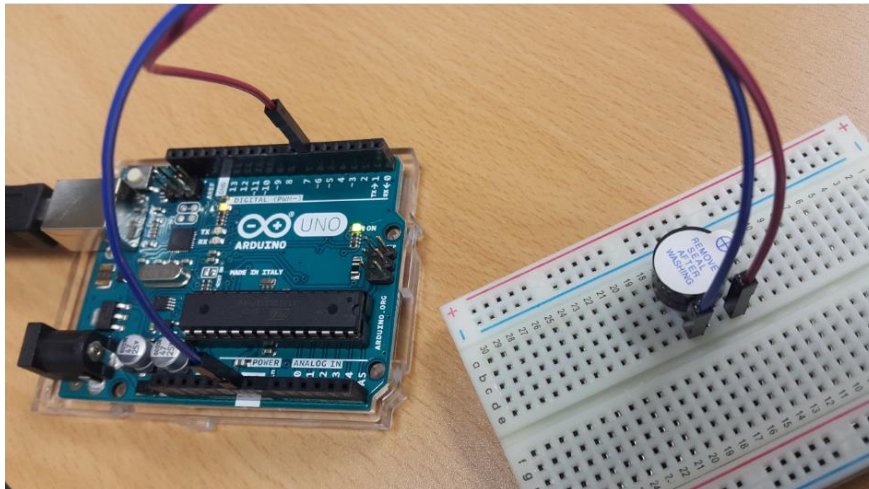
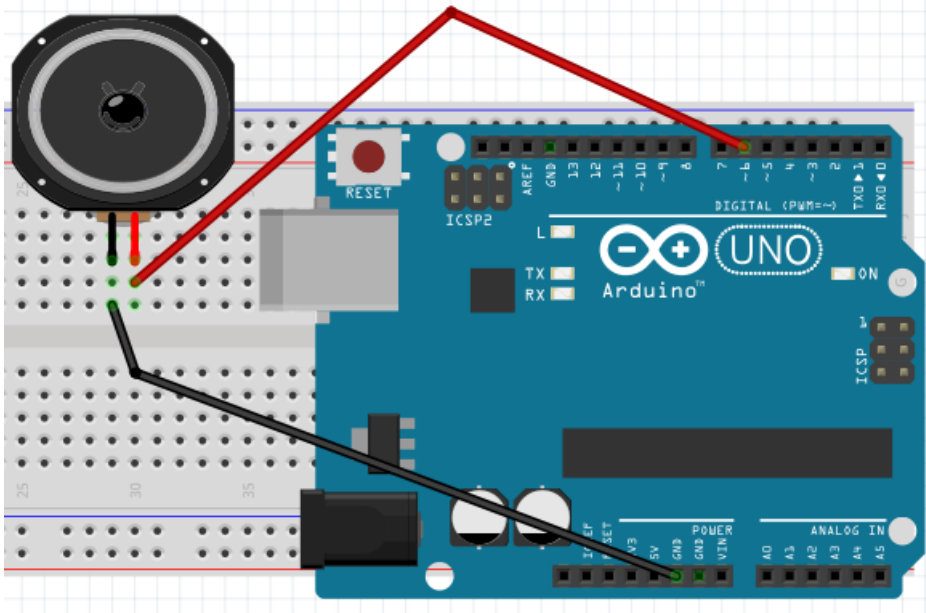


BUZZER1

```
1  
2 void setup()  
3 {  
4   pinMode(3, OUTPUT);  
5 }  
6  
7 void loop()  
8 {  
9   digitalWrite(3, HIGH);  
10  delay(1);  
11  digitalWrite(3, LOW);  
12  delay(1);  
13 }
```

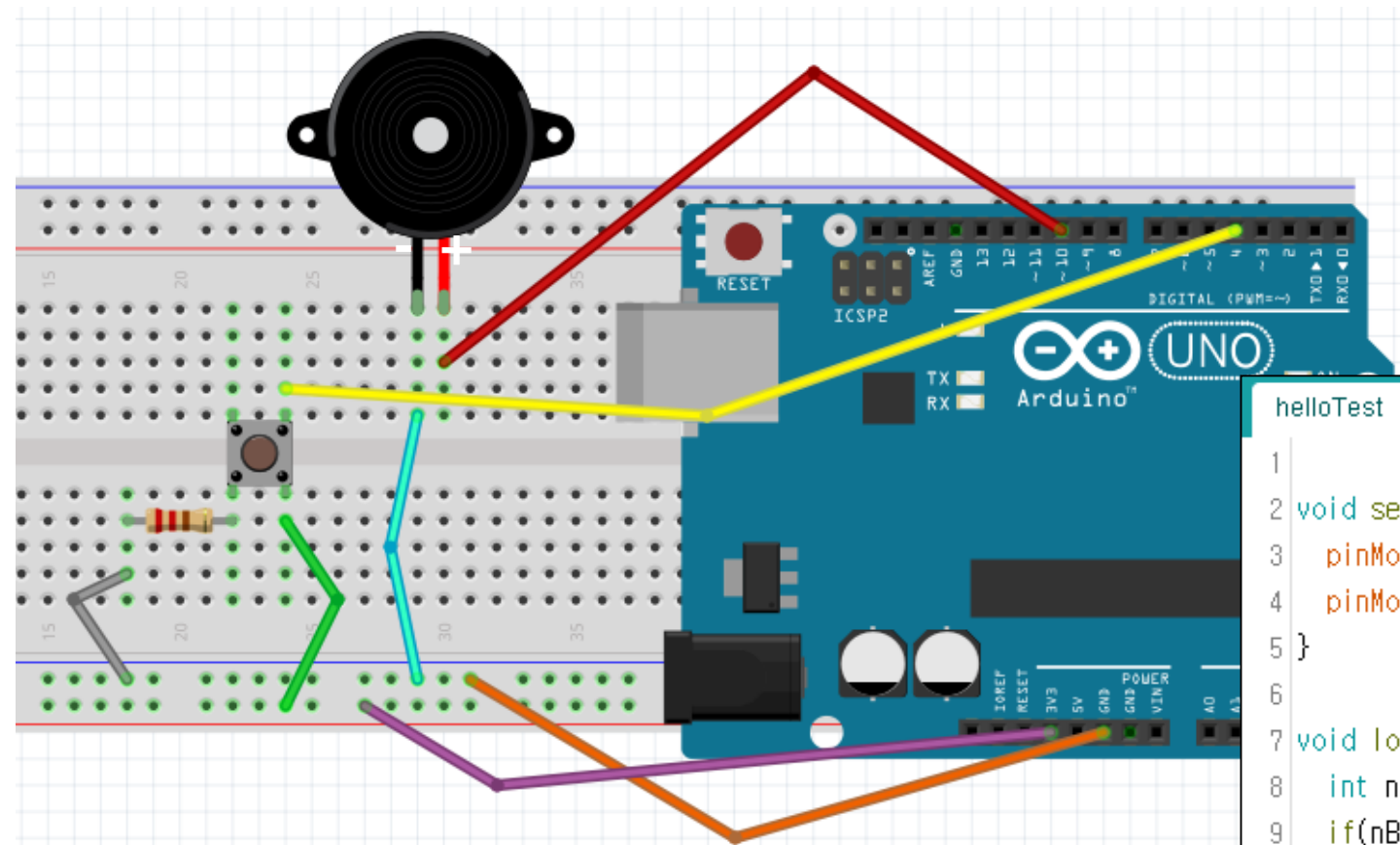
[[~~~~~

부저



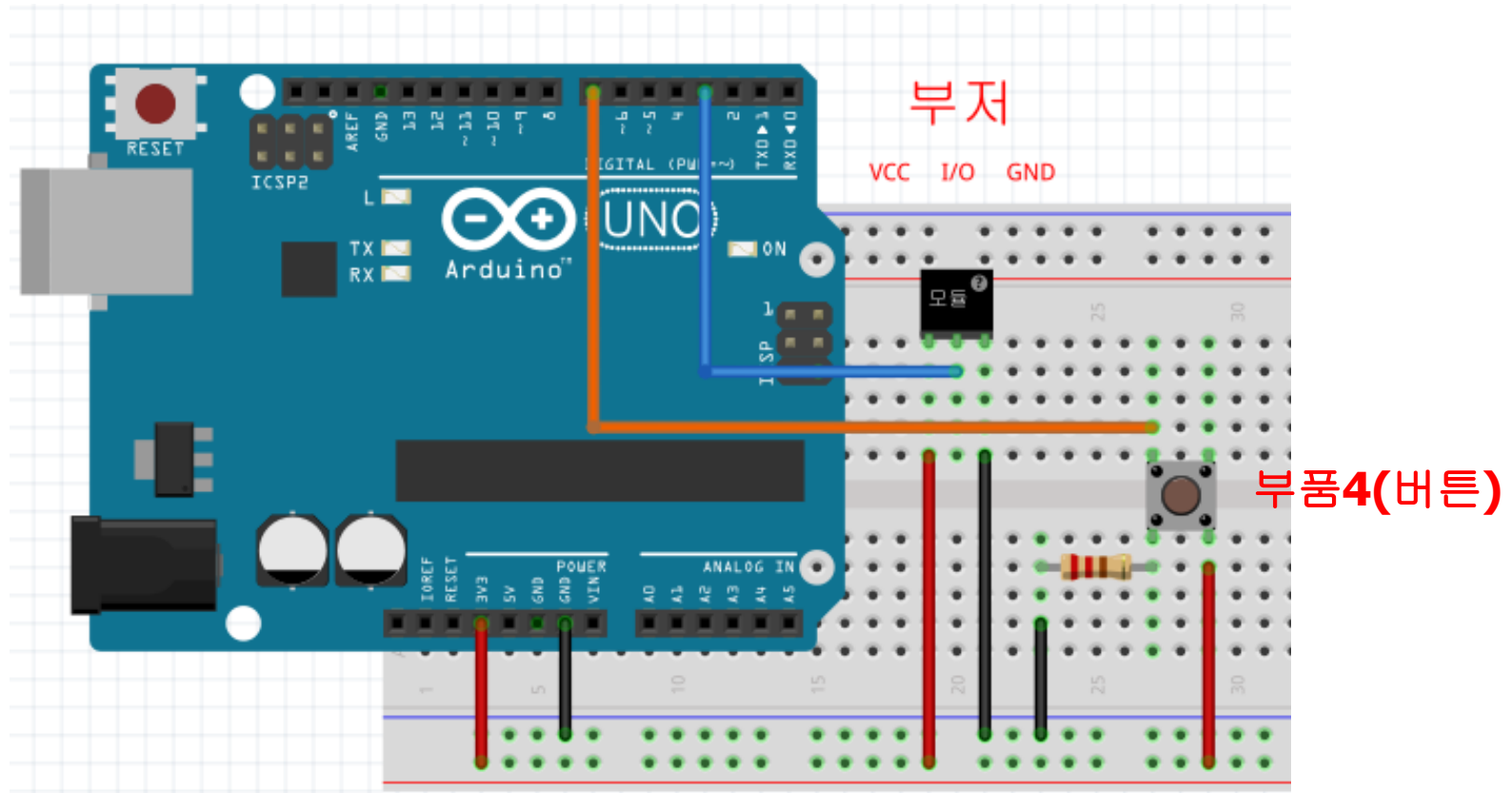
helloTest

```
1 void setup() {  
2   Serial.begin(9600);  
3   pinMode(6, OUTPUT);  
4 }  
5  
6 void loop() {  
7   digitalWrite(6, HIGH);  
8   delay(1000);  
9  
10  digitalWrite(6, LOW);  
11  delay(1000);  
12 }
```



helloTest

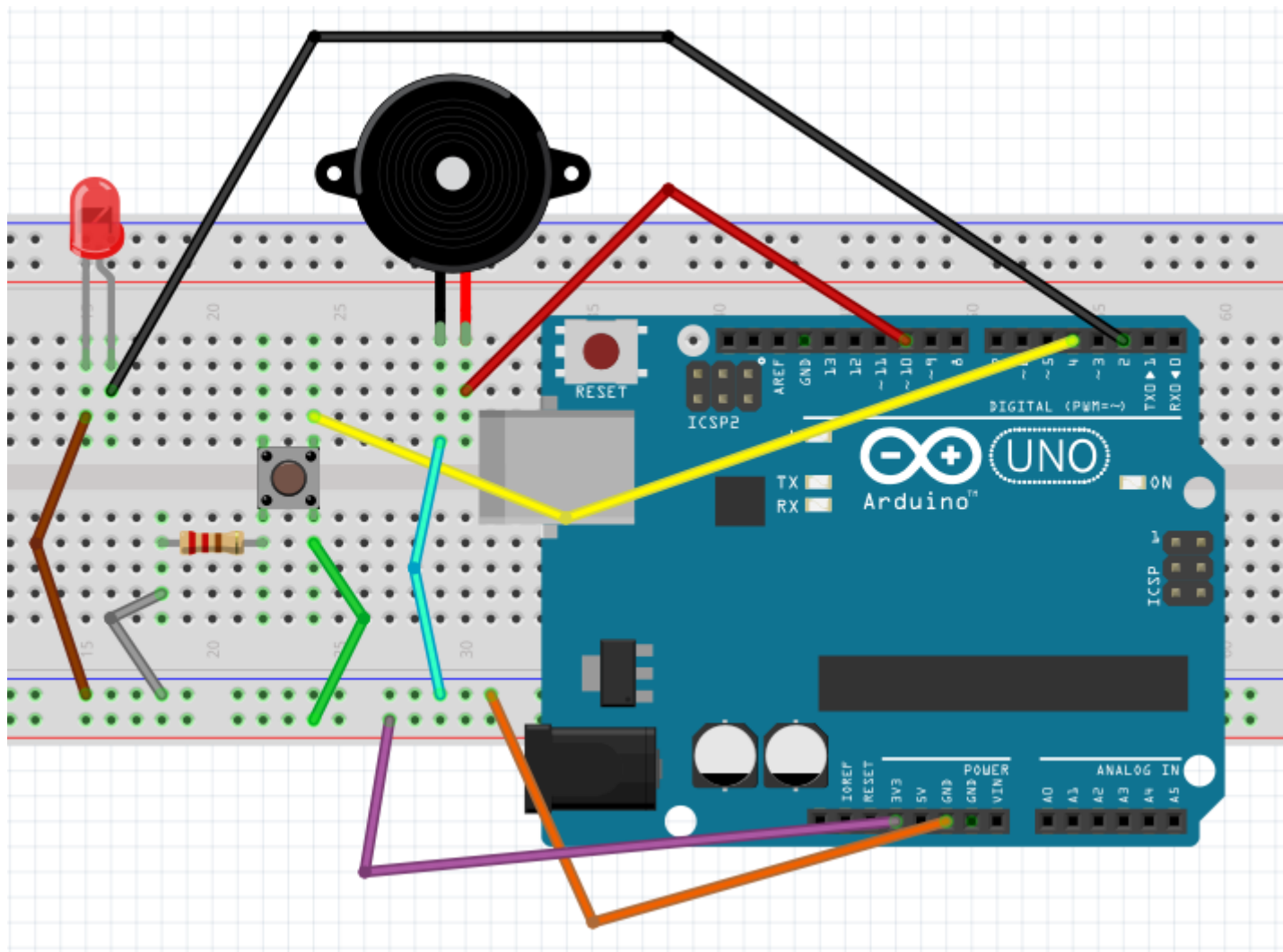
```
1
2 void setup() {
3   pinMode(10, OUTPUT);
4   pinMode(4, INPUT);
5 }
6
7 void loop() {
8   int nButton = digitalRead(4);
9   if(nButton == LOW)
10  {
11    digitalWrite(10, LOW);
12  } else{
13    digitalWrite(10, HIGH);
14  }
15 }
```



BUZZER2

```
1
2 void DUBEEP()
3 {
4     digitalWrite(3, HIGH);
5     delay(1);
6     digitalWrite(3, LOW);
7     delay(1);
8 }
9
10 void setup()
11 {
12     pinMode(3, OUTPUT);
13     pinMode(7, INPUT);
14 }
15
16 void loop()
17 {
18     int nButton = digitalRead(7);
19
20     if (nButton != LOW)
21     {
22         DUBEEP();
23     }
24 }
```

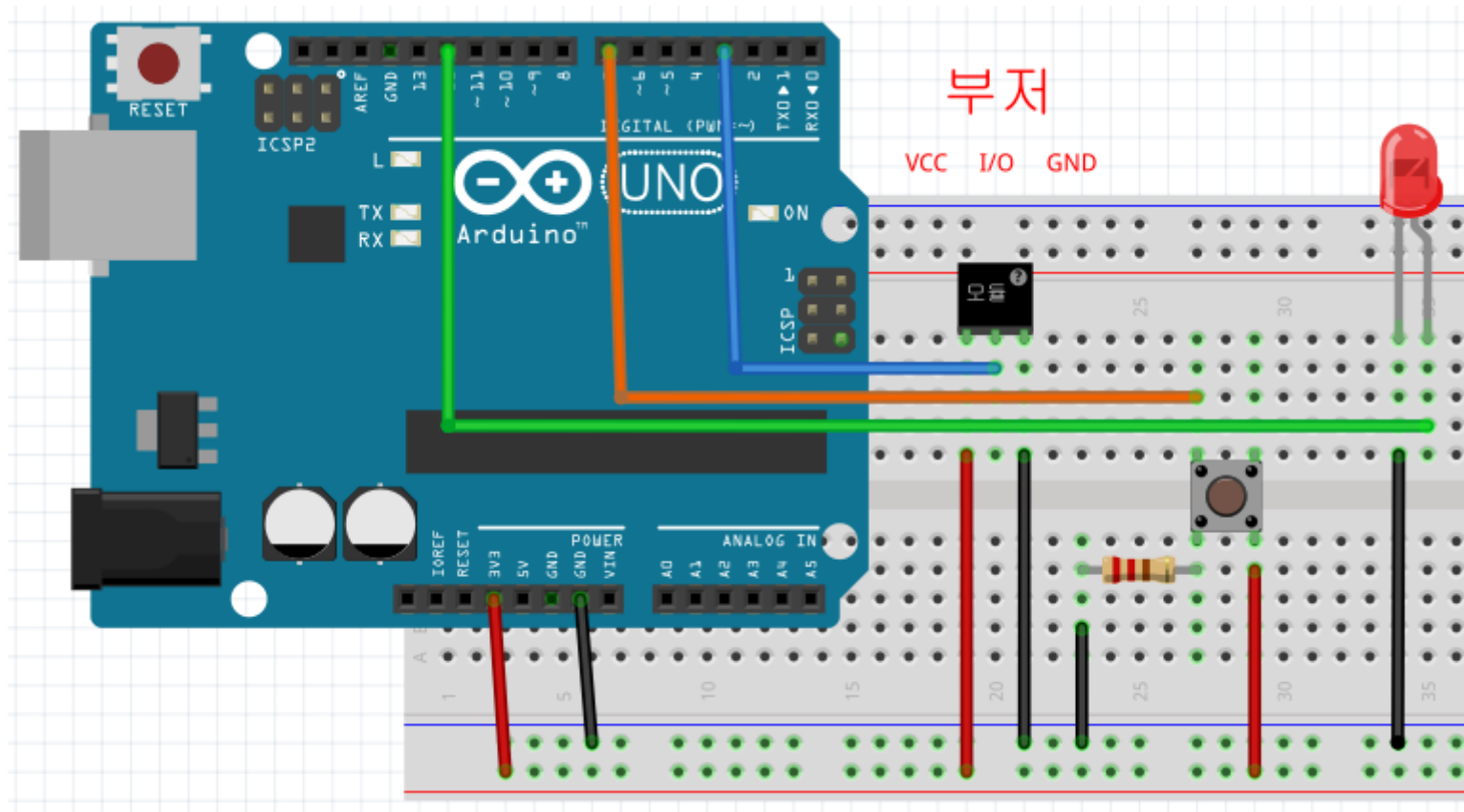
- 버튼을 누르면
“띠~~”



버튼을 이용한 LED켜기와 부저 울리기

helloTest

```
1
2 void setup() {
3   pinMode(10, OUTPUT);
4   pinMode(2, INPUT);
5   pinMode(4, INPUT);
6 }
7
8 void loop() {
9   int nButton = digitalRead(4);
10  if(nButton == LOW)
11  {
12    digitalWrite(10, LOW);
13    digitalWrite(2, LOW);
14  } else{
15    digitalWrite(10, HIGH);
16    digitalWrite(2, HIGH);
17  }
18 }
```



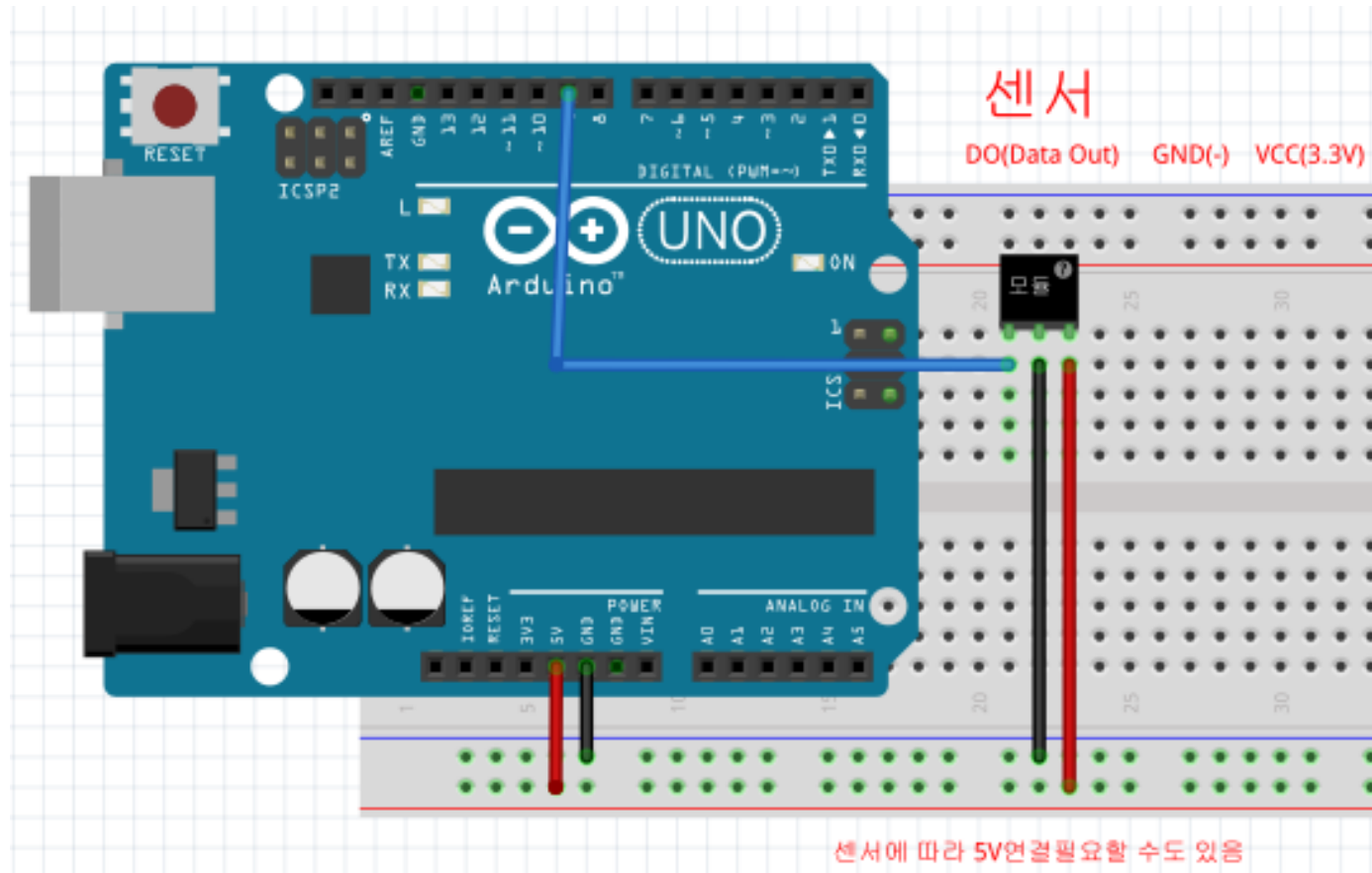
BUZZER3

```

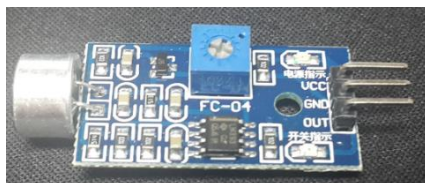
1 void DUBEEP()
2 {
3   digitalWrite(3, HIGH);
4   delay(1);
5   digitalWrite(3, LOW);
6   delay(1);
7 }
8 void setup()
9 {
10  pinMode(3, OUTPUT);
11  pinMode(7, INPUT);
12
13  pinMode(12, OUTPUT);
14 }
15 void loop()
16 {
17   int nButton = digitalRead(7);
18   if (nButton != LOW)
19   {
20     DUBEEP();
21     digitalWrite(12, HIGH);
22   }
23   else
24   {
25     digitalWrite(12, LOW);
26   }
27 }

```

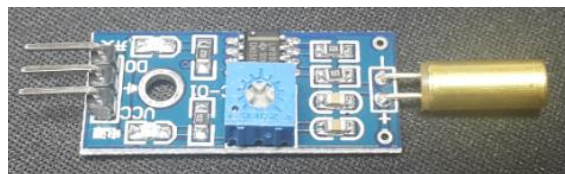
- 버튼을 누르면 “띠
~~” & LED On



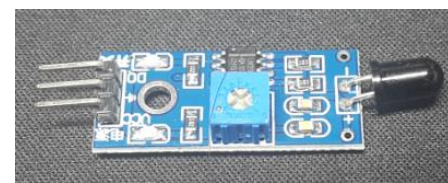
사운드(모듈9)



틸트(모듈6)



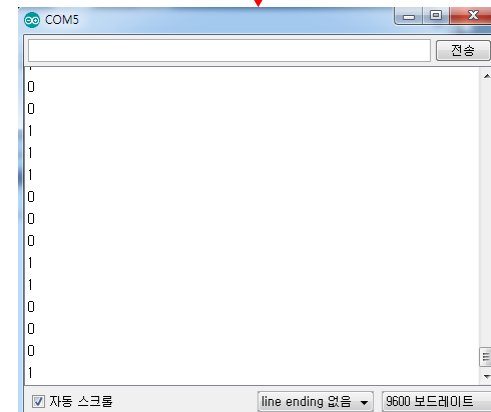
화염(모듈10)



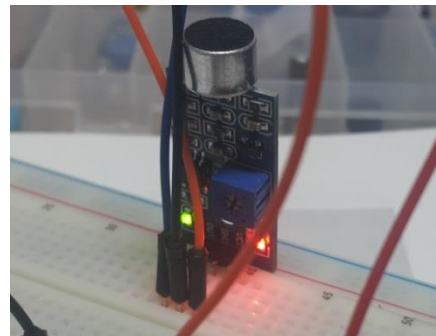
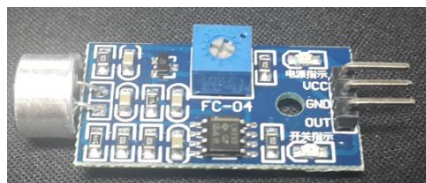
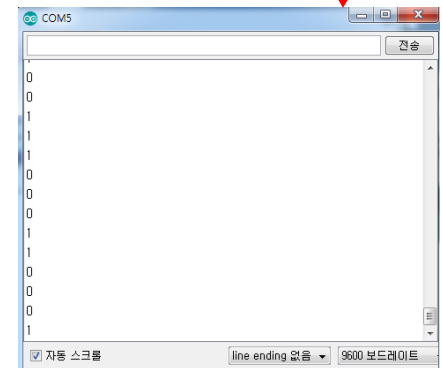
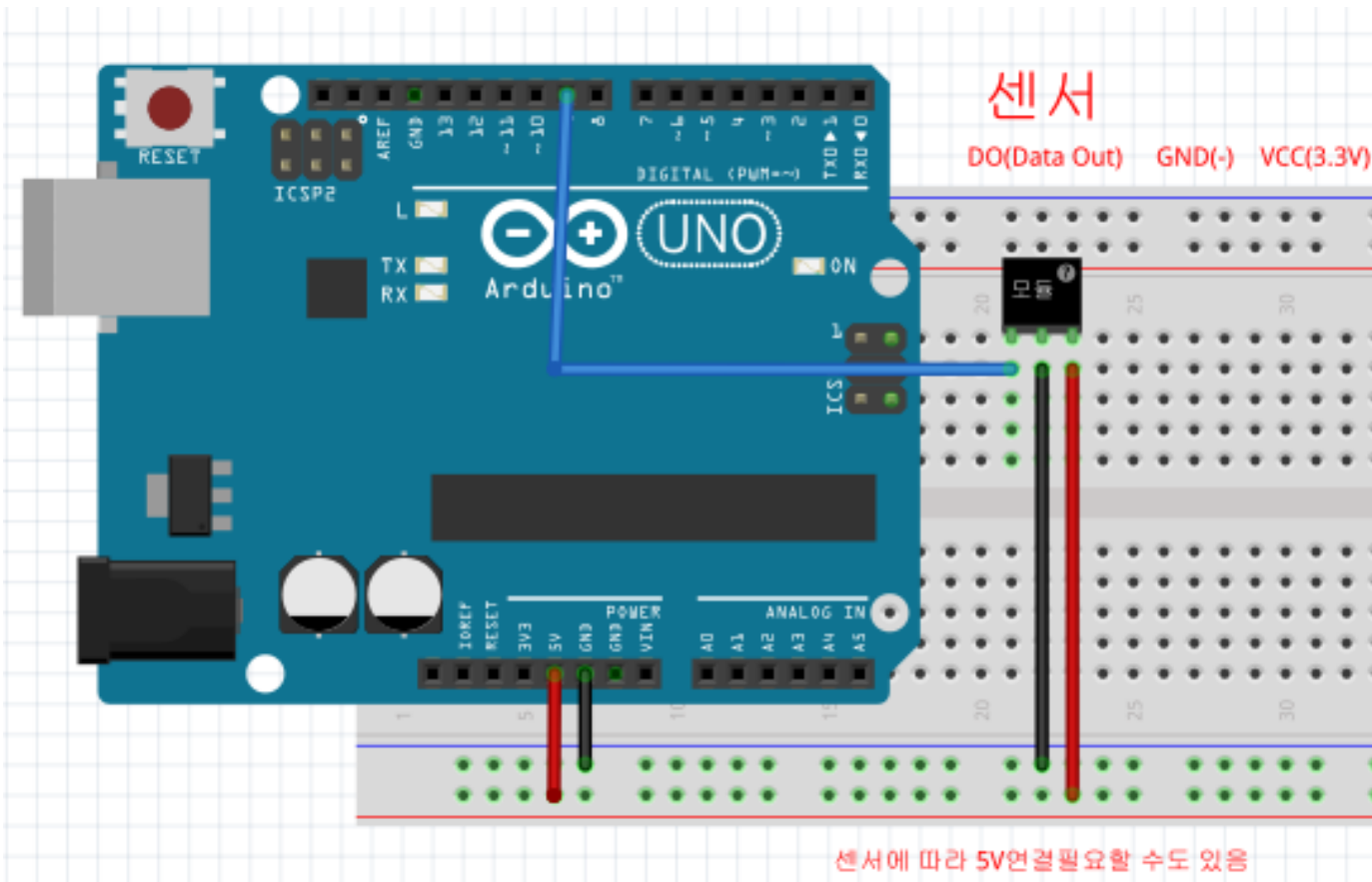
```

Sensor1
1 void setup()
2 {
3   pinMode(9, INPUT);
4   Serial.begin(9600);
5 }
6
7 void loop()
8 {
9   int nData = digitalRead(9);
10  Serial.println(nData);
11 }
    
```

- 9 로 입력 받음

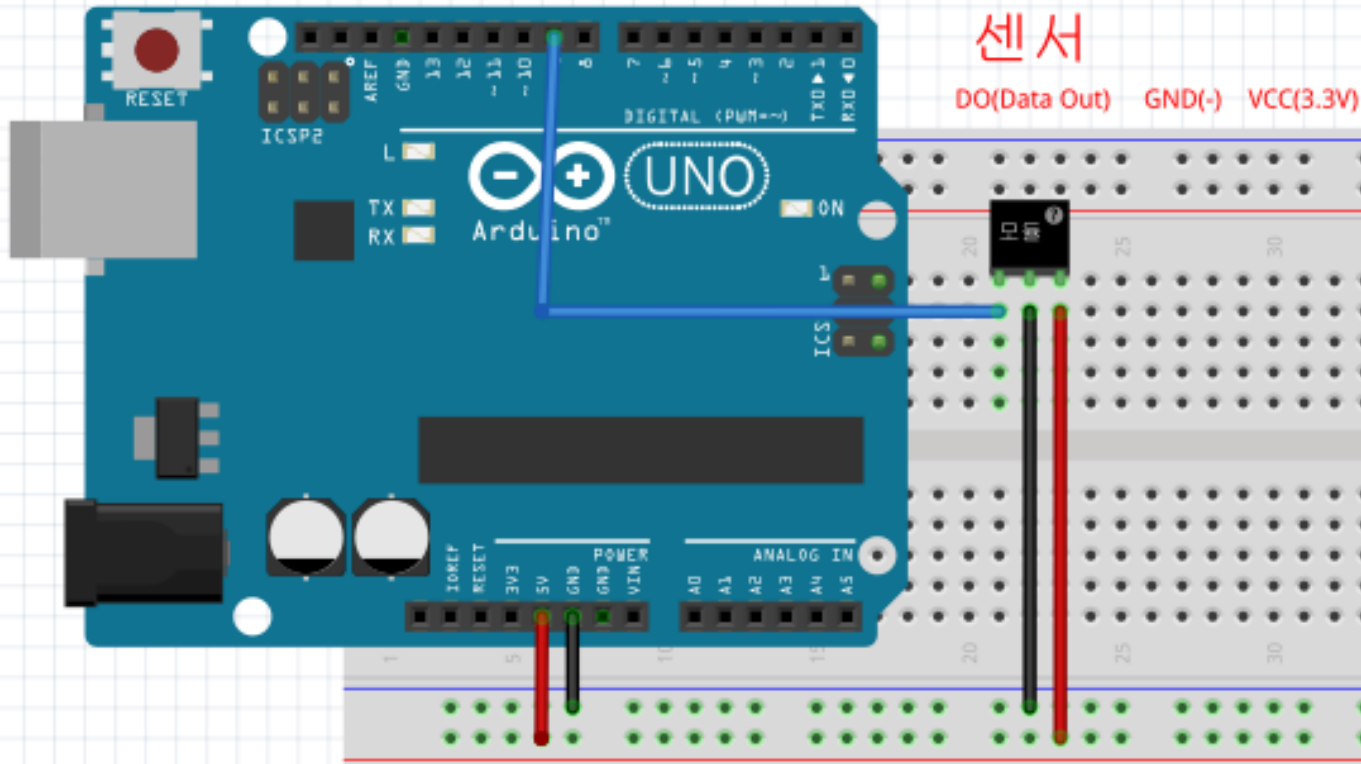


센서(사운드)



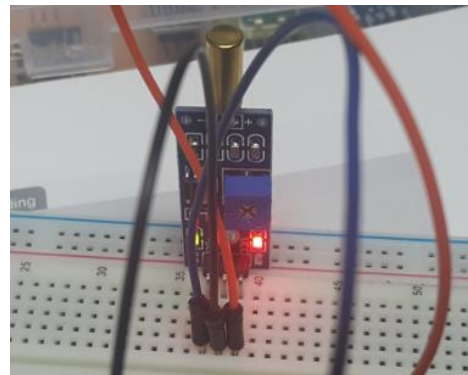
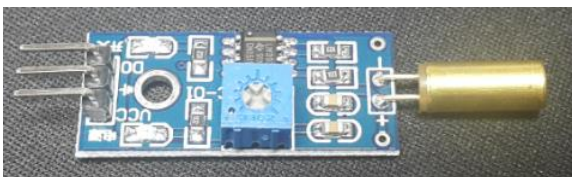
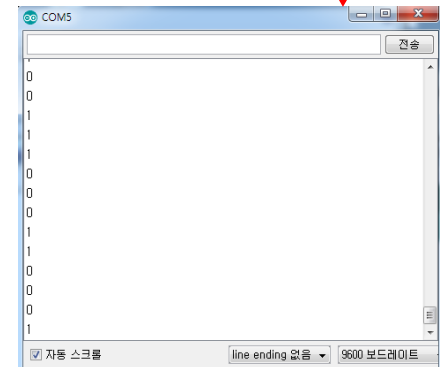
모듈 9

센서(틸트)



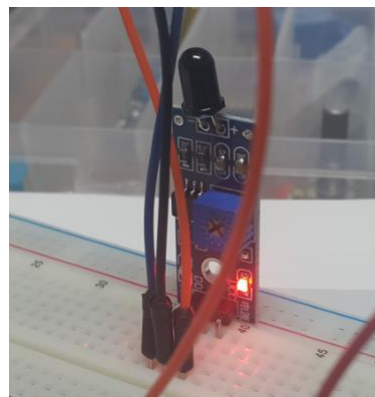
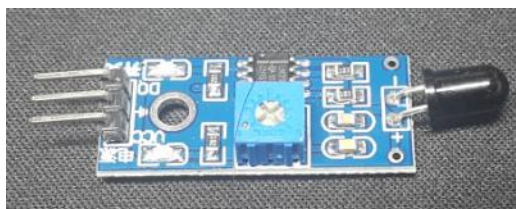
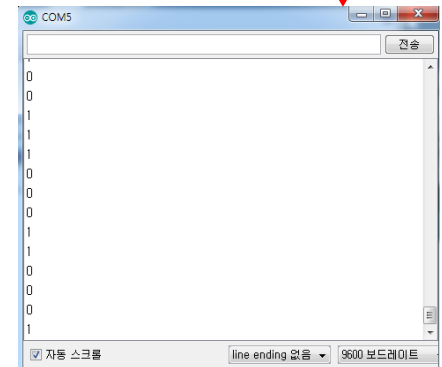
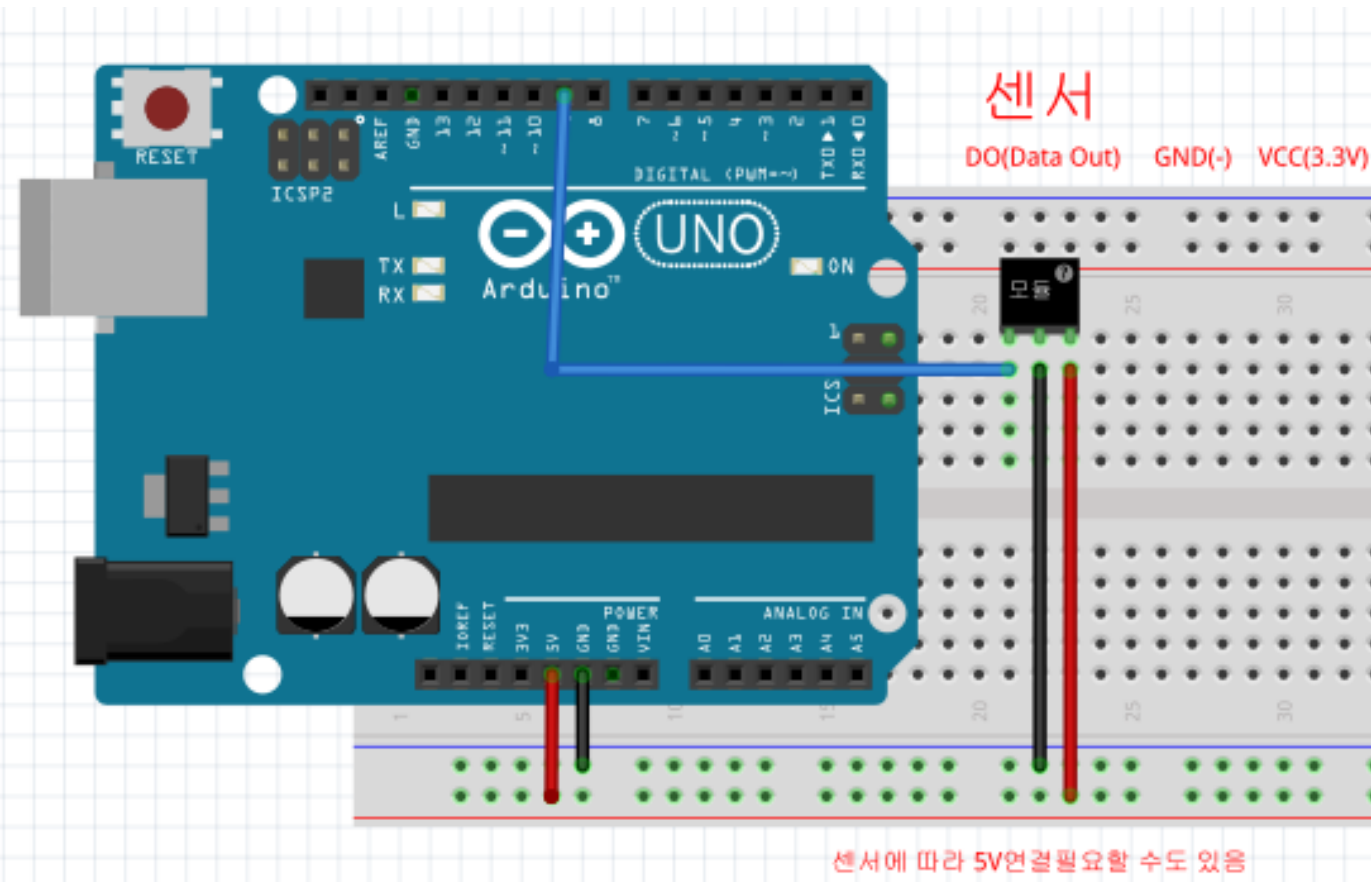
센서
DO(Data Out) GND(-) VCC(3.3V)

센서에 따라 5V연결필요할 수도 있음

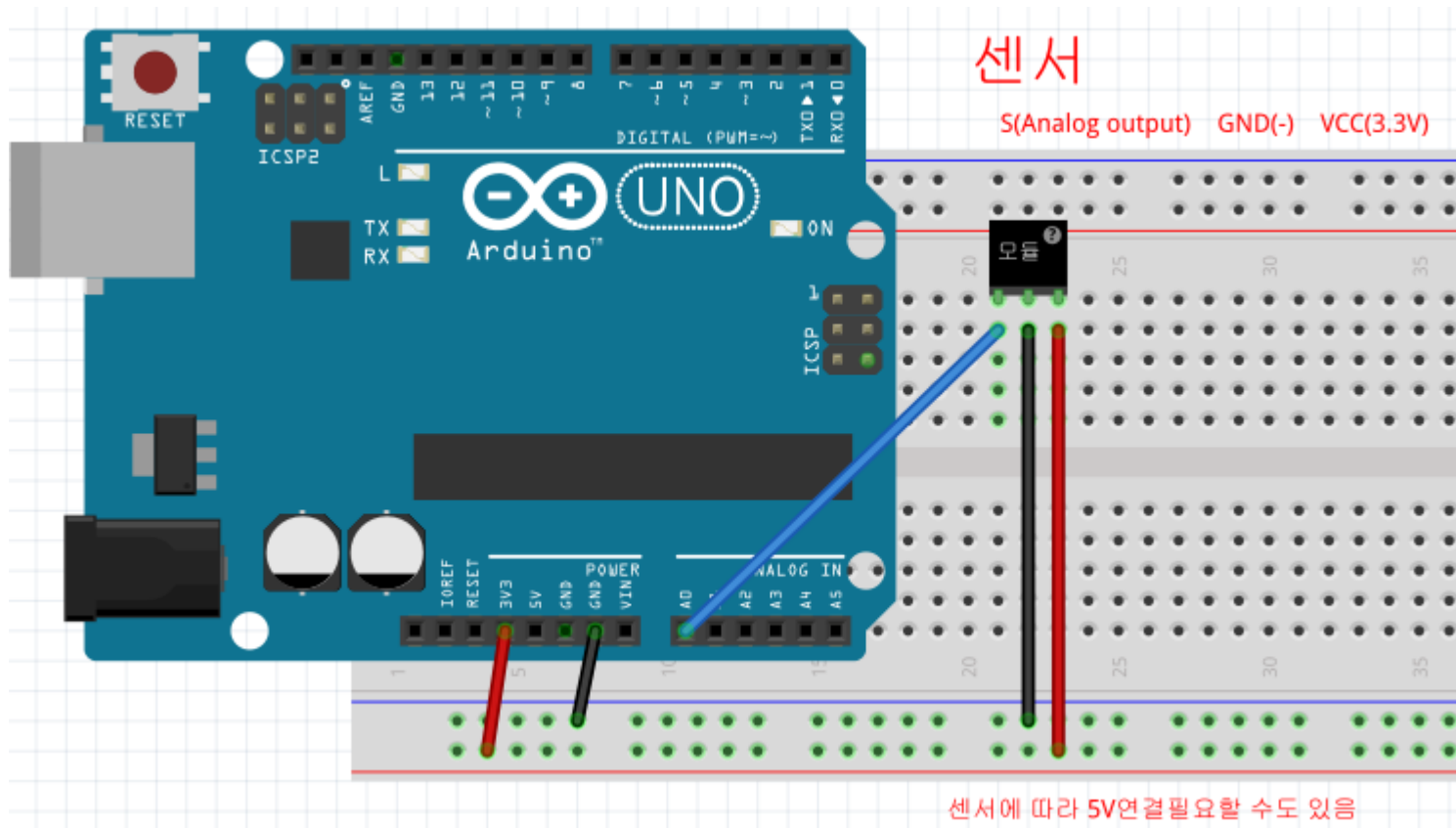


모듈 6

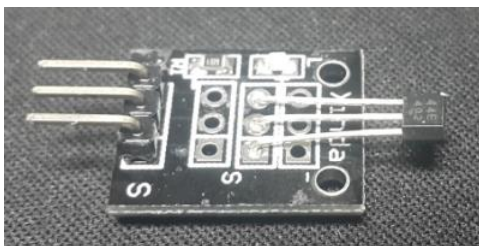
센서(화염)



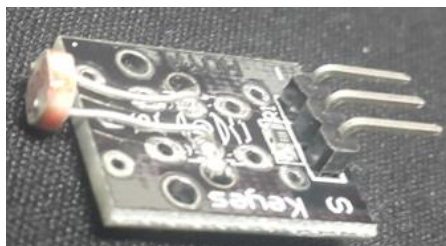
모듈10



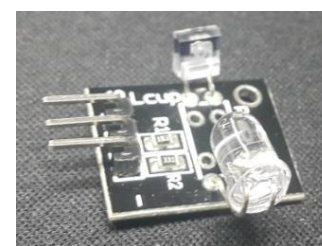
홀(모듈8)



조도(모듈11)



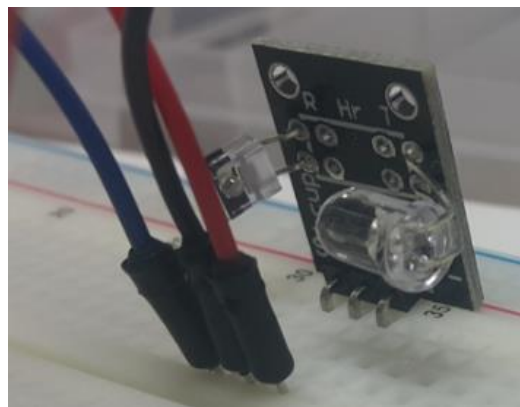
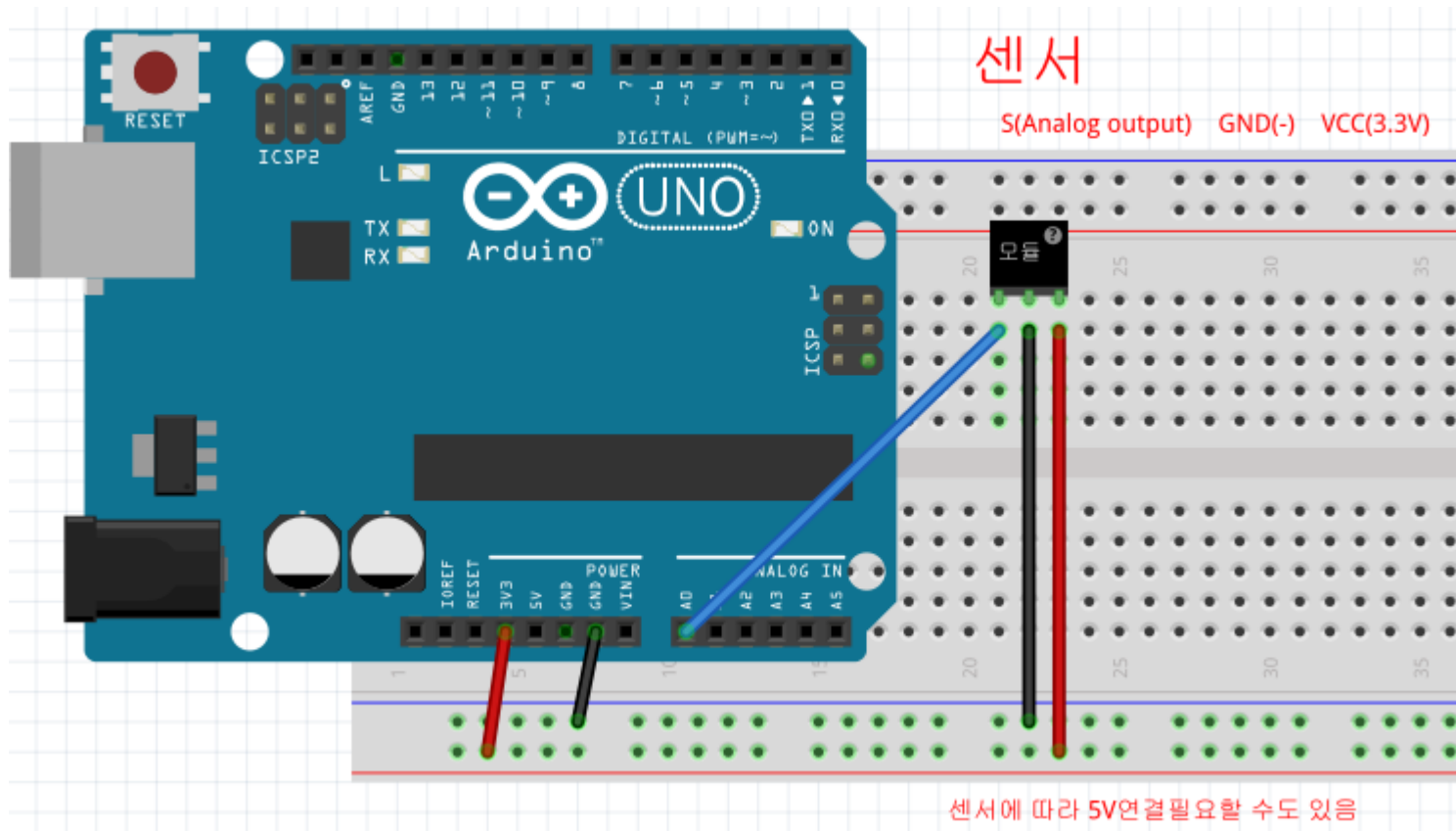
심박(모듈14)



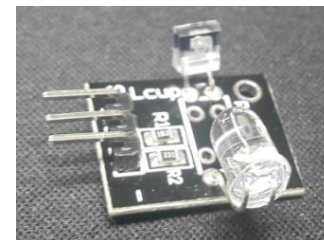
Sensor1

```
1 void setup()  
2 {  
3   Serial.begin(9600);  
4 }  
5  
6 void loop()  
7 {  
8   int nData = analogRead(A0);  
9   Serial.println(nData);  
10 }
```

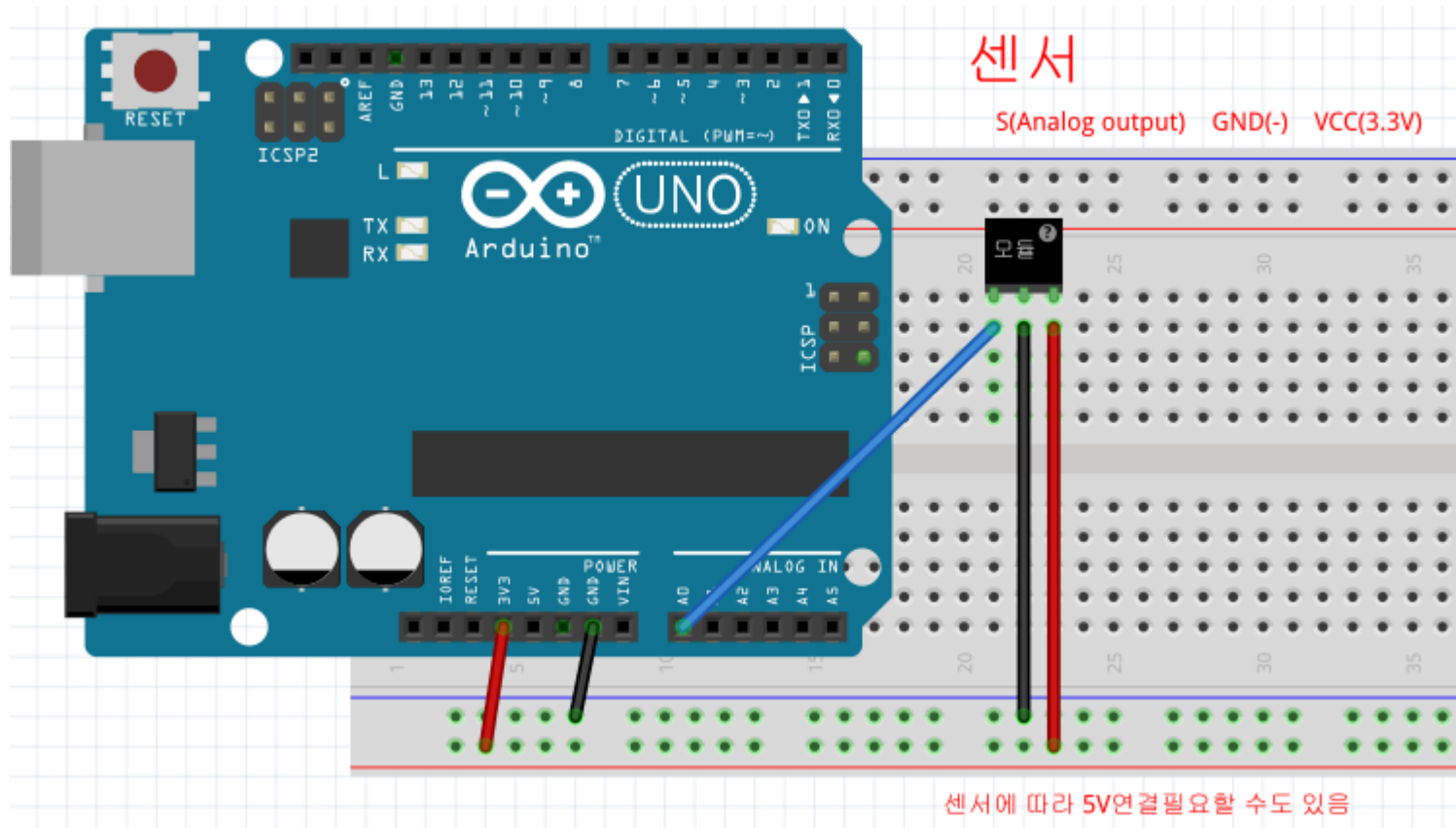
아날로그 센서(심박)



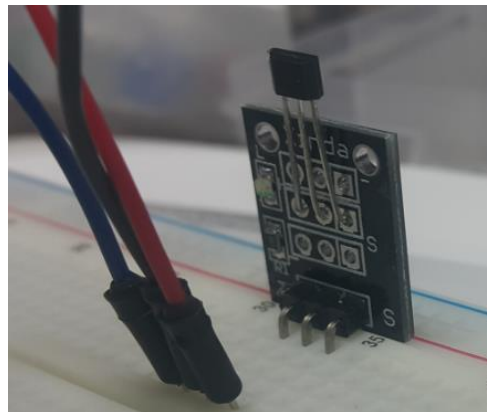
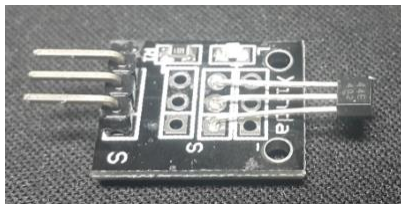
심박(모듈14)



아날로그 센서(홀)

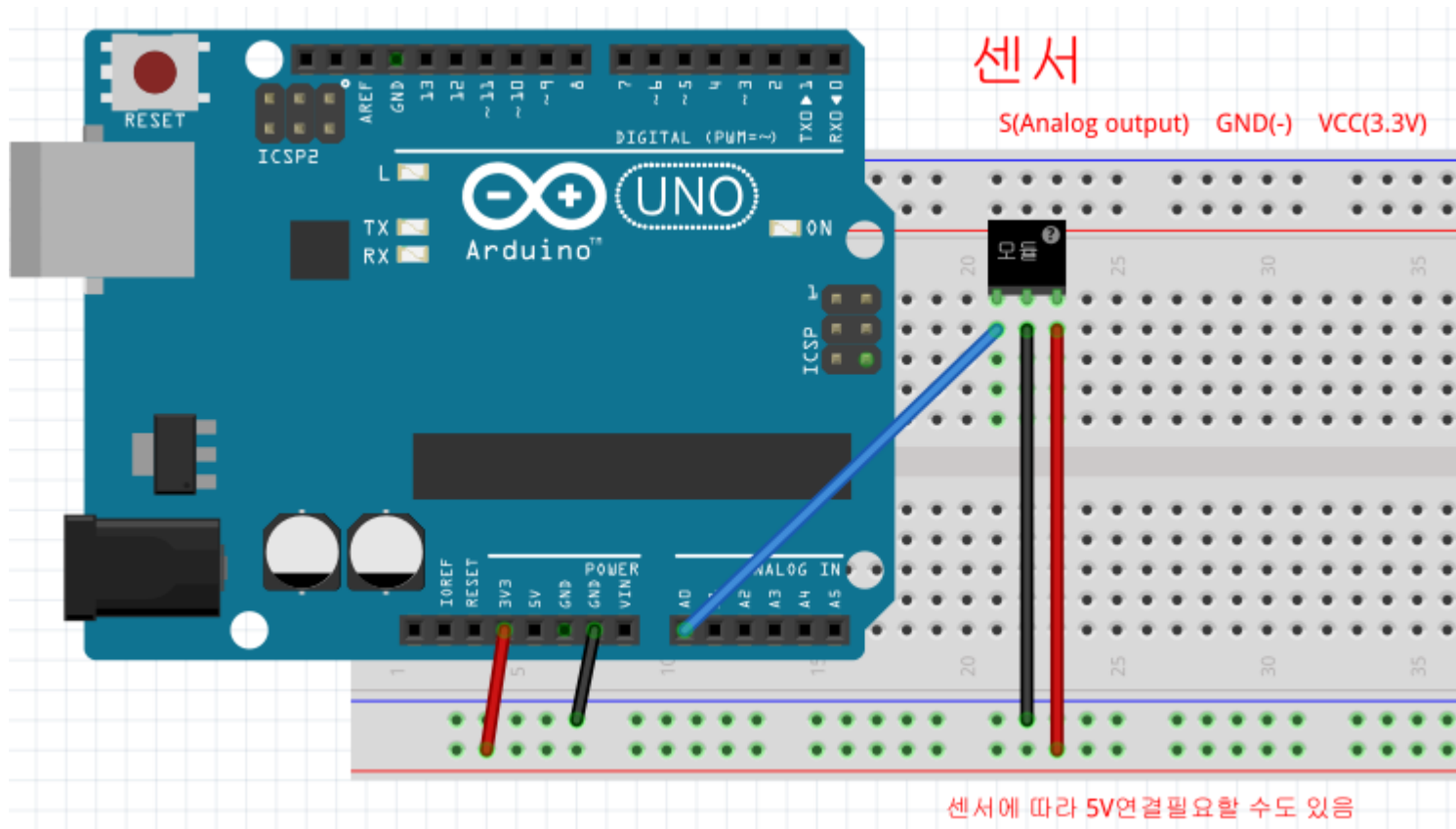


홀(모듈8)

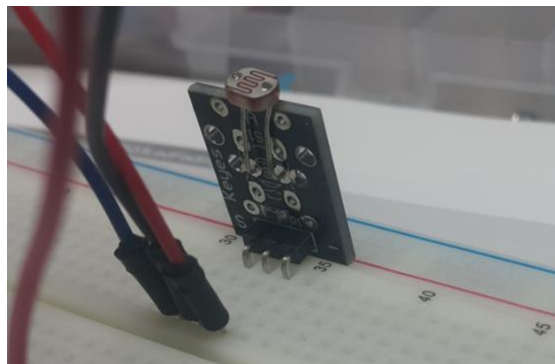
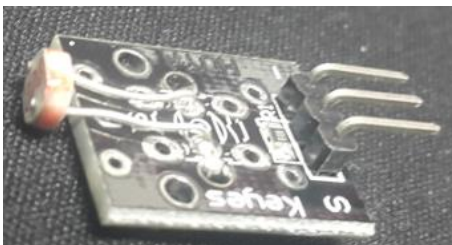


홀 자기 센서는 자기장의 세기에 따라 전압이 변하는 소자

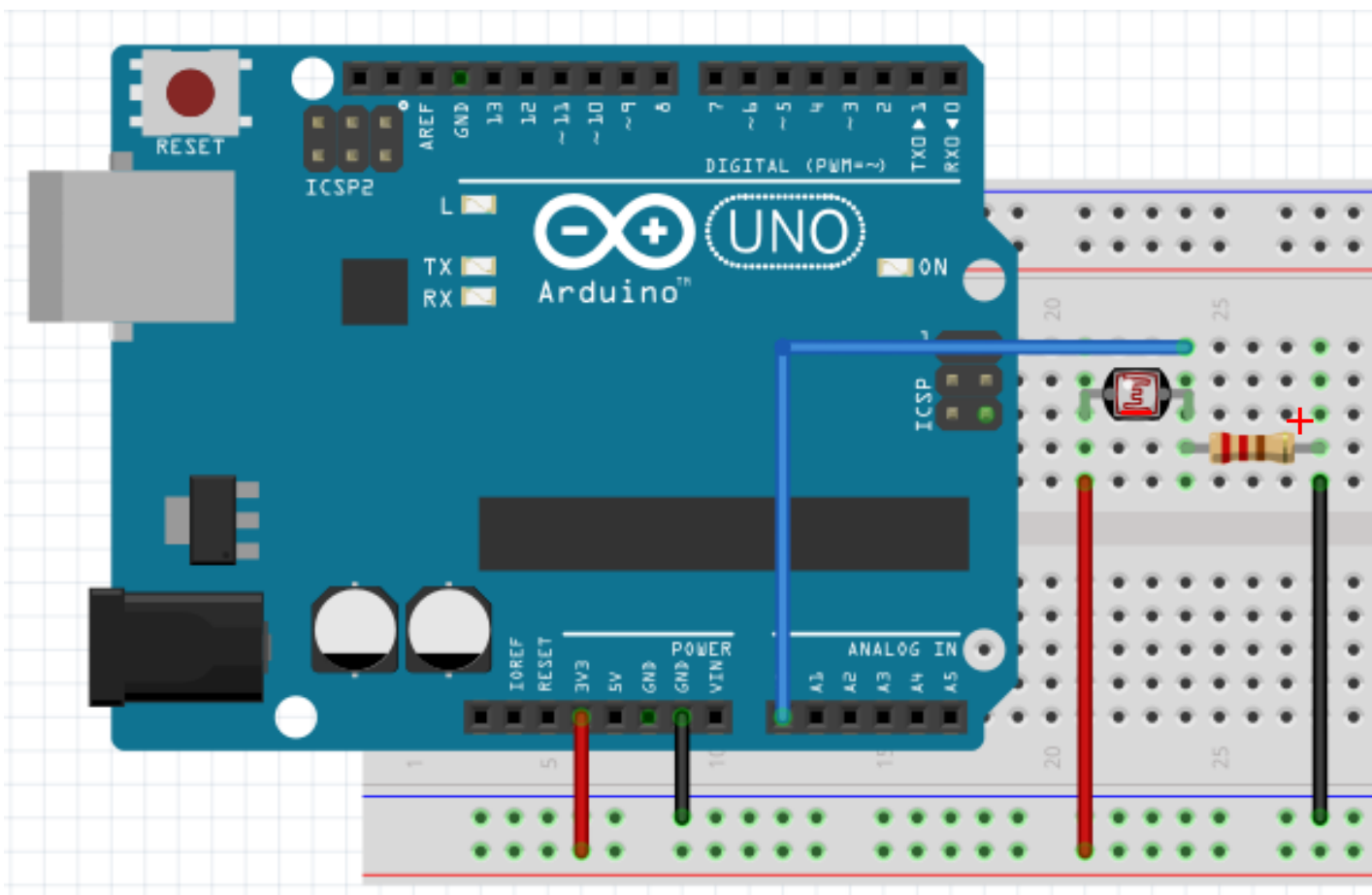
아날로그 센서(조도)



조도(모듈11)



빛의 검출용 부품(부품 7)

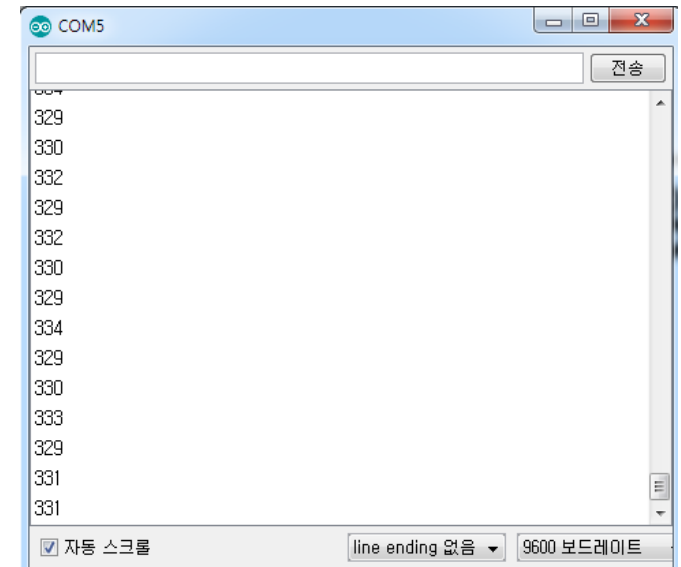


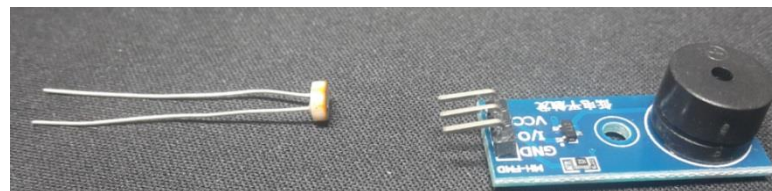
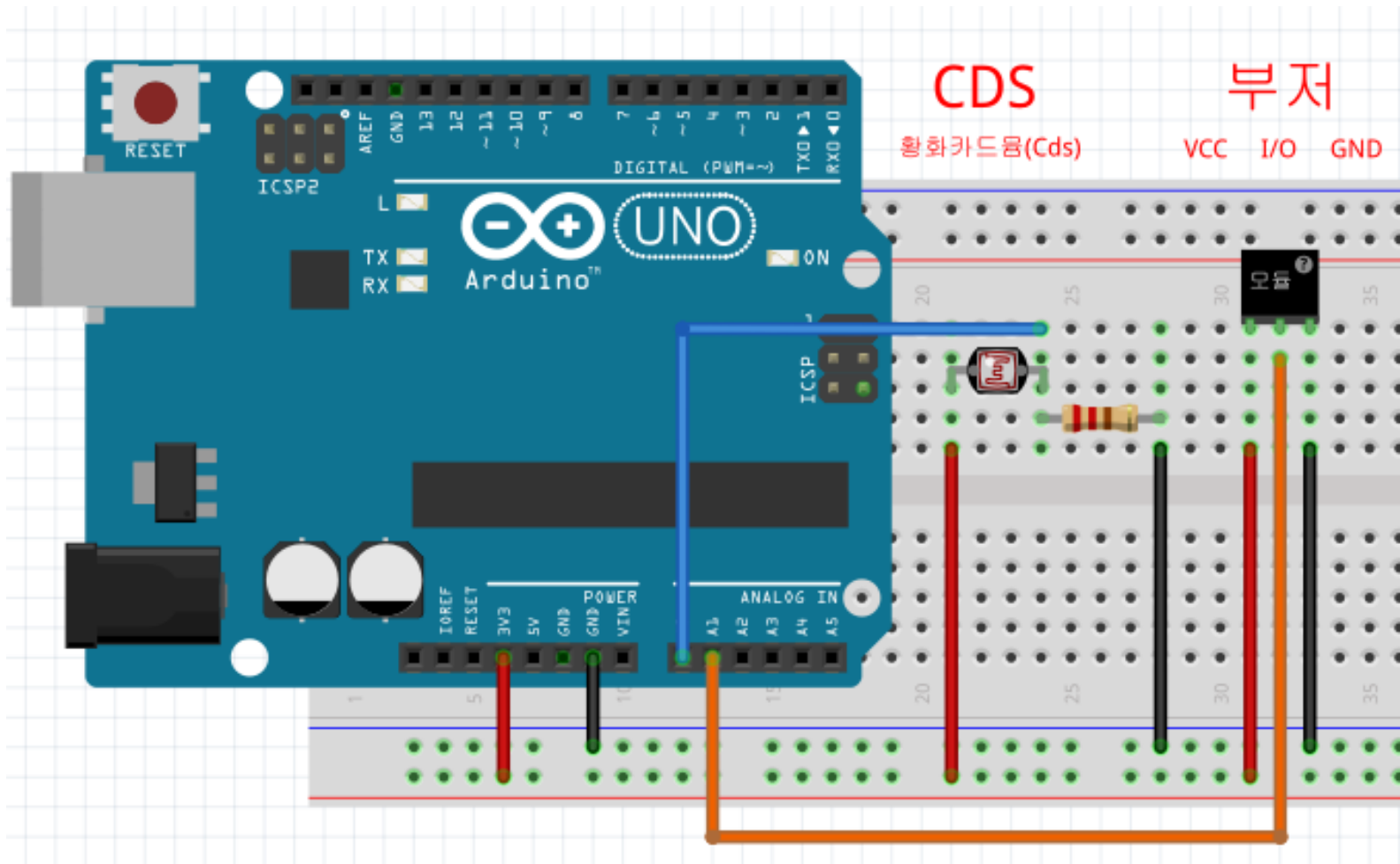
조도센서 CDS



CDS2

```
1 void setup()
2 {
3   Serial.begin(9600);
4 }
5
6 void loop()
7 {
8   int nData = analogRead(A0);
9   Serial.println(nData);
10 }
```





CDS

부저(모듈 17)

```
1
2 #define NOTE_C3  131
3 #define NOTE_F6  1397
4
5 void setup()
6 {
7   Serial.begin(9600);
8 }
9
10 void loop()
11 {
12   int nData = analogRead(A0);
13   Serial.println(nData);
14
15   if (nData < 50)
16   {
17     tone(A1, NOTE_C3);
18   }
19   else if (nData > 300)
20   {
21     tone(A1, NOTE_F6);
22   }
23   else
24   {
25     noTone(A1);
26   }
27
28   delay(100);
29 }
```

