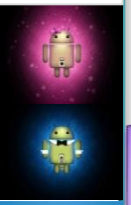
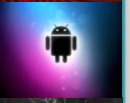
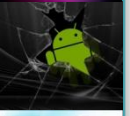
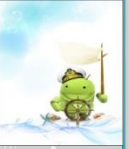


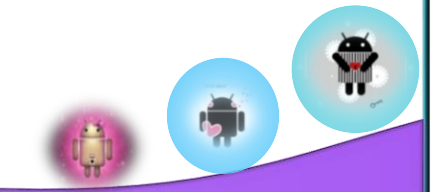


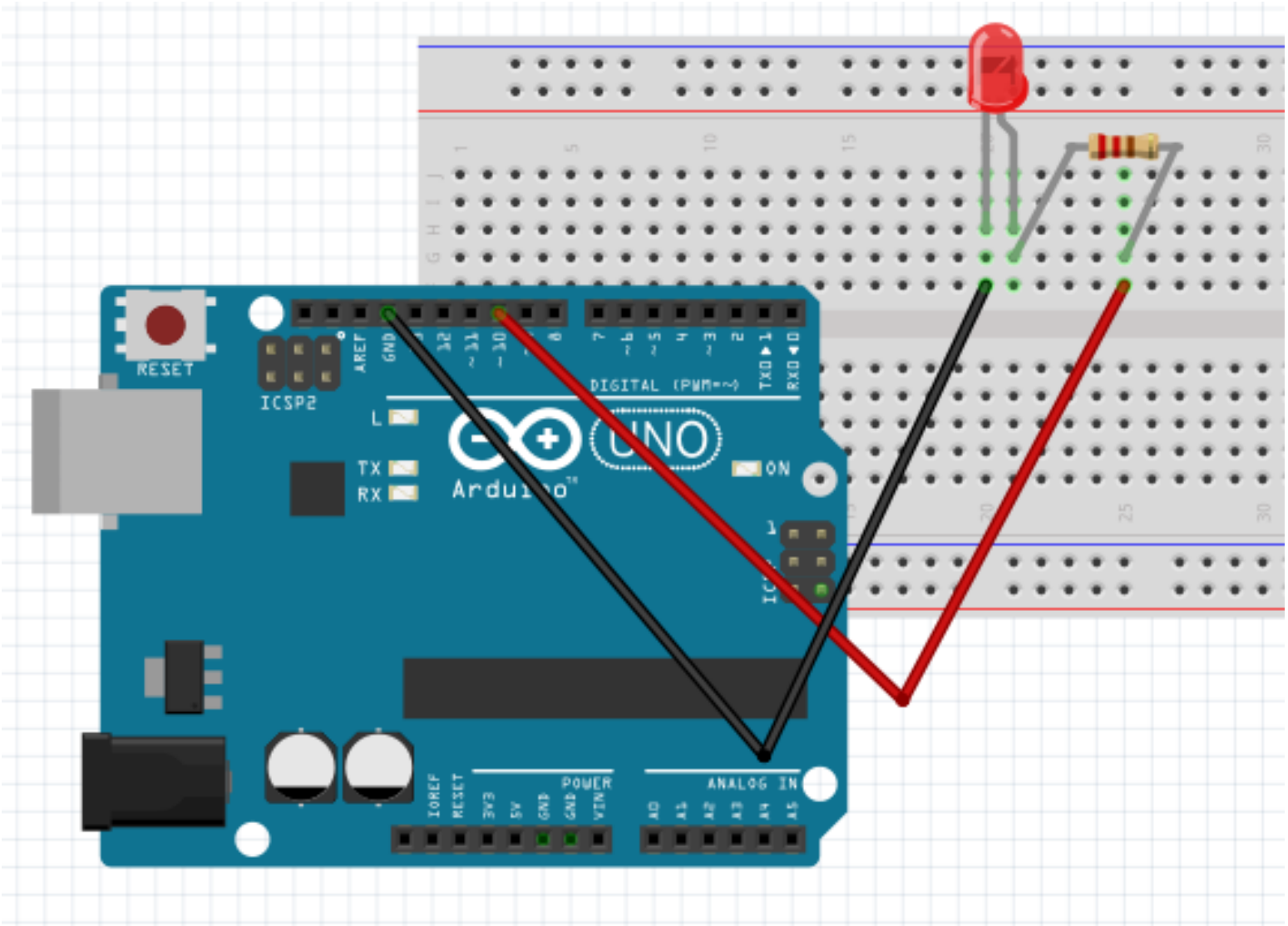



LED



LED_01


RESET
ICSP2
AREF
GND
DIGITAL (PWM=~)
TXD
RXD
L
TX
RX
UNO
ON
POWER
ANALOG IN
IOREF
RESET
3V3
5V
GND
VIN
A0
A1
A2
A3
A4
A5

LED_01

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 }
```

LED_02

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 }
```

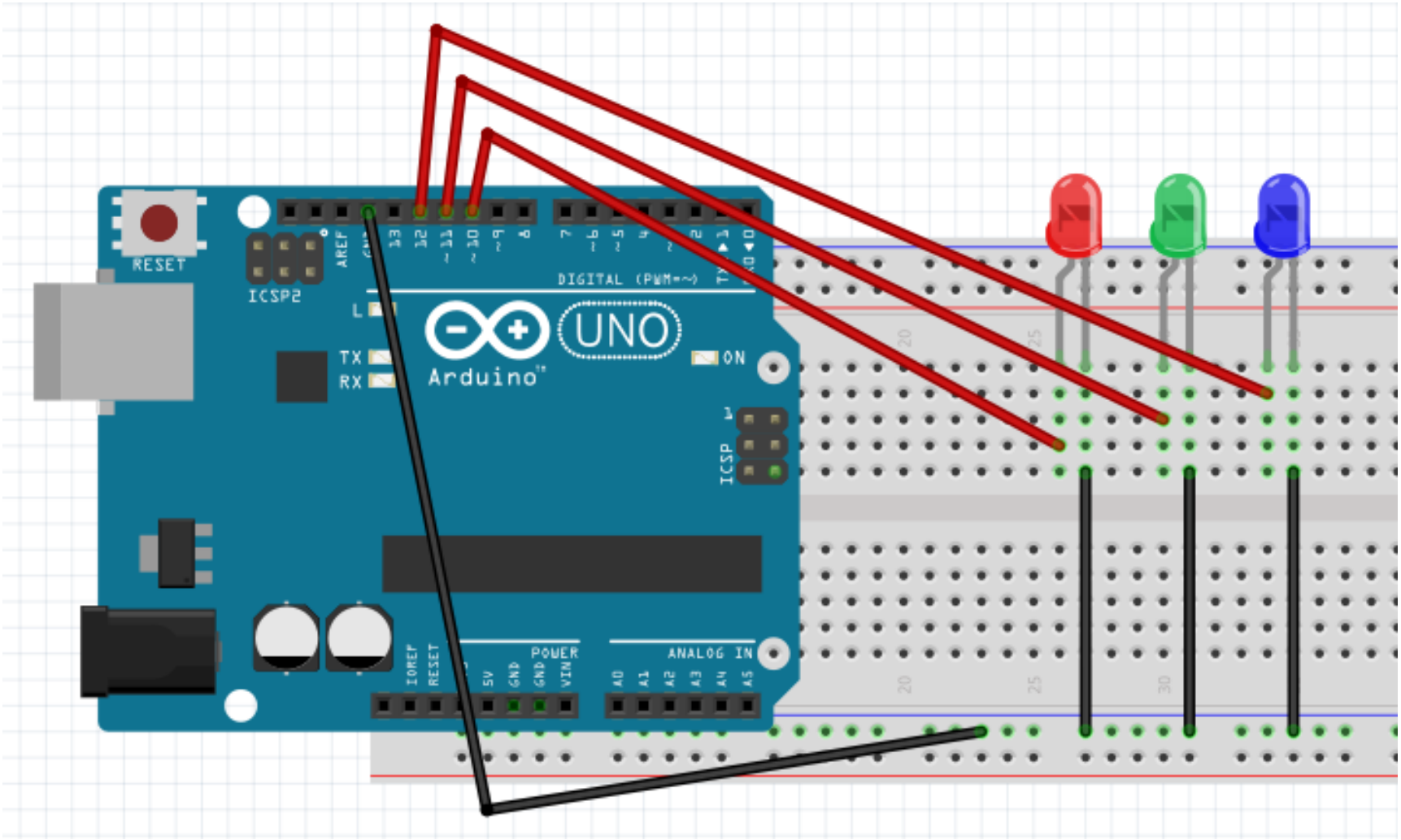
LED 켜기

0.5초 기다리기

LED 끄기

0.5초 기다리기

LED_10


RESET
ICSP2
AREF
DIGITAL (PWM~)
UNO
Arduino
TX
RX
ON
ICSP
POWER
ANALOG IN
IOREF
RESET
3V3
5V
GND
GND
VIN
A0
A1
A2
A3
A4
A5

LED_10

LED10

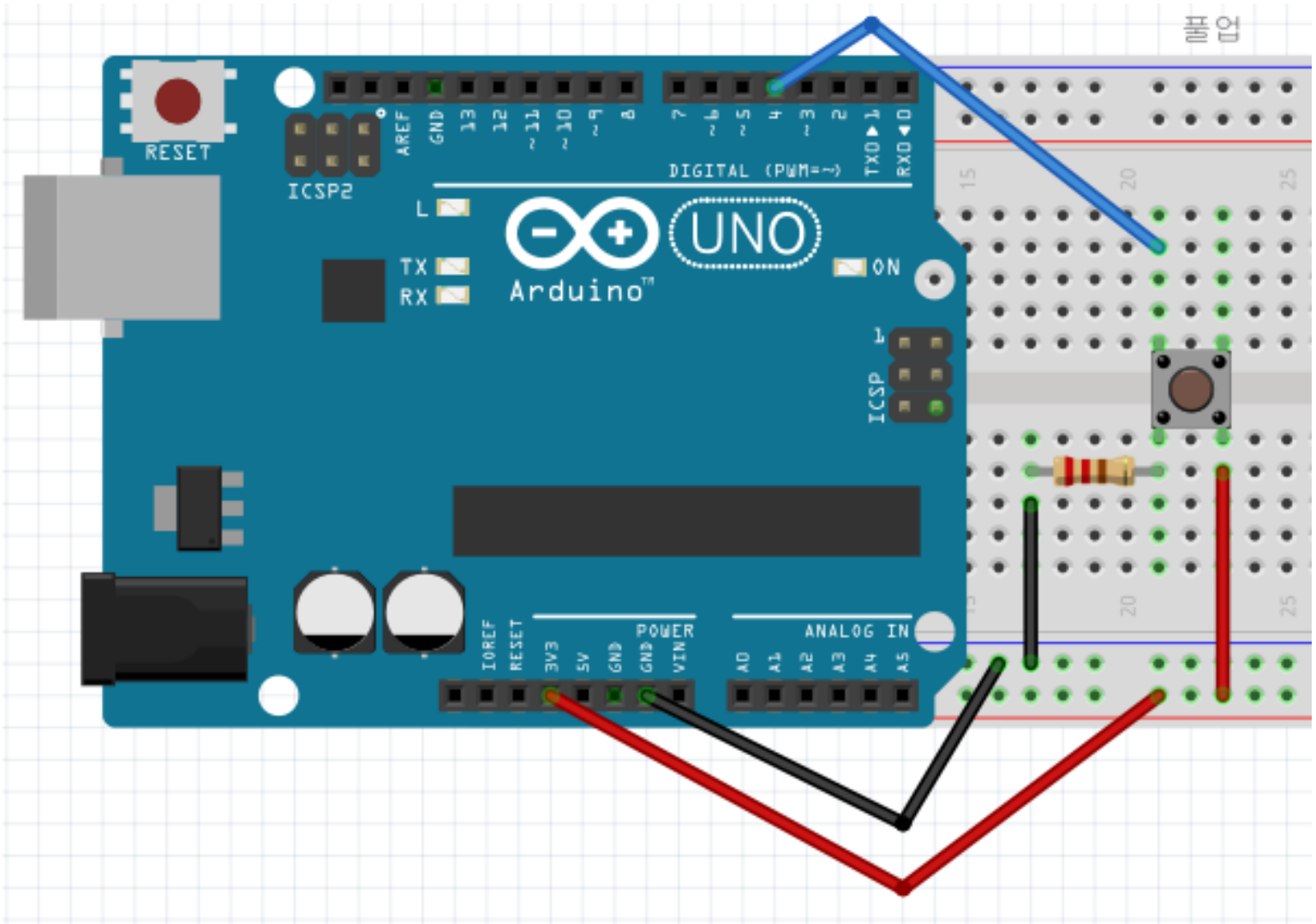
```
1  void setup()
2  {
3     pinMode(10, OUTPUT);
4     pinMode(11, OUTPUT);
5     pinMode(12, OUTPUT);
6  }
7
8  void loop()
9  {
10   digitalWrite(10, HIGH);
11   digitalWrite(11, LOW);
12   digitalWrite(12, LOW);
13   delay(500);
14   digitalWrite(10, LOW);
15   digitalWrite(11, HIGH);
16   digitalWrite(12,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

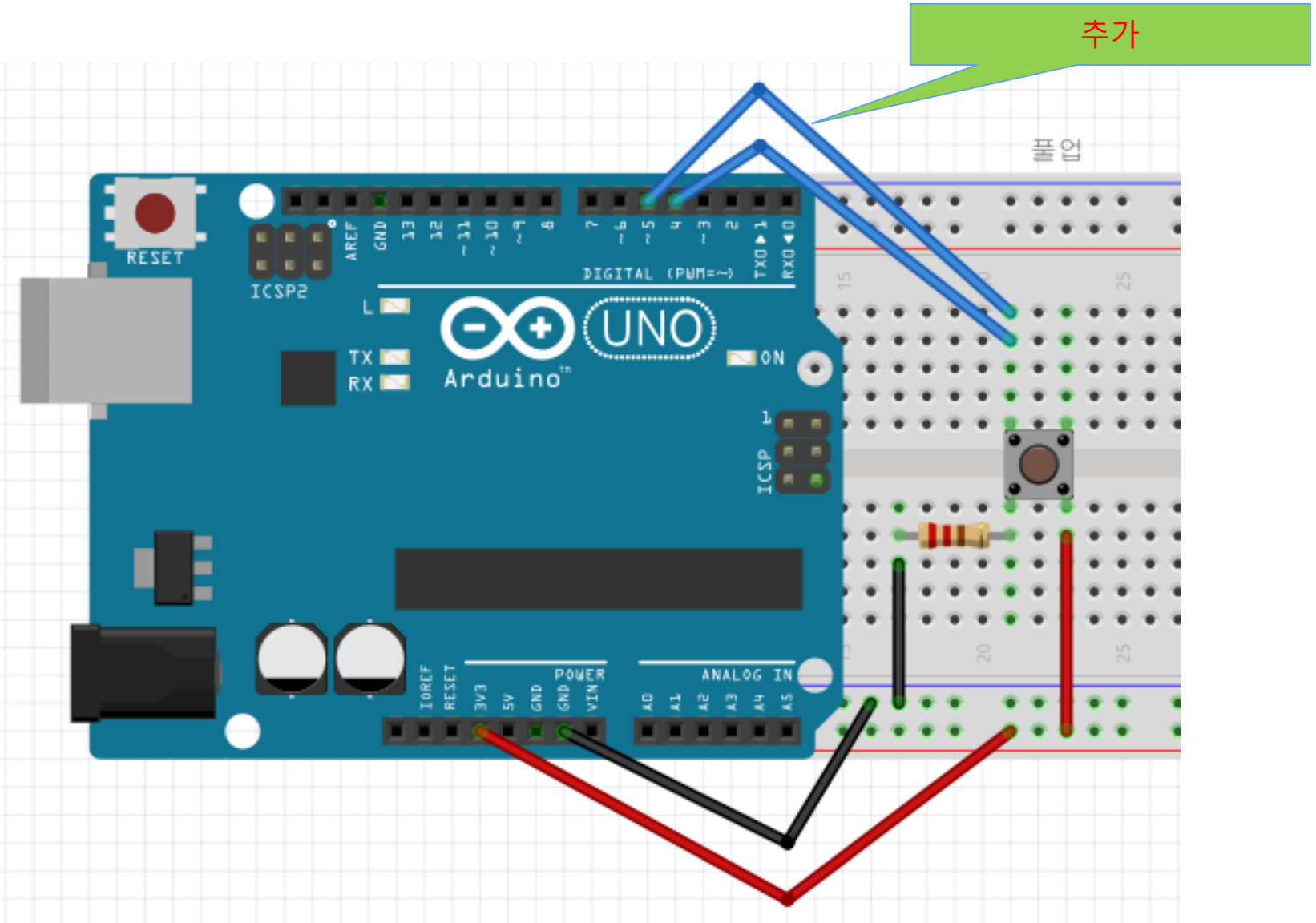
0.5초 기다리기

BTN01


RESET
ICSP2
AREF
GND
13
12
~11
~10
~9
8
7
~6
~5
4
~3
2
TX→1
RX←0
DIGITAL (PWM=~)
L
TX
RX
UNO
Arduino™
ON
ICSP
POWER
IOREF
RESET
3V3
5V
GND
GND
VIN
ANALOG IN
A0
A1
A2
A3
A4
A5

BUTTON2 §

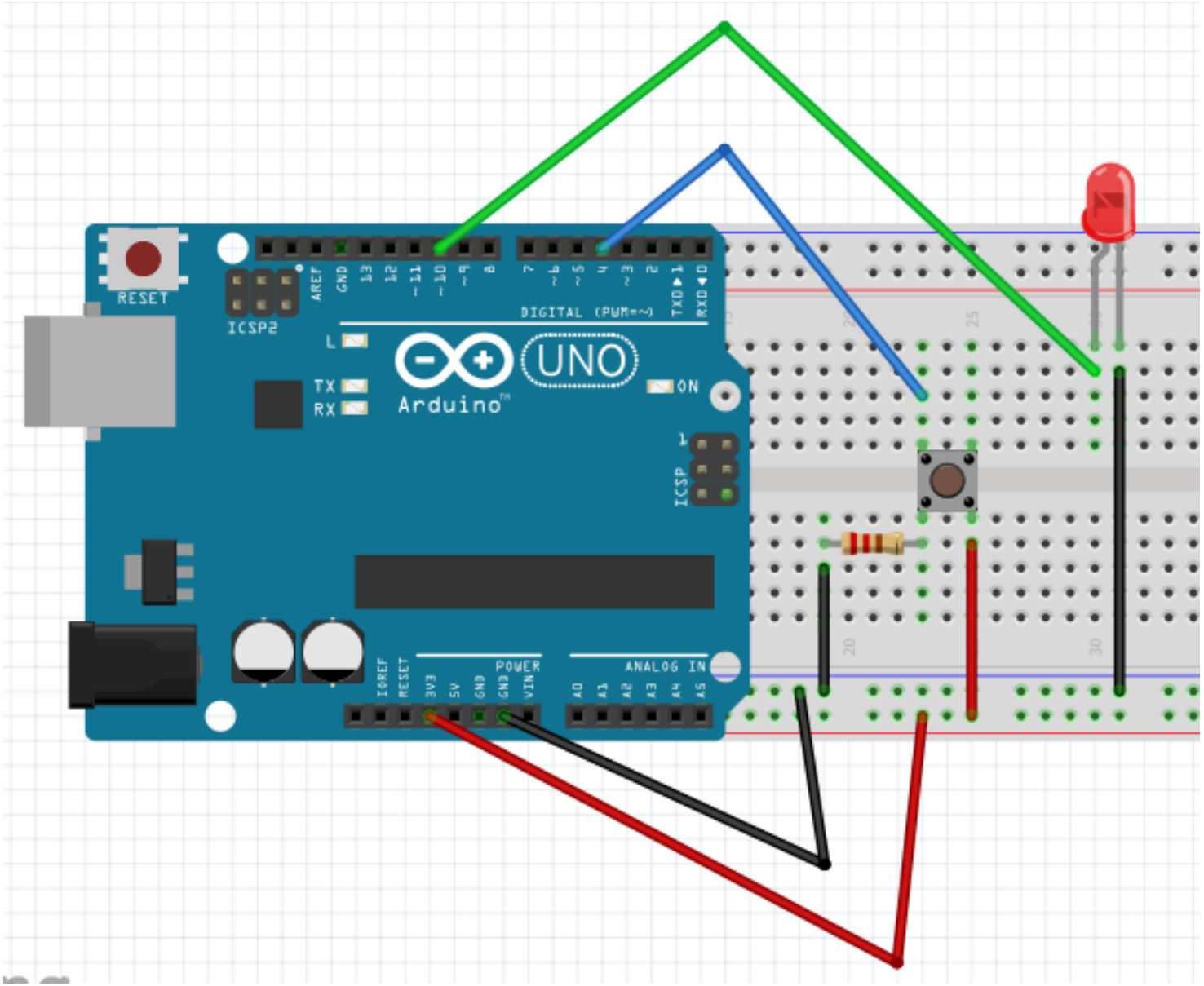
```
void setup()
{
  pinMode( 4, INPUT ); // Pull-up
  pinMode( 5, INPUT ); // Pull-down
  Serial.begin(9600);// 기본 시리얼 포트는 9600
}
// 화면 상단에 돋보기를 부르면 상태 모니터링됨
void loop()
{
  int nBtn4 = digitalRead(4); //4번 핀으로 부터 입력받는다.
  int nBtn5 = digitalRead(5);
  if (nBtn4 == LOW)
  {
    Serial.print("4 - LOW  ");
  }
  else
  {
    Serial.print("4 - HIGH ");
  }
  if (nBtn5 == HIGH)
  {
    Serial.print("5 - HIGH");
  }
  else
  {
    Serial.print("5 - LOW");
  }
  Serial.println(" ");
}
```


추가
풀업
RESET
ICSP2
AREF
GND
13
12
~11
~10
~9
8
7
~6
~5
4
~3
2
TX→1
RX←0
DIGITAL (PWM=~)
L
TX
RX
Arduino
UNO
ON
ICSP
POWER
ANALOG IN
IOREF
RESET
3V3
5V
GND
GND
VIN
A0
A1
A2
A3
A4
A5

BUTTON2 §

```
void setup()
{
  pinMode( 4, INPUT ); // Pull-up
  pinMode( 5, INPUT ); // Pull-down
  Serial.begin(9600);// 기본 시리얼 포트는 9600
}
// 화면 상단에 돋보기를 부르면 상태 모니터링됨
void loop()
{
  int nBtn4 = digitalRead(4); //4번 핀으로 부터 입력받는다.
  int nBtn5 = digitalRead(5);
  if (nBtn4 == LOW)
  {
    Serial.print("4 - LOW  ");
  }
  else
  {
    Serial.print("4 - HIGH ");
  }
  if (nBtn5 == HIGH)
  {
    Serial.print("5 - HIGH");
  }
  else
  {
    Serial.print("5 - LOW");
  }
  Serial.println(" ");
}
```

BTN02


RESET
ICSP2
AREF
GND
13
12
~11
~10
~9
8
7
~6
~5
4
~3
2
TX→1
RX←0
DIGITAL (PWM=~)
L
TX
RX
UNO
Arduino™
ON
ICSP
POWER
IOREF
RESET
3V3
5V
GND
GND
VIN
ANALOG IN
A0
A1
A2
A3
A4
A5

BTN02

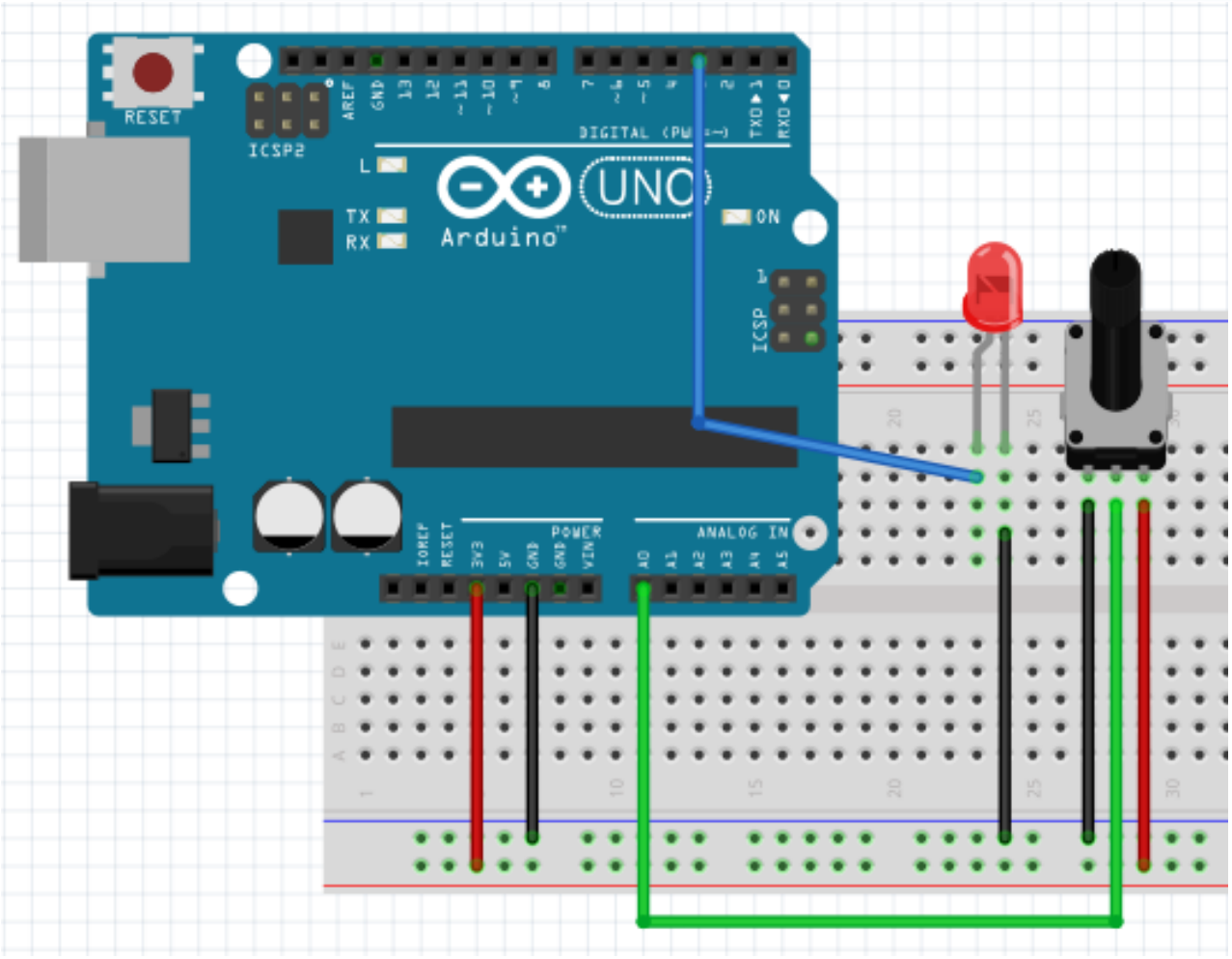
BUTTON02§

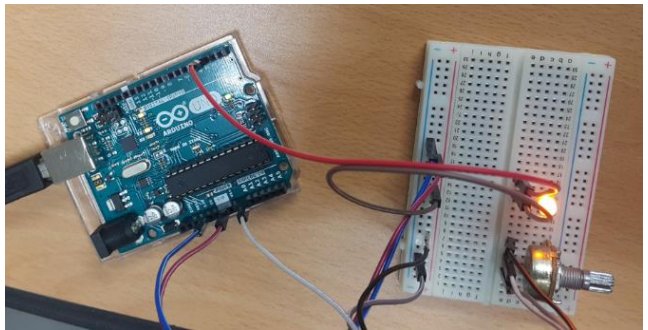
```
1  void setup()
2  {
3    pinMode(10, OUTPUT);
4    pinMode(4, INPUT);
5  }
6
7  void loop()
8  {
9    int nBtn4 = digitalRead(4);
10
11   if (nBtn4 == LOW)
12   {
13     digitalWrite(10, LOW);
14   }
15   else
16   {
17     digitalWrite(10, HIGH);
18   }
19 }
```

4 입력
10 출력

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

가변저항1

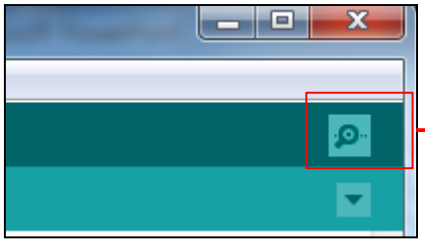

RESET
ICSP2
L
TX
RX
ON
ICSP
UNO
Arduino
DIGITAL (PWM~)
POWER
ANALOG IN

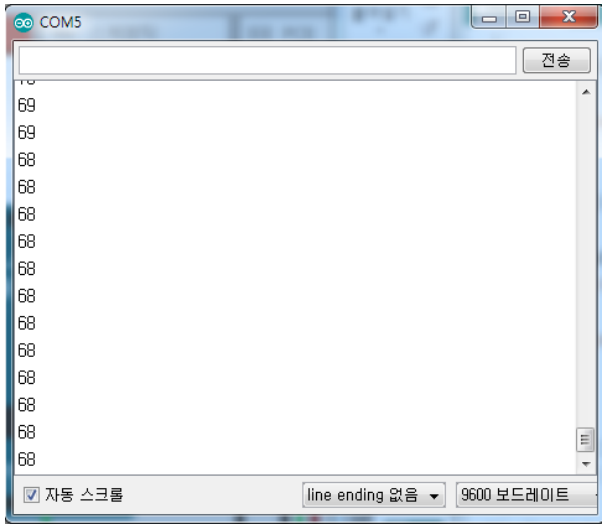


가변저항1

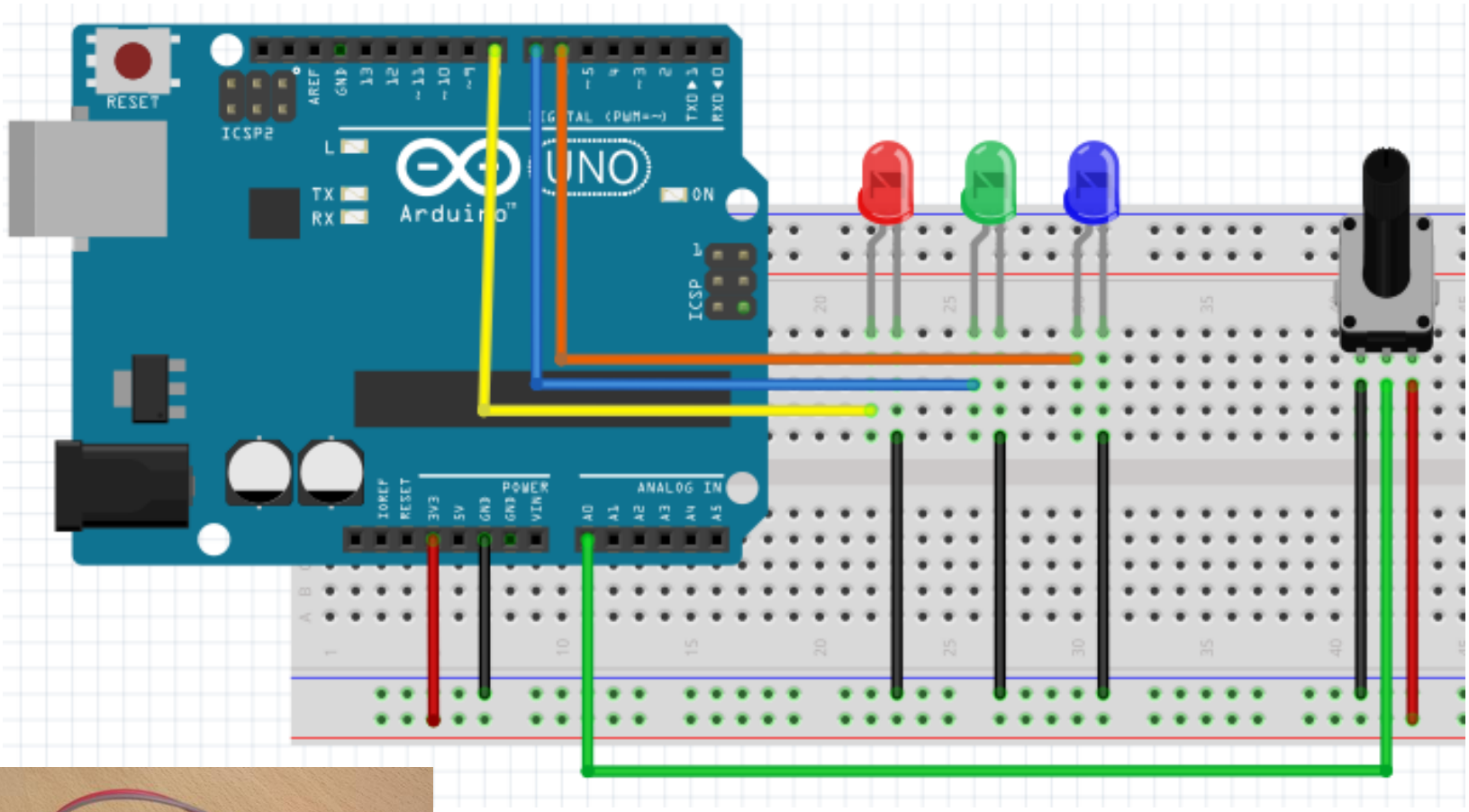
RESIST1

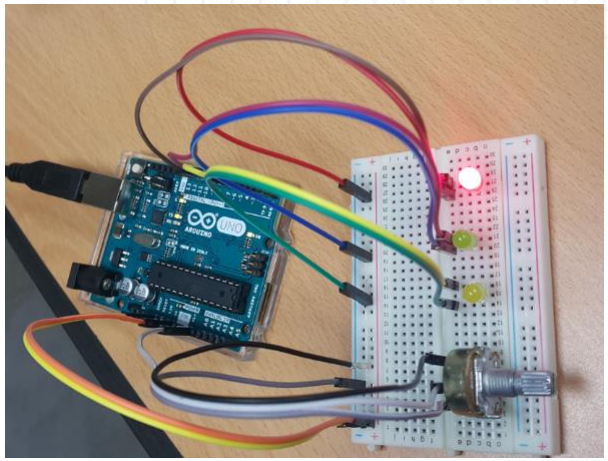
```
1
2  void setup()
3  {
4    Serial.begin(9600);
5  }
6
7  void loop()
8  {
9    int nRead = analogRead(A0); //저항값을 A0에서 읽어옴.
10   analogWrite(3,nRead/3 ); //임시로, 255값으로 변환가기 위해 연산함. 685?정도..나옴, 실제 LED 표시가 어렵기때문에 임시로.
11   Serial.println(nRead);
12 }
```





가변저항2


RESET
ICSP2
L
TX
RX
ON
ICSP
POWER
ANALOG IN
IOREF
RESET
3V3
5V
GND
GND
VIN
A0
A1
A2
A3
A4
A5
TXD
RXD

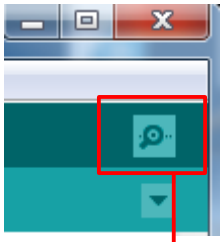


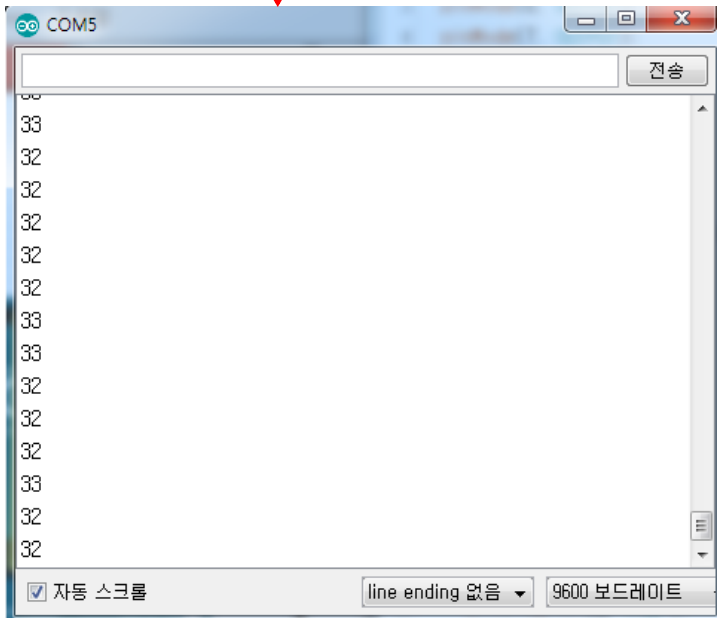
가변저항 2

RESIST2

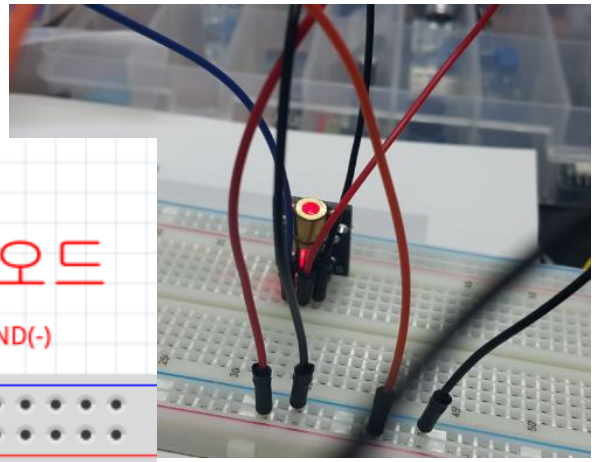
```
1  void setup()
2  {
3    pinMode(6, OUTPUT);
4    pinMode(7, OUTPUT);
5    pinMode(8, OUTPUT);
6    Serial.begin(9600);
7  }
8  void loop()
9  {
10   int nRead = analogRead(A0);
11   Serial.println(nRead);
12   if (nRead < 85)
13   {
14     digitalWrite(6, HIGH);
15     digitalWrite(7, LOW );
16     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 }
```

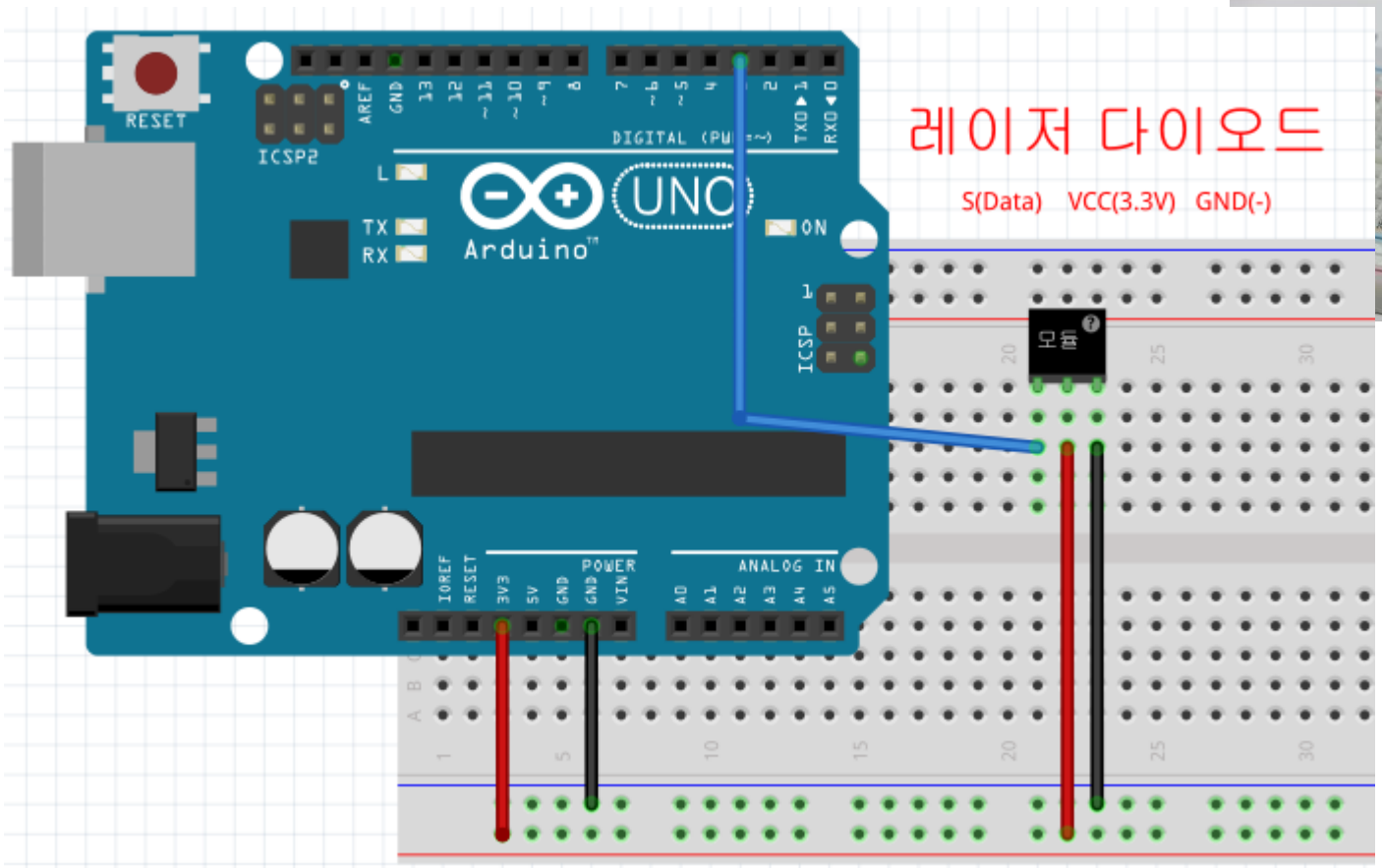
- 85보다 작으면 6 켜기
- 170보다 작으면 7켜기
- 그 외는 8켜기





참고혀요!




레이저 다이오드
S(Data) VCC(3.3V) GND(-)
모듈
RESET
ICSP2
UNO
Arduino
TX
RX
ON
ICSP
DIGITAL
POWER
ANALOG IN

모듈 18

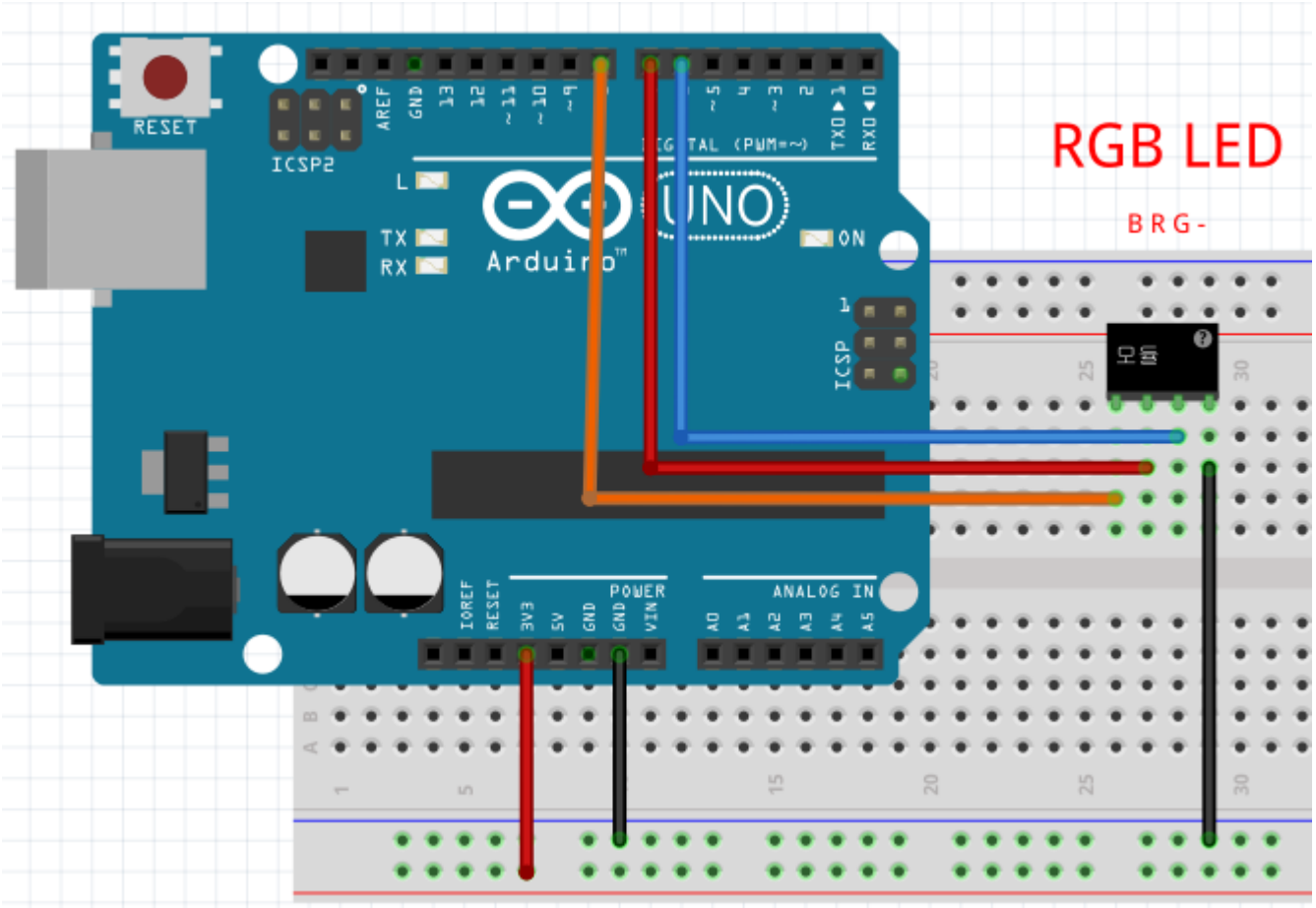
레이저1

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

참고혀요!



모듈 19

RGB1

RGB1

```
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 }
```

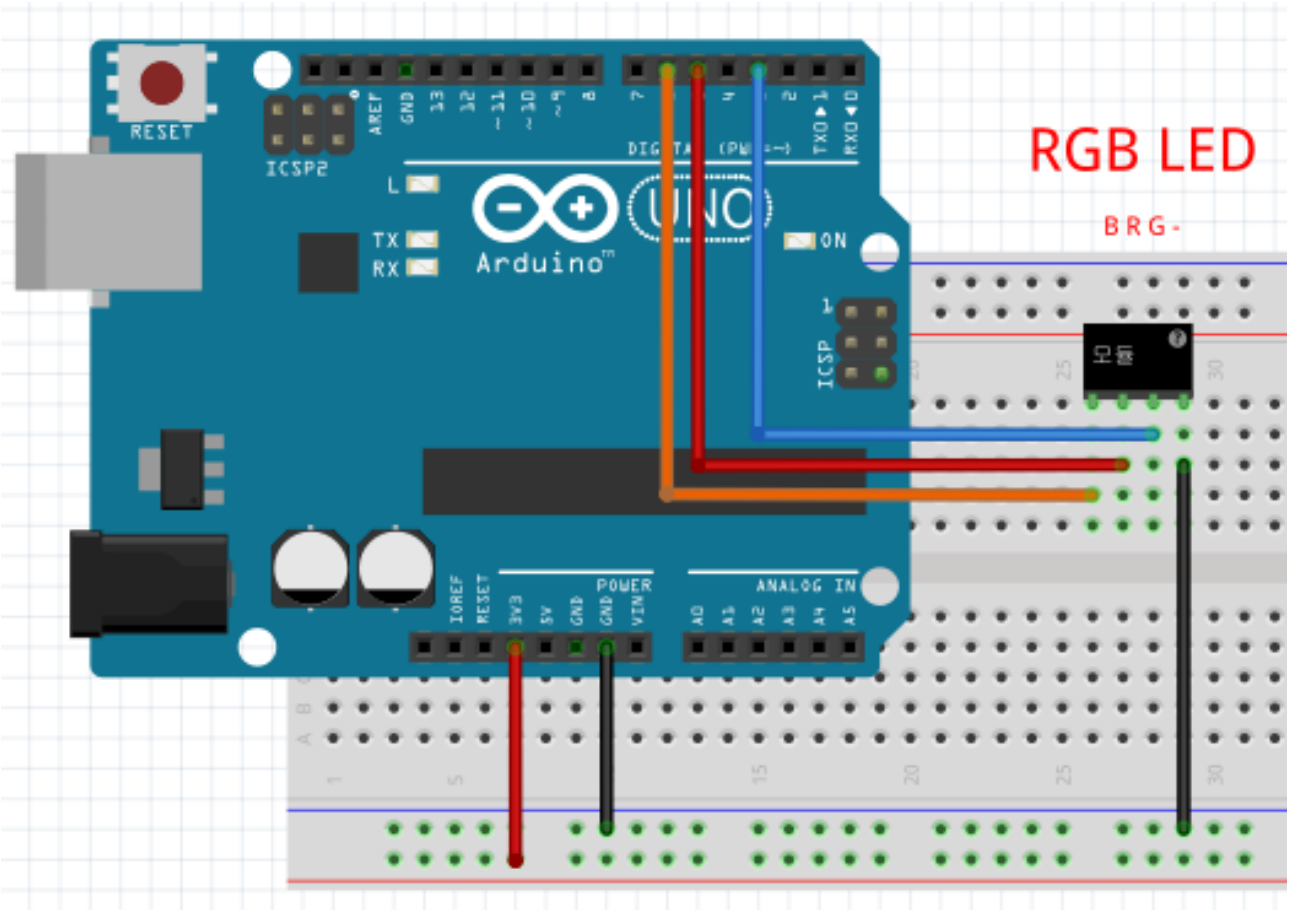
RGB1

```
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 순서로 출력

```
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 }
```

참고혀요!


RGB LED
BRG-
RESET
ICSP2
Arduino
UNO
ON
TX
RX
ICSP
모듈
POWER
ANALOG IN

모듈 19

RGB2

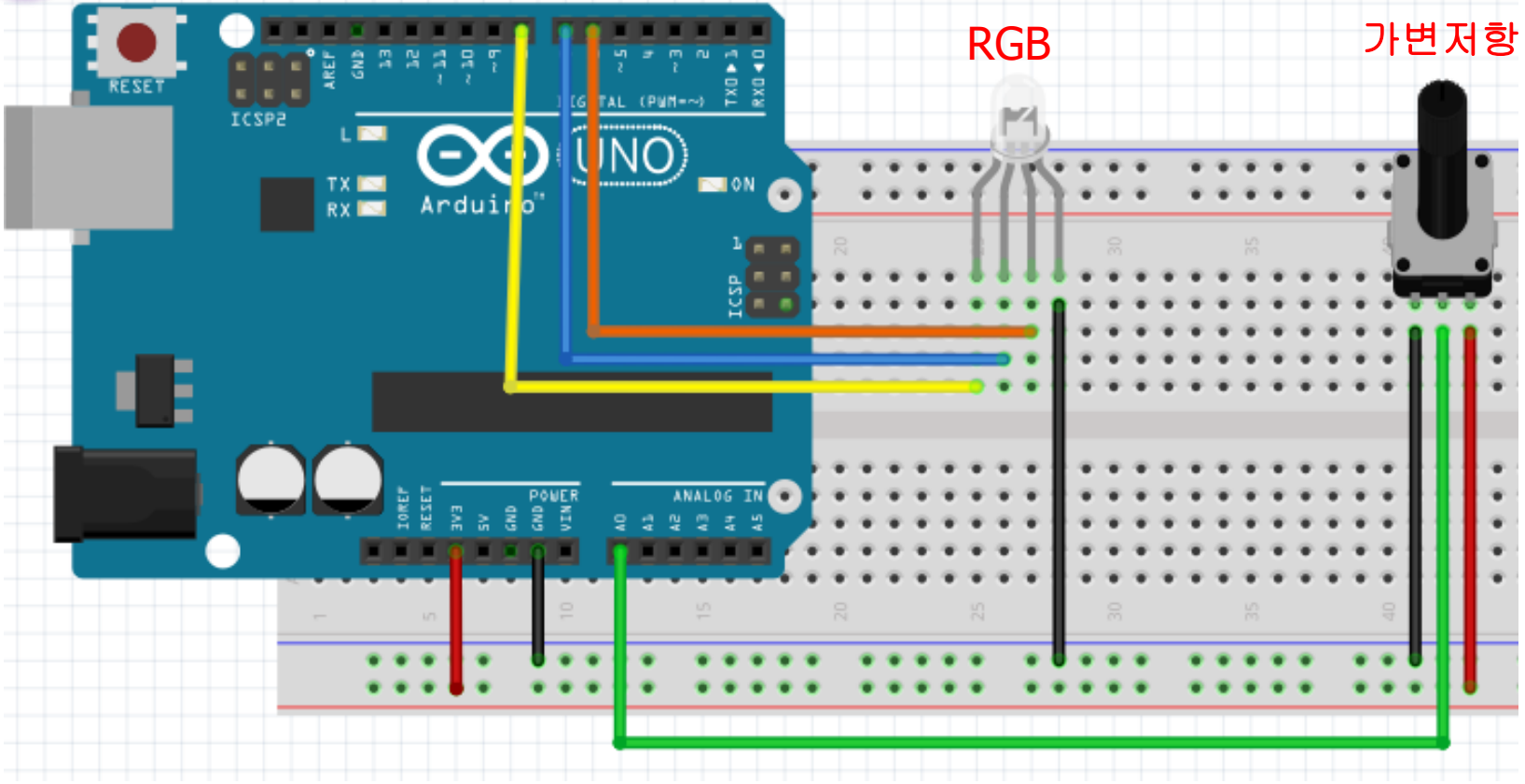
RGB2

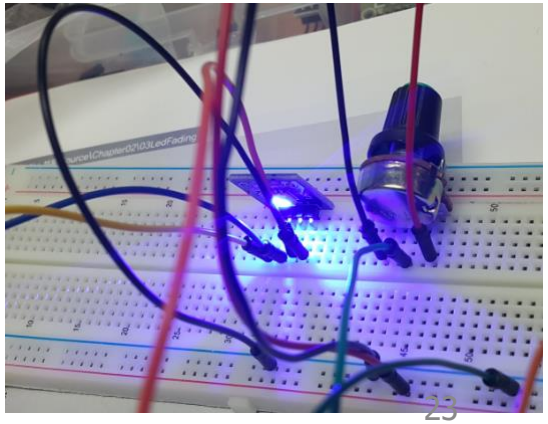
```
1  void setup()
2  {
3  }
4  int nG = 3;
5  int nR = 5;
6  int nB = 6;
7  void loop()
8  {
9    for (int g = 0; g < 255; g += 10)
10   {
11     for (int r = 0; r < 255; r += 10)
12     {
13       for (int b = 0; b < 255; b += 10)
14       {
15         analogWrite(nG, g);
16         analogWrite(nR,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

- 0.1로 색상 변경

RGB3

참고혀요!


RGB
가변저항
RESET
ICSP2
UNO
Arduino
TX
RX
ON
ICSP
POWER
ANALOG IN



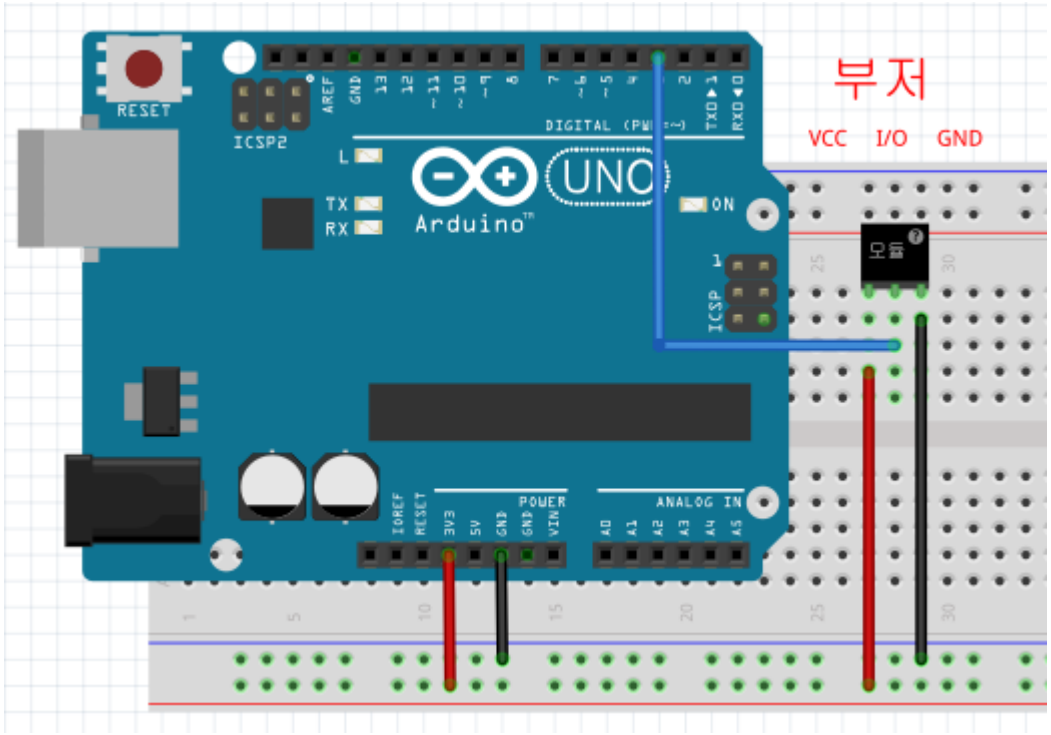
RGB3

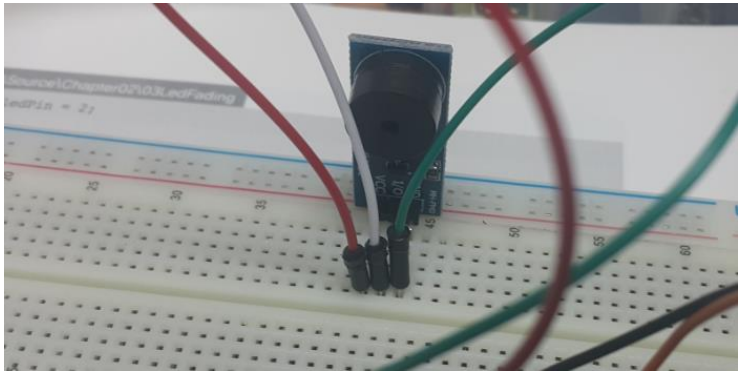
RGB3

```
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**


부저
VCC I/O GND
RESET
ICSP2
UNO
Arduino
TX
RX
ON
ICSP
POWER
ANALOG IN
모듈




GND
I/O
VCC

부저1

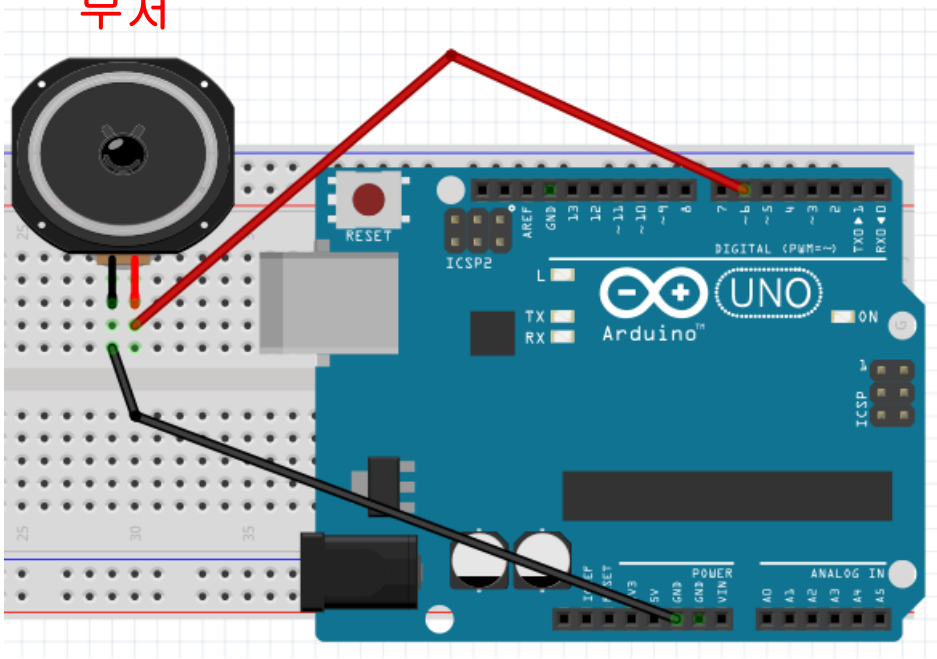
BUZZER1

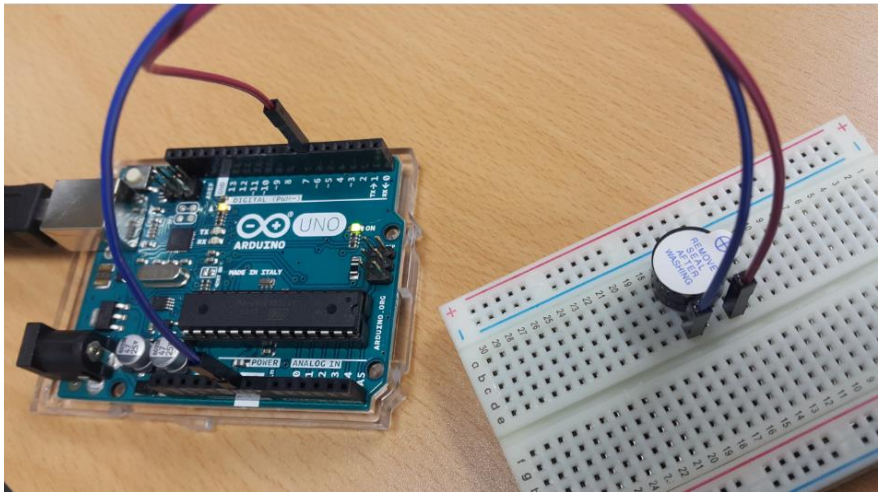
```
1
2  void setup()
3  {
4    pinMode(3, OUTPUT);
5  }
6
7  void loop()
8  {
9    digitalWrite(3, HIGH);
10   delay(1);
11   digitalWrite(3, LOW);
12   delay(1);
13 }
```

삐~~~~~

부품 부저

부저

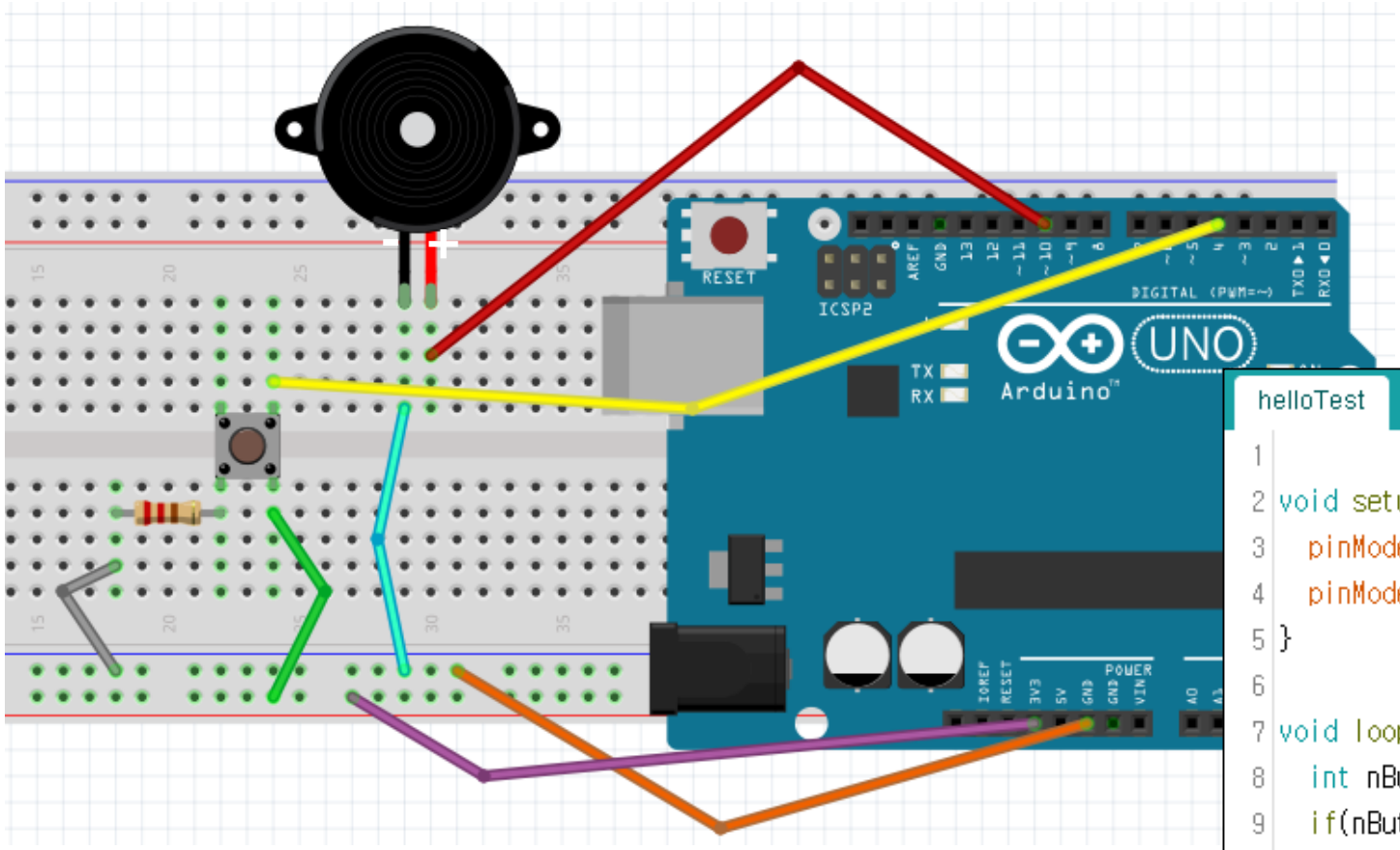




helloTest

```
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 }
```

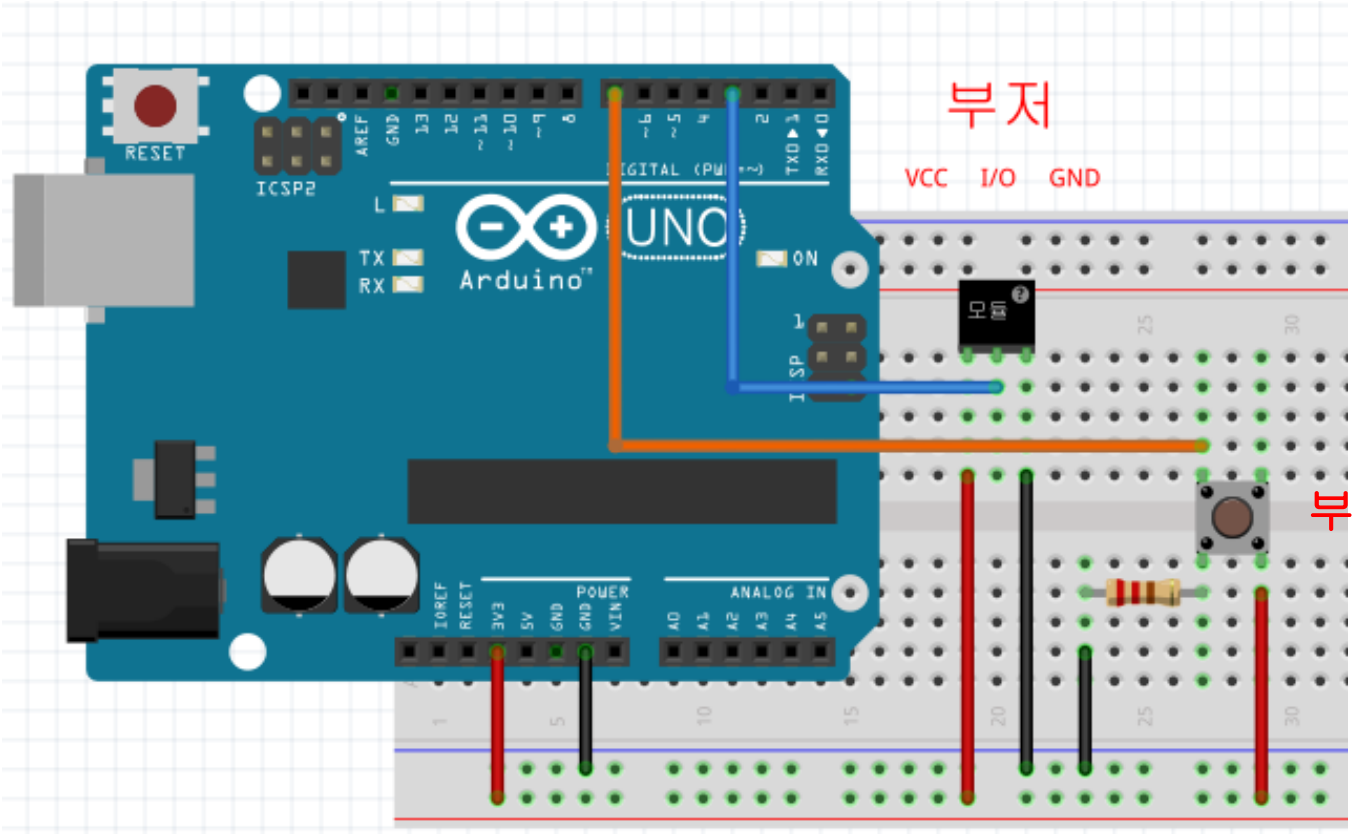
부품 부저2

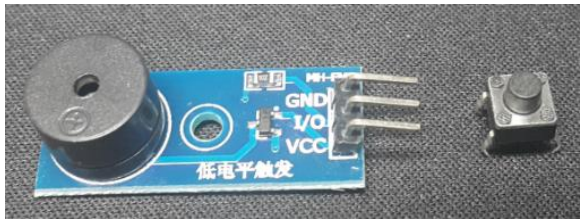


helloTest

```
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 }
```

모듈 부저3


부저
VCC I/O GND
RESET
ICSP2
Arduino
UNO
POWER
ANALOG IN
부품4(버튼)


GND
I/O
VCC
低电平触发

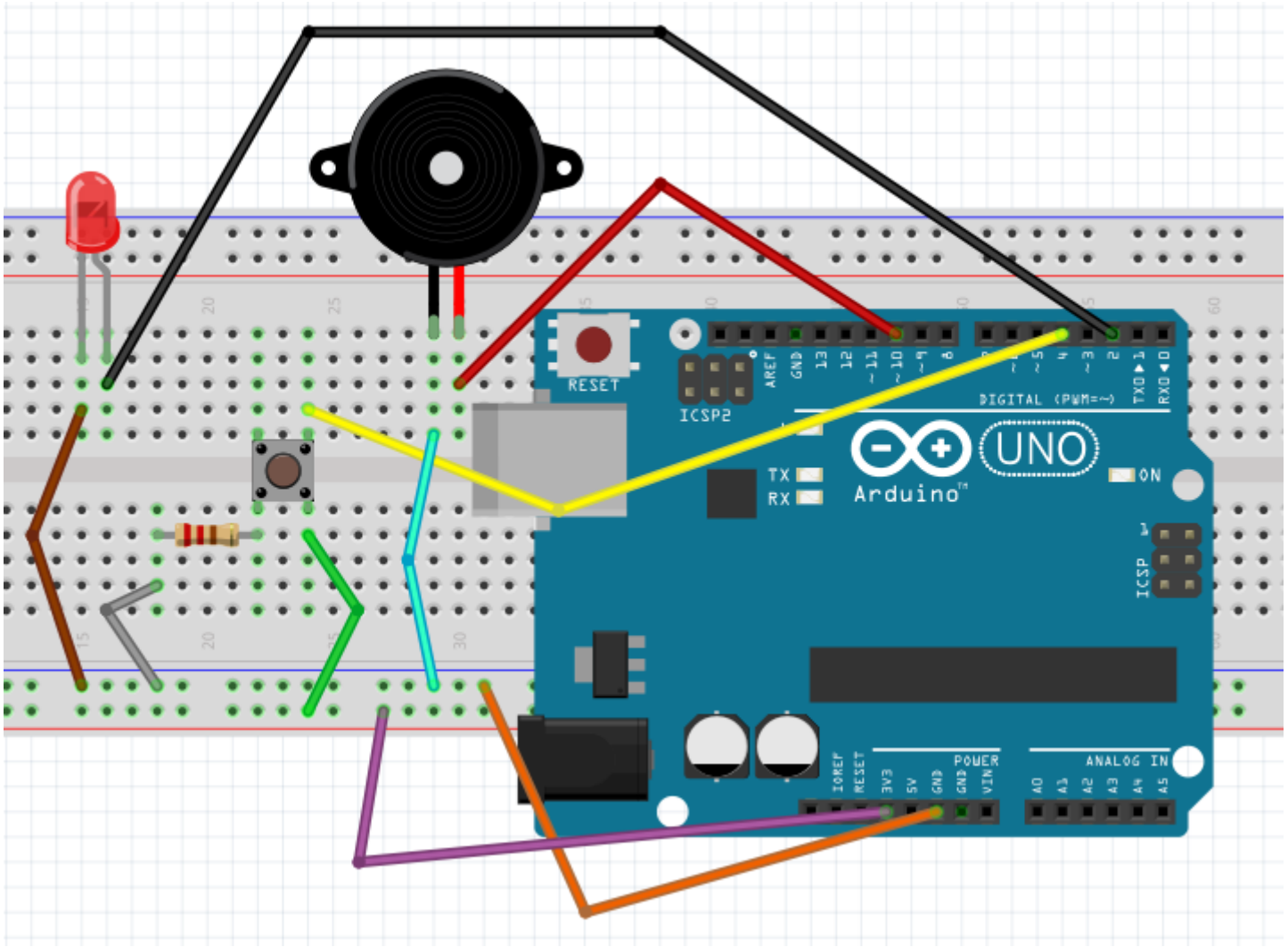
부저2

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~~"

부품 부저

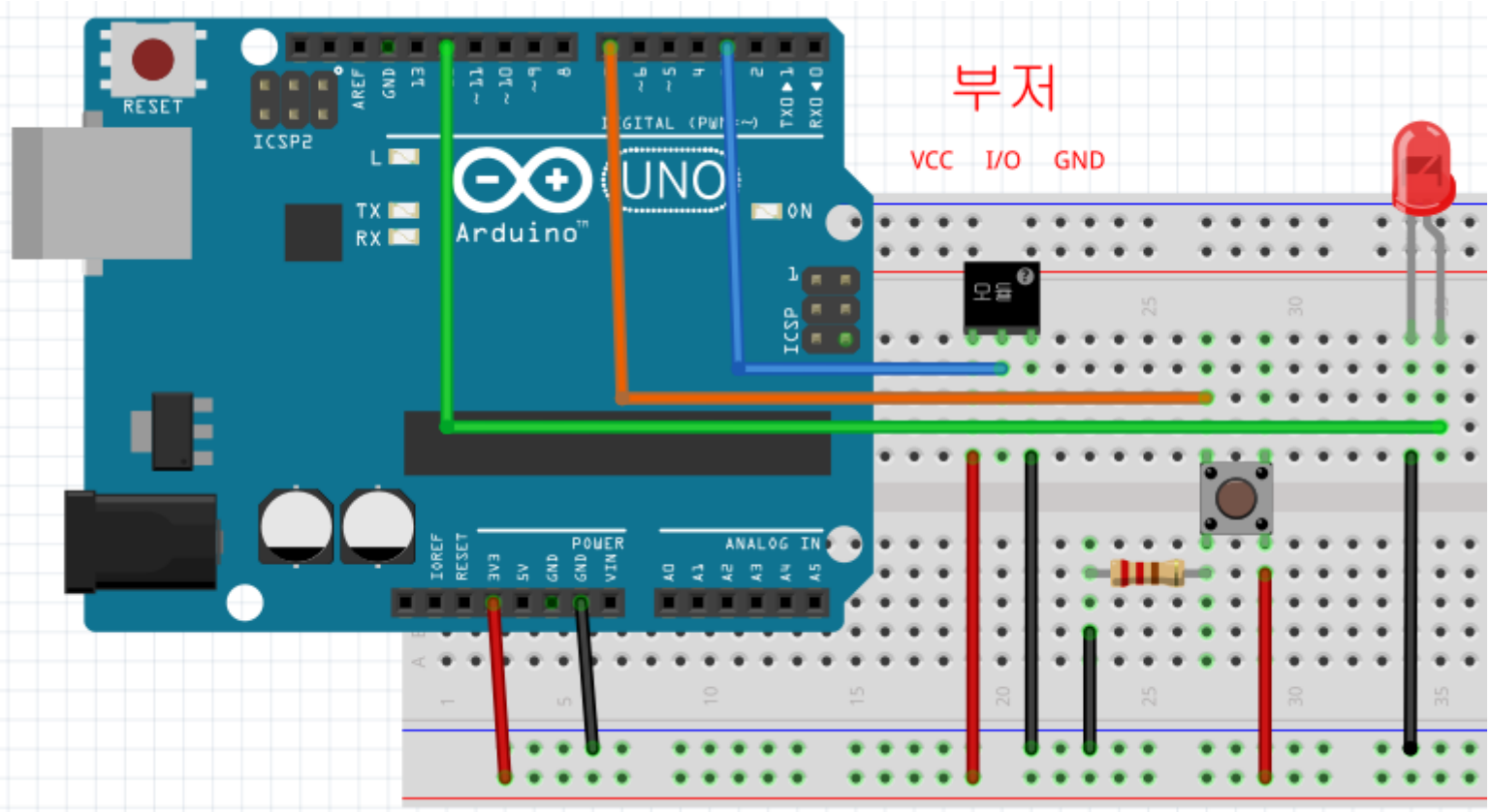

RESET
ICSP2
AREF
GND
13
12
~11
~10
~9
8
7
~6
~5
4
~3
2
TX→1
RX←0
DIGITAL (PWM=~)
TX
RX
UNO
Arduino™
ON
ICSP
POWER
ANALOG IN
IOREF
RESET
3V3
5V
GND
GND
VIN
A0
A1
A2
A3
A4
A5

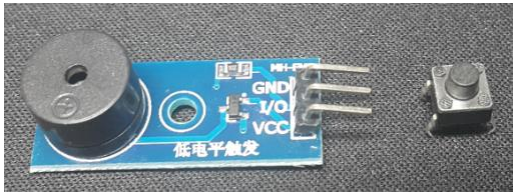
버튼을 이용한 LED켜기과 부저 울리기

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 }
```

모듈 부저3


부저
VCC I/O GND
RESET
ICSP2
UNO
Arduino
ON
POWER
ANALOG IN


GND
I/O
VCC

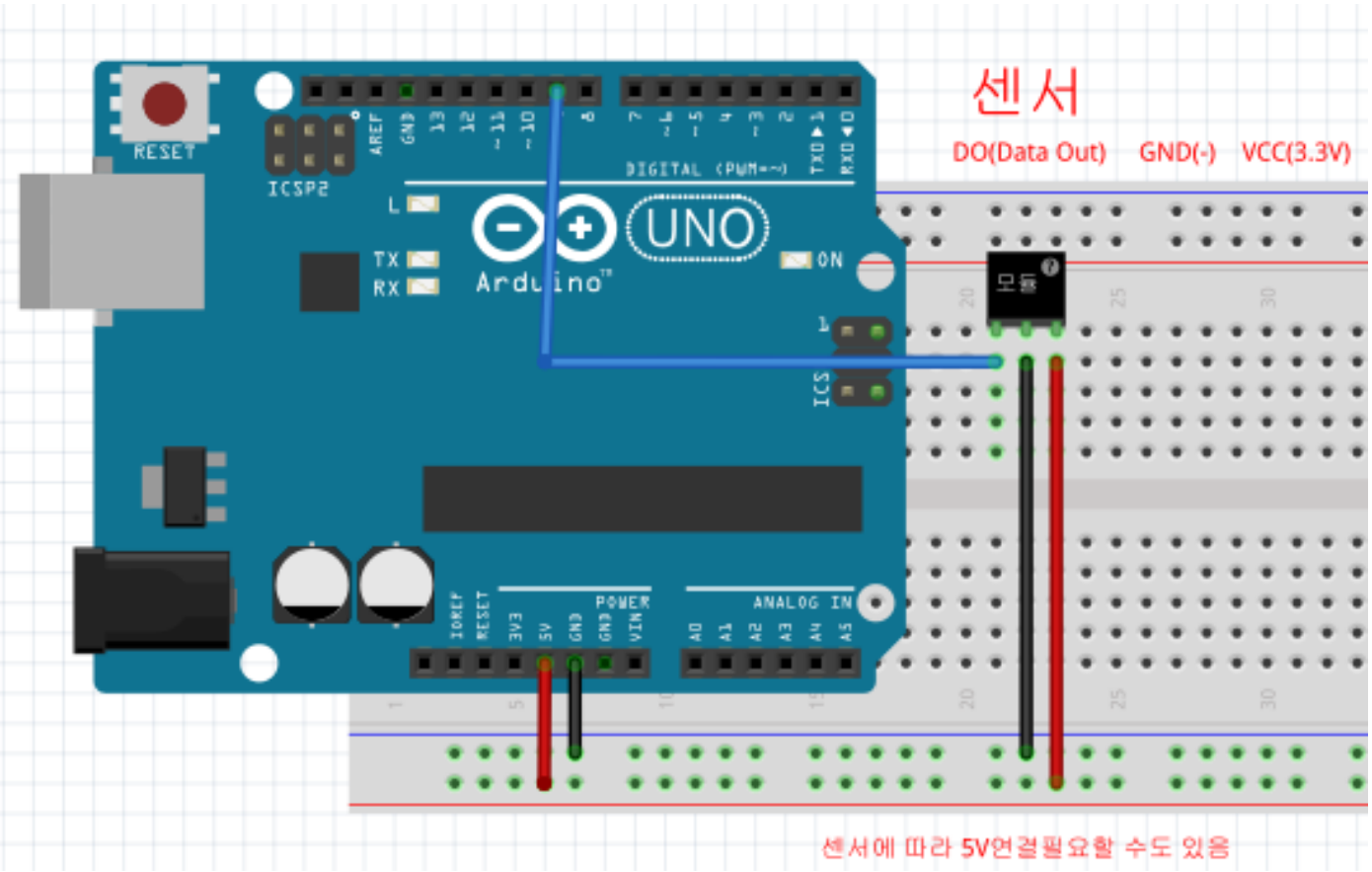
모듈 부저3

BUZZER3

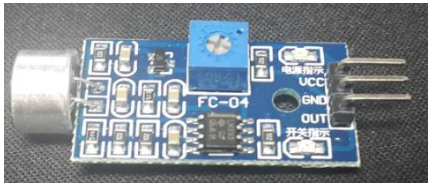
```
void DUBeep()
{
  digitalWrite(3, HIGH);
  delay(1);
  digitalWrite(3, LOW);
  delay(1);
}
void setup()
{
  pinMode(3, OUTPUT);
  pinMode(7, INPUT);

  pinMode(12, OUTPUT);
}
void loop()
{
  int nButton = digitalRead(7);
  if (nButton != LOW)
  {
    DUBeep();
    digitalWrite(12, HIGH);
  }
  else
  {
    digitalWrite(12, LOW);
  }
}
```

- 버튼을 누르면 "띠~~" & LED On

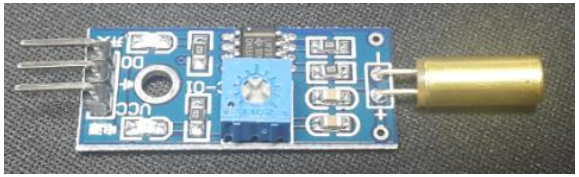
디지털 센서



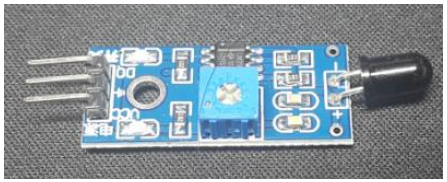
사운드(모듈9)



틸트(모듈6)



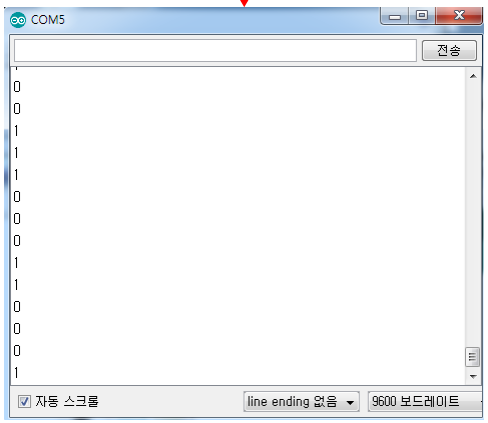
화염(모듈10)



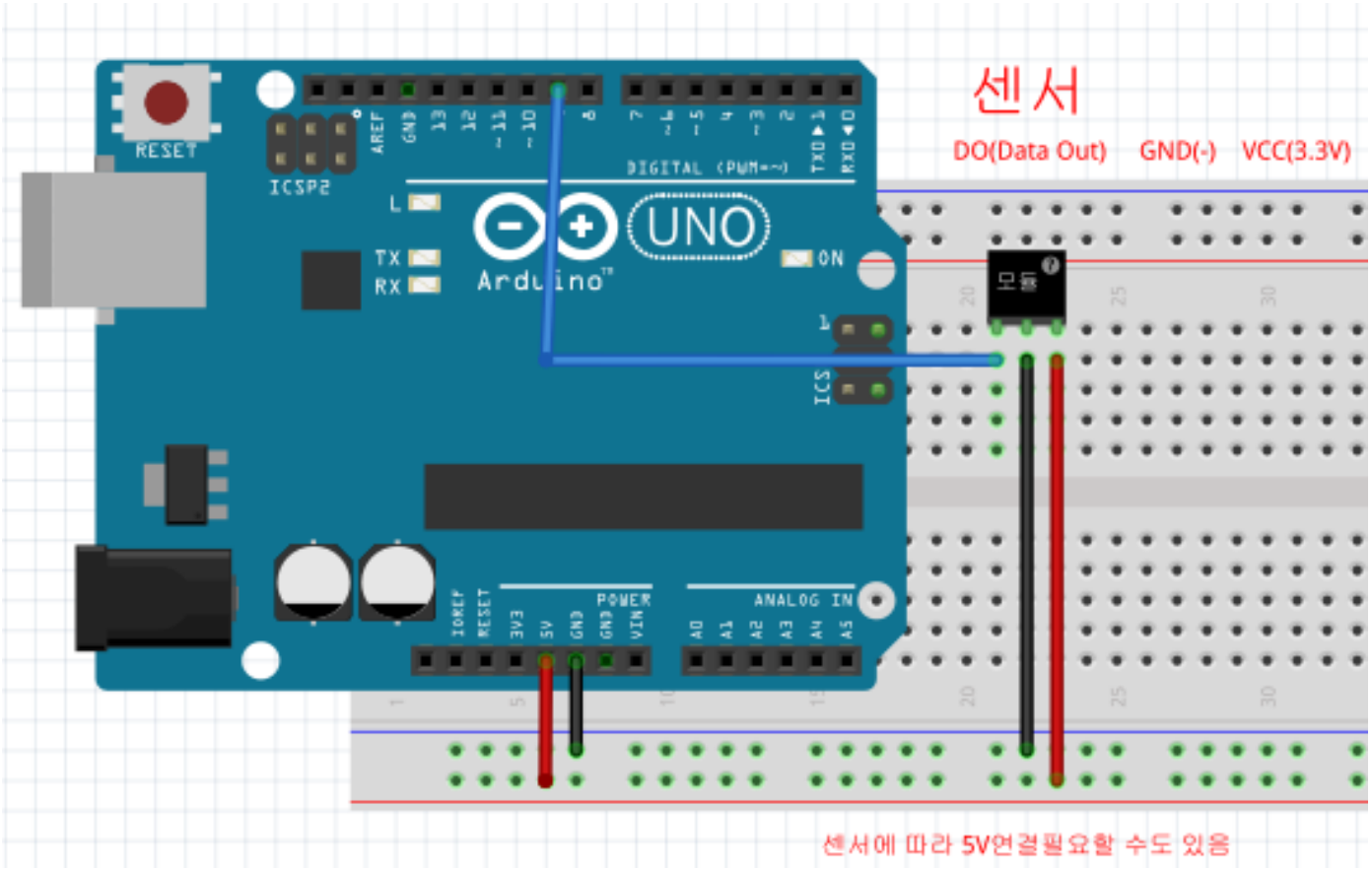
Sensor1

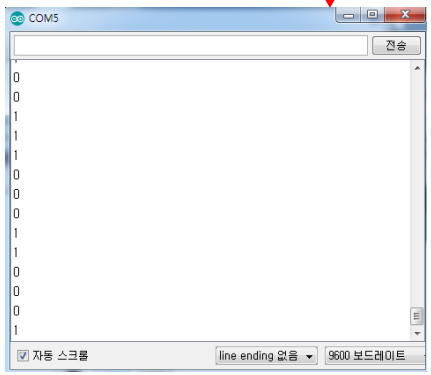
```
1  void setup()
2  {
3    pinMode(9, INPUT);
4    Serial.begin(9600);
5  }
6
7  void loop()
8  {
9    int nData = digitalRead(9);
10   Serial.println(nData);
11 }
```

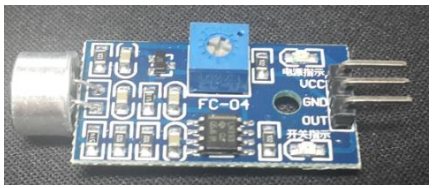
- 9 로 입력 받음

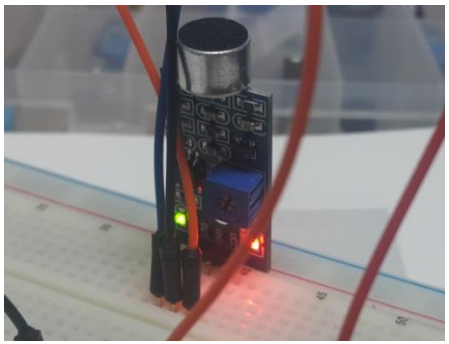


센서(사운드)


센서
DO(Data Out) GND(-) VCC(3.3V)
RESET
ICSP2
UNO
Arduino
ON
TX
RX
POWER
ANALOG IN
모듈
센서에 따라 5V연결필요할 수도 있음

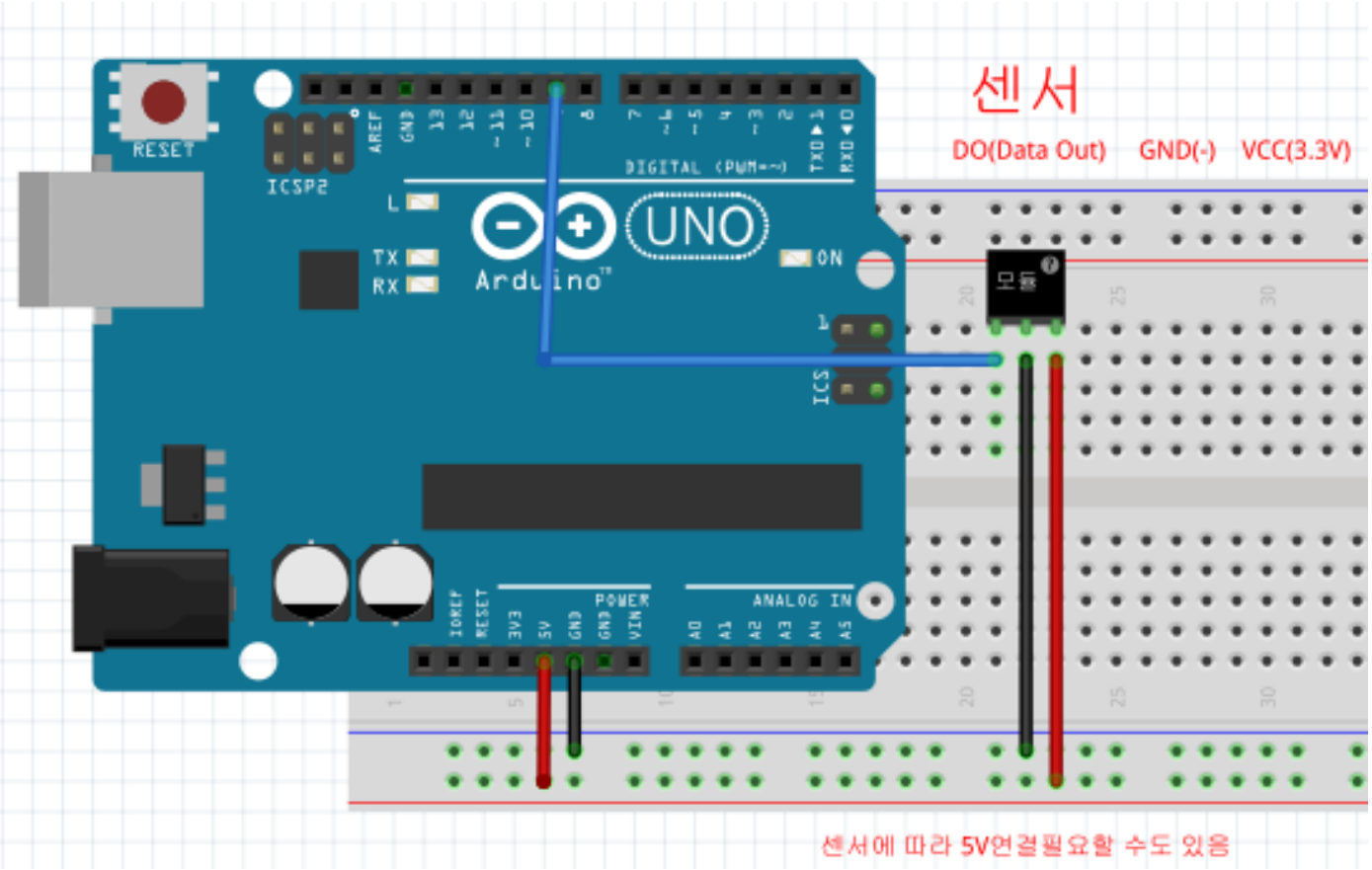

COM5
전송
0
0
1
1
1
0
0
0
1
1
0
0
0
1
자동 스크롤
line ending 없음
9600 보드레이트

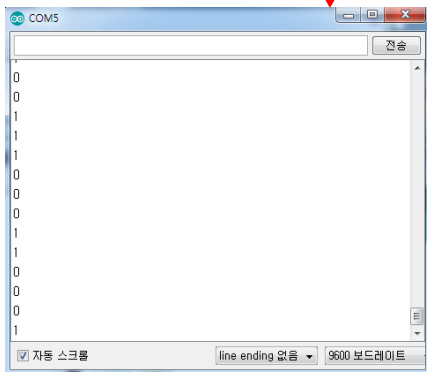

FC-04
VCC
GND
OUT

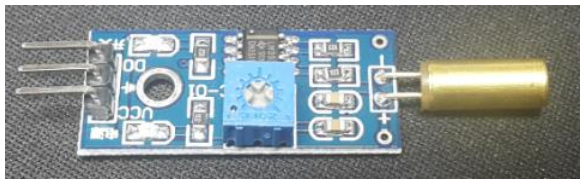


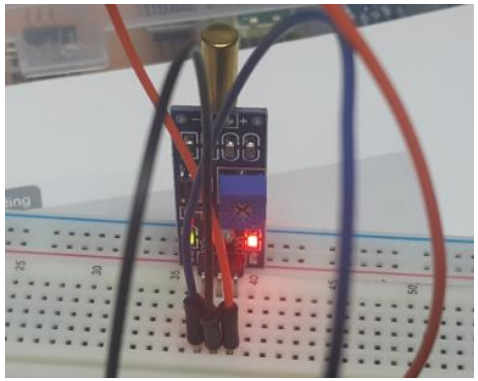
모듈 **9**

센서(틸트)


센서
DO(Data Out) GND(-) VCC(3.3V)
UNO
Arduino
모듈
센서에 따라 5V연결필요할 수도 있음

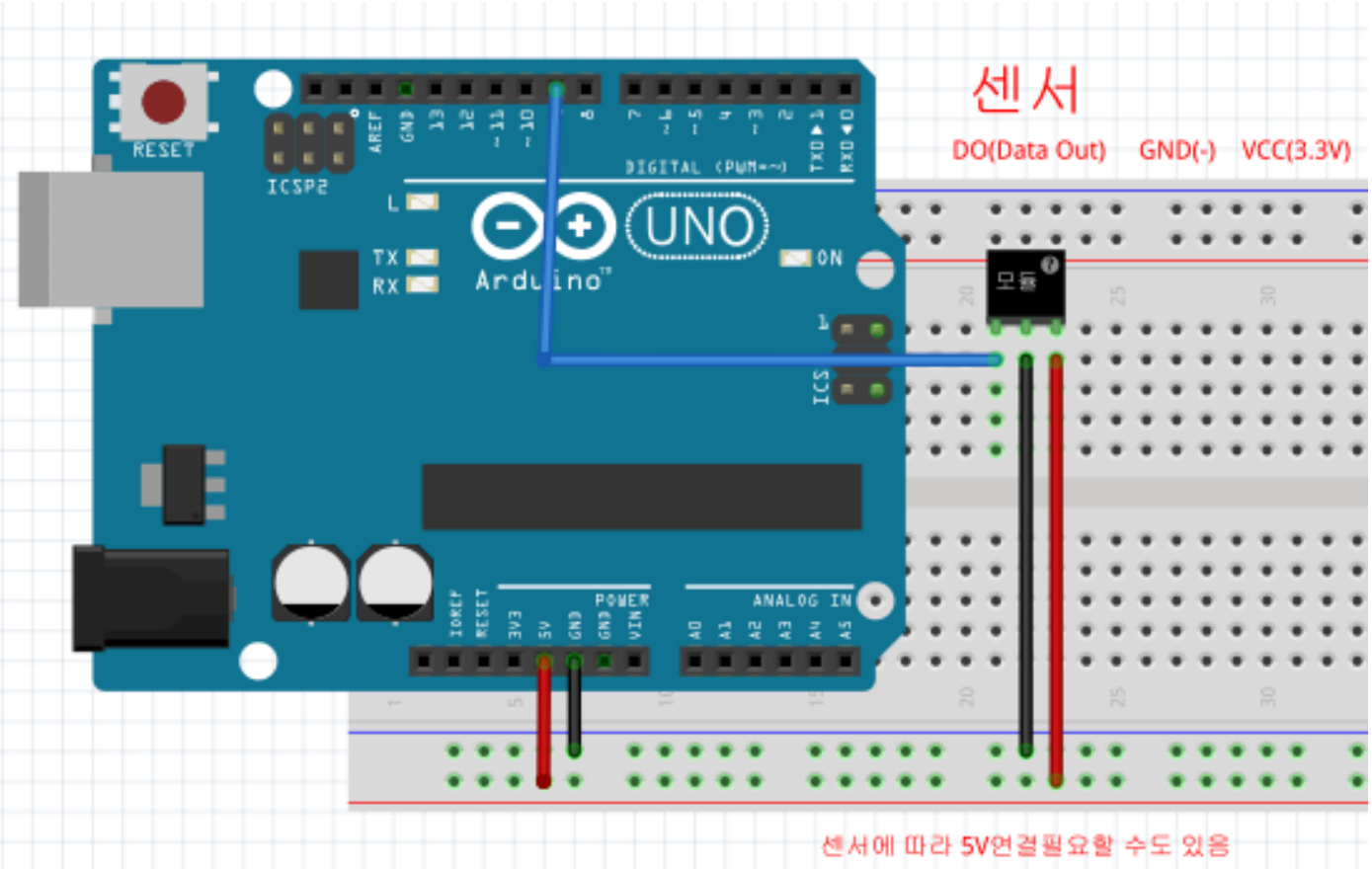

COM5
전송
자동 스크롤
line ending 없음
9600 보드레이트

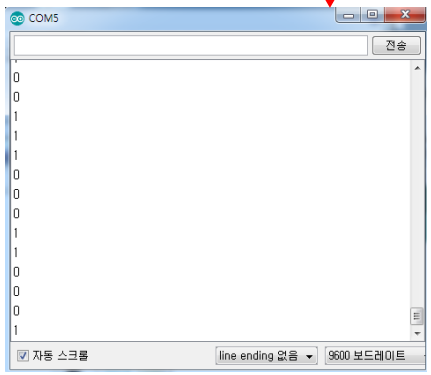


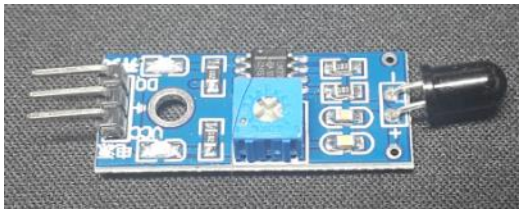


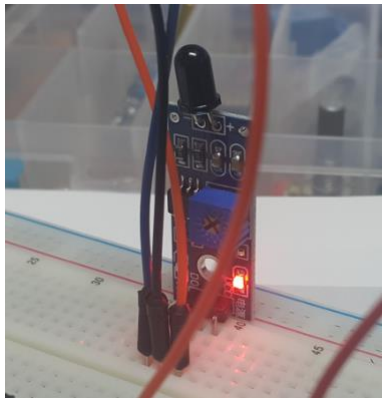
모듈 6

센서(화염)


센서
DO(Data Out) GND(-) VCC(3.3V)
RESET
ICSP2
DIGITAL (PWM~)
UNO
Arduino
ON
TX
RX
모듈
POWER
ANALOG IN
센서에 따라 5V연결필요할 수도 있음

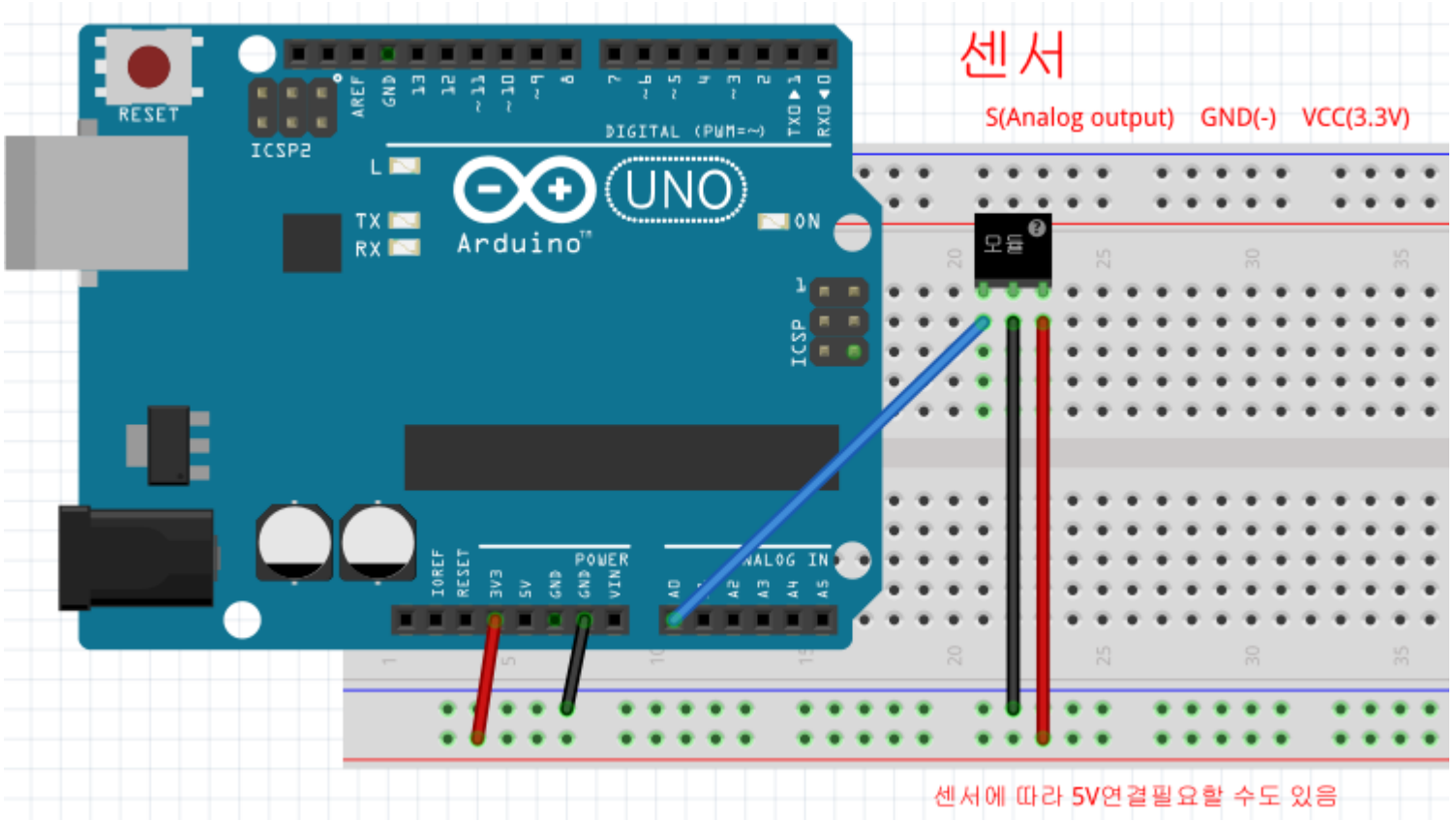

COM5
전송
0
0
1
1
1
0
0
0
1
1
0
0
0
1
자동 스크롤
line ending 없음
9600 보드레이트



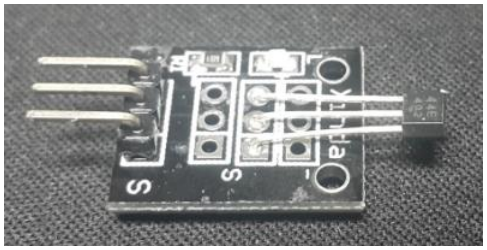


모듈10

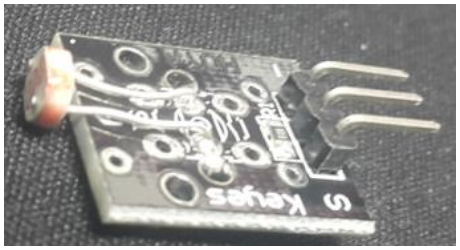
아날로그 센서



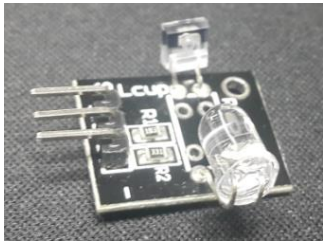
홀(모듈8)



조도(모듈11)



심박(모듈14)

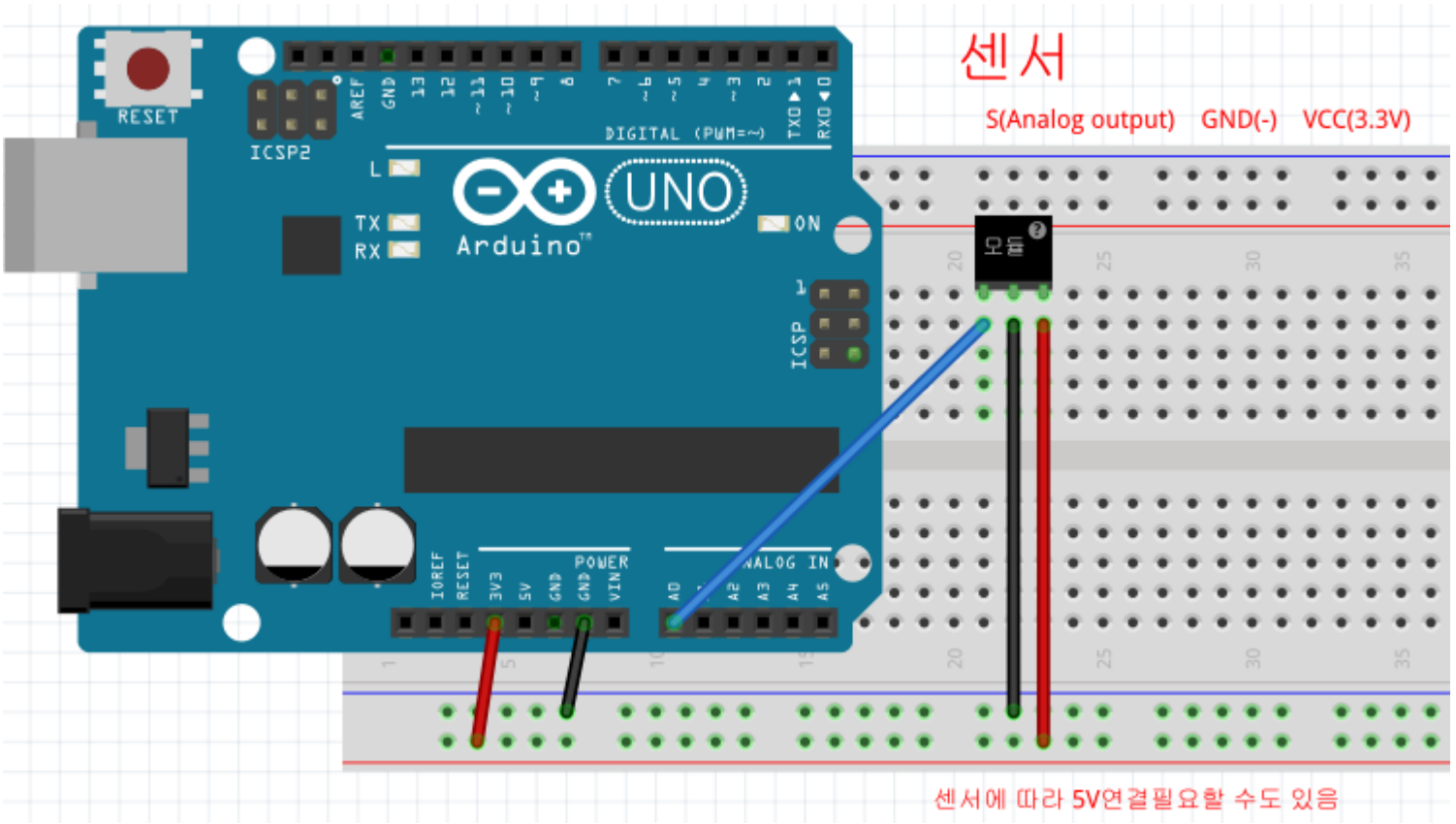


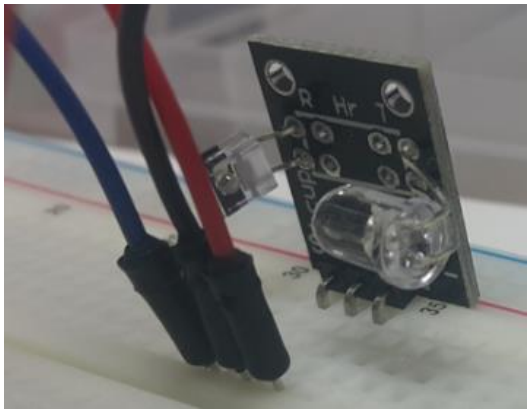
아날로그 센서

Sensor1

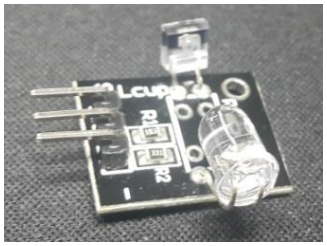
```
1  void setup()
2  {
3    Serial.begin(9600);
4  }
5
6  void loop()
7  {
8    int nData = analogRead(A0);
9    Serial.println(nData);
10 }
```

아날로그 센서(심박)

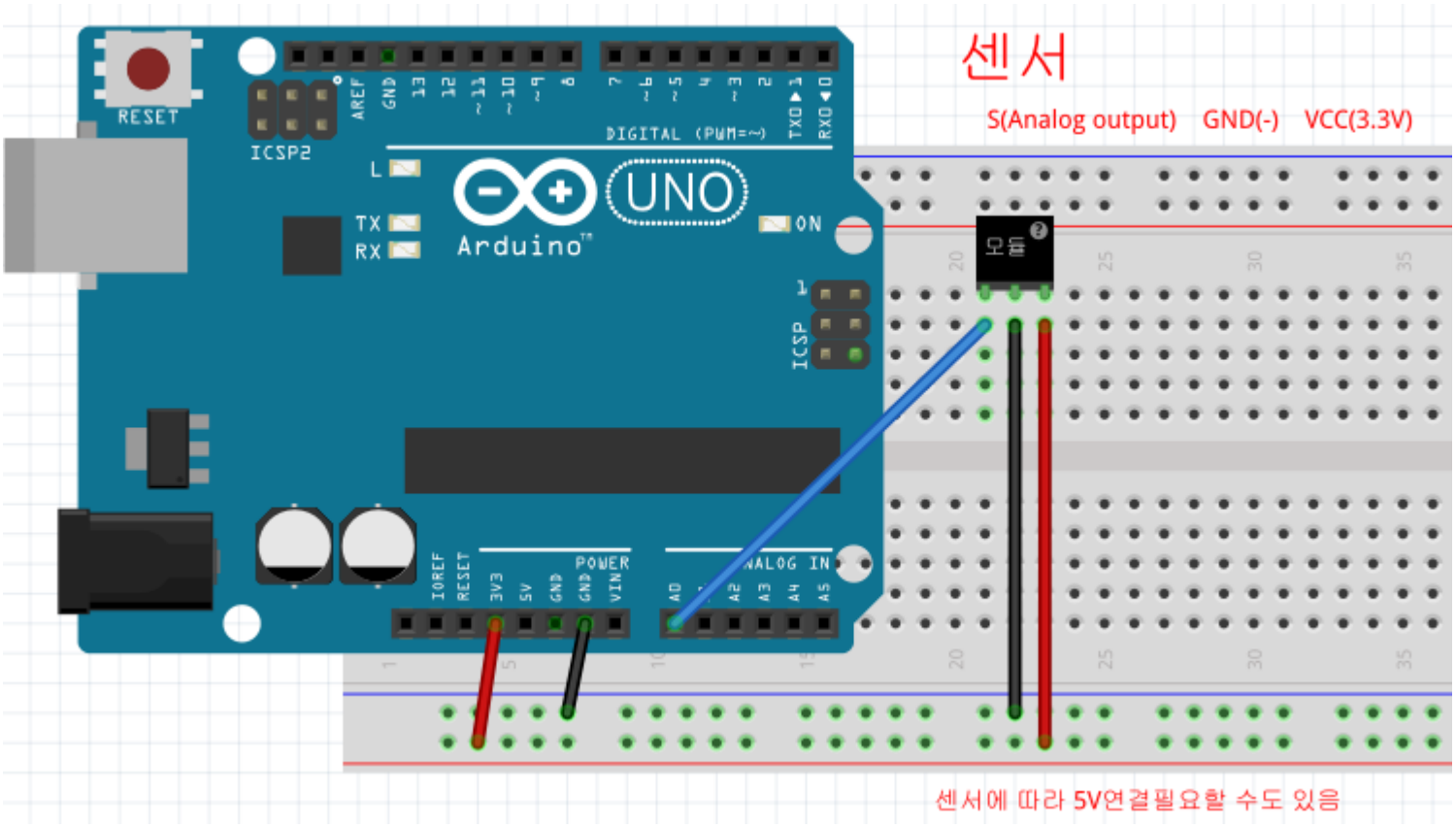




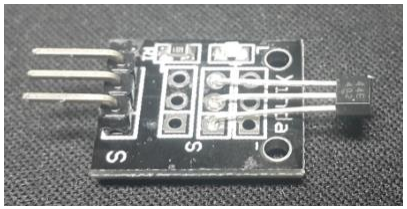
심박(모듈14)

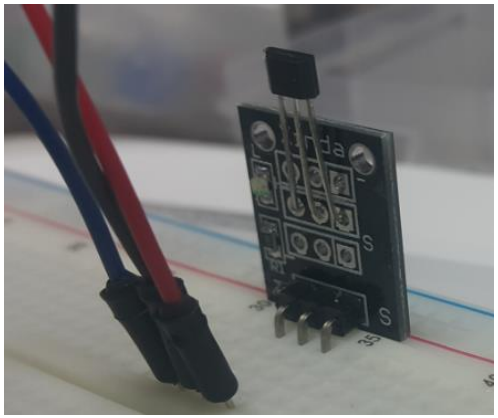


아날로그 센서(홀)



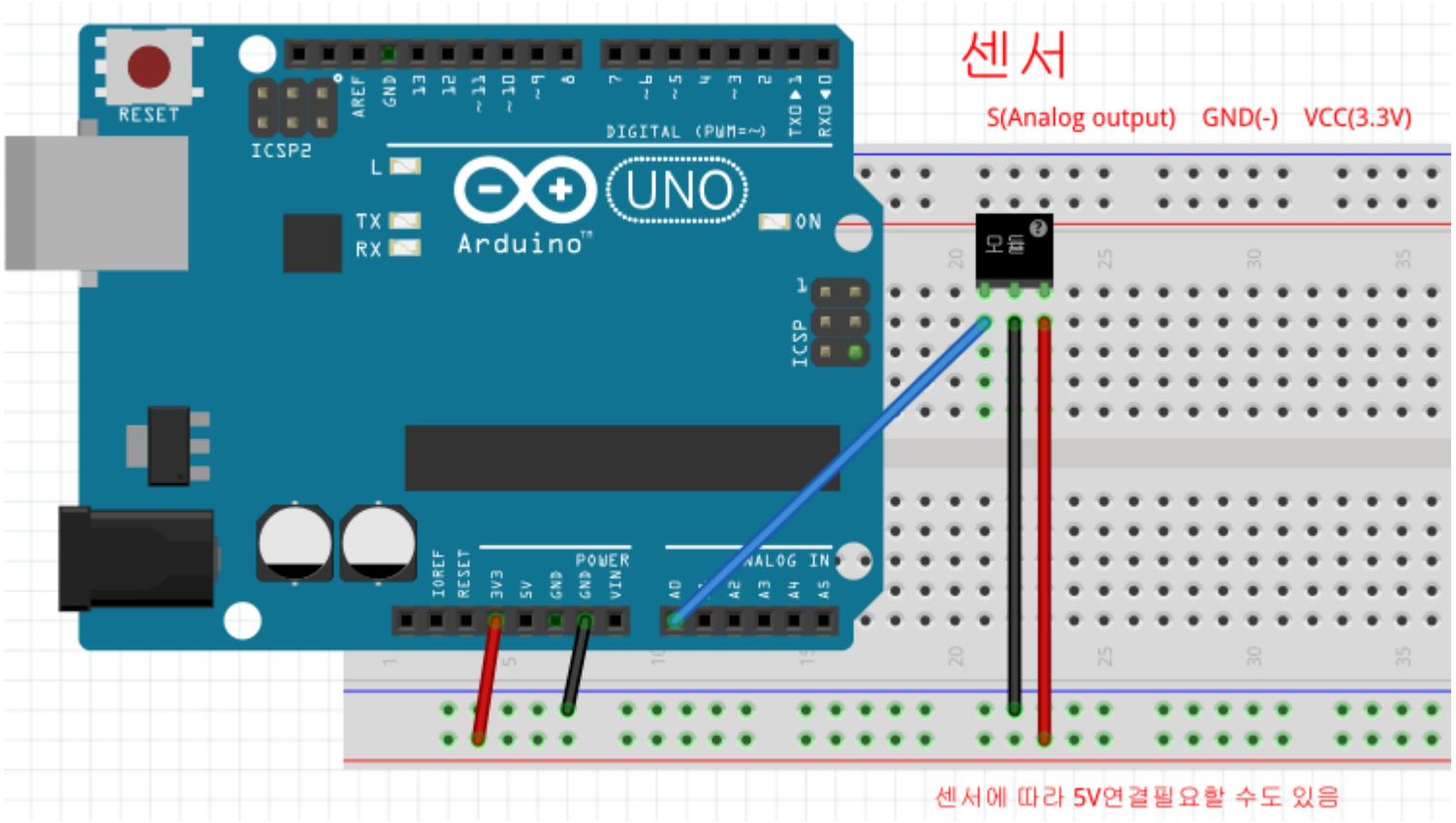
홀(모듈8)



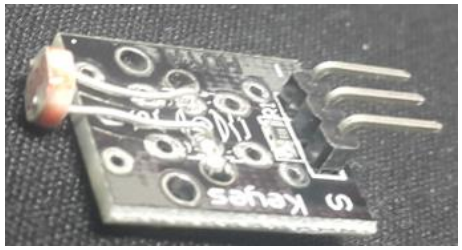


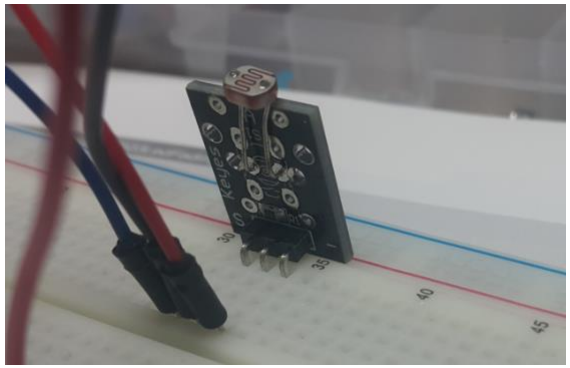
홀 자기 센서는 자기장의 세기에 따라 전압이 변하는 소자

아날로그 센서(조도)

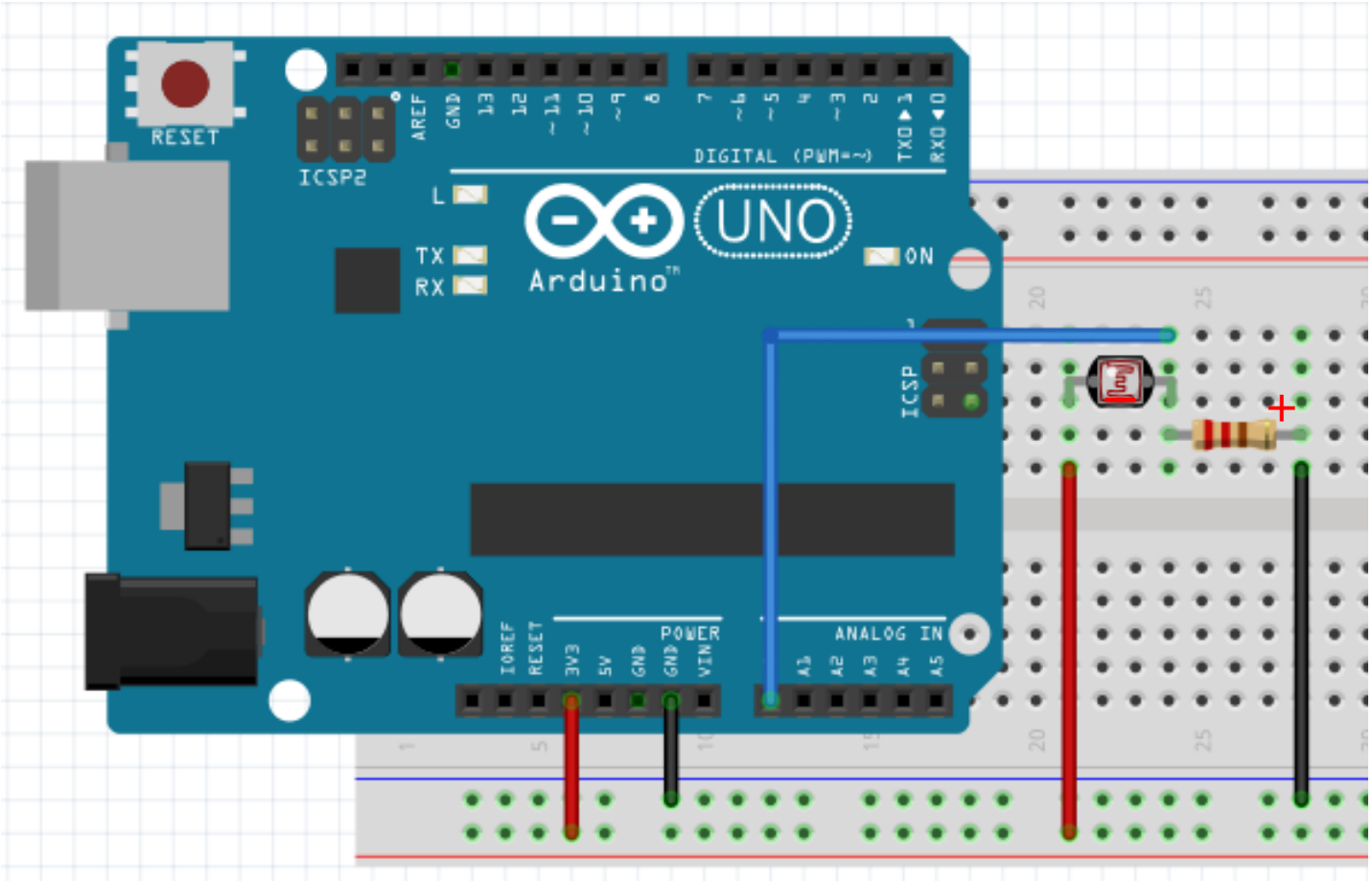


조도(모듈11)





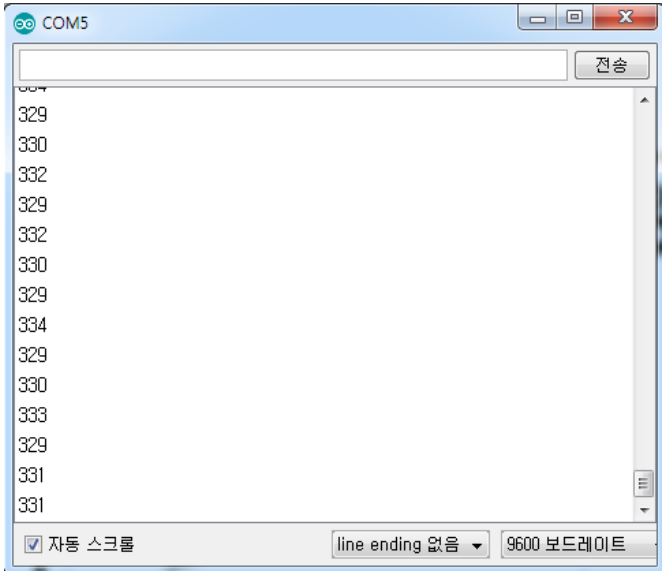
빛의 검출용 부품**(부품 7)**

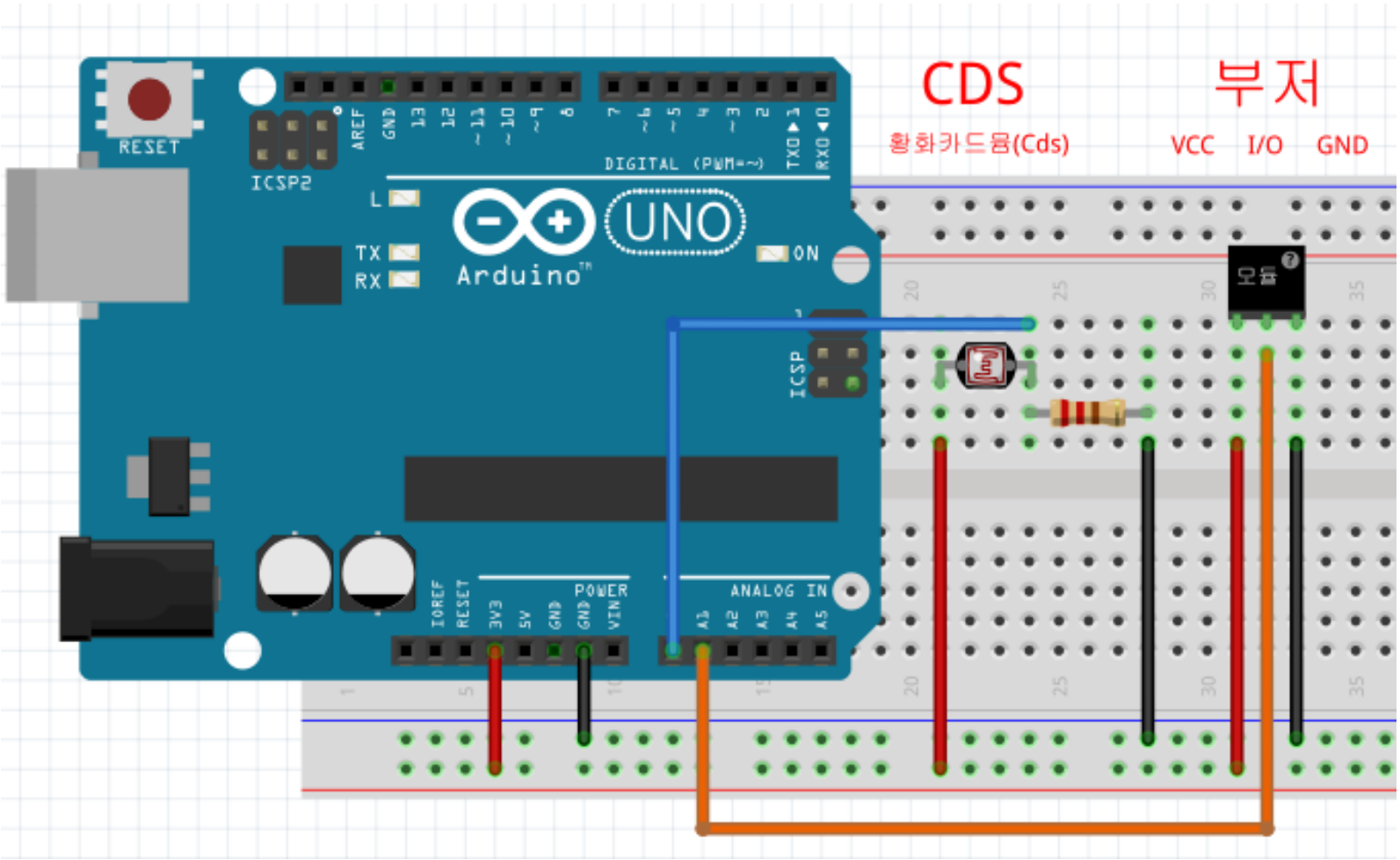


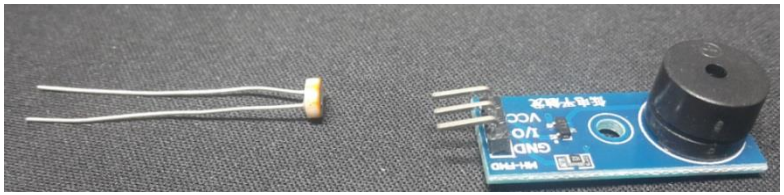
조도센서 CDS

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
황화카드뮴(Cds)
부저
VCC I/O GND
RESET
ICSP2
AREF
GND
DIGITAL (PWM~)
TX
RX
ON
Arduino
UNO
ICSP
모듈
POWER
ANALOG IN
IOREF
RESET
3V3
5V
GND
GND
VIN
A0
A1
A2
A3
A4
A5



CDS 부저(모듈 17)

CDS2 활용

CDS2

```
#define NOTE_C3   131
#define NOTE_F6  1397

void setup()
{
  Serial.begin(9600);
}

void loop()
{
  int nData = analogRead(A0);
  Serial.println(nData);

  if (nData < 50)
  {
    tone(A1, NOTE_C3);
  }
  else if (nData > 300)
  {
    tone(A1, NOTE_F6);
  }
  else
  {
    noTone(A1);
  }

  delay(100);
}
```