



사물인터넷 Internet of Things



스마트인재개발원
나 예 호 선임연구원



3. Photoresistor(조도센서)



Photoresistor (조도센서)
0 ~ 1023 까지 표현

3. Photoresistor(조도센서)

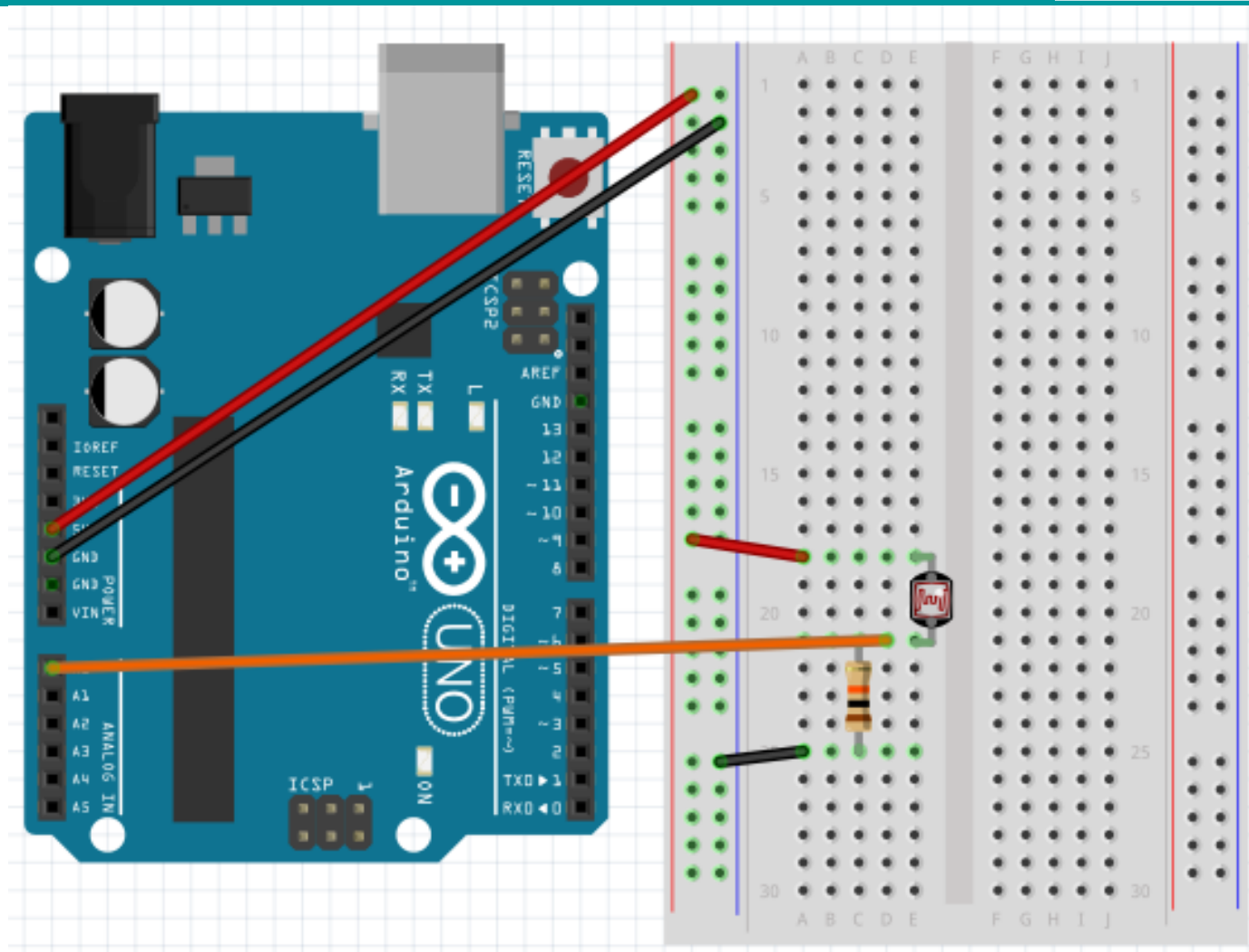


값을 읽어 Serial모니터에 출력!

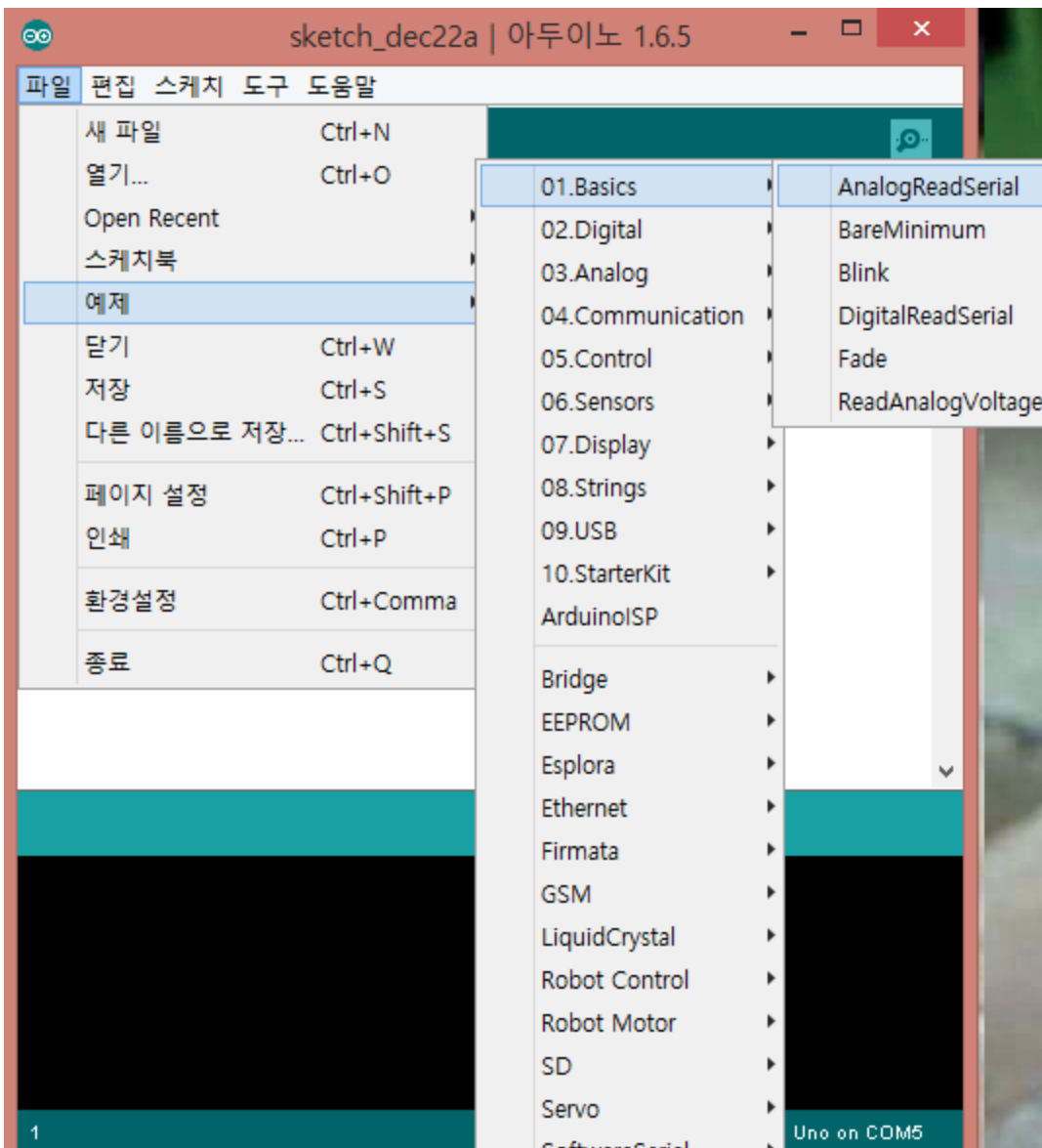


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3. Photoresistor(조도센서)



3. Photoresistor(조도센서)



1. 파일

2. 예제

3. Digital

4. AnalogReadSerial

3. Photoresistor(조도센서)



- **analogRead(A0);**

Analog 데이터를 읽을 pin번호



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3. Photoresistor(조도센서) - 코드



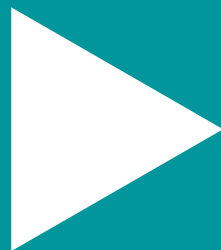
```
void setup() {  
  Serial.begin(9600);  
}
```



가로등을 만들려면...?

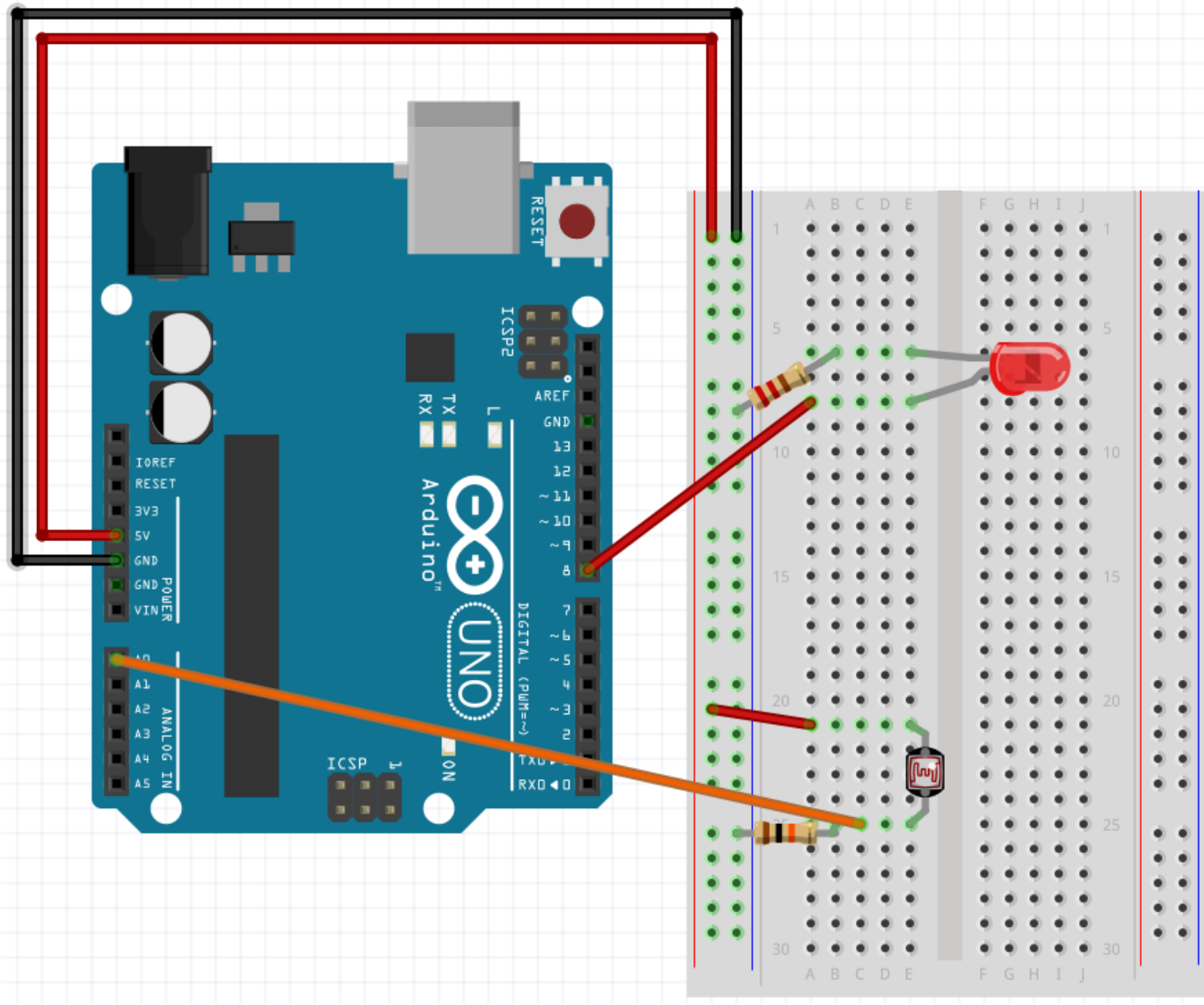
LED + 조도센서

4. 가로등 만들기



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4. 가로등 만들기 - 배선도



4. 가로등 만들기 - 코드



```
void setup() {  
  Serial.begin(9600);  
  pinMode(8, OUTPUT);  
}
```



4. 가로등 만들기 - 코드



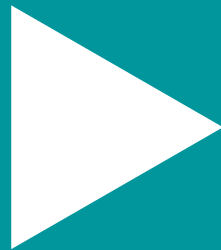
```
void loop() {
```

```
}
```



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선물 상자 만들기



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소리내기



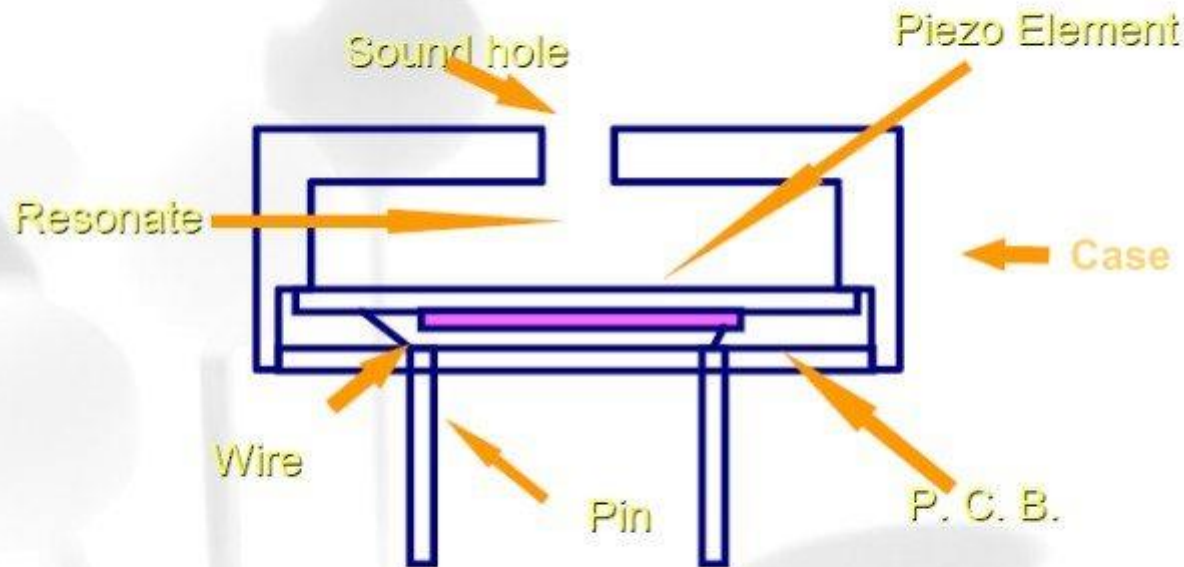
Piezo : 31 ~ 65535

Piezo Buzzer



A.A.T.C.

Structure

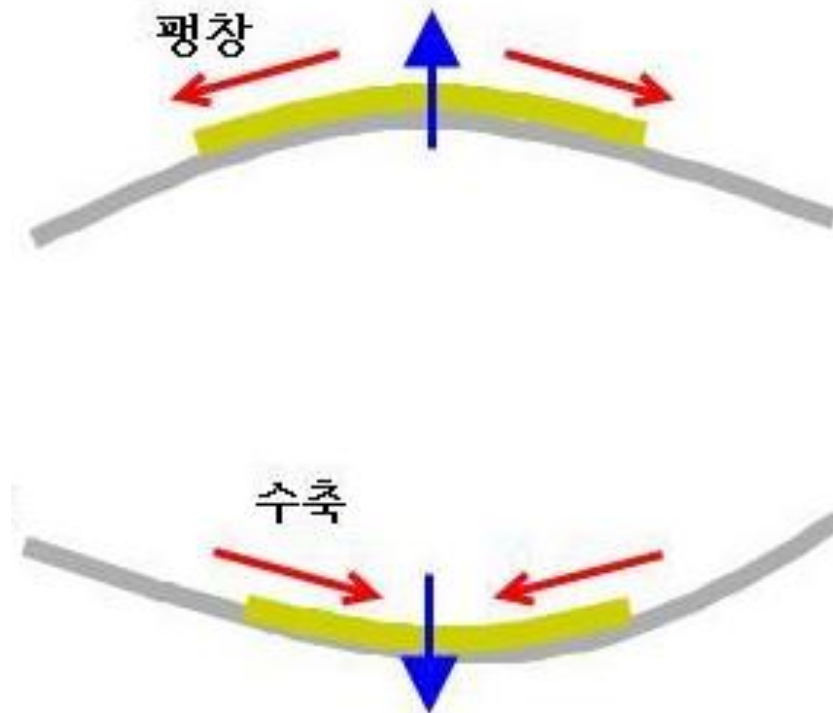


We always innovate the best audio technology for you

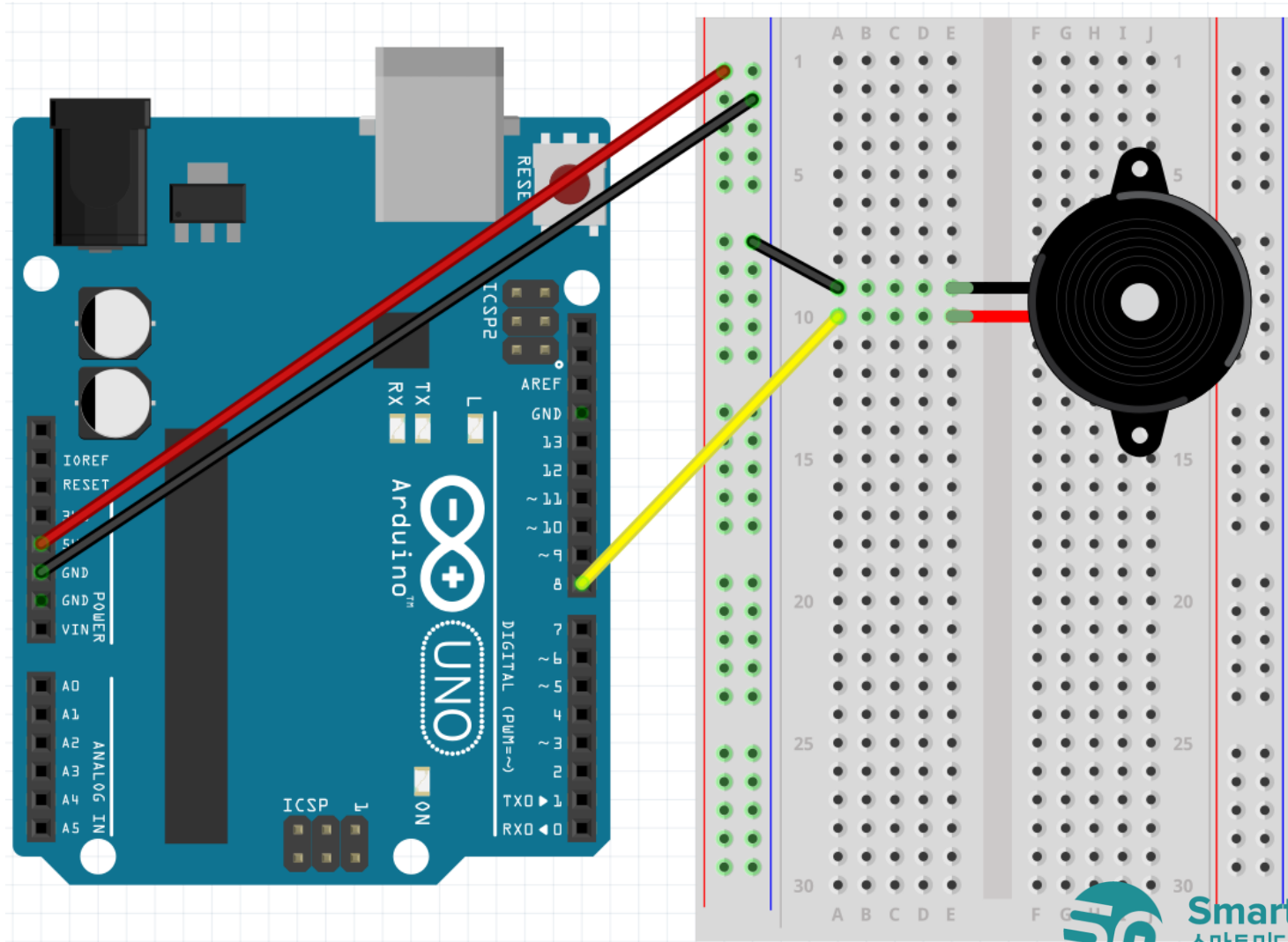


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Piezo Buzzer



소리내기 - 배선도



tone(pin, frequency, duration)

연결된 pin번호

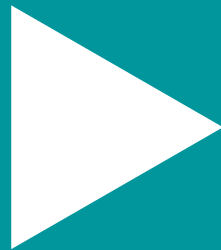
주파수

시간

**tone(
);**

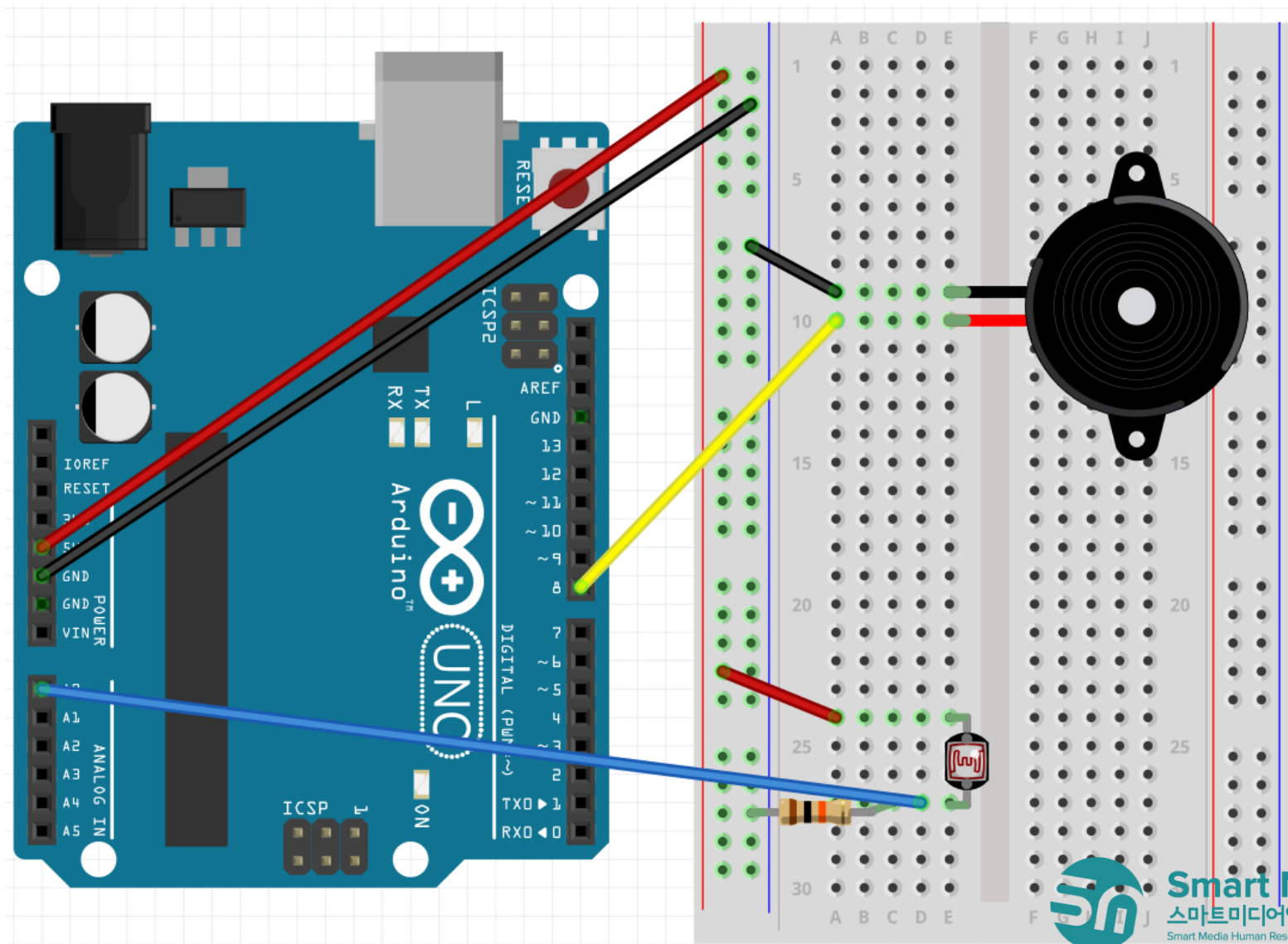
```
void setup(){  
}
```

7. 조도센서 이용해 소리 바꾸기



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7. 조도센서 이용해 소리 바꾸기



7. 조도센서 이용해 소리 바꾸기

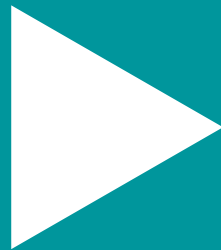


```
void setup(){  
}
```

```
void loop(){  
    int value = analogRead(A0);  
    int pitch =map(value,0,1023,50,3000);  
    tone(8,pitch,20);  
    delay(100);  
}
```

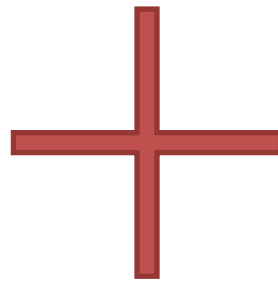


8. 피아노 만들기

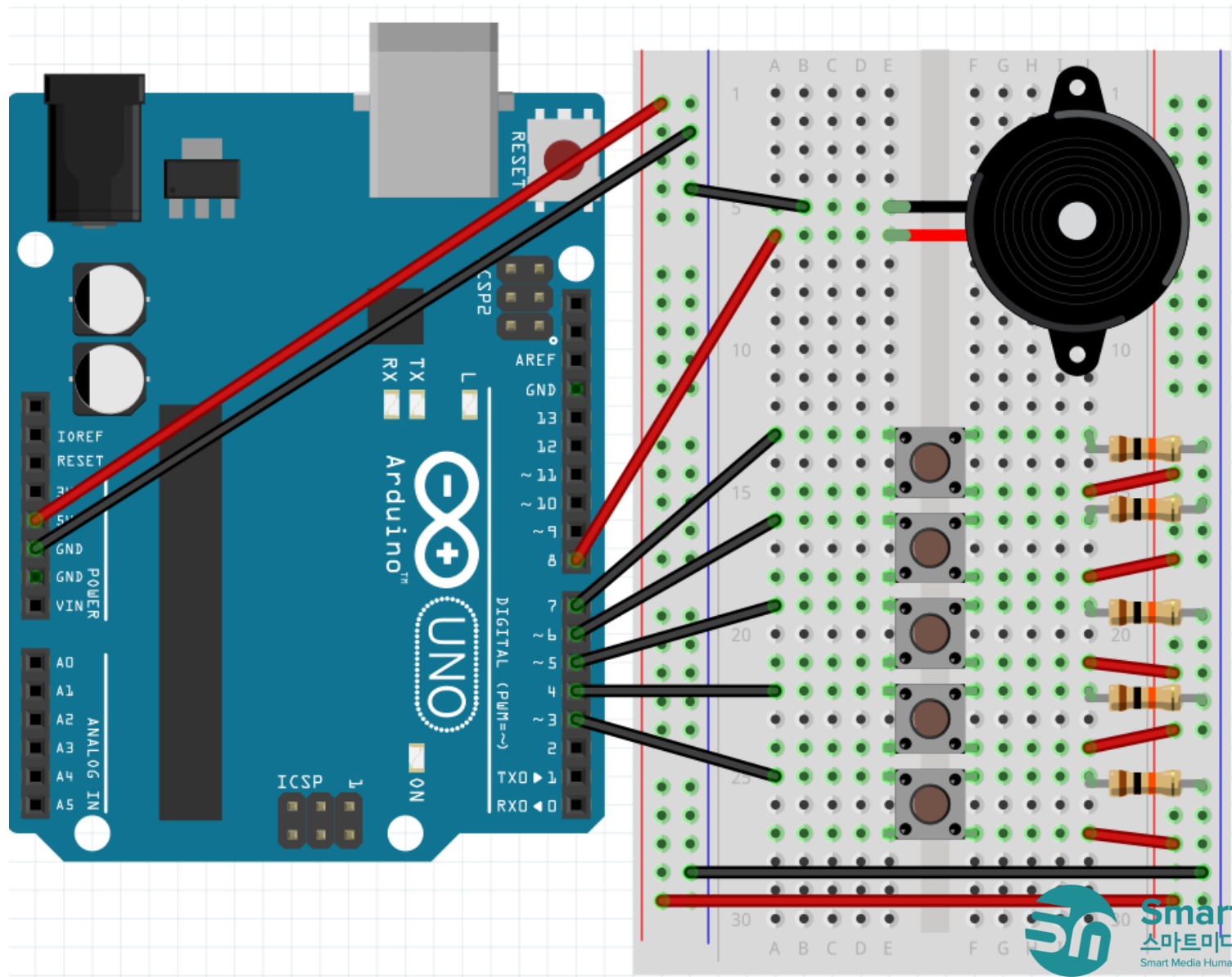


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8. 피아노 만들기



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8. 피아노 만들기



262 294 330 349 392

도 레 미 파 솔



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8. 피아노 만들기



```
int piezo = 8;
```



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8. 피아노 만들기



```
void setup(){  
    pinMode(3, INPUT);  
    pinMode(4, INPUT);  
    pinMode(5, INPUT);  
    pinMode(6, INPUT);  
    pinMode(7, INPUT);  
}
```



8. 피아노 만들기

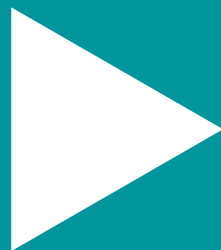


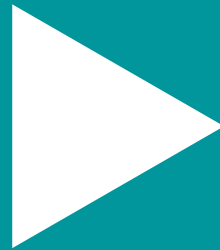
```
void loop(){
```

```
}
```



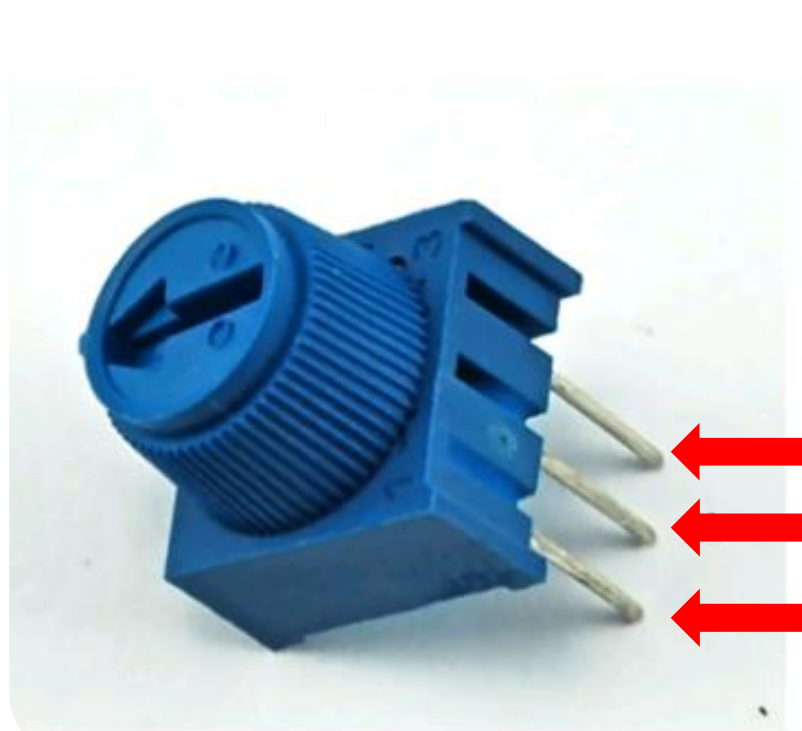
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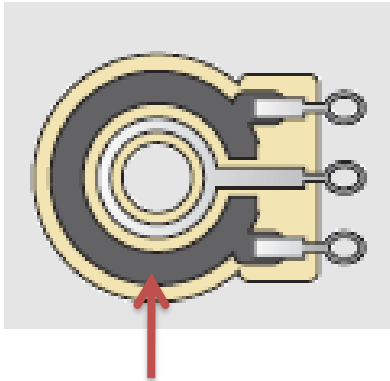
Potentiometer(가변저항)



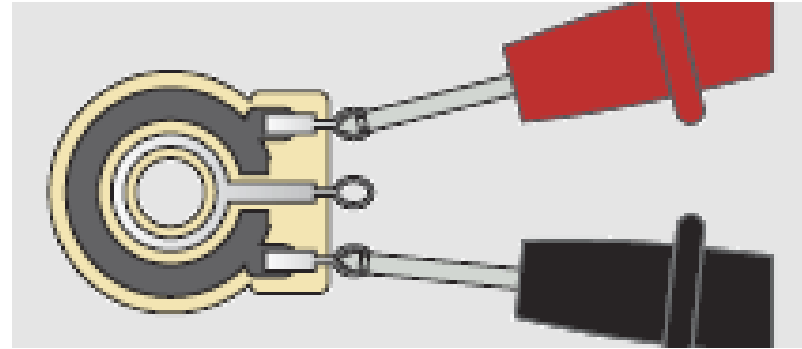
+

-

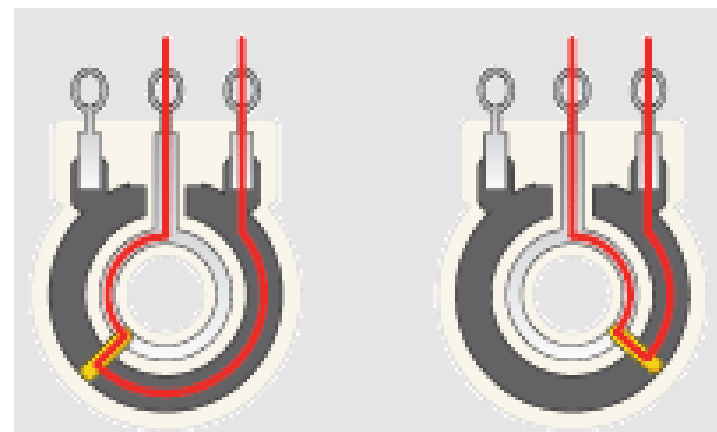
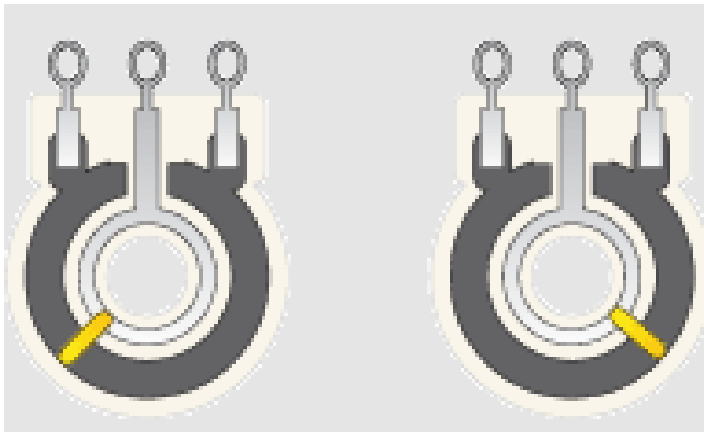




카본(탄소)



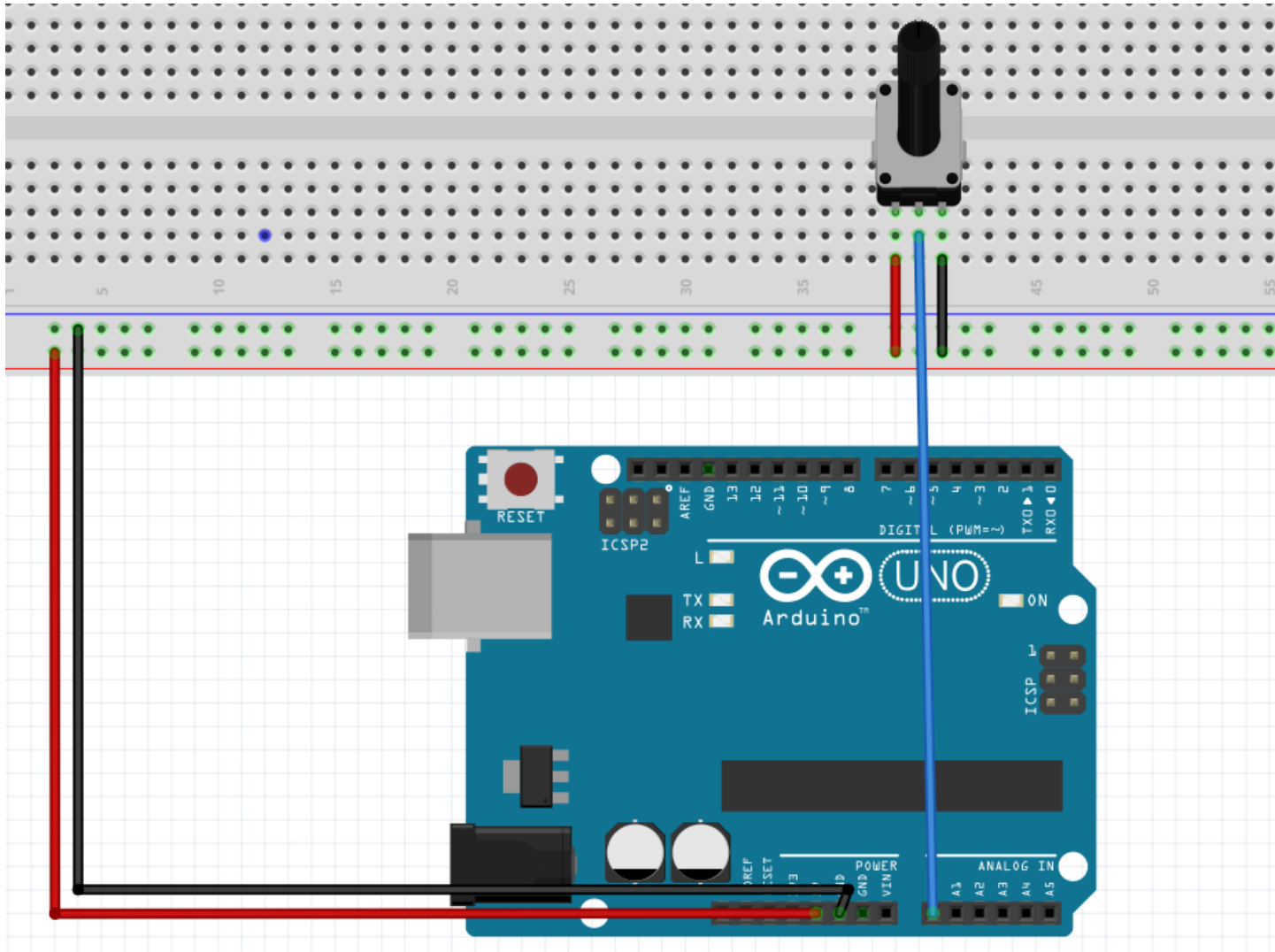
최대 저항치 확인



- **analogRead(A0);**

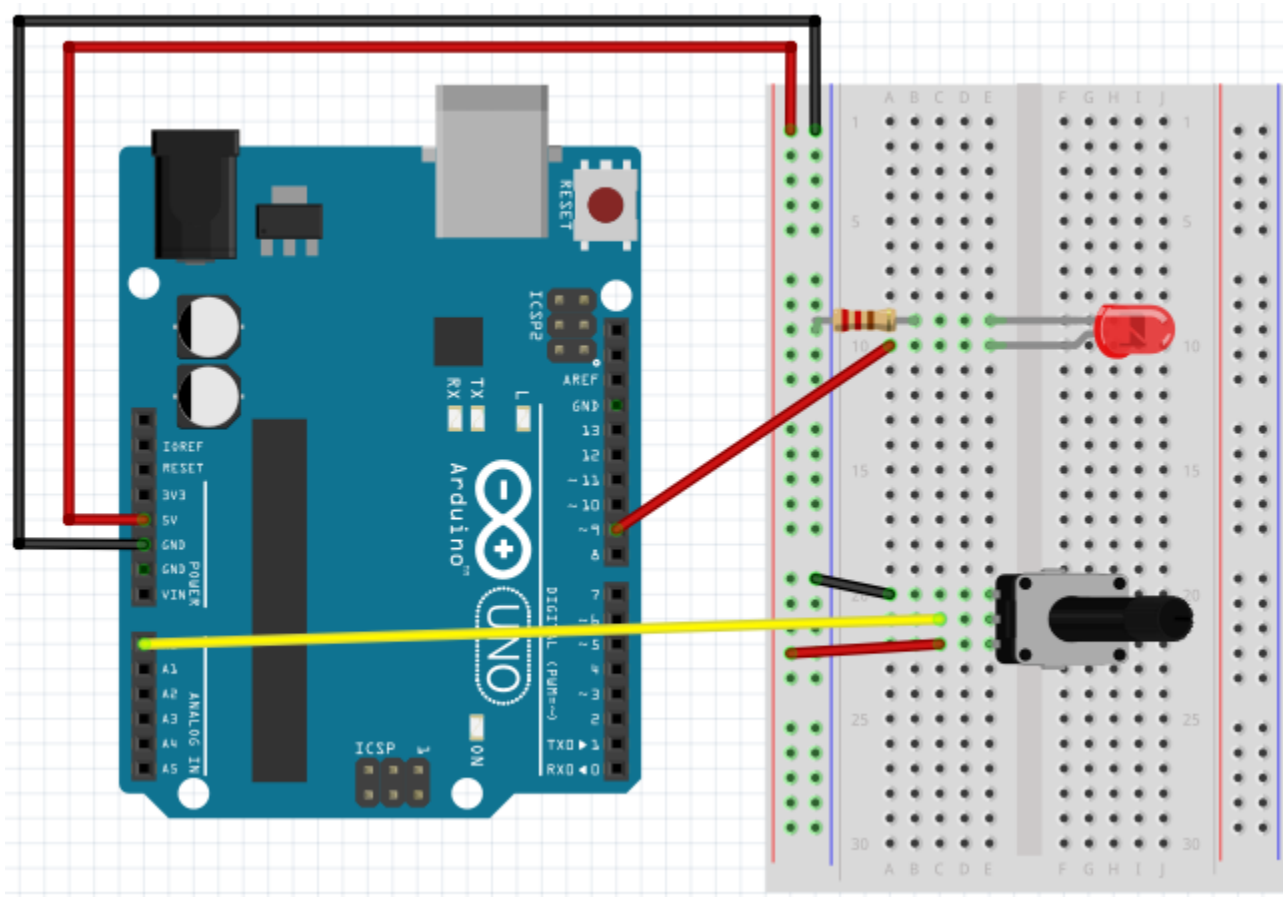
값을 읽을 핀 번호

가변저항



```
void setup() {  
    Serial.begin(9600);  
}  
void loop() {  
    int sensorValue = analogRead(A0);  
    Serial.println(sensorValue);  
    delay(1);  
}
```


9. 가변저항을 이용한 Fade 예제



9. 가변저항을 이용한 Fade 예제



```
void setup() {  
    Serial.begin(9600);  
    pinMode(9,OUTPUT);  
}  
void loop() {  
    int sensorValue = analogRead(A0)/4;  
    Serial.println(sensorValue);  
    analogWrite(9, sensorValue);  
    delay(100);  
}
```



9. 가변저항을 이용한 Fade 예제



```
map( sensorValue , 0 , 1023 , 0 , 255 );
```

```
map(
```



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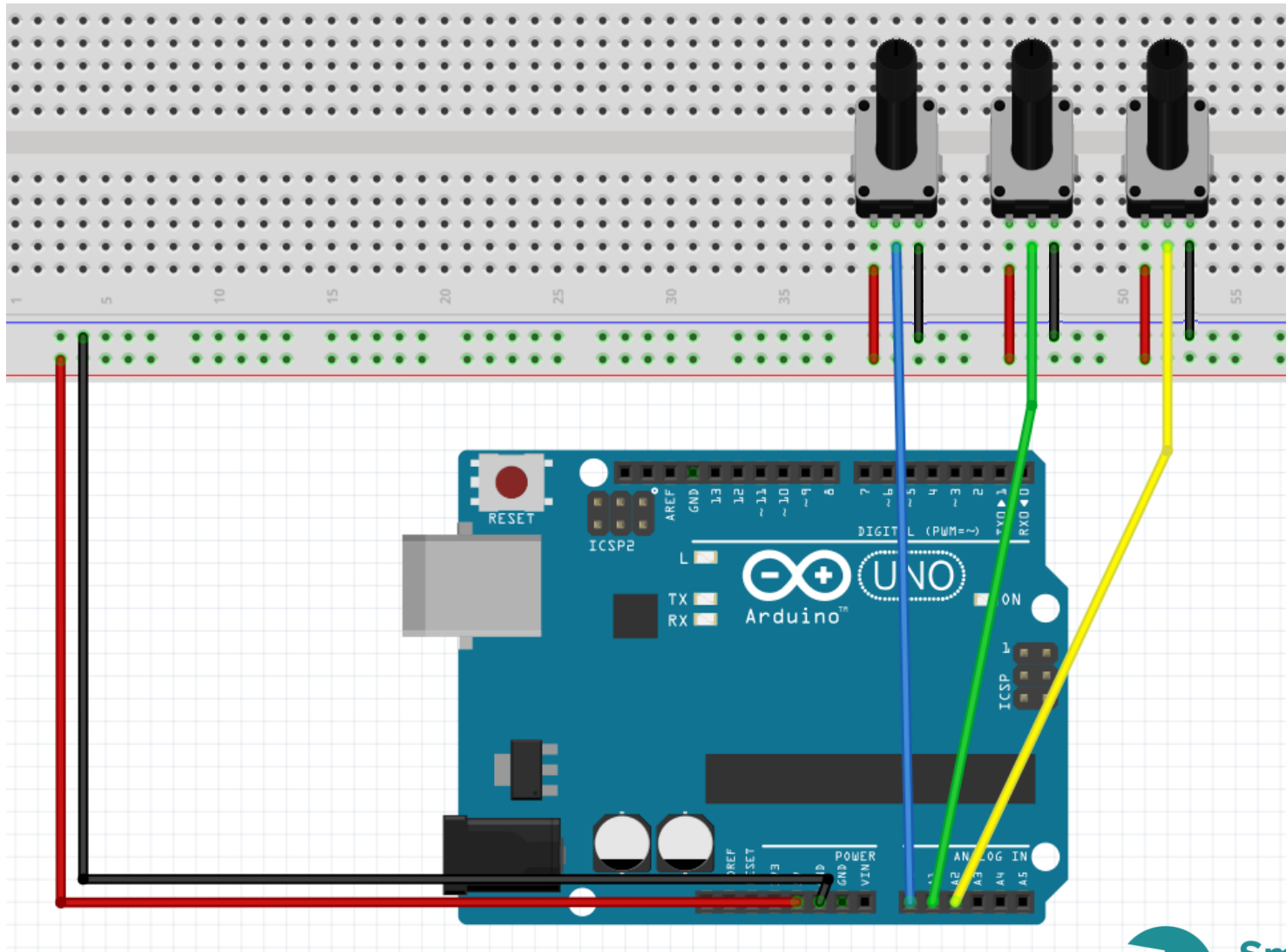
9. 가변저항을 이용한 Fade 예제



```
void setup() {  
    Serial.begin(9600);  
    pinMode(9,OUTPUT);  
}  
void loop() {  
    int sensorValue = map(analogRead(A0),0,1023,0,255);  
    Serial.println(sensorValue);  
    analogWrite(9, sensorValue);  
    delay(100);  
}
```



10. 가변저항 3개 값 읽기



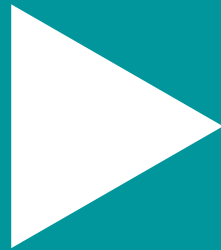
10. 가변저항 3개 값 읽기



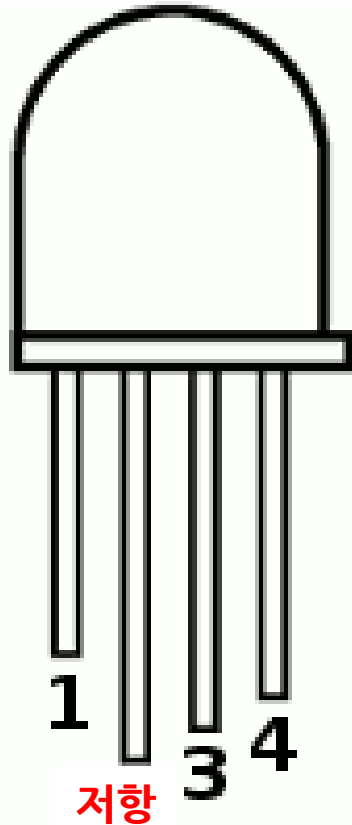
```
void loop() {  
  int rest1 = analogRead(A0);  
  int rest2 = analogRead(A1);  
  int rest3 = analogRead(A2);  
  Serial.print("rest1 : ");  
  Serial.print(rest1);  
  Serial.print(" rest2 : ");  
  Serial.print(rest2);  
  Serial.print(" rest3 : ");  
  Serial.println(rest3);  
}
```



11. ColorMix



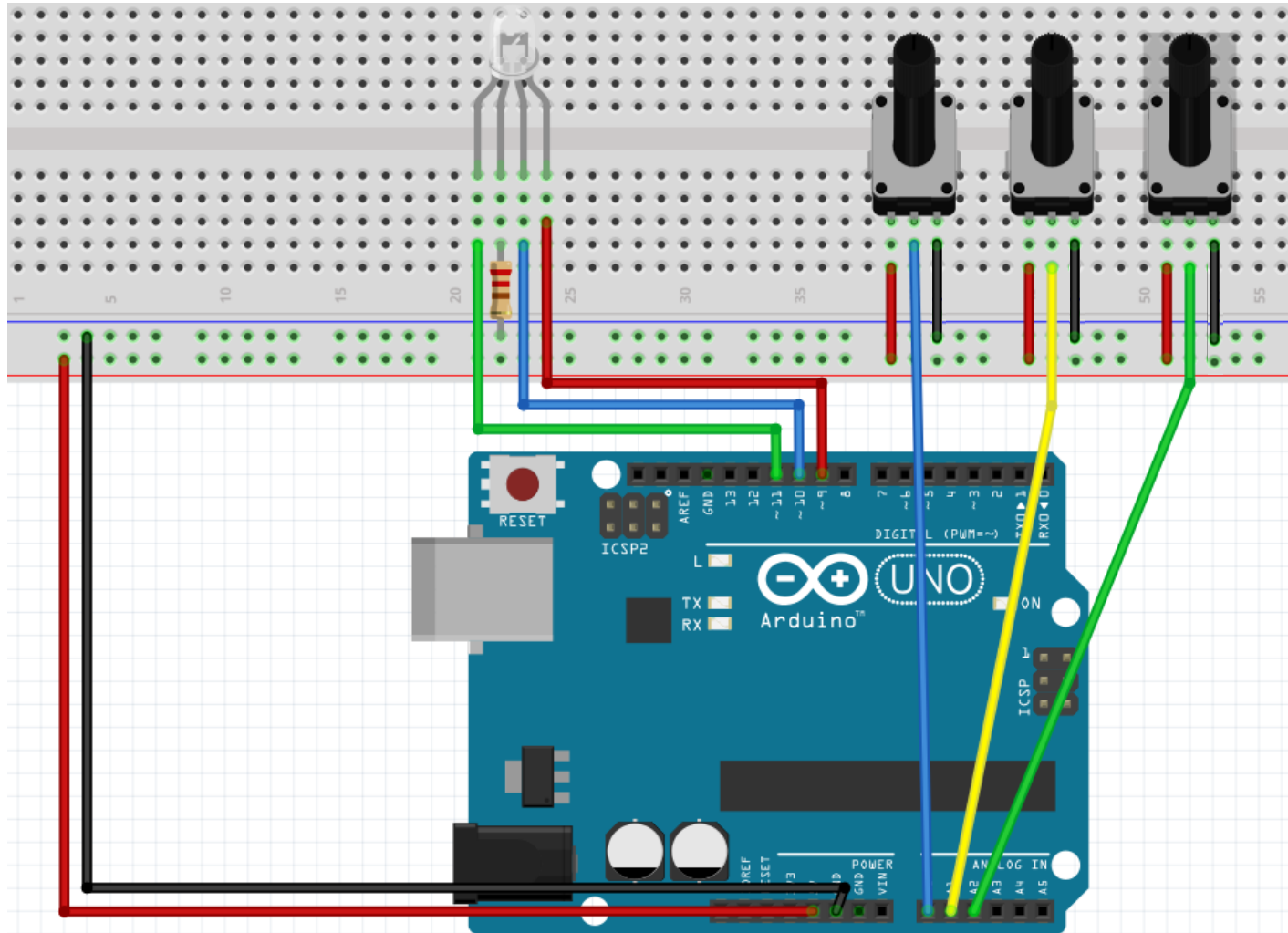
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RGB LED

- 1: Green (+)
- 2: Ground (-)
- 3: Blue (+)
- 4: Red (+)

11. ColorMix - 배선도



11. ColorMix - 코드



```
int Rled = 9;  
int Bled = 10;  
int Gled = 11;  
  
void setup() {  
  pinMode(Rled, OUTPUT);  
  pinMode(Bled, OUTPUT);  
  pinMode(Gled, OUTPUT);  
  Serial.begin(9600);  
}
```



11. ColorMix - 코드



```
void loop() {  
  int rest1 = analogRead(A0);  
  int rest2 = analogRead(A1);  
  int rest3 = analogRead(A2);  
  Serial.print("rest1 : ");  
  Serial.print(rest1);  
  Serial.print(" rest2 : ");  
  Serial.print(rest2);  
  Serial.print(" rest3 : ");  
  Serial.println(rest3);  
}
```



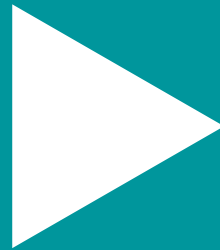
11. ColorMix - 코드



```
rest1=map(rest1,0,1024,0,250);  
rest2=map(rest2,0,1024,0,250);  
rest3=map(rest3,0,1024,0,250);  
analogWrite(Rled,rest1);  
analogWrite(Bled,rest2);  
analogWrite(Gled,rest3);  
delay(100);  
}
```

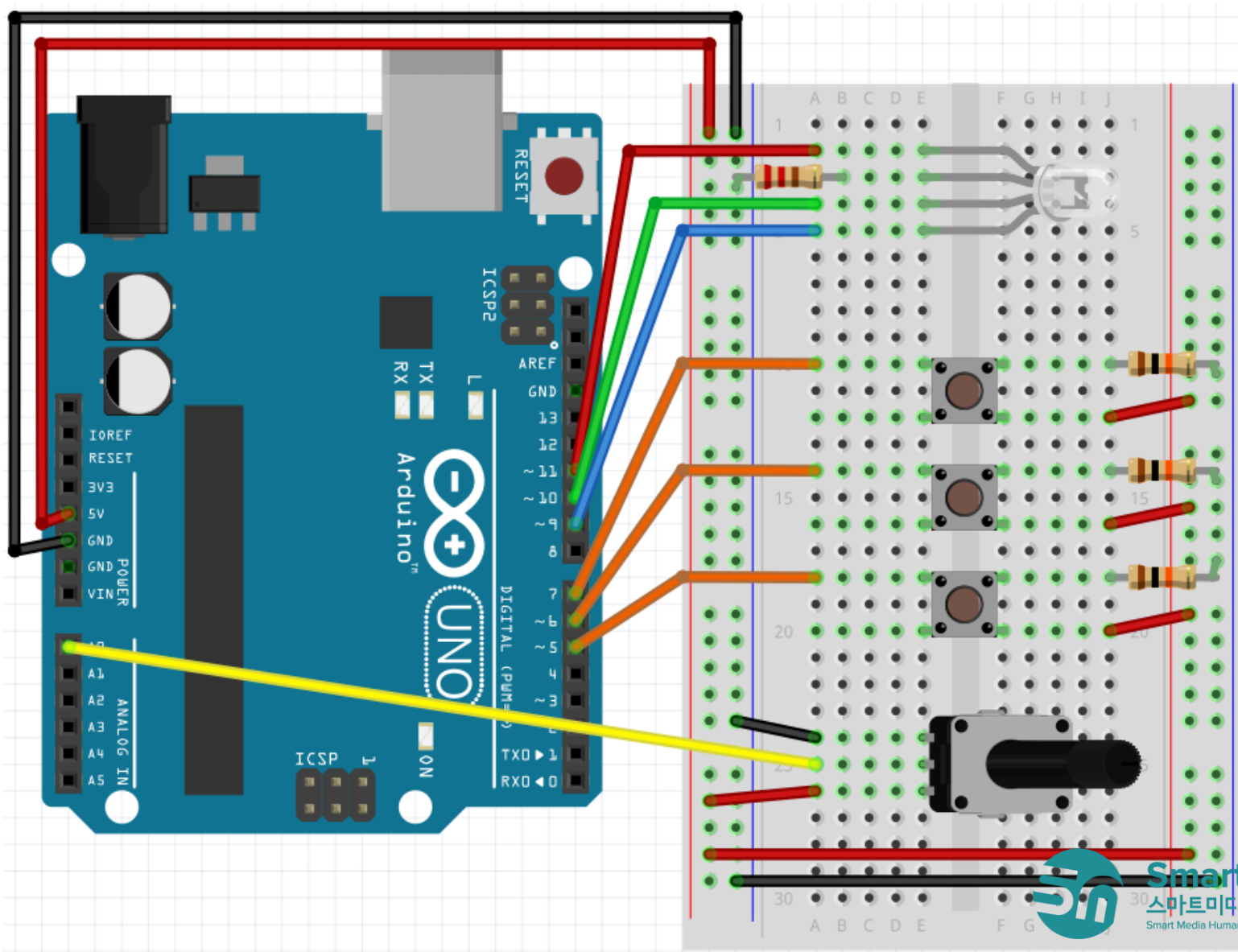


12. 색깔이 바뀌는 조명



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12. 색깔이 바뀌는 조명 - 배선도





감사합니다!



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