Making Sounds

Overview

In this lesson, you will learn how to make sounds with your Arduino. First you will make the Arduino play a 'musical' scale and then combine this with a photocell, to make a Theremin-like instrument that changes the pitch played as you wave your hand over the photocell.

Specification

Passive buzzer:

Working Voltage: 3V/5V

Resistance: 16Ohm

Resonance Frequency: 2KHZ

Photoresistor:

Model: GL5528

Maximum Voltage: 150 Volt DC

Spectral Peak: 540nm

Maximum Wattage: 100mW

Operating Temperature: -30 ~ +70℃

Light Resistance (10 Lux): 10-20Kohm

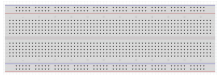
Pin definition

Passive Buzzer

Long pin

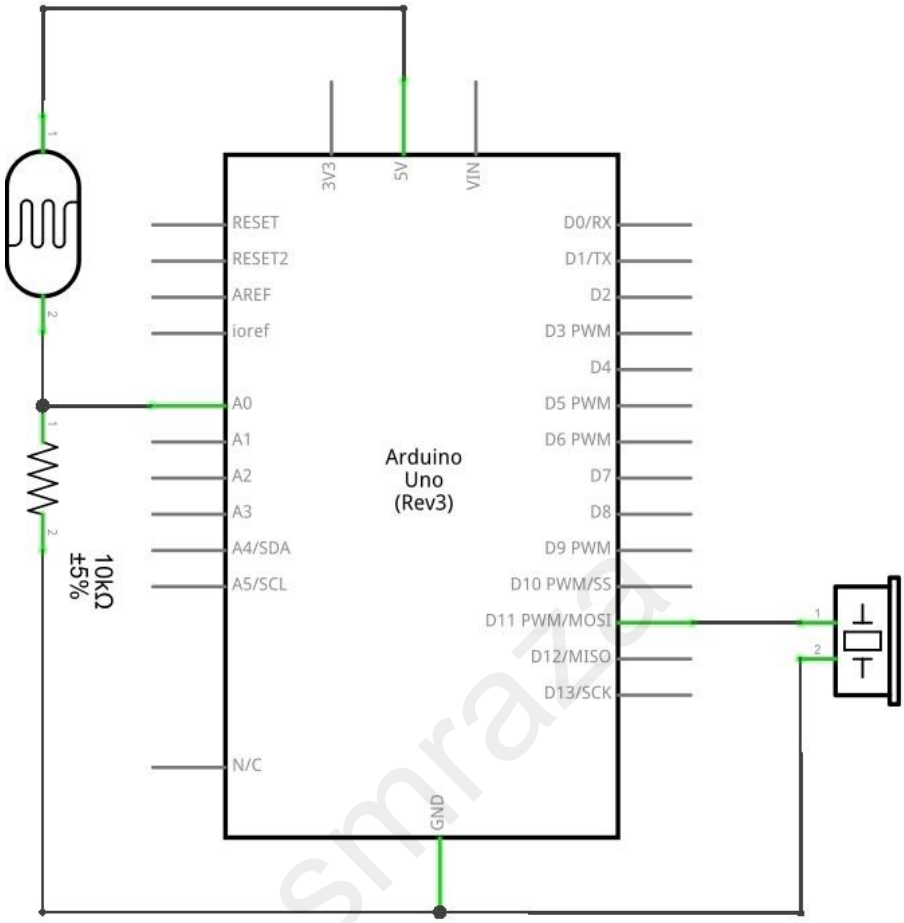
Short pin

Hardware required

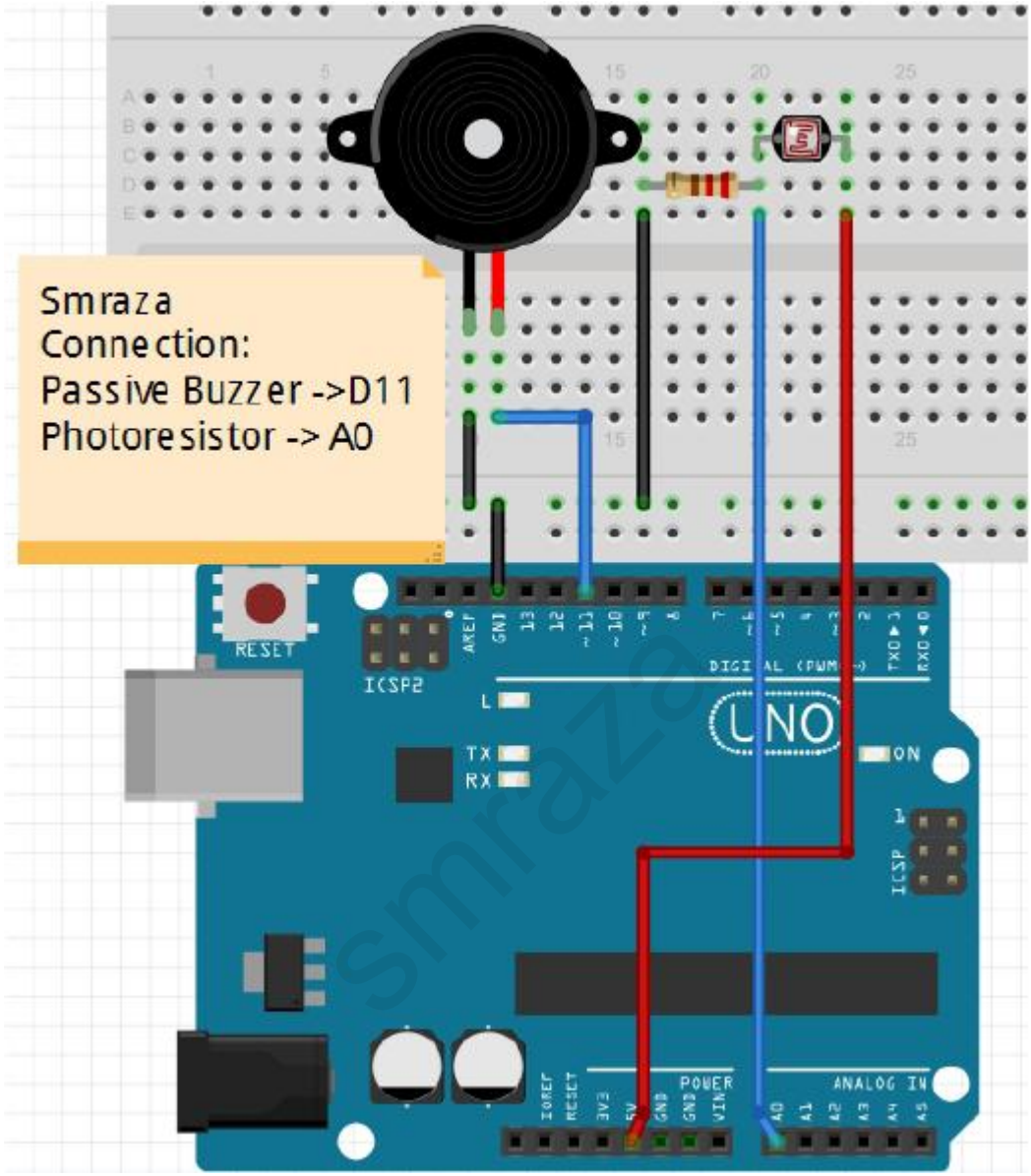
Material diagram	Material name	Number
	Photoresistor	1
	Passive buzzer	1
	10KΩ resistor	1
	USB Cable	1
	UNO R3	1
	Breadboard	1
	Jumper wires	Several

Connection

Schematic



Connection diagram



Note: Photoresitor`s pin is not divided into positive and negative polarity

Sample code

Note: sample code under the **Sample code** folder

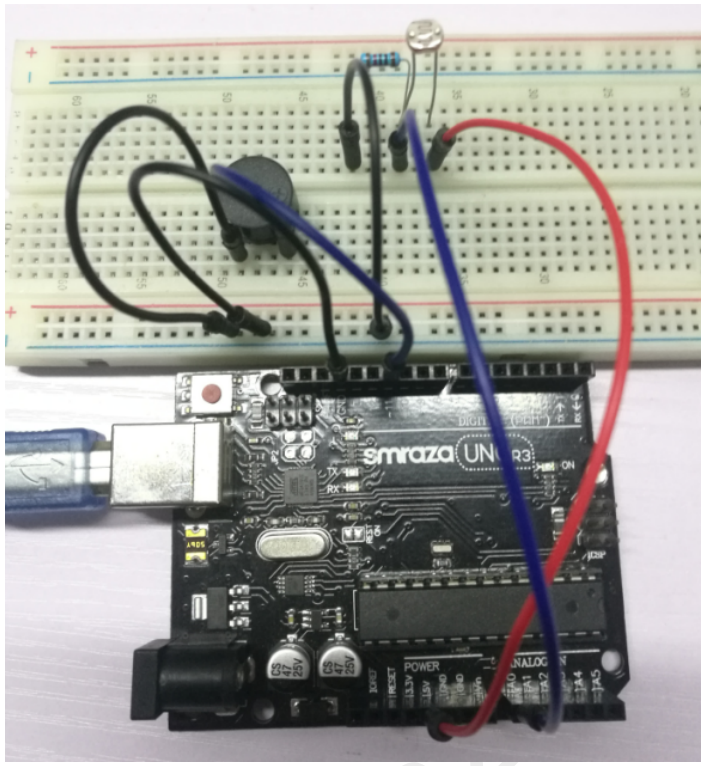
```
int speakerPin = 11;
int photocellPin = A0;
void setup()
{
}

void loop()
{
      int reading = analogRead(photocellPin);
      int pitch = 200 + reading / 4;
      tone(speakerPin, pitch);
}
//Tips: Try changing the value 4 in the line below to lower and higher values.
//int pitch = 200 + reading / 4;
```

We simply take an analog reading from A0, to measure the light intensity. This value will be in the range of something like 0 to 700.

We add 200 to this raw value, to make 200 Hz the lowest frequency and simply add the reading divided by 4 to this value, to give us a range of around 200Hz to 370Hz.

Example picture



Language reference

tone()
+ (addition)
/ (divide)

Application effect

When you use the hand slowly close to the photosensitive resistance, the buzzer sounds will be changed.

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* About Smraza:
* We are a leading manufacturer of electronic components for Arduino and Raspberry Pi.
* Official website: http://www.smraza.com/
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