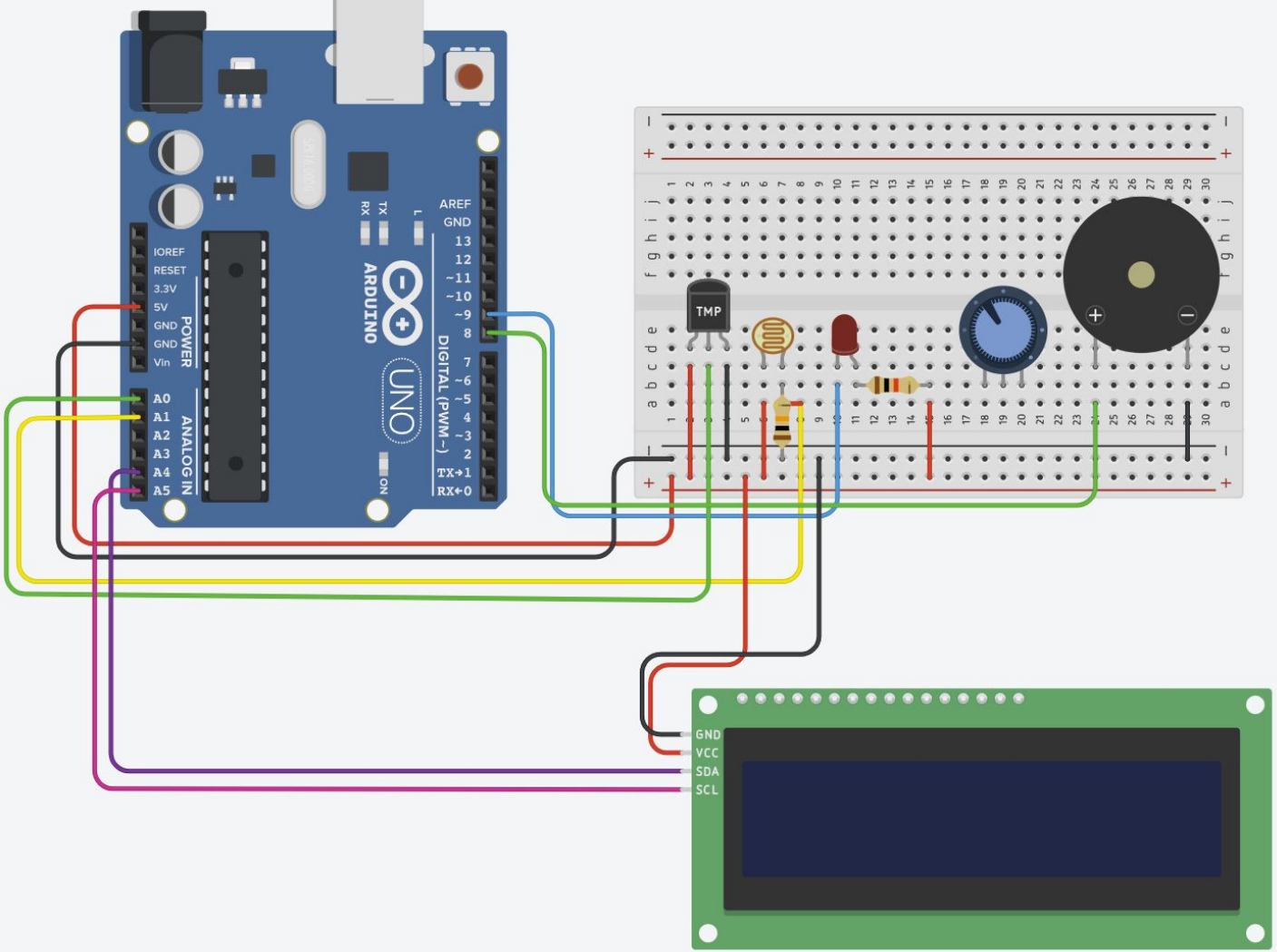
Smart Parking Sensor

Lesson 11

```arduino
const int tempPin   = A0;
const int ldrPin    = A1;
const int ledPin    = 9;
const int buzzerPin = 8;

void setup() {
  pinMode(ledPin, OUTPUT);
  pinMode(buzzerPin, OUTPUT);
  Serial.begin(9600);
}

void loop() {
  int tempValue = analogRead(tempPin);
  float voltage = tempValue * 5.0 / 1023.0;

  int lightValue = analogRead(ldrPin);

  Serial.print("Температура: "); Serial.print(tempC); Serial.print(" °C");
  Serial.print("  Свет: "); Serial.println(lightValue);

  if (tempC > 30 || lightValue < 300) {
    digitalWrite(ledPin, HIGH);
    digitalWrite(buzzerPin, HIGH);
  } else {
    digitalWrite(ledPin, LOW);
    digitalWrite(buzzerPin, LOW);
  }

  delay(500);
}
```

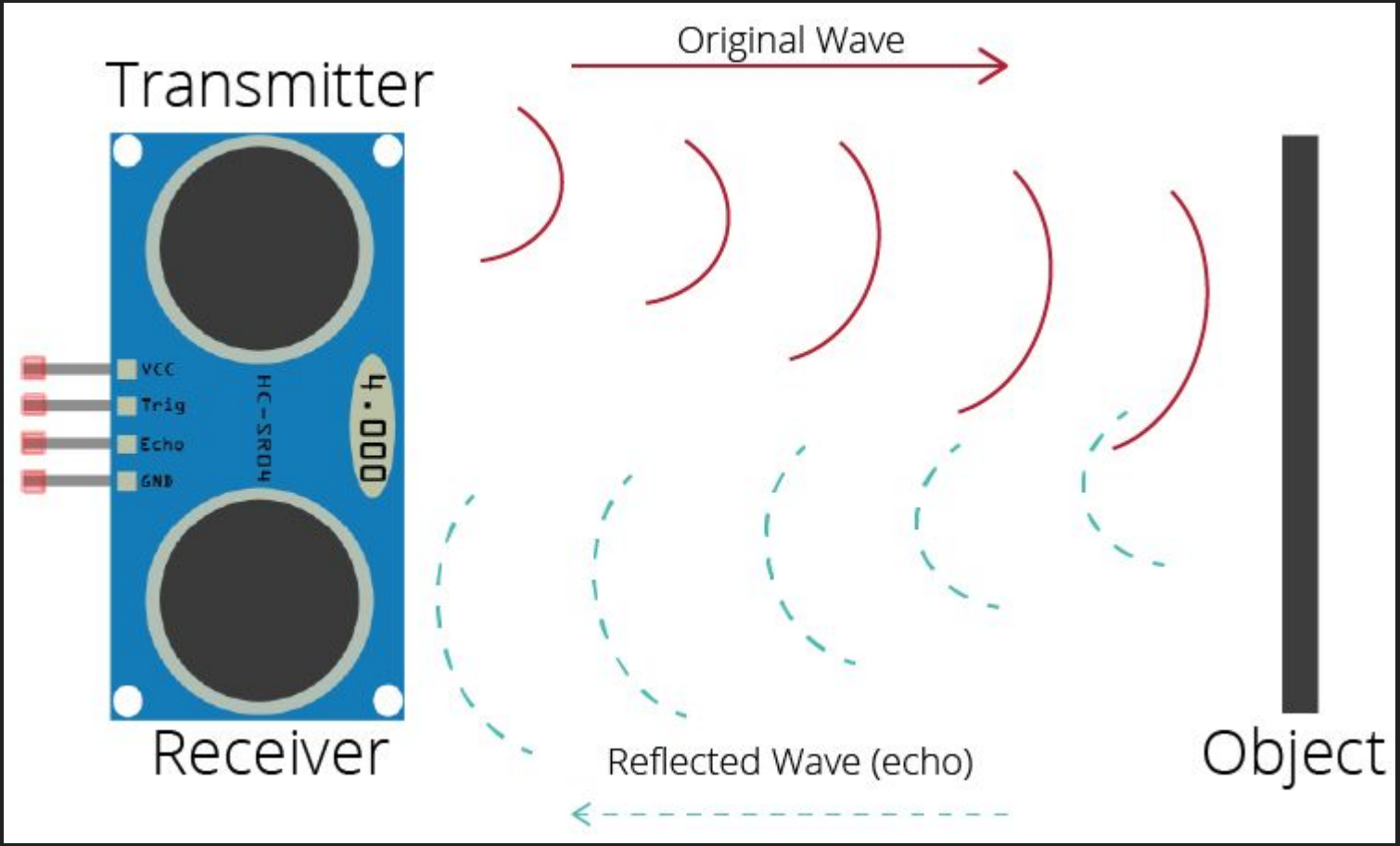

IOREF
RESET
3.3V
5V
GND
GND
Vin
POWER
A0
A1
A2
A3
A4
A5
ANALOG IN
AREF
GND
13
12
~11
~10
~9
8
7
~6
~5
4
~3
2
TX→1
RX←0
DIGITAL (PWM~)
RX
TX
L
ON
ARDUINO
UNO
TMP
GND
VCC
SDA
SCL

Smart Parking Sensor

Design a parking distance warning system that helps a driver know how close an object is.

The project uses an ultrasonic sensor (HC-SR04) and gives feedback with LEDs and a buzzer.

Ultrasonic Sensor HC-SR04 with Arduino


Transmitter
Original Wave
VCC
Trig
Echo
GND
HC-SR04
Receiver
Reflected Wave (echo)
Object

"**trigger input**" is an action or signal from an external device or event that initiates a specific function or code execution in the Arduino

“Echo output” - These sensors work by emitting a burst of ultrasonic sound (triggered by the "Trig" pin) and then listening for the echo (reflected sound) with the "Echo" pin

VCC	Powers the sensor (5V)
Trig	Trigger Input Pin
Echo	Echo Output Pin
GND	Common GND

Components

Red LED - Close Warning

Yellow Led - Medium Distance

Green Led - Safe Distance

HC-SR04 Ultrasonic Sensor

Buzzer

How It Works

he HC-SR04 sends sound waves and measures how long they take to return.

Arduino calculates the distance (cm) using duration * 0.034 / 2.

Based on the result:

- Green = Safe
- Yellow = Getting close
- Red + Buzzer = Too close!

```
if (distance > 30) {
        // Safe zone
        Turn on Green led and Buzzer
} else if (distance <= 30 && distance > 15) {
    // Caution Zone
        Turn on Yellow led and Buzzer
}  etc..
```

Additionally

Replace LEDs with an RGB LED and use different colors instead of three separate LEDs