**LM35 temperature sensor with an ESP8266**

**Components Needed:**

1. **LM35 Temperature Sensor**
2. **ESP8266 (e.g., NodeMCU, Wemos D1 Mini)**
3. **Breadboard and Jumper Wires**
4. **Power Supply (USB or battery)**

**Wiring:**

1. **LM35 Connections**:
   * **VCC (Pin 1)**: Connect to the 3.3V pin on the ESP8266.
   * **Output (Pin 2)**: Connect to an analog pin on the ESP8266 (e.g., A0 on NodeMCU).
   * **GND (Pin 3)**: Connect to the GND pin on the ESP8266.

**Code:**

#include <ESP8266WiFi.h>

void setup() {

Serial.begin(115200);

// Configure the analog pin

pinMode(A0, INPUT);

}

void loop() {

// Read the voltage from the LM35

int sensorValue = analogRead(A0);

// Convert the analog reading (0-1023) to voltage (0-3.3V)

float voltage = sensorValue \* (3.3 / 1023.0);

// Convert voltage to temperature in Celsius (LM35 outputs 10mV per degree)

float temperatureC = voltage \* 100.0;

Serial.print("Temperature: ");

Serial.print(temperatureC);

Serial.println(" °C");

// Wait for a second before the next reading

delay(1000);

}

**Explanation:**

* **Analog Read**: The analogRead(A0) function reads the voltage output from the LM35, which is proportional to the temperature.
* **Voltage Calculation**: The value read from the analog pin (0-1023) is converted to a voltage value (0-3.3V).
* **Temperature Calculation**: The voltage is then converted to temperature in Celsius (10mV per degree Celsius).

**Uploading the Code:**

1. Connect the ESP8266 to your computer.
2. Open the Arduino IDE, select the correct board and port.
3. Upload the code.

**Result:**

Open the Serial Monitor in the Arduino IDE to view the temperature readings from the LM35.

**Note:**

Make sure to handle the voltage levels properly, as the ESP8266 operates at 3.3V. The LM35 is safe to use at this voltage level.

// Pin Definitions

const int sensorPin = A0; // Analog input pin A0 for LM35

void setup() {

Serial.begin(115200); // Initialize serial communication at 115200 baud rate

}

void loop() {

// Read the analog value (0-1023) from the LM35

int sensorValue = analogRead(sensorPin);

// Convert the analog value to voltage (ESP8266 is 10-bit ADC with 1V reference)

float voltage = sensorValue \* (1.0 / 1024.0); // for ESP8266

// Convert voltage to temperature in Celsius

float temperatureC = voltage \* 100.0; // 10mV per degree Celsius

// Print the temperature in Celsius

Serial.print("Temperature: ");

Serial.print(temperatureC);

Serial.println(" °C");

delay(1000); // Wait for a second before reading again

}