

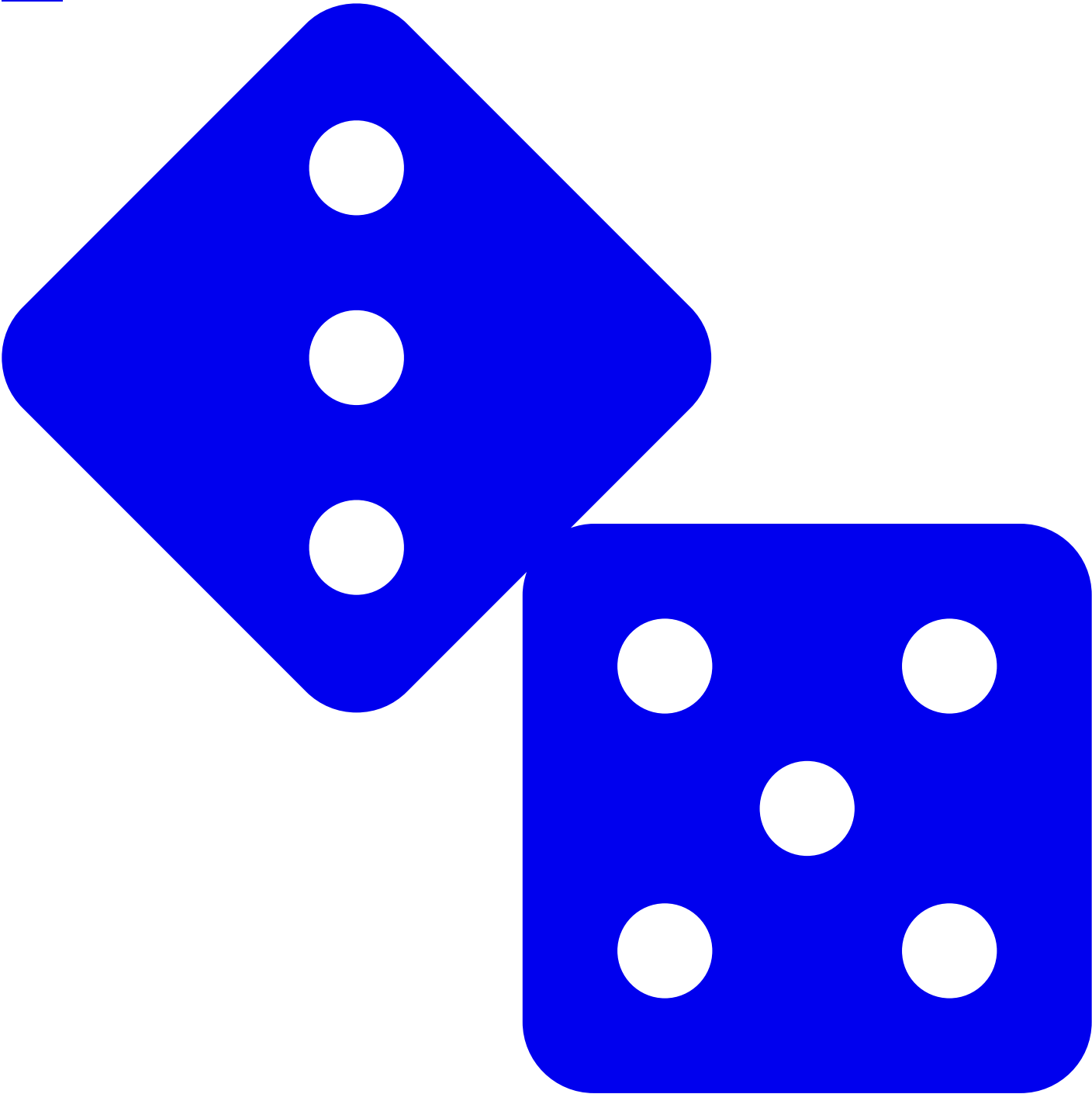
[Skip to main content](#)

- [Shop](#)
- [Learn](#)
- [Blog](#)
- [Forums](#)
- [LIVE!](#)
- [AdaBox](#)
- [IO](#)

toggle menu

0

- [Sign In](#) | [Create Account](#)
- [New Guides](#)
- [Series](#)
- [Wishlists](#)



- [Shop](#)
- [Learn](#)
- [Blog](#)
- [Forums](#)
- [LIVE!](#)
- [AdaBox](#)
- [IO](#)

[Sign In](#)  
0

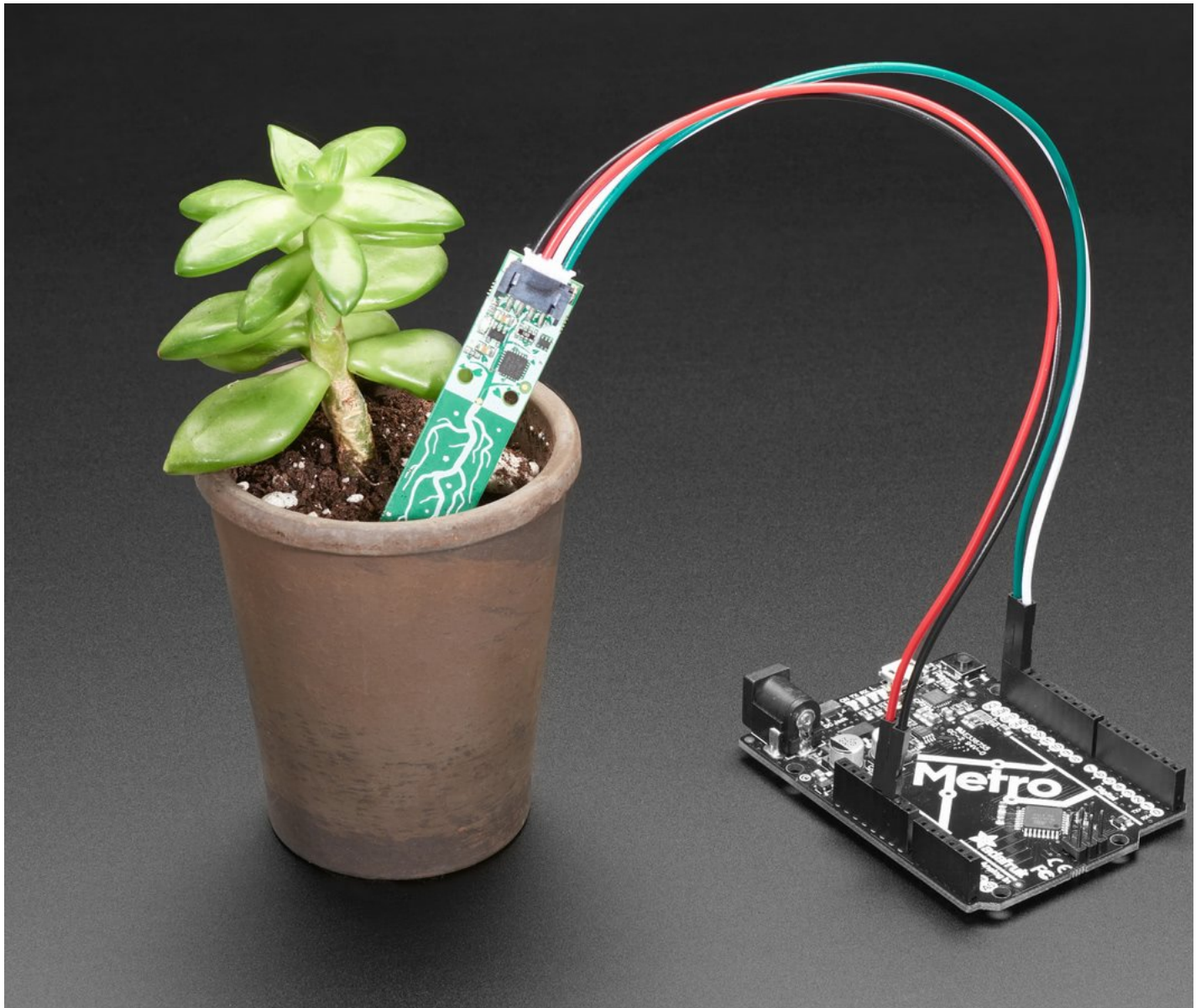
- [Explore & Learn](#)

Learn Categories [view all](#)

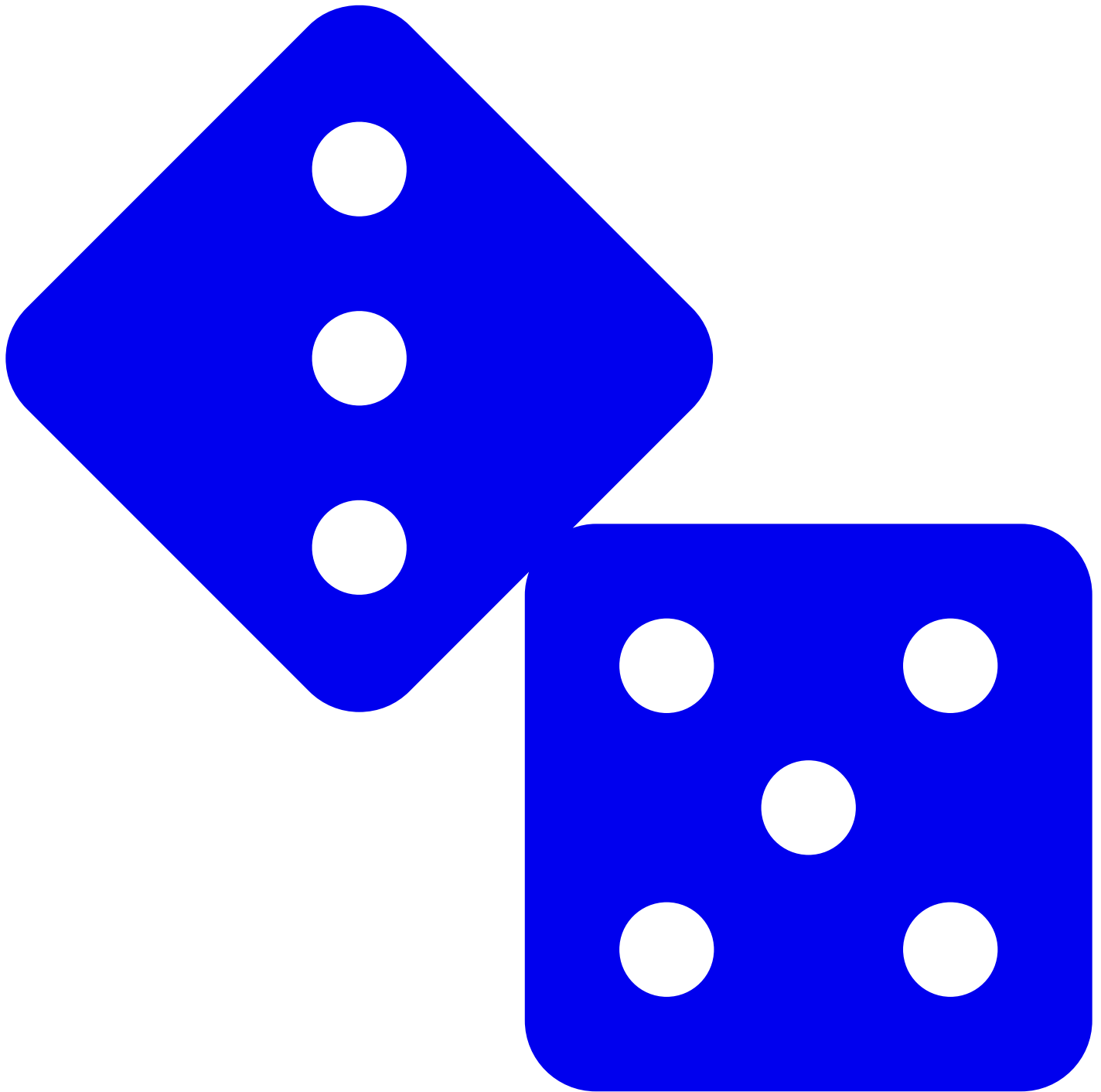
- [3D Printing](#)
- [AdaBox](#)
- [Adafruit Products](#)
- [Arduino Compatibles](#)
- [Breakout Boards](#)
- [Circuit Playground](#)
- [CircuitPython](#)
- [CLUE](#)
- [Community Support](#)
- [Components](#)
- [Crickit](#)
- [Customer & Partner Projects](#)
- [Development Boards](#)
- [Educators](#)
- [EL Wire/Tape/Panel](#)
- [Feather](#)
- [Gaming](#)
- [Hacks](#)
- [Internet of Things - IOT](#)
- [LCDs & Displays](#)
- [LEDs](#)
- [Machine Learning](#)
- [MakeCode](#)
- [Maker Business](#)
- [micro:bit](#)
- [Microcontrollers](#)
- [Programming](#)
- [Projects](#)
- [Raspberry Pi](#)
- [Robotics & CNC](#)
- [Sensors](#)
- [STEMMA](#)
- [Tools](#)
- [Trellis](#)
- [Wearables](#)

Groups [view all](#)

- [Circuit Playground](#)
- [Adafruit IO Basics](#)
- [Collin's Lab](#)

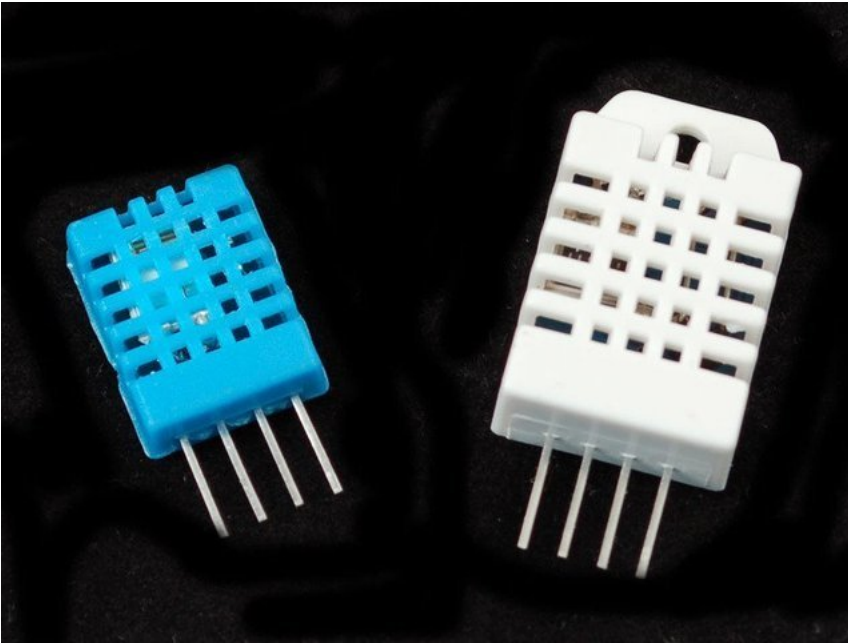


STEMMA  
Plug-n-play components  
[Get connected](#)  
• [New Guides](#)



•

[DHT11, DHT22 and AM2302 Sensors](#) Overview



## DHT11, DHT22 and AM2302 Sensors

By [lady\\_ada](#)

Basic temperature & humidity sensors

- [Overview](#)
- [Connecting to a DHTxx Sensor](#)
- [Using a DHTxx Sensor](#)
- [DHT CircuitPython Code](#)
  - [Python Docs](#)
- [Downloads](#)
- [Featured Products](#)
- [Single page](#)
- [Download PDF](#)

[Feedback? Corrections?](#)

## Overview

[Save](#) [Subscribe](#)



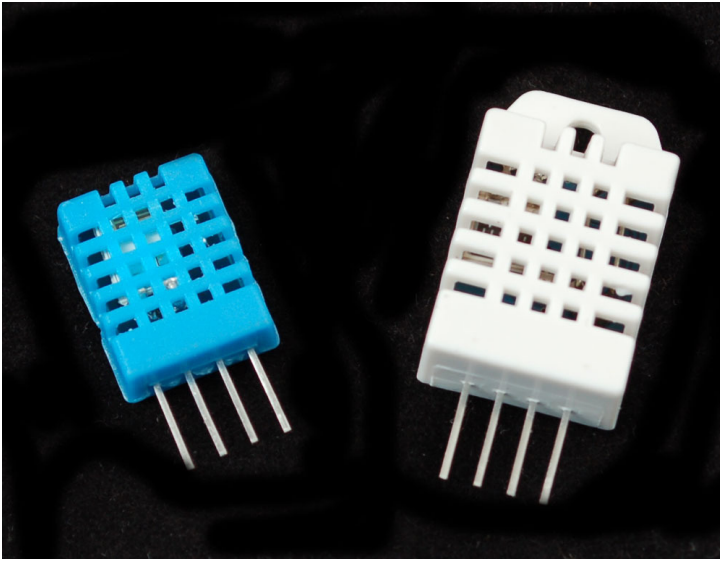
### New Subscription

Please [sign in](#) to subscribe to this guide.

You will be redirected back to this guide once you [sign in](#), and can then subscribe to this guide.

Close

This tutorial covers the low cost [DHT temperature & humidity sensors](#). These sensors are very basic and slow, but are great for hobbyists who want to do some basic data logging. The DHT sensors are made of two parts, a capacitive humidity sensor and a [thermistor](#). There is also a very basic chip inside that does some analog to digital conversion and spits out a digital signal with the temperature and humidity. The digital signal is fairly easy to read using any microcontroller.



## DHT11 vs DHT22

We have two versions of the DHT sensor, they look a bit similar and have the same pinout, but have different characteristics. Here are the specs:

### DHT11

- Ultra low cost
- 3 to 5V power and I/O
- 2.5mA max current use during conversion (while requesting data)
- Good for 20-80% humidity readings with 5% accuracy
- Good for 0-50°C temperature readings  $\pm 2^\circ\text{C}$  accuracy
- No more than 1 Hz sampling rate (once every second)
- Body size 15.5mm x 12mm x 5.5mm
- 4 pins with 0.1" spacing

### DHT22 / AM2302 (Wired version)

- Low cost
- 3 to 5V power and I/O
- 2.5mA max current use during conversion (while requesting data)
- Good for 0-100% humidity readings with 2-5% accuracy
- Good for -40 to 80°C temperature readings  $\pm 0.5^\circ\text{C}$  accuracy
- No more than 0.5 Hz sampling rate (once every 2 seconds)
- Body size 15.1mm x 25mm x 7.7mm
- 4 pins with 0.1" spacing

As you can see, the [DHT22](#) / [AM2302](#) is a little more accurate and good over a slightly larger range. Both use a single digital pin and are 'sluggish' in that you can't query them more than once every second or two.

**You can pick up both the [DHT11](#) and [DHT22](#) or [AM2302](#) from the adafruit shop!**

### [Connecting to a DHTxx Sensor](#)

This guide was first published on Jul 29, 2012. It was last updated on Jul 29, 2012.

This page (Overview) was last updated on Aug 02, 2022.

Text editor powered by [tinymce](#).

Difficulty: Beginner

Guide Type: Tutorial

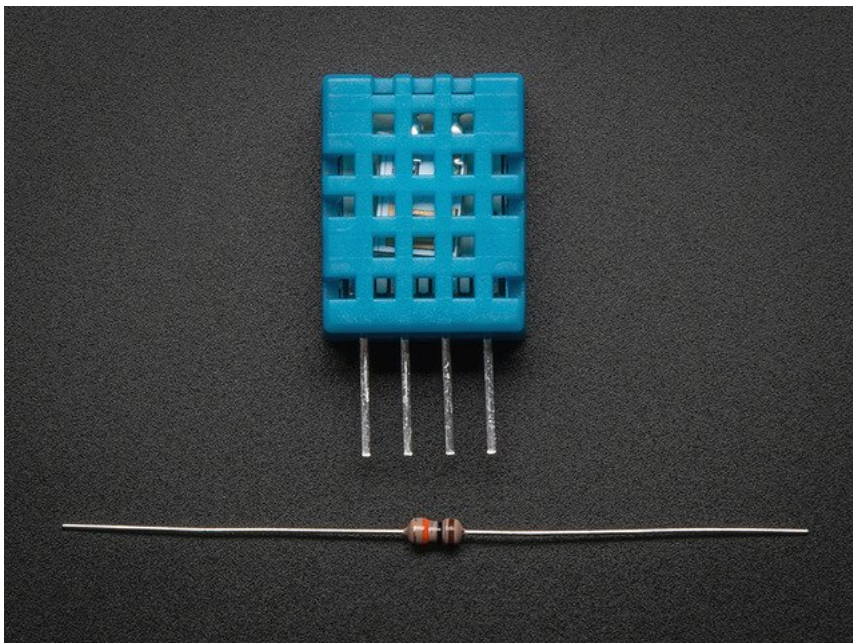
Contributors: [lady ada](#), [Tony DiCola](#), [Kattni Rembor](#)

Categories: [Sensors/Weather](#)

131 Saves

Featured Products



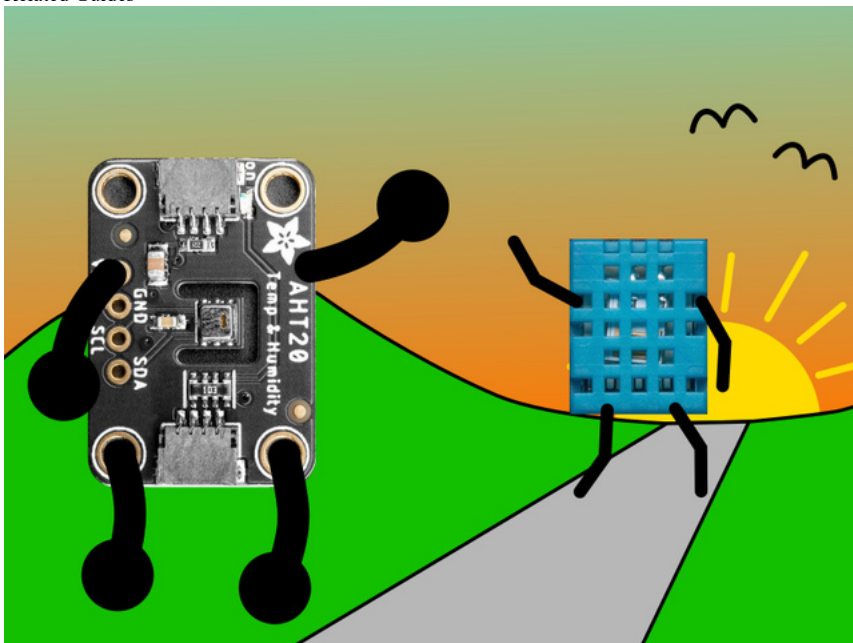


[DHT11 basic temperature-humidity sensor + extras](#)

\$5.00

[Add to Cart](#)

[Related Guides](#)

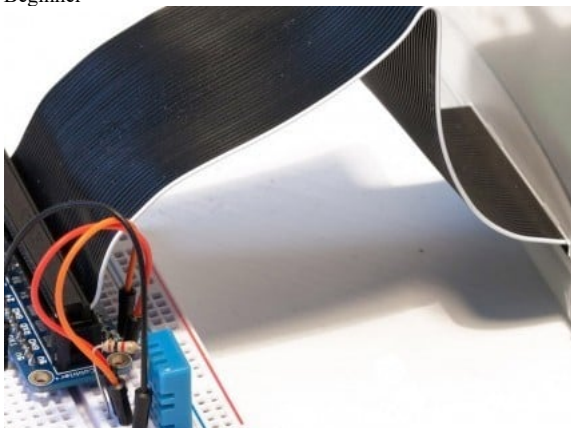


[Modern Replacements for DHT11 and DHT22 Sensors](#)

By [Carter Nelson](#)

15

Beginner



[Monitor Your Home With the Raspberry Pi B+](#)

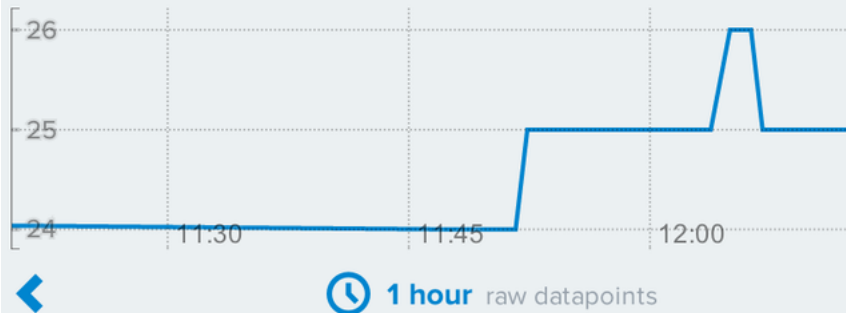
By [M. Schwartz](#)

87

Intermediate

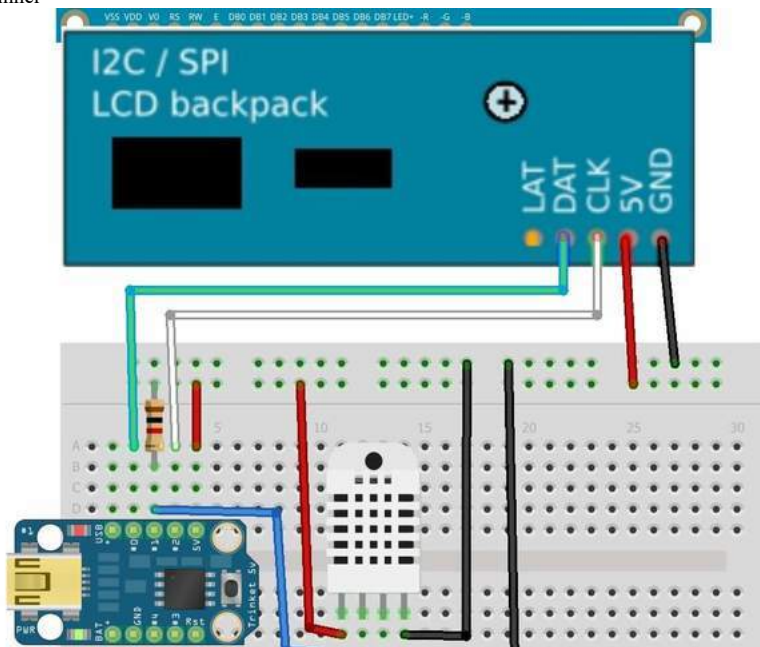
## Temperature

Last updated a few se


[Edit](#) [Delete](#)
[Adafruit CC3000 WiFi and Xively.](#)By [M. Schwartz](#)

3

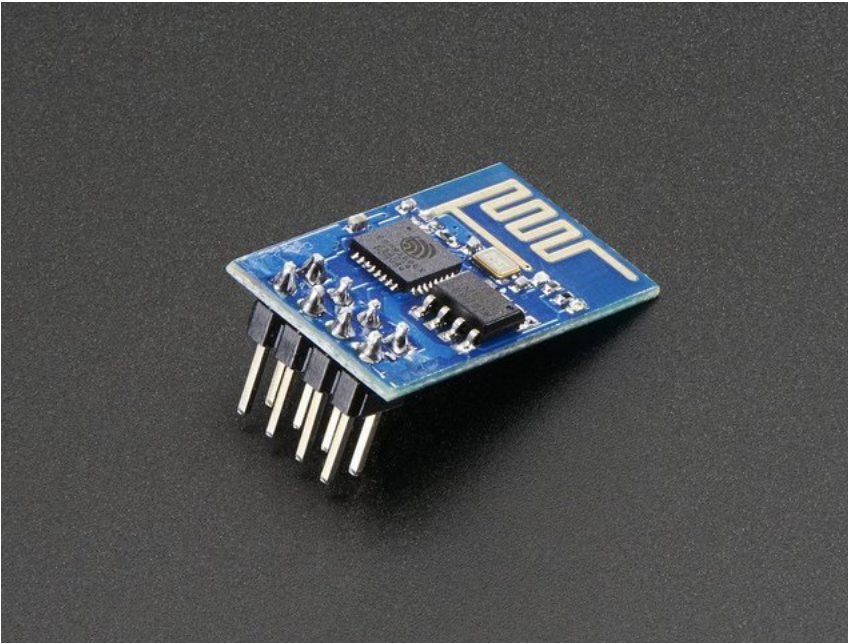
Beginner

[Trinket Temperature & Humidity LCD Display.](#)By [Anne Barela](#)

42

Beginner



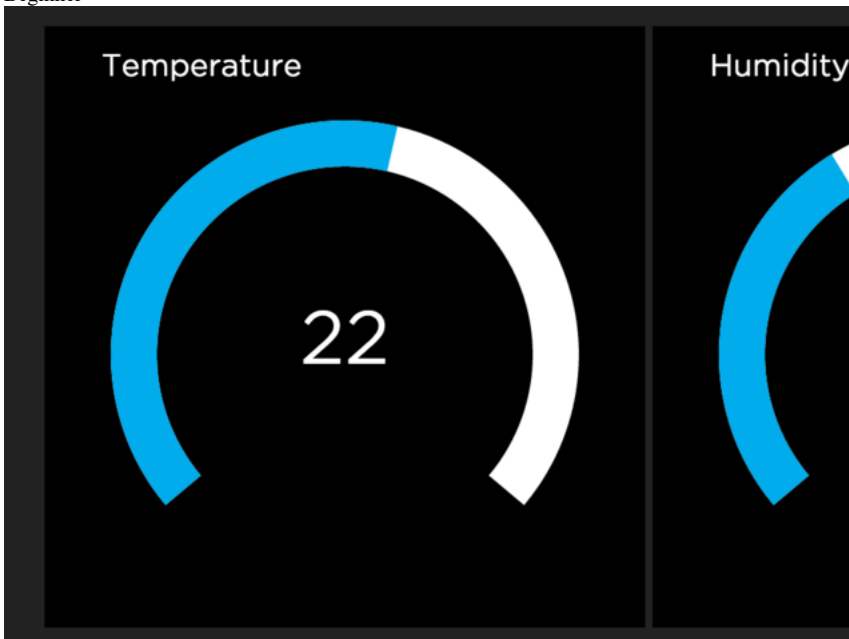


[ESP8266 Temperature / Humidity Webserver](#)

By [Anne Barela](#)

116

Beginner

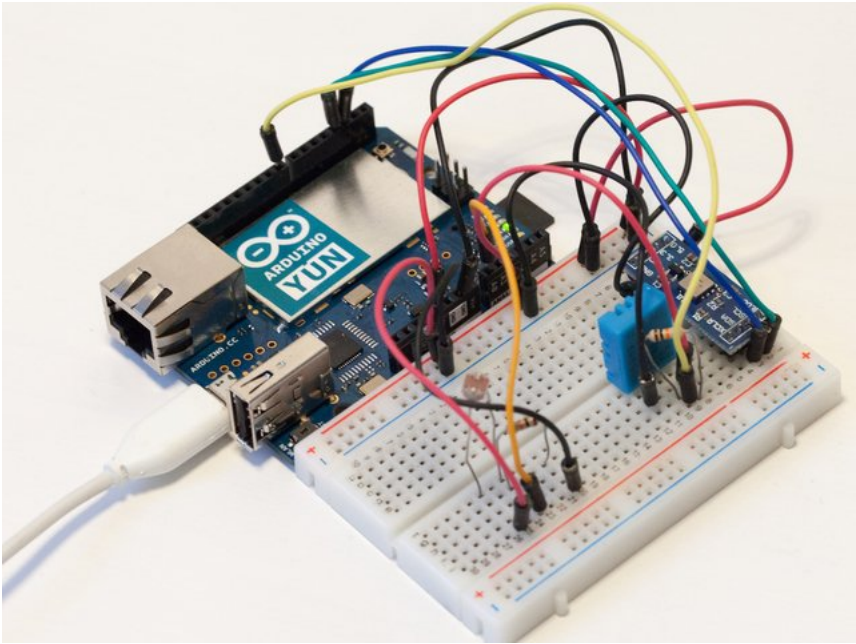


[Create an Internet of Things Dashboard with Adafruit IO](#)

By [M. Schwartz](#)

78

Beginner

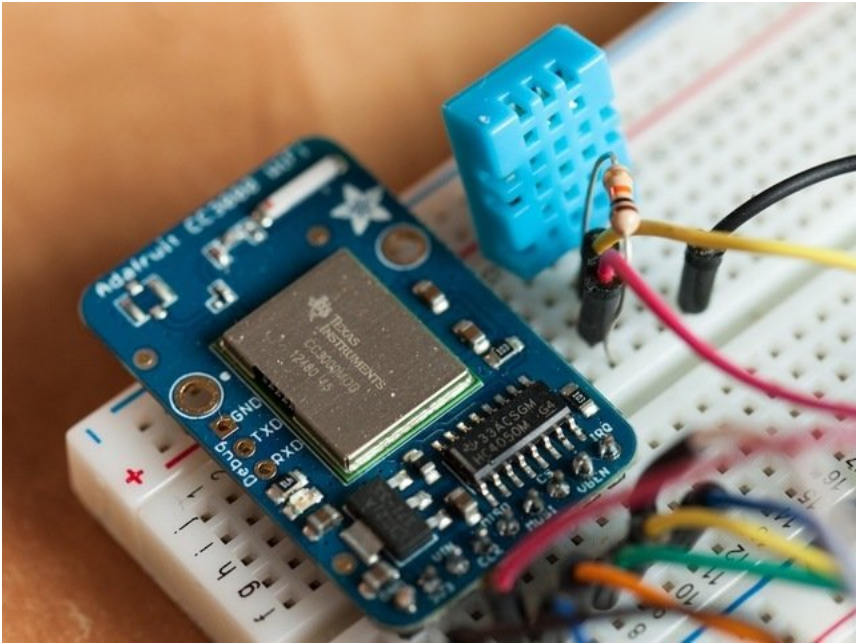


Cloud-Connected Weather Station with the Arduino Yun...

By [M. Schwartz](#)

38

Advanced



WiFi Weather Station

By [M. Schwartz](#)

68

Intermediate

[×](#)

OUT OF STOCK NOTIFICATION

YOUR NAME

YOUR EMAIL

[NOTIFY ME](#)

Search

# Search

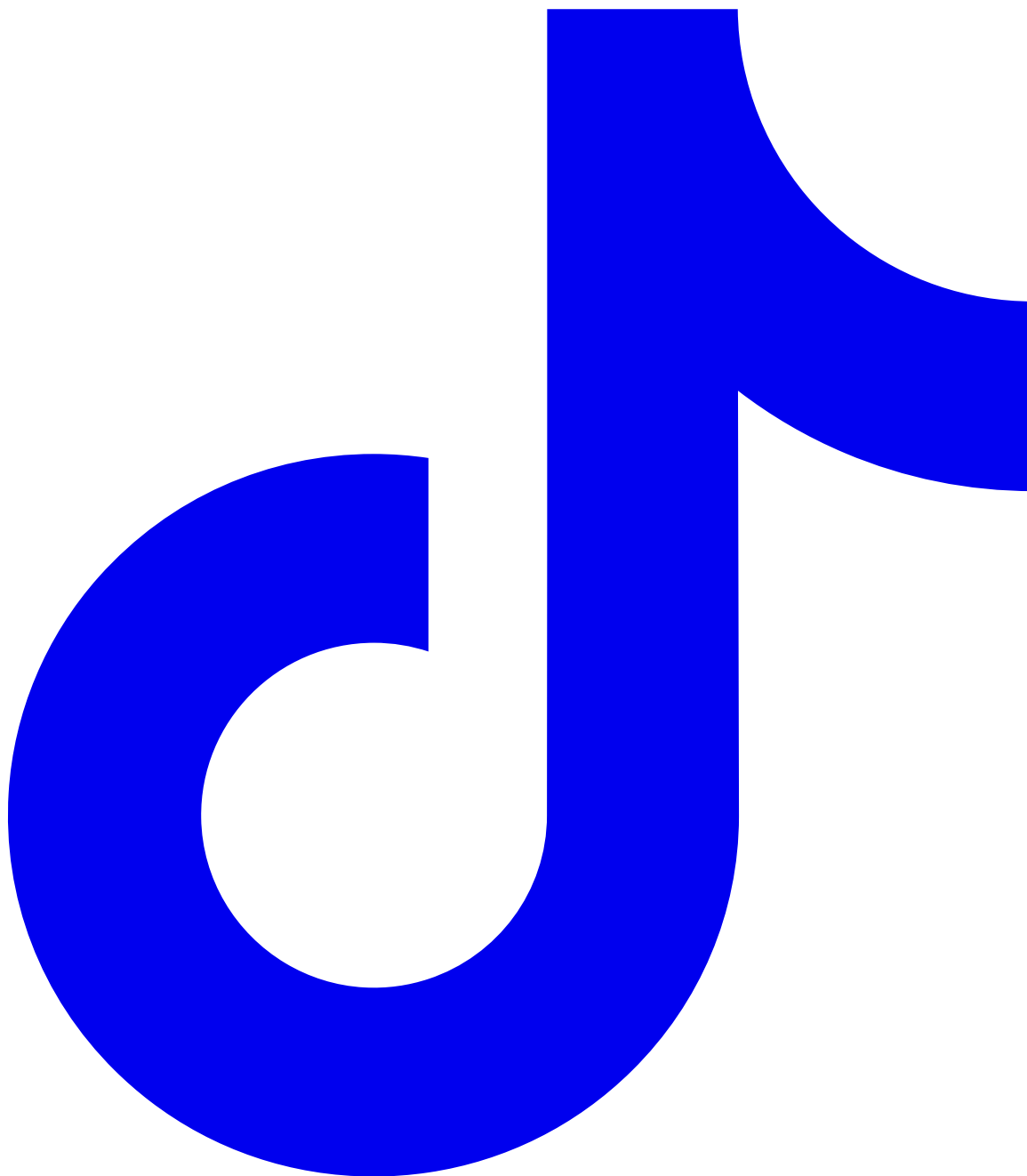
Categories

No results for query

- «
- <

- [1](#)
- [›](#)
- [»](#)
- [Contact Us](#)
- [Tech Support Forums](#)
- [FAQs](#)
- [Shipping & Returns](#)
- [Terms of Service](#)
- [Privacy & Legal](#)
- [Website Accessibility](#)
- [About Us](#)
- [Press](#)
- [Educators](#)
- [Distributors](#)
- [Jobs](#)
- [Gift Cards](#)

"I don't care that they stole my idea — I care that they don't have any of their own"  
[Nikola Tesla](#)



[A Minority and Woman-owned Business Enterprise \(M/WBE\)](#)