Experiment 009 Humidity

#WeAreAllMakers

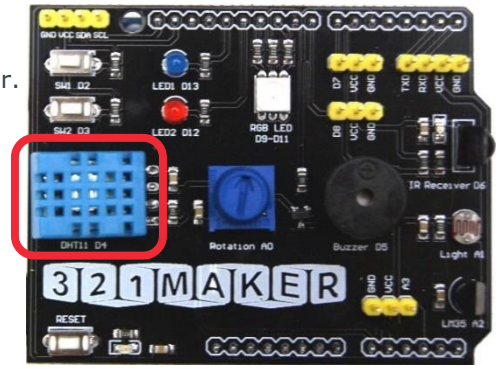
OVERVIEW

In this experiment you will control how read from the humidity sensor on the 321Maker Shield.

OUTCOMES

By the end of this experiment you will be able to:

- Install an Arduino library.
- Read both temperature and Humidity from a DHT11 sensor.



REQUIREMENTS

- Arduino-Compatible board
- 321Maker Things Shield
- USB Cable
- Arduino Software

PREREQUISITES

- Getting Started Tutorial: http://321maker.com/start
- Source Code: https://git.io/vP2vh
- DHT11 Library: https://git.io/vP2Ya
- Adafruit Sensor Library: https://git.io/vhriJ

VIDEO TUTORIAL

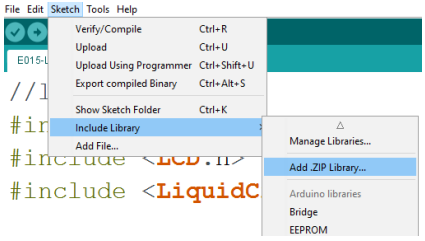
http://youtube.com/indevelopment

BACKGROUND

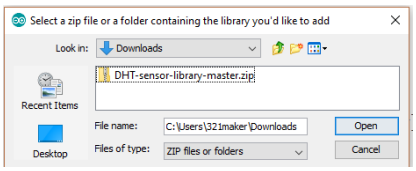
The DHT11 is a smart sensor that has its own internal microcontroller. The sensor takes about 2 seconds to sample the environment. The sensor uses a digital serial connection to transmit the sensor readings.

LEVEL 1 PROCEDURE

- [ ] Connect your Arduino to your computer using the USB port. Open the Arduino software.
- [ ] Download and install the DHT11 library. Click on this link: https://git.io/vP2Ya
- [ ] From the github page click the green **Clone or Download** button on the right hand side, choose Download ZIP. This should download the library zip file.
- [ ] From within the Arduino software choose. **Sketch, include Library, Add .ZIP Library**



- [ ] Browse to your downloads folder and select the **DHT-sensor-library-master.zip** file
- [ ] Download the **Humidity** program code from here: https://git.io/vP2vh
- [ ] Copy and paste the program code into the Arduino software editor.
- [ ] Make sure you have the correct Arduino Board port setup.
- [ ] Click the upload button in the upper left corner to compile and upload the code to the Arduino device. If you see an Orange error in the bottom of your screen, then something went wrong.



- [ ] Congratulations, if you open up the serial monitor you should see the data from the sensor being displayed.

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LEVEL 2 PROGRAM MODIFICATION

- [ ] Add the following lines inside the loop function.

```
Serial.print("Dewpoint:");
Serial.println(dewPoint(celsius,humidity));
```

- [ ] Add the following lines to the very end of the program. (Outside of loop)

```
double dewPoint(double celsius, double humidity)
{
  double a = 17.271;
  double b = 237.7;
  double temp = (a * celsius) / (b + celsius) + log(humidity*0.01);
  double dP = (b * temp) / (a - temp);
  return dP;
}
```

LEVEL 3 ADVANCED APPLICATION

- [ ] Have the Red LED (D12) turn on when the temperature is 25C or and the Blue LED (D13) when the temperature is below 25C
- [ ] Have the Green LED on the RGB (D9) turn on when the humidity is below 50% and Blue LED on the RGB (D11) when it's above 50%.

LEVEL 4 PROJECT CHALLENEGE

- [ ] Create a humidity alarm such that when the humidity is above a threshold set by the rotation sensor (A0). Then the buzzer will chirp.