

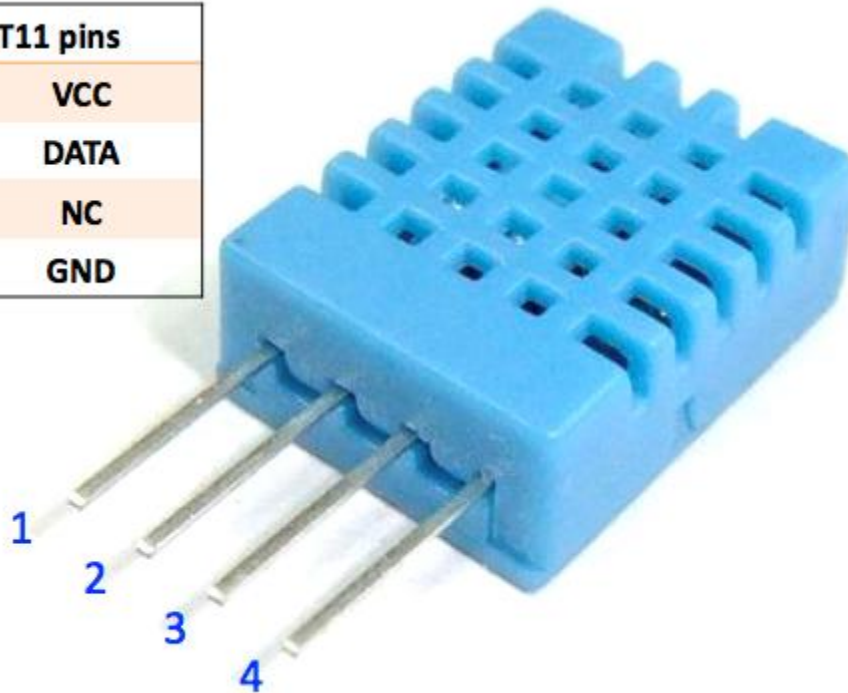
GoldSTEM_Lesson_15_Temperature_and_Humidity_to_Monitor_in_Celsius

tm 3-23-2016

For this experiment we will be using a new component the DHT11 Temperature and Humidity sensor

DHT11 Temperature and Humidity sensor

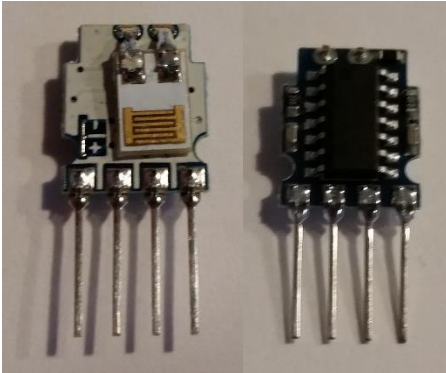
DHT11 pins	
1	VCC
2	DATA
3	NC
4	GND



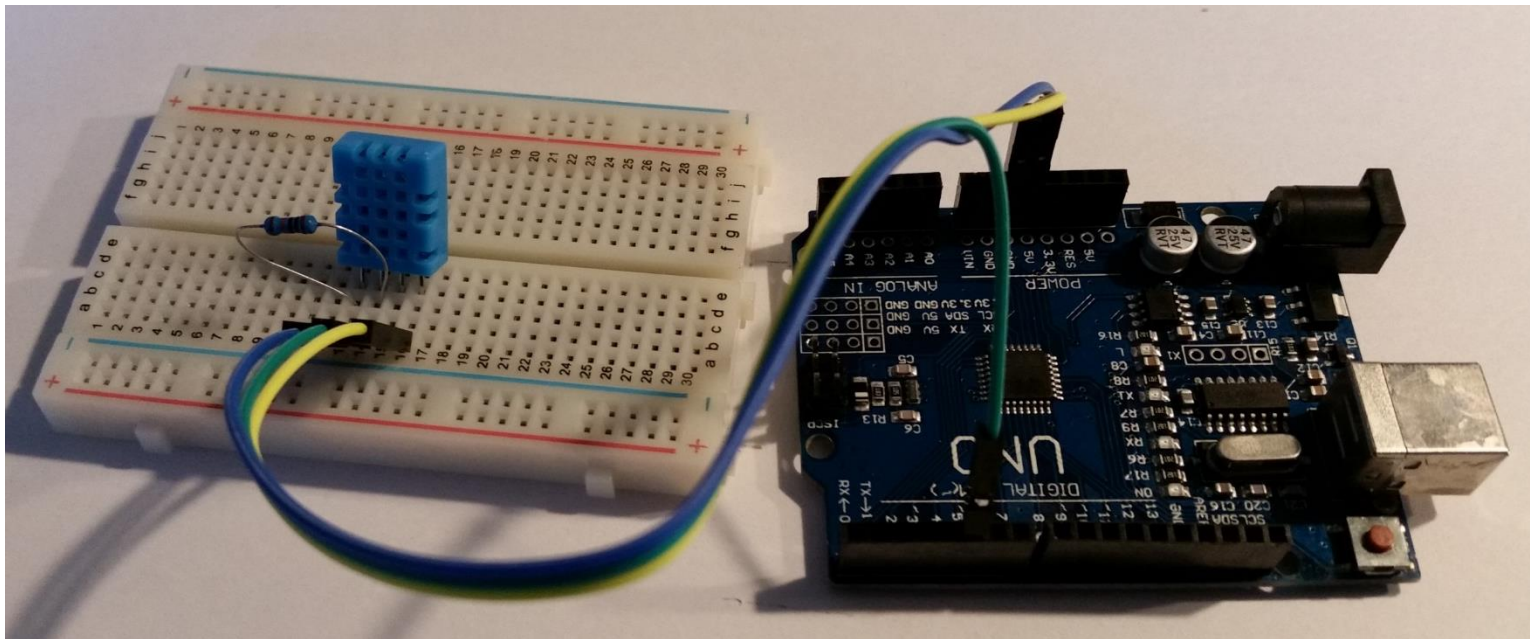
Data sheet on DHT11

<http://akizukidenshi.com/download/ds/aosong/DHT11.pdf>

Don't take your unit apart but let's have a look inside.



Not as trivial as we may have thought.



Wiring the circuit

Insert the DHT11 Temperature and Humidity sensor into the breadboard

HDT11 Pin 1 to d13

HDT11 Pin 2 to d14

HDT11 Pin 3 to d15

HDT11 Pin 4 to d16

R1 Resistor 10K c13 to c14

Blue jumper a13 to UNO POWER 5V

Green jumper a14 to UNO DIGITAL 5

Yellow jumper a16 to UNO POWER GND

Load the Code

GoldSTEM_Lesson_15_Temperature_and_Humidity_to_Monitor_in_Celsius

```
// GoldSTEM_Lesson_15_Temperature_and_Humidity_to_Monitor_in_Celsius GoldSTEM tm 3-15-2016
```

```
#include "DHT.h" // Include a separate program that interfaces to the DHT Temperature sensors.
```

```
#define DHTPIN 5 // Connect pin 2 data to UNO pin 5
```

```
#define DHTTYPE DHT11 // Tell the include program we are using the DHT11
```

```
DHT dht(DHTPIN, DHTTYPE); // Initialize chip
```

```
void setup() {
```

```
  Serial.begin(9600); // Set Serial port to 9600
```

```
  dht.begin(); // Start DHT
```

```
}
```

```
void loop() {
```

```
// Wait a few seconds between measurements.
delay(2000); // Wait 2 seconds between measurements

float h = dht.readHumidity(); //Read Humidity using DHT Include File
float t = dht.readTemperature(); //Read Temperature in Celsius

// Check for valid reading
if (isnan(h) || isnan(t)) {
  Serial.println("Failed to read from DHT sensor!");
  return;
}

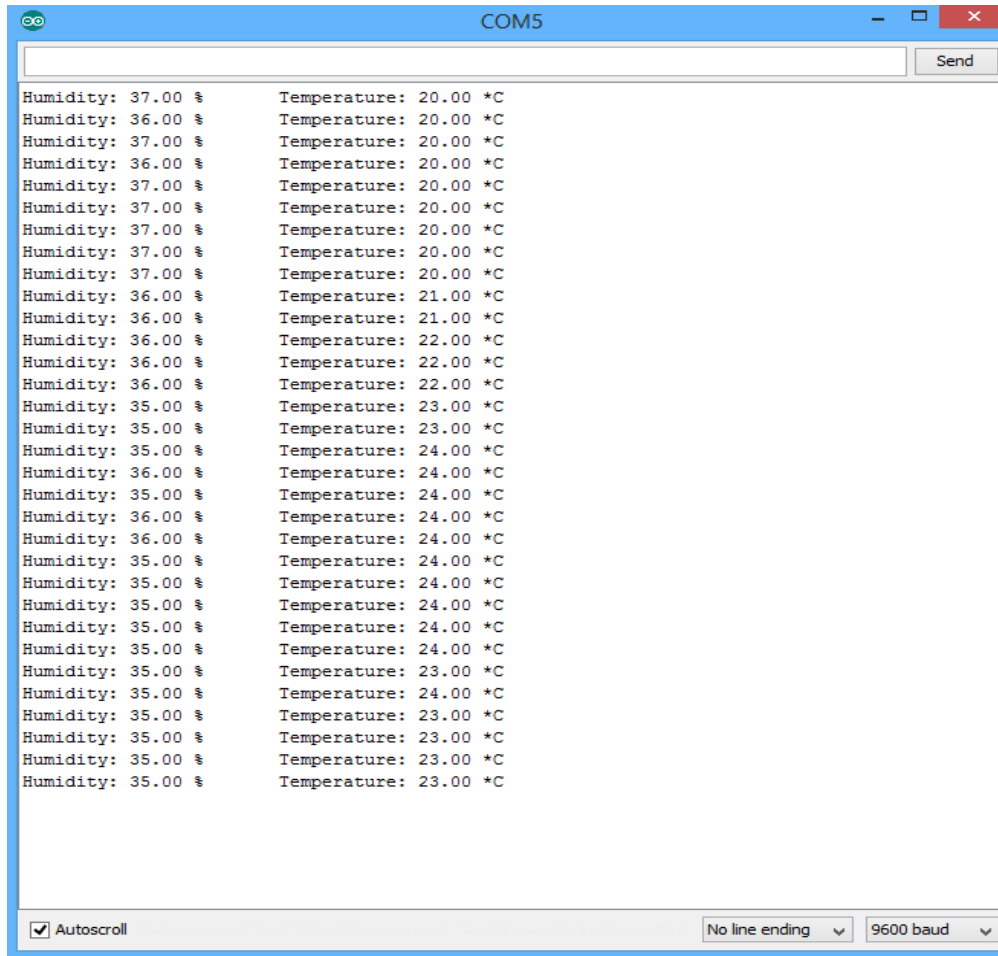
Serial.print("Humidity: ");
Serial.print(h);
Serial.print(" %\t");
Serial.print("Temperature: ");
Serial.print(t);
Serial.println(" *C "); //Print C and create a new line.

}
```

Output to monitor

To see the Monitor output click on the Serial Monitor Icon, on the Sketch page it looks like a magnifying glass on the right side of the page.

This is what you should see.



Ok is it working?

Questions

- 1) Put your fingers on the temperature sensor, do you see the temperature rising?
- 2) Remove the green jumper from a14 what happens?
- 3) Can you find that in the code?
- 4) What happens if you remove the 10K resistor from the circuit?

This is the first time we used the statement

```
#include
```

What it does is brings in a separate program called DHT.h

This program interfaces with the DHT11 and makes our program allot simpler.

If you look at the DHT.h it has the capability of doing some interesting and complicated calculations that we don't need to know all the details about right now.

To learn more about DHT.h

<https://github.com/adafruit/DHT-sensor-library/blob/master/DHT.h>

End of Lesson