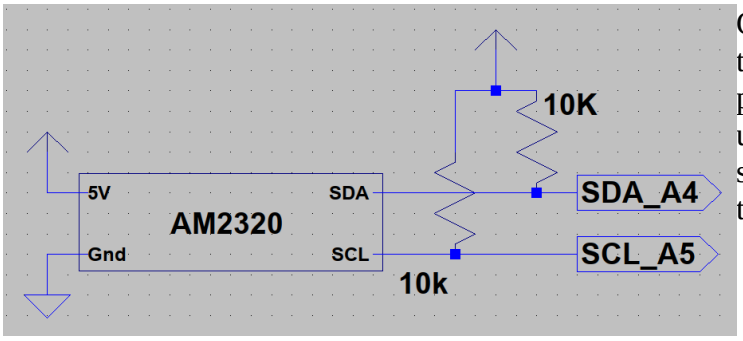
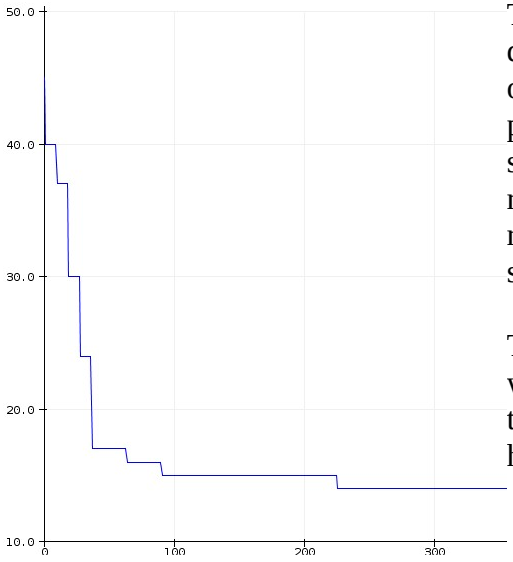
Our next dish on the menu will be the am2320 humidity sensor. **(I'll be testing with a dht sensor until we get parts for the kit, then the example code will be swapped.)** This sensor is a capacitive plate humidity sensor that changes capacitance as its inner material absorbs moisture from the air, and has an internal temperature sensor for compensation. We will only be paying attention to the humidity values for now and will have a section for temperature alone. It has an internal interface device that takes these raw measurements and communicates meaningful values through a protocol called I^2C (eye-squared-see). Like our last example which used SPI to communicate with an sd card, I^2C is a method for a microcontroller to communicate with and control many digital devices. I^2C differs from SPI in that SPI uses a chip select pin to select a specific device from a network of devices with one pin per device. I^2C instead uses an I^2C address, which is an id number for the device being selected. This is nice because increasing device number doesn't increase the number of pins used on the master controller, since instead all of the devices effectively "know thier own name" and know when to ignore a callout for data. This does however require that no sensors have identical I^2C addresses since they will both answer to the same name at the same time, ruining access to both sensors.



Construct this circuit to connect this sensor to the arduino, and and upload the humidity.ino program. After the program is finished uploading, open up the serial monitor and/or serial plotter and gently breathe on the sensor to stimulate the sensor and see the reaction.



This is a screen grab of the output of a sensor settling back down after being exposed to high humidity briefly. The X axis of the arduino serial plotter is the datapoint number, and this program runs not as fast as the arduino can, but faster than the sensor can update its internal values. Some sensors have longer reaction times, and especially cheaper humidity sensors have relatively low sensitivity. Some of this is displayed in the stepped shape of this data.

These grade of humidty sensors are more ideal for ground weather stations or otherwise situaitons with more air available than extremely high altitudes. Not to mention that these usually have relatively narrow operating temperature ranges.