

- BF-V

Our Experiment

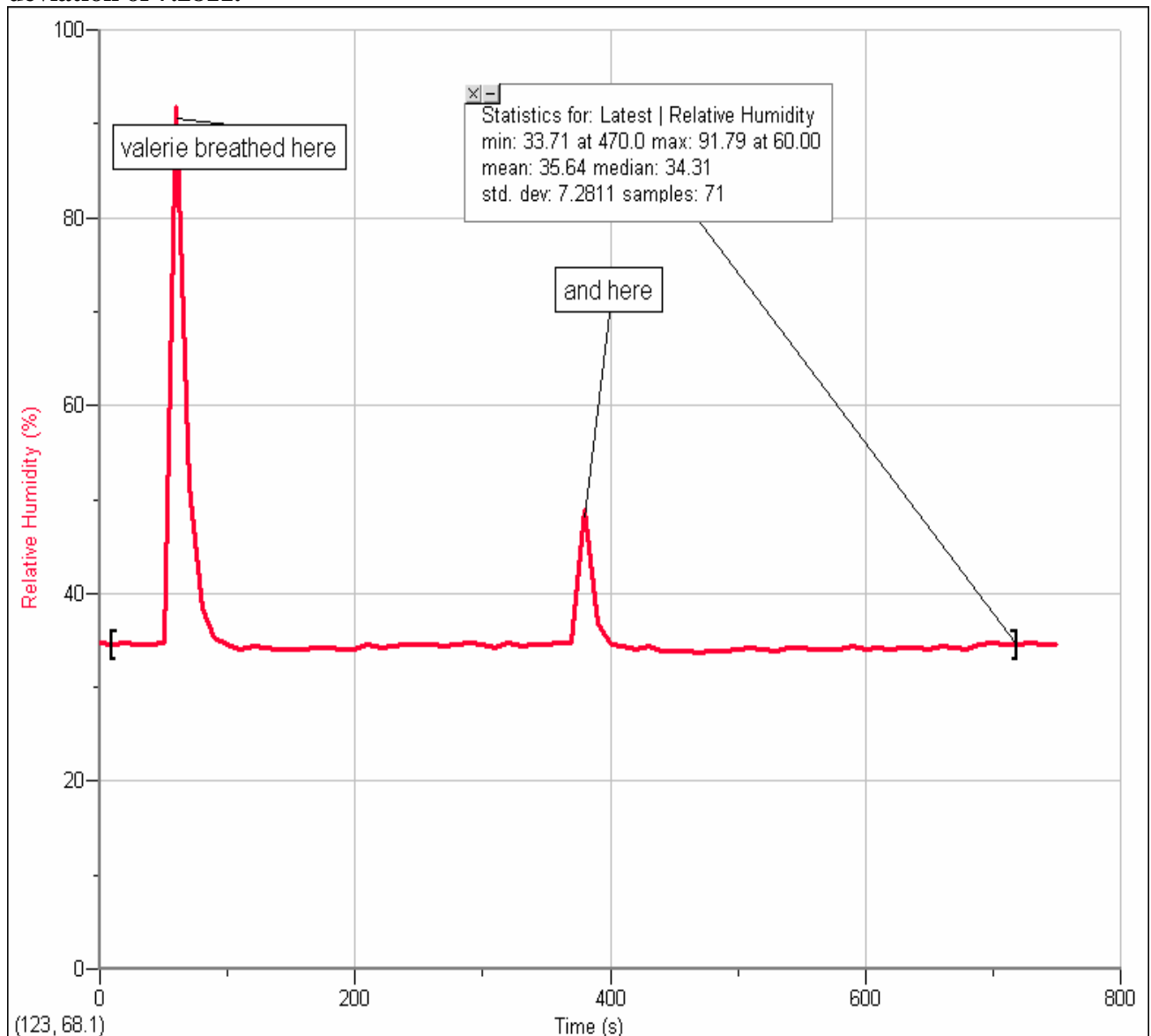
We needed to develop an experiment that would measure the relative humidity in a room and in a jar with 100% humidity. We would compare what our relative humidity sensor detects to the already known humidity in the jar in order to measure the precision and the uncertainty. After calculating the uncertainty by hand, we can use LoggerPro to compare our uncertainty to the computer calculated uncertainty.

Sources of Error

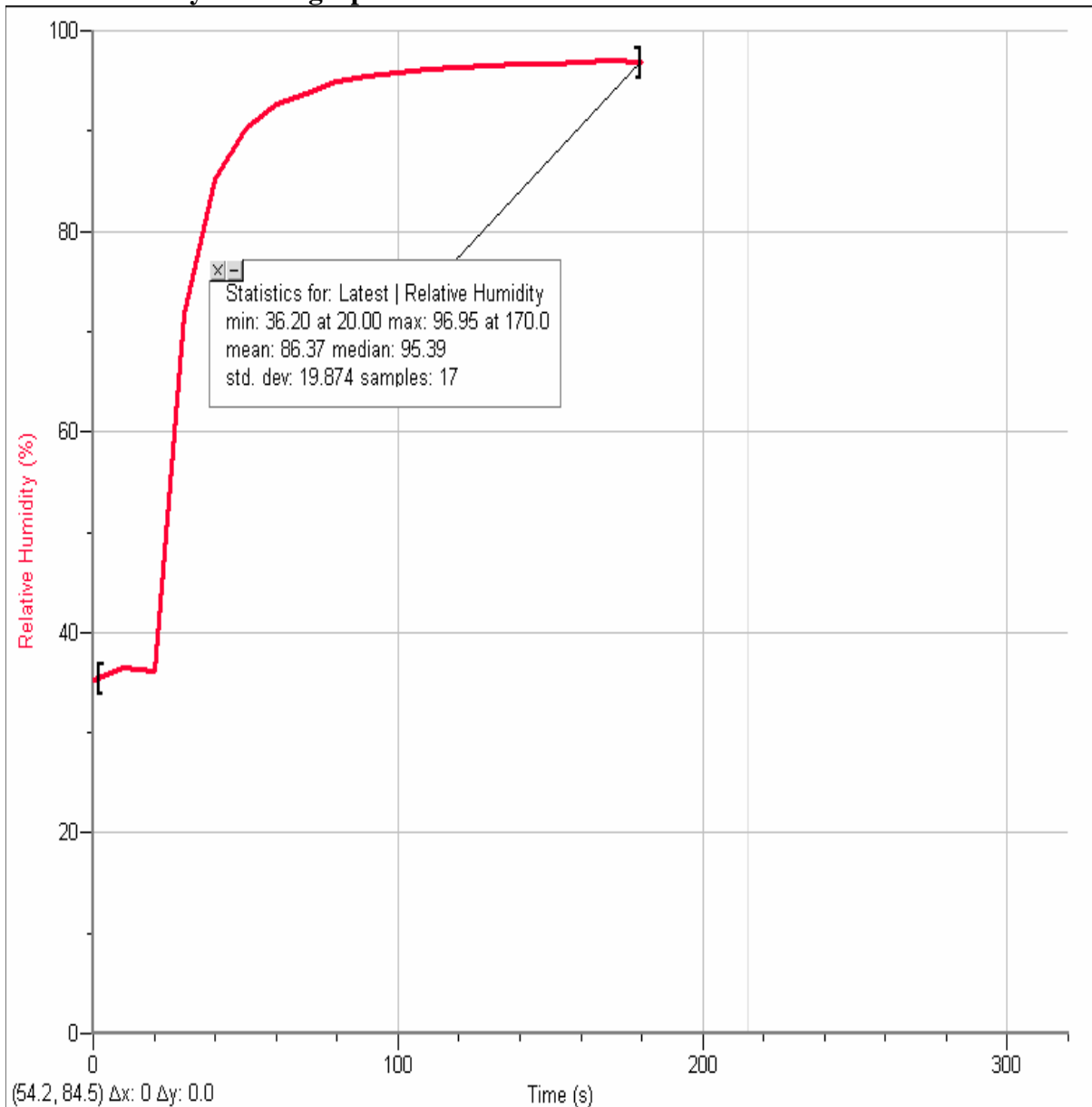
- Sensitivity to the humidity.
- Temperature is extremely varying.
- Dew touches the probe and completely ruins the experiment.
- Foggy in the morning and sunny in the afternoon.
- If the probe gets wet.
- If the heat is extreme.
- Start in morning and finish in the afternoon, (starting and finishing at different times.)
- If you accidentally breathe on it, this will create a spike in the graph which can result in a wrong uncertainty.
- The buttons malfunction.
- The batteries are dead.

Analysis

This is our first test. We purposely had errors in our test. We tried breathing on the probe to see if it would detect the change in humidity, which it did. Besides the peaks from our breathing on it, the graph is pretty constant with a few tiny bumps. This shows that our detector was able to detect very small changes in humidity which is a good thing because we were afraid that the detector wouldn't detect small changes without vigorous air movement. **This graph shows the uncertainty to be 35.64% with a standard deviation of 7.2811.**



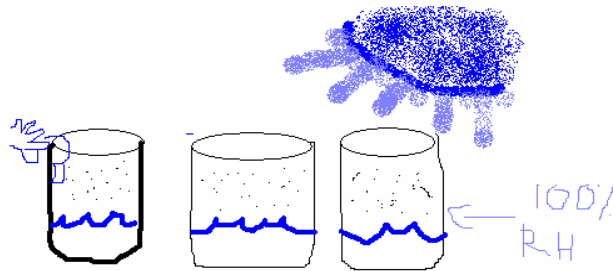
This is our final test in which we placed the relative humidity sensor inside of a jar with 100% humidity. We placed the relative humidity sensor in the jar for approximately 180 seconds which is where we reached our highest percent relative humidity. The closest we got to 100% humidity was 96.80% which is very good. We calculated our accuracy by subtracting our highest percentage of humidity from the standard (100%) and then dividing by 100. **Our calculated accuracy was +/- 0.032%. The uncertainty for this graph is 86.37 and the standard deviation is 19.874.**



Lab Report

Purpose: Design an experiment that measures precision and uncertainty. We will also have to find the sources of error so that we know what our possible problems will be. Our whole experiment is that we will be measuring relative humidity with altitude.

Method:



Research: Total accuracy +/- 10% relative humidity
Operating temperature range 0-85degrees Celsius

Prediction: I don't think we will reach 100% relative humidity because the temperature is not between 85 degrees Celsius. So our accuracy will have a difference.

Conclusion: In our experiment we did not reach 100%. However our experiment was very close. Our actual humidity was 96.8. So I think that if we had a little more time we would be able to reach a perfect 100%. We will spend more time in our next experiment to finish it off.