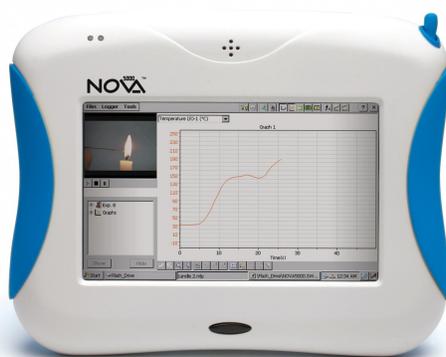


MultiLab Demonstration



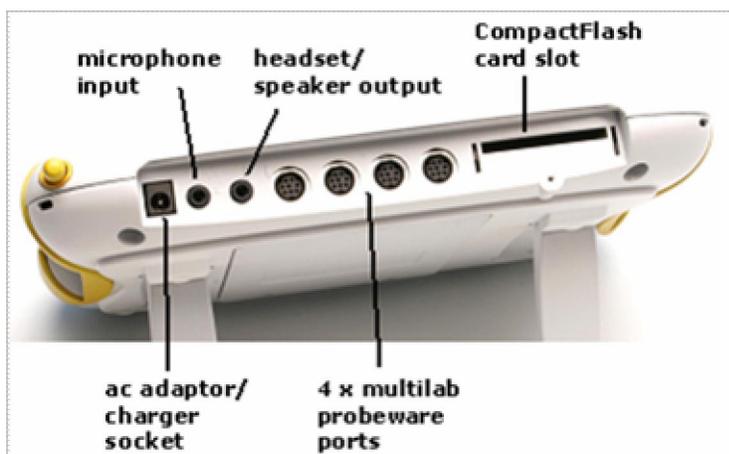
If you only have 1-2 minutes to demonstrate the scientific probes, here's how you can cover the basics. The main points you want to make are:

- a. Using probeware with the Nova5000 is very easy. The ease of use will allow students to focus on the science rather than on the technology which is just a tool.
- b. When you plug a sensor into the Nova5000, it is automatically identified. Sensor auto identification is another ease of use feature.
- c. There are many sophisticated mathematical data analysis tools within MultiLab that allows students to work like practitioner scientists and also see the relationship between math and science.
- d. Fourier makes over 65 scientific probes and also can accommodate Vernier probes. Hence the Nova5000 can accommodate more probes than any data logging system on the market.

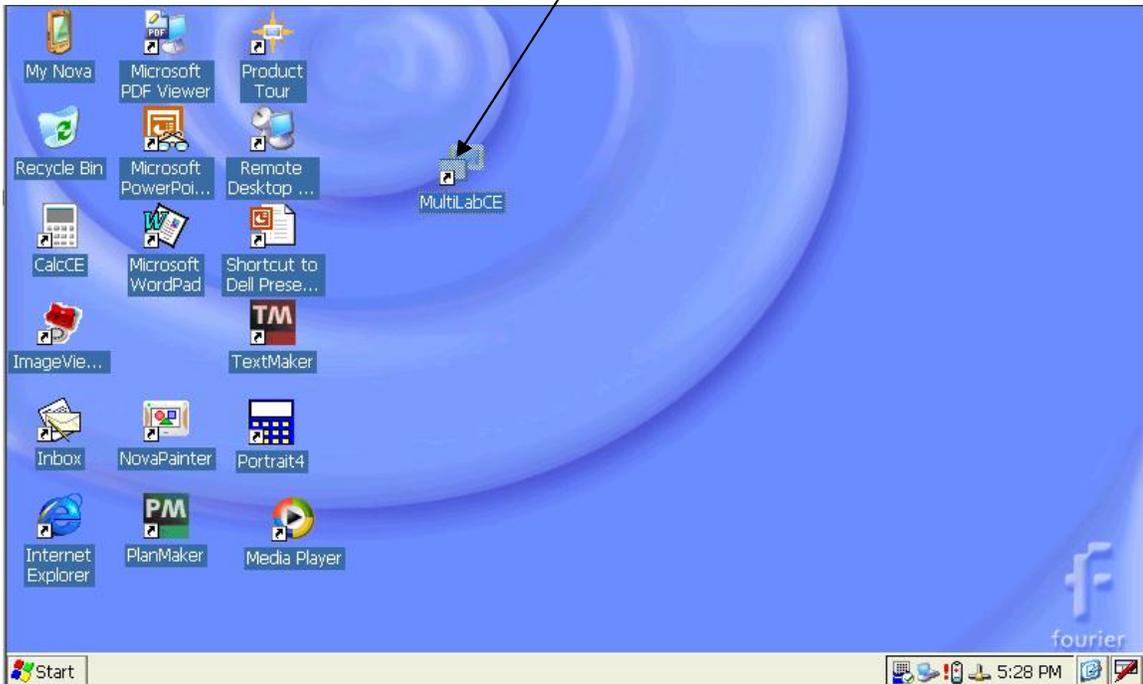
1. You should have a temperature sensor that looks like this.



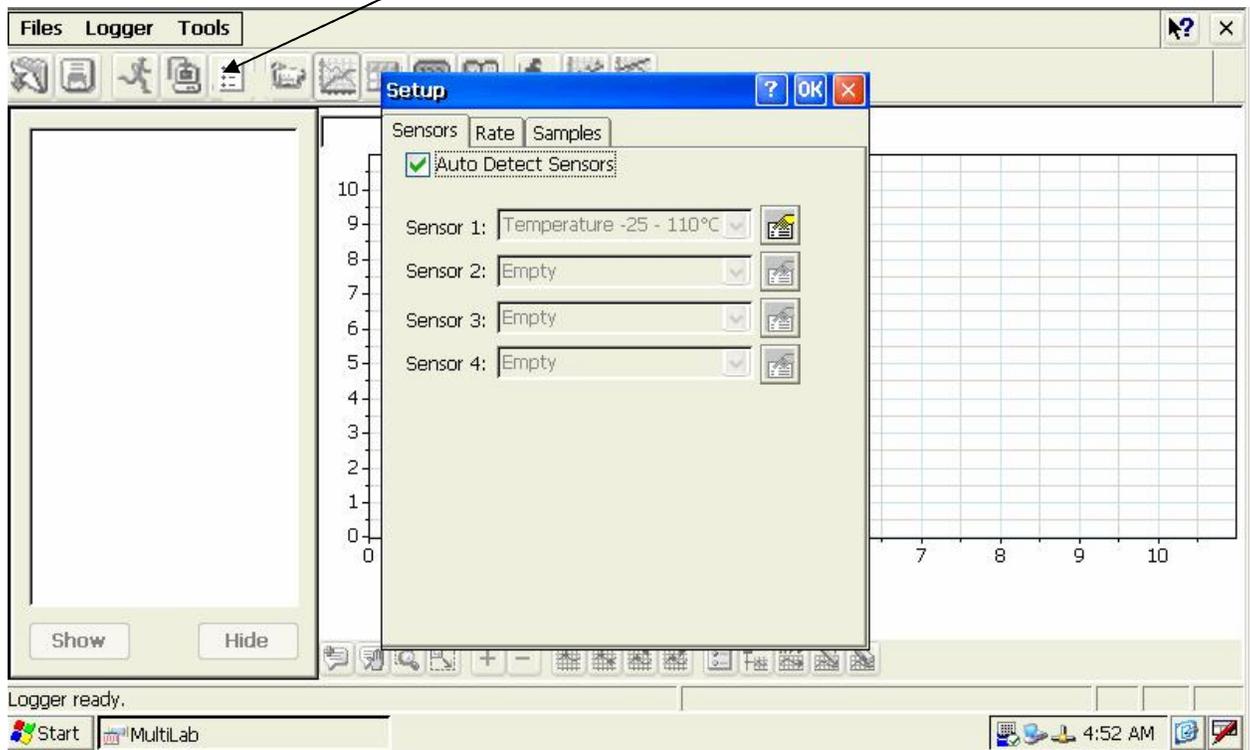
Plug this sensor into the Port labeled: I/O 1. The arrow on the plug of the temperature probe should face down. As you face the Nova, it is the port on the right. If the probe is not plugged into port 1, the NOVA5000 will not recognize it.



2. On your desktop, launch the program called **MultiLabCE** icon on the desktop. If there is no shortcut on the desktop, select **START PROGRAMS SCIENCE AND MATH MULTILAB**

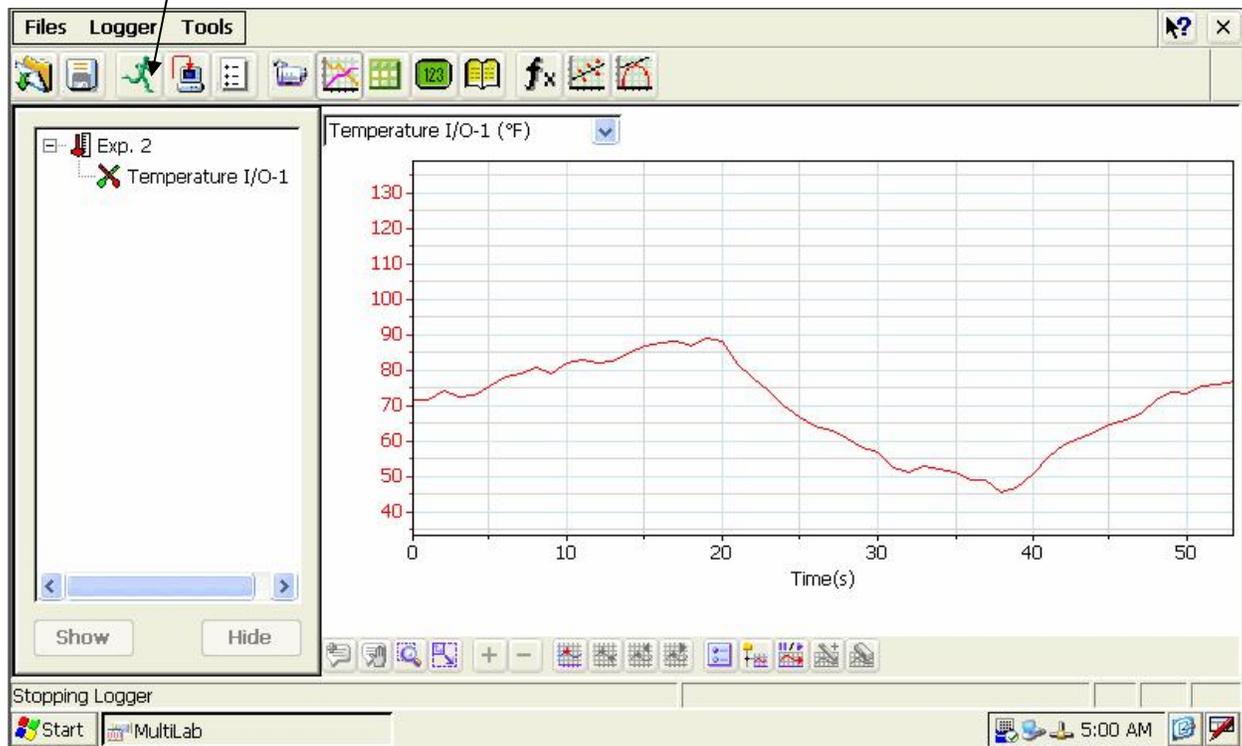


3. After you launch MultiLabCE, click on the **SETUP** icon which opens the SETUP dialog box as shown below. The following screen appears. Please notice that the temperature sensor is automatically identified.



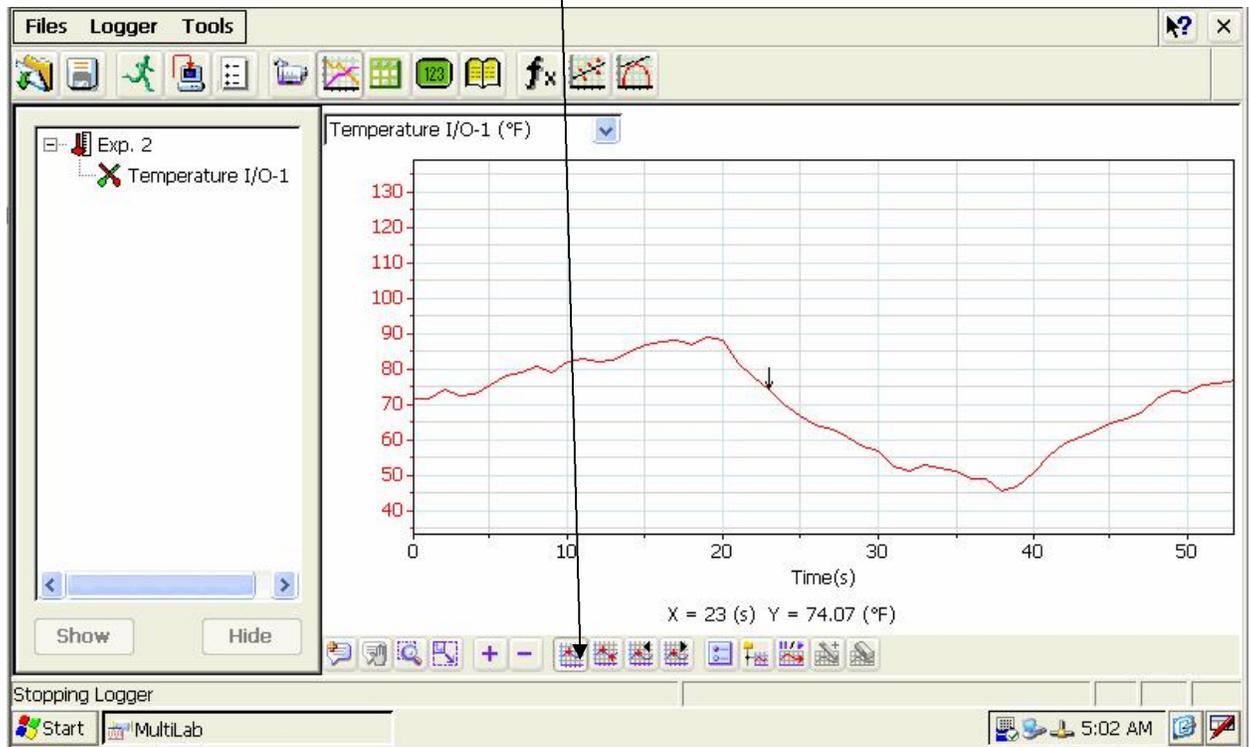
The default settings can be used to collect data (or you can change Rate and Samples manually if you choose). Click **OK** to accept these settings.

4. Have handy either cups of hot and cold water or you can use your hand and demonstrate friction heating of the sensor. The temperature sensor itself is at the tip of the stainless steel sheathe.
5. Click on the **RUN** icon on the menu bar at the top of the screen. You will see a graph of the temperature vs time. You should either heat and/or cool the temperature probe and watch the temperature change on the graph. In the graph below, the temperature probe is being heated (temperature rising), cooled (temperature declining) and heated again (temperature rising).

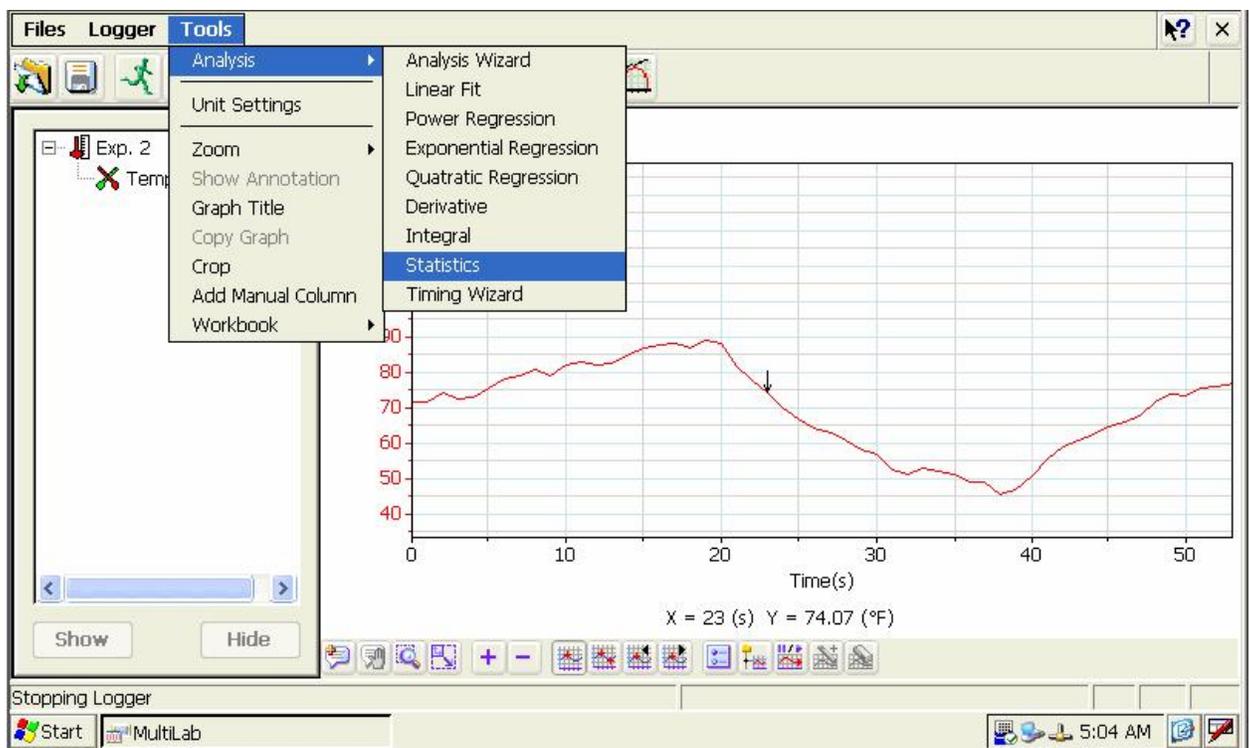


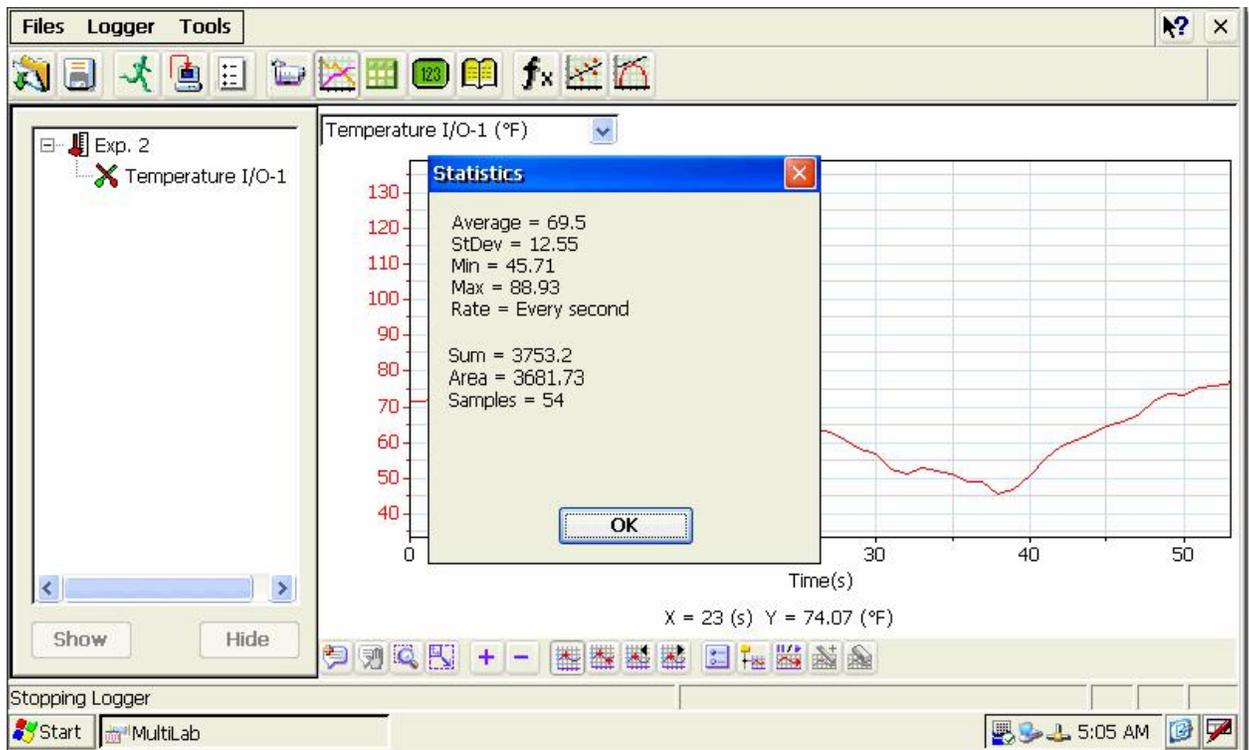
6. To STOP the experiment, click on the **STOP** icon  on the menu bar at the top of the screen.

7. To read points on the graph, click on the **First Cursor** icon at the bottom of the screen below the graph. An arrow will appear on the graph, and the temperature and time readings for the location of the arrow will appear at the bottom screen below the graph. You can drag the arrow along the graph to see how the readings change. This feature helps students with graphical interpretation which is a skill that is required on many standardized tests.

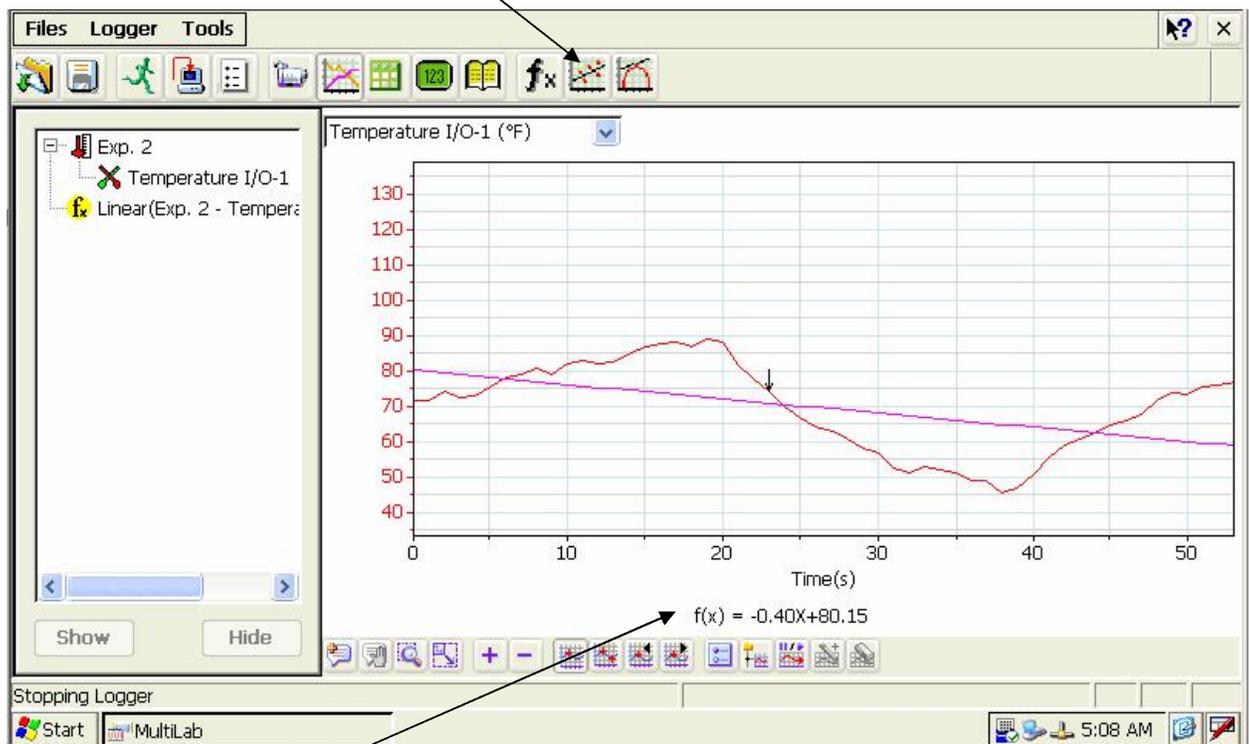


8. Go to the **Analysis** drop down menu at the top of the screen and select **STATISTICS**. You will see the statistics for this graph. After viewing the **STATISTICS**, click **OK**.



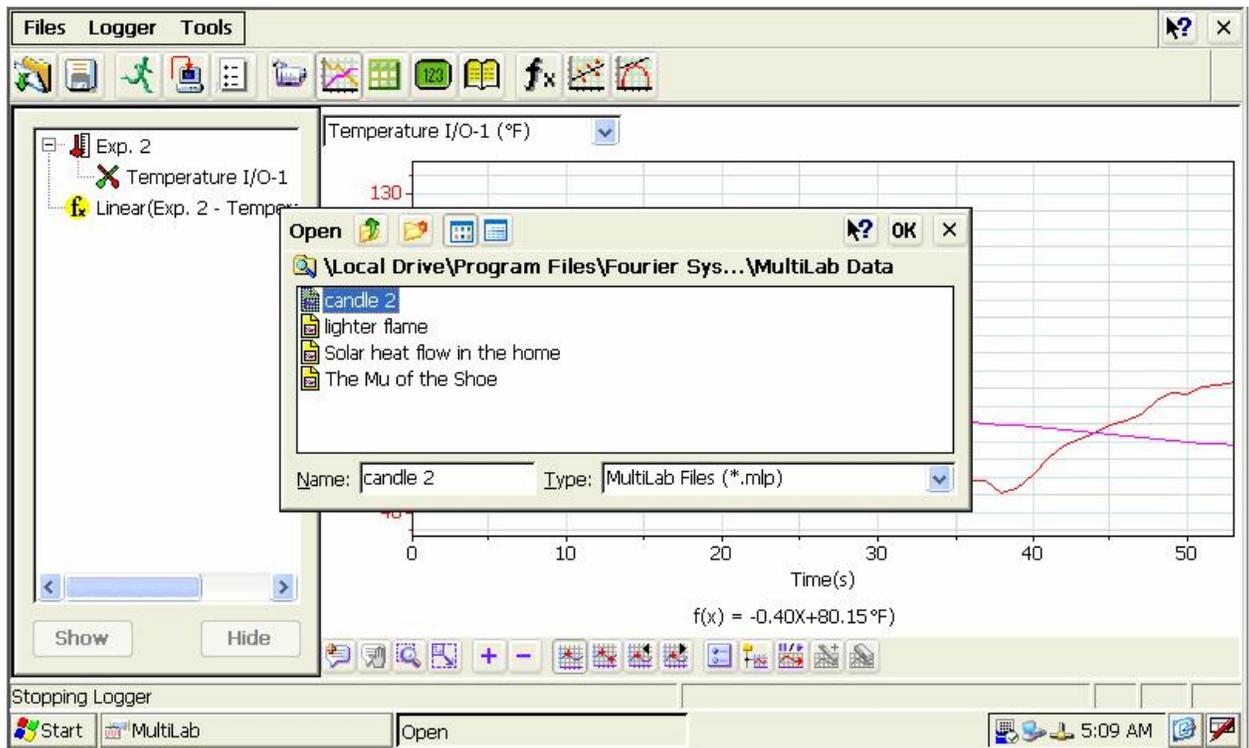


- Select the **LINEAR FIT** icon on the menu bar at the top of the screen, and you will see the best fit line to the temperature graph. The equation of this best fit line appears below the graph. One of the common data analysis techniques in science is the fitting of experimental data to equations. This is a feature of MultiLab. If you want, you can point out that MultiLab also allows students to do quadratic, power and exponential fits. This demonstrates the power of MultiLab.



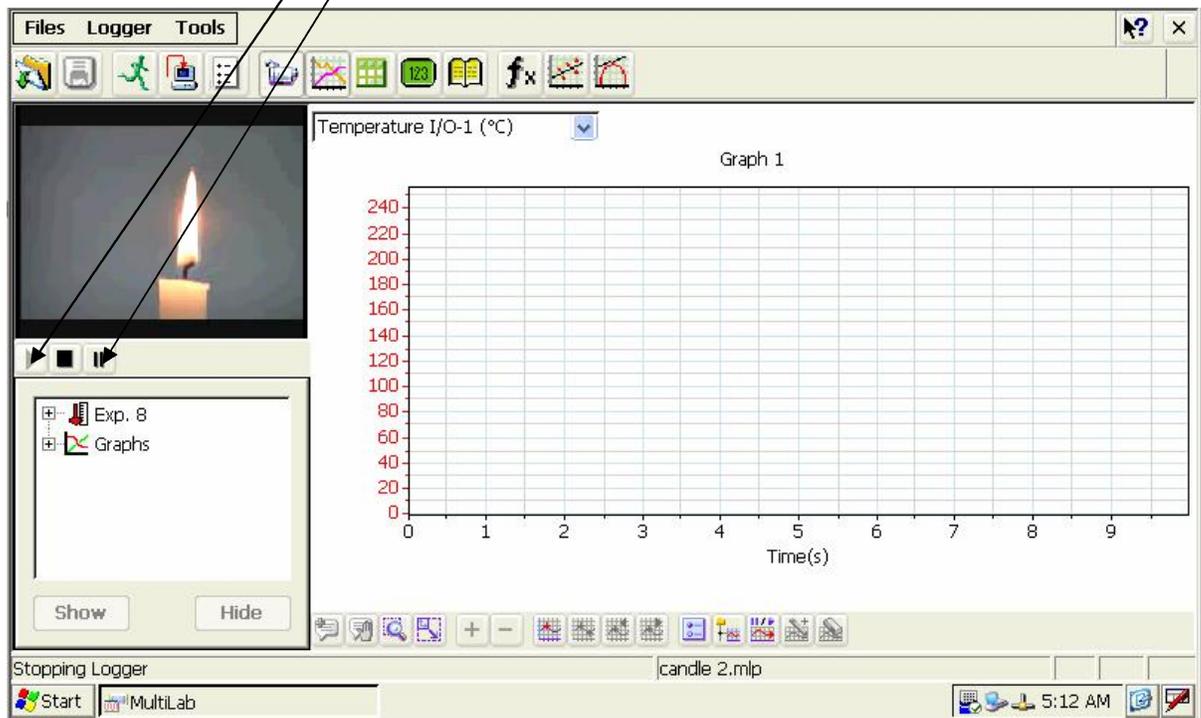
The best fit linear equation is displayed in standard form below the graph.

10. The final activity I would recommend is to show how one can video experiments. Go to **File** , then **Open** and select **candle 2** ,then click on **OK**.



11. When this document Opens, click on the **Play Video** icon  in the Windows media player window that appears and run the video. Tell participants the probe is measuring the temperature of the flame in different parts of the flame. As you move the probe to different parts of the flame the temperature changes. Tell participants to watch the graph and the video simultaneously and they will see the video and the graph are synchronized. Hence as the probe moves to different parts of the flame they will see the temperature change on the graph as the probe is moved into different parts of the flame

on the video. You can also **PAUSE**  the video to show this feature. Students can produce their own videos, narrate their experiments, and thereby produce multimedia lab reports. The synchronization feature helps students with graphical interpretation, an important skill that is tested on standardized tests.



This quick demo shows how easy the system is to use and some of the data analysis functions which are of great interest to science teachers.