













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Which cup material (paper, ceramic, or Styrofoam) holds “coffee” hottest, longest?

Needed: Temperature Probe, TI-84 calculator (with EasyData application installed), boiling water, and cups (paper, ceramic & Styrofoam)




Steps for collecting the time versus cooling water data

- 1) Plug in the Temperature Probe to the top of the calculator.
 - a. If EASY DATA doesn't load: Find the Apps key and select it.
 - b. Scroll down to EasyData.
 - c. Choose EasyData by selecting the  key.
- 2) Once the EasyData App is running, the room temperature will be displayed. Write down the room temperature value (in Fahrenheit): _____
- 3) Choose Setup by selecting the  key.
- 4) Choose 2:Time Graph by selecting the 2 key.
- 5) Choose Edit by selecting the  key.
- 6) Make sure the value is 10 (arrow to the left and type over the value). Choose Next by selecting the  key.
- 7) Make sure the value is 180 (arrow to the left and type over the value). Choose Next by selecting the  key.
- 8) Choose Ok by selecting the  key.
- 9) The data collection will run 1800 seconds or 30 minutes.
- 10) When the temperature reaches it HIGHEST point and starts to DECLINE, insert the Temperature Probe into boiling water, choose Start by selecting the  key.
- 11) Once the data is collected (you will see Main at the bottom of the screen), choose Main by selecting the  key. Now, choose Quit by selecting the  key and ok by selecting the  key again.






The information will be stored in 2 lists:


L1 will have the time intervals 0 – 1800 seconds. L2 will have the temperature recorded at each interval. Next, save the lists with names so your data won't be lost.

- 1) Choose  STAT and 1.
- 2) After L1 is showing on the home screen, choose STO> and type the name TIME (using Alpha Lock). Select .
- 3) Choose  STAT and 2.




4) After L2 is showing on the home screen, choose STO> and type the name TEMPP, TEMPS, or TEMPC (using Alpha Lock). Select .



5) Now, to graph the data, start by selecting the  and  keys.

6) Choose Plot 1 by selecting 1 or selecting the  key.



7) To turn on the plot, select the  key when the cursor is over On.

8) Press the down arrow to go to the next category, Type. Scroll over to the first type of graph and select the  key.




9) Down arrow to the next category, Xlist. Choose  STAT and scroll down to TIME then choose the  key.



10) Down arrow to the next category, Ylist. Choose  STAT and scroll down to TEMP then choose the  key.

11) What type of graph do you expect? Circle one: Linear, quadratic, cubic, exponential

12) To plot the data correctly in the window, choose the  key then 9. Which type of graph does the data produce? Circle one: Linear, quadratic, cubic, exponential





Next, determine an equation for the data. Depending on the choices you made above, that will determine what type of equation to fit onto the data.

1) Choose STAT and scroll to the right to CALC. The calculator will fit an equation to the data (see choices 4, 5, 6, and 0; there are others but these match the above choices).






2) To choose any of the above, select that number (i.e. 4, 5, 6, or 0).

3) Each regression equation needs more information: the Xlist values, Ylist values and where to store the regression equation.

4) Choose  STAT and scroll down to TIME then choose the  key. Select the Comma key (above 7). Choose  STAT and scroll down to TEMP then choose the  key. Select the Comma key (above 7) and finally, choose VARS, scroll over to Y-VARS, choose 1:Function...



and 1:Y1. Now, select  and select  one more time.

5) To view the equation and the data, select .

6) If you feel that the equation doesn't fit the data well, then to back to Step 1 above.