

Grade Level: 7th - 8th

Subject: Temperature/Time : COOL CANS

Sol's: P.S. 1, P.S. 7, Math 7.20, 7.21, 8.13, c/t 8.4

Objective: The student will be able to :

- * predict which can will cool the quickest.
- * use the data analyzer to collect data on temperature and time.
- * transfer data to the calculator.
- * use the calculator to graph the relationship between time and temperature.

Equipment : 2 cans of soda, 2 beakers, ice cubes, 200 grams of rock salt, data analyzer, calculator, 2 temp probes

Procedure:

1. Place equal amounts of ice in both beakers.
2. Set up data analyzer with 2 temp probes to take 30 samples in 30 minutes.
3. Add rock salt to beaker #2 and mix well.
4. Position the cans into the beakers.
5. One person puts the probes into the open cans as another person pushes the TRIGGER button.
6. When the analyzer is DONE, you are now ready to transfer your data to the calculator.

How to transfer your data:

1. Connect the calculator to the Data Analyzer.
 2. Execute the RUN command from the main MENU.
 3. Press SHIFT PRGM , then F6 to arrow to a new bottom menu.
 4. Select F4 (for I/O) , then select F4 (for Recv) from the menu.
 5. You should see : Receive(
 6. Press OPTN
 7. Select F1 twice (For LIST) and then 1)
 8. You should see: Receive (List 1)
 9. To retrieve a second set of data at the same time, press SHIFT EXE.
 10. Repeat steps 3 - 7, but enter a 2 for list 2 and you should see Receive (List 1)
Receive (List2)
- Press SHIFT EXE()
11. Repeat steps 3 - 7 to enter list 3
 12. Press EXE

When the screen says DONE, you are ready to view your graph. Choose STAT ; EXE; F1(graph);F6(SET); highlight Graph Type ; F2(xy); scroll down to select mark type and color. Now type EXIT; F1(Graph). Time will appear on the x- axis and temp will appear on the y- axis.

To store your graph do these steps:

1. SHIFT F2(ZOOM) ; F5(AUTO)
2. choose OPTN
3. F1(pic)
4. F1(stor)
5. F(select picture number)

You now need to add the graph from list 3. To do so, follow these steps:

1. EXIT
2. F6 (SET) to change y list to list #3.
3. Change the graph color.
4. EXIT
5. F1(Graph 1)
6. Now, type OPTN, F1, RCL, PIC 2 and store your graph as Pic 2.

Now, to get your graphs on the screen from scratch here is what you do:

1. AC/on
2. STAT
3. EXE
4. F1(GRPH)
5. F1(GPH1)
6. OPTN
7. PICT
8. RCL
9. PIC 2

You should see 2 graphs in different colors.

Assessment: I would have the students share their graphs with the class. I would have a rubric to score their work.

Closure: How could you use this information to see which can is kept the coolest for the longest amount of time?
How could you use the information to keep your drinks cooler at the beach or on a long car trip ?
What other practical information¹ could you gain from this experiment?

Hoqw

¹ Casio Workshop @ Gloucester High School, June 1997
John Dixon, Bill Foxwell, and Molly McFerrin

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