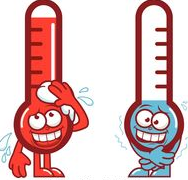
STEM Algebra 2 Hand Warmer PBL Name:



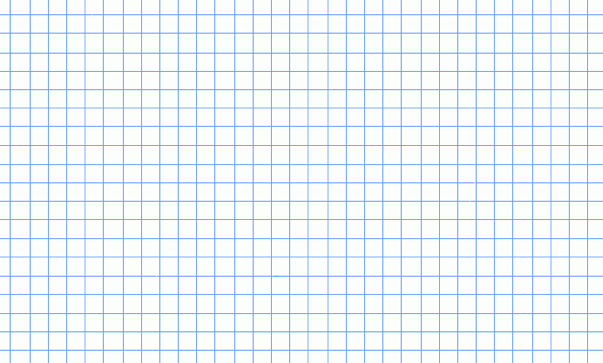
Cooling Data Worksheet

Four new start-up companies are promoting their hand-warmers. Each company is using a different substance in their hand warmer.

Each of the hand warmers was activated and stuffed into a basic leather ski glove. After 15 minutes the temperature was measured inside the glove. Then the glove stuffed with the hand warmer and wool sock for insulation was put into a 30° F freezer. Every 30 minutes for 2 hours the temperature was taken again. Here are the results.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Time (minutes) | GRABBERS | HOTTEES | HotSnapz | Hot Hands |
|  | Lithium Chloride | Calcium Chloride | Sodium Acetate | Sodium Carbonate |
| 15 | 103°F | 102°F | 107°F | 98°F |
| 30 | 103°F | 101°F | 93°F | 90°F |
| 60 | 101°F | 84°F | 81°F | 82°F |
| 90 | 100°F | 84°F | 64°F | 71°F |
| 120 | 100°F | 83°F | 47°F | 57°F |

1: Plot each set of data below.



2: What family function do these graphs belong to? How can you tell?

3: Using your calculator create equations for the graphs above. Be sure to label each one.

4: What does the independent variable in your equations represent?

5: What does the dependent variable in your equations represent?

6. What does the “a” in your exponential equations represent?

7. What does the “b” in your exponential equations represent?

8. Solve the following formula for C°



9. Given your equations above answer the following questions: Show your work!

Don’t forget…

x = time

y = temperature in Fahrenheit

Round all your answers to the nearest hundredth.

a. How hot will Grabbers be in 3 hours? Give your answer in

Fahrenheit and Celsius.

b. How hot would the Hot Snapz be in 3.5 hours? Give your

answer in Celsius and Fahrenheit.

c. How long would it take for Hottees to reach 50°F?

d. How long until Hot Hands would be at 65°F?

e. When Rachel goes to the bus stop and finally gets to school it is a total of 1 hour

and 15 minutes. On the coldest day of the year it is 22° outside. Rachel has

Grabbers hand warmers. How hot will they be once she gets to school?

f. Steven lives on the opposite side of town and has a total bus trip with waiting and travel of 70 minutes. He has Hottees hand warmers. How hot will his hand warmers be when he arrives at school?