

COFFEE-CREAM PROBLEM

Print NAME _____ Period _____

PURPOSE: To measure which keeps the coffee warmest: Adding the cream immediately or waiting eight minutes before adding the cream?
And to discuss how the following two laws apply:

Newton's Law of Cooling: *The rate of heat conduction is directly proportional to the temperature difference between the surfaces.*

The Stefan-Boltzman Law of Radiation: *The rate of heat radiation is proportional to the Fourth Power of the Absolute Temperature.*

<ol style="list-style-type: none">1. Use two 250ml beakers for <i>coffee cups</i> and two 100ml beakers for <i>creamers</i>.2. Put 200ml of water (<i>coffee</i>) in the cups and 40ml of water (<i>cream</i>) in the <i>creamers</i>.3. Heat the <i>coffees</i> to boiling (don't evaporate much).4. Set both <i>cups</i> ON THE TABLE.5. To one cup, add the <i>cream</i> immediately.	<ol style="list-style-type: none">6. On the back, record the temperatures for BOTH cups simultaneously every 30 seconds for 8 minutes.7. Add the <i>cream</i> to the creamless cup and continue to record the temperature for another two minutes.8. Graph the temperature-time curves on the SAME set of axes, and evaluate the results.9. Explain the results with the two laws of cooling above.10. Write a critique for this lab.
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