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15.0.A Daily Outline

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Chem 444A, Fire and Ice, Day 14 March 12, CFB Daily OUTLINE

Purpose:

- Extending idea of heat as transfer of molecular motion
- Setting up heat capacity relationship
- Linking to historical literature (Rumsford, Joule)

Board

Find your group (same roles as last class)

(Just put nametags out without saying make them. See if they do.)

Once your entire table is present, get started. See folder for instructions.

DON'T FORGET TO CLAP

Materials

Name tags (4 per table) – note, did they put them on?

Premade name cards (set on tables) – ~~shuffle the table locations~~ ~~B D E~~

Keep the same as last time ~~A C~~

Markers, poster paper

Returns

- Group notes from Tuesday

Distributions

- Group organization instructions
- Blank copies of exam

Starting Comments 1 minute max

- Select someone to clap
- Seems like Task 2 (questions) all done except #8, yes? Hold off on that. Do together during Research Symposium today
- Task 1: finish up experiments and data reporting from Tuesday: try to be done in 30 min
- Task 2: Proceed right to discussion of readings.
- Task 3: time filler
- Research Symposium: each group presents (Spokesperson) results from past several days and what the results tell us about heat and our model for heat

Agenda

30 min: Task 1 12 min: Task 2

5 min: me summarizing results of first stage of experiment, and linking to conservation of energy

25 min: Research Symposium (keep it to <5 min per group per)

Exam comments: give them a feedback packet

Christopher F. Bauer, Principal Investigator.
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Keep the same role structure today as you had last class (manager, recorder, spokesperson, encourager – if you are in 5-person group, let the encourager be the person who did not have a role last time)

Task 1:

Tie up loose ends. Some groups have data to graph. Some groups have experiments to finish. Please get this done as efficiently as you can. Your folder has your recorder reports from Tuesday, with a few comments.

HOLD OFF on discussing Question #8 (below) from Task 2 (Mar 10). We will do this all together.

8) Try to write a little mathematical equation that expresses this energy idea in terms of the information on the graph. [It may be easier to figure this out by using the direct mixing experimental data. And to look at the equal-volume condition first. Then consider the non-equal volume condition.] Your equation should make sense in terms of your model that you described in #5.

Task 2 Discussion of Count Rumford and Joule readings

Manager should inform me when you start this. Allow up to 12 minutes to address all the questions. Notes onto a fresh recorder report.

Once everyone has completed Tasks 1 and 2, we will have a research conference on our past several days of experiments. Your spokesperson should be prepared to describe what it is you have done and your interpretations of your data.

Task 3 If you complete Task 2 and are waiting, I have something for you.

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Need hot and cold water reservoirs.
Assorted cups and containers.
Thermometers.

Olive oil (60 mL) in a can. Labelled.

Crushed dry ice in a mug, freezing the water in the phase change apparatus.
Set up stirrers.

5 dunking birds for time killing

Rubber stoppers and cork borers – hand these out when they start talking about Rumford

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Materials available to view:

Small glass, Styrofoam, plastic, aluminum containers

- These are for "control of heat movement" experiments. Glass and Styrofoam will be most interesting.
- Nested blue plastic cups will also be interesting – an example of air insulation

Thermometer stuck in a bulb of water (like phase change experiments):

- Put into powdered dry ice until temperature is falling below freezing point
- Use mug containing enough water to submerge the bulb of the pipet (to prevent residual ice from staying around)
- Do it on a stir plate -- keeps temp of water even STIR PLATE AND STIR BAR

There is 40 mL of methanol in the freezer in an aluminum can. Seal with Parafilm? NEED SEVERAL

Blocks of metal and sand. PUT SAND IN A BEAKER

Microwave oven for making hot water (500 mL for 1 min → about 60C)

Freezer set to about – 15 C

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