

# The Heating Curve

Name: \_\_\_\_\_ Date: \_\_\_\_\_ Period: \_\_\_\_\_

**Purpose/Problem:** What happens when continuous \_\_\_\_\_ energy is transferred to different matter?  
How will the temperature change look as heat is continuously added?

**Research:** \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Hypothesis:** If we continuously add heat energy to matter, then the temperature of the matter will show a  
1) ↗ 2) ↘ 3) ↙ or 4) ↗ line when graphed on a temperature vs. time line graph because ...

**Experiment:**

**Safety Issues:**

- You **MUST** wear safety goggles throughout the entire exp.
- **Do not** remove your goggles until your recycler collects them.
- **Do not** play with or overuse the igniter.
- **Do not** walk around the classroom; call the teacher to your group.

**Materials per Group:**

- Ring Stand w/Ring
- Wire Mesh
- Glass \_\_\_\_\_ (\_\_\_\_mL)
- Glass Thermometer
- Cold Water
- Bunsen Burner
- Igniter
- Salt
- Sugar
- Tongs

**Procedures:** Remember Safety First!!!

**EXPERIMENT 1:**

1. Collect \_\_\_\_\_ mL of water record the starting temperature.
2. Light the Bunsen burner, place flask above the flame on the O ring w/wire mesh; begin timing.
3. Record the temperature increase every minute for the next \_\_\_\_\_ minutes.
4. Turn off Bunsen burners; use paper towels or tongs to remove glass flask; dump out hot water.
5. Gather more water, and add \_\_\_\_\_ g of salt to water, mix.
6. Place back on the ring stand; turn on Bunsen burner and begin steps 2-3.
7. Repeat procedure for sugar water; add \_\_\_\_\_ g of sugar to water, and repeat steps 2-3.
8. Turn off the Bunsen burner; leave the flask on O ring stand to cool.

**Analysis:** Using this table, record the temperature change over a twelve-minute period.

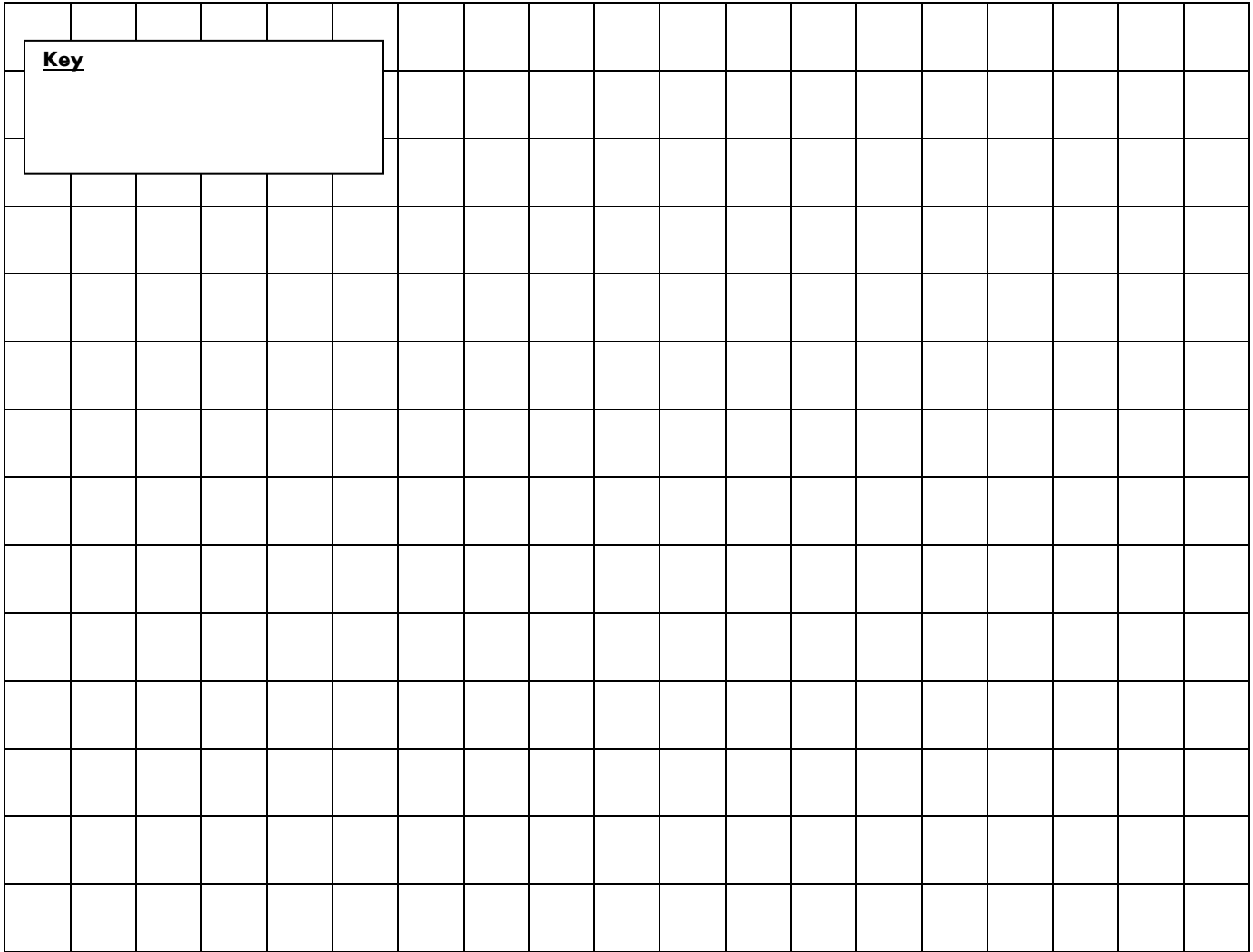
Time (min)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Tap Water Temperature (°C)																
Salt Water Temperature (°C)																
Sugar Water Temperature (°C)																

1. What was the manipulated variable (changed on purpose) of this experiment? \_\_\_\_\_  
 What was the responding variable (measured) of this experiment? \_\_\_\_\_  
 Which variables were controlled? \_\_\_\_\_

## The Heating Curve

2. Graph your results from using a line graph. Remember, 1. Title the graph. 2. Identify & label the manipulated variable (the one you changed) along the X axis and the responding variable (measured) along the Y axis (use different colors for each of the three liquids). Must show appropriate metric units!!

Title: \_\_\_\_\_



### Conclusions:

1. Was your hypothesis correct? Explain your results either way in detail.

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2. On the graph, highlight each horizontal line. Explain what was happening to the liquid and the temperature when the graph shows a horizontal line (——). Why? \_\_\_\_\_

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## The Heating Curve

3. Explain what is happening to the liquid when the line in the graph shows a positive slope. Why?

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4. Was this a physical change or a chemical change for the water molecules? Explain why

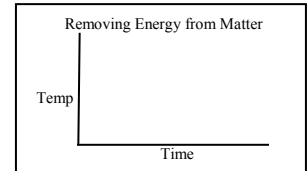
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5. What would the graph look like if we were removing energy from the matter?

Explain and draw: \_\_\_\_\_



6. Draw a model showing the water molecules' change in motion and spacing between molecules as the water was heated.

First minute

minutes 9-10

7. Did your solutions create bubbles as they were heated? If so, what do you think were inside of the bubbles? Where did they come from, and why? Explain in detail.

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8. Did the salt or sugar solutions provided different data than the water alone? \_\_\_\_\_. Explain why you think that happened in detail. \_\_\_\_\_

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9. Did each group place their ring and flask at the same height? If not, what kind of influence do you think this had on each group's data? Be specific, use examples and detail in your answer. \_\_\_\_\_

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Which is more "characteristic or unique" about each liquid, the **time** it takes for the liquid to change phase or the **temperature** at which it changes phase? Explain your answer. \_\_\_\_\_

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