

NNIN Nanotechnology Education

| Name: | _Date: | _Class: |
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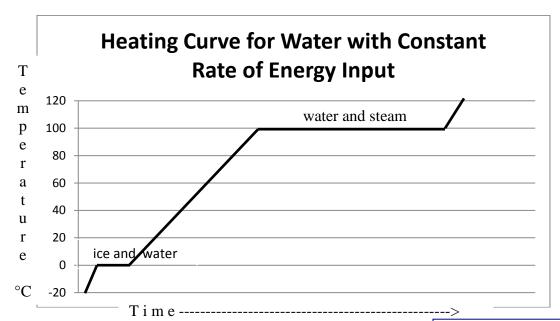
Student Worksheet—Pre-lab

Nanotechnology Invention and Design: Phase Changes, Energy, and Crystals

Read the lab handout and your notes to complete the following questions before the lab day.

| 1. | What are the 3 purposes of this laboratory experiment? |
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| 2. | What are the 4 safety concerns of this lab? |
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3.



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Need a quick review? Before completing Question 3, review the basics of Heating and Cooling Curves at http://www.kentchemistry.com/links/Matter/HeatingCurve.htm (Mr. Kent's Chemistry Page). Then, on the graph on the previous page: a) Label the heating curve—solid, liquid, gas, melting, condensation, solidification, vaporization. b) Draw particle pictures of how the particles behave in a solid, liquid, and gas on the graph. Use arrows to represent movement and circles as particles. a) What is special about the plateau on the graph? 4. How do you know if a phase change is a chemical or physical change? 5. If a 5.63 g metal alloy sample was originally at room temperature, 22.9 °C, and the specific heat capacity of the alloy is 0.27 J/g°C, how much energy must be absorbed before the metal can change phase at 37.1°C? Show all work below. 6. What area on the graph represents when energy is being absorbed for the phase change—the sloped area or the plateau? Explain your answer.