

Name: \_\_\_\_\_ Date: \_\_\_\_\_ Class: \_\_\_\_\_

## 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?

---

---

---

---

---

---

2. What are the 4 safety concerns of this lab?

---

---

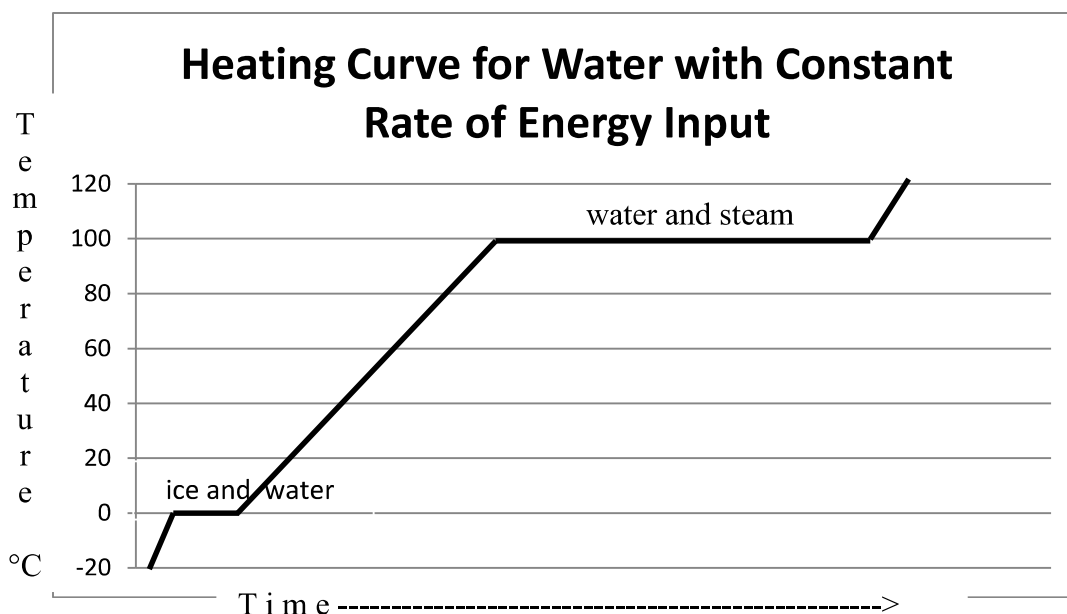
---

---

---

---

- 3.



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.

---

---

---

---