I. Be able to define or apply these terms:

kinetic and potential energy
temperature
system and surroundings
specific heat capacity
phase diagram
ΔH_{fus} and ΔH_{vap}
endothermic
exothermic
activated complex
activation energy
ΔH_r

II. Label each of the following as "endothermic" or "exothermic":

_____ a) Products are more stable than reactants.

_____ b) Kinetic energy is converted into potential energy.

_____ c) evaporation

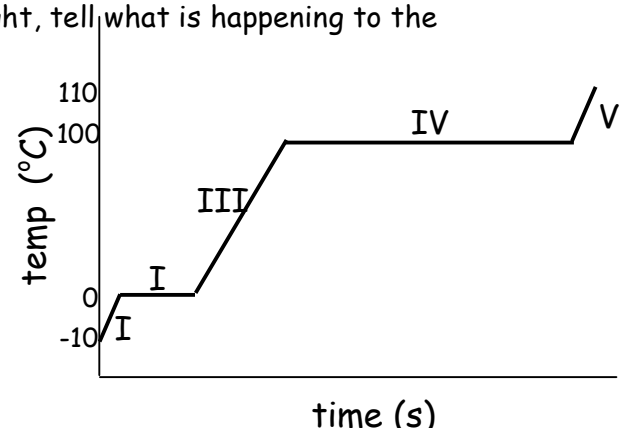
_____ d) combustion

_____ e) Water freezes.

_____ f) Heat seems to disappear.

III. In each section of the diagram at the right, tell what is happening to the kinetic and potential energy of the water molecules:

section	kinetic energy	potential energy
I	(inc, dec, same)	(inc, dec, same)
II	(inc, dec, same)	(inc, dec, same)
III	(inc, dec, same)	(inc, dec, same)
IV	(inc, dec, same)	(inc, dec, same)
V	(inc, dec, same)	(inc, dec, same)



IV. Discussion:

1. Three liquids of the same mass absorb the same amount of heat. Liquid A's temperature rises 20° C, liquid B's rises 10 °C, and liquid C's doesn't change. Explain.

2. Why does the air inside the shower feel warm as the water vapor condenses?

3. Why does the temperature of boiling water not change, even though the water is being heated?

4. We know that molecules must collide in order to react. Why is energy required to make this happen? What is the energy called and how does it affect reaction rates?

IV. Math:

1. a. Calculate the amount of heat released when 25.0 g of water at 25.0°C cools to 0.0°C.

   b. Calculate the amount of heat released when the same sample freezes.

2. What is the specific heat capacity of a 35 g sample of an unknown metal that releases 6700 J of heat when it cools from 94 °C to 29 °C?