

• Key.

5. Describe how the law of conservation of energy is supported by the scenario in 2a above.

The energy from the surroundings (floor) is transferred to the ice to melt it.

I can identify the difference between kinetic & potential energy in terms of particle arrangement and motion.

6. What is the difference between kinetic and potential energy?

energy of motion

energy of arrangement (stored energy)

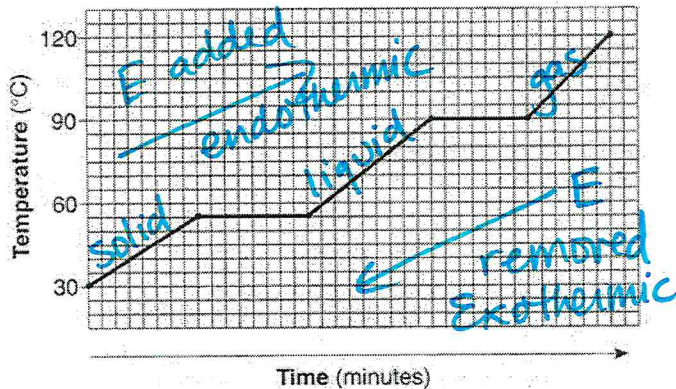
7. When does kinetic energy of particles change? When does potential energy of particles change?

when temp changes

when a phase changes  
solid  $\leftrightarrow$  liquid

I can interpret evidence from a heating curve.

Use the heating curve below to answer the questions:



8. Label the phases and phase changes on the graph in both energy flow directions.

9. Which phase changes are endothermic?

melting, boiling

10. What is happening to the kinetic and potential energy of the particles during these phase changes?

KE = constant

PE = transferred to complete a phase change (arrangement changes)

11. Which phase changes are exothermic?

freezing, condensing

12. Explain why the melting point and freezing point of a substance can be the same.

endothermic process

exothermic process

I can calculate change in energy in a system.

$$Q = mc\Delta T$$

13. A cup of coffee (140 g) cools from 75°C down to comfortable room temperature 20.°C. How much energy does it release to the surroundings? Assume the coffee has the same specific heat as water.

$$\Delta T = 20 - 75 = -55^\circ\text{C}$$

$$c = 4.18$$

$$m = 140$$

$$Q = (140)(4.18)(-55) = -32186 \text{ J}$$

4.18

14. How many joules of energy are used to heat water by 4.00 °C if the mass is 86g?

$$c = 4.18$$

$$\Delta T$$

$$m$$

$$Q = mc\Delta T$$

$$Q = (86)(4.18)(4) = 1437.92 \text{ J}$$

15. If the specific heat of aluminum is 0.9 J/g\*°C, what is the energy added to 249 g of aluminum to increase the temperature from 23 to 42°C?

$$\Delta T = 42 - 23 = 19^\circ\text{C}$$

$$m = 249 \text{ g}$$

$$c = 0.9$$

$$Q = mc\Delta T$$

$$Q = (249)(.9)(19) = 42579 \text{ J}$$