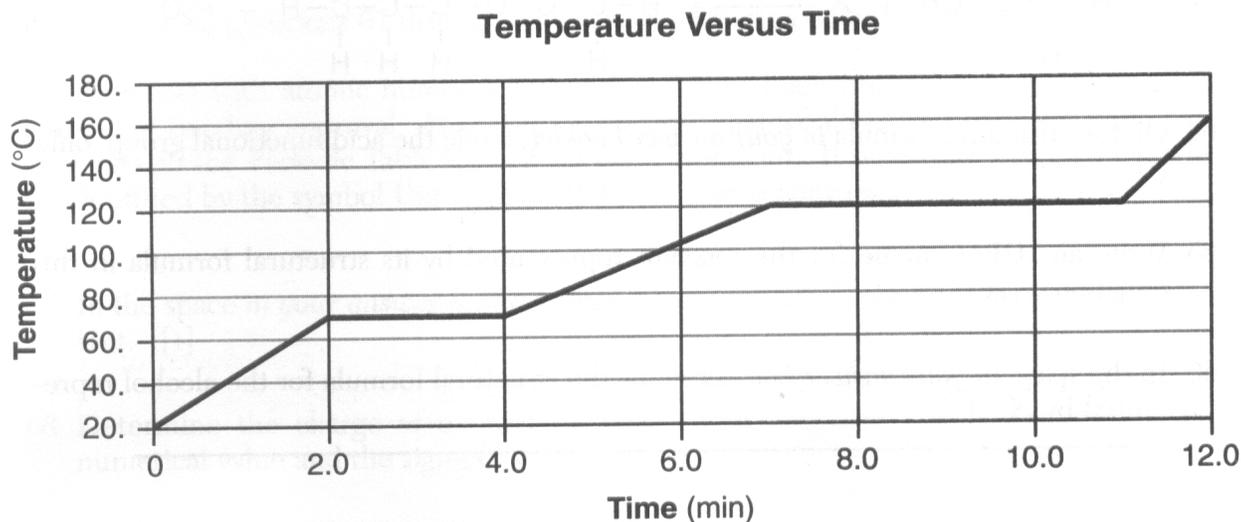
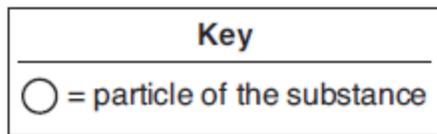


Base your answers to questions 1 through 4 on the information below.

The temperature of a sample of a substance is increased from 20.°C to 160.°C as the sample absorbs heat at a constant rate of 15 kilojoules per minute at standard pressure. The graph below represents the relationship between temperature and time as the sample is heated.



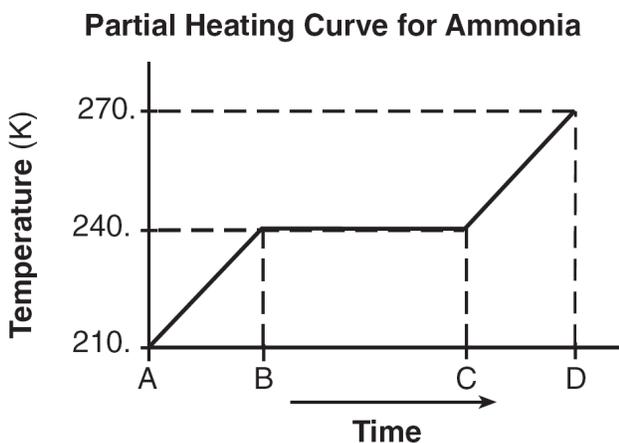
1. Determine the total amount of heat required to completely melt this sample at its melting point.
2. What is the total time this sample is in the liquid phase, only?
3. Use the key below to draw at least nine particles in the box, showing the correct particle arrangement of this sample during the first minute of heating.



4. What is the boiling point of this sample?

Base your answers to questions 5 through 7 on the information below

A 5.00-gram sample of liquid ammonia is originally at 210. K. The diagram of the partial heating curve below represents the vaporization of the sample of ammonia at standard pressure due to the addition of heat. The heat is *not* added at a constant rate.



Some physical constants for ammonia are shown in the data table below.

Some Physical Constants for Ammonia

specific heat capacity of $\text{NH}_3(\ell)$	4.71 J/g•K
heat of fusion	332 J/g
heat of vaporization	1370 J/g

- Determine the total amount of heat required to vaporize this 5.00-gram sample of ammonia at its boiling point.
- Describe what is happening to *both* the potential energy and the average kinetic energy of the molecules in the ammonia sample during time interval BC. Your response must include both potential energy and average kinetic energy.
- Calculate the total heat absorbed by the 5.00-gram sample of ammonia during time interval AB. Your response must include *both* a correct numerical setup and the calculated result.

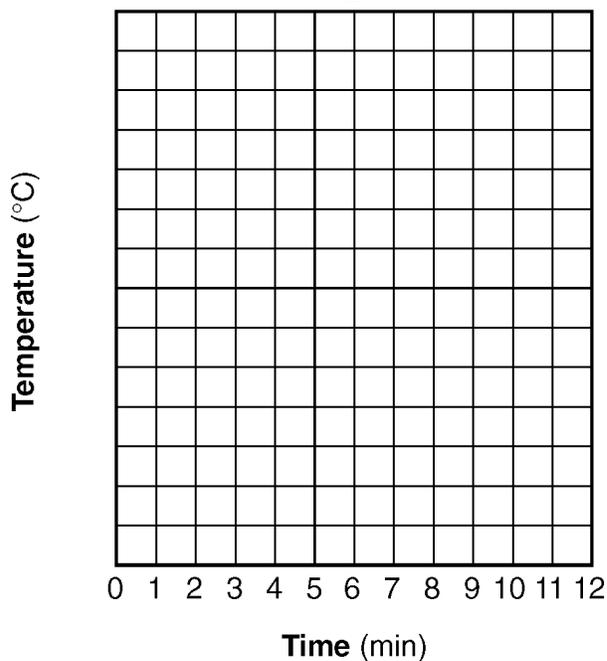
Unit 6 Heat Part 2 Review

Base your answers to questions 8 through 11 on the information below.

A substance is a solid at 15°C. A student heated a sample of the solid substance and recorded the temperature at one-minute intervals in the data table below.

Time (min)	0	1	2	3	4	5	6	7	8	9	10	11	12
Temperature (°C)	15	32	46	53	53	53	53	53	53	53	53	60	65

Heating Curve



- Plot the data from the data table. Circle and connect the points.
- Based on the data table, what is the melting point of this substance?
- The heat of fusion for this substance is 122 joules per gram. How many joules of heat are needed to melt 7.50 grams of this substance at its melting point?
- What is the evidence that the average kinetic energy of the particles of this substance is increasing during the first three minutes?

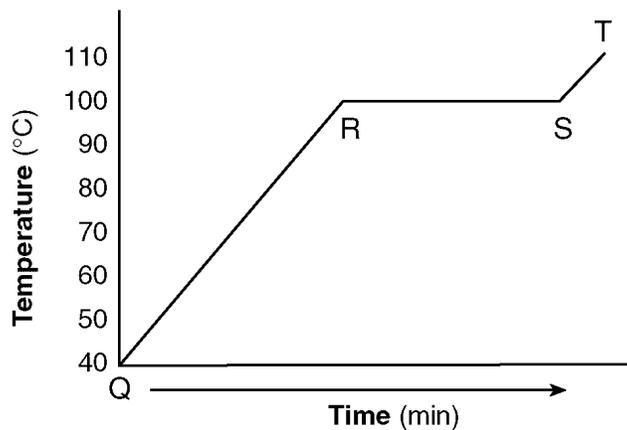
12. A sample of water is heated from a liquid at 40°C to a gas at 110°C . The graph of the heating curve is shown below.

a. On the heating curve diagram provided *below*, label *each* of the following regions:

Liquid, only

Gas, only

Phase change



b. For section QR of the graph, state what is happening to the water molecules as heat is added.

c. For section RS of the graph, state what is happening to the water molecules as heat is added.

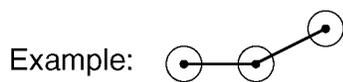
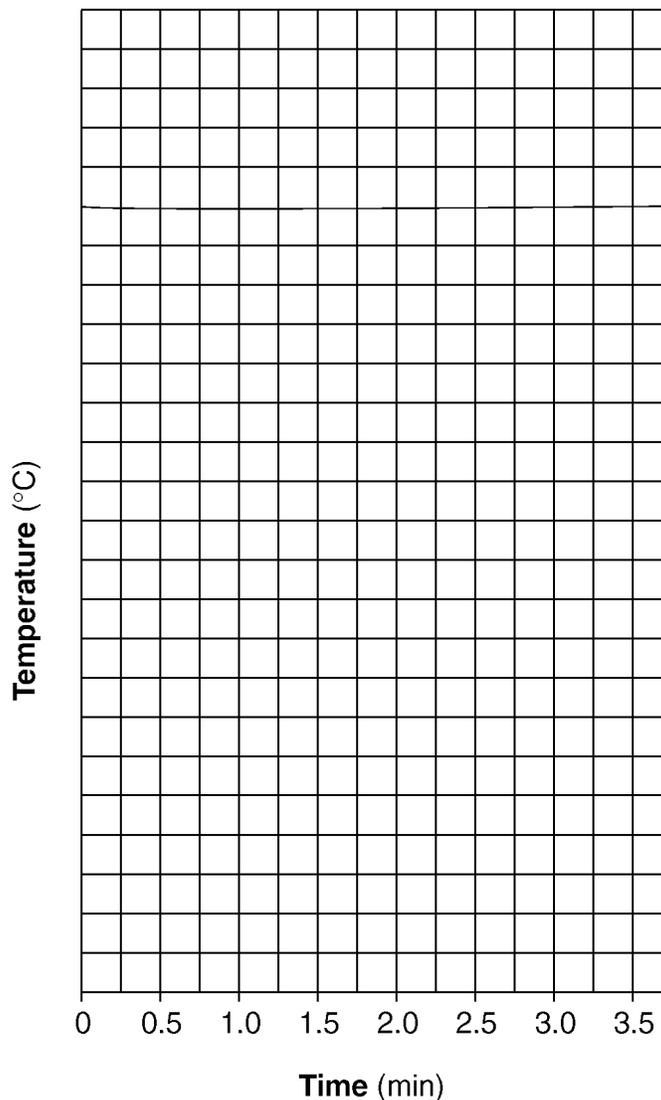
Base your answers to questions 13 through 15 on the information below.

In a laboratory experiment, 10.00 grams of an unknown solid is added to 100.0 milliliters of water and the temperature of the resulting solution is measured over several minutes, as recorded in the table below.

Data Table

Time (minutes)	Temperature (°C)
0	24.0
0.5	28.5
1.0	31.0
1.5	34.5
2.0	41.0
2.5	45.5
3.0	46.5

**Change in Temperature
During the Dissolving of a Solid**



13. On the grid provided, mark an appropriate scale on the axis labeled “Temperature (°C).” An appropriate scale is one that allows a trend to be seen.
14. Plot the data from the data table. Circle and connect the points.
15. Given the statement:
 The unknown solid is either sodium hydroxide or lithium bromide, and both of these compounds dissolve in water exothermically.
 - a) Explain how the experimental data support the statement.
 - b) State specific information from Reference Table I to support the statement.