

Practice Questions for Unit 6

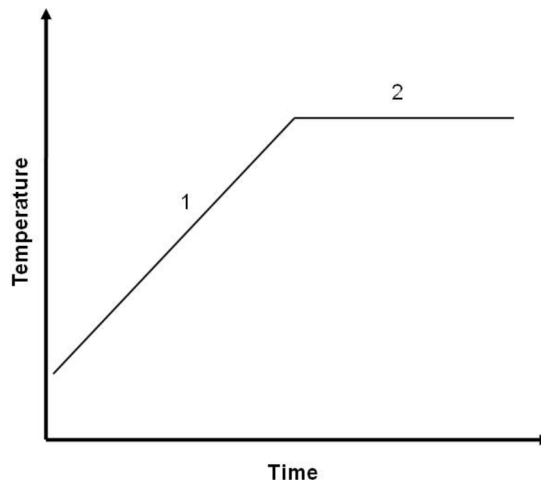
Name: _____

1. Which statement *correctly* describes both gases and liquids?
- A. Their shapes stay the same in any container.
 - B. Their shapes change when they are in different containers.
 - C. Their volumes stay the same in any container.
 - D. Their volumes change when they are in different containers.

2. A glass of ice water is placed on a table. After 10 minutes, there are drops of water on the outside surface of the glass. Which change in phase caused the drops of water?

- A. Liquid water in the air evaporated into a gas.
- B. Liquid water in the air condensed into a solid.
- C. Water vapor from the air evaporated into a liquid.
- D. Water vapor from the air condensed into a liquid.

3. Alex placed a small beaker of cold water on a hot plate and heated it for 10 minutes. He took the temperature of the water several times during those 10 minutes and recorded his data. Alex claims that the graph below shows the relationship between temperature and time when water is heated.



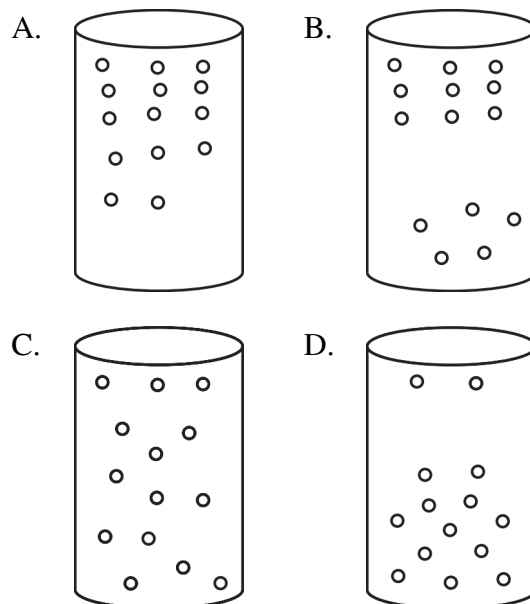
Which statement *best* explains why the temperature leveled off in section 2 of the graph?

- A. Alex turned off the hot plate so the water did not get any warmer.
- B. The water reached the boiling point, so the temperature no longer increased.
- C. An experimental error caused the graph to level off, because the water temperature should keep increasing over time.
- D. Cold water heats faster than warm water, so once the cold water was room temperature, it took more than 10 minutes to make it hot.

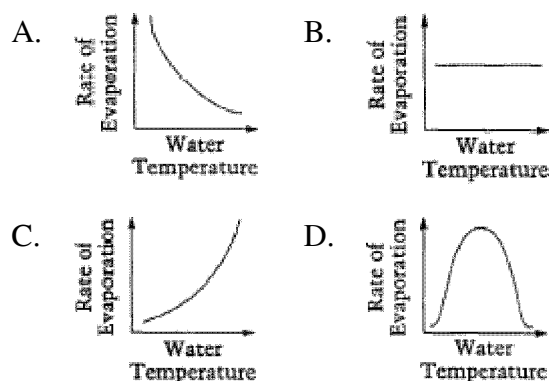
4. As a sample of water turns to ice,
- new molecules are formed.
 - the mass of the sample is increased.
 - the arrangement of the molecules changes.
 - energy is absorbed by the molecules.

5. If the attractive forces among solid particles are less than the attractive forces between the solid and a liquid, the solid will
- probably form a new precipitate as its crystal lattice is broken and re-formed.
 - be unaffected because attractive forces within the crystal lattice are too strong for the dissolution to occur.
 - begin the process of melting to form a liquid.
 - dissolve as particles are pulled away from the crystal lattice by the liquid molecules.

6. Nitrogen molecules within a glass tube are allowed to move randomly. Which figure shows the molecules in a state of greatest entropy?



7. Which of the following graphs shows how the rate of evaporation changes with changes in water temperature?



8. When water changes from solid to liquid to gas, which statement is true?
- A. The mass (amount) stays the same.
 - B. The temperature goes down.
 - C. The temperature stays the same.
 - D. The mass (amount) is greater.

9. The data table below includes information about how temperature affects the state of matter for three substances.

HOW TEMPERATURE AFFECTS STATES OF MATTER

Substances	State of Matter at Room Temperature (22° C)	State of Matter when Heated
Butter	Solid	Liquid (29° C)
Sugar	Solid	Liquid (186° C)
Water	Liquid	Gas (100° C)

The information in the table indicates that

- A. the atoms in matter slow when heated
- B. temperature physically changes matter
- C. temperature chemically changes matter
- D. the atoms in matter change shape when heated

10. Use the information below to answer the question(s) that follow(s)

A student filled three beakers, each with 50 milliliters of liquid water. The student cooled Beaker 1 to form ice. The student heated Beaker 2 to form water vapor (gas). Beaker 3 remained at room temperature.

The student removed Beaker 1 from the freezer the next day. When the student turned the beaker over, a block of ice fell out and broke into small pieces.

Which statement describes the relationship between the mass of the block of ice and the mass of the small pieces of ice?

- A. The mass of the block of ice was slightly greater because some of the small pieces melted.
- B. The mass of the block of ice was less than the total mass of the smaller pieces of ice.
- C. The mass of the block of ice was equal to the total mass of the smaller pieces of ice.
- D. The mass of the block of ice was greater than the total mass of the smaller pieces of ice.

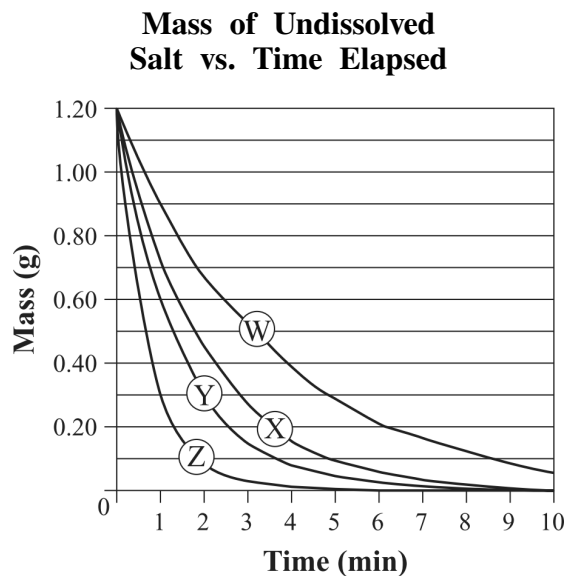
11. A technician prepared a solution by heating 100 milliliters of distilled water while adding KCl crystals until no more KCl would dissolve. She then capped the clear solution and set it aside on the lab bench. After several hours she noticed the solution had become cloudy and some solid had settled to the bottom of the flask. Which statement *best* describes what happened?

- A. As the solution cooled, evaporation of water increased the KCl concentration beyond its solubility.
- B. Water molecules, trapped with the KCl crystals, were released after heating.
- C. At lower temperatures the solubility of the KCl decreased and recrystallization occurred.
- D. At increased temperatures the solubility of KCl increased and remained too high after cooling.

12. The table below lists the conditions for four trials in a student's solubility rate experiment. In each trial, a 1.20 g sample of a sodium salt was dissolved in 10.0 mL water.

Trial	Size of Crystals (mm)	Temperature (°C)
1	0.1–0.2	20.0
2	0.1–0.2	40.0
3	0.5–1.0	10.0
4	0.5–1.0	20.0

During each trial, the student determined the mass of the undissolved salt and the time that had elapsed. The data were used to plot the curves on the graph below.



Which curve on the graph *most likely* represents trial 2?

- A. curve W
- B. curve X
- C. curve Y
- D. curve Z

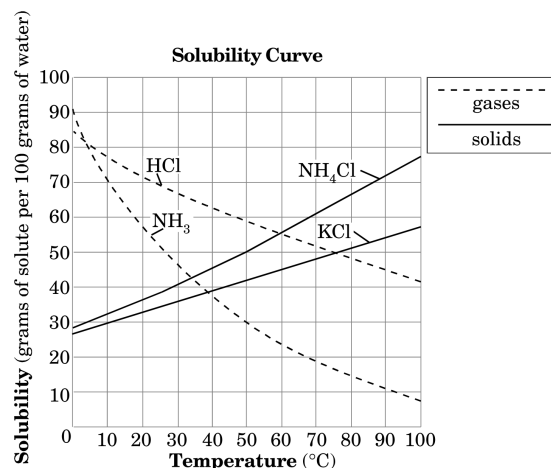
13. Which of the following statements explains why people spread salt on icy sidewalks in the winter?
- The salt causes the ice to undergo sublimation.
 - The salt lowers the surface tension of melted ice.
 - The ice-salt mixture has a higher density than ice has.
 - The ice-salt mixture melts at a lower temperature than ice does.

14. Kareem wants to dissolve rock salt in a glass of water at room temperature.

Which process will speed up the time it takes for the salt to dissolve?

- Add hot water to the glass.
- Add cold water to the glass.
- Pour the water into a larger container.
- Pour the water into a smaller container.

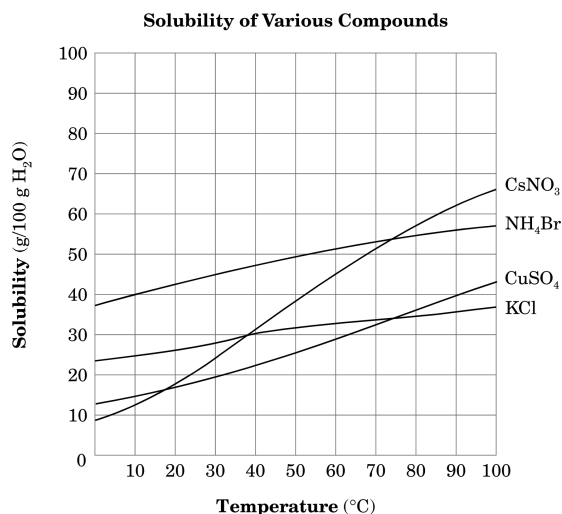
15.



Which solute exhibits the *least* response to temperature change?

- NH₄Cl
- KCl
- HCl
- NH₃

16. This graph shows the solubility curves for various ionic compounds.



Which compound is *most* affected by a change in temperature from 30°C to 50°C?

- A. CsNO₃ B. NH₄Br
C. CuSO₄ D. KCl
17. What happens to the dissolving of sugar as the temperature of a cup of tea increases?
- A. Dissolving cannot be determined.
B. Dissolving does not change.
C. Dissolving decreases.
D. Dissolving increases.

18. Which statement correctly describes a mixture that is a solution?
- A. Cereal mixed with milk forms a solution because the cereal becomes soggy.
B. Salt mixed with water forms a solution because the salt dissolves in the water.
C. Wood chips mixed with oil form a solution because the wood chips float on the oil.
D. Iron filings mixed with sand form a solution because the filings can be separated with a magnet.

19. A gas becomes more soluble in liquid when
- A. its particles are larger.
B. pressure is greater.
C. the mixture is stirred.
D. the temperature is raised.

20. An ionic solid is placed in a beaker of water. Which of the following occurs when there is a strong attraction between the solute and the solvent?

- A. The solute melts.
- B. The solute dissolves.
- C. The solute remains intact.
- D. The solute reacts to form a precipitate.

21. On a warm sunny afternoon, ocean water splashed onto a rock. A short time later, the rock was dry. Which statement *best* explains what happened to the water on the rock?

- A. Heat caused the water to become a gas.
- B. Heat melted the water and it disappeared.
- C. Salt caused the water to become a gas.
- D. Salt melted the water and it disappeared.

22. As the molecules of water begin to slow down they go into a phase where they are no longer able to easily move past each other. The water is passing through a phase change and will

- A. remain a mixture.
- B. remain a compound.
- C. become an element.
- D. become a compound.

23. Bromine (Br) is a liquid at room temperature. Oxygen (O) is a gas at room temperature. Room temperature is 25°C.

Which of the following statements is true?

- A. The boiling point of oxygen is colder than room temperature.
- B. The boiling point of bromine is colder than room temperature.
- C. The melting point of oxygen is warmer than room temperature.
- D. The melting point of bromine is warmer than room temperature.

24. In which example is matter changing state?
- A. heating a pan of water until the water is all gone
 - B. putting a soft drink can in the refrigerator to cool it
 - C. heating soup on the stove until it is hot to your tongue
 - D. transferring sugar into a storage container

25. Joyce put 200 milliliters of water in a beaker, put a thermometer in it, and heated it until it started to boil. She recorded a temperature of 100°C when it started to boil. She repeated the process with 400 milliliters of water. What would be the temperature when this second sample started to boil?
- A. twice as high as the first sample's
 - B. slightly higher than the first sample's
 - C. half as high as the first sample's
 - D. the same as the first sample's