

## Phase Changes

The accompanying graph shows the relationship between temperature and heat energy during the phase changes of water. Study the graph and answer the questions.

The graph illustrates the phase changes of water as a function of temperature and heat energy. The vertical axis represents Temperature, and the horizontal axis represents Heat Energy. The graph shows three states of matter: SOLID, LIQUID, and GAS. The transitions between these states are labeled: Melts, Freezes, Boils, and Condenses. The graph also shows the direction of temperature change: Warms and Cools.

- SOLID to LIQUID:** Melts (Warms)
- LIQUID to SOLID:** Freezes (Cools)
- LIQUID to GAS:** Boils (Warms)
- GAS to LIQUID:** Condenses (Cools)

[illegible]

1. Does the temperature increase during melting? \_\_\_\_\_
2. Is energy required for each phase change? \_\_\_\_\_
3. Can both liquid water and steam exist at  $100^{\circ}\text{C}$ ? \_\_\_\_\_
4. What must be changed, temperature or heat energy, during condensation? \_\_\_\_\_
5. How would you describe the change in the arrangement of particles as heat energy and temperature increase? \_\_\_\_\_
6. What rule can you state about the relationship between phase changes and temperature? Between phase changes and heat energy? \_\_\_\_\_  
\_\_\_\_\_

[illegible]

Change of state	Direction	Endothermic or exothermic?
Melting		
Freezing		
Evaporation		
Boiling		
Condensation		
Sublimation		

Exothermic—

Endothermic--

[illegible]