

Name: Key
Chapter 2 study guide

Period: _____
Date: _____

WARNING

This guide is not the only thing you should use to study. It does not provide you with everything you need. You should also rely on your textbook, homework, and classroom notes. Use everything you can for the best results.

Topic 1: States of matter – Textbook pg. 42 – 47

1. What are the three main states of matter?

a. Solids b. Liquids c. Gases

2. Match the following characteristics with the correct state of matter, there may be more than one answer for each characteristic.

<u>C</u> No fixed shape & volume	A. Solids
<u>C+B</u> Flows easily	B. Liquids
<u>A</u> Not easily compressed	C. Gases
<u>A</u> Little free space	
<u>A</u> Fixed volume & shape	
<u>C</u> Easily compressed	
<u>C</u> Particles in motion	
<u>C</u> Highest energy	
<u>B</u> Particles slide past each other	
<u>C</u> Oxygen	
<u>A</u> Able to melt	

3. What is the difference between crystalline solids like salt and amorphous solids like butter?

- Crystalline solids = particles form a regular repeating pattern, melts at specific Temp.
- Amorphous solids = particles not arranged in a regular pattern.

4. There is 45mL of a liquid sitting in a 250mL beaker. If you pour the liquid into a 500mL flask, which of its two physical properties will change: Shape or Volume

5. A student pours 5 different liquids out of their containers and times how long they take to empty. Based on her data, put the liquids in order from least viscous (1) to most viscous (5).

Liquid	Time (min)	Viscosity
A	1.2	3
B	5	5
C	0.3	1
D	0.8	2
E	2.6	4

6. A sewing needle is made of a metal that is denser than water. However, a sewing needle can appear to float on top of water. Explain the unique property of liquids that allows this to occur.

Surface Tension (The attraction of water molecules at the surface.)

7. Unlike solids and liquids, a gas will:
- Keep its volume in different containers
 - Keep its shape in different containers
 - c. Expand to fill the space available

8. Describe the motion of particles in a solid.

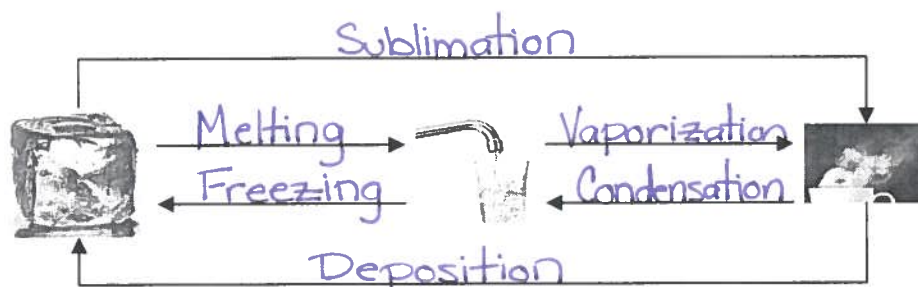
Vibrate (Move back and forth slightly)

9. Why are both liquids and gases called fluids?

Both liquids and gases flow.

Topic 2: Change of state - Online textbook pg. 48 - 53

10. Fill in the diagram for phase changes:



11. When particles go from solid to liquid states, their thermal energy ↑ speed ↑ and the amount of space ↑.

12. When particles go from gas to liquid states, their thermal energy ↓ speed ↓ and the amount of space ↓.

13. **True/False:** A substance changes from a solid to a liquid at its boiling point.

14. **True/False:** In vaporization, liquid particles have enough energy to become gas particles.

15. What is the difference between evaporation and boiling?

Evaporation = only on the surface of a liquid.

Boiling = Liquid changing to gas below its surface and at its surface.

16. Sweating is important. When the sweat on your body evaporates, it actually cools you down. Why does this evaporation cool you down (think about where it gets the necessary energy from)?

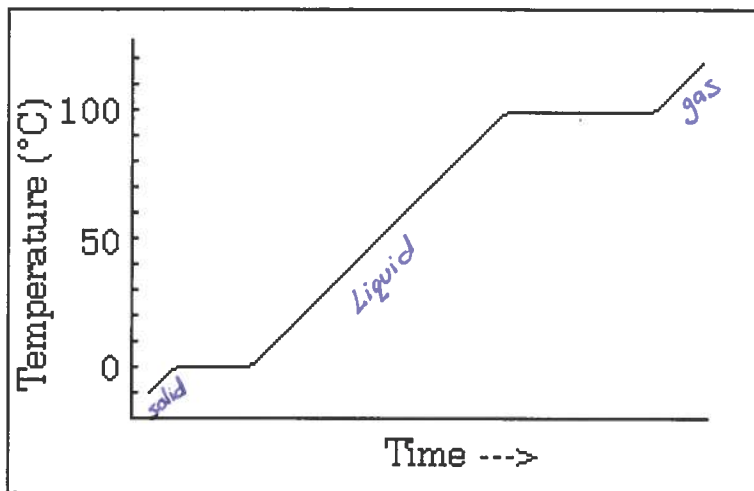
Sweating cools you down because when the sweat evaporates it gets the thermal energy from the heat of our body thus cooling us down.

17. Solid carbon dioxide is known as dry ice. When a piece of it is placed on a desk, it turns straight into a gas. Therefore, dry ice undergoes _____ at room temperature.

- a. Condensation b. Sublimation c. Deposition d. Melting

thermal energy from the heat of our body thus cooling us down.

18 - 26. Use the time versus temperature graph to answer questions



- As time increases, is the temperature of the substance increasing or decreasing?
- As time increases, is the substance gaining thermal energy or loosing thermal energy?
- As time increases, are its particles speeding up or slowing down?
- As temperature increases, are its particles moving farther apart or moving closer together?
- During which range of temperatures is the substance a solid? $-10^{\circ}\text{C} \rightarrow 0^{\circ}\text{C}$
- During which range of temperatures is the substance a liquid? $0^{\circ}\text{C} \rightarrow 100^{\circ}\text{C}$
- During which range of temperatures is the substance a gas? $100^{\circ}\text{C} \rightarrow 120^{\circ}\text{C}$
- At which temperature does the substance boil? 100°C
- At which temperature does the substance melt? 0°C

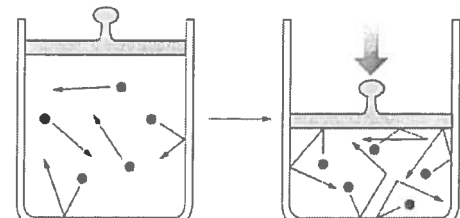
Topic 3: Gas behavior - Textbook pg. 55 - 61

27. When the temperature of a gas decreases, its particle speed ↓ and their thermal energy ↓.
28. True/False: Gases exert a force on the walls of their containers, creating pressure.
29. A machine exerts a force of 252N on a piston having an area of 0.430m^2 . What is the pressure on the piston in Pa?

$$\text{Pressure} = \text{Force} / \text{Area} = \frac{252\text{N}}{0.430\text{m}^2} = \boxed{586\text{Pa}}$$
30. A trash compactor exerts a force of 5,600N over an area of $.342\text{m}^2$. What pressure does the compactor exert in Pa?

$$\text{Pressure} = \text{Force} / \text{Area} = \frac{5,600\text{N}}{.342\text{m}^2} = \boxed{16,374\text{Pa}}$$
31. Look at the images to the right. What happens to pressure and volume as the plunger drops (Boyle's law)?

Pressure Increases; Volume Decreases



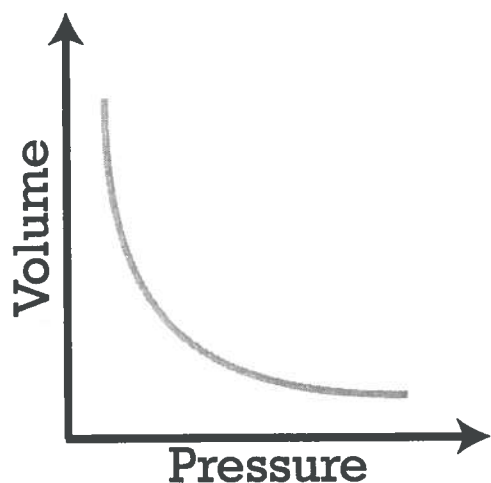
32. When you decrease the temperature of a gas, its volume also decreases. How would this decrease in temperature affect the pressure of the gas?

As the temperature decreases, particles move slower and are closer together. Therefore decreasing temperature decreases the pressure.

33. Explain why placing a dented ping-pong ball in boiling water is one way to remove the dent in the ball.

As temperature increases, gas particles move faster, resulting in more collisions of the gas particles on the walls of the ping pong ball &

34. Refer to the graph below to answer the following questions. **Note: The Temperature is Constant!**



a) As Pressure Increases, Volume Decreases.

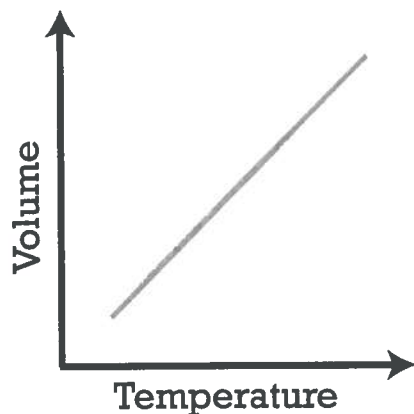
b) As Pressure Decreases, Volume Increases.

c) What Gas Law is demonstrated by the graph?

Boyle's Law.

increasing
the
volume

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a) As Temperature Increases, Volume Increases.

b) As Temperature Decreases, Volume Decreases.

c) What Gas Law is demonstrated by the graph?

Charles's Law.