Chapter 2

States of Matter

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Chapter 2 –States of Matter Outline Section 1-Three States of Matter P. 30 - 35

Introduct	ion:
* <mark>1</mark>	Notes: The three most common states of matter are
LIQ	UID, andGAS Ice, liquid water, and steam are the three states of
matter for	r water.
I.	Particles of Matter
	es: Matter is made up of extremely small particles called ATOMS and
_	These particles are always in MOTION.
INOU	es: Figure #1 (page 32) shows that particles that make up matter move at different SPEEDS
II.	Solids
	A. Solids have Definite Shape and Volume
	Notes: Matter in a solid state means the volume and shape of the substance are
	DEFINITE or not changing. (constant or fixed)
	B. There are Two Kinds of Solids (picture on page 33)
	*Notes: Solids can either be CRYSTALLINE or AMORPHOUS .
	Crystalline solids have a very orderly, 3-dimensional arrangement of particles.
	Amorphous solids are made up of particles that do not have a special arrangement.
III.	Liquids
111.	Notes:LIQUIDthe state of matter that has a definite volume but not a definite shape
	A. Liquid Changes Shape But Not Volume
	Notes: The state of matter in which atoms and molecules are close together but can
	slide past each other is LIQUID.
	B. Liquids Have Unique Characteristics
	*Notes: The force that acts on the surface of a liquid and that tends to minimize the area
	of the surface is called SURFACE TENSION .
	*A drop of vinegar has a <u>lower</u> surface tension and <u>lower</u> viscosity than vegetable oil.
	The vinegar will flow and spread out, but the oil will form a bead.
	*The resistance of a gas or liquid to flow is called _VISCOSITY Viscosity is affected by the strength of the attraction between the molecules.
IV.	Gases
	*Notes: Gases have no definite shape or VOLUME .

	(Gas Behavior Law	'S
	0	0	0
Pressure		Temperature	Volume
		\	
		Boyle's Law =	
		temperature is constant,	
		so pressure and volume are	
		<i>inversely</i> related <i>(oppos</i>	site)
		<u> </u>	-
	V		
Charles's	s Law = pressure	e is constant, so temperature and v	olume are
	tionally related		

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A.	Temperature *Notes: TEMPERATURE is the measure of how hot (or cold) something is. It can be determined by measuring the speed of the MOLECULES (particles).
В.	Volume *Notes: is the amount of space that an object takes up. It is measured in 3 dimensions: length, width, and height.
C.	Pressure *Notes:PRESSURE is the amount of force exerted per unit area of a surface.

II. Gas Behavior Laws

Describing Gas Behavior

I.

A. Boyle's Law

*Notes: Boyle's Law explains the relationship between volume and pressure for a fixed amount of a GAS.

B. Charles's Law

*Notes: Charles's Law states that the volume of a gas is directly proportional to the temperature of a gas when the pressure is constant. According to this law heating a balloon will cause it to **EXPAND**.

Chapter 2 – States of Matter Outline Section 3-Changes of State p. 40 - 45

I. *Note	Energy and Changes of State es: When a liquid boils and changes to steam there is a change of STATE .
II,	Melting: Solid to Liquid ** Know and be able to label the chart on page 40! A. Adding Energy *Notes: Melting is an _ENDOTHERMIC change because energy is gained by the substance as it changes state. (think AND-othermic = ADD heat)
III.	Freezing: Liquid to Solid *Notes: The change in state from a liquid to a solid is called FREEZING The melting point and freezing point of a substance occur <i>at the same temperature</i> .
	A. Removing Energy *Notes: Freezing is an EXOTHERMIC change because energy is removed from the substance as it changes state. (think EXIT-thermic = takes energy OUT)
IV.	Evaporation: Liquid to Gas *Notes: Particles that evaporate from an open container differ from the particles that remain because they have moreENERGY and higher _SPEED A. Boiling and Evaporation *Notes:EVAPORATION is the change of state from a liquid to a gas Being able to smell perfume from the other side of the room of the bottle is a result of evaporation. *Notes: No matter how much of a substance is present, neither the boiling point nor the melting point of the substance will change. For example, 5 liters of water will boil at 100 degrees Celsius and 5 milliliters of liquid will boil at 100 degrees Celsius. At what temperature will 5 gallons of water boil?? B. Effects on Pressure on Boiling Point *Notes: The _ATMOSPHERIC pressure at which water is heated could affect the temperature at which water boils.
V.	Condensation: Gas to Liquid *Notes: Condensation is the opposite ofEVAPORATION
VI.	Sublimation: Solid to Gas *Notes: In order for carbon dioxide gas to enter the air from dry ice, the dry ice must SUBLIMATE .
VII.	Change of Temperature Vs. Change of State (See graph on page 45) *Notes: The graph shows that as a substance is heated the temperature will remain constant as itCHANGES STATE **When the line is STRAIGHT, there's a change of STATE!