

# Chapter 2

## States of Matter

Name ***ANSWER KEY***

Class Hour: \_\_\_\_\_

Test Date: \_\_\_\_\_

## Chapter 2 –States of Matter Outline

### Section 1-Three States of Matter P. 30 - 35

Introduction:

\*Notes: The three most common states of matter are **SOLID**, **LIQUID**, and **GAS**. Ice, liquid water, and steam are the three states of matter for water.

#### I. Particles of Matter

\*Notes: Matter is made up of extremely small particles called **ATOMS** and **MOLECULES**. These particles are always in **MOTION**.

\*Notes: 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

\*Notes: **LIQUID** -the 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 lower surface tension and lower 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**.



## Chapter 2 –States of Matter Outline

### Section 3-Changes of State p. 40 - 45

#### I. Energy and Changes of State

\*Notes: 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 *at the same temperature*.

##### 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 more **ENERGY** 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 of **EVAPORATION**.

#### 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 it **CHANGES STATE**.

**\*\*When the line is STRAIGHT, there's a change of STATE!**