Name Agot Date 12-2-16 Class 1 & 3

Solids, Liquids, and Gases ▪ *Guided Reading and Study*

States of Matter pp. 42-47

This section explains how shape, volume, and the motion of particles are useful in describing solids, liquids, and gases.

Solids, Liquids, and Gases

Use Target Reading Skills

A definition states the meaning of a word or phrase by telling about its most important feature or function. After you read the section, reread the paragraphs that contain definitions of Key Terms. Use all the information you have learned to write a definition of each Key Term in your own words.

solid has a definite shape and definite volume

crystaline solid solids that are made up of crystals (salt, sugar & snow - they melt at a specific temp.)

butter, plastics, rubber & glass — amorphous solid particles are not arranged in a regular pattern and don't melt at a certain temperature.

liquid has a definite volume but no shape of its own.

fluid a substance that flows

surface tension result of an inward pull among the molecules of a liquid that brings the molecules on the surface closer together.

Beads of water on leaves, insect "standing" on water.

viscosity a liquids resistance to flowing Ex: honey

a gas is a fluid & can change volume easily — gas has neither a definite shape nor definite volume

Solids

1. Which state of matter has a definite volume and a definite shape?
   Solid
2. Is the following sentence true or false? A solid will keep its volume and its shape in any position and in any container.
   true

Name _____ Date _____ Class _____

States of Matter *(continued)*

3. Why do solids have a definite shape and a definite volume?
The particles that make up a solid are packed very close together and each particle is tightly fixed in one position.

4. Complete the table about types of solids.

Solids			
Type of Solid	**Description**	**Examples**	**Melting Temperature**
a. Crystalline	Made up of crystals	b. Salt, Sugar, snow	Specific
c. Amorphous	Particles not arranged in a regular pattern	d. butter, plastics, rubber, glass	Not distinct

5. Circle the letter of each sentence that is true about particles in a solid.
   a. They are completely motionless.
   (b.) They stay in about the same position.
   (c.) They vibrate back and forth.
   d. They move around one another freely.

Liquids

6. Which state of matter has no definite shape but does have a definite volume? liquid

7. Is the following sentence true or false? A liquid's volume does not change no matter what shape its container has.
true

8. A substance that flows is called a(n) fluid.

Name _____ Date _____ Class _____

9. What causes surface tension? AND water molecules attract one another strongly Causing the ones on the surface to be pulled toward the ones beneath the surface
An inward pull among the molecules of a liquid that brings the molecules on the surface closer together

10. Circle the letter of the term that means the resistance of a liquid to flowing.
   a. amorphous
   b. solid
   c. viscosity
   d. surface tension

11. Is the following sentence true or false? Liquids with high viscosity flow quickly. false

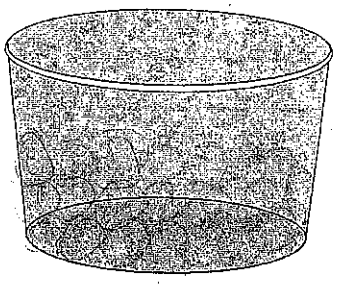
Gases

12. Which state of matter has neither definite shape nor volume?
gas

13. If you put a gas into a container with a top, what will the gas do?
The particles will either spread apart or be squeezed together as they fill the container

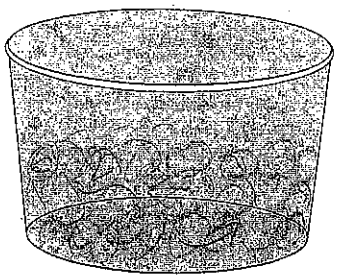
14. Is the following sentence true or false? Like a liquid, a gas is a fluid.
true

15. In the containers below, draw how the particles are arranged in the three states of matter.



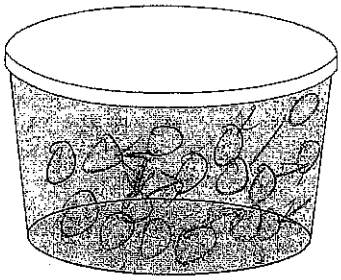
Solid

Vibrate



Liquid

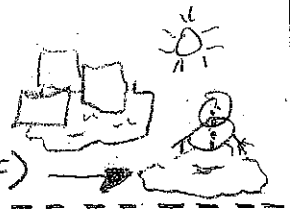
Slide & trade places



Gas

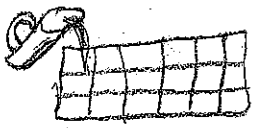
move freely & spread out

solid → liquid



snow above 0°C (32°F)

melting - change in state from solid to liquid



solid ← liquid

snow/sleet instead of rain

freezing - change in state from liquid to solid

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liquid to gas

vaporization - takes place when the particles in a liquid gain enough energy to form a gas. Two types of vaporizatn are: evaporation and boiling

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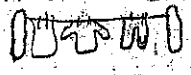
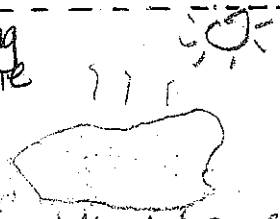


laundry drying on clothes line



puddle dries up

evaporation - vaporization that only takes place on the surface of a liquid

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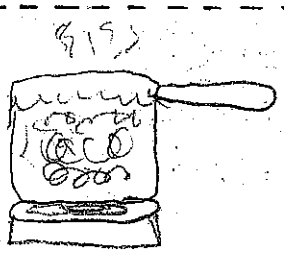

boiling - liquid changes to a gas below the surface besides at the surface

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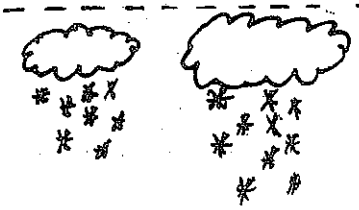
- foggy mirror after a hot shower
- water droplets on outside of cup of cold drink on a hot day
- dew on the grass on a summer morning

condensation - particles in gas lose enough thermal energy to form a liquid.

- dry ice
- snow disappears on sunny day when temperature is not at the melting point

sublimation - surface particles of a solid gain enough energy to form a gas without going through a liquid

solid → ~~liquid~~ → gas



frost on windows

deposition (desublimation) - a phase change in which a gas turns into a solid. A gas substance cools so quickly it skips the liquid phase.

3rd

12-14-16

Changes of State p. 48-53

Introduction

- Thermal energy flows as heat from a warmer substance to a cooler one

- A substance changes state when it's thermal energy increases or decreases enough.

A. Changes Between Solid and Liquid

① Melting
- Melting point is the temperature where something melts
- After melting, particles have more energy so they move more

② Freezing
- Freezing = change from liquid to solid
- When something is frozen, its particles lose thermal & kinetic energy.
- water (H_2O) freezes at 0°C (freezing point)

B. Vaporization

- Vaporization takes place when the particles of a liquid gain enough energy to become a gas

2 kinds

Evaporation

Evaporation is vaporization that only takes place on the surface of a liquid.

Boiling

- Boiling is vaporization that takes place below the surface and on the surface of a liquid.
- Water (H_2O) boiling point = 100°C

Condensation

- Condensation is opposite of vaporization.
- Condensation occurs when particles of a gas lose thermal and kinetic energy to become a liquid.

3rd Hour

Sublimation

- Sublimation is when a solid gains enough energy to skip the liquid phase and turn directly into a gas. (dry ice)

ASSIST

States of Matter

vaporization (2 ways): ① evaporation (puddle dries up) ② boiling water

Solid	Liquid	Gas
thermal energy increases ↑ →		
← thermal energy decreases ↓		
	~~liquid~~ sublimation → dry ice	
		
melting →	vaporization → ① evaporation puddle ② boiling water	
← freezing	← condensation	
Definite shape & volume ——— Particles very close, stay in the same place & vibrate slightly	liquids touch but arrows show movement Takes the shape of its container and has definite volume ——— Particles are close together but they are able to move apart, trade places and flow from place to place (slide)	higher energy and movement No definite shape or volume, fills the available space of the container ——— Rapid, random particles move freely and spread out
← freezing / melting →	vaporization ① boiling throughout ② evaporation - surface → ← condensation	
sublimation →		

name 1 state

change in state

freezing 0°C (32°F) melting point