

SNC 1

The Particle Motion Theory of Matter (Kinetic Molecular Theory)

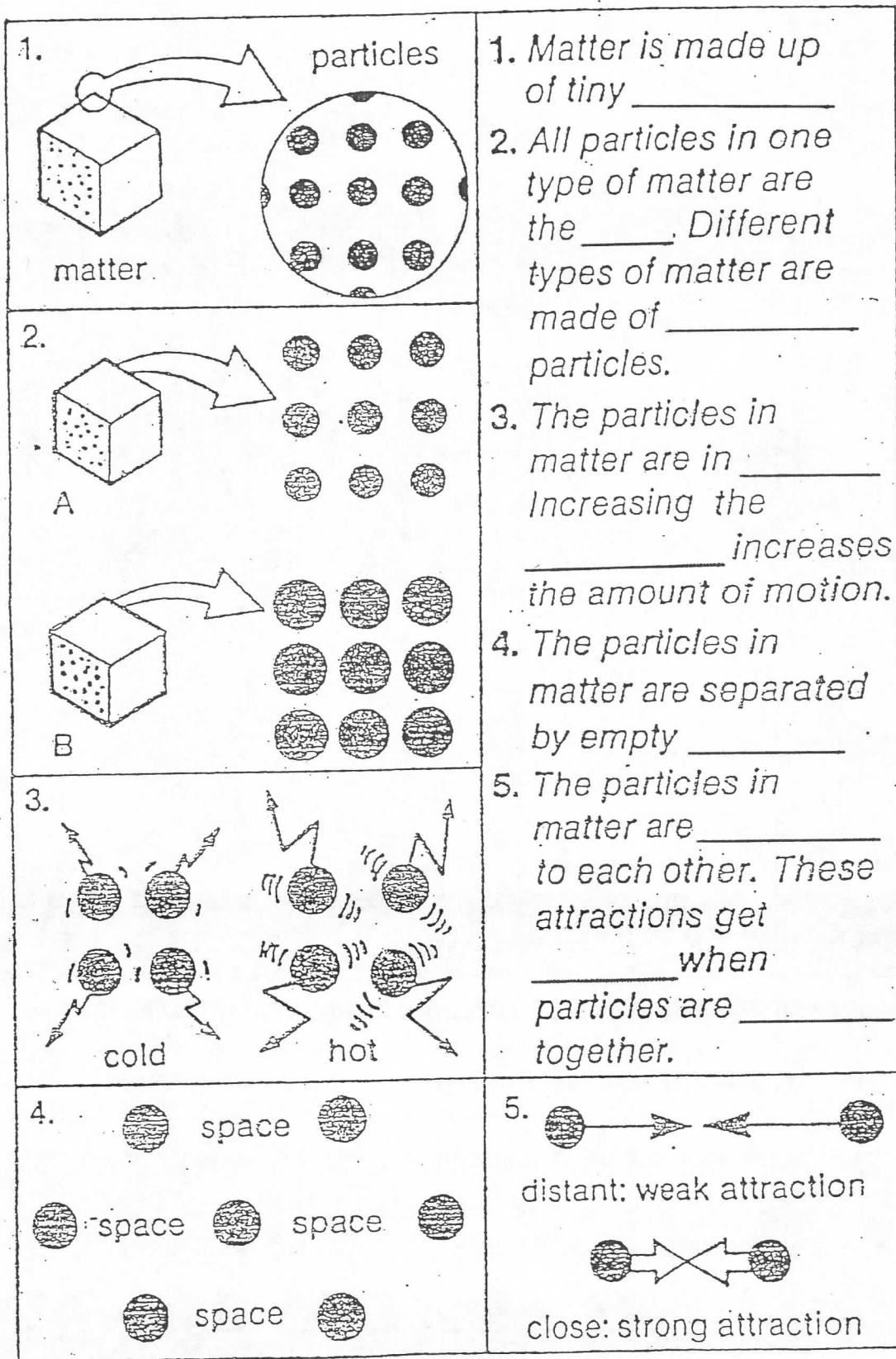


Figure 3.5 The particle model for matter

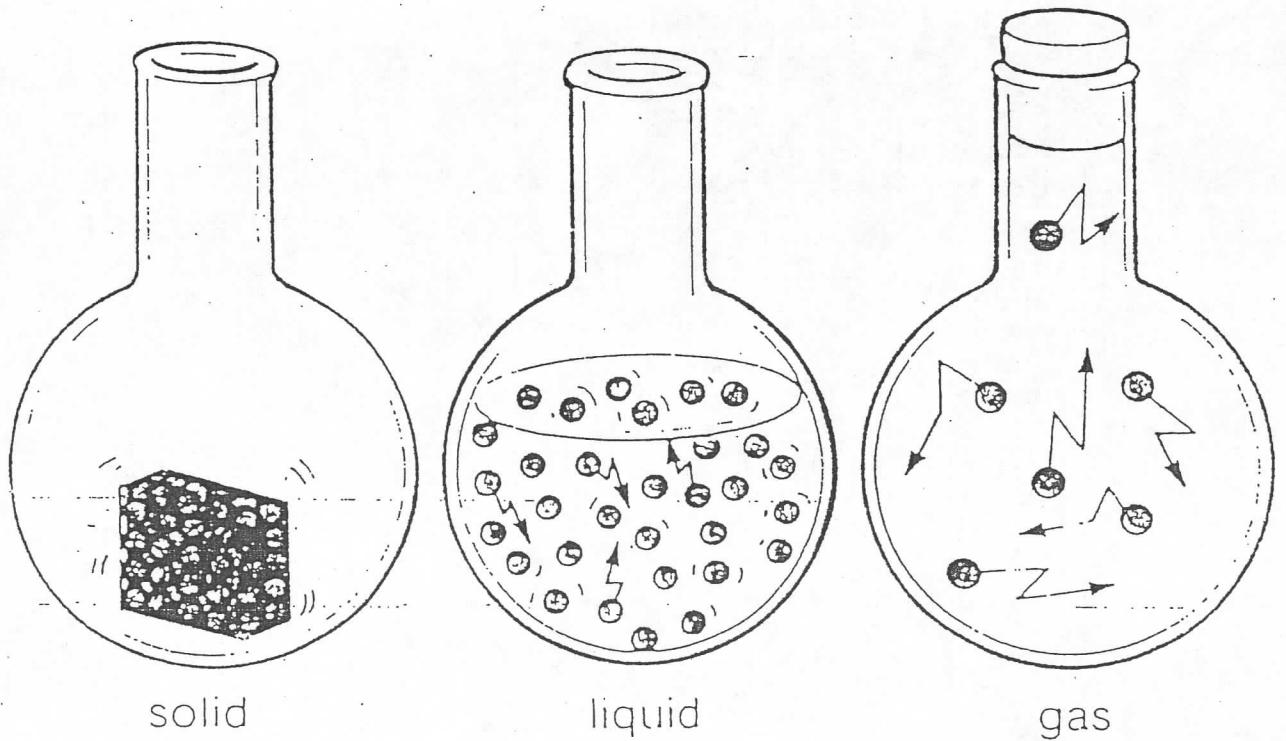


Figure 3.7 *Particles in the solid, liquid, and gas states*

Table 3.1 *The States of Matter and the Particle Model*

STATE OF MATTER	SOLID	LIQUID	GAS
Particle motion			
Particle spacing			
Attraction of particles for each other			

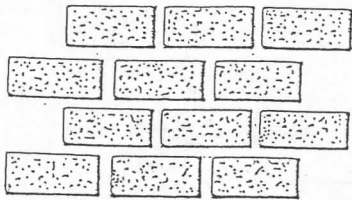
Using the Particle Theory

How The Particle Theory Explains States of Matter

Why do the three states of matter look and behave so differently if the same particles are present in each state? The explanation given by the particle theory is that particles are arranged differently in each state.

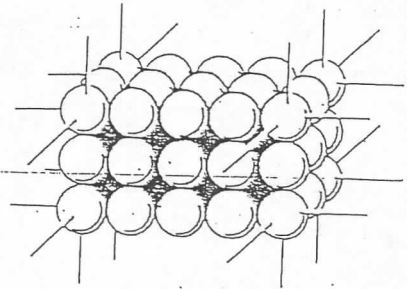
Observations

Solids have a definite shape and a definite volume. They can be compressed only very slightly.

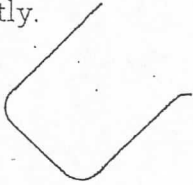


Explanation (Theory)

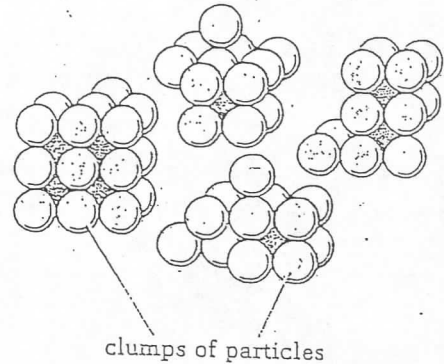
There are strong forces of attraction between the particles, holding them together in a definite pattern. The particles are relatively close together and cannot move past each other. The ordered arrangement of particles is called a lattice.



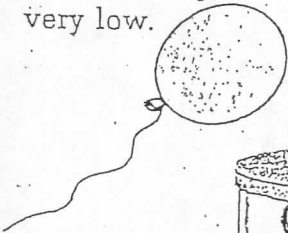
Liquids have a definite volume but no definite shape. They flow easily, and can be compressed only slightly.



The particles are farther apart in liquids than in solids; therefore, the forces of attraction must be weaker. There is no definite lattice. The particles exist in "clumps" that can slide or roll by each other. There are gaps between the clumps.



Gases have no definite shape or volume. They can be compressed greatly. Their density is very low.



The particles are very far apart. The attractive forces between them are extremely weak; therefore gas particles can completely fill any container in which they are placed. Because the particles are fast-moving, we can detect their pressure on the walls of a container.

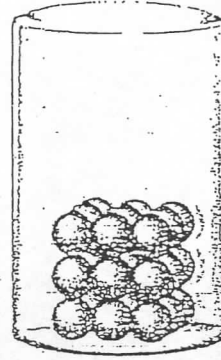
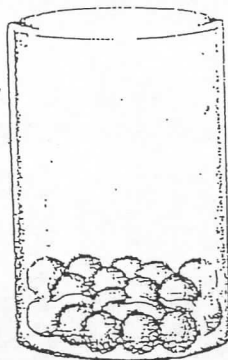
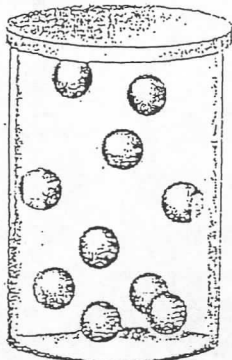
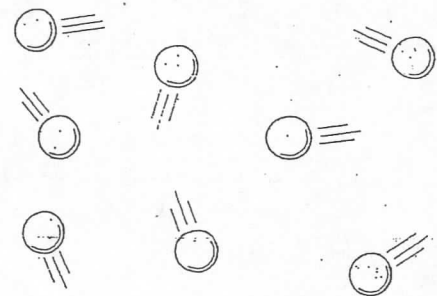


Figure 5.1A In gases, the particles have enough energy to overcome attractive forces that would hold them together.

Figure 5.1B The particles of a liquid do not have enough energy to overcome all attractive forces, but they do have enough energy to

Figure 5.1C Solids are made up of particles that do not have enough energy to move from one place to another.

The Particle Theory of Matter

Name: _____

In the chart below, enter in the first column the five statements of the particle theory of matter. In the second column, copy one piece of evidence that supports the statement made by the particle theory from the following list:

- A • solids are often difficult to break apart
- B • when 50 mL of alcohol is added to 50 mL of water, the total volume is less than 100 mL
- C • the physical and chemical properties of carbon, oxygen, and all the other elements are all different from each other
- D • if a tiny smoke particle is observed in a microscope, it can be seen to be constantly in motion
- E • if any small amount of carbon or any other element is subdivided again and again, eventually you must end up with a single particle of carbon

→ See pg. ①

→ Choose from above, A to E.

Statement of the Particle Theory	Evidence that supports the theory
#1	
#2	
#3	
#4	
#5	