Chapter- 5

Solids, Liquids, and Gases

STUDY NOTES

Let's learn

Matter:

- You will see doors, windows, books, tumblers, water bottles, pens, CDs and many other things.
- All these things around us are made of different materials.
- Anything that occupies space and has weight is known as **matter.**

MATTER MADE UP OF:

- Matter is made up of molecules.
- Molecules are the smallest substances in a matter that can exist independently. (Ex: A drop of water is made up of molecules of water.)

STATES OF MATTER:

- Matter exists in three states - solid, liquid, and gas.

SOLIDS:

- Solid has a fixed shape and a definite volume. (it is a space occupied by a solid, liquid, or a gas)
- Solids can be held because the molecules in solids are tightly packed.
- So, solids have a fixed shape and a fixed volume.

LIQUIDS:

- Liquid does have a fixed shape because the molecules in a liquid are loosely packed and can move around.
- They can take the shape of the container in which they are poured, and can flow.
- However, liquid has affixed volume.

GASES:

- Air is a mixture of gases. Molecules of air are loosely packed and can flow easily.
- Thus gases have no fixed shape and volume.

- Gases can fill the space of the vessel, and flow more easily than liquids.

STATES OF MATTER AND INTERCHANGEABLE:

- Solid, liquid, and gas are interchangeable states.
- EX: Take a wax candle, light it and let it burn.

Observe it.

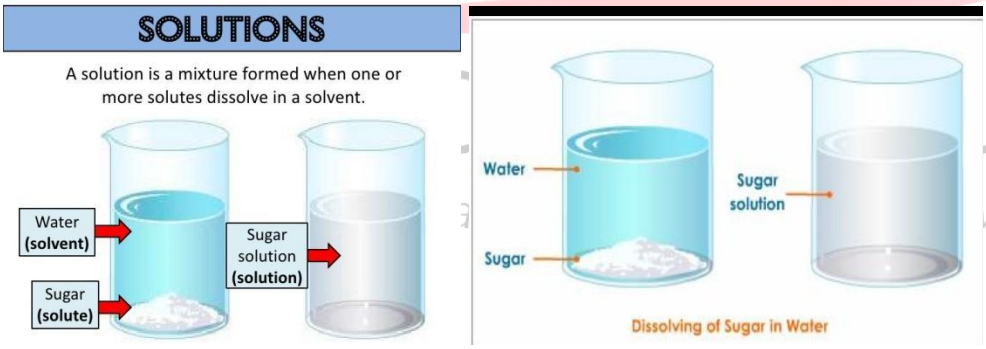
The solid wax melts on getting heated.

DISSOLVING SOLIDS IN WATER:

- DISSOLVING OF SUGAR IN WATER

  SUGAR + WATER = SWEET WATER

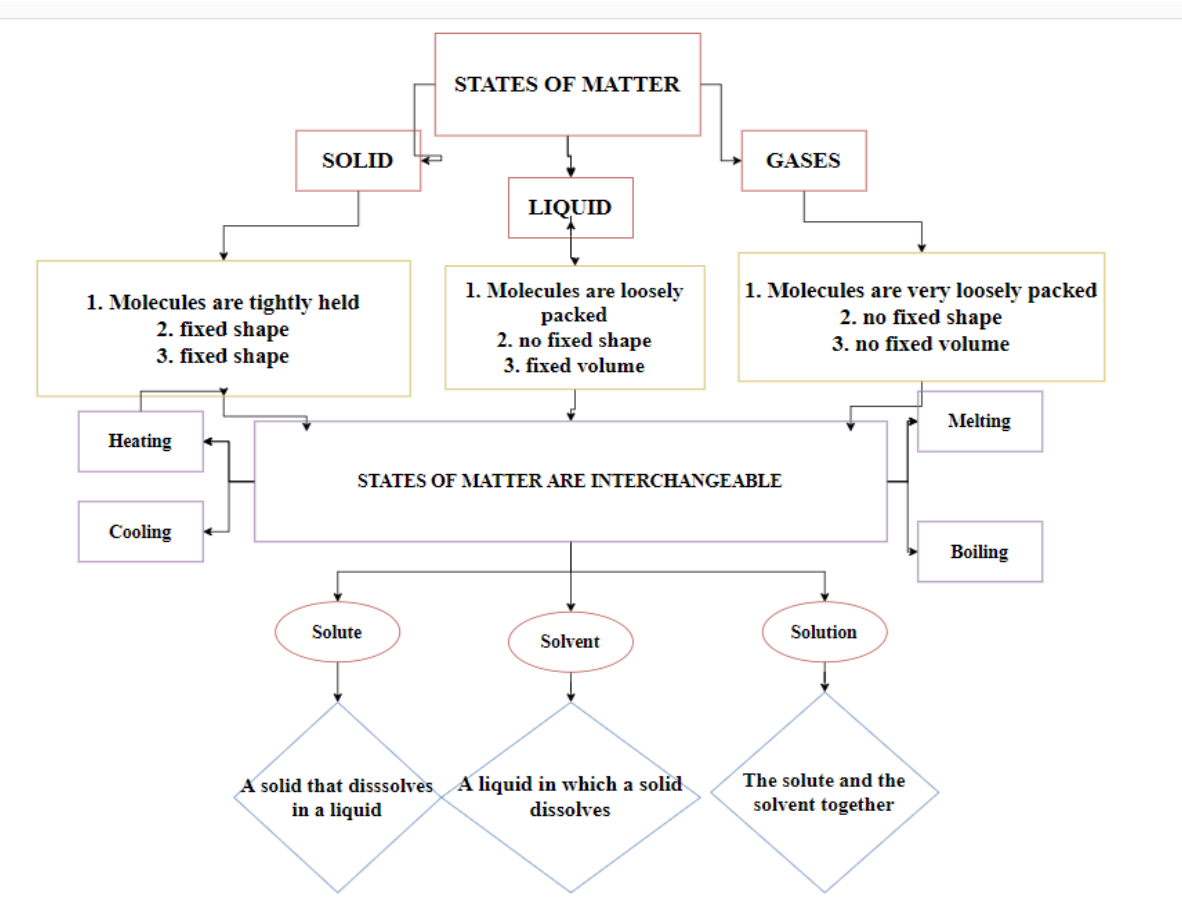
  Solute solvent solution



- **Solute:** a solid that dissolves in a liquid
- **Solvent:** a liquid in which a solid dissolves
- **Solution:** the solute and the solvent together
- When we put sugar into the water, its molecules scatter throughout the water.
- They occupy the empty spaces in between the molecules of water.
- This is why sugar seems to disappear when it is dissolved in water.
- The sugar solution does not look different from pure water.
- The volume of the solution remains almost the same as the volume of the solvent.

Therefore, sugar does not take up any extra space, its molecules only fill up the empty spaces between the molecules of water.

MEMORY MAP



Let's Know more

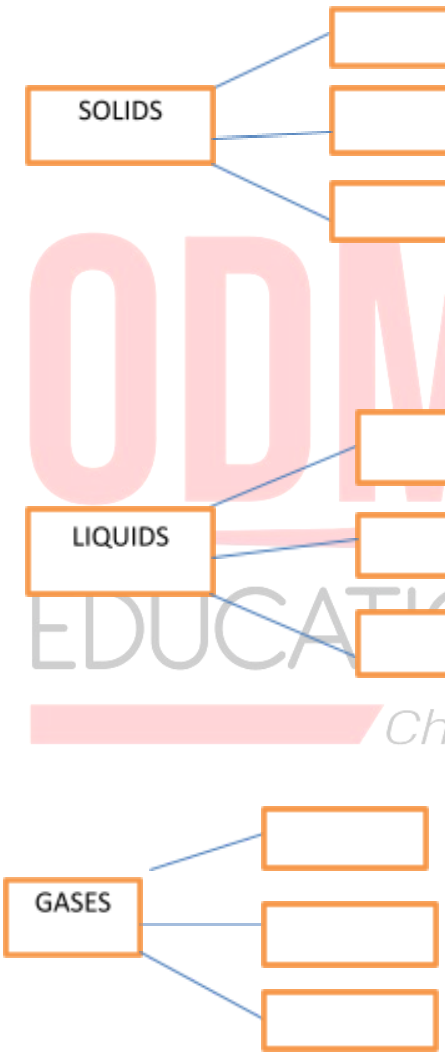
A. Tick the correct answer.

1. This is a state of matter
   a) Solid b) sugar c) salt d) wax
2. Which of the following is not solid?
   a) Sugar b) button c) ink d) rice
3. Which of the following is soluble in water?
   a) Stone b) salt c) sand d) rice
4. Which of the following has a fixed volume?
   a) Stone b) smoke c) air d) perfume

B. Write T for True or F for False.

1. The molecules of solids are held together very loosely.
2. Liquids do not have a fixed volume.
3. Water changes into water vapor when it is frozen.
4. In water – sugar solution, water is the solute.
5. Sugar is soluble in water.

C. Fill in the names of any three solids, liquids, and gases in the empty boxes.



D. How solids liquids gases are different from each other? Fill in the table.

SOLIDS	LIQUIDS	GASES

Understand and Answer

E. Write short answers.

1. What is a matter made up of?
2. What are molecules?
3. Name a solid that turns to liquid when taken out from the refrigerator.
4. Name a liquid that you drink often.
5. Name a gas that you use for breathing.

F. Answer these questions.

1. How will you show that gas does not have a fixed volume?
2. What is the difference between the following two solutions?
   a) Sugar in water b) sand in water
3. When sugar is dissolved in water the volume of the solution does not change.

Teacher's Note

- Display samples of matter in the class and ask children to identify them and develop an interest in conducting experiments by making solutions with solute and solvent.

Improve Your Gk

- The smell of perfume spreads very quickly from one corner to another because the molecule of perfume and molecules of air will mix (diffuse) together and can easily flow throughout the room.

Answer Key

A 1. Solid

2. ink

3. salt

4. stone

B. 1. F

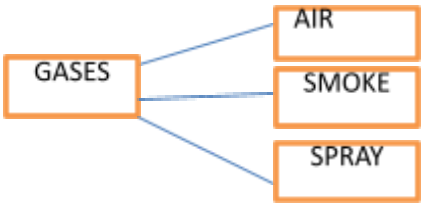
2. F

3. F

4. F

5. T

C.



D.

SOLIDS	LIQUIDS	GASES
• Solid has a fixed shape and volume. • Molecules in solids are tightly packed.	• Liquid does not have a fixed shape but has fixed volume. • Molecules in liquids are loosely packed.	• A gas does not have a fixed shape and volume. • Molecules in gases are very loosely packed.

E1. All matter in the world is made up of molecules.

2. Molecules are the smallest substances in matter that can exist independently.

3. Ice cubes

4. Water

5. Oxygen

F1. When air is filled into a balloon it takes up all the spaces inside it.

- We can pump more and more air into a football.
- It means more air can be filled and it does not have any fixed volume as molecules are loosely packed and can flow easily.

2. The difference between the following two solutions is:

SUGAR IN WATER	SAND IN WATER
• When we put sugar in water, its molecules scatter throughout the	• When we put sand in water, its molecules do not dissolve in water and are insoluble.

water and occupy empty spaces. ● Sugar will disappear in water.	● Sand will not disappear in water, it will settle down in the container.

4. The volume of the solution does not change when sugar is dissolved in water because the level of water remains the same as the sugar particles get into the spaces between water molecules.

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