

Subject – Science

Class- 6

Topic – chapter -5

the smart board in class to do these exercises.)

A Tick (✓) the correct options.

- The gaseous state has
 - (a) fixed shape
 - (b) unfixed shape and volume ✓
 - (c) fixed volume
 - (d) fixed mass
- The main particle of outer part of an atom is
 - (a) proton
 - (b) neutron
 - (c) proton & neutron
 - (d) electron ✓
- The substance made up of only one type of particle is
 - (a) compound
 - (b) element ✓
 - (c) mixture
 - (d) mixed metal
- Sugar, salt, glass, plastics are called
 - (a) elements
 - (b) compounds ✓
 - (c) mixtures
 - (d) all of these

B Fill in the blanks.

- Proton and neutron are present in the nucleus of atom.
- The particles of solid are close to each other, while particles of gases are far away.
- Sugar is a compound, while its syrup is mixture.

C Match the following correctly.

Column A	Column B
1. Iron c	(a) atom
2. Salt d	(b) mixture
3. Sorbet b	(c) element
4. Electron, proton and neutron a	(d) compound

Short answer type questions

- Write names of 5 compounds used in our daily life. Sugar, salt, glass, plastic and water
- Draw a labelled diagram of structure of atom. 47
- Identify elements, compounds and mixture from the following— oxygen gas, iron, sugar, salt, hydrogen gas, sand, brass, soap, surf, sugar, syrup, sorbet, air
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E Long answer type questions

1. Explain with experiments the state of matter. 48, 49
2. Define elements, compound and mixtures with examples. 51
3. Differentiate atom and molecule with example. 1/6
4. Explain the making of water molecule with diagram. 47

F Practical Work

1. Make a model of structure of an atom on a cardboard with the help of balls or marbles.
2. Draw a chart of symbols of elements and hang in your class.

ADDITIONAL QUESTIONS FOR PRACTICE

A Tick (✓) the correct options.

1. Which of the following states of matter has maximum intermolecular space?
(a) solid ☐ (b) liquid ☐ (c) gas ✓ ☐ (d) all of these
2. Iron, gold and silver are examples of
(a) elements ✓ ☐ (b) compounds ☐ (c) mixtures ☐ (d) plasma
3. Which of the following is the symbol of sodium?
(a) So ☐ (b) Na ✓ ☐ (c) Sd ☐ (d) S
4. Cu is the symbol of
(a) calcium ☐ (b) carbon ☐ (c) chlorine ☐ (d) copper ✓

B Fill in the blanks.

1. The substance from which an object is made is called material.
2. All materials are made up of matter.
3. Matter is made up of very small particles called atom.
4. Two atoms of oxygen form a molecule of oxygen.
5. The space or gap between the molecules is called intermolecular space.
6. As the intermolecular force of attraction decreases, the distance between the molecules of matter increases.
7. In solids, the molecules vibrate only about their fixed positions.
8. The intermolecular space in liquids is larger than solids.
9. The molecules of a gas can move freely in any direction.
10. At room temperature, water exists in liquid state.
11. The process of interconversion of states of water in nature can be seen in the form of water cycles.

Name the following.

1. Neutral particles of an atom: neutrons
2. State of matter that is generally opaque: solids

D Short answer questions

1. Define matter. 52
2. What are sub-atomic particles? Name them. 47
3. Why is a nucleus positively charged? 47
4. What is intermolecular force of attraction? 47
5. What is meant by interconversion of states of matter?
6. What happens when water is: (a) heated to 100°C (b) cooled at 0°C ?
7. Classify matter on the basis of its (a) physical state (b) chemical composition.
8. Why is oxygen an element? 5
9. What are symbols? What do they represent? 5
10. Write the symbols of the following elements: Mercury, Magnesium, Argon, Lead, Silver, Zinc
11. Write the formulae of glucose, hydrochloric acid, carbon dioxide and nitric acid.

E Long answer questions

1. Describe different states of matter with the help of diagrams showing their molecular arrangements.
2. Differentiate between solids, liquids and gases.

F Think and answer

Why do we see water droplets on the outer surface of a glass containing ice cold water?

Chapter 5: Let Us Know The Nature Of Matter

Multiple Choice Questions

Page No.48

1. (c) 2. (a)

Multiple Choice Questions

Page No. 50

1. (a) 2. (b)

Multiple Choice Questions

Page No. 52

1. (b) 2. (d)

EXERCISE

A. Tick (✓) the correct options.

1. (b) 2. (d) 3. (b) 4. (b)

B. Fill in the blanks.

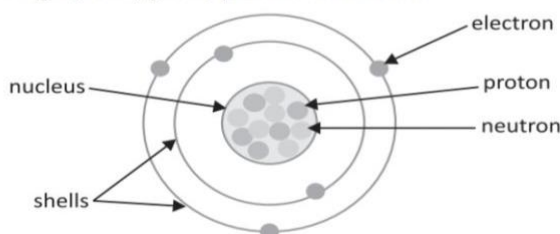
1. Proton, neutron 2. close, far away 3. mixture

C. Match the following correctly.

1. (c) 2. (d) 3. (b) 4. (a)

D. Short answer type questions

1. Sugar, salt, glass, plastic and water
2.



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3.	Elements	Compounds	Mixture
	oxygen gas, iron, hydrogen gas	sugar, salt	sand, brass, soap, surf, sugar syrup, sorbet, air

E. Long answer type questions

- The states of matter are solid, liquid and gas.
 - Activity for solids:** Take a solid wooden cube and try to press it. It is hard to change its shape. Also, it does not flow. Therefore, we conclude that solids have definite shape and volume. They are generally hard, incompressible and do not flow on their own.
 - Activity for liquids:** Take 50 mL water in a measuring cylinder. Observe its shape and volume. Now, pour it into a beaker. We can observe that while pouring water into beaker, it flows and takes the shape of beaker. But, the volume of water remains 50 ml in both the cases. Thus, we can conclude that liquids have no definite shape. They take the shape of the container in which they are kept. They have definite volume. They are not hard like solids and are slightly compressible.
 - Activity for gases:** Take a disposable syringe and seal its nozzle with fevicol and let it dry. Try to push the plunger inwards with some force and we see that the plunger moves inwards. Now, withdraw the force applied on the plunger, the plunger gets pushed outwards. We observe that gases have no definite shape. They are not hard and are highly compressible.

2. **Element:** An element is a pure substance that cannot be split into two or more simpler substances by chemical methods. Examples are oxygen, aluminium, copper, etc.

Compound: A compound is a pure substance made up of two or more elements chemically combined in a fixed proportion (by mass). For example, water is a compound made by the chemical combination of hydrogen and oxygen.

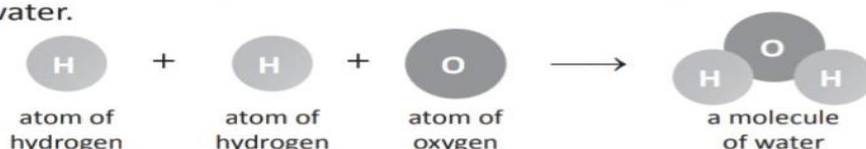
Mixture: When two or more substances are mixed together in any proportion, without undergoing any chemical change and each substance retains its property, the resulting substance is called a mixture. For example, air is a mixture of gases like oxygen, carbon dioxide and nitrogen.

3. The smallest particle that exhibits all the properties of matter and does not have an independent existence is called an atom. While, the smallest particle of matter that exhibits all the properties of matter and has an independent existence is called a molecule.

For example, two atoms of oxygen form a molecule of oxygen.



4. Two atoms of hydrogen and one atom of oxygen form a molecule of water.



5. Practical Work

- Students can do this work by themselves.
- Students can do this work by themselves.

ADDITIONAL QUESTIONS FOR PRACTICE

A. Tick (✓) the correct options.

- (c)
- (a)
- (b)
- (d)

3. Fill in the blanks.

- | | | | |
|-------------------------|--------------|------------|-----------------|
| 1. material | 2. matter | 3. atoms | 4. Two |
| 5. intermolecular space | 6. increases | 7. solids | |
| 8. solids | 9. gas | 10. liquid | 11. water cycle |

C. Name the following.

- neutrons
- solid

D. Short answer questions

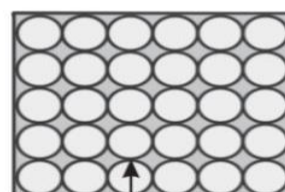
- Anything that has mass and occupies space is called matter.
- Atom consists of three fundamental particles:
 - electrons—negatively-charged particles
 - protons—positively-charged particles
 - neutrons—neutral particles
 Electrons, protons and neutrons are collectively called sub-atomic particles.
- A nucleus consists of protons and neutrons. A nucleus is positively-charged because of the presence of protons which are positively-charged. Since, neutrons are neutral particles i.e., they do not carry any charge. Therefore, they do not affect the positive charge of nucleus.

4. A force of attraction exists between the molecules of matter. This is called intermolecular force of attraction. The intermolecular force of attraction holds the molecules together.
5. The process of change of matter from one state to another and back to its original state by changing temperature or pressure is called interconversion of states of matter.

6. (a) When water is heated to 100°C , it starts boiling and turns into steam. So, water exists in the gaseous state in the form of steam at a temperature of 100°C or above.
(b) When water is cooled at 0°C , it turns into ice. So, water exists as a solid in the form of ice at a temperature of 0°C or below.
7. (a) On the basis of physical state, matter can be classified into solids liquids and gases.
(b) On the basis of chemical composition, matter can be classified into elements, compounds and mixtures.
8. Oxygen is made up of only one type of atoms, i.e., oxygen atoms. Oxygen cannot be broken down into simpler substances by chemical methods. Thus, oxygen is an element.
9. The abbreviation used to denote an element is called a symbol. The symbol of an element represents its name and an atom. For example, the symbol of sodium is Na.
10. (i) Mercury: Hg (ii) Magnesium: Mg (iii) Argon: Ar
(iv) Lead: Pb (v) Silver: Ag (vi) Zinc: Zn
11. (i) Glucose: $\text{C}_6\text{H}_{12}\text{O}_6$ (ii) Hydrochloric acid: HCl
(iii) Carbon dioxide: CO_2 (iv) Nitric acid: HNO_3

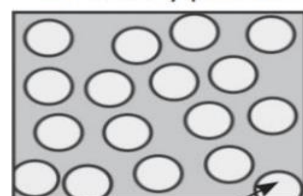
E. Long answer questions

1. **Solids:** Solids have a definite shape and volume. In solids, the molecules are closely packed. It is because of strong intermolecular force of attraction in solids that holds them together in fixed positions. The intermolecular space in solids is very small (almost negligible).



Molecules of a solid are closely packed.

Liquids: Liquids have a definite volume, but no definite shape. In liquids, the molecules are loosely packed or less closely packed than solids. They have weak intermolecular force of attraction than solids, so, it cannot hold the molecules of liquid together in fixed positions. The intermolecular space in liquids is larger than that in solids.

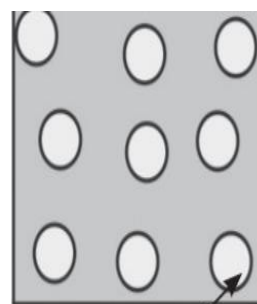


Molecules of a liquid are loosely packed.



liquids is larger than that in solids.

Gases: Gases neither have a definite shape nor a definite volume. In gases, the molecules are far apart from one another as compared to solids and liquids. The intermolecular force of attraction in gases is negligible. The space between the molecules of a gas is larger than that of liquids.



Molecules of a gas are far apart.

2.	S. No.	Parameters	Solid	Liquid	Gas
	(i)	Shape	Definite shape	No definite shape. It takes the shape of the container in which it is kept.	No definite shape
	(ii)	Volume	Definite volume	Definite volume	No definite volume. It occupies the entire volume of the container in which it is kept.
	(iii)	Hardness	It is generally hard.	It is not hard.	It is not hard.
	(iv)	Fluidity (tendency to flow)	It does not flow.	It flows from the higher level to the lower level.	It flows in all directions.
	(v)	Compressibility	Incompressible	Slightly compressible	Highly compressible
	(vi)	Intermolecular space	Almost negligible	More than that in case of solids	Very large

F. Think and answer

When water vapour present in the atmosphere comes in contact with the cold outer surface of a glass containing ice cold water, they condense to form water droplets on it. Thus, we see the water droplets on the outer surface of a glass containing ice cold water.