ODM EDUCATIONAL GROUP
Changing your Tomorrow

MATTER

SUBJECT-CHEMISTRY

CHAPTER NO- 3

Introduction, Nature Of Matter , Composition of Matter

PERIOD-1

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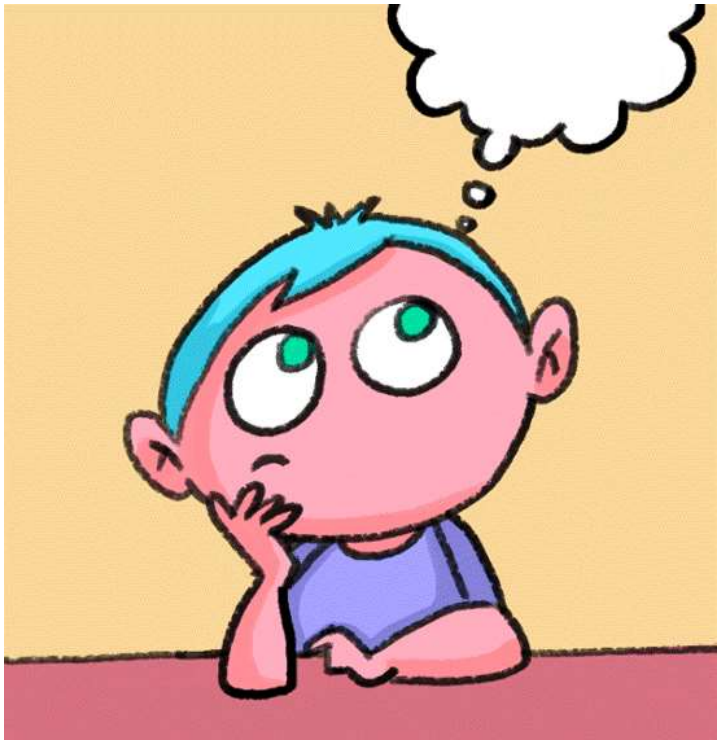
LEARNING OBJECTIVE

Students will be able to

- Understand the meaning of matter
- Sensitized about the nature of matter
- Understand the composition of matter



WARM UP QUESTIONS

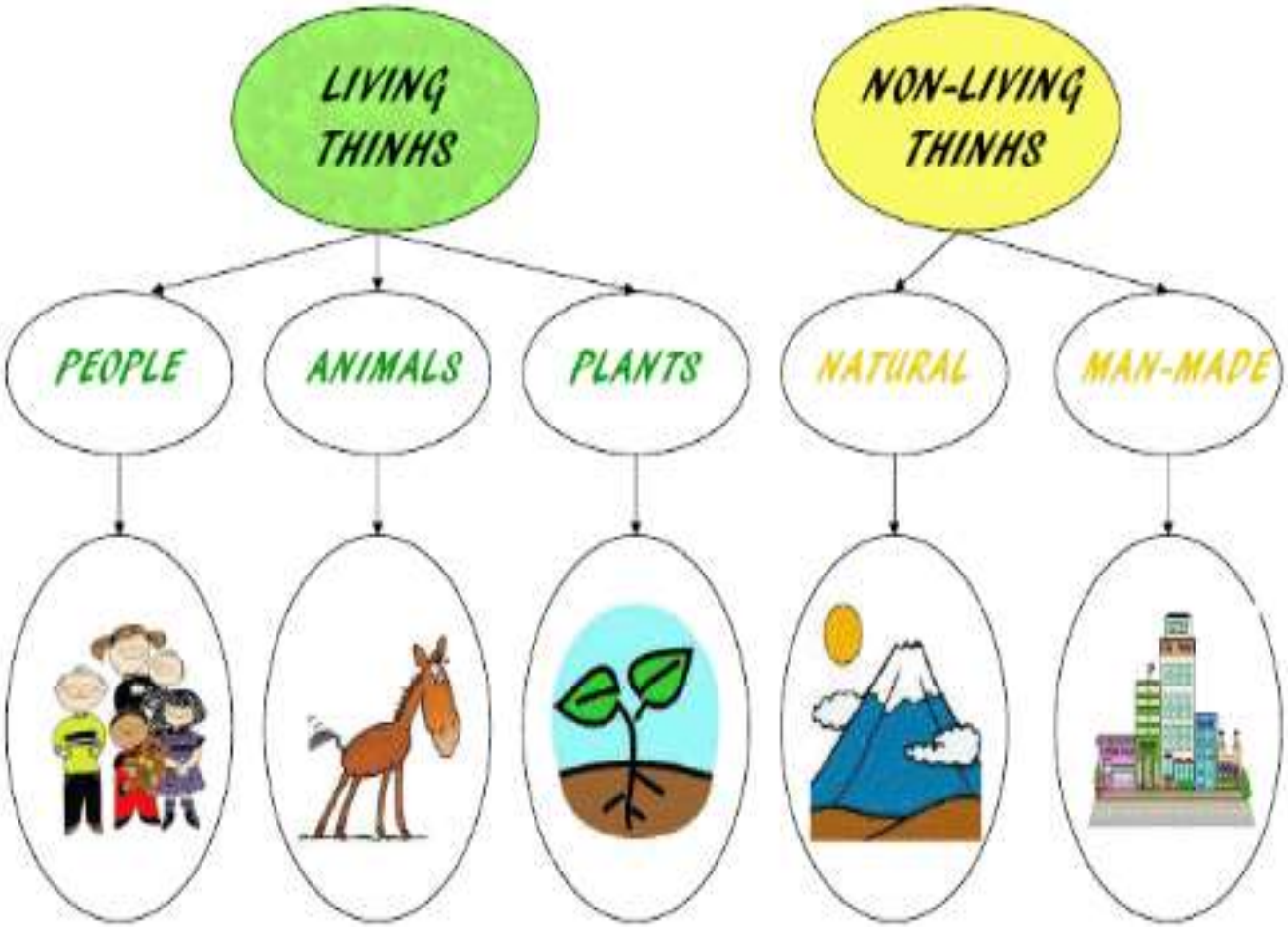
- Discuss the previous knowledge with the students.
- What are the things around us like water, soil, plants, minerals, animals etc called?
- Ask the difference between living and non living
- Elaborate the creation of matter by explaining Big- bang theory

- https://youtu.be/HdPzOWlLrbE

What do you mean by matter?

- **Matter** is anything that occupies space and has mass. All physical objects are composed of **matter**, and an easily observed property of **matter** is its state or phase. The classical states of **matter** are solid, liquid and gas.

CLASSIFICATION OF MATTER



ACTIVIY 1

- LIST FIVE OBJECTS MADE BY USING EACH OF THE FOLLOWING MATERIALS

1. WOOD
2. PAPER
3. PLASTIC
4. METALS
5. LEATHER
6. CLOTH

NATURE OF MATTER

- Anything that occupies space and has mass is called **MATTER.**

My WEIGHT on Earth is around 560N

My WEIGHT on the moon is around 90N

My MASS is always 56kg!!

- The mass of an object is a measure of the amount of matter the object has.
- The measure of the space occupied by an object is called volume.

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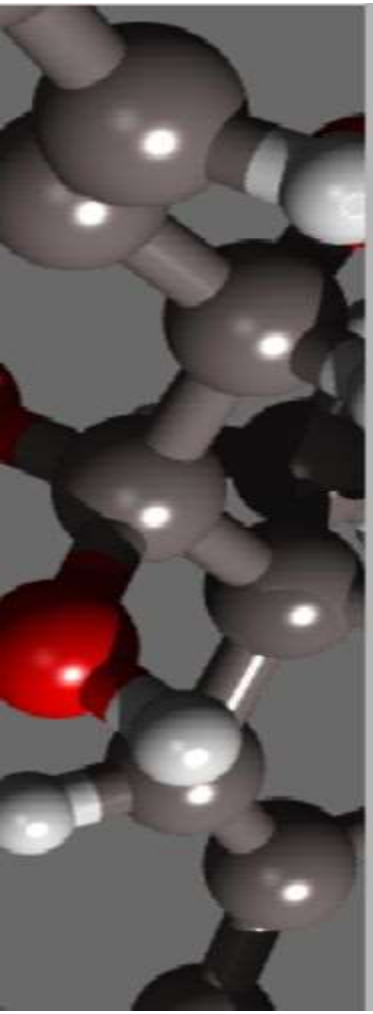
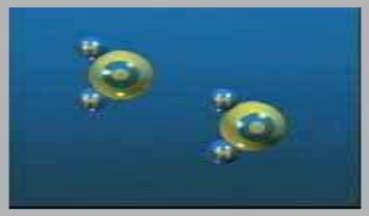
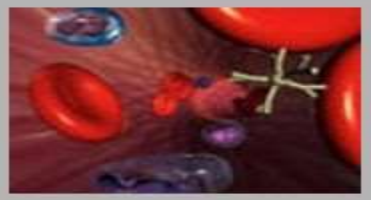
- Matter can be perceived by our senses- see, touch, smell, feel
- Matter offers resistance
- **Resistance** is the force offered by a substance in an direction opposite. Since **matter** has mass, it can come in contact with other **matter** of specific mass and will offer **resistance** to it.

COMPOSITION OF MATTER

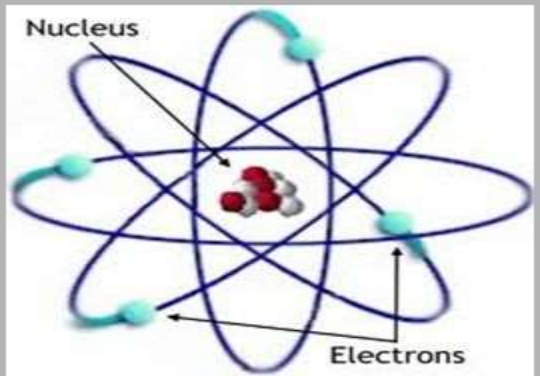


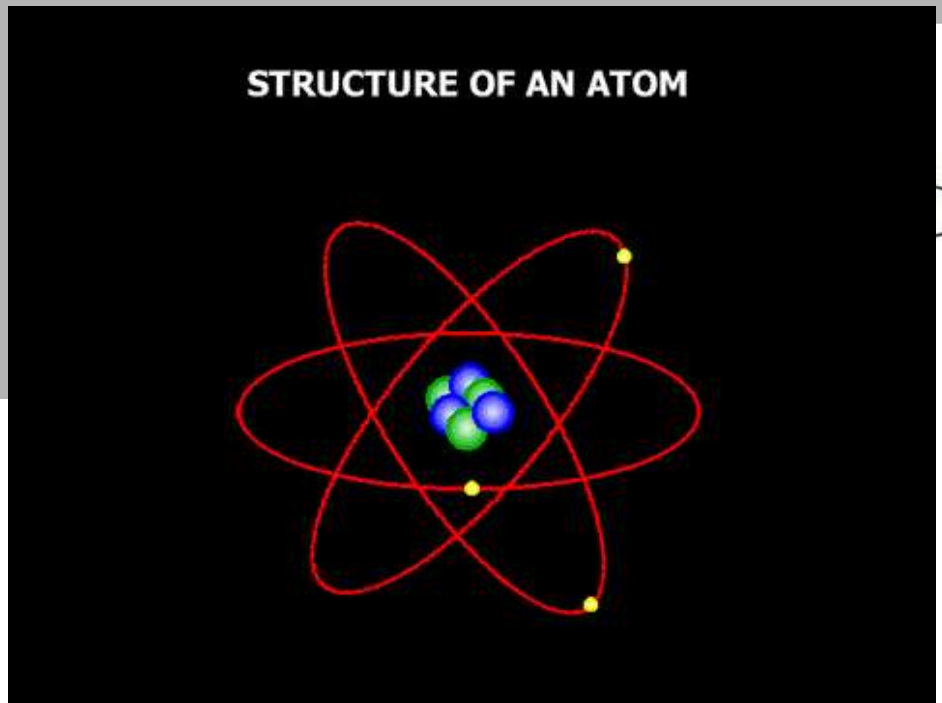


ATOMS



- ALL MATTER IS MADE OF ATOMS
- Definition: ATOMS ARE THE SMALLEST PIECE OF MATTER and CANNOT BE BROKEN DOWN INTO A SIMPLER SUBSTANCE.

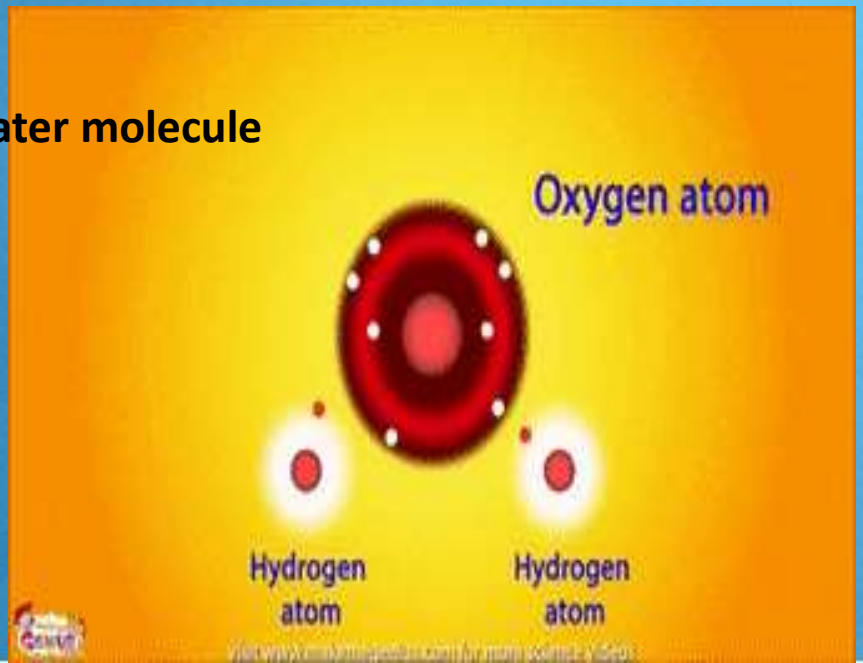


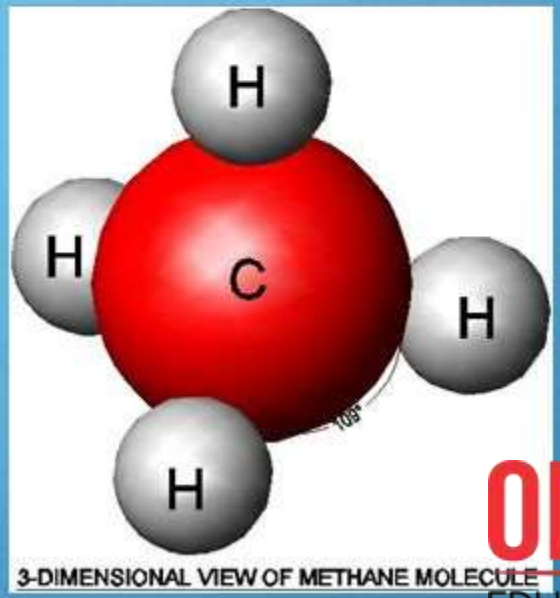


What are molecules?

A group of atoms which are joined together are called molecules.
The chemical formula for water is H_20 because a molecule of water consists of two hydrogen atoms joined to an oxygen atom.
The formula For methane is CH_4. It has this formula because a molecule of methane
Consists of an atom of carbon joined to four atoms of hydrogen.

Water molecule





Methane molecule

HOME ASSIGNMENT

- Exercise- objective question and answers
- Q. What do you mean matter?
- Describe mono atomic and diatomic molecules along with examples.
- Give an example that shows matter offers resistance.

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MATTER

SUBJECT-CHEMISTRY

CHAPTER NO- 3

States of Matter, Explanation of the States of Matter on the Basis of the Characteristics of the Particles of Matter

PERIOD-2

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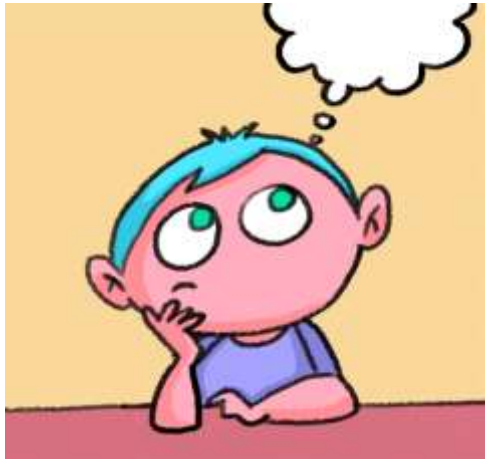
LEARNING OBJECTIVE

- Students will be able to
- Understand the characteristics of particles or molecules of matter
- Demonstrate different states of matter.
- Differentiate between solids, liquids and gases on the basis of their properties
- Understand the difference in States of Matter on the Basis of the Characteristics of the Particles of Matter



WARM UP QUESTIONS

- Recapitulation of previous class topic by asking following questions
- Define the term matter. What is it composed of?
- Classify matter

characteristics of particles of matter

Characteristics of particles of Matter:

The important characteristics of particles of matter are the following:

1. The particles of matter are very, very small.
2. The particles of matter have space between them.
3. The particles of matter are constantly moving.
4. The particles of matter attract each other.

1. Particles of matter are very small in size by demonstrating an activity

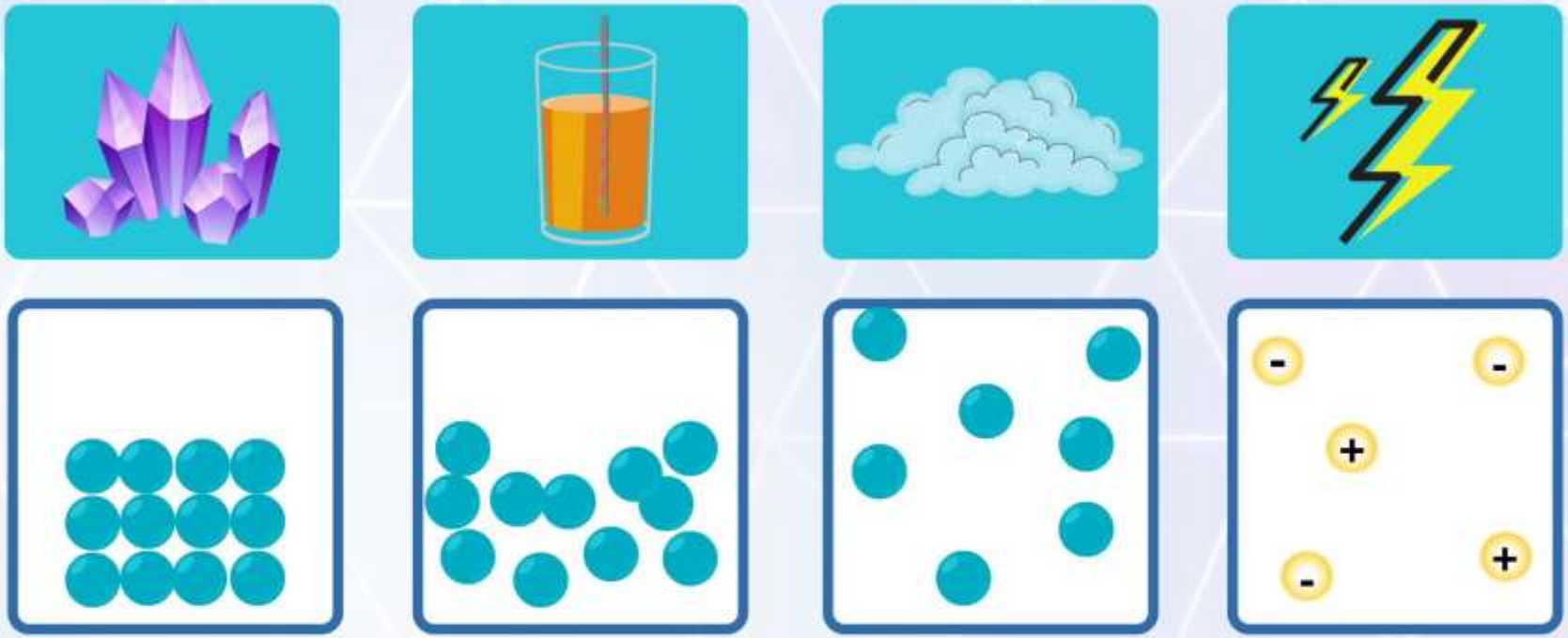
https://youtu.be/wMTmsyPPFsQ

2.Explain that Particles of matter have space between them by the help of a video demonstrating an activity for the better understanding of concept
https://youtu.be/fUzKozeqDPo

3. Explain Particles of matter are always in random motion by the help of a video demonstrating an activity for the better understanding of concept

https://youtu.be/_tbgGgxA29s

States of Matter



Solid ⇄ Liquid ⇄ Gas ⇄ Plasma

Melting / Freezing

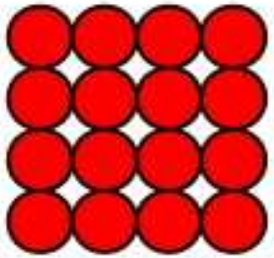
Vaporization / Condensation

Ionization / Deionization

sciencenotes.org

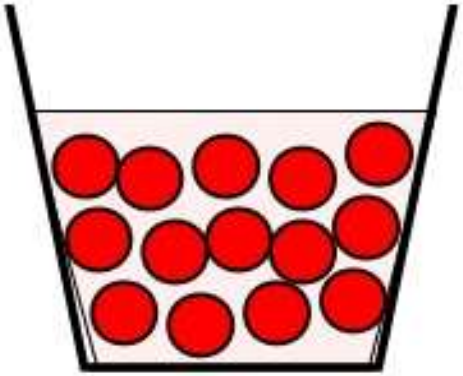
Properties of solid , liquid, gas

SOLIDS



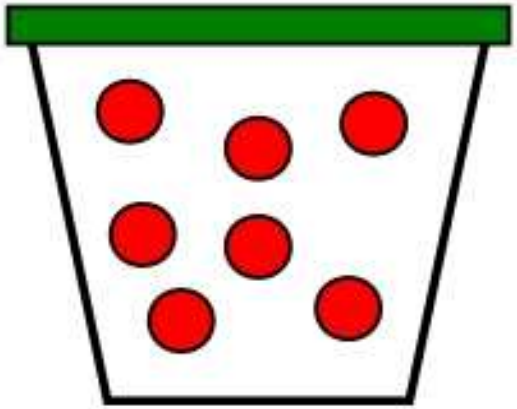
The molecules are held together with strong bonds. They don't move very easily so SOLIDS can keep their own shape and size

LIQUIDS



The molecules have weaker bonds. They can move around slightly so LIQUIDS can flow. They can't keep their shape unless they're in a container.

GASES



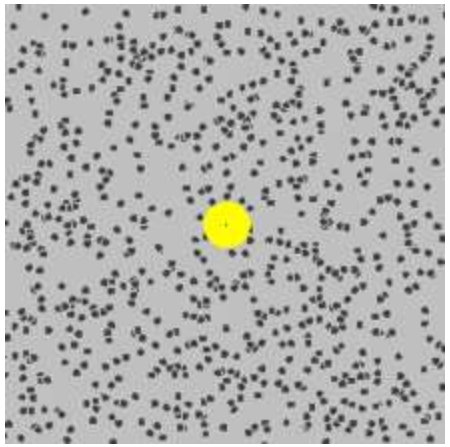
The molecules are free to move around. They can spread around an open space quickly and freely. GASES can't keep their shape unless they are kept in a *sealed* container.

	Properties	Solids	Liquids	Gases
1	**Mass**	Definite	Definite	Definite
2	**Shape**	Definite	Acquires the shape of the container	Acquires the shape of the container
3	**Volume**	Definite	Definite	Indefinite
4	**Compressibility**	Not possible	Almost Negligible	Highly Compressible
5	**Fluidity**	Not possible	Can flow	Can flow
6	**Rigidity**	Highly rigid	Less rigid	Not rigid
7	**Diffusion**	Slow	Fast	Very fast
8	**Space between particles**	Most closely packed 	Less closely packed 	Least closely packed 
9	**Interparticle force**	strongest	Slightly weaker than in solids	Negligible

- Explanation of the molecular model of solids liquids and gases by showing a video.
- https://youtu.be/6bHkWh5T3mk

Differentiate between solids, liquids and gases on the basis of their properties- cohesive force, random movement of particles.

- **Cohesive force-** force of attraction between like particles. SOLIDS>LIQUIDS>GASES
- Random motion-



Brownian movement- the zig zag motion of particles in a medium.

Diffusion- the phenomenon of intermixing of particles of one kind with another kind

GASES>LIQUIDS>SOLIDS

HOME ASSIGNMENT

- Exercise Q1,Objective type Q4,5 6,7 and MCQ

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MATTER

SUBJECT-CHEMISTRY

CHAPTER NO- 3

Effect of heat on matter, chemical change on heating

PERIOD-3

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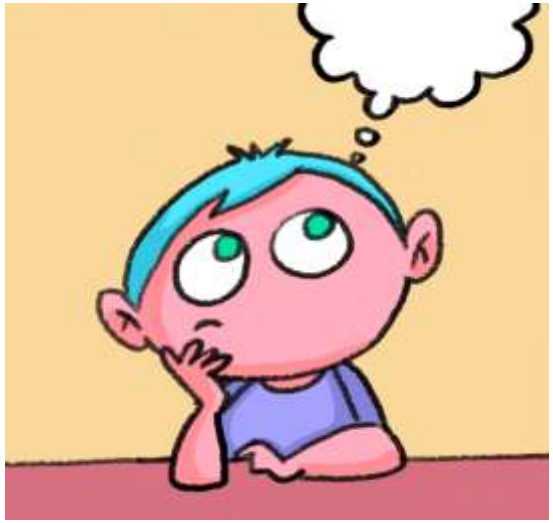
LEARNING OBJECTIVE

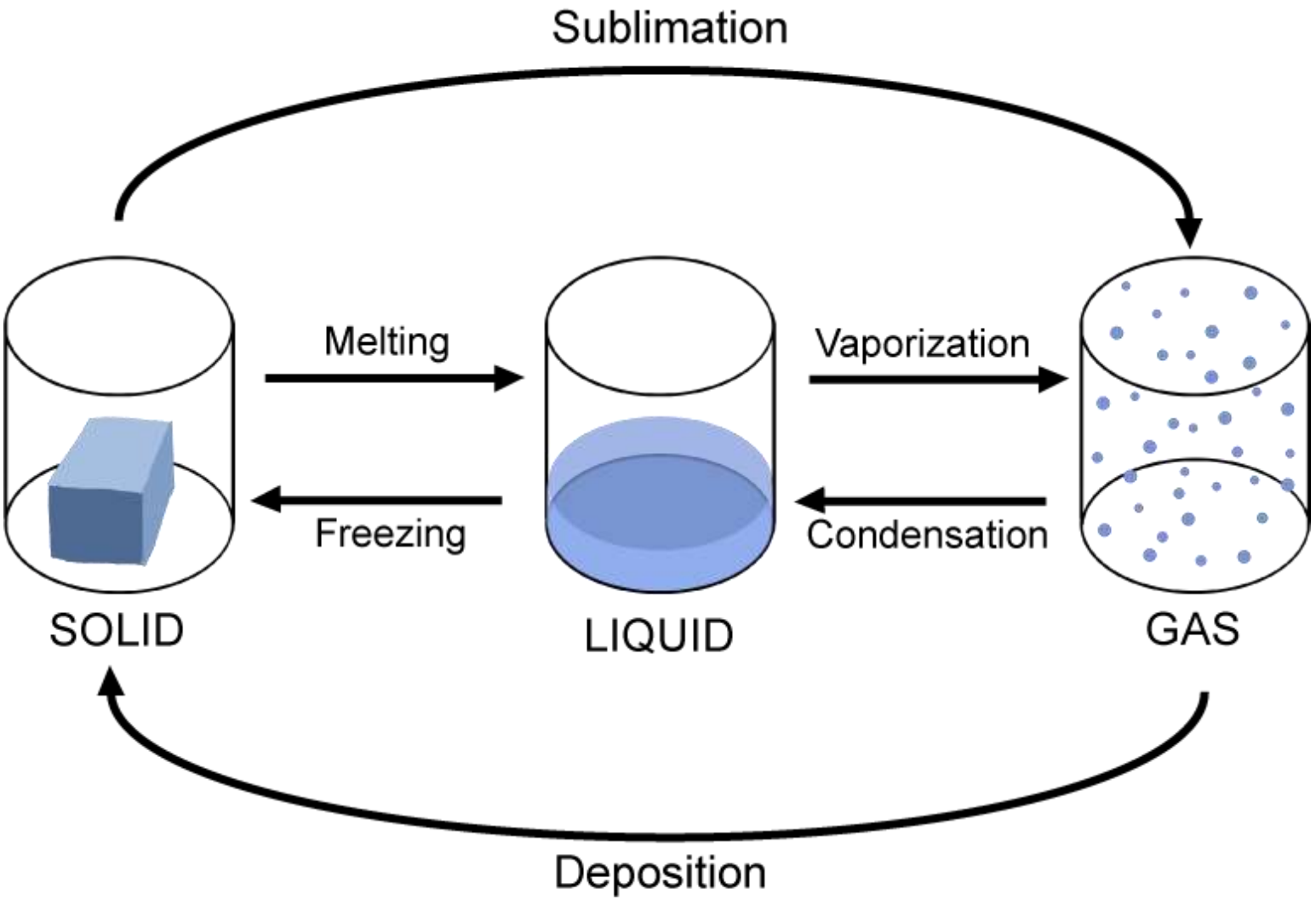
- Students will be able to
- Understand the concept of inter conversion of states of matter
- Familiarize with the causes which results into the change in state of matter.
- Sensitize the change from solid to liquid state
- Sensitize the change from liquid to gaseous state
- Understand the chemical change on heating.

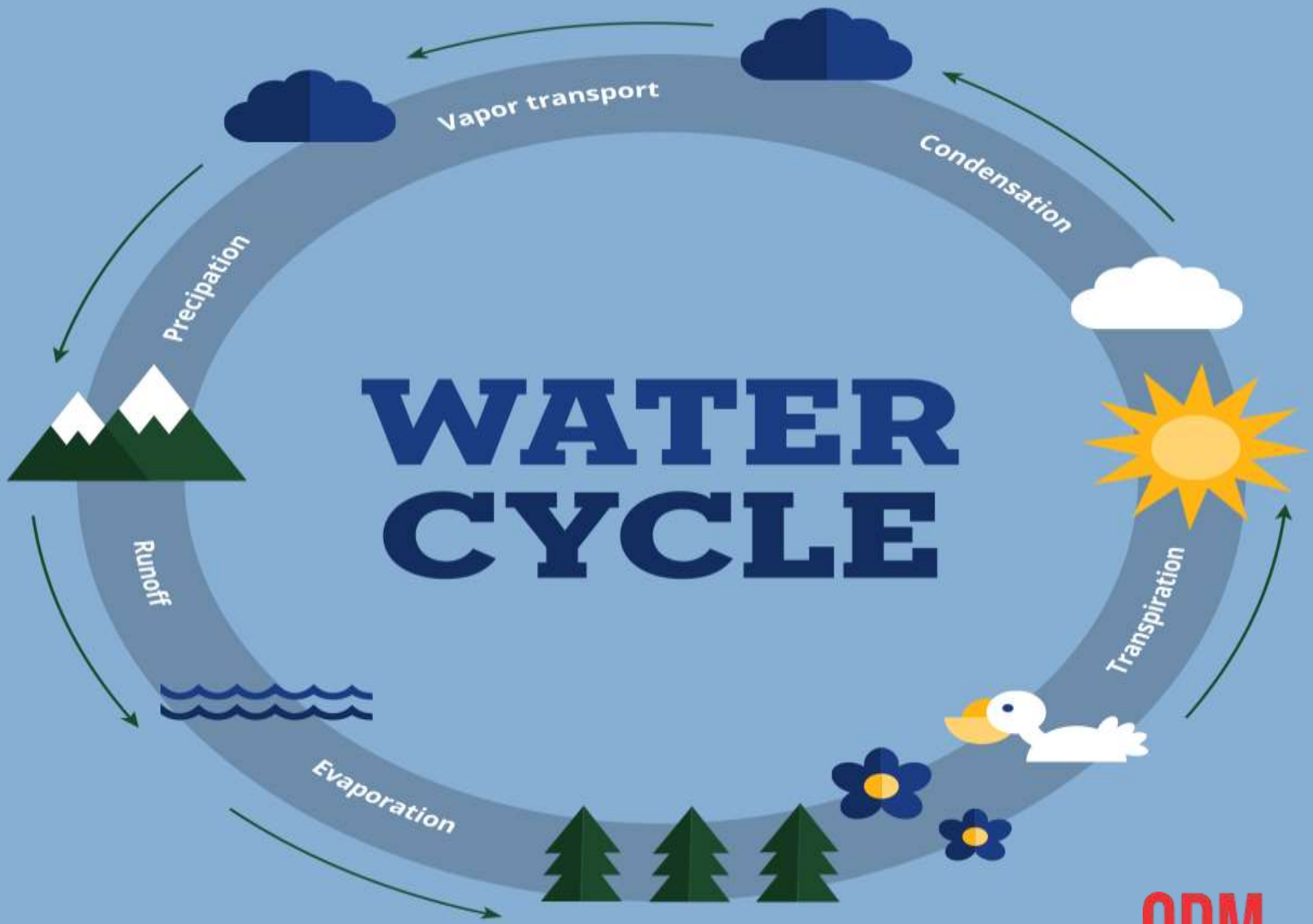


WARM UP QUESTIONS

- Recapitulation of the previous topic by asking the following questions.
- Discuss the three states of matter solid, liquid and gas on the basis of molecular model.

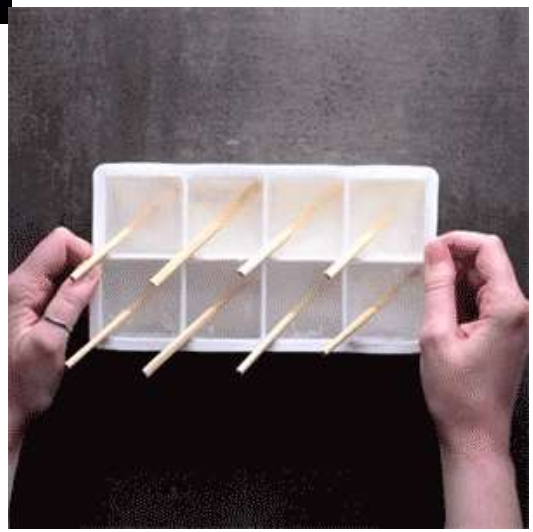
INTERCONVERSION OF STATES OF MATTER





CHANGE IN STATE OF MATTER BY

- 1. CHANGE IN TEMPERATURE-



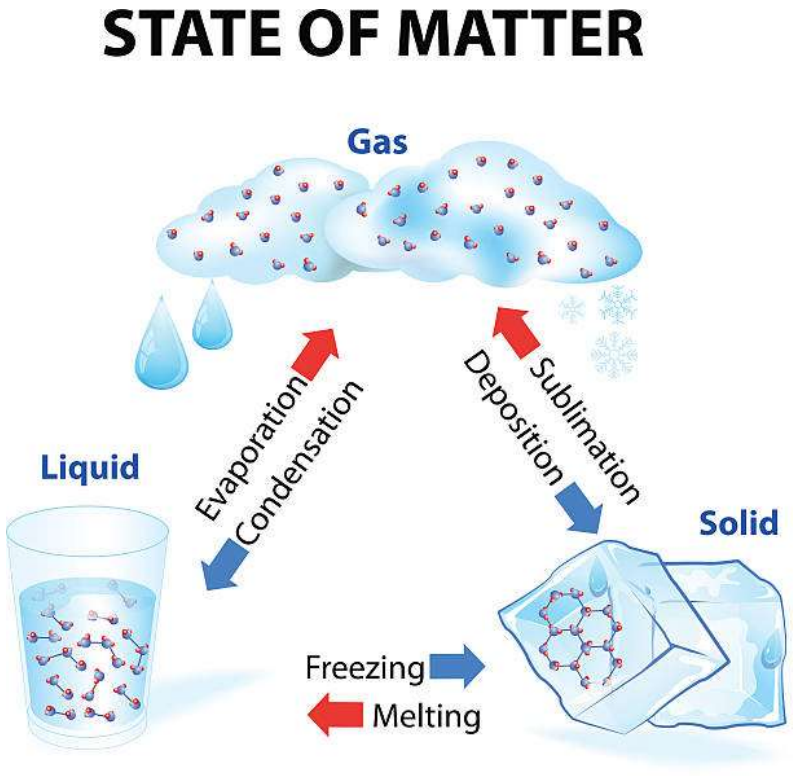
2. APPLYING PRESSURE

LPG CYLINDER

OXYGEN CYLINDER

SUBLIMATION

- Sublimation is the conversion between the solid and the gaseous phases of matter, with no intermediate liquid stage. For those of us interested in the water cycle, sublimation is most often used to describe the process of snow and ice changing into water vapor in the air without first melting into water.



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EXPANSION OF MATTER

- 1. BALL- RING ACTIVITY
  https://youtu.be/GgrnhHMqZDY
- 2. LIQUID EXPANDS ON HEATING.
- https://youtu.be/3K7zcfcUJ_E

3. THERMAL EXPANSION OF GASES

https://youtu.be/BvD6qFgWgPg

CHEMICAL CHANGE ON HEATING

Burning candle

Chemical Change – wax is the fuel that produces heat and light, carbon dioxide and water vapour

Physical change – wax melts when it gets hot and solidifies when it gets cold

HOME ASSIGNMENT

Exercise Q 1, 8 &9

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MATTER

SUBJECT-CHEMISTRY

CHAPTER NO- 3

Some Terms Related to the Inter conversion of Matter

PERIOD-4

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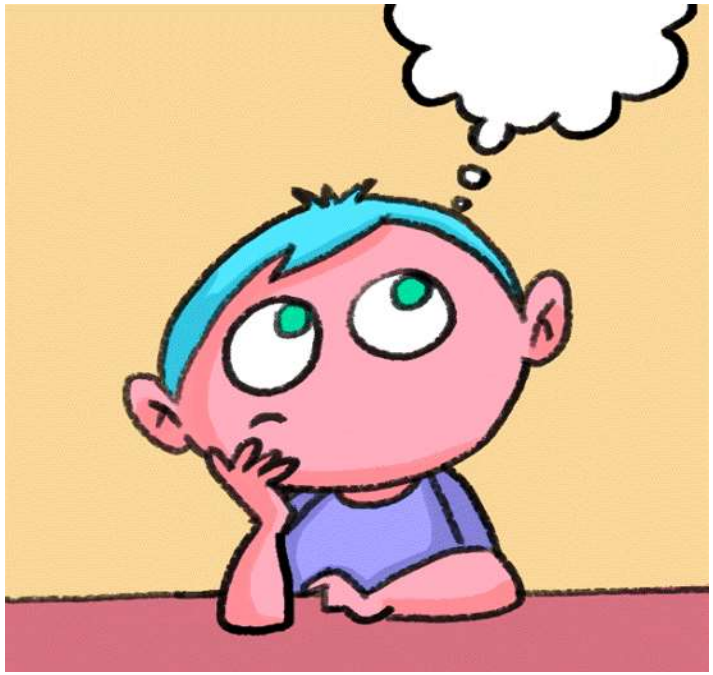
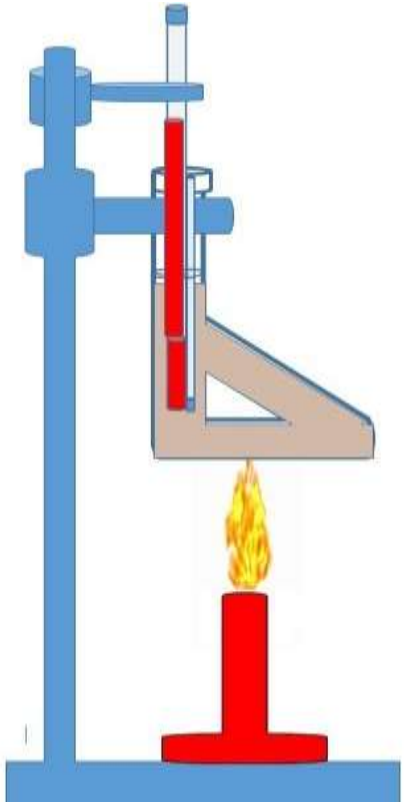
LEARNING OBJECTIVE

- Students will be able to explain the following terms related to inter conversion of states of matter.
- Melting, melting point
- Vaporisation or evaporation, boiling point
- Condensation, condensation point
- Freezing ,freezing point



WARM UP QUESTIONS

- Recapitulation of the previous topic by asking the following questions.
- Explain that particles of matter have space between them by the help of an example.
- How can you explain that particles of matter are always in random motion?
- Give any one example to explain particles of matter attract each other.



Melting Point Determination

Melting Point :-The temperature at which a solid melts and becomes a liquid is the melting point.

Vaporization conversion of a substance from the liquid or solid phase into the gaseous (vapour) phase. If conditions allow the formation of vapour bubbles within a liquid, the vaporization process is called boiling. Direct conversion from solid to vapour is called sublimation.

Define Vaporization by showing a video
https://youtu.be/e27UguK78C4

BOILING POINT- The temperature at which a liquid boils and turns to vapour.

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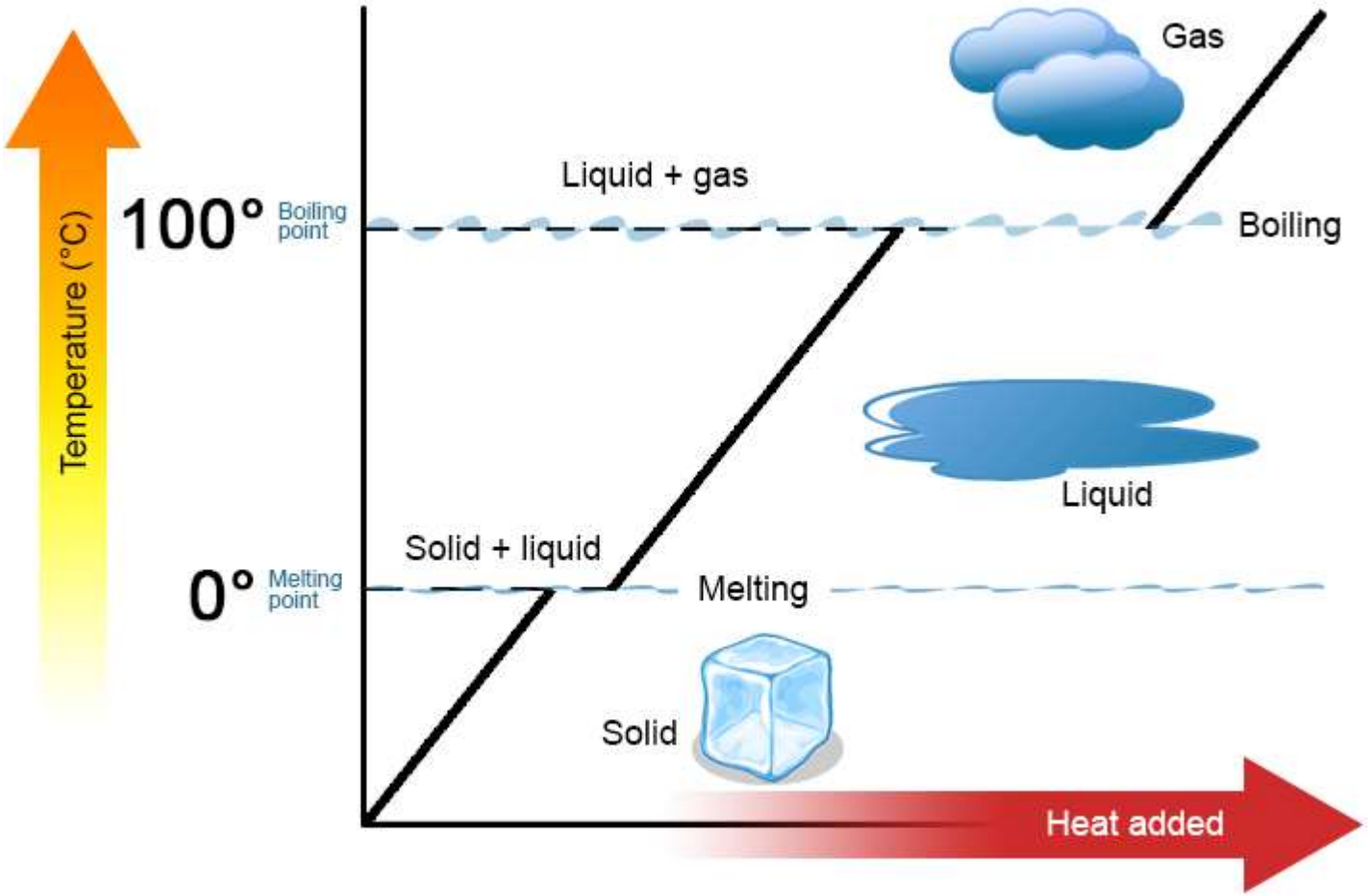

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Condensation OR liquefaction

is the process through which the physical state of matter changes from the gaseous phase into the liquid phase. For example, condensation occurs when water vapour (gaseous form) in the air changes into liquid water when it comes in contact with a cooler surface.

Condensation point

is the temperature at which a vapor condenses into a liquid Condensation point of steam is 100 degree C

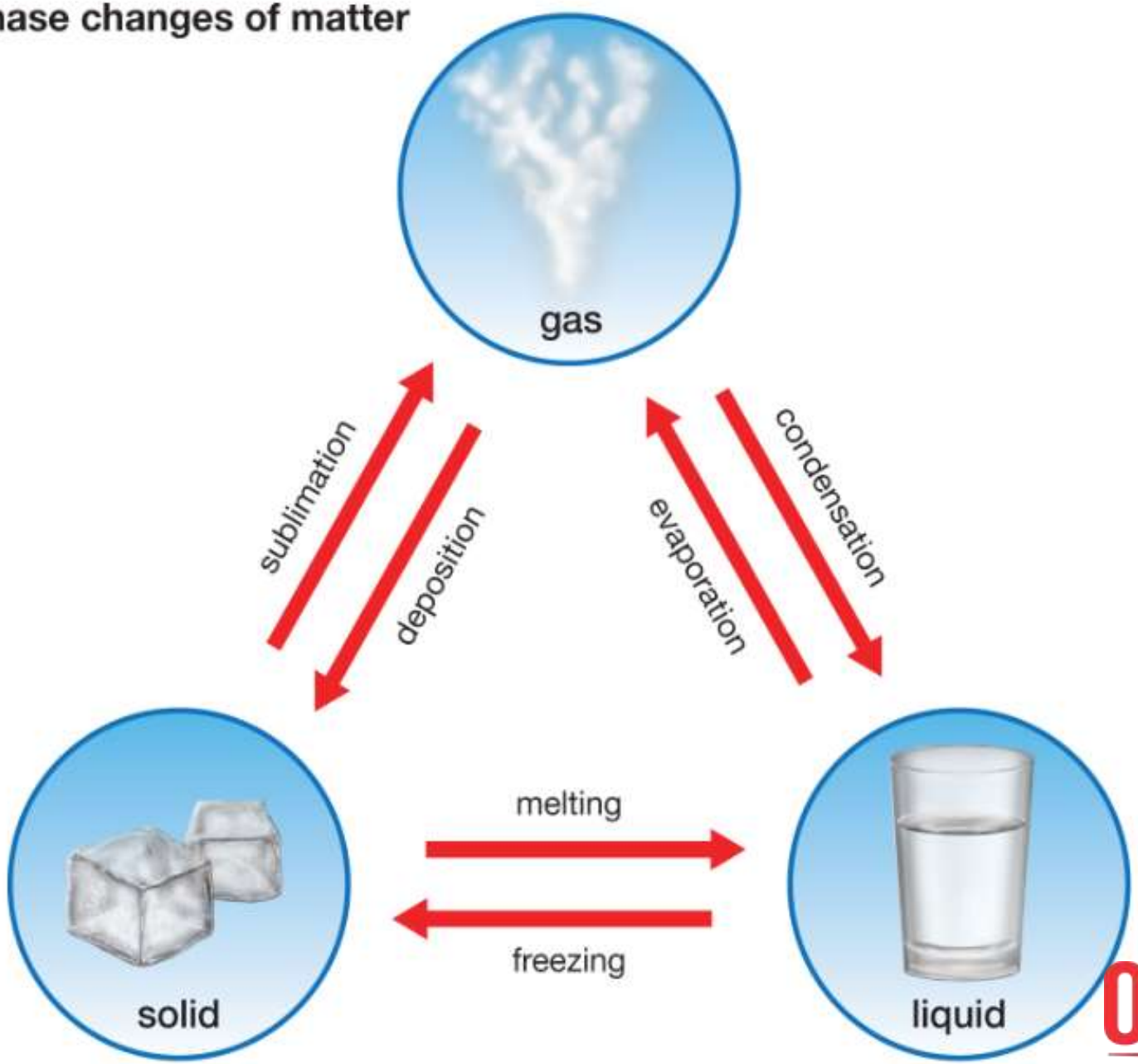
Freezing or solidification

The process that causes a substance to change from a liquid to a solid.

Freezing occurs when the molecules of a liquid slow down enough that their attractions cause them to arrange themselves into fixed positions as a solid.

Freezing point- temperature at which a liquid becomes a solid.

Phase changes of matter



HOME ASSIGNMENT

Exercise Q2,3,4,5,6 &7

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CHAPTER NO- 3

Recapitulation and Class Test

PERIOD-5

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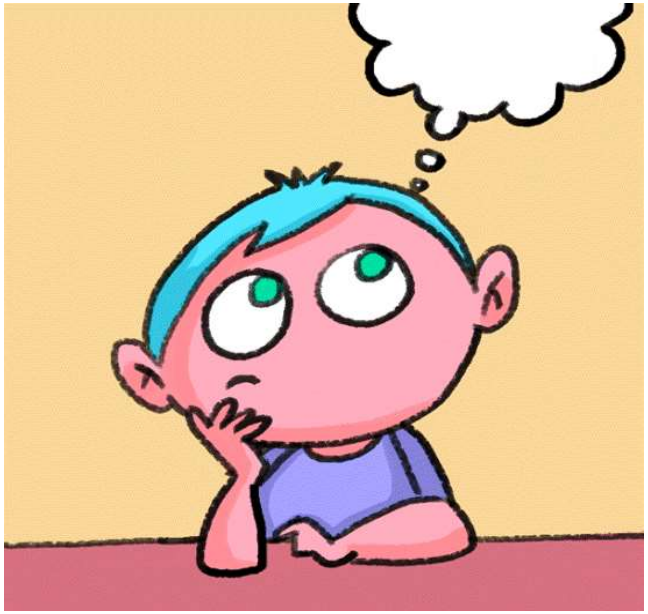
LEARNING OBJECTIVE

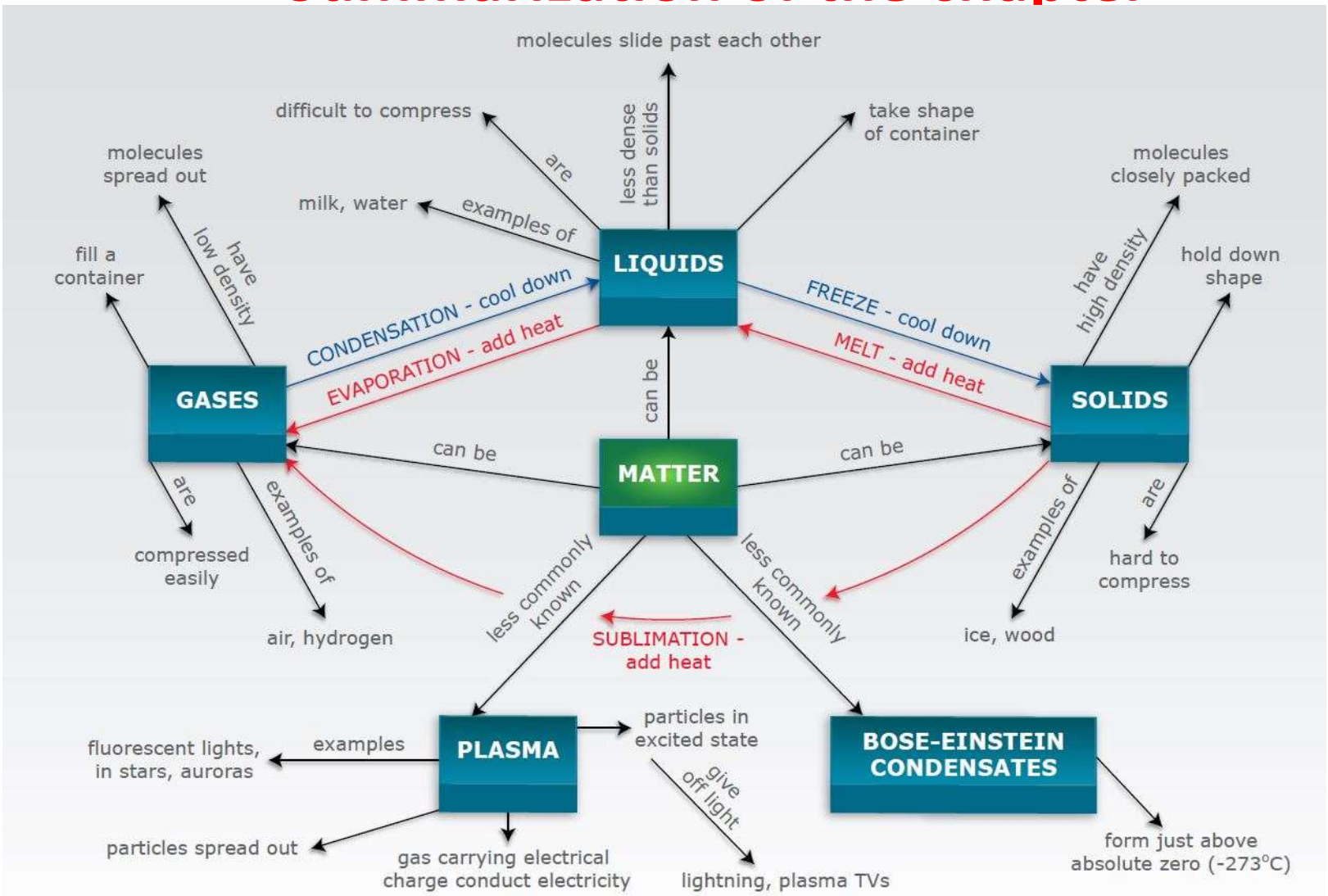
- Students will be able to
- Understand the states of matter
- Sensitize the arrangement of atoms /molecules in solid , liquid and gas
- Understand the space between the particles of matter
- Apprise the effect of heat on matter



WARM UP QUESTIONS

- Ask the following questions
- Define matter.
- Characteristics of molecules.
- Three states of matter.
- Evaporation

Summarization of the chapter



- Exercise questions are to be discussed.
- True false, fill in the blanks, Match the following, Short question answers are to be discussed.

HOME ASSIGNMENT

- What are the three states of matter?
- Q. How can you differentiate solid liquid and gases based on the following properties?
- a. intermolecular space
- b. fluidity
- c. transparency
- d. volume
- e. lusture
- f. volume
- g. effect of pressure
- Q. Define the following term
- 1. evaporation
- 2. condensation
- 3. sublimation
- 4. vaporization

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