



TOPIC-SOLIDS, LIQUIDS AND GASES

NAME - _____ CLASS V/ SEC _____

Date –11th - 15th Jan 2021

LEARNING OUTCOMES:

Each child would be able to:-

- Define Matter and list the three states of matter
- Explain the building blocks of all matter, listing their properties
- Differentiate between the three states of matter on molecular basis

Warm up Activity: - Let's play Antakshri..... in our own unique way!!

How to play - Take turns to name any object from your surroundings beginning with the last letter of the previously named object.

Example- Tub -----Ball ----- Lamp -----Pot etc.

Keep listing these objects in a spare sheet of paper.

Step 2 - Now place them in appropriate columns-

Very Hard with fixed shape and volume	Loose, can flow easily , no fixed shape but a fixed volume	No fixed shape or volume, can spread easily through air

Let's Learn-

Objects like those in Column A are called **SOLIDS**

Column B are called **LIQUIDS**

Column C are called **GASES**

These are all **FORMS OF MATTER!!!** Click on this link to have some fun, groove and enjoy moving like a State of Matter--<https://youtu.be/3IW8E1YR0kE>

But, **what is Matter??** Well, Matter is.....

*Anything that has
weight and occupies
space*

TIME TO EXPERIMENT!!

You will need: An aspirin tablet and some water in a glass.

What to do: Take some water in a glass and simply, drop the aspirin tablet into it. Carefully observe what happens!! What do you see? _____

DO YOU KNOW??? You just **experienced the three forms of matter.**

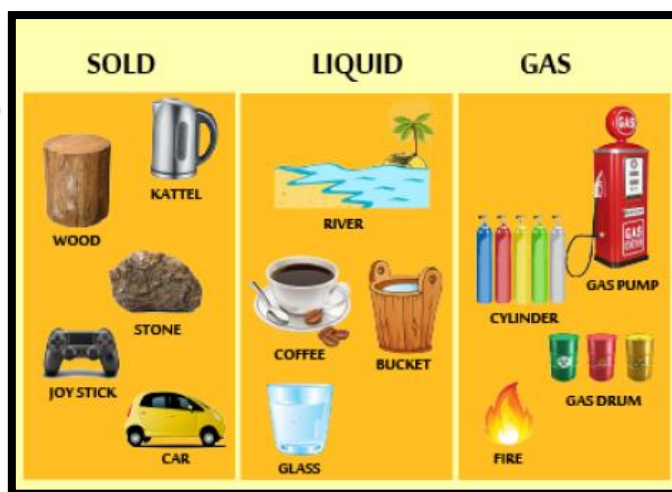
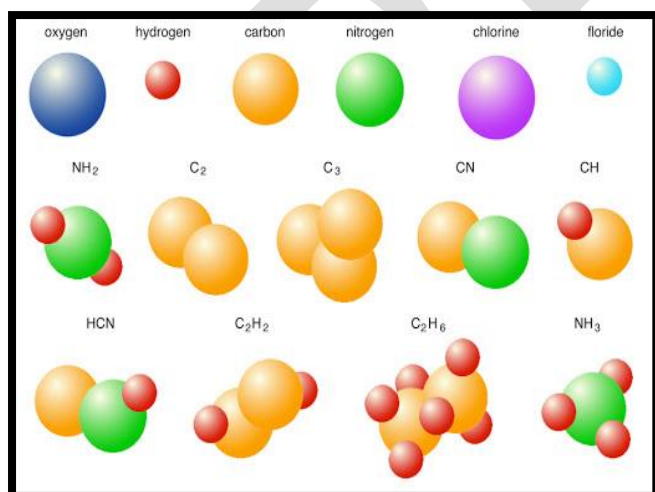
The **tablet**.... a **Solid**,

Water...a **Liquid** and the **Bubbles** (seen as effervescence)...a **Gas**!!

Now, have you ever thought what makes most solids like the tablet so hard, liquids like water to flow and gases to spread around easily?

Well, you would know the answer if you have ever played with your set of either Legos or even Blocks in your kindergarten years!!

Very similarly, **all matter too, is made up of tiny building blocks called ATOMS.** These **atoms combine to form MOLECULES** that arrange themselves differently to give the three forms of matter their distinctive properties.



Click on this link to learn more about atoms and molecules--

<https://youtu.be/MF6F7BTtYbQ>

Let's Understand....

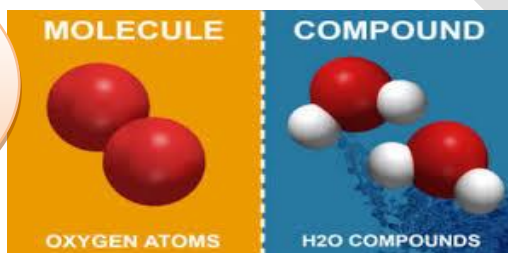
MATTER (Everything around us)

Made up of **117 kinds of atoms**

Atoms of **same kind** combine to form

ELEMENTS

e.g.- Aluminium, Copper, oxygen



Atoms of **different kinds** combine to form

COMPOUNDS

e.g. - Water, Carbon-di-oxide,

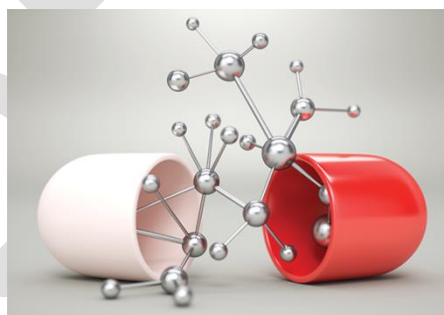
Let's be molecule friendly..... Getting to know more about molecules

Molecules are always moving, never at rest

Molecules cannot be seen with naked eyes

Molecules are constantly attracted towards each other with strong molecular forces of attraction

The space between two molecules is called intermolecular space



Molecules can be broken into smaller units called atoms

Molecules that make up a substance are the same, whether big or small

Molecules in different substances are arranged differently

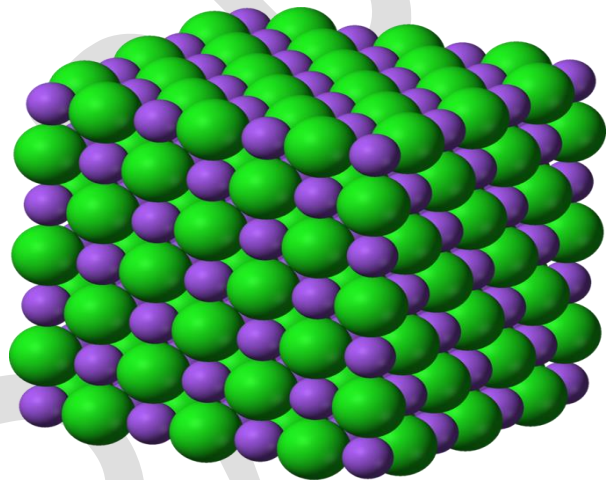
Molecules of different substance have different weight, shape and size

We now know that matter exists in three different states; ie--Solids, Liquids and Gases. Let's try understand how the varied arrangement of molecules in different these forms of matter imparts them their characteristic properties.

ACTIVITY ... Interested in some role play???

Well, it's time to **don the hat of a molecule** and **Enact!!.....** Considering your behaviours in the following three situations....

- When a teacher is present in your class- Perhaps, you all are most disciplined and stay fixed on your seats, making minimal movements!! Now, you are **like molecules in a solid**.

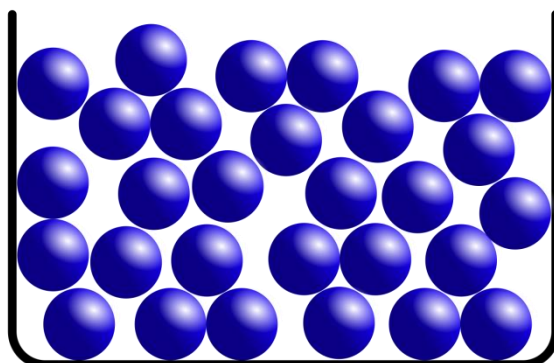


Molecules in a solid are

- **arranged in a fixed pattern**
- **held together by strong forces of attraction**
- **very close to each other**
- **have minimum intermolecular space, so cannot move**

Thus, solids have a fixed shape and volume.

- When the teacher leaves the classroom for a short while-How quickly you all get up and run to your friends to talk to them and also take care to not leave your classroom!! It's here that you behave absolutely **like the molecules in a liquid**.

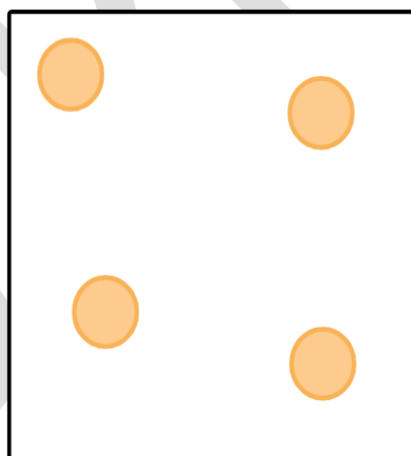


Molecules in a liquid are

- *not arranged in any particular pattern*
- *are less tightly packed*
- *the intermolecular spaces are greater than in solids; hence a greater degree of freedom for movement of molecules*
- *weaker intermolecular forces of attraction as compared to solids*

Therefore, it is possible for molecules in a liquid to move around in different directions. This allows liquids to flow and change their shape. Their volume, however, remains fixed.

And, thirdly, what happens when the school gets over? You become so carefree and disperse running out of the class helter-skelter in all different directions!!! This time, you are ***like the molecules in a gas***.



Molecules in a gas are

- *not arranged in any pattern*
- *very loosely packed and keep moving with maximum freedom for movement*
- *very far apart from each other with large intermolecular spaces*
- *Forces of attraction amongst the molecules of a gas are the weakest. Thus they can move away from each other very easily.*

That is why gases have **no fixed shape or volume** and can **easily spread** all around.

For a quick recap, click on the following links.

<https://youtu.be/MF6F7BTtYbQ>

<https://www.youtube.com/watch?v=jmm1J2yl9tk>

LET'S REVISE

(To be done in the notebooks)

Q1) Define Matter. Name the building blocks of all matter.

Q2) How many states does matter exist in? Name them with at least three examples for each. Also draw or paste pictures.

Q3) Guess, what am I??

- a) A gas used to fill balloons_____.
- b) A liquid known to exist in all three forms of matter_____.
- c) Two solids used in the making of a pencil that you use to write with_____.
- d) A solid that directly changes into its gaseous state_____.
- e) A liquid with an unpleasant odour_____.
- f) A gas used as fuel to run vehicles_____.
- g) A gas used in cooking_____.
- h) A fragrant solid_____.
- i) A liquid that vaporises very quickly_____.
- j) A gas used to make fizzy drinks._____.

Q4) Complete the following table to distinguish between solids, liquids and gases on the molecular basis:--

Forms of Matter	SOLIDS	LIQUIDS	GASES
Arrangement of molecules			
Intermolecular spaces			
Intermolecular forces of attraction			

Q5) Give reasons to complete the following statements: ---

- a) Liquids like water or milk can flow easily because_____.
- b) A piece of wood is hard and breaks if we try to change its shape by pressing it because_____.
- c) You can smell a fragrant incense stick lighted far away from you because_____.

ACTIVITY TIME... LEARNING CAN BE FUN TOO!!

LET'S PUT THE STE (A) M BACK INTO STEM

CLICK ON THIS LINK TO ENJOY DOING SOME FUN SCIENTIFIC ACTIVITIES. AND WHAT'S MORE... THEY ARE ALL BASED ON STATES OF MATTER!!!

<https://www.sciencebuddies.org/blog/states-of-matter-stem-activities>

YOU MAY TRY OUT ANY 1-2 ACTIVITIES OF YOUR CHOICE. USE AN A4 SHEET/S TO DRAW AND DESCRIBE YOUR OBSERVATIONS AND THE LEARNING EXPERIENCE.

HAPPY LEARNING!!