بسم اللّٰہ الرحمن الرحیم

السلام علیکم ورحمۃ اللہ وبرکاتہ

Pakistan School
Kingdom of Bahrain

Our Life and Chemistry

Grade: 9th

RULES OF THE CLASS!!

- Be on **time**
- Enter the class with your **name** and **CPR number**
- **Respect** all participants
- Do **not** create any disturbance
- **Raise your hands** for questions (the teacher will respond when the time is suitable)
- Pay **attention** to the teacher
- Follow the **time table**
- **BE READY TO SCREENSHOT**
- **NO BACKGROUND NOISES**

Objectives

After completing the chapter, the students will be able to:

1) Describe the 3 basic elements necessary for life
2) Know the solvent properties of water and anomalous behavior of water
3) Know about the composition of air and importance of different gases in air
4) Know about the importance and applications of different elements for our health, in agriculture and daily life.


OUR LIFE & CHEMISTRY

Water as Universal Solvent

- Water is able to dissolve into a variety of substances
- This unique and important property makes it a universal solvent
- We cannot live without water for more than three of four days
- All aquatic life depends on water
- Gases are soluble in water and used for respiration by animals
- Salts cannot be directly absorbed by plants so they dissolve in water to be used by plants


PROPERTIES OF WATER
Study.com

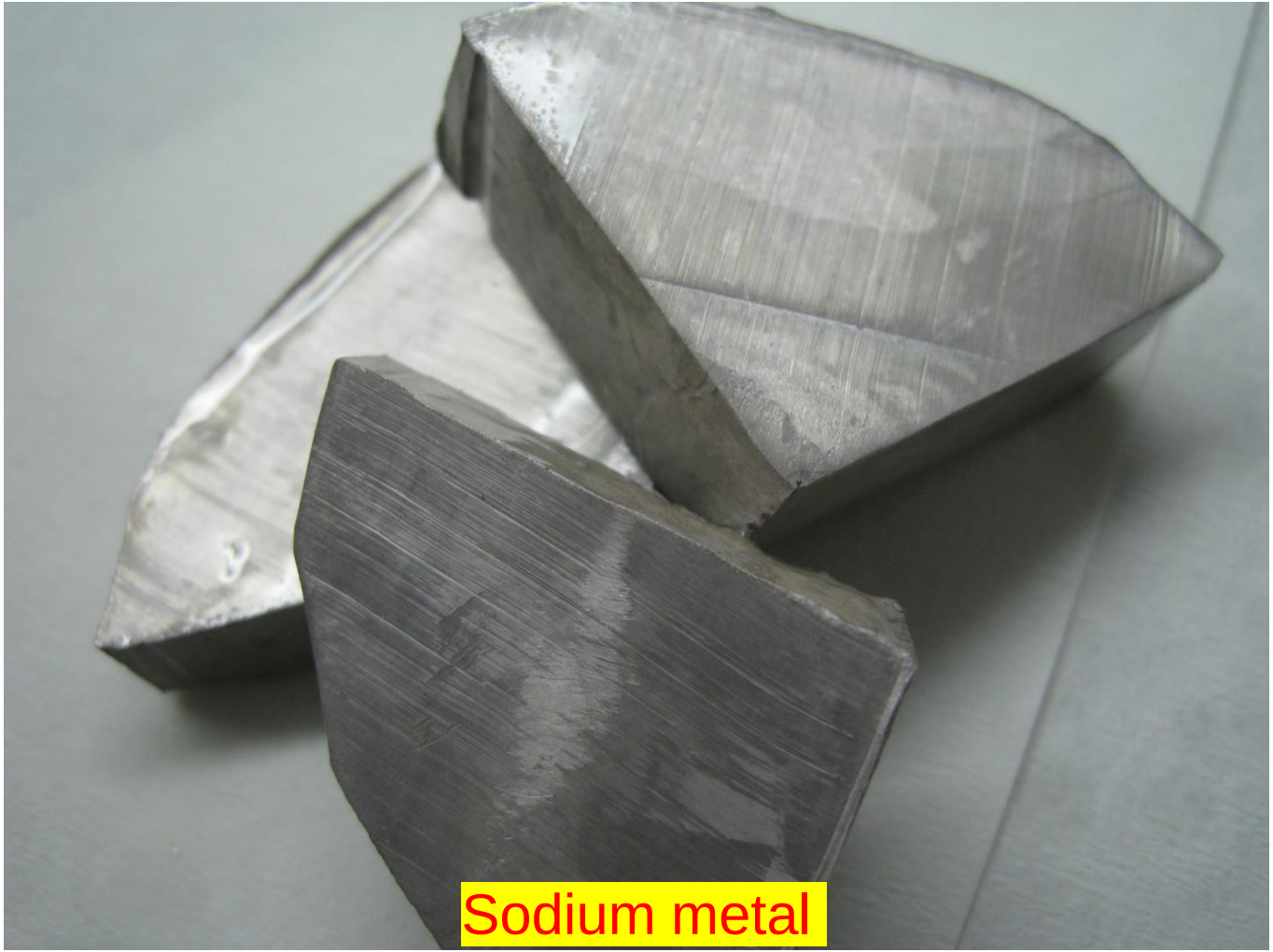
- Rainy water dissolves useful mineral salts from the Earth surface and carries them up to agricultural fields
- This process enables the plants to grow and produce good yield
- In industry water is used to dissolve chemical compounds
- In laboratories, water is the most important solvent to carry out chemical reactions
- At domestic level all sort of cooking is carried out with water
- Water dissolves oxygen and carbon dioxide from the air which enables aquatic animal and plants to survive

Importance of Elements in our Health

- Sodium is required in large amounts by our body
- In deficiency, it can cause certain ailments to the body such as sun stroke and irregular heartbeat
- We take sodium through table salt in our food

Sodium

- Molten sodium is used as coolant in some reactors
- Sodium vapour lamps are used for street lighting
- They are also used to prepare different chemicals such as sodamide and sodium-cyanide


Sodium metal

Important Compounds of Na and their Uses

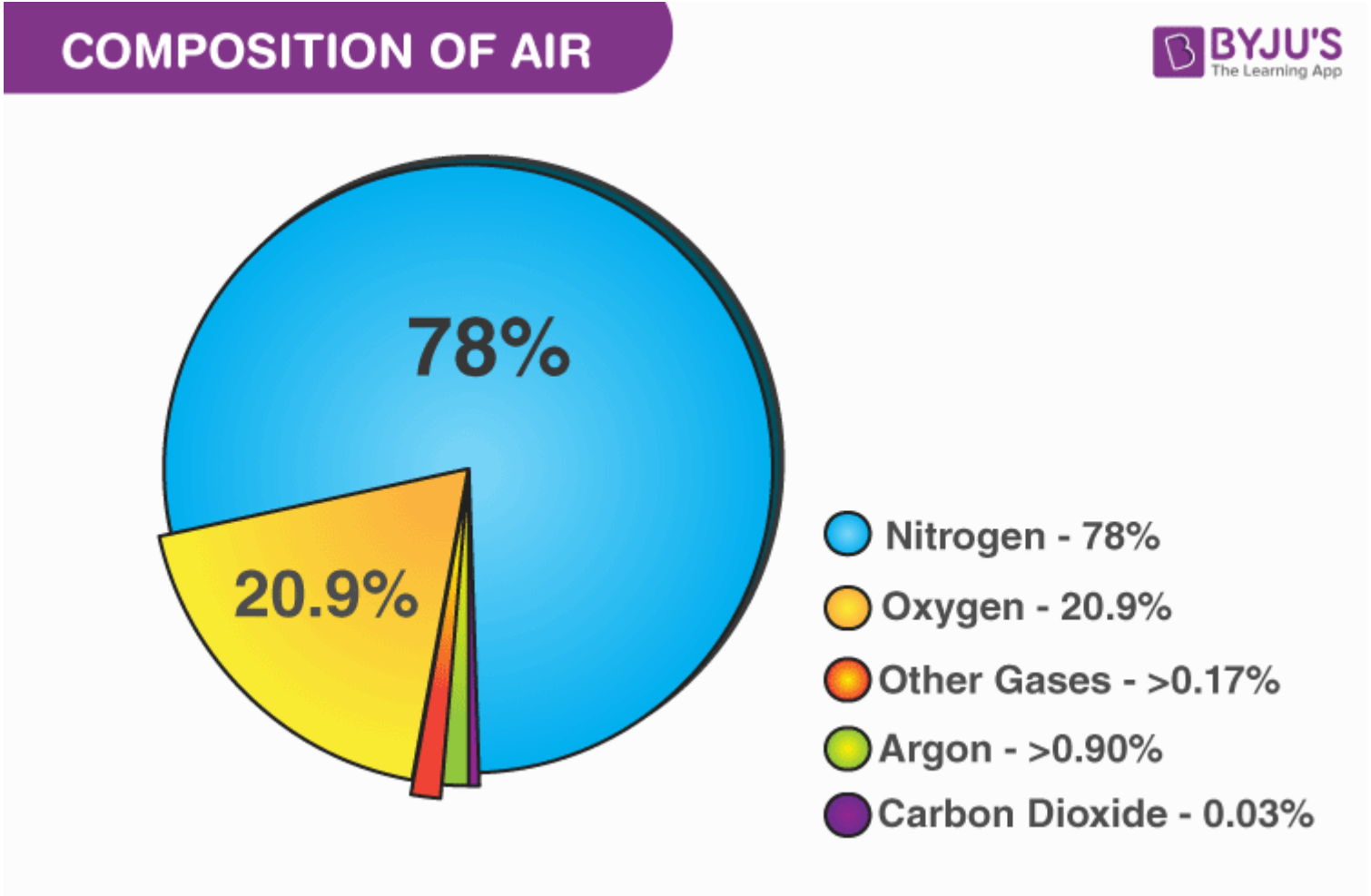
Compound	Common name	Uses
Sodium hydroxide	Castic soda	Used in manufacturing of soap, paper and artificial silk, to purify petroleum and vegetable oil. Softening of hard water to prepare glass, paper, soaps and detergents
Sodium carbonate	Washing soda	Used to soften hard water, to prepare glass papers, soaps and detergents. Baking purposes.
Sodium bicarbonate	Baking soda	Used as fertilizer and for manufacturing of nitric acid.
Sodium nitrate	Chile salt peter	Used for developing and printing of photo graphic films.

Composition of Air

- Air is a mixture of different gases
- Two major components of air are nitrogen and oxygen gas
- Percent composition of air by volume is given below:

	Component Gas	%by volume
1	Nitrogen	78.03
2	Oxygen	20.99
3	Argon and other rare gases	0.94
4	Carbon Dioxide	0.03
5	Ammonia and Ozone	Traces
6	Water vapours	Amount varies

COMPOSITION OF AIR



QUESTIONS & ANSWERS

What metal is present in chlorophyll?

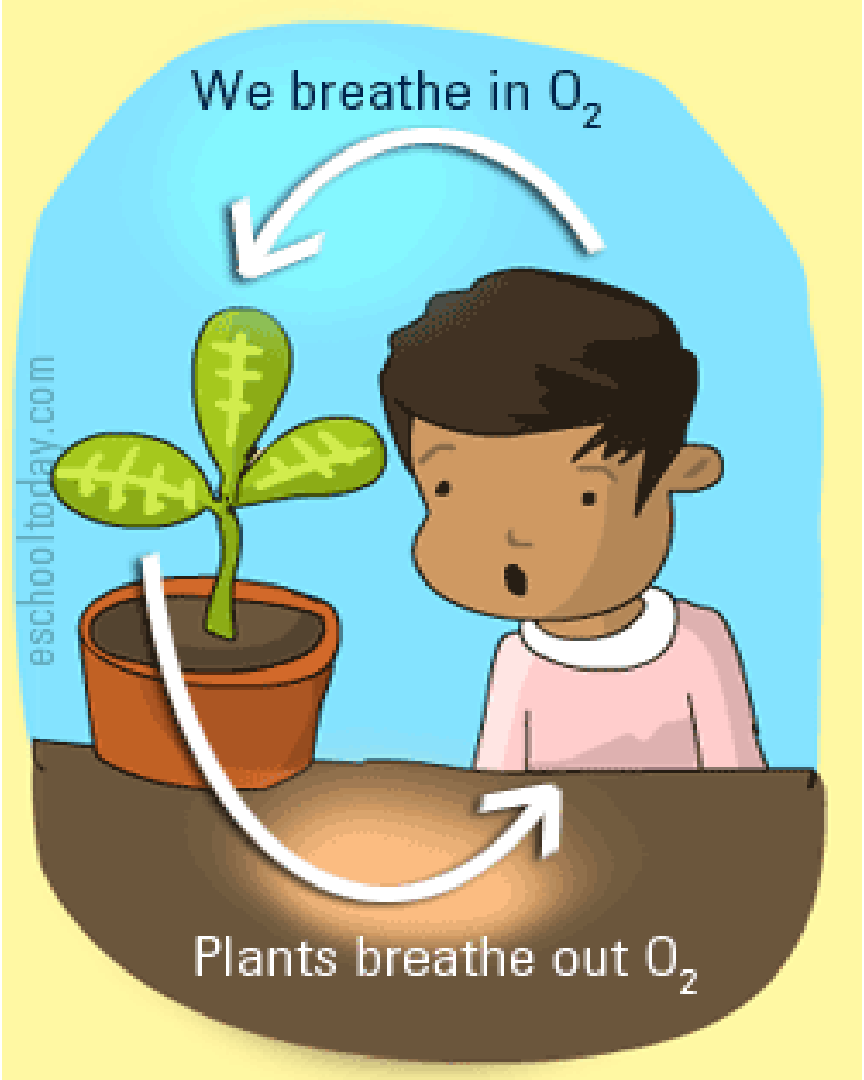
magnesium

Chlorophyll a contains a **magnesium** ion encased in a large ring structure known as a chlorin. The chlorin ring is a heterocyclic compound derived from pyrrole. Four nitrogen atoms from the chlorin surround and bind the **magnesium** atom. The **magnesium** center uniquely defines the structure as a chlorophyll molecule.


Magnesium

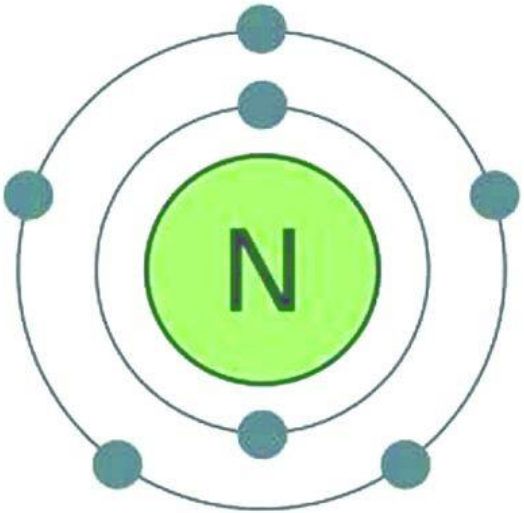
What is the Importance of Oxygen in Air?

Oxygen plays a critical **role** in respiration, the energy-producing chemistry that drives the metabolisms of most living things. We humans, along with many other creatures, need **oxygen** in the **air** we breathe to stay alive. ... Plants both use **oxygen** (during respiration) and produce it (via photosynthesis).


We breathe in O_2
eschooltoday.com
Plants breathe out O_2

What is the Importance of Nitrogen in Air?

Nitrogen dilutes the oxygen to a concentration, which is in the “Goldilocks” zone for life to develop. **Nitrogen** compounds such as nitrates are essential plant foods. Some bacteria, such as Rhibozium have the ability to fix atmospheric **nitrogen** to make nitrates.



Why do we need Nitrogen in the Air?

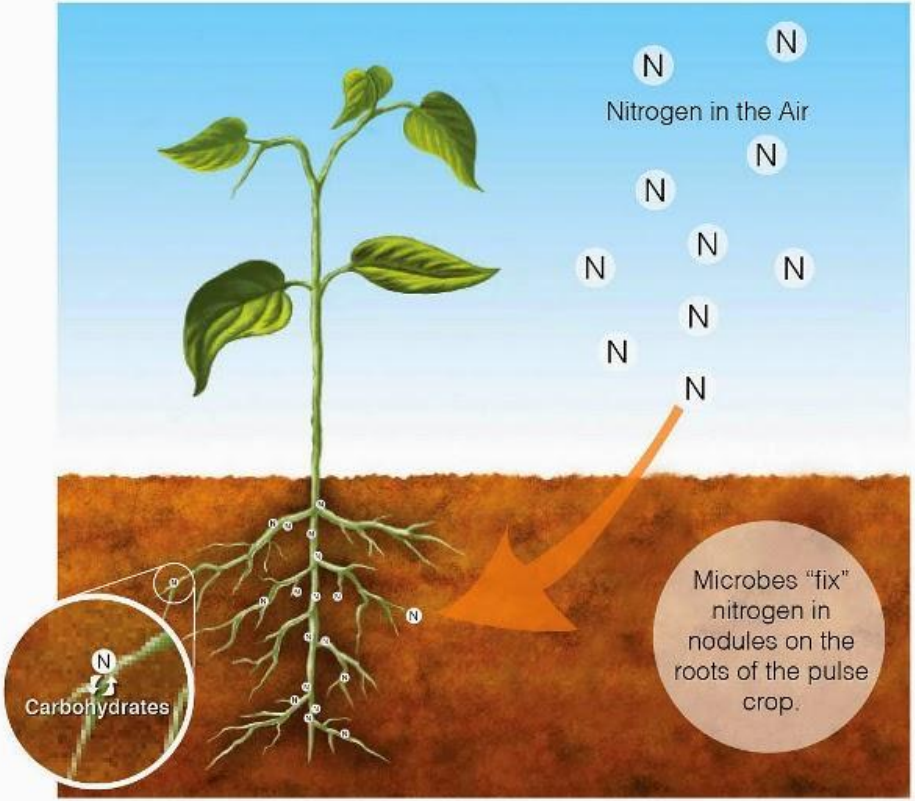
All plants and animals **need nitrogen** to make amino acids, proteins and DNA, but the **nitrogen in the atmosphere is** not in a form that they **can** use. ... When organisms die, their bodies decompose bringing the **nitrogen** into soil on land or into ocean water. Bacteria alter the **nitrogen** into a form that plants **are** able to use.

What is the Importance of Nitrogen to Plants?

Nitrogen in **Plants**

Nitrogen is so vital because it is a major component of chlorophyll, the compound by which **plants** use sunlight energy to produce sugars from water and carbon dioxide (i.e., photosynthesis). It is also a major component of amino acids, the building blocks of proteins.

Plant Fixing Nitrogen



Pulse crop with root nodules

What is an Organic Compound?

Organic compound, any of a large class of chemical **compounds** in which one or more atoms of carbon are covalently linked to atoms of other elements, most commonly hydrogen, oxygen, or nitrogen. The few carbon-containing **compounds** not classified as **organic** include carbides, carbonates, and cyanides.

What are the 5 Main Organic Compounds?

Organic compounds, which are the compounds associated with life processes, are the subject matter of organic chemistry. Among the numerous types of organic compounds, four major categories are found in all living things: **carbohydrates**, **lipids**, **proteins**, and **nucleic acids**.

ACTIVITIES

Activity 1: FIB

1) Percentage of oxygen element in the human body is

   _____

2) Carbon dioxide is necessary for the life of _____

3) The physical properties of allotropes are _____

4) The water has maximum density at _____

5) Oxygen is responsible for _____ types of fuels.

Activity 2: T/F

1) Diamond and graphite are impure forms of carbon. ____
2) All types of paper are made of cellulose. ____
3) Nitrogen is very reactive and does not control the combustion process. ____
4) Potassium is essential for plants as sodium is for animals. ___
5) Pig iron is the purest form of iron. ___


ALMOST THERE...

Plenary

1) The average percentage of carbon in human body is:

a) 16% **b**) 18% **c**) 20%

d) 22%

1) Two major constituent of air are:

a) Nitrogen and carbon dioxide **b**) nitrogen and oxygen

c) carbon dioxide and oxygen **d**) oxygen and argon

Homework

Q1) Define photosynthesis.

Q2) Name some compounds of sodium.

Q3) Define and explain respiration.

Q4) Define allotropy and explain different allotropic forms of carbon.

Q5) Justify the statement “water as a universal solvent”

Q6) Describe the role of nitrogen and oxygen in air.

Q7) Describe the importance and application of sodium metal and its compound in daily life.

As-salamu Alaikum

MAY ALLAH SWT BLESS YOU ALL