بسم اللہ الرحمن الرحیم

السلام علیکم ورحمۃ اللہ وبرکاتہ

Pakistan School
Kingdom of Bahrain

Introduction and Role of Science

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**

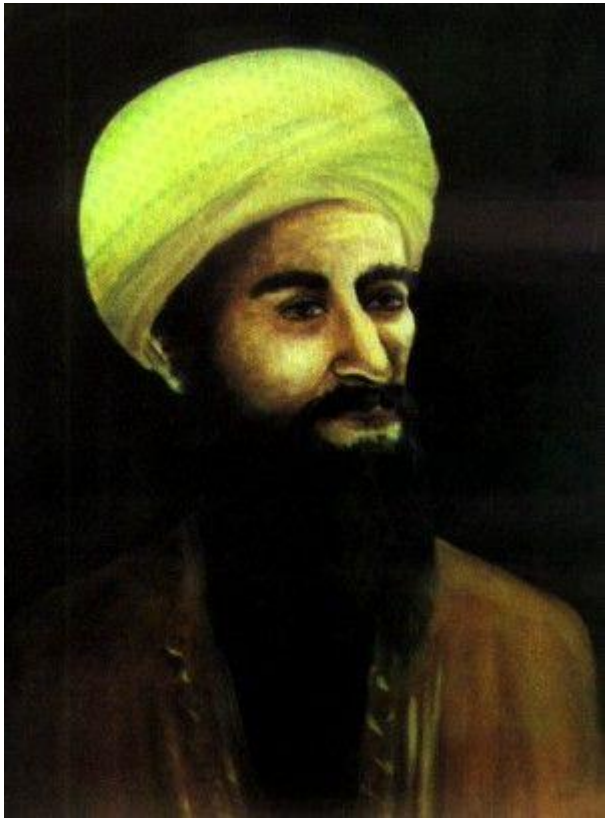
Objectives

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

1) Describe the compounds of sodium.
2) Determine the different types of iron.
3) Notify the importance of iodine for our health.
4) Understand the importance of phosphorous for human health and in agriculture.
5) Role of science for welfare of human beings
6) Al-Beirui, Ibnul Haitham, Jabir Bin Hayyan
7) Role of Science in agriculture and medicine

Our life and Chemistry

Jabar Bin Hayyan (722-803 A.D)



Jabar Bin Hayyan (722-803 A.D)

- He is considered as the father of chemistry.
- He established his own laboratory where he worked devotedly.
- He invented sulphuric acid, nitric acid, hydrochloric acid and several other important compounds.
- His contributions to chemistry also include some important scientific techniques such as crystallization, distillation, sublimation and evaporation.

Al-Bairuni (973-1048 AD)

Al-Bairuni (973-1048 AD)

- He was a great scholar of Physics, Mathematics, Geography and Astronomy.
- He travelled through India and recorded his observations in his famous book “Kitab-ul-Hind”.
- In another famous book, “Qanoon-i-Masoodi” he has discussed Astronomy, Solar and Lunar motions.
- He has written more than 150 books on varied topics.

Ibn-ul-Haitham (965-1039 AD)

Ibn-ul-Haitham (965-1039 AD)

- He was a renowned physicist of all times.
- He gave the basic principles of reflection and refraction.
- He worked on lenses and explained the working of eye.
- In Europe, he is known as Al-Hazem.
- His famous book “Kitab Al-Mana-Zir” was translated in latin.
- He is considered the father of topics.

Role of Science and Technology

- Technology is the outcome of scientific knowledge.
- It helps us to understand our physical world but also gave the laws that govern the various phenomena.
- Application of these laws have helped in the invention of new devices for the welfare of society.
- The science has played the basic role to improve the standard of living.
- In the field of agriculture, industry, transport, communication, computers, television, drugs and construction, the technology has brought a drastic advancement affected the human society.

Agriculture

- The use of machines like tractors, scrapers, harvesters, thrashers and tube wells have greatly helped the man to get maximum production.
- The use of pesticides, insecticides, and fungicides has saved the crops from conventional diseases.
- Fertilizers are in no way less important than other technologies.
- The use of fertilizers have increased the fertility of the soils and produced better crops.

Medicine

- Upon the 19th century, the medicines were obtained from natural sources i.e plants, animals or minerals.
- With biochemistry, the drugs are being synthesized in the laboratories.
- Many antibiotics and vaccines are now being synthesized in the labs.
- These drugs are then produced at a large scale for prevention and treatment of various diseases.
- Nowadays, the major biological problems are cancer, aids, and hepatitis.

Engineering

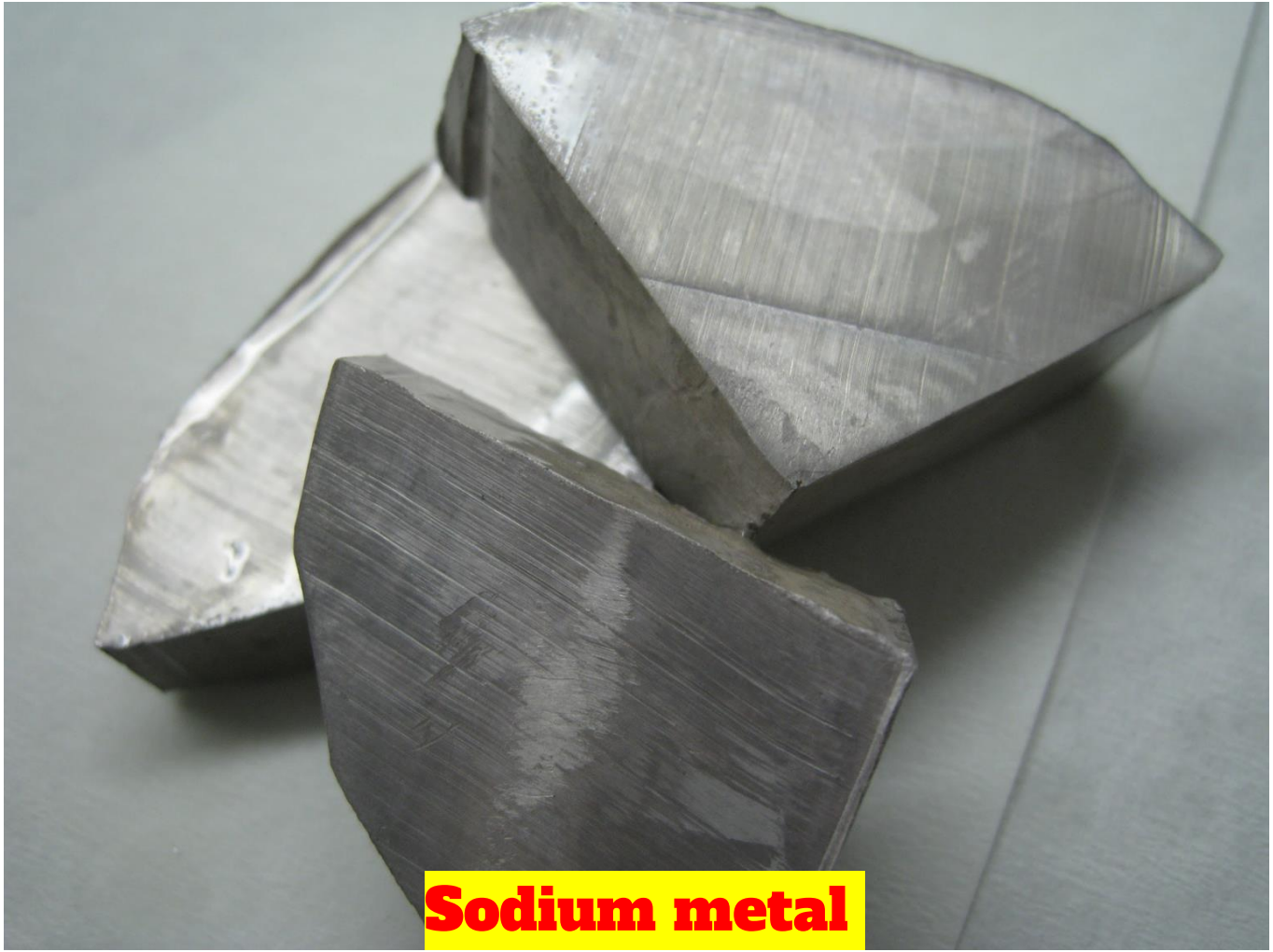
- With the awakening of human society, the man has constructed and created great structures like “Pyramids of Egypt” and “Great Wall of China”.
- These are the symbols of advancements in the field of engineering.
- Through mechanical engineering, a great variety of machines have been invented which have made the production of thousands of utility goods, possible.
- The construction of factories, bridges, dams, computers, and various machines have changed the human society.
- Modern communication has made the world a global village.

4 ELEMENTS

- Sodium
- Phosphorus
- Iron
- Iodine

Sodium

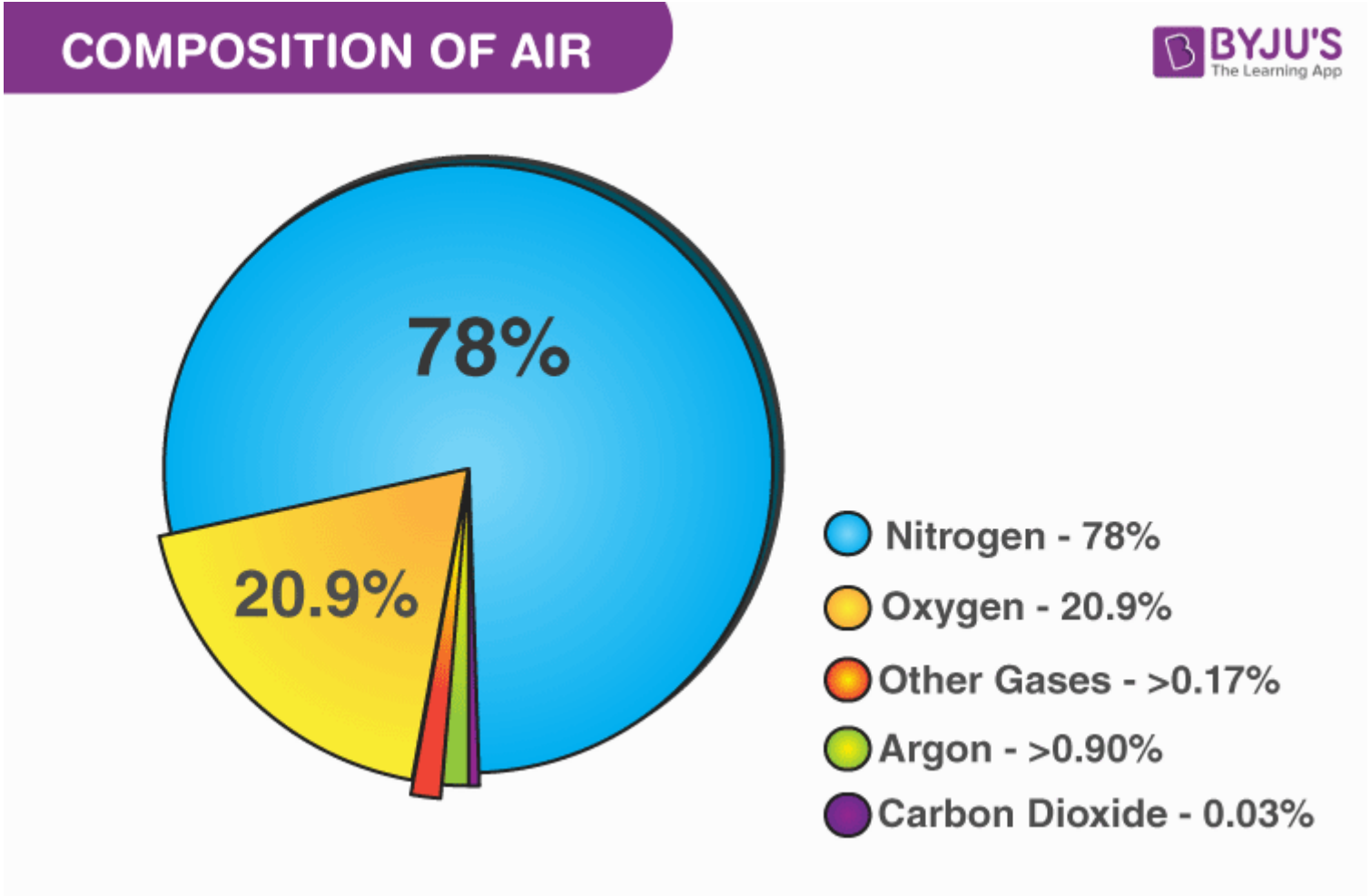
- Molten sodium is used as coolant in some reactors
- Sodium vapour lamps are used for street lighting
- They are also used to prepare different chemicals such as sodamide and sodium-cyanide


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

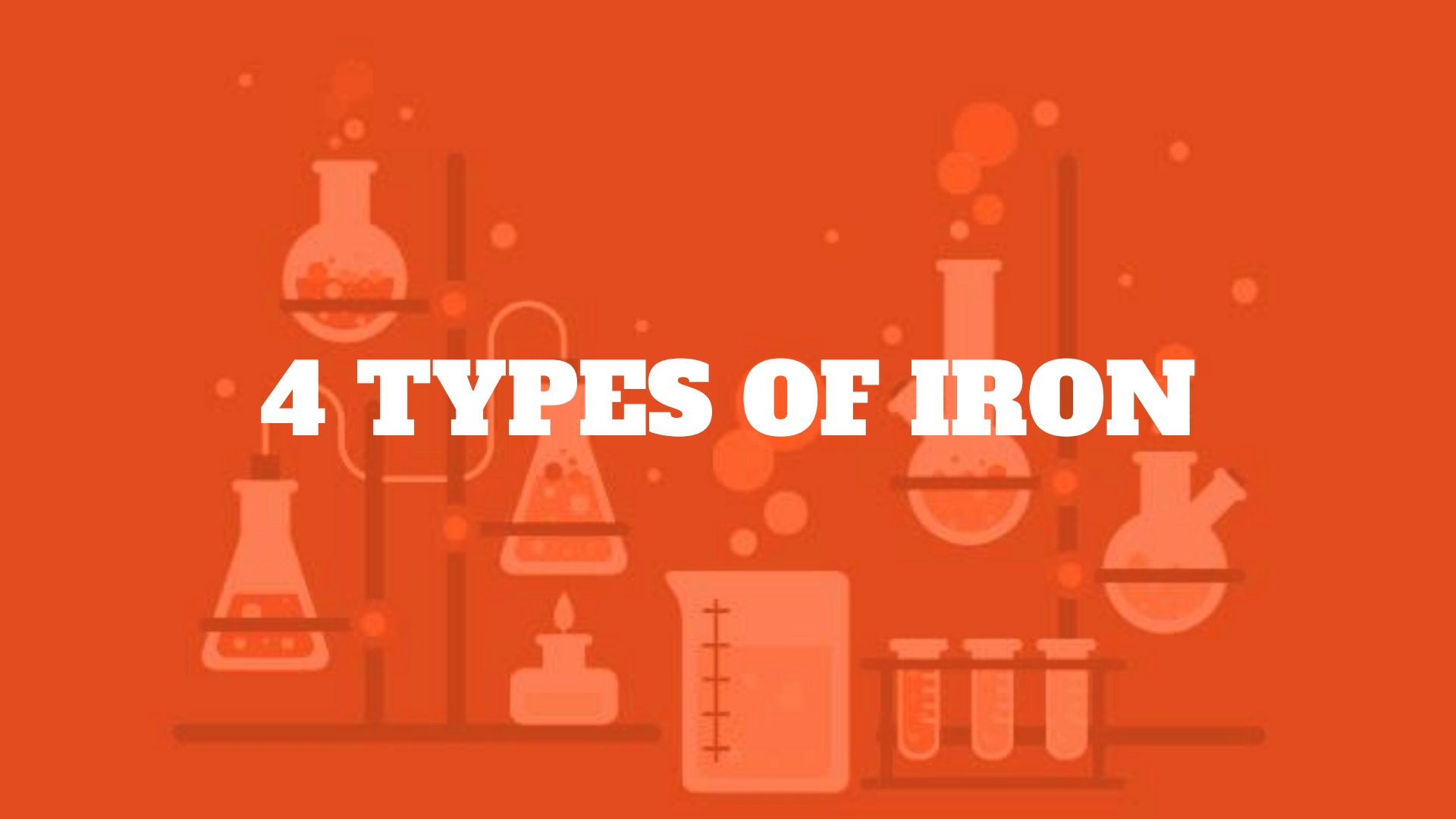


Phosphorus

- It is an essential element like calcium.
- It is needed for formation and proper growth of bones and teeth.
- It hards and strengthens the bones.
- It is necessary and controls the joints and muscles activity.
- Its deficiency stiffens the joints, makes the bones brittle and growth of the bones is affected adversely.
- It is found in fish, dry fruit and eggs.

Iron

- It is an important component of hemoglobin found in blood of animals.
- It acts as an oxygen carrier and transport oxygen to the body cells.
- Deficiency of iron, reduce the formation of blood, which causes anemia.
- Iron is found in liver in large quantity.
- It is also found in meat and yellow of eggs.


4 TYPES OF IRON

PIG IRON

- It is most impure form of iron.
- It contains impurities like phosphorus, sulphur and manganese.
- It is hard and brittle, so it is converted to cast iron and steel.

CAST IRON

- It is obtained from pig iron.
- It is also brittle and can’t be welded or forged.
- It has low tensile strength.
- It is used to make stoves, cooker, radiators, lamp posts, and railing etc.

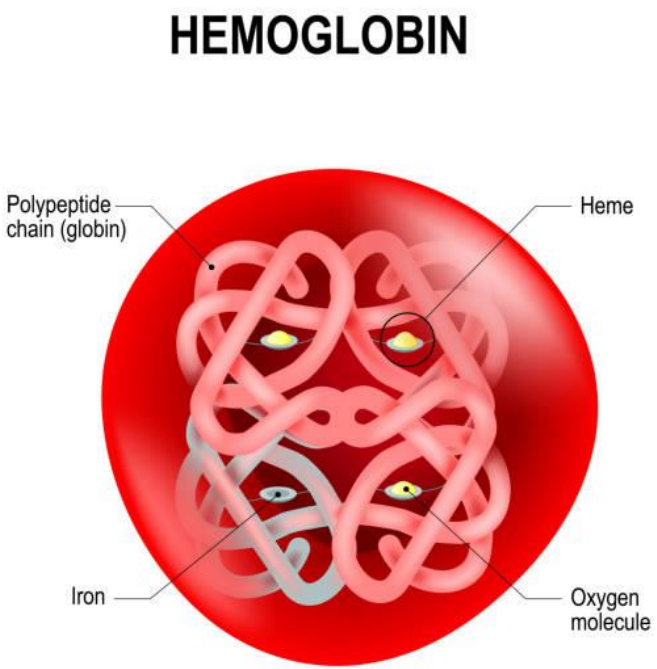
WROUGHT IRON

- It is the purest commercial form of iron.
- It is obtained by heating cast iron in a furnace.
- Impurities are removed.
- It is soft but tough and malleable.
- It can be welded and forged.
- It is used to make nails, chains, iron rods and sheets, agriculture implements.

STEEL

- It is an alloy of iron.
- It is made from pig iron.
- Steel is hard, tough and strong.
- It is used to make stainless steel, which resists rusting.
- Stainless steel is used to make cutlery, scissors, saws, machinery and permanent magnets.

HAEMOGLOBIN



HAEMOGLOBIN

- It is a protein molecule in red blood cells that **carries oxygen** from the lungs to the body's tissues and return carbon dioxide from the tissues back to the lungs.
- Red blood cells are red because of the red colored compound called **heme**.
- **Heme** contains an **iron atom** which binds to oxygen and it transports oxygen in your body.
- Iron deficiency is one of the causes of **anemia** (low hemoglobin).
- Normal range for hemoglobin for men is **13.5 to 17.5 g/dL** and for women it is **12.0 to 15.5 g/dL**.

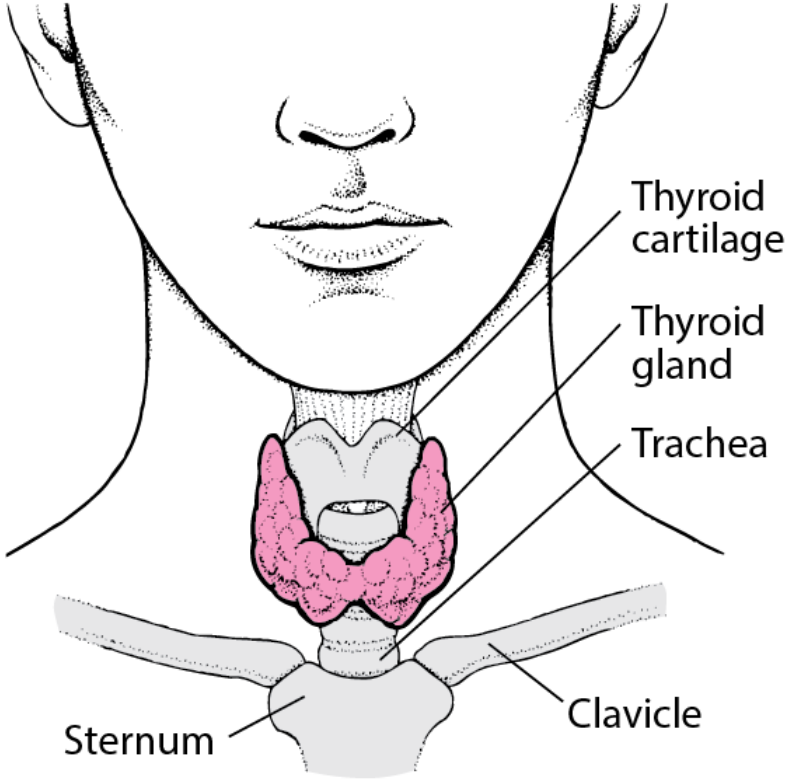
IODINE


GENESTRA
BRANDS
Liquid Iodine
Dietary Supplement
Promotes proper function of the thyroid gland†
1 FL OZ (30 ML)

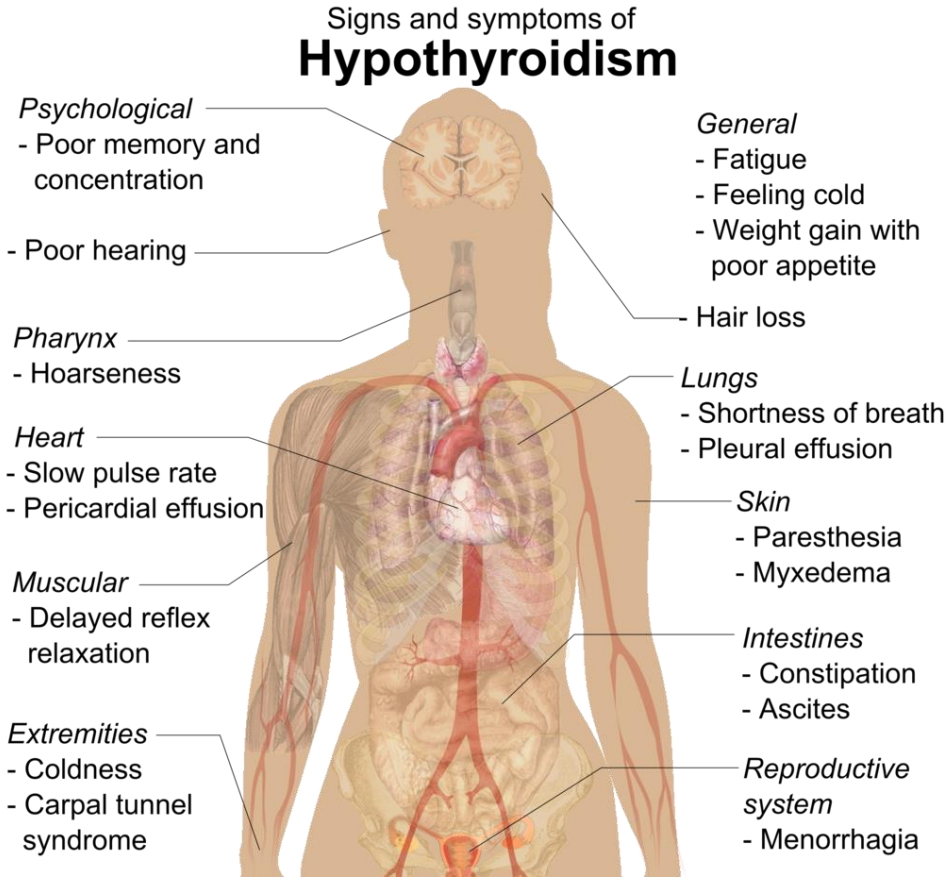
IODINE

- Iodine is required in a very small amount by our body.
- Thyroid gland functions in the presence of iodine, and produce thyroxine.
- Thyroxine plays a very important role in the proper growth of body.
- Your body does not make iodine. You get iodine from your diet.
  - Hypothyroidism is due to less secretion of thyroxine by the thyroid gland.
  - Hyperthyroidism is due to more secretion of thyroxine by the thyroid gland.

THYROID GLAND



HYPOTHYROIDISM



DEFICIENCY OF IODINE

- If you do not have enough iodine in your body, you cannot make enough thyroid hormone.
- Deficiency of iodine hinders mental physical growth.
- The body dries up and skin thickens.
- Body gives ugly look in old age, face gets disfigured, and wrinkled.
- Goiter disease is especially due to deficiency of iodine.

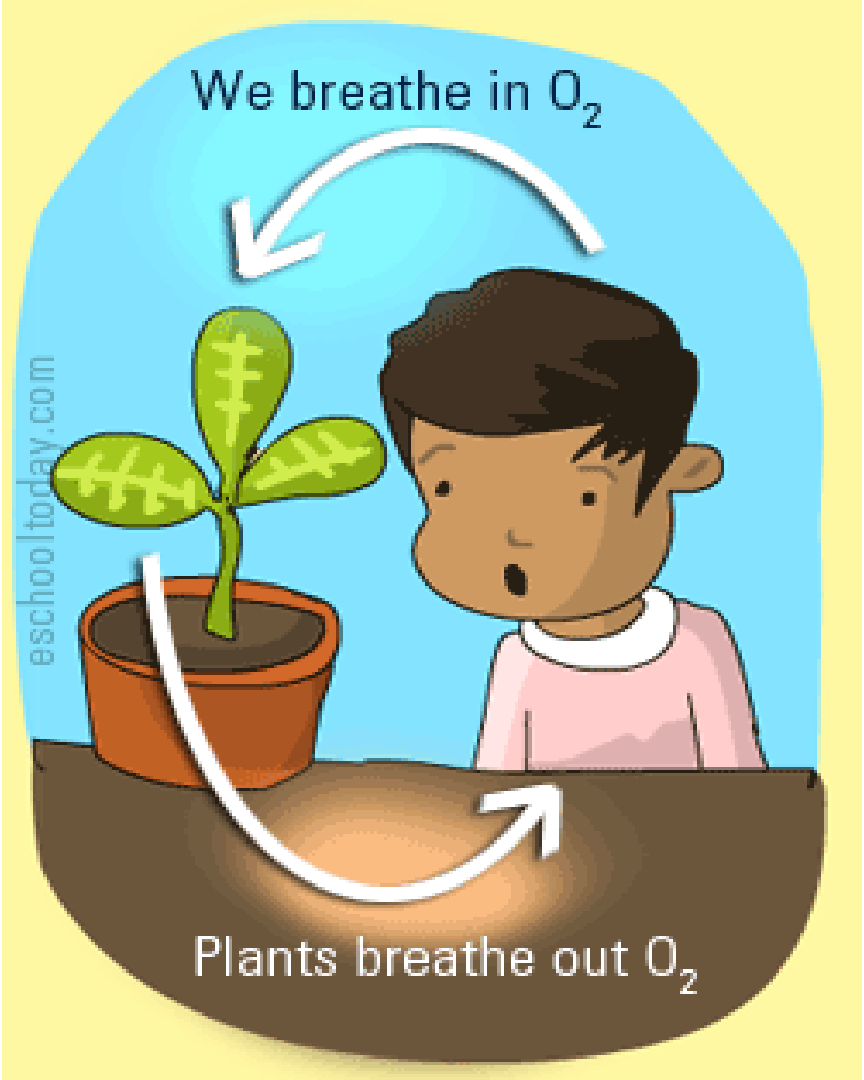
Uses of Iodine

- It is used in making dyes for colour photography.
- It is used in pharmaceutical chemicals.
- Iodine tincture is used as antiseptic.
- Other compounds of iodine such as sodium iodide and potassium iodide are used in medicines.

QUESTIONS & ANSWERS

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 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) Jabar bin Hayyan is _____ of chemistry.

2) The theory of relativity was formulated by _____.

3) Astronomy is the branch of physical sciences that deals with the study of _____.

4) Biological sciences are divided into _____ and _____.

5) Ibn Nafees was the first scientist who explained structure of _____.

6) Dr. Abdus Salam was a great _____.

Activity 2: T/F

1) Iron does not act as an oxygen carrier. T/F

2) Phosphorus transports the oxygen to the body cells. T/F

3) Phosphorus controls the joint and muscles activity. T/F

4) Iodine is not used to make medicines and photography dyes. T/F

5) Deficiency of iron leads to anaemia. T/F


ALMOST THERE...

Plenary

1) Who was Jabar bin Hayyan?
2) Who was Al-Bairuni?
3) Who was Ibnul Haitham?

Homework

Q1) What is the role of science and technology for the betterment of human living?

Q2) Briefly describe the contributions of Al-Bairuni, Ibnul-Haitham and Jabir Bin Hayyan, in the field of Science.

Q3) What is the role of science in the fields of agriculture and medicines?

As-salamu Alaikum

MAY ALLAH SWT BLESS YOU ALL