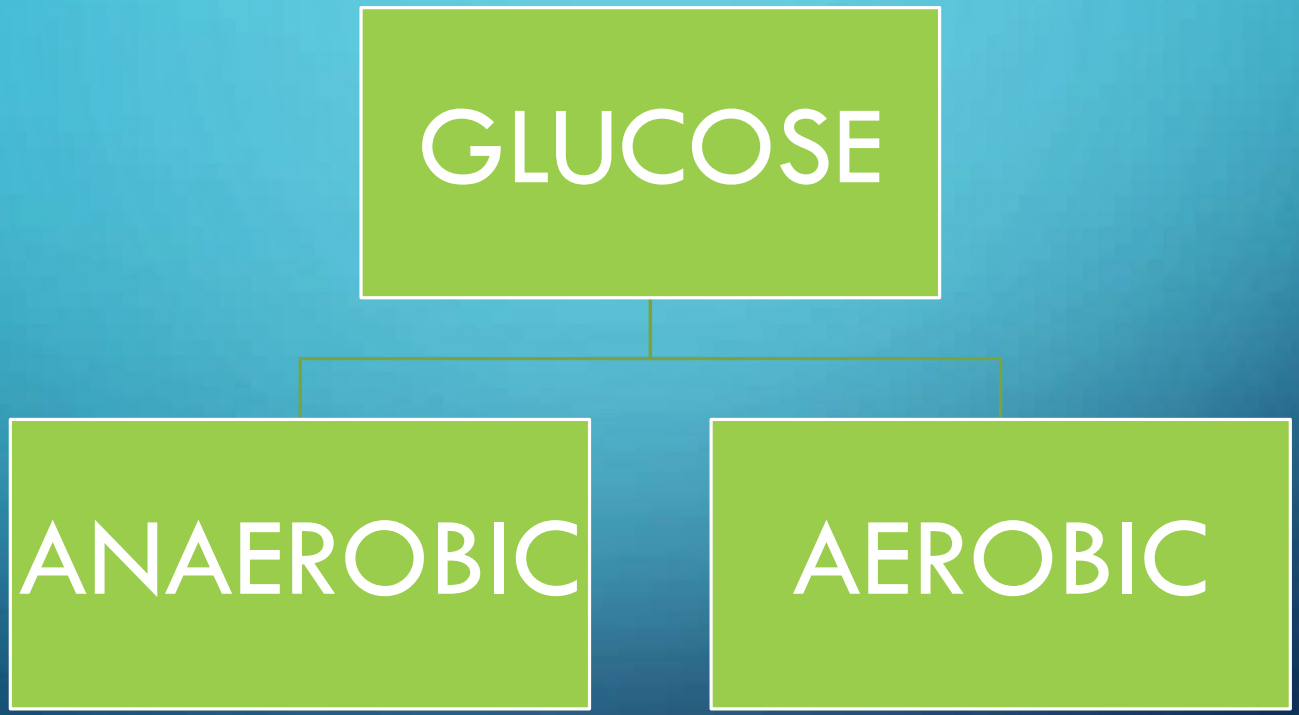
Chapter - 7
Class VII
(20.7.20 to 24.07.20)

RESPIRATION

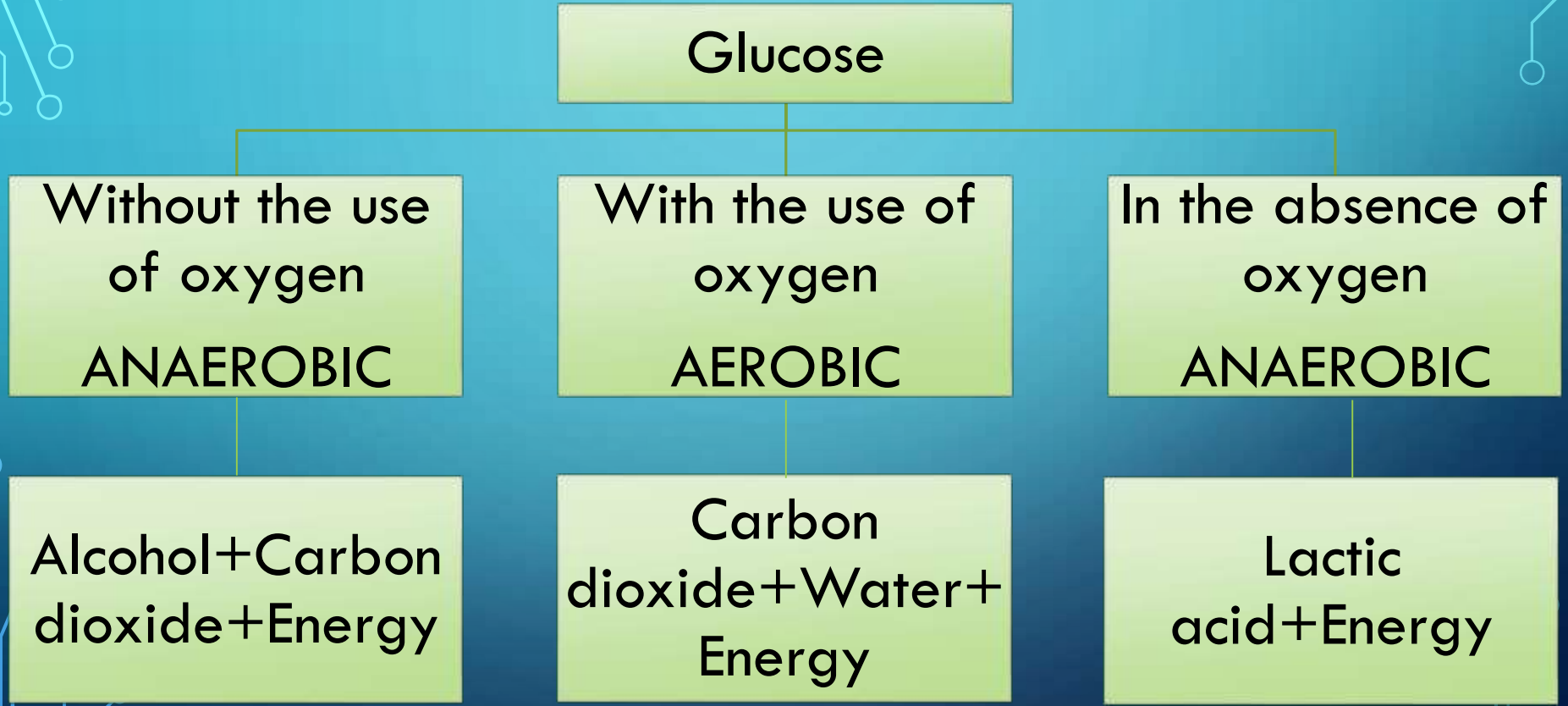
- Respiration is the general process in which organisms convert sugars into biochemical energy using oxygen
- During respiration energy is produced which is used in different processes necessary to support line.
- Respiration involves exchange of gases-oxygen is used in body and carbon dioxide is release from the lungs

CELLULAR RESPIRATION

- Oxygen reaches to all cells of the body when we breath.
- In the body cells oxygen combines with the absorbed food with the help of enzymes.
- As a result, energy and carbon dioxide are produced.
- This process that releases energy in the cells is known as cellular respiration.


GLUCOSE
ANAEROBIC
AEROBIC

Types of Respiration

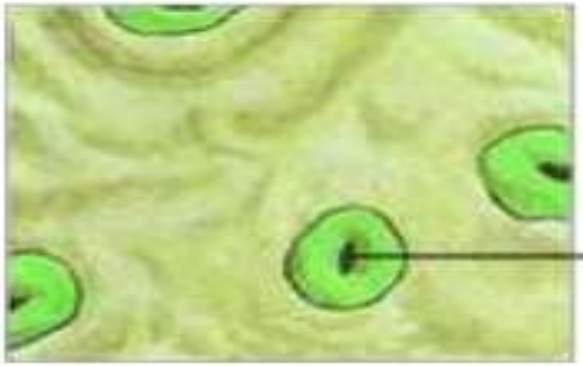


Difference between Aerobic and Anaerobic respiration

Aerobic respiration	Anaerobic respiration
It occurs in the presence of O_2.	It occurs in the absence of O_2.
It involves the exchange of gases between an organism and outside environment.	Exchange of gases is absent.
It occurs in the cytoplasm and mitochondria.	It occurs only in the cytoplasm.
It always releases CO_2 and H_2O.	End products may vary.
It yields 36 ATP.	It yields 2 ATP.
Example: Cells in our body	Example: Yeast and muscle cells

RESPIRATION IN PLANTS

Just like all other living organisms, plants too respire. They respire through the tiny pores on the surface of their leaves called **stomata**. Oxygen enters the plant, while carbon dioxide leaves the plant through these pores.



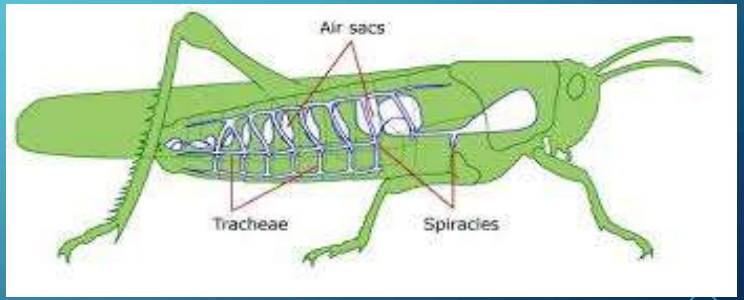
The roots of plants also respire.

They do so by taking in oxygen from the **air spaces** present in soil by the process of diffusion. Oxygen is taken in and carbon dioxide moves out with the help of diffusion only. This type of gaseous exchange takes place in the younger roots only, and not in the older roots. In the older roots, the exchange of gases occurs by **lenticels**. The lenticels are thin walled loosely arranged cells with intercellular spaces present for gaseous exchange.

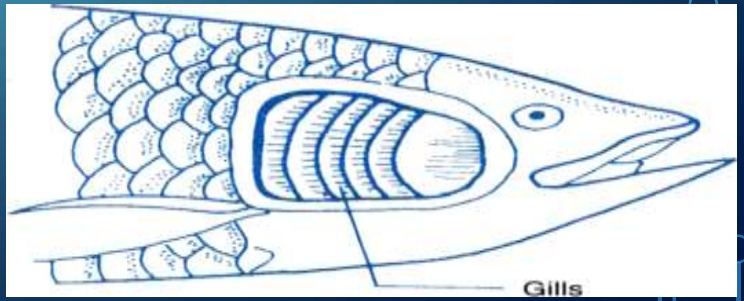
RESPIRATION IN ANIMALS

Earthworm and leech respire through their skin

Insects respire through tracheae

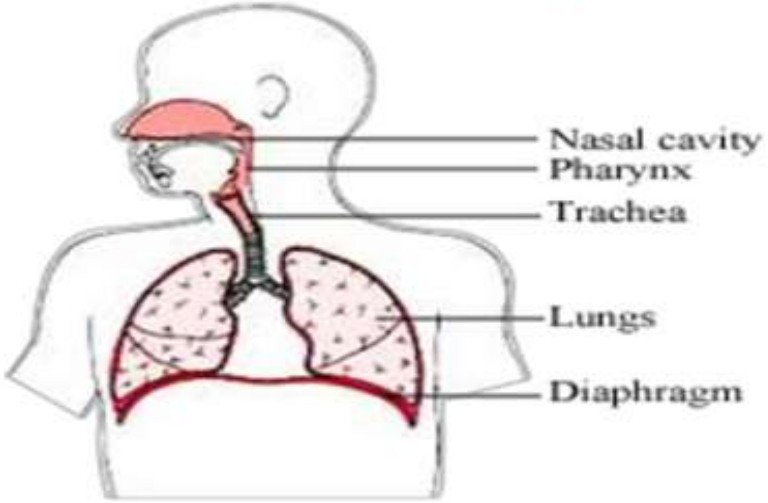


Fish, prawns and crabs respire through gills



The number of times a person inhales and exhales, or breathes in one minute is known as the breathing rate.

Parts of the Human Respiratory System



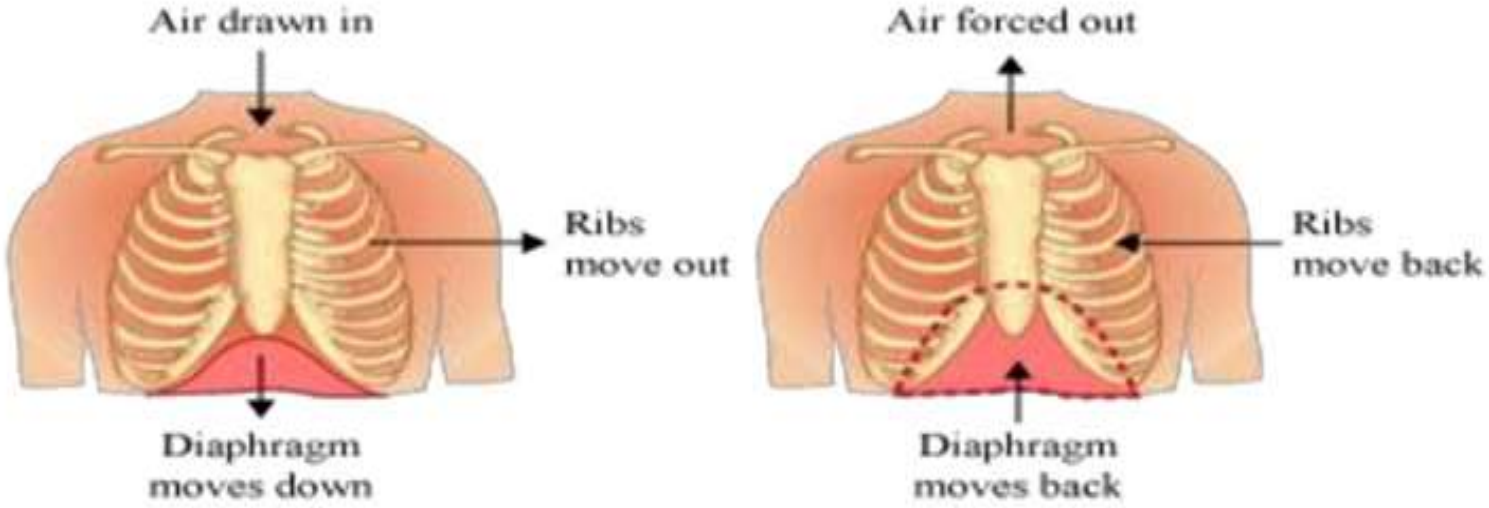
External nostrils → (Lead to) Nasal passage → (Leads to) Nasal chamber → (Leads to) Nasopharynx → (Leads to) Larynx (Sound box) → (Leads to through glottis) Trachea → (Divide) Divides at 5th thoracic vertebra → Primary bronchi → (Divide) Secondary bronchi and bronchioles → (Divide) Tertiary bronchi and bronchioles → (Divide) Terminal bronchioles → (Divide) Alveoli

Process of Breathing in Human Beings

The process of breathing involves taking in oxygen-rich air and giving out carbon dioxide-rich air. This entire process occurs because of the actions of various organs of the respiratory system.

We all know that we take in air through our nostrils, and when we breathe in, air passes through our nostrils into the **nasal cavity**.

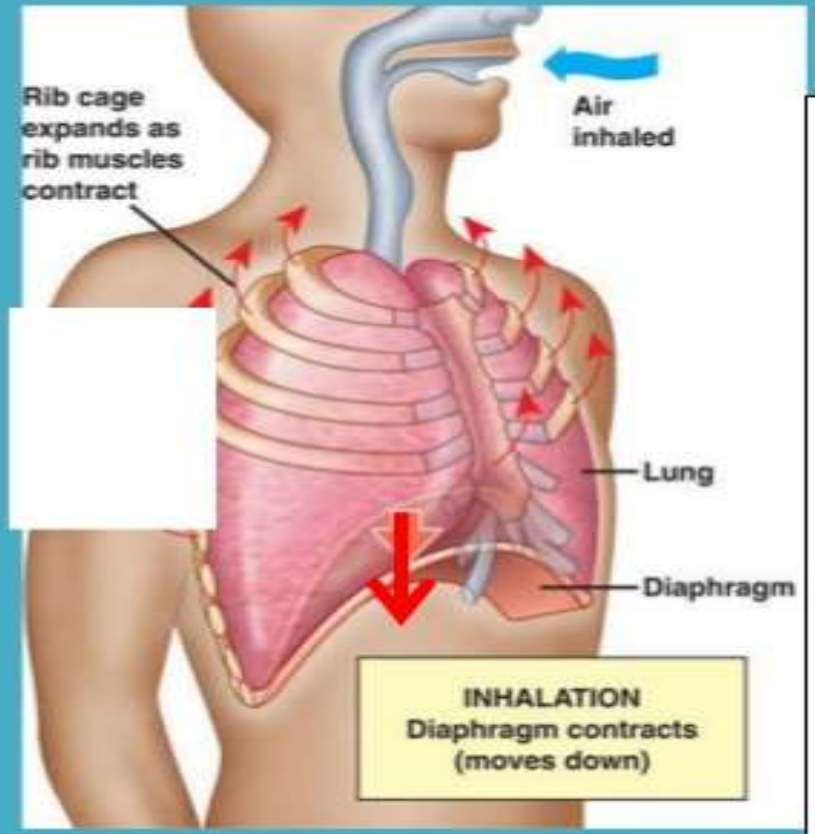
Air then reaches the lungs, which are located in the chest cavity. The actual mechanism of breathing involves the movement of the **rib cage** and the **diaphragm,** which are located around and at the base of the chest cavity respectively.



The breathing involves two processes: Inhalation and exhalation.

During **inhalation**, the diaphragm moves down and the ribs move upwards and outwards, thereby increasing the space in the chest cavity. This leads to the movement of air inside the lungs.
During **exhalation**, the diaphragm moves to its former position and the ribs move downwards and inwards, thereby reducing the size of the chest cavity. This leads to the movement of air out of the lungs.

INHALATION



Internal intercostal muscle relaxed

↓

External intercostal muscle contract

↓

Rib cage moves upwards & outwards

↓

Diaphragm contracts & flattens

↓

Volume of thorax cavity increase

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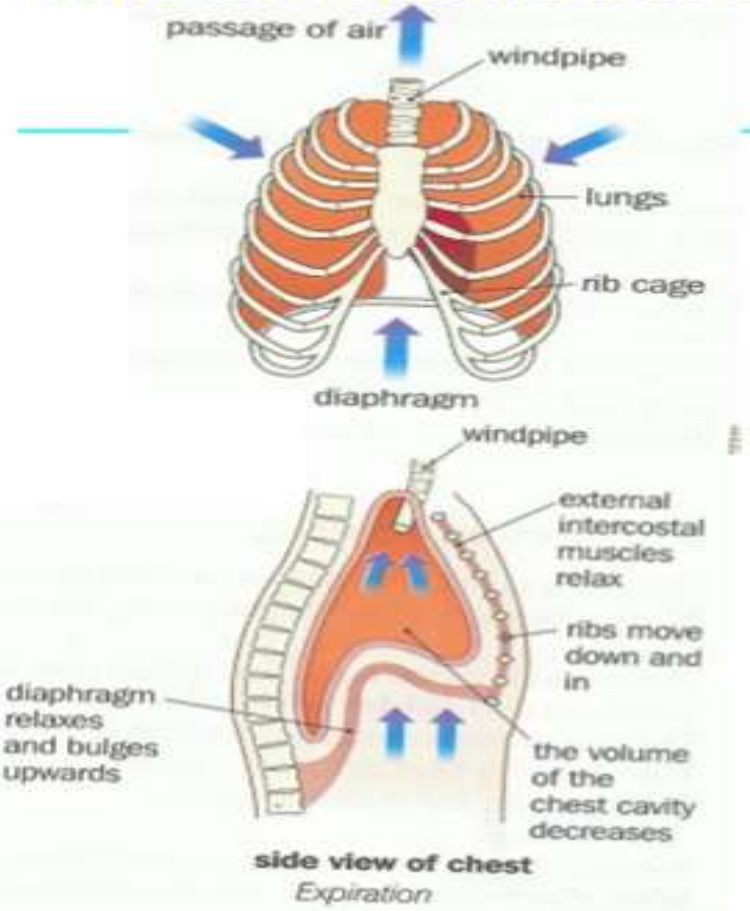
Pressure in alveoli decrease

↓

Air moves in

The mechanism of Expiration (exhalation)



- **Describe the mechanisms involved in expiration**
- The diaphragm and **external** intercostal muscles relax. The **internal** intercostal muscles contract. So the rib cage moves downwards and inwards. The diameter and length of the thorax decreases.
- Overall, the volume of the thorax decreases which results in an increase in pressure in the lungs compared to atmospheric pressure.
- Air leaves the lungs – which deflate.
- The elastic fibres between the alveoli recoil and the alveoli return to their natural shape.

THANKS