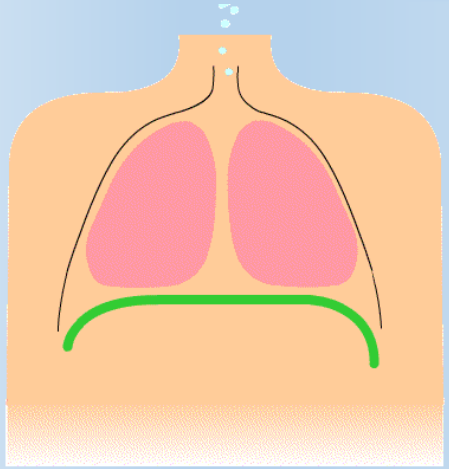


Biology Grade 7

CHAPTER 3: RESPIRATION OF LIVING BEINGS

Activity1: Respiratory movements and circulation of air or water

INSTRUCTOR: SUHAIB AUDI

Introduction

❖ Respiration of living beings

- Respiration is a vital necessity for all living things.
- In spite of the diversity of the respiratory organs, the process of respiration is basically the same: absorption of oxygen and excretion of carbon dioxide.
- Respiratory gas exchange occurs between the living things and their environment.
- How do living things respire?

Activity1: Respiratory movements and circulation of air or water

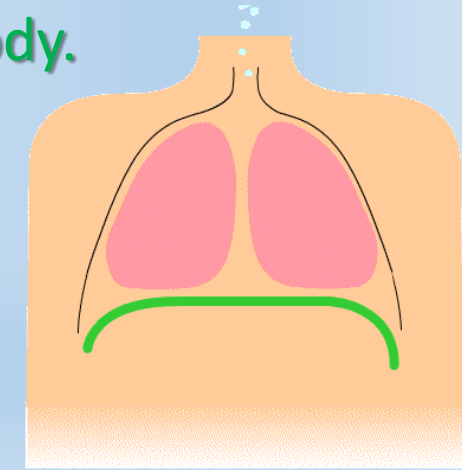
- Whether the life medium is terrestrial or aquatic, living things respire.
- Renewal of air or water, by an organism, is ensured by respiratory movements.
- How are these movements manifested?
- What is their role?

❑ **Respiration is the exchange of gases between the body and the surrounding medium (air or water) where oxygen is absorbed and carbon dioxide is released.**

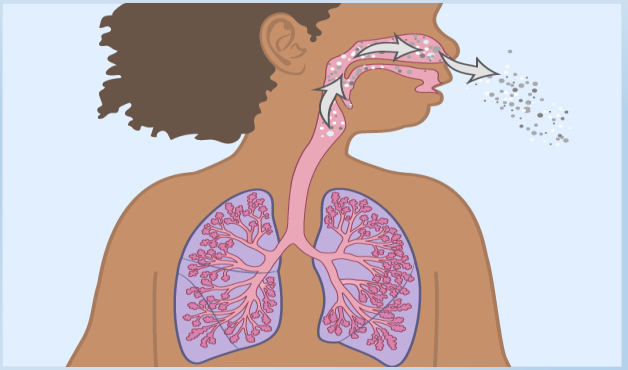
- There are two respiratory movements:

1. Inhalation: is the movement that allows air rich in oxygen to enter the body.

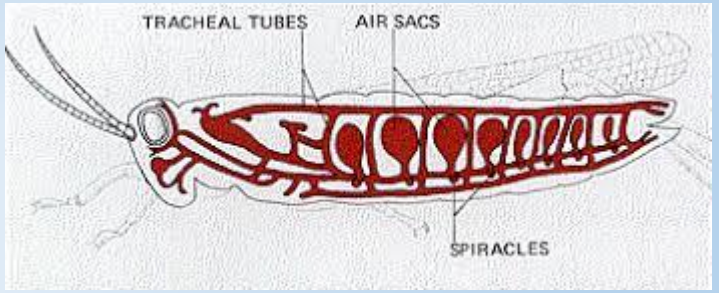
2. Exhalation: is the movement that allows air rich in carbon dioxide to get outside the body.



- Some living things respire by lung, they have **pulmonary mode of respiration** like human.



- Others, with **tracheal mode,** they respire by trachea like insects.



- Some animals have **cutaneous mode,** in which they use skin for respiration, like the earthworm.

- Another group uses gills, so they have **gill mode of respiration,** like fish.

❖ Respiratory Movements and Circulation of Air in Human

- For any organism to be alive, it should feed, reproduce and respire.
- In respiration, the human body consumes oxygen and releases carbon dioxide through the lungs.
- This happens in 2 respiratory movements, as shown in the following document.

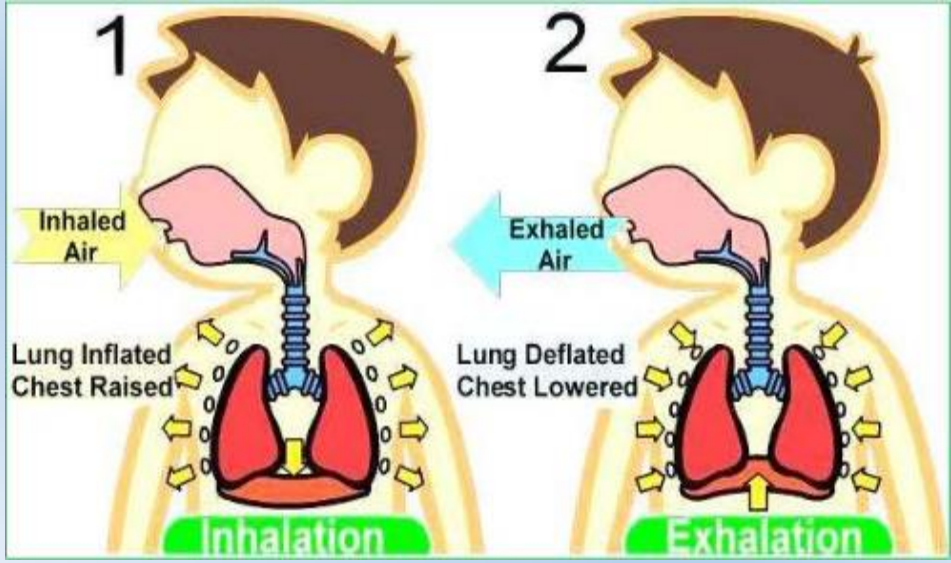


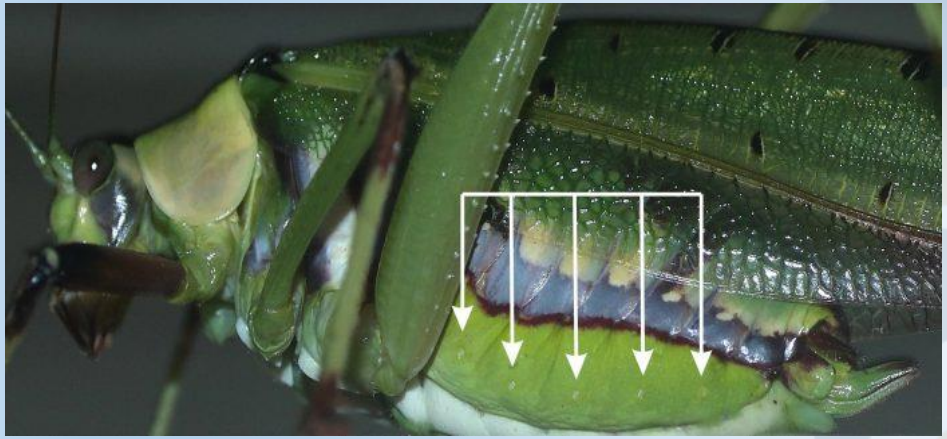
Figure	1	2
Name of respiratory movement	Inhalation	Exhalation
Kind & direction of gas flow	O_2 Entering	CO_2 Leaving
Chest state	Raised	Lowered
Lung state	Inflated	Deflated

1. Fill the above table:
2. Draw out your mode of respiration

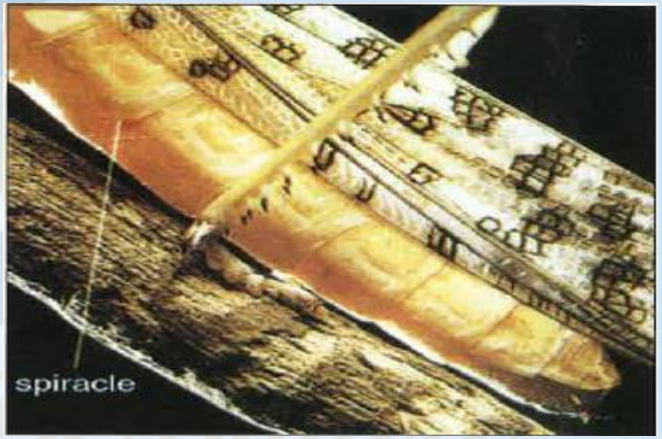
Pulmonary mode of respiration.

❖ Respiratory Movements & Circulation of Air in the Insects.

Insects, like grasshopper respire through small openings called **spiracles** found on their **abdomen**. The grasshopper inhales O_2 through anterior spiracles, toward an internal tube called trachea, causing the abdomen to inflate and lower. It exhales CO_2 through posterior spiracle causing the abdomen to deflate and raise up.

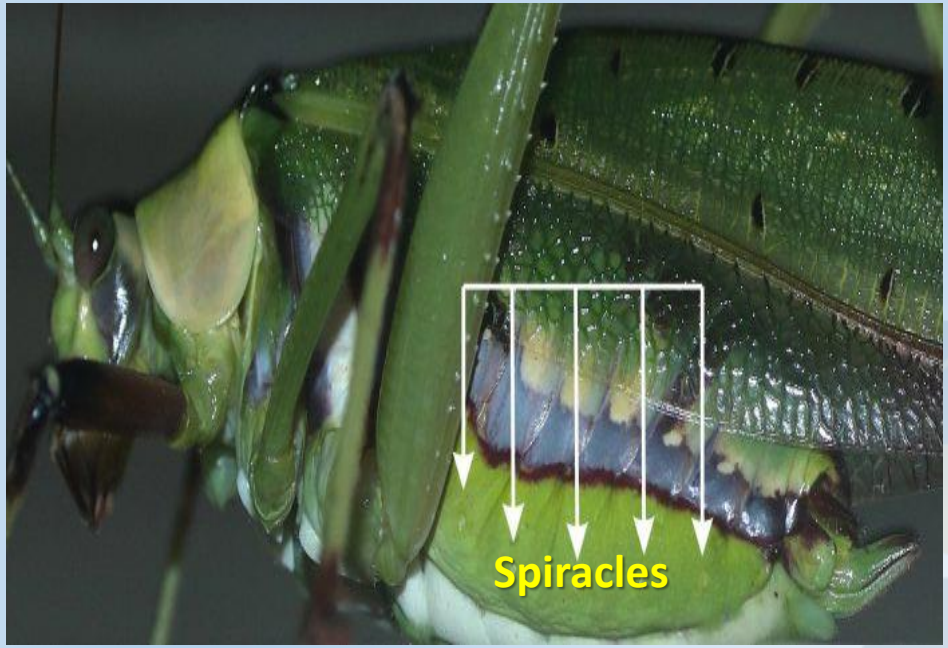


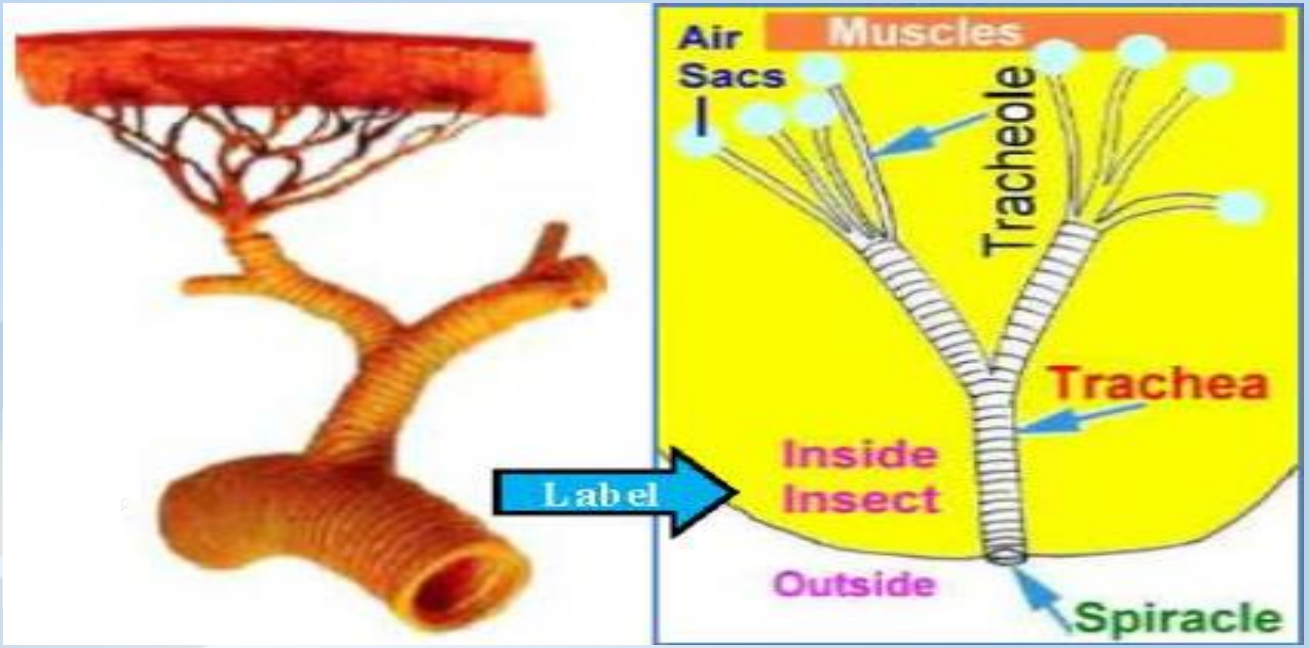
Spiracles



Inhalation

Exhalation





Using the text and the figures:

1. Pick out the name of

1.1. The respiratory opening:

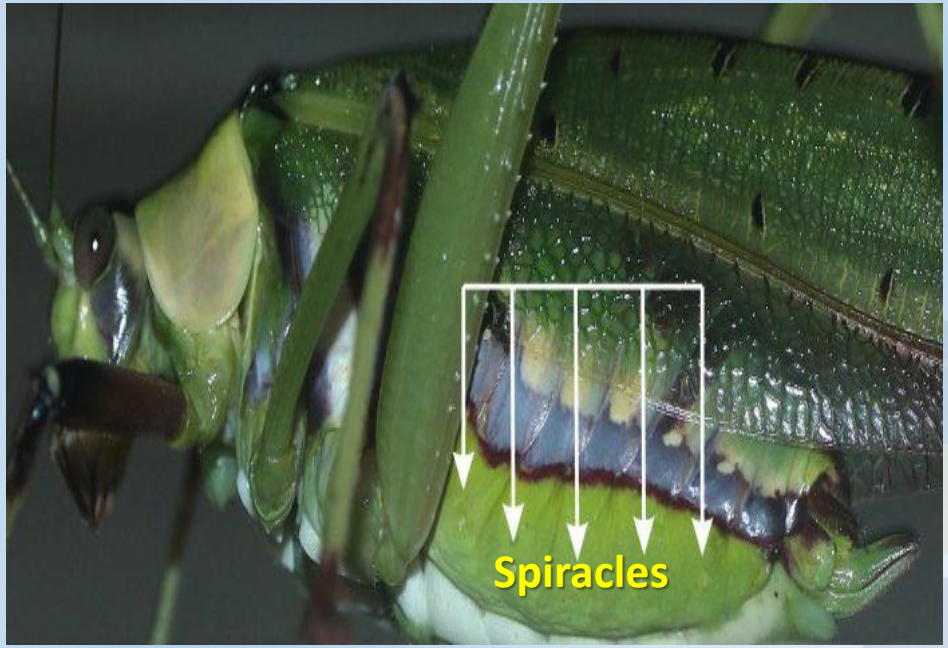
Spiracle

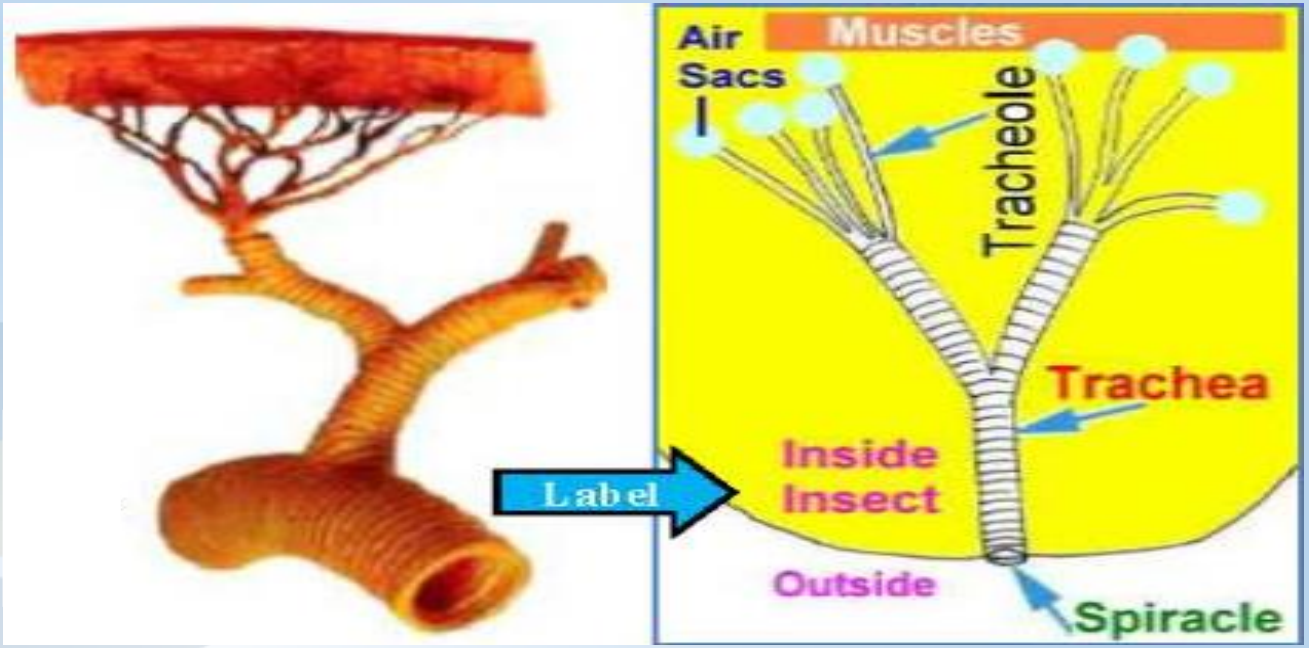
1.2. The tube.

Trachea

2. Conclude the mode of respiration.

Tracheal mode of respiration





3. Fill the given table

Respiratory Movements	Inhalation	Exhalation
Gas exchange	Inhale O2	Exhale CO2
Pathway of gas flow	Out→ spiracle→ trachea → tracheole → air sacs → muscle	Muscle→ air sacs→ tracheole→ trachea→ spiracle → Out
Abdomen state	Inflated and Lowered	Deflated and raised up

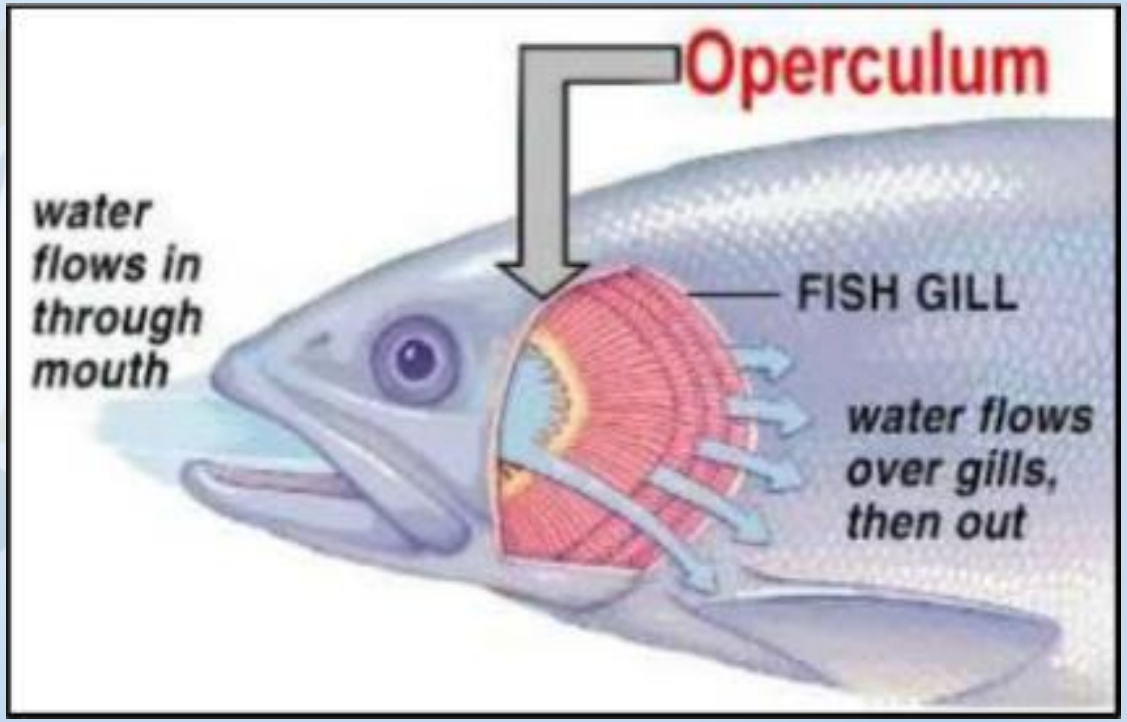
4. Predict the consequences of covering the abdomen with a nontoxic clay.

Grasshopper dies, because the spiracles are closed thus it can't respire any more.

❖ Respiratory Movements & Circulation of Water

Marine animals, like fish, respires oxygen from **water** and not from air.

In such case, **fish respire oxygen and releases carbon dioxide** from two different places alternatively (when one place is opened, the other one is closed) as shown in the given figure:



1. Pick out:

1.1. The respiratory organ.

Gills

1.2. The organ in which O2 is inhaled.

Mouth

1.3. The organ in which CO2 is exhaled.

Operculum

2. Fill the given table, using the given text and fig.

Respiratory Movements	Inspiration	Expiration
Pathway of gas flow	Sea→ Mouth	Gills → Sea
Mouth state (opened or closed)	Opened	Closed
Operculum state (opened or closed)	Closed	Opened

3. Derive a conclusion concerning the mode of respiration.

Gill mode of respiration.

- During inhalation, the fish opens its mouth and closes its operculum; water enters and flows over the gills.
- During exhalation, the fish closes its mouth and opens its operculum; water exits through the gills.

Respiratory movements ensure the renewal and circulation of air (in terrestrial animals) or water (in aquatic animals) across the respiratory surfaces (Gills or Lungs).