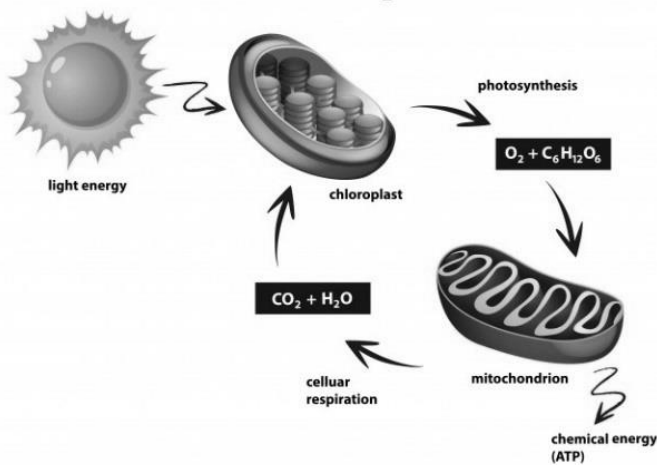


G. Answer the following in brief:

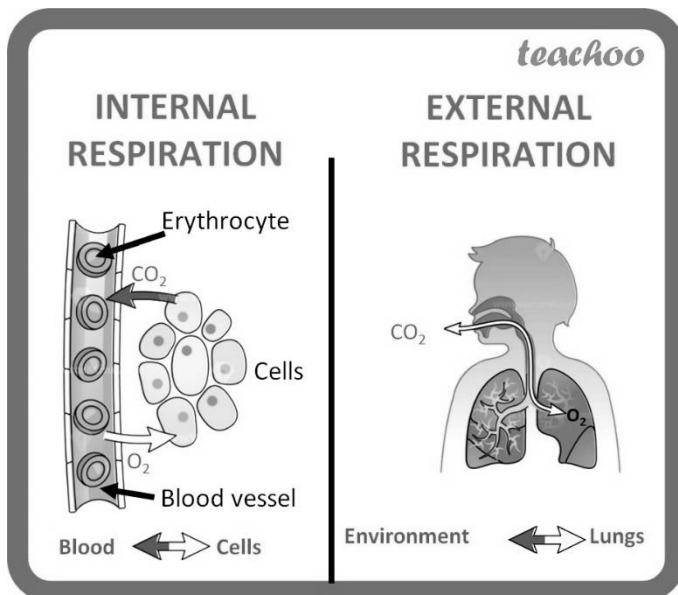
Q1. How do living organisms obtain energy from the food?

Cellular Respiration



Answer: *Respiration* is the **process** by which **living things obtain energy from food**. **Oxygen** is required to **convert the food** that we eat **into energy**. This is acquired through breathing which is then used to obtain energy from the nutrients obtained from our food.

Q2. Differentiate between external and internal respiration.

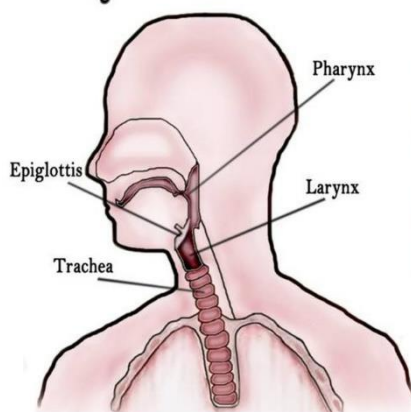


Answer:

Internal respiration occurs **in the body tissues**, where cells release carbon dioxide and take in oxygen from the blood.

External respiration occurs in the **lungs or gills** and occurs when the body takes in oxygen from the atmosphere and releases carbon dioxide.

Diagram of the Human Throat



Q3. How is food prevented from entering trachea when we eat or drink.

Answer: The **epiglottis** is a small, movable **cartilaginous flap** just **above the larynx** that **prevents food** from **entering the trachea** during swallowing.

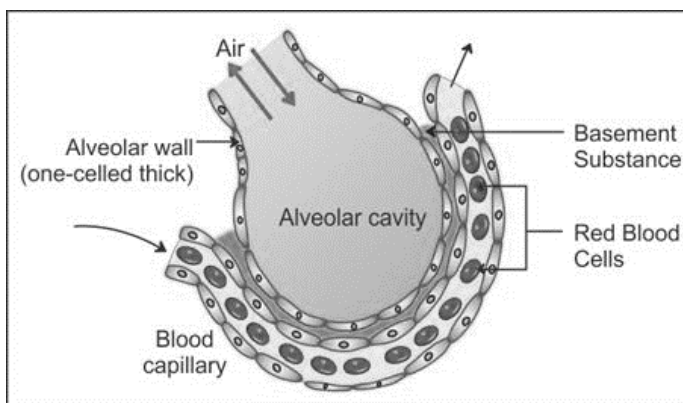
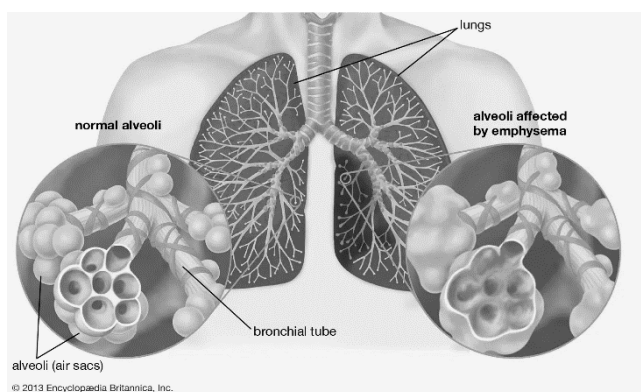
Q4. List the three features of alveoli which enable to perform their function.

Answer:

The alveoli present in the lungs have **thin walls composed only of a single layer of cells** in order to **minimize the diffusion distance**.

Their **walls are moist** which helps the **gases to diffuse better**.

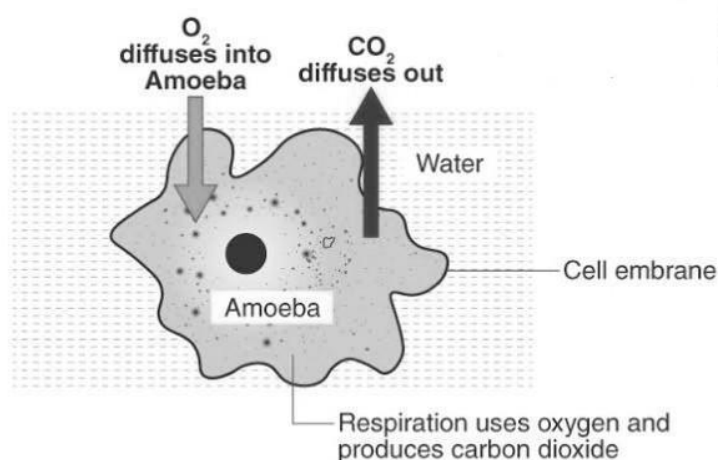
They are richly supplied with **blood capillaries** to ensure the **efficient exchange of gases** with the bloodstream.



Q5. Why does breathing become faster when we do physical exercise?

Answer: When you **exercise** and your **muscles work harder**, your **body uses more oxygen** and **produces more carbon dioxide**. To cope with this extra demand, your breathing has to **increase from about 15 times a minute** when you are resting, up to **about 40–60 times a minute** during exercise.

Q6. How does Amoeba acquire oxygen from its surrounding?



Answer:

- Amoeba **gets oxygen gas dissolved in surrounding water** through its **plasma membrane** by the **process of diffusion**.
- The **oxygen gas diffused inside the body** is used up by amoeba.
- In the body the **oxygen gas absorbed** is used to **break down the complex food material into simple** molecules.

Q7. Why do farmers turn the soil in their fields?**Answer:**

- By **ploughing** the field, the **upper layer of the soil can be turned over** so that the **inner layer of soil can be brought up to the surface** which contains more nutrients.
- By **levelling the farming area is increased**. - It also helps in burying the weeds and the remains of previous crops

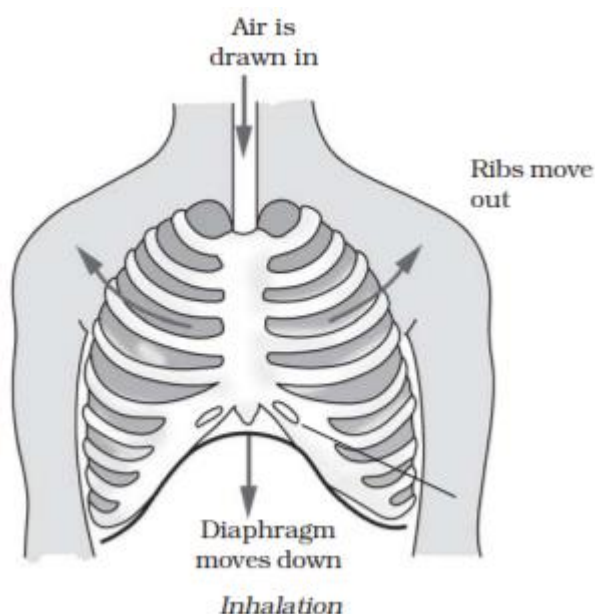
and allowing them to break down

- This allows the **roots to penetrate deep into the soil**. The roots can also breathe easily as loosened soil helps in better aeration.

H. Answer the following questions in detail.**Q1. Explain the mechanism of berating in human beings.****Answer:****Breathing in humans:**

In breathing, human beings inhale oxygen and exhale carbon dioxide.

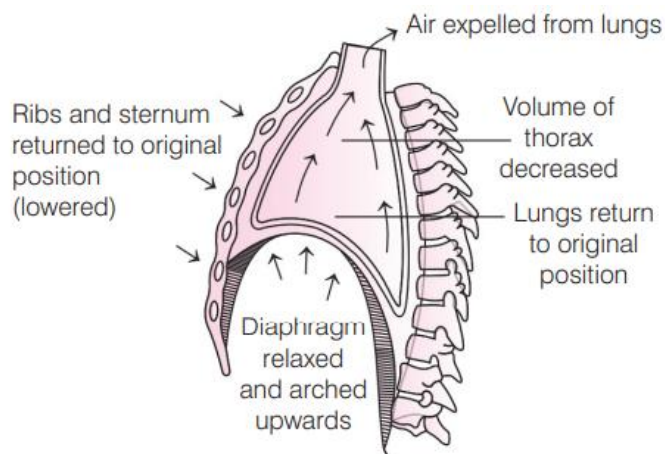
Mechanism of breathing in human beings:

Inhalation:

During **inhalation process**, the **diaphragm contracts** and **moves down**. The **ribcage moves upwards** and **outwards** and **expands**.

This results in **increasing the volume of the chest cavity** and **reduces the pressure inside** it as volume is inversely proportional to pressure.

When the **pressure inside the lungs reduces** then **the air from outside rushes into the lungs**.

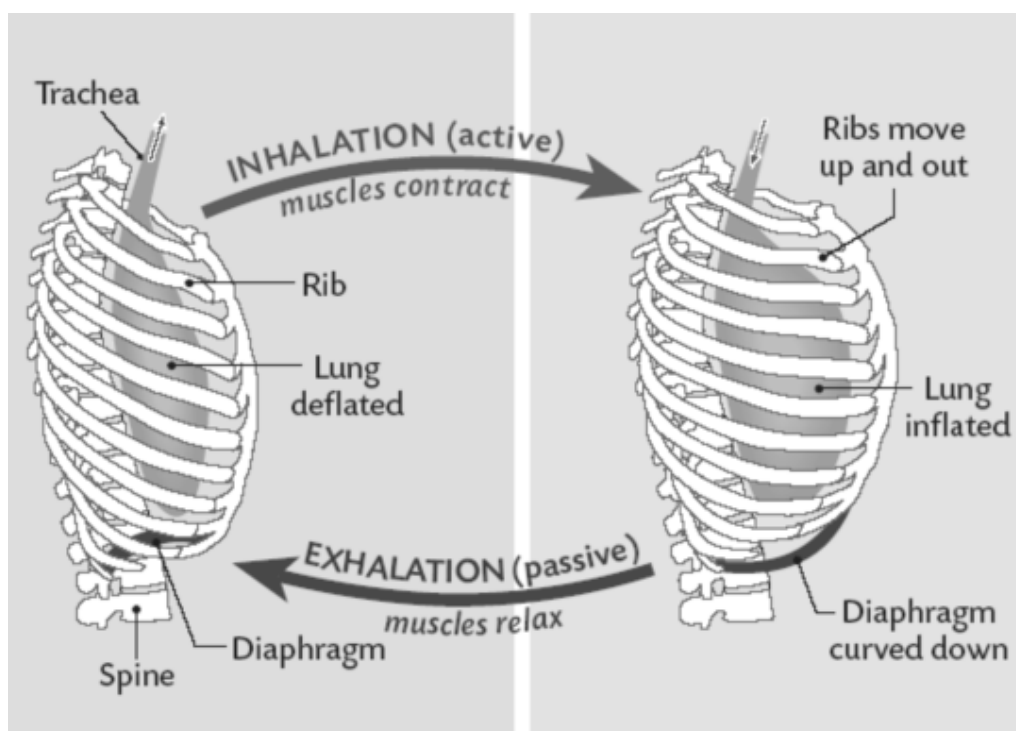
Exhalation:

Mechanism of breathing showing expiration

During **exhalation** process, the **diaphragm relaxes as it moves up** and **returns** to its **normal dome shape**. The **ribcage** also **returns to its normal position**.

This **reduces the volume of the chest cavity**, which in **turn increases the pressure inside** it. And thus air is expelled out.

In this way, process of breathing takes place in human beings.

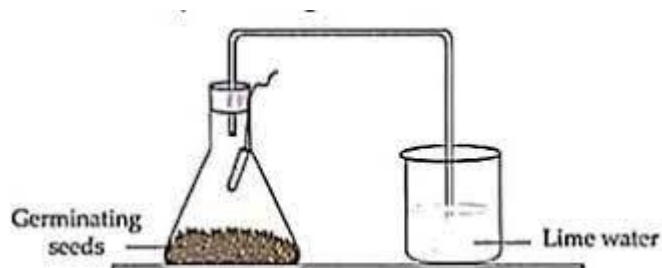


Q2. Look at the picture given below and answer the question that follow.

(a) What could be the aim of the experiment?

(b) Why do you think germinations seed are being used in the experiment?

(c) Why has the lime water in the test tube turned milky?



Answer:

(a) To prove that CO₂ is released out during respiration in germinating seeds

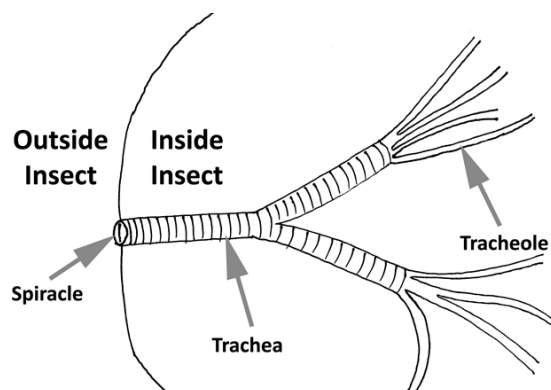
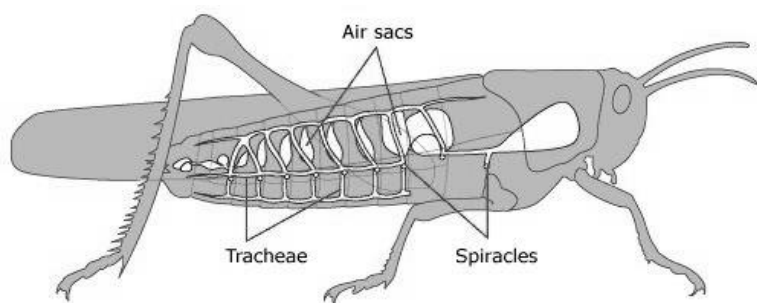
(b) A germinating seed shows respiration instead of photosynthesis

© Germinating seeds release carbon dioxide which in turn reacts with lime water to form white precipitate of calcium carbonate

Q3. Explain the process of exchange of gases in insects. Draw a diagram in support of your answer.

Answer:

- ***In insects, gaseous exchange*** occurs through a network of tubes collectively known as ***the tracheal system***.
- The ***small openings on the sides of an insect's body*** are known as ***spiracles***.
- ***Oxygen-rich air*** enters through the ***spiracles***.
- The spiracles are connected to the network of tubes. ***From the spiracles, oxygen enters the tracheae***. From here, ***oxygen diffuses*** into the ***cells of the body***.
- The movement of ***carbon dioxide follows the reverse path***. The ***CO₂*** from the cells of the body ***first enters the tracheae*** and then ***leaves*** the body through the ***spiracles***.



Q4. Justify the statement that composition of inhaled and exhaled air is not same.

Answer: The amount of inhaled air contains 21% of oxygen and 0.04% of carbon dioxide, while the air we breathe out contains 16.4% of oxygen and 4.4% of carbon dioxide. This is because our cells use oxygen from the inhaled air to release energy and give out carbon dioxide as a by-product.

Inhalation		Exhalation	
Oxygen	21%	Oxygen	16.4 %
CO ₂	0.04%	CO ₂	4.4%
Nitrogen	79%	Nitrogen	79%

The composition of inhaled air is rich in oxygen while the composition of exhaled air is rich in carbon dioxide.

Q5. Differentiate between the following pairs:

(a) Aerobic and anaerobic respiration

Answer:

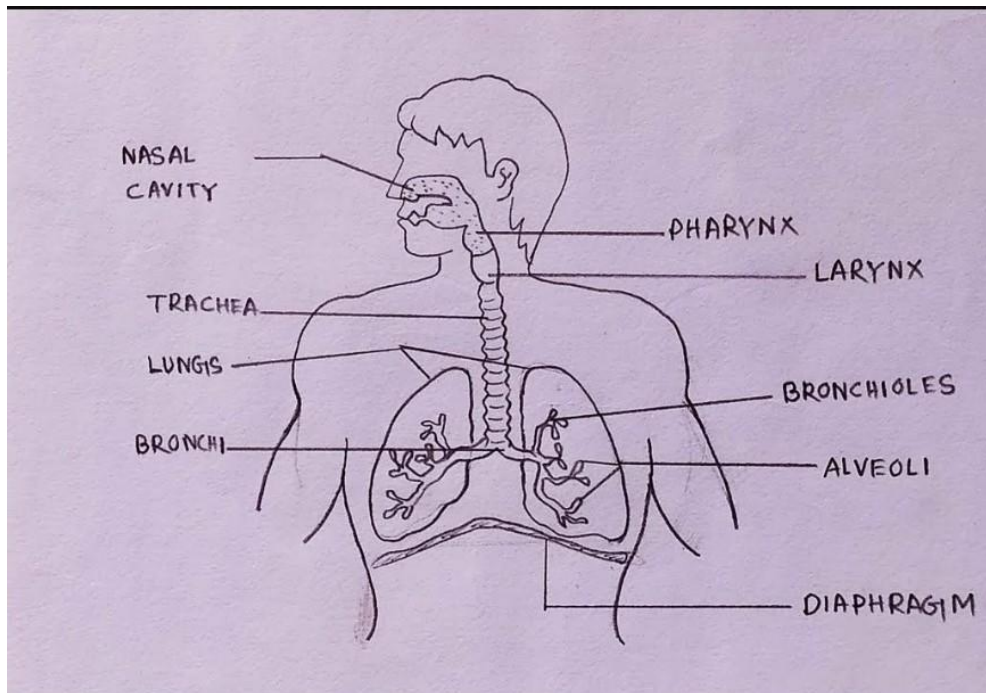
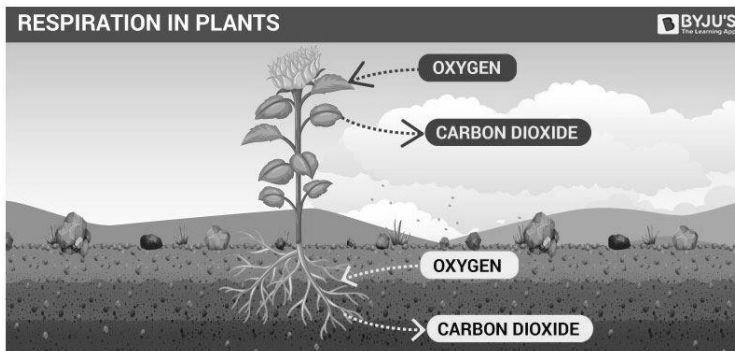
S.No.	Aerobic Respiration	Anaerobic Respiration
1.	Occurs in the presence of oxygen.	Occurs in the absence of oxygen.
2.	Glucose is completely oxidised.	Glucose is broken down incompletely.
3.	End products are carbon dioxide and water.	End products are either ethyl alcohol and carbon dioxide or lactic acid.
4.	More energy is produced.	Very little energy is produced.
5.	Occurs in most of the plants and animals.	Occurs in few organisms like yeast, some bacteria and some parasitic worms.

(b) Breathing and Respiration

Breathing	Respiration
Breathing is a continuous process that involves both inhalation and exhalation.	The process in which food is broken down in the cells to release energy is known as respiration.
It is a physical process.	It is a biochemical process.
Breathing is a part of respiration.	It involves the release of energy.

(c) Inhalation and Exhalation

Inhalation	Exhalation
It is the inspiration of air in breathing.	It is the expiration of air in breathing.
To inhale air, rib cage moves upward and outwards	To exhale air, rib cage moves downward and inward.
Volume of the thoracic cavity increases.	Volume of the thoracic cavity decreases.
The muscles of diaphragm contracts get flattens.	The muscles of the diaphragm relax and form dome shape.
Lungs get inflated.	Lungs get deflated.

Q6. Draw a labelled diagram of human respiratory system.**Answer:** Practice this diagram.**Q7. How do plants respire? Explain.****Answer:** This happens as follows:

- In this process of **cellular respiration**, **plants** generate **glucose molecules** through photosynthesis by capturing energy from sunlight and **converting it into glucose**.
- **Oxygen** from the **air enters into a leaf** through **stomata** and reaches all the cells by the **process of diffusion**.
- This **oxygen** is **used in respiration in cells of the leaf**.
- The carbon dioxide produced during diffuses out from the leaf into the air through same stomata.
- **Respiration happens in leaf, roots and stems**.
- Consequently, **leaves, stems and roots of plants separately exchange gases**. Leaves possess stomata – tiny pores, for gaseous exchange. **The oxygen consumed via stomata** is used up by **cells in the leaves** to **disintegrate glucose into water and carbon dioxide**.

Do plants breathe at night?

Yes, plants breathe throughout its life span both during the day and night. The chemical equation of cellular respiration is expressed as —

Oxygen + glucose => carbon dioxide + water + heat energy.

Q8. Draw a labelled diagram of stomata.

Answer:

