

4. INTRODUCTION TO RESPIRATION IN ORGANISMS

TEACHING TASK

Choose the correct answers:

1. The process which involves the exchange of gases is called

- a) Respiration
- b) circulation
- c) Digestion
- d) Breathing

Correct Answer: d) Breathing

Explanation: Breathing specifically refers to the physical process of inhaling oxygen and exhaling carbon dioxide, while respiration is the cellular process of energy production.

2. Roots respire through

- a) Spiracles
- b) lenticels
- c) Stomata
- d) Air spaces

Correct Answer: b) lenticels

Explanation: Lenticels are porous tissues in stems and roots that allow gas exchange. Roots cannot use stomata (found in leaves) or spiracles (insect structures).

3. Which animal breathes through skin and lungs?

- a) Fish
- b) Frog
- c) Snake
- d) Earthworm

Correct Answer: b) Frog

Explanation: Frogs use cutaneous (skin) respiration in water and pulmonary (lung) respiration on land. Earthworms use only skin, while snakes/fish use only lungs/gills respectively.

4. What happens to lime water, when we exhale air into it

- a) Remains same
- b) Turns Blue
- c) Turns Milky
- d) Becomes colourless

Correct Answer: c) Turns Milky

Explanation: Exhaled air contains CO₂ which reacts with lime water (calcium hydroxide) to form insoluble calcium carbonate, making it milky.

5. Plants respire through

- a) Cells
- b) Stomata
- c) Gills
- d) Cell membrane

Correct Answer: b) Stomata

Explanation: Stomata are microscopic pores in leaves that open at night for gas exchange during respiration (O₂ in, CO₂ out).

6. The respiratory organs in cockroach are

- a) Lungs
- b) gills
- c) Lenticels
- d) Spiracles

Correct Answer: d) Spiracles

Explanation: Spiracles are external openings connected to tracheal tubes that deliver oxygen directly to tissues in insects like cockroaches.

II. Fill in the blanks:

1. In earthworm the respiratory organ are moist skin

Explanation: Their skin must stay moist for oxygen diffusion; they lack specialized organs.

2. Joseph Priestley published the book “experiments and observations on different kinds of air”.

Explanation: He discovered oxygen's role in respiration through plant experiments (1774).

3. Dissolved oxygen is used by aquatic animals

Explanation: Water-breathing animals extract oxygen dissolved in water (e.g., fish via gills).

4. The respiratory organs of human beings is lungs

Explanation: Lungs contain alveoli where gas exchange with blood occurs.

5. During lungs plants will not use CO₂ completely.

Explanation: Plants don't perform photosynthesis at night, so CO₂ isn't fully utilized.

6. Water contain dissolved oxygen in it.

Explanation: Atmospheric oxygen dissolves in water, enabling aquatic respiration.

7. The numbers of times we breathe in and breathe out air in a minute is called the breathing rate

Explanation: Normal adult rate is 12-20 breaths/minute.

8. Earthworms breathe through its whole body surface

Explanation: Their entire skin surface participates in gas exchange.

9. Plants respire through stomata

Explanation: These close during day to prevent water loss, opening at night for respiration.

10. At night time plants in hale oxygen and exhale carbon dioxide

Explanation: At night, plants only respire (no photosynthesis), reversing daytime gas exchange.

III. Matching:

1. Gills - (b) Fish

Explanation: Gills are filamentous respiratory organs in aquatic animals.

2. Spiracles - (d) Cockroach

Explanation: Spiracles are the external openings of tracheal systems in insects.

3. Respiration - (a) Taking in O₂ and giving off CO₂

Explanation: This is the fundamental definition of gas exchange in respiration.

4. Exchange of gases - (e) Stomata

Explanation: Stomata facilitate gas exchange in plants (O₂/CO₂).

5. Root respiration - (c) Lenticels

Explanation: These porous bark structures allow gas diffusion in woody roots/stems.

Final Matching Answer:

1-b, 2-d, 3-a, 4-e, 5-c

LEARNERS TASK

Choose the correct answers:

1. Exchange of gases through skin is called

- a) Anaerobic respiration
- b) Aerobic respiration
- c) Cutaneous respiration
- d) a&b

Correct Answer: c) Cutaneous respiration

Explanation: Cutaneous respiration refers specifically to gas exchange through the skin (e.g., in earthworms and frogs).

2. In cockroach respiration takes place through

- a) spiracles
- b) moist skin
- c) lungs
- d) b&c

Correct Answer: a) spiracles

Explanation: Cockroaches use a tracheal system with spiracles (external openings) for breathing; they lack lungs or skin respiration.

3. At the entrance of trachea there is a voice box called

- a) spiracles
- b) larynx
- c) pharynx
- d) epiglottis

Correct Answer: b) larynx

Explanation: The larynx (voice box) is located at the top of the trachea in humans.

4. The blood of cockroach is

- a) red
- b) blue
- c) white
- d) yellow

Correct Answer: d) yellow

Explanation: Cockroach blood (hemolymph) is yellow due to the absence of hemoglobin; it uses hemocyanin for oxygen transport.

5. The process in which food is oxidized and energy is released is called

- a) excretion
- b) respiration
- c) digestion
- d) transpiration

Correct Answer: b) respiration

Explanation: Cellular respiration breaks down glucose to release energy (ATP).

Additional Information Questions:

1. What is cutaneous respiration?

Answer: Cutaneous respiration is the exchange of gases (oxygen and carbon dioxide) through the moist skin, observed in earthworms and amphibians like frogs.

2. Who am I?

a) I live in the soil and breathe through the skin which is thin and moist with minute holes?

Answer: Earthworm

b) I live in the water and I respire through gills?

Answer: Fish

3. Write an experiment to find out moisture in our breathe?

Answer: Breathe onto a clean, dry mirror. The condensation formed proves moisture in exhaled air.

4. How do you appreciate the scientist van Helmont and Joseph Priestley?

Answer: Van Helmont discovered gases involved in respiration. Priestley identified oxygen's role. Their work laid the foundation for understanding gas exchange.

Comprehensive

Questions

1. The respiration in fish is called

Answer: Branchial respiration

Explanation: Because fish use gills to exchange gases with water.

2. What is cutaneous respiration ?

Answer: Respiration through the skin

Explanation: In this, gases are exchanged directly through the moist skin surface (e.g., in frogs and earthworms).““

3. In human beings which type of respiration ?

Answer: Pulmonary respiration

Explanation: Because humans use lungs for gas exchange.

4. What is the common respiratory organ in frog & earthworm ?

Answer: Skin

Explanation: Both perform cutaneous respiration through their moist skin