



BIOLOGY

SAMPLE BOOK



BIOLOGY



I'm the
Intelli Kid

and
I'm becoming the
Best Version
of myself with





INDEX

GRADE-7



Nutrition in
Plants

1



Nutrition in
Animals

24



Respiration in
Organisms

50



Transportation
in Plants &
Animals

72







Experiential Experimental Edutaining



I AM PROGRESSING

(Tick mark the columns after achieving the Learning Milestones)



TOPIC	1st Learning	Exercise Solving	1 st Revision	2 nd Revision
 Nutrition in Plants				
 Nutrition in Animals				
 Respiration in Organisms				
 Transportation in Plants & Animals				

BIOLOGY

SAMPLE THEORY

CHAPTER 3

RESPIRATION IN ORGANISMS

INTRODUCTION

- Have you ever noticed, while playing, running or swimming you eventually breathing faster & wondered why it happens. But if you think breathing and respiration are the same, then think again! Breathing is just a part of respiration. Let's understand the concept of respiration in detail in this chapter.
- All organisms are made up of cells, and cells have the capability to perform different vital biochemical reactions.
- It is necessary to produce or obtain energy to perform these processes. The food taken during nutrition takes part in further reactions to get energy.

BREATHING

- It is the process of taking oxygen from the environment and releasing carbon dioxide back into the environment. It is a part of respiration.
- **Breathing rate:** It is the number of breaths a person takes in a minute.
- Normal breathing rate in humans (adult) – approx **12-16 per minute**
- Breathing rate after vigorous exercise – more than approx **30 per minute**
- Breathing rate in child – approx **20-40 per minute**

RESPIRATION

- Respiration is a biochemical process in which assimilated food breaks down and releases energy in the form of ATP.
- Assimilated food is generally organic compounds & known as **respiratory substrate**. The most common respiratory substrate is **glucose**.
- Respiration is a slow process that shows the involvement of various enzymes.

STEPS OF RESPIRATION

- Respiration includes three steps:

External respiration

This step includes a gaseous exchange between an organism & its environment.

Internal respiration

This step includes a gaseous exchange between tissues & the extracellular environment.

Cellular respiration

This step includes food breakdown & release of energy within a cell.

TYPES OF RESPIRATION

- Based on the presence & absence of oxygen, it is classified into two types:

Aerobic Respiration

- It is a complete breakdown of assimilated food in the presence of oxygen to obtain energy.



- Glycolysis:** The process of breakdown of glucose into pyruvic acid. It occurs in the cell's cytoplasm. Pyruvic acid ($\text{C}_3\text{H}_4\text{O}_3$) is a 3 carbon compound.
- Pyruvic acid is further converted into CO_2 , water & release energy (38 ATP) in mitochondria.

Anaerobic Respiration

- It is a process in which the breakdown of food occurs without oxygen. It results in the formation of less amount of energy. Many other byproducts also form during the process.
- Anaerobic respiration occurs in many organisms.

Anaerobic respiration in yeast

- The breakdown of glucose occurs in the cytoplasm & a small amount of energy (2 ATP) produce along with CO_2 and ethanol ($\text{C}_2\text{H}_5\text{OH}$).
- This process is known as **alcoholic fermentation** & was first discovered by Louis Pasteur.
- Fermentation is used in bakeries & breweries.



Fermentation

BIOLOGY

SAMPLE EXERCISE



EXERCISE

GRADE-7

Respiration in Organisms



Directions: Solve the following multiple choice questions by choosing the most appropriate option.

1. Read the given statement carefully & select the incorrect option for the words that are italicized & in black colour.

The trachea is made up of *cartilages*. It protects the trachea from collapsing. A box-like structure present above the trachea is *the larynx*. There is two pair of *vocal cords* present inside it. Vocal cords are responsible for the formation of *adam's apple*.

- (1) Cartilage is flexible in nature & helps in giving a framework.
- (2) Larynx is involved in the gaseous exchange between lungs and blood.
- (3) Vocal cords vibrate when we exhale air and produce voice.
- (4) Adam's apple is a protruding part of the neck because of the cartilage.

2. Four sentences are given in the question. Select the one word for each of them & tick the correct option.

- (a) It is the main site of gaseous exchange. _____.
- (b) It is the number of breaths a person takes in a minute. _____.
- (c) It is the process of taking out carbon dioxide-rich air from the body to the environment. _____.
- (d) It is a narrowing of airways that leads to breathing obstruction. _____.

(i)	(ii)	(iii)	(iv)
(1) Alveoli	Breathing rate	Exhalation	Bronchitis
(2) Blood capillaries	Respiration rate	Inhalation	Asthma
(3) Brochiles	Breathing rate	Inhalation	Pneumonia
(4) Alveoli	Breathing rate	Exhalation	Asthma

3. Which of the following statements is correct about the gaseous exchange in lower animals ?

- (1) Unicellular organisms only use moist skin for the exchange of gases.
- (2) In insects, spiracles and bronchiole tubes are present to take in & expel out the gases.
- (3) Fishes use dissolved oxygen for respiration with the help of the body's surface.
- (4) Frogs can perform the cutaneous, branchial, buccal, and pulmonary types of respiration.

4. Refer to the flow chart & complete it by selecting the correct option.



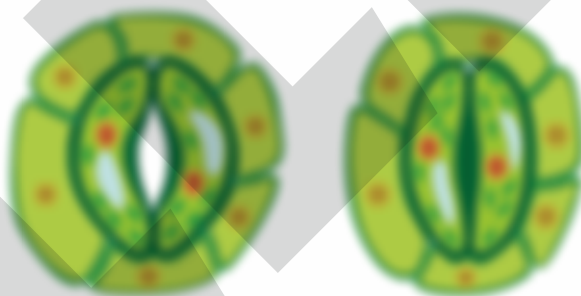
- P**
- Anaerobic
 - Facultative
 - Anaerobic
 - Facultative

- Q**
- Human
 - Human
 - Human
 - Human

- R**
- Lactic acid
 - Hydrochloric acid
 - Lactic acid
 - Sulphuric acid

- S**
- Anaerobic
 - Paramecium
 - Yeast
 - Anaerobic

5. Observe the figure & choose the correct statement for it.



- It is present at the back part of the stem.
- It is responsible for the exchange of gases during photosynthesis & respiration simultaneously.
- It can only release carbon dioxide and cannot take oxygen.
- It exchanges gases through simple diffusion with the help of root hair.

6. Which is the correct passage during inhalation of oxygen in humans?

- Nose → Bronchi → Nasal cavity → External nostrils → Larynx → Trachea → Bronchioles → Pharynx
- Nasal cavity → External nostrils → Pharynx → Trachea → Bronchi → Larynx → Bronchioles → Nose
- External nostrils → Nasal cavity → Pharynx → Larynx → Trachea → Bronchi → Bronchioles → Nose
- Nose → Nasal cavity → Bronchi → Trachea → Larynx → Bronchioles → Pharynx → External nostrils