

CLASS-9 BIOLOGY

DATE - 22.07.2024

CHAPTER- 14

TEACHER- Nidhi Rana

THE RESPIRATORY SYSTEM.

INSPIRED AIR VS EXPIRED AIR.

The air inside the lungs is never replaced completely. Air with oxygen is continuously taken in and air with CO_2 is continuously going out. Hence there is a mixture of CO_2 and O_2 containing air (in different proportions) in lungs. Thus air in lungs is becoming better when we inspire (air with more O_2 coming in) and worse when we exhale (air with more CO_2 going out). Air that we breathe in qualitatively contains all those gases which are present in normal composition of air (i.e. O_2 , CO_2 , nitrogen, water vapours etc.). Average composition of inspired and expired air is given in Table 14.3 of text book.

Effect of altitude on breathing.

As we go up on higher altitudes (Eg above 4500 mts above sea level) air pressure decreases, thus, the oxygen content in air decreases. Lack of oxygen leads to air sickness, dizziness, unsteady vision, loss of hearing, lack of muscular coordination and even complete blackouts.

Hypoxia - is a condition due to deficiency of oxygen reaching the tissues. Reasons may be-

- 1) Sitting in a crowded room (for long hours) with poor ventilation.
- 2) Person breathing at high altitudes where the oxygen content of air is low.

ASPHYXIATION - condition in which blood becomes more venous by accumulation of more CO_2 and the oxygen supply is reduced. It may be due to strangulation, drowning or any obstruction in the respiratory tract. It may cause death of the person.

Artificial respiration may be given to sufferer.

Experiments on Breathing and Respiration

- 1) Aim - To demonstrate that water is lost during breathing.

Gently breathe upon a cold surface [Eg on glass]

Observation - Water droplets appear on the surface

Inference - Water vapours exhaled during respiration have condensed on the glass surface

- 2) AIM - To demonstrate that CO_2 is given out in breathing

Set up an apparatus as shown in Fig 14.9 [Pg 145]

with two flasks containing lime water connected to each other (and with a common opening to the mouth) as shown in Fig. 14.9. Also Clip C and D are present. When Clip C is open, Clip D remains closed and flask B is disconnected/separated from the apparatus. Similarly when Clip D is open, Clip C remains closed, disconnecting the flask A from the apparatus. Now perform the following process -

Inhalation - Close clip D, Clip C is open. Suck the air in by the mouth, through the centre. Atmospheric air rushes in flask A bubbling through lime water

Exhalation - Close Clip C, Clip D is open.

Air is blown out (exhaled), through the same

central tube. This time air is forced into flask B bubbling through lime water.

Both inhalation and exhalation is repeated 10 times.

Observation - Lime water in flask B turns milky faster than flask A because in exhaled air CO_2 content is more than inhaled air.

3. AIM To demonstrate the action of diaphragm during breathing

Set up an experimental apparatus as shown in Fig 14.10 [Page 146] of text book.

Rubber sheet tied around the bottom edge of bell jar represents diaphragm and balloons represent the two lungs.

Inhalation - When the rubber sheet is pulled downwards, volume of inner cavity is increased lower the air pressure inside the bell jar and rubber balloons get expanded by the air rushing into them through the tube at the top.

Exhalation - When the sheet is pushed upward, volume of inner cavity is decreased and balloons collapse due to air rushing out from them through the tube at the top.

4. AIM To measure volume of expired air

Set up an apparatus as shown in Fig 14.11. Fill your chest with air to the maximum and then blow out through the short tube expelling as much air as you can.

Observation - The water expelled from the other tube when measured gives the volume of exhaled air.

5 AIM - To show that Oxygen is taken in by animals during respiration.

Take two flask A & B as -

Flask A - Place a live cockroach

Flask B - Place a dead cockroach soaked in formalin to prevent decay

Make both flask air tight by fitting rubber cork.
Leave the flasks for few hours.

Introduce a burning candle in both flasks and immediately close the mouth of flask again.

Observation - Flame goes out faster in flask A with live cockroach

Reason - Since Oxygen supports burning, the flame of candle goes out faster in flask A because living cockroach also consumes oxygen for respiration

Home Assignment

Q1 Do the following questions from "Progress Check" (given on Page 146 of your text book) in notebook

Q No 2 and 3

Q2 Do the following questions from "Review questions" (given on Pg 148 - 149 of your text book) in notebook

C. Short Answer type

Q No 4

D Long Answer type

Q No 4.