

# VIDYA BHAWAN BALIKA VIDYAPEETH

## STUDY MATERIAL SCIENCE CLASS-VII

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### ▶ Respiration in organisms

Differences between aerobic and anaerobic respiration

<b>Aerobic respiration</b>	<b>Anaerobic respiration</b>
It occurs in the presence of oxygen.	It takes place in the absence of oxygen.
The complete breakdown of food takes place in aerobic respiration.	Partial breakdown of food occurs in anaerobic respiration.
End products of aerobic respiration are CO <sub>2</sub> and water.	End products of anaerobic respiration are alcohol and CO <sub>2</sub> or lactic acid (in muscles).
A large amount of energy is produced during aerobic respiration.	Less amount of energy is produced during anaerobic respiration.

### **Breathing**

It is the process in which air rich in oxygen is taken inside and air rich in CO<sub>2</sub> is given out, with the help of respiratory organs. Thus, breathing involves two steps which take place alternately.

- **Inhalation:** Taking in of air rich in oxygen into our body is called inhalation.

- **Exhalation:** Giving out air rich in carbon dioxide from our body to the external environment is called exhalation.

This activity must be performed under the supervision of your teacher or parent. Close your nostrils and mouth tightly and look at a watch. Note down the time for which you could hold your breath. We will soon start feeling uneasy and cannot hold our breath for even one minute.

### **Breathing Rate**

The number of times a person breathes in a minute is termed as breathing rate. An adult human being can inhale and exhale 15-18 times in a minute. It is the average breathing rate of an adult human being.

The breathing rate of a person is not always constant. It changes according to the oxygen requirement of the body. Breathing rate is somewhat faster in women than in men and in children, it is higher (20-30 times/min) than adults. Breathing rate is slowest while sleeping (as less energy is required) while maximum during heavy exercise like running, weight lifting, etc. (much energy is required). Increased breathing rate provides a greater amount of air entry into the lungs, hence blood can absorb oxygen at a faster rate. Faster breathing supplies more oxygen to the body cell for producing more energy, required for heavy exercises.

During heavy exercise, the breathing rate can increase to 25 times per minute. Because of this, food gets broken down at a faster rate and thus make us feel hungry.

When we feel drowsy, sleepy or tired, we yawn (i.e. open our mouth wide to take a long and deep breath, of

air), because our breathing rate slows down and the body does not receive sufficient oxygen.

## Mechanism of Breathing

The mechanism of breathing can be understood by the following points:

- Normally, we take in air through our nostrils. When we inhale air, it passes through our nostrils into the nasal cavity.
- From the nasal cavity, the air reaches our lungs through the windpipe.
- Lungs are present in the chest cavity. This cavity is surrounded by ribs on the sides.
- A large, muscular sheet called diaphragm forms the floor of the chest cavity.

