

CLASS 11

BIOLOGY

NCERT SOLUTIONS

NCERT Solutions for Class 11 Biology Chapter 14: Breathing and Exchange of Gases – Free PDF Download

Chapter 14 of Class 11 Biology is Breathing and Exchange of Gases. It covers the human respiratory system, the mechanism of breathing, and gas exchange/transport in the body. These Class 11 Biology Chapter 14 solutions are also useful as quick revision notes before exams.

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- Human Respiratory System
- Mechanism of Breathing
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Human Respiratory System

Air passes through: nostrils → nasal cavity → pharynx → larynx → trachea → bronchi → bronchioles → **alveoli** (site of gas exchange, thin-walled, richly vascularized).

Mechanism of Breathing

Inspiration: diaphragm contracts (flattens) and external intercostal muscles contract, increasing thoracic volume, decreasing pressure, drawing air in. **Expiration:** diaphragm relaxes (domes upward), thoracic volume decreases, pressure increases, air is pushed out. Governed by **Boyle's Law** (pressure inversely proportional to volume).

Lung Volumes and Capacities

Tidal volume (~500mL, normal breath), **vital capacity** (maximum volume that can be forcibly exhaled after maximum inhalation), **residual volume** (air remaining after maximal exhalation, cannot be expelled).

Gas Exchange

Occurs by simple **diffusion** across the alveolar membrane, driven by partial pressure gradients: O_2 diffuses from alveoli (high pO_2) into blood (low pO_2); CO_2 diffuses from blood (high pCO_2) into alveoli (low pCO_2).

Transport of Gases

O_2 transport: ~97% bound to haemoglobin as oxyhaemoglobin, ~3% dissolved in plasma. **CO_2 transport:** ~70% as bicarbonate ions (HCO_3^-), ~20-25% bound to haemoglobin as carbaminohaemoglobin, ~7% dissolved in plasma.

Regulation of Respiration

Controlled by the **respiratory rhythm centre** in the medulla oblongata, primarily sensitive to CO_2 concentration (and pH) in the blood, rather than O_2 levels directly.

Class 11 Biology Chapter 14 – Notes and Extra Questions

Along with these NCERT Solutions, students can also use the [Class 11 Biology Chapter 14 Extra Questions](#) and [Class 11 Biology Chapter 14 Revision Notes](#) for quick revision and extra practice.

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