CLASS 11 BIOLOGY NCERT SOLUTIONS

NCERT Solutions for Class 11 Biology Chapter 12: Respiration in Plants – Free PDF Download

Chapter 12 of Class 11 Biology is Respiration in Plants. It covers cellular respiration -- glycolysis, fermentation, the Krebs cycle, and the electron transport chain -- and the energy yield from glucose breakdown. These Class 11 Biology Chapter 12 solutions are also useful as quick revision notes before exams.

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Glycolysis

Occurs in the **cytoplasm**, common to both aerobic and anaerobic respiration. One glucose molecule (6C) is broken down into two pyruvate molecules (3C), yielding a net gain of **2 ATP** and 2 NADH.

Fermentation (Anaerobic Respiration)

Occurs in absence of oxygen. **Alcoholic fermentation** (yeast): pyruvate → ethanol + CO_2. **Lactic acid fermentation** (some bacteria, muscle cells): pyruvate → lactic acid. Both regenerate NAD^+ but yield very little energy (net 2 ATP from glycolysis only), and are incomplete oxidation.

Aerobic Respiration: Krebs Cycle

Pyruvate is first converted to Acetyl CoA (in the mitochondrial matrix), which enters the **Krebs cycle (citric acid cycle)**, producing CO_2, NADH, $FADH_2$, and a small amount of ATP (via substrate-level phosphorylation).

Electron Transport System (ETS) and Oxidative Phosphorylation

Occurs on the **inner mitochondrial membrane**. NADH and $FADH_2$ donate electrons to the ETS; as electrons pass through complexes, protons are pumped, creating a gradient used by **ATP synthase** to produce the bulk of ATP (chemiosmosis). Oxygen is the final electron acceptor, forming water.

Energy Yield (Aerobic Respiration)

Complete aerobic oxidation of one glucose molecule yields a theoretical maximum of about **36-38 ATP**, vastly more than the 2 ATP from fermentation, because oxygen allows complete oxidation of glucose to CO_2+H_2O.

Respiratory Quotient (RQ)

RQ = volume of CO_2 evolved / volume of O_2 consumed. RQ=1 for carbohydrates, <1 for fats/proteins, >1 for organic acids.

Class 11 Biology Chapter 12 – Notes and Extra Questions

Along with these NCERT Solutions, students can also use the Class 11 Biology Chapter 12 Extra Questions and Class 11 Biology Chapter 12 Revision Notes for quick revision and extra practice.

See also: Chapter 1 | Chapter 2 | Chapter 3 | Chapter 4 | Chapter 5 | Chapter 6 | Chapter 7 | Chapter 8 | Chapter 9 | Chapter 10 | Chapter 11

Practice more: Chapter 1 | Chapter 2 | Chapter 3 | Chapter 4 | Chapter 5 | Chapter 6 | Chapter 7 | Chapter 8 | Chapter 9 | Chapter 10 | Chapter 11

Quick revision: Chapter 1 | Chapter 2 | Chapter 3 | Chapter 4 | Chapter 5 | Chapter 6 | Chapter 7 | Chapter 8 | Chapter 9 | Chapter 10 | Chapter 11