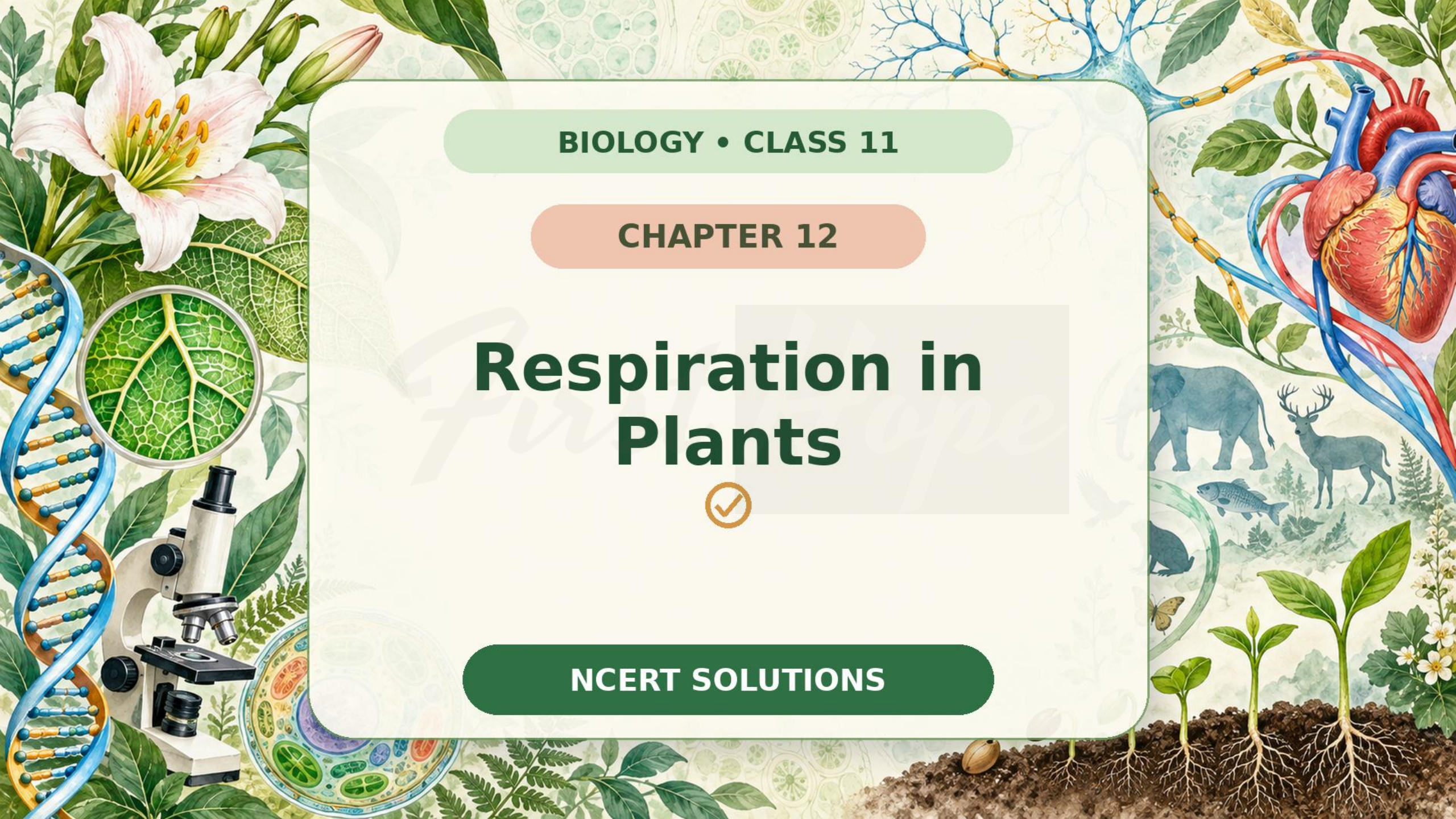


A detailed biology-themed collage serves as the background. It includes a large pink lily flower in the top left, a blue and orange DNA double helix on the left, a magnifying glass focusing on a green leaf's vein structure, a microscope in the bottom left, a cross-section of a plant cell, a human heart with red and blue blood vessels on the right, a blue elephant and a deer in the middle right, a fish and a frog in a pond, and several green seedlings with roots growing from brown soil at the bottom.

BIOLOGY • CLASS 11

CHAPTER 12

Respiration in Plants



NCERT SOLUTIONS

EXERCISE SOLUTION: QUESTION 1

1. Differentiate between (a) respiration and combustion, (b) glycolysis and Krebs' cycle, and (c) aerobic respiration and fermentation.

Answer:

(a)	RESPIRATION • Enzyme-controlled, step-wise oxidation in living cells. • Occurs at ordinary cellular temperature. • Energy is conserved mainly in ATP. • No flame.	COMBUSTION • Rapid, uncontrolled oxidation outside cells. • Usually needs ignition/high temperature. • Energy appears mainly as heat and light. • May produce a flame.
(b)	GLYCOLYSIS • Occurs in the cytoplasm. • Glucose $\rightarrow$ 2 pyruvate. • Linear pathway. • Net 2 ATP and 2 NADH per glucose.	KREBS' CYCLE • Occurs in the mitochondrial matrix in eukaryotes. • Acetyl-CoA $\rightarrow$ CO₂. • Cyclic pathway. • Per glucose forms 2 ATP/GTP, 6 NADH and 2 FADH₂.
(c)	AEROBIC RESPIRATION • Requires O₂. • Complete oxidation of glucose. • Occurs in cytoplasm plus mitochondria. • End products are CO₂ + H₂O. • Produces much more ATP per glucose.	FERMENTATION • Occurs without O₂. • Incomplete breakdown of glucose. • Occurs in the cytoplasm. • End products are ethanol + CO₂ or lactate. • Net 2 ATP per glucose.

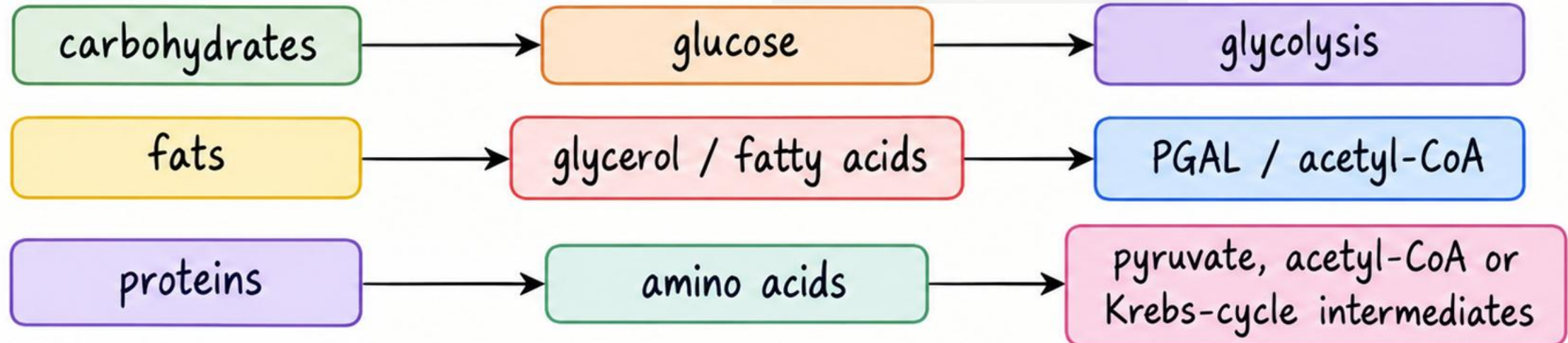
EXERCISE SOLUTION: QUESTION 2

2. What are respiratory substrates? Name the most common respiratory substrate.

Answer: Respiratory substrates are organic substances that cells oxidise during respiration to release energy and form ATP.

Most common respiratory substrate = glucose ($C_6H_{12}O_6$)

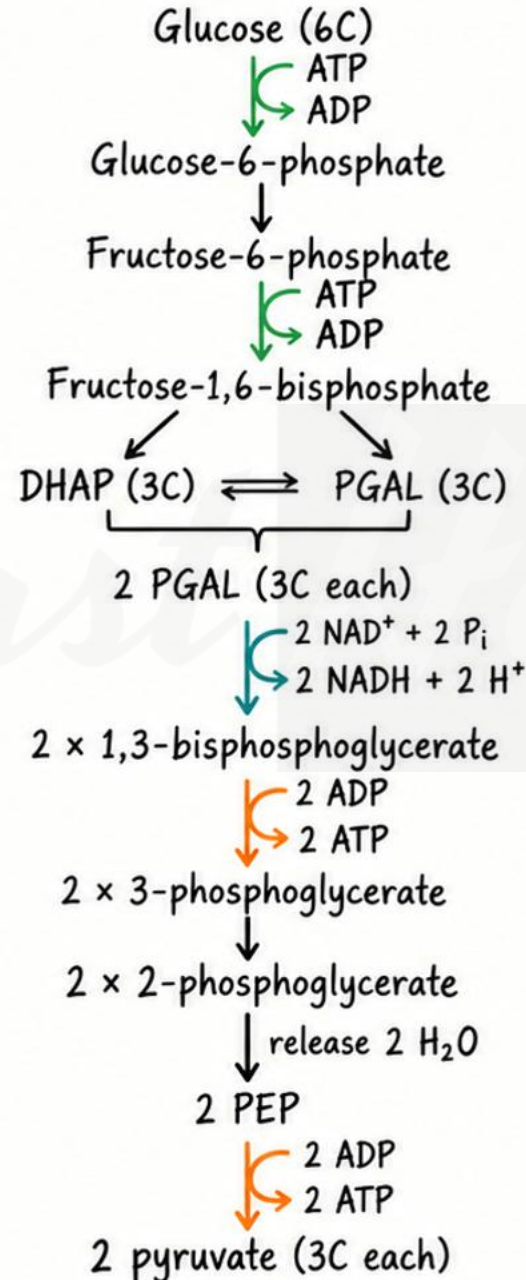
- Carbohydrates are usually converted to glucose before entering respiration.
- Fats and proteins can also be used when required: glycerol enters glycolysis; fatty acids form acetyl-CoA; amino acids enter after deamination.



EXERCISE SOLUTION: QUESTION 3

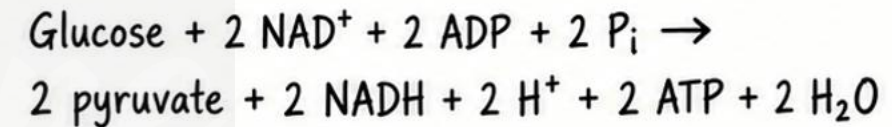
3. Give the schematic representation of glycolysis.

Answer:



Site: cytoplasm

Net equation:



ATP used = 2

ATP formed = 4

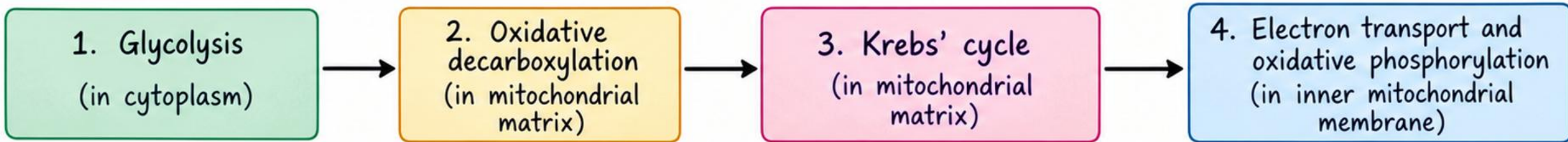
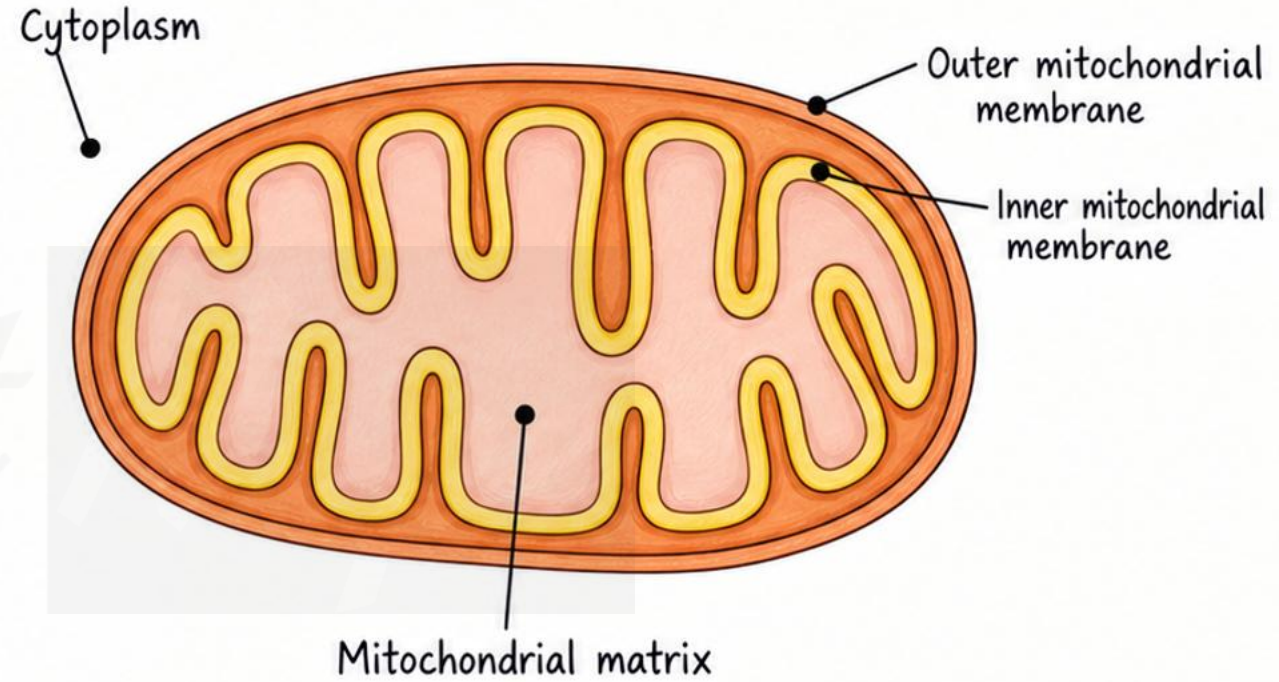
net gain = 2 ATP.

EXERCISE SOLUTION: QUESTION 4

Q4. What are the main steps in aerobic respiration? Where do they take place?

Answer:

1. Glycolysis—glucose becomes two pyruvate molecules; cytoplasm.
2. Oxidative decarboxylation—pyruvate becomes acetyl-CoA, releasing CO_2 and forming NADH; mitochondrial matrix.
3. Krebs' cycle—acetyl-CoA is oxidised to CO_2 ; NADH, FADH_2 and ATP/GTP form; mitochondrial matrix.
4. Electron transport and oxidative phosphorylation—electrons pass to O_2 , a proton gradient forms and ATP synthase makes ATP; inner mitochondrial membrane.



Overall flow: glucose $\rightarrow$ pyruvate $\rightarrow$ acetyl-CoA $\rightarrow$ Krebs' cycle $\rightarrow$ NADH/ FADH_2 $\rightarrow$ ETS $\rightarrow$ ATP + H_2O

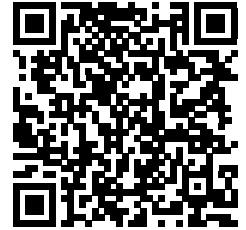


FREE PREVIEW

[Click here to visit our website](#)

SCHOOL NOTES & NCERT SOLUTIONS

Complete notes and
NCERT solutions are
available on
FirstHope app only.



[Scan or click here](#)

Click here to get the app



Available on Google Play

JOIN THE FIRSTHOPE COMMUNITY

Join our Telegram channel

Click here to join Telegram



[Scan or click here](#)

@FirstHope_CBSE_Notes

Instagram

@firsthope.school

[Click here to follow >](#)

YouTube channel

@firsthope.school

[Click here to watch >](#)

FirstHope website

firsthope.co.in

[Click here to visit our website >](#)

CBSE / Class 9 / Class 10 / Class 11 / Class 12

Preview notes and NCERT solutions. Full PDFs in the FirstHope app.