

Solutions

Each answer shows the steps, then the **result**.

2.1

- glycolysis — cytoplasm; Krebs cycle — mitochondrial matrix; oxidative phosphorylation — inner mitochondrial membrane

2.2

- 2 (a net gain of 2 ATP)

3.1 D

- In oxidative phosphorylation oxygen is the final electron acceptor

3.2 B

- In mammals, anaerobic respiration converts pyruvate to lactate

3.3

(a)

- pyruvate enters the mitochondrial matrix; it loses a CO_2 (decarboxylation) and is oxidised to a 2C acetyl group, reducing NAD; the acetyl group joins coenzyme A to form acetyl coenzyme A

(b)

- cristae give a large surface area for more electron carriers and ATP synthase, so more ATP is made

3.4

(a)

- energetic electrons pass along the electron transport chain, releasing energy; this pumps protons across the inner membrane into the intermembrane space; the protons flow back into the matrix through ATP synthase; this flow provides energy to make ATP (chemiosmosis)

(b)

- anaerobic respiration uses only glycolysis, without the link reaction, Krebs cycle and oxidative phosphorylation that release most of the ATP