

3.7 Cell respiration – summary of past mark schemes

3.7.2	<p>State that, in cell respiration, glucose in the cytoplasm is broken down by glycolysis into pyruvate, with a small yield of ATP.</p> <p>Mark Scheme</p> <ul style="list-style-type: none">A. one hexose sugar / glucose is converted to two 3-carbon compounds / pyruvate;B. at start 2 ATP are used / phosphorylation of glucose;C. net gain of 2 ATP / 4 ATP produced in total;D. production of 2NADH + H⁺ / reduced NAD;
3.7.4	<p>Explain that, during aerobic cell respiration, pyruvate can be broken down in the mitochondrion into carbon dioxide and water with a large yield of ATP.</p> <p>Mark Scheme</p> <ul style="list-style-type: none">A. glucose is broken down to pyruvate in the cytoplasm;B. with a small yield of ATP / net yield of 2 ATP;C. and NADH + H⁺ / NADH;D. aerobic respiration in the presence of oxygen;E. pyruvate converted to acetyl CoA;F. acetyl CoA enters Krebs cycle;G. Krebs cycle yields a small amount of ATP / one ATP per cycle;H. and FADH₂ / FADH + H⁺ / NADH / NADH + H⁺ / reduced compounds / electron collecting molecules;I. these molecules pass electrons to electron transport chain;J. oxygen is final electron acceptor / water produced;K. electron transport chain linked to creation of an electrochemical gradient;L. electrochemical gradient / chemiosmosis powers creation of ATP;M. through ATPase;
	<p><i>Compare anaerobic with aerobic</i></p> <p>Mark Scheme</p> <p>similarities:</p> <ul style="list-style-type: none">A. both can start with glucose;B. both use glycolysis;C. both produce ATP / energy (heat);D. both produce pyruvate;E. carbon dioxide is produced;F. (both start with glycolysis) aerobic leads to Krebs' cycle and anaerobic leads to fermentation; <p>Differences - anaerobic:</p> <ul style="list-style-type: none">G. (fermentation) produces lactic acid in humans;H. (fermentation) produces ethanol and CO₂ in yeast;I. occurs in cytoplasm of the cell;J. recycles NADH (NAD⁺); <p>Differences - aerobic cellular respiration:</p> <ul style="list-style-type: none">K. pyruvate transported to mitochondria;L. further oxidized to CO₂ and water (in Krebs' cycle);M. produce a larger amount of ATP (36–38 ATP) / anaerobic produces less ATP (2);N. can use other compounds / lipids / amino acids for energy;