

Scheme of work for Chapter 3, *The chemistry of life*

Syllabus section	Content	Time required	Outline of lesson content	Coursebook resources	Worksheets	Teacher's resources / Teaching ideas
3.1	Chemical elements and water	2 lessons	<ul style="list-style-type: none"> Identify the important elements in living things and their roles; draw water molecules and discuss polarity and hydrogen bonding Consider the properties of water and its uses as a coolant, transport and reaction medium 	p40–42 Short-answer Qs p46 End-of-chapter Qs p65–66: Q1	Support: Q1	Practical activity: practical to compare water and another solvent Link to ICT Exemplar exam question
3.2	Carbohydrates, lipids and proteins	2 lessons	<ul style="list-style-type: none"> Draw and identify amino acids, glucose, ribose and fatty acids; show how condensation reactions link them Give examples and functions of mono, di and polysaccharides, and of triglycerides and polypeptides; compare carbohydrates and lipids in energy storage 	p42–46 Short-answer Qs p46 End-of-chapter Qs p65–66: Q3	Support: Q2	Practical activity: simple kinaesthetic practical – assembling model molecules
3.3 and 3.4	DNA structure; DNA replication	2 lessons	<ul style="list-style-type: none"> Draw and label a nucleotide and show how nucleotides are linked to form a single strand and a double helix Explain DNA replication, complementary base pairing and semi-conservative replication 	p46–49 Short-answer Qs p53 End-of-chapter Qs p65–66: Q2	Support: Q3	Practical activity: video clips
3.5	Transcription and translation	2 lessons	<ul style="list-style-type: none"> Review DNA structure and compare it with that of RNA; outline the formation of RNA during transcription; describe the genetic code and codons Explain translation and polypeptide formation from genes 	p49–53 Short-answer Qs p53 End-of-chapter Qs p65–66: Q2	Extension: Q2, Q3 Support: Q4, Q5	

3.6	Enzymes	2–3 lessons	<ul style="list-style-type: none"> Explain the structure of enzymes and the lock-and-key hypothesis; explain how the structure is altered by pH and temperature and how enzymes are denatured Conduct practical work to show the effects of temperature, pH or substrate concentration on enzyme activity or the use of lactase in producing lactose-free products 	p53–57 Short-answer Qs p57 End-of-chapter Qs p65–66: Q4	Extension: Q5 Support: Q6	Practical activities: analysis of graphs; opportunity for assessed practical work; search for lactose-free products Link to TOK Link to ICT Link to Aspects of internationalism
3.7	Cell respiration	2 lessons	<ul style="list-style-type: none"> Explain cell respiration and the breakdown of glucose to pyruvate in both aerobic and anaerobic respiration; compare the yield of ATP in each case Carry out practical work using yeast to consider anaerobic respiration 	p58–60 Short-answer Qs p60 End-of-chapter Qs p65–66: Q5, Q6	Extension: Q1 Support: Q7	Practical activity: demonstration of anaerobic respiration using yeast Link to ICT
3.8	Photosynthesis	3 lessons	<ul style="list-style-type: none"> Consider the theory of photosynthesis including energy conversion, use of different wavelengths of light, chlorophyll; explain that photosynthesis involves photolysis, carbon dioxide fixation and oxygen production Explain the ways in which rate of photosynthesis can be measured Carry out practical work to show the effects of temperature, light intensity and/or CO₂ concentration on photosynthesis 	p60–64 Short-answer Qs p61, p64 End-of-chapter Qs p65–66: Q5, Q6	Extension: Q4	Practical activity: opportunity for assessed practical investigating rate of photosynthesis Link to ICT

Note: 1 lesson = approximately 40 minutes