

Biological molecules

Specification reference	Checklist questions	
3.1.1	Can you explain that all living things have a similar biochemical basis?	<input type="checkbox"/>
3.1.1	Can you explain that monomers are smaller units from which larger molecules are made?	<input type="checkbox"/>
3.1.1	Can you describe polymers and state that they are made from a large number of monomers?	<input type="checkbox"/>
3.1.1	Can you name examples of monomers – for example, monosaccharides, amino acids, and nucleotides?	<input type="checkbox"/>
3.1.1	Can you describe how a condensation reaction joins two molecules together?	<input type="checkbox"/>
3.1.1	Can you explain that a condensation reaction forms a chemical bond and involves the elimination of a molecule of water?	<input type="checkbox"/>
3.1.1	Can you describe how a hydrolysis reaction breaks a chemical bond between two molecules, involving the use of a water molecule?	<input type="checkbox"/>
3.1.2	Can you describe how larger carbohydrates are made from monosaccharide monomers?	<input type="checkbox"/>
3.1.2	Can you list some common monosaccharides – for example, glucose, galactose and fructose?	<input type="checkbox"/>
3.1.2	Can you describe how a condensation reaction between two monosaccharides forms a glycosidic bond?	<input type="checkbox"/>
3.1.2	Can you describe how disaccharides are formed by the condensation of two monosaccharides?	<input type="checkbox"/>
3.1.2	Can you explain that maltose is a disaccharide formed by the condensation of two glucose molecules?	<input type="checkbox"/>

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3.1.2	Can you explain that sucrose is a disaccharide formed by the condensation of a glucose molecule and a fructose molecule?	<input type="checkbox"/>
3.1.2	Can you explain that lactose is a disaccharide formed by the condensation of a glucose molecule and a galactose molecule?	<input type="checkbox"/>
3.1.2	Can you describe how glucose has two isomers, α -glucose and β -glucose?	<input type="checkbox"/>
3.1.2	Can you draw the structure of an α -glucose isomer?	<input type="checkbox"/>
3.1.2	Can you draw the structure of an β -glucose isomer?	<input type="checkbox"/>
3.1.2	Can you describe how polysaccharides are formed by the condensation of many glucose units?	<input type="checkbox"/>
3.1.2	Can you explain that glycogen and starch are formed by the condensation of α -glucose?	<input type="checkbox"/>
3.1.2	Can you explain that cellulose is formed by the condensation of β -glucose?	<input type="checkbox"/>
3.1.2	Can you describe the basic structure and functions of glycogen, starch and cellulose?	<input type="checkbox"/>
3.1.2	Can you describe the relationship of structure to function of glycogen, starch and cellulose in animal cells?	<input type="checkbox"/>
3.1.2	Can you describe the relationship of structure to function of glycogen, starch and cellulose in plant cells?	<input type="checkbox"/>
3.1.2	Can you describe and conduct biochemical tests using Benedict's solution for reducing sugars and non-reducing sugars?	<input type="checkbox"/>
3.1.2	Can you describe and conduct biochemical tests using iodine/potassium iodide for starch?	<input type="checkbox"/>

Specification reference	Checklist questions	
3.1.3	Can you explain how triglycerides and phospholipids are two groups of lipid?	<input type="checkbox"/>
3.1.3	Can you describe how triglycerides are formed by the condensation of one molecule of glycerol and three molecules of fatty acid?	<input type="checkbox"/>
3.1.3	Can you describe how a condensation reaction between glycerol and a fatty acid (RCOOH) forms an ester bond?	<input type="checkbox"/>
3.1.3	Can you explain that the R-group of a fatty acid may be saturated or unsaturated?	<input type="checkbox"/>
3.1.3	Can you describe how, in phospholipids, one of the fatty acids of a triglyceride is substituted by a phosphate-containing group?	<input type="checkbox"/>
3.1.3	Can you list and describe the different properties of triglycerides and phospholipids related to their different structures?	<input type="checkbox"/>
3.1.3	Can you describe and conduct the emulsion test for lipids?	<input type="checkbox"/>
3.1.3	Can you recognise a diagram of a saturated fatty acid?	<input type="checkbox"/>
3.1.3	Can you recognise a diagram of an unsaturated fatty acid?	<input type="checkbox"/>
3.1.3	Can you explain the different properties of triglycerides?	<input type="checkbox"/>
3.1.3	Can you explain the different properties of phospholipids?	<input type="checkbox"/>
3.1.4.1	Can you explain that amino acids are the monomers from which proteins are made?	<input type="checkbox"/>
3.1.4.1	Can you recognise and draw the general structure of an amino acid?	<input type="checkbox"/>
3.1.4.1	Can you explain that the twenty amino acids that are common in all organisms differ only in their side group?	<input type="checkbox"/>

Specification reference	Checklist questions	
3.1.4.1	Can you explain that a condensation reaction between two amino acids forms a peptide bond?	<input type="checkbox"/>
3.1.4.1	Can you describe how dipeptides are formed by the condensation of two amino acids?	<input type="checkbox"/>
3.1.4.1	Can you describe how polypeptides are formed by the condensation of many amino acids?	<input type="checkbox"/>
3.1.4.1	Can you explain that a functional protein may contain one or more polypeptides?	<input type="checkbox"/>
3.1.4.1	Can you describe the role of hydrogen bonds, ionic bonds and disulfide bridges in the structure of proteins?	<input type="checkbox"/>
3.1.4.1	Can you explain that proteins have a variety of functions within all living organisms?	<input type="checkbox"/>
3.1.4.1	Can you describe the relationship between primary, secondary, tertiary and quaternary structure, and protein function?	<input type="checkbox"/>
3.1.4.1	Can you describe and conduct the biuret test for proteins?	<input type="checkbox"/>
3.1.4.1	Can you relate the structure of proteins to properties of a variety of proteins?	<input type="checkbox"/>
3.1.4.2	Can you explain that each enzyme lowers the activation energy of the reaction it catalyses?	<input type="checkbox"/>
3.1.4.2	Can you describe the induced-fit model of enzyme action?	<input type="checkbox"/>
3.1.4.2	Can you explain that the properties of an enzyme relate to the tertiary structure of its active site and its ability to combine with complementary substrate(s) to form an enzyme-substrate complex?	<input type="checkbox"/>
3.1.4.2	Can you describe the specificity of enzymes?	<input type="checkbox"/>

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3.1.4.2	Can you describe the effects of the following factors on the rate of enzyme-controlled reactions: <ul style="list-style-type: none">• enzyme concentration• substrate concentration• concentration of competitive and of non-competitive inhibitors• pH• temperature?	<input type="checkbox"/>
3.1.4.2	Can you describe how models of enzyme action have changed over time?	<input type="checkbox"/>
3.1.4.2	Can you describe how enzymes catalyse a wide range of intracellular and extracellular reactions that determine structures and functions from cellular to whole-organism level?	<input type="checkbox"/>
3.1.4.2	Can you investigate the effect of a named variable on the rate of an enzyme-controlled reaction?	<input type="checkbox"/>