GCSE Biology

Unit 1: CELLS, ORGAN SYSTEMS and ECOSYSTEMS

GCSE Biology Sub-topic	NEW The sciences (double award) Sub-topic	Points to note
1.1 Cells and movement across membranes	1.1.1 Structure of animal and plant cells	Similar requirement to GCSE Biology. There is no longer a requirement to cover the limitations of light microscopy or to make simple comparisons with the electron microscope.
	1.1.2 Levels of organisation within multicellular organisms	Similar requirement to GCSE Biology.
	1.1.3 How cells get what they need	Similar requirement to GCSE Biology. Osmosis is now explained using water potential rather than water concentration, offering students better preparation for progression to A level.
	1.2.1 Function of enzymes	Similar requirement to GCSE Biology. There is no longer a requirement for learners to understand how different enzymes are composed of amino acids linked into a chain, which is then folded into a specific shape
1.2 Respiration and the respiratory system in humans	1.2.2 Aerobic and anaerobic respiration in humans	Similar requirement to GCSE Biology. Institute of Physics (IoP) 'stores and pathways' model adopted when discussing energy (Unit 3.2.1) does not match with the legacy specification. Using germinating peas to demonstrate that energy is released as heat during respiration is no longer required.
	1.3.3 Respiratory system in humans	Similar requirement to GCSE Biology. The effects of asthma on the respiratory system are now included in the specification, along with the ability to carry out and interpret peak flow measurements. However, the use of a bell jar model to illustrate inspiration and expiration, including its limitations, is no

		longer required. Similarly, learners are no longer expected to study the percentage composition of inspired and expired air or the reasons for the differences. Detailed recall of the effects of smoking on cilia and mucus in the respiratory system, and the consequences for the individual, is also no longer required.
1.3 Digestion and the digestive system in humans	1.3.2 Digestive system in humans	Similar requirement to GCSE Biology. The use of Visking tubing as a model gut, including discussion of its limitations, is no longer required. However, learners are still expected to understand how Visking tubing can be used to illustrate the size of membrane pores and the size of particles involved, which determines which substances are able to pass through. This is covered in section 1.1.3: How cells get what they need.
1.4 Circulatory system in humans	1.3.4 Circulatory system in humans	Similar requirement to GCSE Biology. The structure of arteries, veins, and capillaries and how this relates to their function are no longer required. Similarly, learners are not expected to study the advantages and disadvantages of treatments for cardiovascular disease in the new Double Award.
1.5 Plants and photosynthesis	1.2.3 Photosynthesis and factors that affect it	Similar requirement to GCSE Biology. The practical techniques used to investigate photosynthesis, including the use of sodium hydroxide to absorb carbon dioxide and testing a leaf for the presence of starch, are no longer required.
	1.3.1 Transport systems in plants	Similar requirement to GCSE Biology. Detailed knowledge of potometers is not required in the new Double Award. However, scientific investigations into transpiration may still involve measuring changes in the volume of water or the mass of a plant cutting placed in water under different environmental conditions. The effects of plant nutrient deficiencies on plant growth, including the use of NPK fertilisers, are no longer required.
1.6 Ecosystems, nutrient cycles and human impact on the environment	1.4.1 Relationships within an ecosystem	Similar requirement to GCSE Biology. Pyramids of numbers and biomass are no longer required. However, calculating the efficiency of energy transfers between trophic levels is now common to both tiers, although equations will be provided in the assessment.

		Institute of Physics (IoP) 'stores and pathways' model adopted when discussing energy (Unit 3.2.1) does not match with the legacy specification.
	4.1.1 Impact of human activity on local ecosystems	Similar requirement to GCSE Biology.
	4.1.2 Impact of human activity on the global ecosystem	Similar requirement to GCSE Biology. Nitrogen cycle is no longer required for higher tier.

UNIT 2 – VARIATION, HOMEOSTASIS and MICRO-ORGANISMS

GCSE Biology Sub-topic	NEW The sciences (double award) Sub-topic	Points to note
2.1 Classification and Biodiversity	1.4.2 Biotic and abiotic factors within an ecosystem	Classification is no longer required. Competition is now taught in the context of biotic and abiotic factors. The term *invasive non-native species* is now used instead of *alien species*.
	4.3.2 Natural selection	Adaptations covered in the context of natural selection.
	4.1.1 Impact of human activity on local ecosystems	Similar requirements to GCSE Biology. The principles of capture/recapture techniques including simple calculations on estimated population size, are no longer required.
	4.1.2 Impact of human activity on the global ecosystem	Biological control is now treated separately from 'alien' species and is set in the context of the advantages and disadvantages of farming methods used to increase yield.

2.2 Cell Division and Stem Cells	4.2.2 Stem cells	Similar requirement to GCSE Biology. Mitosis is introduced with less detail in the context of stem cells.
	4.2.3 Inheritance	Meiosis is introduced with less detail in the context of gamete production.
2.3 DNA and Inheritance	4.2.1 DNA structure and function	Similar requirement to GCSE Biology.
	4.2.3 Inheritance	Similar requirement to GCSE Biology.
	4.3.3 Gene technology	The description of genetic modification has been updated to include adding, removing, or editing genes.
2.4 Variation and Evolution	4.3.1 Types of variation	Similar requirement to GCSE Biology. Includes reference to heritable and non-heritable variation.
	4.2.1 DNA structure and function	Mutations are included.
	4.2.3 Inheritance	No specific examples of genetic disease required; only an understanding of inheritance.
	4.3.2 Natural selection	Similar requirement to GCSE Biology. Modelling of camouflage colouring in predator-prey relationships and its limitations is no longer required.
2.5 Response and Regulation	4.4.1 The nervous system	Similar requirement to GCSE Biology. The structure and function of parts of the eye are not required.
	4.4.2 Control of temperature in humans	Similar requirement to GCSE Biology.
	4.4.3 Control of blood glucose in humans	Similar requirement to GCSE Biology.
		The positive response of plant shoots to light (phototropism) and plant roots to gravity (gravitropism), and the explanation that phototropism is due to the plant hormone auxin, are no longer required.

2.6 Role of Kidney in Homeostasis		Not covered.
2.7 Micro-Organisms and Their Applications	4.5.2 Communicable disease	Investigating the effect of antimicrobials on the growth of bacteria. The use of aseptic techniques to prevent contamination is covered in this topic.
		The factors that influence the growth of the fungus Penicillium when grown industrially in a fermenter, and how penicillin is extracted from the surrounding medium, is not required.
2.8 Disease, Defence and Treatment	4.5.2 Communicable disease	Similar requirement to GCSE Biology. Detailed study of HIV/AIDS, Chlamydia, and Malaria is not required.
	4.5.3 Natural defence systems and immunity	Similar requirement to GCSE Biology. New drug treatments and the process of discovering and developing new drugs are not required.