

# Combined Science: Biology (AQA - Trilogy)

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## Paper 1

### Cell biology

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|  | I can describe the differences between eukaryotic and prokaryotic cells.               |
|  | I can describe the structures in animal and plant cells and explain their functions.   |
|  | I can use a light microscope to observe and draw cells with a scale.                   |
|  | I can explain how specialised cells are adapted for their functions.                   |
|  | I can explain the importance of cell differentiation.                                  |
|  | I can compare light and electron microscopes and carry out magnification calculations. |
|  | I can describe the structure and role of chromosomes.                                  |
|  | I can describe the stages of the cell cycle including mitosis.                         |
|  | I can explain what stem cells are and discuss their uses and ethical issues.           |
|  | I can describe diffusion and explain the factors that affect its rate.                 |
|  | I can describe osmosis and interpret data from practicals.                             |
|  | I can describe active transport and explain how it differs from diffusion and osmosis. |

### 4.2 Organisation

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|  | I can describe how cells, tissues, organs and organ systems are related.                      |
|  | I can describe the human digestive system and the roles of enzymes in digestion.              |
|  | I can interpret enzyme rate graphs and describe the effect of pH and temperature.             |
|  | I can describe the structure and function of the heart and blood vessels.                     |
|  | I can describe the components of blood and their functions.                                   |
|  | I can evaluate treatments for cardiovascular disease (e.g. stents, statins, and transplants). |
|  | I can explain how different diseases interact and affect health.                              |

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|  | I can explain how lifestyle factors affect non-communicable diseases.                     |
|  | I can explain the causes and effects of cancer.   |
|  | I can describe the structure and function of plant tissues (e.g. xylem, phloem, stomata). |
|  | I can describe how factors affect transpiration and explain translocation                 |

### 4.3 Infection and Response

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|  | I can describe the types of pathogens and how diseases spread.                                     |
|  | I can describe symptoms and transmission of measles, HIV and TMV.                                  |
|  | I can describe symptoms and prevention of Salmonella and gonorrhoea.                               |
|  | I can describe symptoms and treatment of rose black spot.  |
|  | I can explain how malaria is transmitted and how it is controlled.                                 |
|  | I can describe the non-specific defence systems of the human body.                                 |
|  | I can explain the role of white blood cells in defence (phagocytosis, antibodies, and antitoxins). |
|  | I can explain how vaccination works and evaluate its use.  |
|  | I can describe how antibiotics and painkillers treat disease and discuss resistance.               |
|  | I can describe how new drugs are developed and tested.   |

### 4.4 Bioenergetics

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|  | I can write the word and symbol equation for photosynthesis and describe it as endothermic. |
|  | I can describe and interpret graphs showing how factors affect the rate of photosynthesis.  |
|  | I can evaluate the use of greenhouses to increase photosynthesis.                           |
|  | I can describe how plants use the glucose they make in photosynthesis.                      |
|  | I can describe aerobic respiration using word and symbol equations.                         |
|  | I can compare aerobic and anaerobic respiration in animals and microorganisms.              |
|  | I can describe the body's response to exercise and define oxygen debt.                      |

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|  | I can describe metabolism and give examples of metabolic reactions. |
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## Paper 2

### 4.5 Homeostasis and response

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|  | I can explain the importance of homeostasis and describe automatic control systems.      |
|  | I can describe the structure and function of the nervous system including reflex arcs.   |
|  | I can plan and carry out a practical to measure human reaction time.                     |
|  | I can name the main endocrine glands and describe the roles of hormones.                 |
|  | I can describe how insulin and glucagon control blood glucose levels.                    |
|  | I can describe the roles of hormones in the menstrual cycle.                             |
|  | I can evaluate methods of contraception.   |
|  | (HT) I can explain how hormones are used to treat infertility (e.g. IVF).                |
|  | (HT) I can describe the roles of adrenaline and thyroxine and explain negative feedback. |

### 4.6 Inheritance, variation and evolution

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|  | I can compare sexual and asexual reproduction.                                      |
|  | I can describe the process of meiosis and its role in sexual reproduction.          |
|  | I can describe the structure of DNA and define genome.                              |
|  | I can use genetic diagrams to show inheritance and predict outcomes.                |
|  | I can describe inherited disorders and evaluate embryo screening.                   |
|  | I can complete a genetic diagram to show sex inheritance.                           |
|  | I can describe causes of variation in organisms.                                    |
|  | I can describe how evolution occurs through natural selection.                      |
|  | I can explain how selective breeding works and discuss its risks and benefits.      |
|  | I can describe genetic engineering and evaluate its uses in crops and medicine.     |
|  | I can describe the evidence for evolution including fossils and resistant bacteria. |
|  | I can explain how fossils form and why the fossil record is incomplete.             |

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|  | I can list factors that cause extinction.  |
|  | I can explain how resistant bacteria evolve and how to reduce resistance.          |
|  | I can describe classification systems including Linnaean and three-domain systems. |

#### 4.7 Ecology

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|  | I can describe different levels of organisation in an ecosystem and explain the importance of interdependence and competition. |
|  | I can suggest what organisms compete for in a habitat and how they are adapted to survive.                                     |
|  | I can explain how changes in abiotic factors (like light, temperature, or moisture) affect a community.                        |
|  | I can explain how changes in biotic factors (like food, predators, or disease) affect a community.                             |
|  | I can explain how organisms are adapted to survive in their environments, including extremophiles.                             |
|  | I can describe feeding relationships in food chains and understand the roles of producers and consumers.                       |
|  | I can use transects and quadrats to estimate population size and distribution.   |
|  | I can calculate means and interpret predator-prey cycles using graphs.   |
|  | I can describe the carbon and water cycles and explain the role of microorganisms in cycling materials.                        |
|  | I can explain what biodiversity is and why it is important.  |
|  | I can describe types of pollution (air, water, land) and their effects on biodiversity.  |
|  | I can describe how human land use affects biodiversity, including peat bog destruction.  |
|  | I can explain the causes and effects of deforestation.   |
|  | I can describe the biological consequences of global warming.  |
|  | I can describe positive and negative human impacts on biodiversity and evaluate ways to maintain it.                           |

## 4.8 Key ideas

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|  | I understand that life processes depend on molecules whose structure is related to their function.   |
|  | I understand that cells are the basic units of life and are organised into tissues, organs, and organ systems to perform living processes effectively. |
|  | I understand that living organisms form populations and communities within ecosystems, and interact with each other, the environment, and humans.      |
|  | I can explain that living organisms are interdependent and adapted to their environments.  |
|  | I understand that life on Earth depends on photosynthesis in plants and algae, which trap light energy to make food and oxygen.                        |
|  | I can explain that organic compounds are used as fuels in cellular respiration to support life processes.  |
|  | I know that chemicals in ecosystems are continually cycled through living and non-living components.   |
|  | I understand that an organism's characteristics are influenced by its genome and how it interacts with the environment.                                |
|  | I can explain that evolution by natural selection accounts for biodiversity and the relationships between organisms.                                   |