OCR Biology Checklist

Double Award

VIDEO | EXAM Q&A

Topic 1. Cell level systems

Video: **Eukaryotic and prokaryotic cells**

- Compare the structure of animal and plant cells.
- Label typical and atypical prokaryotic cells.
- Compare prokaryotic and eukaryotic cells.

Video: **Orders of Magnitude and Standard Form**

- Practice converting units.
- Write numbers in standard form.
- Calculate differences in orders of magnitude.
- Multiply and divide numbers in standard form [Higher Tier].

Video: **Microscopes and Magnification**

- Compare light and electron microscopes.
- Describe how to use a microscope to view prepared animal and plant cells.
- Calculate magnification [Maths Skills].

Video: **Microscope Drawing and Maths Skills**

- Estimate cell size based on the diameter of the field of view.
- Accurately calculate cell size using an eyepiece graticule and a stage micrometer.
- Draw low and high plan drawings from microscopes.

Video: **DNA**

- Describe DNA as a polymer.
- Describe DNA as being made up of 2 strands forming a double helix.
- BIOLOGY ONLY: Explain that DNA is made up of nucleotides comprised of a sugar, a phosphate and one of four different bases.

Video: **Enzymes**

- Describe enzyme structure and how they work.
- Describe and explain the factors that affect enzyme reactions with reference to typical rates of reaction graphs.

Video: **PAG Investigating Enzymes and Calculating the Rate of Reaction**

- Describe how to conduct a rates of reaction investigation on amylase.
- Calculate and plot the rate of reaction.

Video: **Respiration**

- Describe respiration as an exothermic reaction that generates ATP.
- Compare aerobic and anaerobic respiration.
- Compare anaerobic respiration in animals with plants and fungi.

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Video: **PAG Breakdown and testing of biological molecules**

- Describe the monomers and polymers of the major food groups.
- BIOLOGY ONLY PAG 2 'Describe how to test food for the presence of biological molecules'.
- Describe how enzymes work in the digestive system.

Video: **Photosynthesis**

- Describe how glucose is used in a plant.
- Describe the 2 stage process of photosynthesis and explain why it is an endothermic reaction.
- Describe experiments using starch to investigate photosynthesis in the absence of chlorophyll, light and carbon dioxide.

Video: **PAG Investigating the rate of photosynthesis**

- Describe how light intensity affects the rate of photosynthesis.
- Apply the principle of the inverse square law [Higher Tier & Maths Skill].
- Calculate the rate of reaction [Maths Skills].

Video: **Limiting Factors in Photosynthesis**

- Explain the effect of temperature, light intensity and carbon dioxide concentration on the rate of photosynthesis.
- Explain the interaction of these limiting factors [Higher Tier].

Topic 2. Scaling up

Video: **Exchange Surfaces and Diffusion**

- Define diffusion.
- Explain why multicellular organisms need exchange surfaces with large surface area to volume ratios.
- Calculate the surface area to volume ratio [Maths Skill].
- Explain how the lungs and the small intestine are adapted to maximise diffusion.

Video: **Osmosis including PAG 'Effect of water potentials on potato'**

- Define osmosis in terms of water potential.
- Explain what could happen to animal and plant cells, due to osmosis, if the water potential is not regulated.
- Investigate how the concentration of a solution could affect the change in mass of potato chips.
- Calculate the % change in mass [Maths Skill].

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Video: **Active Transport**

- Define active transport.
- Describe the process of active transport and the involvement of carrier proteins.
- Describe the process of active transport in root hair cells and in the small intestine.

Video: **Specialised Cells**

- Explain the importance of cell differentiation in multicellular organisms to form cells that are specialised.
- Describe and explain the adaptations of some specialised cells.

Video: **Mitosis**

- Describe the cell cycle in terms of DNA replication and mitosis.
- Explain the importance of mitosis.

Video: **Stem Cells**

- Define a stem cell.
- Describe the difference between embryonic and adult stem cells
- State that stem cells in plants are found in their meristems.

Video: **The Circulatory System**

- Explain how red blood cells and plasma are adapted for transport.
- Describe the structure of the double circulatory system.
- Explain how the structure of the heart and blood vessels are adapted to their function.

Video: **Plant Tissues**

- Describe the adaptations of the tissues in a leaf.
- Explain how water and mineral ions are taken up by plant roots, relating the structure of root hair cells to this function.
- Explain how the structure of the xylem and phloem are adapted to their function in the plant.

Video: **Transpiration**

- Explain the effect of a variety of environmental factors on the rate of water uptake by a plant.
- Describe how a simple potometer can be used to investigate a factor that affects the rate of water uptake in plants.

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Topic 3. Organism level systems

Video: **The Nervous System**

- Describe the structure of the nervous system|Explain how the components of the nervous system can produce a coordinated response.
- Explain how the structure of a reflex arc is related to its function.
- Describe the role of synapses.

Video: **The Endocrine System**

- Describe the principles of hormonal control in the endocrine system.
- Name some of the endocrine glands.
- Compare hormonal and nervous control.

Video: **Human Reproduction**

- Describe the roles of the hormones in the menstrual cycle.
- Describe how these hormones interact in the menstrual cycle [Higher Tier].
- Evaluate the use of hormones as contraceptives.
- Explain how hormones are used to treat infertility [Higher Tier].

Video: **Adrenaline and Thyroxine**

- Explain the role of thyroxine and adrenaline in the body.
- Explain why thyroxine is an example of negative feedback.

Video: **Controlling Blood Glucose**

- Explain how insulin controls blood sugar levels in the body.
- Explain how glucagon interacts with insulin to control blood sugar levels in the body [Higher Tier].
- Compare type 1 and type 2 diabetes and explain how they should be treated.

Topic 4. Community level systems

Video: **Interdependence**

- Describe how ecosystems are organised.
- Explain how biotic and abiotic factors affect communities.
- Describe how species interact in a community by referring to competition and predator-prey cycles.

Video: **Nutrient Cycling**

- Describe how carbon, nitrogen and water are cycled in ecosystems.
- Describe the role of decomposers in the cycling of nutrients in ecosystems.
- Describe the factors that effect decay and calculate the rate of decay of biological material [Maths Skills].

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Video: **Practical Activity Group (PAG) Sampling**

- Describe how quadrats can be used to estimate the population of an organism in a habitat.
- Describe how to use transects with quadrats to investigate the effect of an abiotic factor on the distribution of a plant species.
- Describe how to minimise bias in an ecological study.

Topic 5. Genes, inheritance and selection

Video: **Variation and Mutations**

- Define what is meant by variation.
- Explain how variation arises from mutations.
- Compare inherited and environmental causes of variations.
- Describe how mutations can cause a variety of phenotypic outcomes.
- Explain why mutations on non-coding DNA can have no affect on protein structure but can also result in the DNA not being transcribed to make a protein, while mutations in coding DNA can alter the protein's final shape. [Higher Tier]

Video: **Sexual and Asexual Reproduction and Meiosis**

- Compare sexual and asexual reproduction.
- Evaluate both forms of reproduction in a range of organisms.

Video: **Inheritance**

- Distinguish between the terms dominant, recessive, homozygous and heterozygous.
- Explain the inheritance of characteristics using Punnett squares.
- Explain why there is a 50:50 ratio of the inheritance of gender.

Video: **Fractions, Ratios, Proportion and Probability of Inheriting Diseases**

- Apply the concept of probability in the context of inherited diseases.
- Analyse genetic cross' using ratios, fractions and percentages [Maths Skills].

Video: **Natural Selection**

- Describe the process of natural selection as a driving force for evolution.

Video: **Evidence of Evolution and Extinction**

- Describe how fossils and antibiotic resistance in bacteria provide evidence for evolution.
- Explain why extinction occurs if a species cannot adapt to change.

Video: **Classification**

- Describe how scientific advances have led to the natural classification system.
- Describe binomial nomenclature.

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Topic 6. Global challenges

Video: **Biodiversity**

- Define biodiversity.
- Explain the reasons behind a loss in biodiversity.
- Describe ways that biodiversity can be maintained and increased.

Video: **Sampling Techniques**

- Define a sample.
- Describe some techniques used to sample animals.
- Explain how to use an identification key.

Video: **Selective Breeding**

- Define selective breeding.
- Explain the impact of selective breeding on food plants and domesticated animals.
- Evaluate the process of selective breeding.

Video: **Genetic Engineering**

- Describe what genetic engineering is.
- Evaluate the use of genetic engineering in agriculture.
- Describe how to genetically engineer bacteria to produce insulin and how marker genes are used to select the GM bacteria [Higher Tier].
- Describe how to genetically modify an organism using viral vectors [Higher Tier].

Video: **Preventing The Spread of Pathogens**

- Describe the mechanisms of pathogen transfer and describe the body's physical barriers to pathogens transferred in those ways, including the role of platelets in clotting.
- Describe ways that plant pathogens can be spread and how humans can prevent the spread of such pathogens.
- Describe methods used to prevent the spread of communicable diseases to other countries.

Video: **Preventing and Treating Communicable Disease**

- Explain the use of vaccines and medicines in the prevention and treatment of communicable disease.

Video: **Culturing Microorganisms**

- Define what is meant by aseptic techniques.
- Describe how to use aseptic techniques to culture a species of bacteria.
- Describe how to investigate the effect of an antimicrobial agent on the growth of bacteria (PAG).
- Calculate the area of the inhibition zones (Maths Skill) to evaluate the effectiveness of different antimicrobial agents on bacteria growth.

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Video: **Communicable Diseases in Humans and Plants**

- Describe a range of common bacterial, fungal and viral infections that affect humans.
- Describe a range of common bacterial, fungal and viral infections that affect plants.

Video: **Immunity and Vaccination**

- Recap the body's first line of defence (non-specific immunity).
- Describe the role of phagocytes in non-specific immunity.
- Describe the role of lymphocytes in the body's second line of defence (specific immunity).
- Describe how vaccines generate antibodies to provide immunity to communicable diseases.

Video: **Developing New Drugs**

- Describe the process of discovery, development and trialling of new medicines.
- Explain how bias is reduced in drug trialling

Video: **Health, Disease and Risk Factors**

- Define and give examples of non-communicable human diseases.
- Analyse the effect of lifestyle factors on the incidence of communicable diseases.

Video: **Cardiovascular Disease (CVD)**

- Describe a range of different forms of cardiovascular disease.
- Describe and evaluate the treatments available for each type of issue associated with the circulatory system.

Video: **Modern Advancements in Medicine**

- Discuss and evaluate the use of stem cells in medicine.
- Discuss and evaluate the use of stem cells from therapeutic cloning.
- Discuss and evaluate the use of gene therapy in treating diseases.
- Describe the benefits of the Human Genome Project.