

## Biology

### KS2

- **Living Things and Their Habitats** – What is the life process of reproduction in some plants and animals? How are living things classified into broad groups according to common observable characteristics and based on similarities and differences?
- **Animals Including Humans** – What are the main parts of the human circulatory system? What is the impact of diet, exercise, drugs and lifestyle on the way our bodies function? How does the human body change as we age?
- **Evolution and Inheritance** – How have living things changed over time and what information can fossils provide about this? How can animals and plants be adapted to suit their environment and how can this lead to evolution?
- **Working scientifically** – what are the stages of a scientific enquiry?

### Year 7

- **Cells** – What is a living organism? Can you set up a light microscope and observe plant or animal cells?
- **Reproduction** – What is pollination and how does it lead to reproduction in plants? How do animals, including humans, reproduce?
- **Inheritance and variation** – How many pairs of chromosomes do humans have? How many chromosomes do we inherit from each parent?
- **Ecological relationships** – What abiotic factors affect where woodlice live? Can you describe a predator-prey relationship?

### Year 8

- **Respiration & Gas Exchange** - How do the organs of the respiratory system work together to deliver oxygen and remove carbon dioxide from the body?
- **Nutrition & Digestion** – What is a balanced diet and how do our bodies digest food?
- **Photosynthesis** - Using experimental methods to determine the effect of light intensity on the rate of photosynthesis in green plants
- **Inheritance and Genetic Material** – What is DNA and how was the DNA model developed? What causes variation and how does this link to natural selection?
- **Fit & Healthy** – How can we prevent the spread of disease-causing microbes? What are the functions of muscles and the skeleton?

### Year 9

- **Cell Biology** – How do structural differences between types of cells enable them to perform specific functions within an organism?
- **Cell Division** – How do cells divide by mitosis to facilitate growth and repair? What is stem cell technology?
- **The Human Digestive System** – How do the organs of the digestive system work together to digest and absorb food? What are enzymes and what role do they play in digestion and other metabolic reactions?
- **Transport in Organisms** – How do animals and plants transport substances? What happens when these transport systems, e.g the heart, fail?
- **Health and Lifestyle** – How can diet and lifestyle choices affect our health?

### Year 10

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- **Communicable Diseases** – What are communicable diseases and how can we prevent them?
- **Monoclonal Antibodies (Trebles only)** - How are monoclonal antibodies produced and how are they used?
- **Bioenergetics** – How do plants use the glucose they make during photosynthesis? What is the difference between aerobic and anaerobic respiration?
- **Homeostasis** – How does the body maintain optimal internal conditions for all cell functions? How does the nervous system allow humans to react to their surroundings and coordinate their behaviour?
- **The Brain and the Eye (Trebles only)** – How do the structures of the brain and the eye relate to their functions? How does the eye focus on near and distant objects?

### Year 11

- **Hormones and Reproduction** – What are the roles of hormones in human reproduction? How can hormones be used for contraception and to treat infertility?
- **Genetics** – What is DNA and the human genome? How are characteristics passed from parents to their offspring?
- **Genetic Technologies** – What is genetic engineering and what are the potential benefits and disadvantages of this technology?
- **Evolution** – How does evolution by natural selection take place and why are mutations important?
- **Competition and Adaptation** – What is adaptation and why is it so important?
- **Feeding Relationships and Cycling of Materials** - Why is the cycling of materials in nature so vital to life on earth?
- **Biodiversity and Ecosystems** – What is global warming and why does it matter? How can we make food production more efficient?

### Year 12

- **Biological molecules** - The variety of life, both past and present, is extensive, but the biochemical basis of life is similar for all living things.
- **Cells** - All life on Earth exists as cells. These have basic features in common. Differences between cells are due to the addition of extra features and provides indirect evidence for evolution.
- **Organisms exchange substances with their environment** - The internal environment of a cell or organism is different from its external environment. The exchange of substances between the internal and external environments takes place at exchange surfaces.
- **Genetic information, variation and relationships between organisms** - Biodiversity is reflected in the vast number of species of organisms, in the variation within a single species and in the variation of cell types.

### Year 13

- **Energy transfers in and between organisms** - Life depends on continuous transfers of energy.
- **Organisms respond to changes in their internal and external environments** - Stimuli, both internal and external, are detected and lead to a response.
- **Genetics, populations, evolution and ecosystems** - The theory of evolution underpins modern Biology, all new species arise from an existing species.
- **The control of gene expression** - Cells are able to control their metabolic activities by regulating the transcription and translation of their genome.

**Preparing for the future: What can I do with biology qualifications?**

- **Medicine and Healthcare:** Doctor, Nurse, Pharmacologist, Dentist, Vet, Physiotherapist
- **Agriculture:** Ecologist, Horticulturist
- **Science and Research:** Forensic Scientist, Research Scientist
- **Sport and Fitness:** Nutritionist, Sports Scientist, Personal Trainer
- **Engineering:** Biochemical Engineer, Computational Biologist