# Curriculum Overview 2023-onwards

## Curriculum Leader: Mr. Smith  Subject: Science - Biology Year: 9

### Year 9 Curriculum:

### Autumn Term:

**Genetics & Evolution Fundamentals**

All pupils will develop their core substantive knowledge through studying the differences between species and how these are categorised, and whether the characteristics are inherited, caused by the environment the organism lives in or a combination of both. All pupils will continue to develop explicit core disciplinary knowledge of recording data, and drawing both bar charts and line graphs.

**Cells 2**

All pupils will build on prior and further develop their core substantive knowledge about how to use a microscope to identify and compare cells. All pupils will learn to apply their knowledge of their structure to work out their function. All pupils will learn about the process of osmosis and how plants use this to move water into the roots. All pupils will develop their core substantive knowledge of diffusion to explain how cells and organs are adapted to carry out this process. All pupils will continue to develop explicit core disciplinary knowledge of planning an investigation to identify all the variables, recording data and plotting data as a line graph.

**Spring Term**

**Structure and function of living things 3**

All pupils will develop further their core substantive knowledge of multicellular organisms and the organs systems needed to keep the cells alive. All pupils will learn about the structure of the breathing system and how it is adapted to get oxygen in and carbon dioxide out. All pupils will learn to apply their knowledge of the breathing system to explain the affects of smoking, asthma and exercise. All pupils will develop their core substantive knowledge of the organs of the digestive system and the events that take place to turn a meal into simple food molecules. Pupils will continue to develop their core disciplinary skills by analysing data using bar charts.

**Ecosystems and their Processes 3**

All pupils will build on their core substantive knowledge to understand and explain why plants need minerals. All pupils will explain how plants get the resources they need for photosynthesis and how the organs of a plant are adapted. All pupils will develop explicit core disciplinary knowledge by testing for the glucose. All pupils will develop further their core substantive knowledge of chemosynthesis, explaining why it is an important discovery.

All pupils will continue to develop explicit core disciplinary knowledge of safely carrying out an investigation. plotting data as a line graph and analysing and interpreting graphs.

**Summer Term**

**Genetics and evolution 2**

All pupils will develop their core substantive knowledge through studying the differences between species. All pupils will learn how features that cause variation are inherited, how these features give rise to adaptations (changes in DNA) that either help or hinder organisms in changing environments. All pupils will learn that natural selection can lead to evolution and increase biodiversity and why this is important. All pupils will continue to develop explicit core disciplinary knowledge in evaluating data, using numeracy to analyse data, as well as presenting observations and data using a bar chart and line graph

### Links to National Curriculum

Our Year 9 Science Biology curriculum is carefully sequenced to build on the KS2 knowledge of **Plants, Animals including Humans, Living Things and their Habitats** and the KS3 Year 7 curriculum of **Cells and Organisation** and **Reproduction**. This allows all pupils to learn the fundamental concepts of **Nutrition and Digestion, Health, Photosynthesis** and **Cellular respiration**. All pupils will also learn the fundamental concepts of **Relationships in an ecosystem** as well as **inheritance**.

Our Year 9 Science curriculum ensures that over the year and all three sciences all pupils will learn the fundamentals of each core disciplinary knowledge skills for full coverage of **working scientifically**.

In the Year 9 Biology curriculum all pupils will continue to learn the **experimental and investigation** skills of carrying out a practical, applying sampling techniques and recording data and the **analysis and evaluation** skills of drawing line graphs and bar charts, as well as showing awareness of potential sources of error and identify further questions arising through evaluation.

### Knowledge and understanding of this curriculum will be assessed by:

Embedded within the curriculum, a range of high-quality assessment techniques will be deployed at the point of learning to ensure that all pupils are acquiring the core substantive knowledge, identifying gaps, and addressing misconceptions.

Sequentially throughout the year pupils will be assessed on their retention of the core substantive knowledge, further identifying gaps and misconceptions which will be addressed through a targeted intervention.

Pupils disciplinary core knowledge will be assessed systematically throughout the year, using a variety of bespoke practical scenarios to allow them to demonstrate fundamental core skills required within science and clear guidance of the next steps to progression in each area.

### Powerful Knowledge/Cultural Capital Opportunities

The powerful knowledge obtained throughout Year 9, will allow all pupils to evaluate their relationship with a range of living organisms, to make informed choices that can impact of their own health and life and that of many more on a global scale, such as our dependence on bees as pollinators in the $30 billion dollar crop industry.

To ensure pupils are curious, inquisitive and questioning about the world around them we equip pupils with the skills to make informed decisions about our ever-changing world and their ability to carry out investigations, apply techniques, collect and analyse evidence and subsequently evaluate is vital to take their seat at the table of science-based society.