Curriculum Overview

Curriculum Area: Science - Biology Year: 8

Year 8 Curriculum:

Autumn Term:

Structure & Function of living things

All pupils will build on prior and further develop their substantive core knowledge to identify the components of a healthy human diet and why each is needed. They will also learn about the energy requirements in a healthy daily diet and understand the consequences of imbalances in diet to include obesity, starvation, and deficiency diseases and how exercise can impact our health.

All pupils will learn about the tissues and organs of the human digestive system, including adaptations to function and how the digestive system digests food.

All pupils will learn the effects of drugs, smoking and alcohol on behaviour, health and life processes including fertilisation and pregnancy.

All pupils will continue to develop explicit core disciplinary knowledge in carrying out an experiment.

Spring Term

Ecosystems and their Processes Fundamentals

All pupils will learn that almost all life on Earth is dependent on the ability of photosynthetic organisms, such as plants and algae, to use sunlight in photosynthesis to provide essential energy stores and maintain levels of oxygen and carbon dioxide in the Earth's atmosphere. They will also learn how plant organs, specifically leaves are adapted to carry out photosynthesis.

All pupils will also develop their substantive core knowledge of the key processes of aerobic and anaerobic respiration within humans and microorganisms, identifying reactants and products and summarising through word equations. They will also learn about how the process of anaerobic respiration (fermentation) is pivotal in the brewing and bread making industries.

Summer Term

Ecosystems and their Processes

All pupils will build upon and further develop their core substantive knowledge through studying the interdependence of organisms in an ecosystem. They will identify and analyse food chains, which link to form food webs within specific ecosystems and describe how populations are affected by factors including predation, disease, pollution and competition for resources. They will also learn how organisms affect, and are affected by their specific environment.

All pupils will continue to develop explicit core disciplinary knowledge in Analysis and Concluding, through interpreting data presented in the form of graphs, as well as evaluating.

All pupils will develop explicit core disciplinary knowledge of how to apply sampling techniques appropriately.

Genetics & Evolution Fundamentals

All pupils will develop their core substantive knowledge through studying the differences between species. They will learn that variation between individuals within a species and species' can be categorised as continuous or discontinuous.

All pupils will continue to develop explicit core disciplinary knowledge in recording data, as well as presenting observations and data using a bar chart and line graph.

Links to National Curriculum

Our Year 8 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 8 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 8 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 8, 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.

Curriculum Overview

Curriculum Area: Science - Chemistry Year: 8

Year 8 Curriculum:

Autumn Term:

Periodic table (Building blocks 3)

All pupils will build on their substantive core knowledge of pure substances and elements and compounds from Year 7 to develop their core substantive knowledge of the periodic table and materials focusing on the physical properties of metals and non metals and three specific groups on the periodic table.

They will introduce the concept of reactivity and describe patterns in properties of groups.

All pupils will develop core disciplinary knowledge in analysing and concluding from data tables.

Spring Term:

Developing Chemical reactions and materials.

All pupils will build on their substantive core knowledge of chemical reactions from Year 7 to develop their core substantive knowledge of oxidation and displacement reactions.

They will use their knowledge that chemical reactions involve the rearrangement of atoms, resulting in the formation of a new substances, to write word equations for any reaction they come across. They will also develop on the knowledge from Year 7 of describing reactions in qualitative terms including endothermic and exothermic in respect of energy changes.

All pupils will build on their substantive core knowledge of materials from Year 7 and previous Year 8 units to develop their core substantive knowledge of ceramics, polymers and composites.

Summer Term:

Earth and atmosphere

All pupils will develop their substantive core knowledge of the Earth and atmosphere.

They will develop their substantive core knowledge of the composition and the structure of the Earth. They will learn the three layers of the Earth and the minerals of which it comprises.

They will develop their substantive core knowledge of the rock cycle by focusing on the processes of the rock cycle and the three types of rock.

They will build on their knowledge of the Earth by developing their substantive core knowledge of the Earth as a limited resources and why we recycle.

They will develop their substantive core knowledge of the atmosphere by learning about the composition of the Earth's atmosphere and the carbon cycle and its role as a greenhouse gas.

They will build on their knowledge of the atmosphere by developing their substantive core knowledge of global warming and climate change.

All pupils will develop explicit core disciplinary knowledge in presenting observations and data using a line graph and analysing and concluding from graphs and data tables.

Links to National Curriculum

Our Year 8 Science Chemistry curriculum is carefully sequenced to build on the KS2 knowledge of **rock** the Year 7 KS3 curriculum of **Pure and Impure substances, atoms, elements and compounds** and the fundamentals of **chemical reactions** in order to further developing the concepts of **the periodic table, Materials** and the **Earth and atmosphere** during the Year 8 Chemistry curriculum.

Our Year 8 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 8 Chemistry curriculum all pupils will learn the **analysis and evaluation** skills of drawing line graphs and analysing and concluding from data tables and analysing and concluding from graphs.

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 of the materials and the Earth and atmosphere will allow our pupils to understand world issues such as renewability and energy usage in extraction of material and the processes of global warming and climate change.

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 plan investigations, collect evidence and analyse evidence is vital to take their seat at the table of science-based society.

Curriculum Overview

Curriculum Area: Science - Physics Year: 8

Year 8 Curriculum:

Autumn Term:

Circuit and magnet fundamentals

All pupils will develop their core substantive knowledge of electrical charge by using static electricity to focus on the electric field generated by charged objects and the electrostatic forces with which it is associated

All pupils will develop their core substantive knowledge on current electricity. They will be able to identify the charge carriers as electrons and build simple circuits. They will define and measure current, potential difference, and resistance.

All pupils will develop their core substantive knowledge of magnetism by learning about magnetic materials, permanent magnets and poles, and temporary magnets including electromagnets.

All pupils will develop core disciplinary knowledge in carrying out an experiment, writing a plan and recording data using tables.

Spring Term

Energy transfers and energy resources fundamentals

All pupils will build on prior and further develop their core substantive knowledge of energy in the context of energy stores, transfers and energy resources.

All pupils will learn the major energy stores, thermal transfers mechanisms qualitatively and the concept of work quantitatively.

All pupils will develop their core substantive knowledge of fuel uses and costs. They will learn what renewable and non-renewable fuels are and how to work out how much we pay for energy.

All pupils will develop explicit core disciplinary knowledge in writing a plan and the analysis skills of numeracy in calculating work and energy costs.

Summer Term

Motion and pressure (Motion and forces 2)

All pupils will build on prior and further develop their core substantive knowledge of forces and motion by scientifically describing motion using words such as speed, acceleration and relative motion and using motion graphs.

All pupils will further develop their core substantive knowledge of energy changes and transfers by understanding moments and how levers make a job easier.

All pupils will further develop their core substantive knowledge of pressure in fluids by focusing on how to calculate pressure, atmospheric pressure and upthrust to explain floating and sinking.

All pupils will develop core disciplinary knowledge in presenting observations and data using line graphs, numeracy of calculations and evaluation of an investigation.

Links to National Curriculum

Our Year 8 Science Physics curriculum is carefully sequenced to build on KS2 knowledge of **Electricity** by describing the physical world through the fundamentals of the KS3 concept of **Electricity and Magnetism** with a particular concentration on **Current electricity**, **Static electricity**, and **Magnetism.**

Our Year 8 Science Physics curriculum carefully builds Year 7 knowledge of **Motion and Forces** and **Energy** by developing the KS3 concept of **Describing motion, Pressure in fluids, Forces and motion, Calculation of fuel use and energy costs** and **Energy changes and transfers.**

Our Year 8 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 8 Physics curriculum all pupils will learn the **experimental and investigation** skills of carrying out an investigation, writing a plan and recording data and the **analysis and evaluation** skills of drawing line, numeracy of calculations and evaluation of an investigation.

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 of electricity and magnetism will allow all pupils to build circuits and build switches, know which materials are affected by magnets and be aware of the uses and dangers of electrostatic.

The powerful knowledge of energy resources will enable all pupils to work out energy costs and the impact of issues such as renewability and climate change.

The powerful knowledge of motion and pressure will allow all pupils to understand speed and acceleration in vehicles, how levers make life easier and why things float or sink.