Curriculum Overview

Curriculum Area: Science - Biology Year: 7

Year 7 Curriculum:

Autumn Term:

Cells & Transport Fundamentals

All pupils will develop their core substantive knowledge focusing on cells as the fundamental unit of living organisms, including how to observe, interpret and record cell structure using a light microscope. They will identify key organelles found within both animal and plant cells and describe their functions, successfully making comparisons. All pupils will learn about the structural adaptions of cells of both unicellular and multicellular organisms, linked to their specific functions. They will learn about the role of diffusion in the movement of specific materials in and between cells.

All pupils will develop core disciplinary knowledge in scientific numeracy, using simple equations and carrying out appropriate calculations.

Spring Term

Structure & Function of living things Fundamentals

All pupils will build on prior and further develop their core substantive knowledge focusing on the hierarchical organisation of multicellular organisms from cells to tissues to organ systems to organisms. They will learn about the structure and function of the human skeleton and the interaction between the skeleton and muscles to bring about movement. All pupils will also develop a fundamental understanding of the structure and function of the human gas exchange system, the mechanism of breathing and use a pressure model to explain the movement of gases, including simple measurements of lung volume and the impact of exercise on the rate of breathing.

All pupils will develop explicit core disciplinary knowledge in writing a plan and presenting observations and data using a bar chart.

Summer Term

Reproduction

All pupils will build on prior and further develop their core substantive knowledge learning about reproduction in humans (as an example of a mammal). They will learn about the structure and function of the male and female reproductive systems, menstrual cycle, gametes, fertilisation, gestation, and birth, including the effect of maternal lifestyle on the foetus through the placenta. All pupils will additionally learn about reproduction in plants, including flower structure, wind and insect pollination, fertilisation, seed and fruit formation and dispersal, including a quantitative investigation of some dispersal mechanisms. They will also develop an understanding of the importance of plant reproduction through insect pollination.

All pupils will develop their core disciplinary knowledge in analysis and concluding, through interpreting data presented in the form of graphs.

Links to National Curriculum

Our Year 7 science Biology curriculum is carefully sequenced to build on the KS2 knowledge of **animals including humans**, **living things and their habitats** and **plants** by describing the biological world through the KS3 concept of **Cells and organisation.** This fundamental concept is continually used and built upon throughout the year to allow all pupils to develop their core knowledge of **the skeletal and muscular, and gas exchange systems** in humans. Additionally, the fundamental concept allows all pupils to further develop their core knowledge of **reproduction**.

Our Year 7 science curriculum ensures that over the year in all three sciences all pupils will learn the fundamentals of each core disciplinary knowledge skills for full coverage of **working scientifically**.

In the Year 7 Biology curriculum all pupils will learn the **measurement** skills of using simple equations, **experimental and investigation** skills of carrying out a practical, and **analysis and evaluation** skills of drawing bar charts and interpreting graphical data.

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 cells and organisation will allow our pupils to understand key biological processes. By learning about cells, they will come to understand key life processes, how we can protect cells to prevent infection and other harmful effects, diagnose disease, treat cells to heal illnesses and stop harming cells through our choices and actions.

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 deploy appropriate numeracy strategies, plan investigations, as well as collect, present and analyse evidence is vital to take their seat at the table of science-based society.

Curriculum Overview

Curriculum Area: Science - Chemistry Year: 7

Year 7 Curriculum:

Autumn Term:

Particles and substances fundamentals

All pupils will develop their core substantive knowledge focusing on properties of the different states of matter (solid, liquid and gas) in terms of the particle model. They will be able to identify and describe specific properties of each state of matter in terms of particles in motion but with differences in the arrangement and movement of these same particles. All pupils will be able to identify changes in state and describe in terms of particles gaining and losing energy, as well as represent these changes using particle diagrams.

All pupils will develop core disciplinary knowledge in presenting observations and data using Line Graphs.

Separation fundamentals

All pupils will develop their core substantive knowledge focusing on the concept of a pure substance. They will be able to confidently identify pure substances and describe the relationship between a mixture and a pure substance. Developing their core substantive knowledge pupils will explore simple techniques for separating mixtures including filtration, evaporation, distillation and chromatography.

All pupils will develop core disciplinary knowledge in presenting observations and data using tables.

Spring Term

Atoms, elements and compounds fundamentals

All pupils will build on prior and further develop their core substantive knowledge to recognise atoms and molecules as particles. They will use particle diagrams to classify a substance as an element, mixture or compound and as molecules or atoms and form links to properties based on their composition. All pupils will explore the simple atomic model and understand that scientific method and theories develop as earlier explanations are modified to take account of new evidence and ideas together with the importance of publishing results and peer review.

All pupils will identify common elements based on their chemical symbols, Name simple compounds using rules and identify elements present in a compound based on chemical formula.

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

Summer Term

Chemical reactions fundamentals

All pupils will build on prior and further develop their core substantive knowledge to recognise that chemical reactions involve the rearrangement of atoms, resulting in the formation of a new substances, all while being conserved. They will learn about a range of different chemical reactions including combustion, thermal decomposition, neutralization and some metals with acids in order to identify reactants and products and write simple word equations. They will also describe reactions in qualitative terms including endothermic and exothermic in respect of energy changes.

All pupils will develop core disciplinary knowledge in presenting observations and data using bar graphs as well as select, plan and carry out appropriate scientific enquiries to test predictions.

All pupils will develop core disciplinary knowledge in writing a plan and presenting observations and data using a bar chart.

Links to National Curriculum

Our Year 7 Science Chemistry curriculum is carefully sequenced to build on the KS2 knowledge of **properties and changes of materials** by describing the chemical world through the KS3 concept of **particulate nature of matter.** This fundamental concept is continually used and built upon throughout the year to allow all pupils to learn about **Pure and Impure substances** that leads to the fundamentals of **atoms, elements and compounds** which in turn allows all pupils to learn the fundamentals of **chemical reactions**.

Our Year 7 Science curriculum ensures that over the year in all three sciences all pupils will learn the fundamentals of each core disciplinary knowledge skills for full coverage of **working scientifically**.

In the Year 7 Chemistry curriculum all pupils will learn the **experimental and investigation** skills of carrying out a practical, writing a plan and recording data and the **analysis and evaluation** skills of drawing line graphs and bar charts.

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. (Termly Substantive Assessment)

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 particulate nature of matter will allow our pupils to understand the properties of everyday materials and explain important world issues such as the melting of ice caps leading to rising sea levels.

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: 7

Year 7 Curriculum:

Autumn Term:

Forces (Forces and motion 1)

All pupils will develop their core substantive knowledge focusing on contact and non-contact forces and examples including Friction, Tension, Compression and Weight. All pupils will know the idea of resultant force and equilibrium and state how they move in each situation. All pupils will be able describe what happens to springs when force is added to them. All pupils will be able to distinguish between mass and weight and calculate the weight of an object from its mass on Earth.
All pupils will develop core disciplinary knowledge in carrying out an experiment, recording data and presenting observations and data using Line Graphs.

Spring Term:

Space fundamentals

All pupils will build on prior and further develop their core substantive knowledge of weight and gravity from the Forces topic and develop their core substantive knowledge in Space Physics. They will be focusing on the concept of weight force on different planets and the moon.
All pupils will develop their core substantive knowledge of our solar system and how the tilt of the Earth plays a role in seasons and changing day length. Developing their core substantive knowledge pupils will know units we can use to measure astronomical scale distances.
All pupils will develop core disciplinary knowledge presenting observations in a bar chart, analysing data from a results table and using numeracy to calculate values.

Summer Term:

Sound waves (Waves A)

All pupils will develop their core substantive knowledge to learn about sound waves. They will develop a knowledge of the properties of waves including amplitude, frequency wavelength and speed. All pupils develop their knowledge of the wave properties by applying them to sound waves and therefore linking properties of sound such as pitch and volume to the wave property. They will be able to describe the auditory range of human hearing and the function of a microphone, loudspeaker and the parts of a human ear.
All pupils will develop their understanding of longitudinal and transverse waves and the general behaviour of waves.
All pupils will develop core disciplinary knowledge in analysing data from a results table and evaluating an investigation.

Light waves (Waves B)

All pupils will build upon and develop their core substantive knowledge of waves to learn about light waves. They will develop a knowledge of the transfer of energy via waves and how waves can be transmitted, reflected or absorbed. The behaviour of light through different substances will be described by all pupils through transparency, reflection, refraction and scattering ray diagrams. All pupils develop their knowledge of light through lenses and the structure of the eye.
All pupils will develop core disciplinary knowledge in evaluating an investigation.

Links to National Curriculum

Our Year 7 Science Physics curriculum is carefully sequenced to build on the KS2 knowledge of **Earth and space**, **Forces** and **Sound** by addressing the KS3 concepts of **Motion and Forces, Waves** and **Space physics.**
The fundamental concepts are continually used and built upon throughout the year.
The concept of **waves** allows all pupils to learn about **Observed waves, Sound waves** and **Light**
The concept of **Forces and motion** allows all pupils to learn about **Forces, Balanced forces** and **Space Physics.**

Our Year 7 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 7 Physics curriculum all pupils will learn the **experimental and investigation** skills of carrying out a practical and recording data and the **analysis and evaluation** skills of drawing line graphs and bar charts, analysing data tables and evaluating 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 the Forces and Space Physics will allow our pupils to understand everyday phenomenon such as the seasons, day length and gravity's role on this planet. The powerful knowledge of waves will allow our pupils to know the structure of our eyes and ears and how pitch and loudness of sound are linked to their wave.
To ensure pupils are curious and questioning about the world around them we equip pupils to make informed decisions and their ability to plan investigations, collect and analyse evidence is vital to take their seat at the table of science-based society.