



FRAMEWORK FOR LEARNING



CREATIVE

An education where imagination, curiosity and resilience enable us to ignite our learning.

HAPPY

A shared belief that optimism, empathy and responsibility are the foundations for a respectful, safe and inclusive community.

SUCCESSFUL

Individuals who are ready to learn, practise being reflective, and are motivated to become champions.

SUBJECT

SCIENCE

INTENT

"Every brilliant experiment, like every great work of art, starts with an act of imagination." - **Jonah Lehrer**

The Scientific area of learning is concerned with increasing pupils' knowledge and understanding of our world, and with developing skills associated with Science as a process of enquiry. It will develop the natural curiosity of the child, encourage respect for living organisms and the physical environment and provide opportunities for critical evaluation of evidence.

At CHS south we aim to create Scientists that are curious about the natural world and understand the importance of scientific process. We are passionate about developing a curriculum that is accessible to all and one that enriches through cultural capital and extra-curricular opportunities which are provided throughout the 5-year course.

We encourage students to be inquisitive throughout their time at the school and beyond. The curriculum is designed to ensure that students can acquire key scientific knowledge through practical experiences, using equipment, conducting experiments, building arguments and explaining concepts confidently. The school's approach to science takes account of the school's own context, ensuring access to people with specialist expertise and places of scientific interest as part of the school's commitment to learning outside the classroom.



YEAR GROUP

YEAR 7

RATIONAL / NARRATIVE

To learn the “big ideas” associated with Science. To develop firm foundations in Biology, Chemistry and Physics and to explore and engage pupil’s curiosity of the natural world. Students will learn how to carry out and write scientifically and then explore the fundamental areas of science which include cells, reproduction, atoms, electricity, photosynthesis and states of matter.

TERM KNOWLEDGE

AUTUMN 1

Energy – stores and transfers
 HSW Skills
 Practical skills and writing scientifically
 Command words
 Repeats, means, anomalies, accuracy, errors.
 Variables and methods.
 Graphs
 Sample size (range, intervals and scale)
 Control groups.

AUTUMN 2

Elements, compounds and mixtures
 Using the Periodic table
 Group 1 in the periodic table
 Chemical reactions
 Chemical Equations
 Structure of an atom
 Electron shells
 Atomic and mass number
 Reactivity of metals
 Investigating the reactivity of metals

SPRING 1

Menstrual cycle
 Animal and Plant cells
 Specialised cells
 Movement in and out of cells
 Labelling and describing cell organelles
 Reproductive system
 Foetal development
 Fertilisation
 Puberty
 Using microscopes

SPRING 2

Circuit Component
 Series and parallel circuits
 Conductors and insulators
 Measuring current and Voltage
 Magnetism
 Electromagnetism
 Static
 Resistance

SUMMER 1

States of matter (solids, liquids and gases)
 Conservation of matter
 Boiling
 Melting
 Stearic acid (latent heat investigation)
 Solubility
 Separating techniques
 Filtration, evaporation, condensation, distillation and chromatography

SUMMER 2

Photosynthesis
 Testing leaves for starch
 Investigating photosynthesis
 Food chains
 Food webs
 Predator/Prey relationships
 Insect pollination
 Leaf structure
 Seed dispersal
 Observing Stomata
 Ecosystems and Habitats

SKILLS

- Identifying key Scientific Equipment
- Learning how to keep themselves and others safe in a lab
- Carrying out/writing up scientific equations
- Effectively using key terms such as anomaly, range, mean, repeats, resolution, interval, scale
- Understanding how to write a conclusion
- Explaining the findings of practical results
- Identifying variables

- Identify properties of certain elements
- Become familiarised with the periodic table
- Write word equations for the reactions including the reactions of metals and non-metals and the formation of oxides from non-metals.
- Students will investigate reactions to see if they are exo or endothermic
- Students will investigate metals with acid to see the

- Learning how to use a microscope
- Memory recall – for cell parts and the reproductive system
- Creative writing – journey of a sperm
- Information retrieval on specialised cells
- Comparison of egg and sperm cell
- Modelling the menstrual cycle by creating a bracelet

- Make predictions on whether materials are conductive or not, then testing their predictions
- Correctly building series and parallel circuits
- Investigate current in series and parallel circuits
- Investigate voltage in series and parallel circuits
- Investigate static electricity and use a Van der Graff generator.
- Using magnets to understand the

- Learning how to annotate a graph
 - Retrieval practice
- Students will carry out/write up scientific investigations:
- Conservation of mass
 - Rate of evaporation
 - Cooling curve for stearic acid
 - Investigating solubility, melting and boiling points
 - Evaporation and condensation
 - Chromatography
 - Distillation

- Students work as a team to complete complex food webs
- Students will carry out/write up scientific investigations:
- Iodine test for starch
 - Testing rate of photosynthesis using pond weed
 - Observe stomata using a microscope



<p>ASSESSMENT</p>	<ul style="list-style-type: none"> Learning how to plot a line graph Learning how to plot a bar chart Choosing an appropriate scale Analysing a graph 	<p>temperature change (reactivity)</p> <ul style="list-style-type: none"> Students will heat metals with oxygen. 		<p>difference between repel and attract</p> <ul style="list-style-type: none"> Use compasses to draw magnetic field lines Demonstrate magnetic field lines using permanent magnets and iron shaving Learn how to make an electromagnet and investigate what happens when its strength is increased or decrease 		
	<p>EOT low stakes testing - Specific focus on how to draw a line graph and a bar chart.</p> <p>EOT low stakes testing graph skills and HSW skills. Specific focus on drawing and analysing graphs.</p>	<p>EOT low stakes testing - specific focus on writing a long answer question about the conservation of mass.</p> <p>EOT low stakes testing - Reactivity of metals with hydrochloric acid. Specific focus on data and hypothesis.</p>	<p>EOT low stakes testing - Specific focus on the comparison of cells</p> <p>EOT low stakes testing - Specific focus on the fertilisation.</p> <p>Progress test (all knowledge content from Autumn 1 and 2).</p>	<p>EOT low stakes testing - Including specific focus about how to measure voltage and current in series and parallel (method with diagrams).</p> <p>EOT low stakes testing - Including specific focus on method for making an electromagnet.</p>	<p>EOT low stakes testing - describing the arrangement in solids, liquids and gases</p> <p>EOT low stakes testing - Including extended writing distillation.</p>	<p>EOT low stakes testing - Method for how the rate of photosynthesis is affected by the intensity of a light.</p> <p>EOT low stakes testing Analysing a predator prey graph (feeding relationships)</p> <p>Progress test (all knowledge content from Autumn, spring)</p>
	<p>Weekly quizzes set on Educate covering the terms topics, Energy and Key Skills.</p>	<p>Weekly quizzes set on Educate covering the terms topics, Elements and The Periodic Table.</p>	<p>Weekly quizzes set on Educate covering the terms topics, Cells and the Reproductive System.</p> <p>Revision booklet relevant to the END OF TOPIC TEST.</p>	<p>Weekly quizzes set on Educate covering the terms topics, Electricity and Magnetism.</p>	<p>Weekly quizzes set on Educate covering the terms topics, States of Matter and Separating Techniques.</p>	<p>Weekly quizzes set on Educate covering the terms topics, photosynthesis and biodiversity.</p> <p>Revision booklet relevant to the END OF TOPIC TEST.</p>
<p>READING, WRITING, TALK, NUMERACY</p>	<p>Reading: students will read and analyse various texts that given them a firmer understanding of the key words shown below. They will carry out</p>	<p>Writing: Students will learn how to write scientifically. They will write a scientific report that demonstrates how to use evidence to test a</p>	<p>Writing: students will use the creative writing skills they have learnt in English to produce a piece of creative writing in science.</p>	<p>Writing: Students will learn how to write scientifically. They will write a scientific report that describes current</p>	<p>Writing: Extended writing piece on linking particles knowledge to states of matter/state changes</p> <p>Reading: students will read texts about interdependence and feeding relationships. They will carry out comprehension exercises</p>	



TIER 2 VOCABULARY

TIER 3 VOCABULARY

<p>comprehension exercises to help them develop higher levels of literacy.</p> <p>Writing: Students will learn how to write scientifically. They will write a scientific report that demonstrates how to use evidence to test a scientific hypothesis. This will be about the time taken for tea to dissolve.</p> <p>Oracy: Students will discuss lab safety and how to use equipment effectively.</p> <p>Oracy launch, boost and re-route strategy used during SEEC tasks.</p>	<p>scientific hypothesis. This will be about the reactivity of metals.</p> <p>Oracy launch, boost and re-route strategy used during SEEC tasks. Students will extensively use whiteboards and these tasks will form discussions that address misconceptions relating to specific topics.</p>	<p>This will link to fertilisation and is about the journey of sperm cell through the female reproductive system.</p> <p>Oracy launch, boost and re-route strategy used during SEEC tasks.</p> <p>Oracy: Discussing possible changes that happen during puberty.</p>	<p>and voltage in both series and parallel circuits.</p> <p>Oracy launch, boost and re-route strategy used during SEEC tasks.</p>	<p>Reading: Successfully reading methods in order to carry out practical's safely</p> <p>Oracy - Think pair share task using hinge questions from best evidence science teaching</p> <p>Oracy launch, boost and re-route strategy used during SEEC tasks.</p>	<p>to help them develop higher levels of literacy specific to how energy is transferred along a food chain or web.</p> <p>Writing: Students will learn how to write scientifically. They will write a scientific report that describes how light intensity affects the rate of photosynthesis.</p> <p>Oracy launch, boost and re-route strategy used during SEEC tasks.</p>
<p>Calculate Choose Complete Define Discuss Give Identify List Method Name State</p>	<p>Annotate Balance Data Find Formula Identify Justify Occur Period Select Similar</p>	<p>Area Comment Compare Create Issue Period Process Research Role Specific Structure Labour</p>	<p>Analyse Create Data Design Discuss Function Identify Issue Method Name Role</p>	<p>Analyse Create Choose Define Discuss Illustrate Process Select Similar Support</p>	<p>Area Available Find Function Method Process Specific Summarise Support</p>
<p>SEEC:</p> <ul style="list-style-type: none"> • Categorical • Continuous • Describe • Explain • Conclusion • Evaluation • Independent • Dependent 	<p>SEEC:</p> <ul style="list-style-type: none"> • Element • Compound • Mixture • Reactivity • Exothermic • Endothermic 	<p>SEEC:</p> <ul style="list-style-type: none"> • Reproduction • Specialised • Adapted • Fertilisation • Magnification 	<p>SEEC:</p> <ul style="list-style-type: none"> • Voltage • Current • Conductor • Insulator • Attract • Repel 	<p>SEEC:</p> <ul style="list-style-type: none"> • State • Matter • Conservation • Conduction • Convection • Evaporation • Condensation 	<p>SEEC:</p> <ul style="list-style-type: none"> • Photosynthesis • Pollination • Dispersal • Producer • Consumer



PSPSMC, BRITISH VALUES AND DIVERSITY

Social:

Students will make, bake and sell their cells cakes as part of their autumn 1 science homework. The money raised will be given to local charities reinforcing the importance of kindness within our local communities.

Social/Moral and Cultural:

Students will learn about puberty and conception. They will discuss the issues surrounding fertility and the impact that this can have on parents. Students may also discuss the issues surrounding embryos and the objections that can be made surrounding embryo technology.

Cultural:

Students will learn about the role of Dmitri Mendeleev. They will learn how the periodic table was designed and improved to become the document is today. This will reinforce the importance of scientific curiosity and hopefully engage them with scientific process. Demonstrating the importance of science internationally, as it provides all cultures the ability to answer some of life's fundamental questions.

Social:

Students will learn about the generation of electricity and discuss the issue facing the world's population in the future.

They will discuss renewable technologies and evaluate the advantages and disadvantages of a future that uses cleaner fuels.

Social:

Students will learn about the importance of plants both locally and internationally. They will learn how crop populations are affected by the decrease in insect pollinating species like bees.

Students will also learn the importance of plants in food production and how this links to all food chains on earth.