Chadsgrove Curriculum Long Term Planning: Science

Curriculum Intent

Chadsgrove's Science curriculum is designed to ensure that all pupils are provided with the opportunity to explore and understand the world in which they live whilst developing scientific skills and understanding. This document will outline the curriculum overview with reference to the three curriculum pathways at Chadsgrove.

Pre-Formal Curriculum Pathway – Pupils follow an alternative programme based around the Barrs Court Curriculum, however they have access to the EQUALS and Strata schemes of work should this support their lessons.

Semi-Formal Curriculum Pathway –
Pupils in Key Stage 1 currently follow the Early Years Foundation Stage curriculum and thus explore science across the curriculum and through the EYFS area of 'Understanding the world', this will be reviewed each year according to the pupils in this class.
In Key Stage 2 and 3 within this pathway there may be pupils who are identified as CUTA in Science and need challenge, in which case the class teacher may wish to refer to the Formal Pathway to support this extension and differentiation.

Formal Curriculum Pathway-
Within this pathway teachers may choose to use the Semi-Formal pathway resources to support pupils learning and to enable effective differentiation and personalisation.

Pupils following the Semi-Formal and Formal Curriculum Pathways have at least one science lesson per week focused on the curriculum detailed below. However it may be more appropriate for this to be integrated into cross curricula activities depending on pupils abilities. Pupils will also have access to science throughout the curriculum for example through forest school, topic work, sensory sessions, science week activities and curriculum days.

Pupils following the Semi-Formal Curriculum Pathway predominantly follow the EQUALS scheme of work, supported by the use of an updated STRATA 2019 scheme of work and resources which support the National Curriculum and EYFS curriculum as appropriate.

Pupils following the Formal Curriculum Pathway will follow the National Curriculum.

Science content will be delivered through a differentiated and personalised curriculum with content being delivered at an appropriate level for each pupil.

The table below, links as best as is possible the EQUALS topics to the relevant National Curriculum content to allow teachers to easily differentiate and extend learning for their most able pupils. It also references the STRATA units which give further teaching ideas and differentiated activities for pupils from P1 – L3.
The overview contains the focus of each term; content and activities are as per teachers' Medium Term Plans which enables activities to be matched appropriately to pupils' needs and ability levels.

Key Stage 1:

Term	***Semi-Formal Pathway (EQUALS KS1 units of work)***	***Supporting STRATA units and NC topics***
Key Stage 1 Autumn 22	People and Places Everyday Materials (2) Teeth and eating	STRATA: Teeth STRATA: Diet & Digestion NC: Animals, including humans Y2: Describe the importance for humans of exercise, eating the right amounts of different types of food and hygiene.
Key Stage 1 Spring 23	Amazing animals Animals including humans (3) Animals including humans (4) Variations and comparison with plants Moving and Growing	STRATA: Plants STRATA: Energy – Living Things STRATA: Human Skeleton NC: Animals inc. humans Y1: Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals / Identify and name a variety of common animals that are carnivores, herbivores and omnivores. NC: Living things and their habitats Y2: Identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants and how they depend on each other / Describe how animals obtain their food using the idea of a simple food chain.
Key Stage 1 Summer 23	Out at sea Seasonal Changes (2) Keeping warm	STRATA: Energy – heat STRATA: Environment NC: Seasonal Changes Y1: Observe changes across the four seasons / observe and describe weather associated with the seasons and how day length varies.

Term	*Semi-Formal Pathway (EQUALS KS1 units of work)*	*Supporting STRATA units and NC topics*
Key Stage 1 Autumn 23	All about me Animals inc. humans (1) Ourselves	STRATA: Body Parts and Senses NC: Animals, including humans. Y1: To identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense Y2: Notice that animals, including humans, have offspring which grow into adults.
Key Stage 1 Spring 24	Let's Build Everyday materials (1) Sorting & using materials	STRATA: Making new materials NC: Everyday materials Y1: Distinguish between an object and the material from which it is made / identify and name a variety of everyday materials / describe the simple properties of materials / compare and group. Y2: Identify and compare the suitability of a variety of everyday materials for particular uses / Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.
Key Stage 1 Summer 24	Out and about Plants (1) Growing plants	STRATA: Plants NC: Plants Y1: Identify and name a variety of common wild and garden plants and identify and describe the basic structure of a variety of flowering plants, inc. trees.
Key Stage 1 Autumn 24	Wonderful world Animals including humans (2) Health and growth	STRATA: Environment STRATA: Skeleton STRATA: Adaptation NC: Animals inc humans Y1: Describe and compare the structure of a variety of common animals NC: Living things and their habitats Y2: Explore and compare the differences between things that are living, dead, and things that have never been alive
Key Stage 1 Spring 25	Perfect Plants Plants (2) Helping plants grow well	STRATA: Plants NC: Plants Y2: Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy / Observe and describe how seeds and bulbs grow into mature plants.
Key Stage 1 Summer 25	Journeys Seasonal Changes (1) Light and dark	STRATA: Energy - Light NC: Seasonal Changes Y1: Observe changes across the four seasons / observe and describe weather associated with the seasons and how day length varies.

Key Stage 2:

Term	**Semi-Formal Pathway** (EQUALS)	**Formal Pathway Extension** (NC Lower Key Stage 2) *Twinkl topic titles*	**Supporting STRATA Resources**
Key Stage 2 Term 4 Autumn 21	**Marvellous Me** **Animals inc humans 2** Living things and their environments **Light** Light and shadow	**Marvellous Me** **Y3: Animals inc. humans**	**Biology** **Adaptation**
Key Stage 2 Term 5 Spring 22	**Rise of the Robots** **Electricity** Using electricity **Forces and Magnets 2** Electricity and magnetism	**Rise of the Robots** **Y4: Electricity**	**Physics** **Energy – Electricity**
Key Stage 2 Term 6 Summer 22	**Water** **Everyday Materials 2** Grouping and changing materials	**Water** **Y4: States of mater**	**Physics** **Solids, liquids and gases**
Key Stage 2 Term 7 Autumn 22	**Our Environment** **Animals including humans 1** Plants and animals in local environment	**Our Environment** **Y4: Living things and their habitats**	**Biology** **Environment**
Key Stage 2 Term 8 Spring 23	**Jungle Beat** **Rocks** Rocks and soils **Properties and changes in materials 3** Materials and properties 3	**Jungle Beat** **Y3: Rocks**	**Chemistry** **Acid, Alkalis and Earth Science**
Key Stage 2 Term 9 Summer 23	**Around the world** **Everyday materials 1** Characteristics of materials **Forces 2** Forces and movement	**Around the world** **Y3: Forces and magnets (focus on forces)**	**Physics** **Forces**

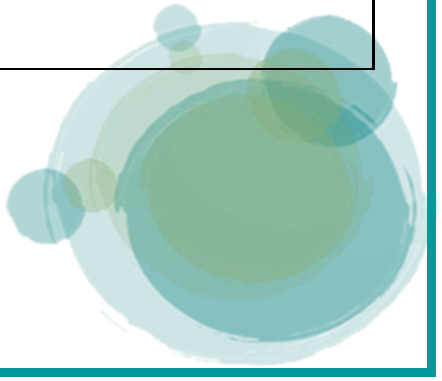
Term	Semi-Formal Pathway (EQUALS)	Formal Pathway Extension (NC Lower Key Stage 2) *Twinkl topic titles*	Supporting STRATA Resources
Key Stage 2 Term 10 Autumn 23	**Our bodies and minds** **Animals inc. humans 3** variation and classification **Sound** Sound and hearing	**Our bodies and minds** **Y4: Animals inc humans**	**Biology** **Human Skeleton** **Physics** **Energy - Sound**
Key Stage 2 Term 11 Spring 24	**Clever construction** **Forces 1** Pushes and pulls **Forces and magnets 1** Forces and motion	**Clever construction** **Y3: Forces and magnets (focus on magnets)**	**Physics** **Forces**
Key Stage 2 Term 12 Summer 24	**Pirates** **Properties and changes in materials 1** Grouping and classifying Materials and properties 1	**Pirates** **Y2: Uses of everyday materials**	**Chemistry** **Making new materials**
Key Stage 2 Term 1 Autumn 24	**New Adventures** **Plants** Green plants **Properties and changes in materials 2** Materials and properties 2	**New Adventures** **Y3: Plants**	**Biology** **Plants**
Key Stage 2 Term 2 Spring 25	**Space and the Solar System** **Light (and sound)** Light and Sound **Earth and Space** The Earth & Beyond	**Space and the Solar System** **Y3: Light**	**Physics** **Energy – Light** **Physics** **Space**
Key Stage 2 Term 3 Summer 25	**Fantasy and Magical Worlds** **Forces and magnets 3** Magnets and magnetism	**Fantasy and Magical Worlds** **Y4: Sound**	**Physics** **Energy – Sound** **Physics** **Forces**

Key Stage 3:

Term	***Semi-Formal Pathway (EQUALS KS3)***	***Formal Pathway Extension (National Curriculum Upper Key Stage 2)***
Key Stage 3 Autumn 2022	Africa & EQUALS: People EQUALS: Living things and their environment • habitat and environment variations • animals adaptations to environmental changes in their habitats • food chains • animals adaptations as predators and prey	Africa NC Year 6 Living things and habitats • Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals. • Give reasons for classifying plants and animals based on specific characteristics. (this builds on knowledge from Year 4 which can be revisited if necessary).
Key Stage 3 Spring 2023	Our Community / Britain & People / Recycling EQUALS: Variation and classification Pupils will be introduced to and have the opportunity to explore: • variation within individual members of the same species • similarities between individuals of the same species due to inheritance • environmental differences in individuals of the same species • sorting and classifying organisms into groups according to observable features • animal and plant cells. If a focus on recycling use: EQUALS: Separating materials and their properties Students should: experience, explore, and investigate, record and communicate what they discover and learn about. • mixed solids • filtering • dissolving and evaporation • separation of solutes using chromatography	Our Community / Britain NC Year 6 Evolution and inheritance • Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago. • Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents. • Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.
Key Stage 3 Summer 2023	Celebrations / Food and Drink & Festivals Food EQUALS: Light & Sound Pupils will be introduced to and will explore: • sounds that are caused by vibrations • pitch and loudness • different ways sound travels through solids, liquids and gases • sound frequency differences in humans and animals • the problem of noise pollution • how light travels • transparent and opaque • reflection • spectrums	Celebrations / Food and Drink NC Yr 6 Light • Recognise that light travels in straight lines. • use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye. • explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes • use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.

Term	*Semi-Formal Pathway (EQUALS KS3)*	*Formal Pathway Extension (National Curriculum Upper Key Stage 2)*
Key Stage 3 Autumn 2023	Victorian Britain EQUALS: Electricity and magnetism Pupils will be introduced to and explore: • household power sources • hazards of electricity and how to use it safely • making simple circuits work • exploring more complex circuits • using switches • conductors and insulators • series and parallel circuits • magnetism	Victorian Britain NC Y6 Electricity • Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in a circuit • compare and give reasons for the variation in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches • use recognized symbols when representing a simple circuit in a diagram.
Key Stage 3 Spring 2024	The Human Body & Life Cycles of Animals & Plants EQUALS: Keeping Healthy Pupils will be introduced to and will explore: • healthy eating and exercise • how the heart pumps blood around the body through blood vessels • how to measure pulse rate and how it relates to heart beat • the harmful effects of tobacco, alcohol and other drugs and how some drugs like medicines can be helpful if taken in the correct doses	The Human Body NC Yr 5 Animals inc humans • describe the changes as humans develop to old age NC Yr 6 Animals inc humans (if appropriate/ time allows) • identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood. • recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function • describe ways in which nutrients and water are transported within animals, including humans.
Key Stage 3 Summer 2024	Asia & The Seasons / Weather EQUALS: Green plants Pupils will be introduced to and will explore: • the parts of a plant • seeds and seed dispersal • importance of sunlight for plant growth • photosynthesis • roots	Asia NC Y5. Living things and their habitats • describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird • describe the life process of reproduction in some plants and animals

Term	*Semi-Formal Pathway (EQUALS KS3)*	*Formal Pathway Extension (National Curriculum Upper Key Stage 2)*
Key Stage 3 Autumn 2024	How Things Move and Work & Digital photography EQUALS: Forces and motion Pupils explore the properties and resulting actions of a variety of forces. • Explore measure of Newtons • multiple forces • Water resistance • Upthrust • Balanced forces • Air resistance • Friction	How Things Move and Work NC Y5. Forces • explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object • identify the effects of air resistance, water resistance and friction, that act between moving surfaces • recognise that some mechanisms including levers, pulleys and gears allow a smaller force to have a greater effect
Key Stage 3 Spring 2025	Mysteries / Time Travel & Change EQUALS: Earth and Beyond Pupils explore the consequences of the relative movement between the Sun, the Moon and the Earth in the context of the Solar System. • Learn that the earth spins around the sun • Seasons • Eclipses of the sun • Luminosity • The solar system	Mysteries / Time Travel NC Y5. Earth and Space • Describe the movement of the Earth and other planets relative to the sun in the solar system • describe the movement of the moon relative to the Earth. • describe the sun, Earth and moon as approximately spherical bodies. • use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.
Key Stage 2 Summer 2025	Rivers and Coasts & Water EQUALS: Grouping and classifying materials and their properties Students should: experience, explore, and investigate, record and communicate what they discover and learn about. • solids and liquids • the shape and volume of liquids • solids and their liquid properties • solids that do not dissolve • saturation • gases and changes in shape and volume • materials classifications as solid, liquid or gas Extension to dip into: 3.3B Changing materials and their properties • solids, liquids and gases • changes are reversible and irreversible • changes that occur when solids and liquids are mixed • separating solids from their solutions	Rivers and Coasts NC Y5. Properties and changes of materials • compare nd group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets • know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution • use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating • give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic • demonstrate that dissolving, mixing and changes of state are reversible changes. • explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda



Key Stage 4:

Pupils in Key Stage 4 who follow the Semi-Formal Curriculum Pathway encounter Science skills by following a life skills based curriculum. They learn about the world around them and practical applications of science through working towards the 'OCR life and living' qualification

Pupils in Key Stage 4 who follow the Formal Curriculum Pathway are encouraged to develop their scientific knowledge, skills and understanding enabling them to gain an Entry Level Science Qualification.
This implementation plan will be updated on a yearly basis to reflect the current pupils in the class, their interests and our partnership with Bromsgrove School.

2022-23	**Autumn**	**Spring**	**Summer**
WJEC Module	Science and our Universe (Credit value 3) Science: Health & Safety (Credit value 3)	Science and our Universe (Credit value 3) Science: Health & Safety (Credit value 3)	Science and our Universe (Credit value 3) Science: Health & Safety (Credit value 3)
Bromsgrove School Project	**Autumn 1:** Crater formation **Autumn 2:** Digestive System modelling	**Spring 1:** Red Cabbage Indicator **Spring 2:** Van der Graaf & Circuits	**Summer 1:** Heart & Lung Dissections **Summer 2:** Acid & Base titrations

2023-24	**Autumn**	**Spring**	**Summer**
WJEC Module	The Science of Light and Sound (Credit value 3) Working as Part of a Group (Credit value 2)	The Science of Light and Sound (Credit value 3) Science: Health & Safety (Credit value 2)	The Science of Light and Sound (Credit value 3) Science: Health & Safety (Credit value 3)
Bromsgrove School Project	**Autumn 1:** Light & Sound **Autumn 2:** Light & Sound	**Spring 1:** Science Week Workshops **Spring 2:** Light & Sound	**Summer 1:** TBC **Summer 2:** TBC

Curriculum Impact

Key Stage 1:

By the end of Key Stage 1 all pupils should have had the opportunity to access the fundamentals of the Key Stage 1 National curriculum by:

- Experiencing and observing phenomena, looking more closely at the natural and humanly-constructed world around them
- Being encouraged to be curious and ask questions about what they notice
- Helping them to develop their understanding of scientific ideas by using different types of scientific enquiry to answer their own questions, including observing changes over a period of time, noticing patterns, grouping and classifying things, carrying out simple comparative tests
- Being exposed to simple scientific language to talk about what they have found out
- Being encouraged to communicate their ideas to a range of audiences in a variety of practical experiences
- Sharing secondary sources of information with them such as books, photographs and videos.

Pupils should have developed their ability to work scientifically and to the best of their abilities will be able to:

- ask simple questions and recognising that they can be answered in different ways.
- observing closely, using simple equipment
- performing simple tests
- identifying and classifying
- using their observations and ideas to suggest answers to questions
- gathering and recording data to help in answering questions

Key Stage 2:

By the end of Key Stage 2 all pupils should have had the opportunity to have greater experience of and develop further confidence in the fundamentals of working scientifically in the Key Stage 1 National Curriculum.

- ask simple questions and recognising that they can be answered in different ways.
- observing closely, using simple equipment
- performing simple tests
- identifying and classifying
- using their observations and ideas to suggest answers to questions
- gathering and recording data to help in answering questions

Pupils following the Formal Pathway should also have had opportunities to begin experiencing and developing knowledge of the lower Key Stage 2 elements of working scientifically including:

- asking relevant questions and using different types of scientific enquiries to answer them
- setting up simple practical enquires, comparative and fair tests
- making systematic and careful observations including beginning to take measurements using standard units.
- Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions
- Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts and tables
- Reporting on findings from enquiries – oral and written explanations, displays or presentations of results and conclusions
- Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions
- Identifying differences, similarities or changes related to simple scientific ideas and processes
- Using straightforward scientific evidence to answer questions or to support their findings

Key Stage 3:

By the end of Key Stage 3 all pupils should have had the opportunity to have greater experience of and develop further confidence in the fundamentals of working scientifically

- ask simple questions and recognising that they can be answered in different ways.
- observing closely, using simple equipment
- performing simple tests
- identifying and classifying
- using their observations and ideas to suggest answers to questions
- gathering and recording data to help in answering questions

Pupils should also have had opportunities to begin experiencing and developing knowledge of the lower Key Stage 2 elements of working scientifically including:

- asking relevant questions and using different types of scientific enquiries to answer them
- setting up simple practical enquires, comparative and fair tests
- making systematic and careful observations including beginning to take measurements using standard units.
- Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions
- Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts and tables
- Reporting on findings from enquiries – oral and written explanations, displays or presentations of results and conclusions
- Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions
- Identifying differences, similarities or changes related to simple scientific ideas and processes
- Using straightforward scientific evidence to answer questions or to support their findings

Pupils following the Formal Pathway should have had chance to begin consolidating these skills and to begin to be taught to use the following practical scientific methods, processes and skills which will be needed for progression to an Entry Level Science course:

- Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary
- Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate
- Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs
- Using test results to make predictions to set up further comparative and fair tests
- Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations
- Identifying scientific evidence that has been used to support or refute ideas or arguments

Key Stage 4:

By the end of Key Stage 4 pupils following the formal pathway will have achieved an Entry Level Qualification in Science at either Entry Level 1, 2 or 3.

Key Scientific Skills that pupils will develop during this course include:

- knowledge and understanding of key areas of science and its application
- competence and confidence in a variety of practical, and problem-solving skill
- scientific enquiry and modelling skills and understanding in laboratory, and work-related contexts
- understanding of the relationships between data, evidence and explanations
- understanding of how society makes decisions about scientific issues
- communication, mathematical and technological skills in scientific contexts