www.eat.uk.com

ETHOS COLLEGE

Ethos College

Curriculum Planning

Science – Year 1

“Science and everyday life cannot and should not be separated”

Rosalind Franklin

Curriculum Intent: The World Around Us science curriculum at Ethos is designed to ignite curiosity, develop a sense of wonder, and lay strong foundations in scientific thinking for pupils with SEMH and SEND needs. We recognise that many of our learners arrive with limited experience of science and the wider world, and our curriculum seeks to bridge this gap through a carefully sequenced, inclusive, and nurturing approach.

Our intent is to provide a broad and balanced science education that is aligned with the National Curriculum but thoughtfully adapted to meet pupils’ diverse needs and starting points. While pupils are of KS4 age, many require a return to key knowledge and skills from the KS3 curriculum to secure the building blocks necessary for deeper understanding. We believe that securing these fundamentals is essential in enabling learners to progress confidently to post 16 education.

At its core, our science curriculum aims to:

- Develop pupils’ understanding of the natural world and scientific phenomena.
- Build foundational knowledge and scientific enquiry skills in a step-by-step, accessible manner.
- Foster self-confidence, curiosity, and independence through hands-on and relatable science experiences.
- Prepare pupils for future scientific study and everyday life, including understanding health, the environment, and technology.
- Encourage collaboration, communication, and problem-solving within a safe, inclusive learning environment.

Through this intentional design, we aim not only to teach science, but to nurture young people who are better equipped to question, explore, and understand the world in which they live.

Implementation: Our science curriculum is designed to engage pupils with SEND, ADHD, and Autism through an investigative, hands-on approach that builds curiosity about the world around them. The curriculum is carefully structured to align with the National Curriculum while being accessible, flexible, and responsive to learning needs.

We implement science through practical activities, visual supports, and clear, structured lessons that break down complex concepts into manageable steps. Multisensory experiences, repetition, and real-life contexts are embedded to reinforce understanding and maintain engagement.

Pupils are supported to scientific skills Pupils are supported to develop scientific skills such as observation, questioning, predicting, and recording findings at a level appropriate to their abilities. The curriculum provides frequent opportunities to revisit and consolidate prior knowledge, ensuring progress is secure and meaningful.

Social interaction, communication, and emotional regulation are nurtured through collaborative tasks and structured discussion, helping pupils to develop confidence in expressing ideas. Adaptations and scaffolds, including the use of visual aids, simplified language, and personalised resources, ensure that every pupil can access and enjoy science.

Through this approach, we aim to develop not only scientific understanding but also critical thinking, independence, and a sense of achievement, preparing pupils for further learning and everyday life.

Impact: The impact of our science curriculum is that pupils with SEND, ADHD, and Autism develop a deeper understanding of the world around them through meaningful, hands-on experiences. They are able to apply key scientific concepts in practical contexts, showing curiosity, confidence, and improved problem-solving skills.

Through repeated exposure, adapted teaching, and scaffolded support, pupils retain knowledge over time and make clear, measurable progress from their individual starting points. They demonstrate increased independence in using scientific skills such as observing, questioning, and predicting.

Pupils develop improved communication and social interaction skills by engaging in structured discussions and collaborative activities. Their emotional confidence grows as they experience success and recognition in science learning, contributing positively to their self-esteem.

As a result, pupils are better prepared for future learning, both within science and across the wider curriculum, and are equipped with knowledge and skills they can apply in everyday life.

.

Year 1

Time	Key Subject Content	Sequencing	Rationale	Careers, Industry Links and Cultural Capital	Enrichment	SEMH
Half Term 1: Who am I?	This unit teaches about the main body systems. Pupils learn how the heart, blood vessels, and blood work together to move oxygen and nutrients around the body and remove waste. They find out how breathing happens through the lungs. The muscles and skeleton work together to help us move. The nervous system sends messages to control the body and reflex actions. Lastly, pupils learn	**Cells: The Building Blocks of Life** Structure and function of animal cells; cell specialisation; simple microscopy. **The Skeleton and Muscles** Structure and function of the human skeleton; joints, movement, muscles working in pairs. **The Digestive System** Organs involved in digestion; function of enzymes; journey of food through the body.	This unit is designed for KS3/KS4, many of whom have gaps in their scientific understanding and limited experience of structured science learning. Starting with the human body, growth, senses, and identity allows pupils to connect science to their own experiences, making it more engaging and less abstract. By learning about themselves first, pupils build confidence and curiosity, essential for re-engaging with learning. Covers key biological concepts: cells, body	Teaching basic human biology develops pupils' cultural capital by helping them understand their own bodies and health, as well as the biological diversity of humans worldwide. Pupils learn about key systems such as the digestive, nervous, and skeletal systems, and processes like growth and puberty, which are relevant to their everyday lives and wellbeing. This topic introduces careers in healthcare and science, including doctors, nurses, physiotherapists, biomedical scientists, nutritionists, and psychologists. Highlighting these professions encourages	**Science/Medical Museums:** Visit a science museum with human biology exhibits (e.g. The Thackray Medical Museum in Leeds). Sensory walks in school grounds or local area. Use sports / yoga to explore how movement supports skeletal and muscular health.	Opportunities will be planned for to enable the students to develop Boxall strands A to E which are: A. Giving purposeful attention B. Participating constructively C. Connects up experiences D. Showing insightful involvement E. Engaging connectively with peers

	about hormones and glands that help the body grow and stay balanced.	**Growth, Puberty and Changes** Physical and emotional changes during puberty; human development stages. **Senses and the Nervous System** The five senses and how the body responds to stimuli; basic understanding of the nervous system. **Life Cycles and Reproduction** Human life cycle; comparison with other animals (e.g. insects, frogs); sexual vs asexual reproduction.	systems, reproduction, life cycles, and health. Lays the groundwork for later topics such as genetics, inheritance, health and disease, and bioenergetics**.**	pupils to consider pathways in medicine, health, and life sciences. By exploring human biology alongside cultural perspectives on health, growth, and body awareness, pupils gain a broader appreciation of diversity, personal responsibility, and the social and ethical aspects of biology—fostering empathy, informed decision-making, and preparation for active citizenship.		Team Work – Working with others to explore ideas Communication - Communicate with a partner and make decisions about their own work Building Confidence – Performing to others Mutual Respect and Tolerance: Being a good audience; Respect of performances; Use of equipment; tolerance of differing people (abilities); respect of different cultures Democracy: with decision making within a groups/pairs;

						understanding roles; Rule of Law: following activity rules and conventions; Individual Liberty: making judgements of their own and others performances and feeling safe in their activity.
Half Term 2: Bubbles, Bangs and Burning	This unit teaches pupils about chemical reactions and how substances change to make new products. They will learn how to write and understand simple chemical equations using symbols. Pupils will explore acids and alkalis, including how to test for them with indicators. They will study	Lesson 1: What is a Chemical Reaction? Define a chemical reaction. Identify signs of a chemical reaction (colour change, gas, temperature change, new substance). Lesson 2: Writing Chemical Equations Understand the terms reactants and products.	Chemistry provides a highly practical, visual, and engaging area of science that encourages curiosity about the material world. For pupils with SEMH, SEND, and ADHD, this topic sequence builds foundational knowledge, promotes hands-on learning, and develops core scientific skills such as observation, prediction, and evaluation. Understanding chemical reactions	Teaching basic chemical reactions helps pupils build cultural capital by connecting scientific principles to everyday life, industry, and global challenges. Pupils learn how substances interact and transform, which underpins important processes such as cooking, cleaning, medicine production, and environmental management.	Simulate crime scene investigations using chemical tests to identify substances. Explore reactions in cooking, such as caramelisation, baking (bicarbonate of soda reactions), or pickling (acid reactions). Enter national competitions such as the *Royal Society of*	Opportunities will be planned for to enable the students to develop Boxall strands A to E which are: A. Giving purposeful attention B. Participating constructively C. Connects up experiences

	neutralisation, seeing how acids and alkalis react together in real-life examples. The topic of combustion will show what fuels are and what is needed for things to burn. Finally, pupils will learn about chemical reactions they see in everyday life and how to explain them.	Write simple word equations for reactions observed. Lesson 3: Acids and Alkalis Identify properties of acids and alkalis Use common indicators to identify everyday substances as acid or alkali Lesson 4. Neutralisation Define **neutralisation** and describe it as a reaction between an acid and an alkali. Write a **word equation** for neutralisation: *acid + alkali → salt + water.* Identify examples of **neutralisation in everyday life** Lesson 5 Combustion ▯ Define combustion and explain that it is a chemical reaction that requires fuel,	supports functional knowledge for life (e.g., safety with household chemicals, cooking, and environmental awareness), while also preparing learners for formal KS3 and Entry Level pathways. Pupils are introduced to the concept that materials can change to form new substances. This lays essential groundwork for understanding irreversible changes and contrasts with physical changes (previously taught or revised from KS2). Visual and practical experiments (e.g., colour changes, gas production) provide instant feedback that helps engage learners who struggle with abstract concepts. Although symbolic representation is challenging, simplified word equations help pupils link real-life observations with	This topic introduces a range of careers including chemists, pharmacists, chemical engineers, environmental scientists, forensic scientists, and food technologists. Highlighting these roles shows pupils the wide-reaching impact of chemistry and inspires interest in STEM pathways. By exploring chemical reactions from different cultural perspectives and historical contexts, pupils appreciate the global contributions to science and understand how chemistry shapes technology, health, and sustainability worldwide—equipping them with knowledge essential for informed citizenship and future opportunities.	*Chemistry's Top of the Bench* or *The Big Bang Competition.*	D. Showing insightful involvement E. Engaging connectively with peers Team Work – Working with others to explore ideas Communication - Communicate with a partner and make decisions about their own work Building Confidence – Performing to others Mutual Respect and Tolerance: Being a good audience; Respect of performances; Use of equipment; tolerance of differing people (abilities);

		heat, and oxygen (the fire triangle). ▯ Describe what happens when one part of the fire triangle is removed. Understand the **safety implications** of combustion. Lesson 6 chemistry in everday life ▯ Identify and describe signs of a chemical reaction (colour change, gas production, temperature change, new substances formed). ▯ Give examples of chemical reactions in everyday life (e.g. rusting, cooking, burning fuels, baking). ▯ Differentiate between physical changes and chemical reactions.	scientific language. This bridges the gap between practical experience and formal science, building confidence in literacy and numeracy within a scientific context. Bringing relevance to learning is critical for engagement. Exploring familiar chemical reactions (e.g., baking, rusting, fireworks) helps pupils see the value of science beyond the classroom. This recap lesson encourages connections between taught concepts and lived experience, aiding retention and deeper understanding.			respect of different cultures Democracy: with decision making within a groups/pairs; understanding roles; Rule of Law: following activity rules and conventions; Individual Liberty: making judgements of their own and others performances and feeling safe in their activity.

Half Term 3: **Be The Change**	In this unit, pupils will learn about the three states of matter: solids, liquids, and gases, and their key properties. They will use the particle model to explain how particles are arranged and move in each state. Pupils will explore how substances change state through processes like melting, freezing, evaporation, and	What Are Solids, Liquids, and Gases? - Identify the three states of matter. - Describe the observable properties of solids, liquids, gases. The Particle Model: Explaining States of Matter - Describe the particle model of solids, liquids, gases. - Explain how particle arrangement and movement differ in each state.	Teaching solids, liquids, and gases in Year 1 provides pupils with essential foundational knowledge about the physical world. Understanding the properties of materials and how they change state supports pupils in making sense of everyday experiences, such as melting, freezing, and evaporation. This topic introduces key scientific concepts like the particle model, which underpins further learning in	Teaching changes of state enriches pupils' cultural capital by helping them understand fundamental natural processes that affect everyday life, industry, and the environment. Pupils explore how heating and cooling transform materials, linking these scientific concepts to practical applications across cultures and societies worldwide.	Uses knowledge of melting, freezing, and evaporation in food preservation, cooking, and packaging. Explore how different cultures use heating and freezing in cooking, food preservation, or crafts (e.g. metalwork, pottery glazes). Link to environmental issues, such as	Opportunities will be planned for to enable the students to develop Boxall strands A to E which are: A. Giving purposeful attention B. Participating constructively C. Connects up experiences D. Showing insightful

	condensation. They will also investigate how particles move in gases and liquids through diffusion and learn how gas pressure is created.	Changing State: Melting, Freezing, Boiling, Condensing - Name and describe processes that change the state of matter. - Explain changes of state using particle models. Diffusion and Gas Pressure: How Particles Move - Describe diffusion in gases and liquids. - Understand how gas pressure works in a container. - Explain both using the particle model.	chemistry and physics. It also develops observation, investigation, and enquiry skills through practical, hands-on activities that are engaging and accessible for all learners, including those with SEND, ADHD, or Autism. By exploring materials and their behaviour, pupils gain confidence in using scientific language and reasoning. This prepares them for more advanced topics in Year 2, such as chemical reactions and energy changes, building a clear and progressive understanding of the material world.	This topic highlights careers such as meteorologists, chemical engineers, food scientists, environmental scientists, and materials scientists—professions that rely on knowledge of melting, freezing, evaporation, and condensation. Introducing these roles helps pupils see the relevance of science in solving real-world problems, from weather prediction to food production and sustainable materials development. By connecting changes of state to global environmental issues like climate change and water cycles, pupils gain a broader perspective on human impact and sustainability, fostering scientific literacy and responsible citizenship.	the melting of polar ice caps, recycling materials, or reducing plastic waste. Engage with research scientists through 'I'm a scientist get me out of here' discussing real life applications of what student are learning. Discuss how changes of state are portrayed in films and media (e.g. dry ice in special effects). .	involvement E. Engaging connectively with peers Team Work – Working with others to explore ideas Communication - Communicate with a partner and make decisions about their own work Building Confidence – Performing to others Mutual Respect and Tolerance: Being a good audience; Respect of performances; Use of equipment; tolerance of differing people (abilities); respect of

						different cultures Democracy: with decision making within a groups/pairs; understanding roles; Rule of Law: following activity rules and conventions; Individual Liberty: making judgements of their own and others performances and feeling safe in their activity.
Half Term 4: New Beginnings	In this unit, pupils will learn why plants are important, including their role in producing oxygen, providing food, and creating habitats for other living things. They will identify	Why Are Plants Important? - Understand the role of plants in life on Earth. - Identify ways humans use plants. Parts of a Plant and Their Functions	In an engagement-focused science curriculum for KS3/KS4 pupils with SEND, SEMH, ADHD, and Autism, teaching Plants in Spring Term 2 provides a timely, accessible, and meaningful learning	Teaching about plants helps pupils develop cultural capital by deepening their understanding of the vital role plants play in ecosystems, human culture, and global economies. Pupils learn how plants provide food, medicine, materials, and cultural significance	Promotes **wellbeing and mindfulness**, as engaging with nature has proven benefits for mental health, especially for SEMH learners. Conduct habitat surveys of local	Opportunities will be planned for to enable the students to develop Boxall strands A to E which are: A. Giving purposeful attention

	the parts of a plant—roots, stem, leaves, and flowers—and understand what each part does. Pupils will explore how plants make their own food through photosynthesis and why this is essential for life on Earth. They will also study the plant life cycle and how plants reproduce using seeds and other methods. Finally, pupils will look at how humans use plants for food, materials, medicine, and other everyday products.	- Name parts of a plant and explain their functions. - Identify roots, stem, leaves, flowers. Photosynthesis: How Plants Make Food - Understand the basics of photosynthesis. - Identify what plants need to grow. Plant Life Cycle and Reproduction - Describe the life cycle of a flowering plant. - Understand pollination, fertilisation, seed dispersal. Plants in Our Lives: Food, Medicine, Culture - Recognise different uses of plants globally. - Understand the cultural and health value of plants.	experience. Pupils often have gaps in prior knowledge and limited interaction with the natural world, which this unit addresses through practical, sensory-rich activities. • Spring is a natural time of growth and regeneration, offering real-world examples of plant life cycles, growth, and reproduction in the environment around pupils. • Learners can observe local plant growth, flower emergence, and pollination, linking theoretical concepts to visible change.	across different societies and throughout history. This topic also introduces a variety of careers related to plants, such as botanists, horticulturists, agricultural scientists, environmental consultants, and pharmacists. Highlighting these professions shows pupils the diverse opportunities available in science and encourages them to consider how plant science impacts everyday life and the future of sustainable living. Through learning about plants, pupils gain awareness of environmental stewardship, sustainability, and the interconnectedness of people and nature, equipping them with knowledge that supports informed citizenship and respect for the natural world.	wildlife, insects, and plants within the school grounds.	B. Participating constructively C. Connects up experiences D. Showing insightful involvement E. Engaging connectively with peers Team Work – Working with others to explore ideas Communication - Communicate with a partner and make decisions about their own work Building Confidence – Performing to others Mutual Respect and Tolerance: Being a good audience; Respect of

						performances; Use of equipment; tolerance of differing people (abilities); respect of different cultures Democracy: with decision making within a groups/pairs; understanding roles; Rule of Law: following activity rules and conventions; Individual Liberty: making judgements of their own and others performances and feeling safe in their activity. .

Half Term 5: Home and Away belongs.	In this unit, pupils will learn what a habitat is and how it provides the basic needs for living things to survive. They will explore different types of habitats such as forests, oceans, deserts, and urban areas, and the animals and plants that live in each. Pupils will investigate how living things are adapted to survive in various environments. They will also learn how energy is transferred through food chains and food webs. The unit examines the impact of human activities like pollution and deforestation on habitats and biodiversity. Finally, pupils will explore the	What Is a Habitat? Define habitats Explain why organisms live in specific habitats. Types of Habitats Identify and describe different habitat types (forest, desert, pond, etc.). Adaptations for Survival Understand how living things are adapted to their habitats. Food Chains and Food Webs Describe food chains and food webs; explain producer, consumer, predator, prey Human Impact on Habitats Explain how humans affect habitats and biodiversity. Conservation and Protection Understand methods of habitat conservation and	Teaching Habitats and Living Things in Summer Term 1 of Year 1 is carefully planned to align with seasonal opportunities for outdoor learning. Spring and summer provide ideal conditions for observing local wildlife, plant growth, and changes in ecosystems, making the learning more relevant and engaging. This is particularly beneficial for pupils with SEMH and SEND needs, as time in nature supports mental health, emotional regulation, sensory engagement, and encourages curiosity through hands-on exploration. The unit builds core biological knowledge by introducing habitats, ecosystems, and biodiversity—key concepts that underpin KS3 and KS4 biology. It prepares pupils for future learning on ecology, biodiversity,	Teaching habitats provides valuable opportunities to build pupils' cultural capital by exploring the diversity of life across different environments and cultures around the world. Pupils learn how people in various cultures interact with, rely on, and protect their local habitats, from rainforests to oceans and deserts. This broadens their understanding of global biodiversity and the importance of conservation. The topic also introduces pupils to a range of careers connected to habitats and the environment, such as ecologists, wildlife conservationists, marine biologists, park rangers, and environmental scientists. Learning about these roles helps pupils see the real-world impact of science and inspires them to consider careers that protect and study	. Create a space on-site to attract and support local biodiversity. Use VR or online resources to explore habitats like rainforests, coral reefs, and savannahs. Watch and discuss nature documentaries such as *Planet Earth*, *Blue Planet*, or *Our Planet*.	Opportunities will be planned for to enable the students to develop Boxall strands A to E which are: A. Giving purposeful attention B. Participating constructively C. Connects up experiences D. Showing insightful involvement E. Engaging connectively with peers Team Work – Working with others to explore ideas Communication - Communicate with a partner and make decisions about

	importance of conservation and how we can protect endangered species and their habitats.	importance of protecting biodiversity.	conservation, and human impacts on the environment. Pupils also develop an understanding of food chains, food webs, and adaptations, which links to later topics such as evolution, genetics, and environmental science. This learning builds on prior knowledge from the Plants topic in Spring Term 2 and the Who Am I? unit, where pupils explored life processes, reproduction, and growth, providing a cohesive and progressive science curriculum.	living things and their environments. Through this topic, pupils develop respect for nature, awareness of human impact on ecosystems, and an understanding of global sustainability challenges—essential knowledge for informed and responsible citizenship.		their own work Building Confidence – Performing to others Mutual Respect and Tolerance: Being a good audience; Respect of performances; Use of equipment; tolerance of differing people (abilities); respect of different cultures Democracy: with decision making within a groups/pairs; understanding roles; Rule of Law: following activity rules and conventions; Individual

						Liberty: making judgements of their own and others performances and feeling safe in their activity.
Half Term 6: Going Places	In this unit, pupils will learn about forces and energy through six lessons. They will start by understanding that a force is a push or pull and be able to identify contact and non-contact forces. Pupils will then explore types of forces	What is a Force? - Define a force as a push or pull. - Identify contact and non-contact forces. Types of Forces: Gravity, Friction, Air Resistance - Describe different forces acting on objects. - Understand how friction and air resistance affect	Introducing energy and forces in the final half term of Year 1 provides a strong foundation for understanding key physical science concepts that are essential for everyday life and further study. This timing allows pupils to consolidate prior knowledge in other scientific areas and apply logical	eaching forces and energy enhances pupils' cultural capital by explaining fundamental concepts that govern how the world works, from everyday activities to large-scale technologies. Pupils explore how forces cause movement and how energy is transferred,	Conduct a mini energy audit of the school or home to identify energy use and waste. Design and build models of wind turbines, solar ovens, or water wheels. Visit science museums, power stations, or engineering	Opportunities will be planned for to enable the students to develop Boxall strands A to E which are: A. Giving purposeful attention B. Participating constructively

	including gravity, friction, and air resistance, and how these affect the movement of objects. They will investigate balanced and unbalanced forces and how they influence whether objects stay still or move. The unit introduces energy, helping pupils identify different forms such as kinetic, potential, heat, and sound, and understand that energy makes things happen. Pupils will also learn how energy transfers from one form to another in simple situations. Finally, they will apply their understanding of forces and energy to everyday	movement. - Introduce gravity. Balanced and Unbalanced Forces - Explain what happens when forces are balanced or unbalanced. - Predict the motion of objects based on forces. Introduction to Energy - Define energy and identify different forms of energy (kinetic, potential, heat, sound, etc.). - Recognise that energy makes things happen. Energy Transfers and Transformations - Understand that energy can be transferred from one form to another. - Describe simple energy transfers. Forces and Energy in Everyday Life - Apply knowledge of forces and energy to real-world examples (e.g.	thinking to physical processes. Energy and forces are highly relevant and practical topics that help pupils make sense of movement, transport, and the use of energy in real-world contexts. By engaging pupils in practical experiments and relatable scenarios, we can foster curiosity and develop essential skills such as prediction, measurement, and analysis. Positioning this topic at the end of Year 1 enables pupils to build confidence in physical science before progressing to more complex concepts in Year 2, such as energy transfers, motion, and Newton's Laws. This sequence ensures learning is progressive, accessible, and engaging, supporting pupils to develop scientific understanding and	stored, and used in various contexts. This topic connects to a wide range of careers, including engineers, physicists, renewable energy specialists, automotive technicians, and architects. Introducing these professions helps pupils understand the practical applications of science and encourages interest in STEM fields. By linking forces and energy to global challenges such as sustainable energy, transportation, and technology development, pupils gain awareness of environmental issues and innovation across cultures—equipping them with knowledge and skills to engage meaningfully with the modern world.	workshops to see forces and energy in action. Write reports or persuasive texts about renewable energy or the importance of energy conservation.	C. Connects up experiences D. Showing insightful involvement E. Engaging connectively with peers Team Work – Working with others to explore ideas Communication - Communicate with a partner and make decisions about their own work Building Confidence – Performing to others Mutual Respect and Tolerance: Being a good audience; Respect of performances; Use of equipment;

	examples like transport, sports, and machines, consolidating their knowledge through real-life connections.	transport, sports, machines). - Review and consolidate learning.	critical thinking in a way that is meaningful to them.			tolerance of differing people (abilities); respect of different cultures Democracy: with decision making within a groups/pairs; understanding roles; Rule of Law: following activity rules and conventions; Individual Liberty: making judgements of their own and others performances and feeling safe in their activity.