



Chester-le-Street CE Primary School

Science

INTENT

At Chester-le-Street CE Primary School, we believe that Science is fundamental to helping children understand the world in which they live. It is an important and valued subject because it is relevant to every child, every day — from understanding our own bodies and the food we eat, to exploring the weather, nature, materials, technology and the environment around us.

Our Science curriculum is rooted in our vision of Our Community, Our World and Our Impact. Through Science, children develop an understanding of the world around them, their place within it and the positive contribution they can make to it. As a Church of England school, we seek to nurture a sense of curiosity, awe and wonder at God's wondrous world, encouraging children to respect themselves, others and the world they share.

We want every child to develop the confidence to ask “why?”, “how?” and “what if?” and, importantly, to develop the knowledge and skills needed to investigate these questions. Science is not simply about knowing facts; it is about understanding how scientific knowledge is developed, using evidence, thinking critically, solving problems and communicating ideas.

We therefore aim to develop children who are curious, knowledgeable and confident scientists, who can observe carefully, ask meaningful questions, investigate systematically, use evidence to draw conclusions and recognise that scientific understanding continues to develop over time.

OUR AIMS

Our Science curriculum aims to:

- **Nurture curiosity and wonder**, inspiring children to explore and ask questions about the natural and physical world.
- **Develop secure scientific knowledge and understanding**, building progressively on prior learning across EYFS, Key Stage 1 and Key Stage 2.
- **Develop Working Scientifically skills**, enabling children to ask questions, make predictions, plan and carry out investigations, observe and measure, gather and interpret data, draw conclusions and evaluate their findings.
- **Develop critical thinking and problem-solving**, encouraging children to use scientific knowledge and evidence to explain phenomena, solve problems and make informed decisions.
- **Develop scientific vocabulary and communication**, enabling children to discuss, explain and present their scientific ideas clearly using appropriate terminology.
- **Help children understand how the world works**, linking individual facts and concepts to develop a coherent understanding of the natural world.

- **Develop respect and responsibility**, helping children understand the relationship between human activity and the natural environment and how their actions can have a positive impact.
- **Provide opportunities for practical and enquiry-based learning**, allowing children to experience Science through observation, experimentation, investigation and first-hand experiences.
- **Make meaningful connections across the curriculum**, particularly with Mathematics, Computing, Design and Technology, Geography, English and PSHE, recognising the important role Science plays within STEM.
- **Develop awareness of the role of scientists and scientific discovery**, including how scientific knowledge has contributed to positive advancements and continues to shape our lives.
- **Prepare children for their future**, developing transferable skills such as curiosity, collaboration, communication, resilience, reasoning and evidence-based decision making, while introducing children to the contribution Science makes to different careers and industries.
- **Ensure Science is accessible to all**, with appropriate support, challenge and adaptation so that every child can participate meaningfully and develop as a scientist.

KNOWLEDGE AND WORKING SCIENTIFICALLY

We recognise that children need both **scientific knowledge** and the ability to **work scientifically**. These two aspects are deliberately developed together throughout the curriculum.

Children progressively build knowledge across the disciplines of **biology, chemistry and physics**, revisiting and connecting important concepts as they move through the school. New learning is built upon prior knowledge so that children increasingly move from describing what they observe to explaining scientific ideas using increasingly precise vocabulary and evidence.

Alongside this substantive knowledge, children develop disciplinary knowledge through our progression in **Working Scientifically**. Beginning in the Early Years with exploring, observing, questioning, predicting and talking about the world around them, children progressively learn to plan investigations, identify variables, select appropriate equipment, collect and represent data, recognise patterns, draw evidence-based conclusions and evaluate the reliability and limitations of their findings.

This progression enables children to increasingly understand not only **what we know about the world, but how we know it**.

SCIENCE, OUR WORLD AND OUR IMPACT

Science provides children with opportunities to understand the world locally, nationally and globally. We make meaningful use of our local environment and encourage children to observe and investigate the world immediately around them.

Children explore how scientific understanding can be used to address real-world challenges, including health, materials, energy, habitats and the environment. They consider both the positive and negative impact of human activity and are encouraged to think about how scientific knowledge can help us make responsible choices and improve the world around us.

Through this, we want children to understand that they are not simply learners of Science; they can become people who **use knowledge, evidence and curiosity to make a positive difference**.

OUR VISION

Ultimately, we want our Science curriculum to leave children with a lasting sense of **curiosity and wonder**. We want them to leave Chester-le-Street CE Primary School understanding more about the world,

confident to question what they see, equipped to investigate what they do not yet know and able to use evidence to form and communicate their ideas.

We want every child to recognise that Science is something they can **do**, not simply something they learn about.

Through Science, we aim to develop children who are curious about God's world, respectful of it, confident in their ability to explore it and committed to making a positive impact upon it.

“Let all that you do be done with love.”

IMPLEMENTATION

CURRICULUM

Our Science curriculum is carefully planned and sequenced to ensure that pupils develop secure scientific knowledge, vocabulary and Working Scientifically skills as they progress from EYFS through to Year 6. Learning is designed to build on pupils' prior knowledge and experiences, allowing children to make meaningful connections between scientific concepts and the world around them.

Science is organised around three overarching themes: Our Community, Our World and Our Impact. These themes provide a coherent structure through which pupils explore the natural and physical world, their place within it, and the ways in which science and human activity can influence it.

The curriculum is underpinned by the National Curriculum for Science, ensuring appropriate coverage of biology, chemistry and physics alongside the development of Working Scientifically. Units are carefully selected and sequenced so that pupils revisit and build upon important concepts, progressively developing their understanding and scientific vocabulary.

Across each year group, pupils encounter a balance of substantive knowledge – what scientists know about the world – and disciplinary knowledge – how scientific knowledge is developed through observation, questioning, investigation, evidence and reasoning. Working Scientifically is therefore taught explicitly alongside scientific content rather than being treated as an additional or separate element of the curriculum.

Our curriculum provides opportunities for pupils to:

- develop knowledge and understanding of key scientific concepts;
- build on prior learning and make connections between different areas of Science;
- ask increasingly relevant and scientific questions;
- make predictions and suggest ways to investigate their ideas;
- observe closely and use appropriate equipment;
- carry out practical investigations and simple tests;
- gather, record, present and interpret data in increasingly sophisticated ways;
- identify patterns, similarities, differences and changes;
- use evidence to draw conclusions and explain their thinking;
- communicate scientific ideas using increasingly accurate scientific vocabulary;
- recognise the importance of evidence when developing scientific understanding.

Practical and enquiry-based learning is an important part of our curriculum. Pupils are given regular opportunities to observe, explore, test, compare, classify, measure, investigate and explain. These experiences are carefully matched to the knowledge being taught and become increasingly independent as pupils move through the school.

The curriculum also makes meaningful connections to pupils' everyday experiences and the world beyond the classroom. Science is used to help pupils understand familiar contexts such as nature, weather, materials, plants, animals, food, health, light, sound, electricity and the environment, while also introducing them to wider scientific ideas and developments.

Where appropriate, Science is connected with other areas of the curriculum, including Mathematics, Computing, Design and Technology and English, enabling pupils to apply their knowledge and skills in different contexts. Scientific vocabulary, discussion and written explanation are developed throughout the curriculum so that pupils can confidently communicate their understanding.

The curriculum is designed to be inclusive and accessible to all pupils. Teachers adapt teaching, resources, scaffolding and practical activities in response to individual needs, ensuring that pupils with SEND and other additional needs can participate meaningfully in scientific learning. Support is informed by pupils' individual needs, Support Plans and EHCPs where appropriate, in collaboration with the SENDCo and other relevant adults.

Our Science curriculum also reflects our Christian ethos. Through the study of the natural world, pupils are encouraged to develop a sense of curiosity, awe and wonder, alongside respect for themselves, others and the world in which they live. They are encouraged to consider how scientific understanding can contribute positively to their community and the wider world and to recognise the responsibility that comes with increased knowledge and understanding.

By the end of Year 6, pupils will have developed a progressively broader and deeper body of scientific knowledge alongside the skills and confidence required to investigate questions, use evidence and communicate scientific ideas. This provides a strong foundation for future learning and encourages pupils to see Science as an important part of understanding and positively contributing to the world around them.

CURRICULUM COVERAGE

	Our community		Our World		Our Impact	
	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
1	It's my life	This is our school	Royal Patrons – Story of Elizabeth and Victoria	We are united	King of the Castle	Beside the Seaside
	Science: Sensitive bodies	Science: Uses of everyday materials	Science: Making connections: Investigating science through stories	Science: Forces and space: Seasonal changes	Science: Animals: Comparing animals	Science: Introduction to plants
2	Made in Durham	There's no place like home	Medicine Women	Adventures around the world	Fire! Fire!	Going Wild
	Science: Plants	Science: Living things: Habitats	Science: Microhabitats	Science: Uses of everyday materials	Science: Seasonal changes	Science: Making Connections: Plant-based materials
3	May the force be with you	The Lambton worm	Captain Caveman	Pack your bags	Who Let the Gods out	Where Land Meets Sea
	Science: Forces and Magnets	Science: Animals: Movement and nutrition	Science: Rocks	Science: Light	Science: Plants	Science: Making connections: Does hand span affect grip strength?
4	You're Not Invited	The Uk uncovered	Revolting Rebels	The Rhythm of the Rain	Walk like an Egyptian	Spiritual rivers
	Science: Energy: Electricity and circuits	Science: Living things: Classification and changing habitats	Science: Animals including humans: Digestion and food	Science: Materials: States of matter	Science: Energy: Sound and vibrations	Science: Making connections: How does the flow of liquids compare?
5	Saxon Raiders	Awesome Alps	Viking Warriors	Guardians of the Gorge	Mysteries of the Maya	Rainforest Rescue
	Science: Evolution and Inheritance	Science: Energy: Circuits, batteries and switches	Science: Energy: Light and reflection	Science: Living things: Classifying big and small	Science: x (SATs)	Science: Animals, including humans: Circulation and h

6	Mining's Footprint	Extreme Earth	Battle of Britain	The Place inbetween	Achievements of the ancients	Planet Earth
	Science: Evolution and Inheritance	Science: Energy: Circuits, batteries and switches	Science: Energy: Light and reflection	Science: Living things: Classifying big and small	Science: x (SATs)	Science: Animals, including humans: Circulation and h

SKILLS PROGRESSION

The development of scientific skills is a fundamental part of our Science curriculum. **Working Scientifically is taught progressively from EYFS to Year 6**, with pupils building confidence, independence and precision as they move through the school.

Our progression ensures that pupils do not simply acquire scientific facts, but develop the skills needed to **ask questions, plan investigations, carry out practical work, interpret evidence and communicate their findings**.

The progression is organised into four key areas:

Ponder – Questioning, Predicting and Thinking Scientifically

Children develop their ability to ask questions and use their existing knowledge and observations to make predictions.

- **EYFS:** Explore the natural world, notice changes, ask questions and begin to make predictions.
- **Years 1–2:** Ask simple questions, use scientific vocabulary and suggest what might happen. Children begin to consider different ways of answering questions.
- **Years 3–4:** Ask relevant questions, make predictions using scientific knowledge and begin to identify appropriate ways to investigate.
- **Years 5–6:** Ask their own scientific questions, use scientific knowledge to explain predictions and use conclusions to generate further questions. Pupils increasingly distinguish between fact and opinion.

Plan – Planning and Designing Investigations

Children progressively develop independence in deciding how scientific questions can be explored.

- **EYFS:** Follow simple instructions, select resources and explore ideas through play and investigation.
- **Years 1–2:** Follow instructions, select appropriate equipment and recognise potential dangers and variables.
- **Years 3–4:** Recognise different types of enquiry, select suitable equipment and begin to plan practical and fair tests with increasing independence.
- **Years 5–6:** Select appropriate enquiry types and equipment, identify and control variables, decide how data will be recorded and plan investigations in a logical and increasingly precise way.

Practical – Observing, Measuring, Recording and Handling Data

Children develop increasing accuracy when carrying out investigations and recording their observations and results.

- **EYFS:** Explore, observe, compare and begin to record their experiences through drawings, models, talk and simple representations.
- **Years 1–2:** Make close observations using simple equipment, use standard units where appropriate, classify and group objects and record findings using pictures, words, tables, block charts and pictograms.
- **Years 3–4:** Make systematic observations and accurate measurements using appropriate equipment and standard units. Pupils gather, classify and present data using tables and charts.

- **Years 5–6:** Measure with increasing accuracy and precision, repeat readings where appropriate and record increasingly complex data. Pupils use tables, line graphs, scatter graphs and other appropriate representations, selecting scales and methods of presentation with increasing independence.

Present – Analysing, Concluding and Communicating

Children develop their ability to use evidence to explain what they have found and communicate their scientific understanding.

- **EYFS:** Talk about observations, describe changes and share ideas through play, discussion and simple representations.
- **Years 1–2:** Talk about observations, identify simple patterns and relationships, explain findings and suggest how an investigation could be improved or explored differently.
- **Years 3–4:** Identify differences and similarities in data, recognise simple patterns and present findings in a range of ways. Pupils begin to draw conclusions and suggest improvements.
- **Years 5–6:** Identify patterns, trends and anomalies, draw evidence-based conclusions and use scientific ideas to support explanations. Pupils evaluate investigations, identify limitations and suggest improvements or further questions.

Progression in Independence

As pupils progress through the school, the expectation is that they become increasingly **independent, accurate and critical scientists**. The level of adult support and scaffolding gradually reduces as pupils develop the knowledge and confidence to make their own decisions.

This progression ensures that by the end of Year 6, pupils are able to apply Working Scientifically skills across a range of contexts. They can ask relevant questions, plan appropriate enquiries, select equipment, gather and analyse evidence, draw conclusions and communicate their findings using appropriate scientific vocabulary.

Working Scientifically is therefore embedded throughout the curriculum, with skills deliberately revisited and developed alongside substantive scientific knowledge. This enables pupils to understand not only **what we know about the world, but how scientific knowledge is developed and tested**.

Science Skills Progression EYFS, Year 1 - 6

Early Years Foundation Stage

Understanding the World - The Natural World:

- Explore the natural world around them, making observations and drawing pictures of animals and plants.
- Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class.
- Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter

Working Scientifically Strands	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Ponder 	a. Ask simple questions b. With help, say what might happen	a. Ask questions using some scientific words b. Say what might happen in an investigation c. Begin to understand different ways to answer questions	a. Ask my own relevant questions b. Predict what might happen using scientific knowledge	a. With help, decided which type of enquiry will best answer my question b. Make a relationship prediction to predict a trend c. Know when and how to use a secondary source to find answers	a. Use scientific knowledge to ask my own questions b. Use my conclusions to make new predictions c. Use my knowledge and understanding to explain my prediction	a. Begin to separate opinions from fact b. Raise relevant questions to discuss scientific concepts c. Use my conclusions to ask new questions

Plan 	a. Follow simple instructions b. Name everyday items to use in an investigation c. Find an answer with help d. Work safely with an adult e. Know that things can change in an investigation	a. Follow instructions in order b. Choose helpful scientific equipment to use in a test c. Recognise some dangers d. Know what variables are going to change	a. Know that there are different types of enquiries b. Decide what equipment to use c. Identify risks d. With help, set up simple practical enquiries to carry out a fair test	a. Know that there are different types of enquiries and give examples of each b. Select suitable equipment for a task c. Learn how to use new equipment safely d. Use different enquiry types to test my questions e. Set up my own simple test	a. Know that there are different types of enquiries and give examples of each b. Select suitable equipment for practical tasks c. Decide how to record data d. Plan to collect repeat recordings e. Design an ordered method f. Plan a fair test	a. Suggest ways of exploring ideas through practical investigation or using secondary sources b. Recognise and control variables precisely c. Select what equipment to use d. Select and plan the most appropriate type of scientific enquiry to use
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Practical



a. Use non-standard units to measure b. Add to block charts and pictograms c. Record using pictures and words in a table d. Use a number track to measure	a. Measure using standard units and whole numbers b. Observe closely c. Record using my own block chart or pictogram d. Group things using simple features e. Record what I notice in different ways f. Use a simple table with words and numbers	a. Accurately measure using standard units b. Group and sort using data c. Record my results as a bar chart d. Construct a simple table using a frame e. Make logical observations f. Begin to collect and record data from my own observations	a. Accurately measure using standard units b. Measure using a range of equipment c. Construct a simple table and bar chart d. Measuring using unmarked divisions on a number line e. Make systematic observations f. Group and sort using different criteria	a. Measure division on a scale including negatives b. Construct a scatter or line graph using a frame c. Construct a complex table using a frame d. Join plotted coordinates with straight lines e. Use standard units to measure and convert f. Round decimals	a. Construct a range of graphs and choose appropriate scales of axis b. Decide what observations and measurements to make c. Use decimal numbers when collecting data d. Construct a complex table e. Create classification keys
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 Present	a. Talk about simple number patterns b. Use more or less to compare numbers c. Describe changes I can see d. Explore scientific ideas when I play	a. Talk about what I have seen b. With help, suggest a different way to do things next time c. Explain what I have found out d. Notice patterns and relationships e. Use simple scientific language in my writing and talk	a. Recognise difference in my data b. Suggest improvements to my investigations c. Present my findings in different ways d. Use scientific language to explain what I have found e. Describe simple patterns in my data	a. Suggest improvements to my investigations b. Present my findings in different ways c. Draw simple conclusions d. Use scientific language to explain what I have found out e. Describe simple patterns, trends and relationships in my data	a. Suggest improvements to my tests b. Spot anomalous data c. Present my findings in different ways d. Support data with scientific ideas in my conclusions e. Use scientific language and illustration in a conclusion f. Identify and describe changing patterns and trends	a. Suggest improvements to my tests b. Explain limitations in my data and use this to suggest improvements c. Use scientific language to identify and comment on patterns that I notice d. Explain how scientific ideas develop over time e. Use a range of data and models to explain my conclusions

National Curriculum Programme of Study					
Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Animals including humans - identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense. - Pupils should have plenty of opportunities to learn the names of the main body parts (including head, neck, arms, elbows, legs, knees, face, ears, eyes, hair, mouth, teeth) through games, actions, songs and rhymes.	Animals including humans - notice that animals, including humans, have offspring which grow into adults - find out about and describe the basic needs of animals, including humans, for survival (water, food and air) - describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene - Pupils should be introduced to the basic needs of animals for	Animals including Humans - identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat - identify that humans and some other animals have skeletons and muscles for support, protection and movement - Pupils should continue to learn about the importance of nutrition	Animals Including Humans - describe the simple functions of the basic parts of the digestive system in humans - identify the different types of teeth in humans and their simple functions - Pupils should be introduced to the main body parts associated with the digestive system, for example: mouth, tongue, teeth, oesophagus, stomach, and small and large intestine, and explore questions that help them to	Animals including Humans - describe the changes as humans develop to old age - Pupils should draw a timeline to indicate stages in the growth and development of humans. They should learn about the changes experienced in puberty. - Pupils could work scientifically by researching the gestation periods of other animals and comparing them with humans; by finding out	Animals including humans - 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 the ways in which nutrients and water are transported within animals, including humans

• using their senses to compare different textures, sounds and smells. • 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 • describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets) • Pupils should use the local environment throughout the year to explore and answer questions about animals in their habitat. • They should understand how to take care of animals taken from their local environment and the need to return them safely after study. • Pupils should become familiar with the common names of some fish, amphibians, reptiles, birds and mammals, including those that are kept as pets. • Pupils might work scientifically by: using their observations to compare and contrast animals at first hand or through videos and photographs, describing how they identify and group them; grouping animals according to what they eat	survival, as well as the importance of exercise and nutrition for humans. They should also be introduced to the processes of reproduction and growth in animals. The focus at this stage should be on questions that help pupils to recognise growth; they should not be expected to understand how reproduction occurs. • The following examples might be used: egg, chick, chicken; egg, caterpillar, pupa, butterfly; spawn, tadpole, frog; lamb, sheep. Growing into adults can include reference to baby, toddler, child, teenager, adult. • Pupils might work scientifically by: observing, through video or first-hand observation and measurement, how different animals, including humans, grow; asking questions about what things animals need for survival and what humans need to stay healthy; and suggesting ways to find answers to their questions	and should be introduced to the main body parts associated with the skeleton and muscles, finding out how different parts of the body have special functions. • Pupils might work scientifically by: identifying and grouping animals with and without skeletons and observing and comparing their movement; exploring ideas about what would happen if humans did not have skeletons. They might compare and contrast the diets of different animals (including their pets) and decide ways of grouping them according to what they eat. They might research different food groups and how they keep us healthy, and design meals based on what they find out.	understand their special functions. • Pupils might work scientifically by: comparing the teeth of carnivores and herbivores and suggesting reasons for differences; finding out what damages teeth and how to look after them. They might draw and discuss their ideas about the digestive system and compare them with models or images.	and recording the length and mass of a baby as it grows.	• Pupils should build on their learning from years 3 and 4 about the main body parts and internal organs (skeletal, muscular and digestive system) to explore and answer questions that help them to understand how the circulatory system enables the body to function. • Pupils should learn how to keep their bodies healthy and how their bodies might be damaged - including how some drugs and other substances can be harmful to the human body. • Pupils might work scientifically by: exploring the work of scientists and scientific research about the relationship between diet, exercise, drugs, lifestyle and health.
Everyday materials • distinguish between an object and the material from which it is made • identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock • describe the simple physical properties of a variety of everyday materials • compare and group together a variety of everyday materials on	Everyday materials and their properties • identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses • find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching	Rocks • compare and group together different kinds of rocks on the basis of their appearance and simple physical properties • describe in simple terms how fossils are formed when things that have lived are trapped within rock • recognise that soils are made from rocks and organic matter	States of Matter • compare and group materials together, according to whether they are solids, liquids or gases • observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C) • identify the part played by evaporation and condensation in the water cycle and associate the	Properties of Materials • compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets • give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic	Living things and their 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

the basis of their simple physical properties. • Pupils should explore, name, discuss and raise and answer questions about everyday materials so that they become familiar with the names of materials and properties such as: hard/soft; stretchy/stiff; shiny/dull; rough/smooth; bendy/not bendy; waterproof/not waterproof; absorbent/not absorbent; opaque/transparent. • Pupils should explore and experiment with a wide variety of materials, not only those listed in the programme of study, but including for example: brick, paper, fabrics, elastic, foil. • Pupils might work scientifically by: performing simple tests to explore questions, for example: 'What is the best material for an umbrella? ...for lining a dog basket? ...for curtains? ...for a bookshelf? ...for a gymnast's leotard?'	• Pupils should identify and discuss the uses of different everyday materials so that they become familiar with how some materials are used for more than one thing (metal can be used for coins, cans, cars and table legs; wood can be used for matches, floors, and telegraph poles) or different materials are used for the same thing (spoons can be made from plastic, wood, metal, but not normally from glass). • They should think about the properties of materials that make them suitable or unsuitable for particular purposes and they should be encouraged to think about unusual and creative uses for everyday materials. • Pupils might find out about people who have developed useful new materials, for example John Dunlop, Charles Macintosh or John McAdam. • Pupils might work scientifically by: comparing the uses of everyday materials in and around the school with materials found in other places (at home, the journey to school, on visits, and in stories, rhymes and songs); observing closely, identifying and classifying the uses of different materials, and recording their observations.	• Linked with work in geography, pupils should explore different kinds of rocks and soils, including those in the local environment. • Pupils might work scientifically by: observing rocks, including those used in buildings and gravestones, and exploring how and why they might have changed over time; using a hand lens or microscope to help them to identify and classify rocks according to whether they have grains or crystals, and whether they have fossils in them. Pupils might research and discuss the different kinds of living things whose fossils are found in sedimentary rock and explore how fossils are formed. Pupils could explore different soils and identify similarities and differences between them and investigate what happens when rocks are rubbed together or what changes occur when they are in water. They can raise and answer questions about the way soils are formed.	rate of evaporation with temperature • Pupils should explore a variety of everyday materials and develop simple descriptions of the states of matter (solids hold their shape; liquids form a pool not a pile; gases escape from an unsealed container). Pupils should observe water as a solid, a liquid and a gas and should note the changes to water when it is heated or cooled. • Pupils might work scientifically by: grouping and classifying a variety of different materials; exploring the effect of temperature on substances such as chocolate, butter, cream (for example, to make food such as chocolate crispy cakes and ice-cream for a party). They could research the temperature at which materials change state, for example, when iron melts or when oxygen condenses into a liquid. They might observe and record evaporation over a period of time, for example, a puddle in the playground or washing on a line, and investigate the effect of temperature on washing drying or snowmen melting.	• 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 • 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 • They should explore reversible changes, including evaporating, filtering, sieving, melting and dissolving, recognising that melting and dissolving are different processes. Pupils should explore changes that are difficult to reverse, for example, burning, rusting and other reactions, for example, vinegar with bicarbonate of soda. • They could observe and compare the changes that take place, for example, when burning different materials or baking bread or cakes. • They should find out about how chemists create new materials, for example, Spencer Silver, who invented the glue for sticky notes or Ruth Benerito, who invented wrinkle-free cotton. • Pupils might work scientifically by: carrying out tests to answer questions, for example, 'Which materials would be the most effective for making a warm jacket, for wrapping ice cream to stop it melting, or for making blackout curtains?' • They might research and discuss how chemical changes have an impact on our lives, for example,	• Pupils should build on their learning about grouping living things in year 4 by looking at the classification system in more detail. They should be introduced to the idea that broad groupings, such as micro-organisms, plants and animals can be subdivided. Through direct observations where possible, they should classify animals into commonly found invertebrates (such as insects, spiders, snails, worms) and vertebrates (fish, amphibians, reptiles, birds and mammals). They should discuss reasons why living things are placed in one group and not another. • Pupils might find out about the significance of the work of scientists such as Carl Linnaeus, a pioneer of classification. Pupils might work scientifically by: using classification systems and keys to identify some animals and plants in the immediate environment. They could research unfamiliar animals and plants from a broad range of other habitats and decide where they belong in the classification system.
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				cooking, and discuss the creative use of new materials such as polymers, super-sticky and super-thin materials.	
Seasonal Changes - observe changes across the four seasons – Autumn / Winter - observe and describe weather associated with the seasons and how day length varies. - Pupils might work scientifically by: making tables and charts about the weather; and making displays of what happens in the world around them, including day length, as the seasons change.	Living things and their habitats - explore and compare the differences between things that are living, dead, and things that have never been alive - 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 - identify and name a variety of plants and animals in their habitats, including microhabitats - describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food - Pupils should be introduced to the idea that all living things have certain characteristics that are essential for keeping them alive and healthy. They should raise and answer questions that help them to become familiar with the life processes that are common to all living things. Pupils should be introduced to the terms 'habitat' (a natural environment or home of a variety of plants and animals) and 'microhabitat' (a very small habitat, for example for woodlice under stones, logs or leaf litter). They should raise and answer questions about the local environment that help them to identify and study a variety of plants and animals within their habitat and observe how living things depend on each other, for example, plants serving as a source of food and shelter for animals. Pupils should compare animals in familiar habitats with animals found in less familiar	Light - recognise that they need light in order to see things and that dark is the absence of light - notice that light is reflected from surfaces - recognise that light from the sun can be dangerous and that there are ways to protect their eyes - recognise that shadows are formed when the light from a light source is blocked by an opaque object - find patterns in the way that the size of shadows change - Pupils should explore what happens when light reflects off a mirror or other reflective surfaces, including playing mirror games to help them to answer questions about how light behaves. They should think about why it is important to protect their eyes from bright lights. They should look for, and measure, shadows, and find out how they are formed and what might cause the shadows to change. - Pupils might work scientifically by: looking for patterns in what happens to shadows when the light source moves or the distance between the light source and the object changes.	Living things and their Habitats - recognise that environments can change and that this can sometimes pose dangers to living things - Pupils should explore examples of human impact (both positive and negative) on environments, for example, the positive effects of nature reserves, ecologically planned parks, or garden ponds, and the negative effects of population and development, litter or deforestation. - recognise that living things can be grouped in a variety of ways - explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment - recognise that environments can change and that this can sometimes pose dangers to living things - Pupils should use the local environment throughout the year to raise and answer questions that help them to identify and study plants and animals in their habitat. They should identify how the habitat changes throughout the year. Pupils should explore possible ways of grouping a wide selection of living things that include animals, flowering plants and non-flowering plants. Pupils could begin to put vertebrate animals into groups, for example: fish, amphibians, reptiles, birds, and mammals; and invertebrates into snails and slugs, worms, spiders, and insects. - Pupils should explore examples of human impact (both positive and negative) on environments, for example, the positive effects of nature reserves, ecologically planned parks, or garden ponds,	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 - Pupils should study and raise questions about their local environment throughout the year. They should observe life-cycle changes in a variety of living things, for example, plants in the vegetable garden or flower border, and animals in the local environment. They should find out about the work of naturalists and animal behaviourists, for example, David Attenborough and Jane Goodall. - Pupils should find out about different types of reproduction, including sexual and asexual reproduction in plants, and sexual reproduction in animals. - Pupils might work scientifically by: observing and comparing the life cycles of plants and animals in their local environment with other plants and animals around the world (in the rainforest, in the oceans, in desert areas and in prehistoric times), asking pertinent questions and suggesting reasons for similarities and differences. They might try to grow new plants from different parts of the parent plant, for example, seeds, stem and root cuttings, tubers, bulbs. They might observe changes in an animal over a period of time (for example, by hatching and rearing chicks), comparing how different animals reproduce and grow.	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 - Building on what they learned about fossils in the topic on rocks in year 3, pupils should find out more about how living things on earth have changed over time. They should be introduced to the idea that characteristics are passed from parents to their offspring, for instance by considering different breeds of dogs, and what happens when, for example, labradors are crossed with poodles. They should also appreciate that variation in offspring over time can make animals more or less able to survive in particular environments, for example, by exploring how giraffes' necks got longer, or the development of insulating fur on the arctic fox. Pupils might find out about the work of palaeontologists such as Mary Anning and about how Charles Darwin and Alfred Wallace developed their ideas on evolution. - Pupils might work scientifically by: observing and raising questions about local animals and how they are adapted to

	habitats, for example, on the seashore, in woodland, in the ocean, in the rainforest. Pupils might work scientifically by: sorting and classifying things according to whether they are living, dead or were never alive, and recording their findings using charts. They should describe how they decided where to place things, exploring questions like: 'Is a flame alive? Is a deciduous tree dead in winter?' and talk about ways of answering their questions. They could construct a simple food chain that includes humans (eg, grass, cow, human). They could describe the conditions in different habitats and microhabitats (under log, on stony path, under bushes); and find out how the conditions affect the number and type(s) of plants and animals that live there.		and the negative effects of population and development, litter or deforestation. Pupils might work scientifically by: using and making simple guides or keys to explore and identify local plants and animals; making a guide to local living things; raising and answering questions based on their observations of animals and what they have found out about other animals that they have researched.		their environment; comparing how some living things are adapted to survive in extreme conditions, for example, cactuses, penguins and camels. They might analyse the advantages and disadvantages of specific adaptations, such as being on 2 feet rather than 4, having a long or a short beak, having gills or lungs, tendrils on climbing plants, brightly coloured and scented flowers
Plants - identify and name a variety of common wild and garden plants, including deciduous and evergreen trees - identify and describe the basic structure of a variety of common flowering plants, including trees. - Pupils should use the local environment throughout the year to explore and answer questions about plants growing in their habitat. Where possible, they should observe the growth of flowers and vegetables that they have planted. - They should become familiar with common names of flowers, examples of deciduous and evergreen trees, and plant structures (including leaves, flowers (blossom), petals, fruit, roots, bulb, seed, trunk, branches, stem). - Pupils might work scientifically by: observing closely, perhaps using magnifying glasses, and comparing and contrasting	Plants - observe and describe how seeds and bulbs grow into mature plants - find out and describe how plants need water, light and a suitable temperature to grow and stay healthy - Pupils should use the local environment throughout the year to observe how plants grow. Pupils should be introduced to the requirements of plants for germination, growth and survival, as well as the processes of reproduction and growth in plants. - Pupils might work scientifically by: observing and recording, with some accuracy, the growth of a variety of plants as they change over time from a seed or bulb, or observing similar plants at different stages of growth; setting up a comparative test to show that plants need light and water to stay healthy.	Forces and Magnets - compare how things move on different surfaces - notice that some forces need contact between 2 objects, but magnetic forces can act at a distance - observe how magnets attract or repel each other and attract some materials and not others - compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials - describe magnets as having 2 poles - predict whether 2 magnets will attract or repel each other, depending on which poles are facing - Pupils should observe that magnetic forces can act without direct contact, unlike most forces, where direct contact is necessary (for example, opening a door, pushing a swing). They should explore the behaviour and	Electricity - identify common appliances that run on electricity - construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers - identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery - recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit - recognise some common conductors and insulators, and associate metals with being good conductors - Pupils should construct simple series circuits, trying different components, for example, bulbs, buzzers and motors, and including switches, and use their circuits to create simple devices. Pupils should draw the circuit as a	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 - Pupils should be introduced to a model of the sun and Earth that enables them to explain day and night. Pupils should learn that the sun is a star at the centre of our solar system and that it has 8 planets: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune (Pluto was reclassified as a 'dwarf planet' in 2006). They should understand that a moon is a celestial body that orbits a planet (Earth has 1 moon; Jupiter has 4 large moons and numerous smaller ones).	Light - recognise that light appears to travel 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 - Pupils should build on the work on light in year 3, exploring the way that light behaves, including light sources, reflection and shadows. They should talk about what happens and make predictions. - Pupils might work scientifically by: deciding where to place rear-view mirrors on cars; designing and making a

familiar plants; describing how they were able to identify and group them, and drawing diagrams showing the parts of different plants including trees. Pupils might keep records of how plants have changed over time, for example the leaves falling off trees and buds opening; and compare and contrast what they have found out about different plants.		everyday uses of different magnets (for example, bar, ring, button and horseshoe). Pupils might work scientifically by: comparing how different things move and grouping them; raising questions and carrying out tests to find out how far things move on different surfaces, and gathering and recording data to find answers to their questions; exploring the strengths of different magnets and finding a fair way to compare them; sorting materials into those that are magnetic and those that are not; looking for patterns in the way that magnets behave in relation to each other and what might affect this, for example, the strength of the magnet or which pole faces another; identifying how these properties make magnets useful in everyday items and suggesting creative uses for different magnets.	pictorial representation, not necessarily using conventional circuit symbols at this stage; these will be introduced in year 6. Pupils might work scientifically by: observing patterns, for example, that bulbs get brighter if more cells are added, that metals tend to be conductors of electricity, and that some materials can and some cannot be used to connect across a gap in a circuit.	- Pupils should find out about the way that ideas about the solar system have developed, understanding how the geocentric model of the solar system gave way to the heliocentric model by considering the work of scientists such as Ptolemy, Alhazen and Copernicus. - Pupils might work scientifically by: comparing the time of day at different places on the Earth through internet links and direct communication; creating simple models of the solar system; constructing simple shadow clocks and sundials, calibrated to show midday and the start and end of the school day; finding out why some people think that structures such as Stonehenge might have been used as astronomical clocks	periscope and using the idea that light appears to travel in straight lines to explain how it works. They might investigate the relationship between light sources, objects and shadows by using shadow puppets. They could extend their experience of light by looking a range of phenomena including rainbows, colours on soap bubbles, objects looking bent in water, and coloured filters (they do not need to explain why these phenomena occur).
		Plants - identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers - explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant - investigate the way in which water is transported within plants - explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal - Pupils should be introduced to the relationship between structure and function: the idea that every part has a job to do. They should explore questions that focus on the role of the roots and stem in nutrition and support, leaves for nutrition and flowers for reproduction.	Sound - identify how sounds are made, associating some of them with something vibrating - recognise that vibrations from sounds travel through a medium to the ear - find patterns between the pitch of a sound and features of the object that produced it - find patterns between the volume of a sound and the strength of the vibrations that produced it - recognise that sounds get fainter as the distance from the sound source increases - Pupils should explore and identify the way sound is made through vibration in a range of different musical instruments from around the world; and find out how the pitch and volume of sounds can be changed in a variety of ways.	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 - Pupils should explore falling objects and raise questions about the effects of air resistance. They should explore the effects of air resistance by observing how different objects such as parachutes and sycamore seeds fall. They should experience forces that make things begin to move, get faster or slow down.	Electricity - associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit - compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches - use recognised symbols when representing a simple circuit in a diagram - Building on their work in year 4, pupils should construct simple series circuits, to help them to answer questions about what happens when they try different components, for example, switches, bulbs, buzzers and motors. They should learn how to represent a simple circuit in a diagram using recognised symbols.

		Pupils might work scientifically by: comparing the effect of different factors on plant growth, for example, the amount of light, the amount of fertiliser; discovering how seeds are formed by observing the different stages of plant life cycles over a period of time; looking for patterns in the structure of fruits that relate to how the seeds are dispersed. They might observe how water is transported in plants, for example, by putting cut, white carnations into coloured water and observing how water travels up the stem to the flowers.	Pupils might work scientifically by: finding patterns in the sounds that are made by different objects such as saucepan lids of different sizes or elastic bands of different thicknesses. They might make earmuffs from a variety of different materials to investigate which provides the best insulation against sound. They could make and play their own instruments by using what they have found out about pitch and volume	Pupils should explore the effects of friction on movement and find out how it slows or stops moving objects, for example, by observing the effects of a brake on a bicycle wheel. Pupils should explore the effects of levers, pulleys and simple machines on movement. - Pupils might find out how scientists, for example, Galileo Galilei and Isaac Newton helped to develop the theory of gravitation. - Pupils might work scientifically by: exploring falling paper cones or cupcake cases, and designing and making a variety of parachutes and carrying out fair tests to determine which designs are the most effective. They might explore resistance in water by making and testing boats of different shapes. They might design and make products that use levers, pulleys, gears and/or springs and explore their effects.	Pupils might work scientifically by: systematically identifying the effect of changing one component at a time in a circuit, designing and making a set of traffic lights, a burglar alarm or some other useful circuit.
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EARLY YEARS FOUNDATION STAGE (EYFS)

Science at Foundation Stage is covered in the 'Understanding the World' area of the EYFS Curriculum. It is introduced indirectly through activities that encourage every child to explore, problem solve, observe, predict, think, make decisions and talk about the world around them.

During their first years at school our children will explore creatures, people, plants and objects in their natural environments. They will observe and manipulate objects and materials to identify differences and similarities. They will also learn to use their senses, feeling dough or listening to sounds in the environment, such as sirens or farm animals. They will make observations of animals and plants and explain why some things occur and talk about changes. Children will be encouraged to ask questions about why things happen and how things work. They might do activities such as increasing the incline of a slope to observe how fast a vehicle travels, or opening a mechanical toy to see how it works. Children will also be asked questions about what they think will happen to help them communicate, plan, investigate, record and evaluate findings.

The most relevant statements for Science are taken from the following areas of learning:

- Communication and Language
- Personal, Social and Emotional Development
- Understanding the World

SPECIAL EDUCATIONAL NEEDS AND DISABILITY (SEND)

The Science curriculum at Chester-le-Street CE Primary School is **inclusive and accessible to all pupils**, including children with Special Educational Needs and/or Disabilities (SEND). We are committed to ensuring that all pupils have meaningful opportunities to develop scientific knowledge, vocabulary and Working Scientifically skills, regardless of their individual starting points or additional needs.

Teachers adapt the teaching and learning of Science to meet the individual needs of pupils, informed by their **Support Plan or EHCP**, where appropriate. Individualised learning needs and targets are developed in conjunction with the **SENDCo, parents and relevant professionals**, ensuring that provision is appropriate and purposeful.

Adaptations may include:

- modifying or scaffolding tasks to make learning accessible;
- breaking learning into smaller, manageable steps;
- providing additional modelling, explanation and repetition;
- using visual prompts, practical resources and concrete materials;
- pre-teaching and revisiting key scientific vocabulary;
- adapting recording methods and expected outcomes;
- providing appropriate adult support and carefully deployed teacher time;
- allowing additional processing time;
- adapting practical investigations and equipment where necessary;
- providing opportunities for pupils to demonstrate their understanding in different ways.

Where appropriate, teachers use **adaptive teaching rather than reducing the scientific ambition of the curriculum**. Pupils are supported to access the same core scientific concepts and experiences, with scaffolding and resources carefully matched to their needs.

Practical and enquiry-based Science provides valuable opportunities for pupils with SEND to engage through **observation, exploration, discussion and hands-on experiences**. Teachers consider accessibility, sensory needs, communication, physical access and levels of independence when planning practical activities.

Teachers work closely with the SENDCo and support staff to review the effectiveness of adaptations and identify appropriate next steps. Assessment and observation are used to ensure that pupils are making progress from their individual starting points and are developing increasing independence in their scientific learning.

Our approach reflects our commitment to ensuring that **every child can participate, achieve and develop a sense of curiosity and wonder about the world around them**.