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# WHITMORE PARK PRIMARY SCHOOL SCIENCE CURRICULUM



**Whitmore  
Park**  
Primary School

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## Our Curriculum Drivers

Our whole school curriculum drivers thread throughout our curriculum.

**Vocabulary**

**Inclusion**

**Oracy**

**First-hand  
Experiences**

**Diversity**

## Our Science Key Concepts

Whitmore Park Primary focuses its science curriculum around these three key concepts. Children build a secure understanding of key scientific knowledge through exploration of these concepts across multiple lessons, producing an inquisitive and knowledgeable child able to ask relevant questions, plan investigations and make conclusions.

**Scientific  
Vocabulary**

**Knowledge and  
Understanding of  
Concepts**

**Planned Scientific Enquiry:  
Exploring, Collecting,  
Analysing, Reaching an  
Outcome.**

## **Overview**

At Whitmore Park Primary School, we recognise the importance of science in every aspect of daily life. As one of the core subjects taught in Primary Schools, we give the teaching and learning of science the prominence it requires.

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

In conjunction with the aims of the National Curriculum, our science teaching offers opportunities for children to:

- develop scientific knowledge and conceptual understanding through the specific disciplines of Biology, Chemistry and Physics;
- develop understanding of the nature, processes and methods of science through different types of science enquiries that help them to answer scientific questions about the world around them;
- be equipped with the scientific knowledge required to understand the uses and implications of science, today and for the future.
- develop the essential scientific enquiry skills to deepen their scientific knowledge.
- use a range of methods to communicate their scientific information and present it in a systematic, scientific manner, including I.C.T., diagrams, graphs and charts.
- develop a respect for the materials and equipment they handle with regard to their own, and other children's safety.
- develop an enthusiasm and enjoyment of scientific learning and discovery.

At Whitmore Park Primary School:

Children have weekly lessons in Science throughout Key Stage 1 and 2. In Early years, science is taught through the children learning about the world around them in their learning through play. Additional opportunities are provided in science, such as Science days for children and educational visits linked to the science curriculum. Whitmore Park Primary School's long-term plan for science follows the national curriculum's sequence of knowledge and concepts. Opportunities are planned to secure understanding of each key block of knowledge and concepts, in order to progress to the next stage. Describing associated processes and key characteristics in technical language is encouraged and children are given the opportunity to build up an extended specialist vocabulary. Mathematical knowledge is applied to support understanding of science, including collecting, presenting and analysing data.

We endeavour to ensure that the Science curriculum we provide will give children the confidence and motivation to continue to further develop their skills into the next stage of their education and life experiences.

## **Intent**

The National Curriculum states, "A high-quality science education provides the foundations for understanding the world through the specific disciplines of biology, chemistry and physics. Science has changed our lives and is vital to the world's future prosperity, and all pupils should be taught essential aspects of the knowledge, methods, processes and uses of science."

The national curriculum for science aims to ensure that all pupils:

- develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics.

- develop understanding of the nature, processes and methods of science through different types of science enquiries that help them to answer scientific questions about the world around them.
- are equipped with the scientific knowledge required to understand the uses and implications of science, today and for the future.

At Whitmore Park Primary School, our science curriculum fosters a healthy curiosity in children about our universe and promotes respect for the living and non-living. We intend to develop children who are not only inquisitive and knowledgeable but also able to plan fair investigations and experiments which they can use to form conclusions using scientific vocabulary. We want our children to be able to discuss and write about the aspects of science they have learnt using scientific vocabulary. We want children to be able to build arguments and explain concepts confidently using appropriate language.

Through our Long-Term Plan (LTP), the children acquire and develop the key knowledge (used as LO in lessons) and scientific vocabulary that has been identified within each unit (listed on science knowledge mats.) Knowledge mats are used as teaching and retrieval practise tool throughout the unit and are passed up each year to enable teachers to practise retrieval of knowledge taught from previous years.

Key skills (used as Success Criteria in lessons) are mapped for each year group and are progressive throughout the school. These ensure systematic progression to identified skills end points which are in accordance with the Working Scientifically skills expectations of the national curriculum. We want children to use this bank of skills to independently plan investigations and fair experiments. Children will therefore complete at least one supported investigation/experiment per half term, so that by Year 5/6 children are able to plan and conduct fair tests independently. We use a 'Big Question' for each topic to encourage children to want to explore, investigate and experiment.

## **Implementation**

Science teaching at Whitmore Park Primary School is taught as discrete units. Teachers adapt and extend planning to match all pupils' needs, their interests, current events, their own teaching style, the use of any support staff and the resources available.

Our school aspires to promote children's independence and for all children to take responsibility for their own learning, therefore we encourage children in each class to devise at least one independent investigation per half-term; where possible, linked to the Big Question.

Our children begin their science experience in Early Years Foundation Stage, with informal investigation within the setting. Teachers facilitate children's curiosity with open ended questions and clearly thought-out learning experiences which are both child and adult lead. In KS1 and KS2, children continue to build on their science knowledge and skills with more formal weekly science lessons for one hour per week.

Our approach to science takes account of the school's context, where possible we ensure access to people with specialist expertise and places of scientific interest. When appropriate, we use our school grounds to enhance the teaching of science.

As we want our children to have a love of science and aspiration to be a scientist or life-long learner of science, we research and learn about scientists or inventors linked to the unit we are studying.

### Foundation Stage/Key Stage 1

The principal focus of science teaching in Foundation Stage and Key Stage 1 is to enable pupils to experience and observe phenomena, looking more closely at the natural and humanly constructed world around them. They should be encouraged to be curious and ask questions about what they notice. They should be helped to develop their understanding of scientific ideas by using different types of scientific enquiry to answer their own questions, including observing changes over time, noticing patterns, grouping and classifying things, carrying out simple comparative tests, and finding things out using secondary sources of information. They should begin to use simple scientific language to talk about what they have found out and communicate their ideas to a range of audiences in a variety of ways.

Most of the learning about science should be done using first-hand practical experiences, but there should also be some use of appropriate secondary sources, such as books, photographs and videos. “Working scientifically” must also be taught through and clearly related to the teaching of substantive science content in the LTP.

Pupils should read and spell scientific vocabulary at a level consistent with the increasing word reading and spelling knowledge at Key Stage 1.

### Years 3 - 4

The principal focus of science teaching in Years 3 and 4 is to enable pupils to broaden their Scientific view of the world around them. They should do this through exploring, talking about, testing and developing ideas about everyday phenomena and the relationships between living things and familiar environments, and by beginning to develop their ideas about functions, relationships and interactions.

They should ask their own questions about what they observe and make some decisions about which types of scientific enquiry are likely to be the best ways to answer them, including observing changes over time, noticing patterns, grouping and classifying things, carrying out simple comparative and fair tests and finding things out using secondary sources of information. They should draw simple conclusions and use some scientific language, first, to talk about and, later, to write about what they have found out. “Working scientifically” must also be taught through and clearly related to the teaching of substantive science content in the LTP.

Pupils should read and spell scientific vocabulary correctly and with confidence.

### Years 5-6

The principal focus of science teaching in Years 5 and 6 is to enable pupils to develop a deeper understanding of a wide range of scientific ideas. They should do this through exploring and talking about their ideas; asking their own questions about scientific phenomena; and analysing functions, relationships and interactions more systematically.

In years 5 and 6, they should encounter more abstract ideas and begin to recognise how these ideas help them to understand and predict how the world operates. They should also begin to recognise that scientific ideas change and develop over time. They should select the most appropriate ways to answer science questions using different types of scientific enquiry, including changes over different periods of time, noticing patterns, grouping and classifying things, carrying out comparative and fair tests and finding things out using a wide range of secondary sources of information. Pupils should draw conclusions based on their data and observations, use evidence to justify their ideas, and use their scientific knowledge and understanding to explain their findings. “Working scientifically” must also be taught through and clearly related to the teaching of substantive science content in the LTP.

Pupils should read, spell and pronounce scientific vocabulary correctly.

### **Retrieval Practice**

At Whitmore Park Primary School, we use Rosenshine's 10 Principles of Instruction to ensure all children achieve in science:

- Begin the lesson with a review of previous learning.
- Present new material in small steps.
- Ask a large number of questions.
- Provide models and worked examples.
- Practise using the new material.
- Check for understanding frequently and correct errors.
- Obtain a high success rate.
- Provide scaffolds for difficult tasks.
- Independent practice.
- Monthly and weekly reviews of knowledge and vocabulary learnt.

We use our science knowledge mats to support this practice and continually refer back to these during topics. We also use them for retrieval practice beyond the point of teaching.

### **Impact**

The successful approach to the teaching of science at Whitmore Park Primary School will result in a fun, engaging, high quality science education, that provides children with the foundations for understanding the world around them.

The impact of science will be measured through regular monitoring of the provision of teaching and learning, planning, work done in books or evidenced on Seesaw and pupil voice. Our aim is to show impact through the following:

- Children demonstrate a love of science work and an interest in further study and work in this field.
- Children retain knowledge that is pertinent to science with a real-life context.
- Children who can question ideas and reflect on knowledge, using the key science vocabulary identified for each unit.

- Children who can articulate their understanding of scientific concepts and be able to reason scientifically, using rich language linked to science.
- Children demonstrate an enthusiasm for mathematical skills through their science work, showing organised recording and interpreting of results.
- Children work independently and practically to investigate and experiment.
- Children achieve age related expectations in science at the end of their cohort year.

Summative Assessment of science is completed through formal strategies (e.g. Learning By Questions quizzes taken half-way through and at the end of a topic) and informal strategies (e.g. use of concept maps, verbal/written outcomes, reflection tasks/presentations and other retrieval practices). Teachers use these to inform their end of year teacher assessments on DCPro.

Formative assessment is used continually by teachers to assess the impact of science teaching and learning in their classrooms, as this allows for misconceptions and gaps to be addressed as soon as possible. A variety of Assessment for Learning methods will be used for this, some of which are mentioned above.





## Pupil Offering

Year Group	Educational Visits (Off-Site)	Educational Visitors (On-Site)	Residential Visits	Outdoor Learning Sessions (e.g. Forest Schools)	Arts and Culture	Community and Partnership	Specialist Curriculum Days	Specialist Curriculum Weeks
1	Transport Museum <i>Transport</i>  Twycross Zoo <i>Animals</i>	Stage Coach <i>Transport</i>					5x Faith/RE Days International Day World Book Day Science Day Maths Day 3 x Book/Author Focus Day	<i>Art Week</i> <i>STEAM</i> <i>Alternate</i> Enterprise Book Week Healthy Body, Healthy Mind
2	Selly Manor <i>Great Fire of London</i>  Conkers <i>Habitats and Living Things</i>				Morning of Music		5x Faith/RE Days International Day World Book Day Science Day Maths Day 3 x Book/Author Focus Day	<i>Art Week</i> <i>STEAM</i> <i>Alternate</i> Enterprise Book Week Healthy Body, Healthy Mind
3	Coombe Abbey <i>Stone Age to Iron Age</i>  Coundon Wedge Jubilee Crescent	Roman Visitor Saxon Visitor					5x Faith/RE Days International Day World Book Day Science Day Maths Day 3 x Book/Author Focus Day	<i>Art Week</i> <i>STEAM</i> <i>Alternate</i> Enterprise Book Week Healthy Body, Healthy Mind
4	Field Trip – City Centre	Egyptian Visitor	Space Camp TBC		Morning of Music		5x Faith/RE Days International Day World Book Day Science Day Maths Day 3 x Book/Author Focus Day	<i>Art Week</i> <i>STEAM</i> <i>Alternate</i> Enterprise Book Week Healthy Body, Healthy Mind
5	Transport Museum Blitz Experience <i>Blitz</i>  Herbert Art Museum <i>Blitz</i>		PGL – 2 Nights		President Kennedy		5x Faith/RE Days International Day World Book Day Science Day Maths Day 3 x Book/Author Focus Day	<i>Art Week</i> <i>STEAM</i> <i>Alternate</i> Enterprise Book Week Healthy Body, Healthy Mind
6		Mayan Visitor   Science Visitor	Dol-y-Moch		1 Theatre Visit (Holes)		5x Faith/RE Days International Day World Book Day Science Day Maths Day 3 x Book/Author Focus Day	<i>Art Week</i> <i>STEAM</i> <i>Alternate</i> Enterprise Book Week Healthy Body, Healthy Mind



## Year 1 Knowledge and Skills

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12	Week 13	Week 14	Week 15
Autumn	Materials Seasonal Changes														
Spring	Human Senses Seasonal Changes							Plants Seasonal Changes							
Summer	Animals Seasonal Changes														

### Seasonal Changes

- Observe changes across the four seasons
- Observe weather associated with changes of season and how day length varies

### 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 the basis of their simple physical properties.

### 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.
- 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

### 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
- Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees

### **Working Scientifically in Year 1**

During years 1 and 2, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:

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

***5 types of Scientific enquiry that need to be covered whilst answering scientific question (initially through teachers questions but increasingly through pupils own questions):***

1. ***Observing over time*** (observe / measure how one variable changes over time); 2. ***Identifying and classifying*** (identify features or tests that help them distinguish between different things); 3. ***Pattern seeking*** (observe and record data, do surveys or collect secondary data – leading to identifying relationships between data); 4. ***Research*** (use secondary sources of evidence); 5. ***Fair testing*** (pupils investigate the effect one variable has on another whilst controlling other variables)

### **Scientists and Inventors to be studied in Year 1**

Ole Kirk Christiansen  
Mae Jemison  
George Mottershead  
George James Symons  
Linda Brown Buck

## Year 2 Knowledge and Skills

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12	Week 13	Week 14	Week 15
Autumn	Materials														
Spring	Animals							Plants							
Summer	Living Things and their Habitats														

<b>Materials</b>	<b>Animals including Humans</b>	<b>Plants</b>	<b>Living things in their habitats</b>
<ul style="list-style-type: none"> <li>Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses</li> <li>Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.</li> </ul>	<ul style="list-style-type: none"> <li>Find out about and describe the basic needs of animals, including humans, for survival (water, food and air)</li> <li>describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.</li> <li>notice that animals, including humans, have offspring which grow into adults</li> </ul>	<ul style="list-style-type: none"> <li>observe and describe how seeds and bulbs grow into mature plants</li> <li>find out and describe how plants need water, light and a suitable temperature to grow and stay healthy (focus on seeds and germination not mature plants)</li> <li>find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.</li> </ul>	<ul style="list-style-type: none"> <li>explore and compare the differences between things that are living, dead, and things that have never been alive</li> <li>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</li> <li>identify and name a variety of plants and animals in their habitats, including micro-habitats</li> <li>describe how animals obtain their food from plants and other animals, using the idea of a</li> </ul>

## Working Scientifically in Year 2

During years 1 and 2, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:

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

**5 types of Scientific enquiry that need to be covered whilst answering scientific question** (initially through teachers questions but increasingly through pupils own questions):

2. **Observing over time** (observe / measure how one variable changes over time);
2. **Identifying and classifying** (identify features or tests that help them distinguish between different things);
3. **Pattern seeking** (observe and record data, do surveys or collect secondary data – leading to identifying relationships between data);
4. **Research** (use secondary sources of evidence);
5. **Fair testing** (pupils investigate the effect one variable has on another whilst controlling other variables)

## Scientists and Inventors to be studied in Year 1

Tim Smit  
Nicholas Grimshaw  
Jane Colden  
Elizabeth Garrett Anderson  
Louis Pasteur  
Charles Macintosh  
Rachel Carson  
James Blyth

## Year 3 Knowledge and Skills

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12	Week 13	Week 14	Week 15
Autumn	Light Rocks Day														
Spring	Forces and Magnets							Animals							
Summer	Plants														

### 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 a solid object

### 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.

### 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

### 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

### Forces and Magnets

- Compare how things move on different surfaces
- Notice that some forces need contact between two 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 two poles and predict whether two magnets will attract or repel each other, depending on which poles are facing.

### **Working Scientifically in Year 3**

During years 3 and 4, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:

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

*5 types of Scientific enquiry that need to be covered whilst answering scientific question (initially through teachers questions but increasingly through pupils own questions):*

1. *Observing over time (observe / measure how one variable changes over time);*
2. *Identifying and classifying (identify features or tests that help them distinguish between different things);*
3. *Pattern seeking (observe and record data, do surveys or collect secondary data – leading to identifying relationships between data);*
4. *Research (use secondary sources of evidence);*
5. *Fair testing (pupils investigate the effect one variable has on another whilst controlling other variables)*

### **Scientists and Inventors to be studied in Year 3**

Sir Joseph Banks Banks

David Douglas

Jeanne Baret Baret

Tom Hart Dyke

Marie Curie

George Washington Carver

William Smith

Inge Lehmann

## Year 4 Knowledge and Skills

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12	Week 13	Week 14	Week 15
<i>Autumn</i>	<b>States of Matter</b>														
<i>Spring</i>	<b>Sound</b>							<b>Electricity</b>							
<i>Summer</i>	<b>Living Things</b>							<b>Animals including Humans</b>							

States of Matter	Sound	Electricity	Living things and their habitats	Animals including humans
<ul style="list-style-type: none"> <li>Compare and group materials together, according to whether they are solids, liquids or gases</li> <li>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)</li> <li>Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.</li> </ul>	<ul style="list-style-type: none"> <li>Identify how sounds are made, associating some of them with something vibrating</li> <li>Recognise that vibrations from sounds travel through a medium to the ear</li> <li>Find patterns between the pitch of a sound and features of the object that produced it</li> <li>Find patterns between the volume of a sound and the strength of the vibrations that produced it</li> </ul>	<ul style="list-style-type: none"> <li>Identify common appliances that run on electricity</li> <li>Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers</li> <li>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</li> <li>Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit</li> <li>Recognise some common conductors and insulators, and associate metals with being good conductors.</li> </ul>	<ul style="list-style-type: none"> <li>Recognise that living things can be grouped in a variety of ways</li> <li>Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment</li> <li>Recognise that environments can change and that this can sometimes pose dangers to living things.</li> </ul>	<ul style="list-style-type: none"> <li>Describe the simple functions of the basic parts of the digestive system in humans</li> <li>Identify the different types of teeth in humans and their simple functions</li> <li>Construct and interpret a variety of food chains, identifying producers, predators and prey.</li> </ul>



### **Working Scientifically in Year 4**

During years 3 and 4, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:

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

***5 types of Scientific enquiry that need to be covered whilst answering scientific question (initially through teachers questions but increasingly through pupils own questions):***

2. ***Observing over time*** (observe / measure how one variable changes over time);
2. ***Identifying and classifying*** (identify features or tests that help them distinguish between different things);
3. ***Pattern seeking*** (observe and record data, do surveys or collect secondary data – leading to identifying relationships between data);
4. ***Research*** (use secondary sources of evidence);
5. ***Fair testing*** (pupils investigate the effect one variable has on another whilst controlling other variables)

### **Scientists and Inventors to be studied in Year 4**

Gerald Durrell  
Alexander Graham Bell  
James West and Gerhard M. Sessler  
Maria Telkes  
Garrett Morgan  
Antoine Lavoisier and Joseph Priestley  
Lewis Howard Latimer  
Thomas Edison  
Washington Sheffield  
Lord Kelvin William Thomson

## Year 5 Knowledge and Skills

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12	Week 13	Week 14	Week 15
<i>Autumn</i>	<b>Properties and Changes of Materials</b>														
<i>Spring</i>	<b>Living Things and their Habitats</b>														
<i>Summer</i>	<b>Forces</b>							<b>Earth and Space</b>							

### Properties and changes of materials

- 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.
- 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,

### Living things and their habitats

- Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird

### 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.

### 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

### Working Scientifically in Year 5

During years 5 and 6, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:

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

**5 types of Scientific enquiry that need to be covered whilst answering scientific question** (initially through teachers questions but increasingly through pupils own questions):

1. **Observing over time** (observe / measure how one variable changes over time); 2. **Identifying and classifying** (identify features or tests that help them distinguish between different things); 3. **Pattern seeking** (observe and record data, do surveys or collect secondary data – leading to identifying relationships between data); 4. **Research** (use secondary sources of evidence); 5. **Fair testing** (pupils investigate the effect one variable has on another whilst controlling other variables)

### Scientists and Inventors to be studied in Year 5

David Attenborough  
Eva Crane  
Eva  
Stephanie Kwolek  
Leonardo da Vinci  
Margaret Hamilton  
Neil deGrasse Tyson

## Year 6 Knowledge and Skills

	Week 1	Week 2	Week 3	Wk 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12	Week 13	Week 14	Week 15
Autumn	Evolution and Inheritance								Animals including Humans						
Spring	Electricity														
Summer	Light								Living Things and their Habitats						

### 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.
- recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago

### 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.

### 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.

### 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

### 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 microorganisms, plants and animals
- give reasons for classifying plants and animals based on specific characteristics.

### Working Scientifically in Year 6,

During years 5 and 6, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:

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

**5 types of Scientific enquiry that need to be covered whilst answering scientific question** (initially through teachers' questions but increasingly through pupils own questions):

2. **Observing over time** (observe / measure how one variable changes over time);
2. **Identifying and classifying** (identify features or tests that help them distinguish between different things);
3. **Pattern seeking** (observe and record data, do surveys or collect secondary data – leading to identifying relationships between data);
4. **Research** (use secondary sources of evidence);
5. **Fair testing** (pupils investigate the effect one variable has on another whilst controlling other variables)

### Scientists and Inventors to be studied in Year 6

Stephen Hawking  
Libbie Hyman  
Marie Maynard Daly  
Alexander Fleming  
Mary Leakey  
Dr Daniel Hale Williams  
Steve Jobs