

The Warriner Multi Academy Trust

Primary Science Curriculum

The Warriner Multi Academy Trust Primary Science Curriculum – Purpose and Aims

Purpose

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. Through building up a body of key foundational knowledge and concepts, pupils should be encouraged to recognise the power of rational explanation and develop a sense of excitement and curiosity about natural phenomena. They should be encouraged to understand how science can be used to explain what is occurring, predict how things will behave, and analyse causes.

Aims

The Warriner Multi Academy Trust primary curriculum for science aims to ensure that all pupils:

- Develop a broad and deep scientific knowledge and understanding of all aspects of the primary science curriculum
- Understand the key types of scientific enquiry, so that children appreciate how science knowledge is obtained
- Revisit and relearn topics more often than the national curriculum stipulates, helping children to become more secure in their understanding and children appreciate that the knowledge they are learning now will be important for a future topic for a particular reason (ie. a teacher might say we are learning about forces now, but we will have to know this information for when we study this other topic for this reason...)
- Are supported to ensure that all pupils know the materials, and that if there are gaps in the knowledge, this is identified, and can be remedied in future teaching when the topic is revisited
- Link, wherever feasibly possible, the Science being learned to the context of the topic and literature being covered. For example, when studying forces in year 6, pupils should learn about Aristotle's thoughts on forces.

Scientific knowledge and conceptual understanding

The programmes of study describe a sequence of knowledge and concepts. While it is important that pupils make progress, it is also vitally important that they develop secure understanding of each key block of knowledge and concepts in order to progress to the next stage. Insecure, superficial understanding will not allow genuine progression: pupils may struggle at key points of transition, build up serious misconceptions, and/or have significant difficulties in understanding higher-order content.

Pupils should be able to describe associated processes and key characteristics in common language, but they should also be familiar with, and use, technical terminology accurately and precisely. They should build up an extended specialist vocabulary. They should also apply their mathematical knowledge to their understanding of science, including collecting, presenting and analysing data. The social and economic implications of science are important but, generally, they are taught most appropriately within the wider school curriculum: teachers will wish to use different contexts to maximise their pupils' engagement with and motivation to study science.

The nature, processes and methods of science

‘Working scientifically’ specifies the understanding of the nature, processes and methods of science for each year group. It should not be taught as a separate strand. The notes and guidance give examples of how ‘working scientifically’ might be embedded within the content of biology, chemistry and physics, focusing on the key features of scientific enquiry, so that pupils learn to use a variety of approaches to answer relevant scientific questions. These types of scientific enquiry should include: observing over time; pattern seeking; identifying, classifying and grouping; comparative and fair testing (controlled investigations); and researching using secondary sources. Pupils should seek answers to questions through collecting, analysing and presenting data. ‘Working scientifically’ will be developed further at key stages 3 and 4, once pupils have built up sufficient understanding of science to engage meaningfully in more sophisticated discussion of experimental design and control.

Spoken language

The Warriner Multi Academy Trust primary curriculum for science reflects the importance of spoken language in pupils’ development across the whole curriculum – cognitively, socially and linguistically. The quality and variety of language that pupils hear and speak are key factors in developing their scientific vocabulary and articulating scientific concepts clearly and precisely. They must be assisted in making their thinking clear, both to themselves and others, and teachers should ensure that pupils build secure foundations by using discussion to probe and remedy their misconceptions.

Topics with lesson by lesson knowledge maps

The below topics and knowledge maps ensure that all children are exposed to the whole national curriculum, as detailed by the national curriculum coverage below. The science topics chosen for each unit of work have been selected so they best fit with the overall themes for that unit of work.

Each national curriculum objective has been mapped so that, wherever possible, it is covered in some level of depth at least twice. This is to ensure that knowledge is covered, and revised often, to ensure that students in our classrooms better remember and understand it. If a topic has “introduction” as its heading, it is being covered for the first time. If it has “apply” in its heading, it is being covered for the second time, and the aim is to apply that knowledge to the new situation in hand for that topic. If a topic has “recap” in its heading, it has been covered twice before, and the aim is to cover it for a third time, in another new context, to further embed and deepen the knowledge and understanding contained in the objective.

Knowledge maps

The lesson by lesson knowledge maps should be followed to ensure that children learn, and revise often, all of the knowledge contained in the national curriculum, whilst linking this knowledge that can be found in the first-hand experiences that can be offered by that individual school. The knowledge covered should also be linked to literature covered where possible, and the aim throughout is that children learn more, and deeper knowledge than the national curriculum says is mandatory.

The knowledge map should be strictly followed, to ensure that knowledge is built upon over a series of lessons. The knowledge maps should ensure that every pupil in our care is exposed to a broad and balanced science curriculum. The knowledge maps do not say **how** the knowledge should be taught, although occasionally there have been suggestions and resources given below the knowledge in order to help teachers plan. Each knowledge map has a list of the key vocabulary that should be covered, in line with the Warriner MAT strategy, and explains clearly what knowledge has been covered before, and what is to be covered next.

Below the knowledge maps, there are knowledge organisers. These are to be used by the teacher, and the pupils if appropriate, to quickly revise and embed all of the key knowledge that needs to be covered in this unit, and the depth in which it needs to be covered into.

Assessments

The assessments are to be used to ascertain what concepts have been learned well, and which need to be better revised next time. The assessments for each unit have been chosen to best reflect the main overall themes for that unit. The results of these assessments should be recorded and sent to the Science lead in the school you are based, along with a statement explaining what formative lessons can be learned for the tests, so this information can be used going forwards. A guide to how the tests



Year 1 Science
Assessment Pack.pdf

should be used (particularly for younger children) can be found here: [here](#). This also contains details, on page 5, on what the test results mean. A link to all assessments and mark schemes can be found [here](#).

To support these assessments, there should be regular revision of all material taught throughout school. A template which may be useful for this type of revision, so that



Retrieval practice.ppt

pupils know that they will be expected to revise topics throughout their time in school, can be found here: . It should be stressed to pupils that they will be expected to remember the covered information often, and they should expect the teacher to get them to do various retrieval practices/mini quizzes on a regular basis.

Year 1			
Brilliant Brackley	Arctic Adventures	World Changers throughout history	London and the Great Fire of 1666
<p><u>LESSON BY LESSON KNOWLEDGE MAP</u></p>  <p>Year 1 Science - Brilliant Bodicote Te</p>	<p><u>LESSON BY LESSON KNOWLEDGE MAP</u></p>  <p>Year 1 Science - Arctic Explorers Tern</p>	<p><u>LESSON BY LESSON KNOWLEDGE MAP</u></p>	<p><u>LESSON BY LESSON KNOWLEDGE MAP</u></p>
<p>Introduction</p> <p>Plants knowledge organiser</p> <p>Seasonal changes knowledge organiser</p>	<p>Introduction</p> <p>Animals including Humans knowledge organiser</p> <p>Seasonal changes knowledge organiser</p>	<p>Introduction</p> <p>Animals Including Humans – Revision sheet</p> <p>Apply</p> <p>Plants knowledge organiser</p> <p>Seasonal changes knowledge organiser</p>	<p>Introduction</p> <p>Everyday Materials Knowledge Organiser</p> <p>Seasonal changes knowledge organiser</p>
<p><u>ASSESSMENT</u></p>	<p><u>ASSESSMENT</u></p>	<p><u>ASSESSMENT</u></p>  <p>Y1 - Plants (Answers).docx</p>  <p>Y1 - Plants.docx</p>  <p>Y1 - Animals Inc Humans (Answers).d</p>  <p>Y1 - Animals Inc Humans.docx</p>	<p><u>ASSESSMENT</u></p>  <p>Y1 - Everyday Materials (Answers).</p>  <p>Y1 - Seasonal Changes.docx</p>  <p>Y1 - Seasonal Changes (Answers).c</p>  <p>Y1 - Everyday Materials.docx</p>

Year 2

Ancient Monuments Around the World

The Great Rainforests

The British Coastline and beyond

LESSON BY LESSON KNOWLEDGE MAP

LESSON BY LESSON KNOWLEDGE MAP

LESSON BY LESSON KNOWLEDGE MAP



Year 2 Science -
Ancient Monuments

Apply

[Everyday Materials Knowledge Organiser](#)

Introduction

[Uses of Materials Knowledge Organiser](#)

Introduction

[Habitats Knowledge Organiser](#)

Introduction

[Animals Including Humans – Revision sheet \(y2\)](#)

Introduction

[Plants Revision Organiser \(y2\)](#)

Recap

[Plants knowledge organiser \(y1\)](#)

Recap

[Everyday Materials Knowledge Organiser](#)

Apply

[Uses of Materials Knowledge Organiser](#)

Apply

[Plants Revision Organiser \(y2\)](#)

Apply

[Habitats Knowledge Organiser](#)

Apply

[Animals Including Humans – Revision sheet \(y2\)](#)

ASSESSMENT



Y2 - Uses of
Materials (Answers).



Y2 - Uses of
Materials.docx

ASSESSMENT



Y2 - Plants
(Answers).docx



Y2 - Living Things &
Habitats.docx



Y2 - Living Things &
Habitats (Answers).c



Y2 - Plants.docx

ASSESSMENT



Y2 - Animals Inc
Humans (Answers).d



Y2 - Animals Inc
Humans.docx

Year 3

The Stone Age to the Iron Age		Natural disasters	The Roman Empire	The Saxons, The Vikings and the battle for England in 1066
<u>LESSON BY LESSON KNOWLEDGE MAP</u>	<u>LESSON BY LESSON KNOWLEDGE MAP</u>	<u>LESSON BY LESSON KNOWLEDGE MAP</u>	<u>LESSON BY LESSON KNOWLEDGE MAP</u>	<u>LESSON BY LESSON KNOWLEDGE MAP</u>
 Y3 T1 Rocks knowledge map x.docx	 Y3 T2 Forces and Magnets knowledge map	 Y3 T3 States of Matter knowledge map		
<p>Introduction</p> <p>Rocks Knowledge Organiser</p>	<p>Introduction</p> <p>Forces and Magnets Knowledge Organiser</p>	<p>Introduction</p> <p>States of Matter Knowledge Organiser</p> <p>Apply</p> <p>Rocks Knowledge Organiser (recap)</p>	<p>Introduction</p> <p>Plants (y3) Knowledge Organiser</p> <p>Introduction</p> <p>Animals including humans knowledge Organiser (y3)</p>	<p>Apply</p> <p>Animals including humans knowledge Organiser (y3) (recap) (assessed topic)</p> <p>Apply</p> <p>Forces and Magnets Knowledge Organiser (recap)</p> <p>Apply</p> <p>Plants 2 Knowledge Organiser</p>
<u>ASSESSMENT</u>	<u>ASSESSMEENT</u>	<u>ASSESSMENT</u>	<u>ASSESSMENT</u>	<u>ASSESSMENT</u>
 Y3 - Rocks (Answers).docx  Y3 - Rocks.docx  Y3 Science Tracking.xlsx	 Y3 - Forces & Magnets.docx  Y3 - Forces & Magnets (Answers).docx	 Y4 - States of Matter (Answers).docx  Y4 - States of Matter.docx	 Y3 - Plants (Answers).docx  Y3 - Plants.docx	 Y3 - Animals, Inc Humans (Answers).docx  Y3 - Animals, Inc Humans.docx

Year 4

A local history study – the battle for Edgehill and the English Civil War	Light	The Ancient Egyptians		Mountains, rivers and oceans
<p><u>LESSON BY LESSON KNOWLEDGE MAP</u></p>  <p>Y4 T1 Sound knowledge map x.docx</p>	<p><u>LESSON BY LESSON KNOWLEDGE MAP</u></p>  <p>Y4 T2 Light knowledge map x.docx</p>	<p><u>LESSON BY LESSON KNOWLEDGE MAP</u></p>	<p><u>LESSON BY LESSON KNOWLEDGE MAP</u></p>	<p><u>LESSON BY LESSON KNOWLEDGE MAP</u></p>
<p>Introduction Sound Revision Sheet</p> <p>Apply States of Matter Knowledge Organiser (recap)</p> <p>Recap Forces and Magnets Knowledge Organiser (recap)</p>	<p>Introduction Light Knowledge Organiser</p> <p>Introduction Electricity Knowledge Organiser Intro</p>	<p>Recap Animals including humans knowledge Organiser (y3)</p> <p>Introduction Animals including humans knowledge Organiser (y4)</p>	<p>Introduction Living Things in Their Habitats revision sheet</p> <p>Recap Forces and Magnets Knowledge Organiser</p>	<p>Apply Electricity Knowledge Organiser</p> <p>Apply Living Things in Their Habitats revision sheet (recap)</p> <p>Recap Plants 2 Knowledge Organiser (recap)</p>
<p><u>ASSESSMENT</u></p>  <p>Y4 - Sound.docx</p>  <p>Y4 - Sound (Answers).docx</p>	<p><u>ASSESSMENT</u></p>  <p>Y3 - Light (Answers).docx</p>  <p>Y3 - Light.docx</p>	<p><u>ASSESSMENT</u></p>  <p>Y4 - Animals, Inc Humans (Answers).docx</p>  <p>Y4 - Animals, Inc Humans.docx</p>	<p><u>ASSESSMENT</u></p>  <p>Y4 - Living Things & Habitats (Answers).docx</p>  <p>Y4 - Living Things & Habitats.docx</p>	<p><u>ASSESSMENT</u></p>  <p>Y4 - Electricity (Answers).docx</p>  <p>Y4 - Electricity.docx</p>

Year 5

Ancient Greece	Victorians	The Mayans	Earth and Space
<p><u>LESSON BY LESSON KNOWLEDGE MAP</u></p>  <p>Y5 T12 Ancient Greece knowledge r</p>	<p><u>LESSON BY LESSON KNOWLEDGE MAP</u></p>	<p><u>LESSON BY LESSON KNOWLEDGE MAP</u></p>	<p><u>LESSON BY LESSON KNOWLEDGE MAP</u></p>
<p>Introduction Forces Yr5</p> <p>Introduction Earth and Space Knowledge Organiser (intro)</p>	<p>Introduction Properties and Changes of Materials Knowledge Organiser</p> <p>Recap Electricity Knowledge Organiser (y4)</p> <p>Recap Forces and Magnets Knowledge Organiser</p> <p>Introductio</p> <p>Light Yr 6 Revision Sheet</p>	<p>Introduction Animals including Humans Y5 Knowledge Organiser Main</p> <p>Introduction Evolution and Inheritance Yr6 Knowledge Organiser</p> <p>Plants revision</p>	<p>Apply Earth and Space Knowledge Organiser Recap and assessed</p> <p>Apply Forces Yr5</p>
<p><u>ASSESSMENT</u></p>  <p>Y5 - Forces (Answers).docx</p>  <p>Y5 - Forces.docx</p>	<p><u>ASSESSMENT</u></p>  <p>Y5 - Properties of Materials (Answers).</p>  <p>Y5 - Properties of Materials.docx</p>	<p><u>ASSESSMENT</u></p>  <p>Y5 - Animals Inc Humans (Answers).d</p>  <p>Y5 - Animals Inc Humans.docx</p>	<p><u>ASSESSMENT</u></p>  <p>Y5 - Earth and Space (Answers).doc</p>  <p>Y5 - Earth and Space.docx</p>

Year 6

Frozen Kingdoms	WW1	WW2	Empathy tolerance and injustice	Circulation	Evolution
<p><u>LESSON BY LESSON KNOWLEDGE MAP</u></p>  <p>Y6 T1 Frozen kingdoms knowledc</p>	<p><u>LESSON BY LESSON KNOWLEDGE MAP</u></p>  <p>Y6 T2 WW1 (light) knowledge map.doc</p>	<p><u>LESSON BY LESSON KNOWLEDGE MAP</u></p>	<p><u>LESSON BY LESSON KNOWLEDGE MAP</u></p>	<p><u>LESSON BY LESSON KNOWLEDGE MAP</u></p>	<p><u>LESSON BY LESSON KNOWLEDGE MAP</u></p>
<p>Introduction Living Things in Their Environment Yr 6 Revision sheet</p>	<p>Apply Light Yr 6 Revision Sheet</p> <p>Recap Properties and Changes of Materials Knowledge Organiser</p>	<p>Introduction Electricity Y6 Knowledge Organiser</p> <p>Recap Electricity Knowledge Organiser (y4)</p> <p>Recap Earth and Space Knowledge Organiser</p> <p>Recap Forces Yr5</p>	<p>Global warming focus Elec recap Mag recap</p> <p>Electricity Y5 Knowledge Organiser</p> <p>Forces and Magnets Knowledge Organiser</p>	<p>Introduction Animals Including Humans Yr 6 Knowledge Organiser</p> <p>Recap SRE Animals including Humans Y5 Knowledge Organiser</p> <p>Recap Animals including humans knowledge Organiser (y4)</p>	<p>Apply Evolution and Inheritance Yr6 Knowledge Organiser</p>
<p><u>ASSESSMENT</u></p>  <p>Y5 - Living Things & Habitats (Answers).c</p>  <p>Y5 - Living Things & Habitats.docx</p>	<p><u>ASSESSMENT</u></p>  <p>Y6 - Light (Answers).docx</p>  <p>Y6 - Light.docx</p>	<p><u>ASSESSMENT</u></p>  <p>Y6 - Electricity (Answers).docx</p>  <p>Y6 - Electricity.docx</p>	<p><u>ASSESSMENT</u></p>	<p><u>ASSESSMENT</u></p>  <p>Y6 - Animals Inc Humans (Answers).d</p>  <p>Y6 - Animals Inc Humans.docx</p>	<p><u>ASSESSMENT</u></p>  <p>Y6 - Evolution & Inheritance (Answer</p>  <p>Y6 - Evolution & Inheritance.docx</p>

National Curriculum Coverage

Key Stage 1 Science – Aims

The principal focus of science teaching in 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 a period of 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 through the use of first-hand practical experiences, but there should also be some use of appropriate secondary sources, such as books, photographs and videos.

‘Working scientifically’ is described separately in the programme of study, but must always be taught through and clearly related to the teaching of substantive science content in the programme of study. Throughout the notes and guidance, examples show how scientific methods and skills might be linked to specific elements of the content.

Pupils should read and spell scientific vocabulary at a level consistent with their increasing word-reading and spelling knowledge at key stage 1

Working scientifically

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

Year 1

Brilliant Brackley	Arctic Adventures	World Changers throughout history	London and the Great Fire of 1666
<p>Introduction</p> <ul style="list-style-type: none"> • identify and name a variety of common wild and garden plants, 	<p>Introduction</p> <ul style="list-style-type: none"> • identify and name a variety of common animals including fish, 	<p>Apply</p> <ul style="list-style-type: none"> • identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals 	<p>Introduction</p> <ul style="list-style-type: none"> • distinguish between an object and the material from which it is made

<p>including deciduous and evergreen trees</p> <ul style="list-style-type: none"> • identify and describe the basic structure of a variety of common flowering plants, including trees. • observe changes across the four seasons • observe and describe weather associated with the seasons and how day length varies. 	<p>amphibians, reptiles, birds and mammals</p> <ul style="list-style-type: none"> • 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) • observe changes across the four seasons • observe and describe weather associated with the seasons and how day length varies. 	<ul style="list-style-type: none"> • 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) <p>Introduction</p> <ul style="list-style-type: none"> • 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. <p>Apply</p> <ul style="list-style-type: none"> • 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. • observe changes across the four seasons • observe and describe weather associated with the seasons and how day length varies. 	<ul style="list-style-type: none"> • 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. • observe changes across the four seasons • observe and describe weather associated with the seasons and how day length varies. <p>Apply</p> <ul style="list-style-type: none"> • 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. <p>Introduction</p> <ul style="list-style-type: none"> • 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. • observe changes across the four seasons observe and describe weather associated with the seasons and how day length varies
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Year 2

Ancient Monuments Around the World

Apply

- 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.

Apply

- 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.

The Great Rainforests

recap

- 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.
- observe changes across the four seasons
- observe and describe weather associated with the seasons and how day length varies.

Introduction

- 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

Introduction

- 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

Introduction

- 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

The British Coastline and beyond

Recap

- 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.

Recap

- 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.

Apply

- 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

Apply

- 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

Lower Key Stage 2 Science Aims

The principal focus of science teaching in lower key stage 2 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 of answering 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’ is described separately at the beginning of the programme of study, but must always be taught through and clearly related to substantive science content in the programme of study. Throughout the notes and guidance, examples show how scientific methods and skills might be linked to specific elements of the content.

Pupils should read and spell scientific vocabulary correctly and with confidence, using their growing word-reading and spelling knowledge.

LKS2 Working Scientifically

- 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.

Year 3

The Stone Age to the Iron Age	Natural Disasters and Geology	The Roman Empire	The Saxons and The Vikings
<p>Introduction</p> <ul style="list-style-type: none"> • 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. 	<p>Introduction</p> <ul style="list-style-type: none"> • 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 	<p>Introduction</p> <ul style="list-style-type: none"> • 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, 	<p>Apply</p> <ul style="list-style-type: none"> • 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.

- 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 rate of evaporation with temperature.

Introduction

- 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
- predict whether two magnets will attract or repel each other, depending on which poles are facing.

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 rate of evaporation with temperature.

Introduction

- 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.
- 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

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.

Introduction

- 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.

Apply/recap

- 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.

Apply

- 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
- predict whether two magnets will attract or repel each other, depending on which poles are facing.

water cycle and associate the rate of evaporation with temperature.

Year 4

A local history – The Battle of Edge Hill and the English Civil War	Light and lenses	The Ancient Egyptians	Mountains, Rivers and Oceans
<p>Introduction</p> <ul style="list-style-type: none"> 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. <p>Apply/recap</p> <ul style="list-style-type: none"> compare and group materials together, according to whether they are solids, liquids or gases 	<p>Introduction</p> <ul style="list-style-type: none"> 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 <p>find patterns in the way that the size of shadows change.</p> <p>Apply/recap</p> <ul style="list-style-type: none"> identify common appliances that run on electricity construct a simple series electrical circuit, identifying and naming its basic parts, including 	<p>Introduction/ Apply/recap</p> <ul style="list-style-type: none"> 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 construct and interpret a variety of food chains, identifying producers, predators and prey. <p>Recap</p> <ul style="list-style-type: none"> 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. <p>recap</p> <ul style="list-style-type: none"> 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 predict whether two magnets will attract or repel each other, depending on which poles are facing. <p>Introduction</p>	<p>Apply/recap</p> <ul style="list-style-type: none"> 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. <p>Apply/recap</p> <ul style="list-style-type: none"> 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. <p>Recap</p> <ul style="list-style-type: none"> 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

<ul style="list-style-type: none"> 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 rate of evaporation with temperature. <p>Introduction</p> <ul style="list-style-type: none"> 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 predict whether two magnets will attract or 	<p>cells, wires, bulbs, switches and buzzers</p> <ul style="list-style-type: none"> 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. 	<ul style="list-style-type: none"> 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. 	<ul style="list-style-type: none"> explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.
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repel each other, depending on which poles are facing.			
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Upper Key Stage 2 Science Aims

The principal focus of science teaching in upper key stage 2 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. At upper key stage 2, 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 observing 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 and thinking scientifically’ is described separately at the beginning of the programme of study, but must always be taught through and clearly related to substantive science content in the programme of study. Throughout the notes and guidance, examples show how scientific methods and skills might be linked to specific elements of the content.

Pupils should read, spell and pronounce scientific vocabulary correctly.

Working Scientifically UKS2

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

Year 5

Ancient Greece	Victorians	The Mayans	Earth and Space
<p>Introduction</p> <ul style="list-style-type: none"> • 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. 	<p>Introduction</p> <ul style="list-style-type: none"> • 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 • know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution 	<p>Apply</p> <ul style="list-style-type: none"> • 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. 	<p>Apply</p> <ul style="list-style-type: none"> • explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object

<p>Introduction – but not to be taught in detail until term 6</p> <ul style="list-style-type: none"> 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. 	<ul style="list-style-type: none"> use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic demonstrate that dissolving, mixing and changes of state are reversible changes explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda <p>Introduction</p> <ul style="list-style-type: none"> 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. 		<ul style="list-style-type: none"> 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. <p>Apply</p> <ul style="list-style-type: none"> 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.
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Year 6

Frozen Kingdoms	WW1	WW2	Dystopian futures	Circulation	Evolution
<p>Introduction</p> <ul style="list-style-type: none"> describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including 	<p>Apply</p> <ul style="list-style-type: none"> 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 	<p>Introduction</p> <ul style="list-style-type: none"> 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 	<p>Apply/recap</p> <ul style="list-style-type: none"> 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 	<p>Introduction</p> <ul style="list-style-type: none"> identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood 	<p>Recap</p> <ul style="list-style-type: none"> recognise that living things have changed over time and that fossils provide information about living things that inhabited

<p>microorganisms, plants and animals</p> <ul style="list-style-type: none"> • give reasons for classifying plants and animals based on specific characteristics. 	<p>give out or reflect light into the eye</p> <ul style="list-style-type: none"> • 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. <p>Apply</p> <ul style="list-style-type: none"> • 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 	<p>function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches</p> <ul style="list-style-type: none"> • use recognised symbols when representing a simple circuit in a diagram. <p>Recap</p> <ul style="list-style-type: none"> • 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. <p>Introduction</p> <ul style="list-style-type: none"> • 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 	<p>function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches</p> <ul style="list-style-type: none"> • use recognised symbols when representing a simple circuit in a diagram. <p>recap</p> <ul style="list-style-type: none"> • 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 • predict whether two magnets will attract or repel each other, depending on which poles are facing. 	<ul style="list-style-type: none"> • 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. 	<p>the Earth millions of years ago</p> <ul style="list-style-type: none"> • 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. <p>Apply/recap</p> <ul style="list-style-type: none"> • 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.
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		<ul style="list-style-type: none"> use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky. 			
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Coverage of Core Concepts

The below can be referred to as a guide as to when key concepts are covered, and covered again.

Plants

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Term 1	Plants					
Term 2						

Term 3		Plants	Plants			
Term 4						
Term 5		Plants	Plants		Plants	
Term 6						

Animals Inc humans

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Term 1						
Term 2						
Term 3	Animals Inc humans	Animals Inc humans	Animals Inc humans	Animals Inc humans		
Term 4						

Term 5		Animals Inc humans				Animals Inc humans
Term 6						

Materials

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Term 1		Materials	Materials (as part of Rocks)			
Term 2						Materials
Term 3			Materials		Materials	
Term 4						
Term 5						

	Materials	Materials				
Term 6						

Electricity

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Term 1						
Term 2				Electricity		
Term 3					Electricity (as part of materials)	Electricity
Term 4						
Term 5						

				Electricity		
Term 6						

Space and Forces

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Term 1	Space and Forces		Space and Forces		Space and Forces	
Term 2	Space and Forces					
Term 3	Space and Forces			Space and Forces		Space and Forces
Term 4						

Term 5	Space and Forces				Space and Forces	
Term 6						

Light

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Term 1						
Term 2				Light		Light
Term 3					Light	

Term 4						
Term 5						
Term 6						

Living things and their habitats

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Term 1						Living things and their habitats
Term 2	Living things and their habitats					
Term 3						

Term 4				Living things and their habitats		
Term 5		Living things and their habitats				
Term 6						