Bowerham Primary and Nursery School
Science Whole School Curriculum

EYFS

Subject specific focus from statutory framework for Early Years Foundation Stage
Providers must support children in the specific area of:
• Understanding the world:
Educational programmes must involve activities and experiences for children, as follows:
Understanding the world involves guiding children to make sense of their physical world and their community through opportunities to explore, observe and find out about people, places, technology and the environment.

Other developmental strands involved with Science:
Physical development - Health and self-care: children know the importance for good health of physical exercise, and a healthy diet, and talk about ways to keep healthy.

Guidance from Development Matters (2013)
Early Years Outcomes- 40-60+ months

- **Closely observes what animals, people and vehicles do.**
- **Notices detailed features of objects in their environment.**
- **Comments and asks questions about aspects of their familiar world such as the place where they live or the natural world.**
- **Can talk about some of the things they have observed such as plants, animals, natural and found objects.**
- **Developing an understanding of growth, decay and changes over time.**
- **Shows care and concern for living things and the environment.**

Early Learning Goal
Children know about similarities and differences in relation to places, objects, materials and living things. They talk about the features of their own immediate environment and how environments might vary from one another. They make observations of animals and plants and explain why some things occur, and talk about changes.

Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
The World focus- learning about our pets in school: hens,	The World focus- season of Autumn discussing changes.	The World focus – taking care of birds over the winter, types of	Understanding the world – float or sink experiments		Understanding the world – planting seeds – making observations of plants

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Harvesting fruit and veg around school.		**birds, features of a bird, the sounds they make**	**Looking closely at similarities and differences – observing and analysing daffodils and how the season of spring changes our environment.**		

KS1 **Working Scientifically**	Working scientifically Pupils in years 1 and 2 should explore the world around them and raise their own questions. They should experience different types of scientific enquiries, including practical activities, and begin to recognise ways in which they might answer scientific questions. They should use simple features to compare objects, materials and living things and, with help, decide how to sort and group them, observe changes over time, and, with guidance, they should begin to notice patterns and relationships. They should ask people questions and use simple secondary sources to find answers. They should use simple measurements and equipment (for example, hand lenses, egg timers) to gather data, carry out simple tests, record simple data, and talk about what they have found out and how they found it out. With help, they should record and communicate their findings in a range of ways and begin to use simple scientific language. These opportunities for working scientifically should be provided across years 1 and 2 so that the expectations in the programme of study can be met by the end of year 2. Pupils are not expected to cover each aspect for every area of study. Large Discovery Dog.pub

YEAR 1						
	AUTUMN 1	**AUTUMN 2**	**SPRING 1**	**SPRING 2**	**SUMMER 1**	**SUMMER 2**

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National Curriculum	**Animals, including humans** Pupils should be taught to: •identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals •identify and name a variety of common animals that are carnivores, herbivores and omnivores •describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals including pets) •identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense	**Seasonal changes** Pupils should be taught to: •observe changes across the 4 seasons •observe and describe weather associated with the seasons and how day length varies	**Everyday materials** Pupils should be taught to: •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	**Seasonal changes** Pupils should be taught to: •observe changes across the 4 seasons •observe and describe weather associated with the seasons and how day length varies	**Seasonal changes** Pupils should be taught to: •observe changes across the 4 seasons •observe and describe weather associated with the seasons and how day length varies	**Plants** Pupils should be taught to: •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 Investigation - Animal Poo experiment.
School Coverage	**Humans-** **Body parts and senses** **Animals- Minibeasts** **Animals, including humans** Pupils should use the local environment throughout the year to explore and answer questions about animals in their habitat. They should understand how to take care	**Science investigations and experiments** – linked to the working scientifically skills. The children will be taught how to ask questions about what they can see. They will	**Materials** **Everyday materials** Pupils to explore, name and discuss a wide range of materials by comparing them against each other, using scientific vocabulary (stretchy, smooth, transparent, opaque, waterproof, etc). They will	**Seasonal changes** **Materials** **Seasonal changes** Note: pupils should be warned that it is not safe to look directly at the sun, even when wearing dark glasses.	**Seasonal changes** **Animals** **Seasonal changes** The children will create a weather diary by observing the weather first hand and onscreen. They will draw on previous learning to talk about the different seasons and	**Plants** **Plants** Pupils should use the local environment throughout the year to explore and answer questions about plants growing in their habitat. Where possible, they should observe the growth of flowers and vegetables that they have planted.

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	of animals taken from their local environment and the need to return them safely after study. Children discuss the definition of a vertebrate and sort a variety of common animals into specific groups - fish, amphibians, reptiles, birds and mammals. Children identify and verbally name a variety of common animals; They learn how to identify carnivores, omnivores and herbivores by looking at their teeth. Animals are then sorting into a Venn diagram to show their understanding. *Can I name and identify common animals?* *Can I name & identify carnivores, herbivores & omnivores?* Through games, actions, songs and rhymes the children learn the names and positions of the basic parts of	be investigating which sweets will cause the greatest chemical reaction (which sweets will make a mess) when they add them to diet coke.	record their finding through drawings and simple tables/diagrams. *Can I name & describe a range of materials, place materials in groups and talk about how I sorted them?* *Can I tell the difference between an object & its material?* , Through a home task (building a model house – Teddy Bear House), chn demonstrate their understanding of materials and their properties using their learning from Spring 1.	Through a range on line resources, children observe the differences between the 4 seasons and complete sheet - match season to item eg, sun cream, scarf, pumpkin, lamb. Demonstrate their understanding of how a tree might change during the 4 seasons by showing how a tree would look during each season. *Can I spot the changes in the different seasons?* *Can I talk about the weather & how the day changes in length?* **Everyday materials** Egg Drop challenge – to build something that will protect an egg when dropped from a height. This experiment will be carried out in front of parents	describe them using their senses. They will ask questions and make predictions about the weather and create a 'weather diary'. They will record their observations through pictures and captions. They will talk about and observe how the seasons affect the length of the day. *Can I spot the changes in the different seasons?* *Can I talk about the weather & how the day changes in length?* **Animals** The children will learn about the five animal groups, mammals, birds, reptiles, amphibians, fish. They will describe and compare the structure of various common animals and sort them into the 5 groups. The children will recap on their previous learning about	**Plants** Use of the local environment throughout the year to observe how plants grow. Pupils should be introduced to the requirements of plants for germination, growth and survival, as well as the processes of reproduction and growth in plants. Note: seeds and bulbs need water to grow but most do not need light; seeds and bulbs have a store of food inside them. Pupils might work scientifically by: observing and recording, with some accuracy, the growth of a variety of plants as they change over time from a seed or bulb, or observing similar plants at different stages of growth; setting up a comparative test to show that plants need light and water to stay healthy. Pupils should be taught to: •identify and name a variety of common wild and garden plants, including deciduous and evergreen trees

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	the body and label on a simple drawing. Children match their senses to the part of the body and then experience each of their senses through a variety of simple activities. This to be recorded on a simple chart. *Can I draw and label the parts of the human body?* *Can I link these parts to my senses?*			Drawing on previous learning, and teacher led questioning, the children will record their initial ideas and then plan their design, considering what materials will be suitable to protect the egg. *Can I choose and compare different materials for particular purposes?* • *Design a Teddy Bear House linked to DT*	carnivores, omnivores and herbivores. They will carry out an investigation to identify whether an animal is an omnivore, carnivore or herbivore by looking at its poo. Through teacher lead questioning, and generating their own questions, the children will use simple equipment to observe. They will record their findings using simple charts and answer questions about their findings. *Can I name and identify common animals?* *Can I name & identify carnivores, herbivores & omnivores?*	•identify and describe the basic structure of a variety of common flowering plants, including trees The children will look at a variety of plants and learn how to identify the basic parts through simple observations. They will learn how to identify and name a variety of common wild and garden plants. They will grow
Investigation		***Sweets and Chemical reaction with Coke investigation***	***Design a Teddy Bear House***	***Egg Drop Challenge*** ***Build a Teddy Bear House at home***	***Making a Weather Diary***	***Animal Poo investigation***

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Working scientifically skills	They work scientifically through teacher led questioning and children answering a range of ways to identify variables and monitor. *Can I ask questions about what I see?* *Can I try to answer questions in different ways?*	They will be taught to work scientifically by being led through an investigation, focusing on the process from beginning to end. Through teacher lead questioning they will investigate the how different sweets react when placed into a particular fizzy drink. They will learn about fair testing, generating and answering questions, planning a test, predicting, recording and reporting back on the outcome. They will use simple measurements and equipment. They will use some scientific vocabulary when answering questions.	They work scientifically by observing closely using their senses to compare and identify different materials and sort them into the appropriate category. They will use some scientific vocabulary when verbally describing the materials. Through teacher lead questioning they investigate the properties of many materials and test such things as is the material strong, Is the material waterproof. They then use this information to build a Teddy Bear House. *Can I try to answer questions in different ways?* *Can I plan and perform a simple test?* *Can I give some reasons why things may happen?*	They work scientifically by observing changes over time by using simple secondary resources to find answers. They will discuss what they see and record their observation through simple drawings and diagrams. *Can I tell others about what I observe?* *Can I draw pictures of what I observe?* They work scientifically by using their knowledge of materials and their properties. They will select the most appropriate materials through their investigations to protect the egg from breaking. Teacher led questioning and children answering a range of ways to identify variables. *Can I give some reasons why things may happen?*	They work scientifically by observing changes over time by using simple secondary resources to find answers. They will discuss what they see and record their observation through simple drawings and diagrams. *Can I tell others about what I observe?* *Can I draw pictures of what I observe?* They will work scientifically by using simple equipment to aid their observations. They will record their observations in simple charts and talk about their findings. *Can I ask questions about what I see?* *Can I try to answer questions in different ways?* *Do I know why I am trying to find out things?* *Can I sort things into different groups?**	*Can I plan and perform a simple test?* *Can I give some reasons why things may happen?* *Can I tell others about what I observe?* *Can I answer questions from what I have done and found out?* *Can I draw pictures of what I observe?*

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		Can I give some reasons why things may happen? *Can I tell others about what I observe?* *Can I answer questions from what I have done and found out?* *Can I draw pictures of what I observe?* *Can I make accurate measurements using simple equipment?*	*Can I sort things into different groups?* *Can I explain why I've sorted them?* *Can I answer questions from what I have done and found out?* *Can I put information on a chart?*	*Can I answer questions from what I have done and found out?* *Can I plan and perform a simple test?* **Child led investigation at home**. At home, the children will raise their own questions based on the knowledge they have gained about materials and their properties for everyday uses. Once the house has been built, they have to explain why they have chosen the materials they have. *Can I tell others about what I observe?* *Can I give some reasons why things may happen?* *Can I answer questions from what I have done and found out?*	*Can I explain why I've sorted them?* *Can I tell others about what I observe?* *Can I answer questions from what I have done and found out?* *Can I draw pictures of what I observe?* *Can I put information on a chart?*	
Year 2						

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	Plants Pupils should be taught to: •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 **Seasonal Changes**		**Uses of everyday materials** Pupils should be taught to: •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 **Seasonal Changes**	**Animals, including humans** Pupils should be taught to: •notice that animals, including humans, have offspring which grow into adults •find out about and describe the basic needs of animals, including humans, for survival (water, food and air) •describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene **Living things and their habitats** Pupils should be taught to: •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 **Seasonal Changes**
Year 2 programme of study **Notes and guidance (non-statutory)**	**Plants-** Through Seasonal changes throughout the year the children observe and keep records of how plants have changed over time, for example, the leaves falling off	**Seasonal Changes throughout the Year – Linked to Sun Light, Weather and Plants.** **Living Things and their Habitats**	**Seasonal Changes throughout the Year – Linked to Sun Light, Weather and Plants.** **Materials** Uses of Everyday Materials Recap on materials used in everyday-	**Seasonal Changes throughout the Year – Linked to Sun Light, Weather and Plants.** **Humans – Health and Growth** Animals, including Humans

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	trees and buds opening; and compare and contrast what they have found out about different plants. Children complete a tree walk and look at plants within the environment to become familiar with common names of flowers, examples of deciduous and evergreen trees, and plant structures (including leaves, flowers (blossom), petals, fruit, roots, bulb, seed, trunk, branches, stem). This area of science is revisited throughout the seasons in year 2 *Can I identify and describe different habitats?* • *Trees as a habitat* • *Trees in their habitat* *Can I name a range of animals and different tree species in their habitat?*	Children discuss what is the difference between living and non-living and are introduced to the idea that all living things have certain characteristics that are essential for keeping them alive and healthy. How do we know we're alive? Raise and answer questions that help them to become familiar with the life processes that are common to all living things. Classification of living, dead or were never alive. Habitats Introduction to the terms 'habitat' (a natural environment or home of a variety of plants and animals) and 'microhabitat' (a very	Identify and discuss the uses of different everyday materials so that they become familiar with how some materials are used for more than one thing (metal can be used for coins, cans, cars and table legs; wood can be used for matches, floors, and telegraph poles) or different materials are used for the same thing (spoons can be made from plastic, wood, metal, but not normally from glass). Properties of materials using Venn diagrams to sort. Suitability of materials for purposes. Investigation of items that are broken and children had to fix the item with the most suitable materials. Thinking about the properties of materials that make them suitable or unsuitable for particular purposes and they should be encouraged to think about unusual and creative uses for everyday materials. Pupils work scientifically by: comparing the uses of everyday materials in and around the school with materials found in other places (at home, the journey to school, on visits, and in stories, rhymes and songs); observing closely, identifying and classifying the uses of different materials, and recording their observations. *Can I identify materials that can change shape?* *Possible experimental materials: a stone, ball of playdough or clay, eraser, piece of sponge, ruler, elastic*	Focus on nutrition and food groups through healthy eating plate and pyramids Vocabulary surrounding food Focus on Exercise and effects of this through PE lessons. Through PSHEE RSE scheme- focus on understanding how reproduction occurs. Growing into adults includes reference to baby, toddler, child, teenager, adult. Construct simple food chains for humans. *Can I describe the importance of staying healthy?* *Can I describe the basic needs for humans to survive?* *Can I talk about the basic life cycle of a human?*

		small habitat, for example for woodlice under stones, logs or leaf litter). Compare animals in familiar habitats with animals found in less familiar habitat- THE RAINFOREST. Small Mammal Investigation. Using the trim trail, children create a small mammal investigation to find a good nesting site for a wood mouse. Through this investigation they: Describe how they decided where to place things, exploring questions like: 'Is a flame alive? Is a deciduous tree dead in winter?' and talk about ways of answering their questions. Describe the conditions in different habitats and microhabitats (under log,	*band, a piece of string, ball, piece of fabric, plastic straw, metal spoon, piece of wood, spaghetti (dry and wet).* *Explore forces that are exerted on different materials, including squashing, bending, twisting and stretching.* *Can I choose and compare different materials for particular purposes?*	

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		on stony path, under bushes); and find out how the conditions affect the number and type(s) of plants and animals that live there. Construct simple food chains for animals (eg, grass, cow, human). *Can I name a range of animals and different tree species in their habitat? Can I describe the differences between living and dead things? Can I create simple food chains?*		
Working scientifically	**GROWING AN APPLE TREE FROM A PIP**		**BROKEN EVERYDAY OBJECTS TO FIX**	**FITNESS LEVELS AND EFFECTS OF ACTIVITY** **SMALL MAMMAL INVESTIGATION**
Notes and guidance (non-statutory) Pupils in years 1 and 2 should explore the world around them and raise their	They work scientifically by: observing closely, perhaps using magnifying glasses, and comparing and contrasting familiar plants; describing how they were able to	They work scientifically by using their knowledge of an animals needs to survive in a nesting site to develop an ideal habitat.	Child led investigation The children will work scientifically by raising their own questions based on the knowledge they have of materials and purposes. They will select the most appropriate material through their investigations to fix the broken	Child led investigation Children work scientifically to generate questions surrounding health and fitness in order to develop a group experiment. Asking simple questions and recognising that they can be answered in different ways

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own questions. They should experience different types of scientific enquiries, including practical activities, and begin to recognise ways in which they might answer scientific questions. They should use simple features to compare objects, materials and living things and, with help, decide how to sort and group them, observe changes over time, and, with guidance, they should begin to notice patterns and relationships. They should ask people questions and use simple secondary sources to find answers. They should use simple measurements and equipment (for example, hand lenses, egg timers) to gather data, carry out simple tests, record simple data, and talk about what they	identify and group them, and drawing diagrams showing the parts of different plants including trees. They perform a simple observational test- teacher led. Children explore the world around them and raise their own questions. *Can I ask questions about the world around me?* *Can I use all of my senses to observe so that I can try to answer questions?* *Can I answer a range of questions about how things grow?* *Can use my own observations?* *Can I plan and perform simple tests with a range of appropriate equipment?** *Can I compare observations using scientific vocabulary?*	Teacher led questioning and children answering a range of ways to identify variables and monitor. Observing closely, using simple equipment- thermometers, magnifying glasses, senses. *Can I answer a range of questions in a range of ways?* *Can I make accurate measurements using simple equipment. (temperature)?* *Can I describe my observations using scientific vocabulary?*	item to be used again using their awareness of material properties and aesthetics. Children ask simple questions and recognising that they can be answered in different ways- through small group work and discussion Gathering information to help in answer questions for verbal feedback of suitability of product and material. *Can I ask a range of questions?* *Can I answer a range of questions in a range of ways?* *Can I compare objects and materials?* *Can I sort objects and materials and explain my choices?* *Can I report back my findings- verbally?*	Using their observations and ideas to suggest answers to questions Recording data through tables and graphs (to be taught discreetly in Maths) *Can I ask a range of questions?* *Can I use all of my senses to observe so that I can try to answer questions?* *Can I answer a range of questions in a range of ways?* *Can I act on suggestions about how to find more things out?* *Can I use my observations and ideas to answer questions?*

have found out and how they found it out. With help, they should record and communicate their findings in a range of ways and begin to use simple scientific language. These opportunities for working scientifically should be provided across years 1 and 2 so that the expectations in the programme of study can be met by the end of year 2. Pupils are not expected to cover each aspect for every area of study.				
KS2				
KS2- LOWER KEY STAGE 2				

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Working Scientifically	**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 Post_it_Planning.doc				
YEAR 3					
NC coverage	**<u>Rocks</u>** Pupils should be taught to: •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	**<u>Light</u>** Pupils should be taught to: •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	**<u>Animals, including humans</u>** Pupils should be taught to: •identify that humans and some other animals have skeletons and muscles for support, protection and movement	**<u>Forces and magnets</u>** •compare how things move on different surfaces •notice that some forces need contact between 2 objects, but magnetic forces can act at a distance •observe how magnets attract or repel each other and attract some materials and not others •compare and group together a variety of everyday materials on the	**<u>Animals, including humans</u>** Pupils should be taught to: •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 **<u>Plants</u>** Pupils should be taught to: •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

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		•recognise that shadows are formed when the light from a light source is blocked by an opaque object •find patterns in the way that the size of shadows change		basis of whether they are attracted to a magnet, and identify some magnetic materials •describe magnets as having 2 poles •predict whether 2 magnets will attract or repel each other, depending on which poles are facing	•explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal	
School coverage	**Rocks and Fossils** Linked with work in geography, children explore different kinds of rocks and soils, including those in the local environment- rocks and soil from Crooke O'Lune. Know the types of rocks and soils and how they are formed.	**Light and Shadow and Reflection** Recap on sources of light and light exposure. Light travels in straight lines- use of mirrors to reflect light# Shadows Children explore what happens when light reflects off a mirror or other reflective surfaces, including playing mirror games to help them to answer questions about how light behaves.	**Animals including Humans- Skeletal** Introduction to the main body parts associated with the skeleton and muscles, finding out how different parts of the body have special functions. Science investigations and experiments	**Forces and Magnets** Friction Magnetic forces and how they work. Behaviour and uses of magnets-(for example, bar, ring, button and horseshoe).	**Humans, health and nutrition** Recap on work on Nutrition in KS1- health plate/ lifestyle- linked to PSHEE curriculum.	**Plants** Study of the relationship between structure and function of a plant: the idea that every part has a job to do. Explore questions that focus on the role of the roots and stem in nutrition and support, leaves for nutrition and flowers for reproduction. Introduction to photosynthesis and food production for plants.

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		Children to think about why it is important to protect their eyes from bright lights. Children look for, and measure, shadows, and find out how they are formed and what might cause the shadows to change.				
Investigation	**How do we know where soil comes from?** **How do we know what type of rock it is?** Identification and classification of rocks and soils through knowledge of both. Identification of fossils	**Light investigations-** Design a bag for in the dark- reflective strip looking at range of materials How can a shadow change in appearance? Light tent and targets- How can we use mirrors to hit them?	**Where's your backbone?** Grouping of animals with and without invertebrate **Does a long arm equal a long leg?** Comparison of arm span to leg span	**How strong is my magnet?** Comparative study of different magnets- amount of paperclips picked up. **Is it magnetic?** Looking at magnetic materials How effective is my cart? Looking at efficiency of cart built in DT over different	**What makes a healthy meal?** Plan and create a healthy meal- linked to DT skills	**How can I best grow a plant?** Child led question and investigation through post it method

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				services- measure by Newton meters.		
Working Scientifically	Pupils work scientifically by: • Looking for patterns in what happens to shadows when the light source moves or the distance between the light source and the object changes. • Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions. *Can I predict what might happen before I carry out any tests?* *Can I use my results to make a simple conclusion and develop further questions I might answer?** *Can I suggest how I can make improvements to my work?* Pupils work scientifically by: • Observing rocks and exploring how and why they might have changed over time; using a hand lens or microscope to help them to identify and classify rocks according to whether they have grains or crystals, and whether they have fossils in them.		Pupils work scientifically by: • Identifying and grouping animals with and without skeletons and observing and comparing their movement; exploring ideas about what would happen if humans did not have skeletons. • Asking relevant questions and using different types of scientific enquiries to answer them. • Carrying out simple practical enquires, comparative and fair tests • Making systematic and careful observations, where appropriate, taking accurate measurements using	Pupils work scientifically by: • Comparing how different things move and grouping them; raising questions and carrying out tests to find out how far things move on different surfaces, and gathering and recording data to find answers to their questions; exploring the strengths of different magnets and finding a fair way to compare them; sorting materials into those that are magnetic and those that are not; looking for patterns in the way that magnets behave in relation to each other and what might affect this, for example, the strength of the magnet or which pole faces another;	Pupils work scientifically by: • Researching different food groups and how they keep us healthy, and designing meals based on what they find out. • Asking relevant questions and using different types of scientific enquiries to answer them • Using straightforward scientific evidence to answer questions or to support their findings • Reporting on findings from enquires, including oral and written explanations, displays or presentations of results and conclusions • Asking relevant questions and using different types of scientific enquiries to answer them	Pupils work scientifically by: • Comparing the effect of different factors on plant growth, for example, the amount of light, the amount of fertiliser; discovering how seeds are formed by observing the different stages of plant life cycles over a period of time; looking for patterns in the structure of fruits that relate to how the seeds are dispersed. They observe how water is transported in plants, for example, by putting cut, white carnations into coloured water and observing how water travels up the stem to the flowers. • Asking relevant questions and using different types of scientific enquiries to answer them

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	• Researching and discussing the different kinds of living things whose fossils are found in sedimentary rock and explore how fossils are formed. • Exploring different soils and identify similarities and differences between them and investigate what happens when rocks are rubbed together or what changes occur when they are in water. They raising and answering questions about the way soils are formed. • 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 and keys. • They report on findings from enquires, including oral and written explanations, displays or presentations of results and conclusions. Using straightforward scientific evidence to answer questions or to support their findings *Can I give reasons for my observations?* *Can I record my observations, comparisons and measurements using tables, charts, text and labelled diagrams?* *Can I use scientific vocabulary to describe my observations and data presentations?* *Can I give reasons for my observations?* *Can I use explain how to use secondary sources of information to answer questions that cannot be answered through practical investigations?*	standard units, using a range of equipment- tape measure • Using straightforward scientific evidence to answer questions or to support their findings *Can I act on suggestions and put forward my own ideas about how to find the answer to a question?* *Can I plan and carry out a comparative test?* *Can I predict what might happen before I carry out any tests?* *Can I accurately measure length using suitable equipment?* *Can I use explain how to use secondary sources of information to answer questions that cannot be answered through practical investigations?*	identifying how these properties make magnets useful in everyday items and suggesting creative uses for different magnets. • Using different types of scientific enquiries to answer questions posed to them. • Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions? • Reporting on findings from enquires, including oral and written explanations, displays or presentations of results and conclusions • Identifying differences, similarities or changes related to simple scientific ideas and processes *Can I recognise why it is important to collect data to answer questions?* *Can I record my observations, comparisons*	• Setting up simple practical enquires, comparative and fair tests *Can I act on suggestions and put forward my own ideas about how to find the answer to a question?* *Can I plan and carry out a comparative test?* *Can I plan and carry out a fair test and explain why it was fair?* *Can I give reasons for my observations?* *Can I explain how to use secondary sources of information to answer questions that cannot be answered through practical investigations?* *Can I recognise why it is important to collect data to answer questions?*	• Using straightforward scientific evidence to answer questions or to support their findings • Reporting on findings from enquires, including oral and written explanations, displays or presentations of results and conclusions • Asking relevant questions and using different types of scientific enquiries to answer them • Setting up simple practical enquires, comparative and fair tests *Can I act on suggestions and put forward my own ideas about how to find the answer to a question?* *Can I plan and carry out a comparative test?* *Can I plan and carry out a fair test and explain why it was fair?* *Can I give reasons for my observations?* *Can I explain how to use secondary sources of information to answer questions that cannot be answered through practical investigations?*

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			and measurements using tables, charts, text and labelled diagrams? *Can I give reasons for my observations?* *Can I present my results clearly?* *Can I look for patterns in my data and try to explain them?* *Can I carry out a fair test and explain why it was fair?*		*Can I recognise why it is important to collect data to answer questions?*
YEAR 4					
Year 4 programme of study	**Animals, including humans** Pupils should be taught to: •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	**States of matter** Pupils should be taught to: •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)	**Electricity** Pupils should be taught to: •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 **Sound**	**Living things and their habitats** Pupils should be taught to: •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	

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		•identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature	Pupils should be taught to: •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	
School Coverage	**<u>Animals including Humans, Teeth and Digestion</u>** Parts associated with the digestive system, for example: mouth, tongue, teeth, oesophagus, stomach, and small and large intestine, and explore questions that help them to understand their special functions. Parts of a Mouth	**<u>States of Matter</u>** Pupils explore a variety of everyday materials and develop simple descriptions of the states of matter (solids hold their shape; liquids form a pool not a pile; gases escape from an unsealed container). Pupils observe water as a solid, a liquid and a gas and should note the changes to water when it is heated or cooled.	**<u>Sound</u>** Pupils explore and identify the way sound is made through vibration in a range of different musical instruments from around the world; and find out how the pitch and volume of sounds can be changed in a variety of ways. **<u>Electricity</u>** Pupils construct simple series circuits, trying different components, for example, bulbs, buzzers and motors, and including switches, and use their circuits to create simple devices. Pupils should draw the circuit as a pictorial representation, not necessarily using conventional circuit symbols at this stage; these will be introduced in year 6. Note: pupils might use the terms current and voltage, but these are not introduced or defined formally at this stage. Electrical safety.	**<u>Living Things and their Habitats</u>** Ongoing- pupils use the local environment throughout the year to raise and answer questions that help them to identify and study plants and animals in their habitat. They identify how the habitat changes throughout the year. Grouping of a wide selection of living things that include animals, flowering plants and non-flowering plants. Begin to put vertebrate animals into groups, for example: fish, amphibians, reptiles, birds, and mammals; and invertebrates into snails and slugs, worms, spiders, and insects. Grouping plants into categories such as flowering plants (including grasses) and non-flowering plants, for example ferns and mosses. Explore examples of human impact (both positive and negative) on environments, for example, the positive effects of nature reserves, ecologically planned parks, or garden ponds, and the negative

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		Linked to The water cycle.		effects of population and development, litter or deforestation- link to eco schools work.
Investigation	**Teeth enamel investigation**		**What is the best bug hotel?** **DT link (creating bug hotel poles for forest)**	
Working Scientifically	Pupils work scientifically by: • Comparing the teeth of carnivores and herbivores and suggesting reasons for differences; finding out what damages teeth and how to look after them. They might draw and discuss their ideas about the digestive system and compare them with models or images. • Setting up simple practical enquires, comparative and fair tests • Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts and tables *Can I describe how to vary one factor while keeping others the same?*	Pupils might work scientifically by: • Grouping and classifying a variety of different materials; exploring the effect of temperature on substances such as chocolate, butter, cream (for example, to make food such as chocolate crispy cakes and ice-cream for a party). They could research the temperature at which materials change state, for example, when iron melts or when oxygen condenses into a liquid. They might observe and record evaporation over a period of time, for example, a puddle in	Pupils might work scientifically by: • Using and making simple guides or keys to explore and identify local plants and animals; making a guide to local living things; raising and answering questions based on their observations of animals and what they have found out about other animals that they have researched. • Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions • Reporting on findings from enquires, including oral and written explanations, displays or presentations of results and conclusions • Using straightforward scientific evidence to answer questions or to support their findings *Can I research and select which information to use from sources provided for me (print and screen)?* *Can I relate my conclusions to observable patterns?* *Can I suggest improvements to my work and give reasons?* *Can I report fully on my findings and appropriately for the audience?*	Pupils might work scientifically by: • Finding patterns in the sounds that are made by different objects such as saucepan lids of different sizes or elastic bands of different thicknesses. They might make earmuffs from a variety of different materials to investigate which provides the best insulation against sound. They could make and play their own instruments by using what they have found out about pitch and volume. • Pupils might work scientifically by: observing patterns, for example, that bulbs get brighter if more cells are added, that metals tend to be conductors of electricity, and that some materials can and some cannot be used to connect across a gap in a circuit. • Asking relevant questions and using different types of scientific enquiries to answer them • Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions? *Can I recognise that scientific ideas are based on evidence that can answer a range of questions?* *Can I decide on the most appropriate approach to an investigation (eg. a fair test, comparative) to answer a question?* *Can I record my observations using a range of appropriately detailed approaches?*

	Can I make predictions? *Can I consider how changing one variable can alter another and use the convention of 'er' words to describe this (eg. The heavier the load, the longer the spring)?* *Can I use appropriate scientific language in all written and spoken recordings?*	the playground or washing on a line, and investigate the effect of temperature on washing drying or snowmen melting. • Making systematic and careful observations, where appropriate, taking accurate measurements using standard units, using a range of equipment including thermometers and data loggers • Identifying differences, similarities or changes related to simple scientific ideas and processes *Can I make observations using materials and equipment that are accurate, timely and right for the task?* *Can I use my data to interpret patterns, similarities and differences?*		

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KS2- UPPER KEY STAGE 2					
National Curriculum Working Scientifically	**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:** •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 a 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 Post_it_Planning.doc				
YEAR 5					
National Curriculum	**Forces, Earth and space** Pupils should be taught to: •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	**Living things and their habitats** Pupils should be taught to: •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		**Properties and changes of materials** Pupils should be taught to: •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	**Animals, including humans** Pupils should be taught to: •describe the changes as humans develop to old age

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					recover a substance from a solution •use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating •give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic •demonstrate that dissolving, mixing and changes of state are reversible changes •explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda	
School Coverage	**<u>Forces</u>**- friction, air resistance & mechanisms Pupils should explore falling objects and raise questions about the effects of air resistance. They should explore the effects	**Earth and space** Pupils should be taught to: •describe the movement of the Earth and other planets relative to the sun in the solar system	**<u>Living things and their habitats</u>** Pupils should study and raise questions about their local environment throughout the year.	**<u>Living things and their habitats</u>** Pupils should study and raise questions about their local environment throughout the year. They should observe life-	**<u>Properties and Changes of Materials</u>** uses, comparisons, thermal/electrical conductivity & transparency Pupils should build a more systematic understanding of materials by exploring and	**<u>Animals including Humans</u>** Observe life cycle of plants and animals in the local environment throughout the year. Pupils should draw a timeline to indicate stages in the growth and development of humans. They

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	of air resistance by observing how different objects such as parachutes and sycamore seeds fall. They should experience forces that make things begin to move, get faster or slow down. Pupils should explore the effects of friction on movement and find out how it slows or stops moving objects, for example, by observing the effects of a brake on a bicycle wheel. Pupils should explore the effects of levers, pulleys and simple machines on movement. Pupils might find out how scientists, for example, Galileo Galilei and Isaac Newton helped to develop the theory of gravitation.	•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 **<u>Earth and Space</u>** Pupils should be introduced to a model of the sun and Earth that enables them to explain day and night. Pupils should learn that the sun is a star at the centre of our solar system and that it has 8 planets: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune (Pluto was reclassified as a 'dwarf planet' in 2006). They should understand that a moon is a celestial body that orbits a planet (Earth has 1 moon; Jupiter has 4 large moons and numerous smaller ones).	They should observe life-cycle changes in a variety of living things, for example, plants in the vegetable garden or flower border, and animals in the local environment. They should find out about the work of naturalists and animal behaviourists, for example, David Attenborough and Jane Goodall. Pupils should find out about different types of reproduction, including sexual and asexual reproduction in plants, and sexual reproduction in animals. Observe life cycle of plants and animals in the local environment throughout the year.	cycle changes in a variety of living things, for example, plants in the vegetable garden or flower border, and animals in the local environment. They should find out about the work of naturalists and animal behaviourists, for example, David Attenborough and Jane Goodall. Pupils should find out about different types of reproduction, including sexual and asexual reproduction in plants, and sexual reproduction in animals.	comparing the properties of a broad range of materials, including relating these to what they learnt about magnetism in year 3 and about electricity in year 4. They should explore reversible changes, including evaporating, filtering, sieving, melting and dissolving, recognising that melting and dissolving are different processes. Pupils should explore changes that are difficult to reverse, for example, burning, rusting and other reactions, for example, vinegar with bicarbonate of soda. They should find out about how chemists create new materials, for example, Spencer Silver, who invented the glue for sticky notes or Ruth Benerito, who invented wrinkle-free cotton. Note: pupils are not required to make quantitative measurements about conductivity and insulation at this stage. It is sufficient for them to observe that some conductors will produce a	should learn about the changes experienced in puberty.

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		Note: pupils should be warned that it is not safe to look directly at the sun, even when wearing dark glasses. Pupils should find out about the way that ideas about the solar system have developed, understanding how the geocentric model of the solar system gave way to the heliocentric model by considering the work of scientists such as Ptolemy, Alhazen and Copernicus.			brighter bulb in a circuit than others and that some materials will feel hotter than others when a heat source is placed against them. Safety guidelines should be followed when burning materials.	
Investigations	**Devise a pulley system** **Design a crane** **Design a boat** **Design a sled for transporting rocks across different terrain**	**Presentation on a chosen Planet**	**Asexual reproduction of a geranium** **Investigating endangered species**	**Asexual reproduction of a geranium** **Investigating endangered species**	**Growing crystals** **Extract iron from a breakfast cereal** **Chromatography**	
Working Scientifically	Pupils work scientifically by: observing and comparing the life cycles of plants and animals in their local environment with other plants and animals	Pupils work scientifically by: observing and comparing the life cycles of plants and animals in their local environment with other plants and animals around		Pupils might work scientifically by: They might explore resistance in water by making and testing boats of different shapes. They might design and make products that use levers,	Pupils might work scientifically by: carrying out tests to answer questions, for example, 'Which materials would be the most effective for making a warm jacket, for wrapping ice cream	Pupils could work scientifically by researching the gestation periods of other animals and comparing them with humans; by finding out and recording the length and mass of a baby as it grows.

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	around the world (in the rainforest, in the oceans, in desert areas and in prehistoric times), asking pertinent questions and suggesting reasons for similarities and differences. They might try to grow new plants from different parts of the parent plant, for example, seeds, stem and root cuttings, tubers, bulbs. They might observe changes in an animal over a period of time (for example, by hatching and rearing chicks), comparing how different animals reproduce and grow. Identify scientific evidence that has been used to support or refute ideas or arguments.	the world (in the rainforest, in the oceans, in desert areas and in prehistoric times), asking pertinent questions and suggesting reasons for similarities and differences. They might try to grow new plants from different parts of the parent plant, for example, seeds, stem and root cuttings, tubers, bulbs. They might observe changes in an animal over a period of time (for example, by hatching and rearing chicks), comparing how different animals reproduce and grow. Identify scientific evidence that has been used to support or refute ideas or arguments.		pulleys, gears and/or springs and explore their effects. 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 enquires, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations	to stop it melting, or for making blackout curtains?' They might compare materials in order to make a switch in a circuit. They could observe and compare the changes that take place, for example, when burning different materials or baking bread or cakes. They might research and discuss how chemical changes have an impact on our lives, for example, cooking, and discuss the creative use of new materials such as polymers, super-sticky and super-thin materials. 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,	Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary Reporting and presenting findings from enquires, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations 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 • Can I recognise that scientific ideas are based on evidence that can answer a range of questions?

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				Can I recognise that scientific ideas are based on evidence that can answer a range of questions? Can I decide on the most appropriate approach to an investigation (eg. a fair test, comparative) to answer a question? Can I describe how to vary one factor while keeping others the same? Can I consider how changing one variable can alter another and use the convention of 'er' words to describe this (eg. The heavier the load, the longer the spring)? Can I make observations using materials and equipment that are accurate, timely and right for the task? Can I record my observations using a range of appropriately detailed approaches? Can I use appropriate scientific language in all written and spoken recordings? Can I suggest improvements to my work and give reasons?	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 enquires, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations Can I recognise that scientific ideas are based on evidence that can answer a range of questions? Can I decide on the most appropriate approach to an investigation (eg. a fair test, comparative) to answer a question? Can I describe how to vary one factor while keeping others the same? Can I consider how changing one variable can alter another and use the convention of 'er'	• Can I decide on the most appropriate approach to an investigation (eg. a fair test, comparative) to answer a question? • Can I describe how to vary one factor while keeping others the same? • Can I consider how changing one variable can alter another and use the convention of 'er' words to describe this (eg. The heavier the load, the longer the spring)? • Can I make observations using materials and equipment that are accurate, timely and right for the task? • Can I record my observations using a range of appropriately detailed approaches? • Can I use appropriate scientific language in all written and spoken recordings?

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				Can I make predictions? Can I relate my conclusions to observable patterns? Can I use my data to interpret patterns, similarities and differences?	words to describe this (eg. The heavier the load, the longer the spring)? Can I make observations using materials and equipment that are accurate, timely and right for the task? Can I record my observations using a range of appropriately detailed approaches? Can I use appropriate scientific language in all written and spoken recordings? Can I suggest improvements to my work and give reasons? Can I make predictions? Can I relate my conclusions to observable patterns? Can I use my data to interpret patterns, similarities and differences?	• Can I suggest improvements to my work and give reasons? • Can I make predictions? • Can I relate my conclusions to observable patterns? Can I use my data to interpret patterns, similarities and differences? Pupils might work scientifically by: comparing the time of day at different places on the Earth through internet links and direct communication; creating simple models of the solar system; constructing simple shadow clocks and sundials, calibrated to show midday and the start and end of the school day; finding out why some people think that structures such as Stonehenge might have been used as astronomical clocks. Identify scientific evidence that has been used to support or refute ideas or arguments.

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						Can I research and select which information to use from sources provided for me (print and screen)?
YEAR 6						
National Curriculum	**Animals including humans** Pupils should be taught to: •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	**Light** Pupils should be taught to: •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** Pupils should be taught to: •describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals •give reasons for classifying plants and animals based on specific characteristics	**Evolution and inheritance** Pupils should be taught to: •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	**Electricity** Pupils should be taught to: •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	

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School Coverage	**Animals including Humans** Pupils should build on their learning from years 3 and 4 about the main body parts and internal organs (skeletal, muscular and digestive system) to explore and answer questions that help them to understand how the circulatory system enables the body to function. Pupils should learn how to keep their bodies healthy and how their bodies might be damaged – including how some drugs and other substances can be harmful to the human body.	**Light** Pupils should build on the work on light in year 3, exploring the way that light behaves, including light sources, reflection and shadows. They should talk about what happens and make predictions. Light – straight line, shadows, reflectors and emitters – linked to National Science Week .	**Living things and their habitats** Pupils should build on their learning about grouping living things in year 4 by looking at the classification system in more detail. They should be introduced to the idea that broad groupings, such as micro-organisms, plants and animals can be subdivided. Through direct observations where possible, they should classify animals into commonly found invertebrates (such as insects, spiders, snails, worms) and vertebrates (fish, amphibians, reptiles, birds and mammals). They should discuss reasons why living things are placed in one group and not another. Pupils might find out about the significance of the work	**Evolution and inheritance** Building on what they learned about fossils in the topic on rocks in year 3, pupils should find out more about how living things on earth have changed over time. They should be introduced to the idea that characteristics are passed from parents to their offspring, for instance by considering different breeds of dogs, and what happens when, for example, labradors are crossed with poodles. They should also appreciate that variation in offspring over time can make animals more or less able to survive in particular environments, for example, by exploring how giraffes' necks got longer, or the development of insulating fur on the arctic fox. Pupils might find out about the work of palaeontologists such as Mary Anning and about how Charles Darwin and Alfred Wallace developed their ideas on evolution.	Living things & their habitats – classification by characteristics (short topic) – using keys to identify species **Electricity** Building on their work in year 4, pupils should construct simple series circuits, to help them to answer questions about what happens when they try different components, for example, switches, bulbs, buzzers and motors. They should learn how to represent a simple circuit in a diagram using recognised symbols. Note: pupils are expected to learn only about series circuits, not parallel circuits. Pupils should be taught to take the necessary precautions for working safely with electricity. Electricity – circuit components and detailed circuit diagrams	Forces – recap effects of air resistance, water resistance and friction on moving surfaces

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			of scientists such as Carl Linnaeus, a pioneer of classification.	Note: at this stage, pupils are not expected to understand how genes and chromosomes work		
Investigation	**FITNESS LEVELS AND EFFECTS OF ACTIVITY**	**Design a working light for a lighthouse**	**. Design a camouflage for an insect or animal**	**Design a 'What am I' game**		**Design a paper aeroplane that is wind resistant**
Working scientifically skills	Pupils work scientifically by: exploring the work of scientists and scientific research about the relationship between diet, exercise, drugs, lifestyle and health. Can I draw conclusions that are consistent with the evidence and relate these to scientific knowledge? Can I repeat observations and measurements and offer explanations for any differences I encounter? Can I record observations and measurements systematically? Can I present (where appropriate) data as in a range of suitable forms?	Pupils might work scientifically by: observing and raising questions about local animals and how they are adapted to their environment; comparing how some living things are adapted to survive in extreme conditions, for example, cactuses, penguins and camels. They might analyse the advantages and disadvantages of specific adaptations, such as being on 2 feet rather than 4, having a long or a short beak, having gills or lungs, tendrils on climbing plants, brightly coloured and scented flowers.	Pupils might work scientifically by: systematically identifying the effect of changing one component at a time in a circuit; designing and making a set of traffic lights, a burglar alarm or some other useful circuit. Can I find an appropriate approach when trying to answer a question? Can I select apparatus and plan to use it effectively? Can I draw conclusions that are consistent with the evidence and relate these to scientific knowledge?	Pupils might work scientifically by: deciding where to place rear-view mirrors on cars; designing and making a periscope and using the idea that light appears to travel in straight lines to explain how it works. They might investigate the relationship between light sources, objects and shadows by using shadow puppets. They could extend their experience of light by looking a range of phenomena including rainbows, colours on soap bubbles, objects looking bent in water, and coloured filters (they do not need to explain why these phenomena occur). When investigation involves a fair test, can I find the key factors to be considered, clearly communicating the variables I	Pupils might work scientifically by: using classification systems and keys to identify some animals and plants in the immediate environment. They could research unfamiliar animals and plants from a broad range of other habitats and decide where they belong in the classification system. Can I draw conclusions that are consistent with the evidence and relate these to scientific knowledge? Can I use the computer to collect data (data logging)? Can I present (where appropriate) data as in a range of suitable forms? Can make predictions based on my scientific knowledge and understanding?	Can I present (where appropriate) data as in a range of suitable forms? Can make predictions based on my scientific knowledge and understanding? Can I use appropriate scientific language and conventions to communicate quantitative and qualitative data? Can I research, select and evaluate a range of sources of information, including primary and secondary sources?

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	Can make predictions based on my scientific knowledge and understanding? Can I use appropriate scientific language and conventions to communicate quantitative and qualitative data? Can I research, select and evaluate a range of sources of information, including primary and secondary sources?	Can I describe how experimental evidence and creative thinking have been combined to provide a scientific explanation? (eg. Jenner's work on vaccination.)? Can I draw conclusions that are consistent with the evidence and relate these to scientific knowledge? Can I make a series of observations, comparisons, classifications or measurements with precision? Can make predictions based on my scientific knowledge and understanding? Can I use appropriate scientific language and conventions to communicate quantitative and qualitative data? Can I research, select and evaluate a range of sources of information, including primary and secondary sources?	Can I make a series of observations, comparisons, classifications or measurements with precision? Can I record observations and measurements systematically? Can make predictions based on my scientific knowledge and understanding? Can make practical suggestions about how my working methods can be improved? Can I use appropriate scientific language and conventions to communicate quantitative and qualitative data? Can I research, select and evaluate a range of sources of information, including primary and secondary sources?	alter and those I leave unchanged? Can I draw conclusions that are consistent with the evidence and relate these to scientific knowledge? Can I make a series of observations, comparisons, classifications or measurements with precision? Can I record observations and measurements systematically? Can make predictions based on my scientific knowledge and understanding? Can make practical suggestions about how my working methods can be improved? Can I use appropriate scientific language and conventions to communicate quantitative and qualitative data? Can I research, select and evaluate a range of sources of information, including primary and secondary sources?	Can I use appropriate scientific language and conventions to communicate quantitative and qualitative data? Can I research, select and evaluate a range of sources of information, including primary and secondary sources?	