St. Mary's Church of England Primary School, High Crompton

Science Scheme of Work

EYFS - Spring		
Programme of Study	**Knowledge, Skills and Understanding**	**Activity/ Link to scheme of work**
We will look at similarities and differences in objects and materials.	Children know about similarities and differences in objects and materials.	Name and describe the material of different objects. Sort according to different criteria: magnetic, hard, soft, waterproof, hot/cold etc
We will look at similarities and differences in living things. We will make observations of plants and say why things change and may happen.	Children know about similarities and differences in relation to living things. Children make observations of animals and plants and explain why some thing occur, and talk about changes.	Plant seeds Name and label parts of a plant. Discuss functions of each part. Look at similarities and differences between plants and other living things. Measure and describe changes as it grows (including decay)

EYFS - Summer		
Programme of Study	**Knowledge, Skills and Understanding**	**Activity/ Link to scheme of work**
Learn about location of animals and how features of animals relate to their environment.	Know about similarities and differences in relation to living things. Make observations of animals and explain why some things occur, and talk about changes.	Bug hunt Identify, name and talk about mini-beasts in the local environment. Label parts of mini-beasts Discuss how animals adapt to different environments (compare hot and cold climates)

Year 1 - Autumn		
Programme of Study	**Knowledge, Skills and Understanding**	**Activity/ Link to scheme of work**
Working scientifically: 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	Can they talk about what they see, touch, smell, hear or taste? Can they use simple equipment to help them make observations? Can they perform a simple test? Can they tell other people about what they have done? Can they identify and classify things they observe? Can they think of some questions to ask? Can they answer some scientific questions? Can they give a simple reason for their answers? Can they explain what they have found out? Can they show their work using pictures, labels and captions? Can they record their findings using standard units? Can they put some information in a chart or table?	Pupils 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.
Everyday materials: distinguish between an object and the material from which it is made identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock describe the simple physical properties of a variety of	Can they distinguish between an object and the material from which it is made? Can they describe materials using their senses? Can they describe materials using their senses, using specific scientific words? Can they explain what material objects are made from? Can they explain why a material might be useful for a specific job? Can they name some different everyday materials? e.g. wood, plastic, metal, water and rock Can they sort materials into groups by a given criteria? Can they explain how solid shapes can be	Pupils should explore, name, discuss and raise and answer questions about everyday materials so that they become familiar with the names of materials and properties such as: hard/soft; stretchy/stiff; shiny/dull; rough/smooth; bendy/not bendy; waterproof/not waterproof; absorbent/not absorbent; opaque/transparent. Pupils should explore and experiment with a wide variety of materials, not only those listed in the programme of study, but including for example: brick, paper, fabrics, elastic, foil. Pupils might work scientifically by: performing simple

everyday materials compare and group together a variety of everyday materials on the basis of their simple physical properties.	changed by squashing, bending, twisting and stretching? Can they describe things that are similar and different between materials? Can they explain what happens to certain materials when they are heated, e.g. bread, ice, chocolate? Can they explain what happens to certain materials when they are cooled, e.g. jelly, heated chocolate?	tests to explore questions, for example: 'What is the best material for an umbrella? ...for lining a dog basket? ...for curtains? ...for a bookshelf? ...for a gymnast's leotard?'
Uses of everyday materials: 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.	Can they describe the simple physical properties of a variety of everyday materials? Can they compare and group together a variety of materials based on their simple physical properties? Can they describe the properties of different materials using words like, transparent or opaque, flexible, etc.? Can they sort materials into groups and say why they have sorted them in that way? Can they say which materials are natural and which are man made? Can they explore how the shapes of solid objects can be changed? (squashing, bending, twisting, stretching) Can they find out about people who developed useful new materials? (John Dunlop, Charles Macintosh, John McAdam) Can they identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper, cardboard for particular uses? Can they explain how things move on different surfaces? Can they explain how materials are changed by heating and cooling? Can they explain how materials are changed by bending, twisting and stretching? Can they tell which materials cannot be changed back after being heated, cooled, bent, stretched or twisted?	Compare and group various materials based on observations. Pupils should give reasons why they have grouped materials in that way. Understand and use terms transparent, opaque and flexible to describe materials. Explore and recoginse natural and man made materials. Explore how the shapes of solid objects can be changed? (squashing, bending, twisting, stretching) Pupils should identify and discuss the uses of different everyday materials so that they become familiar with how some materials are used for more than one thing (metal can be used for coins, cans, cars and table legs; wood can be used for matches, floors, and telegraph poles) or different materials are used for the same thing (spoons can be made from plastic, wood, metal, but not normally from glass). They should think about the properties of materials that make them suitable or unsuitable for particular purposes and they should be encouraged to think about unusual and creative uses for everyday materials. Pupils might find out about people who have developed useful new materials, for example John Dunlop, Charles Macintosh or John McAdam. Developing science book Year 2- Cold stuff activity and other activities exploring how materials are

		changed by heating and cooling. Discuss which materials are cannot be changed back after being heated, cooled, bent, stretched or twisted. Complete a fair investigation to consider how something moves on different surfaces e.g. using ramp and car and consider how different surfaces affect how far the car travels. Pupils might work scientifically by: comparing the uses of everyday materials in and around the school with materials found in other places (at home, the journey to school, on visits, and in stories, rhymes and songs); observing closely, identifying and classifying the uses of different materials, and recording their observations.

Year 1 - Spring		
Programme of Study	**Knowledge, Skills and Understanding**	**Activity/ Link to scheme of work**
Working scientifically: 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	Can they talk about what they see, touch, smell, hear or taste? Can they use simple equipment to help them make observations? Can they perform a simple test? Can they tell other people about what they have done? Can they identify and classify things they observe? Can they think of some questions to ask? Can they answer some scientific questions? Can they give a simple reason for their answers? Can they explain what they have found out? Can they show their work using pictures, labels and captions? Can they record their findings using standard units? Can they put some information in a chart or table?	Pupils 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.
Seasonal changes: observe changes across the four seasons observe and describe weather associated with the seasons and how day length varies.	Can they observe changes across the four seasons? Can they name the four seasons in order? Can they observe and describe weather associated with the seasons? Can they observe and describe how day length varies? Can they observe features in the environment and explain that these are related to a specific season? Can they observe and talk about changes in the weather? Can they talk about weather variation in different parts of the world?	You tube video/song/rhyme about the names and order of seasons. Pupils should observe and talk about changes in the weather and the seasons. **Note:** Pupils should be warned that it is not safe to look directly at the Sun, even when wearing dark glasses. Pupils might work scientifically by: making tables and charts about the weather; and making displays of what happens in the world around them, including day length, as the seasons change.

Year 1 - Summer		
Programme of Study	**Knowledge, Skills and Understanding**	**Activity/ Link to scheme of work**
Working scientifically: 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	Can they talk about what they see, touch, smell, hear or taste? Can they use simple equipment to help them make observations? Can they perform a simple test? Can they tell other people about what they have done? Can they identify and classify things they observe? Can they think of some questions to ask? Can they answer some scientific questions? Can they give a simple reason for their answers? Can they explain what they have found out? Can they show their work using pictures, labels and captions? Can they record their findings using standard units? Can they put some information in a chart or table? Can they find out by watching, listening, tasting, smelling and touching? Can they give a simple reason for their answers? Can they talk about similarities and differences? Can they explain what they have found out using scientific vocabulary? Can they use ICT to show their working? Can they make accurate measurements?	Pupils 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.
Animals including humans: identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense. find out about and describe the basic needs of humans, for	Can they sort photographs of living things and non-living things? Can they point out differences between living things and non-living things? Can they name the parts of the human body that they can see? Can they draw & label basic parts of the human body? Can you feel bones in your own bones?	Sort pictures of living/non living things. Identify differences between living and non living things. Pupils should have plenty of opportunities to learn the names of the main body parts (including head, neck, arms, elbows, legs, knees, face, ears, eyes, hair, mouth, teeth) through games, actions, songs

survival (water, food and air) describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.	Can you recognize that bones are hard? Can they identify the main parts of the human body and link them to their senses? Can they name some parts of the human body that cannot be seen? Can they explain the basic needs of humans for survival? (water, food, air) Can they describe why exercise, balanced diet and hygiene are important for humans? Can you say why you sometimes need medicine? Can you recognise the importance of taking care of your teeth? Do you know that bones in our body make up our skeleton?	and rhymes. Pupils should be introduced to the basic needs of humans for survival, as well as the importance of exercise and nutrition. They should also be introduced to the processes of reproduction and growth in humans. The focus at this stage should be on questions that help pupils to recognise growth; they should not be expected to understand how reproduction occurs. Pupils might work scientifically by: observing, through video or first-hand observation and measurement, how humans, grow; asking questions about what things humans need for survival and what humans need to stay healthy; and suggesting ways to find answers to their questions.

Year 2 - Spring		
Programme of Study	**Knowledge, Skills and Understanding**	**Activity/ Link to scheme of work**
Working scientifically: 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	Can they use see, touch, smell, hear or taste to help them answer questions? Can they use some scientific words to describe what they have seen and measured? Can they compare several things? Can they carry out a simple fair test? Can they explain why it might not be fair to compare two things? Can they say whether things happened as they expected? Can they suggest how to find things out? Can they use prompts to find things out? Can they organise things into groups? Can they find simple patterns (or associations)? Can they identify animals and plants by a specific criteria, eg, lay eggs or not; have feathers or not? Can they use text, diagrams, pictures, charts, tables to record their observations? Can they measure using simple equipment? Can you follow instructions in order to stay safe	Pupils 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.
Animals, including humans 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	Can they point out some of the differences between different animals? Can they identify and name a variety of common animals? (birds, fish, amphibians, reptiles, mammals, invertebrates) Can they describe how an animal is suited to its environment? Can they identify and name a variety of common animals that are carnivores, herbivores and omnivores? Can they begin to classify animals according to a number of given criteria? Can they name the parts of an animal's body?	Animal and invertebrate hunt in school grounds Collins CDROM Animals in their environment. Pupils should use the local environment throughout the year to explore and answer questions about animals in their habitat. They should understand how to take care of animals taken from their local environment and the need to return them safely after study. Pupils should become familiar with the common names of some fish, amphibians, reptiles, birds and mammals, including those that are kept as pet.

common animals (fish, amphibians, reptiles, birds and mammals, including pets) notice that animals, including humans, have offspring which grow into adults find out about and describe the basic needs of animals, for survival (water, food and air)	Can they name a range of domestic animals and their babies? Can they classify animals by what they eat? (carnivore, herbivore, omnivore) Can they compare the bodies of different animals? Can they say why certain animals have certain characteristics? Can they name a range of wild animals? Can they describe what animals need to survive? Can they explain that animals grow and reproduce? Can they explain why animals have offspring , which grow into adults? Can they describe the life cycle of some living things? (e.g. egg, chick, chicken) Can they explain the basic needs of animals for survival? (water, food, air) Can they explain that animals reproduce in different ways?	Understand and use terms such as carnivores, herbivores and omnivores to describe animals. Name parts of an animal and compare bodies of different animals. Use features to classify animals. Classify animals using criteria variation section on Collins CDROM. Collins cdrom- animals and their young/life cycles Hatch chicks Pupils might work scientifically by: using their observations to compare and contrast animals at first hand or through videos and photographs, describing how they identify and group them; grouping animals according to what they eat; and using their senses to compare different textures, sounds and smells. Pupils should be introduced to the basic needs of animals for survival. They should also be introduced to the processes of reproduction and growth in animals. The focus at this stage should be on questions that help pupils to recognise growth; they should not be expected to understand how reproduction occurs. The following life cycle examples might be used: egg, chick, chicken; egg, caterpillar, pupa, butterfly; spawn, tadpole, frog; lamb, sheep. Pupils might work scientifically by: observing, through video or first-hand observation and measurement, how different animals, grow; asking questions about what things animals need for survival and what humans need to stay healthy; and suggesting ways to find answers to their questions.
Living things and their habitats:	Can they match certain living things to the habitats they are found in?	Collins cdrom –variation. Match living things 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 micro-habitats 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.	Can they explain the differences between living and non-living things? Can they describe some of the life processes common to plants and animals, including humans? Can they decide whether something is living, dead or non-living? Can they describe how a habitat provides for the basic needs of things living there? Can they describe a range of different habitats? Can they describe how plants and animals are suited to their habitat? Can they name some characteristics of an animal that help it to live in a particular habitat? Can they describe what animals need to survive and link this to their habitats?	habitat. Discus 'How do we know that something is living, dead or non living. Name different habitats- produce a collage with pictures of animals and plants that should be found in chosen environment. Give reasons why plants and animals are suited to their environment and how they can survive. Pupils should be introduced to the idea that all living things have certain characteristics that are essential for keeping them alive and healthy. They should raise and answer questions that help them to become familiar with the life processes that are common to all living things. Pupils should be introduced to the terms 'habitat' (a natural environment or home of a variety of plants and animals) and 'micro-habitat' (a very small habitat, for example for woodlice under stones, logs or leaf litter). They should raise and answer questions about the local environment that help them to identify and study a variety of plants and animals within their habitat and observe how living things depend on each other, for example, plants serving as a source of food and shelter for animals. Pupils should compare animals in familiar habitats with animals found in less familiar habitats, for example, on the seashore, in woodland, in the ocean, in the rainforest.

Year 2 - Summer		
Programme of Study	**Knowledge, Skills and Understanding**	**Activity/ Link to scheme of work**
Working scientifically: 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	Can they use see, touch, smell, hear or taste to help them answer questions? Can they use some scientific words to describe what they have seen and measured? Can they compare several things? Can they carry out a simple fair test? Can they explain why it might not be fair to compare two things? Can they say whether things happened as they expected? Can they suggest how to find things out? Can they use prompts to find things out? Can they organise things into groups? Can they find simple patterns (or associations)? Can they identify animals and plants by a specific criteria, eg, lay eggs or not; have feathers or not? Can they use <text, diagrams, pictures, charts, tables> to record their observations? Can they measure using <simple equipment>? Can they suggest ways of finding out through listening, hearing, smelling, touching and tasting? Can they say whether things happened as they expected and if not why not? Can they suggest more than one way of grouping animals and plants and explain their reasons? Can they use information from books and online information to find things out? Can you follow instructions in order to stay safe Can you recognise risks with help?	Pupils 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.
Plants identify and name a variety of common wild and garden plants, including deciduous	Can they name the petals, stem, leaf, bulb, flower, seed, stem and root of a plant? Can they identify and name a range of common plants and trees?	Pupils should use the local environment throughout the year to explore and answer questions about plants growing in their habitat. Where possible, they should observe the growth of flowers and

and evergreen trees identify and describe the basic structure of a variety of common flowering plants, including trees 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.	Can they recognise deciduous and evergreen trees? Can they name the trunk, branches and root of a tree? Can they describe the parts of a plant (roots, stem, leaves, flowers)? Can they name the main parts of a flowering plant? Can they describe what plants need to survive? Can you find seeds in a plant given to me? Can they observe and describe how seeds and bulbs grow into mature plants? Can you say what a seed needs to grow? Can they find out & describe how plants need water, light and a suitable temperature to grow and stay healthy? Can they describe what plants need to survive and link it to where they are found? Can they explain that plants grow and reproduce in different ways?	vegetables that they have planted. They should become familiar with common names of flowers, examples of deciduous and evergreen trees, and plant structures (including leaves, flowers (blossom), petals, fruit, roots, bulb, seed, trunk, branches, stem). Pupils might work scientifically by: observing closely, perhaps using magnifying glasses, and comparing and contrasting familiar plants; describing how they were able to identify and group them, and drawing diagrams showing the parts of different plants including trees. Pupils might keep records of how plants have changed over time, for example the leaves falling off trees and buds opening; and compare and contrast what they have found out about different plants. Pupils should use the local environment throughout the year to observe how different plants grow. Pupils should be introduced to the requirements of plants for germination, growth and survival, as well as to 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.
Living things and their habitats: explore and compare the	Can they match certain living things to the habitats they are found in? Can they explain the differences between living and	Pupils might work scientifically by: sorting and classifying things according to whether they are living, dead or were never alive, and recording

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 micro-habitats 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.	non-living things? Can they describe some of the life processes common to plants and animals, including humans? Can they decide whether something is living, dead or non-living? Can they describe how a habitat provides for the basic needs of things living there? Can they describe a range of different habitats? Can they describe how plants and animals are suited to their habitat? Can they name some characteristics of an animal that help it to live in a particular habitat? Can they describe what animals need to survive and link this to their habitats?	their findings using charts. They should describe how they decided where to place things, exploring questions for example: 'Is a flame alive? Is a deciduous tree dead in winter?' and talk about ways of answering their questions. They could construct a simple food chain that includes humans (e.g. grass, cow, human). They could describe the conditions in different habitats and micro-habitats (under log, on stony path, under bushes) and find out how the conditions affect the number and type(s) of plants and animals that live there.

Year 3 - Autumn

Programme of Study	Knowledge, Skills and Understanding	Activity/ Link to scheme of work
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	Can they use different ideas and suggest how to find something out? Can they make and record a prediction before testing? Can they plan a fair test and explain why it was fair? Can they set up a simple fair test to make comparisons? Can they explain why they need to collect information to answer a question? Can they measure using different equipment and units of measure? Can they record their observations in different ways? labelled diagrams, charts etc Can they describe what they have found using scientific language? Can they make accurate measurements using standard units? Can they explain what they have found out and use their measurements to say whether it helps to answer their question? Can they use a range of equipment (including a data- logger) in a simple test? Can you recognise risks with help?	Pupils should be given a range of scientific experiences to enable them to raise their own questions about the world around them. They should start to make their own decisions about the most appropriate type of scientific enquiry they might use to answer questions; recognise when a simple fair test is necessary and help to decide how to set it up; talk about criteria for grouping, sorting and classifying; and use simple keys. They should begin to look for naturally occurring patterns and relationships and decide what data to collect to identify them. They should help to make decisions about what observations to make, how long to make them for and the type of simple equipment that might be used. They should learn how to use new equipment, such as data loggers, appropriately. They should collect data from their own observations and measurements, using notes, simple tables and standard units, and help to make decisions about how to record and analyse this data. With help, pupils should look for changes, patterns, similarities and differences in their data in order to draw simple conclusions and answer questions. With support, they should identify new questions arising from the data, making predictions for new values within or beyond the data they have collected and finding ways of improving what they have already done. They should also recognise when and how secondary sources might help them to answer questions that cannot be answered through practical investigations. Pupils should use relevant scientific language to discuss their ideas and communicate their findings in ways that are appropriate for different audiences. **<u>Activities</u>** Investigate permeability and hardness of rocks. Investigate soil permeability. Investigate magnet strength. Investigate movement on different surfaces. Exploring Science 3 CD rom.

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.		<u>Year 3 Handling Science Data:</u> p.30 Permeable Rocks p.32 Soil sampling p.34 Sieving Soil p. 48 Investigating different surfaces. p.54 Snakey Magnets
Rocks compare and group together different kinds of rocks on the basis of their appearance and simple physical properties describe in simple terms how fossils are formed when things that have lived are trapped within rock recognise that soils are made from rocks and	Can they compare and group together different rocks on the basis of their appearance and simple physical properties? Can they describe and explain how different rocks can be useful to us? Can they describe and explain the differences between sedimentary and igneous rocks, considering the way they are formed? Can they describe in simple terms how fossils are formed when things that have lived are trapped within rock? Can they recognise that soils are made from rocks and organic matter?	Linked with work in geography, pupils should explore different kinds of rocks and soils, including those in the local environment. Pupils might work scientifically by: observing rocks, including those used in buildings and gravestones, and exploring how and why they might have changed over time; using a hand lens or microscope to help them to identify and classify rocks according to whether they have grains or crystals, and whether they have fossils in them. Pupils might research and discuss the different kinds of living things whose fossils are found in sedimentary rock and explore how fossils are formed. Pupils could explore different soils and identify similarities and differences between them and investigate what happens when rocks are rubbed together or what changes occur when they are in water. They can raise and answer questions about the way soils are formed. **<u>Activities</u>** Exploring Science 3 CD rom.

organic matter	Can they classify igneous and sedimentary rocks? Can they begin to relate the properties of rocks with their uses?	Investigate different rock samples. Group and compare, giving reasons. **http://www.bbc.co.uk/schools/scienceclips/ages/7_8/rocks_soils.shtml** Investigate permeability of rocks. Learn how igneous, sedimentary and metamorphic rocks are formed. **https://www.youtube.com/watch?v=acqRoasmxzg** Watch video. Complete flow chart showing fossil formation. **https://www.youtube.com/watch?v=TVwPLWOo9TE** **http://jurassiccoast.org/education/download-resources/602-jurassic-coast-rocks-and-fossils?showall=&limitstart=** Investigate soil contents. Draw and label cross section of soil layers.
Forces and magnets compare how things move on different surfaces notice that some forces need contact between two objects, but magnetic forces can act at a distance observe how magnets attract or repel each other and attract some materials and not others compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet,	Can you describe and show how to make something move? Do you recognise that that when you push a toy car it will eventually stop? Can you show a push and a pull? Can you change the shape of an object or make things move using a pull, push, twist or stretch? Can you describe changes in movement as a result of an action? Can you describe a push or a pull as big or small and describe what will happen? Can you change the direction of an object? Can you change the speed of an object? Can you sort different movements as a push or a pull? Can they compare how things move on	Pupils should observe that magnetic forces can act without direct contact, unlike most forces, where direct contact is necessary (for example, opening a door, pushing a swing). They should explore the behaviour and everyday uses of different magnets (for example, bar, ring, button and horseshoe). Pupils might work scientifically by: comparing how different things move and grouping them; raising questions and carrying out tests to find out how far things move on different surfaces and gathering and recording data to find answers their questions; exploring the strengths of different magnets and finding a fair way to compare them; sorting materials into those that are magnetic and those that are not; looking for patterns in the way that magnets behave in relation to each other and what might affect this, for example, the strength of the magnet or which pole faces another; identifying how these properties make magnets useful in everyday items and suggesting creative uses for different magnets. **Activities** Exploring Science 3 CD rom. **http://172.30.108.199/espresso/modules/s2_forces_motion/index.html**

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.	different surfaces? Can they observe that magnetic forces can be transmitted without direct contact? Can they observe how some magnets attract or repel each other? Can they classify which materials are attracted to magnets and which are not? Can they notice that some forces need contact between two objects, but magnetic forces can act at a distance? Can they compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet? Can they identify some magnetic materials? Can they describe magnets have having two poles (N & S)? Can they predict whether two magnets will attract or repel each other depending on which poles are facing? Can they investigate the strengths of different magnets and find fair ways to compare them?	**http://www.bbc.co.uk/schools/scienceclips/ages/7_8/magnets_springs.shtml** 100 Science Lessons- Unit 6 Investigate bar magnets and effect of putting different poles together. Record observations. Predict, test and record magnetic/ non magnetic materials. Predict, test and record strength of magnets.

Year 3 - Spring		
Programme of Study	**Knowledge, Skills and Understanding**	**Activity/ Link to scheme of work**
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	Can they use different ideas and suggest how to find something out? Can they make and record a prediction before testing? Can they plan a fair test and explain why it was fair? Can they set up a simple fair test to make comparisons? Can they explain why they need to collect information to answer a question? Can they measure using different equipment and units of measure? Can they record their observations in different ways? labelled diagrams, charts etc Can they describe what they have found using scientific language? Can they make accurate measurements using standard units? Can they explain what they have found out and use their measurements to say whether it helps to answer their question? Can they use a range of equipment (including a data- logger) in a simple test? Can you recognise risks with help?	Pupils should be given a range of scientific experiences to enable them to raise their own questions about the world around them. They should start to make their own decisions about the most appropriate type of scientific enquiry they might use to answer questions; recognise when a simple fair test is necessary and help to decide how to set it up; talk about criteria for grouping, sorting and classifying; and use simple keys. They should begin to look for naturally occurring patterns and relationships and decide what data to collect to identify them. They should help to make decisions about what observations to make, how long to make them for and the type of simple equipment that might be used. They should learn how to use new equipment, such as data loggers, appropriately. They should collect data from their own observations and measurements, using notes, simple tables and standard units, and help to make decisions about how to record and analyse this data. With help, pupils should look for changes, patterns, similarities and differences in their data in order to draw simple conclusions and answer questions. With support, they should identify new questions arising from the data, making predictions for new values within or beyond the data they have collected and finding ways of improving what they have already done. They should also recognise when and how secondary sources might help them to answer questions that cannot be answered through practical investigations. Pupils should use relevant scientific language to discuss their ideas and communicate their findings in ways that are appropriate for different audiences. **Activities** Handling Science Data Year 3: P14 Healthy Eating P16 How often do I brush my teeth? p.18 What do we eat at break?

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.		Measure and compare bones of people of different ages.
Animals including humans: identify that humans and animals, need the right types and amount of nutrition, and that	Can they explain the importance of a nutritionally balanced diet? Can you name foods that can damage teeth? Can they describe how nutrients, water and oxygen are transported within animals and humans?	Pupils should continue to learn about the importance of nutrition and should be introduced to the main body parts associated with the skeleton and muscles, finding out how different parts of the body have special functions. Pupils might work scientifically by exploring ideas about what would happen if humans did not have skeletons. They might research different food groups and how they keep us healthy and design meals based on what they find out.

they cannot make their own food; they get nutrition from what they eat identify that humans and some animals that have skeletons and muscles for support, protection and movement. identify the different types of teeth in humans and animals and their simple functions	Can they identify that animals, including humans, cannot make their own food: they get nutrition from what they eat? Can you explain how to take good care of your teeth? Can they compare the teeth of herbivores and carnivores? Can you identify where your spine, ribs and skull are? Can you explain 3 jobs your skeleton does? Can they describe and explain the skeletal system of a human? Can you locate the position of the heart and describe how it is protected? Can they describe and explain the muscular system of a human? Can they explain how the muscular and skeletal systems work together to create movement? Can you recognise that your muscles are attached to your bones? Can you explain some of the dangers of medicines and how to stay safe? Can you explain that muscles work in pairs? Can you explain how muscles move your arm? Can they identify the simple function of different types of teeth in humans?	Pupils might work scientifically by: comparing the teeth of carnivores and herbivores, and suggesting reasons for differences; finding out what damages teeth and how to look after them. Pupils might work scientifically by: identifying and grouping animals with and without skeletons and observing and comparing their movement. They might compare and contrast the diets of different animals (including their pets) and decide ways of grouping them according to what they eat. **Activities** Exploring Science 4 CD rom Moving and Growing 100 Science Lessons Year 3 Unit 1 Ourselves Unit 2 Animals and Plants: Lesson 7 Food Pyramid Info Text- If you're not Looking after your diet, You're not looking after your teeth. Handling Data p.10 Cat food survey. Whose skeleton? Examine how animals skeletons help them to move. http://www.bbc.co.uk/schools/scienceclips/ages/8_9/moving_growing.shtml 'Skeletons and support' Exploring Science CD 4 Espresso >Science 2 > Bodies (lower) Espresso >Science 2 > Our Bodies Resource Box Espresso >Science 2 > Teeth and Eating

Year 3 - Summer		
Programme of Study	**Knowledge, Skills and Understanding**	**Activity/ Link to scheme of work**
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,	Can they use different ideas and suggest how to find something out? Can they make and record a prediction before testing? Can they plan a fair test and explain why it was fair? Can they set up a simple fair test to make comparisons? Can they explain why they need to collect information to answer a question? Can they measure using different equipment and units of measure? Can they record their observations in different ways? labelled diagrams, charts etc Can they describe what they have found using scientific language? Can they make accurate measurements using standard units? Can they explain what they have found out and use their measurements to say whether it helps to answer their question? Can they use a range of equipment (including a data- logger) in a simple test? Can they record and present what they have found using scientific language, drawings, labelled diagrams, bar charts and tables? Can they explain their findings in different ways (display, presentation,	Pupils should be given a range of scientific experiences to enable them to raise their own questions about the world around them. They should start to make their own decisions about the most appropriate type of scientific enquiry they might use to answer questions; recognise when a simple fair test is necessary and help to decide how to set it up; talk about criteria for grouping, sorting and classifying; and use simple keys. They should begin to look for naturally occurring patterns and relationships and decide what data to collect to identify them. They should help to make decisions about what observations to make, how long to make them for and the type of simple equipment that might be used. They should learn how to use new equipment, such as data loggers, appropriately. They should collect data from their own observations and measurements, using notes, simple tables and standard units, and help to make decisions about how to record and analyse this data. With help, pupils should look for changes, patterns, similarities and differences in their data in order to draw simple conclusions and answer questions. With support, they should identify new questions arising from the data, making predictions for new values within or beyond the data they have collected and finding ways of improving what they have already done. They should also recognise when and how secondary sources might help them to answer questions that cannot be answered through practical investigations. Pupils should use relevant scientific language to discuss their ideas and communicate their findings in ways that are appropriate for different audiences. **Activities** Handling Science Data Y3 : p.50 Reflecting light p. 52 See through or not? p.58 Sundial p.60 Torch Shadows

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.	writing)? Can they use their findings to draw a simple conclusion? Can they suggest improvements and predictions for further tests? Can they suggest how to improve their work if they did it again? Can you recognise risks with help?	Observe and record how shadow length changes through the day. Link to position of sun in the sky. Observe and record how size and clarity of shadow is affected by distance from the light source. Observe position of shadows in relation to sun and explain how shadows are formed, Investigate which materials reflect light. Year 3 100 Science lessons : Unit 8 The sun and shadows
Light recognise that they need light in order to see things and that dark is the absence of light notice that light is reflected from surfaces	Can you identify and name the sources of light? Do you know what the sun is a source of? Can they recognise that they need light in order to see things? Can they recognise that dark is the absence of light? Can they notice that light is reflected	Pupils should explore what happens when light reflects off a mirror or other reflective surfaces, including playing mirror games to help them to answer questions about how light behaves. They should think about why it is important to protect their eyes from bright lights. They should look for, and measure, shadows, and find out how they are formed and what might cause the shadows to change. **Note:** Pupils should be warned that it is not safe to look directly at the Sun, even when wearing dark glasses. Pupils might work scientifically by: looking for patterns in what happens to

recognise that light from the sun can be dangerous and that there are ways to protect their eyes recognise that shadows are formed when the light from a light source is blocked by a solid object find patterns in the way that the size of shadows change.	from surfaces? Can they recognise that light from the sun can be Can they recognise that shadows are formed when the light from a light source is blocked by a solid object? Can they find patterns in the way that the size of shadows change? Can they explain why lights need to be bright or dimmer according to need? Can they explain the difference between transparent, translucent and opaque? Can you predict the shape of the shadow of an object? Can they explain why their shadow changes when the light source is moved closer or further from the object?	shadows when the light source moves or the distance between the light source and the object changes. **Activities:** Investigate different light sources – relate to darkness being the absence of any light. Observe and record how shadow length changes through the day. Link to position of sun in the sky. Observe and record how size and clarity of shadow is affected by distance from the light source. Observe position of shadows in relation to sun and explain how shadows are formed, Investigate which materials reflect light. Year 3 100 Science lessons: Unit 8 The sun and shadows Lessons 2, 3, 4 Exploring Science 3 CD Light and Shadows unit. Espresso >Science > Light and Shadows http://www.bbc.co.uk/schools/scienceclips/ages/7_8/light_shadows.shtml

Year 4 - Autumn		
Programme of Study	**Knowledge, Skills and Understanding**	**Activity/ Link to scheme of work**
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	Ongoing: Can they set up a simple fair test to make comparisons? Can they plan a fair test and isolate variables, explaining why it was fair and which variables have been isolated? Can they suggest improvements and predictions? Can they decide which information needs to be collected and decide which is the best way for collecting it? Can they use their findings to draw a simple conclusion? Can they take measurements using different equipment and units of measure and record what they have found in a range of ways? Can they make accurate measurements using standard units? Can they explain their findings in different ways (display, presentation, writing)? Can they find any patterns in their evidence or measurements? Can they make a prediction based on something they have found out? Can they evaluate what they have found using scientific language, drawings, labelled diagrams, bar charts and tables? Can they use straightforward scientific evidence to answer questions or to support their findings? Can they identify differences, similarities or changes related to simple scientific ideas or processes?	Pupils should be given a range of scientific experiences to enable them to raise their own questions about the world around them. They should start to make their own decisions about the most appropriate type of scientific enquiry they might use to answer questions; recognise when a simple fair test is necessary and help to decide how to set it up; talk about criteria for grouping, sorting and classifying; and use simple keys. They should begin to look for naturally occurring patterns and relationships and decide what data to collect to identify them. They should help to make decisions about what observations to make, how long to make them for and the type of simple equipment that might be used. They should learn how to use new equipment, such as data loggers, appropriately. They should collect data from their own observations and measurements, using notes, simple tables and standard units, and help to make decisions about how to record and analyse this data. With help, pupils should look for changes, patterns, similarities and differences in their data in order to draw simple conclusions and answer questions. With support, they should identify new questions arising from the data, making predictions for new values within or beyond the data they have collected and finding ways of improving what they have already done. They should also recognise when and how secondary sources might help them to answer questions that cannot be answered through practical investigations. Pupils should use relevant

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.		scientific language to discuss their ideas and communicate their findings in ways that are appropriate for different audiences. ONGOING
Sound identify how sounds are made, associating some of them with something vibrating recognise that vibrations from sounds travel through a medium to the ear find patterns between the pitch of a sound and features of the object that produced it find patterns between the volume of a sound and the strength of the vibrations that	Can you name loud and quiet sounds?W1 Can you say how you recognise sound?W1 Can you make sounds? W1 Can they describe a range of sounds and explain how they are made? W1 Can they associate some sounds with something vibrating? W1 Can they compare sources of sound and explain how the sounds differ? W1 Can you compare the loudness and pitch of sounds?W6 Can they explain how to change a sound (louder/softer)? W6 Can they recognise how vibrations from sound travel through a medium to a ear?W3 Can you describe how sound is made when something moves? W1 Can you say how sound gets to your ears?W2 Can they find patterns between the pitch of a sound and features of the object that produce it? W6 Can they find patterns between the volume of the	Overview and Non stat guidance. Pupils should explore and identify the way sound is made through vibration in a range of different musical instruments from around the world; and find out how the pitch and volume of sounds can be changed in a variety of ways. 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. Week1- Can you make careful observations about how a sound is made? Children to close their eyes and listen. List all the different things they can hear on the board. Discuss the vocabulary . 'Circus' of short activities eg trying out musical instruments from around the world which make sounds by banging, shaking, plucking, blowing; tapes of high, low, loud and quiet sounds; tapes of sirens

produced it recognise that sounds get fainter as the distance from the sound source increases.	sound and the strength of the vibrations that produced it? W6 Can they recognise that sounds get fainter as the distance from the sound source increases? W2 Can they explain how you could change the pitch of a sound? W4&6 Can they investigate how different materials can affect the pitch and volume of sounds? W6 Can they explain why sound gets fainter or louder according to the distance?W2 Can they explain how pitch and volume can be changed in a variety of ways?W4&6 Can they work out which materials give the best insulation for sound?W4&5 Can you explain how sound is heard through materials (soilds, liquids, air)?W3	approaching and going away; pictures of dogs or other animals pricking up their ears accompanied by questions eg – How do these instruments make a sound? – Which of these sounds is high, low, loud, quiet, going away, approaching? – Why do dogs and cats move their ears? Children to take part in or observe a number of activities using sounds associated with visible vibrations eg a drum skin with rice grains on it. Children to record in writing or in drawings what they see and feel with their fingers and to state what is common to the sources of sound. Use sheet 228& 229 to assist with the layout. AEN complete the sheets. Discuss the term vibrate. Week 2: Do I know how sound travels and does the distance make a difference? Revise vibrations. Mention air waves. Children to draw a simple diagram of the sound travelling from the source to the ear in waves. Ext sheet 234. Reinforce how we often do not see the vibrations. Children to draw an annotated diagram showing the sound traveling from the air raid siren to the ear. In waves getting weaker. What do you think happens to the sound the further away from it that you get? Children to make a prediction. Use a planning grid to plan an experiment together. Model the structure and discuss apparatus, fair testing and variables. Carry out the experiment. Children to record results in a table and analyse their findings in a sentence. Discuss repeating the experiment. Week3: Can I make careful observations and identify the types of materials that sound can travel through? Show children using a ticking clock or buzzer that sounds can be heard through a variety of materials (U tube) eg putting it in water, sand, a wooden box. Use Tick Tock Trick, tube telephone, stethoscope Ask children to make a table showing the materials tested and whether the sound travelled through them well and discuss what their results show. Discuss with children why sometimes it is important to prevent sounds travelling. Ask them to suggest how this is done eg ear muffs, ear plugs, soft floor

		coverings. Walk around the school to see where sounds eg footsteps are loud and where they are not. Ask children to describe what they observed. How can we soften these sounds? Why do we need too? Children identify where, loudness and method of reducing them. Week 4: Can I design a fair and reliable test to observe how well different materials muffle sounds? Present children with a range of materials eg bubble wrap, foam sheeting, artificial fur, blanket material and ask them what question could they ask about sound and materials based upon what we have learnt last lesson? Which material muffles the sound the best? Does the number of layers affect the quality of the sound? How they could find out which would be best for muffling a sound eg in ear muffs, soundproofing a model house. Children to plan and carry out the experiment. Week 5: Can I evaluate my results and say how well they support my predictions? Model drawing a graph from a table of results. Children to draw a graph of their findings. Otherwise children analyse their table of info. Ask children to describe to others in the class what they did and what they found out. Encourage children to question each other about the chosen method. How can the science help us to explain our results? Were there any patterns in our findings? The greater the number of layers, the quieter the sound etc… Were our tests fair and reliable? What were the limitations? How could we have done it better? Week 6: Can I investigate and explain how to change the pitch or the loudness of the sound? Ask children to demonstrate playing a range of musical instruments or show children a video of a band or orchestra playing. Talk with children about sounds made by individual instruments and help them to describe the pitch of sounds using terms eg high, low and the loudness of sounds eg loud, soft. Can you compare them? Use Bitesize to show how you can alter the pitch and volume of a sound. Leave out the drum. Which was the highest, lowest, loudest? Can you put them in order?

		Why do you think this happens? Ask children to suggest how to make particular sorts of sound eg a high, loud sound and test their ideas. Use changing sounds sheet and elastic bands, bottles of water and drum as extensions. Use activity sheets. What did they find out? Each group report back. Why is this? Number of vibrations. Week 7:Can I show my understanding of the topic of sound? Assessment sheets.
Electricity identify common appliances that run on electricity construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit. recognise some common conductors and insulators, and associate metals with being	Can they identify common appliances that run on electricity?W1 Can they construct a simple series electric circuit? Can they identify and name the basic part in a series circuit, including cells, wires, bulbs, switches and buzzers? W2 Can they 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? W2 Can they recognise that a switch opens and closes a circuit? W3 Can they associate a switch opening with whether or not a lamp lights in a simple series circuit? W3 Can they recognise some common conductors and insulators? W4 Can they associate metals with being good conductors? W4 Can they explain how a bulb might get lighter? W6&7 Can they recognise if all metals are conductors of electricity? W5 Can they work out which metals can be used to connect across a gap in a circuit? W5 Can they explain why cautions are necessary for working safely with electricity? W1	Overview and Non stat guidance Pupils should construct simple series circuits, trying different components, for example, bulbs, buzzers and motors, and including switches, and use their circuits to create simple devices. Pupils should draw the circuit as a 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 should not be introduced or defined formally at this stage. Pupils should be taught about precautions for working safely with electricity. 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. Week 1: Can I identify the power source in an electric circuit and identify electrical appliances, highlighting the dangers of electricity? What are the different sources of electricity? What powers our toys? What powers larger appliances? Distribute a range of batteries to the children. Look at the voltage and explain that it is a measure of the amount of power. How do you think an old battery will work compared to a new one? What is the voltage of electricity? 240V. Discuss that mains electricity can kill but batteries are safe to use in appliances. Discuss pylons and cables etc... Watch the IWB favourites of the dummy getting too close to electricity. As a class carry out an IWB activity to identify the dangers in the house. Then another activity to list the dangers in their books or complete the picture circling ten dangers. (to be printed off internet) Activity 2 B.A colour in the appliances using mains power sheet 2a.

good conductors.		A.A & A p 7&8 either on sheet or in books. W.C go through and finally look at electricity rules to be put on WW. <u>Week 2:</u> Can I construct a circuit, including a power supply and a switch to make an electrical devices work? Can I say what the purpose of each component is and draw a diagram using each component. W.C examine the different components in a circuit, what do they do? Battery/Cell, bulb, wire switch, buzzer, motor. Model how to make a circuit. Show the different symbols for each part of the circuit. Children in pairs to create a circuit. B.A with bulb. A with buzzer and A.A with motor. Children to show their working circuits to the class. Model drawing each circuit using the symbols or get volunteers to try it. B.A complete sheet p3. With support reading. Rest either p91 or 3. W.C name each symbol and practise drawing in their books. <u>Week 3:</u> Can I explain why a complete circuit is needed in order for a device to work? Can I understand and explain the role of the switch? (Make or break a circuit to turn things on and off) W.C discussion on why we need a full circuit. Use the Science balls to show a human circuit. Have a child let go to show the break and the buzzer going quiet. Explain that electricity can travel through us and that is why it is dangerous to come into contact with high voltage of power. Let the children have a try putting the balls to different body parts and setting the buzzer off. Model the circuit inside and how we form the wires to complete the circuit between the two metal points. Show the broken circuit on the board. Explain that electricity always flows from the negative to the positive. Activity: A.A- changing circuits sheet. A. Gaps in circuit sheet. B.A- Circuits and conductors sheet. Discuss reasons why and assess 3c. W.C discussion on how a switch breaks a circuit. Discuss open and closed switch and model on the board. More on switches associated with the lamp going on and off. Activity: All- P15 &16. If time make a switch using paper clips and card. Ext p17

		Week 4: Can I design an experiment to find out which materials allow electricity to pass through them? Ask children what materials are used to make electric circuits and ask them to suggest why this is. (Allow electricity to flow through) Ask children how they could test their ideas eg by inserting different materials into a complete circuit with a bulb, motor or a buzzer and observing whether the device will still work. Record which materials complete the circuit and which do not. Model starting to fill in the planning grid. Children complete using p1o to help. Make predictions. Record results on sheet 3a and stick into books. Complete qu2 on p10. Discuss results with children and ask them to make a generalisation about the type of materials, which complete the circuit. E.g most conductors are metal. Introduce the concepts of electrical conductors and insulators. Research and record where conductors and where insulators are useful. Like copper in wires and plastic around it etc. Ext or homework: conductors and insulator sheets. Week 5 or in with Week 4.: Can I find out which metals are conductors of electricity? Recap on last week. Children to plan experiment in groups and carry out. Which metals were conductors? Are all metals conductors? Week 6: Can I make predictions about the effect of including additional batteries in a circuit? Discuss the voltages of batteries. What is the difference between the voltages? How will this affect the power? The higher the voltage the higher the level of power. Look at the bulbs 2.5 v. What would happen if the battery was a higher voltage then the bulb? Children to write their prediction in their books and say why. Demonstrate circuits where the bulbs are very bright. Ask children to predict what would happen if an additional battery is added. If possible demonstrate this. Point out to children that bulbs and motors are designed to be used with batteries of a particular voltage and that if the voltage is exceeded the device may burn out. Children complete planning sheet for either bulb B.A. motor A.A and buzzer A. Support for B.A. Think about questions, predictions, fair testing, observations and results. Children complete table 5a sheet from each-

		others results. W.C discuss what we found out. Any patterns. The higher the voltage the brighter, faster, louder the…. Ext or homework: p18 & 19. <u>Week 7 :</u> Can I work out how to change the brightness of bulbs in a circuit? Ask children to make a simple circuit and to suggest how they might change the brightness of the bulbs eg by changing the number of bulbs, the type of bulb, the number of batteries, the voltage of the battery. Ask them to plan what to do and what circuits they would use. Help them to recognise the importance of changing only one thing at a time. Children to plan their fair test experiment. B.A with 4fd2 sheets to help. Rest with 4Fd/3 sheets and planning board. Only focus on no of bulbs and planning a fair test. Carry out experiment and discuss. How well do your results support your predictions? Get bite size on board and go through the test to make bulbs dimmer. Look at wire length and thickness, voltages of battery, no of batteries and bulbs etc. Complete circuit and conductors sheet saying how dim the light bulbs will be. <u>Week 8:</u> To assess understanding using rising stars or Unit 4f test.

Year 4 - Summer		
Programme of Study	**Knowledge, Skills and Understanding**	**Activity/ Link to scheme of work**
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	Ongoing: Can they set up a simple fair test to make comparisons? Can they plan a fair test and isolate variables, explaining why it was fair and which variables have been isolated? Can they suggest improvements and predictions? Can they decide which information needs to be collected and decide which is the best way for collecting it? Can they use their findings to draw a simple conclusion? Can they take measurements using different equipment and units of measure and record what they have found in a range of ways? Can they make accurate measurements using standard units? Can they explain their findings in different ways (display, presentation, writing)? Can they find any patterns in their evidence or measurements? Can they make a prediction based on something they have found out? Can they evaluate what they have found using scientific language, drawings, labelled diagrams, bar charts and tables? Can they use straightforward scientific evidence to answer questions or to support their findings? Can they identify differences, similarities or changes related to simple scientific ideas or processes? Can they plan and carry out an investigation by controlling variables fairly and accurately? Can they use test results to make further predictions and set up further comparative tests?	Pupils should be given a range of scientific experiences to enable them to raise their own questions about the world around them. They should start to make their own decisions about the most appropriate type of scientific enquiry they might use to answer questions; recognise when a simple fair test is necessary and help to decide how to set it up; talk about criteria for grouping, sorting and classifying; and use simple keys. They should begin to look for naturally occurring patterns and relationships and decide what data to collect to identify them. They should help to make decisions about what observations to make, how long to make them for and the type of simple equipment that might be used. They should learn how to use new equipment, such as data loggers, appropriately. They should collect data from their own observations and measurements, using notes, simple tables and standard units, and help to make decisions about how to record and analyse this data. With help, pupils should look for changes, patterns, similarities and differences in their data in order to draw simple conclusions and answer questions. With support, they should identify new questions arising from the data, making predictions for new values within or beyond the data they have collected and finding ways of improving what they have already done. They should also recognise when and how secondary sources might help them to answer questions that cannot be answered through practical investigations. Pupils should use relevant scientific language to discuss their ideas and communicate their findings in ways that are appropriate for different audiences.

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.	Can they record more complex data and results using scientific diagrams, classification keys, tables, bar charts, line graphs and models? Can they report findings from investigations through written explanations and conclusions? Can they use a graph or diagram to answer scientific questions? Following instructions, can you take action to control obvious risks to yourself?	
Plants: identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant investigate the way in which water is transported within plants explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.	Can they identify and describe the functions of different parts of flowering plants? (roots, stem/trunk, leaves and flowers)? Sum1 – Week 4 Can they explore the requirement of plants for life and growth (air, light, water, nutrients from soil, and room to grow)? Summer 1 – week 1&2 Can they explain how they vary from plant to plant? Summer 1 – Week 5 Can they investigate the way in which water is transported within plants? Summer 1 – Week 3 Can I name parts of a flower? Summer 1 Week 4 Can you identify the main parts of a flowering plant and explain their functions? Summer 1 Week 4 Can they explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal? Sum 1 – Week 6 Can they classify a range of common plants according to many criteria (environment found, size, climate required, etc.)?Sum 2 Week – 1 with Habitats.	Pupils should be introduced to the relationship between structure and function: the idea that every part has a job to do. They should explore questions that focus on the role of the roots and stem in nutrition and support, leaves for nutrition and flowers for reproduction. **Note:** Pupils can be introduced to the idea that plants can make their own food, but at this stage they do not need to understand how this happens. Pupils might work scientifically by: comparing the effect of different factors on plant growth, for example, the amount of light, the amount of fertiliser; discovering how seeds are formed by observing the different stages of plant life cycles over a period of time; looking for patterns in the structure of fruits that relate to how the seeds are dispersed. They might observe how water is transported in plants, for example, by putting cut, white carnations into coloured water and observing how water travels up the stem to the flowers. Week 1: Can I design and set up an experiment to show how important water is for the healthy growth of a plant? Review children's knowledge of plants as living things by asking them questions *eg* – *What plants can you see from the window?*

		– *Are they all living?* – *How do you know?* – *How do we help plants to grow well?* *Why do we need plants to grow well?* Show a video/series of pictures illustrating plants being grown for food. Discuss what children have seen and ask them to make a poster illustrating why we need plants to grow well. Lesson 1 Fin on Pulse --- *What do all plants need if they are to grow at all? Discuss water, light, air and temperature.* *Lesson4 Watering plants – Finger on Pulse.* Remind children that plants need water and ask them whether they think the more water they have the better they will grow. Show children a planted seedling *eg bean* and ask how they could use this and similar seedlings to investigate the question. Help children to decide what evidence to collect. *Eg give four seedlings no water; 5cm^3 water, 20cm^3 water or 50cm^3 water each day or every two days* and what to measure *eg the distance from the soil to the top leaf.* Help children to use suitable apparatus to measure volume of water and height of the bean plant. Model measuring accurately. Children to complete a planning sheet and set up the experiment. Reinforce all the elements that need to be kept the same if the test is to be fair. Place a plant in the cupboard to show next week or cover a patch of grass on the field. <u>Week 2</u> Can I show that plants need warmth and light to grow well and carry out a fair test to prove it? Whole class recap on last week. Have a look at the plants, what has happened to them so far? Why is light also important to the growth of a healthy plant? *Finger on the Pulse lesson 5.* Take children to look at grass which has been covered or show them a plant which has been in the dark and ask them to describe and explain what has happened. Encourage children to speculate and ask questions *eg* – *What will happen if we uncover the grass?*

		– *Would it be the same for other plants?* – *Would the plant die if we leave it in the dark for a long time?* and test some of their ideas. Children complete p33 drawing a plant from the beginning and after it has been in the dark. Use bitesize to show more examples. Remind children of their visit to the allotment, market garden or large greengrocer or show them pictures of greenhouses and cold frames. Ask what else besides water and light is important for healthy growth. Compare growth in summer and winter. If necessary, prompt them to think about warmth. Design and set up 2 experiments. Show children some trays of growing cress seedlings and ask why you plan to use these to test ideas rather than pots containing just one bean seedling. Mention accuracy of results. Tell children your plan deliberately making the test unfair *eg by suggesting one tray is left in the fridge*. If necessary prompt children to recognise it is both cold and dark in the fridge. Ask children to suggest a better plan which takes account of the effects of water and light on plant growth. Help children to carry out an investigation ensuring they measure volumes of water accurately. Talk about the outcomes with the children. Help children to write an explanation of how they made their test fair and of what the work showed so that another class could understand it. Complete p34 after 2 weeks. Week 3: Can I say what the jobs of the root and stem of a plant are and why they are important? Show children the roots of a plant which has outgrown its pot. Ask them why it will be better for the plant to be in a larger container. Extend their knowledge from *eg the roots need more room* to *eg the roots need more room so that they can take in more water.* Finger on the pulse lesson p26 &27 discuss why plants need a strong root and stem. What jobs do they do? Show children a complete head of celery and ask them to look closely at the stem of the plant. Cut a stem across and observe the cut end. Put the celery stems upright in a shallow container of water coloured with red ink or food colouring. Show the capillaries inside the celery.

		Ask children to make drawings to show what they observe and to explain on their drawing what they think has happened. Repeat with a carnation as well. Ask children to summarise what they have found out about leaves, stems and roots by drawing a plant that they think will grow well and one they think will not. (leaves/root/stem) Week 4:Can I identify and describe the functions of different parts of flowering plants? (roots, stem/trunk, leaves and flowers)? (CAN BE AN ART LESSON) Use Science Boot Camp Can I prove that plants need leaves to grow and carry out accurate measurements to show this? Introduce the idea of a plant as an organism in which different parts *eg leaf, stem and root* all need to work properly if the plant is to grow well. Present children with similar plants of the same species *eg geranium* and ask them to suggest how these could be used to find out whether plants need leaves to grow well. Respond to children's suggestions or remove many of the leaves from one plant, keep both in the same place and water equally. Discuss with children what they are going to measure and observe *eg height from soil level to the tip of the shoot, colour and number of leaves.* Over a period of several weeks, help each child to make and record careful measurements of the height of the plants. Display measurements on a prepared chart. Set up exp. Look at the other parts of a plant and draw a diagram of the dissected tulip/ poppy on the board. Children to produce their own annotated drawing of a flower and label the different parts. Ext: Children to write the different job that each part of the plant has. Buhu- to complete a pre prepared diagram. OR P24 & 25- Fing on the pulse. Lesson 2. Discuss the importance of leaves. What do they do? Why is this important? Using a plant, children to cover several leaves in tin foil and place the plant in tin foil. What do they think will happen? Talk with children about what the results from both experiments show. <u>Week 5:</u> Can I describe what I have found out in my

		measurements and what I have learnt about what a healthy plant needs to grow? (air, light, water, nutrients, room) Can I explain how they vary from plant to plant? Can I use Scientific vocabulary and a cause an effect statement to describe my results? Can I say how my experiment could be improved or made more accurate? Can I produce a graph of my results? After 10 – 14 days or the end of the topic discuss what has happened in each of the experiments. Ask children to explain what they think their results showed and if they are sure about this. Show children a tray of cress seedlings. Ask children to suggest why using lots of seeds rather than one or two might be better. Reinforce checking results to ensure accuracy. Complete p34 after 2 weeks. Children to write what they have found out and what a healthy plant needs to grow. Possible I.T Graph work of results. Remind children why we need plants to grow well. Review what children have learnt from the unit and ask children to produce a leaflet giving advice on how to look after plants kept in the classroom or at home. Does what a plant need vary from plant to plant? Does a Cactus need different things to a poppy? <u>Lesson 6:</u> Can I record the different stages of the plant life cycle? Can I explore the part that the flowers play in the life cycle of a flowering plant, including pollination, seed formation and seed dispersal? Use Science Boot Camp Whole class look at a flower and discuss how it discovering how seeds are formed by observing the different stages of plant life cycles over a period of time. Quick recap on seed germination and discuss. Discuss pollination and the help that the wind and other animals play. Discuss how the seeds are formed. Finish with how the seeds are dispersed using animal excretion, sticking to animals, exploding or wind dispersal. Children to complete a cycle of a closed procedure on the life cycle of a plant.

		Ext: Children look at a range of seeds. How are they dispersed and how do you know? Looking for patterns in the structure of fruits that relate to how the seeds are dispersed. Excellence in Science and enquiry sheets and assessment sheets Unit 3b test. Possible homework if no time- science enquiry sheets
Animals including humans: construct and interpret a variety of food chains, identifying producers, predators and prey.	Can they classify living things and non-living things by a number of characteristics that they have thought of? Summer 1 Week 7 (One lesson taught as Art to make a 6 week term) Can they explain how people, weather and the environment can affect living things? Summer 2 Week 3 &6. Can they explain how certain living things depend on one another to survive? Summer 2 Week 4 Interdependence. Can they explain what a simple food chain shows? Summer 2 Week 4 Can they construct and interpret a variety of food chains, identifying producers, predators and prey? Summer 2 Week 4	<u>Lesson 7 Summer 1</u> Do I know the characteristics of a living organism and can sort things into living and non living? (That there are life processes, including growth, nutrition and reproduction common to plants and animals) Can I distinguish similarities and differences between organisms and begin to understand the word habitat? (Life processes lesson. – Lesson 5 from plant plans.) W.C discussion on the topic. Ask the children to complete a KWL grid on what they know about organisms and habitats. What question would you most like to find out the answer to by the end of this topic? Give out vocab lists to help spelling and understanding. Discuss life processes. What do plants do? How is this similar to animals? Revise Mrs Gren and the seven characteristics of all living things. Use this and the large cards (see school resources) Children to do verbally or list in their books/white boards either living and non living, or was living etc.. Elicit children's understanding of 'plant' and 'animal'. Introduce the term 'organism' as a general term for all living things. Use pictures of *eg vertebrates, invertebrates, humans, small flowering plants, trees* and challenge children to sort them according to their own criteria and then into plants and animals. Let children choose how to record their groupings. Use organism cards L/A to cut and paste H/A can create a list/table. Introduce children to the word 'habitat' using pictures to illustrate meaning. Use Link on Hamilton studio lesson session A. Explain the meaning of 'habitat'. Explain to children that they will be studying local habitats, and go for a walk round the school and/or immediate locality to find and make a list of habitats. Review the final list with the children and group habitats of similar scale or

		diversity together *eg pond, field, wood, tree, hedge, flower bed, grassy patch, plant trough, under leaf, under stone*. Ask children to record the habitats identified. Habitats in our school ground- Ponds woodland-trees and bushes. Under stones, walls and hedges & grassland. <u>Week 1-summer2</u> Can I identify habitats in the school grounds and predict and observe the organisms that live there? Using pictures of places in the immediate locality or similar to those in the locality as stimuli ask the children to predict where a particular organism will be found *eg woodlice, snail, butterfly, bee. The woodlice is under the stones because…* Look at arrange of common plants according to their habitats, desert, woodland, artic. How do we know? In books or on sheet -Activity- sheet 2a matching the organism to its habitat – ext why?(food, water, shade, light, air, shelter, breeding area) Children to visit the locality to check predictions. The woodland, recreation area and grassland or wall. Different groups could investigate different habitats and share results with others. This gives a valid reason for recording carefully and deciding on how to present information to others Explain that collecting animals must be done with care so that the animals are not damaged. Help children to collect invertebrates and record locations in which they were found. Ask children to observe and describe the conditions *eg light, water, soil, shade, temperature*. Ask children whether they found the organisms they expected. Help children return any animals collected to their habitat. Back in class, children share results and discuss any surprises and why certain animals are suited to certain environments. What they found and where, the conditions. Two factual sentences about what they have learnt about the habitat they have visited. Why were worms not found in tarmac? Ext sheet- matching conditions to the habitat. Features of habitats sheet. <u>Week 3 – Summer 2:</u> Can I investigate whether woodlice prefer dry or damp conditions? Can I pose questions about organisms and the habitat in

		which they live and make predictions Can I decide what evidence to collect and to design a fair test Can I make reliable observations of organisms Can I indicate whether their prediction was valid and to explain findings in scientific terms Compare Keys from different habitats – e.g under the sea. ♦ Ask children to generate a question to investigate mini beasts or offer alternatives *eg* – *How do we know that woodlice prefer damp conditions?* – *Dark or light?* – *Which foods do slugs/snails prefer?* – *How much could a slug/snail eat in 24 hrs?* – *How do we know mealworms prefer dark?* – *How can we find out what snails prefer to eat?* – *Do earth worms live above or below ground?* Discuss the questions with the children and help them to decide how to collect evidence for their investigation and what equipment to use *eg* – *How many woodlice should we use?* – *How long should we leave them to find out?* – *What sort of food should we give the snails?* – *How can we see worms if they're underground?* Decide on a question to investigate and plan how to set it up. Woodlice, damp/dry or dark/light Children to complete a planning sheet (choice chamber sheet) and make a prediction. Help children to carry out the investigation and to make careful observations. Use C.D Rom to model the outcome on the interactive WB and table then model creating a graph of the results. Children produce their own table and graph of results. Discuss their results and ask children to explain these in terms of what they already know about the animals and their usual habitats. Which habitats do these mini beasts prefer? How do we know/ evidence. How is the experiment limited? What could be done to make the results more accurate? Reinforce fair testing. <u>Week 4 – Summer 2:</u> Can I identify the parts of the food chain and create my

		own? Can identify the food sources of different animals in different habitats? Can I see how living things depend upon each-other to survive? Use Food Chains CDROM Exploring Science. Review habitats with children and ask them to say which organisms are found in a specific habitat. Challenge children to identify the food of specific animals, some of which eat plants and some of which eat animals – refer back to previous activity. Extend children's ideas about the food of animals using secondary sources *eg CD-ROM, reference books.*. Discuss how a food chain always starts with a plant, why? What comes before the plant? The sun which gives light so that always starts the food chain. Reinforce the names producer and consumer. Show how a food chain is represented. Look at predator and prey, carnivore and herbivore. Note the arrow means gives food away NOT eats. So the arrow points away from the organism that is eaten towards the animal that is eating them/it. Use Images from pic pack to create and record food chains. Give children pictures of organisms in a habitat with information about what each eats and ask them to practise writing or sequencing food chains. Can be written in books or play the food chain game. Make a food chain mobile. Where possible relate this to the local habitat to consolidate earlier work.
Living things and their habitats 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 they recognise that living things can be grouped in a variety of ways? Summer 2 Week 2 A&B Can they explore and use a classification key to group, identify and name a variety of living things? (plants, vertebrates, invertebrates) Summer 2 Week 2 A&B Can they compare the classification of common plants and animals to living things found in other places? (under the sea, prehistoric) Summer 2 Week 2 A&B Do they recognise that environments can change and this can sometimes pose a danger to living things? Summer 2 Week 6	Pupils should use the local environment throughout the year to raise and answer questions that help them to identify and study plants and animals in their habitat. They should identify how the habitat changes throughout the year. Pupils should explore possible ways of grouping a wide selection of living things that include animals and flowering plants and non-flowering plants. Pupils could begin to put vertebrate animals into groups such as fish, amphibians, reptiles, birds, and mammals; and invertebrates into snails and slugs, worms, spiders, and insects. **Note:** Plants can be grouped into categories such as flowering plants (including grasses) and non-flowering plants, such as ferns and mosses.

can change and that this can sometimes pose dangers to living things.	Can they give reasons for how they have classified animals and plants, using their characteristics and how they are suited to their environment? Summer 2 Week 2 and Week 5. Can they explore the work of pioneers in classification? (e.g. Carl Linnaeus) Summer 2 Week ICT lesson. Can they name and group a variety of living things based on feeding patterns? (producer, consumer, predator, prey, herbivore, carnivore, omnivore) Summer 2 Week 4.	Pupils should explore examples of human impact (both positive and negative) on environments, for example, the positive effects of nature reserves, ecologically planned parks, or garden ponds, and the negative effects of population and development, litter or deforestation. 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. Summer 2 Week 2 Part A Can I group organisms according to observable features? Part B Can I use keys to identify local plants or animals? EXT OR FURTHER ACTIVITY- Can I design my own classification key? W.C intro. Use Identifying organisms lesson 3 windmill press p30- 35 Present children with pictures (or living organisms collected earlier) including similar pairs *eg bee/wasp, spider/beetle, daisy/dandelion* and discuss features *eg legs, wings, eyes, colours.* Ask children to group similar organisms together and explain their groupings. Use p31 if organisms available or 32 with images. Look at images or organisms with a mag glass. Look at how the features help us to classify them and name them. Discuss over a million species of animals and plants. Imagine a school with one big class!!! Crazy- so we group them according to characteristics. Because of their variety, it is important to identify them and assign them to groups. The classification system and classification keys help us to identify plants and animals. Living non- living, plant, animal. Show simple animal key – vertebrates, invertebrates . Vertebrates into birds, reptiles, mammals etc Invertebrates into worms in segments shelled molluscs etc.. Present children with an organism (or picture of an organism) from the local environment which is likely to be unfamiliar to most of them. Ask them to write down two or three things about it. OR HIGHLIGHTED ACTIVITY. Show some reference books and

		ask children how easy it would be to identify the organism from these. Show how they can be turned into questions. Use Exploring Science Interactive CD ROM 4b- Butterflies –and moths children to answer yes know to identify them. Discuss how keys use only yes no closed questions. Show children a simple key and how to use it. Practise with other keys and other organisms. Children to follow a key and identify plants and animals. EXT- OR further activity- Model designing a key. Show examples. – Children create own using blank and leaf sheets. L.B support B.A. M.A in pairs. A.A unaided. <u>Week 5 – Summer 2:</u> Can I identify why animals live in certain places? Can I Identify how animals and plants in two different habitats are suited to their environment? BIG TALK HOMEWORK- session B HABITAT ESTATES PERSUASIVE WRITING REVISION. Advertise a habitat so it appeals to the organism; use adjectives to describe it I detail. The needs of the organism to survive, not the wants. Warm up sheet p5. Write multiple choice answers in books in pairs. Go through the reasons and reinforce previous lessons. Food water, light, shelter, air or breeding area etc…. But how are organisms suited to their environment and how do they adapt? Look at an example of an animal on the IWB, where does it live? What features does it have that help it to survive? See power point saved in Science folder. Children either use IT to research 2 plants, cactus and moss in two diff habitats and say how they adapt or camel and polar bear. H.A with blank sheets. OR Complete sheets in their books. One activity finding the correct adaptation of the animal and reason for it. 2 – Made to dig sheet – children say what each feature is used for in its habitat. 3- Woodlice adaptation sheet. 4- Rabbit sheet where the children write how it is suited to the environment. SING ADAPTATION SONG <u>Week 6 – summer 2:</u> Can I identify the ways in which living things and the

		environment need protection? Can I say what would happen if there was a change to their environment? Discuss the effects on the food chains. Possible big write environmental letter or explanation text revision. See Hamilton activity sheet. Why do animals and plants need protection? Ask children to think about the effect on plants and animals of changing conditions in a particular habitat in various ways *eg draining the pond, removing the pond weed, removing the shade, ground cover.* Children to complete p22 and 23 to find out why organisms need protection and write a letter to oppose the draining of a pond. H.A - look at habitat changes sheet first and decide on their own purpose for writing a letter opposing a change which would alter a habitat. OR Ask children to prepare a presentation to an audience to explain why the organisms could no longer live in a changed habitat. Protection of the environment (links with geography) Ask children: Would draining the school pond and replacing it with an adventure playground be a good idea? What would happen to the organisms that live in and around the pond? Ask children to think about the effect on plants and animals of changing conditions in the pond. Divide the class into 2 groups and ask one group to develop a debate in favour of the proposal and the other group to develop a debate against the proposal. Ask each group to find out as much information as possible on the chosen issue and to prepare a poster to illustrate their case. Carry out the debate but make sure the rules are clear: No shouting out, listen to others points of view. PLENARY- Show on IWB on simulations programme to show effects on rabbits and foxes. How the whole food chain is effected not just one organism. Changing habitat sheet as ext Week 7 – Summer 2: Can I show my understanding of habitats and the organisms that live there? Assessment sheets from rising stars or Exploring science CD ROM. Children to complete 4B- end of unit test.

		Readers given to support poor readers.

Year 5 - Autumn		
Programme of Study	**Knowledge, Skills and Understanding**	**Activity/ Link to scheme of work**
Working scientifically: 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	Can they plan and carry out a scientific enquiry to answer questions, including recognising and controlling variables where necessary? Can they make a prediction with reasons? Can they use test results to make predictions to set up comparative and fair tests? Can they present a report of their findings through writing, display and presentation? Can they take measurements using a range of scientific equipment with increasing accuracy and precision? Can they take repeat readings when appropriate? Can they record more complex data and results using scientific diagrams, labels, classification keys, tables, scatter graphs, bar and line graphs? Can they report and present findings from enquiries through written explanations and conclusions? Can they use a graph to answer scientific questions? Following instructions, can you take action to control obvious risks to yourself?	Pupils should use their science experiences to: explore ideas and raise different kinds of questions; select and plan the most appropriate type of scientific enquiry to use to answer scientific questions; recognise when and how to set up comparative and fair tests and explain which variables need to be controlled and why. They should use and develop keys and other information records to identify, classify and describe living things and materials, and identify patterns that might be found in the natural environment. They should make their own decisions about what observations to make, what measurements to use and how long to make them for, and whether to repeat them; choose the most appropriate equipment to make measurements and explain how to use it accurately. They should decide how to record data from a choice of familiar approaches; look for different causal relationships in their data and identify evidence that refutes or supports their ideas. They should use their results to identify when further tests and observations might be needed; recognise which secondary sources will be most useful to research their ideas and begin to separate opinion from fact. They should use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas and should talk about how scientific ideas have developed over time.

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.		
States of matter compare and group materials together, according to whether they are solids, liquids or gases observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C) identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.	Can they compare and group materials together, according to whether they are solids, liquids or gases? Can you name a liquid? Can you name a solid? Can you name some gases? Can you recognize that gases flow easily? Can explain the use of common gases? Can they explain what happens to materials when they are heated or cooled? Can they measure or research the temperature at which different materials change state in degrees Celsius? Can they use measurements to explain changes to the state of water? Can you recognise that water as a liquid turns into steam (water as a gas) when liquid water is boiled? Can you explain that evaporation is when a liquid turns into a gas? Can you describe changes using scientific words? (melt, boil, freeze) Can they identify the part that evaporation and condensation has in the water cycle? Can they associate the rate of evaporation with temperature? Can they group and classify a variety of materials according to the impact of temperature on them? Can they explain what happens over time to materials such as puddles on the playground or washing hanging on a line? Can they relate temperature to change of state of	Pupils should explore a variety of everyday materials and develop simple descriptions of the states of matter (solids hold their shape; liquids form a pool not a pile; gases escape from an unsealed container). Pupils should observe water as a solid, a liquid and a gas and should note the changes to water when it is heated or cooled. **Note:** Teachers should avoid using materials where heating is associated with chemical change, for example, through baking or burning. Pupils might work scientifically by: grouping and classifying a variety of different materials; exploring the effect of temperature on substances such as chocolate, butter, cream (for example, to make food such as chocolate crispy cakes and ice-cream for a party). They could research the temperature at which materials change state, for example, when iron melts or when oxygen condenses into a liquid. They might observe and record evaporation over a period of time, for example, a puddle in the playground or washing on a line, and investigate the effect of temperature on washing drying or snowmen melting. - use water cycle box experiment in class to see water cycle in action, watch videos and make diagrams/notes on the subject. -plan and perform 'rate of evaporation' experiment with water to discover that temperature affects rate of evaporation. -ensure a range of liquids, solids and gases are classified according to properties, places and

	materials?	applications. -measure the boiling point of water (with adult help) and also note frozen puddles in the playground at zero degrees on a thermometer. -experiment to discover which gas travels the quickest / evaporates the quickest. -research a range of common gases and their uses. -use helium-filled balloons to weight them, discover that helium is a gas lighter than air and also to measure how much mass needs to be added in order to make the balloon 'hover' rather than float away. - watch uses of gases in operations and in dental care – anesthetic uses of – dangers of..
Properties and changes of materials compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (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 use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating	Can they compare and group together everyday materials on the basis of their properties, including hardness, solubility, transparency, conductivity (thermal), and response to magnets? Can you recognise good thermal insulators? Can you suggest materials which could be used for specific jobs eg glass for windows? Can they explain how some materials dissolve in liquid to form a solution? Can they describe how to recover a substance from a solution? Can you use and understand the term 'mixture'? Can you name simple separation methods eg sieving? Can you name some materials that will and won't dissolve in water? Can you use the scientific terms soluble/insoluble? Can you describe the process of sieving and when it is appropriate to use as a separation method? Eg separating large and small particles. Can you separate a solid from a liquid using filtering? Can they use their knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving, evaporating?	Pupils should build a more systematic understanding of materials by exploring and comparing the properties of a broad range of materials, including relating these to what they learnt about magnetism in year 3. They should explore reversible changes, including, evaporating, filtering, sieving, melting and dissolving, recognising that melting and dissolving are different processes. - Arrange materials into groups according to their solid state, if soluble, transparent, conductivity of heat. - Which materials allow heat to travel through? Which dissolve in water? Which are see-through? **Note:** Pupils are not required to make quantitative measurements about insulation at this stage. It is sufficient for them to observe that some materials will feel hotter than others when a heat source is placed against them. Safety guidelines should be followed when burning materials. Pupils might work scientifically by: carrying out tests to answer questions, for example, 'Which materials would be the most effective for making a warm jacket, for wrapping ice cream to stop it melting, or

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	Can they give reasons, based on evidence for comparative and fair tests for the particular uses of everyday materials, including metals wood and plastic? Can they describe changes using scientific words? (evaporation, condensation) Can they demonstrate that dissolving, mixing and changes of state are reversible changes? Can they use the terms 'reversible' and 'irreversible'? Can they describe methods for separating mixtures? (filtration, distillation) Can they work out which materials are most effective for keeping us warm or for keeping something cold? Can they use their knowledge of materials to suggest ways to classify? (solids, liquids, gases) Can they explore the work of chemists who created new materials, e.g. Spencer Silver (glue on sticky notes) or Ruth Benerito (wrinkle free cotton)? Can you separate a dissolved substance from a liquid? Can you recognise that there is a limit to how much of a solid can be dissolved in a liquid? Can you name a factor that affects the rate of dissolving? Can you name some materials that are mixtures of solids, liquids and or gases? Can you suggest ways to separate mixtures based on what you know about certain materials eg using combination of filtering and evaporation	for making blackout curtains?' Provide mixture and set of sieves / filters. How can the mixture be separated, thereby proving a reversible change? Examine a range of solids that can change state by heating or cooling. Classify according to reversibility. Look at burning as an irreversible change and the change that takes place. Cook an egg and melt chocolate to see the change that takes place. Complete diagrams to note changes and how they occur. Use of 'heating' / 'cooling' to denote how key changes take place. Provide key reasons why from photos of materials used in everyday contexts, why the design is made so? Prove a dissolves material (eg salt) in water can be retrieved by process of evaporation – distillation. Test which insulators work best in order to prevent an ice-cube from melting the fastest. Research chemists and their biographies / discoveries. How much salt can be dissolved before water becomes saturated? How can you speed up rate of dissolving sugar in water? Suggest reasons why. Combine methods explored to separate a range of mixtures in a solution. Eg dirty water with salt / metal filings. **Take care with metal filings eye goggles should be worn.**

Year 5 - Spring		
Programme of Study	**Knowledge, Skills and Understanding**	**Activity/ Link to scheme of work**
Working scientifically: 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,	Can they plan and carry out a scientific enquiry to answer questions, including recognising and controlling variables where necessary? Can they make a prediction with reasons? Can they use test results to make predictions to set up comparative and fair tests? Can they present a report of their findings through writing, display and presentation? Can they take measurements using a range of scientific equipment with increasing accuracy and precision? Can they take repeat readings when appropriate? Can they record more complex data and results using scientific diagrams, labels, classification keys, tables, scatter graphs, bar and line graphs? Can they report and present findings from enquiries through written explanations and conclusions? Can they use a graph to answer scientific questions? Following instructions, can you take action to control obvious risks to yourself?	Pupils should use their science experiences to: explore ideas and raise different kinds of questions; select and plan the most appropriate type of scientific enquiry to use to answer scientific questions; recognise when and how to set up comparative and fair tests and explain which variables need to be controlled and why. They should use and develop keys and other information records to identify, classify and describe living things and materials, and identify patterns that might be found in the natural environment. They should make their own decisions about what observations to make, what measurements to use and how long to make them for, and whether to repeat them; choose the most appropriate equipment to make measurements and explain how to use it accurately. They should decide how to record data from a choice of familiar approaches; look for different causal relationships in their data and identify evidence that refutes or supports their ideas. They should use their results to identify when further tests and observations might be needed; recognise which secondary sources will be most useful to research their ideas and begin to separate opinion from fact. They should use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas and should talk about how scientific ideas have developed over time.

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.		
Earth and space describe the movement of the Earth, and other planets, relative to the Sun in the solar system describe the movement of the Moon relative to the Earth describe the Sun, Earth and Moon as approximately spherical bodies use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.	Can you describe where the sun is in the sky at different times of the day? Can you order the Earth, Sun and Moon by size? Can they identify and explain the movement of the Earth and other plants relative to the sun in the solar system? Can they explain how seasons and the associated weather is created? Can they describe and explain the movement of the Moon relative to the Earth? Can they describe the sun, earth and moon as approximately spherical bodies? Can they use the idea of the earth's rotation to explain day and night and the apparent movement of the sun across the sky? Can they compare the time of day at different places on the earth? Can you describe how shadows from the sun change over the day? Can you predict where a shadow will be by knowing where the sun is in the sky? Can you explain where the sun rises and sets? Can you explain what happens to shadows (position and length) as the sun appears to move across the sky? Can you explain how and why the moon seems to change shape over 28 days? Can they create shadow clocks? Can they begin to understand how older civilizations used the sun to create astronomical clocks, e.g. Stonehenge? Can they explore the work of some scientists?	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 eight 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 one moon; Jupiter has four large moons and numerous smaller ones). -look at a safe video to show the position of the Sun as it appears to move during the course of the day in winter and summer. - make a paper cup sun-dial to show the movement of the shadow during a day. - revise use of poles as playground markers (large sundials) Measure in terms of N/E/S/W - use small-scale models using tennis balls to look at the tilt of the earth as it orbits a model sun. Note that in winter, the earth is tilted away in northern hemisphere and this results in cooler weather. The opposite is true for summer. -use torches to experiment how the apparent movement of the sun affects length of shadow (i.e. less shadow at midday) according to how high it is in the sky. Map into science books. -use light source to discover that as earth spins, the side facing away from the light source is dark and the side facing is light.

	(Ptolemy, Alhazen, Copernicus)	-use iPads and world time clocks to discover current times around the globe. -'facetime' where possible a person in Australia to witness the time of day whilst currently daylight in UK. Could also use webcams of Sydney to demonstrate. -make a Moon diary to track the changes over a month (homework) Note the phases of the moon and learn the 'waning' and 'waxing' phase. **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. 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.

Year 5 - Summer		
Programme of Study	**Knowledge, Skills and Understanding**	**Activity/ Link to scheme of work**
Working scientifically: 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,	Can they plan and carry out a scientific enquiry to answer questions, including recognising and controlling variables where necessary? Can they make a prediction with reasons? Can they use test results to make predictions to set up comparative and fair tests? Can they present a report of their findings through writing, display and presentation? Can they take measurements using a range of scientific equipment with increasing accuracy and precision? Can they take repeat readings when appropriate? Can they record more complex data and results using scientific diagrams, labels, classification keys, tables, scatter graphs, bar and line graphs? Can they report and present findings from enquiries through written explanations and conclusions? Can they use a graph to answer scientific questions? Can they explore different ways to test an idea, choose the best way and give reasons? Can they vary one factor whilst keeping the others the same in an experiment? Can they use information to help make a prediction? Can they explain, in simple terms, a scientific idea and what evidence supports it? Can they decide which units of measurement they need to use? Can they explain why a measurement needs to be repeated? Can they find a pattern from their data and explain what it shows? Can they link what they have found out to other	Pupils should use their science experiences to: explore ideas and raise different kinds of questions; select and plan the most appropriate type of scientific enquiry to use to answer scientific questions; recognise when and how to set up comparative and fair tests and explain which variables need to be controlled and why. They should use and develop keys and other information records to identify, classify and describe living things and materials, and identify patterns that might be found in the natural environment. They should make their own decisions about what observations to make, what measurements to use and how long to make them for, and whether to repeat them; choose the most appropriate equipment to make measurements and explain how to use it accurately. They should decide how to record data from a choice of familiar approaches; look for different causal relationships in their data and identify evidence that refutes or supports their ideas. They should use their results to identify when further tests and observations might be needed; recognise which secondary sources will be most useful to research their ideas and begin to separate opinion from fact. They should use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas and should talk about how scientific ideas have developed over time.

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.	science? Can they suggest how to improve their work and say why they think this? Following instructions, can you take action to control obvious risks to yourself?	
Animals including humans describe the simple functions of the basic parts of the digestive system in humans describe the changes as humans develop to old age.	Can they identify and name the basic parts of the digestive system in humans? Can they describe the simple functions of the basic parts of the digestive system in humans? Can they describe the changes as humans develop to old age? Can they create a timeline to indicate stages of growth in certain animals, such as frogs and butterflies? Can they describe the changes experienced in puberty? Can they draw a timeline to indicate stages in the growth and development of humans? Can they identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood? Do you know that the heart is a muscle? Can you describe how the heart pumps blood around the body and what happens during exercise? Can they recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function? Can they describe the ways in which nutrients and water and transported within animals, including humans? Can they explore the work of medical pioneers, for example, William Harvey and Galen and recognise how much we have learnt about our bodies? Can they compare the organ systems of humans to other animals? Can they make a diagram of the human body and explain how different parts work and depend on one another?	Pupils should be introduced to the main body parts associated with the digestive system, for example, mouth, tongue, teeth, oesophagus, stomach and small and large intestine and explore questions that help them to understand their special functions. They might draw and discuss their ideas about the digestive system and compare them with models or images. Pupils should draw a timeline to indicate stages in the growth and development of humans. They should learn about the changes experienced in puberty. Pupils could work scientifically by researching the gestation periods of other animals and comparing them with humans; by finding out and recording the length and mass of a baby as it grows.

	Can they name the major organs in the human body? Can they locate the major human organs? • Can they make a diagram that outlines the main parts of a body?	
Living things and their habitats describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird describe the life process of reproduction in some animals. 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.	Can they describe the differences in the life cycles of a mammal, an amphibians, an insects and a bird? Can they explore the work of well know naturalists and animal behaviourists? (David Attenborough and Jane Goodall) Can they observe their local environment and draw conclusions about life-cycles of animals Can they compare the life cycles of animals in their local environment with the life cycles of those around the world	Pupils should study and raise questions about their local environment throughout the year. They should observe life-cycle changes in a variety of living things, for example, 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 sexual reproduction in animals. Pupils might work scientifically by: observing and comparing the life cycles of animals in their local environment with other animals around the world (in the rainforest, in the oceans, in desert areas and in prehistoric times), asking pertinent questions and suggesting reasons for similarities and differences. They might observe changes in an animal over a period of time (for example, by hatching and rearing chicks), comparing how different animals reproduce and grow. Pupils should build on their learning from years 3 and 4 about the main body parts and internal organs (skeletal, muscular and digestive system) to explore and answer questions that help them to understand how the circulatory system enables the body to function. Pupils should learn how to keep their bodies healthy and how their bodies might be damaged – including how some drugs and other substances can be harmful to the human body. Pupils might work scientifically by: exploring the work of scientists and scientific research about the

		relationship between diet, exercise, drugs, lifestyle and health.
Evolution and inheritance recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents identify how animals are adapted to suit their environment in different ways and that adaptation may lead to evolution.	Can they recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents? Can they give reasons why offspring are not identical to each other or to their parents? Can they identify how animals are adapted to suit their environment in different ways and that adaptation may lead to evolution? Can they explain how some living things adapt to survive in extreme conditions? Can they analyse the advantages and disadvantages of specific adaptations, such as being on two rather than four feet?	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. **Note:** At this stage, pupils are not expected to understand how genes and chromosomes work. 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, penguins and camels. They might analyse the advantages and disadvantages of specific adaptations, such as being on two feet rather than four, having a long or a short beak, having gills or lungs.

Year 6 - Autumn

Programme of Study	Knowledge, Skills and Understanding	Activity/ Link to scheme of work
Working scientifically: 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	Can they explore different ways to test an idea, choose the best way, and give reasons? Can they vary one factor whilst keeping the others the same in an experiment? Can they explain why they do this? Can they plan and carry out an investigation by controlling variables fairly and accurately? • Can they make a prediction with reasons? Can they use information to help make a prediction? Can they use test results to make further predictions and set up further comparative tests? Can they explain, in simple terms, a scientific idea and what evidence supports it? Can they present a report of their findings through writing, display and presentation? Can they explain why they have chosen specific equipment? (incl ICT based equipment) Can they decide which units of measurement they need to use? Can they explain why a measurement needs to be repeated? Can they record their measurements in different ways? (incl bar charts, tables and line graphs) Can they take measurements using a range of scientific equipment with increasing accuracy and precision? Can they find a pattern from their data and explain what it shows? Can they use a graph to answer scientific questions? Can they link what they have found out to other science? Can they suggest how to improve their work and say why they think this?	explore ideas and raise different kinds of questions; select and plan the most appropriate type of scientific enquiry to use to answer scientific questions; recognise when and how to set up comparative and fair tests and explain which variables need to be controlled and why. use and develop keys and other information records to identify, classify and describe living things and materials identify patterns that might be found in the natural environment. make their own decisions about what observations to make, what measurements to use and how long to make them for, and whether to repeat them; choose the most appropriate equipment to make measurements and explain how to use it accurately.

displays and other presentations identifying scientific evidence that has been used to support or refute ideas or arguments.	Can they record more complex data and results using scientific diagrams, classification keys, tables, bar charts, line graphs and models? Can they report findings from investigations through written explanations and conclusions? Can they identify scientific evidence that has been used to support to refute ideas or arguments? Can they report and present 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? Following instructions, can you take action to control obvious risks to yourself?	decide how to record data from a choice of familiar approaches; look for different causal relationships in their data and identify evidence that refutes or supports their ideas. use their results to identify when further tests and observations might be needed; recognise which secondary sources will be most useful to research their ideas and begin to separate opinion from fact. use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas talk about how scientific ideas have developed over time
Living things and their habitats describe the life process of reproduction in some plants. 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.	Can they describe the life cycles of common plants? Can they observe their local environment and draw conclusions about life-cycles, e.g. plants in the vegetable garden or flower border? Can they compare the life cycles of plants and animals in their local environment with the life cycles of those around the world, e.g. rainforests?	Pupils should study and raise questions about their local environment throughout the year. They should observe life-cycle changes in a variety of living things, for example, plants in the vegetable garden or flower border in the local environment. Growing seeds of flowers and beans etc Pupils should find out about different types of reproduction, including sexual and asexual reproduction in plants. Full understanding of parts of a flower, (male and female) pollination and fertilization including wind and insect pollination, seed dispersal. Pupils might work scientifically by: observing and comparing the life cycles of plants in their local environment with other plants around the world (in

	Can they explain how some living things adapt to survive in extreme conditions? Can they 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? Can they give reasons for classifying plants and animals based on specific characteristics? Can they explain why classification is important? Can they readily group animals into reptiles, fish, amphibians, birds and mammals? Can they sub divide their original groupings and explain their divisions? Can they group animals into vertebrates and invertebrates? Can they find out about the significance of the work of scientists such as Carl Linnaeus, a pioneer of classification?	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. Adaptations which allow plants to live in the rainforests – drip tips – stilt/prop roots buttress roots etc Sorting out living thing – E.g. classifying invertibrates spotting and recording similarities and differences – e.g. fish breathe with gills- lay eggs etc Reptiles breath with lungs, lay eggs etc E.g. classifying plants – flowereing, non-flowering, shape of leaves, drop leaves etc Using and making keys to identify unknown plants and animals. Through direct observations where possible, they should classify animals into commonly found invertebrates (such as insects, spiders, snails, worms) and vertebrates (fish, amphibians, reptiles, birds and mammals). They should discuss reasons why living things are placed in one group and not another. Pupils might find out about the significance of the work of scientists such as Carl Linnaeus, a pioneer of classification. https://www.tes.co.uk/teaching-resource/linnaeus-poster-6423380 health/variation_classification/revision/1/

	Can you say 3 things a micro organism can do to prove that it is living? Can you give examples of decay and illness caused by micro organisms? Can you give examples of micro organisms being used in food production? Can you recognise some applications and implications of science eg use of predators to control pest populations?	What processes are common to all living things and how would we recognize them in plants and animals. Decay – composting – rotting apples, etc? (in tank) Disease and illness caused by microbes e.g. flu, colds etc and prevention Use of yeast in bread and beer. Investigating natural predators in allotments and gardens etc 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.
Evolution and inheritance recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago identify how plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.	Can they recognise that living things have changed over time and that fossils provide information about living things that inhabited the earth millions of years ago? Can they explain the process of evolution and describe the evidence for this? Can they identify how plants are adapted to suit their environment in different ways and that adaptation may lead to evolution? Can they talk about the work of Charles Darwin, Mary Anning and Alfred Wallace? Can they begin to understand what is meant by DNA?	They should be introduced to the idea that characteristics are passed from parents to their offspring. 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. Interdependence and adaptation – how animals and plants are suited to their environments. Biography work – link literacy

Year 6 – Spring (up to SATS week)		
Programme of Study	**Knowledge, Skills and Understanding**	**Activity/ Link to scheme of work**
Working scientifically: 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	Can they explore different ways to test an idea, choose the best way, and give reasons? Can they vary one factor whilst keeping the others the same in an experiment? Can they explain why they do this? Can they plan and carry out an investigation by controlling variables fairly and accurately? Can they make a prediction with reasons? Can they use information to help make a prediction? Can they use test results to make further predictions and set up further comparative tests? Can they explain, in simple terms, a scientific idea and what evidence supports it? Can they present a report of their findings through writing, display and presentation? Can they explain why they have chosen specific equipment? (incl ICT based equipment) Can they decide which units of measurement they need to use? Can they explain why a measurement needs to be repeated? Can they record their measurements in different ways? (incl bar charts, tables and line graphs) Can they take measurements using a range of scientific equipment with increasing accuracy and precision? Can they find a pattern from their data and explain what it shows? Can they use a graph to answer scientific questions? Can they link what they have found out to other science? Can they suggest how to improve their work and say	explore ideas and raise different kinds of questions; select and plan the most appropriate type of scientific enquiry to use to answer scientific questions; recognise when and how to set up comparative and fair tests and explain which variables need to be controlled and why. use and develop keys and other information records to identify, classify and describe living things and materials identify patterns that might be found in the natural environment. make their own decisions about what observations to make, what measurements to use and how long to make them for, and whether to repeat them; choose the most appropriate equipment to make measurements and explain how to use it accurately.

and written forms such as displays and other presentations identifying scientific evidence that has been used to support or refute ideas or arguments.	why they think this? Can they record more complex data and results using scientific diagrams, classification keys, tables, bar charts, line graphs and models? Can they report findings from investigations through written explanations and conclusions? Can they identify scientific evidence that has been used to support to refute ideas or arguments? Can they report and present 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? Can they choose the best way to answer a question? Can they use information from different sources to answer a question and plan an investigation? Can they make a prediction which links with other scientific knowledge? Can they identify the key factors when planning a fair test? Can they explain how a scientist has used their scientific understanding plus good ideas to have a breakthrough? Can they plan in advance which equipment they will need and use it well? Can they make precise measurements? Can they collect information in different ways? Can they record their measurements and observations systematically? Can they explain qualitative and quantitative data? Can they draw conclusions from their work? Can they link their conclusions to other scientific knowledge? Can they explain how they could improve their way of working? Can you recognize hazard symbols and make, and act on, simple suggestions to control obvious risks to	decide how to record data from a choice of familiar approaches; look for different causal relationships in their data and identify evidence that refutes or supports their ideas. use their results to identify when further tests and observations might be needed; recognise which secondary sources will be most useful to research their ideas and begin to separate opinion from fact. use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas talk about how scientific ideas have developed over time.

	myself and others?	
Light recognise that light appears to travel in straight lines use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.	Can they recognise that light appears to travel in straight lines? Can they 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? Can they explain that we see things because light travels from light sources to our eyes or from light sources to object s and then to our eyes? Can they use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them? Can they explain how different colours of light can be created? Can they use and explain how simple optical instruments work? (periscope, telescope, binoculars, mirror, magnifying glass, Newton's first reflecting telescope) Can they explore a range of phenomena, including rainbows, colours on soap bubbles, objects looking bent in water and coloured filters. Can you use a mirror to change the direction of light to show how this explains the path of light?	Recap light sources, reflection and shadows. How we see things – Know how our eyes enable us to see Know that non-luminous objects can be seen because light scattered from them enters our eyes. Light travelling from a source can be blocked by an opaque object, making a shadow. Investigate factors affecting size of shadows. They should talk about what happens and make predictions. Investigate splitting light using prisms. (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). 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.
Forces and magnets explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object	Can they explain that unsupported objects fall towards the earth because of the force of gravity acting between the earth and the falling object? (Can you describe a type of force that is not made by a person) Do you know weight is a force? Can you measure force using a force meter?	Accuracy of measuring with a Newton meter – force meter. Children have a collection of objects to measure. Link grams to Newton's. Practical activity – How does up thrust affect weight. Weighing objects in and out of water. Comparing weights.

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.	Can you use a force meter accurately and can measure using Newtons? Do you know that force is measured in Newtons? Can they explore how scientists, such as Galileo Galilei and Isaac Newton helped to develop the theory of gravitation? Can you explain which shapes move easily through water and why? Do you understand why an object seems lighter in water? Can they work out how water can cause resistance to floating objects? (Can you describe a type of force that is not made by a person) Can you describe the speed and direction of moving objects? Can you explain the forces acting on an object when it is still? Can they identify the effects of air resistance, water resistance and friction that act between moving surfaces? (Can you describe a type of force that is not made by a person) Can they design very effective parachutes? (Can you describe a type of force that is not made by a person) Can you suggest ways in which friction can be increased? Do you recognise that friction slows things down and stops them from moving?	How does the shape of an object affect how it moves through water? Bloat experiment – time different shapes of bloat travelling through water. Force arrows. How do I draw force arrows? Understand the size and direction of force arrows. Pupils should explore falling objects and raise questions about the effects of air resistance. They should explore the effects of air resistance by observing how different objects such as parachutes and sycamore seeds fall. They should experience forces that make things begin to move, get faster or slow down. 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**.

	Can you give everyday examples of when friction is useful? Can you make simple generalisations eg the harder the push the further the distance travelled? Can you describe how an object can be stopped more quickly? Can you describe and explain how motion is affected by forces? (including gravitational attractions, magnetic attraction and friction) Can you give examples of where a spring is used? Can you describe the forces when you stretch an elastic band and compress or stretch a spring? Can they recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect? Can they describe and explain how forces affect motion? (Including gravitational attractions, magnetic attraction and friction) Can you explain why there is a change of direction/change of speed/change of shape? (Using cause and effect eg a push/pull changed speed or direction of a moving object)	Investigate different surfaces Investigate slippiness of shoes Elastic band experiment Investigate what happens to an elastic band when a force is increased. Investigate springs, pushing, pulling, springs in every day life Bungee rope – reading information from graphs and charts How do levers and pulleys work? What is the smallest weight you can use to lift a rubber with a lever? Investigate cogs and gears – changing direction Pupils should explore the effects of levers, pulleys and simple machines on movement. They might design and make products that use levers, pulleys, gears and/or springs and explore their effects.

Electricity associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches use recognised symbols when representing a simple circuit in a diagram.	Can you recognise that most electrical components have 2 terminals? Can they use recognised symbols when representing a simple circuit in a diagram? Can you build circuits from diagrams? Can they identify and name the basic parts of a simple electric series circuit? (cells, wires, bulbs, switches, buzzers) Can they explain how to make changes in a circuit? Can they explain the impact of changes in a circuit? Can they explain the effect of changing the voltage of a battery? Can you describe the relationship between the length or thickness of wires and the brightness of the bulb? Can they compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers, the on/off position of switches? Can they make their own traffic light system or something similar? Can they explain the danger of short circuits? Can they explain what a fuse is?	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. 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.
Properties and changes of materials compare and group together	Can they compare and group together everyday materials on the basis of their properties of conductivity (electrical). Can you recognise electrical conductors?	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

everyday materials on the basis of their properties, including, conductivity (electrical). 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.	Can you recognise electrical insulators? Can you suggest materials which could be used for specific jobs eg copper for electric cables, Can they 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? Can they use the terms 'reversible' and 'irreversible'? Can they explore changes that are difficult to reverse, e.g. burning, rusting and reactions such as vinegar with bicarbonate of soda?	new materials, for example, Spencer Silver, who invented the glue for sticky notes or Ruth Benerito, who invented wrinkle-free cotton. Safety guidelines should be followed when burning materials. Pupils might work scientifically by: carrying out tests to answer questions. 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.