Oakdene Primary School

Science at Oakdene

Subject Leader: Mrs E Garton-Pope

Mission Statement

Oakdene – Growing and Learning Together

The above statement is our Mission Statement which is what we are all aiming to achieve at Oakdene.

We will try to achieve this through our aims in everything we do at Oakdene.

The Science curriculum is underpinned by the whole school Intent, Implementation and Impact statement.

(see separate Curriculum Statement document)

Science at Oakdene

Science teaches an understanding of natural phenomena. It aims to stimulate a child's curiosity in finding out why things happen in the way they do. It teaches methods of enquiry and investigation to stimulate creative thought. Children learn to ask scientific questions and begin to appreciate the way science will affect their future on a personal, national, and global level.

The aims of Science are to enable children to:

- ask and answer scientific questions;
- plan and carry out scientific investigations, using equipment, including computers, correctly;
- know and understand the life processes of living things;
- know and understand the physical processes of materials, electricity, light, sound and natural forces;
- know about the nature of the solar system, including the earth;
- evaluate evidence and present their conclusions clearly and accurately.

Curriculum and Coverage

The Science National Curriculum 2014 is followed at Oakdene Primary School. It is a core subject taught weekly and in Key Stages 1 and 2, the National Curriculum for Science is delivered using a plan devised by the subject leader using the NC programmes of study. Each year group has specific milestones to complete.

'Working scientifically' specifies the understanding of the nature, processes and methods of science for each year group. It should not be taught as a separate strand but should be embedded within the content of biology, chemistry and physics, focusing on the key features of scientific enquiry, so that pupils learn to use a variety of approaches to answer relevant scientific questions. These types of scientific enquiry should include: observing over time; pattern seeking; identifying, classifying and grouping; comparative and fair testing (controlled investigations); and researching using secondary sources. Pupils should seek answers to questions through collecting, analysing and presenting data.

We use a variety of teaching and learning styles in science lessons. Our principal aim is to develop children's knowledge, skills, and understanding. Sometimes we do this through whole-class teaching, while at other times we engage the children in an enquiry-based research activity. We encourage the children to ask, as well as answer scientific questions. They have the opportunity to use a variety of data, such as statistics, graphs, pictures, and photographs. They use computing in science lessons where it enhances their learning. They take part in role-play and discussions and they present

reports to the rest of the class. They engage in a wide variety of problem-solving activities. Wherever possible, we involve the pupils in 'real' scientific activities, for example, researching a local environmental problem or carrying out a practical experiment and analysing the results.

We have planned the topics in Science so that they build upon prior learning. We ensure that there are opportunities for children of all abilities to develop their skills and knowledge in each unit and we also build progression into the science long term plan, so that the children are increasingly challenged as they move up through the school.

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OAKDENE SCIENCE PROGRESSION DOCUMENT 2020

WORKING SCIENTIFICALLY		
Key Stage 1 NC	YEAR ONE MILESTONES	YEAR TWO MILESTONES
• *asking simple questions & recognising that they can be answered in different ways* • *observing closely, using simple equipment* • *performing simple tests* • *identifying & classifying* • *using their observations & ideas to suggest answers to questions* • *gathering & recording data to help in answering questions.*	I can talk about what I see, touch, smell, hear & taste I can use simple equipment with increasing independence to help me make observations (e.g. hand lenses, egg timers) With support, I can begin to use basic equipment for measuring quantities such as length or mass, in non-standard units I can perform a simple test I can identify & classify things I observe I can give a simple reason for my answers I can explain what I have found out I can show my work using pictures, labels & captions I can put some information in a chart or table	I can use seeing, touching, smelling, hearing & tasting to help them answer questions I can suggest how to find things out I can use some scientific words to describe what I have seen & measured I can compare several things I can carry out a simple fair test I can explain why it might not be fair to compare two things I can say whether things happened as I expected I can organise things into groups I can find simple patterns I can use text, diagrams, picture, charts & tables to record my observations I can measure using simple equipment for measuring quantities such as length or mass, in standard units I can use simple equipment with increasing independence (eg hand lenses & egg timers)
Lower Key Stage 2 NC	YEAR THREE MILESTONES	YEAR FOUR MILESTONES
• *asking relevant questions and using different types of scientific enquiries to answer them* • *setting up simple practical enquiries, comparative and fair tests* • *making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers* • *gathering, recording, classifying and presenting data in a variety of ways to help in answering questions* • *recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables* • *reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions* • *using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions*	I can use different ideas and suggest how to find something out. I can make and record a prediction before testing. I can plan a fair test and explain why it was fair. I can set up a simple fair test to make comparisons. I can record my observations in different ways. I can describe what I have found using scientific language. I can make accurate measurements using standard units. I can begin to use standard units (mm, cm, m, ml, l, °C). I can explain what I have found out and use my measurements to say whether it helps to answer my question. I can use a range of equipment (including a datalogger) in a simple test.	I can set up a simple fair test to make comparisons. I can plan a fair test and isolate variables, explaining why it was fair and which variables have been isolated. I can suggest improvements and predictions. I can decide which information needs to be collected and decide which is the best way for collecting it. I can use my findings to draw a simple conclusion. I can take measurements using different equipment and units of measure and record what I have found in a range of ways. I can make accurate measurements using standard units (N, g, kg, mm, cm, mins, seconds, °C). I can use a measuring cylinder accurately. I can use a thermometer accurately. I can explain my findings in different ways (display, presentation, writing). I can find patterns in my evidence or measurements. I can evaluate what I have found using scientific language, drawings, labelled diagrams, bar charts and tables.

• *identifying differences, similarities or changes related to simple scientific ideas and processes* • *using straightforward scientific evidence to answer questions or to support their findings.*		I can use straightforward scientific evidence to answer questions or to support my findings.
Upper Key Stage 2 NC	YEAR FIVE MILESTONES	YEAR SIX MILESTONES
• *planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary* • *taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate* • *recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs* • *using test results to make predictions to set up further comparative and fair tests* • *reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations* • *identifying scientific evidence that has been used to support or refute ideas or arguments.*	I can plan and carry out a scientific enquiry, including recognising and controlling variables where necessary. I can vary one factor whilst keeping the others the same in an experiment. I can decide what to observe and how long to collect observations. I can make a prediction with reasons. I can present a report of my findings through writing, display and presentation. I can take measurements using a range of scientific equipment with increasing accuracy (N, g, kg, mm, cm, mins, seconds, cm^2, km/h, m per sec, m/ sec). I can take repeat readings when appropriate. I can record more complex data and results using scientific diagrams, labels, classification keys, tables, scatter graphs, bar and line graphs. I can report and present findings from enquiries through written explanations and conclusions. I can use a graph to answer scientific questions. I can suggest how to improve my work and say why I think this.	I can explore different ways to test an idea, choose the best way, and give reasons why. I can plan and carry out an investigation by controlling variables fairly and accurately. I can use information to help make a prediction. I can use test results to make predictions to set up comparative and fair tests. I can explain why I have chosen specific equipment. I can decide which units of measurement I need to use. I can explain why a measurement needs to be repeated. I can take measurements using a range of scientific equipment with increasing accuracy and precision. I can record my measurements in different ways including bar charts, tables and line graphs. I can find patterns from my data and explain what it shows. I can report findings from investigations through written explanations and conclusions. I can record more complex data & results using scientific diagrams, classification keys, tables, bar charts & line graphs. I can identify scientific evidence that has been used to support to refute ideas or arguments.

Y1 NC	Y2 NC	Y1 MILESTONES	Y2 MILESTONES
BIOLOGY			
• *identify & name a variety of common wild & garden plants, including deciduous & evergreen trees* • *identify & describe the basic structure of a variety of common flowering plants, including trees*	• *observe & describe how seeds & bulbs grow into mature plants* • *find out & describe how plants need water, light & a suitable temperature to grow & stay healthy*	I can identify & name a range of common plants & trees I can recognise deciduous & evergreen trees I can name the trunk, branches & root of a tree I can describe the parts of a plant (roots, stem, leaves, flowers)	I can describe what plants need to survive I can observe & describe how seeds & bulbs grow into mature plants I can find out & describe how plants need water, light & a suitable temperature to grow & stay healthy
• *identify & name a variety of common animals including fish, amphibians, reptiles, birds & mammals* • *identify & name a variety of common animals that are carnivores, herbivores & omnivores* • *describe & compare the structure of a variety of common animals (fish, amphibians, reptiles, birds & mammals, including pets)* • *identify, name, draw & label the basic parts of the human body & say which part of the body is associated with each sense*	• *notice that animals, including humans, have offspring which grow into adults* • *find out about & describe the basic needs of animals, including humans, for survival (water, food & air)* • *describe the importance for humans of exercise, eating the right amounts of different types of food, & hygiene (link to SRE)* • *explore & compare the differences between things that are living, dead, & things that have never been alive* • *identify that most living things live in habitats to which they are suited & describe how different habitats provide for the basic needs of different kinds of animals & plants, & how they depend on each other* • *identify & name a variety of plants & animals in their habitats, including microhabitats* • *describe how animals obtain their food from plants & other animals, using the idea of a simple food chain, & identify & name different sources of food.*	I can point out some of the differences & compare the bodies of different animals I can identify & name a variety of common animals that are birds, fish, amphibians, reptiles, mammals & invertebrates I can identify & name a variety of common animals that are carnivores, herbivores & omnivores I can draw & label basic parts of the human body I can identify the main parts of the human body & link them to their senses I can name the parts of an animal's body I can name the four seasons in order I can observe changes across the four seasons I can observe & describe how day length varies I can observe & describe weather associated with the seasons	I can describe that animals need water, food, & air to survive I can explain why animals have offspring which grow into adults I can describe the life cycle of some living things (e.g. egg, chick, chicken) I can describe why exercise is important for humans I can describe why a balanced diet is important for humans I can describe why good hygiene is important for humans I can match certain living things to the habitats they are found in I can explain the differences between living & non-living things I can decide whether something is living, dead or non-living I can describe how a habitat provides for the basic needs of things living there I can describe a range of different habitats I can describe how plants & animals are suited to their habitat

Y3 NC	Y4 NC	Y3 MILESTONES	Y4 MILESTONES
BIOLOGY			
• *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*	• *recognise that living things can be grouped in a variety of ways* • *explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment* • *recognise that environments can change and that this can sometimes pose dangers to living things*	I can describe the functions of different parts of flowering plants. (roots, stem/trunk, leaves and flowers). I can explore the requirement of plants for life and growth (air, light, water, nutrients from soil, and room to grow). I can investigate the way in which water is transported within plants. I can explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.	I can recognise that living things can be grouped in a variety of ways. I can explore and use a classification key to group, identify and name a variety of living things. (plants, vertebrates, invertebrates) I can compare the classification of common plants and animals to living things found in other places. (under the sea, prehistoric) I can recognise that environments can change and this can sometimes pose a danger to living things.
• *identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat* • *identify that humans and some other animals have skeletons and muscles for support, protection and movement.*	• *describe the simple functions of the basic parts of the digestive system in humans* • *identify the different types of teeth in humans and their simple functions* • *construct and interpret a variety of food chains, identifying producers, predators and prey*	I can explain the importance of a nutritionally balanced diet. I can identify that animals, including humans, cannot make their own food: I get nutrition from what I eat. I can describe and explain the muscular system of a human. I can describe and explain the skeletal system of a human.	I can describe the simple functions of the basic parts of the digestive system in humans. I can identify the simple function of different types of teeth in humans. I can compare the teeth of herbivores and carnivores. I can explain what a simple food chain shows. I can construct and interpret a variety of food chains, identifying producers, predators and prey.

Y5 NC	Y6 NC	Y5 MILESTONES	Y6 MILESTONES
• *describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird* • *describe the life process of reproduction in some plants and animals.*	• *describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals* • *give reasons for classifying plants and animals based on specific characteristics*	I can describe the life cycle of a mammal. I can describe the life cycle of an amphibian I can describe the life cycle of an insect. I can describe the life cycle of a bird. I can describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird. I can describe the life cycles of common plants. I can explore the work of well-known naturalists and animal behaviourists. (e.g. David Attenborough and Jane Goodall)	I can describe how living things are classified into broad groups according to observable characteristics and based on similarities and differences including microorganisms, plants and animals. I can give reasons for classifying plants and animals based on specific characteristics. I can readily group animals into reptiles, fish, amphibians, birds and mammals. I can sub divide my original groupings and explain my divisions.
• *describe the changes as humans develop to old age.*	• *identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood* • *describe the ways in which nutrients and water are transported within animals, including humans* • *recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function*	(LINKS TO SRE) I can describe the changes as humans develop to old age. I can describe the changes experienced in puberty. I can draw a timeline to indicate stages in the growth and development of humans.	I can locate the major human organs. I can identify and name the main parts of the human circulatory system. I can describe the functions of the heart, blood vessels and blood. I can describe the ways in which nutrients and water and transported within animals, including humans. I can recognise the impact of diet, exercise, drugs and lifestyle on the way bodies function.
	• *recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago* • *recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents* • *identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution*		I can recognise that living things have changed over time and that fossils provide information about living things that inhabited the earth millions of years ago. I can recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents. I can give reasons why offspring are not identical to each other or to their parents. I can identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution. I can talk about the work of Charles Darwin, Mary Anning and Alfred Wallace.

Y1 NC	Y2 NC	Y1 MILESTONES	Y2 MILESTONES
CHEMISTRY			
distinguish between an object & the material from which it is made identify & name a variety of everyday materials, including wood, plastic, glass, metal, water, & rock *describe the simple physical properties of a variety of everyday materials* *compare & group together a variety of everyday materials on the basis of their simple physical properties*	*identify & compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper & cardboard for particular uses* *find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting & stretching.*	I can distinguish between an object & the material from which it is made I can describe materials using my senses, using specific scientific words I can explain what material objects are made from I can explain why a material might be useful for a specific job I can name some different everyday materials e.g. wood, plastic, metal, water & rock I can sort materials into groups on the basis of simple physical properties e.g. shiny / dull, rough / smooth I can explain how solid shapes can be changed by squashing, bending, twisting & stretching	I can describe the simple physical properties of a variety of everyday materials I can compare & group together a variety of materials based on their simple physical properties I can explore how the shapes of solid objects can be changed (squashing, bending, twisting, stretching) I can identify & compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper, cardboard for particular uses I can explain how things move on different surfaces
Y3 NC	Y4 NC	Y3 MILESTONES	Y4 MILESTONES
compare and group together different kinds of rocks on the basis of their appearance and simple physical properties *describe in simple terms how fossils are formed when things that have lived are trapped within rock* *recognise that soils are made from rocks and organic matter.*	• *compare and group materials together, according to whether they are solids, liquids or gases* • *observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C)* • *identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature*	I can compare and group together different rocks on the basis of their appearance and simple physical properties. I can describe and explain how different rocks can be useful to us. I can describe in simple terms how fossils are formed when things that have lived are trapped within rock. I can recognise that soils are made from rocks and organic matter.	I can compare and group materials together, according to whether they are solids, liquids or gases. I can explain what happens to materials when they are heated or cooled. I can measure or research the temperature at which different materials change state in degrees Celsius. I can identify the part that evaporation and condensation has in the water cycle.

Y5 NC	Y6 NC	Y5 MILESTONES	Y6 MILESTONES
• *compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets* • *know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution* • *use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating* • *give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic* • *demonstrate that dissolving, mixing and changes of state are reversible changes* • *explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda.*		I can compare and group together everyday materials on the basis of their properties, including hardness, solubility, transparency, conductivity (electrical and thermal) & magnetism. I can explain how some materials dissolve in liquid to form a solution. I can describe how to recover a substance from a solution. I can decide how mixtures might be separated, including through filtering, sieving, evaporating. I can give reasons, based on evidence for comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic. I can demonstrate that dissolving, mixing and changes of state are reversible changes. I can explain that some changes result in the formation of new materials, and that this kid of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda. I can use the terms 'reversible' and 'irreversible'.	

PHYSICS			
No NC requirements for physics in KS1			
Y3 NC	Y4 NC	Y3 MILESTONES	Y4 MILESTONES
recognise that they need light in order to see things and that dark is the absence of light *notice that light is reflected from surfaces* *recognise that light from the sun can be dangerous and that there are ways to protect their eyes* *recognise that shadows are formed when the light from a light source is blocked by an opaque object* *find patterns in the way that the size of shadows change*	• *identify how sounds are made, associating some of them with something vibrating* • *recognise that vibrations from sounds travel through a medium to the ear* • *find patterns between the pitch of a sound and features of the object that produced it* • *find patterns between the volume of a sound and the strength of the vibrations that produced it* • *recognise that sounds get fainter as the distance from the sound source increases*	I can recognise that I need light in order to see things and that dark is the absence of light. I can notice that light is reflected from surfaces. I can recognise that light from the sun can be dangerous and that there are ways to protect eyes. I can recognise that shadows are formed when the light from a light source is blocked by a solid object. I can find patterns in the way that the size of shadows change.	I can describe a range of sounds and explain how they are made. I can associate some sounds with something vibrating. I can recognise how vibrations from sound travel through a medium to the ear. I can find patterns between the pitch of a sound and features of the object that produce it. I can find patterns between the volume of the sound and the strength of the vibrations that produced it. I can recognise that sounds get fainter as the distance from the sound source increases.
compare how things move on different surfaces *notice that some forces need contact between two objects, but magnetic forces can act at a distance* *observe how magnets attract or repel each other and attract some materials and not others* *compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials* *describe magnets as having two poles* *predict whether two magnets will attract or repel each other, depending on which poles are facing.*	• *identify common appliances that run on electricity* • *construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers* • *identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery* • *recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit* • *recognise some common conductors and insulators, and associate metals with being good conductors.*	I can compare how things move on different surfaces. I can observe how some magnets attract or repel each other. I can classify, compare and group which materials are attracted to magnets and which are not. I can notice that some forces need contact between two objects, but magnetic forces can act at a distance. I can identify the poles of a magnet. I can predict whether two magnets will attract or repel each other depending on which poles are facing.	I can identify common appliances that run on electricity. I can construct a simple series electric circuit. I can identify and name the basic part in a series circuit, including cells, wires, bulbs, switches and buzzers. I can identify whether or not a lamp will light in a simple series circuit. I can identify whether a lamp will light or not in a circuit, depending on if the switch is open or closed. I can recognise some common conductors and insulators of electricity. I can draw a picture to represent a circuit.

Y5 NC	Y6 NC	Y5 MILESTONES	Y6 MILESTONES
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* *explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object* *identify the effects of air resistance, water resistance and friction, that act between moving surfaces* *recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.*	• *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* • *associate the brightness of a lamp or the volume of a buzzer with the number & 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*	I can identify and explain the movement of the Earth and other planets relative to the sun in the solar system. I can describe and explain the movement of the Moon relative to the Earth. I can describe the sun, earth and moon as approximately spherical bodies. I can use the idea of the earth's rotation to explain day and night and the apparent movement of the sun across the sky. I can explain how seasons and the associated weather is created. I can explain that unsupported objects fall towards the earth because of the force of gravity acting between the earth and the falling object. I can identify the effects of air resistance. I can identify the effects of water resistance. I can identify the effects of friction. I can recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.	I can recognise that light appears to travel in straight lines. I can 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. I can 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. I can use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them. I can identify and name the basic parts of a simple circuit (cells, wires, bulbs, switches, buzzers). I can 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. I can use recognised symbols when representing a simple circuit in a diagram.

Prior learning and progression

The following document is the Curriculum Map which has been devised by the subject leader to ensure that all staff know what has been learned prior to their current unit, plus what they will learn next:

RECEPTION	Seasonal change / Ourselves	Seasonal change / Celebrations	Seasonal Change / Journeys	Seasonal Change- New Life	Seasonal change / animals	Seasonal change / Superheroes
	Scientific Enquiry Children know about similarities and differences in relation to places, objects, materials and living things. They talk about the features of their own immediate environment and how environments might vary from one another. They make observations of animals and plants and explain why some things occur, and talk about changes.					
	Recording weather each day/discuss seasons. Looking at baby photos- how have we changed. What are our needs as a baby /now? Keeping healthy. Sequence simple human life cycle. Are we all the same?	Recording weather each day/discuss seasons. Autumn- autumn walk, signs of autumn How does autumn change into winter? Looking at change- jelly, candle,toast.	Recording weather each day/discuss seasons. What gives light at night? Discuss sun The naughty bus sank in the pond. What other things float and sink?	Recording weather each day/discuss seasons. Signs of spring, Spring Walk Growing cress. What gives light day/ night? Discuss sun/moon Life cycle of a hen - how could we keep an egg warm/safe? Observe eggs hatching Discuss if all animals come from eggs	Recording weather each day/discuss seasons. Visit to Safari park? Discuss animals- similarities and differences. Looking after pets- what are their needs?- link to our needs	Recording weather each day/discuss seasons. What would be the best material to make a cape for a superhero? Find out about veg and where it grows. Find info on potatoes and plant potatoes

1	**Everyday materials** • to distinguish between an object and the material from which it is made • to describe materials using my senses, using specific scientific words • to explain what material objects are made from • to explain why a material might be useful for a specific job • to name some different everyday materials e.g. wood, plastic, metal, water and rock • to sort materials into groups on the basis of simple physical properties e.g. shiny / dull, rough / smooth • to explain how solid shapes can be changed by squashing, bending, twisting and stretching	**Animals including humans** • to point out some of the differences and compare the bodies of different animals • to identify and name a variety of common animals that are birds, fish, amphibians, reptiles, mammals and invertebrates • to identify and name a variety of common animals that are carnivores, herbivores and omnivores • to identify the main parts of the human body and link them to their senses • to name the parts of an animal's body	**Plants** • To identify and name a variety of common wild and garden plants, including deciduous and evergreen trees • to identify and describe the basic structure of a variety of common flowering plants, including trees • to identify and name the roots, trunk, branches and leaves of a tree.	**Seasonal change (ongoing unit)** • to name the four seasons in order • to observe changes across the four seasons • to observe and describe how day length varies • to observe and describe weather associated with the seasons
	Scientific Enquiry			
	Material hunts Sorting materials by different criteria Matching materials with specific products 'Silly match-up materials'-match product with materials and discuss positive and negatives of the product being made with the material. Possible visit to factory to watch change process for specific material, linking to visible and tactile properties. Experiments: What materials would you use for…. (meet range of needs, link to topic/story characters) Link material uses to their properties. (Design products to meet specific needs: linking to materials and basic justification) Classify objects made of one material in different ways e.g. a group of object made of metal. Classify in different ways one type of object made from a range of materials e.g. a collection of spoons made of different materials. Classify materials based on their properties. Test the properties of objects e.g. absorbency of cloths, strength of party hats made of different papers, stiffness of paper plates, waterproofness of shelters.	Group and classify animals using venn diagrams/ sorting activities. Compare different animals (have visitors with animals/visit zoo/farm) Make a cookbook/recipe for an animal e.g a cook book/recipe for a lion Design a dish for a specific animal Look at parts of animal/photographs/real objects e.g fish from fish counter. Label and draw. Experiment with senses e.g taste testing, what sound is this? Sing and recall songs to associate body with senses. Body map drawing/photographs-labelling parts of body with sense. Sense poetry Write descriptively about an animal Write a What am I? riddle about an animal During PE, follow instructions involving parts of the body Make first-hand, close observations of animals from each of the groups. Classify animals using a range of features. Take measurements of parts of their body. Look for patterns between people e.g. Do people with big hands have big feet? Classify people according to their features.	Sensory walks around school with verbal identification 'Plant hunt'-tick off list/collect on board and name Design a wild garden for different times of year/all year round plants/flowers Simple labels of flowers/ plants/trees linked to vocabulary Make close observations of leaves, seeds, flowers etc. Compare two leaves, seeds, flowers etc. Classify leaves, seeds, flowers etc. using a range of characteristics. Identify plants by matching them to named images. Make observations of how plants change over a period of time. When further afield, spot plants that are the same as those in the local area studied regularly, describing the key features that helped them.	Collect photo log/journal of same place in different weathers and discuss/show changes/label Play spot the difference between to scenes (in different weather conditions) Match clothing to different weathers-look at 'inappropriate choices' for different weather e.g sandals on rainy day. Make simple recorded weather logs/daylight logs (link to telling the Role play weather report Collect information about the weather regularly throughout the year. Collect information, regularly throughout the year, of features that change with the seasons e.g. plants, animals, humans. Gather data about day length regularly throughout the year and present this to compare the seasons.
	Key Vocabulary			
	Object, material, wood, plastic, glass, metal, water, rock, brick, paper, fabric, elastic, foil, card/cardboard, rubber, wool, clay, hard, soft, stretchy, stiff, bendy, floppy,	*living, non-living, alive, not-alive, humans, animals, fish, amphibians, birds, mammals, carnivore, herbivore, omnivore, mammals (children should be able to identify*	evergreen and deciduous plants including *daisy, oak,* and *holly, roots, stem, leaves, flowers and*	*Spring, Summer, Autumn* and *Winter* as well as seasons. Relate and compare using *weather* related terminology; *sun,*

	waterproof, absorbent, breaks/tears, rough, smooth, shiny, dull, see through, not see through	*common examples of each variety, including those kept as pets)* Children should also use words to discuss senses and the related body parts; *sense, eye, sight, see, ear, nose, smell, touch, taste, tongue* Words to compare; *tall, taller, tallest, small, smallest, smaller than, like, similar to, different from* *Head, body, mouth, teeth, leg, tail, wing, claw, fin, scales, feathers, fur, beak, paws, hooves*	*roots. blossom, petal, fruit, berry, seed, trunk, branch, bark, stalk, bud*	*rain, snow, frost, dry, wind, cloudy, hot, cold, warm, cool,* as well as some reference to day length. *sunrise, sunset, day length*
Next steps				
1	**Year 2** Describe the simple physical properties of a variety of everyday materials; compare and group together a variety of materials based on their simple physical properties; explore how the shapes of solid objects can be changed (squashing, bending, twisting, stretching; identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper, cardboard for particular uses; explain how things move on different surfaces; find out about people who developed useful new materials (e.g. John Dunlop, Charles Macintosh, John McAdam) **Year 4 States of matter** Compare and group solids, liquids and 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 **Year 5 Materials** Compare and group together everyday materials on the basis of their properties, including hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets; know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution; use knowledge of solids, liquids and gases to separate mixtures, including through filtering, sieving and evaporating; give reasons, based on evidence from comparative and fair tests, for uses of everyday materials, including metals, wood and plastic; demonstrate that dissolving, mixing and changes of state are reversible changes; explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda	**Year 2** Explore and compare the difference between things that are living, dead & 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; Describe how animals obtain their food from plants and other animals. **Year 3** Identify that animals, inc humans, need the right types and amount of nutrition, and they cannot make their own food; they get their nutrition from what they eat; Know how nutrients, water and oxygen are transported within animals and humans; Know about the importance of a nutritious, balanced diet; Identify that humans and some other animals have skeletons and muscles for support, protection and movement; Know about the skeletal and muscular system of a human. **Year 4 Human Body – Digestion and Teeth** Identify that animals need the right nutrition and that this comes from what they eat; describe the main parts of the digestive system; explore the different types of teeth in humans. **Year 6 Human Body - Nutrition, Staying healthy & Circulatory system** Explain the human circulatory system in detail and impact of diet, exercise, drugs and lifestyle; describe how nutrients are transported in the body **Year 6 Living things - Classification** Give reasons for classifying plants and animals; construct and interpret a variety of food chains; identify and name a variety of animals including fish, amphibians, reptiles, birds and mammals; identify and name a variety of common animals that are carnivores, herbivores and omnivores.	**Year 2** 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. **Year 3** Name and describe functions of flowering plants; explore the requirements of plants for life; investigate how water is transported in plants; explore the part that flowers play in the life cycle **Year 5 Living things - Life cycles** Describe reproduction in plants and animals; name and describe functions of flowering plants; explore the requirements of plants for life; explore the part that flowers play in the life cycle	**Year 5 Earth, Sun and Moon** Describe the movement of the Earth and other planets relative to the sun in the solar system; describe the movement of the moon and Earth; describe the sun, Earth and moon as spherical; explain the process of day and night; explain that objects fall to Earth due to gravity

2	**Materials** • to describe the simple physical properties of a variety of everyday materials • to compare and group together a variety of materials based on their simple physical properties • to explore how the shapes of solid objects can be changed (squashing, bending, twisting, stretching • to identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper, cardboard for particular uses • to explain how things move on different surfaces • to find out about people who developed useful new materials (e.g. John Dunlop, Charles Macintosh, John McAdam)	**Animals including humans** • to describe that animals need water, food, and air to survive • to explain why animals have offspring which grow into adults • to describe the life cycle of some living things (e.g. egg, chick, chicken) • to describe why exercise is important for humans • to describe why a balanced diet is important for humans • to describe why good hygiene is important for humans	**Living things and their habitats** • to match certain living things to the habitats they are found in • to explain the differences between living and non-living things • to decide whether something is living, dead or non-living • to describe how a habitat provides for the basic needs of things living there • to describe a range of different habitats • to describe how plants and animals are suited to their habitat	**Plants** • to describe what plants need to survive • to observe and describe how seeds and bulbs grow into mature plants • to find out & describe how plants need water, light and a suitable temperature to grow and stay healthy
	Scientific Enquiry			
	Design and test. Make predictions (See Y1 for further ideas to extend upon) Explore and experiment with materials. Tick sheet against properties/uses Classify materials. Make suggestions about alternative materials for a purpose that are both suitable and unsuitable Test the properties of materials for particular uses e.g. compare the stretchiness of fabrics to select the most appropriate for Elastigirl's costume, test materials for waterproofness to select the most appropriate for a rain hat	Sequencing life cycles Survival rucksack, desert island etc Draw/make a healthy plate Food experiments e.g 3 slices of bread; everyone touches, one touches and use tongs- which goes mouldy first in plastic sandwich bag (Make predictions/ explain) Make hygiene poster/presentation Explore the outside environment regularly to find objects that are living, dead and have never lived. Ask people questions and use secondary sources to find out about the life cycles of some animals. Observe animals growing over a period of time e.g. chicks, caterpillars, a baby. Ask questions of a parent about how they look after their baby. Ask pet owners questions about how they look after their pet. Explore the effect of exercise on their bodies. Classify food in a range of ways, including using the Eatwell Guide.	Observational work of a plant (living) Cut down and observe changes as it dies. Explore what things need to stay alive Design a habitat for a mythical/ real animal Observe at pictures of habitats/places and predict who might live there Make habitats and predict which animals might live there - observe over time Classify objects found in the local environment. Observe animals and plants carefully, drawing and labelling diagrams. Create simple food chains for a familiar local habitat from first-hand observation and research. Create simple food chains from information given e.g. in picture books (Gruffalo etc.).	Plant and observe e.g 'plant growth diary'. Rearrange and label photographs of growth in wrong order Can they find the odd one out? Observation over time - take a variable in plant growth away - keep a diary and, make predictions Make close observations of seeds and bulbs. Classify seeds and bulbs. Research and plan when and how to plant a range of seeds and bulbs. Look after the plants as they grow – weeding, thinning, watering etc. Make close observations and measurements of their plants growing from seeds and bulbs. Make comparisons between plants as they grow.

		Investigate washing hands, using glitter gel.		
	Key Vocabulary			
	Names of materials – *increased range from year 1* Properties of materials - as for year 1 plus *opaque, transparent and translucent, reflective, non-reflective, flexible, rigid, shape, push/pushing, pull/puling, twist/twisting, squash/squashing. Bend/bending, stretch/stretching*	*Offspring, reproduction, growth, child, young/old stages (eg - chick/hen, baby/child/adult, caterpillar/butterfly), exercise, heartbeat, breathing, hygiene, germs, disease,* food types *(meat, fish, vegetables, bread, rice, pasta)*	*Living, dead, never been alive, suited, suitable, basic needs, food, food chain, shelter, move, feed, names of local habitats e.g. pond, woodland etc.,* names of micro-habitats *e.g. under logs, in bushes etc.*	As for year 1 plus - *light, shade, sun, warm, cool, water, grow, healthy, germinate*
	Prior Learning			
	Year 1 To distinguish between an object and the material from which it is made; to describe materials using my senses, using specific scientific words; to explain what material objects are made from; to explain why a material might be useful for a specific job; to name some different everyday materials e.g. wood, plastic, metal, water and rock; to sort materials into groups on the basis of simple physical properties e.g. shiny / dull, rough / smooth; to explain how solid shapes can be changed by squashing, bending, twisting and stretching.	**Year 1** To point out some of the differences and compare the bodies of different animals; to identify and name a variety of common animals that are birds, fish, amphibians, reptiles, mammals and invertebrates; to identify and name a variety of common animals that are carnivores, herbivores and omnivores; to identify the main parts of the human body and link them to their senses to name the parts of an animal's body		**Year 1** To identify and name a variety of common wild and garden plants, including deciduous and evergreen trees; to identify and describe the basic structure of a variety of common flowering plants, including trees; to identify and name the roots, trunk, branches and leaves of a tree.
	Next Steps			
	Year 4 States of matter Compare and group solids, liquids and 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. **Year 5 Materials** Compare and group together everyday materials on the basis of their properties, including hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets; know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution; use knowledge of solids, liquids and gases to separate mixtures, including through filtering, sieving and evaporating; give reasons, based on evidence from comparative and fair tests, for uses of everyday materials, including metals, wood and	**Year 3** Identify that animals, inc humans, need the right types and amount of nutrition, and they cannot make their own food; they get their nutrition from what they eat. Know how nutrients, water and oxygen are transported within animals and humans. Know about the importance of a nutritious, balanced diet. Identify that humans and some other animals have skeletons and muscles for support, protection and movement. Know about skeletal/muscular system of human **Year 4 Human Body – Digestion and Teeth** Identify that animals need the right nutrition and that this comes from what they eat; describe the main parts of the digestive system; explore the different types of teeth in humans	**Year 4** 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. **Year 6 Living things - Classification** Give reasons for classifying plants and animals; construct and interpret a variety of food chains; identify and name a variety of animals including fish, amphibians, reptiles, birds and mammals; to identify and name a variety of common animals that are carnivores, herbivores and omnivores	**Year 3** Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers; Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal; Explain the requirements of plants for life and growth (air, light, water, nutrients from soil, room to grow) and how they vary from plant to plant; Know the way in which water is transported within plants. **Year 5 Living things - Life cycles** Describe reproduction in plants and animals; name and describe functions of flowering plants; to explore the requirements of plants for life; to explore the part that flowers play in the life cycle

	plastic; demonstrate that dissolving, mixing and changes of state are reversible changes.	**Year 6 Human Body - Nutrition, Staying healthy & Circulatory system** Explain the human circulatory system in detail and impact of diet, exercise, drugs and lifestyle; describe how nutrients are transported in the body		

3	**Plants** • to name and describe functions of flowering plants • to explore the requirements of plants for life • to investigate how water is transported in plants • to explore the part that flowers play in the life cycle	**Light and Shadow** • to recognise that they need light in order to see things • to notice that light is reflected from surfaces • to recognise that light from the sun can be dangerous • to recognise that shadows are formed when the light from a light source is blocked by a solid object • to find patterns in the way that size of shadows change	**Rocks (including fossils)** • to compare and group different kinds of rocks on the basis of appearance and simple physical properties • to describe in simple terms how fossils are formed when things that have lived are trapped within rock • to recognise that soils are made from rocks and organic matter	**Animals, including humans** • to identify that some animals have skeletons and muscles for support, protection and movement • to identify that animals need the right nutrition and that this comes from what they eat	**Forces and Magnets** • to compare how things move on different surfaces • to notice that some forces need contact between 2 objects, but magnetic forces can act at a distance • to observe how magnets attract or repel each other • to compare and group together materials on the basis of whether they are attracted to a magnet • to describe magnets as having 2 poles • to predict whether 2 magnets will attract or repel
	Scientific Enquiry				
	Observe what happens to plants over time when the leaves or roots are removed Observe the effect of putting cut white carnations or celery in coloured water Investigate what happens to plants when they are put in different conditions e.g. in darkness, in the cold, deprived of air, different types of soil, different fertilisers, varying amount of space Spot flowers, seeds, berries and fruits outside throughout year Observe flowers carefully to identify the pollen Observe flowers being visited by pollinators e.g. bees and butterflies in the summer Observe seeds being blown from the trees e.g. sycamore seeds	Explore how different objects are more or less visible in different levels of lighting Explore how objects with different surfaces e.g. shiny vs matt are more or less visible Explore how shadows vary as the distance between a light source, an object or surface is changed Explore shadows which are connected to and disconnected from the object e.g. shadows of clouds and children in the playground Choose suitable materials to make shadow puppets Create artwork using shadows	Observe rocks closely Classify rocks in a range of ways based on their appearance Devise a test to investigate the hardness of a range of rocks Devise a test to investigate how much water different rocks absorb Observe how rocks change over time e.g. gravestones or old building Research using secondary sources how fossils are formed Observe soils closely Classify soils in a range of ways based on their appearance Research the work of Mary Anning	Classify food in a range of ways Use secondary sources to find out they types of food that contain the different nutrients Plan a daily diet contain a good balance of nutrients Use secondary sources to research the parts and functions of the skeleton Investigate pattern seeking questions such as • Can people with longer legs run faster? • Can people with bigger hands catch a ball better? Compare, contrast and classify skeletons of different animals	Carry out investigations to explore how objects move on different surfaces e.g. spinning tops/coins, rolling balls/cars, clockwork toys, soles of shoes etc. Explore what materials are attracted to a magnet Classify materials according to whether they are magnetic Explore the way that magnets behave in relation to each other Use a marked magnet to find the unmarked poles on other types of magnets Explore how magnets work at a distance e.g. through the table, in water, jumping paper clip up off the table Devise an investigation to test the strength of magnets
	Key Vocabulary				
	Photosynthesis, pollen, insect/wind pollination, seed formation, seed dispersal, wind dispersal, animal dispersal, water dispersal	Light, light source, dark, absence of light, transparent, translucent, opaque, shiny, matt, surface, shadow, reflect, mirror, sunlight, dangerous	Rock, stone, pebble, boulder, grain, crystals, layers, hard, soft, texture, absorb water, soil, fossil, marble, chalk, granite, sandstone, slate, soil, peat, sandy/chalk/clay soil, sedimentary,	Nutrition, nutrients, carbohydrates, sugars, protein, vitamins, minerals, fibre, fat, water, skeleton, bones, muscles, support, protect, move, skull, ribs, spine, muscles, joints, contract, relax	Force, push, pull, twist, contact force, non-contact force, magnetic force, magnet, strength, bar magnet, ring magnet, button magnet, horseshoe magnet, attract, repel, magnetic material, metal, iron, steel, poles, north pole, south pole

Prior Learning				
Year 2 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. **Year 1** Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees. Identify and describe the basic structure of a variety of common flowering plants. Identify and name the roots, trunk, branches and leaves of a tree.			**Year 2** Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene. Know that animals, including humans, have offspring which grow into adults Know the basic stages in a life cycle for animals, including humans. Find out and describe the basic needs of animals, including humans, for survival (water, food and air). **Year 1** 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.	
Next steps				
Year 5 Living things - Life cycles • to describe reproduction in plants and animals • to name and describe functions of flowering plants • to explore the requirements of plants for life • to explore the part that flowers play in the life cycle	**Year 6 Light and how we see** • to recognise that light travels in straight lines • to explain that we see things because light travels from light sources to our eyes (or via reflections) • to explain why shadows have the same shape as the objects that cast them		**Year 4 Human Body – Digestion and Teeth** • to identify that animals need the right nutrition and that this comes from what they eat • to describe the main parts of the digestive system • to explore the different types of teeth in humans **Year 5 Human Body - Birth to old age** • to describe changes as humans develop to old age **Year 6 Human Body Nutrition, Staying healthy & Circulatory system** • to explain the human circulatory system in detail and impact of diet, exercise, drugs and lifestyle • to describe how nutrients are transported in the body	**Year 5 Forces** • to explain effects of air/water resistance and friction • to recognise that some mechanisms allow a smaller force to have a greater effect

4	**Sound** • to identify how sounds are made, associating some of them with something vibrating • to recognise that vibrations from sounds travel through a medium to the ear • to find patterns between the pitch of a sound and features of the object that produced it • to find patterns between the volume of a sound and the strength of the vibrations that produced it • to recognise that sounds get fainter as the distance from the sound source increases	**Electricity** • to identify common appliances that run on electricity • to construct a simple circuit, naming its basic parts • to identify whether a circuit is complete • to recognise some common conductors and insulators, and associate metals with being good conductors	**Human Body – Digestion and Teeth** • to identify that animals need the right nutrition and that this comes from what they eat • to describe the main parts of the digestive system • to explore the different types of teeth in humans	**Living things - Classification keys, Habitats, Food chains** • to recognise that living things can be grouped • to explore and use classification keys to help group, identify and name a variety of living things • to recognise that environments can change and that this can sometimes pose dangers to living things • to construct and interpret a variety of food chains	**States of matter** • to compare and group solids, liquids and gases • to 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) • to identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature
	Scientific Enquiry				
	Classify sound sources Explore making sounds with a range of objects such as musical instruments and other household objects Explore how string telephones or ear gongs work Explore using objects that change in feature to change pitch and volume such as length of guitar string, bottles of water or tuning forks Measure sounds over different distances Measure sounds through different insulation materials	Construct a range of circuits Explore which materials can be used instead of wires to make a circuit Classify the materials that were suitable/not suitable for wires Explore how to connect a range of different switches and investigate how they function in different ways Choose switches to add to circuits to solve particular problems such as a pressure switch for a burglar alarm Apply their knowledge of conductors and insulators to design and make different types of switch	Research the function of the parts of the digestive system Create a model of the digestive system using household objects Explore eating different types of food, to identify which teeth are being used for cutting, tearing and grinding (chewing) Classify animals as herbivores, carnivores or omnivores according to the type of teeth they have in their skulls	Use food chains to identify producers, predators and prey within a habitat Use secondary sources to identify animals in a habitat and find out what they eat Observe plants and animals in different habitats throughout the year Compare and contrast the living things observed Use classification keys to name unknown living things Classify living things found in different habitats based on their features Create a simple identification key based on observable features Use secondary sources to find out about human impact, both positive and negative, on environments	Observe closely and classify a range of solids Observe closely and classify a range of liquids Explore making gases visible e.g. squeezing sponges under water to see bubbles, and showing their effect e.g. using straws to blow objects, trees moving in the wind Classify materials according to whether they are solids, liquids and gases Observe a range of materials melting e.g. ice, chocolate, butter Investigate how to melt ice more quickly Observe the changes when making rocky road cakes or ice-cream Investigating melting point of different materials e.g. ice, margarine, butter and chocolate Explore freezing different liquids e.g. tomato ketchup, oil, shampoo Use a thermometer to measure temperatures e.g. icy water (melting), tap water, hot water, boiling water (demonstration) Observe water evaporating and condensing e.g. on cups of icy water and hot water Set up investigations to explore changing the rate of evaporation e.g. washing, puddles, handprints on paper towels, liquids in containers Use secondary sources to find out about the water cycle

	Key Vocabulary				
	Sound, source, vibrate, vibration, travel, pitch (high, low), volume, faint, loud, insulation	Electricity, electrical appliance/device, mains, plug, electrical circuit, complete circuit, component, cell, battery, positive, negative, connect/connections, loose connection, short circuit, crocodile clip, bulb, switch, buzzer, motor, conductor, insulator, metal, non-metal, symbol N.B. Children in year 4 do not ned to use standard symbols as this is taught in year 6	Digestive system, digestion, mouth, teeth, saliva, oesophagus, stomach, small intestine, nutrients, large intestine, rectum, anus, teeth, incisor, canine, molar, premolars, herbivore, carnivore, omnivore, producer, predator, prey, food chain	Classification, classification keys, environment, habitat, human impact, positive, negative, migrate, hibernate	Solid, liquid, gas, state change, melting, freezing, melting point, boiling point, evaporation, temperature, water cycle, condensation, precipitation
	Prior Learning				
			Year 3 Identify that animals, inc humans, need the right types and amount of nutrition, and they cannot make their own food; they get their nutrition from what they eat. Know how nutrients, water and oxygen are transported within animals and humans. Know about the importance of a nutritious, balanced diet. Identify that humans and some other animals have skeletons and muscles for support, protection and movement. Know about the skeletal and muscular system of a human.	**Year 2** Explore and compare the difference between things that are living, dead & 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. Describe how animals obtain their food from plants and other animals.	
	Next steps				
		Year 6 Electricity • to associate lamp brightness or volume of a buzzer with the number/voltage of cells in the circuit • to use recognised symbols in a simple circuit diagram	**Year 6 Human Body Nutrition, Staying healthy & Circulatory system** • to explain the human circulatory system in detail and impact of diet, exercise, drugs and lifestyle	**Year 6 Living things - Classification** • to give reasons for classifying plants and animals • to construct and interpret a variety of food chains • to identify and name a variety of animals including fish,	**Year 5 Materials** • to compare and group together everyday materials on the basis of their properties, including hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets • to know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution • to use knowledge of solids, liquids and gases to separate mixtures, including through filtering, sieving and evaporating

			• to describe how nutrients are transported in the body	amphibians, reptiles, birds and mammals • to identify and name a variety of common animals that are carnivores, herbivores and omnivores	• to give reasons, based on evidence from comparative and fair tests, for uses of everyday materials, including metals, wood and plastic • to demonstrate that dissolving, mixing and changes of state are reversible changes • to 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

5	**Living things - Life cycles** • to compare the life cycles of different animals • to describe reproduction in plants and animals • to name and describe functions of flowering plants • to explore the requirements of plants for life • to explore the part that flowers play in the life cycle	**Human Body - Birth to old age** • to describe changes as humans develop to old age	**Materials** • to compare and group together everyday materials on the basis of their properties, including hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets • to know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution • to use knowledge of solids, liquids and gases to separate mixtures, including through filtering, sieving and evaporating • to give reasons, based on evidence from comparative and fair tests, for uses of everyday materials, including metals, wood and plastic • to demonstrate that dissolving, mixing and changes of state are reversible changes • to 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	**Forces** • to explain effects of air/water resistance and friction • to recognise that some mechanisms allow a smaller force to have a greater effect	**Earth, Sun and Moon** • to describe the movement of the Earth and other planets relative to the sun in the solar system • to describe the movement of the moon and Earth to describe the sun, Earth and moon as spherical • to explain the process of day and night • to explain that objects fall to Earth due to gravity
	Scientific Enquiry				
	Use secondary sources and, where possible, first hand observations to find out about the life cycle of a range of animals Compare the gestation times for mammals and look for patterns e.g. in relation to size of animal or length of dependency after birth Look for patterns between the size of an animal and its expected life span Grow and observe plants that reproduce asexually e.g. strawberries, spider plant, potatoes Take cuttings from a range of plants e.g. African violet, mint Plant bulbs and then harvest to see how they multiply Use secondary sources to find out about pollination		Investigate the properties of different materials in order to recommend materials for particular functions depending on these properties e.g. test waterproofness and thermal insulation to identify a suitable fabric for a coat Explore adding a range of solids to water and other liquids e.g. cooking oil, as appropriate Investigate rates of dissolving by carrying out comparative and fair test Separate mixtures by sieving, filtering and evaporation, choosing the most suitable method and equipment for each mixture Explore a range of non-reversible changes e.g. rusting, adding fizzy tablets to water, burning Carry out comparative and fair tests involving non-reversible changes e.g. What affects the rate of rusting? What affects the amount of gas produced? Research new materials produced by chemists e.g. Spencer Silver (glue of sticky notes) and Ruth Benerito (wrinkle free cotton)	Investigate the effect of friction in a range of contexts e.g. trainers, bath mats, mats for a helter-skelter Investigate the effects of water resistance in a range of contexts e.g. dropping shapes through water, pulling shapes e.g. boats along the surface of water Investigate the effects of air resistance in a range of contexts e.g. parachutes, spinners, sails on boats Explore how levers, pulleys and gears work Make a product that involves a lever, pulley or gear Create a timer that uses gravity to move a ball Research how the work of scientists such as Galileo Galilei and Isaac Newton helped to develop the theory of gravitation	Use secondary sources to help create a model e.g. role play or using balls, to show the movement of the Earth around the Sun and the Moon around the Earth. Use secondary sources to help make a model to show why day and night occur Make first-hand observations of how shadows caused by the Sun change through the day Make a sundial Research time zones Consider the views of scientists in the past and evidence used to deduce shapes and movements of the Earth, Moon and planets before space travel

Key Vocabulary				
Life cycle, reproduce, sexual, sperm, fertilises, egg, live young, metamorphosis, asexual, plantlets, runners, bulbs, cuttings	Puberty: the vocabulary to describe sexual characteristics inc growth, development, puberty, gestation, infancy/infant, youth, teenager, stage, change, develop, elderly, age, death, hormones,	Thermal/electrical insulator/conductor, change of state, mixture, dissolve, solution, soluble, insoluble, filter, sieve reversible/non-reversible change, burning, rusting, new material	Force, gravity, Earth, air resistance, water resistance, upthrust, friction, mechanisms, simple machines, levers, pulleys, gears	Earth, Sun, Moon, (Mercury, Jupiter, Saturn, Venus, Mars, Uranus, Neptune) spherical, solar system, rotates, star, orbit, planets rotation, spin, axis, orbit, daytime, night-time, gravity, solar, star, lunar, satellite, crescent, sunrise, sunset, shadow, sky, equator, poles, hemisphere, astronomy
Prior Learning				
Year 4 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. Know and label the features of a river Recognise that environments can change and that this can sometimes pose danger to living things. **Year 3** Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers. Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. Explain the requirements of plants for life and growth (air, light, water, nutrients from soil, room to grow) and how they vary from plant to plant. Know the way in which water is transported within plants.	.	**Year 4** Compare and group materials together, according to whether they are solids, liquids or gases. Observe that some materials change state when heated or cooled, and measure and research the temperature at which this happens in degrees Celsius. Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature	**Year 3** Compare how things move on different surfaces. Know how a simple pulley works and use making lifting an object simpler Notice that some forces need contact between two objects, but magnetic forces can act at a distance. Observe how magnets attract and repel each other and attract some materials and not others. Compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials. Describe magnets as having two poles. Predict whether two magnets with attract or repel each other, depending on which poles are facing.	

	Next Steps				
	Year 6 Living things - Classification • to give reasons for classifying plants and animals • to construct and interpret a variety of food chains • to identify and name a variety of animals including fish, amphibians, reptiles, birds and mammals • to identify and name a variety of common animals that are carnivores, herbivores and omnivores				

6	**Living things - Classification** • to give reasons for classifying plants and animals • to construct and interpret a variety of food chains • to identify and name a variety of animals including fish, amphibians, reptiles, birds and mammals • to identify and name a variety of common animals that are carnivores, herbivores and omnivores	**Evolution and adaptation** • to recognise that living things change over time and that fossils provide information about this • to identify how animals and plants are adapted to suit their environment in different ways	**Human Body - Nutrition** **Staying healthy** **Circulatory system** • to explain the human circulatory system in detail and impact of diet, exercise, drugs and lifestyle • to describe how nutrients are transported in the body	**Light and how we see** • to recognise that light travels in straight lines • to explain that we see things because light travels from light sources to our eyes (or via reflections) • to explain why shadows have the same shape as the objects that cast them	**Scientific enquiry**	**Electricity** • to associate lamp brightness or volume of a buzzer with the number/voltage of cells in the circuit • to use recognised symbols in a simple circuit diagram
	Scientific enquiry					
	Use secondary sources to learn about the formal classification system devised by Carl Linnaeus and why it is important Use first hand observation to identify characteristics shared by the animals in a group Use secondary sources to research the characteristics of animals that belong to a group Use information about the characteristics of an unknown animal or plant to assign it to a group Classify plants and animals presenting this in a range of ways – Venn diagrams, Carroll diagrams and keys Create an imaginary animal which has features from one or more groups	Design a new plant or animal to live in a particular habitat Use models to demonstrate evolution e.g. Darwin's finches bird beak activity Use secondary sources to find out about how the population of peppered moths changed during the industrial revolution Make observations of fossils to identify living things that lived on Earth millions of years ago Identify features in animals and plants that are passed on to offspring Explore this process by considering the artificial breeding of animals or plants e.g. dogs Compare the ideas of Charles Darwin and Alfred Wallace on evolution Research the work of Mary Anning and how this provided evidence of evolution	Create a role play model for the circulatory system Carry out a range of pulse rate investigations Fair test – effect of different activities on my pulse rate Pattern seeking – exploring which groups of people may have higher or lower resting pulse rates Observation over time - how long does it take my pulse rate to return to my resting pulse rate (recovery rate) Pattern seeking – exploring recovery rate for different groups of people Learn about the impact of exercise, diet, drugs and lifestyle on the body. This is likely to be taught through direct instruction due to its sensitive nature	Explore different ways to demonstrate that light travels in straight lines e.g. shining a torch down a bent and straight hose pipe, shining a torch through different shaped holes in card Explore the uses of the behaviour of light, reflection and shadows such as in periscope design, rear view mirrors and shadow puppets.		Explain how a circuit operates to achieve particular operations, such as control the light for a torch with different brightnesses or make a motor go faster or slower Make circuits to solve particular problems such as a quiet and a loud burglar alarm Carry out fair tests exploring changes in circuits Make circuits that can be controlled as part of a D&T project

Key Vocabulary					
Vertebrates, fish, amphibians, reptiles, birds, mammals, invertebrates, insects, spiders, snails, worms, flowering and non-flowering, micro-organisms, subdivisions, vertebrates, characteristics, classification, classify, deciduous, differences, evergreen, groups, insects, invertebrates, keys, molluscs, plants, similarities	Offspring, sexual reproduction, vary, characteristics, suited, adapted, environment, inherited, species, fossils, adaptation, changes, Darwin, differences, evolution, generations, genes, inherit, inheritance, parents, similarities, survival of the fittest, variation, interdependence, habitat, advantages/disadvantages.	Heart, pulse, rate, pumps, blood, blood vessels, transported, lungs, oxygen, carbon dioxide, nutrients, water, muscles, cycle, circulatory system, diet, exercise, drugs, lifestyle, circulation, circulatory system, blood, veins, arteries, capillaries, oxygenate, deoxygenate, function, health, diet, balance, protein, calcium, dairy, carbohydrate, vitamins, minerals, fruit, vegetables, medicines, drugs, effects, smoking, tobacco, tar, carbon-monoxide, stimulant, depressant, alcohol, intoxication, substances, harmful, effects, lifestyle, addiction, illegal, abuse,	Light, light source, dark, absence of light, transparent, translucent, opaque, shiny, matt, surface, shadow, reflect, mirror, sunlight, dangerous, straight lines, light rays.		Circuit, circuit diagram, circuit symbol, cell, battery, bulb, buzzer, motor, switch, voltage component, current, matched, wires, break, electrical conductor, electrical insulator, metal, non-metal, plastic, voltage, plug, volts, symbols, series circuit, safety, components, uses, control, NB Children do not need to understand what voltage is but will use volts and voltage to describe different batteries. The words cells and batteries are now used interchangeably
Prior Learning					
Year 5 Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird. Describe the life process of reproduction in some plants and animals. **Year 4** 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. Know and label the features of a river		**Year 4** Describe the simple functions of the basic parts of the digestive system in humans. Identify the different types of teeth in humans and their simple functions. Construct and interpret a variety of food chains, identifying producers, predators and prey. Year 5 Know the life cycle of different living things, e.g. Mammal, amphibian, insect bird. Know the differences between different life cycles. Know the process of	**Year 3** Recognise that they need light in order to see things and that dark is the absence of light. Notice that light is reflected from surfaces. Recognise that light from the sun can be dangerous and that there are ways to protect their eyes. Recognise that shadows are formed when the light from a light source is blocked by a solid object. Find patterns in the way that the sizes of shadows change.		**Year 4** Identify common appliances that run on electricity Construct a simple circuit, naming its basic parts Identify whether a circuit is complete Recognise some common conductors and insulators, and associate metals with being good conductors

	Recognise that environments can change and that this can sometimes pose danger to living things.		reproduction in plants. Know the process of reproduction in animals. **Year 3** Identify that animals, including humans, need the right types and amount of nutrition, and they cannot make their own food; they get their nutrition from what they eat. Know how nutrients, water and oxygen are transported within animals and humans. Know about the importance of a nutritious, balanced diet. Identify that humans and some other animals have skeletons and muscles for support, protection and movement: Know about the skeletal and muscular system of a human.			

When working with tools, equipment and materials in practical activities and in different environments, pupils should be taught:

- about hazards, risks and risk control;
- to recognise hazards, assess consequent risks and take steps to control the risks to themselves and others;
- to use information to assess the immediate and cumulative risks;
- to manage their environment to ensure the health and safety of themselves and others;
- to explain the steps they take to control risks.