Whole School Science Overview 2019-2020

Subject	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer
Reception	Talks about or responds to what they are seeing or experiencing in the natural world. (By 24 months) Shows care and concern for living things and the environment. (By 42 months) Responds to experiences and explorations of why things happen and how things work in the 'natural' and 'made' world. (By 48 months) Looks closely at similarities, differences, patterns and change in own environment and that of others. (By 54 months) Knows that living things live, grow and die. (By 60 months) Knows about similarities and differences in relation to places, objects, materials and living things. Can make observations of animals and plants and explain why some things occur and talk about changes. (By 66months) Knows that the environment and living things are influenced by human activity. Can describe some actions which people in their own community do that helps to maintain the area they live in. Knows the properties of some materials and can suggest some of the purposes they are used for. (By 67 months +)					

Reception Working Scientifically	**Planning**	Asking questions	Asks questions about aspects of their familiar world
		Planning detail	Generate a variety of ideas for testing (not always appropriate/ realistic)
	Observing	Using equipment	Measure by direct comparison Non-standard units of measurement –it's the length of an arm Simple comparative vocabulary – bigger, smaller
		Making observations	General sensory observations of animals and plants. Simple descriptions of the world around them. Look at objects and pictures and discus what they can see.
	Recording	Presenting evidence	Talk about objects and events. Simple recording – pictures/images.
	Concluding	Drawing conclusions	Notice 'which worked best' – simple comparative statements.
		Explaining evidence	Answer initial question simply. Answer how and why questions about their experiences
	Evaluating	Evaluating outcomes	NA

Whole School Science Overview 2019-2020

	Autumn	Spring	Summer
Year 1	**Animals including humans** Types of animals Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense **Plants** Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees	**Seasonal Change** Observe changes across the 4 seasons Observe and describe weather associated with the seasons and how day length varies **Plants** Identify and describe the basic structure of a variety of common flowering plants, including trees	**Everyday materials** Comparing Describe the simple physical properties of a variety of everyday materials Compare and group together a variety of everyday materials on the basis of their simple physical properties Identifying 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 **Animals including humans** Parts of animals 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 Types of animals Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals including pets)

Year 1 Working Scientifically	**Planning**	Asking questions	Recognise the difference between a statement and a question. Begin to shape questions using different question stems.
		Planning detail	Decides which questions can be answered practically and which cannot. Suggests next step, or a sequence of steps, in a plan.
	Observing	Using equipment	Begin to choose appropriate equipment to use to make observations and follows simple instructions for using it correctly and safely.
		Making observations	Make relevant observations in familiar contexts. With support, take some non-standard measurements.
	Recording	Presenting evidence	Use drawings and labels to present evidence. With support, uses prepared simple tables and charts, including ICT forms.
	Concluding	Drawing conclusions	Describe simple observations of an object or objects or of an event and with support makes a simple comparison.
		Explaining evidence	With support, recognises the links between cause and effect in simple, familiar situations
	Evaluating	Evaluating outcomes	Review work and with support, recognise some of the difficulties encountered.

Whole School Science Overview 2019-2020

	Autumn	Spring	Summer
Year 2	**USES OF EVERYDAY MATERIALS** Uses of 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. **USES OF EVERYDAY MATERIALS** Changing shape Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.	**ANIMALS INCLUDING HUMANS** Living things Explore and compare the differences between things that are living, dead, and things that have never been alive Notice that animals, including humans, have offspring which grow into adults.	**LIVING THINGS AND THEIR HABITATS** Habitats 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. **ANIMALS INCLUDING HUMANS** Feeding and exercise 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 Find out about and describe the basic needs of animals, including humans, for survival (water, food and air) Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.
		PLANTS Growing plants 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 2 Working Scientifically	**Planning**	Asking questions	With support, suggest own questions that they might investigate.
		Planning detail	Decide independently simple questions that could be answered practically and some that cannot.
	Observing	Using equipment	Chooses appropriate equipment from a selection and follows instructions for using it, sometimes working independently of adult support.
		Making observations	Make relevant observations. Take non-standard measurements. Begin to use basic equipment for measuring length or mass, in standard units.
	Recording	Presenting evidence	Use drawings and labels to present evidence. Use prepared tables and block graphs, including ICT forms.
	Concluding	Drawing conclusions	Describe what has happened, making comparisons where appropriate. With support, sequences results, e.g. from smallest to largest.
		Explaining evidence	Recognise the link between cause and effect in simple, familiar situations. Begin to notice simple patterns in results.
	Evaluating	Evaluating outcomes	Review their work and recognises some of the difficulties encountered. With support, suggests how these might have been avoided.

Whole School Science Overview 2019-2020

	Autumn	Spring	Summer
Year 3	**PLANTS** Parts of plants • identify and describe the functions of different parts of flowering plants: roots, stem/ trunk, leaves and flowers • 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. **ROCKS AND SOILS** • 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.	**FORCES** Magnets and forces 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. **LIGHT** Light and shadow • recognise that they need light in order to see things and that dark is the absence of light • understand and 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 size of shadows change	**ANIMALS INCLUDING HUMANS** Movement and feeding • 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 . **PLANTS** What plants need • Explore the requirements of plants for life and growth (air, light, water, nutrients from soil and room to grow) How they vary from plant to plant.

Year 3 Working Scientifically	**Planning**	Asking questions	Ask questions independently and generate own ideas to explore through Scientific enquiry.
		Planning detail	Recognise when to answer a question by using a fair test method and when other methods might be needed. In a fair test, identify what to keep the same and sometimes ant to change and measure.
	Observing	Using equipment	Select from a wider range of equipment what to use in an investigation. Use basic equipment correctly, safely and with increasing accuracy.
		Making observations	Make relevant observations throughout an investigation. Use standard measuring equipment for quantities, such as volume and temperature.
	Recording	Presenting evidence	Gather, records, classifies and presents data in a variety of ways to help in answering questions. Sometimes create own tables and bar charts, using ICT where appropriate. Interpret a line graph with support.
	Concluding	Drawing conclusions	Report on findings from enquiries, including oral and written, displays or presentations of results and conclusions. Make a general statement about simple patterns they notice in a set of results.
		Explaining evidence	Provide explanations for simple patterns in results, referring to everyday experiences when explaining reasoning.
	Evaluating	Evaluating outcomes	Suggest how an enquiry might be improved. With support, recognise some of the limitations and significance of evidence.

Whole School Science Overview 2019-2020

	Autumn	Spring	Summer
Year 4	**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 **LIVING THINGS** <u>Grouping living things</u> • 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.	**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 good conductors. **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 produced it • recognise that sounds get fainter as the distance from the sound source increases	**LIVING THINGS** <u>Dangers to living things</u> • recognise that environments can change and that this can sometimes pose dangers to living things • construct and interpret a variety of food chains, identifying producers, predators and prey. **ANIMALS INCLUDING HUMANS** <u>Human nutrition</u> • 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

Year 4 Working Scientifically	**Planning**	Asking questions	Ask questions and offer ideas for a range of scientific enquiry. With support, improve focus of question to clarify its scientific purpose.
		Planning detail	Know when to answer a question by using a fair test method and when better evidence could be generated in other ways, e.g. through a survey, diary/log or research. Set up a fair test controlling variables, what to keep the same, what to change, measure or observe.
	Observing	Using equipment	Use a wide range of equipment for example thermometers and data loggers, correctly, safely, and accurately. Deal with most equipment difficulties independently before asking for help if necessary.
		Making observations	Choose to make a series of observations that will add to the evidence they collect while investigating. With support, take accurate readings on measuring equipment, recognising when to repeat them.
	Recording	Presenting evidence	Select the most appropriate way to present evidence they have collected. Record findings using drawings, labelled diagrams, bar charts, tables and graphs, using ICT where appropriate. Use simple scientific language effectively to communicate outcomes.
	Concluding	Drawing conclusions	Make a comparative statement, sometimes referring to the factors under investigation. Identify differences, similarities, or changes related to simple scientific ideas and processes. Use straightforward scientific evidence to answer questions or to support their findings.
		Explaining evidence	Relate explanations of patterns in results to scientific knowledge and understanding when explaining reasoning.
	Evaluating	Evaluating outcomes	Suggest how much to trust results, identifying some of the limitations of evidence. Suggest new questions and predictions for setting up further tests.

Whole School Science Overview 2019-2020

	Autumn	Spring	Summer
Year 5	**ANIMALS INCLUDING HUMANS LIVING THINGS AND THEIR HABITATS** Life cycles • 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 the changes as humans develop to old age **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	**MATERIALS AND CHANGES OF STATE** Separating mixtures • 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. Types of change • 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. Materials • compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets • give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic.	**LIGHT** Light and sight (Year 6 UNIT) • 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. **FORCES** • explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object • identify the effects of air resistance, water resistance and friction, that act between moving surfaces • Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.

Year 5 Working Scientifically	**Planning**	Asking questions	Independently ask questions and offers ideas for scientific enquiry, which have a clear scientific purpose
		Planning detail	Identifies the most appropriate enquiry methods to use to generate evidence needed to solve problems and answer scientific questions. Plan familiar enquiry types in appropriate detail.
	Observing	Using equipment	Select the most appropriate equipment to use in a range of contexts and enquiries. Take measurements using a range of science equipment with increasing accuracy and precision.
		Make observations	Choose to make a series of observations or measurements that will add to the quality of the evidence collected while investigating.
	Recording	Presenting evidence	Record data and results of increasing complexity using scientific diagrams, classification keys, tables, bar and line graphs and models. Communicate findings in written form, displays and uses other forms of presentation. Uses scientific language to communicate increasingly detailed analysis.
	Concluding	Drawing conclusions	Where appropriate, make a comparative statement, describing relationships between factors being investigated. Use simple models to help describe scientific ideas.
		Explaining evidence	Relate explanations of evidence gathered to scientific knowledge and understanding. Make generalisations about what that evidence seems to indicate.
	Evaluating	Evaluating outcomes	Recognise some of the limitations of their evidence and can suggest why it should not be trusted. Use test results to set up further comparative tests.

Whole School Science Overview 2019-2020

	Autumn	Spring	Summer
Year 6	**LIVING THINGS** Classifying living things • 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 . **ANIMALS INCLUDING HUMANS** Evolution and Inheritance • recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago • recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents • identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution	**ELECTRICITY** Changing Circuits • 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 .	**ANIMALS INCLUDING HUMANS** Our bodies • 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.

Year 6 Working Scientifically	**Planning**	Asking questions	Recognise scientific questions that do not yet have definitive answers.
		Planning detail	Select methods to use to solve problems or answer questions, including a full range of enquiry methods, which are planned in detail.
	Observing	Using equipment	Explain why particular pieces of equipment or information sources will provide better quality evidence.
		Making observations	Repeats sets of observations or measurements, where appropriate, selecting suitable ranges and intervals, to give sufficient depth of evidence.
	Recording	Presenting evidence	Decide on the most appropriate formats to present sets of scientific data, such as using line graphs for continuous variables. Communicates findings in written form, across a range of genre, and uses multi-media and other forms of presentation.
	Concluding	Drawing conclusions	Use scientific evidence to answer questions or support findings. Draw valid conclusions that utilise more than one piece of supporting evidence.
		Explaining evidence	Provide explanations for differences repeated observations or measurements, identifying reasons for any anomalies noticed.
	Evaluating	Evaluating outcomes	Evaluate the effectiveness of their working methods, making practical suggestions for improving them. Identify scientific evidence that has been used to support or refute ideas or arguments.

Whole School Science Overview 2019-2020