SCIENCE

EXPECTATIONS:

Early Learning Goals which link to the Curriculum

Understanding the World (the Natural World)

Pupils at the expected level of development will:

- Explore the natural world around them, making observations and drawing pictures of animals and plants
- Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class
- Understand some important processes and changes in the natural world around them, including the seasons, simple life cycles and changing states of matter.

Key Stage 1 National Curriculum Expectations

The principal focus of science teaching in Key Stage 1 is to enable pupils to experience and observe phenomena, looking more closely at the natural and humanly constructed world around them. They should be encouraged to be curious and ask questions about what they notice. They should be helped to develop their understanding of scientific ideas by using different types of scientific enquiry to answer their own questions, including observing changes over a period of time, noticing patterns, grouping and classifying things, carrying out simple comparative tests, and finding things out using secondary sources of information. They should begin to use simple scientific language to talk about what they have found out and communicate their ideas to a range of audiences in a variety of ways. Most of the learning about science should be done through the use of first-hand practical experiences, but there should also be some use of appropriate secondary sources, such as books, photographs and videos.

Working Scientifically

'Working scientifically' is described separately in the programme of study, but must always be taught through and clearly related to the teaching of substantive science content in the programme of study. Throughout the notes and guidance, examples show how scientific methods and skills might be linked to specific elements of the content.
Pupils should read and spell scientific vocabulary at a level consistent with their increasing word-reading and spelling knowledge at Key Stage 1.

SUBJECT OVERVIEW

Lower Key Stage 2 National Curriculum Expectations	Upper Key Stage 2 National Curriculum Expectations
The principal focus of science teaching in lower Key Stage 2 is to enable pupils to broaden their scientific view of the world around them. They should do this through exploring, talking about, testing and developing ideas about everyday phenomena and the relationships between living things and familiar environments, and by beginning to develop their ideas about functions, relationships and interactions. They should ask their own questions about what they observe and make some decisions about which types of scientific enquiry are likely to be the best ways of answering them, including observing changes over time, noticing patterns, grouping and classifying things, carrying out simple comparative and fair tests and finding things out using secondary sources of information. They should draw simple conclusions and use some scientific language, first, to talk about and, later, to write about what they have found out. **Working Scientifically** 'Working scientifically' is described separately at the beginning of the programme of study, but must always be taught through and clearly related to substantive science content in the programme of study. Throughout the notes and guidance, examples show how scientific methods and skills might be linked to specific elements of the content. Pupils should read and spell scientific vocabulary correctly and with confidence, using their growing word-reading and spelling knowledge.	The principal focus of science teaching in Upper Key Stage 2 is to enable pupils to develop a deeper understanding of a wide range of scientific ideas. They should do this through exploring and talking about their ideas; asking their own questions about scientific phenomena; and analysing functions, relationships and interactions more systematically. At Upper Key Stage 2, they should encounter more abstract ideas and begin to recognise how these ideas help them to understand and predict how the world operates. They should also begin to recognise that scientific ideas change and develop over time. They should select the most appropriate ways to answer science questions using different types of scientific enquiry, including observing changes over different periods of time, noticing patterns, grouping and classifying things, carrying out comparative and fair tests and finding things out using a wide range of secondary sources of information. Pupils should draw conclusions based on their data and observations, use evidence to justify their ideas, and use their scientific knowledge and understanding to explain their findings. **Working Scientifically** 'Working and thinking scientifically' is described separately at the beginning of the programme of study, but must always be taught through and clearly related to substantive science content in the programme of study. Throughout the notes and guidance, examples show how scientific methods and skills might be linked to specific elements of the content. Pupils should read, spell and pronounce scientific vocabulary correctly.

SUBJECT OVERVIEW

STATEMENTS OF:

INTENT

Science is a fundamental subject taught at Riverside Primary School. Science contributes to the preparation of pupils for adult and working life. We teach Science to enable all pupils to reach their full potential. We offer practical opportunities for careful observations, measurement and communication in a variety of forms, prediction from perceived patterns and regularities, appreciation of cause and effect and the solving of problems in an everyday context. We aim to ensure all pupils enjoy Science and are able to ask Scientific questions linked with a variety of topics. We intend to offer a range of different investigations the pupils have the opportunity to carry out and continue to promoting independence using a variety of specially selected scientific equipment throughout the school. Each half term, we aim to reinforce previous learning and build on working scientifically skills to follow a specific enquiry.

IMPLEMENTATION

Through our Science curriculum, we cover a range of topics covering areas of Biology, Chemistry and Physics where a wide selection of key scientific vocabulary is taught. Pupils are encouraged to ask scientific questions at the start of each unit and they get the opportunity to revisit the question at the end of the unit to see if hey can add more information. During the term, each child creates a word bank with key vocabulary and, as they progress through the school, they define them in their own terms to aid their understanding. We cover both statutory and non-statutory content from the curriculum, including Science gifted and talented groups where pupils across the school are given the opportunity to participate base don the assessments we carry out. SEND pupils are given the opportunity to cover a range of science skills through our individually designed branch mapping where they encouraged to explore the world around them. Through sequencing of lessons and differentiation within some activities, pupils learn a wide range of content and working scientifically skills.

IMPACT

The pupils at Riverside thoroughly enjoy Science lessons. They develop an inquisitive outlook about the world around them, asking questions and delving further into ideas through research. Many pupils are confident in using Scientific vocabulary and are often excited to start the lessons. Progression of objectives is seen through planning across the school which is further evident in the pupils' understanding of certain topics and scientific ideas in discussions during class and outside. Academic progress is measured through scientific samples that are carried out at the end of each topic based on the content taught. These work alongside our working scientifically statements that are always available at the front of pupils' books – these progress throughout the school to aid progression. It is evident to see that by the time many pupils reach Upper Key Stage 2, they are confident at using a range of scientific equipment in a variety of investigations and their use of terminology is improved. The teachers use the pupils' passion and prior knowledge during lessons and encourage them to apply it to real life situations around them.

SUBJECT OVERVIEW

	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
ANIMALS INCLUDING HUMANS	Pupils can: • ask questions about world them. • explore, make observations and draw pictures of a variety of plants. • make observations about world around them.	Pupils can: • identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals; • identify and name a variety of common animals that are carnivores, herbivores and omnivores; • describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals including pets); • identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense	Pupils can: • notice that animals, including humans, have offspring which grow into adults; • find out about and describe the basic needs of animals, including humans, for survival (water, food and air); • describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.	Pupils can: • 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.	Pupils can: • 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.	Pupils can: • describe the changes as humans develop to old age.	Pupils can: • 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.
PLANTS	Pupils can: • ask questions about world them. • explore, make observations and draw pictures of a variety of plants. • make observations about world around them	Pupils can: • identify and name a variety of common wild and garden plants, including deciduous and evergreen trees • identify and describe the basic structure of a variety of common flowering plants, including trees	Pupils can: • 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.	Pupils can: • 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.			

SUBJECT OVERVIEW

	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
LIVING THINGS AND THEIR HABITATS	Pupils can: • ask questions about world them. • know similarities and differences between the natural world around them and contrasting environments.		Pupils can: • explore and compare the differences between things that are living, dead, and things that have never been alive; • identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other; • identify and name a variety of plants and animals in their habitats, including microhabitats; • describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food.		Pupils can: • 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.	Pupils can: • 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.	Pupils can: • describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals; • give reasons for classifying plants and animals based on specific characteristics
EVOLUTION AND INHERITANCE	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
							Pupils 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; • 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.

SUBJECT OVERVIEW

	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
SEASONAL CHANGES	Pupils can: • ask questions about world them. • identify the changes of seasons. • make observations about world around them.	Pupils can: • observe changes across the 4 seasons; • observe and describe weather associated with the seasons and how day length varies.					
FORCES				**Forces and Magnets** Pupils can: • compare how things move on different surfaces; • notice that some forces need contact between 2 objects, but magnetic forces can act at a distance; • observe how magnets attract or repel each other and attract some materials and not others; • compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials; • describe magnets as having 2 poles; • predict whether 2 magnets will attract or repel each other, depending on which poles are facing.		**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.	

SUBJECT OVERVIEW

	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
LIGHT				Pupils can: 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.			Pupils can: • 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. •
SOUND	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
					Pupils can: • 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.		

SUBJECT OVERVIEW

	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
EARTH AND SPACE						Pupils can: • 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.	
ELECTRICITY	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
					Pupils can: • 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.		Pupils can: • 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.

SUBJECT OVERVIEW

	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
MATERIALS	Pupils can: • ask questions about world them. • understands the different states of matter. • explore a variety of materials for a given purpose. • make observations about world around them.	**Everyday Materials** Pupils can: • distinguish between an object and the material from which it is made; • identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock; • describe the simple physical properties of a variety of everyday materials; • compare and group together a variety of everyday materials on the basis of their simple physical properties.	**Use of Everyday Materials** Pupils can: • identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses; • find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.	**Rocks** Pupils can: • 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.	**States of Matter** Pupils can: • 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.	**Properties and Changes of Materials** Pupils can: • 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.	

Working Scientifically overview

KS1	LKS2	UKS2
Asking and answering questions (Scientific enquiry)	Asking and answering questions (Scientific enquiry)	Asking and answering questions (Scientific enquiry)
Using scientific vocabulary	Using scientific vocabulary	Using secondary sources
Making observations and comparisons	Making observations, comparisons and drawing conclusions	Using scientific language to justify and discuss ideas (including their own)
Using secondary sources	Gathering, recording and using data	Gathering, recording and using data and results
Carrying out experiments	Carrying out experiments	Carrying out experiments
Recording and communicating findings	Recording and communicating findings	Recording and communicating findings

SUBJECT OVERVIEW

Year A:

KS1		LKS2		UKS2	
Our Bodies	Asking and answering questions (Scientific enquiry)	**Forces**	Asking and answering questions (Scientific enquiry)	**Life Cycles**	Asking and answering questions (Scientific enquiry)
What is an Animal?	Using scientific vocabulary	**Animal Survival**	Using scientific vocabulary	**Classifying Living Things**	Using scientific language to justify and discuss ideas (including their own)
What lives in the water?	Making observations and comparisons	**Electricity**	Carrying out experiments	**Gravity & Resistance**	Carrying out experiments
Material Uses	Carrying out experiments	**Rocks**	Making observations, comparisons and drawing conclusions	**Solid, Liquids and Gases**	Gathering, recording and using data and results
The Four Seasons	Using secondary sources	**Light**	Gathering, recording and using data	**Earth, Sun, Moon and the Solar System**	Using secondary sources
What's in the Garden?	Recording and communicating findings	**How Plants grow**	Recording and communicating findings	**Independent Investigation**	Recording and communicating findings

SUBJECT OVERVIEW

Year B:

KS1		LKS2		UKS2	
Animals	Using scientific vocabulary	**Classifying Plants**	Using scientific vocabulary	**Circuits**	Carrying out experiments
Our Bodies & Taking Care of It	Using secondary sources	**Fossils**	Making observations, comparisons and drawing conclusions	**Evolution and Inheritance**	Using scientific language to justify and discuss ideas (including their own)
Properties of Materials	Carrying out experiments	**Magnetism**	Carrying out experiments	**Reversible and Irreversible Changes**	Gathering, recording and using data and results
What we Eat	Asking and answering questions (Scientific enquiry)	**Matter**	Gathering, recording and using data	**The Human Body**	Asking and answering questions (Scientific enquiry)
What's the Weather Like	Making observations and comparisons	**Sound**	Carrying out experiments	**Light**	Using secondary sources
Will My Plant Grow?	Recording and communicating findings	**The Human Body**	Asking and answering questions (Scientific enquiry)	**Independent Investigation**	Recording and communicating findings