Science - Disciplinary Knowledge

	Key stage 1	Lower key stage 2
Make observations over time	• observe closely, using simple equipment	• make systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers
Ask questions and Identify patterns	• ask simple questions and recognise that they can be answered in different ways • use observations and ideas to suggest answers to questions	• ask relevant questions and use different types of scientific enquiries to answer them • report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions • use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions
identify, classify and group	• identify and classify objects using a range of criteria	• identify differences, similarities or changes related to simple scientific ideas and processes
Carry out controlled investigations	• perform simple tests	• set up simple practical enquiries, comparative and fair tests
Research using secondary sources	• Use books, photographs and videos to answer questions of find out information	• use straightforward scientific evidence to answer questions or to support their finds.
Apply mathematical knowledge including collecting, presenting and analysing data	• gather and record data to help in answering questions	• gather, record, classify and present data in a variety of ways to help in answer questions • record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables

Science - Substantive Knowledge

Key Stage 1: Year A

Autumn	Spring	Summer
Every Day Materials and their uses • What materials are everyday objects at school and at home made of? • What words can I use to describe how materials look or feel? • How can I group objects according to their materials? • What is the difference between man-made (manufactured) and natural materials? • Which materials come from plants? • Which plants provide useful materials? • How can I classify objects according to their origin?	**Everyday Materials and their Uses** • What is meant by the following terms: malleable, waterproof, absorbent, transparent, magnetic? • How can I group objects according to their material properties? • Which properties make some materials better suited for specific objects than others? • How could I test if a material was suited to a particular purpose? • Why are we grateful to John Mackintosh?	**Plants** • What plants are growing in our school grounds? • What are the main parts of a flowering plant? • What is the role of each part of the flowering plant? • How can I group plants according to what I can see? • What do seeds need in order to germinate? • What do plants need to grow and stay healthy? • How can I use scientific diagrams to record changes in a growing seedling? • Why is it important for a plant to spread its seeds and not just drop them in one place? • How are some seeds well suited for wind dispersal?

Key Stage 1: Year B

Autumn	Spring	Summer
Animals including Humans • How have I changed since I was a baby? • What are the different parts of my body called? • What are my senses? • Which parts of my body is associated with each sense? • How do my senses help me as a scientist? • What do we call the young of some common animals? • Do all young animals look like their adult animals? • What do humans and other animals need for survival? • What is the difference between what I want and what I need? • Why does it matter what I eat? • Why is exercise important for humans? • What do we mean by good hygiene?	**Seasonal Changes** • What do we mean by seasons? • What is the difference between weather and climate? • How can I record weather changes over time? • What patterns can I observe in the current weather? • What tools do scientists use to measure weather changes? • What words and symbols do weather forecasters use to share information about weather patterns? • Why does the length of day change through the year? • How can I use shadows to record the movement of the sun across the day? **Plants** • How do the plants in the school grounds change through the year? • Which trees are deciduous and which are evergreen?	**Living Things and their Habitats** • What is the differences between things that are living, things that are dead, and things that have never been alive? • How do scientists classify animals into groups? • What are the key characteristics of fish, amphibians, reptiles, birds and mammals? • What is a habitat and a micro-habitat? • What can I observe in a micro-habitat in our school grounds? • How are living things suited to this habitat? • Which animals are carnivores, herbivores or omnivores? • What is a food chain?

Science - Substantive Knowledge
Lower Key Stage 2: Year A

Autumn	Spring	Summer
Rocks • Are all rocks the same? • How do they differ? • What rocks can I observe in my local environment? • How do geologists group rocks? • What is soil? • How are fossils formed? • What was Mary Anning's contribution to science?	**Sound** • What are sounds? • How are sounds made? • How do we hear sound? • How can we change the pitch of a sound? • How can we change the volume of a sound? • How do a string or percussion musical instruments produce sounds of different pitch?	**Living things and their Habitats** • What criteria might a scientist use to group different plants and animals? • What are the seven characteristics of living things? • What is the difference between vertebrate and invertebrate animals? • What sub categories can be used to group vertebrate and invertebrate animals? • What are the unique characterises of some of these groups? • What is an ecosystem? • What is a habitat? • What plants and animals live in a given* habitat? • In what ways are they well suited to this habitat? • How do they interact with one another? • In what ways can humans' actions or decisions negatively impact this natural environment? • What changes could we suggest to address this problem? * river, pond, rock pool, hedgerow
States of Matter • What are the differences between solids, liquids and gases? • How can a liquid be changed into a solid or a gas? • Can we reverse these changes? • At what temperatures can water be changed into a solid and a gas? • Do all materials change state at the same temperature? • What is meant by the terms condensation and evaporation? • What effect does temperature have on evaporation and condensation? • What is the water cycle?	**Light** • What are natural and artificial sources of light? • How do we see? • What is meant by reflection? And what sort of materials can act as reflectors? • How does the appearance of a reflection differ from the real object? • How are shadows formed? • How can I change the appearance of a shadow? • What happens when light is shone through a prism? • What did Ibn Al-Haytham contribute to science? • Why can light from the sun be dangerous? How can I protect my eyes?	

Lower Key Stage 2: Year B

Autumn	Spring	Summer
Forces and Magnets • How do scientists define force? • What is the effect of different surface on a moving object? • In what way does magnetic force differ from other forces? • How can I sort magnetic and non-magnetic objects? • Which materials are magnetic? • How do magnets behave towards each other? • How are magnets useful in everyday life? **Electricity** • Where does electricity come from? • Why can electricity be dangerous? • Where do we use electricity at home and at school? • What is a circuit? • What components could I include in a circuit? • What must be in place for a lamp to light up in a simple series circuit? • What is the role of a switch in a circuit? • How can I find out if a material conducts electricity?	**Animals including humans** • Why do I need a skeleton? • How do my muscles work? • Why do I need to eat? • What are the nutritional properties of each food group? • How should this understanding influence what I eat? • What is my digestive system and how does it work? • Why are my teeth different shapes? • How can my teeth become damaged and what should I do to look after them? • How are animals' teeth adapted to their diet? • How do producers, predators and prey fit together in a food chain? • What is the role played by decomposers?	**Plants** • What are the functions of each part of a flowering plant? • What do plants need to live and grow? • Do all plants need the same things? • What can I learn about plants by changing certain growing conditions? • How is water transported within a plant? • What is the role of flowers in the life cycle of a plant? • What role do insects play in pollination and fertilization of flowers? • How are different seeds adapted for specific means of dispersal?