Spring Meadow Primary and ‘School House’ Nursery

Science Curriculum Overview

Science Curriculum

Purpose of study

Our high-quality science education promotes intrigue and knowledge through our engaging biology, chemistry and physics curriculum. Our science curriculum is designed to ensure pupils build upon prior learning, develop their knowledge of concepts, methods and processes in science and make connections in their understanding of science in the wider world. Through the study of science children will develop both a love of learning and a sense of curiosity, helping them gain the skills they need to understand how science can inform what is happening and why, enabling them to predict causes and affect through analysis of investigative enquiry.

'The important thing is not to stop questioning. Curiosity has its own reason for existing.' – Albert Einstein

Aims

Our science curriculum aims to ensure that all pupils:

- Foster a positive attitude towards science and an awareness of science in the world around them.
- Develop broad scientific vocabulary.
- Use their knowledge to understand the what, why, when, where of working scientifically.
- Develop a scientific knowledge and understanding of different concepts through the areas of biology, chemistry and physics.

Organisation

- Our children develop their scientific understanding through termly topic themes of different concepts in the areas of biology, chemistry and physics.
- Science is explored through enquiry based learning and practical scientific investigation.
- Science learning continues to be developed beyond dedicated science teaching, with links to our whole school themed book led curriculum.
- Themed days and curriculum weeks are planned to enhance of science curriculum.

Progression- Working Scientifically

	EYFS	Key Stage 1	Lower Key Stage 2	Upper Key Stage 2
Working Scientifically **Lines of Enquiry:** Pattern seeking Observing over time Identifying and classifying Comparative and fair testing Research using secondary sources	• Playing and exploring: investigate and experience things and 'have a go.' • Active learning: concentrate and keep on trying if they encounter difficulties, and enjoy achievements. • Creating and thinking critically: children have and develop their own ideas, make links between ideas, and develop strategies for doing things. • Talk about what they see, using a wide vocabulary. • Explore how things work. • Describe what they see, hear and feel whilst outside.	• Ask simple questions and recognise that they can be answered in different ways. • Observe closely, using simple equipment. • Perform simple tests. • Identify and classify. • Use their observations and ideas to suggest answers to questions. • Gather and record data to help in answering questions.	• Ask relevant questions and using different types of scientific enquiries to answer them. • Set up simple practical enquiries, comparative and fair tests. • Make systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers. • Gather, record, classify and present data in a variety of ways to help in answering questions. • Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables. • Report on findings from enquiries, including oral	• Plan 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. • Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs. • Use test results to make predictions to set up further comparative and fair tests. • Report and present findings from enquiries, including conclusions, causal relationships and

			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 differences, similarities or changes related to simple scientific ideas and processes. ● Use straightforward scientific evidence to answer questions or to support their findings.	explanations of and degree of trust in results, in oral and written forms such as displays and other presentations. ● Identify scientific evidence that has been used to support or refute ideas or arguments.

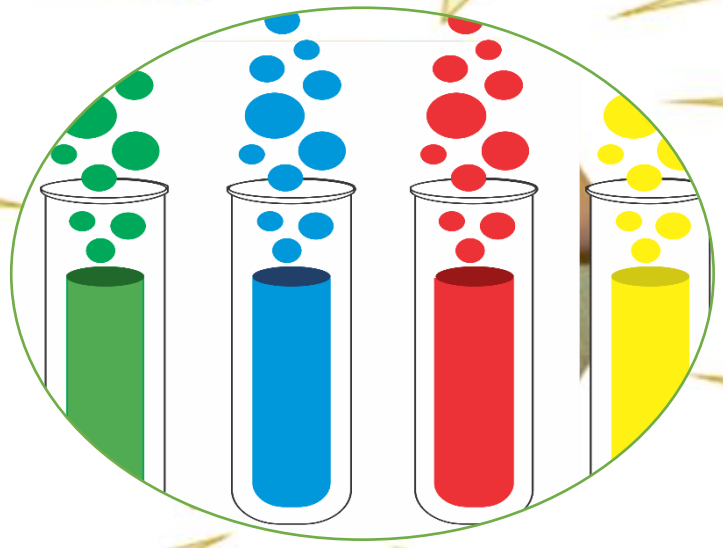
Working Scientifically in Early Years Foundation Stage

I question why things happen

I have my own ideas

I test my ideas

I begin to use science words



I notice similarities and differences

I can talk about things like plants, animals, natural and found objects

I can use my senses and look closely

I can create simple representations of people and objects

I use equipment and tools carefully

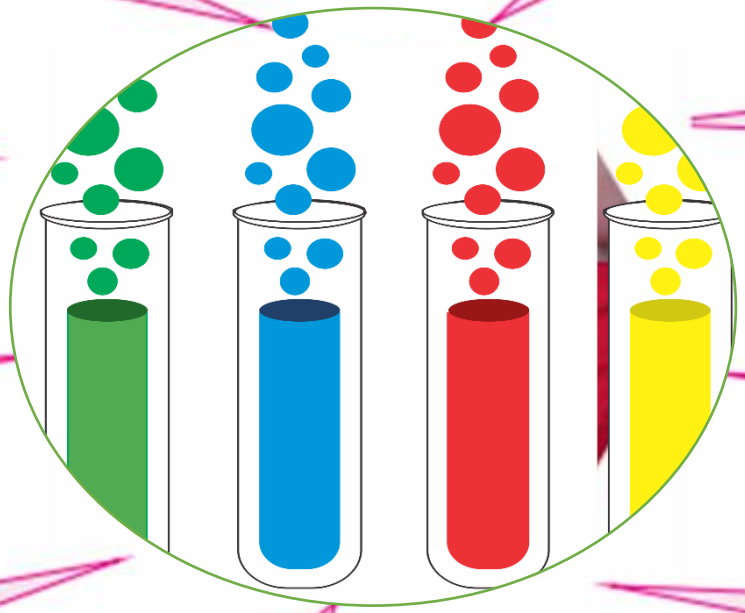
Working Scientifically Key Stage 1

I recognise that questions can be answered in different ways

I perform simple tests

I ask simple questions

I can compare things. I sort and group them



I use simple scientific language

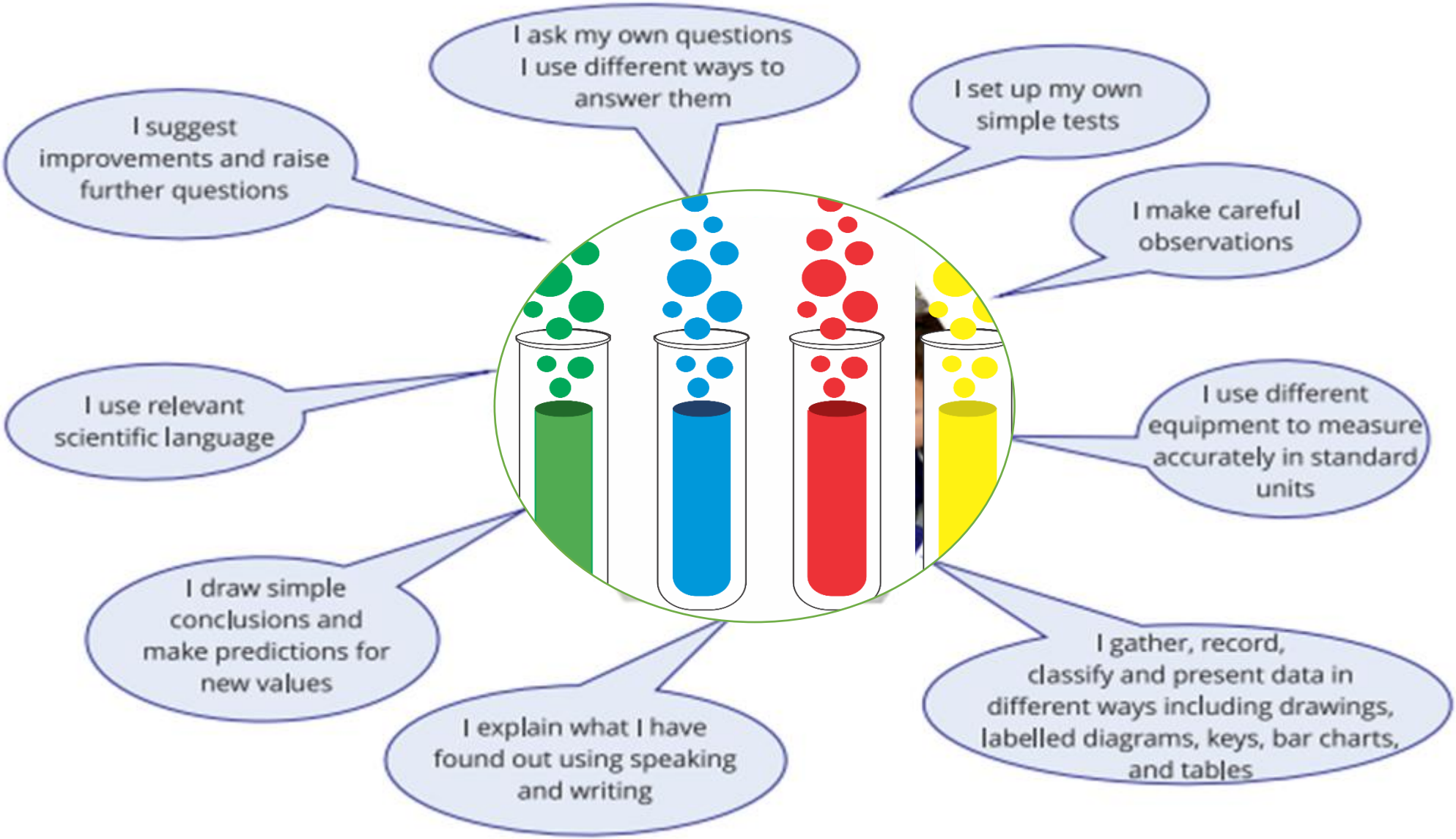
I observe closely

I talk about what I have found out

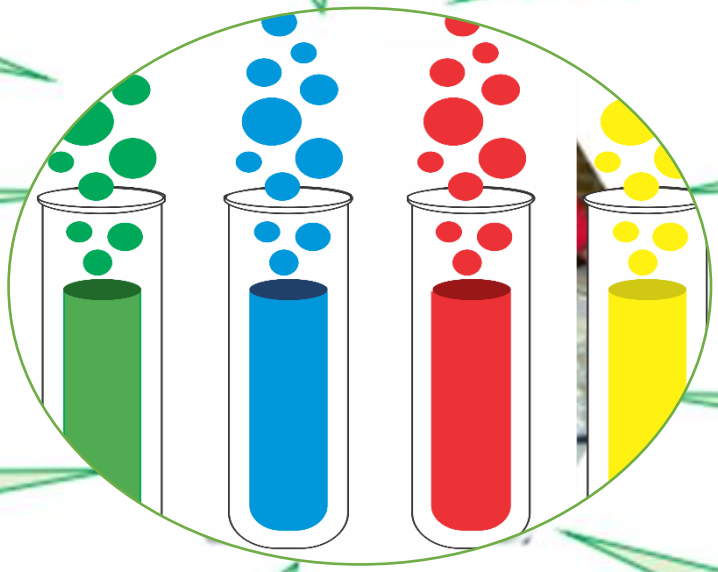
I use simple equipment to make measurements

I gather and record simple data in different ways

Working Scientifically Lower Key Stage 2



Working Scientifically Upper Key Stage 2



I ask different kinds of questions

I plan different types of scientific enquiries to answer questions

I use results to make predictions and set up more tests (including fair tests)

I can set up fair tests when necessary

I use relevant scientific language and illustrations

I decide what observations and measurements to make

I report and present findings using speaking and writing including displays and presentations

I use different scientific equipment to measure with precision. I take repeat readings when appropriate

I decide how to record data and results. I can use scientific diagrams, labels, classification ,keys, tables, scatter, bar and line graphs

Working Scientifically Vocabulary Progression

Year 1	Answers Beaker Compare Describe	Egg timers Equipment Explore Gather Group	Measure Metre stick Observe Pipette Questions	Record Results Ruler Similar/similarities Sort	Syringe Tape measure Test
Year 2	Block diagram Describe Explore	Group Hand lenses Link Notice patterns	Observe Observe changes over time Order Pictogram	Secondary sources Similar/similarities Stop watch Table	Tally chart Test Venn diagram
Year 3	Accurate Answer Answers Bar charts Careful Changes Classify Comparative tests Conclusions	Data loggers Data/evidence/results Equipment Evidence Fair tests Gather Group	Identify Keys Link Magnifying glass Measure Microscope Notice patterns Observations	Observe changes over time Order Prediction Present Questions Questions Record Results	Secondary sources Similarities Sort Support/not support Table Thermometers
Year 4	Accurate Conclusions Gather Fair tests Identify Comparative tests Careful Changes Bar charts	Classify Link Data/evidence/results Evidence Appearance Keys Magnifying glass Decrease Answer	Measure Increase Answers Data loggers Group Equipment Microscope Notice patterns	Observations Observe changes over time Order Prediction Present Questions Record Results Results	Secondary sources Similarities Sort Support/not support Table Thermometers
Year 5	Accuracy Accurate Answer Answers Bar charts Careful Causal relationships Changes Classify Comparative tests	Conclusions Controlled variable Data loggers Data/evidence/results Decrease Degree of trust Dependent variable Equipment Evidence Fair tests	Forces and magnets Gather Group Identify Increase Independent variable Keys Line graphs Link Magnifying glass Measure	Microscope Notice patterns Observations Observe changes over time Order Precision Prediction Present Questions Record Results	Scatter graphs Secondary sources Similarities Sort Support/refute Table Thermometers Variables
Year 6	Accuracy Accurate Answer Answers Bar charts Careful Causal relationships Changes Classify	Conclusions Controlled variable Data loggers Data/evidence/results Decrease Degree of trust Dependent variable Equipment Evidence	Gather Group Identify Increase Independent variable Keys Line graphs Link Magnifying glass Measure	Notice patterns Observation Observe changes over time Opinion/fact Order Precision Prediction Present Questions Record	Scatter graphs Secondary sources Similarities Sort Support/refute Table Thermometers Variables Fair tests

Curriculum Progression

Curriculum Progression					
EYFS	**Plants**: grow in our environment, living, care for them.	**Animals**: begin to name animals, match, sort into groups, name parts of the body.	**Everyday Objects**: recognise, compare and group different materials.	**Seasonal Changes**: make, sort seasonal collections, observe changes around them, and explore changes in colour on trees and plants.	
Year 1	**Plants**: identify, name structure-link to seasonal changes.	**Animals Including Humans**: identify and name common animals and types along with food preferences.	**Everyday Materials**: identify, name, describe, and compare everyday objects and materials from which they are made.	**Seasonal Changes**: observe changes, weather across the 4 seasons.	
Year 2	**Living Things and Their Habitats**: compare differences between living, dead, identify habitats, animals and plants, name plants and animals in their habitats, including microhabitats, describe a simple food chain, name sources of food.	**Animals Including Humans**: basic needs for survival and animal offspring.	**Use of Everyday Materials**: identify, suitability of materials for particular uses and changes to solid objects.	**Seasonal Changes**: observe changes, weather across the 4 seasons.	
Year 3	**Plants**: functions of parts of plants, requirements for life and growth, water transport and plant life cycles. soil.	**Animals Including Humans**: nutrition, skeleton and muscles.	**Rocks**: compare, describe rocks, fossils and	**Light**: reflection of shadows.	**Forces and Magnets**: movements on surfaces, magnetic attraction, repelling of different materials, understanding of poles.
Year 4	**Livings Things and Their Habitats**: grouping and classification of living things, changes in environment.	**Animals Including Humans**: digestive system, teeth, food chains.	**States of Matter**: solids, liquids, gases, changing state, water cycle.	**Sound**: how sound is made, how sound travels, pitch, volume.	**Electricity**: uses, constructing series circuits, switches, conductors and insulators.
Year 5	**Living Things and Their Habitats**: life cycles of mammals, reproduction in animals.	**Properties and Changes of Materials**: properties of materials, changes of state and reversibility and recovering from a solution, separation, describe uses of materials, formation of new materials.	**Forces**: gravity, resistance, levers, pulleys and gears.	**Earth and Space**: Earth, planets and sun and moon.	**Light**: travel, sight, shadows.
Year 6	**Living Things and Their Habitats**: life cycles of amphibians, insects and plants, life classifications, microorganisms, plants and animals including specific characteristics.	**Animals Including Humans**: circulatory system, impact of factors on human body, nutrients and water transport in animals and humans.	**Evolution and (Inheritance)**: changes over time (from fossils), offspring, adaptation to environments and links to evolution.	**Electricity**: brightness and volume linked to voltage, function of component parts, symbols use in circuits.	

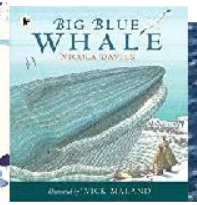
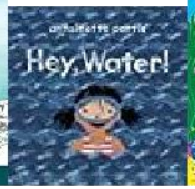
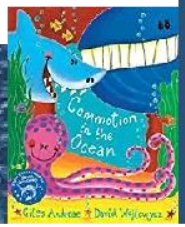
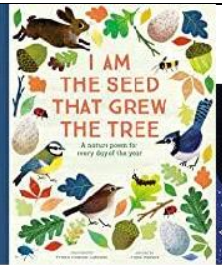
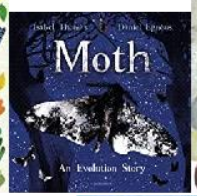
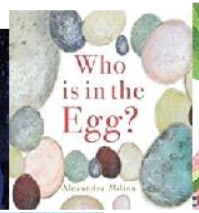
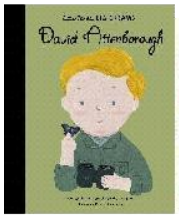
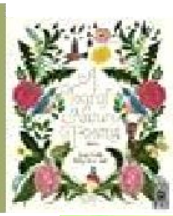
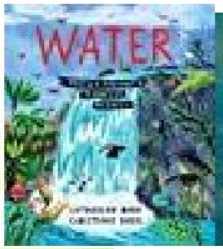
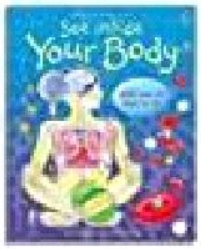
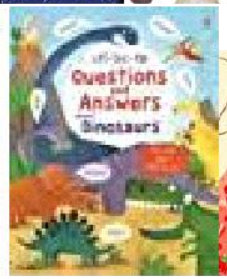
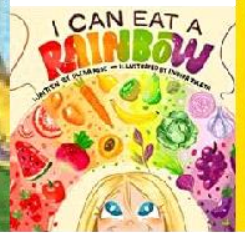
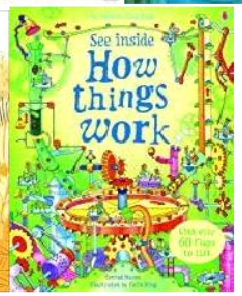
Knowledge Progression

<table>
<tr><th colspan="4">Knowledge Progression By Year Group</th></tr>
<tr><td>EYFS
Nursery</td><td colspan="3">Understanding of the World: The Natural World ELG Children 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 and changing states of matter.
Repeat actions that have an effect.
Explore materials with different properties.
Explore natural materials, indoors and outside.
Use all their senses in hands-on exploration of natural materials.
Explore collections of materials with similar and/or different properties.
Talk about what they see, using a wide vocabulary.
Plant seeds and care for growing plants.
Understand the key features of the life cycle of a plant and an animal.
Begin to understand the need to respect and care for the natural environment and all living things.
Talk about the differences between materials and changes they notice.
Explore and talk about different forces they can feel.</td></tr>
<tr><td>EYFS
Reception</td><td colspan="3">Understanding of the World: The Natural World ELG Children 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 and changing states of matter.</td></tr>
<tr><td></td><td><u>Understand the world – Animals (including Humans</u>
Washing Hands- germ experiment (bread test)
Our bodies
Senses</td><td><u>Understand the world – Seasonal Change</u>
- Weather
- observing winter changes
- explore snow/ ice

<u>Understand the world – Animals (including Humans): Winter</u></td><td><u>Understand the world – Animals (including Humans) and understand the world – Living things in their habitat</u>
Continue to provide opportunities for the children to observe, draw and record what they see in our environment</td></tr>
</table>

	Understand the world – Seasonal Change: Autumn - Weather - observing autumn changes - Compare autumn leaves - Go on an autumn walk **Understand the world – Living things in their habitat** ● What animals hibernate? ● Make hedgehog homes **Key Ideas** ● know the names of some animals and match the adults to their young. Begin to know the name of some animals. ● sort and group animals in different ways, e.g. number of legs, colour, furry, scaly etc. ● identify the different parts of the body and find out what they do – My hands can… My feet can… ● there are plants in the immediate environment ● plants grow and should be treated with care. ● know that plants are living but artificial plants are not living. ● care for the environment ● recognise some everyday materials, e.g. wood, glass, plastic.	- Look at and classifying animals and observing their features **Understand the world – Living things in their habitat** ● Read about nocturnal animals **Understand the world – Materials: Floating and Sinking** - Making own boat like in a story - Investigating what items float/ sink and discover why - What materials are best for making a bridge **Understand the world – Living things in their habitat** ● On the Farm- life cycles, recognise features of the environment **Understand the world – Seasonal Change** - Weather - observing winter changes **Understand the world – Animals (including Humans): Spring** - Draw and label different plants - Look at life cycles of different animals; butterflies, frogs ● Easter Week: Explore eggs- different methods of cooking.. How many different ways can we change an egg? **Understand the world – Plants**	● Making minibeast homes ● Caterpillars- observe the metamorphosis process ● Continue to look at and observe different minibeasts and plants in the environment **Understand the world – Materials** ● Exploring sound (causing vibrations) ● Magnets: sorting magnetic/ nonmagnetic- stronger & weaker ● Explore materials that are waterproof **Understand the world – Materials** ● Shadow Drawings ● Shadow Puppet show retelling familiar fairy tales. ● Shadows at different parts of the day **Understand the world – Animals (including Humans)** ● Animals: classifying animals **Understand the world – Plants** - Look at plants that grow around the world e.g. desert, rainforests etc **Understand the world – Seasonal Change: Summer** - Weather

	• compare and group together some everyday objects made from wood, plastic and glass. • Observe the changes in the school playground, building with the natural materials available and exploring the changes in colour on the trees and plants. Make seasonal collections of leaves and plants and look for similarities and differences.	• Planting- broad beans, sun flowers- maintaining EYFS gardens- planting fruit and vegetables **Key Ideas** • know the names of some animals and match the adults to their young. Begin to know the name of some animals. • sort and group animals in different ways, e.g. number of legs, colour, furry, scaly etc. • identify the different parts of the body and find out what they do – My hands can… My feet can… • there are plants in the immediate environment • plants grow and should be treated with care. • know that plants are living but artificial plants are not living. • care for the environment • recognise some everyday materials, e.g. wood, glass, plastic. • compare and group together some everyday objects made from wood, plastic and glass. • Observe the changes in the school playground, building with the natural materials available and exploring the changes in colour on the trees and plants. Make seasonal collections of leaves and plants and look for similarities and differences.	- observing summer changes - discuss how to keep safe in the heat - Explore Summer- what do we wear, celebrate etc in summer **Understand the world – Materials** • Exploring magnets • Explore light- transparent, opaque and translucent **Key Ideas** • know the names of some animals and match the adults to their young. Begin to know the name of some animals. • sort and group animals in different ways, e.g. number of legs, colour, furry, scaly etc. • identify the different parts of the body and find out what they do – My hands can… My feet can… • there are plants in the immediate environment • plants grow and should be treated with care. • know that plants are living but artificial plants are not living. • care for the environment • recognise some everyday materials, e.g. wood, glass, plastic.

			• compare and group together some everyday objects made from wood, plastic and glass. • Observe the changes in the school playground, building with the natural materials available and exploring the changes in colour on the trees and plants. Make seasonal collections of leaves and plants and look for similarities and differences.
Book Led Curriculum Links	                  

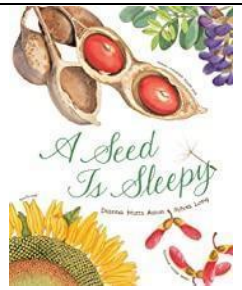
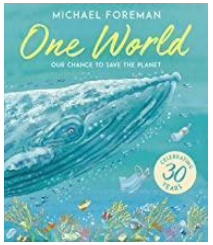
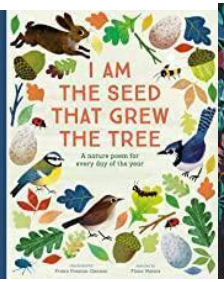
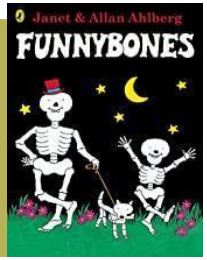
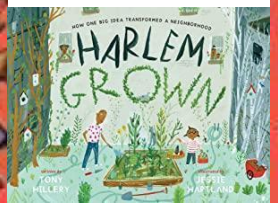
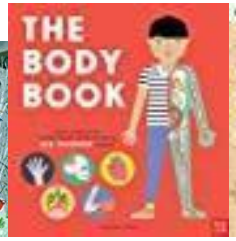
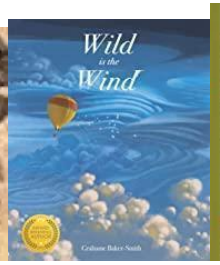
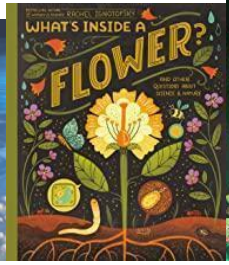
	Key Stage 1		
	Working scientifically During years 1 and 2, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content: ● asking simple questions and recognising that they can be answered in different ways ● observing closely, using simple equipment ● performing simple tests ● identifying and classifying ● using their observations and ideas to suggest answers to questions ● Gathering and recording data to help in answering questions		
Year 1	**Animals, including humans** Pupils should be taught to: ● 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 **Key Ideas** Pupils should use the local environment throughout the year to explore and answer questions about animals in	**Everyday materials** Pupils should be taught to: ● 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 **Key Ideas** Pupils should explore, name, discuss and raise and answer questions about everyday materials so that they become familiar with the names of	**Plants** Pupils should be taught to: ● 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 **Key Ideas** Pupils should use the local environment throughout the year to explore and answer questions about plants growing in their habitat. Where possible, they should observe the growth of flowers and vegetables that they have planted. They should become familiar with common names of flowers, examples of deciduous and evergreen trees, and plant

	their habitat. They should understand how to take care of animals taken from their local environment and the need to return them safely after study. Pupils should become familiar with the common names of some fish, amphibians, reptiles, birds and mammals, including those that are kept as pets. Pupils should have plenty of opportunities to learn the names of the main body parts (including head, neck, arms, elbows, legs, knees, face, ears, eyes, hair, mouth, teeth) through games, actions, songs and rhymes. ● there are many different animals with different characteristics ● animals have senses to help individuals survive. When animals sense things they are able to respond ● animals need food to survive ● animals need a variety of food to help them grow, repair their bodies, be active and stay healthy **Working Scientifically** ● What sort of birds live in our local area? Set up a bird table and make observations ● minibeasts Spiders Investigation – Web hunt, Spider observations ● investigating Bees – Making models to show key features of bees, observing how bees fly, local area walk – what sort of flowers attract bees?	materials and properties such as: hard/soft; stretchy/stiff; shiny/dull; rough/smooth; bendy/not bendy; waterproof/not waterproof; absorbent/not absorbent; opaque/transparent. Pupils should explore and experiment with a wide variety of materials, not only those listed in the programme of study, but including for example: brick, paper, fabrics, elastic, foil. ● there are different materials ● materials have describable properties ● different materials have different properties **Working Scientifically** ● What sort of materials are in our classroom? Children make observations; try to group the materials they find ● What sort of materials are in our community? Children make observations of buildings, roads and pavements; try to group the materials they find ● Which materials can I squash? Which are the squashiest? ● which materials can I stretch? Which are most stretchy? Measuring length with weights handing from them – different types of plastic bags, stretchy animals.	structures (including leaves, flowers (blossom), petals, fruit, roots, bulb, seed, trunk, branches, stem). ● plants usually grow from seeds and bulbs ● plants need warmth, light and water to grow and survive ● flowering plants make seeds to reproduce and make more plants. Some plants die after producing seeds and others live for many generations **Working Scientifically** ● How does a daffodil grow? Plant daffodil bulbs and monitor growth over the term ● Investigate factors affecting growth of cress seeds. (Which is the best compost? How important is light for plants?) ● How can we group leaves? Observe, compare and group leaves ● Which tree is the oldest? Carry out a tree survey in the local park measure circumference using string ● Grow beans – monitor growth using photos and measurements. Keep a bean diary ● what trees and plants grow in our local area? Use books and the internet to identify common plants.

<table>
<tr><td></td><td>How do frogs change over their lifetime?
where do different minibeasts prefer to live?
snail Hunt and activities
investigating sizes of hands and feet
investigating balancing
how high can I jump?
do we get taller as we get older? Class life graphing
investigation – Month of birth and heights.
what different tastes can I taste?
is my hearing better with my eyes closed
how do people use their bodies differently in different sports?</td><td>(Which superhero has the stretchiest tights?)
Which material bends the most? Comparing plastic and wooden rulers with weights hanging from them.
Which shape structure is the strongest? (Art Straws tower – context earthquake proof)</td><td>what have all flowers got in common? Compare flowers.
to investigate fruit and vegetables.
grow carrot tops and measure growth.
use microscopes and magnifying glasses to make close up observations of plants</td></tr>
<tr><td></td><td colspan="3"><u>Plants, animals and seasonal changes</u>- pupils should use the local environment throughout the year to explore and answer questions.
<u>Seasonal changes</u>
observe changes across the four seasons
observe and describe weather associated with the seasons and how day length varies</td></tr>
<tr><td>Year 2</td><td><u>Uses of everyday materials</u>
Pupils should be taught to:
identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses</td><td><u>Animals including humans</u>
Pupils should be taught to:
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)</td><td><u>Living things and their habitats</u>
Pupils should be taught to:
explore and compare the differences between things that are living, dead, and things that have never been alive
identify that most living things live in habitats to which they are suited and describe how different habitats provide</td></tr>
</table>

	● find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching **Key Ideas** Pupils should identify and discuss the uses of different everyday materials so that they become familiar with how some materials are used for more than one thing (metal can be used for coins, cans, cars and table legs; wood can be used for matches, floors, and telegraph poles) or different materials are used for the same thing (spoons can be made from plastic, wood, metal, but not normally from glass). They should think about the properties of materials that make them suitable or unsuitable for particular purposes and they should be encouraged to think about unusual and creative uses for everyday materials. Pupils might find out about people who have developed useful new materials, for example John Dunlop, Charles Macintosh or John McAdam. Materials can be changed by physical force (twisting, bending, squashing and stretching) **Working Scientifically** ● what sort of materials are in our classroom? Children make observations; try to group the materials they find ● what sort of materials are in our community? Children make observations of buildings, roads and pavements; try to group the materials they find	● describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene **Key Ideas** Pupils should be introduced to the basic needs of animals for survival, as well as the importance of exercise and nutrition for humans. They should also be introduced to the processes of reproduction and growth in animals. The focus at this stage should be on questions that help pupils to recognise growth; they should not be expected to understand how reproduction occurs. The following examples might be used: egg, chick, chicken; egg, caterpillar, pupa, butterfly; spawn, tadpole, frog; lamb, sheep. Growing into adults can include reference to baby, toddler, child, teenager, adult. ● animals move in order to survive ● different animals move in different ways to help them survive ● exercise keeps animal's bodies in good condition and increases survival chances. ● all animals eventually die ● animals reproduce new animals when they reach maturity ● animals grow until maturity and then don't grow any larger	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 **Key Ideas** Pupils should be ntroduced to the idea that all living things have certain characteristics that are essential for keeping them alive and healthy. They should raise and answer questions that help them to become familiar with the life processes that are common to all living things. Pupils should be introduced to the terms 'habitat' (a natural environment or home of a variety of plants and animals) and 'micro-habitat' (a very small habitat, for example for woodlice under stones, logs or leaf litter). They should raise and answer questions about the local environment that help them to identify and study a variety of plants and animals within their habitat and observe how living things depend on each other, for example, plants serving as a source of food and shelter for animals. Pupils should compare animals in familiar habitats with animals found in less familiar habitats, for

	• which materials can I squash? • which materials can I stretch? Which are most stretchy? Measuring length with weights handing from them – different types of plastic bags, stretchy animals. (Which superhero has the stretchiest tights?) • which material bends the most? Comparing plastic and wooden rulers with weights hanging from them • which shape structure is the strongest? (Art Straws tower – context earthquake proof)	**Working Scientifically** • how does exercise affect you heart rate? Data logger investigation • how does height change with age? Children collect data from every class and then compare • what are our bodies made up of? Investigating the skeleton and organs in the body • making observations of microbes through a microscope • what is the best way to wash your hands? Children investigate different techniques to wash paint off their hands • how does exercise affect how many breaths you make every minute?	example, on the seashore, in woodland, in the ocean, in the rainforest. • some things are living, some were once living but now dead and some things never lived • there is variation between living things. • different animals and plants live in different places • living things are adapted to survive in different habitats. Environmental change can affect plants and animals that live there **Working Scientifically** • what does a plant need to stay healthy and grow? (Dark, Light, Water, Dry) • how can we group animals by their features? • which conditions do different minibeasts prefer? • comparing Habitats (Rainforest/local woodland/Pond/Desert/Arctic/Rock pools) • how are different animals/plants suited to their habitats?
	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.		

	Seasonal changes can be looked at again through plants learning ● observe changes across the four seasons ● observe and describe weather associated with the seasons and how day length varies
Book Led Curriculum Links	             

<table>
<tr><td></td><td colspan="3"><u>Lower Key Stage 2</u></td></tr>
<tr><td></td><td colspan="3"><u>Working Scientifically</u>
During years 3 and 4, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:
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
identifying differences, similarities or changes related to simple scientific ideas and processes
using straightforward scientific evidence to answer questions or to support their findings.</td></tr>
<tr><td>Year 3</td><td><u>Animals including humans</u>
Pupils should be taught to:
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
<u>Key Ideas</u></td><td><u>Rocks</u>
Pupils should be taught to:
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</td><td><u>Plants</u>
Pupils should be taught to:
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</td></tr>
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	Pupils should continue to learn about the importance of nutrition and should be introduced to the main body parts associated with the skeleton and muscles, finding out how different parts of the body have special functions. ● different animals are adapted to eat different foods ● many animals have skeletons to support their bodies and protect vital organs ● muscles are connected to bones and move them when they contract ● movable joints connect bones **Working Scientifically** ● how do human skeletons compare with those of other animals? ● which crisps have the highest salt/fat content? Analyse data from food packaging, draw graphs and demo burning of each type of crisp to compare observations with findings **Light** Pupils should be taught to: ● 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	**Key Ideas** Linked with work in Geography, pupils should explore different kinds of rocks and soils, including those in the local environment. Fossils provide evidence that living things have changed over time **Working Scientifically** ● which type of rock soaks up the most water? ● challenge - Which type of rock is the heaviest? (Introduce the idea of density) ● which type of soil does water flow through the quickest? **Forces and magnets** Pupils should be taught to: ● 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	● explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal **Key Ideas** Pupils should be introduced to the relationship between structure and function: the idea that every part has a job to do. They should explore questions that focus on the role of the roots and stem in nutrition and support, leaves for nutrition and flowers for reproduction. Note: Pupils can be introduced to the idea that plants can make their own food, but at this stage they do not need to understand how this happens. ● plants make their own food in their leaves to pseeds and bulbs need the right conditions to germinate. They contain a food store for the first stages of growthrovide them with energy, growth, repair and reproduce ● leaves absorb sunlight and carbon dioxide ● plants have roots to provide support and to draw moisture from the soil, through stems to take water to the rest of the plant ● the plant makes its food from water and carbon dioxide, using sunlight as energy, in the green parts of plants (mainly leaves).

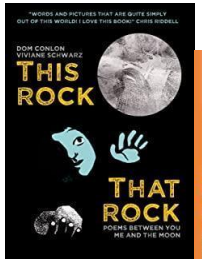
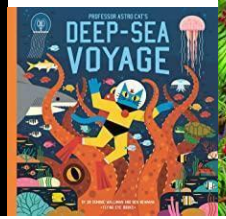
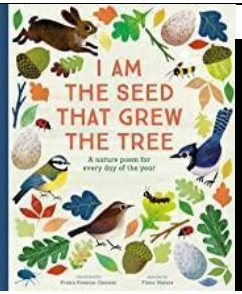
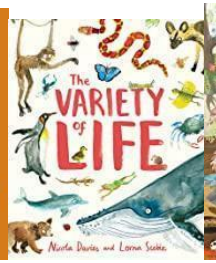
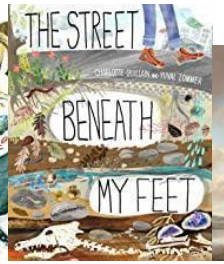
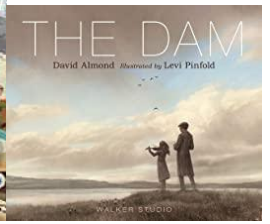
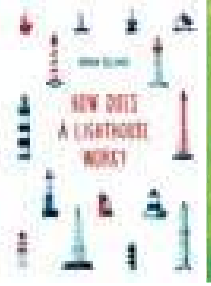
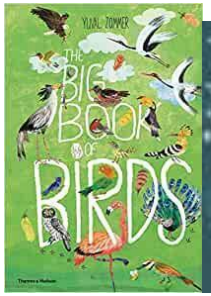
	● recognise that shadows are formed when the light from a light source is blocked by a solid object ● find patterns in the way that the size of shadows change **Key Ideas** Pupils should explore what happens when light reflects off a mirror or other reflective surfaces, including playing mirror games to help them to answer questions about how light behaves. They should think about why it is important to protect their eyes from bright lights. They should look for, and measure, shadows, and find out how they are formed and what might cause the shadows to change. Note: Pupils should be warned that it is not safe to look directly at the Sun, even when wearing dark glasses. ● there must be light for us to see. Without light it is dark ● we need light to see things even shiny things ● transparent materials let light through them and opaque materials don't let light through ● beams of light bounce off some materials (reflection) ● shiny materials reflect light beams better than non-shiny materials ● light comes from a source **Working Scientifically**	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 **Key Ideas** Pupils should observe that magnetic forces can act without direct contact, unlike most forces, where direct contact is necessary (for example, opening a door, pushing a swing). They should explore the behaviour and everyday uses of different magnets (for example, bar, ring, button and horseshoe). ● pushing and pulling can make things move faster or slower ● pushing and pulling can make things move or stop ● things can move in different ways ● larger masses take bigger pushes and pulls to move or stop them ● pushing and pulling can change the shape of things ● bigger pushes and pulls have bigger effects ● magnets exert attractive and repulsive forces on each other.	● flowering plants have evolved specific parts to carry out pollination, fertilization and seed growth. Seed dispersal improves chances of enough seeds germinating and growing to mature ● (ie until the plant is able to produce its own food) **Working Scientifically** ● how long does it take for water to travel up a plant? (Investigating Xylem – flowers and celery –microscope to see the xylem) ● what factors affect plant growth? (Cress seeds in different amounts of light) ● what do plants grow best in? (Comparing soil, sand, cotton wool, paper etc – Grass seeds and cress seeds) ● designing a seed to fly far from the tree?

	• where is the light brightest in our school? Data logging investigation to investigate our local environment • what is white light made from? (Prisms) • what factors affect the size of a shadow? Making shadow sticks and measuring shadow size • which sunglasses will protect our eyes best? Data logging investigation looking at light intensity.	• magnets exert non-contact forces, which work through some materials • magnets exert attractive forces on some materials • magnet forces are affected by magnet strength, object mass, distance from object and object material **Working Scientifically** • which materials will stick to magnets? • how far will a toy car go on different surfaces? • how many layers of card can you place between a magnet and a paperclip before it won't attract? • how close will a paperclip get to different magnets before it attracts? • which magnet is the strongest?	
Year 4	**Sound** Pupils should be taught to: • 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	**Animals including humans** Pupils should be taught to: • 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	**States of matter** Pupils should be taught to: • 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)

	● 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 **Key Ideas** Pupils should explore and identify the way sound is made through vibration in a range of different musical instruments from around the world; and find out how the pitch and volume of sounds can be changed in a variety of ways. ● sound travels from its source in all directions and we hear it when it travels to our ears ● sound travel can be blocked ● sound spreads out as it travels ● changing the shape, size and material of an object will change the sound it produces ● sound is produced when an object vibrates ● sound moves through all materials by making them vibrate ● changing the way an object vibrates changes its sound ● bigger vibrations produce louder sounds and smaller vibrations produce quieter sounds ● faster vibrations (higher frequencies) produce higher pitched sounds **Working Scientifically** ● how do different instruments make sounds? ● how do we make sounds louder and quieter?	**Key Ideas** Pupils should be introduced to the main body parts associated with the digestive system, for example, mouth, tongue, teeth, oesophagus, stomach and small and large intestine and explore questions that help them to understand their special functions. ● animals have teeth to help them eat. Different types of teeth do different jobs ● food is broken down by the teeth and further in the stomach and intestines where nutrients go into the blood. The blood takes nutrients around the body ● nutrients produced by plants move to primary consumers then to secondary consumers through food chains **Working Scientifically** ● which cereal has the most iron in it? (Practical investigation using magnets) ● which chocolate bar is most unhealthy? (Comparing food labels) ● which drink causes the most damage to teeth? (leaving dirty coins in different drinks to compare the effects)	● identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature **Key Ideas** Pupils should explore a variety of everyday materials and develop simple descriptions of the states of matter (solids hold their shape; liquids form a pool not a pile; gases escape from an unsealed container). Pupils should observe water as a solid, a liquid and a gas and should note the changes to water when it is heated or cooled. ● solids, liquids and gases are described by observable properties ● materials can be divided into solids, liquids and gases ● heating causes solids to melt into liquids and liquids evaporate into gases ● cooling causes gases to condense into liquids and liquids to freeze into solids ● the temperature at which given substances change state are always the same ● when two or more substances are mixed and remain present the mixture can be separated ● some changes can be reversed and some can't ● materials change state by heating and cooling

	• what materials can sound travel through? • what materials will stop sound travelling? Sound proofing • investigating water in milk bottles • how does the volume of sound change with distance? **Electricity** Pupils should be taught to: • 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 **Key Ideas** Pupils should construct simple series circuits, trying different components, for example, bulbs, buzzers and motors, and including switches, and use their circuits to		**Working Scientifically** • what which melts fastest – Ice cream, butter or ice? • which evaporates quickest – water, vinegar or nail varnish remover? • how does the temperature of ice cream change over time? • how does the temperature of wax/water change as you heat it up? • which type of chocolate melts fastest? • how do they make condensed and evaporated milk? • what conditions make washing dry quicker?

	create simple devices. Pupils should draw the circuit as a pictorial representation, not necessarily using conventional circuit symbols at this stage; these will be introduced in year 6. Note: Pupils might use the terms current and voltage, but these should not be introduced or defined formally at this stage. Pupils should be taught about precautions for working safely with electricity. ● a source of electricity (mains of battery) is needed for electrical devices to work ● electricity sources push electricity round a circuit ● more batteries will push the electricity round the circuit faster ● devices work harder when more electricity goes through them ● a complete circuit is needed for electricity to flow and devices to work ● some materials allow electricity to flow easily and these are called conductors. Materials that don't allow electricity to flow easily are called insulators **<u>Working Scientifically</u>** ● to identify electrical appliances around us ● to investigate conductors and insulators ● to make and test a switch ● to make and compare simple circuits – series only		

	● to observe differences in circuits and find trends between the number of batteries and the observed effects in the circuit. ● to find out how electricity is made ● to make and compare fruity batteries ● to make and test wind turbines and solar panels		
	Living things and their habitats **Throughout the year**, pupils should be taught to: ● 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		
Book Led Curriculum Links	           	

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<tr><td></td><td colspan="3"><u>Upper Key Stage 2</u></td></tr>
<tr><td></td><td colspan="3"><u>Working scientifically</u>
During years 5 and 6, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:
● 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 a 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</td></tr>
<tr><td>Year 5</td><td><u>Properties and changes of materials</u>
Pupils should be taught to:
● 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</td><td><u>Light</u>
Pupils should be taught to:
● 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
<u>Key Ideas</u></td><td><u>Forces</u>
Pupils should be taught to:
● 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
<u>Key Ideas</u>
Pupils should explore falling objects and raise questions about the effects of air resistance. They should explore the effects of air resistance</td></tr>
</table>

	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 **<u>Key Ideas</u>** Pupils should build a more systematic understand of materials by exploring and comparing the properties of a broad range of materials, including relating these to what they learnt about magnetism in year 3 and about electricity in year 4. They should explore reversible changes, including, evaporating, filtering, sieving, melting and dissolving, recognising that melting and dissolving are different processes. Pupils should explore changes that are difficult to reverse, for example, burning, rusting and other reactions, for example, vinegar with bicarbonate of soda. They should find out about how chemists create new materials, for example, Spencer Silver, who invented the glue for sticky notes or Ruth Benerito, who invented wrinklefree cotton. Note: Pupils are not required to make quantitative measurements about conductivity and insulation at this stage. It is sufficient for them to observe that some conductors will produce a brighter bulb in a circuit than others and that some materials will feel hotter than others when a heat source is placed against them. Safety guidelines should be followed when burning materials.	Pupils should build on the work on light in year 3, exploring the way that light behaves, including light sources, reflection and shadows. They should talk about what happens and make predictions. ● animals see light sources when light travels from the source into their eyes. ● animals see objects when light is reflected off that object and enters their eyes. ● light reflects off all objects (unless they are black). Non shiny surfaces scatter the light so we don't see the beam. ● light travels in straight lines **<u>Working Scientifically</u>** ● investigating light levels in the school/local environment – identifying sources. Data collection and bar graph analysis ● investigating plane mirrors – ray diagrams ● investigating curved mirrors – making careful observations ● what is the relationship between the distance from the object to the shadow and the size of the shadow? Data collection and line graph analysis ● is it easier for light to travel through a thin transparent material or a think one? ● investigating lenses and magnification	by observing how different objects such as parachutes and sycamore seeds fall. They should experience forces that make things begin to move, get faster or slow down. Pupils should explore the effects of friction on movement and find out how it slows or stops moving objects, for example, by observing the effects of a brake on a bicycle wheel. Pupils should explore the effects of levers, pulleys and simple machines on movement. Pupils might find out how scientists, for example, Galileo Galilei and Isaac Newton helped to develop the theory of gravitation. Pupils might work scientifically by: exploring falling paper cones or cup-cake cases, and designing and making a variety of parachutes and carrying out fair tests to determine which designs are the most effective. They might explore resistance in water by making and testing boats of different shapes. They might design and make products that use levers, pulleys, gears and/or springs and explore their e Pupils should be introduced to a model of the Sun and Earth that enables them to explain day and night. Pupils should learn that the Sun is a star at the centre of our solar system and that it has eight planets: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune (Pluto was reclassified as a 'dwarf planet' in 2006). They should understand that a moon is a celestial body that orbits a planet (Earth has one moon; Jupiter has four large moons and numerous smaller ones). Note: Pupils should be warned that it is not safe to look directly at the Sun,

	• all matter (including gas) has mass • sometimes mixed substances react to make a new substance. These changes are usually irreversible • heating can sometimes cause materials to change permanently. When this happens, a new substance is made. These changes are not reversible **Working Scientifically** • which material is the hardest? (Scratch testing with iron nail and magnifying glass) • which material dissolves best in water? (comparing the time for salt, sugar, flour, washing powder to dissolve) • what factors affect how quickly a solid dissolves? (Different sized particles of sugar/ different temperatures) • what happens to the transparency of a material as it gets thicker? (data logger to measure light intensity with increasing layers) • which material is the best thermal insulator? (Hot Chocolate/Penguins investigation) • which material is most magnetic? (Measure the distance in mm that a material can move towards a magnet before it experiences a force)	• investigate the dispersion of light through a prism **Earth and Space** Pupils should be taught to: • 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 **Key Ideas** Pupils should be introduced to a model of the Sun and Earth that enables them to explain day and night. Pupils should learn that the Sun is a star at the centre of our solar system and that it has eight planets: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune (Pluto was reclassified as a 'dwarf planet' in 2006). They should understand that a moon is a celestial body that orbits a planet (Earth has one moon; Jupiter has four large moons and numerous smaller ones). Note: Pupils should be warned that it is not safe to look directly at the Sun, even when wearing dark glasses. Pupils should find out about	even when wearing dark glasses. Pupils should find out about the way that ideas about the solar system have developed, understand how the geocentric model of the solar system gave way to the heliocentric model by considering the work of scientists such as Ptolemy, Alhazen and Copernicus. • air resistance and water resistance are forces against motion caused by objects having to move air and water out of their way • friction is a force against motion caused by two surfaces rubbing against each other • some objects require large forces to make them move; gears, pulley and levers can reduce the force needed to make things move **Working Scientifically** • what shape would be best for a sensor that you want to fall to the bottom of the ocean? Different shaped plasticine shapes –time the fall – could change liquid and look at viscosity • which surface gives the greatest friction? Measuring the angle of the slope that will make a object move. Best grip for shoes.

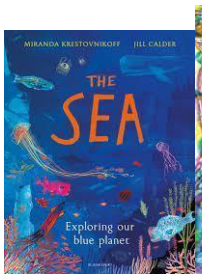
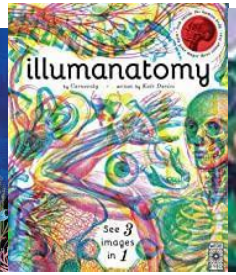
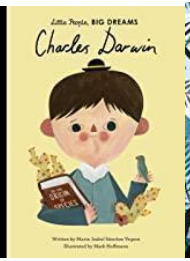
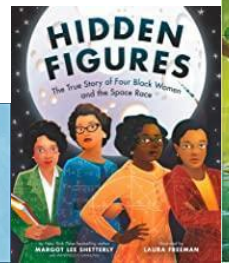
		the way that ideas about the solar system have developed, understand how the geocentric model of the solar system gave way to the heliocentric model by considering the work of scientists such as Ptolemy, Alhazen and Copernicus. ● stars, planets and moons have so much mass they attract other things, including each other due to a force called gravity. Gravity works over distance ● objects with larger masses exert bigger gravitational forces ● objects like planets, moons and stars spin. ● smaller mass objects like planets orbit large mass objects like stars ● stars produce vast amounts of heat and light. All other objects are lumps of rock, metal or ice and can be seen because they reflect the light of stars **<u>Working Scientifically</u>** ● investigating trends in planetary data eg. Size vs distance from the Sun or Temperature vs. Distance from the Sun ● how does the Moon appear to change over a month? – keep a moon diary ● investigating the movement of the Sun in the Sky. (Ping pong ball on a stick) ● investigating shadows over a day	● what is the best design for a rocket? Changing nose cone shapes and investigating effect on distance travelled. ● which boat shape or sail shape would reduce friction forces the most?

		• investigating the link between mass and weight on Earth – comparing with other places in space	
	Living things and their habitats **Throughout the year**, pupils should be taught to: • describe the life process of reproduction in some animals (including puberty talk) • Exploring the features of mammals • Begin to look at some simple life cycles – mammals		
Year 6	**Evolution and inheritance** Pupils should be taught to: • 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 **Key Ideas** Building on what they learned about fossils in the topic on rocks in year 3, pupils should find out more about how living things on earth have changed over time. They should be introduced to the idea that characteristics are passed from parents to their offspring, for instance by	**Animals including humans** Pupils should be taught to: • 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 • 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 • understand the short and long term effects of exercise on the body **Key Ideas** Pupils should draw a timeline to indicate stages in the growth and development of humans.	**Electricity** Pupils should be taught to: • 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 **Key Ideas** Building on their work in year 4, pupils should construct simple series circuits, to help them to answer questions about what happens when they try different components, for example, switches, bulbs, buzzers and motors. They

	considering different breeds of dogs, and what happens when, for example, Labradors are crossed with poodles. They should also appreciate that variation in offspring over time can make animals more or less able to survive in particular environments, for example, by exploring how giraffes' necks got longer, or the development of insulating fur on the arctic fox. Pupils might find out about the work of palaeontologists such as Mary Anning and about how Charles Darwin and Alfred Wallace developed their ideas on evolution. Note: At this stage, pupils are not expected to understand how genes and chromosomes work. ● life cycles have evolved to help organisms survive to adulthood ● over time the characteristics that are most suited to the environment become increasingly common. ● organisms best suited to their environment are more likely to survive long enough to reproduce ● organisms are best adapted to reproduce are more likely to do so ● organisms reproduce and offspring have similar characteristic patterns ● variation exists within a population (and between offspring of some plants) ● competition exists for resources and mates **<u>Working Scientifically</u>**	Pupils should build on their learning from years 3 and 4 about the main body parts and internal organs (skeletal, muscular and digestive system) to explore and answer questions that help them to understand how the circulatory system enables the body to function. Pupils should learn how to keep their bodies healthy and how their bodies might be damaged – including how some drugs and other substances can be harmful to the human body. ● the heart pumps blood around the body ● oxygen is breathed into the lungs where it is absorbed by the blood ● muscles need oxygen to release energy from food to do work. (Oxygen is taken into the blood in the lungs; the heart pumps the blood through blood vessels to the muscles; the muscles take oxygen and nutrients from the blood.) **<u>Working Scientifically</u>** ● how does the average height of a class change as they get older? ● how does a baby's size change over time? ● how are different animals born? Video based investigation – observations recorded, research to find out extra	should learn how to represent a simple circuit in a diagram using recognised symbols. Note: Pupils are expected to learn only about series circuits, not parallel circuits. Pupils should be taught to take the necessary precautions for working safely with electricity. ● batteries are a store of energy. This energy pushes electricity round the circuit. When the battery's energy is gone it stops pushing. Voltage measures the 'push.' ● the greater the current flowing through a device the harder it works ● current is how much electricity is flowing round a circuit ● when current flows through wires heat is released. The greater the current, the more heat is released **<u>Working Scientifically</u>** ● constructing circuits and drawing circuit diagrams ● comparing series and parallel circuits ● investigation: How does voltage (number of batteries) affect the brightness of lamps?

	• investigating variation in the classroom – height, weight, hair colour, shoe size etc Data collection and graph drawing to analyse. • what differences are environmental and what differences are inherited from our parents? Children can bring in family photos to make comparisons or you can provide a set of family photos • how are birds adapted to survive on their island? Investigation to replicate the work of Darwin in the Galapagos Islands using various size tweezers to pick up various food stuffs – small and large nuts, worms and large fruit • making fossils – how are they made? • comparing skeletons of humans, with Neanderthals and apes. Using images to observe similarities and differences **Living things and their habitats** Pupils should be taught to: • describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird • describe the life process of reproduction in plants • describe how living things are classified into broad groups according to common observable characteristics and based on similarities and	details, compare and contrast exercises, conclusions written	• investigation: How does voltage (number of batteries) affect the volume of a buzzer? • fruity batteries – measuring voltage to find which fruit makes the best battery • squidgy circuits – using conductive dough to create electrical art sculpture

	differences, including micro-organisms, plants and animals ● give reasons for classifying plants and animals based on specific characteristics **<u>Key Ideas</u>** Pupils should build on their learning about grouping living things in year 4 by looking at the classification system in more detail. They should be introduced to the idea that broad groupings, such as micro-organisms, plants and animals can be subdivided. Through direct observations where possible, they should classify animals into commonly found invertebrates (such as insects, spiders, snails, worms) and vertebrates (fish, amphibians, reptiles, birds and mammals). They should discuss reasons why living things are placed in one group and not another. Pupils might find out about the significance of the work of scientists such as Carl Linnaeus, a pioneer of classification. Variation exists within a population (and between offspring of some plants) ● organisms best suited to their environment are more likely to survive long enough to reproduce ● organisms are best adapted to reproduce are more likely to do so ● organisms reproduce and offspring have similar characteristic patterns ● competition exists for resources and mates **<u>Working Scientifically</u>**		

	● investigating the stages in a sunflower's life ● comparing sexual and asexual reproduction in plants and animals ● investigating Seed dispersal		
Book Led Curriculum Links	          	

YEAR 1 - Vocabulary				
Working Scientifically	**Plants**	**Animals Including Humans**	**Materials**	**Seasonal Change**
Answers	Bark	Ankle	Absorbent	Season
Beaker	Berry	Arms	Bendy/floppy	Autumn
Compare	Blossom	Back	Breaks/tears	Cloud/cloudy
Describe	Branch	Beak	Brick	Cool/cold
Different/differences	Bulb	Body	Card/cardboard	Day/night
Egg timers	Flower	Bright/dim	Clay	Fog/mist
Equipment	Fruit	Calf	Dull	Frost
Explore	Leaf/leaves	Chest	Elastic	Hail/hailing
Gather	Names of flowers grown	Claw	Fabrics	Hot/warm
Group	Names of locally found flowering plants	Ears	Foil	Ice/icy
Measure	Names of locally found garden plants	Elbows	Glass	Light/dark
Metre stick	Names of locally found trees	Eyebrows	Hard	Light/dark
Observe	Names of locally found wild plants	Eyelashes	Material	Lightning
Pipette	Names of vegetables grown	Eyes	Metal	Rain/rainy
Questions	Petal	Face	Not see through	Rainbow
Record	Root	Feathers	Object	Sleet
Results	Seed	Feet	Paper	Snow/snowing
Ruler	Stalk	Fin	Plastic	Spring
Similar/similarities	Stem	Fingers	Rock	Storm
Sort	Trunk	Fur	Rough	Summer
Syringe	Vegetable	Hair	Rubber	Sun/sunny
Syringe		Hands	See through	Thunder
Tape measure		Head	Shiny	Weather

Working Scientifically		Animals Including Humans	Materials	Seasonal Change
Test		Hear/hearing	Smooth	Wind/windy
		High/low	Soft	Winter
		Hips	Stiff	
		Knees	Stretchy	
		Legs	Water	
		Loud/quiet	Waterproof	
		Mouth	Wood	
		Nails	Wool	
		Names of common animals		
		Names of common animals (eat other animals)		
		Names of common animals (eat plants and animals)		
		Names of common animals (eat plants)		
		Neck		
		Nose		
		Pets		
		Repeating/continuous (sound)		
		Rough/smooth		
		Scales		
		See/seeing		
		Senses		
		Shoulders		
		Smell/smelling		

		Tail		
		Taste/tasting		
		Teeth		
		Thigh		
		Toes		
		Tongue		
		Tongue		
		Touch/touching		
		Trunk		
		Waist		
		Wild animals		
		Wing		
		Wrist		

YEAR 2 – Vocabulary				
Working Scientifically	**Living Things and Their Habitat**	**Plants**	**Animals Including Humans**	**Materials**
Block diagram	Basic needs	Bulbs	Adults	Absorbent
Describe	Damp/wet/dry	Damp/wet/dry	Air	Bend/bending
Different/differences	Dark/light	Dark/light	Babies	Brick
Explore	Dead	Die	Baby/toddler/child/teenager	Card/cardboard
Group	Depend	Dry/crispy	Basic needs	Changed
Hand lenses	E.g. a meadow	Earth	Bread, rice, potato, pasta	Clay
Link	E.g. a pond	Fully grown	Breathing	Elastic
Notice patterns	E.g. a woodland	Grow/growth	Change	Fabrics
Observe	E.g. on stony path	Healthy	Clean	Flexible
Observe changes over time	E.g. under bushes	Hot/warm/cool/cold	Drugs	Foil
Order	E.g. under log	Light	Exercise	Glass
Pictogram	Feed	Seedling	Food	Hard
Secondary sources	Food	Seeds	Food types	Material
Similar/similarities	Food chain	Shoot	Foods high in fat or sugar	Metal
Stop watch	Grow	Soil	Fruit and vegetable	Non reflective
Table	Have offspring/young/babies	Use comparatives e.g. hotter	Grow	Object
Tally chart	Hot/warm/cool/cold	Water	Healthy	Opaque
Test	Living	Wither/limp	Hygiene	Paper
Venn diagram	Move		Meat, fish, egg, beans	Pinch/pinching
	Name local habitats		Medicine	Plastic
	Name micro-habitats		Milk and dairy foods	Poke/poking
	Never been alive		Offspring	Property
	Shelter		Older/younger	Pull/pulling

	Living Things and Their Habitat		**Animals Including Humans**	**Materials**
	Suited/suitable		Survival	Push/pushing
	Use comparatives e.g. hotter		Wash	Reflective
			Water	Rigid
			Young	Rock
				Roll/rolling
				Rough
				Rubber
				Shape
				Smooth
				Soft
				Squash/squashing
				Squeeze/squeezing
				Stretch/stretching
				Stretchy
				Strong/weak
				Suitable/unsuitable
				Translucent
				Transparent
				Twist/twisting
				Use/useful
				Water
				Waterproof
				Wood
				Wool

YEAR 3 – Vocabulary					
Working Scientifically	**Plants**	**Animals Including Humans**	**Rocks**	**Light**	**Force**
Accurate	Air	Balanced diet	Absorb water	Block	Attract
Answer	Bark	Bones	Boulder	Dark/darkness	Bar magnet
Answers	Berry	Bread, rice, potato, pasta	Chalk	Direct/ direction	Button magnet
Bar charts	Blossom	Carbohydrates	Chalky soil	Light source	Contact force
Careful	Branch	Dietary fibre	Clay soil	Mirror	Horseshoe magnet
Changes	Bulb	Fat	Crystals	Names of light sources e.g. torch	Iron
Classify	Damp/wet/dry	Food types	Fossils	Opaque	Magnet
Comparative tests	Dark/light	Foods high in fat or sugar	Grains	Reflect	Magnetic force
Conclusions	Fertiliser	Fruit and vegetable	Granite	Reflective	Magnetic material
Data loggers	Flower	Joints	Hard/soft	Shadow	Metal
Data/evidence/results	Fruit	Meat, fish, egg, beans	Let water through	Translucent	Non-contact force
Differences	Grow/growth	Milk and dairy foods	Marble	Transparent	Non-magnetic material
Equipment	Healthy	Movement	Peat		North pole
Evidence	Hot/warm/cool/cold	Muscles	Pebble		Poles
Fair tests	Leaf/leaves	Nutrients	Rock		Pull/pulling
Gather	Life cycle	Nutrition	Sandstone		Push/pushing
Group	Light	Protection	Sandy soil		Repel
Identify	Nutrients	Protein	Slate		Ring magnet
Keys	Part	Ribs	Soil		South pole
Link	Petal	Skeleton	Stone		Steel
Magnifying glass	Pollination	Skull	Texture		Strength
Measure	Role	Sockets			
Microscope	Root	Spine/vertebra			

Working Scientifically	Plants	Animals Including Humans			
Notice patterns	Seed	Support			
Observations	Seed dispersal	Tendons			
Observe changes over time	Seed formation	Vitamins and mineral			
Order	Soil	Water			
Prediction	Stalk				
Present	Stem				
Questions	Transported				
Questions	Trunk				
Record	Use comparatives e.g. hotter				
Results	Water				
Results					
Secondary sources					
Similarities					
Sort					
Support/not support					
Table					
Thermometers					
Types of scientific enquiry					

YEAR 4 – Vocabulary					
Working Scientifically	**Living Things and Their Habitat**	**Animals Including Humans**	**Materials**	**Sound**	**Electricity**
Accurate	Amphibians	Anus	Air	Brass	Appliances/device
Conclusions	Birds	Molar	Freeze	Pitch	Battery
Gather	Classification keys	Prey	Molten	Tuned instrument	Bright/dim
Fair tests	Environment	Predator	Melting point	Tune	Bulb
Identify	Fish	Rectum	Powder	Volume	Buzzer
Comparative tests	Human impact	Large intestine	Evaporate/evaporation	Percussion	Cell
Careful	Invertebrates	Food chain	Cooled/cooling	Loud/quiet	Circuit diagram
Changes	Mammals	Herbivore	Crystals	Muffle	Circuit symbol
Bar charts	Name negative human impact	Digestive system	Condense/condensation	Insulation	Complete circuit
Classify	Name positive human impact	Incisor	Degrees celsius	Noise	Components
Link	Name some invertebrates	Small intestine	Solidify	Sound	Conductor
Data/evidence/results	Reptiles	Nutrients	Grain/granular	Travel	Connect/connection
Evidence	Vertebrates	Pre-molar	Melt	Instrument	Crocodile clip
Appearance		Consumer	Change state	Sound source	Electrical circuit
Keys		Saliva	Solid	Fainter	Fast(er)/slow(er)
Magnifying glass		Stomach	States of matter	Woodwind	Insulator
Decrease		Nutrition	Heated/heating	High/low	Loose connection
Answer		Canines	Boil	Solid/liquid/gas	Mains
Measure		Teeth	Temperature	Strength of vibrations	Metal/non metal
Increase		Rip, tear, chew, grind, cut	Precipitation		Motor
Answers		Carnivore	Boiling point		Plug
Data loggers		Mouth	Gas		Positive/negative
Differences		Oesophagus (gullet)	Ice/water/steam		Short circuit

Working Scientifically		**Animals Including Humans**	**Materials**	**Sound**	**Electricity**
Group		Producer	Oxygen	Vibrate/vibration	Switch
Equipment		Omnivore	Liquid	Strings	Wire
Microscope		Tongue	Transpiration		
Notice patterns			Water cycle		
Observations			Water vapour		
Observe changes over time					
Order					
Prediction					
Present					
Questions					
Record					
Results					
Results					
Secondary sources					
Similarities					
Sort					
Support/not support					
Table					
Thermometers					
Types of scientific enquiry					

YEAR 5 – Vocabulary				
Working Scientifically	**Living Things and Their Habitat**	**Materials**	**Forces and Magnets**	**Earth and Space**
Accuracy	Amphibian	Absorbent	Air resistance	'Dwarf' planet
Accurate	Asexual	Burning	Attract	Astronomical clocks
Answer	Bird	Change state	Earth	Celestial body
Answers	Eggs	Condensing	Fall	Earth
Bar charts	Fish	Dissolve	Force	Geocentric model
Careful	Germination	Electrical conductivity	Friction	Heliocentric model
Causal relationships	Insect	Evaporating	Gears	Jupiter
Changes	Life cycle	Filtering	Gravity	Mars
Classification keys	Live young	Flexible	Levers	Mercury
Classify	Mammal	Gas	Magnet	Moon
Comparative tests	Plantlets e.g. spider plant	Gas given off	Magnetic force	Neptune
Conclusions	Pollen	Hard	Mechanisms	Night and day
Controlled variable	Pollination	Insoluble	Moving surfaces	Orbit
Data loggers	Reproduction	Liquid	Pulleys	Planets
Data/evidence/results	Reptile	Melting	Transfers	Pluto
Decrease	Runners e.g. strawberry plant	Mix/mixture	Water resistance	Revolve
Degree of trust	Seed dispersal	New material		Rotate/rotation
Dependent variable	Seed formation	Non reflective		Saturn
Differences	Sexual	Not usually reversible		Shadow clocks
Equipment	Stamen	Opaque		Solar system
Evidence	Stigma	Particle		Sphere/spherical
Fair tests		Reflective		Spin
Forces and magnets		Residue		Sun

Working Scientifically		Materials		Earth and Space
Gather		Reversible changes		Sundials
Group		Rigid		Uranus
Identify		Rough		Venus
Increase		Rusting		
Independent variable		Sieving		Light
Keys		Smooth		Mirror
Line graphs		Soft		Names of light sources e.g. torch
Link		Solid		Opaque
Magnifying glass		Solubility		Reflect
Measure		Soluble		Reflective
Microscope		Solute		Shadow
Notice patterns		Solution		Translucent
Observations		Solvent		Transparent
Observe changes over time		States of matter		Absorb
Order		Stretchy		Block
Precision		Strong/weak		Dark/darkness
Prediction		Thermal conductivity		Direct/ direction
Present		Translucent		
Questions		Transparent		
Questions		Waterproof		
Record				
Results				

Working Scientifically	Living Things and Their Habitat	Materials	Forces and Magnets	Earth and Space
Scatter graphs				
Secondary sources				
Similarities				

Sort				
Support/refute				
Table				
Thermometers				
Types of scientific enquiry				
Variables				

YEAR 6 – Vocabulary					
Working Scientifically	**Living Things and Their Habitat**	**Animals Including Humans**	**Evolution**	**Light**	**Electricity**
Accuracy	Amphibians	Blood	Adapted/adaptation	Absorb	Appliances/device
Accurate	Arachnid	Blood vessels	Characteristics	Block	Battery
Answer	Birds	Carbon dioxide	Environment	Dark/darkness	Bright/dim
Answers	Classification keys	Circulatory system	Fossils	Direct/ direction	Bulb
Bar charts	Crustacean	Diet	Inherit/inheritance	Light source	Buzzer
Careful	Environment	Drugs	Offspring	Mirror	Cell
Causal relationships	Fish	Exercise	Suited	Names of light sources e.g. torch	Circuit diagram
Changes	Fungus	Heart	Suited/suitable	Opaque	Circuit symbol
Classification keys	Insect	Lifestyle	Vary/variation	Reflect	Complete circuit
Classify	Invertebrates	Lungs		Reflective	Components
Comparative tests	Mammals	Nutrients		Shadow	Conductor
Conclusions	Micro-organisms	Oxygen		Translucent	Connect/connection
Controlled variable	Mollusc	Pumps		Transparent	Crocodile clip
Data loggers	Mushrooms	Water			Electrical circuit
Data/evidence/results	Name some invertebrates				Fast(er)/slow(er)
Decrease	Organism				Loose connection
Degree of trust	Reptiles				Motor
Dependent variable	Vertebrates				Positive/negative
Differences					Short circuit
Equipment					Switch
Evidence					Terminal
Fair tests					Volume
Gather					Wire

Working Scientifically					
Group					
Identify					
Increase					
Independent variable					
Keys					
Line graphs					
Link					
Magnifying glass					
Measure					
Microscope					
Notice patterns					
Observations					
Observe changes over time					
Opinion/fact					
Order					
Precision					
Prediction					
Present					
Questions					
Questions					
Record					
Results					
Results					
Scatter graphs					

Working Scientifically					
Secondary sources					
Similarities					
Sort					
Support/refute					
Table					
Thermometers					
Types of scientific enquiry					
Variables					