

Science



Holywell C of E Primary School

Flowing, Strengthening, Deepening

INTENT

At Holywell, we use our school vision, *Flowing, Strengthening, and Deepening*, to guide our science intent:

- **Flowing** – developing a secure understanding of key scientific knowledge and skills.
- **Strengthening** – making links between different science units using the key concepts to make these connections. For example, looking at how root hair cells in plants, and villi in the digestive system, have a similar structure related to their similar function of absorbing nutrients.
- **Deepening** – applying knowledge of science across different STEM Subjects such as DT when incorporating electrical components, or exercise science in PE, to strengthen understanding.

We use the National Curriculum as the foundation of our own science curriculum which states that:

A high-quality science education provides the foundations for understanding the world through the specific disciplines of biology, chemistry and physics. Science has changed our lives and is vital to the world's future prosperity, and all pupils should be taught essential aspects of the knowledge, methods, processes and uses of science. Through building up a body of key foundational knowledge and concepts, pupils should be encouraged to recognise the power of rational explanation and develop a sense of excitement and curiosity about natural phenomena. They should be encouraged to understand how science can be used to explain what is occurring, predict how things will behave, and analyse causes. The national curriculum for science aims to ensure that all pupils:

- *Develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics.*
- *Develop understanding of the nature, processes and methods of science through different types of science enquiries that help them to answer scientific questions about the world around them.*
- *Are equipped with the scientific knowledge required to understand the uses and implications of science, today and for the future.*

The intent of our curriculum is to provide children with the scientific knowledge and scientific enquiry skills they need to understand the world around them, make connections between different units and apply their developing scientific knowledge across other curriculum areas.

Cultural capital in Science at Holywell. In science lessons at Holywell, children learn about significant scientific pioneers and change makers throughout history relating to relevant units of work. Use of video clips during lessons to show a variety of scientists working in different areas of science helps children to identify science in our everyday lives and see it as something accessible for them and their future. Children are exposed to a number of science related areas on school trips including adaptation and animals for EYFS and Year 1 and Plants and Growing for Year 2.

Scientific literacy - Children are encouraged to use their literacy knowledge throughout science and articulate and reason in full sentences and, where relevant, do similarly in their written work. Each lesson includes an introduction to key vocabulary, supporting the children to use these key terms in discussion and written work. In this way children start to think as scientists as they learn and use the relevant terminology with increasing confidence. Children are supported with knowledge organisers for each unit of work.

Science in everyday life - In class discussions children are exposed to learning about different career paths in the scientific field, both directly and indirectly. Among other things, these discussions are used as opportunities to broaden pupil's existing ideas and views around diversity and gender related issues in science. Whenever possible we encourage collaboration with our wider community for the children to experience discussion and exploration of science topic areas and exposure to career opportunities

e.g. Science Corner with a scientist parent, visits from St Neots Astronomy Society and links with Needingworth Gardening Club to help support and develop our school gardening club. In this way children are more likely to see science as relevant to everyday life and understand that science is everywhere.

IMPLEMENTATION.

The Long-Term Plan

Our science curriculum covers the statutory content of the national curriculum, including both substantive and disciplinary knowledge and allows children to work in greater depth where appropriate for the child.

We are planning further curriculum content relating to sustainability to develop children's awareness of key environmental issues, some of which relate to the **17 UN Sustainable Development Goals (SDGs)**.



As we develop our curriculum further, we aim to support statutory content with real life contexts, science within our community and scientists of note (past and present). We are always reviewing our curriculum to ensure that we are abreast of current thinking in the field of changing science.

Early Years








Our EYFS provision is designed to ensure children work towards and achieve the Early Learning Goals (ELGs). Specifically in science, our Early Years provision is designed to ensure children have the opportunity to achieve the ELGs related to Understanding the World, whilst also acknowledging that science provides wonderful opportunities to achieve ELGS related to Communication and Language amongst others. The ELG descriptors for both of this key area is below, and the descriptors that are particularly relevant to science have being highlighted. In Early Years, our focus is very much on child-led learning and allowing the children's interests to decide where the learning goes. This means that the focus of the science that the children study year-on-year may change, but the focus on the ELGs remains key.

Understanding the World
Past and Present
<ul style="list-style-type: none">• Talk about the lives of the people around them and their roles in society.• Know some similarities and differences between things in the past and now, drawing on their experiences and what has been read in class.• Understand the past through settings, characters and events encountered in books read in class and storytelling.
People, Culture and Communities
<ul style="list-style-type: none">• Describe their immediate environment using knowledge from observation, discussion, stories, non-fiction texts and maps.• Know some similarities and differences between different religious and cultural communities in this country, drawing on their experiences and what has been read in class.• Explain some similarities and differences between life in this country and life in other countries, drawing on knowledge from stories, non-fiction texts and (when appropriate) maps.
The Natural World
<ul style="list-style-type: none">• 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.

	Autumn		Spring		Summer	
EYFS	<ul style="list-style-type: none"> • 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. 					
Y1	Animals including humans – All about me	Seasonal Change	Materials – Part 1	Plants and Planting	Animals including humans – All about animals	Materials – Part 2
Y2	Habitats and Adaptation	Materials	Plants	Animals including humans - growth	Animals including humans - Lifecycles	Living things and their habitats
Y3	Forces and Magnets	Muscles, Bones and Movement	Rocks, Fossils and Soils	Light	Plants	Scientific Enquiry
Y4	Electricity 1	Living things and their habitats	States of Matter	Sound	Habitats and Classification	The Digestive System
Y5	Forces	Properties and Changes of Matter	Space	Animals including Humans	Lifecycles and Reproduction	Reversible and Irreversible changes
Y6	Classification 2	Electricity 2 Sustainability – Renewable energy	Light Sustainability – Light pollution	1.The Circulatory System 2.Diet, Drugs and Lifestyle	Evolution and Inheritance	Fossils Consolidation & Project

Working Scientifically at Holywell

Science at Holywell includes elements of both substantive knowledge and working scientifically. The following symbols are used across school to represent the key working scientifically skills.

-  Asking questions
-  Making predictions
-  Setting up tests
-  Observing and measuring
-  Recording data
-  Interpreting and communicating results
-  Evaluating

A progression in working scientifically skills can be found in section 5 of this document.

3. Unit Overviews

Every science lesson at Holywell includes learning both substantive knowledge and practising skills in working scientifically. The overview below details the knowledge taught in each unit of work with teachers developing the working scientifically aspect of the lesson to fulfil the learning objectives, national curriculum requirements and cohort of children. Where Forest School gives an opportunity for scientific investigation this is included as FS.

Year 1

Animals including humans – All about me (Autumn 1)	
LOs and Key Concepts	
1	To discover the basic parts of the human body
2	To learn about your eyes and sight
3	To learn about your ears and hearing
4	To explore the tongue and taste
5	To explore your sense of touch
6	To discover how your nose smells
FS	Observe seasonal change, weather patterns and variety in day length across the year - collect and record (Autumn)
Key Outcomes	
Pupils have 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.	
Vocabulary	
head, body, brain, eyes, pupil, ears, mouth, teeth, tongue, fingers, skin, nose, senses, touch, see, smell, taste, hear, *parts of the human body including those within the school's RSE policy	
Key Scientists: Teacher choice	

Seasonal Change (Autumn 2)	
LOs and Key Concepts	
1	To understand that there are 4 seasons
2	Understand the changes that take place in autumn
3	Understand the changes that take place in winter
4	Understand the changes that take place in spring
5	Understand the changes that take place in summer
6	Investigate how you can measure rainfall
FS	Observe seasonal change, weather patterns and variety in day length across the year - collect and record (Summer)
Key Outcomes	
Children will observe changes across the 4 seasons and observe and describe weather associated with the seasons and how day length varies.	
Vocabulary	
Seasonal Change vocabulary: seasons, winter, summer, spring, autumn weather, hibernate, temperature, sunny, rainy, raining, shower, windy, snowy, cloudy, hot, warm, cold, storm, thunder, lightning, hail, sleet, snow, icy, frost, puddles, rainbow, sun, sunrise, sunset, day length	
Key Scientists: Teacher choice	

Materials – Part 1 (Spring 1)	
LOs and Key Concepts	
1	To identify and name a variety of everyday materials including wood, plastic, glass, metal, rock
2	To distinguish between an object and the material it is made from
3	To describe the properties of everyday materials
4	To identify objects that are natural and those that are man made
5	Predict and identify if an object will float or sink
6	To explore which materials are best for different objects
FS	Seasonal change - collect and record (Winter)
Key Outcomes	
Pupils explore, name, discuss and raise and answer questions about everyday materials so that they become familiar with the names of materials and properties such as those in the vocabulary section below. Pupils explore and experiment with a wide variety of materials, including for example: brick, paper, fabrics, elastic, and foil. Pupils might work scientifically by: performing simple tests to explore questions, for example: 'What is the best material for an umbrella?'	
Vocabulary	
Hard, soft, stretchy, stiff, shiny, dull, rough, smooth, bendy, floppy, waterproof, absorbent, transparent, opaque, hard, soft, break/tear, material, wood, plastic, glass, metal, water, rock, brick, paper, fabric, elastic, foil, cardboard, rubber, wool, clay, property	
Key Scientists: Martin Brock (XelfleX inventor, nanotechnology engineer) and Charles Macintosh (inventor of waterproof fabric)	

Plants and Planting (Spring 2)	
LOs and Key Concepts	
1	To understand that seeds grow into plants
2	To identify the basic parts of a plant and tree
3	To understand that different plants can grow in the same environment
4	To know the difference between deciduous and evergreen trees
5	To know that fruit trees and vegetables are varieties of plants
6	To record the growth of a plant
FS	Seasonal change - collect and record (Winter)
Key Outcomes	
<p>Pupils use the local environment throughout the year to explore and answer questions about plants growing in their habitat. They observe the growth of plants that they have planted. Children become familiar with common names of flowers, examples of deciduous and evergreen trees, and plant structures (including leaves, flowers, (blossom), petals, fruit, roots, bulb, seed, trunk, branches, stem). Pupils might work scientifically by: observing closely, perhaps using magnifying glasses, and comparing and contrasting familiar plants; describing how they were able to identify and group them, and drawing diagrams showing the parts of different plants including trees. Pupils might keep records of how plants have changed over time, for example, the leaves falling off trees and buds opening; and compare and contrast what they have found out about different plants.</p>	
Vocabulary	
<p>leaf, flower, blossom, petal, fruit, berry, vegetable, root, seed, trunk, branch, stem, bark, stalk, bud, seed, plant, deciduous, evergreen</p> <p>*names of trees in the local area, names of garden and wild flowering plants in the local area</p>	
Key Scientists: Teacher choice	

Animals including humans – All about animals (Summer 1)	
LOs and Key Concepts	
1	To discover animal families
2	To learn about the differences between mammals and birds
3	To learn about the differences between amphibians, reptiles and fish
4	Discover the types of food living things eat
5	Explore the difference between wild animals and pets
6	To explain the characteristics of an animal
FS	WS: Seasonal change - collect and record (Spring)
Key Outcomes	
<p>Pupils will identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals. They learn how to identify and name a variety of common animals that are carnivores, herbivores and omnivores. Finally, pupils learn how to describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals) including pets</p>	
Vocabulary	
<p>Fish, amphibian, reptile, mammal, bird, warm-blooded, cold-blooded, herbivore, omnivore, carnivore</p>	
Key Scientists: Teacher choice	

Materials – Part 2 (Summer 2)	
LOs and Key Concepts	
1	To build a structure strong enough to withstand wind
2	To build a waterproof structure
3	To understand the properties of glass and its uses
4	Understand that materials are used to create a variety of furniture
5	Explore a variety of fabrics and understand their different properties
6	To explain the uses of materials and why they are suitable
FS	Observe seasonal change, weather patterns and variety in day length across the year - collect and record (Spring)
Key Outcomes	
<p>Children will distinguish between an object and the material from which it is made. They also learn how to identify and name a variety of everyday materials including wood, plastic, glass, metal, water and rock. They describe the simple properties of a variety of everyday materials and finally learn how to compare and group together a variety of everyday materials on the basis of their simple physical properties.</p>	
Vocabulary	
<p>Strong, clay, cotton, brick, roof, slate, window pane, window frame,</p>	
Key Scientists: Teacher choice	

Year 2

Habitats and Adaptation (Autumn 1)	
LOs and Key Concepts	
1	To identify the Earth's major habitats: forest, desert, polar/tundra, grassland and aquatic
2	To identify some of the ways rain forest animals and plants are adapted to live in their habitat
3	To identify some of the ways desert animals are adapted to live in their habitat
4	To identify some of the ways polar animals are adapted to live in their habitat
5	To identify some of the ways grassland animals are adapted to live in their habitat
6	To identify some of the ways aquatic animals are adapted to live in water
Key Outcomes	
The children will learn the key habitats of Earth: forest, desert, polar/tundra, grassland and aquatic as well as prominent examples of each and their location, for example, the Amazon and Congo Rainforests, or the Arabian Desert. They will identify commonly known animals and plants that inhabit each of these environments and ways in which they are adapted to do so. E.g. they might learn how animals commonly have the colouring of their environment for camouflage, or how thick fur might keep them warm. Within this unit children will be introduced to the idea of a simple food chain within the context of adaptations e.g. in the desert camels feed on succulent plants.	
Vocabulary	
Earth, Equator, Forest, Rainforest, Desert, Polar Regions, Tundra, Grassland, Aquatic, Oceanic, Habitat, Adaptation, Camouflage, food chain, living, dead, never been alive, suited, suitable, basic needs, food, food chain, shelter, move, feed, water, air, survive, names of local habitats (e.g. pond, woodland etc.), names of micro-habitats (e.g. under logs, in bushes etc.), conditions, light, dark, shady, sunny, wet, damp, dry, hot, cold, names of living things in the habitats and micro-habitats studied	
Key Scientists: Teacher choice	

Materials (Autumn 2)	
LOs and Key Concepts	
1	To identify different materials and their uses
2	To understand how to select the right materials to build a bridge
3	To explore and test the stretchiness of materials
4	To understand that materials can change their shape by twisting, bending, squashing and stretching
5	Learn about Charles Macintosh and explore how materials are suitable for different purposes
6	Discover which materials change shape when making a road with John McAdam
Key Outcomes	
The children will identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses. Children will also find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.	
Vocabulary	
material, property, construction, wood, paper, cardboard, brick, rock, plastic, glass, metal, fabric, transparent, opaque, translucent, hard, flexible, rough, smooth, absorbent, brittle, shiny, waterproof, strong, insulating, conducting, reflective, non-reflective, rigid, shape, push/pushing, pull/pulling, twist/twisting, squash/squashing, bend/bending, stretch/stretching, elastic, force	
Key Scientists: Julie Brusaw (Solar Roadways inventor, material engineer), John Loudon (McAdam Inventor of macadam road surfacing), Charles Macintosh (waterproofing)	

Plants (Spring 1)	
LOs and Key Concepts	
1	To know the differences between seeds and bulbs
2	Design an experiment to find out what plants need to grow
3	Describe what plants need to grow and stay healthy
4	Describe the life cycle of a plant
5	Observe and record the growth of plants over time
6	Understand that plants adapt to suit their environment
Key Outcomes	
The children will learn that plants need water, light and a suitable temperature to grow and stay healthy, as well as what can happen when they get too much, or too little of them. They will create experiments to test this by planting plants in different conditions. Pupils will observe and describe how seeds and bulbs grow into mature plants.	
Vocabulary	
plant, tree, flower, root, stem, leaves, trunk, branch, sunlight, nutrients, soil, water, seed, bulb, germination, seedling, sapling, conditions, light, shade, sun, warm, cool, water, space, grow, healthy, shoot, photosynthesis, carbon dioxide, oxygen, glucose, pollination	
Key Scientists: Teacher choice	

Animals including humans - Growth - (Spring 2)	
LOs and Key Concepts	
1	Describe the needs of animals for survival
2	Describe the needs of humans for survival
3	Explore the importance of eating the right food
4	Describe what a healthy, balanced diet looks like
5	Investigate the impact of exercise on our bodies
6	Investigate the importance of hygiene
Key Outcomes	
Pupils learn how to notice that animals, including humans, have offspring which grow into adults. They find out about and describe the basic needs of animals for survival (water, food, air), as well as the importance of exercise and nutrition for humans.	
Vocabulary	
Nutrition, healthy, protein, carbohydrate, dairy, fat, exercise, hygiene	
Key Scientists: Teacher choice	

Animals including humans - Lifecycles (Summer 1)	
LOs and Key Concepts	
1	Learn how to order the stages of the human lifecycle
2	Describe the stages of life from adult to old age
3	Learn how to match offspring to their parent
4	Explore the lifecycle of a chicken
5	Describe the lifecycle of a butterfly
6	Explore the lifecycle of a frog
Key Outcomes	
In this unit children build on their knowledge of the last unit on survival. They are introduced to the processes of reproduction and growth in animals. The focus is on questions that help pupils to recognise growth; rather than understanding how reproduction occurs e.g. egg, chick, chicken; egg, caterpillar, pupa, butterfly; spawn, tadpole, frog; lamb, sheep. Growing into adults can include reference to baby, toddler, child, teenager, adult. Pupils work scientifically by: observing, through video or first-hand observation and measurement, how different animals, including humans, grow; asking questions about what things animals need for survival and what humans need to stay healthy; and suggesting ways to find answers to their questions.	
Vocabulary	
Lifecycle, growth, foetus, womb, offspring, adult, reproduction, transformation, metamorphosis, froglet, growth	
Key Scientists: Teacher choice	

Living things and their habitats (Summer 2)	
LOs and Key Concepts	
1	Compare the differences between things that are living, dead and things that have never been alive
2	Identify and name a variety of plants and animals in a microhabitat
3	Design a suitable microhabitat where living things could survive
4	Find out what animals eat to survive in their habitats
5	Understand food chains
6	Understand the journey food makes from the farm to the supermarket
Key Outcomes	
In this unit children explore and compare the differences between things that are living, things that are dead and things which have never been alive. They learn how to identify and name a variety of plants and animals in their habitats, including microhabitat; and 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.	
Vocabulary	
Reproduce, excrete, respire, habitat, microhabitat, survive, producer, consumer	
Key Scientists: Teacher choice	

Year 3

Forces and Magnets (Autumn 1)	
LOs and Key Concepts	
1	To explore contact and non-contact forces
2	To compare how different objects move on different surfaces.
3	To explore different types of magnets
4	To explore the properties of magnets and everyday objects that are magnetic
5	To understand that magnetic forces can act at a distance
6	To explore the everyday uses of magnets
Key Outcomes	
The children will compare how things move on different surfaces; notice that some forces need contact between two objects, but magnetic forces can act at a distance; and observe how magnets attract or repel each other and attract some materials but not others. Children learn how to compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials; describe magnets as having two poles and they learn how to predict whether two magnets will attract or repel each other depending on which poles are facing.	
Vocabulary	
magnet, magnetic, magnetic field, attract, repel, Magnetic Poles, north pole, south pole, force, push, pull, surface, friction, resistance, force, push, pull, non-contact force, strength, bar magnet, ring magnet, button magnet, horseshoe magnet, metal, iron, steel, motion, texture, magnetism, compass, orienteering	
Key Scientists: William Gilbert (Theories on Magnetism) Andre Marie Ampere (Founder of Electro Magnetism)	

The Skeleton and Movement (Autumn 2)	
LOs and Key Concepts	
1	Explore the 5 key food groups
2	Learn about the nutrition in the food we eat
3	Learn about the different types of skeletons - vertebrate and invertebrate
4	To learn about the human skeleton
5	Learn about animals and their skeletons
6	To explore the role of muscles
Key Outcomes	
Children will 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. Children will be able to name and identify that humans and some other animals have skeletons and muscles for support, protection and movement. They will understand the terms vertebrate and invertebrate and be able to comment on whether all skeletons are the same and give some reasons for similarities and differences.	
Vocabulary	
Skeleton, bones, nutrition, growth, movement, vitamins, mineral, nutrition label, balanced, vertebrate, invertebrate, support, protect, move, skull, ribs, spine, muscles, joints, endoskeleton, exoskeleton, radius, tibia, ribcage, spine, hamstrings, biceps	
Key Scientists: Marie Curie (Radiation / X-Rays) Adelle Davis (20th Century Nutritionist)	

Rocks, Fossils and Soils (Spring 1)	
LOs and Key Concepts	
1	Explore the formation and properties of igneous rocks
2	Explore the formation and properties of sedimentary and metamorphic rocks
3	Weathering and the suitability of different rocks for different purposes
4	Explore how water contributes to the weathering of rocks
5	Understand how fossils are formed
6	Explore different types of soil
Key Outcomes	
Pupils will learn to compare and group together different kinds of rocks on the basis of their appearance and simple physical properties. They will learn how to describe in simple terms how fossils are formed when things that have lived are trapped within rocks and finally they learn how to recognise that soils are made from rocks and organic matter.	
Vocabulary	
Sedimentary, metamorphic, igneous, rock, stone, pebble, boulder, grain, crystals, layers, appearance, texture, permeable, impermeable, gravel, clay, chalk, flint, granite, marble, chalk, sandstone, slate, volcano, soft, rough, smooth, layers, hard, sandy/chalky/ clay soil, absorb, texture, absorbs water, fossil, bone, flesh, minerals, types of soil (e.g. peaty, sandy, chalky, clay)	
Key Scientists: Holly Betts (Palaeobiologist) Mary Anning (Discovery of Fossils)	

Light (Spring 2)	
LOs and Key Concepts	
1	To identify the difference between light sources and non-light sources
2	To explore that light comes from the sun and how to stay safe
3	To explore materials that are reflective
4	To discover how shadows are formed when light sources are blocked by an opaque object
5	To investigate how shadows change throughout the day
6	Investigate how you can change the size of a shadow
Key Outcomes	
Pupils will recognise that they need light in order to see things and that dark is the absence of light; they notice that light is reflected from surfaces; and recognise that light from the sun can be dangerous and that there are ways to protect their eyes. Children will learn how to recognise that shadows are formed when the light from a light source is blocked by an opaque object; and they find patterns in the way the size of shadows change. Note: pupils should be warned that it is not safe to look directly at the sun, even when wearing dark glasses. Pupils might work scientifically by: looking for patterns in what happens to shadows when the light source moves or the distance between the light source and the object changes.	
Vocabulary	
Light, light source, dark, absence of light, natural, artificial, transparent, translucent, opaque, shiny, matt, surface, shadow, reflect, mirror, sunlight, dangerous, vitamin D, ultraviolet rays, florescent, high visibility, ray, cast, position	
Key Scientists: James Clerk Maxwell (Visible and Invisible Waves of Light)	

Plants (Summer 1)	
LOs and Key Concepts	
1	To compare the effect of different factors on plant growth
2	To describe the functions of different parts of a flowering plant and how they are used in photosynthesis
3	Investigate the way water is transported in plants
4	To explore the part that flowers play in the lifecycle of flowering plants
5	To understand the pollination process and the different ways seeds are dispersed
6	To compare the effect of different factors on plant growth
Key Outcomes	
Children are introduced to the relationship between structure and function: the idea that every part has a job to do. They explore questions that focus on the role of the roots and stem in nutrition and support, leaves for nutrition and flowers for reproduction. Pupils might work scientifically by: comparing the effect of different factors on plant growth, for example, the amount of light, the amount of fertiliser; discovering how seeds are formed by observing the different stages of plant life cycles over a period of time; looking for patterns in the structure of fruits that relate to how the seeds are dispersed. They observe how water is transported in plants, for example, by putting cut, white carnations into coloured water and observing how water travels up the stem to the flowers.	
Vocabulary	
photosynthesis, pollen, insect/wind pollination, male, female, seed formation, seed dispersal (wind dispersal, animal dispersal, water dispersal), air, nutrients, minerals, soil, absorb, transport, fertiliser, potassium, chlorophyll, photosynthesis, xylem, phloem, anther, filament, stomata, transpiration, pollen, nectar	
Key Scientists: Cindy Looy (Environmental Change and Extinction) Jaques Cousteau (Marine Biologist)	

Scientific Enquiry (Summer 2)	
LOs and Key Concepts	
1	How can a solar oven be made more effective: posing questions and writing predictions
2	How can a solar oven be made more effective: recording and presenting results
3	Cleaning coins: Writing a method and carrying out a practical test
4	Cleaning coins: Writing a conclusion
5	Making a cake: fair testing, controls and variables
6	Making a cake: scientific enquiry
Key Outcomes	
Pupils will learn the scientific skills they will need to apply during units of work in KS2 science, specifically: *Ask relevant questions and use different scientific enquiries to answer them. * Set up simple practical enquiries, comparative and fair tests. * Make systematic and careful observations, take accurate measurements using standard units and using a range of equipment. * Gather, record, classify and present data in a variety of ways. * Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts and tables. * Report on findings including oral and written explanations, displays or presentations of results and conclusions. * Use results to draw simple conclusions, make predictions, suggest improvements and raise further questions. * Identify differences, similarities or changes related to simple scientific ideas and processes. * Use evidence to answer questions or support findings.	
Vocabulary	
Scientific investigation, prediction, plausible, record, data, method, control experiment, equipment, enquiry, practical, conclusion, fair test	
Key Scientists: :	

Year 4

Electricity 1 (Autumn 1)	
LOs and Key Concepts	
1	To identify a variety of appliances that run on electricity
2	To understand simple series electrical circuits
3	To visually using recognised symbol used when representing simple circuits
4	To understand if it is a closed loop, and has the required components, the electricity will flow.
5	To understand switches work and how they work to stop the flow of electricity
6	To understand that some materials conduct electricity
Key Outcomes	
The children will learn how to construct simple series electrical circuits using a variety of components, understanding that they have to be a complete loop to function. They will learn how to represent these visually using recognised symbols, and predict whether or not a series circuit will work by deciding if it is a complete closed loop with necessary components. They will understand how switches work and incorporate them into the circuits they build. They will understand that some materials conduct electricity, and some are insulators, conducting investigations to group and sort them appropriately.	
Vocabulary	
Appliance, Device, Series Circuit, Cell, Battery, Wires, Crocodile Clips, Bulb, Bulb Holder, Buzzer, Motor, Switch, Conductor, Insulator, electricity, mains, plug, electrical circuit, complete circuit, component, positive, negative, connect/connections, loose connection, short circuit, metal, non-metal, symbol.	
Key Scientists: Thomas Eddison (First Working Lightbulb) Joseph Swan (Incandescent Light Bulb)	

Living Things and their habitats (Autumn 2)	
LOs and Key Concepts	
1	To describe ecosystems and how they are affected by changes in the seasons
2	To understand human impact on the environment by deforestation
3	Explore air pollution
4	Understand water pollution
5	Explore methods that can be used to conserve water
6	To understand that humans can have a positive impact on nature
Key Outcomes	
In this unit, which focuses on conservation, children will learn about how ecosystems and habitats are subject to changes – some of which pose a danger to living things. They will explore deforestation, air and water pollution in more detail and identify that humans have both a positive and sometimes negative effect on nature.	
Vocabulary	
Migrate, monsoon, deforestation, biodiversity, emissions, pollution, pesticide, contamination, drought, freshwater, marine sanctuaries, conservation areas	
Key Scientist: Seirian Sumner Evolutionary biologist and behavioural ecologist) and Jane Goodall (Primatologist)	

States of Matter (Spring 1)	
LOs and Key Concepts	
1	To compare and group the three states of matter
2	To explore how particles behave in solids, liquids and gases
3	To investigate melting points
4	To explore freezing and boiling points
5	To explore evaporation and condensation
6	To understand the water cycle
Key Outcomes	
Within this unit, children will 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; and finally identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.	
Vocabulary	
Solid, liquid, gas, changes of state, heating, cooling, melting, freezing, evaporation, temperature, water cycle, melting point, boiling, boiling point, condensation, temperature, thermometer, particles, water vapour, substance	
Key Scientists: Anders Celcius (Celcius Temperature Scale) Daniel Fahrenheit (Fahrenheit Temperature Scale / Invention of the Thermometer)	

Sound (Spring 2)	
LOs and Key Concepts	
1	To understand how sounds are created through vibrations
2	To understand that vibrations from sounds travel through the ear
3	To explore sound insulation
4	To explore volume
5	To explore pitch
6	To explore sounds from near and far
Key Outcomes	
<p>Within this unit children will learn that sounds are made when objects vibrate. This is the first time that children have explored sound and they may have some common misconceptions about sound and how it is produced. These vibrations then travel through the air (or another medium) to our ears. It is important that children are exposed to the different ways objects vibrate to produce sounds, including musical instruments, radios, mobile phones and animals. In the previous block, children explored the concept of solids, liquids and gases. It is important that children are aware that sounds can travel through air, but they can also travel through any material, including solids and liquids.</p>	
Vocabulary	
<p>Sound, source, vibrate, vibration, travel, pitch (high/low), volume, faint, loud, distance, fade, sound insulation, quiet, insulation, medium, energy, materials, reflect, decibels, instruments, particles, sound source</p>	
Key Scientists; Teacher choice	

Habitats and Classification (Summer 1)	
LOs and Key Concepts	
1	Explore different habitats
2	Research a habitat
3	Explore how animals can be classified
4	Create a classification key
5	Adaptation and classification within species
6	Explore and classify pond plants
Key Outcomes	
<p>In Year 2, children looked at animals (including humans) to identify their needs for survival, life cycles and offspring. They explored examples of mammals, birds, fish, amphibians and reptiles. In this step, children identify, sort and group animals into categories based on their features. Children are introduced to the term vertebrate and invertebrate. Children investigate examples of animals that are harder to categorise, such as the duck-billed platypus, to challenge thinking and reasoning skills. Within this unit, children will consolidate their understanding of classification keys from their unit in the Autumn term. They will understand the key requirements for all living things and how we can use these to design our classification keys. They will explore key habitats: Woodlands, Ocean, Polar and Desert, discovering how animals living in these areas access food, water and shelter. We will also explore habitats within our own school grounds including conducting a OPAL Pond Survey.</p>	
Vocabulary	
<p>classification, classification key, environment, habitat, human impact, positive, negative, migrate, hibernate, adapted, coastal, grassland, species, subgroup, region, blubber, ecosystem, oxygenised</p>	
Key Scientists: Carl Linnaeus	

The Digestive System (Summer 2)	
LOs and Key Concepts	
1	To identify the organs in the digestive system
2	To describe the functions of the main organs in the digestive system
3	Identify the types of human teeth and their function
4	Investigate the effects of different liquids on the teeth
5	To understand food chains
6	To understand food webs
Key Outcomes	
<p>Pupils are introduced to the basic body parts associated with the digestive system in humans and explore questions that help them to understand their simple functions. Pupils identify the different types of teeth in humans and their function; finding out what damages teeth and how to look after them. They might draw and discuss their ideas about the digestive system and compare them with models or images. Finally pupils will construct and interpret a variety of food chains , identifying producers, predators and prey.</p>	
Vocabulary	
<p>digestive system, digestion, mouth, teeth, saliva, oesophagus, stomach, small intestine, large intestine, rectum, anus, incisors, canines, molars, premolars, herbivore, carnivore, omnivore, producer, predator, prey, consumer, saliva, peristalsis, enamel, fluoride, tundra, hide</p>	
Key Scientists: Teacher choice	

Year 5

Forces (Autumn 1)	
LOs and Key Concepts	
1	To explore gravity and the life and work of Sir Isaac Newton.
2	To examine the connection between air resistance and parachutes air resistance
3	To explore factors which affect water resistance
4	To investigate the effects of friction on different surfaces
5	To investigate mechanisms – levers and pulleys
6	To investigate mechanisms - gears
Key Outcomes	
The children will identify that like magnetism, gravity is a force that does not require physical touch to work. They will explore the concept of gravity, learn about Newton’s discoveries and how the gravitational pull of the sun keeps the planets of the solar system in place. They will explore the forces of air and water resistance, moving on to understanding friction, and investigate the movement of different objects on different surfaces, measuring the impact of each in newton metres. They will learn that when forces are balanced, there is no motion, and that motion is a consequence of forces being unbalanced. Lastly children will explore the mechanisms of pulleys, levers and gears and how they allow a smaller force to have a greater effect.	
Vocabulary	
Gravity, Sir Isaac Newton, newton meter, friction, resistance, air resistance, water resistance, aerodynamics, balance, force, motion, Earth, mechanisms, simple machines, levers, pulleys, gears	
Key Scientists: Sir Isaac Newton and Galileo Galilei	

Properties and Changes of Materials (Autumn 2)	
LOs and Key Concepts	
1	Explore properties of materials
2	Explore thermal conductors and thermal insulators
3	Explore the hardness of materials
4	Discover materials that are soluble in water
5	Investigate the solubility of materials
6	Explore how mixtures can be separated by filtering, sieving, evaporating or magnets
Key Outcomes	
Children start to build a more systematic understanding of materials by comparing and grouping everyday materials on the basis of their properties including magnetism (year 3), conductivity (year 4), hardness, solubility and transparency. They will learn that some materials will dissolve in liquid to form a solution, use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating. Finally children will learn how to give reasons based on evidence from comparative and fair tests for the particular uses of everyday materials including metals, plastic and wood.	
Vocabulary	
conductive, magnetic, thermal insulator/conductor, hardness, force, change of state, mixture, dissolve, solution, solute, solvent, substance, filtering, evaporation	
Key Scientists: Joe Keddle (Professor of Soft Matter Physics) and Spencer Silver (Inventor of Post-it®notes)	

Space and Sustainability – Global Warming (Spring 1)	
LOs and Key Concepts	
1	Explore the Solar System and its planets
2	Understand the heliocentric model of the Solar System
3	Explain the earth’s movement in space
4	Explain the Earth’s rotation and night and day
5	Explain the movement of the moon
6	What is Global Warming and what is its impact?
Key Outcomes	
Pupils learn that the sun is a star at the centre of our solar system and that it has 8 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 1 moon; Jupiter has 4 large moons and numerous smaller ones). Pupils should find out about the way that ideas about the solar system have developed, understanding 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. Pupils might work scientifically by: comparing the time of day at different places on the Earth through internet links and direct communication; creating simple models of the solar system; constructing simple shadow clocks and sundials, calibrated to show midday and the start and end of the school day; finding out why some people think that structures such as Stonehenge might have been used as astronomical clocks to deepen their understanding of the Moon, time zones and the night and day cycle.	
Vocabulary	
Gravity, orbit, heliocentric, geocentric, solar system, astronomy, Sun, Moon, phase, waxing, waning, Earth, planets (Mercury, Jupiter, Saturn, Venus, Mars, Uranus, Neptune), terrestrial planet, gas giants, axis, spherical, rotate, star	
Key Scientists: Ptolemy, Alhazen and Copernicus	

Animals Inc. Humans (Spring 2)	
LOs and Key Concepts	
1	To identify the key stages of a mammal's life cycle
2	Explore the gestation periods of mammals
3	Learn about foetal development
4	Investigate the hand span of differently aged children
5	Learn about the changes experienced in puberty
6	Describe the changes humans may experience in old age
Key Outcomes	
Pupils study and create their own timeline to indicate stages in the growth and development of humans as they move into old age. They learn about foetal development, the changes experienced in puberty and older age. Pupils could work scientifically by researching the gestation periods of other mammals and compare them with humans and investigating hand spans of differently aged people.	
Vocabulary	
puberty, life cycle, foetus, baby, toddler, child, adolescent, adult, reproduce, sexual, sperm, fertilises, egg, live young, offspring, dependent, gestation, pregnant, prenatal, breeding, embryo, hormones	
The vocabulary to describe sexual characteristics in line with the school's RSE policy	
Key Scientists: Sarah Fowler OBE (Marine biologist) and Sir David Attenborough (Naturalist and broadcaster)	

Lifecycles and Reproduction (Summer 1)	
LOs and Key Concepts	
1	To understand the life processes of a plant Asexual Reproduction:
2	To understand the life cycles of mammals
3	To compare the life cycles of insects and amphibians
4	To understand the life cycles of birds and reptiles
5	To know about the life and work of Jane Goodall and David Attenborough
6	Research and present the life cycle of a creature
Key Outcomes	
Pupils study and raise questions about their local environment throughout the year. They observe life-cycle changes in a variety of living things, for example, plants in the vegetable garden or flower border, and animals in the local environment. They find out about the work of naturalists and animal behaviourists, for example, David Attenborough and Jane Goodall. Pupils find out about different types of reproduction, including sexual and asexual reproduction in plants, and sexual reproduction in animals. Pupils might work scientifically by: observing and comparing the life cycles of plants and animals in our local environment with other plants and animals around the world (in the rainforest, in the oceans, in desert areas and in prehistoric times), asking pertinent questions and suggesting reasons for similarities and differences. They might try to grow new plants from different parts of the parent plant, for example, seeds, stem and root cuttings, tubers, bulbs. They might observe changes in an animal over a period of time (for example, by hatching and rearing chicks), comparing how different animals reproduce and grow.	
Vocabulary	
Living organism, naturalist, primatologist, life cycle, reproduction, asexual, live young, metamorphosis, endangered, fertilisation, placental mammal, monotreme mammal, plantlets, runners, cuttings,	
Key Scientists: David Attenborough and Jane Goodall	

Reversible & Irreversible change (Summer 2)	
LOs and Key Concepts	
1	To use evaporation to recover the solute from a solution
2	Recognise and describe reversible changes
3	Observe chemical reactions and describe how we know new materials are made
4	Investigate rusting reactions
5	Investigate burning reactions
6	Investigate chemical reactions – acids and bicarbonate of soda
Key Outcomes	
Children explore how to recover a substance from a solution (reversible change) including dissolving, mixing and changes of state. Pupils explore that some changes result in a new material being formed (can be non reversible), for example, burning, rusting and other reactions, for example, acid/ vinegar with bicarbonate of soda. They could observe and compare the changes that take place, for example, when burning different materials or baking bread or cakes. They might research and discuss how chemical changes have an impact on our lives, for example, cooking, and discuss the creative use of new materials such as polymers, super-sticky and super-thin materials.	
Vocabulary	
Solute, solvent, reversible/ non-reversible change, evaporate, chemical change, effervescence, fair test, corrosion, combustion, extinguish, reaction, carbon dioxide, soluble, insoluble, burning, rusting, new material	
Key Scientists: Chemists creating new materials, e.g. Spencer Silver, (invented the glue for sticky notes) or Ruth Benerito, (invented wrinkle-free cotton).	

Year 6

Classification 2 (Autumn 1)	
LOs and Key Concepts	
1	Conditions for Life
2	Grouping Organisms
3	Classifying Animals
4	Classifying Plants
5	Microorganisms
6	Carl Linnaeus
Key Outcomes	
<p>Pupils build on their learning about grouping living things in year 4 by looking at the classification system in more detail. They are introduced to the idea that broad groupings, such as micro-organisms, plants and animals can be subdivided. Through observations, they classify animals into commonly found invertebrates (such as insects, spiders, snails, worms) and vertebrates (fish, amphibians, reptiles, birds and mammals). They discuss reasons why living things are placed in one group and not another. Pupils might work scientifically by: using classification systems and keys to identify some animals and plants in the immediate environment. They could research unfamiliar animals and plants from a broad range of other habitats and decide where they belong in the classification system.</p>	
Vocabulary	
vertebrates, fish, amphibians, reptiles, birds, mammals, warm-blooded, cold-blooded, invertebrates, insects, spiders, snails, worms, flowering, non-flowering, mosses, ferns, conifers	
Key Scientists: Chris Nelson (Horticulturalist) and Carl Linnaeus (pioneer of classification).	

Electricity 2 and Sustainability – Renewable energy (Autumn 2)	
LOs and Key Concepts	
1	To identify the effects of adding additional components to a series circuit
2	To construct a variety of parallel electrical circuits and identify the difference to a series circuit
3	To represent a variety of parallel electrical circuits visually using recognised symbols
4	To predict whether or not a parallel circuit will work and identify errors in their construction
5	To understand how power stations work and how electricity is distributed around the country
6	To understand the difference between renewable and non-renewable energy and the prevalence of each in the UK
Key Outcomes	
<p>The children will revisit series electrical circuits and investigate the effect of increasing the number of components without increasing the number of cells on, for example, bulb brightness or buzzer volume, and vice versa. They will then move onto looking at parallel circuits, building a variety of them and representing those using recognised symbols. They will use their knowledge of parallel circuits to identify errors that will prevent them working correctly. They will then move onto looking at different ways electricity is generated in the UK, the prevalence of different types of generation, and how electricity is distributed nationally via the national grid.</p>	
Vocabulary	
Series circuit, parallel circuit, circuit diagram, circuit symbol, voltage, volt, dimness, brightness, volume, power station, turbine, generator, transformer, renewable, non-renewable, fossil fuels, carbon, global warming, sustainable, sustainability, power lines, reactor, nuclear, wind, solar, hydro power, tidal power.	
Key Scientists: Peter Rawlinson (Engineer) and Nicolas Tesla and Thomas Edison	


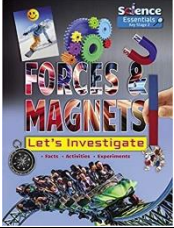
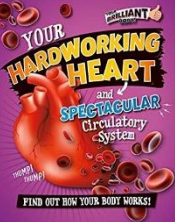
Light and Sustainability – Light Pollution (Spring 1)	
LOs and Key Concepts	
1	To explore how light travels
2	To explore how light enables us to see by reflecting off of objects
3	To understand how we see colours and how rainbows are formed
4	To understand the basic anatomy of an eye and how they enable us to see
5	To identify and understand angles of reflection and refraction
6	To use our knowledge of light and reflection to design and make a periscope
Key Outcomes	
<p>The children will understand that light travels like a wave in straight lines from its source. They will understand the basics of how we see by lighting from a light source bouncing off an object and into our eyes. They will look at the colour spectrum, and explain how rainbows are formed by light from the sun hitting water and refracting and reflecting. They will then move on to look at the basic anatomy of the eye and how our eye, optic nerve and brain work together to enable us to see. They will then look at angles of reflection and refraction, before applying their knowledge of light to design and create periscopes.</p>	
Vocabulary	
Source, wave, particle, photon, eye, lens, cornea, pupils, retina, rods, cones, optic nerve, brain, prism, reflection, refraction, angle, periscope, straight lines, light rays	
Key Scientists: Ernesta Jonkute (Nanotechnologist) and Alhazen (Pioneer of modern optics), Isaac Newton	

The Circulatory System & Diet, Drugs and Lifestyle (Spring 1)	
LOs and Key Concepts	
1	Understand the function of the heart and its role in the circulatory system
2	Blood
3	The heart
4	Blood flow in the heart
5	Oxygenated and deoxygenated blood
6	How can we keep our bodies healthy and what damages our bodies?
Key Outcomes	
Pupils 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 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. Pupils might work scientifically by: exploring the work of scientists and scientific research about the relationship between diet, exercise, drugs, lifestyle and health.	
Vocabulary	
heart, pulse, rate, pumps, blood, blood vessels, transported, lungs, oxygen, carbon dioxide, cycle, circulatory system, diet, drugs, lifestyle	
Key Scientists: Teacher choice	

Evolution & Inheritance (Summer 1)	
LOs and Key Concepts	
1	To introduce the concept of evolution through Darwin's work on the Theory of Natural Selection.
2	To explore why Darwin's work was controversial at the time of his writing.
3	To identify the ways in which humans have evolved over time.
4	To explore examples of how different animals have adapted to their environment and habitat.
5	To identify that fossils give us information on animal life from millions of years ago.
6	To identify that we receive 50% of our genetic material from each parents, resulting in inherited characteristics.
Key Outcomes	
The children will be introduced to the work of Darwin and his Theory of Natural selection which resulted from his observations on the Galapagos Islands. They will explore how he came to his conclusions, and discuss why they were controversial amongst his contemporaries. They will track the evolutionary history of humans, and explore how different animals have adapted via natural selection to thrive in their individual habitats and contexts. They will explore how fossils provide evidence for evolution, and provide insight as to what life was like millions of years ago, also exploring the work of Mary Anning. They will end by exploring the concept of genetic inheritance, identifying that we receive genetic material from each of our parents, and that some characteristics are dominant, and some recessive.	
Vocabulary	
Evolution, natural selection, Galapagos Islands, HMS Beagle, controversial, survival of the fittest, genes, gametes, genetic materials, characteristics, inheritance, allele, dominant, recessive, offspring, sexual reproduction, vary, characteristics, adapted, inherited, species, evolve, evolution, fossil	
Key Scientists: Professor Nazneen Rahman (Human geneticist) Alfred Russel Wallace and Charles Darwin	

Fossils & Consolidation Project (Summer 2)	
LOs and Key Concepts	
1	Fossil formation
2	Explore fossils & Mary Anning
3	Consolidation project
4	Consolidation project
5	Consolidation project
6	Consolidation project
Key Outcomes	
Children will expand on their Year 4 learning on Fossils to understand the process of fossil formation in more depth and study the work of Mary Anning. They will then have the chance to work on a project of choice, developing their own research and communication skills in an area of particular scientific interest.	
Vocabulary	
Ammonite, archaeologist, palaeontologist, fossil, impression, Jurassic Coast, prehistoric, sedimentary rock, skeleton	
Key Scientists: Mary Anning	

4. Science Reading Spine

	Year 1	Year 2	Year 3 	Year 4 	Year 5 	Year 6 
Autumn 1	Human Body - Senses					
Autumn 2				Living things and their habitats		Parallel circuits 
Spring 1						
Spring 2					Animals inc. humans	

<p>Summer 1</p>						
<p>Summer 2</p>			<p>Scientific Enquiry</p>		<p>Reversible and irreversible changes</p>	<p>Fossils consolidation project</p>

5. Working Scientifically Progression of Skills

WORKING SCIENTIFICALLY			
EYFS		KS1	
Plan	<ul style="list-style-type: none"> choose the resources they need for their chosen activities and say when they do or don't need help 	Plan	<ul style="list-style-type: none"> ask simple questions and recognising that they can be answered in different ways
Do	<ul style="list-style-type: none"> know about similarities and differences in relation to places, objects, materials and living things make observations of animals and plants explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function. select and use technology for particular purposes 	Do	<ul style="list-style-type: none"> observe closely, using simple equipment perform simple tests identify and classify
Record	<ul style="list-style-type: none"> represent their own ideas, thoughts and feelings through design and technology, art, music, dance, role play and stories 	Record	<ul style="list-style-type: none"> gather and record data to help in answering questions
Review	<ul style="list-style-type: none"> talk about the features of their own immediate environment and how environments might vary from one another explain why some things occur and talk about changes 	Review	<ul style="list-style-type: none"> use their observations and ideas to suggest answers to questions
Vocabulary	look closely, observe, watch, touch, feel, smell, listen, same, different, compare, ask questions, record, sort, group	Vocabulary	observe, changes, patterns, grouping, sorting, compare, same, different, identify (name), measure, data, record results, drawing, picture, table, tally chart, present, pictogram, block chart, Venn diagram, ask questions, test, investigate, explore, equipment, resources, magnifying glass, hand lens, ruler, tape measure, metre stick, pipette, syringe, spoon, teaspoon, answer questions, interpret results, scientific enquiry, pattern seeking, comparative testing, observing over time, classifying, researching using secondary sources

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WORKING SCIENTIFICALLY

LKS2		UKS2	
Plan	<ul style="list-style-type: none"> ask relevant questions and using different types of scientific enquiries to answer them set up simple practical enquiries, comparative and fair tests 	Plan	<ul style="list-style-type: none"> plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary
Do	<ul style="list-style-type: none"> make systematic and careful observations and, where appropriate, take accurate measurements using standard units, use a range of equipment, including thermometers and data loggers 	Do	<ul style="list-style-type: none"> take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate
Record	<ul style="list-style-type: none"> 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 	Record	<ul style="list-style-type: none"> Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs
Review	<ul style="list-style-type: none"> 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 differences, similarities or changes related to simple scientific ideas and processes use straightforward scientific evidence to answer questions or to support their findings 	Review	<ul style="list-style-type: none"> 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 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
Vocabulary	practical work, fair testing, relationships, accurate, thermometer, data logger, stopwatch, timer, estimate, data, diagram, identification key, chart, bar chart, prediction, similarity, difference, evidence, information, findings, criteria, values, properties, characteristics, conclusion, explanation, reason, evaluate, improve	Vocabulary	variables, independent variable, dependent variable, control variable, evidence, justify, argument (science), causal relationship, accuracy, precision, scatter graphs, bar graphs, line graphs, force meter