Cranborne
Church of England
First School and Nursery
Love, Learn, Fly
Do Everything in Love 1 Corinthians 16:14

Science at Cranborne First School and Nursery

At Cranborne First, we value science as a core subject, which stimulates awe and wonder in our everyday lives. Science is a way of asking questions, following an enquiry, making decisions and beginning to understand the natural world and the physical and energetic laws of our planet. We believe science can have a transformative effect on children, helping them to become curious and inspired by the world around them. We believe that a high-quality science education should engage, stimulate and challenge pupils, equipping them with the knowledge and skills to better understand their life and their planet. We encourage children to learn from, be inspired by the work of great scientists, and understand the contribution science has made to society, both past and present. As pupils progress, we support them to be able to pose increasingly complex scientific questions and carry out experiments to work accurately and analytically.

The 2014 National Curriculum identifies three key areas in which children should be taught:

- Knowledge and understanding of key concepts, laws and theories through the three disciplines of biology, chemistry and physics.
- Working scientifically by taking part in science enquiries and learning the process and methods of science.
- The application of science, developing skills and positive attitudes to the subject.

At Cranborne First, science is taught weekly. Teachers plan sequences of lessons across the unit that will build on and develop the children's knowledge and skills. Each unit of learning has a strong foundation in new knowledge – linked to prior knowledge – that will support the children to understand increasingly complex scientific phenomena and processes. Scientific vocabulary is mapped and taught rigorously to ensure that children can both recognise, understand and use scientific terminology accurately and confidently. Opportunities to learn outdoors and explore our natural environment are embedded throughout our science curriculum. Carefully selected skills are planned to best match each unit of knowledge and progress year on year. Opportunities to practise and embed skills are planned for so that they are revisited and refined over time. The knowledge and skills that children will develop throughout each science topic are mapped across each year group and across the school to ensure progression.

Curriculum Drivers

	In all subjects…	**In Science, this looks like…**
Curiosity	Curiosity is an eagerness to learn or know and being confident in asking questions and researching. This approach to learning enables inquisitive thinking such as exploration, investigation and learning and nurtures future problem solvers.	Science is taught through 'hands on' experiences, where children gain a greater understanding the topic. Awe and wonder. Appreciation of natural phenomena, nature and the world around us. Teachers check prior knowledge, review what learners know and build curiosity in the way they elicit previous learning and present information. 'Wow' moments and interesting lesson starters. (Such as The Ogden Trust Phizzi enquiries, e.g. pipe cleaner push and pull, fly a carp windsock, see 'Directory of Ideas' document for examples of these.) Use of thoughtful texts – e.g. The Tiger Who came to Tea in EYFS as an enjoyable story, followed up with What do you know about tigers? Q. What would happen if you met a tiger? Q. How do you know what a tiger (really eats/drinks/can do)? Q. How could I find out more about tigers? Exploration of the best that has been thought and said by scientists.
Communication	We believe that language is the tool that unlocks opportunities and enables children to share ideas effectively. We want our children to speak with clarity, confidence and eloquence, connecting the words they know (vocabulary) with what they know (knowledge) therefore becoming effective communicators. We know that vocabulary development and the ability to read fluently are key to life-long success and this is our intent for every child.	Oracy is promoted in the classroom to enable children to articulate their thinking using scientific concepts. Use of Phizzi Foundation enquiries, taken from the EYFS Science Talk programme for Ogden primary partnerships. (See 'Directory of Ideas' document for examples of these.) Use of Why/Compare types of examples/questions, and what would happen if? (E.g. In KS2 Digestive system, what would happen if our oesophagus was not working properly?) Learning, understanding and using scientific vocabulary. Vocabulary is taught, understood and revisited. Key words and terms listed, referred to and used. Being able to explain science learning clearly. Asking and answering questions. Predicting, hypothesising and testing. Communicating accurately and effectively in written science. Developing skills of debate to challenge their own and others thinking.

Resilience	Resilience means having the skills and resources to deal with challenges and barriers. Resilience being willing and able to overcome obstacles to achieve. Our children will develop the emotional and physical security needed to become resilient individuals who are able to take risks and deal with different challenges across the curriculum and in the wider world by thinking positively and having the confidence to 'have a go'.	Science is taught weekly and learning is re-visited with children remembering more and knowing more. Science material reviewed and revisited to prevent forgetting and to embed knowledge. Children are challenged to think and apply their learning. Tasks are designed to embed and reinforce learning. There are a range of retrieval practice, spaced repetition, interleaving and low stakes quizzes to support retention of information into long term memory. Teachers give children actionable feedback to guide learning.
Independence	Independence is the ability to live your life to the full, confidently and to be self-sufficient. We aim to promote our children's independence and develop a commitment to learning and self-improvement, both inside and outside of the school environment. We will give our children opportunities to organise themselves, show personal responsibility, initiative, creativity and enterprise. We will nurture our children's awareness that actions have consequences and to make choices based on this awareness, understanding that they have ownership of their actions.	Children are provided with activities to learn and apply science learning. Making decisions (for example, choosing equipment for investigations or a fair test) requires higher level thinking and promotes independence and rigor. When appropriate, children are given some elements of choice and ownership when recording. Within units and though key stages, children progress from structured to more independent learning as children develop their knowledge and expertise.
Aspiration	Aspiration is the hope, desire or ambition to strive to achieve something. To be the best they can possibly be and to challenge themselves as a learner. The development of aspirations encourages children to produce work of high quality, take pride in themselves and be the very best they can be.	Children are set high expectations and are challenged. Understanding of national and international science innovation. Finding out about careers in science – e.g. what a physiotherapist does when learning about the skeletal system and muscles in Y3. STEM visitors, e.g. STEM South West. Knowledge of the impact of global events. Knowledge of what science is telling us about our own impact on the planet and how we can contribute to a more sustainable world.

We believe that learning knowledge is not an end point in itself, it is a springboard to learning more knowledge. Each unit in our overview is underpinned by rich, substantive knowledge and ambitious vocabulary, whilst also ensuring children are developing their disciplinary knowledge (working scientifically and science enquiry skills).

Each unit of work is planned carefully to ensure concepts are taught in optimal order to support children's understanding. As well as developing a breadth of subject knowledge, we want our children to develop subject specific skills. In addition to substantive and disciplinary knowledge, children will develop their experiential and 'science capital' through carefully planned enrichment activities. Examples of these are participation in thematic science weeks (British Science Week in March) and science specific educational visits, e.g. Winchester Science Museum and STEM visits planned.

Curriculum Overview

Cycle 1

	Autumn	**Spring**	**Summer**
EYFS	All About Me Families Autumn Begins Sharing the Harvest Little Red Hen Food and Healthy Eating • Exploring the natural world around them. • Looking at similarities and differences. • Seasonal changes, start to understand processes and change – summer growth to harvest. • Observations of animal hibernation and nocturnal animals. • Making a fruit salad • In D&T Hinges and Catches, container and junk modelling (link to forces) • Explorers in the setting learning about gravity, friction etc. through the experience of play. This especially links to forces.	Weather – One Snowy Night People Who Help Us Seasonal Changes – Spring Around the World we Go People Who Help Us (mothers and caregivers) Growing and Changing • Exploring the natural world around them. Looking at similarities and differences. • Winter seasonal changes and types of weather. • Experiments and observing, for example, floating and sinking. • Sea vessel design Mrs Armitage. • Lifecycles. • Talk about people around them and their roles in society • Explorers in the setting learning about gravity, friction etc. through the experience of play. This especially links to forces. • Learning to switch off electrical devices is also a link to Year 4 learning on Electricity	Growing Transport 10 things I Can Do to Help My World Our Traditions - The Bluebell walk Mini-beasts When I Grow Up – Our Roles in the World • Observations (drawing and painting bluebells following seeing these in their natural environment.) • Planting seeds. • Care for living things, nurturing seedlings. • Knowing the similarities and differences in contrasting environments. • Observations of insects and plants. • Looking after the natural world – sustainability and recycling. • Also Growing and Changing in PSHE Scarf • Explorers in the setting learning about gravity, friction etc. through the experience of play. This especially links to forces.

	• Learning to switch off electrical devices is also a link to Year 4 learning on Electricity		• Learning to switch off electrical devices is also a link to Year 4 learning on Electricity • In D&T Wheels, designing a vehicle with wheels, designing, building and adapting a bridge (link to later work on forces)
Year 1 and 2	Material world (Materials Y1, Materials Y2)	Looking after plants (Plants Y1, Seasons Y1, Plants Y2)	Staying Alive (Animals Y1, Animals Y2, Living things Y2)
Year 3 and 4	The Amazing Human Body (Animals Y3, Animals Y4) * This unit will extend into January as a longer unit. Review when taught in 2024/5 if it will be moved to Spring Term	From the Amazon to Antarctica (States of matter Y4, Living things Y4, Animals Y4	How Stuff Works (Electricity Y4, Forces Y3 *In Summer 2023, Y4s who have completed work on Magnets and Forces in Y3 will complete 4 double sessions on Sound. This is due to the change in mixed class grouping.

Cycle 2

	Autumn	**Spring**	**Summer**
EYFS	All About Me Families Autumn Begins Sharing the Harvest Little Red Hen Food and Healthy Eating • Exploring the natural world around them • Looking at similarities and differences • Seasonal changes, start to understand processes and change – summer growth to harvest	Weather – One Snowy Night People Who Help Us Seasonal Changes – Spring Around the World we Go People Who Help Us (mothers and caregivers) Growing and Changing • Exploring the natural world around them. Looking at similarities and differences. • Winter seasonal changes and types of weather • Experiments and observing, for example, floating and sinking	Growing Transport 10 things I Can Do To Help My World Our Traditions - The Bluebell walk Mini-beasts When I Grow Up – Our Roles in the World • Observations (drawing and painting bluebells following seeing these in their natural environment.) • Planting seeds • Care for living things, nurturing seedlings

	• Observations of animal hibernation and nocturnal animals • Making a fruit salad • In D&T Hinges and Catches, container and junk modelling (link to forces) • Explorers in the setting learning about gravity, friction etc. through the experience of play. This especially links to forces. • Learning to switch off electrical devices is also a link to Year 4 learning on Electricity	• Sea vessel design Mrs Armitage • Lifecycles • Talk about people around them and their roles in society • Explorers in the setting learning about gravity, friction etc. through the experience of play. This especially links to forces. • Learning to switch off electrical devices is also a link to Year 4 learning on Electricity	• Knowing the similarities and differences in contrasting environments • Observations of insects and plants • Looking after the natural world – sustainability and recycling • Also Growing and Changing in PSHE Scarf • Explorers in the setting learning about gravity, friction etc. through the experience of play. This especially links to forces. • Learning to switch off electrical devices is also a link to Year 4 learning on Electricity • In D&T Wheels, designing a vehicle with wheels, designing, building and adapting a bridge (link to later work on forces)
Year 1 and 2	Animal Safari (Animals Y1, Living things Y2, Animals Y2)	Changing Materials (Materials Y1, Materials Y2)	How does your garden grow? (Plants Y1, Y2)
Year 3 and 4	Nurturing Nature (Plants Y3, Living things Y4)	Archaeology (Rocks Y3, Animals Y3, Living things Y4)	Movie Magic (Light Y3, Sound Y4)

Substantive Concepts – these are the concepts that give a subject substance or content.

Our curriculum is refined yearly. We have identified a set of key substantive concepts that children will repeatedly revisit through the first order concepts of Biology, Physics and Chemistry throughout their time at Cranborne First. Our substantive concepts are:

Biology

Life Processes	**Nutrition**	**Reproduction**	**Diversity or classification**
(Movement, Respiration, Sensitivity, Growth, Reproduction, Excretion and Nutrition.) Organisms are organised on a cellular basis and have a finite life span.	Organisms require a supply of energy and materials for which they often depend on, or compete with, other organisms.	Genetic information is passed down from one generation of organisms to another.	The diversity of organisms, living and extinct and the causes of change.

Chemistry

Materials	**Earth Science**
All matter in the Universe is made of very small particles	The composition of the Earth and its atmosphere and the processes occurring within them shape the Earth's surface and its climate

Physics

Earth and Space	**Energy**	**Contact Forces**	**Non-Contact Forces**
Our solar system is a very small part of one of billions of galaxies in the Universe – this is not currently studied at Cranborne as it is part of Y5 learning.	The total amount of energy in the Universe is always the same but can transferred from one energy store to another during an event	Changing the movement of an object requires a net force to be acting on it	Objects can affect other objects at a distance

Second Order Concepts – Shape the Enquiry

Pattern When anything repeats itself in a predictable way e.g. behaviour, data. Using this information to make predictions or explain.	**Change** When something becomes different from its original form and the associated scientific processes that may have taken place to cause this.	**Classification** The systematic arrangement (strictly hierarchical) of sorting according to specific criteria e.g. canines, incisors, conductors
Compare and Contrast The identification and justification of similarities and differences	**Cause and Effect** Relationships. The why and the what; the combination of action and reaction.	**Diversity** Scientific progress relies on problem solving and collaboration. Groups composed of people with diverse experiences and areas of expertise tend to be more creative and innovative. Asking questions drives science forward, and scientists with different perspectives often ask different questions.
Structure and Function The component parts that make up a living thing and how each part serves to support survival.		**Variation** The differences between living things of the same species – inherited or environmental.

Science Progression of Knowledge, Skills and Enquiry

The below details a whole school overview. This page demonstrates what a typical scientist will look like at the end of each year, combining the key skills and knowledge they will require. Page 8 onwards has the National Curriculum objectives for each year group with key vocabulary for that module and also 'key indicators' which demonstrates what the children should know to achieve the objective. For clarity the document shows learning by year group, in practice this will be learned by the end of the key stage.

Any text boxes with a border shows that this skill/knowledge is taught in a different module but builds on from learning in that module. The blue writing in brackets underneath show where this objective was taken from. This is to allow teachers to make the links to prior learning. This grid shows the types of enquiry suggested for each unit. The additional year group document gives suggested activities linked to each 'scientific enquiry'.

Scientific Enquiry	
Research	
Pattern Seeking	
Observing (over time)	
Testing	
Identifying and Classifying	
Problem Solving	

These are the National Curriculum Working Scientifically objectives. These are highlighted through the document in purple. This is to ensure teachers are teaching knowledge alongside skills.

Year 1/2 Working Scientifically

- 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 3/4 Working Scientifically

- 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.

	EYFS	**Year 1**	**Year 2**	**Year 3**	**Year 4**
This is what Cranborne scientists can do…	Children will ask questions about the environment including the weather outside. They will be able to suggest what they might wear. They will develop an understanding of growth, decay and changes over time and show care and concern for living things and the environment. They will use their senses when walking around and investigating. They will develop questioning and curiosity through play and understand the concept of forces	Children will be asking questions about the local environment including plants and animals found there including how they can look after them. They will observe and talk about the weather and changes. They will explore different materials using scientific language to describe them.	Children will be asking questions about the local environment including discussing how plants grow, survive, germinate and reproduce. They investigate different habitats (incl. micro) and observe how different animals depend on each other and its life processes. They understand basic needs of animal survival including exercise and nutrition. They can identify properties of materials and state why they are suited to purpose. They can name some	Children will be asking questions about the local environment and using their observation skills to identify parts of a flower and know how water transports around the plant. Children will understand the lifecycle of a plant by drawing diagrams and using research to find the function of each part. Children will know that humans and animals have skeletons and understand why. They know how humans get nutrients. They will carry out comparative	Children will be asking questions about the local environment and observe how the environment can change along with the dangers this can cause. They will understand the functions of the teeth and the importance of oral hygiene. Children will know about how the digestive system works. Children will be grouping, identifying and classifying living things and materials and using classification keys. Children will understand the water cycle and effect of

	and electricity through twisting, pushing, slotting and magnetic toys and seeing the effects of pushing different buttons to make sounds and movements. They can talk about similarities and differences between living things and materials and make simple observations about animals.		scientists who have developed new materials.	and fair tests to compare and classify rocks and soils based on their properties.	heat with evaporation and condensation as well as materials changing state. Children will use representations to understand how we hear through vibrations and know how to create simple circuits including a switch. Comparative and fair tests will be used to test conductivity of materials.
Year Group	**EYFS**	**Year 1**	**Year 2**	**Year 3**	**Year 4**
Plants Disciplinary/Second Order concepts: Structure and Function, Variation, Categorisation	**Natural world** Explore the world around them making observations and drawings of plants. **Natural world** 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.	Name common plants and describe the basic structure of flowering plants, including deciduous and evergreen. Identify and describe the basic structure of a variety of common flowering plants, including trees. 	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. 	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.	**Recognise that living things can be grouped in a variety of ways.** Living things and habitats

	Communication and language Express their ideas and feelings about their experiences using full sentences.			Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. 	
Key Vocabulary	Plant, leaf, stem, flower, grow, rain, sun, water, soil, seed,	Leaf, flower, blossom, petal, fruit, berry, root, seed, trunk, branch, stem, bark, stalk, bud. Names of trees in local area, garden and wild flowering plants.	As year 1+ light, shade, sun, warn, cool, water, grow, healthy.	Photosynthesis, pollen, insect/wind pollination, seed formation, seed dispersal- wind dispersal, animal dispersal, water dispersal, pollen, roots, stem, trunk, leaves, absorb, nutrients, reproduce, germination, stamen, style.	**Classification, classification keys, environment, habitat, human impact, positive, negative, migrate, hibernate** Living things and habitats
Key Indicators	Can plant seeds and care for growing plants. Understand the basic features of a simple plant lifecycle. Can name basic parts of a plant e.g. leaf, petal.	Can name trees and other plants they see regularly. Can describe key features of the trees and plants e.g. shapes of leaves/colour of the flower/blossom. Can point out trees which lost their leaves	Can describe how plants that have grown from seeds and bulbs have developed over time. Can identify plants that grew well in different conditions. Can spot similarities and differences	Can explain the function of the parts of a flowering plant. Can describe the life cycle of flowering plants, including pollination, seed formation, seed dispersal and germination.	Living things and habitats

		and those who keep them all year. Can point to and name parts of a plant. Can use simple charts to sort. Can use photos to talk about how plants change.	between bulbs and seeds. Can nurture seeds and bulbs into mature plants identifying the different requirements of different plants.	Can give different methods of pollination and seed dispersal, including examples. Can explain observations made during investigations. Can look at features of seeds to decide on method of dispersal. Can draw and label a diagram of their created flowering plant to show its parts and their role and method of pollination and seed dispersal.	
Year Group	**EYFS**	**Year 1**	**Year 2**	**Year 3**	**Year 4**
Animals including humans Disciplinary Second Order concepts: Change Categorisation, Structure and function.	**The Natural World** Explore the natural world around them, making observations and drawing pictures of animals. Begin to make sense of their own life-story and family's history. Begin to understand the key features of the lifecycle of a plant and animal.	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)	Notice that animals, including humans, have offspring which grow into adults. Find out about and describe the basic needs of animals, including humans, for survival (water, food and air) Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.	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.	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. 

	People, culture and communities Describe their immediate environment using knowledge from observation, discussion, stories and non-fiction texts and maps. **Personal, social and emotional development** Manage their own basic hygiene and personal needs, including dressing, going to the toilet and understanding the importance of healthy food choices.	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 Vocabulary	head, body, eyes, ears, mouth, teeth, leg, tail, wing, claw, fin, scales, feathers, fur, beak, paws, hooves, heart,	head, body, eyes, ears, mouth, teeth, leg, tail, wing, claw, fin, scales, feathers, fur, beak, paws, hooves, reptile, amphibian, mammal, omnivore, carnivore, herbivore, all senses.	offspring, grow, adults, nutrition, reproduce, survival, water, food, air, exercise, hygiene, survival, exercise.	nutrition, nutrients, carbohydrates, sugars, protein, vitamins, minerals, fibre, fat, water, skeleton, bones, muscles, support, protect, skull, ribs, spine, muscles, joints.	digestive system, digestion, mouth, teeth, saliva, oesophagus, stomach, small intestine, nutrients, large intestine, rectum, anus, incisor, canine, herbivore, omnivore.
Key Indicators	Children can explore the natural world around them.	Can name a range of animals which includes	Can sequence the stages of a baby.	Can name the nutrients found in food. Can state that to be	Can sequence the main parts of the digestive system. Can

	They can describe what they see, feel and hear when outside. They can recognise environments which is different to the one they live in. They can talk about simple similarities and differences between living things. They can make simple observations about animals and explain why some things occur. They can explore basic lifecycles of animals.	animals from each of the vertebrate groups. Can describe the key features of named animals. Can label key features on a picture/diagram. Can write descriptively about an animal. Can write a 'What am I? riddle about an animal. Can describe what a range of animals eat. Can compare and classify animals.	Observe these changes. Can describe how animals change as they get older. Develops understanding of how insects change (more than a butterfly) through lifecycle diagrams. Can explain what humans and other animals need to survive- this could be through planning a trip to the moon or desert Island. Can describe how to keep clean and healthy. Has a good understanding of the food plate and understands a healthy balanced diet. Can create a diet for an athlete. Can adopt a menu to substitute food from the eat well plate. Understands the effect of exercise on the body.	healthy we need to eat the right types of food to give us the correct amount of these nutrients. Name some bones that make up the skeleton giving examples that support, help them move or provide protection. Can describe how muscles and joints help them to move. Classify food groups (high/low nutrients), answer q's about nutrients in food, use data to look for patterns. Give similarities and differences between skeletons.	draw the main parts of the digestive system onto a human outline. Can describe what happens in each part of the digestive system. Can point to three different types of teeth in their mouth and talk about what each is used for. Demonstrate journey of food through body. Make a dental record, can explain teeth in animals and if they are carnivores, herbivores or omnivores.

Year Group	EYFS	Year 1	Year 2	Year 3	Year 4
Living things and their habitats Disciplinary Second Order concepts: Variation Compare and Contrast Change	People, culture and communities Explain some similarities and differences between life in this country and life in other countries, drawing on knowledge from stories, non-fiction texts and maps. Understanding the world Begin to understand the need to respect and care for the natural environment and all living things. Explore the natural world around them 	**Name common plants and describe the basic structure of flowering plants, including trees.** Plants **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** Animals including Humans	Explore and compare the differences between things that are living, dead, and things that have never been alive. Identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other Identify and name a variety of plants and animals in their habitats, including microhabitats Describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food. 	**Identify and describe the functions of different parts of flowering plants, roots, stem/trunk, leaves and flowers.** Plants	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 environment. Recognise that environments can change and that this can sometimes pose dangers to living things. 

Key Vocabulary	living, dead, eat, food, food chain, shelter, move, some names of local habitats e.g. pond, in bushes etc.	Animals including Humans Plants	living, dead, never been alive, suited, suitable, basic need, food, food chain, shelter, move, feed, names of local habitats e.g. pond, woodland, names of micro habitats e.g. under logs, in bushes etc.	Animals including Humans Plants	classification, classification keys, environment, habitat, human impact, positive, negative, migrate, hibernate.
Key Indicators	Children will be able to explore the natural world and make observations. Children will recognise animal habitats. Children will understand how to look after animals and the environment including habitats. Children will begin to explore where they live and compare to other places in the world e.g. weather, climate.		Find a range of items which are dead, living. Can name plants/animals which live in different habitats and micro habitat. Can talk about the features of the animal/plant and how they are suited to the habitat. Can talk about what the animal eats. Can construct a food chain.		Can name living things in a range of habitats, giving key features that helped identify them. Can give examples of how an environment may change both naturally and due to human impact. Can use classification keys to identify unknown plants and animals.

Year Group	EYFS	Year 1	Year 2	Year 3	Year 4
Materials/States of Matter and Y3 Rocks and Soils Disciplinary Second Order concepts: Compare and Contrast, Categorisation, Cause and Effect	**The Natural World** Understand some important processes and changes in the natural world around them, including changing states of matter. **Speaking** Offer explanations for why things happen, making use of recently introduced vocabulary from stories, non-fiction, rhymes and poems where appropriate. **Understanding of the world** 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. Explore how things work. Talk about the difference between	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. 	Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses. Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. 	Forces and Magnetism **Rocks and Soils** Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties. Describe in simple terms how fossils are formed when things that have lived are trapped within a rock. Recognise that soils are made from rocks and organic matter  **Notice that some forces need contact between two objects, but magnetic forces can act at a distance.**	States of matter Compare and group materials together, according to whether they are solids, liquids or gases (states of matter) 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 (States of matter) Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature. (states of matter)

	materials and changes they notice.				
Key Vocabulary	wet, dry, shiny, dull, bendy, stiff, squashy, hard/soft, lumpy, wrinkly. Smooth, rough.	object, material, wood, plastic, glass, metal, water, rock, brick, paper, fabric, elastic, foil, card/cardboard, rubber, wool, clay, hard, soft, stretchy, stiff, bendy, floppy, waterproof, absorbent, breaks/tears, rough, smooth, shiny, dull, see through, not see through.	Names of materials: wood, plastic, glass, metal, water, rock, brick, paper, fabric, card, rubber, suitable/unsuitable, use/useful, hard/soft, stretchy/stiff. Rigid/flexible, waterproof/absorbent, strong/weak, rough/smooth, transparent/opaque, shape, push/pushing, pull/pulling, twist/twisting, squash/squashing, bend/bending, stretch/stretching.	rock, stone, pebble, boulder, grain, crystals, layers, hard, soft, texture, absorb, water, soil, fossil, marble, chalk, granite, sandstone, slate, soil, peat, sandy, chalk, clay, soil.	solid, liquid, gas, state change, melting, freezing, melting point, boiling point, evaporation, temperature, water cycle
Key Indicators	They can talk about simple similarities and differences between two materials and how materials change in terms of shape, size and texture. They can describe materials using basic scientific words. They can explore how things work.	Can label a picture/diagram of an object made from different materials. Can describe the properties of materials. Can sort materials using their properties. Can test evidence to answer a question.	Can name an object, say what material it is made from, identify properties and make a link between property and use. Whilst changing a shape of an object can describe the actions used. Can use suitable vocabulary. Simple tests relevant to properties. Describe	Can name some types of rock and give physical features of each. Can explain how a fossil is formed. Can explain that soils are made from rocks and also contain living/dead matter. Classify rocks in a range of ways using scientific vocabulary. Test properties of rocks. Show	Can create a concept map, including arrows linking the key vocabulary. Can name properties of solids, liquids and gases. Can give everyday examples of melting and freezing. Can give everyday examples of evaporation and condensation.

	They can group and classify materials using their properties.		similarities and differences.	understanding of how fossils were formed, can identify plant/animal matter in soil, test water retention of soils.	Can describe the water cycle. Can give reasons to justify why something is a solid liquid or gas. Can give examples of things that melt/freeze and how their melting points vary From their observations, can give the melting points of some materials. Using their data, can explain what effects how quickly a solid melts. Can measure temperatures using a thermometer. Can explain why there is condensation on the inside the hot water cup but on the outside of the icy water cup From their data, can explain how to speed up or slow down evaporation. Can present their learning about the water cycle in a range of ways e.g. diagrams, explanation text, story of a water droplet.

Year Group	EYFS	Year 1	Year 2	Year 3	Year 4
Seasonal Changes Disciplinary Second Order concepts: Pattern, Change, Compare and Contrast. **Earth and Space**	**The Natural World** Understand some important processes and changes in the natural world around them, including seasons. 	Observe changes across the four seasons. Observe and describe weather associated with the seasons and how day length varies.  		**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 our eyes. Recognise that shadows are formed when the light source is blocked by a solid object. Find patterns in the way the size of the shadows change.** Light	
Key Vocabulary	snow, wind, rain, sun, day, night, stormy, cloudy, hot, cold, foggy.	weather (sunny, rainy, windy, snowy etc) Seasons (winter, summer, spring, autumn) sun, sunrise, sunset, day length		light, light source, dark, absence of light, transparent, translucent, opaque, shiny, matt, surface,	

				shadow, reflect, mirror, sunlight, dangerous	
Key Indicators	Can describe the weather outside and suggest what they might wear and what they might see. Can comment on the environment e.g. the leaves have fallen off the tree, there is a puddle. Children can understand the effect of changing seasons on the natural world around them.	Can name four seasons and identify when in the year they occur. Can observe and describe weather in different seasons. Can describe days being longer in summer and shorter in winter. Present data in tables charts and compare seasons.			

Year Group	EYFS	Year 1	Year 2	Year 3	Year 4
Light and Sound Disciplinary Second Order concepts: Pattern, Cause and effect, Compare and Contrast.	**Understanding of the world** Explore materials with different properties. Talk about what they see, using a wide vocabulary. **Expressive arts and design** Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture form and function. Explore colour and colour-mixing. Play instruments with increasing control to express their feelings and ideas. 	**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 physical properties.** Materials **Observe changes across the four seasons. Observe and describe weather associated with the seasons and how day length varies.** Seasonal changes	**Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses.** Materials **Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.** Plants	**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.** Plants 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 our eyes. Recognise that shadows are formed when the light source is blocked by a solid object. Find patterns in the way the size of the shadows change. 	**Recognise that environments can change and that this can sometimes pose dangers to living things.** Living things and habitats 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 pitch of a sound and features of the object that produced it. Find patterns between the volume of a sound and the strength of the vibrations that produced it. Recognise that sound gets fainter as the distance from the sound source increases. 

Key Vocabulary	smell, sound, sight, see, look,	**Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.** Animals including humans Seasonal Changes Animals Including Humans		light, light source, dark, absence of light, transparent, translucent, opaque, shiny, matt, surface, shadow, reflect, mirror, sunlight, dangerous.	sound, source, vibrate, vibration, travel, pitch, volume, faint, loud, insulation.
Key Indicators	Children will be able to identify and name different colours. They can mix colours and explain the changes. They can experiment with sound and making different noises with musical instruments and express using different terms such as loud, quiet, beat, vibrate.	Seasonal Changes Animals Including Humans		Can describe how we see objects in lights and can describe dark as the absence of light. Know it is dangerous to look at the sun. Define transparent, translucent and opaque. Can describe how shadows are formed. Predict what materials will be more/less visible.	Can describe different types of objects producing different sounds and that the sound is produced by vibration in the object. Can describe sounds travelling through different mediums such as air, water, metal. Can find patterns between pitch and volume and the features of the object producing it. Can recognise that sounds get fainter as

					the distance from the sound source increases. Can explain what happens when you strike a drum or pluck a string- use diagrams to show. Demonstrates how to increase/decrease pitch and volume.
Year Group	**EYFS**	**Year 1**	**Year 2**	**Year 3**	**Year 4**
Forces Disciplinary Second Order concepts: Cause and effect, compare and contrast.	**Understanding the World** Explore and talk about different forces they can feel. Can talk about the differences between materials and changes they notice. 	**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.** Materials	**Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses.** **Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.**	Compare how things move on different surfaces Notice that some forces need contact between two objects, but magnetic forces can act at a distance. Observe how magnets attract or repel each other and attract some materials and not others. Compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials. Describe magnets as having two poles.	

			Materials	Predict whether two magnets will attract or repel each other, depending on which poles are facing. 	
Key Vocabulary	push, pull, twist, stretch, turn, open, lift, squeeze, pinch, flick, tap.	**object, material, wood, plastic, glass, metal, water, rock, brick, paper, fabric, elastic, foil, card, cardboard, rubber, wool, clay, hard, soft, stretchy, stiff, bendy, floppy, waterproof, absorbent, breaks, tears, rough, smooth, shiny, dull, see through, not see through** Materials	**Wood, plastic, glass, metal, water, rock, brick, paper, fabric, card, rubber, suitable, unsuitable, use, useful, hard, soft, stretchy, stiff, rigid, flexible, waterproof, absorbent, strong, weak, rough, smooth, transparent, opaque, shape, push, pushing, pull, pulling, twist, twisting, squash, squashing, bend, bending, stretch, stretching** Materials	force, push, pull, twist, contact force, non-contact force, magnetic force, magnet, strength, bar magnet, ring magnet, button magnet, horseshoe magnet, attract, repel. Magnetic material, metal, iron, steel, poles, north pole, south pole.	

Key Indicators	Children will be able to play with a range of toys of varying sizes made of different materials and fit them together in different ways such as twisting, pushing, slotting or magnetism. Can manipulate playdough in different ways.	Materials	Materials	Give examples of forces in everyday life. Give examples of objects moving differently on different surfaces. Name a range of magnets and show how the poles attract and repel. Can draw diagrams using arrows to show the attraction and repulsion between the poles of magnets. Can use results to describe how objects move on different surfaces. Can use results to make predictions. Can use some classification to know some metals are not magnetic. Use test data to rank magnets.	

Year Group	EYFS	Year 1	Year 2	Year 3	Year 4
Electricity Disciplinary/Second Order concepts: Cause and effect, Compare and contrast	Shows skills in making toys work by pressing parts or lifting flaps to achieve effects such as sound, movement or new images. 	**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.** Materials	**Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses.** Materials		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. 

					Can name the components in a circuit. Can make an electric circuit. Can control a circuit using a switch. Can name some metals that are conductors. Can name materials that are insulators. Can communicate structures of circuits using drawings. Can incorporate a switch. Can add a circuit with a switch to a DT project and demonstrate how it works. Can describe how a switch works. Electrical, appliance, mains, plug, circuit, component, cell, battery, positive, negative, connect/connectors, loose connection, short circuit, crocodile clip, bulb, switch, buzzer, motor, conductor, insulator, metal, non-metal, symbol.