

ENC for KS1/KS2 Science vs OIPS

Please note: all skills of scientific enquiry are integrated throughout OIPS, and each OIPS unit has an introductory section 'How to be a scientist' which reinforces the skills of scientific enquiry.

English National Curriculum Subject topics by Year	English National Curriculum Subject objectives by topic	OIPS Stage/ Unit number and title	OIPS Unit Objectives
ENC KS1/Year 1: topics and objectives matched to OIPS			
Plants	identify and name a variety of common wild and garden plants, including deciduous and evergreen trees	Book 1, 1.6 Plants	1Bp4 Name the major parts of a plant, looking at real plants and models 1Bp5 Know that plants need light and water to grow 1Bp6 Explore how seeds grow into flowering plants
	identify and describe the basic structure of a variety of common flowering plants, including trees.		
Animals including humans	identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals	Book 1, 1.3 Living and Growing	1Bp3 Explore ways that different animals and plants inhabit local environments
	identify and name a variety of common animals that are carnivores, herbivores and omnivores		
	describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets)		
	identify, name, draw and label the basic parts of the human body and say which part of the body is associated	Book 1, 1.1 Ourselves	1Bh1 Recognise the similarities and differences between each other 1Bh2 Recognise and name the main external parts of the

	with each sense.		body 1Bh4 Explore how senses enable humans and animals to be aware of the world around them
Everyday materials	distinguish between an object and the material from which it is made	Book 1, 1.2 What Is It Made of?	1Cp1 Use senses to explore and talk about different materials 1Cp3 Recognise and name common materials 1Cp2 Identify the characteristics of different materials 1Cp4 Sort objects into groups based on the properties of their materials
	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.		
Seasonal changes	observe changes across the four seasons	Book 2, 2.6 Plants and Animals	2Be3 Observe and talk about their observation of the weather, recording reports of weather data
	observe and describe weather associated with the seasons and how day length varies		
ENC KS1/Year 2: topics and objectives matched to OIPS			
Living things and their habitats	explore and compare the differences between things that are living, dead, and things that have never been alive	Book 1, 1.3 Living and growing	1Bp1 Know that plants are living things 1Bp2 Know that there are living things and things that have never been alive 1Bp3 Explore ways that different animals and plants inhabit local environments
	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 micro-habitats	Book 2, 2.6 Plants and Animals	2Be1 Identify similarities and differences between local environments and know about some of the ways in which these affect the animals and plants that are found there 2Be2 Understand ways to care for the environment. Secondary sources can be used
	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.		
Plants	observe and describe how seeds and bulbs grow into mature plants	Book 3, 3.3 Flowering plants	3Bp1 Know that plants have roots, leaves, stems and flowers 3Bp2 Explain observations that plants need water and light to grow 3Bp4 Know that plants need healthy roots, leaves and stems to grow well 3Bp5 Know that plant growth is affected by temperature
	find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.		
Animals, including humans	notice that animals, including humans, have offspring which grow into adults	Book 1, 1.3 Living and growing	1Bh3 Know about the need for a healthy diet, including the right types of food and water 1Bh5 Know that humans and animals produce 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.	Book 3, 3.6 Keeping healthy	3Bh1 Know life processes common to humans and animals include nutrition (water and food), movement, growth and reproduction 3Bh3 Explore and research exercise and the adequate, varied diet needed to keep healthy 3Bh4 Know that some foods can be damaging to health, e.g. very sweet and fatty foods

Uses of everyday 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	Book 1, 1.2 What Is It Made of?	1Cp1 Use senses to explore and talk about different materials 1Cp3 Recognise and name common materials 1Cp2 Identify the characteristics of different materials 1Cp4 Sort objects into groups based on the properties of their materials
	find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.	Book 2, 2.3 Changing materials	2Cc1 Know how the shapes of some materials can be changed by squashing, bending, twisting and/or stretching
ENC lower KS2/Year 3: topics and objectives matched to OIPS			
Plants	identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers	Book 3, 3.3 Flowering plants	3Bp1 Know that plants have roots, leaves, stems and flowers 3Bp2 Explain observations that plants need water and light to grow 3Bp4 Know that plants need healthy roots, leaves and stems to grow well 3Bp5 Know that plant growth is affected by temperature 3Bp3 Know that water is taken in through the roots and transported through the stem
	explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant		
	investigate the way in which water is transported within plants		
	explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.	Book 5, 5.3 The Life Cycle of a Flowering Plant	5Bp1 Know that plants need energy from light for growth 5Bp2 Know that plants reproduce 5Bp3 Observe how seeds can be dispersed in a variety of ways 5Bp4 Investigate how seeds need water and warmth for germination, but not light 5Bp5 Know that insects pollinate some flowers 5Bp6 Observe that plants produce flowers which have male

			and female organs; seeds are formed when pollen from the male organ fertilises the ovum (female) 5Bp7 Recognise that flowering plants have a life cycle including pollination, fertilisation, seed production, seed dispersal and germination
Animals, including humans	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	Book 3, 3.6 Keeping healthy	3Bh3 Explore and research exercise and the adequate, varied diet needed to keep healthy 3Bh4 Know that some foods can be damaging to health, e.g. very sweet and fatty foods
	identify that humans and some other animals have skeletons and muscles for support, protection and movement.	Book 4, 4.1 Skeleton and Muscles	4Bh1 Know that humans (and some animals) have bony skeletons inside their bodies 4Bh2 Know how skeletons grow as humans grow, support and protect the body 4Bh3 Know that animals with skeletons have muscles attached to the bones 4Bh4 Know how a muscle has to contract (shorten) to make a bone move and muscles act in pairs
Rocks	compare and group together different kinds of rocks on the basis of their appearance and simple physical properties	Book 2, 2.4 Looking at rocks	2Cp1 Recognise some types of rocks and the uses of different rocks 2Cp2 Know that some materials occur naturally and others are man-made
	describe in simple terms how fossils are formed when things that have lived are trapped within rock		
	recognise that soils are made from rocks and organic matter.		
Light	recognise that they need light in order to see things and that dark is the absence of light	Book 2, 2.1 Light and Dark	2PI1 Identify different light sources including the sun 2PI2 Know that darkness is the absence of light 2PI3 Be able to identify shadows

	notice that light is reflected from surfaces		
	recognise that light from the sun can be dangerous and that there are ways to protect their eyes		
	recognise that shadows are formed when the light from a light source is blocked by an opaque object		
	find patterns in the way that the size of shadows change.	Book 2, 2.5 Day and Night	2Pb1 Explore how the sun <i>appears</i> to move during the day and how shadows change 2Pb2 Model how the spin of the Earth leads to day and night, e.g. with different sized balls and a torch
Forces and magnets	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	Book 4, 4.3 How Magnets Work	4Pm4 Explore the forces between magnets and know that magnets can attract or repel each other 4Pm5 Know that magnets attract some metals but not others

	predict whether two magnets will attract or repel each other, depending on which poles are facing		
ENC lower KS2/Year 4: topics and objectives matched to OIPS			
Living things and their habitats	recognise that living things can be grouped in a variety of ways	Book 3, 3.1 Life processes	3Bh6 Sort living things into groups, using simple features and describe rationale for groupings
	explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment	Book 4, 4.4 Habitats	4Be1 Investigate how different animals are found in different habitats and are suited to the environment in which they are found 4Be2 Use simple identification keys 4Be3 Recognise ways that human activity affects the environment, e.g. river pollution, recycling waste
	recognise that environments can change and that this can sometimes pose dangers to living things		
Animals, including humans	describe the simple functions of the basic parts of the digestive system in humans	Book 6, 6.1 Human Organs and Systems	6Bh1 Use scientific names for some major organs of body systems 6Bh2 Identify the position of major organs in the body 6Bh3 Describe the main functions of the major organs of the body 6Bh4 Explain how the functions of the major organs are essential
	identify the different types of teeth in humans and their simple functions	Book 6, 6.3 Food chains	6Be3 Know how food chains can be used to represent feeding relationships in a habitat and present these in text and diagrams 6Be4 Know that food chains begin with a plant (the producer), which uses energy from the sun 6Be5 Understand the terms <i>producer</i> , <i>consumer</i> , <i>predator</i> and <i>prey</i> 6Be6 Explore and construct food chains in a particular habitat
	construct and interpret a variety of food chains, identifying producers, predators and prey.		

States of matter	compare and group materials together, according to whether they are solids, liquids or gases	Book 4, 4.2 Solids, liquids and gases	4Cs1 Know that matter can be solid, liquid or gas 4Cs2 Investigate how materials change when they are heated and cooled 4Cs3 Know that melting is when a solid turns into a liquid and is the reverse of freezing 4Cs4 Observe how water turns into steam when it is heated but on cooling the steam turns back into water
	observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C)		
	identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.		
Sound	identify how sounds are made, associating some of them with something vibrating	Book 4, 4.6 Sound	4Ps1 Explore how sounds are made when objects, materials or air vibrate and learn to measure the volume of sound in decibels with a sound level meter 4Ps2 Investigate how sound travels through different materials to the ear 4Ps3 Investigate how some materials are effective in preventing sound from travelling through them 4Ps4 Investigate the way <i>pitch</i> describes how high or low a sound is and that high and low sounds can be loud or soft. Secondary sources can be used 4Ps5 Explore how pitch can be changed in musical instruments in a range of ways
	recognise that vibrations from sounds travel through a medium to the ear		
	find patterns between the pitch of a sound and features of the object that produced it		
	find patterns between the volume of a sound and the strength of the vibrations that produced it		
	recognise that sounds get fainter as the distance from the sound source increases.		

Electricity	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	Book 2, 2.2 Electricity	2Pm1 Recognise the components of simple circuits involving cells (batteries) 2Pm2 Know how a switch can be used to break a circuit
	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	Book 4, 4.5 Making circuits	4Pm1 Construct complete circuits using switch, cell (battery), wire and lamps 4Pm2 Explore how an electrical device will not work if there is a break in the circuit 4Pm3 Know that electrical current flows and that models can describe this flow, e.g. particles travelling around a circuit 4Pm4 Explore the forces between magnets and know that magnets can attract or repel each other 4Pm5 Know that magnets attract some metals but not others
	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.	Book 6, 6.4 Electrical Conductors and Insulators	6Pm1 Investigate how some materials are better conductors of electricity than others 6Pm2 Investigate how some metals are good conductors of electricity while most other materials are not
ENC upper KS2/Year 5: topics and objectives matched to OIPS			
Living things and their habitats	describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird	Book 3, 3.1 Life processes	3Bh1 Know life processes common to humans and animals include nutrition (water and food), movement, growth and reproduction

	describe the life process of reproduction in some plants and animals.	Book 5, 5.3 The Life Cycle of a Flowering Plant	5Bp2 Know that plants reproduce 5Bp7 Recognise that flowering plants have a life cycle including pollination, fertilisation, seed production, seed dispersal and germination
Animals, including humans	describe the changes as humans develop to old age.		
Properties and changes of materials	compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets		6Cc1 Distinguish between reversible and irreversible changes 6Cc2 Explore how solids can be mixed and how it is often possible to separate them again 6Cc3 Observe, describe, record and begin to explain changes that occur when some solids are added to water 6Cc4 Explore how, when solids do not dissolve or react with water, they can be separated by filtering, which is similar to sieving 6Cc5 Explore how some solids dissolve in water to form solutions and, although the solid cannot be seen, the substance is still present
	know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution		
	use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating		
	give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic		
	demonstrate that dissolving, mixing and changes of state are reversible changes		

	explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda.		
Earth and space	describe the movement of the Earth, and other planets, relative to the Sun in the solar system	Book 2, 2.5 Day and Night	2Pb1 Explore how the sun <i>appears</i> to move during the day and how shadows change 2Pb2 Model how the spin of the Earth leads to day and night, e.g. with different sized balls and a torch
	describe the movement of the Moon relative to the Earth		
	describe the Sun, Earth and Moon as approximately spherical bodies	Book 5, 5.5 Earth's movements	5Pb1 Explore, through modelling, that the sun does not move; its <i>apparent</i> movement is caused by the Earth spinning on its axis 5Pb2 Know that the Earth spins on its axis once in every 24 hours 5Pb3 Know that the Earth takes a year to orbit the sun, spinning as it goes 5Pb4 Research the lives and discoveries of scientists who explored the solar system and stars
	use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.		
Forces	explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object	Book 3, 3.4 Introducing Forces	3Pf1 Know that pushes and pulls are examples of forces and that they can be measured with forcemeters 3Pf2 Explore how forces can make objects start or stop moving 3Pf3 Explore how forces can change the shape of objects 3Pf4 Explore how forces, including friction, can make objects move faster or slower or change direction
	identify the effects of air resistance, water resistance and friction, that act between moving surfaces		

	recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.	Book 6, 6.6 Mass and Weight	<p>6Pf1 Distinguish between mass measured in kilograms (kg) and weight measured in newtons, noting that kilograms are used in everyday life</p> <p>6Pf2 Recognise and use units of force, mass and weight and identify the direction in which forces act</p> <p>6Pf3 Understand the notion of energy in movement</p> <p>6Pf4 Recognise friction (including air resistance) as a force which can affect the speed at which objects move and which sometimes stops things moving</p>
ENC upper KS2/Year 6: topics and objectives matched to OIPS			
Living things and their habitats	describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals		
	give reasons for classifying plants and animals based on specific characteristics.		
Animals including humans	identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood	Book 4, 4.1 Skeleton and muscles	4Bh5 Explain the role of drugs as medicines
	recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function		<p>6Bh1 Use scientific names for some major organs of body systems</p> <p>6Bh2 Identify the position of major organs in the body</p> <p>6Bh3 Describe the main functions of the major organs of the body</p> <p>6Bh4 Explain how the functions of the major organs are essential</p>
	describe the ways in which nutrients and water are transported within animals, including humans.	Book 6, 6.1 Human organs and systems	

Evolution and inheritance	recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago	Book 6, 6.1 Human organs and systems	6Bh2 Identify the position of major organs in the body
	recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents	Book 6, 6.5 Caring for the environment	6Be1 Explore how humans have positive and negative effects on the environment, e.g. loss of species, protection of habitats 6Be2 Explore a number of ways of caring for the environment, e.g. recycling, reducing waste, reducing energy consumption, not littering, encouraging others to care for the environment 6Be5 Understand the terms <i>producer</i> , <i>consumer</i> , <i>predator</i> and <i>prey</i>
	identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.		
Light	recognise that light appears to travel in straight lines	Book 5, 5.1 The way we see things	5PI4 Know that light intensity can be measured 5PI5 Explore how opaque materials do not let light through and transparent materials let a lot of light through 5PI6 Know that we see light sources because light from the source enters our eyes 5PI7 Know that beams/rays of light can be reflected by surfaces including mirrors, and when reflected light enters our eyes we see the object 5PI8 Explore why a beam of light changes direction when it is reflected from a surface
	use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye		
	explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes		
	use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.		

Electricity	associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit	Book 6, 6.4 Electrical conductors and insulators	<p>6Pm4 Predict and test the effects of making changes to circuits, including length or thickness of wire and the number and type of components</p> <p>6Pm5 Represent series circuits with drawings and conventional symbols</p>
	compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches		
	use recognised symbols when representing a simple circuit in a diagram.		