



"Make your light shine so others will see the good that you do"



Science Concepts, Skills, Knowledge and Vocabulary

Our key science concepts are physics, biology and chemistry. This is the key knowledge we learn in each year group. Our skills in science of 'working scientifically' run across all of our concepts. Skills and knowledge are both taught through an enquiry based approach.

This is the key vocabulary which is specified to be covered within each year group through the teaching of science or one of its linked subjects. It is displayed within the classroom during appropriate topics and referred to regularly. This enables our children to have a progressive scientific vocabulary as they move through school.

SCIENCE Concepts	<u>Understanding the world</u> - Guiding children to make sense of their physical world through opportunities to explore, observe and find out about people, places, technology and the environment		
Foundation	People and communities	The world	Technology
	- talk about past and present events in their own lives and in the lives of family members. - know about similarities and differences between themselves and others, and among families, communities and traditions.	- know about similarities and differences in relation to places, objects, materials and living things. - talk about the features of their own immediate environment and how environments might vary from one another. - make observations of animals and plants and explain why some things occur, and talk about changes.	- recognise that a range of technology is used in places such as homes and schools. - select and use technology for particular purposes.
	<u>Vocabulary</u>		
	Same, different, people, family	plant, flower, tree animal, fish, bird, reptile, amphibian	Technology
	<u>Working scientifically</u>		
	children investigate and experience things, and 'have a go'		



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SCIENCE Concepts	<u>Physics</u> The science of forces and the behaviour of the material universe.	<u>Biology</u> The science of living organisms and their interactions with each other & the environment.	<u>Chemistry</u> The science of the structure, properties and reactions of materials.
KS1	<u>EARTH & BEYOND = Seasonal changes</u> -Summer, Spring, Autumn, Winter, -sun, day, moon, night, light, dark -rain, sunshine, snow, cloud, wind ✓ observe changes across the four seasons ✓ observe and describe weather associated with the seasons ✓ observe how day length varies. <u>FORCES - Moving and changing objects</u> -push, pull, twist, squash, stretch ✓ identify how suitable different materials are for different uses ✓ compare how suitable different materials are for different uses ✓ find out which materials can change shape when a force is used on them	<u>HUMANS - What makes us human?</u> -eye, ear, nose, mouth, hand -see, hear, smell, taste, touch -arm, elbow, leg, knee, head, neck, back, chest -baby, child, teenager, adult, offspring ✓ identify, name, draw and label the basic parts of the human body ✓ say which part of the body is associated with each sense ✓ notice that animals, including humans, have offspring which grow into adults <u>HUMAN HEALTH - Healthy Humans</u> -survive, water, food, shelter, air -exercise, muscles, heart -eating, diet, vegetables, meat, sugar, fat -hygiene, clean, germs, sweat ✓ find out about and describe the basic needs of animals, including humans, for survival ✓ describe the importance of exercise for humans ✓ describe the importance of eating the right amounts of different types of food for humans ✓ describe the importance of hygiene for humans	<u>PROPERTIES OF MATERIALS – Materials</u> -hard, soft, smooth, rough -shiny, dull, see through, sparkly -stretchy, stiff, bendy, -waterproof, absorbent ✓ 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 variety of everyday materials on the basis of their simple physical properties ✓ group together a variety of everyday materials on the basis of their simple physical properties
KS1			



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ANIMALS - Describing animals

-fish, reptiles, mammals, birds, amphibians

(+ examples of each)

-herbivore, omnivore, carnivore

-scales, feathers, fur, skin

-wings, beak, tail

-living, dead

- ✓ explore and compare the differences between things that are living, dead, and things that have never been alive
- ✓ identify and name a variety of common animals including **birds and mammals, fish, amphibians and reptiles,**
- ✓ describe and compare the structure of **birds and mammals fish, amphibians and reptiles**
- ✓ explain what the words carnivore, herbivore and omnivore mean
- ✓ identify and name a variety of common animals that are carnivores, herbivores and omnivores

HABITATS – Habitats

-names of a variety of plants and animals

-woodland, pond, desert, forest, field

-energy, food chain, predator, prey

- ✓ identify and name a variety of plants and animals in their **habitats**, including micro-habitats



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		✓ identify that most living things live in habitats to which they are suited ✓ describe how different habitats provide for the basic needs of different kinds of animals & plants ✓ describe how animals obtain their food from plants and other animals (simple food chains) ✓ identify and name different sources of food for animals ✓ explain how animals & plants depend on each other <u>PLANTS - Trees and plants</u> -deciduous, evergreen -leaves, flowers, root, stem, trunk, branches -fruit, seed, bulb -names of common trees -names of a variety of common wild plants -names of garden plants ✓ explain the difference between deciduous & evergreen trees ✓ identify and describe the basic structure of a variety of common flowering plants ✓ identify & describe the basic structure of trees ✓ identify and name common trees and wild plants ✓ identify and name garden plants ✓ observe and describe how seed and bulbs grow into mature plants ✓ find out and describe how plants need water, light and suitable temperature.	
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SCIENCE Concepts	<u>Physics</u> The science of forces and the behaviour of the material universe.	<u>Biology</u> The science of living organisms and their interactions with each other & the environment.	<u>Chemistry</u> The science of the structure, properties and reactions of materials.
LKS2	<u>FORCES – Magnets</u> <i>-magnetic, force, poles, contact</i> <i>- push, pull, attract, repel</i> ✓ 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 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 ✓ observe how magnets attract or repel each other ✓ describe magnets as having two poles ✓ predict whether two magnets will attract or repel each other, depending on which poles are facing.	<u>HUMANS - Digestion System</u> <i>- mouth, tongue, teeth, oesophagus, stomach, small intestine, large intestine, anus</i> <i>- incisors, canines, molars</i> ✓ identify and name the basic parts of the digestive system in humans ✓ describe the simple functions of the digestive organs ✓ identify the different types of teeth in humans and their simple functions <u>HUMAN HEALTH - Human nutrition</u> <i>-protein, carbohydrates, fat, sugar, vitamins, minerals</i> <i>-skeleton, muscle, bone, protect, support, move</i> <i>-skull, rib, spine</i> ✓ identify that animals, including humans, need the right types amount of nutrition ✓ understand that humans get nutrition from what they eat ✓ understand the role of the skeleton and muscles	<u>PROPERTIES OF MATERIALS – Rocks</u> <i>- igneous, basalt, quartz, granite, pyrite</i> <i>- sedimentary, slate, sandstone, flint, chalk</i> <i>- metamorphic, marble, galena</i> <i>- hard, soft, permeable,</i> <i>- fossil, organic, soil</i> ✓ compare different kinds of rocks on the basis of their appearance and simple physical properties ✓ group together different kinds of rocks on the basis of their appearance and simple physical properties ✓ describe in simple terms how fossils are formed when things that have lived are trapped within rock ✓ recognise that soils are made from rocks and organic matter
LKS2			



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LKS2

ELECTRICITY - Building circuits

- cell, battery, wire, switch, buzzer, bulb
- circuit, conductor, insulator

- ✓ identify common appliances that run on electricity
- ✓ construct a simple series electrical circuit,
- ✓ identifying and naming its basic parts of a circuit, 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

LIGHT - Making shadows

- light, dark, shadow
- mirror, reflect
- transparent, opaque, translucent

ANIMALS - Grouping animals

- vertebrates, amphibians, birds, fish, mammals, reptiles
- invertebrates, insects, crustaceans, molluscs, arachnids
- food chain, producer, predator, prey
- herbivore, omnivore, carnivore

- ✓ recognise that living things can be grouped in a variety of ways
- ✓ explore and use classification keys to help group
- ✓ construct and interpret a variety of food chains, identifying producers, predators and prey

HABITATS – Environments

- natural changes, flood, drought, hurricane, fire
- man made changes, litter, construction, deforestation
- endangered, extinct

- ✓ identify and name a variety of living things in their local and wider **environment**
- ✓ recognise that **environments** can change
- ✓ understand that **environmental** change can sometimes pose dangers to living things

PLANTS - Growing plants

- water, light, temperature, nutrient, soil
- leaves, photosynthesis
- stem, transport, support

CHANGES TO MATERIALS - States of matter

- solid, liquid, gas
- evaporate, condense, melt, freeze
- molecules, temperature, vibrate

- ✓ 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
- ✓ measure or research the temperature at which changes happens in degrees Celsius (°C)
- ✓ identify the part played by evaporation and condensation in the water cycle
- ✓ associate the rate of evaporation with temperature



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- ✓ recognise that they need light in order to see things and that dark is the absence of light
- ✓ notice that light is reflected from surfaces
- ✓ recognise that light from the sun can be dangerous and that there are ways to protect their eyes
- ✓ recognise that shadows are formed when the light from a light source is blocked by a solid object
- ✓ find patterns in the way that the size of shadows change

SOUND – Sound

- sound, speaker, vibration, sound wave
- volume, pitch, tone

- ✓ identify how sounds are made, associating some of them with something vibrating
- ✓ recognise that vibrations from sounds travel through a medium to the ear
- ✓ find patterns between the pitch of a sound and features of the object that produced it
- ✓ find patterns between the volume of a sound and the strength of the vibrations that produced it

- root, anchorage, absorb
- flower, fruit, seed, reproduce

- ✓ identify and describe the functions of different parts of flowering plants:
- ✓ explore the requirements of plants for life and growth
- ✓ explore how the requirements vary from plant to plant
- ✓ investigate the way in which water is transported within plants
- ✓ explore the part that flowers play in the life cycles of flowering plants including pollination, seed formation and seed dispersal.



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	✓ recognise that sounds get fainter as the distance from the sound source increases		

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UKS2	<u>FORCES – Resistance</u> -gravity, Newton -air resistance, water resistance, friction, - drag, up thrust, mass ✓ explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object ✓ identify the effects of air resistance ✓ identify the effects of water resistance ✓ identify the effects of friction <u>FORCES – Mechanics</u> -mechanism, gear, pulley, lever ✓ recognise that some mechanisms allow a smaller force to have a greater effect. ✓ observe and explain the effect of gears ✓ observe and explain the effect of levers	<u>HUMANS - Circulatory System</u> - heart, blood, vessels, veins, arteries, valve - oxygenated, deoxygenated, respiration - exercise, pulse ✓ identify and name the main parts of the human circulatory system ✓ describe the functions of the heart, blood vessels and blood ✓ describe the ways in which nutrients and water are transported within humans. <u>HUMAN HEALTH - Healthy lifestyles</u> - diet, balanced, portions - exercise, fitness, injury - drugs, medicine, illegal, alcohol, nicotine -lifestyle, sleep, recreation ✓ describe the changes as humans develop to old age ✓ recognise the impact of diet on the way their bodies function ✓ recognise the impact of exercise on the way their bodies function	<u>Properties of materials</u> -hardness, solubility, transparency, conductivity(electrical/ thermal), response to magnets ✓ compare and group together everyday materials on the basis of their properties ✓ Observe - hardness - solubility - transparency - conductivity(electrical/ thermal) - response to magnets Refer to - know that some materials will dissolve in liquid to form a solution from changes to materials unit.



UKS2

- ✓ observe and explain the effect of pulleys

ELECTRICITY - Changing circuits

- cell, battery, wire, switch, buzzer, bulb
- circuit, series, parallel, conductor, insulator
- amps, volts
- components, symbols, appliance

- ✓ associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit
- ✓ compare and give reasons for variations in how components function (including the brightness of bulbs, the loudness of buzzers and the on/off -position of switches)
- ✓ use recognised symbols when representing a simple circuit in a diagram.

EARTH & BEYOND - Earth and space

-Earth, sun, moon and planets
-orbit, spherical, axis, rotation, revolution
-day, night, seasons, tide, globe

- ✓ describe the movement of the Earth relative to the Sun in the solar system

- ✓ recognise the impact of **drugs** on the way their bodies function
- ✓ recognise the impact of **lifestyle** on the way their bodies function

ANIMALS - Classifying animals and other living things

- vertebrates, amphibians, birds, fish, mammals, reptiles
-invertebrates, insects, crustaceans, molluscs, arachnids
-micro-organisms, bacteria, virus, fungus
-characteristics, classification
-foetus, embryo, womb, gestation
-baby, toddler teenager, adult, puberty

- ✓ describe how **animals** are classified into broad groups according to common observable characteristics
- ✓ describe how **micro-organisms** are classified into broad groups according to common observable characteristics
- ✓ give reasons for classifying plants and animals based on specific characteristics.
- ✓ describe the life process of reproduction in animals - **Link to SRE**
- ✓ describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird

HABITATS - Adaptation

-parents, offspring, reproduce, genetics

Changes to materials

-reversible, irreversible
-soluble, solution, dissolve
-separate, filter, evaporate
-formation, recover

- ✓ know that some materials will dissolve in liquid to form a solution – IN PREVIOUS UNIT
- ✓ 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)
- ✓ 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 (burning and the action of acid on bicarbonate of soda)



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- ✓ describe the movement of the and other planets relative to the Sun in the solar system
- ✓ describe the movement of the Moon relative to the Earth
- ✓ describe the Sun, Earth and Moon as approximately spherical bodies
- ✓ use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.

LIGHT - How we see

-eye, pupil, iris, lens, optic nerve
- light source, reflector, light waves

- ✓ understand the idea that light travels in straight lines
- ✓ 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
- ✓ explain why shadows have the same shape as the objects that cast them.

-evolution, adaptation, extinction, suited

- ✓ recognise that living things produce offspring of the same kind,
- ✓ recognise that normally offspring vary and are not identical to their parents
- ✓ recognise that living things have **changed** over time
- ✓ recognise that fossils provide information about living things that **inhabited** the Earth millions of years ago
- ✓ identify how plants are **adapted** to suit their environment in different ways
- ✓ identify how animals are **adapted** to suit their environment in different ways

PLANTS - Life cycles

-flowering, conifers, ferns, mosses
- pollination, seed formation, seed dispersal

- ✓ describe how **plants** are classified into broad groups according to common - observable characteristics
- ✓ describe the life process of reproduction in some plants
- ✓ explore the part that flowers play in the life cycle of flowering plants, (including pollination, seed formation and seed dispersal.)