



EQUALS TRUST



Science Curriculum v2



Science Curriculum Statement

Intent – What do we want for our children as Scientists?

At KPNS, Science is about developing the children's sense of enquiry and extending their knowledge and understanding of the world around them. We use a range of teaching methods in science lessons, with an emphasis on providing a curriculum which develops and extends the children's scientific concepts and enables them to be curious about the world. The children learn to work as scientists, asking scientific questions, using precise scientific vocabulary and planning and undertaking practical investigations. Science is taught through specific subject lessons and cross curricular topics. Wherever possible, links are made between science and other subjects, particularly literacy, maths, DT and ICT.

At KPNS, we aim to:

- to develop pupils' enjoyment and interest in science and an appreciation of its contribution to all aspects of everyday life (science fair, topic driven science)
- to build on pupils' curiosity and sense of awe of the natural world to deliver engaging and effective science lessons
- to link science with other curriculum areas to fully maximise learning opportunities and promote mastery (linked with English & VIPERS when the topic driver)
- to develop a solid knowledge of the science contained within the programmes of study of the National Curriculum and beyond.
- To build cultural capital and inspire children by developing a knowledge and appreciation of the contributions made by famous as well as familiar scientists (local scientist visits during our annual science week and visits to BGS)
- to encourage pupils to relate their scientific studies to applications and effects within the real world
- to develop creative thinking and curiosity.
- Provide a relevant, challenging and enjoyable Science Curriculum which is progressive in vocabulary, skills and knowledge
- Provide opportunities for co-operative working.

Implementation – How will we carry out our vision?

We will implement our vision by teaching through a 'Scientific Lens'. As scientists, children will be taught to use scientific vocabulary, make predictions, ask question, observe, measure, investigate, report, conclude and evaluate.

Thinking like a scientist, children and teachers ask questions such as...

I wonder why this happens/ that changes, I can see.../I noticed...

How can you find... a pattern, a similar or different answer, proof, another variable?

I wonder if... I can change this/ this happens every time/ can find a similar pattern?

What happens if...I add/ I change/ I see/I use?

Do you think... we will always get this answer/ you can prove your idea/ you can change something/ this will always happen?

What does this tell us about.....?

How can I show my findings/ record the results/ measure?

Why... does this happen/ does it change/ is it similar or different?

What have I found out? What can I conclude from this?

What will I do next time?

Planning:

- All planning should be on the KPNS Topic planning format and is driven by a '**big idea**'. **Skills, knowledge and vocabulary** are clearly identified, and lesson planning is supported by the use of key scientific enquiry questions with opportunities for spaced retrieval practice. '**Plan unit plans**' are used to support the planning process.
- Knowledge organisers support teaching and learning and are similarly structured around the subject driver 'big idea' and key scientific enquiry questions that the children should know and remember at the end of a unit.
- A topic cover page should be stuck at the start of each topic and show the topic title, relevant image and have a small space for a short cold task (allows pupils to show prior learning- see WAGOLL below).
- For hot tasks in science, a blank knowledge organiser is used to assess what pupils know and have remembered.
- The scientific lens for each lesson should be identified along with any questions that probe that lens.
- All planning should be uploaded onto AllStaff at the start of every half term.
- A cross-curricular approach to planning topic with clear skills and knowledge taught, detailed in line with the '**Thinking like a Scientist; what, where, when**' and the '**Science recording and reporting**' document. for KS1 this should be informed by the Chris Quigley skills and for KS2 this should be Cornerstones Essential skills.
- At least one written investigation should be recorded per unit, see year group recording expectations below.
- Enrichment opportunities to promote cultural capital and British Values should be carefully planned and implemented through hooks for the start of the topic, trips, visitors and links with the local community.

Inclusion:

Teachers set high expectations for all pupils. They will use appropriate assessment to set ambitious targets and plan challenging work for all groups, including:

-more able pupils, pupils with low prior attainment, pupils from disadvantaged backgrounds, pupils with SEND, pupils with English as an additional language (EAL).

Further information can be found in our statement of equality information and objectives, and in our SEND policy and information report.

Impact – How will we assess what the children know, remember and understand?

Teachers will monitor the impact of their teaching using:

- AFL during lessons
- **Spaced retrieval** activities embedded into planning and practise.
- **Knowledge organiser** based hot tasks at the end of each topic to assess what knowledge has been remembered and what skills have been mastered.

The Subject Leaders monitor the way their subject is taught throughout the school by looking at the intent, implementation and impact using:

- Planning scrutiny and book dips to evaluate impact of the big ideas and key questions.
- Pupil Interviews/ learning walks; assess impact of spaced retrieval, what is known and remembered.?
- External and internal moderation for QA and to share best practise.
- SIL and Governor visits to monitor provision and provide next steps
- Planning and delivering CPD

The Subject Leaders also have responsibility for resources; storage and management. All monitoring information is used by the Subject Leaders to ensure our provision and pupil outcomes are the very best they can be. Any next steps to move the subject and children's learning forward are fed into the Subject Leader's monitoring and action plans, which form part of the whole school improvement plan.

Governors monitor whether the school is complying with its finding agreement and teaching a 'broad and balanced curriculum' which includes the required subjects through:

- Governor monitoring visits, the Head Teacher repots and the School Development Plan.

Elements of our Science Curriculum

Knowledge and Understanding

Scientists develop:























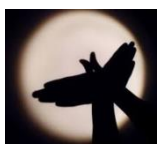






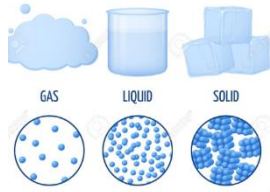
- a knowledge and understanding of scientific concepts across the three disciplines of biology, chemistry and physics
- a knowledge and understanding of the nature, processes and methods of science (working scientifically)
- a scientific vocabulary that includes both: high utility tier 2 words in a scientific context (such as energy) and tier 3 words that are domain specific (such as photosynthesis, evaporation)



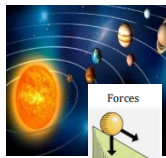








Plants	Living things and their habitats	Animals including humans	Evolution and inheritance
Seasonal changes	Materials	Rocks	Light
Forces	Sound	Electricity	Earth and space

Working Scientifically

Asking questions and hypothesising	Observing and measuring	Undertaking practical enquiry to answer questions
Recording and presenting evidence	Answering questions and concluding	Evaluating and raising further questions

Science Overview

	Autumn Term		Spring Term		Summer Term	
EYFS Cycle A	Marvellous Me! 	Long Ago! 	Books, Books, Books! 	Creep, Crawl, Wriggle 	Let it Grow 	On the Beach 
EYFS Cycle B	Super Me! 	Let's Celebrate 	Once Upon a Time 	Build it up! 	Big Wide World 	Animal Kingdom 
Year 1	Plants and Animals 	Materials 	Animals including humans and teeth 		Seasonal Changes 	
Year 2	Plants 	Animals including humans 	Materials 		Living things and their habitat. 	
Year 3	Animals Including Humans 	Rocks 	Light 	Forces and Magnets 	Plants and Animals 	
Year 4	Living things and their habitats 	Sound 	Electricity 	Animals including humans and teeth. 	States of matter 	

Year 5	<p>Materials</p> 	<p>Living things and their habitats</p> 	<p>Earth and Space and Forces</p> 	<p>Change in materials</p> 	<p>Animals including humans</p> 	<p>Animals Including Humans and Forces</p> 
Year 6	<p>Electricity</p> 	<p>Light</p> 	<p>Living things and their habitat.</p> 	<p>Animals including humans (including heart)</p> 	<p>Evolution and Inheritance (including classification).</p> 	
Y5/6- All animals including humans covered by DART bianullay during the Autumn Term and JigSaw ongoing.						

The 'Big Ideas'

	Autumn Term		Spring Term		Summer Term	
EYFS Cycle A	Marvellous Me!	Long Ago!	Books, Books, Books!	Creep, Crawl, Wriggle	Let it grow,	On the Beach
	Where do rockets go?	What is a museum?	What can we bake?	What is a minibeast?	What do plants need to grow?	How do we stay safe in the sun?
	What does an engineer do?	What does extinct mean?	How do we stay healthy?	What is the life cycle of a butterfly?	What job do worms do?	When is the best time of year to visit the beach?
	How do we power machines?		Why are fruit and vegetables good for us?	What are the signs of spring?	How do trees change?	
EYFS Cycle B	Super Me!	Let's Celebrate	Once Upon a Time	Build it up!	Big Wide World	Animal Kingdom
	What is it like in foundation?	What is my favourite food? What does Winter feel like?	How do we make pancakes?	What is a house made of? What are the signs of spring? What does an architect do?	How do people travel?	How do we care for animals? What does an animal look like?

Year 1	Plants and Animals <i>What is a plant?</i>	Materials <i>What's it made of?</i>	Animals including humans and teeth. <i>What animals are there and what do they eat?</i>		Seasonal Changes <i>What are the four seasons and what are they like?</i>	
Year 2	Plants <i>How do plants grow?</i>	Animals including humans <i>How do animals survive?</i>	Materials <i>Which material and why?</i>		Living things and their habitat. <i>What is a habitat and how does it help animals to survive?</i>	
Year 3	Animals Including Humans <i>What do we need to survive and how do our bodies help?</i>	Rocks <i>How do rocks differ from one another?</i>	Light <i>Where do light sources come from and how do they help us see?</i>	Forces and Magnets <i>What are forces and magnets?</i>	Plants and Animals <i>How do plants survive and reproduce?</i>	
Year 4	Living things and their habitats <i>How do we classify things?</i>	Sound <i>Why do we hear sound?</i>	Electricity <i>What is electricity?</i>	Animals including humans and teeth. <i>What happens when we eat?</i>	States of matter <i>What is a solid, liquid and gas?</i>	
Year 5	Properties of Materials <i>What changes can materials go through?</i>	Living things and their habitats. <i>How do animals change during their life cycle?</i>	Earth and Space <i>What is in our solar system?</i>	Properties and change in materials <i>Can materials change state? If so, can they change back?</i>	Animals including humans <i>How do the life cycles of living things compare?</i>	Animals Including Humans and forces. <i>How do humans change as they grow?</i>
Year 6	Electricity <i>How do we measure changes in electricity?</i>	Light <i>How does light reach our eyes?</i>	Living things and their habitat. <i>How are animals adapted to where they live?</i>		Animals including humans <i>How does our heart keep us alive?</i>	Evolution and Inheritance <i>How do living things change over time to survive?</i>

Thinking like a scientist. As scientists, children will be taught to use the language and terminology of science and to explore and investigate different scientific phenomena in the world around us, share and record our findings.

Teaching children to think like a historian requires creating a **scientific lens** by teaching all of these concepts within a unit.

What we teach, where we teach it and when we teach it? (**vocabulary** & knowledge)

Vocabulary and Lens Strand Progression

Subject Content	EYFS	Y1	Y2	Y3	Y4	Y5	Y6
Animals incl. humans; Biology	<p>Body, plant, animal Can talk about some of the things they have observed such as plants, animals, natural and found objects.</p> <p>Shows care and concern for living things and the environment.</p> <p>Explore and make observations of the world around them Ask questions about what they have observed Suggest possible answers to questions</p> <p>Looks closely at similarities, differences, patterns and change</p> <p>Group together similar objects</p>	<p>skeleton, organ</p> <p>Living things need to be cared for in order for them to survive. They need water, food, warmth and shelter.</p> <p>Label and describe the basic structure of a variety of common animals. Different animal groups have some common body parts, such as eyes and a mouth, and some different body parts, such as fins or wings.</p> <p>Group and sort a variety of common animals based on the foods they eat.</p>	<p>reproduction, offspring, adult, survival, temperature, hygiene, exercise</p> <p>A healthy lifestyle includes exercise, good hygiene and a balanced diet. Hand washing and good hygiene are important parts of a healthy lifestyle and prevent the spread of germs.</p> <p>Human offspring go through different stages as they grow to become adults. These include baby, toddler, child, teenager and adult.</p> <p>Animals need water, food, air and shelter to survive. Their habitat must provide all these things.</p> <p>Compare and group things that are living, dead or have never been alive.</p>	<p>vitamin, balanced diet, cartilage, invertebrate, contract, loosen, ribcage, insect</p> <p>Identify and group animals that have no skeleton, an internal skeleton (endoskeleton) and an external skeleton (exoskeleton).</p> <p>Humans have to get nutrition from what they eat. It is important to have a balanced diet made up of the main food groups, including proteins, carbohydrates, fruit and vegetables, dairy products and alternatives, and fats and spreads. Humans need to stay hydrated by drinking water.</p> <p>Compare and contrast the diets of different animals.</p> <p>Humans have a skeleton and muscles for movement, support and protecting organs. Major bones in the human body include the skull, ribs,</p>	<p>digestion, excretion, peristalsis, anus, duodenum, small intestine, large intestine, stomach, rectum, esophagus, tongue, saliva, acid, bile, enzymes, incisors, canines, molars, predator, prey, producer, consumer, primary, secondary, tertiary</p> <p>Identify the four different types of teeth in humans and other animals, and describe their functions.</p> <p>Regular teeth brushing, limiting sugary foods and visiting the dentist are important for good oral hygiene.</p> <p>The digestive system is responsible for digesting food and absorbing nutrients and water. The main parts of the digestive system are the mouth, oesophagus, stomach, small intestines, large intestines and rectum.</p>	<p>embryo, womb, adolescence</p> <p>Good personal hygiene (washing, wearing clean clothes and teeth brushing) can prevent disease or illness. Puberty is the period during which adolescents reach sexual maturity and become capable of reproduction. It causes physical and emotional changes.</p> <p>Humans reproduce sexually, which involves two parents (one female and one male) and produces offspring that are different from the parents.</p> <p>Humans go through characteristic stages as they develop to old age. These stages include baby, infant, toddler, child, adolescent, young adult, adult and senior citizen. Puberty is the transition between childhood and adulthood.</p>	<p>artery, aorta, atrium, blood vessels capillary, circulatory system, vein, pulse, ventricle, replenished, resting heart rate, body</p> <p>Lifestyle choices can have a positive (exercise and eating healthily) or negative (drugs, smoking and alcohol) impact on the body.</p> <p>The circulatory system includes the heart, blood vessels and blood. There are three types of blood vessel: arteries, veins and capillaries. They each have a different-sized hole (lumen) and walls. The blood carries gases (oxygen and carbon dioxide), water and nutrients to where they are needed. The red blood cells carry oxygen and carbon dioxide, water and nutrients to where they are needed. The red blood cells carry oxygen and carbon dioxide around the body. The blood also contains white blood cells, which protect the body from infection.</p>

				spine, humerus, ulna, radius, pelvis, femur, tibia and fibula. Major muscle groups in the human body include the biceps, triceps, abdominals, trapezius, gluteals, hamstrings, quadriceps, deltoids, gastrocnemius, latissimus dorsi and pectorals.			Explain that the circulatory system in animals transports oxygen, water and nutrients around the body. The role of the circulatory system is to transport oxygen, water and nutrients around the body. They are transported in blood and delivered to where they are needed.
Subject Content	EYFS	Y1	Y2	Y3	Y4	Y5	Y6
Animals inc Humans, Living things and their habitats;	<p>seasons, weather, life cycle, grow, change, healthy, unhealthy, plants and animals</p> <p>Can talk about some of the things they have observed such as plants, animals, natural and found objects.</p> <p>Explore and make observations of the world around them</p> <p>Ask questions about what they have observed Suggest possible answers to questions</p> <p>Looks closely at similarities, differences, patterns and change</p> <p>Group together similar objects</p>	<p>energy, growth, habitat, fish, amphibian, reptile, bird, mammal, offspring, carnivore, herbivore, omnivore, vertebrate</p> <p>All living things (plants and animals) change over time as they grow and mature.</p> <p>Identify, compare, group and sort a variety of common animals, including fish, amphibians, reptiles, birds and mammals, based on observable features.</p> <p>Observe the local environment throughout the year and ask and answer questions about living things and seasonal change. The local environment is a habitat for living things and can change during the seasons.</p>	<p>birth, decay, energy, microhabitat, dead, life cycle, food chain, source, nutrients, reproduction, consumption, environment</p> <p>Living things are those that are alive. Dead things are those that were once living but are no longer. Some things have never been alive.</p> <p>Identify and name a variety of plants and animals in a range of habitats and microhabitats.</p> <p>Describe the basic life cycles of some familiar animals (egg, caterpillar, pupa, butterfly; egg, chick, chicken; spawn, tadpole, froglet, frog).</p> <p>Interpret and construct simple food chains to describe how living things depend on each other as a source of food.</p> <p>Describe a range of local habitats and habitats beyond their locality</p>		<p>kingdom, classification key, species, fungi, bacteria, climate change, characteristics, offspring, extinction, pollution</p> <p>Compare, sort and group living things in a variety of ways based on observable features and behaviour.</p> <p>Habitats change over time, either due to natural or human influences. These changes can pose a risk to animals and plants that live in the habitat.</p> <p>An adaptation helps an animal or plant survive in its habitat. If living things are unable to adapt to changes within their habitat, they are at risk of becoming extinct.</p> <p>Carnivores, herbivores and omnivores have characteristic types of tooth. Herbivores have many large molars for grinding plant material. Carnivores have large</p>	<p>life cycle, life span, embryo, metamorphosis, pupa, larva, chrysalis, caterpillar, tadpole, hatchling, fledgling, insect</p> <p>A life cycle is the series of changes in the life of a living thing and includes these basic stages: birth, growth, reproduction and death. Mammals' life cycles include the stages: embryo, baby, adolescent and adult. Amphibians' life cycles include the stages: egg, larva (tadpole), adolescent and adult. Some insects'</p> <p>Reproduction is the process of producing offspring and is essential for the continued survival of a species. There are two types of reproduction: sexual and asexual. Sexual reproduction involves two parents (one female and one male) and produces offspring that are different from the parents. Asexual reproduction involves one parent and</p>	<p>micro-organism, virus, thorax, arthropod, abdomen, arachnid, antenna, jointed limbs</p> <p>Research unfamiliar animals and plants from a range of habitats, deciding upon and explaining where they belong in the classification system. Living things are classified into groups, according to common observable characteristics and based on similarities and differences.</p> <p>Insulation is important for the survival of many animals. Blubber is a layer of fat that acts as an insulator under the skin of some animals, such as walruses and whales. It is an adaptation that is essential for their survival. Animals with fur, such as polar bears and Arctic foxes, trap a layer of air close to their skin to insulate them from the cold.</p>

			(rainforests, deserts, oceans and mountains) and what all habitats provide for the things that live there. Local habitats include parks, woodland and gardens. Habitats beyond the locality include beaches, rainforests, deserts, oceans and mountains. All living things live in a habitat to which they are suited and it must provide everything they need to survive.		canines for killing and tearing meat. Construct and interpret a variety of food chains and webs to show interdependence and how energy is passed on over time.	produces offspring that is identical to the parent. Research and describe different farming practices in the UK and how these can have positive and negative effects on natural habitats. Farming in the UK can be divided into three main types: arable (growing crops), pastoral (raising livestock), mixed (arable and pastoral). Intensive farming in the past has resulted in the loss of habitats.	Environmental factors can affect the distribution of living things within a habitat. These factors include light (intensity and duration), weather, altitude, soil type and humans, such as when we mow or trample grass.
SubjectContent	EYFS	Y1	Y2	Y3	Y4	Y5	Y6
Materials, Rocks, States of matter Physics, Earth Sciences, Chemistry Biology	<p>Hard, soft rough, smooth Shiny, cold, wet, dry</p> <p>Identify and name objects and discuss differences in materials and the changes they notice.</p>	<p>absorption, matter, property, wood, plastic, glass, metal, water, rock</p> <p>Identify and name what an object is made from, including wood, plastic, glass, metal, water and rock.</p> <p>Investigate and describe the simple physical properties of some everyday materials, such as hard or soft; stretchy or stiff; rough or smooth; opaque or transparent; bendy or rigid; waterproof or not waterproof and magnetic or non-magnetic.</p> <p>Compare and group materials in a variety of ways, such as based on their physical properties; being natural or man-made and being recyclable or non-recyclable.</p>	<p>conductor, brick, paper, cardboard, friction, movement, suitability, surface, stretch, twist, waterproof, deformation, flexible, rigid</p> <p>Observe what happens when a range of everyday materials, including foods, are heated and cooled, sorting and grouping them based on their observations.</p> <p>Compare the suitability of a range of everyday materials for particular uses.</p> <p>A material's physical properties make it suitable for particular purposes, such as glass for windows and brick for building walls. Many materials are used for more than one purpose, such as metal for cutlery and cars.</p>	<p>extinction, igneous, metamorphic, sedimentary, paleontologist, weathering, molten rock, crust, tectonic plates, scavengers, fossil</p> <p>Investigate soils from the local environment, making comparisons and identifying features.</p> <p>Compare and group rocks based on their appearance, properties or uses.</p> <p>Describe simply how fossils are formed, using words, pictures or a model.</p>	<p>bond, condensation, evaporation, reversible, boiling point, melting point, liquid, gas, thermometer, water cycle, continuous precipitation, transpiration, surface run off process, sublimation</p> <p>Describe the water cycle using words or diagrams and explain the part played by evaporation and condensation.</p> <p>Materials can be grouped according to whether they are solids, liquids or gases.</p>	<p>irreversible, dissolve, soluble, insoluble, solvent, solute, solution, filter, sieve, saturation, crystallization, thermal, chemistry</p> <p>Reversible changes include heating, cooling, melting, dissolving and evaporating. Irreversible changes include burning, rusting, decaying and chemical reactions.</p> <p>Some mixtures can be separated by filtering, sieving and evaporating. Sieving can be used to separate large solids from liquids and some solids from other solids. Filtering can be used to separate small solids from liquids. Evaporating can be used to separate dissolved solids from liquids. Compare and group everyday materials by their properties, including</p>	<p>Investigate and identify good thermal insulators, describing their common features.</p>

						hardness, solubility, transparency, conductivity (electrical and thermal) and magnetism. Materials can be grouped according to their basic physical properties. Properties include hardness, solubility, transparency, conductivity (electrical and thermal) and magnetism.	
Subject Content	EYFS	Y1	Y2	Y3	Y4	Y5	Y6
Green plants; Biology	<p>life cycle, grow, change, plants, fruit, vegetable, root, shoot</p> <p>Identify different types and key features of plants eg flower, tree, grass, leaf, root</p> <p>To identify key features of the life cycle of a plant through exploring how seeds and bulbs grown</p>	<p>component, energy, growth, deciduous, evergreen, flower, plant, tree, structure, roots, stem, leaf, trunk, flower</p> <p>Identify, compare, group and sort a variety of common plants, including deciduous and evergreen trees, based on observable features</p> <p>Label and describe the basic structure of a variety of common plants. The basic plant parts include root, stem, leaf, flower, petal, fruit, seed and bulb. Trees have a woody stem called a trunk.</p>	<p>bulb, seed</p> <p>Plants need air, light, water, minerals from the soil and room to grow, in order to survive. Different plants have different needs depending on their habitat. Plants grow from seeds and bulbs.</p> <p>Describe how plants need water, light and a suitable temperature to grow and stay healthy. Plants need water, light and a suitable temperature to grow and stay healthy. Without any one of these things, they will die.</p>	<p>extinction, fruit, nectar, anther, ovary, ovule, petal, pollen, stigma, style, stamen, function, exchange, dispersal, fertilization</p> <p>Flowers are important in the life cycle of flowering plants. The stages of a plant's life cycle include germination, flower production, pollination, fertilisation, seed formation and seed dispersal. Insects and the wind can transfer pollen from one plant to another (pollination).</p> <p>Name and describe the functions of the different parts of flowering plants (roots, stem, leaves and flowers).</p> <p>Investigate how water is transported within plants. Water is transported in plants from the roots, through the stem and to the leaves, through tiny tubes called xylem.</p>		<p>stamen, filament, anther, pollen, carpel, stigma, style, ovary, ovule and sepal</p> <p>Group and sort plants by how they reproduce.</p> <p>Label and draw the parts of a flower involved in sexual reproduction in plants (stamen, filament, anther, pollen, carpel, stigma, style, ovary, ovule and sepal).</p>	
Green plants; Biology							

Subject Content	EYFS	Y1	Y2	Y3	Y4	Y5	Y6
Forces & Magnets; Physics	Floating, sinking, bend, push,pull Explore and make observations about different forces. For exampling floating and sinking in the water tray, push toys, guttering tubes and balls			magnetic, non-magnetic, pole, north, south, sliding friction, static friction, elastic, resist, attraction, repulsion An object will not move unless a pushing or pulling force is applied. Some forces require direct contact, whereas other forces can act at a distance, such as magnetic force. Magnets have two poles (north and south). Opposite poles (north and south) attract each other, while like poles (north and north, or south and south) repel each other. Some materials have magnetic properties. Magnetic materials are attracted to magnets. All magnetic materials are metals but not all metals are magnetic. The metal iron is magnetic.		acceleration, air resistance, buoyancy, effort, force meter, fulcrum, gravity, load, mass, mesh, Newton, pivot, rigid, streamlined, terminal velocity, unsupported, water resistance, weight Gravity is a force of attraction. Anything with a mass can exert a gravitational pull on another object. The Earth's large mass exerts a gravitational pull on all objects on Earth, making dropped objects fall to the ground. Mechanisms, such as levers, pulleys and gears, give us a mechanical advantage. A mechanical advantage is a measurement of how much a simple machine multiplies the force that we put in. The bigger the mechanical advantage, the less force we need to apply.	
Subject Content	EYFS	Y1	Y2	Y3	Y4	Y5	Y6
Seasonal Changes; Biology / Physics Light and Dark; Physics	spring, summer, autumn, winter , hot, cold There are four seasons: spring, summer, autumn and winter. Certain changes happen in the environment in different seasons including observations about the weather.	energy, freezing, melting, orbit, reflection, Sun, clouds, wind, snow, ice, spring, summer, autumn, winter , temperature, thermometer The Earth is spherical and is covered in water and land. When it is daytime in one location, it is night time		wave, mirror, incident ray, image, beam, photons, solid, opaque, transparent, object, source, data logger Light from the Sun is damaging for vision and the skin. Protection from the Sun includes sun cream, sun hats, sunglasses, staying indoors or in the shade.		angle of incidence, angle of reflection, refraction, spectrum, translucent, medium, periscope The Sun, Earth, Moon and other planets and stars are roughly spherical. All planets are spherical because their mass is so large that they have their	Light travels in straight lines. Light sources give out light. They can be natural or artificial. When light hits an object, it is absorbed, scattered, reflected or a combination of all three. Light from a source or reflected light enter the

		<p>on the other side of the world.</p> <p>The UK has typical weather in each of the seasons. For example, winter is cold and sometimes frosty, whereas summer is warm and sometimes sunny.</p> <p>There are four seasons: spring, summer, autumn and winter. Certain events and weather patterns happen in different seasons.</p> <p>Simple equipment can be used for measuring weather, such as measuring temperature with a thermometer;</p> <p>A shadow is formed when light from a light source, such as the Sun, is blocked by an opaque object but not transparent objects.</p> <p>Different types of weather include sun, rain, hail, wind, snow, fog, lightning, storm and cloud.</p> <p>Day length (the number of daylight hours) is longer in the summer months and shorter in the winter months.</p>		<p>Dark is the absence of light and we need light to be able to see.</p> <p>A shadow is formed when light from a light source, such as the Sun, is blocked by an opaque object. Transparent objects allow light to pass through them and do not create shadows.</p> <p>Shadows change shape and size when the light source moves. For example, when the light source is high above the object, the shadow is short and when the light source is low down, the object's shadow is long.</p> <p>Light can be reflected from different surfaces. Some surfaces are poor reflectors, such as some fabrics, while other surfaces are good reflectors, such as mirrors.</p> <p>Group and sort materials as being reflective or non-reflective</p>		<p>own force of gravity. This force of gravity pulls all of a planet's material towards its centre, which compresses it into the most compact shape – a sphere.</p> <p>the sky. However, this is due to the Earth rotating and not the Sun moving. Earth rotates to the east or, if viewed from above the North Pole, it rotates anti-clockwise, which means the Sun rises in the east and sets in the west. As Earth rotates, different parts of it face the Sun, which brings what we call daytime. The part facing away is in shadow, which is night time.</p>	<p>eye. Vertebrates, such as mammals, birds and reptiles, have a cornea and lens that refracts light that enters the eye and focuses it on the nerve tissue at the back of the eye, which is called the retina. Once light reaches the retina, it is transmitted to the brain via the optic nerve.</p> <p>'White' light is a term used to describe visible, ordinary daylight. White light can be split into a spectrum of colours (rainbow) by droplets of water or prisms. Mirrors and lenses are used in a range of everyday objects (telescopes, periscopes, cards and on roads). The human eye has a lens that bends and focuses light on the back of the eye (retina) so that we can see.</p> <p>A shadow appears when an object blocks the passage of light. Apart from some distortion or fuzziness at the edges, shadows are the same shape as the object. The distortion or fuzziness depends on the position or type of light source. Lasers are intense beams of light and they should never be pointed at people's faces or aircraft.</p>
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Progression for WORKING SCIENTIFICALLY; Recording & Reporting

Content	EYFS	Y1 and Y2	Y3 and Y4	Y5 and Y6
Key vocabulary children use and understand	Object, same, different	properties , observe, test, magnifying glass, object, record, equipment	<u>Revision</u> properties , observe, test, magnifying glass, object, record, equipment <u>New learning and vocabulary</u> prediction, measurement, enquiry, dependent variable, independent variable, fair test, similar, theory, hypothesis	<u>Revision</u> prediction, measurement, enquiry, dependent variable, independent variable, fair test, similar, theory, hypothesis <u>New learning and vocabulary</u> line graph, relationship, outlier
Recording and Presenting Evidence	Sorting and recording data to help in answering questions The children discuss their observations e.g. using photographs, practical demos as prompts They group together similar objects (for example, sorting rings)	Gathering and recording data to help in answering questions <ul style="list-style-type: none"> The children record their observations e.g. using photographs, videos, drawings, labelled diagrams or in writing. They record their measurements e.g. using prepared tables, pictograms, tally charts and block graphs. They classify using simple prepared tables and sorting rings. 	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 <ul style="list-style-type: none"> The children sometimes decide how to record and present evidence. They record their observation e.g. using photographs, videos, pictures, labelled diagrams or writing. They record their measurements e.g. using tables, tally charts and bar charts (given templates, if required, to which they can add headings). They record classifications e.g. using tables, Venn diagrams, Carroll diagrams. Children are supported to present the same data in different ways in order to help with answering the question. 	Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs <ul style="list-style-type: none"> The children decide how to record and present evidence. They record observations e.g. using annotated photographs, videos, labelled diagrams, observational drawings, labelled scientific diagrams or writing. They record measurements e.g. using tables, tally charts, bar charts, line graphs and scatter graphs. They record classifications e.g. using tables, Venn diagrams, Carroll diagrams and classification keys. Children present the same data in different ways in order to help with answering the question.

<p style="text-align: center;">Questioning and Measuring</p>	<p>Explore and make observations of the natural world around them Children explore the world around them and are encouraged to talk about what they see/notice. They make observations to support identification, comparison and noticing change. Teachers model observational and investigational skills – for example, asking aloud: “I wonder what will happen if...”</p>	<p>Observing closely, using simple equipment</p> <ul style="list-style-type: none"> Children explore the world around them. They make careful observations to support identification, comparison and noticing change. They use appropriate senses, aided by equipment such as magnifying glasses or digital microscopes, to make their observations. They begin to take measurements, initially by comparisons, then using non-standard units. 	<p>Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers</p> <ul style="list-style-type: none"> The children make systematic and careful observations. They use a range of equipment for measuring length, time, temperature and capacity. They use standard units for their measurements. 	<p>Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate</p> <ul style="list-style-type: none"> The children select measuring equipment to give the most precise results e.g. ruler, tape measure or trundle wheel, force meter with a suitable scale. During an enquiry, they make decisions e.g. whether they need to: take repeat readings (fair testing); increase the sample size (pattern seeking); adjust the observation period and frequency (observing over time); or check further secondary sources (researching); in order to get accurate data (closer to the true value).
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<p>Undertaking Practical Enquiry to Answer Questions</p>	<p>Exploring and enquiring The children use practical resources provided to explore and enquire (sand/water, construction, cooking, outdoor play, garden, small world).</p> <p>Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function. Children use observations to group together similar objects and consider differences, patterns and change.</p>	<p>Performing simple tests</p> <ul style="list-style-type: none"> The children use practical resources provided to gather evidence to answer questions generated by themselves or the teacher. They carry out: tests to classify; comparative tests; pattern seeking enquiries; and make observations over time. <p>Identifying and classifying</p> <ul style="list-style-type: none"> Children use their observations and testing to compare objects, materials and living things. They sort and group these things, identifying their own criteria for sorting. They use simple secondary sources (such as identification sheets) to name living things. They describe the characteristics they used to identify a living thing. 	<p>Setting up simple practical enquiries, comparative and fair tests</p> <ul style="list-style-type: none"> The children select from a range of practical resources to gather evidence to answer questions generated by themselves or the teacher. They follow their plan to carry out: observations and tests to classify; comparative and simple fair tests; observations over time; and pattern seeking. <p>Explanatory note <i>A comparative test is performed by changing a variable that is qualitative e.g. the type of material, shape of the parachute. This leads to a ranked outcome.</i></p> <p><i>A fair test is performed by changing a variable that is quantitative e.g. the thickness of the material or the area of the canopy. This leads to establishing a causative relationship</i></p>	<p>Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary</p> <ul style="list-style-type: none"> The children select from a range of practical resources to gather evidence to answer their questions. They carry out fair tests, recognising and controlling variables. They decide what observations or measurements to make over time and for how long. They look for patterns and relationships using a suitable sample.
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Asking Questions and Hypothesising	<p>Asking simple questions</p> <p>While exploring the world, the children develop their ability to ask questions (such as what something is, how things are similar and different, the ways things work, which is better, how things change and what they think will happen).</p>	<p>Asking simple questions and recognising that they can be answered in different ways</p> <ul style="list-style-type: none"> While exploring the world, the children develop their ability to ask questions (such as what something is, how things are similar and different, the ways things work, which alternative is better, how things change and how they happen). Where appropriate, they answer these questions. The children answer questions developed with the teacher often through a scenario. The children are involved in planning how to use resources provided to answer the questions using different types of enquiry, helping them to recognise that there are different ways in which questions can be answered. 	<p>Asking relevant questions and using different types of scientific enquiries to answer them</p> <ul style="list-style-type: none"> The children consider their prior knowledge when asking questions. They independently use a range of question stems. Where appropriate, they answer these questions. The children answer questions posed by the teacher. Given a range of resources, the children decide for themselves how to gather evidence to answer the question. They recognise when secondary sources can be used to answer questions that cannot be answered through practical work. They identify the type of enquiry that they have chosen to answer their question. 	<p>Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary</p> <ul style="list-style-type: none"> Children independently ask scientific questions. This may be stimulated by a scientific experience or involve asking further questions based on their developed understanding following an enquiry. Given a wide range of resources the children decide for themselves how to gather evidence to answer a scientific question. They choose a type of enquiry to carry out and justify their choice. They recognise how secondary sources can be used to answer questions that cannot be answered through practical work.
Evaluating and Raising Further Questions	<p>Using experiences of natural change to make predictions.</p> <p>Children understand the predictability of seasonal change (weather, clothing, trees etc.)</p>		<p>Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions</p> <ul style="list-style-type: none"> They identify ways in which they adapted their method as they progressed or how they would do it differently if they repeated the enquiry. <p>Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions</p> <ul style="list-style-type: none"> Children use their evidence to suggest values for different items tested using the same method e.g. the distance travelled by a car on an additional surface. <p>Following a scientific experience, the children ask further questions which can be answered by extending the same enquiry.</p>	<p>Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations</p> <ul style="list-style-type: none"> They evaluate, for example, the choice of method used, the control of variables, the precision and accuracy of measurements and the credibility of secondary sources used. They identify any limitations that reduce the trust they have in their data. <p>Using test results to make predictions to set up further comparative and fair tests</p> <ul style="list-style-type: none"> Children use the scientific knowledge gained from enquiry work to make predictions they can investigate using comparative and fair tests.

<p style="text-align: center;">Answering Questions and Concluding</p>	<p>Using their experience, observations and ideas to suggest answers to questions</p> <p>Children use their experiences of the world around them to suggest appropriate answers to questions.</p>	<p><i>Using their observations and ideas to suggest answers to questions</i></p> <ul style="list-style-type: none"> Children use their experiences of the world around them to suggest appropriate answers to questions. They are supported to relate these to their evidence e.g. observations they have made, measurements they have taken or information they have gained from secondary sources. <p><i>Using their observations and ideas to suggest answers to questions</i></p> <ul style="list-style-type: none"> The children recognise 'biggest and smallest', 'best and worst' etc. from their data. 	<p>Using straightforward scientific evidence to answer questions or to support their findings.</p> <ul style="list-style-type: none"> Children answer their own and others' questions based on observations they have made, measurements they have taken or information they have gained from secondary sources. The answers are consistent with the evidence. <p>Identifying differences, similarities or changes related to simple scientific ideas and processes</p> <ul style="list-style-type: none"> Children interpret their data to generate simple comparative statements based on their evidence. They begin to identify naturally occurring patterns and causal relationships. <p>Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions</p> <ul style="list-style-type: none"> They draw conclusions based on their evidence and current subject knowledge 	<p>Identifying scientific evidence that has been used to support or refute ideas or arguments</p> <ul style="list-style-type: none"> Children answer their own and others' questions based on observations they have made, measurements they have taken or information they have gained from secondary sources. When doing this, they discuss whether other evidence e.g. from other groups, secondary sources and their scientific understanding, supports or refutes their answer. They talk about how their scientific ideas change due to new evidence that they have gathered. They talk about how new discoveries change scientific understanding. <p>Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations</p> <ul style="list-style-type: none"> In their conclusions, children: identify causal relationships and patterns in the natural world from their evidence; identify results that do not fit the overall pattern; and explain their findings using their subject knowledge.
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NB - The National Curriculum statements in italics in these tables indicate that they feature more than once.

National Curriculum Coverage for Science

	WS DRIPS	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year One:		<p>Seasonal Changes (ongoing topic)</p> <p>Observe changes across the four seasons. Observe and describe the weather associated with the seasons and how day length varies.</p> <p>Green plants</p> <p>Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees. Identify and describe the basic structure of a variety of common flowering plants, including trees.</p>	<p>Seasonal Changes (ongoing topic)</p> <p>Observe changes across the four seasons. Observe and describe the weather associated with the seasons and how day length varies.</p> <p>Materials</p> <p>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 based on their physical properties. Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.</p>	<p>Animals incl. humans ; chicks.</p> <p>Identify and name a variety of common animals. Identify and name variety of common animals that are carnivores, herbivores and omnivores. Describe and compare the structure of a variety of common animals.</p> <p>Animals incl. humans; sense</p> <p>Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.</p>	<p>Animals incl. humans ; chicks.</p> <p>Identify and name a variety of common animals. Identify and name variety of common animals that are carnivores, herbivores and omnivores. Describe and compare the structure of a variety of common animals.</p> <p>Animals incl. humans; sense</p> <p>Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.</p>	<p>Seasonal Changes (ongoing topic)</p> <p>Observe changes across the four seasons. Observe and describe the weather associated with the seasons and how day length varies.</p>	<p>Seasonal Changes (ongoing topic)</p> <p>Observe changes across the four seasons. Observe and describe the weather associated with the seasons and how day length varies.</p> <p>Light and Dark</p> <p>Observe and name a variety of sources of light, including electric lights, flames and the Sun Associate shadows with a light source being blocked by something.</p>
Year Two		<p>Green plants</p> <p>Observe and describe how seeds and bulbs grow into mature plants. Find out about and describe how plants need water, light and a suitable temperature to grow and stay healthy.</p>	<p>Animals incl. humans ;</p> <p>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 (air, water, food) Describe the importance for humans of exercise, eating the right amounts of food, and hygiene,</p>	<p>Materials</p> <p>Identify and compare the uses of everyday materials and particular uses.</p> <p>Compare how things move on different surfaces.</p>		<p>Living things and their habitats;</p> <p>Explore and compare the difference between things that are living, dead and things that have never been alive. Identify that most things live in habitats to which they are suited and describe how these habitats provide the provide the basic needs, and depend on each other. Identify and name a variety of plants and animals in their habitats, including micro-habitats. Describe how animals obtain their food from plants and animals; use food chains and identify food sources.</p>	

Year Three		<p>Animals, including humans Identify that animals, including humans need the right types of nutrition, and that they cannot make their own food; they get nutrition from what they eat.</p> <p>Identify that humans and some animals have skeletons and muscles for support, protection and movement.</p> <p>(human focus)</p> <p>Animals, incl humans Identify that animals, including humans need the right types of nutrition, and that they cannot make their own food; they get nutrition from what they eat.</p> <p>Identify that humans Identify that humans and some animals have skeletons and muscles for support, protection and movement.</p> <p>(animal focus)</p>	<p>Rocks Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties</p> <p>Recognise that soils are made from rocks and organic matter.</p> <p>Rocks Describe in simple terms how fossils are formed when things that have lived are trapped within rock</p>	<p>Light and Dark Recognise that they need light in order to see things and that dark is the absence of light. Notice that light is reflected from different surfaces.</p> <p>Light and Dark Recognise that light from the sun can be dangerous and that there are ways to protect their eyes. Recognise that shadows are formed when light from a light source is blocked by a solid object. Find patterns in the way that the size of shadows change.</p> <p>Notice that light is reflected from surfaces</p>	<p>Forces & Magnets Notice that some forces need contact between two objects, but magnetic forces can act at a distance. 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</p> <p>Observe how magnets attract or repel each other and attract some materials and not others. Describe magnets as having two poles. Predict whether two magnets will attract or repel each other.</p>	<p>Plants Identify and describe the functions of different parts of flowering plants.</p> <p>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.</p> <p>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.</p>
Year Four		<p>Living things and their habitats Recognise that living things can be grouped in a variety of ways. Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment. Recognise that environments change and that this can sometimes pose dangers to living things.</p>	<p>Sound Identify how sounds are made, associating some of them with something vibrating. Find the pattern between pitch of sound and features of the object that produced it. Find patterns between the volume of sound and the strength of the vibrations that produced it.</p>	<p>Electricity Identify common appliances that run on electricity. Construct a simple series circuit, identifying its basic parts (cells, wires, bulbs, switches, buzzers). Identify whether or not a lamp will light in a simple series circuit.</p> <p>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.</p>	<p>Animals, incl humans Describe the simple function of the basic parts of the digestive system in humans Identify the different types of teeth in humans and their simple functions</p> <p>Animals, incl. humans Construct and interpret a variety of food chains, identifying producers, predators and prey.</p>	<p>States of matter Compare and group materials together, according to whether they are solids, liquids or gases. Observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius . Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.</p>
Year Five		Properties of changes of Materials	Living things and their habitats	Earth & The Solar System	Change in Material Compare and group together	Animals, incl humans

		<p>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.</p> <p>Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution.</p> <p>Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating.</p> <p>Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic.</p> <p>Demonstrate that dissolving, mixing and changes of state are reversible changes..</p>	<p>Explain the differences in the life cycles of a mammal, an amphibian, an insect and a bird.</p> <p>Describe the life process of reproductions in some plants and animals.</p>	<p>Describe the movement of the Earth and other planets relative to the sun in the solar system.</p> <p>Describe the movement of the moon relative to the Earth.</p> <p>Describe the sun, Earth and moon as approximately spherical bodies.</p> <p>Use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.</p> <p>Forces - Gravity</p> <p>Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object.</p>	<p>everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets.</p> <p>Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution.</p> <p>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.</p>	<p>Describe the changes as humans develop into old age.</p>
Year Six		<p>Electricity</p> <p>Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit.</p> <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.</p> <p>Use recognised symbols when representing a simple circuit in a diagram.</p>	<p>Light</p> <p>Recognise that light appears to travel in straight lines.</p> <p>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.</p> <p>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</p> <p>Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.</p>	<p>Living things and their habitats; classification</p> <p>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.</p> <p>Give reasons for classifying plants and animals based on specific characteristics.</p>	<p>Animals, incl. humans</p> <p>Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood.</p> <p>Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function.</p> <p>Describe the ways in which nutrients and water are transported within animals, including humans.</p>	<p>Inheritance and evolution</p> <p>Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago.</p> <p>Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents.</p> <p>Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.</p>

Knowledge Organiser Guidance (use A4 format)

Knowledge organisers are a summary of the key facts, the powerful essential knowledge that pupils need to access a unit of work or a curriculum subject.

They should be no more than one side of A4 with all the information broken down into easily digestible chunks, in this way they become an effective resource to support teaching.

The knowledge included should be concise and should come back to the big idea and cover all enquiry questions from the unit of work.

- Colour: green
- 'Big Idea' and subject at the top
- Vocabulary: in a table on the left with alternating colour rows (child friendly definitions)
- No more than 7-9 labels on diagrams. Events on a timeline or locations on a map.
- Use labelled visuals ONLY where it shares knowledge as dual coding (not for design or decoration)
- Use the same diagrams on your knowledge organiser as you do in the lessons or on your teaching slides.
- TABLES predominantly used to show concise sticky knowledge for the unit-they should be quizzable.
- There is no limit on the boxes used but ensure they are in line and uniform.

REMEMBER: Knowledge organisers are NOT a curriculum, they only summarise the most powerful, important knowledge that will be revisited again and again throughout a unit and beyond.

WAGOLL

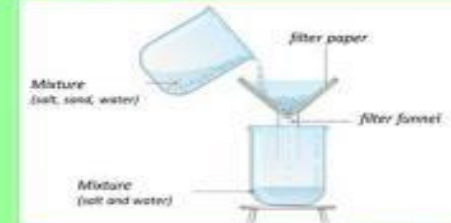
Changes of materials

Vocabulary	Definition
dissolve	A solid that completely mixes in a liquid.
soluble	Solids that dissolve in liquids, so that you can no longer see any bits.
solution	A mixture of a liquid with a dissolved solid.
insoluble	Solids that do not dissolve in liquid.
filter	Separates an insoluble solid that is mixed in a liquid.
evaporation	Separates a soluble solid and a liquid.
reversible change	Changes that are not permanent and can be switched back, eg dissolving, melting, freezing.
non-reversible change	Changes that cannot be reversed back to their original state. E.g. burning, rusting.

Non-reversible changes	These result in the formation of new materials
Burning	
Rusting	
Mixing vinegar and bicarbonate of soda	

Separating materials

Filtering separates insoluble solids from liquids.

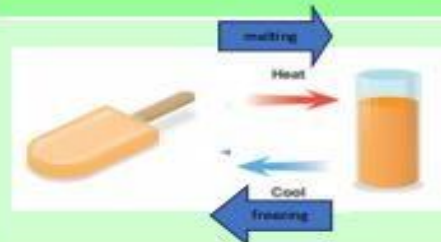
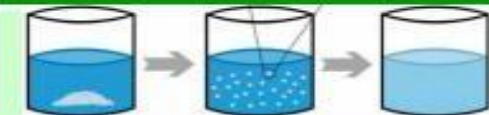


Evaporating separates soluble solids from liquids.



Reversible changes

Dissolving sugar in water to make a solution.



These changes are not permanent.



KPNS Science Planning Template

KPNS Science Unit Planning

Year- Group:

Term: _____

Topic: _____



Big Ideas:

Enquiry question and BG s	Retrieval Activity	Teacher Input (direct teaching)	Activities (modelling and scaffolding)	Key Vocab	Evidence in books and resources	Working Scientifically focus

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