Skills for Working Scientifically					
Asking Questions - Take part in a range of scientific enquiries: • Observation over time • Identifying/classifying • Comparative/fair testing • Research - Ask simple questions - Suggest some appropriate ways to find the answers to our questions - Set up a simple test		<i>Measuring and Recording</i> - Use simple equipment to gather and record data (a ruler, weighing scales, timers)	 Concluding Use simple features to compare and group objects, materials and living things With support, ask people questions and use secondary sources to find answers Use observations and ideas to suggest answers to questions Use the data they have gathered to suggest answers to questions 		
Scientific Knowledge Everyday Materials	Animals, includ	ing humans		Plants	Seasona
- Understand the difference between an object and the material it		als in the local area		- Observe and explore plants in the local area	- Name t
is made from - Identify and explore a variety of everyday materials (<i>including</i>		and label the basic parts of the human body (link to	,	 Observe the growth of plants over time Identify and name common flowers in the local area 	- Observ - Observ
wood, plastic, glass, metal, water, rock, brick, paper, fabrics,	'	e five senses and label which body part is associated with which sense d name a variety of common animals that are carnivores, herbivores		- Compare a variety of common wild and garden plants	- Observ
elastic, foil etc.)	and omnivores			- Explain the difference between deciduous and evergreen trees	Maths)
materials (see key vocabulary)		 Identify and name a variety of common animals that are fish, amphibians, reptiles, birds and mammals Describe and compare the basic structure of a variety of common animals (fish, 		- Identify the parts of a plant (stem, leaves, flowers, petals, fruit,	
				roots, bulb, seed)	Key Voca Spring, Su
- Compare and group together materials based on their physical properties		ptiles, birds and mammals, including pets)	animais (jish,	- Identify the parts of a tree (trunk, branches, root)	Day, night
		files, billus una manninais, incluanty persj			
properties				Key Vocabulary	Months o
Key Vocabulary	Key Vocabulary			Key Vocabulary Tree, plant, deciduous, evergreen	Weather

is made from - Identify and explore a va wood, plastic, glass, meta elastic, foil etc.) - Describe the simple phys materials (see key vocabu - Compare and group toge properties Key Vocabulary Object, material Names of materials - Wood, p fabrics, elastic, foil, card/card Properties of materials - Strei	ether materials based on their physical olastic, glass, metal, water, rock, brick, paper,	 Animals, including humans Observe animals in the local area Identify, draw and label the basic parts of the human body (link to PSHE) Identify the five senses and label which body part is associated with which sense Identify and name a variety of common animals that are carnivores, herbivores and omnivores Identify and name a variety of common animals that are fish, amphibians, reptiles, birds and mammals Describe and compare the basic structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets) Key Vocabulary Parts of the body - Head, body, neck, arms, elbows, legs, knees, face, ears, eyes, hair, mouth, teeth, skin, fingers, nose, tongue Parts of animals - Tail, wing, claw, fin, scales, feathers, fur, beak, paws, hooves Senses - Sight, touch, taste, smell, hearing Carnivore, herbivore, omnivore Fish, amphibian, reptile, bird, mammal Names of animals from each group 	 Plants Observe and explore plants in the local area Observe the growth of plants over time Identify and name common flowers in the local area Compare a variety of common wild and garden plants Explain the difference between deciduous and evergreen trees Identify the parts of a plant (stem, leaves, flowers, petals, fruit, roots, bulb, seed) Identify the parts of a tree (trunk, branches, root) Key Vocabulary Tree, plant, deciduous, evergreen Parts of trees & plants - leaf, flower, blossom, petal, fruit, berry, root, seed, trunk, branch, stem, bark, stalk, bud Names of trees in the local area Names of garden and wild flowering plants in the local area 	Seasonal - Name th - Observe - Observe Maths) Key Vocal Spring, Sur Day, night, Months of Weather -
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Skills for Working Scientifically Year

2

 Take part in a range of scientific enquiries: Observation over time Identifying/classifying Comparative/fair testing 	Use equipment to gather and record simple lata (a ruler, weighing scales, timers, hermometers, measuring cylinders) Use microscopes to observe (e.g. small creatures and plants)	 Concluding Use criteria to classify or group objects, materials and living things (can be given or self-generated criteria) Discuss patterns and relationships we have observed Ask people questions and use secondary sources to find answers Use observations and ideas to suggest answers to questions Use the data they have gathered to suggest answers to questions With support, record and communicate results using simple scientific language (orally and in writing) 	
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Scientific Knowledge

Uses of Everyday Materials	Animals, including humans	Plants	Living Things and Their Habitats
- Observe, describe and compare common uses of everyday materials (including	- Describe and observe the basic stages of the life	- Observe how plants grow (in the local area or	- Observe and explore plants and animals
wood, metal, plastic, glass, brick, rock, paper and cardboard)	cycle of a variety of animals (including humans)	the classroom)	- Explore and compare the differences bet
- Identify and compare whether everyday materials are suited to a particular	(e.g. chickens, caterpillar, frog, sheep)	- Describe how seeds and bulbs grow into plants	been alive
purpose (including how one material can have different uses and one object can be	- Find out and describe the basic needs of all	- Find out and describe what plants need in order	- Recognise that most living things live in h
made from different materials) (Link to DT)	animals for survival (water, food and air)	to grow and stay healthy (water, light & suitable	- Describe how different habitats provide
- Observe and explore how the shapes of solid objects made from some materials	- Explain why exercise is important for humans	temperature)	how they depend on each other
can be changed by squashing, bending, twisting and stretching	- Explain why a balanced diet is important for		- Identify and name a variety of plants and
	humans	Key Vocabulary	- Compare a known habitat with a less fam
Key Vocabulary	- Explain why good hygiene is important for	Tree, plant, deciduous, evergreen	- Identify and name some different source
Material, object, purpose,	humans	Parts of trees & plants - leaf, flower, blossom,	- Understand and construct a simple food
Squashing, Bending, Twisting, Stretching, pushing,	(Link to PSHE)	petal, fruit, berry, root, seed, trunk, branch,	
Names of materials - Wood, plastic, glass, metal, water, rock, brick, paper, fabrics,	Key Vocabulary	stem, bark, stalk, bud	Key Vocabulary
elastic, foil, card/cardboard, rubber, wool, clay	Offspring, reproduction, growth, child, life cycle	Seed, bulb, growth, healthy, light, shade, warm	Food chain, Herbivore, Carnivore, Omnivo
Properties of materials - Stretchy, hard, soft, stiff, bendy, floppy, waterproof,	Stages of the life cycle in chosen animals	cool, water, growth	Habitat, Micro-habitat, shelter, move, fee
absorbent, breaks/tears, rough, smooth, shiny, dull, opaque, transparent,	Exercise, hygiene, germs, disease, balanced diet		Living, Dead, Never been alive
			1

nal Changes

e the four seasons and the months in them rve changes across the four seasons rve and describe the type of weather in each season rve and describe how day length changes in each season (link to

cabulary

Summer, Autumn, Winter ght, sun, sunrise, sunset s of the year r - rain, sun, wind, cloudy, snowy etc.

als in the local area between objects and animals that are living, dead and have never

in habitats de for the basic needs of the plants and animals living there and

and animals in their habitats, including micro-habitats familiar habitat (e.g. the seaside, forest) rces of food for animals od chain to describe how animals get their food

nivore, feed

	translucent, reflective, non-reflective, flexible, rigid	Fish, amphibian, reptile, bird, mammal			Names of local habitats and micro-habitat
Year	Skills for Working Scientifically				
 Asking Questions With support, plan a range of scientific enquiries to answer a question: Observation over time Identifying/classifying Comparative/fair testing Secondary research Recognise that different types of enquiry can answer different questions Ask relevant questions about a topic using prior knowledge Explain what a fair test is 		Measuring and Recording - Recognise that different equipment is used to gat types of data - Use equipment and standard measurements to gat record data (rulers/metre sticks, weighing scales, to thermometers, measuring cylinders) - With support, gather and record information usin tables or charts	ather and imers,	conclusions - With support, use a simple key - With support, present findings f	tables to present their findings and draw when presenting data in a chart or table from an enquiry using oral or written explana patterns, similarities and differences in our ping, sorting and classifying

ar	Skills for Working Scientifically						
5	Asking Questions - With support, plan a range of scientific enquiries to answer a question: • Observation over time • Identifying/classifying • Comparative/fair testing • Secondary research - Recognise that different types of enquiry can answer different questions - Ask relevant questions about a topic using prior knowledge - Explain what a fair test is		- Recognise that different equipment is used to gather different		conclusions - With support, use a simple key - With support, present findings	tables to present their findings and draw when presenting data in a chart or table from an enquiry using oral or written explanations patterns, similarities and differences in our data uping, sorting and classifying	 Evaluating Start to adjust predictions and ideas according to their findings Start to suggest ways an enquiry could be improved or developed
	Scientific Knowledge						
	Materials - Rocks - Describe how soil is made from rocks and organic matter - Describe how fossils are formed when things that have lived are trapped within rock - Observe and describe the difference between sedimentary, metamorphic and igneous rock - Compare and group rocks based on their appearance and physical properties Key Vocabulary Material, soil, rock, fossil, stone, pebble, boulder, grain, crystals, layers, peat, sandy/chalky/clay soil Hard, soft, texture, absorb water, Sedimentary, igneous, metamorphic Marble, chalk, granite, sandstone, slate,	Animals, including humans - Identify that humans and some skeletons and muscles for suppor and movement - Name some important bones in body - Understand the importance of a balanced diet (<i>link to PSHE</i>) - Understand that animals, include cannot make their own food and from what they eat Key vocabulary Animals, including humans Skeleton, bone, muscle, joint Names of bones e.g. skull, ribs, sp balanced diet, nutrition, nutrient carbohydrates, sugars, protein, vir minerals, fibre, fat,	t, protection the human nutritious, ing humans, get nutrition s,	 Plants Identify the parts of plants and trees and describs stem/trunk, leaves flowers) Identify the parts of the flower and explain their Describe the role that flowers play in the life cycloseed formation and seed dispersal) Investigate and describe how water is transport Describe the requirements of plants for life and plant to plant (air, light, water, nutrients from the Key vocabulary Plants Growth, germination, pollination, seed formation pollen, photosynthesis, Parts of flowers and plants - Seed, Bulb, Petals, staflower, trunk, branches, leaves 	function le of flowering plants (pollination, ed in plants growth and how they vary from soil, room to grow) , fertilization, seed dispersal, tem, leaves, bulb, fruit, root,	Light - Understand that we need light in order to see things - Understand that dark is the absence of light - Describe and observe how a shadow is formed - Observe how light is reflected from surfaces - Observe and explain how a shadow can change shape - Find patterns in the way that the size of a shadow changes (through scientific enquiry) - Describe the dangers of sunlight and suggest how to protect our eyes Key vocabulary Light, dark, light source, shadow, reflection, surface, mirror, sunlight Transparent, translucent, opaque, shiny, matt,	Forces and Magnets - Compare how objects move on different surfaces - Observe that some forces need contact between two objects but magnetic forces can act at a distance - Compare and group objects based on whether they are attracted to a magnet - Identify some magnetic materials - Describe magnets as having two poles - Predict and observe whether two magnets will attract or repel each other Key vocabulary Force, push, pull, twist, contact force, non-contact force Magnet, magnetic, North/South pole, attract, repel, strength, magnetic material Names of magnetic materials - metal, iron, steel

Year Skills for Working Scientifically

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4	Asking Questions - Independently or with peers, plan a range of scientific enquiries to answer a	Measuring and Recording - Decide what observations to make and which equipment to use	Concluding - Use bar charts, time graphs, pictograms and tables to present	Evaluatin - Adjust p
	question:	when planning an enquiry	discrete and continuous data and draw conclusions	- Suggest
	Observation over time	- Use equipment and standard measurements to gather and	- Use a simple key when presenting data in a chart or table	- Use pat
	Identifying/classifying	record data systematically (rulers/metre sticks, weighing scales,	- Present findings from an enquiry using oral or written	
	Comparative/fair testing	timers, thermometers, measuring cylinders)	explanations	
	Secondary research	- Use a data logger to gather and record data	- Describe changes, patterns, similarities and differences in our	
	- Ask relevant questions about a topic using prior knowledge	- Gather and record information using drawings, tables and charts	data	
	- Recognise when a fair test is necessary, explain what a fair test is and discuss why	- Explore and use a classification key to identify and describe living	- Decide our own criteria for grouping, sorting and classifying	
	they are important	things		

Scientific Knowledge

 States of Matter Describe the three states of matter in simple scientific terms Group and compare materials based on whether they are solids, liquids or gases Observe that some materials change state when heated or cooled Measure (or research) the temperature at which some materials change state (in degrees Celsius) Describe the part played by evaporation and condensation in the water cycle (and associate the rate of evaporation with temperature) NB - the idea of particles doesn't need to be introduced e.g. a solid keeps its shape and has a fixed volume, a liquid has a fixed volume but changes shape to fit the container, a gas fills all available space and has no fixed approximation. 	 Animals, including humans Identify the parts of the human digestive system and explain their function Identify the different types of human teeth and explain their function Construct and interpret food chains to identify predators, producers and prey Key vocabulary Digestive system, digestion, nutrients, Parts of the digestive system - mouth, tongue, teeth, saliva, oesophagus, stomach, small and large intestine, rectum, anus, Teeth - incisors, canines, molars, premolars 	Electricity - Identify common appliances that run on electricity - Name the basic components of a circuit and represent them using diagrams and pictures - Construct a simple series circuit - Predict and test whether a lamp will light in a series circuit (based on whether or not the lamp is part of a loop with a battery) - Describe the function of a switch and predict whether a lamp will light in a series circuit including a switch - Identify some common conductors and insulators (and associate metals with being good conductors) NB - At this stage standard scientific symbols don't need to be taught or used when drawing circuit diagrams, this is introduced in Y6 Key vocabulary	Living Things and Their Habitats - Explore different ways of grouping living to including animals and plants (including gro- vertebrates and invertebrates) - Use classification keys to group, identify a name living things in their local and wider environment - Describe the positive and negative impact humans on the environment - Explain how changes to a habitat could endanger living things Key Vocabulary classification, classification key,
	S P P P		

tats

iting

st predictions and ideas according to our findings est ways an enquiry could be improved or developed patterns in our data to ask questions and make predictions

	Sound
ng things,	- Describe how sounds are made (associating some
grouping	sounds with something vibrating)
	- Describe how vibrations from sounds travel from a
fy and	source, through a medium to the ear
er	- Explore and describe the patterns between the
	pitch of a sound and the features of the object that
pact of	produced it
	 Explore and describe the patterns between the
b	volume of a sound and the strength of the vibrations
	that produced it
	- Describe how sounds get fainter as the distance
	from the sound source increases
	Key vocabulary

	Solid, liquid, gas, state of matter, heating, cooling, melting point, boiling point, temperature, evaporation, condensation, water cycle	Herbivore, Carnivore, omnivore	Circuit, complete circuit, series, ir negative, metal, non-metal Components of a circuit - cell, wir clip, motor,		Fish, amphibian, reptile, bird, mammal, vertebrate, invertebrate Habitat, Micro-habitat, environment,	Sound, vibrate, vibration, source, medium, pitch, volume,
ear	Skills for Working Scientifically					
5	 Asking Questions Plan a range of scientific enquiries to answer a question: Observation over time Identifying/classifying Comparative/fair testing Secondary research Describe what a variable is and identify which variables need to be controlled in a fair test 	Measuring and Recording - Decide what observations to make, which mequipment is appropriate - Use equipment and standard measurements (rulers/metre sticks, weighing scales, timers, to cylinders, data loggers) - Record data in a range of ways, including dia - Use classification keys to identify and descri	s to gather and record data thermometers, measuring agram, tables and charts	audience, including using IT pr evidence, conclusions and cau - Present their findings using b - Use diagrams to support the	ar or line graphs, charts or tables ir scientific explanations rts or refutes scientific ideas and arguments nship is and give examples	Evaluating - Use the results from an investigation to make predictions - Create and develop a new investigation based on a previous enquiry - Evaluate the findings of an enquiry and suggest how it could be improved

question:

• Observation over time

• Identifying/classifying

• Secondary research

variables need to be controlled

• Comparative/fair testing

Set up a fair test, identifying and explaining which

	 Properties and Changes of Materials Compare and group everyday materials on the basis of properties (including hardness, solubility, transparency, of (electrical and thermal) and response to magnets) Give reasons for the uses of everyday materials (based results of fair and comparative tests) Recognise that a material dissolves in a liquid to form a observe test and be separated (using our kn solids, liquids and gases, e.g. filtering, sieving and evapoot - Investigate and observe reversible changes (including effiltering, sieving, melting and dissolving) Explain that some changes result in the formation of nematerials, and that this kind of change is not usually reveburning, rusting and bicarbonate of soda with acid) OPTION: Research how new materials have been invented/developed by scientists (e.g. Spencer Silver and Benerito) Key vocabulary Solid, liquid, gas, state of matter, change of state, temperature, evaporation, condensation, solution, dissolve, sieving, filtration, irreversible, reversible, h soluble, insoluble, transparent, thermal/electrical of magnetic 	conductivity on the solution owledge of rating) evaporating, ew ersible (e.g. d Ruth	Animals, including humans - Describe the life cycle of a human from birth to old age - Describe the changes experienced in puberty (link to PSHE - SRE) NB - This unit of work should be taught alongside PSHE/SRE Key vocabulary Adult, child, teenager, baby, old age Vocabulary will be linked to PSHE/SRE	Forces - Explain how gravity causes unsupported objects to fall the Earth - Observe and describe the effection - Observe and describe the effection - Observe and describe how mechanisms allow a smaller have a greater effect (e.g. leand and gears) OPTION: Research how scient to develop the theory of gravity, Earth, air resistant resistance, friction, mechana lever, pulley, gear, force	towards the effect of air effect of effect of some force to <i>vers, pulleys</i> ntists helped vitation <i>leo Galilei</i>)	Living Things and Their Habitats - Describe the life cycle of a mammal (including humans) - Describe the life cycle of an inset - Describe the life cycle of a bird - Describe the process of sexual and asexual reproduction in plants - Compare and explain the difference between s and asexual reproduction in plants and animals OPTION: Research the work of naturalists and an behaviourists (e.g. David Attenborough and Jane Goodall) Key vocabulary Life cycle, fish, amphibian, reptile, bird, mamm vertebrate, invertebrate Stages of the life cycle of chosen animals Sexual reproduction, asexual reproduction Pollination, fertilisation, plantlets, runners, bulk cuttings Parts of a flower - anther, filament, stamen, sti ovule, ovary, nectary, sepal
Year 6	Skills for Working Scientifically					
	Asking Questions - Plan a range of scientific enquiries to answer a		<i>nd Recording</i> t observations to make, whic		Concluding - Present find	lings from enquiries in a range of ways appropriat

and what equipment is appropriate

- Explain the importance of accuracy and precision when taking measurements

- Use equipment and standard measurements to gather and record data (rulers/metre sticks, weighing scales, timers, thermometers, measuring cylinders, data loggers)

their audience, including using IT programs, oral and written f (discussing evidence, conclusions, causal relationships and the degree of trust in results)

- Present their findings using scatter graphs, bar or line graph charts, pie charts or tables

 Identify evidence that supports or refutes scientific ideas an arguments (from their own enquiries or secondary sources)

and the work of Ptolemy, Alhazen and Copernicus)albs, witigma,Key vocabulary Moon, planet, Sun, star, celestial body, orbit, rotation, spherical, solar system, rotate, geocentric, heliocentric, shadow Names of the planets - Mercury, Jupiter, Saturn, Venus, Mars, Uranus, Neptuneaturn, Venus, Mars, Uranus, Neptuneate for formatsEvaluating new predictions		
solar system have developed (e.g. looking at the geocentric and heliocentric models and the work of Ptolemy, Alhazen and Copernicus)albs, tigma,Key vocabulary Moon, planet, Sun, star, celestial body, orbit, rotation, spherical, solar system, rotate, geocentric, heliocentric, shadow Names of the planets - Mercury, Jupiter, Saturn, Venus, Mars, Uranus, Neptuneate for formats eEvaluating - Use the results from an enquiry to make new predictions - Create and develop a new investigation	n sexual s animal	 Describe the Moon, Sun and Earth as approximately spherical bodies Identify the planets in our solar system Describe the movement of the Earth and other plants relative to the Sun in the solar system Describe the movement of the Moon relative to the Earth Explain why we have night and day and the apparent movement of the Sun across the sky (using the ideas of the Earth's
Anoon, planet, Sun, star, celestial body, orbit, rotation, spherical, solar system, rotate, geocentric, heliocentric, shadow Names of the planets - Mercury, Jupiter, Saturn, Venus, Mars, Uranus, Neptune Saturn, Venus, Mars, Uranus, Neptune Venus, Mars, Uranus, Neptune Image: star of the star	mal,	solar system have developed (e.g. looking at the geocentric and heliocentric models and the work of Ptolemy, Alhazen and
ate for formats- Use the results from an enquiry to make new predictions - Create and develop a new investigation	·	Moon, planet, Sun, star, celestial body, orbit, rotation, spherical, solar system, rotate, geocentric, heliocentric, shadow Names of the planets - Mercury, Jupiter,
ate for formats- Use the results from an enquiry to make new predictions - Create and develop a new investigation		
ns, enquiry - Evaluate the findings of an enquiry (referring to degree of trust in results, accuracy and precision)	formats e ns,	 Use the results from an enquiry to make new predictions Create and develop a new investigation based on the results from a previous enquiry Evaluate the findings of an enquiry (referring to degree of trust in results,

	charts	ways, including diagrams, tables and ys to identify and describe living things	- Describe ho time	w and why some scientific ideas have chan	ged over	
Scientific Knowledge	· · · · ·					·
Electricity - Draw a simple circuit diagram using recognised scientific symbols - Describe how the number and voltage of cells used in a circuit affects the brightness of a lamp or the volume of a buzzer - Compare and give reasons for variations in how components function (e.g. brightness of bulbs or loudness of buzzers, on/off position of switches) NB - Children do not need to understand what voltage is but use the terms volts and voltage to describe different batteries Key vocabulary Electricity, appliance, voltage, current Circuit - cell, wire, bulb, switch, buzzer, battery, motor, Series, Insulator, conductor Circuit diagram, circuit symbol,	Animals, including humans - Identify the main parts of the human circulatory system - Describe the functions of the heart, blood vessels and blood - Describe the positive and negative impact of diet, exercise, drugs and lifestyle on the way our bodies function - Describe how nutrients and water are transported in animals, including humans Key vocabulary Parts of the circulatory system - heart, blood vessels, blood, lungs, Diet, exercise, drugs, nutrients, pulse, rate, oxygen, carbon dioxide, water, muscles,	 Evolution and Inheritance Describe some ways in which the Eart living things have changed over time Describe how fossils can provide infor about living things that inhabited the E millions of years ago Describe how living things produce of the same kind and that parents pass or characteristics to their offspring Explain how and why normally offspri and are not identical to their parents Describe and compare how animals a are adapted to suit their environment Describe how adaptation over time me evolution OPTION: Research the work of paleont and scientists (e.g. Mary Anning, Charle and Alfred Wallace) Key Vocabulary Fossil, offspring, characteristics, inherit species, variation, adaptation, evolutio identical, sexual reproduction, 	rmation farth fspring of n ing vary nd plants hay lead to ologists es Darwin	 Living Things and Their Habitats Describe how living things are classified into broad groups according to observable characteristics and based on similarities and differences (including microorganisms, plants and animals and how these broader groups can be subdivided e.g. into invertebrates and vertebrates or into fish, amphibians, reptiles, birds and mammals) Use and develop classification keys to identify plants and animals in the local and wider environment OPTION: Find out about the work of relevant scientists (e.g. Carl Linnaeus) Key vocabulary Characteristics, classification key, Micro-organisms, plants, flowering, non-flowering, animals, invertebrates, vertebrates, fish, amphibians, reptiles, birds, mammals, insects, 	(including li - Observe th - Explain ho that light tr light source eye) - Explain wh object that light travels Key vocabu Light, dark,	light source, shadow, reflection, surface light, transparent, translucent, opaque, ,