

SCIENCE KNOWLEDGE AND BREADTH TRACKER

EYFS	THRESHOLD CONCEPT 1: Working Scientifically	THRESHOLD CONCEPT 2: Understanding biology	THRESHOLD CONCEPT 3: Understanding chemistry	THRESHOLD CONCEPT 4: Understanding physics
Statutory Educational programmes	<p><i>Understanding the world involves guiding children to make sense of their physical world and their community. The frequency and range of children's personal experiences increases their knowledge and sense of the world around them – from visiting parks, libraries and museums to meeting important members of society such as police officers, nurses and firefighters. In addition, listening to a broad selection of stories, non-fiction, rhymes and poems will foster their understanding of our culturally, socially, technologically and ecologically diverse world. As well as building important knowledge, this extends their familiarity with words that support understanding across domains. Enriching and widening children's vocabulary will support later reading comprehension. (Understanding the World)</i></p>			
Experiences to build foundations in threshold concepts during EYFS	<p>Explore the natural world around them. Describe what they see, hear and feel whilst outside. Understand the effect of changing seasons on the natural world around them.</p> <p>How?</p> <ul style="list-style-type: none"> • Begin to observe e.g. What happens to the gingerbread man in different liquids? Floating and sinking. Worms and ladybirds. • Begin to explore, investigate and experiment, giving the children the freedom to touch, smell and hear the natural world around them • Begin to sort and compare e.g. in maths, colours, shapes, natural objects, things that they see outside • Begin to name, describe and explain • Seasonal scrapbook / timeline <p>Stem sentences:</p> <ul style="list-style-type: none"> • I can see... 	<p>Explore the natural world around them. Describe what they see, hear and feel whilst outside. Understand the effect of changing seasons on the natural world around them.</p> <p>How?</p> <ul style="list-style-type: none"> • Learn names of parts of the body through songs and role play i.e. doctors, shadow portraits • Explore living things in context – ladybirds and worms habitats in the classroom, observations made outside, growing bulbs and seeds. • Similarities and differences in living things – worms and ladybirds • Observational drawings of living things • Create opportunities to discuss how we care for the natural world around us e.g. growing plants • Offer opportunities to sing songs and join in with rhymes and poems about the natural world • Salcey Forest visit 	<p>Explore the natural world around them. Describe what they see, hear and feel whilst outside. Understand the effect of changing seasons on the natural world around them.</p> <p>How?</p> <ul style="list-style-type: none"> • Learning about material changes e.g. ice investigation, cooking, fizzy mud pies. • Similarities and differences in materials e.g. floating and sinking, sorting and grouping <p>Melt, float, sink, mix, change</p>	<p>Explore the natural world around them. Describe what they see, hear and feel whilst outside. Understand the effect of changing seasons on the natural world around them.</p> <p>How?</p> <ul style="list-style-type: none"> • Observation of weather and discussion of the seasons through hands on observations, i.e. going outside in different seasons • Beginning to investigate forces e.g. pushing and pulling toy vehicles during play, when singing songs such as 'Row, row, row your boat', counter balance games in PE. <p>Season, weather, hot, warm, cold, windy, sunny, snow, rain, hail, ice</p>

	<ul style="list-style-type: none"> • Why... • I'm going to try... • That happened before when... • It's the same as... • It's different to... 	Head, shoulders, knees, toes, eyes, ears, mouth, nose, bulbs, seeds, grow, stem, petal, leaf, flower		
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SCIENCE KNOWLEDGE AND BREADTH TRACKER

	THRESHOLD CONCEPTS & BREADTH DETAIL			
YEAR 1	THRESHOLD CONCEPT 1: Working Scientifically	THRESHOLD CONCEPT 2: Understanding biology	THRESHOLD CONCEPT 3: Understanding chemistry	THRESHOLD CONCEPT 4: Understanding physics
<p>TERM 1</p> <p>Are fairytale characters like you and me?</p>	<p>I know how to carry out simple tests (predicting, explaining, concluding).</p> <p>I know how to identify (name) and classify (arrange by chosen characteristics) things.</p> <p>I know how to explain to others what I have found out.</p> <p>I know how to use simple equipment to make observations (what have I seen or what have I noticed).</p> <p>Test, sort, compare, group, why, identify, observe, notice</p> <p>Working scientifically stem sentences:</p> <ul style="list-style-type: none"> • Why is....? • I know that... • I think... • I found out.... • This is the same because... • This is different because... 		<p><i>Know the name of the materials an object is made from</i></p> <p><i>Know about the properties of everyday materials.</i></p> <p>I distinguish between an object and the material it is made from (e.g. a plastic chair, a metal fork).</p> <p>I know the materials that an object is made from (fabric, wood, glass, rock, water, plastic, metal etc)</p> <p>I know the difference between wood (hard, not flexible or malleable), plastic (sometimes hard, sometimes soft, sometimes flexible and malleable), glass (hard, not flexible, easily broken), metal (sometimes hard, sometimes soft, sometimes flexible and malleable), water (liquid, fills a space) and rock (hard, not flexible or malleable, can be easily broken).</p>	<p><i>Name the seasons and know about the type of weather in each season</i></p> <p>I observe (watch) and know (can explain) about the changes in the seasons (spring, summer, autumn, winter).</p> <p>I name the seasons (spring, summer, autumn, winter) and know about the type of weather in each season (hot, cold, rain, snow, sleet, fog, sun, wind).</p> <p>How?</p> <ul style="list-style-type: none"> • Close observation of Autumn leaves- how have they changed • Observations of weather patterns over time

			<p>I know about the properties (hard, soft, flexible, non-flexible, malleable, natural, unnatural, easily broken) of everyday materials.</p> <p>I group objects based on the materials they are made from.</p> <p>How?</p> <ul style="list-style-type: none"> • Knowledge check- what materials do you know? 'Magic materials box' • Sorting, identifying, classifying materials • What material is most suitable for Goldilocks' bowl? <p>Sort, identify, compare, texture, bendy, smooth, squashy, hard, soft..., wood, plastic, glass, metal, water, rock</p>	<p>season seasonal spring summer autumn winter warm cool wind rain sun fog snow cloud droplet float dark fluffy storm forecast predict future scientist</p>
<p>TERM 2</p> <p>Do all Superheroes wear capes?</p>	<p>I know how to ask simple scientific questions (how, what, when, why).</p> <p>I know how to use simple equipment to make observations.</p> <p>I know how to carry out simple tests.</p> <p>I know how to explain to others what I have found out (using subject specific vocabulary).</p>	<p><i>Know the name of parts of the human body that can be seen</i></p> <p>I know how to name the parts of the human body that I can see (head, nose, eyes, ears, mouth, neck, shoulders, chest, stomach, legs, arms, hands, feet).</p> <p>I know how to link the correct part of the human body to each sense (taste = mouth, smell = nose, touch = skin, sight = eyes, hearing = ears).</p> <p>How?</p> <ul style="list-style-type: none"> • Can you build a tower without being able to see, your partner can't touch the bricks but can help you? What did you use? What are senses? 		<p><i>Name the seasons and know about the type of weather in each season</i></p> <p>I observe and know about the changes in the seasons.</p> <p>I name the seasons and know about the type of weather in each season.</p> <p>How?</p> <ul style="list-style-type: none"> • Observations of weather patterns over time <p>season seasonal spring summer autumn winter warm cool wind rain sun fog snow cloud droplet float dark fluffy storm forecast predict future scientist</p>

		<ul style="list-style-type: none"> • Selection of objects to indicate a task (e.g. binoculars for birdwatching) sort by senses used • Naming body parts associated with 5 senses • Lost senses- Louis Braille (cf. history). Explore link between senses eg. Taste and smell, sound and texture (link to Evelyn Glennie- deaf percussionist- feeling sound). Rice on speakers- drums. <p>Sense, sight, hearing, smell, taste, touch, eyes, ears, nose, tongue, skin, vibration, sort, texture.</p>		
<p>TERM 3</p> <p>Should we explore north south, east or west?</p>	<p>I know how to ask simple scientific questions.</p> <p>I know how to use simple equipment to make observations.</p> <p>I know how to carry out simple tests.</p> <p>I know how to explain to others what I have found out.</p>			<p>*Forces (added as a further focus for working scientifically)</p> <p><i>Know an object can be moved by a push or pull (force)*</i></p> <p>I can identify a push or pull force</p> <p>I can begin to explore forces including gravity</p> <p>How?</p> <ul style="list-style-type: none"> • How can you move a heavy boat? <p>Force, push, pull, move, slide, direction, distance.</p> <p><i>Name the seasons and know about the type of weather in each season</i></p> <p>I observe and know about the changes in the seasons.</p> <p>I name the seasons and know about the type of weather in each season.</p> <p>How?</p>

				<ul style="list-style-type: none"> Exploring ice- how to save a snowman? <p>season seasonal spring summer autumn winter warm cool wind rain sun fog snow cloud droplet float dark fluffy storm forecast predict future scientist melt, thaw, change, liquid, solid, change</p>
<p>TERM 4 Why should we care about nature?</p>	<p>I know how to use simple equipment to make observations. I know how to identify and classify things. I know how to explain to others what I have found out. I know how to use simple data (collected in simple investigations such as counting, measuring or comparing) to answer questions</p>	<p><i>Know how to sort by living and non living things</i> <i>Know and name a variety of common wild and garden plants</i> <i>Know and name the petals, stem, leaves and root of a plant</i> <i>Know and name the roots, trunk, branches and leaves of a tree</i></p> <p>I know and name a variety of common wild and garden plants (e.g. daisys, pansies, sunflowers, tulips, daffodils etc) I know and name the petals, stem, leaves and root of a plant. I know and name the roots, trunk, branches and leaves of a tree.</p> <p>How?</p> <ul style="list-style-type: none"> Plant a seed / bulb to grow a flower Naming parts of a plant Flowers in inky water- see changes <p>Daisy, dandelion, rose, daffodil, thistle, clover, stem, petal, leaves, roots, trunk, branches, seed, bulb, weed,</p>		<p><i>Name the seasons and know about the type of weather in each season</i> I observe and know about the changes in the seasons. I name the seasons and know about the type of weather in each season.</p> <p>How?</p> <ul style="list-style-type: none"> Signs of Spring – changes in environment. <p>season seasonal spring summer autumn winter warm cool wind rain sun fog snow cloud droplet float dark fluffy storm forecast predict future scientist</p>

		living, dead, grow, pollen, basic needs, water, food, shelter, sleep		
<p>TERM 5</p> <p>What did it feel like to be on the Titanic?</p>	<p>I know how to ask simple scientific questions.</p> <p>I know how to use simple equipment to make observations.</p> <p>I know how to carry out simple tests.</p> <p>I know how to identify and classify things.</p> <p>I know how to explain to others what I have found out.</p>		<p><i>Know the name of the materials an object is made from</i></p> <p><i>Know about the properties of everyday materials</i></p> <p><i>Begin to know why a material might or might not be used for a specific job</i></p> <p>I distinguish between an object and the material it is made from.</p> <p>I know the materials that an object is made from.</p> <p>I know the difference between wood, plastic, glass, metal, water and rock.</p> <p>I know about the properties of everyday materials.</p> <p>I group objects based on the materials they are made from.</p> <p>I can find objects that are magnetic</p> <p>How?</p> <ul style="list-style-type: none"> Investigate suitable material for each aspect of the boat (in groups and feedback) cf. DT Magnetic materials sorting <p>Sort, identify, compare, texture, bendy, smooth, squashy, hard, soft..., wood, plastic, glass, metal, water, rock, see-through, transparent, firm, cold, warm, magnetic, non-magnetic, poles, natural</p>	<p><i>Name the seasons and know about the type of weather in each season</i></p> <p>I observe and know about the changes in the seasons.</p> <p>I name the seasons and know about the type of weather in each season.</p> <p>How?</p> <ul style="list-style-type: none"> Where have the puddles gone? Can my chocolate bar / ice lolly be outside in the sun?
<p>TERM 6</p> <p>Can a meerkat live in the north pole?</p>	<p>I know how to ask simple scientific questions.</p> <p>I know how to use simple equipment to make observations.</p>	<p><i>Know and classify animals by what they eat (carnivore, herbivore and omnivore)</i></p>		<p><i>Name the seasons and know about the type of weather in each season</i></p> <p>I observe and know about the changes in the seasons.</p>

	<p>I know how to carry out simple tests.</p> <p>I know how to identify and classify things.</p> <p>I know how to explain to others what I have found out.</p> <p>I know how to use simple data to answer questions</p>	<p><i>Know how to classify a range of animals by amphibian, reptile, mammal, fish and birds</i></p> <p>I know and name a variety of animals including fish, amphibians, reptiles, birds and mammals.</p> <p>I classify and know animals by what they eat (carnivore, herbivore and omnivore).</p> <p>I know how to sort animals into categories (including fish, amphibians, reptiles, birds and mammals).</p> <p>How?</p> <ul style="list-style-type: none"> • Animals and their habitats- why are they suited? • What's in my patch- hoop on ground (forest school visit?)- find minibeasts and identify habitat preferred. Data collection • Explore features of habitats and why they suit different animals • Animal estate agents- use research into animals / minibeasts and match to 'house description' that would suit and say why. <p>Grow, carnivore, herbivore, omnivore, habitat, fish, amphibian, reptile, birds, mammals, meat, plants, food group.</p>		<p>I name the seasons and know about the type of weather in each season.</p> <p>How?</p> <ul style="list-style-type: none"> • Weather chart and observation / tracking changes
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SCIENCE KNOWLEDGE AND BREADTH TRACKER

KEY: **Revisited learning**

	THRESHOLD CONCEPTS & BREADTH DETAIL
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YEAR 2	THRESHOLD CONCEPT 1: Working Scientifically	THRESHOLD CONCEPT 2: Understanding biology	THRESHOLD CONCEPT 3: Understanding chemistry	THRESHOLD CONCEPT 4: Understanding physics
<p>TERM 1</p> <p>Is a healthy diet all you need to thrive?</p>	<p>I know how to ask simple scientific questions. (how, what, when, why).</p> <p>I know how to carry out simple tests (predicting, explaining, concluding).</p> <p>I know how to identify and classify things. (arrange by chosen characteristics)</p> <p>I know how to explain to others what I have found out (using subject specific vocabulary).</p>	<p>Know why exercise (moving our bodies), a balanced diet (the food we eat) and good hygiene (washing, sharing or preparing food etc) are important for humans</p> <p>I know what animals and humans need to survive (water, shelter, warmth, food).</p> <p>I know why exercise, a balanced diet and good hygiene are important for humans.</p> <ul style="list-style-type: none"> • How? • Mouldy bread investigation- germs and bacteria - WOW • How healthy are you? Knowledge check- what does being healthy mean to you? Diet, sleep, hygiene, exercise. • Illustrate you being healthy. • Children select fav snack from a selection (one of each food group) then create chart and analyse- introducing food groups • Sorting food into food groups • Record a food diary for a day- review food groups consumed • Exercise investigation- effects on body. • Explore why a professional athlete / footballer would have different food requirements <p>Grow, food group, pattern, grouping, classifying, carbohydrates, protein, fats and sugars, dairy, fruits and vegetables, health, nutrition, thrive, hygiene</p>		<p>Continuation from Year 1 (this will also continue throughout Year 2):</p> <p>Name the seasons and know about the type of weather in each season</p> <p>I observe and know about the changes in the seasons.</p> <p>I name the seasons and know about the type of weather in each season.</p> <p>How?</p> <p>Weather chart and observation / tracking changes</p>

<p>TERM 2</p> <p>What is it like to live in Kenya?</p> <p><i>Recovery curriculum core skills focus for assessment</i></p> <p><i>Know about herbivores, carnivores, omnivores to develop a good understanding of food chains.</i></p>	<p>I know how to ask simple scientific questions.</p> <p>I know how to use simple equipment to make observations.</p> <p>I know how to carry out simple tests.</p> <p>I know how to identify and classify things.</p> <p>I know how to explain to others what I have found out.</p> <p>I know how to use simple data to answer questions</p>	<p><i>Classify things by living, dead or never lived</i></p> <p><i>Know how a specific habitat provides for the basic needs of things living there (plants and animals).</i></p> <p><i>Match living things to their habitat</i></p> <p><i>Name some different sources of food for animals</i></p> <p><i>Know about and explain a simple food chain</i></p> <p>I identify things that are living (needs water, food, moves by itself), dead and never lived (man made/synthetic).</p> <p>I know how a specific habitat (a place where something lives) provides for the basic needs of things living there (plants and animals) -see above.</p> <p>I identify and name plants (vegetables, fruit, native plants) and animals in a range of habitats e.g. Africa Versus Europe).</p> <p>I match living things to their habitat (Availability of resources).</p> <p>I know how animals find their food (using their senses).</p> <p>I name some different sources (places) of food for animals.</p> <p>I know and can explain a simple food chain (e.g. plant, slug, hedgehog, fox, hawk).</p> <p>I can use a microscope to closely view a plant</p> <p>How?</p> <ul style="list-style-type: none"> • Observation and data collection-hunt for things living, dead and never lived 		
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		<ul style="list-style-type: none"> • Revisit Meerkat Mail – gather skills and knowledge to inform next steps for planning. Revisit enquiry question – Could a meerkat live in the North Pole? Summarise learning in topic book as a mind map. • African grasslands / plains- why is it suited to different animals and plants? Explore habitats via webcams. Discuss food chains in habitats- circle of life. Wildlife film extracts. Compare two animals eg hippo and leopard. • Plant condition INVESTIGATION/RESEARCH- cacti vs other plant (focus on fruit and vegetables, how they grow and where they come from, why they grow there and plot on a map). Analyse impact on plants. • Look closely at cacti and other plants to make comparisons <p>Grow, carnivore, herbivore, omnivore, habitat, fish, amphibian, reptile, birds, mammals, meat, plants, food group, basic needs, water, food, shelter, sleep living, dead, never been alive, adaptation, food chains, hunter, prey, (producer, consumer), parasitic, microscope</p>		
<p>TERM 3</p> <p>Will we ever get to Mars?</p>	<p>I know how to ask simple scientific questions.</p> <p>I know how to use simple equipment to make observations.</p> <p>I know how to carry out simple tests.</p> <p>I know how to identify and classify things.</p> <p>I know how to explain to others what I have found out.</p>		<p><i>Know why a material might or might not be used for a specific job</i></p> <p>I identify and name a range of materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard.</p> <p>I know why a material might or might not be used for a specific job (waterproof, flexible, comfortable, soft, hard, porous etc).</p>	<p>*Forces (added as a further focus for working scientifically)</p> <p><i>Know that gravity is a force that pulls objects down</i></p> <p><i>Know that different surfaces can affect the movement of an object on the surface</i></p> <p>I know that there is a force called gravity and it pulls objects to earth</p> <p>I know that a rougher surface will cause more friction and slow the</p>

	<p>I know how to use simple data to answer questions</p> <p>Test, sort, compare, group, why, identify, observe, notice, suitable, appropriate, predict, fair test, reason, conclusion.</p> <p>Working scientifically stem sentences:</p> <ul style="list-style-type: none"> • Why is....? • I know that... • I think... • I found out.... • This is the same because... • This is different because... • I predict that...because... • I noticed.... • This changed because.... • This material is most suitable because.... 		<p>How?</p> <ul style="list-style-type: none"> • Naming and sorting materials, recognising a range of properties • Which material would make the best spacesuit and why? <p>Sort, identify, compare, texture, bendy, smooth, squashy, hard, soft..., wood, plastic, glass, metal, water, rock, see-through, transparent, firm, cold, warm, natural, manmade, insulation, flexible, rigid, purpose, waterproof, strong, durable</p>	<p>movement of an object on the surface</p> <p>How?</p> <ul style="list-style-type: none"> • Object drop investigation • Moon buggy surfaces <p>Force, push, pull, move, slide, direction, distance, gravity, friction, mass, weight, motion, rough, smooth, bumpy...</p>
<p>TERM 4 TERM 5</p> <p>Where would you build a home, somewhere metropolitan, urban or rural?</p>	<p>I know how to ask simple scientific questions.</p> <p>I know how to use simple equipment to make observations.</p> <p>I know how to carry out simple tests.</p> <p>I know how to identify and classify things.</p> <p>I know how to explain to others what I have found out.</p> <p>I know how to use simple data to answer questions</p> <p>Measure, fair test, pipette, prediction, reasons, method, findings, conclusion</p>	<p><i>Know and explain how seeds and bulbs grow into plants</i></p> <p><i>Know what plants need in order to grow and stay healthy (water, light & suitable temperature)</i></p> <p>I know how seeds and bulbs grow into plants (water, sunlight, oxygen, soil).</p> <p>I know what plants need in order to grow and stay healthy (water, light & suitable temperature).</p> <p>How?</p> <p>Plant conditions growth experiment- light / no light, water / no water, room temp / fridge- grow seeds / bulbs</p> <p>Comparing green spaces – manmade (metropolitan) farm life, what does a farmer do to keep crops alive? What do they need to survive? Link to Cedric</p>	<p><i>Know why a material might or might not be used for a specific job</i></p> <p>I identify and name a range of materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard.</p> <p>I know why a material might or might not be used for a specific job.</p> <p>How?</p> <p>Tent for country mouse- test waterproof (language of fair testing)</p> <p>Vocab as term 3.</p>	

		<p>the seed (story) – A TRIP TO A WORKING FARM</p> <p>Learn an explanation text about seeds growing – cross linked to talk for writing</p> <p>Match the bulb/seed to the grown plant</p> <p>seed, bulb, living, dead, grow, pollen, basic needs, water, light, temperature, stem, petal, leaves, roots, seedling, shoot, germinate, microscope</p>		
<p>TERM 6</p> <p>Where will my coke bottle end up?</p>	<p>I know how to ask simple scientific questions.</p> <p>I know how to use simple equipment to make observations.</p> <p>I know how to carry out simple tests.</p> <p>I know how to identify and classify things.</p> <p>I know how to explain to others what I have found out.</p>	<p><i>Know the basic stages in a life cycle for animals, including humans</i></p> <p><i>Know how a specific habitat provides for the basic needs of things living there (plants and animals).</i></p> <p><i>Match living things to their habitat</i></p> <p><i>Name some different sources of food for animals</i></p> <p><i>Know about and explain a simple food chain</i></p> <p><i>I identify things that are living, dead and never lived.</i></p> <p><i>I know how a specific habitat provides for the basic needs of things living there (plants and animals).</i></p> <p><i>I identify and name plants and animals in a range of habitats.</i></p> <p><i>I match living things to their habitat.</i></p> <p><i>I know how animals find their food.</i></p> <p><i>I name some different sources of food for animals.</i></p> <p><i>I know and can explain a simple food chain.</i></p> <p><i>I know the basic stages in a life cycle for animals, including</i></p>	<p><i>Know how materials can be changed by squashing, bending, twisting and stretching</i></p> <p>I know how materials can be changed by squashing, bending, twisting and stretching.(e.g breaking, change shape, snapping).</p> <p>How?</p> <p>Boat designer- range of materials, making malleable materials into boats</p>	

		<p>humans (Birth, growth, development, reproduction, death).</p> <p>How?</p> <p>Ocean food chains</p> <p>Ocean habitats- how and why they thrive ...or not (environmental change / human impact- cf Geography).</p> <p>Exploring environmental changes- impact of plastic in the ocean</p> <p>Focus on the three Rs – reduce, reuse, recycle</p> <p>Grow, carnivore, herbivore, omnivore, habitat, fish, amphibian, sea creature, birds, mammals, meat, plants, food group, basic needs, water, food, shelter, sleep, adaptation, food chains, hunter, prey, (producer, consumer), parasitic,</p>		
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