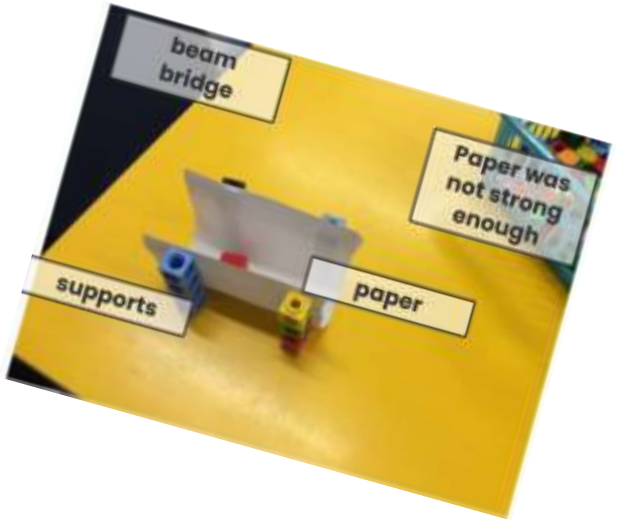
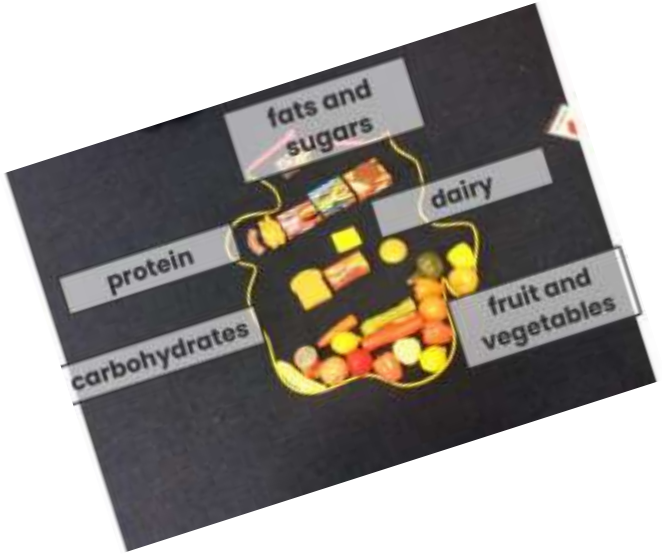
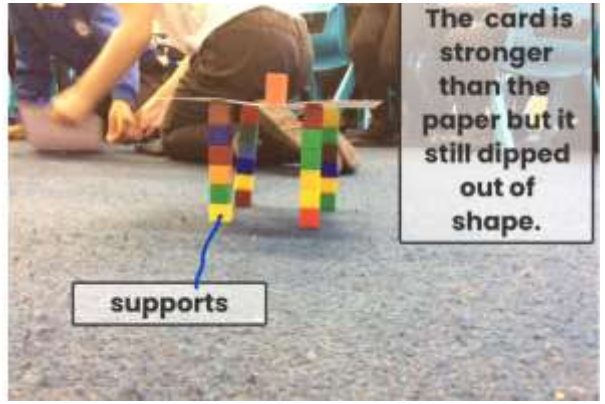






Science Syllabus

To empower our children to be the change-makers of the future.

#WecanWewillTogether

NII is a safe, secure and nurturing school where children develop positive relationships.

Our children are confident, articulate and resilient both in education and attitude to life.

They are compassionate, empathetic and supportive of others.

Our staff are motivated, tenacious and committed working with integrity to ensure the best outcomes for our children and families.

They strive for excellence in all that they do.

We are the focal point of our community where families feel supported, respected and are partners in their children's journey.

Everyone in our school community contributes and is both heard and valued.

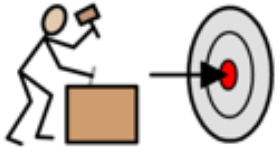
Our high aspirations, forward thinking, innovative approach inspires our children to be change-makers of the future.

inclusivity

Diversity
Equity
Respect
Acceptance

integrity

Moral
Principles
Honesty
Fairness



tenacity

Resilience
Hard working
Perseverance
Never give up

collaboration

Partnerships
Working together
Supportive
'Families'

ambition

Excellence
High expectations
Creative
Innovative
Risk taking

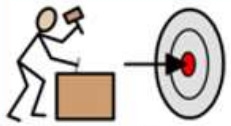
How our Mission, Vision and Values are reflected in Science


inclusivity

Inclusivity ensures that all pupils feel valued, represented, and able to access learning equally. This begins with designing investigations and activities that accommodate diverse needs, backgrounds, and interests. For example, using visual aids, sensory materials, and varied groupings allows children with different learning styles or abilities to participate meaningfully.
Contributions from scientists of diverse cultures, genders, and abilities are highlighted to foster representation and challenge stereotypes. Teachers use inclusive questioning techniques like using sentence stems, scaffolded vocabulary, or partner talk to help build confidence for all learners to share ideas. Children are offered multiple ways to demonstrate understanding, such as drawing, writing, or verbal explanations. Thoughtful resource choices (e.g., tactile materials or multilingual support) further support access.


integrity

During science lessons teachers foster honesty, fairness, and responsibility in both learning and investigation. Children can be guided to record results truthfully, acknowledge mistakes, and avoid changing outcomes to “get it right.” Through collaborative enquiry, children learn to respect different viewpoints and share resources fairly, reinforcing moral responsibility in teamwork. Children are encouraged to ask questions with genuine curiosity to help to develop integrity. Teachers encourage giving credit to others’ ideas and challenge misinformation respectfully. Children can be exposed to ‘big problems’ that are present in the world and begin to develop their own ideas, answers and a sense of social responsibility. When sharing ideas and research, children will be encouraged to show support for their peers and participate in fair and honest debates around their ideas.


tenacity

Tenacity is developed and promoted through inquiry, exploration, and resilience. Children demonstrate tenacity when they persist in investigating questions, even when results are unexpected or tasks are challenging. Children are encouraged to experiment and reflect and are then prompted to adapt, retry, and refine their approaches. Children are presented with open-ended tasks—such as designing a test for waterproof materials—to help them to persevere with critical thinking. Children are given regular opportunities for prediction, observation, and evaluation builds confidence and grit over time. When pupils record their findings, compare results, and revise conclusions, they’re practicing the core of scientific tenacity: curiosity with endurance.


collaboration

Collaboration in a science curriculum means children working together to explore, experiment, and make sense of the world around them. It encourages teamwork through shared investigations, group discussions, and joint problem-solving. For instance, children might plan and conduct a habitat survey in pairs, share observation roles during a materials test, or build models together to demonstrate simple scientific concepts. These activities not only promote communication but also foster listening, compromise, and shared decision-making. Teachers can support collaboration by assigning clear group roles such as recorder, observer, or questioner and modelling respectful dialogue. Celebrating each member’s contribution helps build a sense of collective responsibility and achievement.


ambition

Ambition in a science curriculum inspires children to think big, embrace challenge, and believe in their potential to become curious investigators and future changemakers. To foster ambition, children should be encouraged to ask bold questions, explore complex ideas, and stretch their thinking. For example, when exploring living things or materials, teachers can prompt children to predict, hypothesise, and invent new solutions like designing eco-friendly packaging or imagining habitats for unknown creatures. High expectations, paired with supportive scaffolding, helps children to aim higher and persevere. Importantly, ambition must be inclusive: every child should feel that science is for them, and that their ideas matter. Science in school provides children with the opportunity to understand, explain and ultimately change their world.

Science Curriculum Intent

Science is a key aspect of the primary curriculum and provides children with the essential skills to understand, explain and possibly ultimately change the world they live in. Our aim is to enthuse and inspire pupils to further their scientific understanding and develop their knowledge of the wider world and the issues and challenges we all face. Science is a critical part of a child's curriculum. It develops their understanding of the world around them and inspires and enthuses them to discover why and how things happen and how they can begin to solve problems in their own environment and around the world, allowing science to become part of their life both in and out of school. A high quality science curriculum will allow children to develop a wide range of skills which are essential as they build and develop their science knowledge and understanding throughout their school life. They develop skills of working scientifically based around prediction and forming hypothesis, close observation, conducting investigations and evaluating and communicating their findings and ideas. Alongside these key skills of working scientifically children will be continually building their subject knowledge on various features of their immediate environment working up to knowledge of the wider world. As a result children will be able to look critically at the world around them and begin to question and challenge the things they see and start to find their own solutions to the 'big problems': helping them to develop their sense of social responsibility. Science also helps children to develop their social skills as they will engage with activities working independently as well as collaboratively as part of a team enabling them to develop concepts of team-work, sharing ideas, debate and negotiation.

Implementation

We offer a well-resourced, broad and balanced science curriculum which aims to instil children with a sense of awe and wonder and a passion to question, investigate and problem solve. Our children learn a wide range of key skills of working scientifically allowing them to ultimately conduct their own investigations following each stage from questioning and predicting to conducting an experiment, collecting and analysing results and finally communicating their findings.

In Early Years across a two-week period children will have a dedicated indoor session and scientific activities during their outdoor sessions. In these science sessions learning is based around exploring a range of situations and encouraging a sense of inquisitiveness, teaching children how to observe as adults model and narrate what they can see so the children can develop their understanding of what they are looking at and for. Children will build their basic scientific knowledge, including a range of appropriate scientific vocabulary, which they will then be able to build upon throughout their school life.

During science lessons children have access to a wide range of resources and texts to enable them to build good subject knowledge alongside their skills of working scientifically. They learn how to observe closely looking for differences, changes and patterns and be able to ask questions about things they can see, starting with their immediate environment and working up to the wider world. Their developing subject knowledge enables them to ask questions about why things have happened and begin to explain how and why different processes happen based on their own understanding.

Children will build their knowledge of the keys areas of the KS1 science curriculum in a weekly dedicated lesson through investigation or direct teaching with an emphasis on the use of high quality resources to provide children with real life examples and models of the concepts and facts being taught. Through block based teaching of specific strands of Scientific learning children will engage with topics and concepts covered in lessons and will consolidate and further their understanding of the key learning across a half term.

Science Curriculum Overview

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Nursery	Exploration- observing, touching, tasting, smelling different objects. Sorting into groups. Explore items with batteries and switches and simple force toys.		Animals- Name pets and describe simple features and match baby pets. Naming simple body parts and keeping healthy.	Materials- Exploring textures, finding objects from clues.	Animals- Name farmyard animals and describe simple features and match baby animals.	Plants- Observe plants outdoor, name features and grow seeds.
Reception	Human Body and simple life cycle-Name body parts, using observation skills	Senses- using different senses to explore, healthy and unhealthy food	Investigations- exploring asking questions and making observations	Materials- finding objects of different materials, describing and grouping/ testing materials,	Animals- name and describe insects, butterfly life cycle	Plants- name common flowers and trees and some parts of a flower. Animals- name woodland animals
Year 1	Humans- naming body parts, describing senses	Materials- identify materials and objects, describing and investigating properties	Materials- describing and investigating properties, suitability	Seasons and changes- weather and seasons	Animals- living things and features, carnivores/herbivores	Plants- wildflowers and trees, parts of a plant,
Year 2	Humans- body parts and functions, keeping healthy, life cycle of humans	Materials- naming/ describing and suitability,	Materials/ Investigations- changing shape, suitability,	Plants- labelling parts, describing needs for survival and life cycles	Animals and habitats- living things and offspring, what is a habitat/ micro-habitat	Habitats- how an animal is adapted to its habitat, simple food chains

Science

Implementation-(Areas of the Subject)

- Animals including humans (Humans)
- Animals including humans (Animals)
- Plants
- Materials
- Investigation

Science

Implementation

Animals including humans (Humans)

Nursery

Explore senses- touch, taste, observe, smell, listen to different things. Play simple body part games/ rhymes. Explore healthy eating and sort healthy and unhealthy foods.

Reception

Name body parts, label main body parts practically and using drawn outlines, explore senses- taste, touch, smell, hearing and sight. Name the body part used for the senses. Simple life cycle cut and stick (baby, child, adult), talk about what changes they can see.

Year One

Name a wider range of body parts, label from diagrams and practical activities, discuss simple function of key body parts and write a simple sentence about the function, match body parts to function. Name the body part related to each sense. Explain what each sense is and explore using their senses. Talk about and record what they have found out using each sense. Investigate uniqueness- do all humans look the same? Explore using their peers in class.

Year Two

Understand needs for survival for humans and animals and be able to explain that they need food, air, shelter and water to survive. Understand the human life cycle- construct a life cycle with more stages (baby, toddler, child, teenager, adult, elderly) and be able to describe the main changes at each stage recording as sentences. Understand how humans can stay healthy- exercise, food, hygiene, who helps keep us healthy. Children will create posters, complete sorting activities and matching games and record results from investigations.

Science

Implementation

Animals including humans (Living Things)

Nursery

Name pets and match pictures of offspring to adult pet animal. Be able to verbalise names of main body parts of pets- tail, fur, legs, fin, head, whiskers etc. Discuss how to look after pets at home- food, water, bed. Name farmyard animals and verbalise and label their key body parts, matching offspring to adult animal and name offspring and adult, talk about how to look after the animal, label draw where they would live/ sleep.

Reception

Observe nature- where do we see mini-beasts, birds etc outside. Talk about what time of year we see the different animals. Name, label and draw a range of mini-beasts and name and label the common body parts. Complete a bug hunt in the playground. Draw and label the habitat for a mini-beast. Simple life cycle cut and stick (egg, caterpillar, chrysalis, butterfly), talk about what changes they can see. Name some common woodland animals and their features.

Year One

Describe the difference between living and non-living things and sort living and non-living things practically and cut and stick. Write/ verbalise how they know if something is living or non-living. Name a range of animals and know the five classification names. Sort animals practically using small world toys and sort using pictures into the five classifications. Describe features they look for to identify which group the animal belongs to. Complete odd one out, spot the difference and grouping activities for the animal groups. Group animals based on diet and plan a meal for different animals. Label animals as carnivores or herbivores.

Year Two

Describe the difference between living, dead and non-living things and sort living, dead and non-living things practically and cut and stick. Write/ verbalise how they know if something is living, dead or non-living. Name offspring of a range of animals from the different classifications and cut and stick to match. Cut and stick or draw life cycles of animals and label the different stages. Write/ verbalise sentences about the changes at different stages of the life cycles. Name a range of habitats and label animals that might live there. Know that there are different habitats around the world and label where they would be. Name a range of micro habitats and label the animals that would live there. Observe micro habitats in the environment. Explain simple animal adaptations to help them to survive in different habitats. Label the animals adaptations. Name carnivores/ herbivores and omnivores and construct three or four step food chains.

Science

Implementation

Plants

Nursery

Explore plants in the environment- look for flowers, trees, herbs, grass. Name the colours and features they can see. Point out where these plants grow and name differences that they can see. Plant seeds and look after them- talk about what they did to help the seeds to grow. Name where some food comes from and sort them- tree/ bush/ underground.

Reception

Observe nature- where do we see plants- flowers, trees, grass. Talk about what time of year we see the different plants. Label the features of a garden and name some common flowers and trees they would see. Label the parts of a plant- stem, leaf, root, petal. Planting seeds and looking after them. Over time observe and describe how the seed/ plant grows and changes.

Year One

Identify what is a plant and what is not a plant and sort. Discuss the needs for healthy plants and observe class investigation for healthy growth. Extend vocabulary for parts of a plant and name and label- seed, bulb, flower, bud, leaves, root, stem). Label photographs of flowers/ trees from the playground. Name and label a range of wildflowers and say where they would grow. Name and label parts of a tree (from pictures or real life photographs). Identify plants that can be eaten and sort plants that can be eaten and plants that cannot be eaten.

Year Two

Name and label some common flowers, trees and herbs. Sort these into types of plant and plants that cannot be eaten. Identify seeds and bulbs and where they are on the plant. Know examples of plants that grow from seeds or from bulbs. Explain what a seed/ bulb would need to grow and observe changes over time. Cut and stick or draw life cycles of a plant from a seed and a plant from a bulb and label the different stages. Write/ verbalise sentences about the changes at different stages of the life cycles.

Science

Implementation

Materials

Nursery

Name some common materials (wood, paper, plastic, metal) Explore texture and use a word to describe a material- hard, soft, warm, cold, bumpy etc. Physically sort objects by material and play treasure hunt game for different materials. Make an object to match a criteria- make something smooth, make something bumpy etc.

Reception

Name a wider range of common materials (wood, paper, plastic, metal, cardboard, stone, fabric). Sort and group materials by different criteria- by property or use. Scavenger hunt for objects and materials. Describe materials using scientific properties (hard, soft, rough, smooth, elastic, stiff, strong, flexible). Verbally compare materials and test their properties.

Year One

Explain the different between a material and an object. Name and label a range of materials and their properties and group and sort by different criteria. Complete material investigations completing observations, recording results and communication results- materials for a teddy bear, floating and sinking, suitability. Link uses of materials to learning around castles. Complete an investigation around making mixtures- bubbles.

Year Two

Name and describe properties of a wider range of materials/ objects and complete sorting and grouping. Look at material suitability through different investigations- absorbent, stretchy, for an umbrella, bubble wand etc. Investigate how the shape of different materials can be changed- squash, bend, twist, stretch and complete a comparative test.

Science

Implementation

Investigation

Nursery

Observing- body parts, features of the playground and the nursery, natural environment (plants, trees, changes in the seasons), features of animals, draw simple pictures.
Questioning- make comments about what they have seen.
Simple tests- explore the world around them and notice different effects (water play, sand play, mud kitchen, arts and crafts).
Identify and classify- Name some plants, materials and animals.
Answer questions- make comments about what they have seen.
Gather and record data- sorting and grouping activities, talk about how their planted seeds grow.

Reception

Observing- wider range of body parts, features of the playground and natural environment (plants, trees, changes in the seasons), features of animals and plants, draw simple pictures of plants and animals and label and describe,
Questioning- make comments about what they have seen and ask simple questions about what they have observed,
Simple tests- explore the world around them and test things (ice melting, building with different materials, plant seeds.
Identify and classify- Name some plants, materials and animals and group by different criteria, begin to compare.
Answer questions- make comments about what they have seen and ask questions to clarify their understanding.
Gather and record data- sorting and grouping activities, use some appropriate scientific vocabulary to explain what they have observed, create pictures/ simple diagrams of what they have observed and explored.

Year One

Observing- wider range of body parts and senses, noticing similarities and differences, observe the weather in different seasons, observe changes over time.
Questioning- ask different questions about the world around them and concepts they are learning about
Simple tests- complete comparative tests using simple equipment- magnifying glass, thermometer, pipette,
Identify and classify- name a range of plants, animals and materials and group and classify by different criteria, compare and spot similarities and differences, find odd ones out
Answer questions- answer questions in different ways- diagrams, pictures, sorting, labelling, writing, verbalising
Gather and record data- sorting and grouping activities, use appropriate scientific vocabulary to explain verbally or in written form what they have found out, complete diagrams/ pictures/ life cycles, create tables/ graphs to display data,

Year Two

Observing- wider range of body parts and senses, noticing similarities and differences, observe the weather in different seasons, observe changes over time.
Questioning- ask different questions about the world around them and concepts they are learning about
Simple tests- complete comparative tests using simple equipment- magnifying glass, thermometer, pipette,
Identify and classify- name a range of plants, animals and materials and group and classify by different criteria, compare and spot similarities and differences, find odd ones out
Answer questions- answer questions in different ways- diagrams, pictures, sorting, labelling, writing, verbalising
Gather and record data- sorting and grouping activities, use appropriate scientific vocabulary to explain verbally or in written form what they have found out, complete diagrams/ pictures/ life cycles, create tables/ graphs to display data,

Lesson/Activity Sequencing

Science Overview Nursery

Me and My celebrations

Autumn

Exploration

- **Observing–** what is observing? It means 'good looking'. What body do we use and where is it on your body? We use our eyes-point to eyes. Children can observe flowers, animals, toys and describe what they can see.
- **Touch**– what body part do we use and where is it on your body? We use our hands, point to hands. Children can touch different objects and describe them (hard, soft, bumpy, smooth, wet, dry).
- **Taste–**what body part do we use and where is it on your body? We use our tongue, point to tongue. Children can taste a range of foods with different flavours (sweet, sour salty, bitter), name them and say if they like or dislike them.

- Smell– what body part do we use and where is it on your body? We use our nose, point to nose. Children to smell a range of different things, name what it is and say if they like or dislike it. Help the children to sort into like and dislike.

Outdoor Sessions

· Autumn– talk about the season- this is when the leaves start to change colour, it gets colder, we get more rain and wind. Go outside and look at changes in the playground- trees, flowers, weather, temperature, what we wear.

Exploration

- **Sorting–** talk about what sorting is. Putting things into groups and sorting them by what colour they are/ what size they are/ if they are hard/soft etc. Children to then practise sorting different objects into groups and describe what they have done (leaves/ objects by colour, materials by property etc). E.g I have sorted the leaves into big leaves and small leaves, I have sorted the red toys and blue toys.
- **Explore items that need electricity**– batteries and switches. Show children a range of toys, some that have a switch and some that have batteries. Talk and show the children how the toys are used and how they will not work if they are switched off or have no batteries. Children to the have some time to explore using the different toys.
- **Explore simple forces**– push and pull, sliding, wind-up toys. Show the children how to apply these different forces to different objects and what happens when they do. Pushing and pulling items on the playground, sliding cars/toys down ramps inside and outside.

Outdoor Sessions

· Explore forces in outdoor play– floating and sinking, water play, toys.
· Winter– talk about the season- this is when the leaves fall off the trees, it gets colder, it might snow or be frosty. Look at changes in the playground- trees, flowers, weather, temperature, what we wear.

People Who Help Us

Spring

Animals

- **Name pets-** dog, cat, hamster, rabbit, goldfish, lizard and bird. Talk about the pets that children have at home and talk about names of each one.
- **Describe simple features of pets** legs, tail, body, fin, wings, beak. Have photographs of different body parts and model the vocabulary for each one. Get children to point to the different body parts of each pet.
- **Young pets-** look at baby pets and match to the adult animal. Know the words puppy and kitten. Show children photographs of different young animals and use observation skills to match to the correct older animal. Question the children to reinforce body parts- which animal has a fin? Which animal has a tail? Which animal has 4 legs?
- **Looking after pets-** Why do we need to look after our pets? Talk about feeding them, giving them a drink, somewhere to sleep/ stay safe (beds, cages, tanks)

- Keeping healthy and what to do if you are poorly. Begin by learning names of some body parts- head, shoulders, knees and toes.
We have to look after our pets, we also have to look after ourselves. We might go to the doctor/ hospital and have medicine.

Outdoor Sessions

· Winter– look at changes in the playground- trees, flowers, weather, temperature, what we wear

Materials

- **Explore textures** Name some key materials with the children using different objects to show them (paper, plastic, wood). Introduce words to children to describe these materials- hard, soft, bumpy, smooth, wet, dry. Get children to explore a range of objects- can they name if it is wood, paper or plastic and use a word to describe what it feels like?
- **Find objects by given criteria-** show range of objects made of paper, plastic and wood and recap the names and the describing words they have learnt. Then give children challenges to find a specific material/object e.g Can you find something that is bumpy? Can you find something that is soft?
- **Find objects from clues-** show range of objects made of paper, plastic and wood and recap the names and the describing words they have learnt. Then give children challenges from 'People who help us' who want to find different materials/objects. The police officer needs to find something that is hard and bumpy. The vet needs to find something that is soft and furry.
- **Make an object-** show children a range of materials that they could make crafts with and then give them challenges of what to make- can you make something that is smooth? Can you make something that is bumpy?

Outdoor Sessions

· Find objects from clues (the police officer needs to find something that is hard and bumpy etc.).
Building drain pipes.
Spring- talk about the season- this is when the flowers and leaves start growing, it gets warmer, it is sunnier. Go outside and look at changes in the playground- trees, flowers, weather, temperature, what we wear.

Down on the Farm

Summer One

Animals

- **Name farmyard animals -**cow, horse, sheep, pig, duck, chicken and goat. Talk about the animals we would see at the farm and talk about names of each one.

-**Describe simple features** of farmyard animals- legs, body, tail, beak, wings, horns. Have photographs of different body parts and model the vocabulary for each one. Get children to point to the different body parts of each farmyard animal.

-**Young animals-** look at young animals and match to the adult animal. Know the names calf, lamb, duckling and chick. Show children photographs of different young animals and use observation skills to match to the correct older animal. Question the children to reinforce body parts- which animal has a beak? Which animal has a tail? Which animal has 4 legs?

- **Looking after farmyard animals-** Why do farmers need to look after the animals? Talk about feeding them, giving them a drink, somewhere to sleep/ stay safe (stables, coops, barn, sty, pond)

Outdoor Sessions

· Making mud experiment
· Summer- look at
Summer- talk about the season- this is when the flowers have bloomed and the leaves are green, it is warmer, it is sunnier. Go outside and look at changes in the playground- trees, flowers, weather, temperature, what we wear.

Summer Two

Plants

- **Look for plants in the outdoor area -** grass, trees, flowers, herbs. Observe these things and talk about colours/features. Talk to the children and show them where these things grow. Observe flowers and trees and ask children to spot the difference between a flower and a tree.
- **Grow and look after a seed – '**cress heads' and planting pansies. Children will plant in the outdoor area and plant a 'cress head'. As they are doing this talk about the fact that plants needs food (compost/soil), water and sunlight to grow and keep healthy.
- **Where does our food come from?** Explore a range of fruits and vegetables and that they might come from trees/ bushes/ underground. Children to sort different objects based on where they come from.

- **Investigations–** talk about observation skills when making bread and butter and ask children to look carefully at what is changing.

Outdoor Sessions

· Wind toys– explore how windmills work, bubbles, scarves and streamers, wind chimes.

Science Overview Reception

Nursery Rhyme Land

Autumn

Animals including humans

- **Naming body parts–** talk to the children about different body parts and recap parts of the face from Nursery- mouth, nose, eyes and what each part is for.
- Then move onto bigger body parts using heads, shoulders, knees and toes songs. Singing songs, Simon says games for different body parts, label an outline / stick pictures.
- **Naming body parts–** talk to the children about the names of any other body parts that they know. Move onto naming a wider range of body parts again using songs and labelling activities and cut and stick activities. Work through learning the names and knowing where the following body parts are- head, shoulders, arms, legs, knees, feet, toes, eyes, ears, tongue, nose, hands and fingers.
- **Simple life cycle of a person-** talk to the children about how they have changed from when they were a baby- they have grown, they can walk, talk, run etc. Talk to the children about what will happen as they grow up- they will become an adult- what adults do they know? Work with the children to order a simple life cycle of a person- baby, child, adult, older person.

Outdoor Classroom

· Observation– finding objects outdoors and drawing pictures of natural objects- leaves, acorns, twigs, mini-beasts etc.
· Autumn– talk about the season- this is when the leaves start to change colour, it gets colder, we get more rain and wind. Go outside and look at changes in the playground- trees, flowers, weather, temperature, what we wear.
· Autumn walk– observe and talk about the weather.

Observation skills
Launch with Diwali experience—food tasting.

- Talk about the body parts that are associated with each sense- eyes for looking, nose for smelling, ears for hearing, hands for touching, mouth for tasting.
- Work through using the different senses.

- **Sight-** recap what observation is from Nursery- It means 'good looking'. What body do we use and where is it on your body? We use our eyes-point to eyes. Complete different observation activities- KIMS games, I spy etc. Children will then observe floating and sinking experiments/ dropping objects from height. Encourage children to ask questions about what they can see and make simple predictions about what they think might happen.
- **Smell–** what body part do we use to smell? Point to nose. Use smell pots with a range of fragrances– encourage children to talk about which smells they like or dislike and encourage then to guess what it is before telling them.
- **Touch-** what body part do we use for touch? Show our hands. Share some 'That's not Mine' books and explore different textures in the environment using the 'That's Not Mine' template. Can children find objects that are smooth, rough, hard, soft, warm, cold etc? Sort the objects by their texture.
- **-Taste-** what body part do we use to taste? Point to mouth. Use a range of different foods to experiment with taste. Talk to the children about foods they like and dislike and why.

Healthy and Unhealthy Foods

- Discuss with the children that people need to stay health. We can do this by eating healthy food. Complete activities sorting healthy and unhealthy foods.

Traditional Tales

Spring

Investigations
Linked around traditional tales.

- **Heating and cooling–** Goldilocks Porridge experiment. Which bowl of porridge stays hot the longest? One big, one medium and one small bowl. Test which one stays hot the longest. Adult to model using a thermometer and observing how the temperature drops. Predict and observe which cools the fastest. What happens if we change the material of the bowl? Ceramic, metal and plastic.
- **Dissolving –** Share The Gingerbread Man story and set up an investigation looking at how biscuits dissolve. What happens when Gingerbread gets wet? Experiment with putting gingerbread or biscuit in different liquids (water, milk, juice, fizzy pop). Observe how quickly each one gets soggy and break. Predict and observe.
- **Little Red Riding Hood listening game-** can you recognise sounds like Grandma? Our hearing helps us to sense danger or changes, can you identify what is making the sound? Blindfold the children and shake a container of different objects (coins, rice, pom-poms etc) Can they predict by sound what they think the object is? Have cards to help the children to predict.
- **Light Exploration- Link to story Can't sleep Little Bear.** Explore using different light toys– how can we make rooms brighter, darker, change colour etc.

Outdoor Sessions

Winter weather- talk about the season- this is when the leaves have fallen from the trees, it gets colder, we get snow, ice and frost. Go outside and look at changes in the playground- trees, flowers, weather, temperature, what we wear.
· **Water in different places.** What happens when we place water in different places (outside, freezer, classroom). Children can ask questions and make predictions about each one.
· **Movement exploration–** cars and ramps experiments. How can we make the car travel faster?
Session1– changing the material the ramp is made from.
Session 2– Change the angle of the ramp.

Materials

- **Everyday materials–** recap from Nursery what a material is and the names of some materials- paper, cardboard, wood, plastic and metal. Complete a scavenger hunt and challenge children to find objects that are made from these different materials.
- **Sort/group materials-** After scavenger hunts challenge children to sort the materials into groups- put all of the objects made from wood together/ put all of the materials made from plastic together.
- **Describing materials-** explore a range of different textures with the children explaining the vocabulary and letting children feel each texture- hard, soft, bumpy, smooth, rough, strong, bendy, stiff.
- **Sort/ group materials-**After exploring different textures ask the children to sort the objects and materials into groups- put all of the rough objects together/ put all of the smooth objects together.
- **Compare-** Look at how to compare materials- this material is soft but this one is hard. Give children two different materials and work together to compare the materials. Children to move on to comparing different objects with more independence.
- **Testing Materials-** link to the superhero topic- talk about what material would make a good waterproof cloak for Red Riding Hood and why. Test a range of cloaks made from different materials and decide which ones would make a good one and why. Children to complete a simple table to record which materials are good for a cloak and which are not.

Outdoor Sessions

·**Spring weather–**observe and talk about the weather and what changes they observe in the environment. Talk about the season- this is when the flowers and leaves start growing, it gets warmer, it is sunnier. Go outside and look at changes in the playground- trees, flowers, weather, temperature, what we wear. Children could draw a record of what they can see outside.

At the bottom of the garden

Summer One

Animals/ Plants
Using the Superworm story introduce the topic of creatures at the bottom of the garden.

- **Introduce the first animal** – worm- and ask the children what they already know about a worm- any names of body parts or where it would live. Introduce the vocabulary to describe the worm, where it lives and how it moves- worm, head, tail, saddle, body, garden, soil, slither.
- **Introduce the second animal-** bee- and ask children what they already know about a bee- any names of body parts or where it would live. Introduce the vocabulary to describe the bee, where it lives and how it moves- bee, antennae, legs, wings, body, sting, hive, fly.
- **Explore how pollination works-** complete experiment with finger puppets and cheesy puffs to show how bees collect pollen from the flowers and transfer it as they move between different flowers.
- **Introduce the third animal-** snail- and ask children what they already know about a snail- any names of body parts or where it would live. Introduce the vocabulary to describe the snail, where it lives and how it moves- snail, shell, invertebrate, foot, eyes, tentacle, trail.
- **Introduce the fourth animal-** spider- and ask children what they already know about a spider- any names of body parts or where it would live. Introduce the vocabulary to describe the spider, where it lives and how it moves- spider, arachnid, legs, fangs, head, body, spinneret.
- **Introduce the fifth animal-** caterpillar- and ask children what they already know about a caterpillar- any names of body parts or where it would live. Introduce the vocabulary to describe the caterpillar, where it lives and how it moves- caterpillar, head, eyes, abdomen, jaw, antennae, legs.
- **Butterflies-** talk to the children about what they have learnt about caterpillars and that they will create a cocoon and chrysalis and then develop into a butterfly. Use the chrysalis in class to show this to the children and observe these as they change over time.
- **Butterfly life cycle-** order pictures of stages of the development of a caterpillar into a butterfly. Ask children to comment on what they can see at each stage of development- caterpillar, cocoon, chrysalis, butterfly, wings, antennae, body.

Outdoor Sessions

· Bug hunt– look for the insects that they have been learning about and describe their features using the vocabulary that they have learnt.

Summer Two

Animals/ Plants
Using the Superworm story introduce the topic of features of a garden.

- **Gardens-** Talk to the children about their own or family members gardens' and what is in them. Introduce vocabulary to label features of a garden- grass, plants, trees, flowers, bushes.
- **Naming common flowers-** show children examples of a daisy, buttercup and dandelion and reinforce the names. Talk to the children about what flowers need to grow and stay healthy and plant their own sunflower. Ask children how they think the seed will change over the next few weeks and observe how it changes over the next few weeks.
- **Parts of a flower-** recap the names of the daisy, buttercup and dandelion and then move onto the names of parts of a flower. Introduce the vocabulary- stem, leaves, petal, flower head, roots, soil. Children can cut and stick the parts of a flower and label the different parts.
- **Investigation-** Children to sit in a circle and work together to put a daisy/ white flower in each vase/ pot and to then add the water and a different food colouring into each pot and leave one pot with only water in. Children to make predictions about what they think will happen to each flower- record what the children think will happen- children could draw what they think the flower will look like after an hour.
- **Bring children back to look at the flowers and question them about what has happened-** what can you see? How has the flower changed? What do you think happened? Why did one flower not change colour? What would happen if we mixed the red and blue food dyes?
- **Naming common trees-** show children examples of a cherry, sycamore and chestnut tree (playground and photographs) and reinforce the names. Introduce some key vocabulary to the children- trunk, leaves, branches and then children can draw/ collage their own tree.
- **Naming and describing woodland animals-** Introduce the animals to the children- fox, deer and hedgehog and ask the children what they already know about these animals- names of any body parts, where they live, how they move. Introduce the vocabulary to describe them and the woodland where they live- trees, bushes, body, fur, legs, tail, head, antlers, spines, neck, snout, hoof and muzzle.

Outdoor Sessions

·**Summer weather–**observe and talk about the weather and what changes they observe in the environment. Talk about the season- this is when the flowers and leaves have all grown, it is a lot warmer and much sunnier. Go outside and look at changes in the playground- trees, flowers, weather, temperature, what we wear. Children could draw a record of what they can see outside.
· Summer walk– observe and talk about the weather.

Science Overview Year One

Toys and Me

Autumn 1

HUMANS

Naming body parts- Are everyone's body the same? Have you noticed that although our bodies are alike in some ways, there is no one else in the world who looks quite the same as you? (even in families) We are all different! In this activity, we will think about and compare different parts of our body to see what makes us unique. Discuss the word unique – what does it mean. What makes us unique? What is the same and what is different about us?

Play 'Simon says ….' Taking it in turns to give instructions. Which parts of your body can you name? **Recap from reception (**head, shoulders, arms, knees, legs, feet, toes, eyes, ears, tongue, nose, hands and fingers) and then add- neck, wrist, elbow, ankle.

Use flashcards to label a 'drawn around' outline of a person and then complete cut and stick for the body parts.

Senses-Recap the names of the 5 senses from reception and nursery and ask the children what body part is related to each sense.

- **Hearing-** play different sounds to the children and ask them to listen carefully to the sound and draw a picture or write the name of what makes that sound. Encourage children to think about where they have heard that sound before, is it loud/ quiet, high/ low etc.
- **Smell-** have smell pots for the children to explore and ask them to guess whet the smell is from. Discuss if the smells are strong, sweet, sour, aromatic etc.
- **Touch-** have feely boxes for the children to explore different textures. Children can then describe the object to their partner based on how it feels and ask their partner to guess the object. Encourage scientific vocab- rough, smooth, soft, hard, fluffy, bumpy, rigid, flexible.
- **Sight-** have a scavenger hunt for children to complete using observation. Write down/draw the names of things they have spotted.

Children to write simple sentences or draw a simple diagram of the body part used for each sense.

Are all humans the same?

Introduce the question to the children and ask them for their ideas. Discuss how the children in class are different/ same as each other- looks, height, likes and dislikes, family etc.

Children can then draw/ take photographs of themselves and a friend and label the similarities and differences between them.

Autumn 2

MATERIALS

What is a material?-Talk to the children about the materials that they know, recapping from reception, and show children a range of objects for them to identify the name of the object and the material that it is made from. Materials- paper, metal, wood, plastic, wool, glass, stone.

What are objects made from?- identify the materials used to make a range of objects and sort objects into hoops based on what they are made from.

Describing materials- describe properties of different materials (rough, smooth, bumpy, rigid, flexible, shiny, dull, soft, hard, strong, stiff) and group a range of materials based on their properties. Have materials that have these different properties available for children to handle to ensure they understand the vocabulary.

Name and properties- children to then bring together their learning by labelling an object, the material it is made from and some properties that the material has. Seesaw activity- taking photographs and labelling the objects.

Toys- children to use their knowledge of materials and properties to write clues to describe different toys. Encourage children to use the appropriate scientific vocabulary to describe the material the toy is made from.

How can we sort materials? – think about ways that materials can be sorted – materials that are strong, materials that are soft, materials that are fragile etc. Children will then sort a range of materials into different categories. Challenge the children to think of their own categories to sort materials into.

Material for a teddy bear investigation. Link back to suitability of materials posing different questions. Would glass be a good material for a children's toy? Would metal be good for a jumper? Etc. Introduce the investigation. **What material is good for stuffing a child's teddy?** Show children the range of materials available and complete an investigation sheet where children have chance to make a prediction about the different materials. Test the different materials and then ask the children to record (sentence or drawing) what they have found out to answer the question.

Trad Tales/ Castles

Spring 1

MATERIALS

Investigation– floating and sinking. Talk to the children about scientific investigations. We investigate things to answer a question. Propose the question- Which materials float and which materials sink? **Introduce prediction.** Explain that this is a good guess based on what we already know and ask the children to predict which of the objects will float and which will sink. Record this on a sheet and then carry out the experiment. Discuss that for the investigation we will need to use our **observation skills** to watch what happens to each object.

Suitability- begin to look at why certain materials are suitable for different objects- eg. metal for a spoon because it is strong and rigid, fabric for a jumper because it is soft.

Material suitability- using the knowledge children have gained about materials, their properties and their uses to link to work about castles. **(Through History children will be taught the names of different parts of a castle and items/ furniture that would be found in a castle).**

Introduce the concept of suitable materials for a castle and objects inside a castle, mentioning that different materials have different properties.

Explain and define the key vocabulary:
Materials: substances used to make things.
Suitable: right or appropriate for a particular purpose.
Glass: a transparent material often used in windows.
Wood: a material obtained from trees.
Metal: a solid material that is typically hard, shiny, and malleable.
Fabric: a cloth material made from fibres

Children will then sort pictures of parts of and items in a castle and group them by the materials that they are made from.

Support children to then explore why the items have been made from a certain material and children can then practise verbalising and then writing their explanation. E.G.
Wood is used for furniture because it is strong and can be easily shaped.
Stone is used for walls because it is strong and provides good insulation.
Metal is used for decorative elements because it can be molded into intricate shapes.
Fabric is used for curtains because it can block light and add color to a room.
Glass is used for windows because it allows light to enter while keeping the cold out.

Investigation- Making Mixtures
Discuss what a mixture is- something made when we mix different substances together. Explain that today children will make their own mixture to create the bubble. Link this to the story *Cinder the Bubble* with Simon.
Recap what an investigation is- we are going to complete a comparative test to work out which mixture makes the best

Spring 2

SEASONS AND CHANGE

CC link to Geography

What do we know about weather?- Today we are going to think about what types of weather we know and the seasons. Today we are going to name the four seasons and the different types of weather. Introduce new weather vocabulary and explain what each kind of weather is. What types of weather do you know? We are going to look at the weather that was taken with a camera over 2 days to show what can happen with the weather. What type of weather can you see? https://www.youtube.com/watch?v=d5cFeUmYu98 snow so much snow took 2 days to build up. We do not really have that much snow in this country but in some places they do. How would you feel if you fell in that snow?

Children will then observe the weather outside thinking about what the sky looks like, what the ground look like, Is it wet, dark or cloudy? Then draw a picture of today's weather and label the weather features.

Children will then create a class tally chart drawing and labelling the weather on each day.

How does weather change?- using the weather log they have created discuss how the weather can change from day to day and across the seasons. Discuss ways that scientist would measure weather features- wind sock, rain gauges and thermometers. Explain how this can help scientists to predict how the weather will change and how to keep people safe. Set up a class rain gauge using a plastic bottle and check this over the next few days/ weeks and share with the children how the rain gauge is helping us to measure the rain. **Each child can then create their own wind sock using a paper tube, tissue paper and string.** Let children have some time to then experiment with using their wind sock and what this tells them about the weather that day. Children to then have time across the next few days to use the wind socks to see how the wind is different each day.

Seasons- discuss the fact that across the year the weather will be very different and will change with each season. In Britain our weather is changeable we can see differences in each season. Explain the common features of each season- spring has mild temperatures with heavy rainfall, in summer the temperatures are warmer and there is less rain, in Autumn the temperatures cool down and in Winter is becomes very cold and we may see snow.

Children will then explore each season and research. They will need to look for temperatures, typical weather, activities for each season, plant growth, clothes that would be worn, when days are shorter/longer.

Trees- discuss what the children have learnt about each season so far and the typical weather they would see in each one. Show children what happens to plants across the year in the different seasons focusing specifically on trees. Show children pictures/videos of trees and look at trees in the playground and identify which tree is from each season.

Children will then draw what a typical tree would look like in each season and label the features of each tree- bare branches, buds, leaves, blossom. Children can then write a sentence to describe what happens to the tree in each season- e.g In Autumn the leaves begin to change colour and fall from the trees.

Hibernation- link this to seasons. As the weather changes with each season some animals will hibernate. This helps them to survive in the winter when there is less food and water available. During this time heart rate, temperature and breathing all drop to help the animals to use less energy. Discuss how animals will need to use the Autumn to get ready to hibernate by eating more food and finding somewhere safe and warm for the winter.

Explain that not all animas will hibernate- some may migrate to somewhere warmer and others may have thick fur or layers of fat to help to keep them warm during the winter months.

Dens- Challenge the children to create a comfortable den for a hibernating animal- it will need to be safe and warm. Children can then photograph their den, label the features and type a sentence about what animal they think could use the den for hibernation.

Over Land and Sea

Summer 1

ANIMAL KINGDOM

What is a living thing? – Recap common animal names from Nursery and reception. Introduce to the children the idea of living and non-living. Show children a range of living and non-living things and explain how we know which is which. Discuss life processes- living things will breathe, eat, sensitive to environment, create waste.

Sort a range of non-living and living things with the children verbalising how we know which is which. E.g The elephant is living because it breathes and eats. The book is non-living because it does not eat or breathe. Etc.

Children will then sort pictures of living and non-living things. Children to then write sentences to explain how they know if something is living or non-living.

Features- What is this animal? Over several sessions work on two animal groups at a time – introduce one animal group and send children to sort animals that they think belong in that group based on key characteristics that they tick off on a list. Bring children back to learn about the second animal group – go back to sorting and check their previous sort and sort any unsorted animals using a checklist for the second animal group characteristics.

Talk through the names of some common animals and then introduce the children to the names of the five animal groups. Highlight the features of each of these groups and practise grouping a range of animals. Children can then sort animals into the five groups- practically (small world animals and sorting sets/ tuff trays) or on a sheet. Can children complete an 'odd-one-out' activity? Spot the animal that doesn't belong in the group.

Similarities and differences.

Look at a range of animals from the different animal groups and discuss the features that they have highlighting key vocabulary- legs, head, fins, gills, fur, scales, tail, feathers, wings, beak.

Children to label the features of animals from the different groups.

Then discuss with the children the similarities and differences between animals from different groups. This could be done practically with children using small world animals and verbalising similarities or differences or by labelling pictures and writing any similarities or differences that they can spot. Children could also draw two animals from different groups and then write any similarities or differences.

Other activities- spot the mistake (group animals and spot the one that should not be there).

Odd one out (which animal does not belong and why?)

Grouping and classifying (children to group animals by given or their own criteria).

Do all animals eat the same food?-carnivores, herbivores, omnivores, sorting into groups, basic features of carnivores and herbivores.

Discuss the needs for survival linked to humans and animals- food. Discuss with the children if all humans and animals eat the same things, why/ why not? Discuss the different needs different animals have and introduce the vocabulary carnivore, herbivore, carnivore and discuss the meaning.

Children to then group animals based on whether they are a carnivore, herbivore or omnivore. Create a list of carnivores, herbivores and omnivores in books.

Children could design a meal for the different types of animals- what would a carnivore eat? Etc.

Scientists– David Attenborough, Eugene Clark

Summer 2

PLANTS

What is a plant? Show the children different pictures and ask them which ones are plants and which are not plants. Collect ideas form the children on a mind map. Children could complete a sort of plant/ not plant. Can they spot anything that all of the plants have in common?

THEN- How do I plant a sunflower?

discuss needs of plants, each child to plant a sunflower seed, set up a class investigation into needs of plants and draw and make verbal predictions as a class for each seed.

What are the parts of a plant called? - naming parts of a plant (seed, bulb, flower, bud, leaves, roots, stem). Introduce children to vocabulary for parts of a plant. Children can then label photographs of their sunflower or plants from the playground.

What types of plants grow in the wild? Discuss that some plants grow in the wild and do not need to be planted by humans or cared for as they grow. Show children a range of wild flowers and teach the names and describe the features. Children could then complete a wildflower hunt and name the flowers they spotted or choose pictures of wildflowers to name and label.

Are trees a type of plant?

Pose the question to the children and take their ideas. Explain that trees are a type of plant because they have roots and leaves but they also have trunks and branches. Teach children the parts of a tree and ask them to label the different parts. Children could look at the trees on the playground and photograph and label.

Can we eat plants?

Pose this question to the children and take their ideas.

Recap names of different plants, trees and flowers. Does anyone know which ones we can eat?

The types of plants that we can eat are called fruits and vegetables. **How do you think they grow?-** Explain that they grow from seeds like other plants however they grow in different ways. Fruits grow on trees, bushes or plants whilst vegetables grow on plants or under the ground.

Complete a sort- can children sort the types of plants that we eat and the types of plants that we do not eat?

Odd one out- spot the fruit in the vegetables, spot the plant we do not eat mixed in the plants that we do eat etc.

Scientists– Agnes Arber

Science Overview Year Two

Explorers

Autumn 1

HUMAN LIFESTYLE

What are the needs for survival?
Discuss with the children what humans need to survive- discuss the word survive and then explain that living things need food, water and air to survive.
What are the differences between a pet cat/dog/rabbit and a toy robot? How would we have to look after the pet?
Can children describe what they would need to do to look after a pet? Can they link this to the needs for a human?

How humans change as they grow?
Ask the children if they are the same now as when they were a baby? Do they think they will be the same in ten years time? Etc. How do they think they have changed/ will change? Discuss a human life cycle- what changes can they spot at the different stages.
Children to order a human life cycle, label the stages and write a simple sentence for each stage.

Why is exercise important?
Recap needs for survival and then move onto how people can keep healthy too- take ideas for keeping healthy.
Discuss the importance of exercise and the different ways people can exercise- running, dance, gymnastics, yoga etc and the benefits of different types of exercise. Children will then complete a matching activity around the benefits of different exercises. Discuss that activities like reading and sleep are also important because they help to keep our mind healthy as well as our body.

Heart Rate Investigation (2 sessions to allow for writing up of results). Discuss heart rate/ pulse and then complete heart rate investigation and what happens when we exercise. **Challenge-** write down what happens to our bodies when we exercise.

What is a healthy diet?
Discuss that people also need to follow a healthy diet as well as exercising. Highlight that diet is about what people eat in a typical day and that people should eat foods from all of the different food groups. Work through talking about the different food groups and how much of each one we should eat. Children will then draw a healthy meal on a plate and write about the balanced meal that they have drawn.

Why is it important to be hygienic?
Recap learning on exercise and diet to stay healthy and introduce the idea that people need to keep clean to be healthy. Introduce the word hygienic and discuss the meaning. Take ideas and create a class mind map of ways to keep clean. Children will then draw a poster into their books about how to be hygienic.

Who keeps us healthy? (discussion activity/ P.O.M/PPA)
Discuss what it feels like to be poorly. What do people do to help you? Discuss visiting the Dr/ having medicine and highlight the importance of only taking medicine that is yours. **Discussion q-** 'You should take any medicine because medicine always makes you feel better.'

Scientists– Edward Jenner, Mary Seacole.

Autumn 2

CHANGING MATERIALS

Properties of materials. (What are things made from?)
Recap naming and describing common materials from Year One. Make the distinction between material and object. Then discuss the different properties of materials using a range of scientific vocabulary (hard, soft, rigid, bendy, flexible, waterproof, absorbent, opaque, transparent, rough, smooth). Children to take photographs of objects and label the material it is made from and the properties that it has.

Can the shape of solid objects be changed?
Introduce the term solid and discuss what this means. Introduce the terms squash, bend, twist and stretch- model what these mean and discuss materials they think we will be able to change the shape of. Children will then complete a simple comparative test with different objects- can they change the shape of them? Record results on a table.

What material should be used? (Suitability)- 2 sessions
Recap work from the previous few lessons and start to talk about what materials are good for different objects- would we make a window from bricks? Would we make a jumper from glass? Etc. Encourage the children to talk about the properties of the materials when explaining why something is suitable or unsuitable. Children will then match objects to a suitable material and explain why it is a good choice.

Investigation– Which materials are absorbent? Introduce the new vocabulary- absorbent. This means when something soaks up liquid. Ask children what materials they think will be absorbent. Show children a range of materials and ask them to predict which one they think are absorbent. **Simple equipment-** using a pipette to drip water onto each material. Show children how to use the pipette and then carry out the investigation, recording if the different materials soak up the water or not. Children to then write a sentence to answer the investigation question.

D.T link– investigate bridges (beam, suspension, arch)– types and materials used. Linked to The Troll story- the Troll would like to build his own bridge but needs to know the best material to use and shape to make it into to. Children will then investigate different bridges and find out about; the use if bridges, the names of bridge styles, materials used for bridges and the names of some famous bridges.

D.T link– build bridge models and test and improve the strength. Children will explore using paper, card and cardboard to create a bridge model to test for strength. Take predictions about which will be the strongest and why and then allow children to build and test each model.

Scientists- Charles Macintosh– invented first waterproof fabric.

Pioneers

Spring 1

CHANGING MATERIALS

Which fabric is the most stretchy? (Which material would make a good suit for a pilot?) Recap work around materials and take some ideas about what properties they think a pilot suit needs to have and why. Then take ideas about appropriate materials for a pilot suit based on the properties that it needs to have. Children will then test a range of materials for stretch and record their results.

What material would be good to make an umbrella? Which materials are waterproof- Introduce the new vocabulary- waterproof. This means when something keeps out water. Ask the children what materials they think will be waterproof and why we might need something to be waterproof. Show children a range of materials and ask them to predict which ones they think will be waterproof **Simple equipment-** using a pipette to drip water onto each material. Show children how to use the pipette and then carry out the investigation, recording if the different materials soak up the water or not. Children to then write a sentence to answer the investigation question.

Does the shape of bubble wand change the shape of the bubble? Discuss the investigation question with the children and take some ides. Children will need to write their own prediction for the investigation. Recap work from Year One where they investigated the best mixture for making bubbles- soap and water.

Highlight that everyone will be using the same mixture but creating a different shape for their bubble wand and we will observe what happens when we use them to blow a bubble. Children will then record their results and write a sentence to explain what they have found out.

How can I separate a mixture? Discuss the meaning of the word mixture and link back to previous investigation where they used a mixture to make bubbles.

Ask the children for other mixtures they can think of.

Pose the question- **How can I separate a mixture?**

Explain that today they will investigate different ways that materials can be separated- using magnets, using sieves, sorting by hand and then exploring how to separate a dissolved solid- e.g sugar in water.

CHANGE TO RECYCLING???

Scientists– Charles Macintosh– invented first waterproof fabric.

Spring 2

PLANTS

What flowers and trees can you name?
Recap from Year One what a plant is, the idea that we can eat some plants and then the name of parts of flowers and trees.
Then discuss the names of some common plants- ask children to give names that they already know and then use photographs or physical plants to introduce the names of a variety of plants. This will be focussed on fruits, vegetables, flowers and trees. This could be done as a physical nature walk to sort photographs on Seesaw or sorting using a carol diagram/ Venn diagram etc for names of fruits, vegetables, flowers and trees.
Challenge- can children identify other plants that we can eat (herbs) and plants that we cannot eat?

Are all seeds the same?
Explore with the children where they think plants come from- take some ideas and then show children different seeds and bulbs. All plants grow from these seeds or bulbs.
Give children time to explore the seeds and bulbs and discuss what they can see- similarities and differences.
Where do these seeds and bulbs come from?
Explore that some plants grow seeds inside the plant, in the centre of the plant, on the outside of the plant. Explain that fruits grow their seeds on/ inside them and vegetables do not (they usually grow on another part of the plant).
Give children some fruits and flowers to investigate the seeds- **using a magnifying glass. Draw different seeds and note the similarities and differences.**

What do plants need to survive?
Set up an investigation to determine the needs of a bean plant/ cress plants to grow healthily. What do they think a healthy plant will look like? It will have a strong stem, green leaves and stem and good roots. It may also grow a flower or fruit.
Children will then draw and make written and pictorial predictions about what will happen to each seed- one in perfect conditions, one with no water, one in the cold, one in the dark. **Over the weeks observe what is happening to each plant.**

How do plants grow and change? 2 sessions.
Look at the investigation set up with bean/ cress plants and discuss the needs for a plant to grow and stay healthy- they need water, sunlight and the correct temperature. Recap that plants grow from a seed or a bulb and then focus on a plant that grows from a seed (sunflower) and one that grows from a bulb (daffodil).
Discuss the different stages of growth that these plants will go through and introduce and explain the terminology to the children- seed, bulb, seedling, germinate, shoot, stem, leaves, flower, dormant, die, wilt.
Children will draw a diagram for each type of plant and write a simple sentence using appropriate scientific vocabulary to explain what happens at each stage of the plant's growth.

Scientists– George Washington Carver,

Beyond Britain

Summer 1

ANIMALS AND HABITATS

What does living mean?
Recap work on living and non-living from Year One and show children a range of living and non-living things and remind them how we know which is which. Discuss life processes- living things will breathe, eat, sensitive to environment, create waste.
Introduce the term 'dead'. These are things that used to be alive as they used to do all of the life processes. Use items like fruit, paper, leaves on the floor to explain what the term 'dead' means and that at one point all of these things would have been part of a living plant/ tree.
Children will then sort items using a Venn diagram based on if they are living, dead or have never lived.

What are offsprin
Recap the needs for survival of humans and explain that this is the same for animals.
They needs food, water, air, shelter to survive. Introduce the term reproduce (this means adult animals have create another one of the same species).
Work through matching different young animals to adult animals- children to complete matching in books/.
Link this back to work in Year One on animal groups- which animals lay eggs, which have live young etc.
Challenge- some animals look after themselves as soon as they are born/ hatch. Can human babies do this?

How do animals change as they grow?
Link back to work on the human life cycle and recap how humans change as they grow.
Do children think this is the same for animals?
Focus on the life cycle of a butterfly. Help the children to order the life cycle of a butterfly (link back to work in Reception when they had a chrysalis in class) and ask them what they can see at each stage. Introduce and explain the vocabulary- eggs, caterpillar, chrysalis, butterfly, cocoon, leaf, wings,
Children will then order pictures for the life cycle of a butterfly and write sentences using appropriate scientific vocabulary to describe what is happening at each stage.

What is a habitat and are they the same around the world?
Discuss what a habitat is- it is where an animal/plant lives. It is somewhere that with food and shelter and keeps them healthy and able to grow and reproduce. Animals cannot change their habitat, unlike humans.
Ask the children if they think habitats around the world are all the same? Explain that there are lots of different habitats around the world- mountain, sea, polar, jungle, savannah, desert. Take ideas from the children about what types of plants and animals would live in the different habitats. Children will then work in groups to create a poster/ artwork about a different habitat. Research what the habitat is like/ what plants and animals live there/ adjectives to describe that habitat.
Each team can then share their learning about each habitat with the class.

What is a microhabitat? (2 sessions)
Recap with the children what a habitat is- somewhere that an animal liv ıro
them with food and shelter and keeps them healthy and able to grow a du
Recap the habitats around the world and then introduce the idea that there are habitats within our school and gardens- microhabitats. These could be plants, bushes, logs, ponds, trees.
Take children on a walk around the playground to spot micro-habits. Children can take photographs of the microhabitats they have found and then label them.
Explore the micro-habitats that the children found on the walk and research/ investigate the kinds of animals that would live in each micro-habitat. Children could then add notes to their photographs about the animals that might be found in each micro-habitat.

Scientists– Jane Goodall, Florence Augusta Merriam Bailey, Anita Roddick

Summer 2

ANIMALS AND HABITATS

Investigate- What habitat do woodlice prefer?
Recap work on habitats and micro-habitats- can they name some and remember what a habitat needs to provide for the animals that live there?
Then introduce the investigation question 'What habitats do woodlice prefer?'
Set up an investigation tray split into 4 sections- dark and dry, dark and damp, bright and dry, bright and damp. Predict where they think the woodlice will like to live and explain why.
Then add some woodlice to the tray and after 20 minutes observe where they have chosen to go.
Children will then write down what they have observed.

How are animals adapted to their habitat? 2 sessions
Discuss with the children that animals are adapted to the habitat in which they live. They have different features that mean they are suited to their environment.
Give an example of a shark and talk about how a shark is adapted to live in the seas and oceans- would a shark be able to live in the desert? Why not?
Children will then complete an activity sorting sentences about animal adaptations and match them to the correct animal (camel, polar bear, duck and giraffe). Encourage children to explain their thinking when sorting the sentences and link their explanations back to the animals habitat.
Using what they have learnt children can then choose an animal (from the four already looked at or a new one to research) and label the adaptations the animals has to help it to survive in its habitat.

What is a food chain?
Recap what we learned about humans and how they survive and stay healthy- they need good nutrition. This is the same for animals- discuss the terms carnivore, herbivore and omnivore and what these mean. Can the children name animals which belong to these groups?
Introduce the idea of a food chain. This is a diagram that shows us what is eaten by what. It always starts with a producer (plant) which is then eaten by something and then that is eaten by something else.
Introduce the word consumer- these are animals in the food chain that eat other plants or animals in the food chain.
Model how to construct a simple food chain highlighting starting with a producer.
Children will then construct some food chains in their book with 3 steps (e.g. grass- rabbit- fox).
Children can then label what in the food chain is the producer and what are the consumers.
Ext- children will have some food chains with incorrect steps to spot and then correct.

Scientists–The Chipko Movement

Explorify website- resources for starters or ten minute thinking activities to spark interest or foster questioning and debating.

Activities include

- Odd one out
- Zoom in, zoom out
- What's going on?
- What just happened?
- Big question
- What if?
- Problem solvers

Activities - Explorify

ENQUIRY SKILLS

Asking questions
Asking questions that can be answered using a scientific enquiry.

Making predictions
Using prior knowledge to suggest what will happen in an enquiry.

Setting up tests
Deciding on the method and equipment to use to carry out an enquiry.

Observing and measuring
Using senses and measuring equipment to make observations about the enquiry.

Recording data
Using tables, drawings and other means to note observations and measurements.

Interpreting and communicating results
Using information from the data to say what you found out.

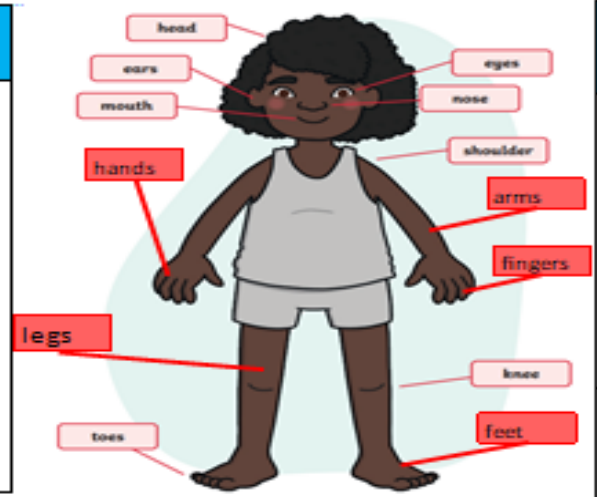
Evaluating
Reflecting on the success of the enquiry approach and identifying further questions for enquiry.

Knowledge Organisers

Reception

Humans- body parts and senses

- Learn the names of key body parts using songs, rhymes and games.
- Labelling body part- diagrams and outlines of their friends.
- Name the body parts associated with senses.
- Explore different things using their five senses- food tasting, smell pots, texture blocks, sounds, sight activities (odd one out, spot the difference etc).



Humans- staying healthy

- Sort examples of healthy and unhealthy food
- Know that we need sleep and exercise to stay healthy
- Understand that humans need to stay clean- wash our hands.

healthy, unhealthy, food, sort, sleep, exercise, wash, clean, hygiene

My prior knowledge What I will have experienced in Nursery.
Exploration of using body parts we use to see, hear, taste, smell and touch. Names of some main body parts- head, shoulders, knees and toes. Ways to keep healthy- go to the doctor, have medicine.

Pre-steps to Living Things in KS1 Science	Year group: Reception	Strand: Humans

Humans- what will I do?

- Label key body parts on outlines of my friends and drawings.
- Explore using my five senses.
- Order and talk about the stages of a human life cycle.
- Talk about some changes I can see from me being a baby to me in reception.
- Sort examples of healthy and unhealthy food.
- Explain some ways I can stay healthy- sleep, eat healthy food, exercise

Humans- life cycle

- Know and order the main stages of a human life cycle.
- Know that humans grow and change.

baby, toddler, child, adult, elderly

Living Things– Animals

- Explore the names of a range of insects– worm, bee, snail, spider, caterpillar and butterfly.
- Know the names of different parts of a range of insects.
- Explore habitats where insects would be found– soil, under leaves, grass, hives, under rocks.
- Begin to understand how pollination works.
- Link an insects body parts to how it moves– fly, crawl, slithering.

My prior knowledge
What I will have experienced in Nursery.

Names of common pets – dog, cat, hamster, rabbit, goldfish, bird and bird, and farm animals – cow, horse, sheep, pig, duck, chicken, goat.

Be able to describe a simple feature of pets – legs, tail, fin, body, wings, beak, and farm animals.

Know the name of some common young pet & farm animals and match to the adult.

Explained how to look after pets and farmyard animals.

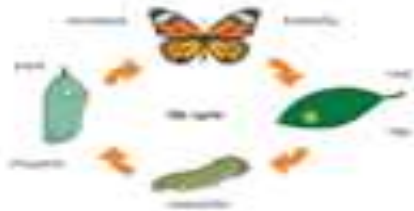
Pre-steps to Living Things in KS1 Science	Year group: Reception	Strand: Animals

Animals- what will I do?

- Take part in bug hunts in the outdoor area.
- Observe the outdoor area at different times of the year.
- Name a range of insects from pictures and in the environment.
- Draw and label different insects.
- Draw habitats for different insects.
- Order the life cycle of a butterfly.
- Talk about the life cycle of a butterfly.

Butterfly- life cycle

- Know and order the main stages of the life cycle of a butterfly.
- Know that caterpillars grow and change.



caterpillar, cocoon, chrysalis, butterfly, wings, antennae, body.

Plants– naming

- Know that there are lots of different types of plants.
- Recognise flowers, trees and vegetables.
- Name some common flowers, trees and vegetables.

plant, seed, bulb, flower, tree, vegetable, daffodil, daisy, sunflower, cherry tree, oak tree, carrot, potato, tomato

Plants– parts

- Name the basic parts of a flower and tree.
- Name some foods we get from plants.

root, stem, leaf, flower, plant, trunk, branch

Pre-steps to Plants in KS1 Science	Year group: Reception	Strand: Plants

Plants- what will I do?

- Observe plants in the outdoor area and sketch.
- Plant seeds in class and explore how to look after them and keep the growing plant healthy.
- Observe their growing plant and make drawing of it.
- Explore plants in the outdoor area at different times of year and talk about what they notice.
- Label different parts of plants and trees.

Plant—growth

- Know that a plant needs to be looked after to grow and be healthy.
- Explore that plants need water, soil and sun to survive and grow.
- Notice and talk about how plants change as they grow.

plant, seed, bulb, grow, change, soil, water, sun

Year One

New Invention Infant School Knowledge Organiser

Science

Topic:	Year group:	Strand:
Animals including humans	1	Animals

My prior knowledge
What I should already know before starting this topic:

The names of common farm and woodland animals and insects.
The names of features of a range of animals and insects.
Grouping animals by observable features.
Know some things that are similar and some that are different about living creatures.
Simple life cycle facts about pets, farm animals and some insects.

What will I know by the end of this unit?

The names of a range of animals from different groups (amphibians, birds, fish, mammals and reptiles) including pets.	How to describe a range of observable features of a range of animals from different groups (amphibians, birds, fish, mammals and reptiles) including pets.
Comparing animals from a range of groups (amphibians, birds, fish, mammals and reptiles) including pets.	How to group animals together based on what they eat. Carnivores eat other animals (meat). Herbivores eat plants. Omnivores eat plants and other animals.

Example of some of the animals children will need to know the name of and how they might group them.

[Links to NC domains/strands e.g. historical enquiry, scientific investigation,

Working scientifically– Group and animals and classify.

Notice simple differences, changes or patterns.

Animals– Name animals from a range of groups and describe observable features,.

Compare observable features of a range of animals from different groups.

Group animals according to what they ear and use the terms carnivore, herbivore and omnivore.

Engagement motivation and thinking (CoL)

To engage children in the world around them and develop skills of spotting patterns, similarities and differences in living things. Encourage children to think about their own pets and how they can be described and how they need looking after.

Cross-curricular links if appropriate

P.O.M– Knows that living things have rights and identifies ways we should and shouldn't treat living things.

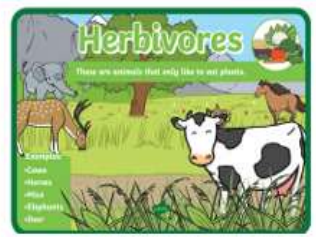
Glossary

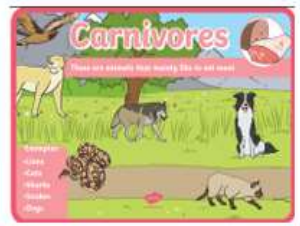
pet	A tame animal kept in a house.
wild	Animals or plants that live or grow in nature and do not need to be looked after.
carnivore	An animal that eats other animals (meat).
herbivore	An animal that only eats plants.
omnivore	An animal that eats other animals (meat) and plants.

Children do not need to be able to explain the characteristics of the different animal classifications but the terms and definitions can be discussed when grouping animals.

bird	Birds have a beak, two legs, feathers and wings.
mammal	Mammals are animals that breathe air, grow hair or fur and feed on their mother's milk as a baby.
fish	Fish live and breathe underwater. They have scales, fins to help them to swim and gills to breathe.
reptile	Reptiles breathe air and have scales on their skin.
amphibian	Amphibians live in the water as babies and on land when they grow up. They have smooth, slimy skin.

Grouping animals by what they eat.





New Invention Infant School Knowledge Organiser

Science

Topic: Animals including humans	Year group: 1	Strand: Humans

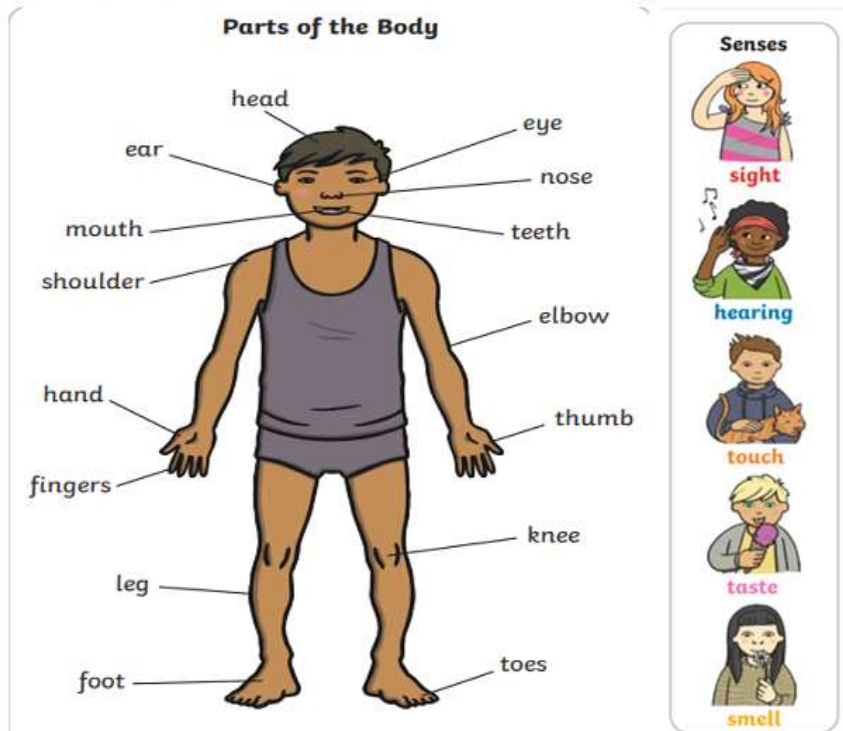
My prior knowledge
What I should already know before starting this topic:

The names of simple body parts from rhymes and songs.
Knowledge of healthy and unhealthy food.
Knowledge of simple life cycle of a human.
Explore using their senses.

What will I know by the end of this unit?

Name and location of different parts of the human body.	Name of the five senses: sight, smell, touch, taste and hearing.
The function of a range of different body parts. The function of a range of other body parts: skull, neck, elbow, knee, feet.	Name of the body parts associated to each of the senses. The function of body parts relating to the senses: ears, eyes, teeth, hands, nose.

Names of body parts, senses and the body parts associated with the senses.



[Links to NC domains/strands e.g. historical enquiry, scientific investigation,

Working scientifically– Use simple secondary sources to find information.

Gather and record data using simple scientific equipment.

Animals including humans– To name and locate parts of the human body.

Describe some ways that humans can stay healthy.

Can name parts of the body related to the senses (sight, smell. touch, taste and hearing).

Engagement motivation and thinking (CoL)

To engage children in the world around them and develop skills of spotting patterns, similarities and differences in humans. Encourage children to think about their own body and how they can be described and how they can keep themselves healthy.

Cross-curricular links

P.E- Beginning to develop an awareness of one's own body, including physical differences (H/S)

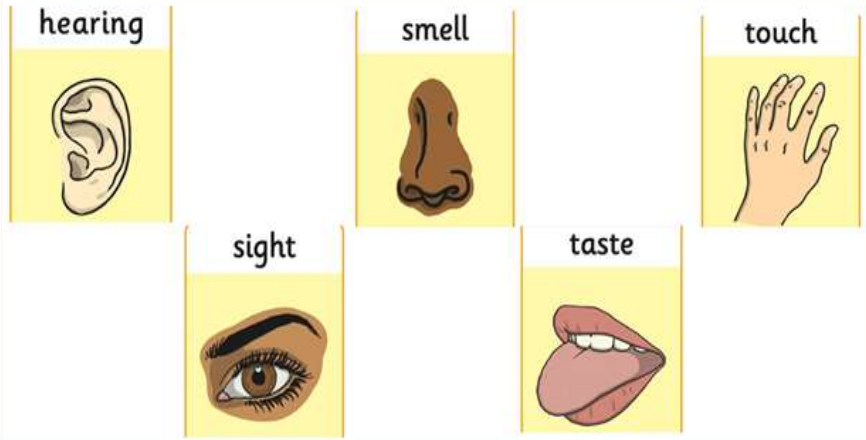
Can recognise the effects of exercise e.g. exercise makes heart beat faster (H/S)

Beginning to show awareness about making healthy choices in relation to healthy eating and exercise with support

Glossary

hearing	Your ears let you listen to what is around you.
sight	Your eyes let you see things which are around you.
smell	You smell things using your nose.
taste	Sense of taste comes from your tongue. You can taste if things are sweet, sour, bitter or salty.
touch	Your skin gives you a sense of touch. You can tell if something is warm, cold, rough or smooth by touching it.
ears	Help us to hear.
elbows	Help us to bend our arms.
eyes	Help us to see.
feet	Help us to stand upright and walk.
hands	Help us to grab things.
knees	Help us to bend our legs.
neck	Connects our head to the rest of our body.
nose	Helps us to smell.
skull	This protects our brain.
teeth	Help us to chew our food.

Senses and their body part.



New Invention Infant School Knowledge Organiser

Science

Topic: Materials	Year group: 1	Strand: Names and properties

My prior knowledge
What I should already know before starting this topic:

Names of some everyday materials- paper, cardboard, wood, plastic and metal.
Some basic properties of some everyday materials-hard, soft, bumpy, smooth, rough, strong, bendy, stiff.
Describe how some materials are the same or different.
Sort and group everyday materials.
Be able to test a range of everyday materials.

What will I know by the end of this unit?

An object is something that can be seen or touched and used.	A material is what an object is made from.
The names of some everyday materials- plastic, wood, glass, fabric, metal, paper, stone, wool.	Identify and describe simple physical properties of everyday materials.
Describe properties of materials- hard/soft, stretchy/stiff, shiny/dull, rough/smooth, water-proof/not waterproof, absorbent/not absorbent, transparent/opaque.	How to group objects and materials together by their properties.

The names of materials children will know the name of and some of the objects they are used to make.

Materials

Objects

[Links to NC domains/strands e.g. historical enquiry, scientific investigation, fieldwork,]

Working scientifically– Conduct simple comparative tests.

Use simple secondary sources to find information.

Group and classify materials.

Materials– Distinguish objects from materials.

Identify and describe simple physical properties of a range of everyday materials.

Group everyday materials based on their properties.

Compare everyday materials based on their properties.

Engagement motivation and thinking (CoL)

To engage children in the world around them by encouraging them to notice features of their environment.

Encourage children to take a role in protecting and preserving the environment through learning about recycling.

Cross-curricular links

P.O.M– Investigate materials which are recyclable and why recycling is important.

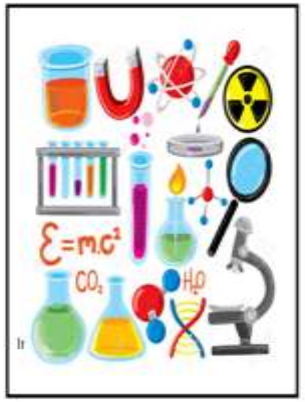
Glossary

Object	Something which can be used. For example a chair, a table, a cup.
Material	Materials are what objects are made from.
Hard	The material is not easy to bend or break.
Soft	It is easy to change the shape, cut or fold the material.
Smooth	Smooth materials have no bumps.
Rough	Rough materials look and feel bumpy and uneven.
Shiny	Shiny materials reflect the light.
Dull	Dull materials do not reflect light and do not look bright or shiny.
Waterproof	Waterproof materials keep water out and keep things dry.
Absorbent	Absorbent materials soak up water.
Transparent	You can see through transparent materials.
Opaque	You cannot see through opaque materials.
Bendy	Bendy materials can be folded really easily.
Stiff	A material which is not easy to bend.
Stretchy	Stretchy materials can be pulled to make them longer or wider without breaking them.

Physical properties of materials.

New Invention Infant School Knowledge Organiser

Science



Topic: Plants	Year group: 1	Strand: Names and plant structure

My prior knowledge
What I should already know before starting this topic:

Plants can grow.

Plants need water to survive.

The names of some common fruits, flowers and vegetables and trees.

Basic structure of a plant.

What will I know by the end of this unit?

People grow plants in their garden to look after.	Wild plants grow where seeds fall and do not need people to look after them.
People grow plants for flowers or fruits or vegetables.	Weeds are wild plants which are not wanted.
The names of some common garden plants, wild plants and trees.	The names of various sections of a tree and what they look like.
The names of various sections of a flower and what they look like.	Evergreen trees keep green leaves all year.
How to simply describe the various sections of a tree and flower.	Deciduous trees loose their leaves in the autumn. They often change colour first.

The names of garden and wild plants and trees to learn.

Garden Plants

Wild Plants

Trees

[Links to NC domains/strands e.g. historical enquiry, scientific investigation, fieldwork,]

Working scientifically– Ask 'what', 'how' and 'why' questions about things they have observed.

Use simple secondary sources to find information.

Use simple scientific equipment to gather and record data.

Plants– Identify 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 and trees (leaves, flowers, petal, fruit, root, bulb, seed, trunk, branch, stem).

Engagement motivation and thinking (CoL)

To engage children in the world around them by encouraging them to notice features of their environment and an understanding that we need to look after and maintain gardens, allotments etc.

Encourage children to look out for the flowers and trees they have learnt about around school and in their home environment.

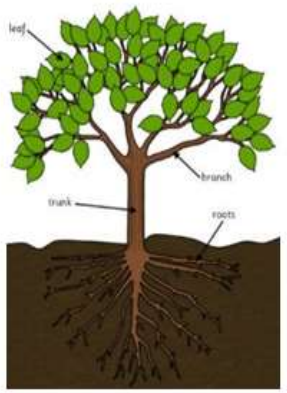
Plant seeds and bulbs and look after them and observe growth as a class.

Cross-curricular links if appropriate

Science– seasonal changes– link to observations of the seasons. When do plants start to grow. when do they flower, when do leaves change colour and fall from trees etc.

Glossary	
wild plant	A wild plant grows where it falls. It does not need looking after as it grows.
garden plant	Garden plants are plants people choose to grow in their garden.
weeds	Weeds are wild plants which grow in places. People do not want them to.
deciduous	Deciduous trees loose their leaves every year.
evergreen	Evergreen trees keep their green leaves all year, even in winter.
seeds	Seeds grow into new plants.
bulbs	Bulbs grow into new plants.
roots	Roots take in water and nutrients from the soil for the plant.
stems	The stem holds the plant up and carries water and nutrients to the leaves and flower.
trunk	The trunk is the stem of the tree.
branches	Branches are the parts of the tree that grow out from the trunk.
leaves	Leaves soak up sunlight to make food.
flowers	Flowers attract insects and birds.
petals	Petals are the colourful part of the flower.
fruit	Fruits contain the plant's seeds. Humans eat fruit from plants and trees.

Names of some of the parts of a tree and flower and what they look like.



New Invention Infant School Knowledge Organiser

Science

Topic: Seasonal change	Year group: 1	Strand: Autumn and Winter

My prior knowledge
What I should already know before starting this topic:

The names of the months of the year.
The weather is different through the year, sometimes times it is hot and sometimes it is cold.
Observations in the environment throughout the year.
Understand appropriate clothing and activities for different seasons.

What will I know by the end of this unit?

There are 4 seasons– spring, summer, autumn and winter.	The weather is different in each of the seasons. Length of the days changes.
The autumn months are: September, October and November.	The winter months are: December, January and February.
What happens in the autumn- • It gets colder and it might be sunny, windy or rainy. • Leaves change colour and fall to the ground • Days get shorter and nights longer • Autumn activities/ celebrations– collect conkers, rake leaves, bonfire night, Hallow-e'en. • Clothes you would wear– t-shirt, shorts, coat, scarf.	What happens in winter- • It gets very cold and it might be frosty, windy, chilly and icy. • Deciduous trees will have lost all of their leaves. • Winter days are the shortest and nights are the longest. • Winter activities/ celebrations– making snowmen, eat warm soup, Christmas. • Clothes you would wear– jumper, coat, woolly hat, scarf, gloves.
Features of autumn.	Features of winter.
Autumn 	Winter 

[Links to NC domains/strands e.g. historical enquiry, scientific investigation, fieldwork,]

Working scientifically– Begins to spot simple patterns.

Begin to use observations to answer simple questions.

Seasons- Observes and can describe seasonal features of Autumn (including weather).

Observes and can describe seasonal features of Winter (including weather).

Begins to compare the weather in Autumn and Winter.

Comment on how day length varies across the seasons.

Engagement motivation and thinking (CoL)

To engage children in the world around them by encouraging them to notice differences and changes in the weather and their environment.

Children could go on nature walks to spot seasonal features and collect different items.

Cross-curricular links

Science– animals– find out about animals which hibernate or migrate in winter. **Plants–** observations of when plants/trees begin to grow or change.

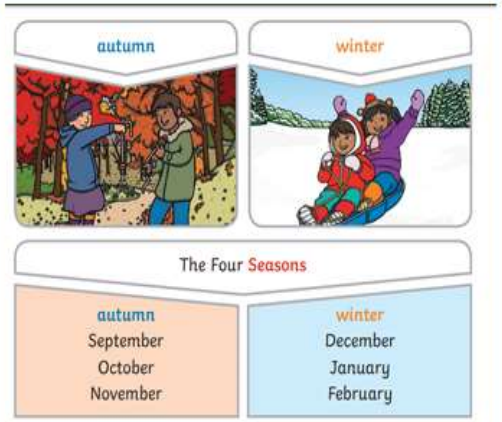
Geography– discussing seasonal and local weather patterns. Noting change in weather over a week.

Geography/ Maths– Create a simple bar chart to show the temperature across a week.

R.E– find out about religious festivals or celebrations which take place around the world in Autumn and Winter.

Art– using natural resources and their imagination to share experiences of the seasons.

Features and months associated with the two seasons.

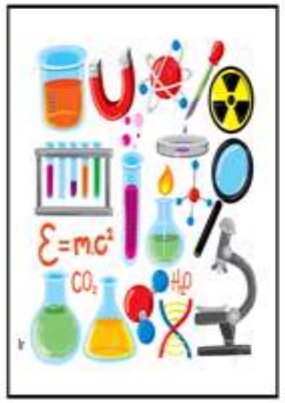


Glossary

autumn	In autumn the weather begins to get colder and the amount of daylight is less. The days are shorter and the nights are longer. The leaves start to change colour and fall from deciduous trees.
chilly	It is very cold.
daylight	Daylight is when it is light outside.
day length	The amount of time there is daylight. This changes every season.
frost	The ground is covered in ice.
ice	Frozen water.
rain	Water which falls from clouds in small droplets.
seasons	There are four seasons in the year, spring, summer, autumn and winter.
snow	Soft white frozen water which falls from the sky when it is cold.
sunny	When the sun is shining brightly.
temperature	How hot or cold something is.
warm	Some heat but not hot.
weather	The weather is about the temperature outside, the wind strength, and wind, rain, sun and snow.
windy	When the wind is blowing.
winter	In winter the weather gets a lot colder and the amount of day light is less. Winter has the shortest days and longest nights. Sometimes it is cold enough to freeze and we see frost and ice on the ground. It sometimes snows. Deciduous trees loose all of their leaves and have bare branches.

New Invention Infant School Knowledge Organiser

Science



Topic: Seasonal Changes	Year group: 1	Strand: Spring and Summer

My prior knowledge
What I should already know before starting this topic:

There are 4 seasons across the year– Spring, Summer, Autumn and Winter.
The weather is different in each season and you can do different activities.
The Autumn months– September, October and November.
The Winter months– December, January and February.
What happens in Autumn– gets colder, could be windy, sunny or rainy, leaves change colour and begin to fall from the trees, can collect conkers and rake leaves.
What happens in Winter– gets very cold, could be frosty, icy, snowy, windy, leaves have fallen from the trees, days are the shortest and nights are the longest.

What will I know by the end of this unit?

There are 4 seasons– spring, summer, autumn and winter.	The weather is different in each of the seasons.
The spring months are: March, April and May.	The summer months are: June, July and August.
What happens in spring- • It starts to get warmer and it might be sunny, windy or rainy. • Leaves begin to grow on trees and some trees grow blossom. • Plants begin to grow and baby animals, like lambs and chicks, are born. • Days begin to get longer and nights shorter. • Spring activities/ celebrations– Easter, St. George's Day. • Clothes you would wear– t-shirt, shirt, shorts, trousers.	What happens in summer- • It gets hotter and it might be hot and sunny with no clouds in the sky. • Summer has the longest days and shortest nights. • Summer activities/ celebrations– picnics, going to the beach, mow the lawn, paddling pools, school summer holidays. • Clothes you would wear– t-shirt, shorts, swimming costume. • Stay safe in the summer by wearing a sun hat, sun cream and sunglasses.

Features of spring.

Spring

Features of summer.

Summer

{Links to NC domains/strands e.g. historical enquiry, scientific investigation,

Working scientifically– Begins to spot simple patterns.
Begin to use observations to answer simple questions.

Seasons- Observes and can describe seasonal features of Spring (including weather).
Observes and can describe seasonal features of Summer (including weather).
Can compare weather and day length across the four seasons.

Engagement motivation and thinking (CoL)

To engage children in the world around them by encouraging them to notice differences and changes in the weather and their environment.
Complete a nature walk to look for signs of Spring/ Summer.

Cross-curricular links

Science– animals– birth of young. **Plants–** when plants and trees grow and change.

Geography– discussing seasonal and local weather patterns. Noting change in weather over a week.

Geography/ Maths– Create a simple bar chart to show the temperature across a week.

R.E– find out about religious festivals or celebrations which take place around the world in Spring and Summer.

Art– using natural resources and their imagination to share experiences of the seasons.

P.O.M– understand how to stay safe in the sun.

Features of the two seasons. Seasons by month.

Glossary

blossom	Flowers that appear on trees before fruit.
daylight	Daylight is when it is light outside.
day length	The amount of time there is daylight. This changes every season.
hot	A high temperature.
rain	Water which falls from clouds in small droplets.
seasons	There are four seasons in the year, spring, summer, autumn and winter.
spring	The weather begins to get warmer and leaves begin to grow on the trees. Some trees have blossom on then. Baby animals like lambs are born. The days start to get longer.
summer	The weather gets hotter. The days are longer and the nights are shorter. Summer has the longest days. The trees are full of leaves and there are lots of bees, butterflies and insects around.
sunny	When the sun is shining brightly.
temperature	How hot or cold something is.
warm	Some heat but not hot.
weather	The weather is about the temperature outside, the wind strength, and wind, rain, sun and snow.
windy	When the wind is blowing.

New Invention Infant School Knowledge Organiser

Science

Topic: Working Scientifically	Year group: 1	Strand:

My prior knowledge
What I should already know before starting this topic:

Similarities and differences in relation to objects, materials and living things.

How to talk about features of their own environment and how environments may vary from each other.

How to make observations of animals and plants.

Explain how some simple processes occur.

What will I know by the end of this unit?

Children should be given the opportunity to gain scientific knowledge in various topics by conducting practical work.	How to ask questions about things they have observed (what, how and why).
How to look for changes over time and spot a simple pattern.	How to conduct simple comparative tests using simple scientific equipment.
How to group and classify animals and materials by given and chosen criteria.	How to use a range of simple secondary sources to find information.

Practical activities and investigations to be explored alongside the science topics covered throughout the year.

Practical work in primary science booklet contains ideas for investigations for biology, chemistry and physics.

For plant based investigations see the RHS website https://schoolgardening.rhs.org.uk/resources

For animal based investigations see the SEALIFE teacher notes and activities sheet

Classification activity pack contains a range of activities and investigations based around the theme of classifying.

STEM website contains lessons plans, resources, video clips and resource packs for all science topics.

https://www.stem.org.uk/

Explorify website to explore different warm up activities

Explorify

Links to NC domains/strands

Can ask 'what', 'how' and 'why' questions about what they have observed.

Can ask 'what', 'how' and 'why' questions about what they have observed.

Can observe changes over time and spot simple patterns.

Uses simple secondary sources to find information.

Can group and classify animals and materials.

Conducts simple comparative tests using simple scientific equipment.

Communicates ideas, what they have done and what they have found out using appropriate scientific language.

Engagement motivation and thinking (CoL)

Pupils should be given the opportunity to engage with and explore the word around them. They should be encouraged to start to ask scientific questions about things they have seen and experience a range of scientific activities to start to find answers to the questions they have.

Cross-curricular links

Children should develop these skills through all of the scientific topics covered throughout the year.

Examples include– grouping and classifying animals/plants and materials, creating charts and graphs for weather, observing and recording plant growth, comparing animals and materials, exploring suitability of materials for different uses.

Glossary

compara-tive test	A test which compares the effect of different actions on a material.
classify	Deciding which group an animal, plant or material fits into based on its properties.
change	The process of something becoming different.
enquiry	Process of doing experiments and investi-gations to learn about science.
observe	To watch closely, examine and remark on.
variable	An element in a test which can be changed.

During teaching of key topics children could be introduced to scientific pioneers or professions to give real world examples of the application of science.

Ole Kirk Christiansen– invented Lego in 1949.

Rachel Carson– studied oceans habitats. She discovered that pollution was affecting oceans and ocean animals.

David Attenborough– conservation activist who studies and informs about the natural world.

Scientist	Scientists study the world around us, the people and animals in it as well as studying space. They do this by observing and doing experiments.
Veterinarian	A vet looks after animals when they are unwell or injured.
Inventor	An inventor finds new ways of doing things or makes something new.

New Invention Infant School Knowledge Organiser

Science

Topic:	Year group:	Strand:
Animals including humans	2	Habitats

My prior knowledge
What I should already know before starting this topic:

The names of a range of amphibians, birds, fish, mammals and reptiles (including pets).

How to sort animals based on observable features and what they eat (carnivore, herbivore or omnivore).

That animals and plants depend on each other and the earth for survival.

Animals can be classified as carnivores, herbivores or omnivores.

What will I know by the end of this unit?

Identifying things which are alive, dead or have never lived.	Describe the basic needs of survival for animals (food, water and air).
Know that animals live in a suitable habitat to survive.	The names of a range of plants and animals from a variety of habitats (including micro-habitats).
How a habitat provides for the basic needs of survival for different animals (provides a food source and shelter).	Some ways in which animals are suited to their habitat. For example: • sharks are suited to the ocean because they have fins to swim and gills to help them breathe underwater. • polar bears are adapted to the arctic because they have white fur to camouflage in the snow and wide flat feet to help them to walk on snow. • succulent plants are adapted to the dessert as they can store water so can survive for a long time without rain.
Micro-habitats are small habitats where mini-beasts live.	

Children will need to know the names of animals which would be able to survive in these habitats and micro-habitats.

Examples of **habitats**:

Examples of **microhabitats**:

National Curriculum statements.

Working scientifically– Groups and classifies a wide range of animals.

Use secondary sources to find information.

Communicate ideas using appropriate scientific language.

Animals– Identify things which are alive, dead or were never living.

Identify that most living things live a suitable habitat.

Describe the basic needs of survival for animals.

Identify and name a variety of plants and animals in their habitat(including micro-habitats).

Can describe how different habitats provide for the basic needs of different animals for survival.

Can describe how animals are suited to their habitat.

Engagement motivation and thinking (CoL)

To engage children in the world around them and develop skills of spotting patterns, similarities, differences and adaptations of living things.

Fostering a sense of how animals and plants in all of the world's habitats depend upon each other and the importance of protecting them.

Cross-curricular links

Science– link to work on animals and plants and food chains.

Art– sketching habitats and microhabitats and features found in each one.

Geography– investigating where the different habitats are found across the world.

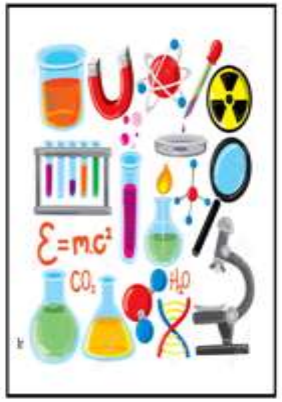
Glossary

life processes	All living things carry out these processes. They move, breathe, sense, grow, make babies, get rid of waste and get energy from food.
alive	Something which is carrying out all of the life processes.
dead	Something which used to be alive and carry out all of the life processes but does not anymore.
never lived	Things which never carried out the life processes. Things like metal, plastic or rock.
habitat	This is the place where something lives. It provides all of the things the animal needs to live there (food, shelter, water).
micro-habitat	This is a very small habitat for example, under a rock or leaves. mini-beasts usually live in micro-habitats.
mini-beast	An insect like a butterfly or worm.
food source	This is the place where an animals food comes from. A habitat will provide an animal with a food source.
survive	To stay alive.

Classifying objects as alive, dead or never lived.

New Invention Infant School Knowledge Organiser

Science



Topic:	Year group:	Strand:
Animals including humans	2	Humans– keeping healthy

My prior knowledge
What I should already know before starting this topic:

The needs of animals for survival (food, water and air).

How animals obtain their food from plants and other animals.

The names of parts of the human body and the functions of some of them.

The names of the five senses and the body part associated with them.

What will I know by the end of this unit?

Know that humans need food, water and air to survive.	Humans need to keep healthy.
Humans must eat a balanced diet and healthy food to stay healthy.	Humans need to exercise to keep healthy and keep muscles and bones strong.
We take medicines when we are poorly to make us feel better.	Good hygiene is important to stop us from getting poorly. This means keeping clean by washing our hands and clothes, and brushing our teeth and hair.

Needs for survival and how to achieve a balanced diet.

To stay alive, all animals have 3 basic needs:

To grow into a healthy adult, we must eat the right types of food in the right amount and **exercise**.

oils and spreads
Choose unsaturated oils and use in small amounts.

Water, lower fat milk, sugar-free drinks including tea and coffee all count.

Eat less often and in small amounts.

[Links to NC domains/strands e.g. historical enquiry, scientific investigation, fieldwork,]

Working scientifically– Use secondary sources to find information.

Communicate their ideas in a variety of ways.

Animals including humans– Can describe the basic needs of survival for humans (food, air and water).

Can describe the importance for humans of exercise, a balanced diet and good hygiene.

Engagement motivation and thinking (CoL)

Understands the importance of keeping healthy and shows a positive attitude towards competing physical activity and maintaining a balanced diet.

Cross-curricular links if appropriate

Science– Link to work on life cycle of humans.

P.E- Understands how healthy eating and exercise is good for the heart and lungs.

Understands how exercise is good for the muscle strength and stamina (how long the child can exercise for) .

Begins to recognise different food groups.

P.O.M– Knows what constitutes, and how to maintain, a healthy lifestyle.

Knows how some diseases spread and how to control them including the importance of, and how to maintain, personal hygiene.

Glossary

balanced diet	A combination of food you regularly eat with food from different food groups.
bones	The parts inside your body which make up your skeleton.
dehydrate	To lose water.
disease	An illness which can affect animals, humans or plants.
energy	The power needed to do a task.
exercise	A physical activity to get fit and stay healthy.
healthy	When you are well and not poorly.
heart rate	The number of times your beats in one minute.
hygiene	Keeping yourself and your environment clean to prevent disease.
medicine	Given by doctors or nurses to cure diseases.
muscles	Things inside your body which connect your bones.
nutrition	Food needed to live.
survive	Continue to live.

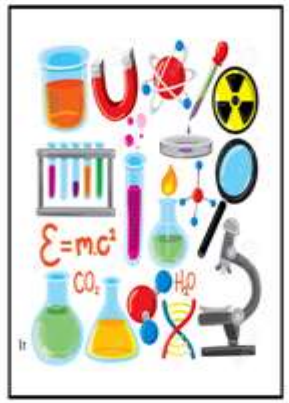
How to stay healthy.

To stop illness and infections spreading, we must be hygienic and keep ourselves clean.

Doing exercise helps our bones and muscles to grow strong. Exercise helps us to stay fit and healthy.

New Invention Infant School Knowledge Organiser

Science



Topic: Animals including humans	Year group: 2	Strand: Animals- Life cycles and food chains

My prior knowledge
What I should already know before starting this topic:

The names of a range of animals from different groups: amphibians, birds, fish, mammals and reptiles).

The terms carnivore, herbivore and omnivore.

The name and location of various body parts on the human body,

The function of some parts of the human body.

What will I know by the end of this unit?

The main changes as humans grow into adults.

The name for each stage of development: baby, toddler, child, teenager, adult.

Some key changes which happen at each stage;

baby– must be looked after, needs to be fed, drinks milk. needs to be changed, kept warm, cannot walk or talk.

toddler– learns to crawl, walk and talk, try eating new foods. still needs looking after– being fed and dressed.

child– can walk and talk, learns to read and write, learns how to play sports, still needs looking after but can feed and dress themselves.

teenager– able to look after themselves, grow taller, may get spots, learn to drive, go to university.

adult– fully grown, look after themselves and have their own family, keep healthy through good diet and exercise, have a job.

The main changes as animals grow into mature animals by looking at the life cycle of frogs and chickens. (children may also find out about other animal life cycles).

Some animals give birth to live young and some animals lay eggs.

Some animals give birth to young which look like them (cats, chickens, dogs, humans etc).

Some animals have offspring which do not look like them (butterflies, frogs).

Frog

spawn– eggs are laid in water and hatch into tadpoles.

tadpole– spend time swimming, eating and growing in the water. They have a tail.

froglet- around 12 weeks frogs grow legs and then arms, body grows longer and head bigger. Can still breathe under water.

frog– fully grown, the frog breathes air and has no tail.

Chicken

egg– a hen lays an egg and keeps it warm by sitting on it.

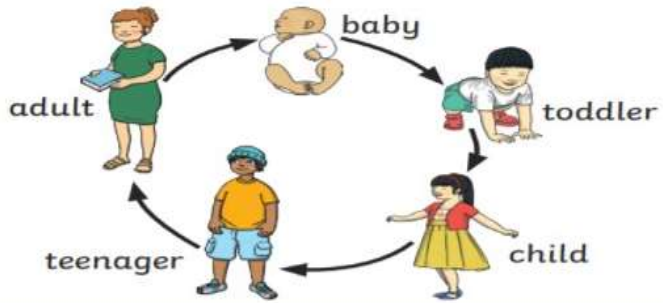
chick– a chick will hatch from the egg when it is ready by poking a hole in the egg with its egg tooth. They are covered in small, fluffy feathers called down to keep them warm.

chicken– chick grows bigger and becomes a chicken. They grow bigger feathers. Female chickens are hens and male chickens are cockerels.

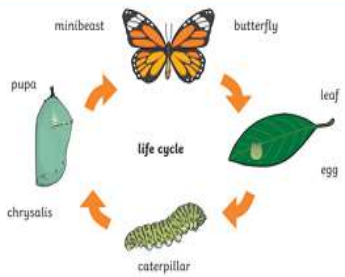
Know that animals need food, water and air to survive. Understand that animals obtain their food from other animals and plants.

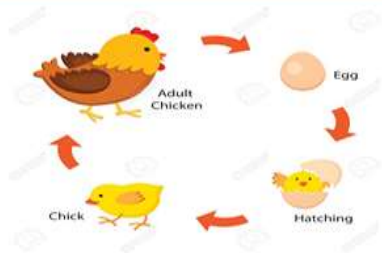
How to draw a simple food chain to show how animals obtain their food.

Life cycle of a human. Children will need to know the name for each stage of development.



Animal life cycles. Children will need to know the main changes at each stage of the life cycles.





[Links to NC domains/strands e.g. historical enquiry, scientific investigation, fieldwork,]

Working scientifically– Ask their own questions about what they have observed.

Use own observations to answer questions.

Group and classify a wide range of animals.

Animals (including humans)- Identify things which are alive, dead or have never lived.

Can describe the main changes as humans grow into adults.

Can describe the main changes as young animals grow into adults.

Can describe the basic needs of survival for animals.

Engagement motivation and thinking (CoL)

To engage children in the world around them and develop skills of spotting patterns, similarities and differences in living things.

To develop a sense of how lining things depend upon the earth and other animals for their own survival.

Cross-curricular links

Science– link to work on seasons from Year One (when would stages of the life cycles take place).

Make links to life cycle of plants and work on habitats.

P.O.M– Know the processes of growing from young to old.

Example of 2-step food chains that show how animals obtain their food.

Producer	Consumer Prey of the fox	Consumer Predator of the rabbit

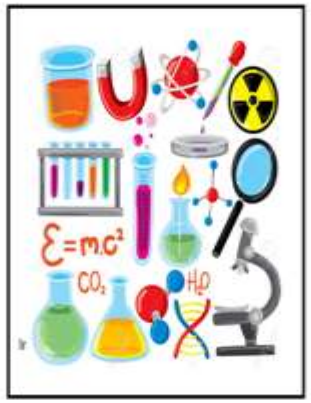
Producer	Consumer Prey of the seal	Consumer Predator of the tuna

Glossary

reproduce	When living things make a new living thing the same as them.
develop	Growing and becoming stronger.
life cycle	How animals or plants change as they grow into adulthood.
offspring	The child of an animal.
young	Offspring that has not yet reached adulthood.
adult	A fully grown animal or plant.
baby	The first stage of human development.
toddler	The second stage of human development, after a baby and before a child.
child	The third stage of human development, after a toddler and before a teenager.
teenager	The fourth stage of human development, after a child and before an adult.
adult	A fully grown and developed human.
egg	Some animals lay eggs which hatch into live young.
chick	A young chicken which has hatched from an egg.
frogspawn	Eggs laid by a frog which will develop into a frog.
tadpole	Hatch from frogspawn. Stage before becoming a froglet.
froglet	Stage of development after tadpole and before a fully grown frog.
food chain	Shows how animals depend on other animals and plants for food.
producer	A plant that makes its own food. They are found at the start of a food chain.
plant	A living things which grows in the earth.
consumer	Animals that eat food.
prey	An animal that is hunted and eaten by another animal.
predator	An animal that hunts another animal to eat.
carnivore	An animal that eats other animals (meat)
herbivore	An animal that only eats plants.
omnivore	An animal that eats other animals (meat) and plants.

New Invention Infant School Knowledge Organiser

Science



Topic: Materials	Year group: 2	Strand: Suitability and changing shape

My prior knowledge
What I should already know before starting this topic:

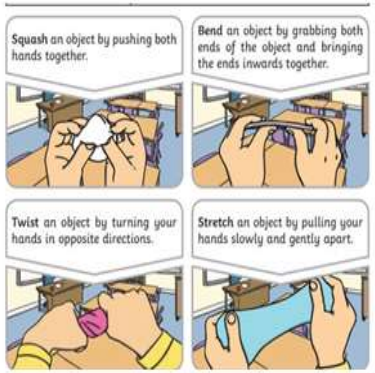
An object is something which can be seen or touched and used.
A material is what an object is made from.
The names of everyday materials– brick, fabric, glass, metal, plastic, stone, water and wood.
How to describe simple physical properties of everyday materials– absorbent, bendy, bright, dull, hard, opaque, rough, shiny, smooth, soft, stiff, stretchy, transparent and waterproof.

What will I know by the end of this unit?

What a range of everyday materials are used for. For example– wood is used to make furniture, glass is used to make windows, fabric is used to make clothing.	What properties of materials make them suitable for making different objects. Understand some objects can be made from more than one material e.g. cups. For example– wood is used to make floors and furniture because it is strong, glass is used to make windows because it is transparent, fabric is used to make clothing because it is soft and warm and can be bent into different shapes.
How the shape of different materials can be changed.	The shape of a material can be changed by bending, squashing, stretching or

How everyday materials can be described.

How the shape of everyday materials can be changed.



[Links to NC domains/strands e.g. historical enquiry, scientific investigation, fieldwork,]

Working scientifically– Ask their own questions about what they have observed.

Use secondary sources to find information.

Group and classify a wide range of materials.

Conduct comparative tests and record and present results.

Materials– Identify the suitability of a range of everyday materials for particular uses.

Compare the suitability of a range of everyday materials for particular uses.

Find out how the shape of solid objects made from everyday materials can be changed by bending, squashing, stretching and twisting.

Engagement motivation and thinking (CoL)

To engage children in the world around them by encouraging them to notice features of their environment and how materials and objects have been developed to have a wide range of uses.

Encourage children to take a role in protecting and preserving the environment through learning about recycling and littering.

Cross-curricular links

History– investigating famous people who developed or discovered new materials.

Art/D.T– investigating which materials are suitable and unsuitable for different projects and how the materials could be changed by bending, squashing, stretching or twisting.

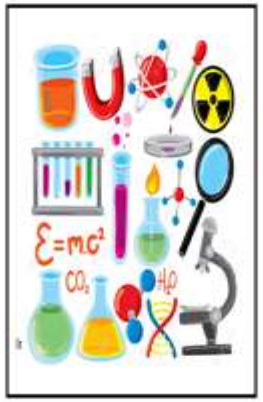
P.O.M– investigate recycling and littering and how these materials effect the environment.

Physical properties of everyday materials.

Glossary	
object	Something which can be used. For example a chair, a table, a cup.
material	Materials are what objects are made from.
hard	The material is not easy to bend or break.
soft	It is easy to change the shape, cut or fold the material.
smooth	Smooth materials have no bumps.
rough	Rough materials look and feel bumpy and uneven.
shiny	Shiny materials reflect the light.
dull	Dull materials do not reflect light and do not look bright or shiny.
waterproof	Waterproof materials keep water out and keep things dry.
absorbent	Absorbent materials soak up water.
transparent	You can see through transparent materials.
opaque	You cannot see through opaque materials.
bendy	Bendy materials can be folded really easily.
stiff	A material which is not easy to bend.
stretchy	Stretchy materials can be pulled to make them longer or wider without breaking them.
properties	What a material is like and how it behaves.
suitable	A material is right for what you want to use it for. It has the correct properties.
unsuitable	A material does not have the correct properties for what you want to use it for.
bend	Push the ends of a material inwards.
squash	To press or crush something to change its shape.
stretch	To pull something to change its shape.
twist	To turn something into a spiral shape.

New Invention Infant School Knowledge Organiser

Science



Topic: Plants	Year group: 2	Strand: Needs and life cycle

My prior knowledge
What I should already know before starting this topic:

The difference between garden and wild plants.

Names of some common plants and trees.

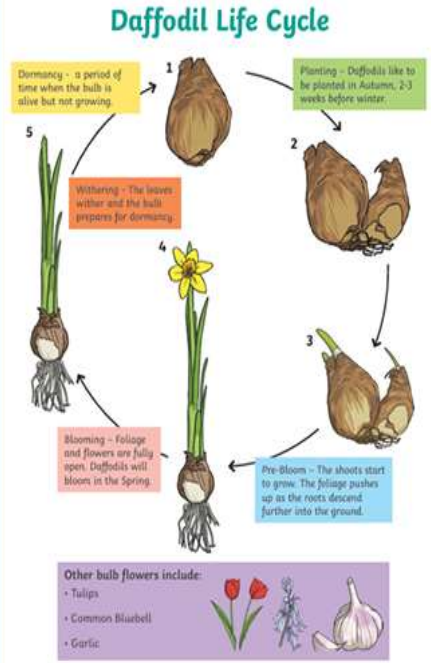
The difference between deciduous and evergreen trees.

The names of different parts of trees and plants– roots, stem, trunk, branch, leaves, flower, petal.

What will I know by the end of this unit?

That it is important that plants have the right conditions to grow properly and stay healthy.	Plants need soil, sunlight and an appropriate temperature to grow healthily.
Plants use sunlight to make food.	Through investigations we can discover what happens when we change these conditions.
How seeds or bulbs grow and change into mature plants.	We can observe how plants grow without water, without sunlight or somewhere that is too hot or too cold.
Know that we can eat some plants and know the names of fruits, vegetables, herbs, flowers and trees.	Explain that fruits grow their seeds on/ inside them and vegetables do not (they usually grow on another part of the plant).

The life-cycle of a seed and bulb.



[Links to NC domains/strands e.g. historical enquiry, scientific investigation, fieldwork,]

Working scientifically– Ask their own questions about what they have observed.

Use secondary sources to find information.

Observe changes over time.

Conduct simple comparative tests.

Gather and record data and talk about what they have found out.

Plants– Observe and describe how bulbs and seeds grow and develop into mature plants.

Investigate and observe how plants need water, light and a suitable temperature to grow and stay healthy.

Identify whether things are alive, dead or have never lived.

Cross-curricular links	Engagement motivation and thinking (CoL)
Science– link to work from Year One about the four seasons. Investigate suitable habitats for a range of common plants. **Maths–** create a graph to show the rate of growth for plants kept in different conditions.	To engage children in the world around them by encouraging them to notice features of their environment and an understanding that we need to look after and maintain gardens, allotments etc. Encourage children to look out for the flowers and trees they have learnt about around school and in their home environment. Plant seeds and bulbs and look after them and observe growth as a class.

Plants we eat

There are some plants that **we can eat**. **Fruits** and **vegetables** grow as part of a plant. **Herbs** are a plant too.

How do plants grow?

We use **seeds** to grow new plants. New seeds grow as **part of the plant**. Seeds can be found **inside some fruits**.

Glossary

seed	A tiny part of a plant that can grow into a new plant.
bulb	A round part of a plant that grows under the soil. It holds food and a tiny baby plant inside.
plant	A plant is something that grows in the soil. It has roots, stems, leaves and may have flowers or fruits.
healthy plant	A healthy plant is one that looks green and strong. It has bright leaves, stands upright and keeps growing.
flower	The flower is a part of a plant that can grow into fruit or seeds.
fruit	A fruit is a part of a plant that grows from a flower. It holds the seeds that can grow into new plants.
vegetable	A vegetable is a part of a plant that people eat. It can be the leaf, stem, root or flower of the plant.
herb	A herb is tiny plant with soft green leaves. People use herbs to add flavour to food.
tree	A tree is a large plant that grows in the ground. It has a thick trunk, branches and leaves.
life cycle	A life cycle shows how something grows and changes.
grow	Grow means to get bigger and change. Plants grow from seeds and bulbs.
germination	When conditions are right, the seed soaks up water and swells, the tiny plant then bursts out of its shell. This is called germination.
nutrients	Plants make their own food using sunlight. They also take in nutrients from the soil.
seed dispersal	Seed dispersal is when the seeds move away from the parent plant. They can be moved by the wind or animals.
shoot	A shoot grows upwards from the seed or plant to find sunlight.
sprout	When a plant sprouts, it grows new shoots.
dormant	Dormant means not active right now. A dormant plant is resting underground and not yet growing.
wilt	Wilt is when a plant is drooping or bending down.
sunlight	All plants need light from the sun to grow well. Plants use sunlight to make food. Some plants need more sunlight than others.
temperature	Temperature is how warm or cold something is. Some plants like cooler temperatures. Some plants like warmer temperatures.
water	All plants need water to grow. Without water, seeds and bulbs would not germinate.

New Invention Infant School Knowledge Organiser

Science

Topic:	Year group:	Strand:
Working Scientifically	2	

My prior knowledge
What I should already know before starting this topic:

Similarities and differences in relation to objects, materials and living things.

How to talk about features of their own environment and how environments may vary from each other.

How to make observations of animals and plants. Explain how some simple processes occur.

What will I know by the end of this unit? [e.g. key facts, concepts]

Children should be given the opportunity to gain scientific knowledge in various topics by conducting practical work.	How to ask a range of questions about things they have observed.
How to answer questions based on their own observations.	How to conduct simple comparative tests using simple scientific equipment.
How to look for changes over time and spot simple patterns.	How to group and classify a wider range of animals and materials by given and chosen criteria.
How to use a wider range of secondary sources to find specific information.	How to gather and then record data in an appropriate way.
How to communicate their own ideas.	How to communicate what they did and what they have found out in an investigation.

Practical activities and investigations to be explored alongside the science topics covered throughout the year.

Practical work in primary science booklet contains ideas for investigations for biology, chemistry and physics.

For plant based investigations see the RHS website https://schoolgardening.rhs.org.uk/resources

Classification activity pack contains a range of activities and investigations based around the theme of classifying.

STEM website contains lessons plans, resources, video clips and resource packs for all science topics.

https://www.stem.org.uk/

Explorify website to explore different discussion and observation activities.

Explorify

[Links to NC domains/strands e.g. historical enquiry, scientific investigation, fieldwork,]

Ask their own questions about what they have observed.

Observe closely to answer questions using simple scientific language.

Observe changes over time and notice simple patterns.

Use secondary sources to find information.

Group and classify a wider range of animals and materials.

Conduct simple comparative tests using simple scientific equipment.

Gather and record data to help answer questions.

Communicate ideas, what they do and what they find out in a variety of ways using appropriate scientific language.

Engagement motivation and thinking (CoL)

Pupils should be given the opportunity to engage with and explore the word around them. They should be encouraged to start to ask scientific questions about things they have seen and experience a range of scientific activities to start to find answers to the questions they have.

Cross-curricular links

Children should develop these skills through all of the scientific topics covered throughout the year.

Examples include– sorting animals and plants, classifying alive, dead or never living, describe and compare habitats, accurately observing and recording plant growth, comparative tests for needs for growth of plants, asking questions about needs for survival and staying healthy, comparing the use of everyday materials, observe materials closely and record findings.

Glossary

comparative test	A test which compares the effect of different actions on a material.
classify	Deciding which group an animal, plant or material fits into based on its properties.
change	The process of something becoming different.
enquiry	Process of doing experiments and investigations to learn about science.
fair test	A test which changes only one variable to observe what changes.
observe	To watch closely, examine and remark on.
variable	An element in a test which can be changed.

During teaching of key topics children could be introduced to scientific pioneers or professions to give real world examples of the application of science.

Mae Jemison– first African American women in space.

Charles Macintosh– invented the first waterproof fabric.

Agnes Arber– a botanist who did lots of research on the structure of flowering plants.

Astronaut	A person who is trained to travel in space.
Botanist	A scientist who studies plants.
Doctor	Doctors treat people who are unwell. A doctor uses science to work out what is wrong with someone and how to treat them.

Questioning

Area of Science	Nursery/ The Hub	Reception	Year One	Year Two
Working Scientifically	**Observing and Exploring** What do you notice about this leaf? How does the water feel — is it warm or cold? What happens when we mix these colours? Can you see what's floating and what's sinking? What do you hear when we shake the bottle? **Predicting and Testing** What do you think will happen if we drop the ball in the water? Which object do you think will roll the fastest? What will happen if we put the ice in the sun? Do you think the paper will tear or bend? What happens when we blow bubbles in the wind? **Talking About Findings** What did you find out? How did the texture feel? Which one was the biggest? What happened when we added the water? Can you tell me what changed? **Exploring Nature and Materials** What can you see in the garden? How does the soil feel? Can you find something that's smooth? Something that's rough? What happens when we pour water on the sand? Can you find something that grows? **Playful Scientific Thinking** Let's test which car goes furthest — what do you think? Can you build a ramp and see what happens? What happens when we mix flour and water? Can you sort these objects by how they feel? What happens when we press the button?	**Observing Closely** What do you notice about this plant? How does the ice change when we leave it in the sun? What happens when we mix water and flour? Can you describe how the snail moves? What colours can you see in the rainbow? **Predicting and Testing** What do you think will happen if we drop the ball in water? Which object do you think will float? Which will sink? What will happen if we blow up the balloon more? Do you think the magnet will stick to this? Which car will go furthest down the ramp? **Talking About Results** What did you find out? Can you explain what changed? Which one was the fastest? Why do you think that? What happened when we added more water? How did the texture feel before and after? **Exploring Nature and Materials** What can you see growing in the garden? How does the soil feel when it's dry? What about when it's wet? Can you find something that's smooth? Something that's rough? What happens when we pour water on sand? Can you sort these materials by how they feel? **Playful Scientific Thinking** Let's test which paper plane flies furthest — what do you think? Can you build a ramp and see what happens when we roll a ball down? What happens when we mix paint colours? Can you find something that changes shape when you squash it? What happens when we press the button on the toy?	**Observing Closely** What do you notice about this plant? How does the texture of the object feel? What happens when we shine a torch on different materials? Can you describe how the snail moves? What changes do you see when the ice starts to melt? **Predicting and Testing** What do you think will happen if we drop the ball in water? Which object do you think will float? Which will sink? Which material will keep the teddy dry in the rain? What will happen if we mix these two liquids? Which toy car will go furthest down the ramp? **Recording and Comparing Results** Can you count how many seeds have sprouted? Which group had the most objects that floated? Can you draw what happened before and after the experiment? What did we find out from our test? Can you sort the materials by how they behaved? **Reasoning and Explaining** Why do you think that happened? How do you know which material is waterproof? What did you learn from your investigation? Can you explain why the ice melted faster in the sun? What would you do differently next time? **Exploring Living Things and Materials** What do plants need to grow? Can you find something that is alive, and something that is not? What happens when we water the plant every day? Which materials are hard, soft, rough, or smooth? Can you sort these objects into natural and man-made?	**Observing Closely and Identifying Change** What do you notice about the seeds as they grow? How does the ice change when it's left in the sun? What happens to the shadow when the light moves? Can you describe how the snail moves? What changes do you see when we mix these materials? **Predicting and Testing** What do you think will happen if we put the paper in water? Which material do you think will keep the teddy dry? What will happen if we add more weight to the boat? Which object will roll furthest down the ramp? Do you think this magnet will stick to the spoon? Measuring, Recording, and Comparing Can you measure how tall the plant has grown? How many drops of water fit on each coin? Which ramp made the car go furthest? Can you record what happened in a table or chart? What did we find out from our test? **Reasoning and Explaining** Why do you think that happened? How do you know which material is waterproof? What did you learn from your investigation? Can you explain why the ice melted faster in the sun? What would you do differently next time? **Exploring Living Things and Materials** What do plants need to grow well? Can you sort these animals by where they live? Which materials are bendy, stretchy, or hard? What happens when we squash or twist these objects? Can you find something that is alive, and something that is not?

Area of Science	Nursery/ The Hub	Reception	Year One	Year Two
Plants	**Observing Plants and Growth** What do you notice about this plant? Can you find a flower in the garden? What colour are the leaves? How does the plant feel — is it soft or rough? What happens when we water the seed? **Exploring Parts of a Plant** Can you find the stem? Where are the leaves? What do roots do? Which part of the plant grows in the soil? What do you think the flower is for? Can you draw a picture of a plant? **Thinking About What Plants Need** What do you think plants need to grow? What happens if we don't water the plant? Do plants like the sun or the shade? What do you think will happen if we put a plant in the dark? Can you help us water the plants today? **Comparing and Sorting** Which plant is the tallest? Which is the shortest? Can you find two leaves that are the same? Two that are different? Which flower smells the nicest? Can you sort the leaves by size or colour? Which plant has the biggest petals? **Playful and Practical Prompts** Let's plant some seeds — what do you think will happen? Can you help dig a hole for the seed? What do you see in the garden today? Can you find a plant that's growing? Let's make a flower shop — what flowers will you sell?	**Observing Plants and Growth** What do you notice about this plant? How has the seed changed since we planted it? What colour are the leaves? Are they all the same? Can you see any roots? Where do they grow? What happens when we water the plant every day? **Exploring Parts of a Plant** Can you find the stem, leaves, and flower? What do roots do for the plant? Which part of the plant grows in the soil? What do you think the flower is for? Can you draw and label a picture of a plant? **Thinking About What Plants Need** What do plants need to grow? What happens if we don't give the plant water? Do plants grow better in the sun or in the shade? What do you think will happen if we put a plant in the dark? Can you help us look after the plants in our garden? **Comparing and Sorting** Which plant is the tallest? Which is the shortest? Can you find two leaves that are the same? Two that are different? Which flower smells the nicest? Can you sort the leaves by size or colour? Which plant has the biggest petals? **Playful and Practical Prompts** Let's plant some seeds — what do you think will happen? Can you help dig a hole for the seed? What do you see in the garden today? Can you find a plant that's growing? Let's make a flower shop — what flowers will you sell? Would you like these questions turned into printable cards, matched to EYFS Development Matters statements, or paired with simple planting and observation activities? I can also suggest seasonal links or outdoor learning enhancements.	**Observing and Identifying Plants** What do you notice about this plant? Can you name the parts of a plant — root, stem, leaf, flower? What colour are the leaves? Are they all the same? Can you find a plant growing in the playground? How is this plant different from that one? **Exploring Growth and Change** What happens when we water the seed every day? How has the plant changed since last week? What do you think will happen if we don't give it sunlight? Can you describe how the seed grows into a plant? What do plants need to stay healthy? **Comparing and Sorting** Which plant is the tallest? Which is the shortest? Can you sort these leaves by shape or size? Which flower has the most petals? Are all stems the same colour or thickness? Can you find two plants that look similar? **Reasoning and Explanation** Why do you think the leaves are turning brown? What do you think will happen if we plant the seed in sand? How do you know this plant is healthy? Why do plants need water and light? What did you learn from watching the plant grow? **Practical and Playful Prompts** Let's plant some seeds — what do you think will happen? Can you help label the parts of our classroom plant? What do you see in the garden today? Can you draw a picture of your favourite plant? Let's make a plant diary — what should we write today?	**Observing and Identifying Plants** Can you name the parts of a plant and describe what they do? What do you notice about the leaves on different plants? How are these two plants similar or different? Can you find a plant with flowers? What colour are they? What do you see happening to the plant as it grows? **Exploring Growth and Conditions** What do plants need to grow well? What happens if a plant doesn't get enough sunlight? How does watering affect the plant's growth? What do you think will happen if we grow a seed in the dark? Can you describe how the plant changed over time? **Investigating and Predicting** Which plant do you think will grow fastest? Why? What do you think will happen if we give one plant more water than the other? How can we test what plants need to grow? What do you predict will happen to the leaves in winter? Which conditions helped our seeds grow best? **Recording and Comparing** Can you measure how tall the plant is each week? What did you notice when you compared the two plants? Can you draw a diagram to show the parts of a plant? What did our results show about plant growth? Can you sort these plants by size, colour, or leaf shape? **Reasoning and Explanation** Why do you think the plant grew better in the sun? What did you learn from your investigation? How do you know which plant is healthy? Why do plants have roots? What would you do differently next time?

Area of Science	Nursery/ The Hub	Reception	Year One	Year Two
Animals- humans	**Exploring Body Parts** Can you point to your nose? What does it do? Where are your knees? Can you bend them? What do we use our hands for? Can you find something that helps you hear? What happens when you wiggle your toes? **Using Our Senses** What can you see in the garden? What does the flower smell like? How does the water feel — is it warm or cold? What sounds can you hear outside? What does the apple taste like? **Keeping Healthy** Why do we wash our hands? What do we wear when it's cold? What foods help us grow strong? Why do we brush our teeth? What do we do when we feel tired? **Daily Routines and Self-Care** What do you do when you wake up? What do we do before lunchtime? Can you show me how you get ready for home time? What do you wear when it's raining? What happens after story time? **Playful and Practical Prompts** Can you draw a picture of yourself? Let's play "Simon Says" — can you touch your elbow? What do you see in the mirror? Can you sort the clothes for summer and winter? Let's make a healthy lunch — what should we include?	**Exploring Body Parts and Functions** Can you name the parts of your body? What do we use our hands for? Where are your elbows, knees, and shoulders? What helps you see, hear, smell, taste, and touch? Can you draw a picture of yourself and label the parts? **Using Our Senses** What can you see in the garden? What does the flower smell like? How does the water feel — warm, cold, or wet? What sounds can you hear in the classroom? What does the apple taste like — sweet or sour? **Keeping Healthy and Safe** Why do we wash our hands? What foods help us grow strong and healthy? Why do we brush our teeth every day? What do we wear when it's cold or rainy? What do we do when we feel tired? **Daily Routines and Self-Care** What do you do when you wake up in the morning? What happens before lunchtime? Can you show me how you get ready for home time? What do you do after story time? What helps you get ready for bed? **Playful and Practical Prompts** Let's play "Simon Says" — can you touch your toes? Can you sort the clothes for summer and winter? What do you see in the mirror? Let's make a healthy lunch — what should we include? Can you find something that smells nice and something that doesn't?	**Naming and Identifying Body Parts** Can you name the parts of your body? What do we use our legs for? Where are your elbows, knees, and shoulders? What helps you see, hear, smell, taste, and touch? Can you label the parts of the body on this diagram? **Exploring the Five Senses** What can you see in the classroom? What does the flower smell like? How does the sand feel — rough or smooth? What sounds can you hear outside? What does the lemon taste like — sweet or sour? **Staying Healthy and Safe** Why do we wash our hands? What foods help us grow strong and healthy? Why is exercise good for our bodies? What do we wear when it's cold or rainy? Why do we need to sleep? **Daily Routines and Self-Care** What do you do when you wake up in the morning? What happens before lunchtime? How do you get ready for bed? What do you do after PE? What helps you stay clean and healthy? **Reasoning and Explanation** Why do you think we need to eat fruit and vegetables? What happens if we don't get enough sleep? How do you know your body is working well? What would happen if we didn't brush our teeth? Why do we need all five senses?	**Naming and Understanding Body Parts** Can you name the main parts of the human body? What does your heart do? Which part of your body helps you breathe? What do your muscles help you do? Can you label the parts of the body on this diagram? **Exploring the Five Senses** What do we use our eyes for? Which sense helps you taste your food? What happens when you cover your ears? Can you describe how something feels using your sense of touch? Which sense helps you know something is burning? **Staying Healthy and Safe** What foods help us stay strong and healthy? Why is exercise important for our bodies? What happens if we don't get enough sleep? Why do we need to brush our teeth every day? How can we keep our bodies clean? **Growth and Change** How have you changed since you were a baby? What do humans need to grow and stay healthy? What happens to your body when you run? How do our needs change as we grow older? Can you compare what a baby needs with what you need? **Reasoning and Explanation** Why do you think your heart beats faster after running? What happens if we eat too much sugar? How do you know your body is working well? Why do we need all five senses? What would happen if we didn't drink water?

Area of Science	Nursery/ The Hub	Reception	Year One	Year Two
Animals	**Observing and Naming Animals** Can you name this animal? What sound does this animal make? How many legs does it have? What colour is its fur, feathers, or skin? Can you find an animal with a tail? **Exploring Features and Movement** How does this animal move — does it walk, fly, or swim? Does it have fur, feathers, or scales? Can you flap like a bird or hop like a rabbit? What do you notice about its ears or nose? Which animals have wings? Talking About Habitats Where do you think this animal lives? Does it live in water, on land, or in the sky? Can you find an animal that lives on a farm? Which animals live in the jungle? Where do pets sleep? **Thinking About Diet and Needs** What do you think this animal eats? Do you think it drinks water like we do? What do we feed our pets? Which animals eat grass? What do animals need to stay healthy? **Playful and Practical Prompts** Can you sort the animals by size? Let's play "Guess the Animal" — I'll make a sound! Can you draw your favourite animal? What animals did you see at the farm/zoo? Can you match the baby animal to its parent?	**Naming and Describing Animals** Can you name this animal? What does it look like — does it have fur, feathers, or scales? How many legs does it have? What sound does it make? Can you find an animal with a tail? **Exploring Movement and Features** How does this animal move — does it walk, fly, swim, or crawl? Can you move like a frog, a bird, or a snake? Which animals have wings? Which have fins? What do you notice about its ears, nose, or feet? Can you sort the animals by how they move? **Talking About Habitats** Where do you think this animal lives — in water, on land, or in the sky? Can you find an animal that lives on a farm? Which animals live in the jungle, desert, or ocean? What do pets need in their homes? Can you match the animal to its habitat? **Thinking About Diet and Needs** What do you think this animal eats? Do you think it drinks water like we do? What do we feed our pets? Which animals eat meat, and which eat plants? What do animals need to stay healthy? **Life Cycles and Growth** What does a baby animal look like? Can you match the baby animal to its parent? How do animals change as they grow? What do you notice about the size of the baby and the adult? Can you draw the life cycle of a chick or frog? **Playful and Practical Prompts** Let's play "Guess the Animal" — I'll make a sound! Can you draw your favourite animal? What animals did you see at the farm/zoo? Can you sort the animals by size or colour? Let's make a vet's surgery — what animals will come in?	**Identifying and Naming Animals** Can you name this animal? Is it wild or a pet? What type of animal is it — mammal, bird, fish, reptile, or amphibian? Which animals have fur, feathers, or scales? Can you name an animal that lives in water? Which animals do we see on a farm? **Exploring Animal Features and Movement** How does this animal move — does it walk, fly, swim, or crawl? What body parts does it have — legs, wings, fins, tail? Which animals have beaks? Which have paws? Can you sort these animals by how they move? What do you notice about its ears, eyes, or feet? **Thinking About Diet and Needs** What do you think this animal eats — meat, plants, or both? Which animals are herbivores, carnivores, or omnivores? What do pets need to stay healthy? Do animals need water like we do? What happens if an animal doesn't get food or shelter? **Life Cycles and Growth** What does a baby animal look like? Can you match the baby animal to its parent? How do animals change as they grow? What do you notice about the size of the baby and the adult? Can you draw the life cycle of a frog or a chick? **Reasoning and Explanation** Why do you think this animal lives in the water? What helps birds fly? How do you know this animal is a mammal? Why do some animals hibernate? What would happen if we didn't feed our pets?	**Identifying and Classifying Animals** Can you name this animal and say what type it is — mammal, bird, reptile, amphibian, or fish? What features help you know it's a reptile? Which animals have fur, feathers, scales, or skin? Can you sort these animals into groups? How are these two animals similar or different? **Life Cycles and Growth** What does a baby animal look like? How does a chick change as it grows? Can you describe the life cycle of a frog or butterfly? What do you notice about the changes from young to adult? Do all animals grow in the same way? **Diets and Food Chains** What does this animal eat — is it a herbivore, carnivore, or omnivore? How do you know what this animal eats? What would happen if an animal didn't get the food it needs? Can you draw a simple food chain? What do animals need to survive? **Body Parts and Functions** What body parts help this animal move, eat, or stay safe? Why do birds have beaks instead of teeth? How do fins help fish? What do you notice about the legs of animals that run fast? Which animals have skeletons? Which don't? **Reasoning and Explanation** Why do you think this animal lives in water? What helps this animal survive in the wild? How do you know this animal is a mammal? Why do some animals hibernate or migrate? What would happen if we kept a polar bear in the desert?

Area of Science	Nursery/ The Hub	Reception	Year One	Year Two
Everyday Materials	**Exploring and Naming Materials** What is this made of — wood, metal, plastic, or fabric? Can you find something that's soft? Something that's hard? What do you notice about this object? Is it shiny or dull? Does it feel smooth or rough? **Using Our Senses** How does this material feel — warm, cold, bumpy, or squishy? What sound does it make when we tap it? Can you smell it? What does it smell like? What happens when you squeeze it? Can you find something that makes a noise? **Testing and Comparing** What happens when we put this in water — does it float or sink? Can you bend it or stretch it? What happens when we drop it? Which one is heavier? Can you sort these objects by how they feel? **Reasoning and Talking About Use** What do we use metal for? Why do we wear clothes made of fabric? Which material would be good for a raincoat? What would happen if your shoes were made of paper? Which material is best for building? **Playful and Practical Prompts** Let's go on a material hunt — what can you find? Can you build something using blocks and tubes? What do you notice when we mix sand and water? Can you sort the objects into soft and hard? Let's make a texture tray — what will you put in it?	**Naming and Identifying Materials** What is this object made of — wood, metal, plastic, or fabric? Can you find something made of glass? Which objects are soft? Which are hard? What do you notice about this material? Can you name something that's shiny? Something that's dull? **Exploring Texture and Properties** How does this material feel — smooth, rough, bumpy, or squishy? Can you bend it, stretch it, or squash it? What happens when you drop it — does it bounce or break? Is it heavy or light? Does it feel warm or cold? **Testing and Comparing** What happens when we put this in water — does it float or sink? Which material is best for keeping something dry? Can you sort these objects by how they feel? Which one is the heaviest? Which is the lightest? What happens when we mix sand and water? **Reasoning and Everyday Use** Why do we use metal for cooking pans? What would happen if your shoes were made of paper? Which material would be best for a raincoat? Why? Why do we use glass for windows? What do we use fabric for? **Playful and Practical Prompts** Let's go on a material hunt — what can you find? Can you build something using different materials? Can you sort the objects into rough and smooth? What do you notice when we press playdough and clay? Let's make a texture tray — what will you put in it?	**Identifying and Naming Materials** What is this object made from — wood, plastic, metal, glass, or fabric? Can you name three things made of metal? Which materials can you see in our classroom? What do you notice about this material? Can you sort these objects by what they're made of? **Describing Properties** Is it hard or soft? Does it feel smooth or rough? Is it bendy or stiff? Is it shiny or dull? Is it waterproof or not? **Testing and Investigating** What happens when we put this material in water? Can you stretch it, squash it, or twist it? Which material is best for keeping something dry? Which object is the strongest? What happens when we drop it — does it bounce or break? **Reasoning and Everyday Use** Why do we use glass for windows? What would happen if your coat was made of paper? Which material would be best for an umbrella? Why? Why do we use metal for cooking pans? What makes plastic useful for bottles? **Playful and Practical Prompts** Can you go on a material hunt around the classroom? Can you build something using different materials? Can you sort these objects into waterproof and not waterproof? What do you notice when we mix sand and water? Let's design a raincoat — what materials should we use?	**Identifying and Naming Materials** What is this object made from — wood, metal, plastic, glass, fabric, or rock? Can you name three things made of the same material? Which materials can you find in our classroom? What do you notice about how this material looks and feels? Can you sort these objects by what they're made of? **Describing Properties** Is it hard or soft? Flexible or rigid? Does it feel smooth, rough, bumpy, or sticky? Is it waterproof or absorbent? Is it transparent, translucent, or opaque? Can you stretch it, squash it, twist it, or bend it? **Testing and Investigating** What happens when we put this material in water — does it float or sink? Which material is best for keeping something dry? Which material would be best for building a strong bridge? What happens when we heat or cool this material? Can you test which material is the strongest? **Reasoning and Everyday Use** Why do we use glass for windows and not fabric? What would happen if your shoes were made of paper? Which material would be best for a raincoat? Why? Why do we use metal for cooking pans? What makes plastic useful for bottles and containers? **Creative and Practical Prompts** Can you go on a material hunt around the classroom or playground? Can you sort these objects into waterproof and not waterproof? Let's design a shelter — what materials should we use? What do you notice when we mix sand and water? Can you build something using different materials and explain your choices

Area of Science	Nursery/ The Hub	Reception	Year One
Seasonal Changes	**General Seasonal Awareness** What's the weather like today? Is it hot, cold, windy, or rainy? What do you see when you look outside? What season do you think it is? What do you like to do when it's sunny? **Autumn** What colours are the leaves? Can you find a crunchy leaf? What happens to the trees in autumn? What clothes do we wear when it's windy? What animals do you see in autumn? **Winter** What does frost or snow feel like? What do you wear when it's really cold? Can you see your breath in the air? What happens to the trees in winter? What do animals do when it's cold? **Spring** What flowers can you see growing? Can you hear any birds singing? What colours do you see in the garden? What happens to the trees in spring? What baby animals might be born in spring? **Summer** What do you like to do when it's hot? What do we wear in summer? Can you find some shade? What do you see at the beach or park? What foods do we eat when it's sunny? **Playful and Practical Prompts** Can you draw a picture of your favourite season? Let's go on a weather walk — what can you see and hear? Can you match the clothes to the right season? What do you notice about the sky today? Can you find something that tells us it's autumn/spring?	**General Seasonal Awareness** What season is it now? How do you know? What's the weather like today? What do you notice when you look outside? What clothes do we wear in this season? What do you like to do when it's sunny/rainy/windy? **Autumn** What colours are the leaves? What happens to the trees in autumn? Can you find a crunchy leaf or a conker? What animals do you see in autumn? What do we wear when it's windy and chilly? **Winter** What does frost or snow feel like? What do you wear when it's really cold? Can you see your breath in the air? What happens to the trees in winter? What do animals do when it's cold? **Spring** What flowers can you see growing? Can you hear any birds singing? What colours do you see in the garden? What happens to the trees in spring? What baby animals might be born in spring? **Summer** What do you like to do when it's hot? What do we wear in summer? Can you find some shade? What do you see at the beach or park? What foods do we eat when it's sunny? **Playful and Practical Prompts** Can you draw a picture of your favourite season? Let's go on a weather walk — what can you see, hear, and feel? Can you match the clothes to the right season? What do you notice about the sky today? Can you sort pictures of trees into seasons?	General Seasonal Awareness What season is it now? How do you know? What changes do you notice outside? How does the weather change in each season? What do you wear in each season? What do you like to do in summer/winter/spring/autumn? Weather and Daylight What is the weather like today? Is it sunny, cloudy, rainy, windy, or snowy? Which season has the longest days? Which season has the shortest days? What happens to the temperature in winter and summer? Nature and Environment What happens to trees in autumn? What do you notice about plants in spring? Can you see any animals or insects today? What changes do you see in the garden across the seasons? What happens to flowers in winter? Reasoning and Comparison Why do we wear coats in winter but not in summer? What would happen if we wore sandals in the snow? Why do some animals hibernate in winter? How do you know it's spring? What do you notice about the sky in summer compared to winter? Playful and Practical Prompts Can you draw a picture of your favourite season? Let's make a weather diary — what should we include? Can you sort clothes into seasons? What do you notice on a seasonal walk? Can you match the tree pictures to the right season?

SEND

Inclusive pedagogy for all learners in Science

How we create an inclusive environment in Science:

Each lesson is planned to follow on from prior learning- both from previous lessons and previous years' learning.
Key concepts and skills are developed systematically over time.
Opportunities for pre-teaching of vocabulary and key concepts.
Provide step-by-step instruction for practical experiments with visual aids if required.

How we scaffold learning to support children who have literacy and numeracy difficulties:

Provide children with topical word banks and picture cards.
TA/LSA to collate a word/ picture bank during introduction to allow children to follow along with the learning.
Scaffold learning as appropriate- child could explain verbally/ adult to scribe or note-take their answers/ film the child explaining or conducting the work.
Use other ways to record- using a pictogram
Use apparatus used in Maths lessons to support science learning when apporpraite.

How we scaffold learning to support children who struggle to retain vocabulary:

Begin each lesson with a review of vocabulary.
Provide word banks that can be accessed throughout a topic- children could tick the words they feel confident using as they move through the topic.
Refer to the language regularly during lessons.

How we scaffold learning to support children who need time to develop conceptual understanding:

Provide children with pre-teaching opportunities to hear vocabulary prior to the lesson.
Plan small group teaching opportunities.
Provide learners with worked examples to use as a model.

How we scaffold learning to support children with attention difficulties:

Create a calm classroom environment.
Think about seating plans- having learners who struggle to concentrate closer to the teacher or teaching assistant.
Pre-expose learners to any equipment being used and how the lesson will be organised and run.

How we support children who struggle with change and transitions:

Prepare learners in advance of the format of the lesson as it may be different to usual (especially during practical activities).
Using visual resources (now/ next boards, visual time lines).
Show children objects/ pictures from the lesson if this motivates them to take part in the lesson.

Assessment

Pre-Nursery and Nursery

Pre-NURSERY 18-36 months										
Names										
Explore and respond to different natural phenomena in their setting or on trips. E.g. jumping in puddles, looking at animals at the farm										
Looks at natural objects and features of their environment sometimes naming them and showing them to adults e.g. picks up a leaf and brings it to grown up saying leaf										
Explores different sensory materials e.g. sand, water, gloop, fabrics and makes simple comments it wet, no like										
Engages with cause and effect toys such as push button toys, hammer and ball, water spinning wheels										

BASELINE FOR NURSERY										
Names										
Explore and respond to different natural phenomena in their setting or on trips commenting as they do. E.g. jumping in puddles and singing rain, rain or looking at animals at the farm and saying it smells of poo										
Notices detailed features of objects in their environment e.g. leaves on trees, insects in the playground										
Beginning to make generalisations and connections e.g. when asked what happens when it rains: we get puddles/wet										
Comments on cause and effect objects e.g. I go fast (when on a bike), it down there (when they drop something), my ice cream gone, (when ice										

Working Towards END OF YEAR EXPECTATIONS FOR NURSERY										
Names										
Makes simple comments on the natural world and tries to answer a range of questions.										
Observes the natural environment with interest, talking about simple features of plants and animals.										
Talk about some of the things that have happened when exploring e.g. comments how the colour has changed when looking through a coloured filter,										
Observes and comments on obvious changes e.g. that an ice-cream has melted/been eaten, a bike moves faster when peddled faster										

Expected for END OF NURSERY and baseline for Reception											
Names											
Comments and asks questions about aspects of the natural world including plants, animals and the weather. E.g. What is that on the tree? Where do ladybirds live? What do worms eat?											
Can communicate related ideas and observations using simple phrases e.g. which food to give which animal, where they found a mini-beast											
Talk about why things happen and how things work and uses senses to explore.											
Can comment on simple changes relating to growth, decay and change over time e.g. eggs turning into chicks											

Reception

Expected for END OF NURSERY and baseline for Reception							
Names							
Comments and asks questions about aspects of the natural world including plants, animals and the weather. E.g. What is that on the tree? Where do ladybirds live? What do worms eat?							
Can communicate related ideas and observations using simple phrases e.g. which food to give which animal, where they found a mini-beast							
Talk about why things happen and how things work using their senses to explore.							
Can comment on simple changes relating to growth, decay and change over time e.g. eggs turning into chicks							

Working TOWARDS EARLY LEARNING GOAL

Names							
Examine living things to find out more about them, talking about similarities and differences E.g. Notices birds and butterflies have wings, knows that it is cold in the snow and warm in the sun.							
Recognise some environments that are different to the one in which they live. E.g. the woods have deer, different types of birds to what I might see in the garden, lots of trees. Etc.							
Show some understanding of growth, decay and change over time and that the environment changes depending on the season. E.g. notices some of the changes that happen as a plant grows.							

Working AT EARLY LEARNING GOAL							
Names							
Explore the natural world around them, making observations and drawing pictures of animals and plants							
Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class							
Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter							

Working AT GREATER DEPTH WITHIN THE EARLY LEARNING GOAL

Names							
Makes links between different parts of the natural world relating to plants and animals e.g. some trees lose their leaves but others don't,							
Talks in more details about the differences and similarities between contrasting environments and is starting to talk about reasons why they might be different.							
Talks about the reasons why things change in more detail and how the processes might happen							

KS1

Year One

Working AT THE EXPECTED STANDARD- Year One					
Names					
Working Scientifically					
Ask what, how and why questions about what they have observed.					
Use observations to answer questions using simple scientific language.					
Observe changes over time and notice simple patterns.					
Use simple secondary sources to find information.					
Group and classify animals and materials.					
Conduct simple comparative tests using simple scientific equipment.					
Communicate ideas, what they do and what they find out using appropriate scientific language.					

Working AT THE EXPECTED STANDARD- Year One					
Names					
Subject Specific Knowledge					
Name and locate parts of the human body.					
Name and locate parts of the body related to senses.					
Describe some ways humans can stay healthy (diet and exercise).					
Name and describe observable features of a range of animals. (Amphibians, birds, fish, mammals and reptiles, including pets).					
Compare observable features of animals from a range of groups. (Amphibians, birds, fish, mammals and reptiles, including pets).					
Group animals according to what they eat. Use the words carnivore, herbivore and omnivore.					
Identify a variety of common wild and garden plants including deciduous and evergreen trees.					

Working AT THE EXPECTED STANDARD- Year One					
Names					
Subject Specific Knowledge					
Identify and describe the basic structure of a variety of common flowering plants and trees. (leaves, flowers, petals, fruit, roots, bulb, seed, trunk, branches, stem).					
Observe and describe seasonal changes.					
Observe and describe weather associated with the four seasons.					
Comment on how day length varies across the seasons.					
Distinguish objects from material.					
Identify and describe simple physical properties of a range of everyday materials. (Wood, plastic, metal, glass, water and rock).					
Compare and group everyday materials based on their physical properties.					

Working AT GREATER DEPTH within THE EXPECTED STANDARD-YEAR ONE					
Names					
Working Scientifically					
Asks a range of appropriate questions that will help them to further their understanding of what they have observed /noticed.					
Is starting to give reasons as to why they think changes might have occurred.					
Chooses an appropriate way to record details they have observed. (E.g. drawings, notes, tables)					
Can group animal and plants by their observable features and materials based on their properties and give appropriate reasons using scientifically accurate language.					
Performs a simple test to explore a question of my own					
Independently uses simple information sources to find out new things and share their findings with their peers					
Begins to explain why I think something happened when making a conclusion about a simple test I have completed.					

Working AT GREATER DEPTH within THE EXPECTED STANDARD- YEAR ONE

Names					
Subject Specific Knowledge					
Applies their knowledge of the human body to label a range of animals					
Is able to group objects according to what sense we would need to use them. (e.g. food – sight, smell, taste, touch; music – hearing; book – sight)					
Observes, researches and begins to explain the functions of the basic structure of plants					
Creates their own 'garden' through photographs, drawing, writing etc that fits a purpose (e.g. Nanny wants her garden to be green all year round, Mum wants a variety of blue flowers but doesn't want anything to grow in the winter, Grandad loves vegetables but hates raking up leaves.)					
Uses knowledge of animal groups to create their own zoo, farm or aquarium ensuring all of the animals are grouped and safe (e.g. don't eat each other)					
Uses knowledge of the structure of a variety of animals to create an animal to match a given criteria (e.g. An animal that flies and swims and that is a carnivore – children will need to consider wings, feathers, scales and gills, sharp teeth and claws when designing their animal.)					

Year Two

Working AT THE EXPECTED STANDARD- Year Two					
Names					
Working Scientifically					
Ask their own questions about what they have observed.					
Observe closely to answer questions using simple scientific language.					
Observe changes over time and notice simple patterns.					
Use secondary sources to find information.					
Group and classify a wider range of animals and materials.					
Conduct simple comparative tests using simple scientific equipment.					
Gather and record data to help answer questions.					
Communicate ideas, what they do and what they find out in a variety of ways using appropriate scientific language.					

Working AT THE EXPECTED STANDARD- Year Two					
Names					
Subject Specific Knowledge					
Describe the main changes as young animals, including humans, grow into adults.					
Describe the basic needs of animals, including humans, for survival. (Water, food and air).					
Describe the importance for humans of exercise, a balanced diet and good hygiene.					
Describe how animals obtain their food from plants and other animals using a simple food chain.					
Observe and describe how seeds and bulbs grow into mature plants.					
Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.					
Know the impact of changing the water, light and temperature to a plants' health.					

Working AT THE EXPECTED STANDARD- Year Two

Names					
Subject Specific Knowledge					
Identify whether things are alive, dead or have never lived.					
Identify that most living things live in suitable habitats.					
Identify and name a variety of plants and animals in their habitats, including microhabitats.					
Describe how different habitats provide for the basic needs of different animals and how animals are suited to their habitat.					
Identify the suitability of a variety of everyday materials for particular uses. (Wood, metal, plastic, glass, brick, rock, paper and cardboard).					
Compare the suitability of a variety of everyday materials for particular uses. (Wood, metal, plastic, glass, brick, rock, paper and cardboard).					
Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.					
Think about the properties that make materials unsuitable for particular purposes.					

Working AT GREATER DEPTH within THE EXPECTED STANDARD-YEAR TWO

Names					
Working Scientifically					
(2S GD) Creates a hypothesis of their own to investigate.					
(2S GD) Select an appropriate way to record what they have found out and explain why they have chosen this method (R&R)					
(2S GD) Proves and explains why changes have occurred over time. (C&E)					
(2S GD) Creates a hypothesis based on patterns they have noticed. (C&P)					
(2S GD) Proves why something belongs/does not belong to a certain group and classification (R&R)					
(2S GD) Uses evidence from different types of scientific investigations they have independently carried out/independent research from secondary sources to compare/contrast/or justify their findings. (C&E, C&P)					
(2S GD) Can complete and write up their own scientific investigation independently. (P, C&E, R&R)					

Working AT GREATER DEPTH within THE EXPECTED STANDARD- YEAR TWO

Names					
Subject Specific Knowledge					
(2S GD) Devises their own food chain of at least three steps and can justify why they have included their chosen animals and plants. (K&U)					
(2S GD) Can create, write about or discuss their own habitat that would suit a group of animals and plants (e.g. a fox, toad, rabbit, daffodil) (K&U)					
(2S GD) Devises a healthy lifestyle and wellness program including diet, hygiene and exercise to help humans stay healthy based on independent research and prior knowledge and can justify why they chose their options. (K&U)					
(2S GD) Using their knowledge of basic needs make links and comparisons to different animals and their needs (e.g. a camel can go long times without water but humans could only survive two days, although whales need air they can stay under water for long periods of time whereas sharks do not need air) (K&U)					
(2S GD) Recommends materials to create an object (e.g. a ship, a building, a car etc.) and can justify why they would recommend their chosen materials based on their properties. (K&U)					