

Science Scheme of Work

Year 2 – Autumn 1 and 2

Topic: Roots, Shoots, Buckets and Boots

Activities	Intended Outcomes	Key Vocabulary and Questions
<u>Growing plants</u> Ongoing task throughout the year – Keeping an allotment or some growing areas. It is highly recommended that throughout the year the children maintain an allotment/growing area. This will help to reinforce the learning they will gain from the more focussed tasks, as well as provide a meaningful link to why it is important for scientists and farmers to know the conditions that seeds and plants require in order to grow. Recording The children could keep a large book in which they can stick drawings and photos of their allotment and other plant areas throughout the year. Children will become more familiar with plant names if they are able to work with a range across the year. <u>Seeds</u> Observing - What are different seeds like? Children use sight and touch to observe their seeds. Encourage children to look at seeds carefully with a hand lens or microscope/viewer. Sorting - How many ways can we sort seeds? Provide children with a range of different seeds (many different types can be found in bird seed). Ask them to find different criteria for sorting them – e.g. colour, shape, size and texture. Provide the children with a ‘seed size chart’. This you can make yourself; simply draw around 6 or so different sized seeds. Shade in these drawings. The children can then try placing these seeds on this chart; trying to find the drawing that has the closest size to that seed.	<u>Plants-:</u> - To be able to observe and describe how seeds and bulbs grow into mature plants. - To be able to use the local environment throughout the year to observe how different plants grow. (non statutory) <u>Living things and their habitats-:</u> - To be able to identify and name a variety of plants... in their habitats. <u>Working Scientifically-:</u> - To be able to observe closely using simple equipment. (Hand lenses) - To be able to use simple features to compare living things and, with help decide how to sort and group them. (non-statutory).	Trees - deciduous, evergreen, ash, birch, beech, rowan, common lime, oak, sweet chestnut, horse chestnut, apple, willow, sycamore, fir, pine , holly, etc Wild flowering plants - cleavers, coltsfoot, daisy, dandelion, garlic mustard, mallow, mugwort, plantain, red clover, self heal, shepherd’s purse, sorrel, spear thistle, white campion, white deadnettle and yarrow. Garden plants – crocus, daffodil, bluebells, etc Parts of plants – roots, branch, trunk, stalk, leaf, flower, petal, seeds, bulbs and twigs Need of plants – water, light, heat, temperature
Assessment Opportunities		

Recording The children could draw some of their seeds in their books. They could group the seeds together according to one of their criteria. They could add any descriptive words. COLLECT ACORNS and CONKERS IN AUTUMN <u>Planting bulbs in different areas</u> Comparative test - What do bulbs need so that can grow healthily? Note-: Key Stage 1 children do not need to conduct a fair test or predict what they think will happen. However, clear 'unfair' examples during testing are a good start to using 'measures' in science and relating back to the question will enable children to use their ideas to make a plan. The children should be encouraged to share their ideas about what they think the bulbs and seeds will need, as well as how they could go about finding out what the seeds/bulbs need. NOTE-; Seeds and bulbs need water to grow but most do not need light; seeds and bulbs have a store of food inside them. Recording – Discuss the question above with the children; capture their ideas in the class book or on learning wall. The bulbs will need to be planted in the autumn; from October to December, before the first frost.. For information on growing bulbs visit - http://www.bbc.co.uk/gardening/basics/techniques/plant_bulbs1.shtml This is an investigation for children to do over some time. They could try growing bulbs in different conditions; pots/garden beds, areas that receive water/drier areas, area in sunlight/areas in the dark, etc. Once the bulbs have started to sprout the children can measure growth over time. Each group could have a set of bulbs in a different area of the school grounds. Which ones sprout first in the Spring? Recording Take a photo of the different types of bulb before they are planted and stick these in the class book. Leave space alongside each of the photos	<u>Plants-:</u> • To be able to observe and describe how seeds and bulbs grow into mature plants. • To find out and describe how plants need water, light and a suitable temperature to grow and stay healthy. <u>Working Scientifically-:</u> • To be able to recognise that questions can be answered in a range of ways. • To be able to perform a simple test. • To be able to observe and record with some accuracy, the growth of a variety of plants as they change over time from a seed or a bulb. (non-statutory) • To be able to set up a comparative test to show that plants need light and water to stay healthy. (non- statutory) • To be able to gather and record data to help in answering questions. (use a ruler to measure in cm once bulbs begin to grow)	Link to end of unit on Insight- Plants/Living things and their habitats. Resources • Whole class book • Bird seed containing a variety of seeds, • Whiteboard viewer • Microscope/Hand lenses, • Home-made 'seed size chart' • Five easy bulbs to grow: Narcissus- 'Tête-à-Tête' Tulipa- 'Queen of Night' Scilla siberica(Siberian squill) - 'Spring Beauty' Fritillaria meleagris (fritillaries) Crocus vernus -'Pickwick' -Flower pots
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to stick in more photos taken of the same plant at different times in the year. Each time new photos are stuck in, include speech bubbles with comments that the children have made. Remember, as the bulbs begin to sprout, to record some length measurements alongside each of the photos.

Science Scheme of Work

Year 1 – Autumn 1 and 2 continued

Topic: Happily Ever After

Activities	Intended Outcomes	Key Vocabulary and Questions
<u>Grass Heads (growing seeds)</u> Simple test – My tights are covered with seeds from outside. How could we find out if they will grow? Hook – Video clip from www.bbc.co.uk/learningzone/clips/ - ‘Growing plants’ and ‘Seeds’ Observe some different grass seeds using a microscope/viewer/hand lenses. How could we find out if they will grow? The children must decide what conditions they think the seeds need in order to grow. Make grass heads by using a small length of tights. They can decide where to place the pot and when to water the seeds. Recording The children can draw each of their seeds They can draw how they are trying to grow the seeds and can make a note of where/why/how they plan to try and grow their seeds. As time passes, they can keep a diary showing changes. <u>Testing the needs of plants (for growth and to stay healthy-water/light)-</u> <u>Mini garden</u> Investigation over time – Do seeds need water so that they can grow? Some could investigate do they need light to be healthy? Ask the children to discuss how they could find out the answer to this question. Hook - Mystery seeds. Provide the children with a small amount of seeds. Ensure that there are pairs of each type of seed. The children will need to ensure that one of the pair is placed in a container with soil and is watered, whereas the other one of the pair is in soil but receives no water. The same with light This can be done as part of the <u>mini garden project</u> in re-cycled food containers.	<u>Plants-:</u> - To be able to observe and describe how seeds grow into mature plants. <u>Working Scientifically-:</u> - To be able to gather and record data to help in answering a question. - To be able to observe closely, using simple equipment (hand lens) - To be able to gather and record data to help in answering questions. <u>Plants-:</u> - To be able to observe and describe how seeds grow into mature plants. - To find out and describe how plants need water, light and a suitable temperature to grow and stay healthy. <u>Working Scientifically-:</u> - To be able to gather and record data to help in answering a question.	Trees - deciduous, evergreen, ash, birch, beech, rowan, common lime, oak, sweet chestnut, horse chestnut, apple, willow, sycamore, fir, pine , holly, etc Wild flowering plants - cleavers, coltsfoot, daisy, dandelion, garlic mustard, mallow, mugwort, plantain, red clover, self heal, shepherd’s purse, sorrel, spear thistle, white campion, white deadnettle and yarrow. Garden plants – crocus, daffodil, bluebells, etc. Parts of plants – roots, branch, trunk, stalk, leaf, flower, petal, seeds, bulbs and twigs Need of plants – water, light, heat, temperature Grow, germinate, reproduce

Recording

Once again, the children can maintain a table over time in which they can draw (maybe including measurements later on) the growth of their seed. The children could record 'germinate' when they see their plant begin to grow from the seed

Testing if temperature affects plant growth (BEST DONE IN SUMMER)

Investigation over time – What type of temperature do plants need so that they can grow?

Show children 4 plants of the same species each in its own flowerpot; 'A', 'B', 'C' and 'D'.

Using some white paint make two marks on each of the plants; where a leaf joins a stem and the next point further up the stem where another leaf joins. Measure the length between the two white marks. Ask them to decide where to place the pots. Explain that each of the places should have a different temperature. Take the pots to the places that the children have decided upon. Model how to measure the temperature in these places with a thermometer.

Recording

The children can draw a map showing where the plants have been left and the temperature in each of these locations.

They can then be provided with the table below, which they can complete over time.

Visit the plants outside over a period of time.

Letter on plant	Where it is	Temperature	Date: Length	Date: Length	Date: Length
A					
B					
C					
D					

- To be able to observe closely, using simple equipment (hand lens)
- To be able to use simple measurements- ruler, cm(non-statutory)

Plants:-

- To find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.

Working Scientifically:-

- To be able to gather and record data to help in answering a question. (fill in a pre-prepared table)
- To be able to use simple measurements and equipment to gather data- thermometer-c modelled. Ruler-cm. (non-statutory)

Assessment Opportunities

Linked to end of unit on Insight -:Plants

Resources

- tights, soil, re-cycled yogurt pots or plastic cups.

Plant pots, Fast growing seeds: white mustard, rocket, flax, mung beans or radishes.

You can use dried beans or peas from the supermarket but make sure you soak them in cold water the night before you want the children to use them.

4 plants (potted Basil works well) white paint, thermometer, ruler

placed in their own pot, whilst 3 or 4 small seeds can be placed in another pot. Once they are covered in soil the whole pot can be wrapped in a polythene bag until the shoots begin to show.	<u>Working scientifically-</u>: • To be able to gather and record data to help in answering a question. • To use their observations and ideas to suggest answers to questions.	Tree seeds , plant pots, soil
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Year 2 – Spring 1 continued into Spring 2
Topic: London's Burning

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playground’. Which of its properties will make it suited to its role and which of them would not? Recording – the children can choose some of their favourite combinations. Each time they can record the object, the material and what they think about the combination. What do you want to know? As a class gather children’s questions about what they want to know about materials. These can be recorded on the white board or on the Learning Wall. <u>How are we going to find out the answers to our questions? (Whole school symbols)</u> Being a detective This game is designed to enable the children to first recognise that there are a range of ways we can find out things in science, and then secondly for them to choose the most appropriate method for a particular question. Begin by sharing with children the ways in which we can find things out in science. Show the whole school symbols (TBC) 1. Survey – count the number of things 2. Do a test - find out what happens to something when we change something about it 3. Classifying – put things into groups 4. Investigation over time – watch or measure something over time 5. Secondary source – use a book or internet Each of these different types of enquiry could be displayed on posters at the front of the room. Call out one of the children’s questions. With help, in a group, they can decide which type of enquiry/enquiries would be best for finding out the answer. When asked, one member from each group can place sticker on the poster showing the enquiry that they have chosen.	• To be able to identify and discuss the uses of different everyday materials so that they become familiar with how some materials are used for more than one thing or different materials are used for the same thing. (non-statutory) <u>Working Scientifically-;</u> • To be able to ask simple questions and recognise that they can be answered in different ways. • To be able to use their observations and ideas to suggest answers to questions.	Resources • Digital microscope/viewer • Home-made spinners; on one there are drawings and labels of different materials – e.g. wood, plastic, metal, glass. On the other are drawings and labels of objects • Posters showing the different types of scientific enquiry
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<u>Best material- suitability for purpose</u> NOTE- other test can be performed to test suitability for purpose BUT N.C PoS and Working Scientifically Learning outcomes including equipment use and measuring must be met by activity. Simple test– Which material is best for the bottom of children’s school shoes? Hook – The mystery box! Begin the lesson with a box wrapped in brown paper and addressed to you class. Open the box and pull out a pair of children’s trainers. Then, pull out a letter. This letter could be from an annoyed customer who has bought a pair of trainers for their child, but they are just not good enough! Allow children an opportunity to discuss the desired properties for a material that was to be used to make the bottom of children’s school shoes. They might choose; it is difficult for it to rub off on other surfaces, it is tough, it is bouncy, it is waterproof, it grips, etc. You could choose to test a range of their questions. <u>Testing materials for ‘bounce’</u> Simple test – How well do different materials bounce? Ask the children to discuss how they could test how well different materials bounce. Provide the children with balls of the same size but made from different materials. Can they help you decide what to measure. Work together to compose a table. (See below) You could use non-standard units of measurement by using a long sheet of paper taped on the wall or chalk marks. On the paper could be stuck different colours of wool of different lengths as a guide or marks on the wall. If the children are able, use standard units with a ruler in cm, m. Recording. The children can record in a table the material being tested and the colour of the wool/height it bounced up to.	<u>Uses of everyday Materials-;</u> - To be able to identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses. <u>Uses of everyday Materials-;</u> - To be able to identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses. <u>Working scientifically-;</u> - To be able to gather and record data to help in answering a question (fill in table that they have had support to create as a class)) - To be able to use simple measurements and equipment to gather data. Ruler-cm, m. (non-statutory)	A mystery box, containing a pair of children’s trainers and wrapped in brown paper A ruler, paper, wool (3 colours) or chalk Balls made from different materials: rubber, plastic, sponge, polystyrene, etc.
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Material	Colour of wool/height it bounced to	Colour of wool/height it bounced to		

They could be encouraged to complete this scientists' recommendation slip – 'I would recommend that you use for your school shoes because

Wood

Survey – what are the uses of wood?

Take the children for a walk in and out of the school. Discover how many things are made form wood. The children could suggest reasons why wood was chosen in each of the cases.

Recording

The children could draw each of the objects made from wood and explain why wood was chosen as the material for these objects.

Testing wood for properties

Simple tests

Hook – An email from an owner of a timber yard. This email could be asking for the assistance of the scientists. The children/scientists must test the properties of wood so that they can let the owner know what wood is good at, so that he can then use this in his advertising posters.

A carousel of tests could be set up around the classroom. The children could visit each one in order to test out a different property of wood:

1. Strength – The children might have discovered that objects like fences need to strength in order to stand up against strong winds. The children place a small sheet of wood between two small piles of books. Using a hair dryer, they could find out what happens when fast air hits the wood panel. They could then try out other types of materials.

Uses of everyday Materials-:

- To be able to identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses.

Working Scientifically-:

- To be able to use their observations and ideas to suggest answers to questions.
- To be able to perform simple tests.

Variety of woods

- Hair dryer
- Drawing pins
- Elastic bands
- Photos of objects made from wood
- Cardboard tubes
- Small, heavy metal objects

2. How easy it is to put nails into it – The children could carefully try pressing drawing pins into the wood. Again, this can be repeated on other materials. 3. Weight. The children could attach an elastic band around a piece of wood of a particular size and try picking it up with only finger and thumb. Once again, compare to other materials of similar size. 4. How hard it is. The children place some wood on the floor. On this wood they can stand up a cardboard tube. They can then drop different small heavy objects made from metal down the tube. Each time, they can look at the wood to see if any marks have been made. They can then try the same test on other materials. 5. Using secondary sources. This could also be part of the carousel. Children could have a range of pictures of objects made from wood. For each picture they will need to suggest why wood was chosen, if another material would have been as good, and which materials would not have worked. Recording The children could design an advertising poster for the owner of the timber yard; explaining the uses for wood. <u>Plastic uses</u> Survey – what are the uses of plastic? Again, take the children around the classroom, school and outside to find out all the objects that are made from plastic. The children can take it in turns to pretend that they were the designer of the object. These children must explain why they chose plastic for that object. Recording Photos of the objects can be placed in the class book or on the Learning wall. Children's explanations can be recorded on thought bubbles and stuck around the pictures. <u>Testing Plastic for flexibility (to squirt liquid!)</u> Hook – An email from an owner of a plastic factory. Just like above, the children can be set the challenge to find the most flexible plastic to be	• To observe closely using simple equipment. • To be able to gather and record data to help in answering questions. <u>Uses of everyday materials:-</u> • To be able to identify and compare the uses of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard. <u>Working Scientifically:-</u> • To be able to use their observations and ideas to suggest answers to questions.	• Plastic containers that could squirt water – e.g. salad cream bottles, ketchup bottles, washing-up liquid
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used as liquid holders. The factory might have received complaints from older people that some of the containers were not flexible enough. Simple test – How flexible are plastics? Show children a range of plastic bottles that have been used for storing different liquids. Good ones to use include: salad cream bottles, ketchup bottles, washing-up liquid bottles, shower gel bottles and water bottles. The children can try to work out how to test how flexible different plastics are. They could decide to test them by placing water inside each of them, taking them out on to the playground, and then seeing how high far they squirt water. They can measure the distance using metre rulers. Each time, they can describe how difficult it was to squirt the water. Recording Can they design a simple table (with some support) to present their results. They could draw each of the containers and record next to each one the length the water travelled and how difficult it was to squeeze the container. <u>Fabric- Stretchiness</u> Simple test – Which tights are the stretchiest? Hook - A context for this investigation could be a poem called 'The Little Old Lady From 54' by Andrew Collett (in 'Always Eat Your Bogies'). The children could be trying to find out the best tights for the little old lady to keep in her handbag in case she is attacked by the spider. The children could help to plan this investigation. This could be assisted by the teacher deliberately doing it wrong – e.g. the teacher can add 100g to one set of tights and then 500g to another. Although at Key Stage 1 there is no expectation for the children to plan fair tests, they will realise by the teacher deliberately doing it wrong that some things need to remain the same to make the test fair. The children can measure how far the tights stretch by placing paper on the wall for marking or chalks. Prepare this resource for the children – ensure that you have at least three colour bands (e.g. red, blue and	• To be able to perform simple tests. • To observe closely using simple equipment. • To be able to gather and record data to help in answering questions (With support, design a simple table to present results.) • To be able to use simple measurements and equipment to gather data-rulers, cm, m.(non-statutory) <u>Uses of everyday materials-:</u> • To be able to identify and compare the uses of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard. <u>Working Scientifically-:</u> • To be able to use their observations and ideas to suggest answers to questions. • To be able to perform simple tests. • To observe closely using simple equipment.	bottles, shower gel bottles and water bottles • Metre rulers Different types of tights • Home-made colour charts for measuring the length of stretch on paper. • Masses (weights from cooking area or maths equipment) Ruler, cm,m.
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green) – and ensure that you have already tested the bands/tights – so that the least stretchy and the most stretchy definitely stretch alongside different colours. The children can then use standard measures with a ruler-cm, m. Recording The children could be encouraged to think about a range of ways or recording what happened. You could then model these methods on the board. It might be then appropriate for children to choose a suitable method. Can they help to prepare a simple table. The children could write a short letter to the Little Old Lady from 54. They could explain which tights are the stretchiest and thus best to keep in her handbag! <u>Modelling and sharing results for transparency</u> Simple test – Which material is best at letting light through? Hook – Begin with evidence Inform the children that they will be shown some evidence from a scientist who is quite well known for making mistakes. He was trying to find out which type of material would be best for a new windscreen in a racing car. They must decide whether his test was any good, as well how much they agree/disagree with what he says that he has found out. Method – ‘I was trying to find out which material was best at letting light pass through. I wanted to test plastic, aluminium foil, glass, paper and wood. I placed each material on the table and used different torches to shine light at them. The glass let through so much light that I decided to use two layers of glass instead of one. My results below show that plastic let through the most light.	• To be able to gather and record data to help in answering questions (With support, design a simple table to present results.) • To be able to use simple measurements and equipment to gather data-rulers, m.(non-statutory) <u>Uses of everyday materials-:</u> • To be able to identify and compare the uses of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard.	• Torches • Different types of materials
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Type of material	Amount of light that passed through
Glass	Some
Plastic	Lots
Aluminium foil	Some
Wood	None
Paper	Lots

Once the children have picked holes in the scientist’s investigation they can decide how they will find the answer to the question.

Health and Safety - Remind children that they cannot shine torches into each other’s eyes.

Recording

The children could record their results in a table.

They can then discuss what they found out and how they found it out.

As a class, you can compose an email back to the ‘scientist’.

Changing the shape of materials

Exploring – How well can we change the shapes of some solid objects

Begin by discussing with children what they think the term ‘solid’ means. Establish that a solid has a definite shape that remains the same unless a force is acting upon it.

Home-made goo– Using only salt, plain flour, water and cooking oil the children can make their own stretchy material. Ask them to make a

Working Scientifically-:

- To be able to use their observations and ideas to suggest answers to questions.
- To be able to perform simple tests.
- To observe closely using simple equipment.
- To be able to gather and record data to help in answering questions
- To be able to use simple measurements and equipment to gather data. (non-statutory)

- Toy cars (check that they will travel in straight lines)
- Ramps (with either different surfaces, or detachable surfaces).
 - Long plain cheap paper
 - Sticky dots
 - Cubes
 - Rulers

Uses of everyday materials-:

- To be able to find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.

variety of shapes e.g. by twisting, stretching, bending, or squashing the materials.

Colourful slime – Put 10 tablespoons of cornflour in a bowl. Add 50ml of water at a time until there is a thick paste. Stir with a wooden spoon/ Add 2 teaspoons food colouring and stir. Squeeze.

Ask children to try to do the same with other objects e.g. Plasticene, Blu Tack, elastic bands, foam sponges, soft rubber ball, paper, fabric, metal/wooden spoon, and to describe what happens.

Children compare the materials and rate (e.g. with stars or their own ratings) according to how bendy, squashy, able to be stretched, able to be twisted, etc.

Recording

Material	Ability to be squashed	Ability to be bent	Ability to be twisted	Ability to be stretched

Problem-solving - Applying knowledge to make a product

The children could be challenged to design and to make a dolls/toy house for a toy company. In order to sell the house, the toy company would like to know why the children choose the materials for the walls, windows, roof, etc. Some of the model might have to be made with a particular material, but labelled to show what it would be in real life – e.g. the walls might be card, but labelled 'brick', etc.

Working Scientifically:-

- To be able to use their observations and ideas to suggest answers to questions.
- To be able to perform simple tests.
- To observe closely using simple equipment.
- To be able to gather and record data to help in answering questions (With support, decide how to rate materials)

A variety of objects that can change when twisted, squashed, stretched and bent.

- Home-made goo ingredients – salt, plain flour and cooking oil.
- Colourful slime ingredients – cornflour and food colouring

Uses of everyday materials:-

- To be able to identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses.

Science Scheme of Work

Year 2 – Spring 2

Topic: Fire and Fantasy

Activities	Intended Outcomes	Key Vocabulary and Questions
<u>Healthy Eating</u> Classifying – Which foods make a healthy diet? Show children an example of a lunchbox. Discuss with children why some food when eaten in too large amounts is bad for our health – e.g. sugar, salts and fats. Share information from secondary sources such as books and internet. With the children, classify the foods in the lunchbox: green for foods we can eat quite a lot of, amber for those we can eat quite often, and red for foods we can eat as treats. Provide children with lunchboxes with different contents. They can classify each one using the 'green, amber, red system'. They can decide what advice they would give to the owners of each of the lunchboxes. Recording Children could draw an unhealthy and a healthy lunchbox. <u>Hygiene</u> Survey – How often do we wash ourselves? Why do we wash our hands etc. Children could find out from each other. Be sensitive here to not let it get personal! Do children have preferences for a shower, a bath? Recording Children could tally how many children perform particular cleaning activities each day: clean teeth, wash hands, wash hair. Or create a tally for bath/shower preference. <u>Food hygiene</u> Keeping food clean. Discuss the importance food hygiene with the children.	<u>Animals including Humans-:</u> - Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene - To be able to ask questions about what humans need to stay healthy (non-statutory). <u>Working Scientifically-:</u> - To be able to use simple secondary sources to find answers (non-statutory) <u>Animals including Humans-:</u> - Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene. - To be able to ask questions about what humans need to stay healthy (non- statutory). <u>Working Scientifically-:</u> - To be able to record simple data- tally (non statutory)	- Life processes – growth, nutrition (feeding), respiration (breathing is part of this) - Hygiene – clean, wash, germs - Foods – healthy, grow, strong, energy
		Assessment Opportunities
		Part of unit on Insight-: Animals, including humans.
		Resources
		Books about keeping healthy, food, • Lunchboxes/pictures of lunchboxes containing different types and amounts of food.

Recording Children could draw a poster showing how someone could look after their food: place in fridge/freezer, wash all container and cutlery, wash hands, etc. <u>A healthy lifestyle</u> When discussing the needs of humans, it is best to consider the bigger picture; i.e. What makes a healthy lifestyle? The children's ideas might be stimulated by the following video: http://www.bbc.co.uk/learningzone/clips/a-healthy-lifestyle/2274.html Importance of exercise Discuss with children why it is important to exercise. They might identify: to maintain a healthy weight, to be flexible, to have strong muscles, to make sure organs like the heart and lungs are in good shape, and to make yourself feel good. Video - http://www.bbc.co.uk/learningzone/clips/the-importance-of-exercise/2268.html <u>Exercise</u> Explore - What happens when you exercise? The children could investigate what happens to their bodies when they try different forms of exercise. Suggest ideas for a simple test and devise a simple table for results. After exercise, they could touch their foreheads to see whether they are warm, or feel their chests to find out whether their hearts are pumping faster and their lungs are working harder. Investigate – Which exercise makes you puff the most? Children could decide three different exercises to try. After doing each exercise a partner can hold a sheet of paper in front of the child and count the number of breaths (the paper moving upwards). Discuss with the children which exercise made their bodies work hardest. Recording The children could show on a table the different exercises and the number of breaths taken after each of them.	<u>Animals including Humans-:</u> • Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene. • To be able to ask questions about what humans need to stay healthy (non- statutory). <u>Working Scientifically-:</u> • To be able to gather and record data to help in answering questions (Devise a simple table). • To be able to perform a simple test.	
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Science Scheme of Work

Year 2 – Summer 1

Topic: Curious Creatures and Seaside Holidays

Activities	Intended Outcomes	Key Vocabulary and Questions
<u>Habitats /Basic needs of animals</u> Deep thinking time – Which habitats do you know of on our amazing planet Earth? Try to begin by establishing with children what an amazing planet it is that we live on. Make sure you model the wonder of the natural world and encourage the children to be fascinated by the variety of the organisms that surround us. Try also not to focus solely on animals and plants from other countries. We are so lucky to live in a country full of amazing organisms. Some amazing animals and plants can be found near our school. The following video will allow your class to discuss the variety of habitats that exist in the world and the different animals and plants that live there: http://www.bbc.co.uk/learningzone/clips/an-introduction-to-different-habitats/2315.html What do you want to know about habitats? As a class gather children' questions about what they want to know about plants and animals in the local habitats and others around the world. These could be recorded on the white board or on the Learning Wall. Being a detective This game is designed to enable the children to first recognise that there are a range of ways we can find out things in science, and then secondly for them to choose the most appropriate method for a particular question Begin by sharing with children the ways in which we can find things out in science. Whole School symbols TBC. You could show these on the white board alongside a symbol or picture that they would recognise as that method again in the future: 1. Survey – count the number of things 2. Do a test - find out what happens to something when we change something about it	<u>Living Things and their Habitats-:</u> • To identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other. • To be able to identify and name a variety of plants and animals in their habitats, including micro-habitats. <u>Working Scientifically-:</u> • To be able to ask simple questions and recognise that they can be answered in different ways.	<u>Living things and their habitats-:</u> Classification - Carnivores, herbivores, omnivores Stages of growth of many insects – egg, larva, pupa, adult Stages of life –baby, toddler, child, teenager, adult Life processes – growth, nutrition (feeding), respiration (breathing is part of this) <u>Animals, including Humans-:</u> Classification - Birds, fish, amphibians, reptiles, mammals and invertebrates Classification - Carnivores, herbivores, omnivores Stages of growth of many insects – egg, larva, pupa, adult Names of some invertebrates – ladybirds, butterflies, dragonflies, etc. Names of some amphibians – smooth newt, common frog, toad Stages of life –baby, toddler, child, teenager, adult • Life processes – growth, nutrition (feeding), respiration (breathing is part of this)

3. Classifying – put things into groups 4. Investigation over time – watch or measure something over time 5. Secondary source – use a book or internet 6. Pattern-seeking – find a relationship between things Each of these different types of enquiry will be displayed on posters at the front of the room. Call out one of the children’s questions. With help, in a group, they can decide which type of enquiry/enquiries would be best for finding out the answer. When asked, one member from each group can place sticker on the poster showing the enquiry that they have chosen. <u>Habitats</u> Identifying – What are different habitats like? Link to Meerkat Mail. Look at Sunny’s Habitat. Research – What lives in other habitats? There are many videos online which will enable the children to view habitats that they might not otherwise be able to visit: http://www.bbc.co.uk/learningzone/clips/a-river-habitat-and-the-living-things-it-supports/13975.html Recording The children could find out a particular habitat and explain why particular animals live there. <u>Food Chains</u> Observation enquiry – What are animals eating? Indoors – Set up a terrarium in which you can keep a small amount of invertebrates throughout a day. Carefully try to select leaves from some of the plants found near where you found them. Allow children to use microscopes and hand lenses to study the animals carefully. Their body parts might give clues as to what they eat. Secondary resources research – Provide children with photos and some simple texts on animals so that they can work out what these animals feed upon.	<u>Living Things and their habitats-:</u> - To be able to describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food. <u>Working Scientifically-:</u> - To be able to observe using a microscope/hand lens - To be able to use simple features to compare living things, and with help decide how to group them	Assessment Opportunities End of unit on Insight-; Animals, including Humans and Living things and their habitats. Resources - Posters showing the different types of scientific enquiry - Camera/iPad
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Outdoors observations – It is rather difficult to find animals actually eating, but there might be evidence left behind. Recording The children could draw some of their animals and the food that it eats. Food-chain headbands Make some headbands from strips of card that have been stapled together. Make a slip at the front in which a picture of an organism can be placed. For a small group of children (around 6) provide them each with a headband and each with an organism card (turned over so they can't see what animal or plant is on it). Ensure that each pile of organism pictures can exist in the same food-chain. Each child must place their picture card in their headbands without looking at the picture. After they have put on their headbands, they must try to organise themselves in a food-chain without telling each what they are. To extend this, children can decide what other animals could have eaten some of the animals in their food chain. Recording Children could draw some of their food-chains. Each time they must ensure that the arrow shows the direction in which the energy is being passed. <u>Animals have offspring</u> NOTE- children are not expected to understand how reproduction occurs. Hook – Creating a wildlife workshop You could inform the children that they are going to be learning about how animals change, what animals need to survive and stay healthy. At the end of the term they will be visited by an 'audience'; this could be parents or other children. During this visit they must be able to share what they have learnt – maybe by showing pictures, drawing, photos, videos, etc. Observing and recording the lifecycle of animals This area of science could be made quite dry to children. With a little more pre-planning and a few resources it could be made much more exciting for them. Videos – Animals and their offspring	• To be able, with guidance, to begin to notice patterns and relationships <u>Animals including Humans-:</u> • To notice that animals, including humans have offspring that grow into adults. <u>Working Scientifically-:</u> • To be able to use observations to suggest answers to questions. • To be able to record data (flow diagram).	
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When looking at the photos, ask the children to work out the order of the animal's life cycle.
<http://www.bbc.co.uk/learningzone/clips/african-animals-and-their-young/12646.html>

<http://www.bbc.co.uk/learningzone/clips/what-are-baby-animals-like/12670.html>

Ordering the stages of animals' development
 How can you work out the order of the animals' life cycles?
 Provide children with pictures of different animals at various points in their development. Children will need to put together the pictures of the same animal. They will then order each of the animals' pictures from young to adult. It would be more challenging to include a range of different types of lifecycles:

1. A chicken - <http://learncreatelove.com/?p=8013>
2. A frog - <http://www.topmarks.co.uk/spring/FrogLifeCycle.aspx?age=ks2>
3. A newt
4. A dragonfly
5. A butterfly

Investigating animals over time
 This is an opportunity for the children to actually see the different stages of some animals' life cycles. A couple of possibilities are described below:

Ladybirds
 Most minibeasts life-cycles are too long for children to observe all events from egg to adult but ladybirds are an exception. They have a life-cycle of 4 to 5 weeks.
 Try to find ladybirds yourself in early May.

1. Start breeding ladybirds in early May. The sexes are not easy to tell apart, so try to capture two that are pairing, or keep in a container until you see mating taking place.
2. After mating has occurred remove the male as he may eat eggs that the female lays. Keep the female in a transparent container and provide her with greenfly (aphids).

3. Remove the female to another container once she has produced one batch of eggs. By doing this, she might lay eggs in different containers, so there is more for children to observe.
4. Once the larvae have hatched from the eggs, be sure to provide plenty of greenfly or they may eat each other.
5. Each larva will moult 3 times and then turn into a pupa which should not be disturbed. After a further 4-6 days an adult will emerge

Eggs of minibeasts (Year 1 often raise butterflies)

Egg hunt – Spring to late summer is a good time to try and find the eggs of minibeasts. Places to look include: soil, damp crevices, under bark, under branches and stones, the under surface of leaves, and where leaves join the stem.

Observation children can record outside:

- Are the eggs attached to anything?
- Are they easy to see?
- Are they found on their own or in groups?
- Where in the wildlife area were they found? (They could make a map)

Making observations of invertebrate eggs indoors

As well as ladybird eggs, you could use: snails, slugs, cabbage butterfly and water snails.

Keep eggs in a container on the material they were found on outside (unless it is likely to decay). Keep the temperature cool and even.

Tadpoles of frogs (EYFS generally raise tadpoles as part of their UW curriculum)

<http://www.cleapss.org.uk/attachments/article/0/G206.pdf?Primary/Resources/Guides/>

The website above provides all the information you will require for making sure that you look after tadpoles in careful manner.

Birds

Video. The following is a video of chaffinch chick being fed and growing -

<http://www.bbc.co.uk/learningzone/clips/the-growth-and-development-of-a-chaffinch-no-narration/7521.html>

A good idea is to install a webcam into a bird box. The children can then keep a diary to show how the changes that take place. Have these ready during the winter so that the birds can nest in them come spring time. Recording The children can keep their own diaries showing the development of the different animals over time. <u>Living/dead/never been alive</u> Survey – How many different living things can we find? The processes common to all living things are: movement, respiration, sensing, nutrition, excretion, reproduction and growth (MRS NERG). Take the children outside. Explain to them that they have the challenge to work out the things that living things can do that non-living things can't do. You will probably need to begin with talking about both plants and animals are things that children will need to look at. It might help them if you have put some laminated symbol, lolly stick, etc next to a range of things for them to visit in order to decide whether it is living or not. Recording The children could divide a page in half. Down one side they record non-living things and down the other side living things. In addition, they could draw a stick man. Around the stick man can be drawn thought bubbles. Inside each bubble the children can write 'A living thing'. Game - Living things – 'run-around' Take the children into a large space. Ask a child to name one thing that all living things can do – e.g. 'move'. Divide the space into two parts; place a 'living' sign' in one half and 'non-living' in the other. Hold a sign up with 'move' written on it. Then, from a pile of upturned picture cards, choose a card and show it to the children. Using the idea that all living things 'move on their own', the children must stand in the half of the area that corresponds to the picture shown. Carry on with this activity, each time identifying another process of living things. Children will probably need a	<u>Living Things and their Habitats-:</u> To be able to explore and compare the differences between things that are living, dead, and things that have never been alive.	Signs for 'run-around' game: 'living', 'non-living', 'movement', 'growth', etc. Pictures of organisms and non-living objects
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little help with: reproduction, respiration (i.e. converting energy from food) and excretion (getting rid of waste products). Add a little challenge by showing images of things that occur outside but are not alive; rocks, shells (from animals that were once alive), wood (from plants that were once alive) and maybe even fossils.		
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Science Scheme of Work

Year 2 – Summer 2

Topic: Curious Creatures and Seaside Holidays

Activities	Intended Outcomes	Key Vocabulary and Questions
<u>Plants and Animals in their habitats –incl micro habitats</u> (under log, on stony path, under bushes) Habitats- incl microhabitats Discuss a range of habitats in the school ground that you would like the children to study (these can include microhabitats). Visit each of the habitats with the children. Ask them to describe each one by using their senses. Now tell them that they are going to pretend that they are special types of estate agents; ones that sell homes to invertebrates! The children will need to visit a habitat and describe what it is like there: damp/dry, light/dark, warm/cold, etc . Do habitats change during a year? Discuss. Recording The children can draw each of the habitats and describe what it is like there. They could do this in the form of an advert at an estate agents. Observation enquiry –Why would an animal live in that habitat? Drama - The amazing shrinking child - Tell the children that they have been shrunk to an animal that is the size of a pen lid. Take them outside and look for animal life under a pile of logs. Now talk with the children about what these animals would need in order to survive. Hopefully you will identify ideas that relate to: air, heat, shelter, light, food and safety from predators. Ask the children to be much fussier now about where they would live – i.e. which of the habitats would fulfil their requirements and which ones would not.	<u>Living Things and their Habitats-:</u> - To be able to identify and name a variety of plants and animals in their habitats, including micro-habitats. <u>Working Scientifically-:</u> - To be able to observe closely (hand lenses) <u>Living Things and their Habitats-:</u> - To be able to identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other.	Habitat, micro habitat Pond, meadow, log pile, woodland, river, lake, beach, cliff Organism – plant, animal Trees - deciduous, evergreen, ash, birch, beech, rowan, common lime, oak, sweet chestnut, horse chestnut, apple, willow, sycamore, fir, pine, holly, etc Wild flowering plants - cleavers, coltsfoot, daisy, dandelion, garlic mustard, mallow, mugwort, plantain, red clover, self heal, shepherd's purse, sorrel, spear thistle, white campion, white deadnettle and yarrow. Garden plants – crocus, daffodil, bluebells, etc Parts of plants – roots, branch, trunk, stalk, leaf, flower, petal, seeds, bulbs and twigs Invertebrates – snail, slug, woodlouse, spider, beetle, fly, etc Pond animals – pond skater, water slater, ramshorn snail, pond snail, leech, common frog, smooth newt, etc

Recording Allow the children a chance to draw what their animal looks like. They can then describe how it is suited to surviving in the habitat in which they have placed it. You can take this further by asking the child what would happen to their animal if they placed it in a range of different habitats. Children could take their imaginary animal to another child's habitat and talk about how well their animal would survive. <u>Whole Class Investigations and Experiments to use practical scientific methods, processes and skills</u> 1) Best material for carrying water- using knowledge from 'Uses of Everyday materials' and 'Working Scientifically'. Children to investigate carrying water in a container- (bucket/flower pot) linked to Seaside Holidays Topic. There could be a hole in the bucket? Which material is best for blocking the hole? Hook – song – 'There's a hole in my bucket'. After singing the song together, a message could arrive. This could be a message from Henry, requesting urgent help in finding the best material to block the hole in his bucket. How can we find out the answer to the question? Use whole school symbols (TBC) to discuss the best way. Show the children a container with a hole in the bottom (bucket/flower pot). Ask them to suggest materials that would be good at preventing water from leaking through the hole. Ask them also to think about how they could find out which is the best material for doing this. Plan and design a test. Children to suggest what could be compared/measured. In small groups, the children could find out which material plugs the hole the best. They could measure the amount of water that goes into the container, and then measure the amount of water that passes through the hole. How will they measure time/water?	<u>Uses of everyday Materials-:</u> - To be able to identify and compare the suitability of a variety of everyday materials for particular uses <u>Working Scientifically-:</u> - To be able to raise and ask simple questions and recognise that they can be answered in different ways. - To be able to carry out simple tests (child to suggest features to be compared). - To be able to observe closely using simple measurements –l, ml, hours, min, sec. - To observe closely using simple equipment-measuring vessels, digital timer. - To be able to gather data to help answer the question. - To be able to record data, with support and communicate their findings (try to suggest ways of recording data)	Assessment Opportunities Linked to end of unit on Insight-Living things and their habitats Opportunities to note those Working Scientifically Resources Pots for collecting invertebrates in - Paint brushes and spoons (for picking up invertebrates) - Hand lenses - Home-made invertebrate identification charts http://www.cleapss.org.uk/attachments/article/0/G206.pdf?Primary/Resources/Guides/ http://www.cleapss.org.uk/attachments/article/0/L071.pdf?Primary/Resources/Guides/ http://www.butterflyschool.org/teacher/raising.html - Pictures of various animals at many of their stages of development. - A variety of resources for keeping the minibeast/s being studied healthy.
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Suggest ways to record data. Gather and record data. Present results and make conclusions (through talking) and link back to original question. Send a message back to Henry, explaining which material is best at blocking the hole in his bucket. Henry could later reply with a thank you. 2)Testing different surfaces for a bathing machine- Topic link- Seaside holidays and Bathing machines (DT design and make). How easily do they roll down different surfaces. <u>Testing surfaces-</u> Simple test– On which surface will the Bathing machine travel the furthest? Begin by allowing the children to explore toy cars on ramps. Children can explore what happens when: they push the car, change the height of the ramp, change the surface of the ramp, change the size of the car, etc. Hook – Osbourne House on the Isle of Wight is replacing the ramps for Queen Victoria’s Bathing machine to travel down. The current ones do not go far enough! Can the children find the ‘best’ surface for the replacement ramps. The children could be encouraged to think about how they should perform the test; how high the ramp should be each time, the type of machine to use, how many surfaces need to be tested, how many tests on each surface, how they will ‘measure’ the distance travelled, and how they could show their results. Measuring distance: 1. The machines could travel along lengths of cheap wallpaper paper, and the distance travelled could be recorded with different colour sticky dots. 2. The children could measure in cm. Recording This is good opportunity to support the children with recording their results in a table. Report back to Osbourne House your findings.	<u>Uses of everyday Materials-:</u> - To be able to identify and compare the uses of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard. Working Scientifically-: - To be able to use their observations and ideas to suggest answers to questions. - To be able to perform simple tests. - To observe closely using simple equipment. - To be able to gather and record data to help in answering questions (With support, design a simple table to present results.)	- Sketches of life cycles of a range of animals -http://www.kidzone.ws/animals/lifecycle.htm - Ladybirds (adults) available from various suppliers (e.g. http://www.greengardener.co.uk/product.asp?id_pc=34&cat=75) Variety of materials for making containers in which to keep the minibeasts. - Minibeast eggs - Containers with holes in the bottom (e.g. a flower pot) - Materials for plugging holes in the flowerpot; Blu Tack, Plasticene, clay, wax, straw, etc, Measuring jugs, digital timers Bathing machines made out of construction kits for testing purpose (not the children’s creations) Ramps (with either different surfaces, or detachable surfaces). - Long plain cheap paper - Sticky dots - Rulers
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