

Science Progression Document



Plants

| Nursery | Reception | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
|---|---|---|--|--|--------|--------|--------|
| <p>Explain that a seed or bulb grow into a plant and then die.</p> <p>Asking simple questions Observing Over Time</p> | <p>Talk about trees, bushes, flowers, vegetables, herbs.</p> <p>Asking simple questions Observing Over Time</p> | <p>Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees.</p> <p>Daisy, daffodil, tulip, Ash tree, pine tree. Recognise that deciduous trees lose their leaves in autumn and grown new leaves in spring, whilst evergreen trees keep their leaves all year round.</p> <p>Supported to use ID charts on nature hunt walks.</p> <p>Identifying and Classifying</p> | <p>Observe and describe how seeds and bulbs grow into mature plants.</p> <p>Seeds, germinations, seedlings, mature plants, flowers, seeds, berries, fruit.</p> <p>Bulbs – dormancy, pre-bloom, bloom</p> <p>Observing Over Time.</p> | <p>Identify and describe the functions of different parts of flowering plants:</p> <p>Know: roots – absorb water with nutrients & minerals & keeps it steady and upright, stem/trunk – carries water and nutrients to different parts of the plant, leaves – uses air, water and sunlight to make food and flowers-produce seeds for new plants.</p> <p>Research</p> | | | |
| <p>Make observations of seeds and bulbs.</p> <p>Identifying and Classifying</p> | <p>Talk about the plants they observe.</p> <p>Identifying and Classifying</p> | <p>Identify and describe the basic structure of a variety of common flowering plants, including trees.</p> <p>Leaf, flower, blossom, petal, fruit, berry, root, seed, trunk, branch, stem, bark, stalk, bud.</p> <p>Identifying and Classifying.</p> | <p>Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.</p> <p>Explain the comparison of plants to show they need light, water and suitable temperature to grow. Research and grow.</p> <p>Observing Over Time Comparative & Fair Testing</p> | <p>Explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant.</p> <p>Group planned enquiries changing 1 variable. Plants with/without light/air/water/nutrients/room. Identify similarities and differences due to the variable.</p> <p>Comparative & Fair Testing. Observing Over Time.</p> | | | |
| | | | | <p>Investigate the way in which water is transported within plants.</p> <p>Identify water and nutrients travels up the stem. Know water in absorbed through the roots and not sucked up.</p> <p>Observing Over Time.</p> | | | |
| | | | | <p>Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.</p> <p>Pollination – able to order the process of pollination.</p> <p>Research Comparative & Fair Testing</p> | | | |

Working Scientifically

| | | | | | | | |
|--|---|---|---|---|--|--|--|
| <p>Use discussion with adults to think about what they can see and what is happening. Discuss with adults, who support children to think of an Is it...? question.</p> | <p>Use discussion with adults to start to question what is happening/what might change? Begin to ask their own Is it...? questions.</p> | <p>Observing closely using simple equipment. Taking photos and using magnifying glasses. Stating what they can see, look at colours and shapes. Make comparisons.</p> | <p>Asking simple questions and recognising that they can be answered in different ways. Additional to Year 1 How does it...? Could it...? Questions to compare similarities and differences. Supported questions to start to consider cause and effect. What if...? If we...will it...?</p> | <p>Asking relevant questions and using different types of scientific enquiries to answer them. Asking unit based questions using the question stems. What if...? Where does...? Who can...? How does...? Is there...? With support, begin to identify which of the 5 enquiry types to use.</p> | | | |
| <p>Introduce magnifying glasses. How does it change what you see?</p> | <p>To choose use of magnifying glasses appropriately. Chooses a magnifying glass to look at smaller detail.</p> | <p>Identifying and classifying Observe and test to compare objects, materials and living things. Sort and group things. Choose 2 criteria. Use ID sheets to identify plants.</p> | <p>Observing closely using simple equipment. Additional to Year 1, use measurements and any other collected data. Additional to Year 1, use measurements using non-standard units and comparisons.</p> | <p>Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers. Measuring in cms and data loggers.</p> | | | |
| <p>With support, group pictures/objects to given criteria. Use 2 columns or 2 sorting rings</p> | <p>Group simple pictures/objects to given criteria. Without adult support, use 2 columns or 2 sorting rings.</p> | <p>Gathering and recording data to help in answering questions Record observations using photographs, drawings & labelled diagrams. Record measurements using prepared tables in non-standard units. Classify using sorting rings.</p> | <p>Performing simple tests Additional to Year 1, begin to recognise the benefits of resources provided and use children's questions.</p> | <p>Setting up simple practical enquiries, comparative and fair tests Select from a range of practical resources to gather evidence to answer questions generated by themselves or the teacher. Gather a range of possible variables through class discussion. Pupils choose 1 variable.</p> | | | |
| | | <p>Using their observations and ideas to suggest answers to questions It can... It will... The biggest... The smallest... The best... The worst...</p> | <p>Identifying and classifying Additional to Year 1, sort and group these things, choose up to 3 criteria for sorting. Use simple secondary sources (such as identification sheets) to name living things. Describe the characteristics they used to identify a living thing.</p> | <p>Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions Sometimes decide how to record and present evidence. Record their observations using photographs, videos, pictures, labelled diagrams and writing. Record measurements using tables, tally charts and bar charts from templates with headings. Record classifications using tables & Venn diagrams.</p> | | | |
| | | | <p>Gathering and recording data to help in answering questions Additional to Year 1, record observations using videos. Record measurements using pictograms, tally charts and block graphs.</p> | <p>Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables Year 3-unit vocabulary. Use photographs, videos, pictures, labelled diagrams and writing.</p> | | | |

| | | | | | | | |
|--|--|--|--|--|--|--|--|
| | | | Classify using simple prepared tables. | Use tables, tally charts and bar charts from templates with headings. Use tables & Venn diagrams. | | | |
| | | | Using their observations and ideas to suggest answers to questions I think...because..., The biggest is...because, The smallest is...because, The best is...because..., The worst is...because... | Using straightforward scientific evidence to answer questions or to support their findings. With support, children use at least 1 piece of evidence from their findings to support their answer. | | | |
| | | | | Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions Use conclusion supported stems and templates for written conclusions - use at least 1 piece of data from their findings to support their answer. Produce at least 2 written conclusions. Use conclusion supported stems and templates for, at least 2, oral presentations with to the class or recorded on seesaw - use at least 1 piece of data from their findings to support their answer. With support, use their labelled diagrams/graphs to support their presentation. | | | |

Vocabulary

| Nursery | Reception | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
|---|--|---|---|--|--------|--------|--------|
| <p>Model and encourage children to use vocabulary such as: plant, leaf, stem, trunk, branch, root, bark, flower, petal, seed, berry, fruit, vegetable, bulb, plant, hole, dig, water, weed, grow, shoot, die, dead, soil Expose children to supplementary vocabulary such as: seedling, healthy, unhealthy, strong, sturdy, wilting, decay, mould, life cycle</p> | <p>Model and encourage children to use vocabulary such as: plant, tree, bush, flower, vegetable, herb, weed, names of plants they see, name of a contrasting environment e.g. beach, forest Expose children to supplementary vocabulary such as: environment</p> | <p>Leaf, flower, blossom, petal, fruit, berry, root, seed, trunk, branch, stem, bark, stalk, bud Ash tree, pine tree. Daisy, daffodil, tulip,</p> | <p>As for Year 1 plus light, shade, sun, warm, cool, water, grow, healthy</p> | <p>Photosynthesis, pollen, insect/wind pollination, seed formation, seed dispersal (wind dispersal, animal dispersal, water dispersal)</p> | | | |

Living Things and Their Habitats

| Nursery | Reception | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
|--|--|--------|--|--------|--|---|---|
| <p>Find and identify natural objects to include in the collection. Which natural objects are from plants, animals or neither?</p> <p>Classification</p> | <p>Name and describe plants and animals they find in the school grounds.</p> <p>Classification</p> | | <p>Explore and compare the differences between things that are living, dead, and things that have never been alive.</p> <p>Know: <i>Living things – needs air, feeds, grows, reproduces & gets rid of waste.</i> <i>Dead things used to do this but no longer does & decays.</i> <i>Never alive has never done any of the above.</i></p> <p>Identifying & Classifying Research</p> | | <p>Recognise that living things can be grouped in a variety of ways.</p> <p>Use Venn and Carroll diagrams to classify animals. Create own criteria e.g. has hair/fur, can fly, has legs, fish, etc</p> <p>Identifying & Classifying Pattern Seeking</p> | <p>Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird.</p> <p>Draw the life cycle of different vertebrates and insects and describe the similarities and difference between them.</p> <p>Research Identifying & Classifying</p> | <p>Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals.</p> <p>Give examples of & key characteristics of animals in the five vertebrate groups and insects</p> <p>Classifying & Identifying Pattern Seeking</p> |
| | <p>Look for minibeasts in different areas of the school grounds. Look for plants in different areas of the school grounds.</p> <p>Pattern Seeking</p> | | <p>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.</p> <p>Habitats: mountain – snow leopard, brown bear, bald eagle; ocean-dolphin, octopus, turtle; forest-squirrel, badger, woodpecker; desert-camel, meerkat, scorpion; polar-polar bear, penguin, narwhale; river-otter, kingfisher, frog; coastal- crab, seal, starfish; rainforest-tiger, orang-utan, macaw; savannah-giraffe, lion, zebra.</p> <p>Research Identifying & Classifying</p> | | <p>Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment.</p> <p>Follow id keys to identify nature around the school ground and pictures from the wider environment. Collect natural things from the school grounds – e.g. insects in pooters (follow guidance), shake from a bush onto a white sheet, pond dipping, leaves, twigs etc.</p> <p>Classifying & Identifying</p> | <p>Describe the life process of reproduction in some plants and animals.</p> <p>Know that most animals reproduce sexually. Explain the difference between sexual and asexual reproduction and give examples of how plants reproduce in both ways</p> <p>Research Identifying & Classifying</p> | <p>Give reasons for classifying plants and animals based on specific characteristics.</p> <p>From vertebrate & insect animals plus flowering/non-flowering plants</p> <p>Identifying & Classifying</p> |
| | | | <p>Identify and name a variety of plants and animals in their habitats, including microhabitats.</p> <p>Choose 2 habitats and 1 microhabitat with a partner and identify 3 animals and 2 plants which live in each (reduce for microhabitat as there may only have an observation of 1 animal and plant e.g., moss/grass).</p> <p>Classifying & Identifying</p> | | <p>Recognise that environments can change and that this can sometimes pose dangers to living things.</p> <p>Research changes to environments over time – negative drought, floods; positive – farmers adding nature areas and stopping the use of pesticides.</p> <p>Use current information as discussion points to</p> | | |

Pattern Seeking

environmental changes in the wider world.
Study how changes to a garden environment can affect hedgehogs and what people can do to help.
Research

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.
3 different, 3-part food chains.
Research

Working Scientifically

With support, group pictures/objects to given criteria.
Use 2 columns or 2 sorting rings

Group simple pictures/objects to given criteria.
Without adult support, use 2 columns or 2 sorting rings.

Identifying and classifying
Additional to Year 1, sort and group these things, choose up to 3 criteria for sorting.
Use simple secondary sources (such as identification sheets) to name living things.
Describe the characteristics they used to identify a living thing.

Setting up simple practical enquiries, comparative and fair tests
Addition to Year 3, more questions to be child generated.

Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.
Turn an independent simple question – do all planets have the same year? Into a scientific question – Does the distance of a planet change the time it takes to orbit the Sun?

Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.
Independently and in pairs chose up to 2 variables and decide on the appropriate enquiry to complete.

Perform simple tests with adults from pupil - adult conversations discussing their observations.
Complete tests planned for through adult discussions.
Discuss what they are testing, how and why and talk about their observations.

Gathering and recording data to help in answering questions
Additional to Year 1, record observations using videos.
Record measurements using pictograms, tally charts and block graphs.
Classify using simple prepared tables.

Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions
Additional to Year 3, record measurements using tables, tally charts and bar charts from templates without headings. Record classifications using Carroll diagrams.
Support given to present the same data in different ways in order to help with answering the question.

Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs
Independently & in pairs choose a suitable type of table for their enquiries. Create labelled diagrams to support conclusions and on whiteboards during recap.
Independently create bar graphs recognising the required increments. With support, create line and scatter graphs. Support provided to choose suitable increments, plot and interpret results.

Identifying scientific evidence that has been used to support or refute ideas or arguments
Independently use their scientific question to create an answer and compare 2 pieces of data as evidence to identify the effect of the variable.

Discuss observations.

Discuss and draw observations.

Recording findings using simple scientific language,

Identifying scientific evidence that has been used to support or refute ideas or arguments.

Reporting and presenting findings from enquiries, including conclusions, causal

| | | | | | | | |
|--|--|--|--|--|--|---|--|
| Through adult questioning, begin to identify similarities and differences. | Begin to identify similarities independently | | | | <p>drawings, labelled diagrams, keys, bar charts, and tables</p> <p>Additional to Year 3</p> <p>Year 4-unit vocabulary.</p> <p>- Use tables, tally charts and bar charts from templates without headings.</p> <p>Use Carroll diagrams.</p> <p>Support given to present the same data in different ways in order to help with answering the question.</p> | <p>With support, use their scientific question to create an answer and compare 2 pieces of data as evidence to identify the effect of the variable.</p> | <p>relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations</p> <p>Independently and in pairs, present their findings. Have at least 2 written conclusions, media presentation, labelled diagrams,</p> <p>Oral explanations use scientific vocabulary and explain causal relationships e.g. the birds with pointy beaks survive better as the shape allows them to eat the seeds easily.</p> |
| | | | | | <p>Using straightforward scientific evidence to answer questions or to support their findings.</p> <p>Additional to Year 3, children complete independently & in pairs.</p> | <p>Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations</p> <p>Use conclusion layout support to present their findings.</p> <p>Have at least 2 written conclusions, media presentation, labelled diagrams,</p> <p>With support oral explanations use scientific vocabulary and explain causal relationships e.g. the hotter the water, the quicker the solid dissolves.</p> | |

Vocabulary

| Nursery | Reception | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
|--|--|--------|--|--------|--|---|--|
| <p>Model and encourage children to use vocabulary such as: natural, plant, animal, leaves, seeds, conkers, acorns, twigs, bark, shells, feathers, pebbles, stones, same, different, pattern</p> <p>Expose children to supplementary vocabulary such as:</p> <p>living, dead, similar</p> | <p>Model and encourage children to use vocabulary such as: plant, tree, bush, flower, vegetable, herb, weed, animal, names of plants and animals they see, name of a contrasting environment e.g. beach, forest</p> <p>Expose children to supplementary vocabulary such as:</p> <p>environment</p> | | <p>Living, dead, never been alive, suited, suitable, basic needs, food, food chain, shelter, move, feed.</p> <p>Habitats - mountain, forest/woodland, ocean, desert, polar, river, coastal, rainforest, savannah.</p> <p>Micro-habitats - under logs, in bushes, under a leaf, soil, flowers, web.</p> | | <p>Classification, classification keys, environment, habitat, human impact, positive, negative, migrate, hibernate</p> | <p>Life cycle, reproduce, sexual, sperm, fertilises, egg, live young, metamorphosis, asexual, plantlets, runners, bulbs, cuttings</p> | <p>Vertebrates, fish, amphibians, reptiles, birds, mammals, invertebrates, insects, spiders, snails, worms, flowering, non-flowering</p> |

Animals including Humans

| Nursery | Reception | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
|--|--|--|---|---|--|---|---|
| <p>Can name and describe animals they have encountered.</p> <p>Identifying and Classifying</p> | <p>Support children to name and describe animals that live in different habitats while reading books, watching videos, looking at pictures or playing matching games.</p> <p>Research Identifying and Classifying</p> | <p>Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals. Goldfish, shark, salmon, frog, toad, salamander, crocodile, lizard, turtle, magpie, robin, starling, human, dog, lion, cat, cow, rabbit, sheep, bear.</p> <p>Research Identifying and Classifying</p> | <p>Notice that animals, including humans, have offspring which grow into adults. <i>Human-baby, frog-tadpole, cat-kitten, dog-puppy, egg-butterfly.</i></p> <p>Research</p> | <p>Identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat. Identify nutrition from food packaging. Identify types of nutrients from the Eatwell plate.</p> <p>Research</p> | <p>Describe the simple functions of the basic parts of the digestive system in humans. Digestive system - able to order the process and explain what happens at each stage.</p> <p>Research Identifying and Classifying Observing Over Time</p> | <p>Describe the changes as humans develop to old age. Create a timeline to identify changes in humans during their life.</p> <p>Research Observing Over Time</p> | <p>Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood.</p> <p>Circulatory system – explain the order of the circulatory system and what happens at each stage.</p> <p>Research</p> |
| <p>Experience caring for eggs/animals and talk about how they cared for them.</p> <p>Observing Over Time Research</p> | <p>Support children to talk about how animals are cared for when they live outside their natural habitat.</p> <p>Research</p> | <p>Identify and name a variety of common animals that are carnivores, herbivores and omnivores. Cat, lion, crocodile, cow, rabbit, sheep, human, dog, bear</p> <p>Research Identifying and Classifying</p> | <p>Find out about and describe the basic needs of animals, including humans, for survival. Identify water, food air & shelter as the basic need of animals for survival.</p> <p>Research</p> | <p>Identify that humans and some other animals have skeletons and muscles for support, protection and movement. Explain: skeletons provide support, movement and protection. Muscles work in pairs to move the bones – when one contracts whilst the opposite relaxes.</p> <p>Research Identifying & Classifying</p> | <p>Identify the different types of teeth in humans and their simple functions. Identify incisors for cutting; canines for tearing; and molars and premolars for grinding (chewing).</p> <p>Research Identifying and Classifying</p> | | <p>Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function. Can explain that diet, exercise, drugs and lifestyle have an impact on the way our bodies function. They can affect how well our heart and lungs work, how likely we are to suffer from conditions such as diabetes, how clearly we think, and generally how fit and well we feel. Some conditions are caused by deficiencies in our diet e.g. lack of vitamins.</p> <p>Research Comparative & Fair Testing Pattern Seeking</p> |
| | | <p>Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and</p> | <p>Describe the importance for humans of exercise, eating the right amounts of different</p> | | <p>Construct and interpret a variety of food chains, identifying producers, predators and prey.</p> | | <p>Describe the ways in which nutrients and water are transported within animals, including humans.</p> |

| | | | | | | | |
|--|--|---|---|--|--|--|---|
| | | <p>mammals, including pets).</p> <p>Fish – scales, gills, fin, tail, lay eggs.</p> <p>Amphibians – tails when young and legs when fully grown, lay eggs, gills when young, lungs when fully grown.</p> <p>Reptiles – lay eggs, scaly, needs sunshine to keep warm, legs.</p> <p>Birds – lay eggs, legs, wings, feathers, beaks.</p> <p>Mammals – hair or fur, 4 legs and some have 2 arms & 2 legs, gives birth.</p> <p>Research Identifying and Classifying</p> | <p>types of food, and hygiene.</p> <p>Running and jumping increase heart rate and sweat. Know too much sugar and fat make it harder for the body to work.</p> <p>Identify between healthy and unhealthy foods – foods from the Eatwell plate. Know the importance of using tissues, washing hands, bathing & brushing teeth.</p> <p>Research Pattern Seeking Identifying & Classifying</p> | | <p>Name producers, predator and prey in a habitat. Create a food chain through research. Know that the arrow is the transfer of energy.</p> <p>Research Classifying & Identifying</p> | | <p>Explain that nutrients, water and oxygen are transported in the blood to the muscles and other parts of the body where they are needed.</p> <p>Research Observing Over Time</p> |
|--|--|---|---|--|--|--|---|

| | | | | | | | |
|---|--|---|--|--|--|--|--|
| <p>Encourage children to describe how they have changed since they were babies.</p> <p>Observing Over Time</p> | <p>Support children to look at photographs of different people and to describe them.</p> <p>Pattern Seeking</p> | <p>Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.</p> <p>Eyes – sight, ears – hearing, nose-smell, tongue – taste, skin – touch.</p> <p>Identifying & classifying Pattern Seeking Comparative & Fair Testing</p> | | | | | |
|---|--|---|--|--|--|--|--|

Working Scientifically

| | | | | | | | |
|---|--|---|--|---|--|--|---|
| <p>With support, group pictures/objects to given criteria. Use 2 columns or 2 sorting rings</p> | <p>Group simple pictures/objects to given criteria. Without adult support, use 2 columns or 2 sorting rings.</p> | <p>Asking simple questions and recognising that they can be answered in different ways. Is it...? Will it...? Can it...? Questions to compare similarities and differences.</p> | <p>Asking simple questions and recognising that they can be answered in different ways. Additional to Year 1 How does it...? Could it...? Questions to compare similarities and differences. Supported questions</p> | <p>Asking relevant questions and using different types of scientific enquiries to answer them. Asking unit based questions using the question stems. What if...? Where does...? Who can...? How does...? Is there...?</p> | <p>Asking relevant questions and using different types of scientific enquiries to answer them. Asking questions; some independently and some using the question stems. I wonder whether...? Can we find a way to...?</p> | <p>Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary. Turn an independent simple question – do all planets have the same year? Into a scientific question – Does the distance of</p> | <p>Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary. Independently create a scientific question. Independently and in pairs chose up to 2 variables and decide</p> |
|---|--|---|--|---|--|--|---|

| | | | | | | | |
|---|--|---|---|--|---|--|--|
| | | | to start to consider cause and effect. What if...? If we...will it...? | With support, begin to identify which of the 5 enquiry types to use. | What happens when...? Why does...? Begin to identify the enquiry type most suitable to find the answer. | a planet change the time it takes to orbit the Sun? Independently and in pairs, choose a variable for their chosen enquiry. | on the appropriate enquiry to complete. |
| <p>Work in small groups to perform provided simple tests with adults.</p> <p>With adult support complete a simple test provided by an adult and discuss what/how they are testing and observing</p> | <p>Perform simple tests with adults from pupil - adult conversations discussing their observations.</p> <p>Complete tests planned for through adult discussions. Discuss what they are testing, how and why and talk about their observations.</p> | <p>Performing simple tests</p> <p>Use practical resources provided to gather evidence to answer teachers adaption of children's simple questions to provide tests to classify; comparative tests; pattern seeking enquiries; and make observations over time.</p> | <p>Observing closely using simple equipment.</p> <p>Additional to Year 1, use measurements and any other collected data. Additional to Year 1, use measurements using non-standard units and comparisons.</p> | <p>Setting up simple practical enquiries, comparative and fair tests</p> <p>Select from a range of practical resources to gather evidence to answer questions generated by themselves or the teacher. Gather a range of possible variables through class discussion. Pupils choose 1 variable.</p> | <p>Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.</p> <p>In addition to Year 3, measuring temperature using thermometers.</p> | <p>Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs</p> <p>Independently & in pairs choose a suitable type of table for their enquiries. Create labelled diagrams to support conclusions and on whiteboards during recap. Independently create bar graphs recognising the required increments. With support, create line and scatter graphs. Support provided to choose suitable increments, plot and interpret results.</p> | <p>Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs</p> <p>Additional to Year 5 – Independently & in pairs choose suitable graphs between bar, line or scatter graphs. Independently & in pairs, decide on suitable increments, plot accurately and interpret results.</p> |
| <p>Discuss observations.</p> <p>Through adult questioning, begin to identify similarities and differences.</p> | <p>Discuss and draw observations.</p> <p>Begin to identify similarities independently</p> | <p>Identifying and classifying</p> <p>Observe and test to compare objects, materials and living things.</p> <p>Sort and group things.</p> <p>Choose 2 criteria.</p> <p>Use ID sheets to identify plants.</p> | <p>Performing simple tests</p> <p>Additional to Year 1, begin to recognise the benefits of resources provided and use children's questions.</p> | <p>Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions</p> <p>Sometimes decide how to record and present evidence. Record their observations using photographs, videos, pictures, labelled diagrams and writing. Record measurements using</p> | <p>Setting up simple practical enquiries, comparative and fair tests</p> <p>Addition to Year 3, more questions to be child generated.</p> | <p>Identifying scientific evidence that has been used to support or refute ideas or arguments.</p> <p>With support, use their scientific question to create an answer and compare 2 pieces of data as evidence to identify the effect of the variable.</p> | <p>Identifying scientific evidence that has been used to support or refute ideas or arguments</p> <p>Independently use their scientific question to create an answer and compare 2 pieces of data as evidence to identify the effect of the variable.</p> |

| | | | | | | | |
|--|--|--|--|--|--|--|--|
| | | | | <p>tables, tally charts and bar charts from templates with headings.</p> <p>Record classifications using tables & Venn diagrams.</p> | | | |
| | | <p>Gathering and recording data to help in answering questions</p> <p>Record observations using photographs, drawings & labelled diagrams.</p> <p>Record measurements using prepared tables in non-standard units.</p> <p>Classify using sorting rings.</p> | <p>Identifying and classifying</p> <p>Additional to Year 1, sort and group these things, choose up to 3 criteria for sorting.</p> <p>Use simple secondary sources (such as identification sheets) to name living things. Describe the characteristics they used to identify a living thing.</p> | <p>Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables</p> <p>Year 3-unit vocabulary.</p> <p>Use photographs, videos, pictures, labelled diagrams and writing.</p> <p>Use tables, tally charts and bar charts from templates with headings.</p> <p>use tables & Venn diagrams.</p> | <p>Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions</p> <p>Additional to Year 3, record measurements using tables, tally charts and bar charts from templates without headings. Record classifications using Carroll diagrams.</p> <p>Support given to present the same data in different ways in order to help with answering the question.</p> | <p>Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations</p> <p>Use conclusion layout support to present their findings.</p> <p>Have at least 2 written conclusions, media presentation, labelled diagrams.</p> <p>With support oral explanations use scientific vocabulary and explain causal relationships e.g. the hotter the water, the quicker the solid dissolves.</p> | <p>Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations</p> <p>Independently and in pairs, present their findings.</p> <p>Have at least 2 written conclusions, media presentation, labelled diagrams.</p> <p>Oral explanations use scientific vocabulary and explain causal relationships e.g. the birds with pointy beaks survive better as the shape allows them to eat the seeds easily.</p> |
| | | <p>Using their observations and ideas to suggest answers to questions</p> <p>It can...</p> <p>It will...</p> <p>The biggest...</p> <p>The smallest...</p> <p>The best...</p> <p>The worst...</p> | <p>Gathering and recording data to help in answering questions</p> <p>Additional to Year 1, record observations using videos.</p> <p>Record measurements using pictograms, tally charts and block graphs.</p> <p>Classify using simple prepared tables.</p> | <p>Using straightforward scientific evidence to answer questions or to support their findings.</p> <p>With support, children use at least 1 piece of evidence from their findings to support their answer.</p> | <p>Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables</p> <p>Additional to Year 3</p> <p>Year 4-unit vocabulary.</p> <p>- Use tables, tally charts and bar charts from templates without headings.</p> <p>Use Carroll diagrams.</p> <p>Support given to present the same data in different ways</p> | | <p>Using test results to make predictions to set up further comparative and fair tests</p> <p>Independently and in pairs, use their findings to create further scientific questions, using their data to support a prediction.</p> |

| | | | | | | | |
|--|--|--|---|---|---|--|--|
| | | | | | in order to help with answering the question. | | |
| | | | <p>Using their observations and ideas to suggest answers to questions</p> <p>I think...because..., The biggest is...because, The smallest is...because, The best is...because..., The worst is...because...</p> | | <p>Using straightforward scientific evidence to answer questions or to support their findings.</p> <p>Additional to Year 3, children complete independently & in pairs.</p> | | |
| | | | | <p>Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions</p> <p>Use conclusion supported stems and templates for written conclusions - use at least 1 piece of data from their findings to support their answer. Produce at least 2 written conclusions. Use conclusion supported stems and templates for, at least 2, oral presentations with to the class or recorded on seesaw - use at least 1 piece of data from their findings to support their answer. With support, use their labelled diagrams/graphs to support their presentation.</p> | <p>Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions</p> <p>Independently use conclusion stems for written conclusions - use at least 1 piece of data from their findings to support their answer. Produce at least 2 written conclusions. Independently use conclusion stems for, at least 2, oral presentations with to the class or recorded on seesaw - use at least 1 piece of data from their findings to support their answer. Use their labelled diagrams/graphs to support their presentation.</p> | | |

Vocabulary

| Nursery | Reception | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
|--|--|--|--|---|--|---|--|
| <p>Model and encourage children to use vocabulary such as: egg, chick, bird, caterpillar, cocoon, chrysalis, butterfly, frog spawn, tadpole, froglet, frog, grow, change, die, names of animals and their young, fur, feathers, scales, tail, wings, beak, claws, paws, hooves, swim, walk, run, jump, fly, patterns, spots, stripes</p> <p>Expose children to supplementary vocabulary such as: life cycle, mane, webbed feet</p> <p>Model and encourage children to use vocabulary such as: grow, change, baby, toddler, child, adult, old person, smell, taste, touch, feel, hear, see, blind, deaf</p> <p>Expose children to supplementary vocabulary such as: life cycle, senses, elderly, die (if appropriate)</p> | <p>Model and encourage children to use vocabulary such as: names of animals, live, on land, in water, jungle, desert, North Pole, South Pole, sea, hot, cold, wet, dry, snow, ice</p> <p>Expose children to supplementary vocabulary such as: environment, polar regions, ocean, camouflage</p> <p>Model and encourage children to use vocabulary such as: hair (black, brown, dark, light, blonde, ginger, grey, white, long, short, straight, curly), eyes (blue, brown, green, grey), skin (black, brown, white), big/tall, small/short, bigger/smaller, baby, toddler, child, adult, old person, old, young, brother, sister, mother, father, aunt, uncle, grandmother, grandfather, cousin, friend, family, boy, girl, man, woman</p> <p>Expose children to supplementary vocabulary such as: bald, elderly, wrinkles, male, female, freckles</p> | <p>Head, body, eyes, ears, mouth, teeth, leg, tail, wing, claw, fin, scales, feathers, fur, beak, paws, hooves</p> <p>Senses – touch, see, smell, taste, hear, fingers (skin), eyes, nose, ear and tongue</p> <p>Goldfish, shark, salmon, frog, toad, salamander, crocodile, lizard, turtle, magpie, robin, starling, human, dog, lion, cat, cow, rabbit, sheep, bear.</p> <p style="text-align: center;">N.B.</p> <p><i>The children need to be able to name and identify a range of animals in each group e.g. name specific birds and fish. They do not need to use the terms mammal, reptiles etc. or know the key characteristics of each, although they will probably be able to identify birds and fish, based on their characteristics.</i></p> <p><i>The children also do not need to use the words carnivore, herbivore and omnivore. If they do, ensure that they understand that carnivores eat other animals, not just meat. Although we often use our fingers and hands to feel objects, the children should understand that we can feel with many parts of our body.</i></p> | <p>Offspring, reproduction, growth, child, young/old stages (examples - chick/hen, baby/child/adult, caterpillar/butterfly), exercise, heartbeat, breathing, hygiene, germs, disease, food types (examples – meat, fish, vegetables, bread, rice, pasta)</p> | <p>Nutrition, nutrients, carbohydrates, sugars, protein, vitamins, minerals, fibre, fat, water, skeleton, bones, muscles, support, protect, move, skull, ribs, spine, muscles, joints</p> | <p>Digestive system, digestion, mouth, teeth, saliva, oesophagus, stomach, small intestine, nutrients, large intestine, rectum, anus, teeth, incisor, canine, molar, premolars, herbivore, carnivore, omnivore, producer, predator, prey, food chain</p> | <p>Puberty – the vocabulary to describe sexual characteristics (See SCARF resources).</p> | <p>Heart, pulse, rate, pumps, blood, blood vessels, transported, lungs, oxygen, carbon dioxide, nutrients, water, muscles, cycle, circulatory system, diet, exercise, drugs, lifestyle</p> |

Evolution and Inheritance

| Nursery | Reception | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
|---------|-----------|--------|--------|--------|--------|--------|--|
| | | | | | | | <p style="color: red; text-align: center;">Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago.</p> <p style="text-align: center;">Look at fossils to identify how they give us evidence of what lived on the Earth millions of year ago.</p> <p style="text-align: center;">Research</p> |
| | | | | | | | <p style="color: red; text-align: center;">Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents.</p> <p style="text-align: center;">Explain that all living things have offspring of the same kind, as features in the offspring are inherited from the parents. Due to sexual reproduction, the offspring are not identical to their parents and vary from each other.</p> <p style="text-align: center;">Research Pattern Seeking</p> |
| | | | | | | | <p style="color: red; text-align: center;">Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.</p> <p style="text-align: center;">Identify characteristics that will make a plant or animal suited or not suited to a particular habitat</p> <p style="text-align: center;">Identifying & Classifying</p> |

Working Scientifically

| | | | | | | | |
|--|--|--|--|--|--|--|---|
| | | | | | | | <p style="color: red; text-align: center;">Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.</p> <p style="text-align: center;">Independently create a scientific question.</p> <p style="text-align: center;">Independently and in pairs chose up to 2 variables and decide on the appropriate enquiry to complete.</p> |
| | | | | | | | <p style="color: red; text-align: center;">Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs</p> <p style="text-align: center;">Additional to Year 5 – Independently & in pairs choose suitable graphs between bar, line or scatter graphs. Independently & in pairs, decide on suitable increments, plot accurately and interpret results.</p> |
| | | | | | | | <p style="color: red; text-align: center;">Identifying scientific evidence that has been used to support or refute ideas or arguments</p> <p style="text-align: center;">Independently use their scientific question to create an answer and compare 2 pieces of data as evidence to identify the effect of the variable.</p> |
| | | | | | | | <p style="color: red; text-align: center;">Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations</p> <p style="text-align: center;">Independently and in pairs, present their findings.</p> <p style="text-align: center;">Have at least 2 written conclusions, media presentation, labelled diagrams.</p> <p style="text-align: center;">Oral explanations use scientific vocabulary and explain causal relationships e.g. the birds with pointy beaks survive better as the shape allows them to eat the seeds easily.</p> |

Vocabulary

| Nursery | Reception | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
|---------|-----------|--------|--------|--------|--------|--------|---|
| | | | | | | | <p style="text-align: center;">Offspring, sexual reproduction, vary, characteristics, suited, adapted, environment, inherited, species, fossils</p> |

Seasonal Changes

| Nursery | Reception | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
|--|--|---|--------|--------|--------|--------|--------|
| Read stories set in different seasons. Research | Talk about the weather throughout the year. Identifying & Classifying | <p style="text-align: center; color: #C00000; margin: 0;">Observe changes across the four seasons.</p> Create pictures, take pictures and record children's observation in big books from their outdoor walks at the start of each half term. Add observation of plants. (Link to deciduous and evergreen trees in plants) Observing Over Time | | | | | |
| Talk about the weather, if it is hot, cold, raining etc. Identifying & Classifying | Talk about changes that happen through weather – the ground when it rains, puddles when the rain has stopped, very hot days. Observing Over Time | <p style="text-align: center; color: #C00000; margin: 0;">Observe and describe weather associated with the seasons and how day length varies.</p> During each season record observations from discussions in the big book about what the weather is like, what they are wearing outside, how much daylight there is. (Can be completed in conjunction with the half term outdoor walks). Observing Over Time | | | | | |

Working Scientifically

| | | | | | | | |
|---|---|--|--|--|--|--|--|
| <p style="color: #C00000; margin: 0;">Discuss observations.</p> Through adult questioning, begin to identify similarities and differences. | <p style="color: #C00000; margin: 0;">Discuss and draw observations.</p> Begin to identify similarities independently | <p style="color: #C00000; margin: 0;">Asking simple questions and recognising that they can be answered in different ways.</p> Is it...? Will it...? Can it...? Questions to compare similarities and differences. | | | | | |
| <p style="color: #C00000; margin: 0;">Use their observations to answer questions.</p> Adults to ask about their observations. It can... | <p style="color: #C00000; margin: 0;">Use their observations to answer questions.</p> Start to answer the questions they generated. It can... It changed when... The biggest.... | <p style="color: #C00000; margin: 0;">Observing closely using simple equipment.</p> Taking photos and using magnifying glasses. Stating what they can see, look at colours and shapes. Make comparisons. | | | | | |
| | | <p style="color: #C00000; margin: 0;">Identifying and classifying</p> Observe and test to compare objects, materials and living things. Sort and group things. Choose 2 criteria. Use ID sheets to identify plants. | | | | | |
| | | <p style="color: #C00000; margin: 0;">Gathering and recording data to help in answering questions</p> Record observations using photographs, drawings & labelled diagrams. Record measurements using prepared tables in non-standard units. Classify using sorting rings. | | | | | |
| | | <p style="color: #C00000; margin: 0;">Using their observations and ideas to suggest answers to questions</p> It can..., It will..., The biggest..., The smallest..., The best..., The worst... | | | | | |

Vocabulary

| Nursery | Reception | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
|--|--|--|--------|--------|--------|--------|--------|
| Model and encourage children to use vocabulary such as: sunny, cloudy, hot, warm, cold, shower, raining, storm, thunder, lightning, snow, icy, frost, puddles, windy, rainbow, animals, young, plants, flowers Expose children to supplementary vocabulary such as: snowflake | Model and encourage children to use vocabulary such as: spring, summer, autumn, winter, seasons, sunny, cloudy, hot, warm, cold, shower, raining, storm, thunder, lightning, hail, sleet, snow, icy, frost, puddles, windy, rainbow, animals, young, plants, flowers Expose children to supplementary vocabulary such as: hibernate, migrate, snowflake | Weather - sunny, rainy, windy, snowy Seasons - winter, summer, spring, autumn Sun, sunrise, sunset, day length | | | | | |

Materials

| Nursery | Reception | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
|---|---|---|--|--------|--|--|--------|
| <p>Support language to talk about materials used in a recipe and what they can observe during the process.</p> <p>Identifying & Classifying</p> | <p>Talk about materials used in a recipe and what they can observe during the process.</p> <p>Identifying & Classifying</p> | <p>Distinguish between an object and the material from which it is made.</p> <p>Objects made from: glass, wood, plastic, water, rock, brick, paper, fabric, elastic, foil, card/cardboard, rubber, wool, clay.</p> <p>Identifying & Classifying</p> | <p>Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses.</p> <p>Give an explanation e.g. a water bottle is made of plastic because it is transparent allowing you to see the drink inside and waterproof so that it holds the water. Know a material can be suitable for different purposes and an object can be made of different materials.</p> <p>Identifying & Classifying Comparative & Fair Testing</p> | | <p>Compare and group materials together, according to whether they are solids, liquids or gases.</p> <p>Can name properties of solids, liquids and gases.</p> <p>Group using own criteria from above knowledge.</p> <p>Research Identifying & Classifying</p> | <p>Compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets.</p> <p>Create a chart or table grouping/comparing everyday materials by different properties</p> <p>Identifying & Classifying Comparative & Fair Testing</p> | |
| <p>Use different materials when making models/pictures. Talk about the name of the materials; fabric, card, foil.</p> <p>Identifying & Classifying</p> | <p>Choose from a range of materials, including natural materials, when making models and identify a key property that was required.</p> <p>fabric, card, foil, plastic, wood, wool,</p> <p>Identifying & Classifying</p> | <p>Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock.</p> <p>Glass, wood, plastic, water, rock, brick, paper, fabric, elastic, foil, card/cardboard, rubber, wool, clay.</p> <p>Research Identifying & Classifying</p> | <p>Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.</p> <p>Use materials from Year 1 and test, make comparisons and sort using the changes as their criteria.</p> <p>Identifying & Classifying Observing Over Time</p> | | <p>Observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C).</p> <p>Give everyday examples of melting and freezing e.g. chocolate, water.</p> <p>Pattern Seeking Comparative & Fair Testing</p> | <p>Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic.</p> <p>Use understanding of properties to explain everyday uses of materials, for example, how bricks, wood, glass and metals are used in buildings</p> <p>Comparative & Fair Testing</p> | |
| <p>Talk about the properties of the material they use; hard, soft, bendy.</p> <p>Pattern Seeking Comparative & Fair Testing</p> | <p>Talk about the properties of the material they use; hard, soft, bendy, rigid, floppy</p> <p>Pattern Seeking Comparative & Fair Testing</p> | <p>Describe the simple physical properties of a variety of everyday materials.</p> <p>hard, soft, stretchy, stiff, rigid, bendy, floppy, waterproof, absorbent, breaks/tears, rough, smooth, shiny, dull, see-through, not see-through</p> <p>Identifying & Classifying Pattern Seeking Comparative & Fair Testing</p> | | | <p>Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.</p> <p>Give everyday examples of evaporation and condensation e.g. heated water, rivers and oceans connected to the stages of the water cycle.</p> <p>Research Observing Over Time</p> | <p>Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution.</p> <p>Explain what dissolving means, giving examples. Draw a labelled diagram or give reasons for their choices of equipment to show the process of recovering a substance from a solution.</p> <p>Pattern Seeking Comparative & Fair Testing</p> | |

| | | | | | | | |
|--|---|--|--|--|--|---|--|
| Support to sort materials to given criteria. Identifying & Classifying | Sort materials to given criteria. Identifying & Classifying | Compare and group together a variety of everyday materials on the basis of their simple physical properties. Decide on a criterion - use sorting hoops and physical tables (post-it note labels with items below). Identifying & Classifying Comparative & Fair Testing | | | | Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating. Use knowledge of liquids, gases and solids to suggest how materials can be recovered from solutions or mixtures by evaporation, filtering or sieving. Assessment | |
| | | | | | | Demonstrate that dissolving, mixing and changes of state are reversible changes. Complete alien soup activity and be able to explain what equipment to use and how to reverse the change. As above | |
| | | | | | | Explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda. Describe some simple non-reversible changes to materials, giving examples Identifying & Classifying Pattern Seeking | |

Working Scientifically

| | | | | | | | |
|--|---|--|--|--|---|--|--|
| Use discussion with adults to think about what they can see and what is happening. Discuss with adults, who support children to think of an Is it...? question. | Use discussion with adults to start to question what is happening/what might change? Begin to ask their own Is it...? questions. | Asking simple questions and recognising that they can be answered in different ways. Is it...? Will it...? Can it...? Questions to compare similarities and differences. | Asking simple questions and recognising that they can be answered in different ways. Additional to Year 1 How does it...? Could it...? Questions to compare similarities and differences. Supported questions to start to consider cause and effect. What if...? If we...will it...? | | Asking relevant questions and using different types of scientific enquiries to answer them. Asking questions; some independently and some using the question stems. I wonder whether...? Can we find a way to...? What happens when...? Why does...? Begin to identify they enquiry type most suitable to find the answer. | Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary. Turn an independent simple question – do all planets have the same year? Into a scientific question – Does the distance of a planet change the time it takes to orbit the Sun? | |
|--|---|--|--|--|---|--|--|

| | | | | | | | |
|---|--|---|---|--|---|---|--|
| <p>Work in small groups to perform provided simple tests with adults.</p> <p>With adult support complete a simple test provided by an adult and discuss what/how they are testing and observing</p> | <p>Perform simple tests with adults from pupil - adult conversations discussing their observations.</p> <p>Complete tests planned for through adult discussions. Discuss what they are testing, how and why and talk about their observations.</p> | <p>Observing closely using simple equipment.</p> <p>Taking photos and using magnifying glasses. Stating what they can see, look at colours and shapes. Make comparisons.</p> | <p>Observing closely using simple equipment.</p> <p>Additional to Year 1, use measurements and any other collected data.</p> <p>Additional to Year 1, use measurements using non-standard units and comparisons.</p> | | <p>Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.</p> <p>In addition to Year 3, measuring temperature using thermometers.</p> | <p>Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.</p> <p>Using force metres and standard units of measure to mms and rounding to the nearest second. With support, decide when repeated measurements are required.</p> | |
| <p>With support, group pictures/objects to given criteria.</p> <p>Use 2 columns or 2 sorting rings</p> | <p>Group simple pictures/objects to given criteria.</p> <p>Without adult support, use 2 columns or 2 sorting rings.</p> | <p>Performing simple tests</p> <p>Use practical resources provided to gather evidence to answer teachers adaption of children's simple questions to provide tests to classify; comparative tests; pattern seeking enquiries; and make observations over time.</p> | <p>Performing simple tests</p> <p>Additional to Year 1, begin to recognise the benefits of resources provided and use children's questions.</p> | | <p>Setting up simple practical enquiries, comparative and fair tests</p> <p>Addition to Year 3, more questions to be child generated.</p> | <p>Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.</p> <p>Independently and in pairs, choose a variable for their chosen enquiry.</p> | |
| <p>Use their observations to answer questions.</p> <p>Adults to ask about their observations. It can...</p> | <p>Use their observations to answer questions.</p> <p>Start to answer the questions they generated. It can... It changed when... The biggest....</p> | <p>Identifying and classifying</p> <p>Observe and test to compare objects, materials and living things. Sort and group things. Choose 2 criteria. Use ID sheets to identify plants.</p> | <p>Identifying and classifying</p> <p>Additional to Year 1, sort and group these things, choose up to 3 criteria for sorting.</p> <p>Use simple secondary sources (such as identification sheets) to name living things. Describe the characteristics they used to identify a living thing.</p> | | <p>Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions</p> <p>Additional to Year 3, record measurements using tables, tally charts and bar charts from templates without headings. Record classifications using Carroll diagrams.</p> <p>Support given to present the same data in different ways in order to help with answering the question.</p> | | |
| | | <p>Gathering and recording data to help in answering questions</p> <p>Record observations using photographs, drawings & labelled diagrams.</p> <p>Record measurements using prepared tables in non-standard units. Classify using sorting rings.</p> | <p>Gathering and recording data to help in answering questions</p> <p>Additional to Year 1, record observations using videos.</p> <p>Record measurements using pictograms, tally charts and block graphs. Classify using simple prepared tables.</p> | | <p>Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables</p> <p>Additional to Year 3 Year 4 unit vocabulary.</p> <p>- Use tables, tally charts and bar charts from templates without headings. Use Carroll diagrams.</p> | <p>Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs</p> <p>Independently & in pairs choose a suitable type of table for their enquiries. Create labelled diagrams to support conclusions and on whiteboards during recap. Independently</p> | |

| | | | | | | | |
|--|--|---|--|--|---|--|--|
| | | | | | Support given to present the same data in different ways in order to help with answering the question. | create bar graphs recognising the required increments. With support, create line and scatter graphs. Support provided to choose suitable increments, plot and interpret results. | |
| | | Using their observations and ideas to suggest answers to questions It can... It will... The biggest... The smallest... The best... The worst... | Using their observations and ideas to suggest answers to questions I think...because... The biggest is...because The smallest is...because The best is...because... The worst is...because... | | Using straightforward scientific evidence to answer questions or to support their findings. Additional to Year 3, children complete independently & in pairs. | Identifying scientific evidence that has been used to support or refute ideas or arguments. With support, use their scientific question to create an answer and compare 2 pieces of data as evidence to identify the effect of the variable. | |
| | | | | | Identifying differences, similarities or changes related to simple scientific ideas and processes Begin to independently interpret their data or given data to generate simple comparative statements based on their evidence. Identify naturally occurring patterns and causal relationships e.g. the greater the force, the louder the volume. | Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations Use conclusion layout support to present their findings. Have at least 2 written conclusions, media presentation, labelled diagrams, With support oral explanations use scientific vocabulary and explain causal relationships e.g. the hotter the water, the quicker the solid dissolves. | |
| | | | | | Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions Independently and in pairs, use at least 1 piece of data from their findings to support their answer. Independently and in pairs, use sentence stems. Use their findings to make predictions for new values and further questions. | Using test results to make predictions to set up further comparative and fair tests With support and in pairs, use their findings to create further scientific questions, using their data to support a prediction. | |

| | | | | | | | |
|--|--|--|--|--|---|--|--|
| | | | | | Use paired discussions, to identify and suggest improvements. | | |
| | | | | | <p>Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions</p> <p>Independently use conclusion stems for written conclusions - use at least 1 piece of data from their findings to support their answer. Produce at least 2 written conclusions.</p> <p>Independently use conclusion stems for, at least 2, oral presentations with to the class or recorded on seesaw - use at least 1 piece of data from their findings to support their answer.</p> <p>Use their labelled diagrams/graphs to support their presentation.</p> | | |

Vocabulary

| Nursery | Reception | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
|---|--|---|---|--------|---|--|--------|
| <p>Model and encourage children to use vocabulary such as:</p> <ul style="list-style-type: none"> • mix, stir, cook, hot, oven, microwave, change, burn, melt, hard, runny, set, freeze, freezer, cold, blended, hard, soft, bendy, stiff, wobbly, wood, plastic, paper, card, fabric <p>Expose children to supplementary vocabulary such as:</p> <ul style="list-style-type: none"> • solid, liquid, rigid, stronger, weaker | <p>Model and encourage children to use vocabulary such as:</p> <ul style="list-style-type: none"> • ice, water, frozen, icicle, snow, melt, wet, cold, slippery, smooth, big, bigger, biggest, smaller, smaller, smallest, hard, soft, bendy, rigid, wood, plastic, paper, card, metal, strong, weak, hot, apply heat, waterproof, soggy, not waterproof, best, change, change back <p>Expose children to supplementary vocabulary such as:</p> <ul style="list-style-type: none"> • solid, liquid, gas, most suited | <p>Object, material, wood, plastic, glass, metal, water, rock, brick, paper, fabric, elastic, foil, card/cardboard, rubber, wool, clay, hard, soft, stretchy, stiff, bendy, floppy, waterproof, absorbent, breaks/tears, rough, smooth, shiny, dull, see-through, not see-through</p> | <p>Names of materials – wood, metal, plastic, glass, brick, rock, paper, cardboard</p> <p>Properties of materials – as for Year 1 plus opaque, transparent and translucent, reflective, non-reflective, flexible, rigid</p> <p>Shape, push/pushing, pull/puling, twist/twisting, squash/squashing, bend/bending, stretch/stretching</p> | | <p>Solid, liquid, gas, state change, melting, freezing, melting point, boiling point, evaporation, temperature, water cycle</p> | <p>Thermal/electrical insulator/conductor, change of state, mixture, dissolve, solution, soluble, insoluble, filter, sieve, reversible/non-reversible change, burning, rusting, new material</p> | |

Rocks

| Nursery | Reception | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
|------------------------|-----------|--------|--------|---|--------|--------|--------|
| | | | | <p style="color: red; text-align: center;">Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties.</p> <p>Use a table to group marble, chalk, granite, sandstone, slate on their different size of grain/ crystal/ hard/ soft.</p> <p style="text-align: center;">Identifying & Classifying</p> | | | |
| | | | | <p style="color: red; text-align: center;">Describe in simple terms how fossils are formed when things that have lived are trapped within rock.</p> <p>Explain fossils were formed millions of years ago. When plants and animals died, they fell to the seabed. They became covered and squashed by other material. Over time the dissolving animal and plant matter is replaced by minerals from the water through discussion and ordering pictures.</p> <p style="text-align: center;">Research</p> | | | |
| | | | | <p style="color: red; text-align: center;">Recognise that soils are made from rocks and organic matter.</p> <p>Explain: Soil – rock, decomposed animals and plants, water & air. Compost – decomposed plants, water & air.</p> <p style="text-align: center;">Research</p> | | | |
| Working Scientifically | | | | | | | |
| | | | | <p style="color: red; text-align: center;">Asking relevant questions and using different types of scientific enquiries to answer them.</p> <p>Asking unit based questions using the question stems. What if...? Where does...? Who can...? How does...? Is there...? With support, begin to identify which of the 5 enquiry types to use.</p> | | | |
| | | | | <p style="color: red; text-align: center;">Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.</p> <p>Measuring in cms and data loggers.</p> | | | |
| | | | | <p style="color: red; text-align: center;">Setting up simple practical enquiries, comparative and fair tests</p> <p>Select from a range of practical resources to gather evidence to answer questions generated by themselves or the teacher. Gather a range of possible variables through class discussion. Pupils choose 1 variable.</p> | | | |
| | | | | <p style="color: red; text-align: center;">Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions</p> <p>Sometimes decide how to record and present evidence. Record their observations using photographs, videos, pictures, labelled diagrams and writing. Record measurements using tables, tally charts and bar charts from templates with headings. Record classifications using tables & Venn diagrams.</p> | | | |
| | | | | <p style="color: red; text-align: center;">Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables</p> <p>Year 3-unit vocabulary. Use photographs, videos, pictures, labelled diagrams and writing.</p> | | | |

| | | | | | | | |
|--|--|--|--|---|--|--|--|
| | | | | Use tables, tally charts and bar charts from templates with headings. use tables & Venn diagrams. | | | |
| | | | | Using straightforward scientific evidence to answer questions or to support their findings. With support, children use at least 1 piece of evidence from their findings to support their answer. | | | |
| | | | | Identifying differences, similarities or changes related to simple scientific ideas and processes. With support, interpret their data or given data to generate simple comparative statements based on their evidence. They begin to identify naturally occurring patterns and causal relationships e.g. the smoother the material means there is less friction. | | | |
| | | | | Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions With support, use at least 1 piece of data from their findings to support their answer. In groups and whole class discussions, use sentence stems. Use their findings to make predictions for new values and further questions. Use group discussions, to identify and suggest improvements. | | | |
| | | | | Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions Use conclusion supported stems and templates for written conclusions - use at least 1 piece of data from their findings to support their answer. Produce at least 2 written conclusions. Use conclusion supported stems and templates for, at least 2, oral presentations with to the class or recorded on seesaw - use at least 1 piece of data from their findings to support their answer. With support, use their labelled diagrams/graphs to support their presentation. | | | |

Vocabulary

| Nursery | Reception | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
|---------|-----------|--------|--------|---|--------|--------|--------|
| | | | | Rock, stone, pebble, boulder, grain, crystals, layers, hard, soft, texture, absorb water, soil, fossil, marble, chalk, granite, sandstone, slate, soil, peat, sandy/chalk/clay soil | | | |

Light

| Nursery | Reception | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
|-------------------------------|-----------|--------|--------|--|--------|--------|---|
| | | | | <p>Recognise that they need light in order to see things and that dark is the absence of light. Explain and use an example e.g. depth of a cave, their black tube with no light hole.</p> <p style="text-align: center;">Research</p> | | | <p>Recognise that light appears to travel in straight lines. Identify this through observations.</p> <p style="text-align: center;">Pattern Seeking</p> |
| | | | | <p>Notice that light is reflected from surfaces. Can use reflection in their description and recognise some materials reflect light better than others.</p> <p style="text-align: center;">Pattern Seeking</p> | | | <p>Use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye. Explain how light reflects off an object into our eyes so we can see it.</p> <p style="text-align: center;">Research</p> |
| | | | | <p>Recognise that light from the sun can be dangerous and that there are ways to protect their eyes. Identify which material makes the best sunglasses using a light sensor through enquiry. Identify and explain what happens when sun cream is added to UV beads through enquiry.</p> <p style="text-align: center;">Comparative & Fair Testing</p> | | | <p>Explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes. As above</p> <p style="text-align: center;">As above</p> |
| | | | | <p>Recognise that shadows are formed when the light from a light source is blocked by an opaque object. Explain objects block light and shadows are the absence of light. Know that transparent materials do not block light, translucent materials block some light and opaque materials block all light.</p> <p style="text-align: center;">Pattern Seeking</p> | | | <p>Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them. Plan an enquiry and use evidence to explain that the object blocks the light, therefore the absence of light is only where it is blocked by the shape.</p> <p style="text-align: center;">Pattern Seeking</p> |
| | | | | <p>Find patterns in the way that the size of shadows changes. Investigate & identify which variable changed the size of the shadow.</p> <p style="text-align: center;">Comparative & Fair Testing</p> | | | |
| Working Scientifically | | | | | | | |
| | | | | <p>Asking relevant questions and using different types of scientific enquiries to answer them. Asking unit based questions using the question stems. What if...? Where does...? Who can...? How does...? Is there...? With support, begin to identify which of the 5 enquiry types to use.</p> | | | <p>Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary. Independently create a scientific question. Independently and in pairs chose up to 2 variables and decide on the appropriate enquiry to complete.</p> |

| | | | | | | |
|--|--|--|--|--|--|--|
| | | | | <p>Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.</p> <p>Measuring in cms and data loggers.</p> | | <p>Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.</p> <p>Select measuring equipment to give the most precise results e.g. ruler, tape measure or trundle wheel, force meter with a suitable scale. Decide when repeated measurements are required.</p> |
| | | | | <p>Setting up simple practical enquiries, comparative and fair tests</p> <p>Select from a range of practical resources to gather evidence to answer questions generated by themselves or the teacher. Gather a range of possible variables through class discussion. Pupils choose 1 variable.</p> | | <p>Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs</p> <p>Additional to Year 5 – Independently & in pairs choose suitable graphs between bar, line or scatter graphs. Independently & in pairs, decide on suitable increments, plot accurately and interpret results.</p> |
| | | | | <p>Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions</p> <p>Sometimes decide how to record and present evidence.</p> <p>Record their observations using photographs, videos, pictures, labelled diagrams and writing.</p> <p>Record measurements using tables, tally charts and bar charts from templates with headings.</p> <p>Record classifications using tables & Venn diagrams.</p> | | <p>Identifying scientific evidence that has been used to support or refute ideas or arguments</p> <p>Independently use their scientific question to create an answer and compare 2 pieces of data as evidence to identify the effect of the variable.</p> |
| | | | | <p>Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables</p> <p>Year 3-unit vocabulary.</p> <p>Use photographs, videos, pictures, labelled diagrams and writing.</p> <p>Use tables, tally charts and bar charts from templates with headings.</p> <p>use tables & Venn diagrams.</p> | | <p>Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations</p> <p>Independently and in pairs, present their findings.</p> <p>Have at least 2 written conclusions, media presentation, labelled diagrams,</p> <p>Oral explanations use scientific vocabulary and explain causal relationships e.g. the birds with pointy beaks survive better as the</p> |

| | | | | | | | |
|--|--|--|--|--|--|--|---|
| | | | | | | | shape allows them to eat the seeds easily. |
| | | | | Using straightforward scientific evidence to answer questions or to support their findings. With support, children use at least 1 piece of evidence from their findings to support their answer. | | | Using test results to make predictions to set up further comparative and fair tests Independently and in pairs, use their findings to create further scientific questions, using their data to support a prediction. |
| | | | | Identifying differences, similarities or changes related to simple scientific ideas and processes. With support, interpret their data or given data to generate simple comparative statements based on their evidence. They begin to identify naturally occurring patterns and causal relationships e.g. the smoother the material means there is less friction. | | | |
| | | | | Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions With support, use at least 1 piece of data from their findings to support their answer. In groups and whole class discussions, use sentence stems. Use their findings to make predictions for new values and further questions. Use group discussions, to identify and suggest improvements. | | | |
| | | | | Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions Use conclusion supported stems and templates for written conclusions - use at least 1 piece of data from their findings to support their answer. Produce at least 2 written conclusions. Use conclusion supported stems and templates for, at least 2, oral presentations with to the class or recorded on seesaw - use at least 1 piece of data from their findings to support their answer. With support, use their labelled diagrams/graphs to support their presentation. | | | |

Vocabulary

| Nursery | Reception | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
|---------|-----------|--------|--------|---|--------|--------|--|
| | | | | Light, light source, dark, absence of light, transparent, translucent, opaque, shiny, matt, surface, shadow, reflect, mirror, sunlight, dangerous | | | As for Year 3 - Light, plus straight lines, light rays |

Forces

| Nursery | Reception | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
|------------------------|-----------|--------|--------|--|--------|---|--------|
| | | | | <p>Compare how things move on different surfaces.</p> <p>Explain the difference in the distance travelled and observations about the materials – string, plastic, ribbon.</p> <p>Comparative & Fair Testing</p> | | <p>Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object.</p> <p>Explain that gravity is a force that pulls towards the centre of the planet.</p> <p>Research</p> | |
| | | | | <p>Notice that some forces need contact between two objects, but magnetic forces can act at a distance.</p> <p>Carousel activities – identify that some objects need to be touched to move, whilst others moved through magnetic attraction or repulsion.</p> <p>Pattern Seeking</p> | | <p>Identify the effects of air resistance, water resistance and friction, that act between moving surfaces.</p> <p>Give examples of friction, water resistance and air resistance. Explain enquiry results through labelled diagrams and conclusions.</p> <p>Comparative & Fair Testing</p> | |
| | | | | <p>Observe how magnets attract or repel each other and attract some materials and not others.</p> <p>Explain that north and north and south and south poles repel and north and south poles attract.</p> <p>Know that only metals are magnetic but not all metals: magnetic - steel & iron; not magnetic copper, aluminium and gold.</p> <p>Observing Over Time</p> | | <p>Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.</p> <p>Can demonstrate how pulleys, levers and gears work.</p> <p>Research</p> | |
| | | | | <p>Compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials.</p> <p>Create tables or Venn diagrams to sort the materials.</p> <p>Comparative & Fair Testing Identifying & Classifying</p> | | | |
| | | | | <p>Describe magnets as having two poles.</p> <p>Identify north and south pole.</p> <p>Research</p> | | | |
| | | | | <p>Predict whether two magnets will attract or repel each other, depending on which poles are facing.</p> <p>Verbal or recorded predictions before testing.</p> | | | |
| Working Scientifically | | | | | | | |
| | | | | <p>Asking relevant questions and using different types of scientific enquiries to answer them.</p> <p>Asking unit based questions using the question stems.</p> <p>What if...? Where does...? Who can...? How does...? Is there...?</p> <p>With support, begin to identify which of the 5 enquiry types to use.</p> | | <p>Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.</p> <p>Turn an independent simple question – do all planets have the same year? Into a scientific question – Does the distance of a planet change the time it takes to orbit the Sun? Independently and in pairs, choose a variable for their chosen enquiry.</p> | |

| | | | | | | | |
|--|--|--|--|--|--|---|--|
| | | | | <p>Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.</p> <p>Measuring in cms and data loggers.</p> | | <p>Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.</p> <p>Using force metres and standard units of measure to mms and rounding to the nearest second. With support, decide when repeated measurements are required.</p> | |
| | | | | <p>Setting up simple practical enquiries, comparative and fair tests</p> <p>Select from a range of practical resources to gather evidence to answer questions generated by themselves or the teacher. Gather a range of possible variables through class discussion. Pupils choose 1 variable.</p> | | <p>Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs</p> <p>Independently & in pairs choose a suitable type of table for their enquiries. Create labelled diagrams to support conclusions and on whiteboards during recap. Independently create bar graphs recognising the required increments. With support, create line and scatter graphs. Support provided to choose suitable increments, plot and interpret results.</p> | |
| | | | | <p>Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions</p> <p>Sometimes decide how to record and present evidence.</p> <p>Record their observations using photographs, videos, pictures, labelled diagrams and writing.</p> <p>Record measurements using tables, tally charts and bar charts from templates with headings.</p> <p>Record classifications using tables & Venn diagrams.</p> | | <p>Identifying scientific evidence that has been used to support or refute ideas or arguments.</p> <p>With support, use their scientific question to create an answer and compare 2 pieces of data as evidence to identify the effect of the variable.</p> | |
| | | | | <p>Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables</p> <p>Year 3-unit vocabulary.</p> <p>Use photographs, videos, pictures, labelled diagrams and writing.</p> <p>Use tables, tally charts and bar charts from templates with headings.</p> <p>use tables & Venn diagrams.</p> | | <p>Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations</p> <p>Use conclusion layout support to present their findings.</p> <p>Have at least 2 written conclusions, media presentation, labelled diagrams,</p> <p>With support oral explanations use scientific vocabulary and explain causal relationships e.g. the hotter the water, the quicker the solid dissolves.</p> | |
| | | | | <p>Using straightforward scientific evidence to answer questions or to support their findings.</p> | | <p>Using test results to make predictions to set up further comparative and fair tests</p> | |

| | | | | | | | |
|--|--|--|--|---|--|---|--|
| | | | | With support, children use at least 1 piece of evidence from their findings to support their answer. | | With support and in pairs, use their findings to create further scientific questions, using their data to support a prediction. | |
| | | | | <p>Identifying differences, similarities or changes related to simple scientific ideas and processes.</p> <p>With support, interpret their data or given data to generate simple comparative statements based on their evidence. They begin to identify naturally occurring patterns and causal relationships e.g. the smoother the material means there is less friction.</p> | | | |
| | | | | <p>Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions</p> <p>With support, use at least 1 piece of data from their findings to support their answer.</p> <p>In groups and whole class discussions, use sentence stems. Use their findings to make predictions for new values and further questions.</p> <p>Use group discussions, to identify and suggest improvements.</p> | | | |
| | | | | <p>Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions</p> <p>Use conclusion supported stems and templates for written conclusions - use at least 1 piece of data from their findings to support their answer. Produce at least 2 written conclusions.</p> <p>Use conclusion supported stems and templates for, at least 2, oral presentations with to the class or recorded on seesaw - use at least 1 piece of data from their findings to support their answer.</p> <p>With support, use their labelled diagrams/graphs to support their presentation.</p> | | | |

Vocabulary

| Nursery | Reception | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
|---------|-----------|--------|--------|--|--------|--|--------|
| | | | | Force, push, pull, twist, contact force, non-contact force, magnetic force, magnet, strength, bar magnet, ring magnet, button magnet, horseshoe magnet, attract, repel, magnetic material, metal, iron, steel, poles, north pole, south pole | | Force, gravity, Earth, air resistance, water resistance, friction, mechanisms, simple machines, levers, pulleys, gears | |

Sound

| Nursery | Reception | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
|---------|-----------|--------|--------|--------|--|--------|--------|
| | | | | | <p style="color: #C00000; margin: 0;">Identify how sounds are made, associating some of them with something vibrating.</p> <p style="margin: 0;">Explain observations from a carousel of activities using sight and touch – banging a cymbal, using a tuning fork, spoons on string knocked against the table, elastic band round a box, guitar string.</p> <p style="text-align: center; margin: 0;">Pattern Seeking</p> | | |
| | | | | | <p style="color: #C00000; margin: 0;">Recognise that vibrations from sounds travel through a medium to the ear.</p> <p style="margin: 0;">Research and explain that sound can travel through solid, liquids and gases but not through a vacuum.</p> <p style="text-align: center; margin: 0;">Research</p> <p style="text-align: center; margin: 0;">Pattern Seeking</p> | | |
| | | | | | <p style="color: #C00000; margin: 0;">Find patterns between the pitch of a sound and features of the object that produced it.</p> <p style="margin: 0;">Enquiry pitch is the highness or lowness of a sound and is affected by features of objects producing the sounds e.g. smaller objects usually produce higher pitched sounds. – boom whackers, straw pipes, water in bottles, elastic bands round a box, different sized drums.</p> <p style="text-align: center; margin: 0;">Pattern Seeking</p> <p style="text-align: center; margin: 0;">Comparative & Fair Testing</p> | | |
| | | | | | <p style="color: #C00000; margin: 0;">Find patterns between the volume of a sound and the strength of the vibrations that produced it.</p> <p style="margin: 0;">Explain that loudness (volume) of the sound depends on the strength (size) of vibrations so a larger strength produces a louder sound. Enquiry.</p> <p style="text-align: center; margin: 0;">Pattern Seeking</p> <p style="text-align: center; margin: 0;">Comparative & Fair Testing</p> | | |
| | | | | | <p style="color: #C00000; margin: 0;">Recognise that sounds get fainter as the distance from the sound source increases.</p> <p style="margin: 0;">Explain that volume decreases as they travel through the medium. Therefore, sounds decrease in volume as you move away from the source. Enquiry.</p> <p style="text-align: center; margin: 0;">Pattern Seeking</p> <p style="text-align: center; margin: 0;">Comparative & Fair Testing</p> | | |

Working Scientifically

| | | | | | | | |
|--|--|--|--|--|---|--|--|
| | | | | | <p style="color: #C00000; margin: 0;">Asking relevant questions and using different types of scientific enquiries to answer them.</p> <p style="margin: 0;">Asking questions; some independently and some using the question stems.</p> <p style="margin: 0; padding-left: 40px;">I wonder whether...? Can we find a way to...?</p> <p style="margin: 0; padding-left: 40px;">What happens when...? Why does...?</p> <p style="margin: 0;">Begin to identify their enquiry type most suitable to find the answer.</p> | | |
| | | | | | <p style="color: #C00000; margin: 0;">Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.</p> <p style="margin: 0;">In addition to Year 3, measuring temperature using thermometers.</p> <p style="color: #C00000; margin: 0;">Setting up simple practical enquiries, comparative and fair tests</p> | | |

| | | | | | | | |
|-------------------|-----------|--------|--------|--------|---|--------|--------|
| | | | | | Addition to Year 3, more questions to be child generated. | | |
| | | | | | <p>Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions</p> <p>Additional to Year 3, record measurements using tables, tally charts and bar charts from templates without headings. Record classifications using Carroll diagrams.</p> <p>Support given to present the same data in different ways in order to help with answering the question.</p> | | |
| | | | | | <p>Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables</p> <p>Additional to Year 3</p> <p>Year 4-unit vocabulary.</p> <p>- Use tables, tally charts and bar charts from templates without headings.</p> <p>Use Carroll diagrams.</p> <p>Support given to present the same data in different ways in order to help with answering the question.</p> | | |
| | | | | | <p>Using straightforward scientific evidence to answer questions or to support their findings.</p> <p>Additional to Year 3, children complete independently & in pairs.</p> | | |
| | | | | | <p>Identifying differences, similarities or changes related to simple scientific ideas and processes</p> <p>Begin to independently interpret their data or given data to generate simple comparative statements based on their evidence. Identify naturally occurring patterns and causal relationships e.g. the greater the force, the louder the volume.</p> | | |
| | | | | | <p>Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions</p> <p>Independently and in pairs, use at least 1 piece of data from their findings to support their answer.</p> <p>Independently and in pairs, use sentence stems. Use their findings to make predictions for new values and further questions.</p> <p>Use paired discussions, to identify and suggest improvements.</p> | | |
| | | | | | <p>Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions</p> <p>Independently use conclusion stems for written conclusions - use at least 1 piece of data from their findings to support their answer. Produce at least 2 written conclusions.</p> <p>Independently use conclusion stems for, at least 2, oral presentations with to the class or recorded on seesaw - use at least 1 piece of data from their findings to support their answer.</p> <p>Use their labelled diagrams/graphs to support their presentation.</p> | | |
| Vocabulary | | | | | | | |
| Nursery | Reception | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
| | | | | | Sound, source, vibrate, vibration, travel, pitch (high, low), volume, faint, loud, insulation | | |

Electricity

| Nursery | Reception | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
|---------|-----------|--------|--------|--------|--|--------|--|
| | | | | | <p style="color: red; text-align: center;">Identify common appliances that run on electricity. Can name a variety of common electrical appliances – mobile phones, TV, washing machine, fridge, computer, vacuum cleaner etc</p> <p style="text-align: center;">Research</p> | | <p style="color: red;">Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit. Explain more voltage means brighter bulb/ louder buzzer/ faster motor.</p> <p style="text-align: center;">Comparative & Fair Testing</p> |
| | | | | | <p style="color: red;">Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers.</p> <p style="text-align: center;">As stated Research</p> | | <p style="color: red;">Compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches.</p> <p>Identify how more bulbs/ buzzers/ motors in a circuit affect the components. Switches stop the flow of electricity when turned off.</p> <p style="text-align: center;">Comparative & Fair Testing</p> |
| | | | | | <p style="color: red;">Identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery.</p> <p>Explain that all components in a circuit must be connected for the electricity to flow.</p> <p style="text-align: center;">Comparative & Fair Testing</p> | | <p style="color: red;">Use recognised symbols when representing a simple circuit in a diagram. Name the component from the symbol and know the symbol from the component e.g. — is a wire.</p> <p style="text-align: center;">Research</p> |
| | | | | | <p style="color: red;">Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit.</p> <p>Explain that the switch, when turned off, makes a break in the circuit and the electricity cannot flow.</p> <p style="text-align: center;">Research Patter Seeking</p> | | |
| | | | | | <p style="color: red;">Recognise some common conductors and insulators, and associate metals with being good conductors.</p> <p>Explain the results from testing – paper, card, aluminium, copper, rubber, iron.</p> <p style="text-align: center;">Comparative & Fair Testing Identifying & Classifying</p> | | |

Working Scientifically

| | | | | | | | |
|--|--|--|--|--|---|--|---|
| | | | | | <p style="color: red;">Asking relevant questions and using different types of scientific enquiries to answer them.</p> <p>Asking questions; some independently and some using the question stems.</p> <p style="text-align: center;">I wonder whether...? Can we find a way to...? What happens when...? Why does...?</p> <p>Begin to identify the enquiry type most suitable to find the answer.</p> | | <p style="color: red;">Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.</p> <p>Independently create a scientific question. Independently and in pairs choose up to 2 variables and decide on the appropriate enquiry to complete.</p> |
| | | | | | <p style="color: red;">Making systematic and careful observations and, where appropriate, taking accurate measurements using</p> | | <p style="color: red;">Taking measurements, using a range of scientific equipment, with increasing</p> |

| | | | | | |
|--|--|--|--|---|---|
| | | | | <p>standard units, using a range of equipment, including thermometers and data loggers.</p> <p>In addition to Year 3, measuring temperature using thermometers.</p> | <p>accuracy and precision, taking repeat readings when appropriate.</p> <p>Select measuring equipment to give the most precise results e.g. ruler, tape measure or trundle wheel, force meter with a suitable scale. Decide when repeated measurements are required.</p> |
| | | | | <p>Setting up simple practical enquiries, comparative and fair tests</p> <p>Addition to Year 3, more questions to be child generated.</p> | <p>Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.</p> <p>Independently and in pairs chose up to 2 variables and decide on the appropriate enquiry to complete.</p> |
| | | | | <p>Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions</p> <p>Additional to Year 3, record measurements using tables, tally charts and bar charts from templates without headings. Record classifications using Carroll diagrams. Support given to present the same data in different ways in order to help with answering the question.</p> | <p>Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs</p> <p>Additional to Year 5 – Independently & in pairs choose suitable graphs between bar, line or scatter graphs. Independently & in pairs, decide on suitable increments, plot accurately and interpret results.</p> |
| | | | | <p>Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables</p> <p>Additional to Year 3 Year 4 unit vocabulary.</p> <p>- Use tables, tally charts and bar charts from templates without headings. Use Carroll diagrams.</p> <p>Support given to present the same data in different ways in order to help with answering the question.</p> | <p>Identifying scientific evidence that has been used to support or refute ideas or arguments</p> <p>Independently use their scientific question to create an answer and compare 2 pieces of data as evidence to identify the effect of the variable.</p> |
| | | | | <p>Using straightforward scientific evidence to answer questions or to support their findings.</p> <p>Additional to Year 3, children complete independently & in pairs.</p> | <p>Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations</p> <p>Independently and in pairs, present their findings. Have at least 2 written conclusions, media presentation, labelled diagrams, Oral explanations use scientific vocabulary and explain causal relationships e.g. the birds with pointy beaks survive better as the shape allows them to eat the seeds easily.</p> |

| | | | | | | | |
|--|--|--|--|--|---|--|--|
| | | | | | <p>Identifying differences, similarities or changes related to simple scientific ideas and processes</p> <p>Begin to independently interpret their data or given data to generate simple comparative statements based on their evidence. Identify naturally occurring patterns and causal relationships e.g. the greater the force, the louder the volume.</p> | | <p>Using test results to make predictions to set up further comparative and fair tests</p> <p>Independently and in pairs, use their findings to create further scientific questions, using their data to support a prediction.</p> |
| | | | | | <p>Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions</p> <p>Independently and in pairs, use at least 1 piece of data from their findings to support their answer.</p> <p>Independently and in pairs, use sentence stems. Use their findings to make predictions for new values and further questions.</p> <p>Use paired discussions, to identify and suggest improvements.</p> | | |
| | | | | | <p>Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions</p> <p>Independently use conclusion stems for written conclusions - use at least 1 piece of data from their findings to support their answer. Produce at least 2 written conclusions.</p> <p>Independently use conclusion stems for, at least 2, oral presentations with to the class or recorded on seesaw - use at least 1 piece of data from their findings to support their answer.</p> <p>Use their labelled diagrams/graphs to support their presentation.</p> | | |

Vocabulary

| Nursery | Reception | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
|---------|-----------|--------|--------|--------|--|--------|--|
| | | | | | <p>Electricity, electrical appliance/device, mains, plug, electrical circuit, complete circuit, component, cell, battery, positive, negative, connect/connections, loose connection, short circuit, crocodile clip, bulb, switch, buzzer, motor, conductor, insulator, metal, non-metal, symbol</p> <p>NB</p> <p>Children in Year 4 do not need to use standard symbols for electrical components, as this is taught in Year 6.</p> | | <p>Circuit, complete circuit, circuit diagram, circuit symbol, cell, battery, bulb, buzzer, motor, switch, voltage</p> <p>NB</p> <p>Children do not need to understand what voltage is, but will use volts and voltage to describe different batteries. The words "cells" and "batteries" are now used interchangeably.</p> |

Earth and Space

| Nursery | Reception | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
|---------|-----------|--------|--------|--------|--------|--|--------|
| | | | | | | <p style="color: red; font-size: small;">Describe the movement of the Earth, and other planets, relative to the Sun in the solar system.</p> <p style="font-size: small;">Identify the orbit times of the planets in the solar system and identify patterns. Explain through a graph/ written conclusion or verbal conclusion.</p> <p style="text-align: center;">Research Pattern Seeking</p> | |
| | | | | | | <p style="color: red; font-size: small;">Describe the movement of the Moon relative to the Earth.</p> <p style="font-size: small;">Can show and explain, using diagrams/ modelling/ verbal presentation, the movement of the Earth and Moon</p> <p style="text-align: center;">Research</p> | |
| | | | | | | <p style="color: red; font-size: small;">Describe the Sun, Earth and Moon as approximately spherical bodies.</p> <p style="font-size: small;">Create a scaled model of the Earth, Sun and Moon.</p> <p style="text-align: center;">Research</p> | |
| | | | | | | <p style="color: red; font-size: small;">Use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.</p> <p style="font-size: small;">Explain what causes night and day using the reason we use time zone as supportive evidence.</p> <p style="text-align: center;">Research Pattern Seeking</p> | |

Working Scientifically

| | | | | | | | |
|--|--|--|--|--|--|---|--|
| | | | | | | <p style="color: red; font-size: small;">Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.</p> <p style="font-size: small;">Turn an independent simple question – do all planets have the same year? Into a scientific question – Does the distance of a planet change the time it takes to orbit the Sun?</p> <p style="font-size: small;">Independently and in pairs, choose a variable for their chosen enquiry.</p> | |
| | | | | | | <p style="color: red; font-size: small;">Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs</p> <p style="font-size: small;">Independently & in pairs choose a suitable type of table for their enquiries. Create labelled diagrams to support conclusions and on whiteboards during recap.</p> <p style="font-size: small;">Independently create bar graphs recognising the required increments. With support, create line and scatter graphs. Support provided to choose suitable increments, plot and interpret results.</p> | |
| | | | | | | <p style="color: red; font-size: small;">Identifying scientific evidence that has been used to support or refute ideas or arguments.</p> <p style="font-size: small;">With support, use their scientific question to create an answer and compare 2 pieces of data as evidence to identify the effect of the variable.</p> | |
| | | | | | | <p style="color: red; font-size: small;">Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations</p> | |

| | | | | | | | |
|------------|-----------|--------|--------|--------|--------|---|--------|
| | | | | | | Use conclusion layout support to present their findings. Have at least 2 written conclusions, media presentation, labelled diagrams, With support oral explanations use scientific vocabulary and explain causal relationships e.g. the hotter the water, the quicker the solid dissolves. | |
| Vocabulary | | | | | | | |
| Nursery | Reception | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
| | | | | | | Earth, Sun, Moon, (Mercury, Jupiter, Saturn, Venus, Mars, Uranus, Neptune), spherical, solar system, rotates, star, orbit, planets | |