Progression in Science

Progression in Working Scientifically

| EYFS | Y1 | Y2 |
| --- | --- | --- |
| **Communication and language:*** Learn new vocabulary.

• Ask questions to find out more and to check what has been said to them.• Articulate their ideas and thoughts in well-formed sentences.• Describe events in some detail.• Use talk to help work out problems and organise thinking and activities, and to explain how things work and why theymight happen.• Use new vocabulary in different contexts.* **Understanding the world:**

Explore the natural world around them.• Describe what they see, hear and feel while they are outside. Make more careful observations (e.g. “The ice has melted; look it’s a puddle now”) and use an increasingly mature vocabulary when discussing the natural world, e.g. soil, roots, stem, temperature, melt.Make simple drawings of natural objects, e.g. leaf. | * Learning how to ask simple questions and that they can be answered in different ways
* Discussing ways to observe closely, how to use simple equipment
* Supported to perform simple tests
* Introduction to identifying and classifying in Science
* Discussing observations and ideas to suggest answers
* gathering and recording data in simple forms with support
 | * ask simple questions and recognising that they can be answered in different ways
* recognising how to discuss observing closely, using simple equipment
* performing simple tests
* recognise how to identify and classify in Science
* using their observations and ideas to suggest answers to questions
* gather and record data to support answering questions.
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Progression in Working Scientifically

| Y3 | Y4 | Y5 | Y6 |
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| * asking relevant questions and using different types of scientific enquiries to answer them
* setting up simple practical enquiries, comparative and fair tests
* making careful observations and, where appropriate, taking accurate measurements using known standard units, using a range of equipment
* gathering, recording, classifying and presenting data in a variety of ways to help in answering questions
* recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables
* reporting on findings from enquiries, including oral and written explanations, presentation of results and conclusions with support
* using results to draw simple conclusions, make supported predictions for new values, suggest an improvement and consider further questions
* identifying differences, similarities or changes related to simple scientific ideas and processes
* using straightforward scientific evidence to answer questions or to support their findings.
 | * Recognising questions for different types of scientific enquiry and using different types of scientific enquiries to answer them
* Explaining how to set up simple practical enquiries, comparative and fair tests
* making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers
* Explain ways to gather, record, classify and present data in a variety of ways to help in answering questions
* recording findings using scientific language, drawings, labelled diagrams, keys, different forms of charts, and tables
* reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions independently
* using results to draw relevant conclusions, make relevant predictions for new values, suggest several improvements and raise further questions
* identifying differences, similarities and changes or improvements related to scientific ideas and processes
* using gathered scientific evidence to answer questions that support their findings and inform their predictions.
 | * planning different types of scientific enquiries to answer questions, including support to recognise controlling variables where necessary
* Explaining how to take measurements, using a range of scientific equipment, with increasing accuracy and precision.
* recording data and results using scientific diagrams and labels, classification keys, tables, bar and line graphs
* Supported with test results to make predictions to set up further comparative and fair tests
* reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations
* identifying scientific evidence that has been used to support or refute ideas or arguments.
 | * Explaining how you can use different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary
* Independently taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate with shown reasoning for this
* Independently recognising the best method for recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs
* Explaining test results and making predictions to set up further comparative and fair tests, showing how to improve on testing
* 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
* Recall and research of scientific evidence that can be been used to support or refute ideas or arguments.
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**Biology**

Plants

| EYFS | Y1 | Y2 | Y3 | Y4 | Y5 | Y6 |
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| -Show understanding that we need to care for living things, e.g. watering plants, handling insects gently.* Children know about similarities and differences in relation to places, objects, materials and living things.
* They make observations of animals and plants and explain why some things occur, and talk about changes.
 | * identify and name a variety of common wild and garden plants, including deciduous and evergreen trees
* identify and describe the basic structure of a variety of common flowering plants, including trees.
 | * observe and describe how seeds and bulbs grow into mature plants
* find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.
 | * identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers
* 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
* investigate the way in which water is transported within plants
* explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.
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Animals, including humans

| EYFS | Y1 | Y2 | Y3 | Y4 | Y5 | Y6 |
| --- | --- | --- | --- | --- | --- | --- |
| **Personal, social and emotional development:**Know and talk about the different factors that support their overall health and wellbeing:- regular physical activity- healthy eating- toothbrushing- sensible amounts of ‘screen time’- having a good sleep routine- being a safe pedestrian**UTW -**They make observations of animals and plants and explain why some things occur, and talk about changes. | * identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals identify and name a variety of common animals that are carnivores, herbivores and omnivores
 | * notice that animals, including humans, have offspring which grow into adults
* find out about and describe the basic needs of animals, including humans, for survival (water, food and air)
* describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.
 | * 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 that humans and some other animals have skeletons and muscles for support, protection and movement.
 | * describe the simple functions of the basic parts of the digestive system in humans
* identify the different types of teeth in humans and their simple functions
* construct and interpret a variety of food chains, identifying producers, predators and prey.
 | * describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird
* describe the life process of reproduction in some plants and animals.
 | * identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood
* recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function
* describe the ways in which nutrients and water are transported within animals, including humans.
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Living things and their habitats

| EYFS | Y1 | Y2 | Y3 | Y4 | Y5 | Y6 |
| --- | --- | --- | --- | --- | --- | --- |
| **Understanding the world:**Explore the natural world around them. • Describe what they see, hear and feel while they are outside. • Recognise some environments that are different to the one in which they live. • Understand the effect of changing seasons on the natural world around them.-They make observations of animals and plants and explain why some things occur, and talk about changes.-Show understanding of some ways that the natural world can be harmed (e.g. pollution) and some ways we can look after it (e.g. recycling). | * *identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals identify and name a variety of common animals that are carnivores, herbivores and omnivores*
 | * explore and compare the differences between things that are living, dead, and things that have never been alive
* 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
* identify and name a variety of plants and animals in their habitats, including microhabitats
* 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.
 | * *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*
 | * recognise that living things can be grouped in a variety of ways
* explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment
* recognise that environments can change and that this can sometimes pose dangers to living things.
 | * describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird
* describe the life process of reproduction in some plants and animals.
 | * 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
* give reasons for classifying plants and animals based on specific characteristics.
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**Cross-discipline: Biology and Chemistry**

| Y1 | Y2 | Y3 | Y4 | Y5 | Y6 |
| --- | --- | --- | --- | --- | --- |
|  |  | Rocks |  |  | Evolution and inheritance |
|  |  | * *compare and group together different kinds of rocks on the basis of their appearance and simple physical properties*
* *describe in simple terms how fossils are formed when things that have lived are trapped within rock*
* *recognise that soils are made from rocks and organic matter*.
 |  |  | * recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago
* recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents
* identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.

*Link to* ***Animals, including humans, Living things and their habitats and Materials*** |

**Chemistry**

| EYFS | Y1 | Y2 | Y3 | Y4 | Y5 | Y6 |
| --- | --- | --- | --- | --- | --- | --- |
|  | Everyday Materials | Uses of everyday materials | Rocks | States of matter | Properties and changes of materials |  |
| -Talk about differences between materials and changes they notice in simple terms, e.g. when cooking, melting ice etc.-Use their senses to explore natural materials and describe what they observe, e.g. “a heavy log” “wet leaves”.- They explain why some things occur, and talk about changes. | * distinguish between an object and the material from which it is made
* identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock
* describe the simple physical properties of a variety of everyday materials
* compare and group together a variety of everyday materials on the basis of their simple physical properties.
 | * identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses
* find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.
 | * compare and group together different kinds of rocks on the basis of their appearance and simple physical properties
* describe in simple terms how fossils are formed when things that have lived are trapped within rock
* recognise that soils are made from rocks and organic matter.
 | * compare and group materials together, according to whether they are solids, liquids or gases
* 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)
* identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.
 | * 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
* know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution
* use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating
* give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic
* demonstrate that dissolving, mixing and changes of state are reversible changes
* 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.
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**Physics**

| EYFS | Y1 | Y2 | Y3 | Y4 | Y5 | Y6 |
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|  |  |  | Forces and magnets |  | Forces |  |
| -Talk about forces they feel, e.g. water pushing a boat up to float, elastic bands stretching, magnets.* Children know about similarities and differences in relation to places, objects, materials and living things.
* They talk about the features of their own immediate environment and how environments might vary from one another.
* They explain why some things occur, and talk about changes.
 |  |  | * compare how things move on different surfaces
* notice that some forces need contact between two objects, but magnetic forces can act at a distance
* observe how magnets attract or repel each other and attract some materials and not others
* 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
* describe magnets as having two poles
* predict whether two magnets will attract or repel each other, depending on which poles are facing.
 |  | * explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object
* identify the effects of air resistance, water resistance and friction, that act between moving surfaces
* recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.
 |  |

| EYFS | Y1 | Y2 | Y3 | Y4 | Y5 | Y6 |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  | Light |  |  | Light |
| * Children know about similarities and differences in relation to places, objects, materials and living things.
* They talk about the features of their own immediate environment and how environments might vary from one another.
 |  |  | * recognise that they need light in order to see things and that dark is the absence of light
* notice that light is reflected from surfaces
* recognise that light from the sun can be dangerous and that there are ways to protect their eyes
* recognise that shadows are formed when the light from a light source is blocked by an opaque object
* find patterns in the way that the size of shadows change.
 |  |  | * recognise that light appears to travel in straight lines
* 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 that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes
* use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.
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| EYFS | Y1 | Y2 | Y3 | Y4 | Y5 | Y6 |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  | Sound |  |  |
| * Children know about similarities and differences in relation to places, objects, materials and living things.
* They talk about the features of their own immediate environment and how environments might vary from one another.
 |  |  |  | * identify how sounds are made, associating some of them with something vibrating
* recognise that vibrations from sounds travel through a medium to the ear
* find patterns between the pitch of a sound and features of the object that produced it
* find patterns between the volume of a sound and the strength of the vibrations that produced it
* recognise that sounds get fainter as the distance from the sound source increases.
 |  |  |

| Y1 | Y2 | Y3 | Y4 | Y5 | Y6 |
| --- | --- | --- | --- | --- | --- |
|  |  |  | Electricity |  | Electricity |
|  |  |  | * identify common appliances that run on electricity
* construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers
* 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
* recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit
* recognise some common conductors and insulators, and associate metals with being good conductors.

*Link to* ***Materials*** |  | * associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit
* 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
* use recognised symbols when representing a simple circuit in a diagram.
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| EYFS | Y1 | Y2 | Y3 | Y4 | Y5 | Y6 |
| --- | --- | --- | --- | --- | --- | --- |
| Seasonal changes | Seasonal changes |  |  |  | Earth and space |  |
| **Understanding the world:**Discuss change in seasons from Summer > Autumn, and then Autumn > Winter. Make reference to changes to the natural world, weather and our habits.• Describe what they see, hear and feel while they are outside. • Recognise some environments that are different to the one in which they live. • Understand the effect of changing seasons on the natural world around them. | * observe changes across the four seasons
* observe and describe weather associated with the seasons and how day length varies.

*Link to* ***Plants, Animals, including humans and Living things and their habitats*** |  |  |  | * describe the movement of the Earth, and other planets, relative to the Sun in the solar system
* describe the movement of the Moon relative to the Earth
* describe the Sun, Earth and Moon as approximately spherical bodies
* use the idea of the Earth’s rotation to explain day and night and the apparent movement of the sun across the sky.

*Link to* ***Light*** |  |