

Progression of Learning in Science (including GD)



| Science | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
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| Working at the expected standard | <p>Working Scientifically: Asking simple questions and recognising that they can be answered in different ways Observing closely, using simple equipment Performing simple tests Identifying and classifying. Using observations and ideas to suggest answers to questions Gather and recording data to help answer questions</p> | | <p>Working Scientifically: Asking relevant questions and using different types of scientific enquires to answer them. Simple practical enquires to compare and fair test Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers. Gathering, recording, classifying and presenting data in a variety of ways to help answer 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, displays or presentations of results and conclusions Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise 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.</p> | | <p>Working Scientifically: Planning different types of scientific enquires to answer questions, including recognising and controlling variables where necessary Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs 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 Using test results to make predictions to set up further comparative and fair tests Identifying scientific evidence that has been used to support or refute ideas or arguments.</p> | |
| | <p>Plants 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.</p> | <p>Living things and their habitats 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 micro-habitats 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.</p> | <p>Plants 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.</p> | <p>Living things in their habitats 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.</p> | <p>Living things and their habitats 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.</p> | <p>Living things in their habitats Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals Give reasons for classifying plants and animals based on specific characteristics.</p> |
| | <p>Animal, including humans 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 Describe and compare the structure of a variety of common animals</p> | <p>Plants 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.</p> | <p>Animals, including humans 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.</p> | <p>Animals, including humans 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.</p> | <p>Animals, including humans Describe the changes as humans develop to old age.</p> | <p>Animals, including humans 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.</p> |

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| | (fish, amphibians, reptiles, birds and mammals, including pets) Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense. | | | | | |
| | Everyday materials 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. | Animals, including humans 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. | Rocks 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. | States of 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. | Properties and changes of materials 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. | Evolution and inheritance 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. |
| | Seasonal change Observe changes across the four seasons Observe and describe weather associated with the seasons and how day length varies. | Uses of everyday materials 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. | Light 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 a solid object Find patterns in the way that the sizes of shadows change. | Sound 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. | Earth and space 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. | Light 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. |
| | | | Forces and magnets Compare how things move on different surfaces Notice that some forces need contact between two objects, but magnetic forces can act at | Electricity Identify common appliances that run on electricity Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, | Forces 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, | Electricity 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 |

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| | | | <p>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.</p> | <p>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.</p> | <p>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.</p> | <p>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.</p> |
| Working above the expected standard | <p>Create meaningful and open questions based on topic knowledge and explain how they can be answered in different ways.</p> <p>Analyse and evaluate results from observations made using clear scientific vocabulary, making links between topics.</p> | | <p>Making systematic and careful observations whilst making meaningful links between topic knowledge.</p> <p>Identifying and creating the most efficient way of recording and presenting data in all topics.</p> <p>Understanding key scientific vocabulary and applying it in a range of different contexts independently and consistently e.g. in prediction, method and conclusion.</p> <p>Using a range of more complex scientific evidence to answer questions or to support findings.</p> | <p>Identifying and creating the most efficient way, with increasing complexity, of recording and presenting data.</p> <p>Evaluating findings from enquiries (e.g. causal relationships and patterns) in a highly sophisticated way demonstrating an exceptional level of understanding of both topic knowledge and skill.</p> <p>Using test results to create predictions for further comparative tests based on previous knowledge and understanding of topic.</p> <p>Applying a deep understanding of topic knowledge to create different types of scientific enquires to answer further questions.</p> | | |
| | <p><u>Year 1</u></p> <p>Identify and notice similarities between various local plants and their structure. Research further examples to add to the categories: 'living', 'dead' and 'things that have never been alive'.</p> <p>Identify common features of the main groups of vertebrates and compare key features of familiar and unfamiliar animals.</p> <p>Suggest whether an unfamiliar animal might be a carnivore, herbivore or omnivore.</p> <p>Suggest how the senses are used in an activity such as eating.</p> <p>Compare the same object made from different materials in terms of its effectiveness.</p> <p>Identify typical uses of a range of materials.</p> <p>Compare the physical properties of different everyday materials and suggest classification of</p> | <p><u>Year 2</u></p> <p>Explain why there may be a limit as to how many of a certain living thing can live in a particular area.</p> <p>Identify a range of living things and suggest why they may be found in that habitat.</p> <p>Suggest, within a simple food chain, what might happen if one of the living things becomes scarce.</p> <p>Identify the effects of a shortage of each of the things that plants need to grow and stay healthy.</p> <p>Compare and contrast the growth patterns of different types of plants.</p> <p>Compare and contrast adults and their offspring for different animals.</p> <p>Suggest how the basic needs of different animals influences their choice of habitat.</p> <p>Suggest effects of poor diet and hygiene.</p> | <p><u>Year 3</u></p> <p>Compare the requirements of different plants and link these to particular habitats.</p> <p>Suggest why parts may vary in size and shape from one species of flowering plant to another.</p> <p>Suggest how water transport might vary from one type of plant to another.</p> <p>Suggest why pollination, seed formation and seed dispersal may vary from one type of plant to another.</p> <p>Explain why a varied diet is important.</p> <p>Compare the ways that the skeletons of different animals provide support, protection and movement.</p> <p>Explain the importance of studying fossils.</p> | <p><u>Year 4</u></p> <p>Suggest why some ways of grouping living things may be more useful than others, e.g. why grouping by number of legs is an easy aid to identification.</p> <p>Devise own classification keys to group living things.</p> <p>Describe examples of living things adapting to environmental change, e.g. urban foxes, and examples of extinction due to environmental change.</p> <p>Explain why the simple functions of the basic parts of the digestive system in humans are necessary.</p> <p>Explain why humans have different types of teeth.</p> <p>Suggest what might happen in a food chain if the population of one of the organisms changes.</p> <p>Recognise that some materials (e.g. toothpaste) cannot be easily classified as solid, liquid or gas.</p> <p>Apply the relationship between rate of evaporation with</p> | <p><u>Year 5</u></p> <p>Suggest similarities in the life cycles of a number of vertebrates, e.g. comparison of dog, human and bird embryos.</p> <p>Suggest why some of the changes that take place in humans happen, e.g. suggest why babies have disproportionately large heads compared to adults.</p> <p>Compare the process of reproduction in animals and plants.</p> <p>Suggest why physical properties might influence the selection of those materials for certain uses.</p> <p>Identify that some soluble materials are more soluble than others.</p> <p>Explain why a particular separation method might be more effective.</p> <p>Classify various processes relating to materials as reversible or irreversible.</p> <p>Provide examples of when changes being irreversible are a good thing, e.g. making bricks, or not, e.g. non-biodegradable plastic bags.</p> <p>Suggest limitations of the uses of selected materials based on test results.</p> <p>Identify that the further out a planet is,</p> | <p><u>Year 6</u></p> <p>Explore why some living things, such as the duck billed platypus, don't neatly fit into one group and suggest possible reasons for changes to living things over time, e.g. why penguins can't fly but are good at swimming.</p> <p>Explain why other features are less useful as a basis for classification, such as size or colour.</p> <p>Recognise that selective breeding may result in offspring with certain features, e.g. pedigree dogs with a certain shape or colour.</p> <p>Give examples of living things that have evolved in different ways.</p> <p>Explain some characteristics of the heart, blood vessels and blood, e.g. explain that the arteries are thicker because they carry blood at a higher pressure.</p> <p>Explain how decisions about lifestyle can affect quality of life.</p> <p>Compare the ways in which nutrients and</p> |

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| | <p>materials.</p> <p>Recognise changes within seasons as well as between seasons.</p> <p>Make and test predictions relating to changing day length and weather patterns.</p> <p>When working scientifically:</p> <p>Pupil can ask simple questions that can be tested.</p> <p>Pupil can suggest different ways of answering question.</p> <p>Pupil can examine carefully, e.g. using a hand lens.</p> <p>Pupil can conduct simple tests.</p> <p>Pupil can, with assistance, draw and label diagrams.</p> <p>Pupil can identify and group key outcomes from an enquiry.</p> <p>Pupil can collect data relevant to the answering of questions.</p> <p>Pupil can answer enquiry questions using data and ideas.</p> | <p>For particular materials in particular uses, identify limitations as well as suitability.</p> <p>Identify that some changes to shapes are permanent and others are temporary, and that this can influence their uses.</p> | <p>Compare different soils in terms of composition.</p> <p>Suggest uses for different kinds of rocks based on their properties.</p> <p>Predict how an object will move on other surfaces and suggest why.</p> <p>Explore how magnetic attraction and repulsion are affected by distance.</p> <p>Explore whether some magnets are stronger than others.</p> <p>Identify some applications of magnets and magnetic materials and apply ideas about the interaction of magnets to contexts such as toys.</p> <p>Explore the similarities and differences between the two poles.</p> <p>Recognise that vision involves light travelling to the eyes.</p> <p>Recognise that some surfaces are better at reflecting light than others.</p> <p>Explain why sunlight can be dangerous and how types of protection works. Suggest how light is travelling to form a shadow.</p> <p>Relate position of an object and position of a screen to the size of the shadow.</p> | <p>temperature to everyday contexts. Suggest patterns in which kinds of materials change state at higher or lower temperatures.</p> | <p>the longer its orbit is around the Sun.</p> | <p>water are transported in two animals that are quite different.</p> <p>Recognise that even when light changes in direction, the path is still continuous.</p> <p>Draw diagrams using straight lines showing light reflecting off objects and into the eye.</p> <p>Refer to the idea that some objects may be better reflectors than others.</p> <p>Use a diagram to explain that although a shadow is the same shape as the object, it may not be the same size.</p> <p>Relate the number or voltage of cells to the number and operation of bulbs or buzzers that can be run from them.</p> <p>Explain the effect of changing the order of the components in a circuit.</p> <p>Design circuits using symbols.</p> |
| <p>Non-statutory units</p> | <p>Pushes and Pulls (PHYSICS) (non-statutory unit)</p> <p>That there are many sorts of movement which can be described in many ways. To observe and describe different ways of moving. That pushing or pulling things can make objects start or stop moving. To identify similarities and differences between the movement of different objects.</p> | <p>Electricity (PHYSICS) (non-statutory unit)</p> <p>Identify appliances which use electricity and those which do not. Record the appliances in categories and justify the groupings Tell someone that mains sockets are dangerous and that plugs should not be touched with wet hands. Use devices with batteries, draw and label some of these. Explain why a particular device requires a particular battery Identify ways batteries might be dangerous Make working circuits using bulbs and/or buzzers and make drawings of these. Recognise simple drawings of circuits which</p> | <p>Exploring Inventions (Additional unit)</p> <p>Introduction to the work of Galileo Galilei, Thomas Edison, Alexander Fleming, Marie Curie, Tu Youyou, Stephen Hawking.</p> <p>Through exploration of ideas, research opportunities and presentations, children might work scientifically by: asking relevant questions and using different types of scientific enquiries to answer them. Identify differences, similarities or changes related</p> | <p>Exploring Inventions (Additional unit)</p> <p>Introduction to the work of Alexander Graham Bell and Lord Kelvin.</p> <p>Pupils might work scientifically by: asking relevant questions and using different types of scientific enquires to answer them. Gathering, recording, classifying and presenting data in a variety of ways to help answer 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, displays or presentations of results and conclusions. Identifying</p> | <p>Exploring Inventions (Additional unit)</p> <p>Pupils might find out how scientists, for example, Isaac Newton, helped to develop the theory of gravitation. Additional scientists to be research: Louis Pasteur, Alfred Nobel, Thomas Edison, Henry Ford, depending on pupils' interests.</p> <p>Pupils might work scientifically by: identifying scientific evidence that has been used to support or refute ideas or arguments.</p> | <p>Science Project/challenge</p> <p>Pupils might work scientifically by: Planning different types of scientific enquires to answer questions, including recognising and controlling variables where necessary Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs Reporting and presenting findings from enquiries, including conclusions, causal</p> |

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| | <p>To make suggestions about how objects can be made to move and to find out whether they were right. To recognise hazards and risks to themselves in moving objects. That it is not only us that make things move by pushing. To ask questions about what is causing movement.</p> <p>Exploring Inventors (additional unit) To use simple secondary sources to find answers.</p> | <p>will not work and explain why the bulb will not light. Interpret drawings of circuits making correct predictions of which circuits will work and explaining these Design, make, test and demonstrate a device and explain the importance of a complete circuit in it.</p> <p>Explore the work of Benjamin Franklin in discovery of lightning and electricity.</p> | <p>to simple scientific ideas and processes using straightforward scientific evidence to answer questions or to support their findings.</p> | <p>differences, similarities or changes related to simple scientific ideas and processes. Using straightforward scientific evidence to answer questions or to support their findings.</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>Using test results to make predictions to set up further comparative and fair tests</p> |
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