Science Skills Progression

Working Scientifically

Nursery	Reception
• I notice detailed features of objects in my environment • I can operate mechanical toys, example: turn the knob on a wind-up toy or pull back on a friction car	• I can make observations of animals and plants and explain why some things occur, and talk about changes. • I can use simple tools and techniques competently and appropriately. • I understand that different media can be combined to create new effects. • I can construct with a purpose in mind, using a variety of resources. • I can select appropriate resources and adapts work where necessary. • I can select tools and techniques needed to shape, assemble and join materials that I am using.

Years 1 and 2 Scientist	Years 3 and 4 Scientist	Years 5 and 6 Scientist
• I can ask simple questions and recognising that they can be answered in different ways • I can observe closely, using simple equipment • I can perform simple tests • I can identify and classify • I can use my observations and ideas to suggest answers to questions • I can gather and record data to help in answering questions	• I can ask relevant questions and using different types of scientific enquiries to answer them • I can set up simple practical enquiries, comparative and fair tests • I can make systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers • I can gather, record, classify and present data in a variety of ways to help in answering questions • I can record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables • I can report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions • I can use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions • I can identify differences, similarities or changes related to simple scientific ideas and processes	• I can plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary • I can take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate • I can record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs • I can use test results to make predictions to set up further comparative and fair tests • I can report and present findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations • I can identify scientific evidence that has been used to support or refute ideas or arguments

	• I can use straightforward scientific evidence to answer questions or to support their findings.	

Biology

Nursery	Reception
• I can closely observe what animals, peoples and vehicles do • I can comment and ask questions about living things around me such as the place where they live or the natural world • I can talk about why things happen and how things work.	• I know about the similarities and differences in relation to places, objects, materials and living things. • I can talk about the features of my environment and how environments might vary from one another. • I am developing my understanding of growth, decay and changes over time. • I show care and concern for living things and the environment

Year 1 Biologist	Year 2 Biologist	Year 3 Biologist
Plants • I can identify and name a variety of common wild and garden plants, including deciduous and evergreen trees • I can identify and describe the basic structure of a variety of common flowering plants, including trees **Animals, including humans** • I can identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals • I can identify and name a variety of common animals that are carnivores, herbivores and omnivores • I can describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals including pets)	**Plants** • I can observe and describe how seeds and bulbs grow into mature plants • I can find out and describe how plants need water, light and a suitable temperature to grow and stay healthy **Animals, including humans** • I notice that animals, including humans, have offspring which grow into adults • I can find out about and describe the basic needs of animals, including humans, for survival (water, food and air) • I can describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene **Living things and their habitat** • I can explore and compare the differences between things that are living, dead, and things that have never been alive	**Plants** • I can identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers • I can 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 • I can investigate the way in which water is transported within plants • I can explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal **Animals, including humans** • I can 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

• I can identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense	• I can 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 • I can identify and name a variety of plants and animals in their habitats, including microhabitats • I can 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	• I can identify that humans and some other animals have skeletons and muscles for support, protection and movement

Year 4 Biologist	Year 5 Biologist	Year 6 Biologist
Animals, including humans • I can describe the simple functions of the basic parts of the digestive system in humans • I can identify the different types of teeth in humans and their simple functions • I can construct and interpret a variety of food chains, identifying producers, predators and prey **Living things and their habitat** • I can recognise that living things can be grouped in a variety of ways • I can explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment • I can recognise that environments can change and that this can sometimes pose dangers to living things	**Animals, including humans** • I can describe the changes as humans develop to old age **Non-Statutory** Pupils should draw a timeline to indicate stages in the growth and development of humans. They should learn about the changes experienced in puberty. **Living things and their habitat** • I can describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird • I can describe the life process of reproduction in some plants and animals **Non-Statutory** Pupils should find out about different types of reproduction, including sexual and asexual reproduction in plants, and sexual reproduction in animals. They might observe changes in an animal over a period of time, comparing how different animals reproduce and grow.	**Animals, including humans** • I can identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood • I can recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function • I can describe the ways in which nutrients and water are transported within animals, including humans **Non-Statutory** Pupils should learn how to keep their bodies healthy and how their bodies might be damaged – including how some drugs and other substances can be harmful to the human body. **Living things and their habitat** • I can 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

		• I can give reasons for classifying plants and animals based on specific characteristics **Evolution and inheritance** • I can recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago • I can recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents • I can identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution

Chemistry

Nursery	Reception
• I can experiment with blocks, colours and marks	• I can explore what happens when they mix colours. • I can experiment to create different textures. • I can manipulate materials to achieve a planned effect. • I can use what I have learnt about media and materials in original ways, thinking about uses and purposes.

Year 1 Chemist	Year 2 Chemist	Year 3 Chemist
Everyday materials • I can distinguish between an object and the material from which it is made • I can identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock • I can describe the simple physical properties of a variety of everyday materials	**Uses of everyday materials** • I can identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses • I can find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching	**Rocks** • I can compare and group together different kinds of rocks on the basis of their appearance and simple physical properties • I can describe in simple terms how fossils are formed when things that have lived are trapped within rock • I can recognise that soils are made from rocks and organic matter

• I can compare and group together a variety of everyday materials on the basis of their simple physical properties		

Year 4 Chemist	Year 5 Chemist	Year 6 Chemist
States of matter • I can compare and group materials together, according to whether they are solids, liquids or gases • I can 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) • I can identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature	**Properties and Changes of material** • I can 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 • I know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution • I can use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating • I can give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic • I can demonstrate that dissolving, mixing and changes of state are reversible changes • I can 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	**Consolidation of objectives and skills acquired in all of the above year groups in this area of Science.**

Science Skills Progression

Physics

Nursery	Reception
• I know things are used in different ways, example: a ball for rolling or throwing, a toy car for pushing • I can match parts of objects that fit together, example: put a lid on teapot. • I can create sounds by banging, shaking, tapping or blowing • I show an interest in the way musical instruments sound	• I can explore the different sounds of instruments. • I can look closely at similarities, differences, patterns and change.

Year 1 Physicist	Year 2 Physicist	Year 3 Physicist
Seasonal Changes • I can observe changes across the 4 seasons • I can observe and describe weather associated with the seasons and how day length varies	**Sound** • I know that sounds travel from sources • I know that sounds are heard when they enter the ear • I can understand that sound and light come from a variety of sources	**Light** • I can recognise that they need light in order to see things and that dark is the absence of light • I can notice that light is reflected from surfaces • I can recognise that light from the sun can be dangerous and that there are ways to protect their eyes • I can recognise that shadows are formed when the light from a light source is blocked by an opaque object • I can find patterns in the way that the size of shadows change **Forces and magnets** • I can compare how things move on different surfaces • I can notice that some forces need contact between 2 objects, but magnetic forces can act at a distance • I can observe how magnets attract or repel each other and attract some materials and not others • I can 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 • I can describe magnets as having 2 poles • I can predict whether 2 magnets will attract or repel each other, depending on which poles are facing

Science Skills Progression

Year 4 Physicist	Year 5 Physicist	Year 6 Physicist
Sound • I can identify how sounds are made, associating some of them with something vibrating • I can recognise that vibrations from sounds travel through a medium to the ear • I can find patterns between the pitch of a sound and features of the object that produced it • I can find patterns between the volume of a sound and the strength of the vibrations that produced it • I can recognise that sounds get fainter as the distance from the sound source increases **Electricity** • I can identify common appliances that run on electricity • I can construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers • I can 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 • I can recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit • I can recognise some common conductors and insulators, and associate metals with being good conductors	**Earth and space** • I can describe the movement of the Earth and other planets relative to the sun in the solar system • I can describe the movement of the moon relative to the Earth • I can describe the sun, Earth and moon as approximately spherical bodies • I can use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky **Forces** • I can explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object • I can identify the effects of air resistance, water resistance and friction, that act between moving surfaces • I can recognise that some mechanisms including levers, pulleys and gears allow a smaller force to have a greater effect	**Light** • I can recognise that light appears to travel in straight lines • I can 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 • I can 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 • I can use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them **Electricity** • I can associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit • I can 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 • I can use recognise symbols when representing a simple circuit in a diagram