Progression of skills and knowledge for Science

(Taken from National Curriculum, Sharp Alliance, Having A Go: Enhancing Skills and Techniques in the Science Curriculum)

Working Scientifically						
	Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
Asking Questions	Ask simple questions and recognise they can be answered in different ways.		Ask relevant questions Set up simple practical enquiries, comparative and fair tests.		Carry out scientific enquiries to answer questions. Recognise and control variables where necessary Explore and talk about their ideas; asking their own questions about scientific phenomena.	
Monitoring and Recording	Observe closely, using simple equipment. Perform simple tests. Gather and record data to help in answering questions. Identify and classify. Record findings using simple scientific language, drawings, labelled diagrams or photographs.		Make systematic and careful observations. Take accurate measurements using standard units, using a range of equipment. Record findings using simple scientific language, drawings, labelled diagrams or photographs, keys, bar charts and tables. Gather, record, classify and present data in a variety of ways to help in answering questions.		Take accurate measurements, using a range of scientific equipment with increasing accuracy and precision. Take repeat readings when appropriate to consider fair tests. Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, and graphs.	
Concluding	Use their observations and ideas to suggest answers to questions. Use age-appropriate scientific language Begin to notice patterns and relationships.		Identify similarities, differences or changes related to simple scientific ideas. Report on findings, including oral and written explanations, diagrams or annotated photographs or presentations of results and conclusions. Use straightforward scientific evidence to answer questions or support findings. Begin to look for naturally occurring patterns and relationships. Use, spell and read scientific vocabulary correctly.		Use scientific evidence to support or refute ideas or arguments. Report and present findings from enquiries, including conclusions and explanations of and degree of trust in their results, in oral and written forms such as diagrams or annotated photographs and other presentations. Draw conclusions based on their results and observations, use evidence to justify their ideas and use their scientific knowledge to explain their findings. Use, spell, read and pronounce scientific vocabulary correctly.	
Evaluating			Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions Begin to recognise when and how secondary resources might help them to answer questions that cannot be answered through practical investigation.		Use test results to make predictions to set up further comparative and fair tests. Recognise that scientific ideas change and develop over time.	

Plants					
Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
	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 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.	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. Know that plants make their own food using water, carbon dioxide, sunlight as energy in the green parts of plants.			

Animals Including Humans					
Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
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 (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.	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.		Describe the changes as humans develop to old age. Draw a timeline to indicate stages in the growth and development of humans. Learn about the changes experienced in puberty.	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. Explore questions to understand how the circulatory system enables the body to function. 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 Habitats					
Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
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.			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. Construct and interpret a variety of food chains, identifying producers, predators and prey.	Describe the life process of reproduction in some plants and animals. Find out about different types of reproduction, including sexual and asexual reproduction in plants and animals. Find out about the work of naturalists and animal behaviourists, for example, David Attenborough and Jane Goodall.	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. Classify animals into commonly found invertebrates (such as insects, spiders, snails, worms) and vertebrates (fish, amphibians, reptiles, birds and mammals). Find out about the significance of the work of scientists such as Carl Linnaeus, a pioneer of classification.

Evolution and Inheritance					
Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
					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. Be introduced to the idea that characteristics are passed from parents to their offspring i.e. different breeds of dogs, and what happens when, for example, Labradors are crossed with poodles. Appreciate the variation in offspring over time can make animals more or less able to survive in particular environments, for example, by exploring how giraffes' necks got longer. Find out about the work of palaeontologists such as Mary Anning and about hoe Charles Darwin and Alfred Wallace developed their ideas on evolution.

Everyday Materials	Uses of Everyday Materials	Rocks	States of Matter	Properties and Changes of Materials	
Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
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. Recognise that soils are made from rocks and organic matter. Explore a variety of everyday materials and develop simple descriptions of the 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. Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating.		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. 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. Explore reversible changes including, evaporating, filtering, sieving, melting and dissolving, recognising that melting and dissolving are different processes. Explore changes that are difficult to reverse, for example, burning, rusting and other reactions, for example vinegar with bicarbonate of soda.	

		Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic.		

Earth and Space					
Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
				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. Understand that the moon is a celestial body that orbits a planet (Earth has one moon; Jupiter has four large moons and numerous smaller ones)	

Sound	**Light**	**Light**	**Sound**		**Light**
Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
Observe and name a variety of sources of sound, noticing what we hear with our ears. Describe how sound travels from its source in all directions and we hear it when it travels to our ears.	Identify and name a variety of sources of light. Explain that darkness is the absence of light. Describe the features of light and day (in relation to light) Compare the variety of sources of light using simple comparisons.	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	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		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.

		formed when the light from a light source is blocked by a solid object. Find patterns in the way that the size of shadows change.	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.		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					
Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
Observe how pulling or pushing can make things move or stop. Observe how pushing or pulling make things move faster or slower Describe how things can move in different ways.			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. Explore the effects of air resistance by observing how different objects such as parachutes and sycamore seeds fall. Explore the effects of friction on movement and find out how it slows or stops moving objects.	

Electricity					
Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
			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. Draw the circuit as a pictorial representation. Use their circuit to create simple devices. Know the precautions of working safely with electricity. 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.		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. Use recognised symbols when representing a simple circuit in a diagram. Construct simple series circuits, to help them to answer questions about what happens when they try different components, for example switches, motors, bulbs, buzzers and motors.