

Stephenson Memorial Science Non-Negotiables

Early Years - Understanding the World

30-50 months	40-60 months	Early Learning Goal	Exceeding
Comments and asks questions about aspects of their familiar world such as the place where they live or the natural world.	Looks closely at similarities, differences, patterns and change	Children know about similarities and differences in relation to places, objects, materials and living things.	Children know that the environment and living things are influenced by human activity. They can describe some actions which people in their own community do that help to maintain the area they live in.
Can talk about some of the things they have observed such as plants, animals, natural and found objects.		They talk about the features of their own immediate environment and how environments might vary from one another.	They know the properties of some materials and can suggest some of the purposes they are used for.
Talks about why things happen and how things work.		They make observations of animals and plants and explain why some things occur, and talk about changes.	They are familiar with basic scientific concepts such as floating, sinking, experimentation.
Developing an understanding of growth, decay and changes over time			
Shows care and concern for living things and the environment			
Comments and asks questions about aspects of their familiar world such as the place where they live or the natural world.			

Working Scientifically

Years 1 and 2	Years 3 and 4	Year 5 and 6
Asking simple questions and recognising that they can be answered in different ways	Asking relevant questions and using different types of scientific enquiries to answer them	Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary
Observing closely, using simple equipment	Setting up simple practical enquiries, comparative and fair tests	Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate
Performing simple 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	Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs
Identifying and classifying	Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions	Using test results to make predictions to set up further comparative and fair tests
Using their observations and ideas to suggest answers to questions	Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables	Reporting and presenting 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
Gathering and recording data to help in answering questions	Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions	Identifying scientific evidence that has been used to support or refute ideas or arguments
	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.	

Plants

Nursery	Reception	Year 1	Year 2	Year 3
		Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees	Observe and describe how seeds and bulbs grow into mature plants	Identify and describe the functions of different parts of flowering plants: roots, stem/ trunk, leaves and flowers
		Identify and describe the basic structure or a variety of common flowering plants, including trees	Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy	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.

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	Notice that animals, including humans, have offspring which grow into adults	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	Describe the simple functions of the basic parts of the digestive system in humans	Describe the changes as humans develop to old age	Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood
Identify and name a variety of common animals that are carnivores, herbivores and omnivores	Find out about and describe the basic needs of animals, including humans, for survival (water, food and air)	Identify that humans and some other animals have skeletons and muscles for support, protection and movement	Identify the different types of teeth in humans and their simple functions		Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function
Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals including pets)	Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene		Construct and interpret a variety of food chains, identifying producers, predators and prey		Describe the ways in which nutrients and water are transported within animals, including humans
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

Year 1	Year 2	Year 4 (states of matter)	Year 5 (properties and changes of materials)
Distinguish between an object and the material from which it is made	Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses	Compare and group materials together, according to whether they are solids, liquids or gases	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
Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock	Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching	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)	Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution
Describe the simple physical properties of a variety of everyday materials		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 a variety of everyday materials on the basis of their simple physical properties			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

Living thing and their habitats

Year 1 (Seasonal change)	Year 2	Year 4	Year 5	Year 6
Observe changes across the 4 seasons	Explore and compare the differences between things that are living, dead, and things that have never been alive	Recognise that living things can be grouped in a variety of ways	Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird	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
Observe and describe weather associated with the seasons and how day length varies	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	Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment	Describe the life process of reproduction in some plants and animals	Give reasons for classifying plants and animals based on specific characteristics
	Identify and name a variety of plants and animals in their habitats, including microhabitats	Recognise that environments can change and that this can sometimes pose dangers to living things		
	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			

Light and sound

Year 3	Year 4	Year 6
Recognise that they need light in order to see things and that dark is the absence of light	Identify how sounds are made, associating some of them with something vibrating	Recognise that light appears to travel in straight lines
Notice that light is reflected from surfaces	Recognise that vibrations from sounds travel through a medium to the ear	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
Recognise that light from the sun can be dangerous and that there are ways to protect their eyes	Find patterns between the pitch of a sound and features of the object that produced it	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
Recognise that shadows are formed when the light from a light source is blocked by an opaque object	Find patterns between the volume of a sound and the strength of the vibrations that produced it	Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them
Find patterns in the way that the size of shadows change	Recognise that sounds get fainter as the distance from the sound source increases	

Earth and Space

Year 5
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

Forces and magnets

Year 3	Year 5
Compare how things move on different surfaces	Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object
Notice that some forces need contact between 2 objects, but magnetic forces can act at a distance	Identify the effects of air resistance, water resistance and friction, that act between moving surfaces
Observe how magnets attract or repel each other and attract some materials and not others	Recognise that some mechanisms including levers, pulleys and gears allow a smaller force to have a greater effect
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 2 poles	
Predict whether 2 magnets will attract or repel each other, depending on which poles are facing	

Electricity

Year 4	Year 6
Identify common appliances that run on electricity	Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit
Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers	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
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	Use recognised symbols when representing a simple circuit in a diagram
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	

Evolution and inheritance

Year 3 (rocks)	Year 6
Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties	Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago
Describe in simple terms how fossils are formed when things that have lived are trapped within rock	Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents
Recognise that soils are made from rocks and organic matter	Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution