

**+Cycle A**

Kagan Goals:  
 Know and demonstrate how PIES principles make a more effective learner.

Know and develop multiple intelligences of verbal/linguistic, visual/special, naturalist, interpersonal/social intrapersonal/introspective

**Curricular Overview  
Science**



Curricular Goals:

- Know and develop scientific knowledge and conceptual understanding through the specific
- Know the disciplines of biology, chemistry and physics
- Know and develop understanding of the nature, processes and methods of science through
- Know different types of science enquiries that help them to answer scientific questions about the world around them
- are equipped with the scientific knowledge required to understand the uses and implications of science, today and for the future.

**Component: Living things (Animals)**

Foundation Stage	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Comments and asks questions about aspects of their world e.g. the place they live or the natural world.	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	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 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
Developing an understanding of growth, decay and changes over time.	Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets)	Describe the simple functions of the parts of the digestive system in humans	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 the ways in which nutrients and water are transported within animals, including humans.	
Shows care and concern for living things and the environment.	Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.	Construct and interpret a variety of food chains, identifying producers, predators and prey.				
Know about similarities & differences in relation to places, objects, materials & living things.						
Make observations of animals & plants						

	<p>&amp; explain why some things occur, &amp; talk about changes.</p>							
<b>Component: Living things (Plants)</b>								
<p>Comments and asks questions about aspects of their world e.g. the place they live or the natural world.</p>	<p>Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees</p>			<p>Developing an understanding of growth, decay and changes over time.</p>				
<p>Shows care and concern for living things and the environment.</p>	<p>Identify and describe the basic structure of a variety of common flowering plants, including trees i.e. roots, a stem, leaves and flowers</p>			<p>Know about similarities &amp; differences in relation to places, objects, materials &amp; living things.</p>				
<p>Make observations of animals &amp; plants &amp; explain why some things occur, &amp; talk about changes.</p>	<p>Observe and describe how seeds and bulbs grow into mature plants</p> <p>Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy</p>			<b>Component: Living things (Habitats)</b>				

	Comments and asks questions about aspects of their world e.g. the place they live or the natural world.			
	Shows care and concern for living things and the environment.			
	Know about similarities & differences in relation to places, objects, materials & living things.			
	They talk about the features of their own environment & how environments might vary from one another.			
<b>Component: Materials / Rocks</b>				
	Know about similarities & differences in relation to places, objects, materials & living things.		<p style="text-align: center;"><b>Rocks</b></p> <p>Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties.</p> <p>Describe in simple terms how fossils are formed when things that have lived are trapped within the rock.</p>	<p><b>Properties and changes of materials</b></p> <p>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</p> <p>Know that some materials will dissolve in liquid to form a solution, and</p>

			Recognise that soils are made rocks and organic matter.	describe how to recover a substance from a solution.	
			<p><b>States of matter</b></p> <p>Compare and group materials together, according to whether they are solids, liquids or gases</p> <p>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)</p> <p>Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.</p>	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.	
	<b>Component: Physical Processes (Forces)</b>				
	<b>Component: Physical Processes (Light)</b>				
					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.

				<p>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</p> <p>Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.</p>
<b>Component: Physical Processes (Sound)</b>				
			<p>Identify how sounds are made, associating some of them with something vibrating</p> <p>Recognise that vibrations from sounds travel through a medium to the ear</p> <p>Find patterns between the pitch of a sound and features of the object that produced it</p> <p>Find patterns between the volume of a sound and the strength of the vibrations that produced it</p> <p>Recognise that sounds get fainter as the distance from the sound source increases.</p>	
<b>Component: Physical Processes (Electricity)</b>				
<b>Component: Seasonal Changes &amp; Earth and Space</b>				
Comments and asks questions about aspects of their world e.g.	<p><b>Seasonal changes</b></p> <p>Observe changes across the four seasons</p>			<p><b>Earth and space</b></p> <p>Describe the movement of the Earth, and other planets, relative to the Sun in the solar system</p>

	the place they live or the natural world.	Observe and describe weather associated with the seasons and how day length varies		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.
<b>Component: Evolution and Inheritance</b>				
<b>Component: Working Scientifically</b> <i>(These aspects will run taught through the other components of the science curriculum)</i>				
	Comments and asks questions about aspects of their world e.g. the place they live or the natural world.	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.
	Talks about some of the things they have observed e.g. plants, animals, natural & found objects.	Observing closely, using simple equipment.  Using their observations and ideas to suggest answers to questions.	Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers	Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.
	Talks about why things happen and why things works	Performing simple tests  Gathering and recording data to help in answering questions.	Setting up simple practical enquiries, comparative and fair tests  Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables.	Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.

		Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions	
Looks closely at similarities, differences, patterns & change.	Identifying and classifying	Identifying differences, similarities or changes related to simple scientific ideas and processes.  Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.	Using test results to make predictions to set up further comparative and fair tests.
		Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results or conclusions.	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 straightforward scientific evidence to answer questions or to support their findings.	Identifying scientific evidence that has been used to support and refute ideas or arguments.

**Cycle B**

<p>Kagan Goals: Know and demonstrate how PIES principles make a more effective learner.</p> <p>Know and develop multiple intelligences of verbal/linguistic, visual/special, naturalist, interpersonal/social intrapersonal/introspective</p>	<p><b>Curricular Overview Science</b></p>  <p>Curricular Goals:</p> <ul style="list-style-type: none"> <li>• Know and develop scientific knowledge and conceptual understanding through the specific</li> <li>• Know the disciplines of biology, chemistry and physics</li> <li>• Know and develop understanding of the nature, processes and methods of science through</li> <li>• Know different types of science enquiries that help them to answer scientific questions about the world around them</li> <li>• are equipped with the scientific knowledge required to understand the uses and implications of science, today and for the future.</li> </ul>
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**Component: Living things (Animals)**

Foundation Stage	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Comments and asks questions about aspects of their world e.g. the place they live or the natural world.	Notice that animals, including humans, have offspring which grow into adults  Find out about and describe the basic need of animals, including humans, for survival (water, food and air)					
Developing an understanding of growth, decay and changes over time.	Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene					
Shows care and concern for living things and the environment.						

	<p>Know about similarities &amp; differences in relation to places, objects, materials &amp; living things.</p>			
	<p>Make observations of animals &amp; plants &amp; explain why some things occur, &amp; talk about changes.</p>			
<b>Component: Living things (Plants)</b>				
	<p>Comments and asks questions about aspects of their world e.g. the place they live or the natural world.</p>		<p>Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers</p> <p>Explore the requirements of plants for life and growth (air, light, water, nutrients from soil, room to grow and the correct temperature) and how they vary from plant to plant</p> <p>Investigate the way in which water is transported within plants.</p> <p>Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal</p>	
	<p>Developing an understanding of growth, decay and changes over time.</p>			
	<p>Shows care and concern for living things and the environment.</p>			
	<p>Know about similarities &amp; differences in relation to places,</p>			

	objects, materials & living things.			
	Make observations of animals & plants & explain why some things occur, & talk about changes.			
<b>Component: Living things (Habitats)</b>				
	Comments and asks questions about aspects of their world e.g. the place they live or the natural world.	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.
	Shows care and concern for living things and the environment.	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. <b>School environment walk</b>	Describe the life process of reproduction in some plants and animals.
	Know about similarities & differences in relation to places, objects, materials & living things.	Identify and name a variety of plants and animals in their habitats, including micro-habitats.	Recognise that environments can change and that this can sometimes pose danger to living things.	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
	They talk about the features of their own environment & how environments might vary from one another.	Describe how animals obtain their food from plants and animals, using the idea of a simple food chain, and identify and name different sources of food.		Give reasons for classifying plants and animals based on specific characteristics.

Component: Materials			
	Know about similarities & differences in relation to places, objects, materials & living things.	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	
		<p style="text-align: center;"><b>Uses of Materials</b></p> 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.	
Component: Physical Processes (Forces)			
			Compare how things move on different surfaces
			Notice that some forces need contact between two objects, but magnetic forces can act at a distance
			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, the act between moving surfaces.

			<p>Observe how magnets attract or repel each other and attract some materials and not others.</p> <p>Compare, predict and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials</p> <p>Describe magnets as having two poles. Predict whether two magnets will attract or repel each other, depending on which poles are facing.</p>	<p>Recognise that some mechanisms including levers, pulleys and gears, allow a smaller force to have a greater effect.</p>
<b>Component: Physical Processes (Light)</b>				
			<p>Recognise that they need light in order to see things and that dark is the absence of light</p> <p>Notice that light is reflected from surfaces</p> <p>Recognise that light from the Sun can be dangerous and that there are ways to protect their eyes</p> <p>Recognise that shadows are formed when the light from a light source is blocked by a solid object</p> <p>Find patterns in the way that the sizes of shadows change</p>	
<b>Component: Physical Processes (Sound)</b>				

**Component: Physical Processes (Electricity)**

		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 (batteries), wires, bulbs, switches and buzzers	No electricity morning
		Identify whether or not a lamp (bulb) will light in a simple series circuit, based on whether or not the lamp (bulb) is part of a complete loop with a battery	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.
		Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp (bulb) lights in a simple series circuit	Use recognised symbols when representing a simple circuit diagram.
		Recognise some common conductors and insulators, and associate metals with being good conductors	

**Component: Seasonal Changes & Earth and Space**

Comments and asks questions about aspects of their world e.g. the place they live or the natural world.			
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**Component: Evolution and Inheritance**

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				<p>Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of Years ago</p> <p>Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents</p> <p>Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.</p>
<b>Component: Working Scientifically</b> <i>(These aspects will run taught through the other components of the science curriculum)</i>				
	Comments and asks questions about aspects of their world e.g. the place they live or the natural world.	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.
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		<p>Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables.</p> <p>Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions</p>	
Looks closely at similarities, differences, patterns & change.	Identifying and classifying	<p>Identifying differences, similarities or changes related to simple scientific ideas and processes.</p> <p>Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.</p>	Using test results to make predictions to set up further comparative and fair tests.
		Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results or conclusions.	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 straightforward scientific evidence to answer questions or to support their findings.	Identifying scientific evidence that has been used to support and refute ideas or arguments.