

## Science Curriculum

### Intent:

The purpose of our cross-phase Science curriculum is to help students understand and question the world around them. It gives them the scientific knowledge and skills that they need in order to be successful in their future lives and make a contribution to the wider community. Students are empowered with a strong knowledge base that they can then use to evaluate important issues, analyse evidence and problem solve. They develop the confidence to form their own opinions and articulate themselves effectively. Our engaging and challenging curriculum means that students who have studied Science at a Futura school will continue to enjoy learning about Science and how the world works throughout their lives.

### Disciplinary skills progression

	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
<b>Organisms</b>	Asking simple questions and recognising that they can be answered in different ways.	Observe plants in the surrounding environment. Identify and classify types of trees and flowering plant.	Observe plants growing from seeds, recording changes over time. Test the impact of different conditions on plants.	Identify parts of the process for pollination, water transport and seed dispersal. Identify the different muscles and parts of the skeleton. Compare the functions of different muscles. Compare the muscles and skeletons of different animals.	Identify different parts of the digestive system and their functions. Observe and model the process of digestion using simple equipment. Identify different teeth and their functions.	Identify how these factors might affect specific parts of the body or general health. Identify different parts of the circulatory and respiratory system and their functions.	Identify the broad scientific categories that living things can be sorted into by observing similarities and differences in their characteristics.
	Observing closely, using simple equipment.  Performing simple tests.	Recognise and label basic parts of animals including humans. Identify, name, sort and group different types of animals. Observe differences between animals.	Identify different sources of food. Collect data on nutritional value of different foods. Test the effects of physical activity on the human body. Identify ways to stay clean and healthy.	Identify the impact of different food groups on the body. Compare nutritional information of different foods. Identify nutritional needs for different animals.			

<b>Ecosystems</b>	Identifying and classifying		Observe changes over time in living things. Observe habitats in the surrounding environment. Identify and compare different habitats. Identify and compare the different parts of food chains and their dependency on one another.		Identify requirements for life and growth of plants. Test and observe the effect of not having one or more of the requirements for growth. Draw bar graphs based the data. Observe and identify changes in the environment, particularly those that pose a danger to living things. Identify ways in which the environment can be protected. Identify and record different parts of a food web and their dependency on one another. Identify the impact of removing part of the food web.	Identify similarities and differences between lifecycles of mammals, amphibians, insects and birds.	
	Using their observations and ideas to suggest answers to questions						
<b>Genes</b>	Gathering and recording data to help in answering questions.						Observe the changes in humans to old age. Identify and compare the reproductive process in some animals, including humans, and plants. Identify the way that offspring vary from their parents. Observe how variation leads to adaptation in different environments. Identify the changes in living things over long period of time, observing fossils to understand how scientists use these as evidence.

Matter		Interact with and compare a variety of materials, recognising their properties. Use materials in different real-life contexts. Begin to test different materials.	Identify more complex features of materials. Test the suitability of materials in different contexts. Gather and record data about the effectiveness of materials in different contexts. Used gathered data and observations to predict the suitability of a material.		Identify and compare materials based on their state. Observe changes in materials as they change state. Test and measure the effect of temperature on materials. Record results of testing in tables and bar graphs.	Use fair testing to demonstrate the suitability of various materials for a range of everyday purposes.	
Reactions							Investigate reversible changes including dissolving and mixing. Observe irreversible changes and identify the formation of new materials.
Earth		Observe changes in the environment and weather throughout the year. Monitor and record simple weather data.		Observe different types of rocks and soils. Identify and classify different types of rocks. Identify composition of soil layers. Test the properties of rocks. Identify how fossils are formed.	Identify different parts of the water cycle and relate them to states of matter.	Record the observable effects of the movement of the Moon around the Earth and the Earth around the Sun. Identify the objects in the Solar System and their movement around the Sun.	
Forces				Test the magnetic properties of various materials. Record results of tests in simple tables.		Observe and test the effects of water resistance, air resistance, friction and gravity. Test the impact that levers and pulleys have on the amount of force required to move objects.	

Waves				<p>Observe shadows and reflections and the effect of the absence of light. Identify the dangers of direct sunlight. Record data on shadows and reflection.</p>	<p>Identify the way sound is made, including the strength of vibrations, and how this enables humans to hear. Observe and compare different objects and the sounds they produce. Test materials, measuring their insulation against sound.</p>		<p>Identify the way light travels and reflects off of objects. Identify the way humans see by reflected light entering the eye. Test the effect of light brightness and position on the size and position of shadows. Record measurements in tables and graphs.</p>
Electricity					<p>Identify the function of various components by constructing simple circuits. Test complete and incomplete circuits. Identify appliances which run on electricity. Test different materials for conductivity. Record results of tests in a table.</p>		<p>Identify circuit symbols. Record simple circuits in diagrams. Test the effect of various components, particularly cells, on the operation of other components, such as lamps or buzzers. Record results of tests in tables.</p>

Substantive knowledge curriculum

	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Organisms	Similarities, differences, patterns and changes in nature.  Makes observations of animals and plants and explains why some things occur, and talks about changes.	Plants and structures.	Plant growth and requirements of life.	Functions of the parts of plants including water transport. Skeleton and muscles. Diet including nutrition.	Teeth and digestion.	Impact of drugs, lack of exercise and poor nutrition and non-communicable diseases. Circulatory and respiratory system.	Classification of plants and animals.
		Name and group animals and humans.	Exercise, food and hygiene.				
Ecosystems			Explain lifecycles and requirements of life. Explain habitats and food chains.		Comparing plant requirements. Habitat changes. Food webs.	Comparing life cycles.	
Genes							Reproduction and changes to old ages. Evolution.
Matter	Knows about similarities and differences in relation to places, objects, materials and living things	Name properties of materials.	Identify the suitability of materials and changing solids.		States of matter	Complex properties and testing materials	
Reactions							Dissolving & separating materials. Reversible and irreversible reactions Basic particle theory.
Earth	Talks about the features of their own immediate environment and how environments might vary from one another.	Understand seasonal changes		Rocks	Water cycles.	Earth and space	
Forces				Magnets and forces		Forces, including gravity and resistance mechanisms.	
Waves				Light including shadows and the danger of sunlight	Sound		Light including how light travels and the way in which humans see.
Electricity					Electricity including conductors and insulators.		Electricity including bulb brightness.