



Progression of Science in St Pius X 2021-2022

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Curriculum Intent of Science in St Pius X

At St Pius X we provide pupils with opportunities to develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics. We encourage children to develop their understanding of the nature, processes and methods of science through different types of scientific enquires that help them answer questions about the world around them. We equip the children with the scientific knowledge required to understand the uses of science, today and for the future, enabling them to become educated citizens.

	<u>Year Group</u>	<u>Learning Intention</u>	<u>Knowledge</u>	<u>Coverage</u>
Animals including humans	Year 1	Can I name a variety of animals? Can I name a variety of animals? Can I describe the structure of a bee? Can I name and describe different types of animals? Can I name and describe different types of animals?	asking simple questions and recognising that they can be answered in different ways identifying and classifying using their observations and ideas to suggest answers to questions gathering and recording data to help in answering questions asking simple questions and recognising that they can be answered in different ways using their observations and ideas to suggest answers to questions identifying and classifying using their observations and ideas to suggest answers to questions gathering and recording data to help in answering questions gathering and recording data to help in answering questions	Autumn 1
	Year 2	Can they describe what animals need to survive? Can they explain that animals grow and reproduce? Can they explain why animals have offspring? Can they describe the life cycle of some living things? (e.g. egg, chick, chicken) Can they explain the basic needs of animals, including humans? Can they describe why exercise and a balanced diet are important for humans?	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) find out about and describe the basic needs of animals, including humans, for survival (water, food and air) find out about and describe the basic needs of animals, including humans, for survival (water, food and air) notice that animals, including humans, have offspring which grow into adults notice that animals, including humans, have offspring which grow into adults	Summer
	Year 3	Can I explain that humans need the right types of nutrition? Can I explain that humans need the right types of nutrition? Can I explain that humans have skeletons and muscles for movement and support? Can I explain that humans have skeletons and muscles for protection and support? Can I identify that animals need the right types of nutrition? Can I identify that animals have skeletons and muscles for support, protection and movement?	identify that 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 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. identify that animals 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 animals 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 some animals have skeletons and muscles for support, protection and movement.	Spring 1
	Year 4	Can I describe the functions of basic parts of the digestive system? Can I describe the functions of basic parts of the digestive system? Can I describe the functions of basic parts of the digestive system? Can I identify different types of human teeth and state their function? Can I identify similarities and differences between the teeth of different animals? Can I construct and identify food chains and food webs?	♣ describe the simple functions of the basic parts of the digestive system in humans ♣ describe the simple functions of the basic parts of the digestive system in humans ♣ 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 Pupils might work scientifically by: comparing the teeth of carnivores and herbivores, and suggesting reasons for differences; finding out what damages teeth and how to look after them. ♣ construct and interpret a variety of food chains, identifying producers, predators and prey.	Autumn 1

	Year 5	<p>Can I investigate the gestation period of humans and other animals?</p> <p>Can I describe the foetal development stage?</p> <p>Can I describe the changes that happen to a baby and child?</p> <p>Can I describe adolescence and puberty?</p> <p>Can I describe what happens to humans as adults and old age?</p> <p>Can I describe the human life cycle and compare it to other life cycles?</p>	<ul style="list-style-type: none"> ♣ I know the changes as humans develop to old age. ♣ I know the changes as humans develop to old age. ♣ I know the changes as humans develop to old age. ♣ I know the changes as humans develop to old age. ♣ I know the changes as humans develop to old age. ♣ I know the changes as humans develop to old age. 	Spring
	Year 6	<p>Can I understand the understand the main parts of the circulatory system?</p> <p>Can I identify and describe the functions of a human heart?</p> <p>Can I explain the impact of exercise on the heart?</p> <p>Can I use explain the scientific dangers of smoking?</p> <p>Can I create a model of human blood?</p> <p>Can I understand the important functions of blood?</p>	<p>identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood</p> <p>identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood</p> <p>recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function</p> <p>recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function</p> <p>describe the ways in which nutrients and water are transported within animals, including humans.</p> <p>describe the ways in which nutrients and water are transported within animals, including humans.</p>	Spring 1
	<u>Year Group</u>	<u>Learning Intention</u>	<u>Knowledge</u>	<u>Coverage</u>
Living things and their habitats	Year 2	<p>Can I investigate microhabitats?</p> <p>Can I further investigate microhabitats?</p> <p>Can I show an understanding of a food chain in a forest?</p> <p>Can I show an understanding of food chains in oceans and savannahs?</p> <p>Can I show understanding the habitat of a bee?</p> <p>Can I show a deeper understanding of the habitat of a bee?</p>	<ul style="list-style-type: none"> ♣ identify and name a variety of plants and animals in their habitats, including microhabitats ♣ 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 microhabitats ♣ 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 ♣ 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. ♣ 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. ♣ 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 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 	Autumn

	Year 4	<p>Can I define living things and sort them in various ways?</p> <p>Can I classify vertebrates and invertebrates?</p> <p>Can I classify plants?</p> <p>Can I identify a variety of living things and classify them?</p> <p>Can I recognise the effects of a changing environment?</p>	<p>I know that living things can be grouped in a variety of ways</p> <p>I know and use classification keys to help group, identify and name a variety of living things in their local and wider environment</p> <p>I know and use classification keys to help group, identify and name a variety of living things in their local and wider environment</p> <p>I know and use classification keys to help group, identify and name a variety of living things in their local and wider environment</p> <p>I know that environments can change and that this can sometimes pose dangers to living things</p>	Spring 2
	Year 5	<p>Can I describe the life process of sexual plants?</p> <p>Can I describe the life process of asexual plants?</p> <p>Can I describe the life process of mammals?</p> <p>Can I describe the life process of bees?</p> <p>Can I describe the metamorphosis process?</p> <p>Can I describe the life cycle of a bird and compare the life cycles of other living things?</p>	<p>♣ I understand the life process of reproduction in some plants and animals.</p> <p>♣ I understand the life process of reproduction in some plants and animals.</p> <p>♣ I understand the life process of reproduction in some plants and animals.</p> <p>♣ I know the differences in the life cycles of a mammal, an amphibian, an insect and a bird</p> <p>♣ I know the differences in the life cycles of a mammal, an amphibian, an insect and a bird</p> <p>♣ I know the differences in the life cycles of a mammal, an amphibian, an insect and a bird</p> <p>♣ I know the differences in the life cycles of a mammal, an amphibian, an insect and a bird</p>	Spring 2
	Year 6	<p>Can I group organisms based on their characteristics?</p> <p>Can I understand the classification system?</p> <p>Can I classify plants according to their characteristics?</p> <p>Can I explore microorganisms and how they should be grouped?</p> <p>Can I investigate the growth of microorganisms?</p> <p>Can I identify and classify organisms in the local area?</p>	<p>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</p> <p>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</p> <p>give reasons for classifying plants and animals based on specific characteristics</p> <p>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</p> <p>give reasons for classifying plants and animals based on specific characteristics</p> <p>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</p>	Spring 2

Plans	Year Group	Learning Intention	Knowledge	Coverage
	Year 1	Can I identify and name different plants in my local area?	<p>identify and name a variety of common wild and garden plants</p> <p>identify and name a variety of common wild and garden plants, including deciduous and evergreen trees</p>	Spring 1

		<p>Can I identify deciduous and evergreen trees and name common parts?</p> <p>Can I identify and name different trees?</p> <p>Can I identify and name parts of a plant?</p>	<p>identify and describe the basic structure of a variety of common flowering plants, including trees</p> <p>become familiar with common names of flowers, examples of deciduous and evergreen trees, and plant structures (including leaves, flowers (blossom), petals, fruit, roots, bulb, seed, trunk, branches, stem)</p>	
	Year 2	<p>Can I observe and describe that bulbs grow into plants?</p> <p>Can I observe and describe that seeds grow into plants?</p> <p>Can I observe and describe that seeds grow into plants?</p> <p>Can I describe that plants need water to stay healthy?</p> <p>Can I describe that plants need light to stay healthy?</p> <p>Can I describe that plants need the right temperature to stay healthy?</p>	<p>♣ observe and describe how seeds and bulbs grow into mature plants</p> <p>♣ observe and describe how seeds and bulbs grow into mature plants</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> <p>♣ find out and describe how plants need water, light and a suitable temperature to grow and stay healthy</p> <p>♣ find out and describe how plants need water, light and a suitable temperature to grow and stay healthy</p>	Spring 2
	Year 3	<p>Can I describe the functions of different parts of plants?</p> <p>Can I explore the requirements of plants for life and growth?</p> <p>Can I explore the requirements of plants for life and growth?</p> <p>Can I investigate how water is transported in plants?</p> <p>Can I explain pollination?</p> <p>Can I explain the different life cycles of plants?</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, and room to grow) and how they vary from plant to plant</p> <p>♣ 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</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>♣ explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.</p>	Summer 1
	<u>Year Group</u>	<u>Learning Intention</u>	<u>Knowledge</u>	<u>Coverage</u>
Everyday materials	Year 1	<p>Can I identify and name a variety of everyday materials that toys can be made out of?</p> <p>Can I distinguish between an object and the material from which it is made?</p> <p>Can I describe the simple physical properties of a variety of everyday materials?</p> <p>Can I describe the simple physical properties of a variety of everyday materials?</p> <p>Can I compare and group together a variety of everyday materials on the basis of their simple physical properties?</p>	<p>♣ distinguish between an object and the material from which it is made</p> <p>♣ identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock</p> <p>♣ distinguish between an object and the material from which it is made</p> <p>♣ identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock</p> <p>♣ describe the simple physical properties of a variety of everyday materials</p> <p>♣ describe the simple physical properties of a variety of everyday materials</p> <p>♣ compare and group together a variety of everyday materials on the basis of their simple physical properties.</p>	Autumn 2
	Year 2	<p>Can I describe the suitability of materials and their properties?</p>	<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</p>	Spring 1

	<p>Can I describe why some materials are not suitable for certain objects?</p> <p>Can I investigate the suitability of materials and their properties?</p> <p>Can I investigate how materials can be changed?</p> <p>Can I investigate how materials can be changed?</p> <p>Can I research key scientists who designed important materials?</p>	<ul style="list-style-type: none"> ♣ identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses ♣ identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses ♣ 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 ♣ find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching 		
Year 5	<p>Can I recognise different properties of materials?</p> <p>Can I test the effectiveness of different properties of materials?</p> <p>Can I investigate which materials will dissolve?</p> <p>Can I use different processes to separate liquids and solids?</p> <p>Can I identify materials which are effective thermal conductors?</p> <p>Can I identify which materials are effective thermal insulators?</p>	<p>To compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity and response to magnets</p> <p>To compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity and response to magnets</p> <p>To compare and group together everyday materials on the basis of their solubility</p> <p>To use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating</p> <p>To demonstrate that dissolving, mixing and changes of state are reversible changes</p> <p>To describe how to recover a substance from a solution</p> <p>Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic</p> <p>Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic</p>	Summer 1	
<u>Year Group</u>	<u>Learning Intention</u>	<u>Knowledge</u>	<u>Coverage</u>	
Forces	Year 3	<p>Can I identify push and pull forces?</p> <p>Can I compare how different objects move on different surfaces?</p> <p>Can I compare and group a variety of magnetic and non-magnetic materials?</p> <p>Can I explain that some forces need contact to act whilst others can act at a distance?</p> <p>Can I describe magnets as having two poles and when they will attract or repel?</p>	<ul style="list-style-type: none"> ♣ I know that some forces need contact between two objects ♣ I know that some forces need contact between two objects ♣ I know that some forces need contact between two objects, but magnetic forces can act at a distance ♣ I know magnets attract or repel each other and attract some materials and not others ♣ I know that some forces need contact between two objects, but magnetic forces can act at a distance ♣ I know magnets attract or repel each other and attract some materials and not others ♣ I know magnets attract or repel each other and attract some materials and not others ♣ I know magnets have two poles ♣ I know two magnets will attract or repel each other, depending on which poles are facing 	Autumn 1
	Year 5	<p>Can I explain who Isaac Newton is?</p> <p>Can I explain how gravity effects different objects?</p> <p>Can I investigate the effects of air resistance?</p> <p>Can I investigate the effects water resistance?</p> <p>Can I investigate the effects of friction?</p> <p>Can I investigate how levers can generate force?</p>	<p>Pupils might find out how scientists, for example, Galileo Galilei and Isaac Newton helped to develop the theory of gravitation.</p> <p>explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object</p> <p>identify the effects of air resistance, water resistance and friction, that act between moving surfaces</p> <p>identify the effects of air resistance, water resistance and friction, that act between moving surfaces</p> <p>identify the effects of air resistance, water resistance and friction, that act between moving surfaces</p>	Autumn 1

			recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.	
Light	Year 3	<p>Can I recognise why we need light?</p> <p>Can I recognise that light reflects from surfaces?</p> <p>Can I explore what happens when a light reflects off a mirror?</p> <p>Can I recognise that light from the sun is dangerous and that there are ways to protect our eyes?</p> <p>Can I recognise how shadows are formed?</p> <p>Can I find patterns in the way that shadows change?</p>	<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>explore what happens when light reflects off a mirror or other reflective 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 an opaque object</p> <p>find patterns in the way that the size of shadows change.</p>	Summer 2
	Year 6	<p>Can I explain that light travels in straight lines?</p> <p>Can I explain how objects reflect light?</p> <p>Can I explain how we see objects?</p> <p>Can I explain how we see objects?</p> <p>Can I explain refraction?</p> <p>Can I explain the shape of shadows?</p>	<p>recognise that light appears to travel in straight lines</p> <p>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> <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>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>They could extend their experience of light by looking a range of phenomena including rainbows, colours on soap bubbles, objects looking bent in water and coloured filter</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>	Autumn 2
Rocks	<u>Year Group</u>	<u>Learning Intention</u>	<u>Knowledge</u>	<u>Coverage</u>
	Year 3	<p>Can I compare rocks on the basis of their appearance?</p> <p>Can I compare rocks on the basis of their physical properties?</p> <p>Can I explain how rocks are formed?</p> <p>Can I explain how fossils are formed?</p> <p>Can I recognise that soil is made from rocks?</p>	<ul style="list-style-type: none"> ♣ compare and group together different kinds of rocks on the basis of their appearance ♣ compare and group together different kinds of rocks on the basis of their physical properties ♣ Pupils might research and discuss the different kinds of living things whose fossils are found in sedimentary rock and explore how fossils are formed. ♣ describe in simple terms how fossils are formed when things that have lived are trapped within rock ♣ recognise that soils are made from rocks and organic matter 	Autumn 2
	Year 6	<p>Can I explain what a fossil is and what they show us?</p> <p>Can I explain how fossils show us that organisms have changed over time?</p>	<p>I understand that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago</p>	Autumn 1

	<u>Year Group</u>	<u>Learning Intention</u>	<u>Knowledge</u>	<u>Coverage</u>
Sound	Year 4	<p>Can I identify how sounds are made?</p> <p>Can I explain how sounds travel?</p> <p>Can I explain patterns between pitch and sound?</p> <p>Can I explain patterns between sound noise and vibrations?</p> <p>Can I explain how sound changes over distance?</p>	<ul style="list-style-type: none"> ♣ 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 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 	Autumn 2
	Year 4	<p>Can I identify appliances that run on electricity?</p> <p>Can I construct an electrical circuit and identify parts?</p> <p>Can I identify problems in circuits?</p> <p>Can I recognise electrical conductors and insulators?</p> <p>Can I connect and design a switch?</p>	<p>I know common appliances that run on electricity</p> <p>I know 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</p> <p>I know 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</p> <p>I know some common conductors and insulators, and associate metals with being good conductors.</p> <p>I know that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit</p>	Summer 2
Electricity	Year 6	<p>Can I show an understanding of electricity and circuits?</p> <p>Can I recognise and use conventional symbols for circuits?</p> <p>Can I investigate ways in which the brightness of a bulb, sound from a buzzer and speed of a motor can be changed?</p> <p>Can I understand how changing the wires in a circuit affects the brightness of a bulb?</p> <p>Can I create circuits to solve simple problems?</p>	<p>construct simple series circuits, to help them to answer questions</p> <p>use recognised symbols when representing a simple circuit in a diagram</p> <p>Compare and give reasons for variations in how components function</p> <p>associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit</p> <p>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</p> <p>systematically identifying the effect of changing one component at a time in a circuit;</p> <p>designing and making a set of traffic lights, a burglar alarm or some other useful circuit</p>	Spring 1

E a r t h a n d s p a c e	Year group	Learning intention	Knowledge	Coverage
	Year 5	<p>Can I describe the shapes and sizes of the Sun, Earth and Moon and give reasons for their shape?</p> <p>Can I explain how day and night occur and the apparent movement of the sun across the sky?</p> <p>Can I explain the movements of the Earth and other planets in our solar system?</p> <p>Can I explain why the moon appears to change shape?</p> <p>Can I investigate the surface of the moon?</p> <p>Can I identify space misconceptions?</p>	<ul style="list-style-type: none"> ♣ I know the Sun, Earth and Moon are approximately spherical bodies ♣ I understand how the Earth's rotates and know how day and night and the apparent movement of the sun across the sky. ♣ I understand 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 ♣ I understand 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 ♣ I know the Sun, Earth and Moon are approximately spherical bodies ♣ I understand 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 ♣ I know the Sun, Earth and Moon are approximately spherical bodies ♣ I understand how the Earth's rotates and know how day and night and the apparent movement of the sun across the sky. 	Autumn 2
E v o l u t i o n a n d i n h e r i t a n c e	Year group	Learning intention	Knowledge	Coverage
	Year 6	<p>I understand 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>I know that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents</p> <p>I know how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution</p> <p>I know how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution</p> <p>I know how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution</p>	<p>Can I explain what a fossil is and what they show us?</p> <p>Can I explain how fossils show us that organisms have changed over time?</p> <p>Can I explain that living things produce offspring?</p> <p>Can I understand that animals have adapted to live in their environment?</p> <p>Can I understand that animals have adapted to live in their environment?</p>	Autumn 1

