Warren School Scientific Learning Curriculum **Curriculum: 2024-2025**



Contents

Our Vision

Scientific Learning is the process of discovery, by working scientifically, of how the world around us functions. Looking at the natural and manmade world and the variety of physical and biological systems that support it. is embedded across the broader curriculum under the headings of the half-termly umbrella topics, using a cross-curricular (rather than discrete) approach.

Equity, access, communication and inclusion is key to enabling all students to experience the scientific world in ways adapted to their individual needs, including access to a varied outdoor environment and a wide range of learning experiences and materials.

Teaching will be adaptive, child-centred and based on each child's needs, Personal Learning Plan and EHCP. It will enable all children and young people on all the learning pathways to investigate and explore the scientific world.

The opportunity to consolidate and build on previous learning will be actively supported by a spiral curriculum allowing all students to make progress and augment their knowledge and understanding.

"Learning is experience. Everything else is just information." Albert Einstein

Our Values

Unity

Scientific Learning will unify our school under umbrella topics, as the spiral curriculum will support different phases to access the same topic in a variety of ways. Science week and other shared learning experiences will sometimes include all our school family (including parents and carers). Phases will come together to do outdoor activities such as growing plants, looking at wildlife in our local area, including the different habitats such as the wildlife pond and woodland area. Science Week will involve the whole school in a variety of exciting Scientific Learning-based activities. Parents and carers will be encouraged to support their child's Scientific Learning in accessible ways at home, for example, looking at plant growth, light & shade, observing wildlife around them.

Equity

Scientific Learning at Warren is accessible to all students in ways adapted to their individual needs. Students' communication methods, interests and strengths will be at the heart of Scientific Learning ensuring that all students acquire scientific knowledge and understanding in ways adapted to them. The Scientific Learning Curriculum provides a balance of science for Independent living and the cultural capital of enhanced knowledge.

Trust

All our students will be supported to learn in ways that foster mutual respect and keep each other safe. All children and young people will have a voice and encouraged to contribute to the learning of the class or group. Gaps in learning or common misconceptions will be treated with respect and addressed as an opportunity to extend knowledge and skills and ensure that all students are empowered to ask questions and address misunderstandings.

Success

Success is measured according to each small step of progress, and not just by academic success. Evidence of individual progress and learning will be collected in folders or books as appropriate for each class, and recorded on school systems, and all students will receive instant verbal feedback on their learning and achievements. Older students will be encouraged to complete Unit Awards and other nationally recognised qualifications as appropriate.

Subject Intent	Subject Implementation	Subject Impact
We recognise the importance of science in every aspect of daily life. As one of the core subjects, we give the teaching of science the prominence it requires. We aim to equip pupils with knowledge, skills and understanding and to encourage children to be inquisitive throughout their time at Warren School. Throughout the programmes of study, the pupils will acquire and develop the key knowledge that has been identified within each unit and across each year group. We will ensure that the Working Scientifically skills are built-on and developed throughout pupil's time at the school so that they can apply their knowledge of science when using equipment, building arguments and explaining concepts confidently. We will encourage them to continue asking questions and to be curious about the world around them.	Through a broad range of teacher-led, child-initiated and continuous learning opportunities, pupils will be taught to: . • Use their senses to investigate a range of objects and materials . • Find out about, identify and observe the different features of living things, objects and worldly events . • Look closely at similarities, differences, patterns and change . • Ask questions about why things happen and why things work • Develop their communication and co-operation skills . • Talk about their findings, sometimes recording them . • Identify and find out about features of the place they live and in the natural world around them.	The successful approach at Warren School results in a fun, engaging, high-quality science education that provides pupils with the foundations and knowledge for understanding the world. Our pupils love Science! Pupils will know more, remember more and understand more about the curriculum. All pupils will have: . • A wider variety of skills linked to both scientific knowledge and understanding, and scientific enquiry/investigative skills . • A richer vocabulary which will enable them to articulate their understanding of taught concepts . • Confidence and a love of learning for all things science

Overview 3-year cycle

Autumn 1	Me and my community
Scientific learning	This is me / Healthy me

	Year 1	Year 2	Year 3
Early Years	**Know some parts of the human body.** **Explorers:** Story & sensory massage, adults explicitly naming body parts, ie hand, foot, nose. Make hand & foot prints with paint or in sand. Listen to songs and recognise body part being named, ie 'head, shoulders, knees & toes'. Start to count toes and fingers. **Discoverers:** Begin to actively recognise parts of the body, name some body parts, matching activities, puzzles, action songs **Adventurers:** Recognise a wider range of body parts and their functions. Count different body parts, ie 2 eyes, 5 fingers. Actively participate in action games and songs using named parts of the body.	**Name the senses and the part of the body associated with them.** **Explorers:** sensory experiences, and beginning, with support, to recognise different sensations and which body part they are linked to. *Resources: sensology, Tacpac* **Discoverers:** Know that we have 5 senses and which body part we use for each. Sorting activities with senses and body parts. Recognising and naming sensations. **Adventurers:** To know that we have 5 senses and which body parts are involved. To recognise and match a sense to a body part, including hunger and thirst.	**Name the senses and the part of the body associated with them.** **Explorers:** sensory experiences, and beginning, with support, to recognise different sensations and which body part they are linked to. *Resources: sensology, Tacpac* **Discoverers:** Know that we have 5 senses and which body part we use for each. Sorting activities with senses and body parts. Recognising and naming sensations. Messy play and sensations of touch and texture. The sensation of running water and soap bubbles when washing off mud, paint etc **Adventurers:** To know that we have 5 senses and which body parts are involved. To recognise and match a sense to a body part, looking at clean or dirty. Messy play with mud and paint and hand washing, cleaning toys and noting the difference in colour, feel. Washing things with water vs water & soap.
Phase 1	**Identify parts of the human body** **And the senses associated with them.** **Explorers:** To recognise and start to name the senses and the associated body part. To use different parts of the body to push, pull, throw, make prints, pictures etc To join in with counting body parts, pointing and actions in songs and rhymes. To look at	**Basic needs of animals (and humans) water, food & air.** **Explorers:** To recognise thirst, hunger, breathing and other needs they have such as sleep and shelter and to start to be aware that animals have these needs as well. **Discoverers:** To recognise thirst, hunger, breathing and other needs such as sleep and shelter and to recognise that animals have these needs as well.	**Hygiene.** **Explorers:** To know it's important to wash hands to stay healthy. That doctors and nurses look after us when we're ill. **Discoverers:** That germs exist but are too small to see. That some of them can make us ill, so we need to keep our hands clean. **Adventurers:** That germs exist and can make us ill. To see some ways that germs can be spread and that there are ways to keep clean and healthy. That

	different textures & colours. To know whether a sound is loud or quiet. **Discoverers:** To recognise when you feel hungry or thirst, hot or cold. To know a range of body parts and the sensations associated with them. To begin to understand that animals and humans have a skeleton and start to know the names of some organs ie heart, stomach, brain. **Adventurers:** To know that animals and humans have a skeleton and internal organs and to know the names of some of these and their basic function. ***Resources:*** *White Rose science Y1: the human body*	**Adventurers:** To name a variety of animals and that they all have basic needs such as food, water and air. To name where they might find these needs, ie water from rain, ponds, rivers. Understand different animals eat different things.	you should wash hands, use tissues and keep clean.
Phase 2	**The digestive system.** **Explorers:** To start to understand what happens to food we eat and name some parts of the digestive system (mouth, teeth, stomach). To know that we eat when we're hungry and food gives us energy. **Discoverers:** To recognise that there are different types of food, and we need a balanced diet to stay healthy. Food goes through our digestive system, and to be able to name more parts of it. **Adventurers:** To know what happens to the food we eat and to name a wider range of parts of the digestive system. To know that the stomach has acid and bacteria in it. To understand the role of teeth in chewing food and why we need to eat a healthy variety of foods.	**The importance of exercise.** **Different food types and a balanced diet** **Explorers:** To recognise the effects exercise has on the body – ie muscles moving, breathing quickens **Discoverers:** To look at different sorts of exercise and their effects. To begin to understand that you need energy from food, and oxygen to exercise and that it will make you thirsty. **Adventurers:** To look at exercise and muscles. To know we get energy from food and that there are different food groups and some foods are good for us and some we should only eat small amounts of.	**Hygiene: Growing bacteria on clean vs dirty slices of bread** **Explorers:** That bacteria are a sort of germ and some of them are bad for us. To know it is important to wash hands before eating and after using the toilet to help us stay healthy. **Discoverers:** To begin to understand how bacteria can be spread and why we need to keep hands and food clean. To know that we might get ill if bacteria are on our food. **Adventurers:** To understand basic hygiene and the reasons for it. To know that some bacteria can make us ill, and steps we can take to prevent it. To predict what might happen if bacteria get onto our food and to understand how they might get there.

	Resources: White Rose Y4: The digestive system[*Maths resources for teachers | White Rose Education*](#) *The poo experiment* [| STEM](#)		
Secondary	**Skeleton & muscle structure** **Enzymes / structure of cells** **Explorers:** To know what a skeleton and bones are. To know that humans have a skeleton. To feel their bones under their skin and start to relate a model skeleton to the body. To know that muscles move parts of the body and see how the muscles in their own body move their limbs **Discoverers:** to recognise the role of bones in supporting and protecting the body and its organs. To name some parts of the skeleton. To develop understanding of how muscles work by exercising muscles and seeing and feeling strength and tiredness. **Adventurers:** A wider understanding of the role of the skeleton in protecting and supporting the body, and to know some of the names of the bones. To recognise that muscles need fuel from the food we eat to be able to work, and that they are fixed to the skeleton. ***Resources:*** *WhiteRose Y3: skeletons & movement* [Maths resources for teachers | White Rose Education](#)	**Breathing – how the lungs work. Impact of exercise, smoking, asthma on lungs.** **Balanced / unbalanced diet.** **Explorers:** Understanding that we breath air. If we exercise we need more air and that smoking can be bad for us. Food gives us energy and we need to eat to gain energy. **Discoverers:** To have some understanding of how the lungs work and that we breath in O2 and breath out CO2. Exercise, smoking & conditions like asthma can affect our breathing. Some foods are good for us and some are less good. **Adventurers:** To have some understanding of a balanced diet and different food groups. To know what happens if we eat too many sugary foods and don't have a balanced diet. That humans and animals need to breath, eat and drink and the role of water, food and O2 on in maintaining health and exercising.	**Health & the effects of drugs.** **Explorers:** To start to recognise that our health can be affected by many things, including diet, drugs as well as germs. **Discoverers:** To start to recognise some of the effects diet, drugs and cigarettes can have on health. **Adventurers:** Understand that some things such as a balanced diet and exercise have a positive impact on our health, and that there are a range of things including cigarettes and drugs which can be unhealthy and sometimes dangerous.

Progression map Scientific Learning

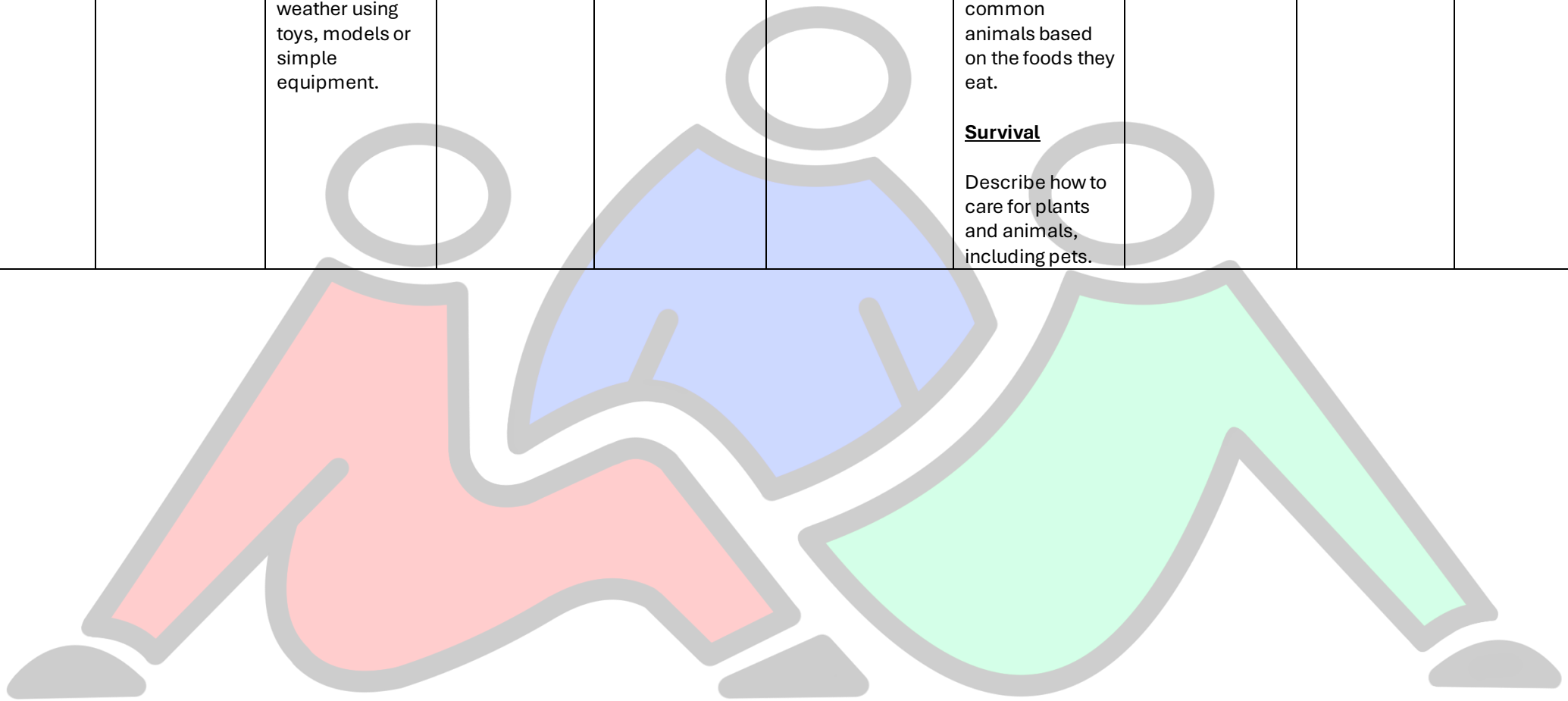
Pathway	Humankind	Processes	Creativity	Investigation	Materials	Nature	Place and Space	Comparison	Change
Explorer	**Human Body** Identify some of the different body parts from pictures. **Staying safe** Follow simple rules with the help of an adult. **Healthy lifestyle** Wash and dry hands after going to the toilet and before eating.	**Pattern seeking** Talk about the weather as being warm or cold. **Changes** Begin to notice the difference in day length. **Earth** Say what the daily weather is like. **Phenomena** Notice and begin to describe natural phenomena, such as weather, rainbows and clouds. **Modelling**	**Report and conclude** Begin to offer simple explanations for why things happen.	**Questioning** Ask or answer a simple scientific question. **Measurement** Place two to three items in order based on length, height or capacity. **Investigation** Find different ways to do things when playing and exploring and use all their senses in hands on exploration of natural materials. **Observation** Talk about some of the things that they have	**Identification and classification** Explore and sort everyday items, with support, into groups of the same material **Properties and uses** Explore and talk about materials which are waterproof.	**Identification and classification** Care for growing seeds and plants and describe observable features of different types of plants and trees. **Parts and functions** Begin to talk about and draw plants with attention to their parts. Begin to talk about and name the body parts of common animals, including pets. **Nutrition**	**Habitats** Begin to observe and talk about living things in the local environment.	**Physical things** Make simple comparisons between objects and materials, such as bigger and smaller, and softer and harder. **Phenomena** Play with objects or their own body outside to create shadows.	**Living things** Say how a living thing has changed over time.

		Play with and explore battery-powered toys and models. **Forces** Talk about and play with objects that float and sink and describe different forces that they can feel.		observed using simple scientific vocabulary.		Describe what a familiar animal or pet eats. **Survival** Begin to talk about ways to care for a plant or animal.			
Discoverers	**Human Body** Draw pictures of the human body and name some of the different body parts. **Staying safe** Follow instructions when in different environments and when handling simple equipment, such as scissors. **Healthy lifestyle**	**Pattern seeking** Notice and begin to describe patterns of weather in summer and winter. **Changes** Notice and talk about the differences in day length between the seasons. **Earth**	**Report and conclude** Represent scientific observations by mark making, drawing or creating simple charts and tables. Offer explanations for why things happen, making use of vocabulary, such as, because, then and next.	**Questioning** Ask a relevant scientific question to find out more, explain how things work and why they might happen. **Measurement** With support, use simple equipment, such as timers, rulers and containers, to measure length, height,	**Identification and classification** Name and sort everyday items into groups of the same material. **Properties and uses** Identify that materials have different properties and explore and sort magnetic and non-magnetic materials through play and exploration.	**Identification and classification** Begin to name and group plants and trees according to their observable features. **Parts and functions** Name and describe basic features of plants and trees. Identify common features for	**Habitats** Observe and describe living things and their habitats within the local environment.	**Physical things** Compare and group objects and materials according to simple given criteria. **Phenomena** Make a shadow bigger or smaller using toys, play equipment and a light source.	**Living things** Explore the natural world around them and give simple descriptions, following observation, of changes.

	Wash and dry hands regularly and say why this is important	Describe simply how weather changes as the seasons change. **Phenomena** Name and describe natural phenomena, such as the size of shadows, the colours of a rainbow, the speed of clouds moving across the sky and the strength of a wave. **Modelling** Explore and describe electrical and non-electrical light sources. **Forces** Describe, predict and sort things that float and sink and talk about the forces that they can feel.	**Gather and record data** Record data in simple tables and pictograms.	capacity and time. **Investigation** Observe how activities are going and adapt their ideas if necessary. **Observation** With support, observe, record and talk about materials and living things.		different groups of animals, including wild and domestic animals. **Nutrition** Match animals to the foods that they eat. **Survival** Describe some ways that plants or animals should be cared for in order for them to survive.			

Adventurers	**Human Body** Draw and label the main parts of the human body and say which body part is associated with which sense. **Staying safe** Describe ways to stay safe in some familiar situations. **Healthy lifestyle** Explain why hand washing and cleanliness are important.	**Pattern seeking** Observe changes across the four seasons. **Changes** Observe and describe how day length changes across the year. **Earth** Observe and describe different types of weather. **Phenomena** Explain in simple terms how shadows are formed. **Modelling** Describe, following exploration, what simple electrical circuits can do.	**Report and conclude** Talk about what they have done and say, with help, what they think they have found out. **Gather and record data** With support, gather and record simple data in a range of ways (data tables, diagrams, Venn diagrams).	**Questioning** Ask simple scientific questions. **Measurement** With support, use simple equipment to measure and make observations. **Investigation** With support, follow instructions to perform simple tests and begin to talk about what they might do or what might happen. **Observation** Observe objects, materials, living things and changes over time, sorting and grouping them	**Identification and classification** Identify and name what an object is made from, including wood, plastic, glass, metal, water and rock. **Properties and uses** Investigate and describe the simple physical properties of some everyday materials, such as hard or soft; stretchy or stiff; rough or smooth; opaque or transparent; bendy or rigid and waterproof or not waterproof.	**Identification and classification** Identify, compare, group and sort a variety of common wild and garden plants, including deciduous and evergreen trees, based on observable features. **Parts and functions** Label and describe the basic structure of a variety of common plants. Label and describe the basic structures of a variety of common animals, including fish, amphibians, reptiles, birds and mammals.	**Habitats** Observe the local environment throughout the year and ask and answer questions about living things and seasonal change.	**Physical things** Compare and group materials in a variety of ways, such as based on their physical properties; being natural or human-made and being recyclable or non-recyclable. **Phenomena** Compare shadows made by different objects and materials.	**Living things** Describe, following observation, how plants and animals change over time.

		Forces Investigate weather using toys, models or simple equipment.		based on their features.		**Nutrition** Group and sort a variety of common animals based on the foods they eat. **Survival** Describe how to care for plants and animals, including pets.			



Assessment Criteria – Explorers

- Pupils use emerging conventional communication
- Pupils greet known people and may initiate interactions and activities [for example, switching on a favourite piece of equipment in the light and sound room]
- Pupils can remember learned responses over increasing periods of time and may anticipate known events [for example, balls falling and bouncing on the floor]
- Pupils may respond to options and choices with actions or gestures [for example, touching one substance rather than another]
- Pupils actively explore objects and events for more extended periods [for example, feeling the textures of different parts of a plant]
- Pupils apply potential solutions systematically to problems [for example, tipping a container in order to pour out its contents]

Assessment Criteria – Discoverers

- Pupils explore objects and materials provided, changing some materials by physical means and observing the outcomes [for example, when mixing flour and water]
- Pupils communicate their awareness of changes in light, sound or movement.
- Pupils initiate actions involving main body parts [for example, clapping or stamping].
- Pupils make sounds using their own bodies [for example, tapping, singing or vocalising], and imitate or copy sounds
- Pupils cause movement by a pushing or pulling action 'Explore' includes access through any sensory mode

Assessment Criteria – Adventurers

- Pupils take part in activities focused on the anticipation of and enquiry into specific environments [for example, finding a hamster under straw, or a CD or video in a pile].
- Pupils match objects and materials in terms of single features or properties [for example, temperature or colour]
- Pupils indicate the before and after of material changes
- Pupils try out a range of equipment in familiar and relevant situations [for example, initiating the activation of a range of light sources]
- Pupils respond to simple scientific questions [for example, 'Show me the flower' 'Is this wet/dry?'] 'Showing', 'demonstrating' 'trying out' 'responding' etc. may be done by any means appropriate to the pupil's preferred mode of communication and physical abilities

Action plan

Focus area:	Quality of Education

Key improvement priority (taken from the SDP)	Action and RAG rating	Led by	Success criteria	Review Date
SDP2 - Curriculum/Teaching and Learning **2.4** Curriculum subject leads plan and develop their curriculum area and celebrate this across the school.	Raise the profile of scientific learning across the school. Improve the standard of work – ensure all staff fully understand and share the expectations. Provide CPD for all staff Work with new teachers to provide support and exemplar work.	Tamzin Berry	Teachers fully aware of and share the high expectations of scientific learning. Schemes of work followed and each part of the process evidenced on EfL. CPD session in place	Implement September 2024 Review November 2024
SDP3 - Planning and Assessment **3.3** Consistent and effective in the use of the Evidence for Learning (EfL) tool by all members of the class teams.	Lesson explorations Regular monitoring of pupils work on EfL Staff voice Pupil Voice	Tamzin Berry	We have a clear monitoring system in place through EfL (TAGS) that supports the teaching of scientific learning and ensures consistency across the school. Pupils voice to be used throughout the year. Leaders are able to identify areas for development and provide support for staff Feedback to all teachers after learning exploration.	Implemented September 2024 Review November 2024

SDP4 - Learning Environment **4.1** Connections to be formed with other schools to enable sharing of good practice.	Connections to be formed with other schools and external agencies	Tamzin Berry	Links formed with Riverwalk School	Implemented September 2024 Review November 2024
SDP2 - Curriculum/Teaching and Learning **2.4** Curriculum subject leads plan and develop their curriculum area and celebrate this across the school.	To provide staff with bespoke CPD so that they can confidently deliver their schemes of work. Staff to understand the skills being taught Progression maps	Tamzin Berry	Teachers possess the skills, enjoy and be confident when delivering the schemes of work.	Implemented September 2024 Review November 2024