PUCKLECHURCH CE VC PRIMARY SCHOOL

Science Handbook 2026-2027

Intent

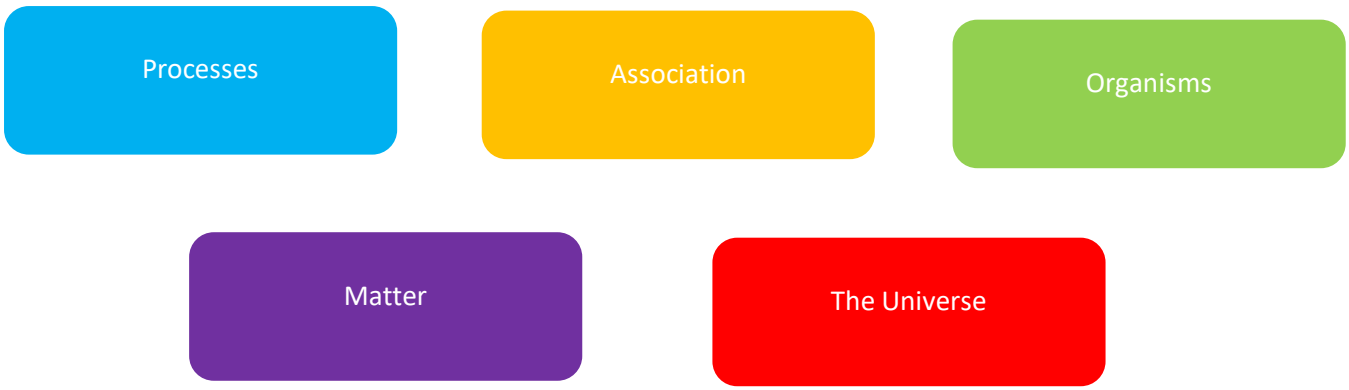
Our science curriculum intends to support our pedagogical principles by:

For our learners at Pucklechurch, Science will…	
Nurture social and emotional growth	The Science curriculum at Pucklechurch will help to produce effective contributors, who will be able to make sensible judgements about the world they live in as global citizens; they will be able to think analytically about matters involving relationships between the physical environment and society.
Promote metacognition	Children will engage with subject specific thinking through observation over time, identifying/classifying, pattern seeking, research and fair testing. Science will enable the children to plan, observe, record, conclude and evaluate helping them to understand what it is to be a scientist and how they learn.
Champion inclusiveness and celebrate differences	Our science curriculum will allow children to study the work of influential scientists (modern day and historical) from different cultures. This will enable the children to consider the significance and impact of important people of varying culture and diversity.
Raise aspirations	Through studying science at Pucklechurch, the children will be able to satisfy their natural interest and curiosity about how everything on Earth works and interconnects. They will understand that individuals and communities can have a positive impact on the future and that they themselves have a role to play in sustaining the world around them.

To enable the realisation of our intent, as specified in our Curriculum and Pedagogy Guide, we aim to achieve this by creating knowledgeable learners

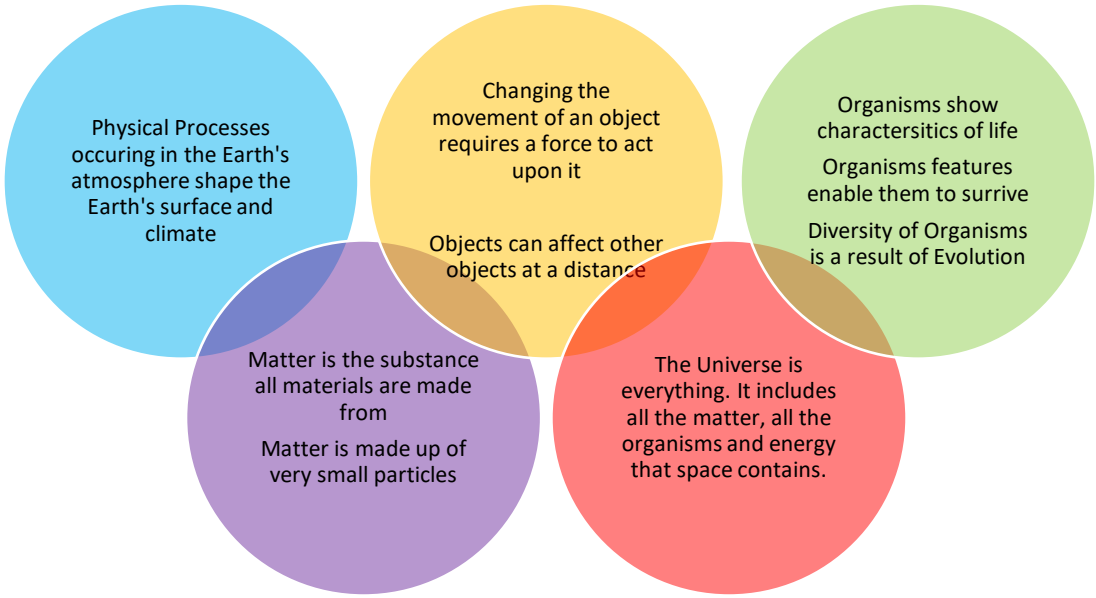
Key Concepts

Our science curriculum has been influenced by five key concepts that we revisit throughout the primary phase to allow children to make connections and links to previous learning and build their conceptual understanding. These concepts are:



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Each of our chosen concepts help to form our big ideas of science. We share one of these big Ideas with the children at the start of each session to encourage children to make conscious connections between their learning and activate schema.

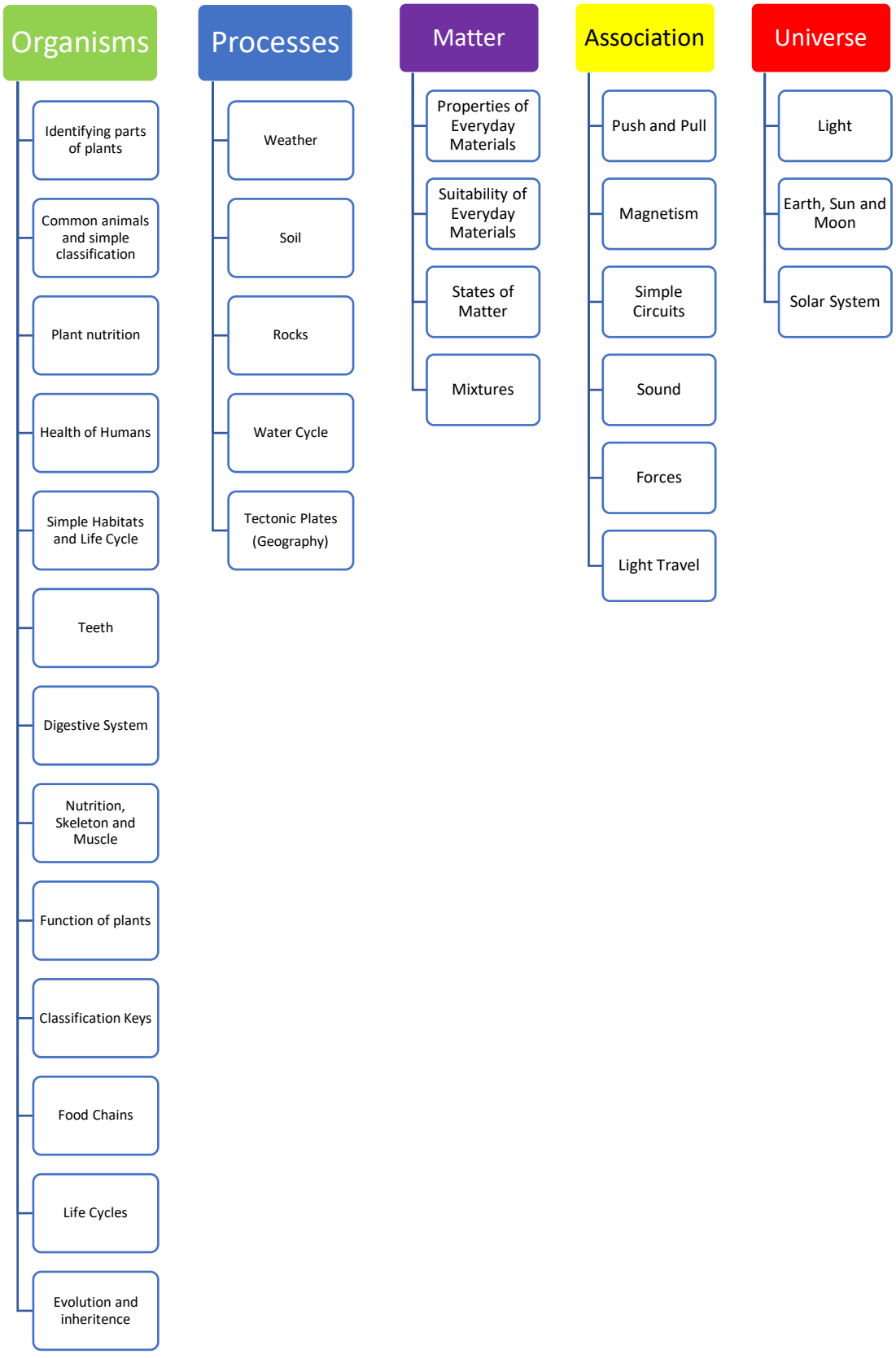


Concept	Making connections through our drivers
Processes	Children will study physical processes that occur on Earth and will understand the impact of these processes on both human health and the sustainability of the planet. The children will understand that humans' actions can have negative and positive influences on both the processes and on their impacts.
Association	The study of energy and forces and the relationship between objects will satisfy children's natural interest and curiosity about how everything on Earth is powered but will also give children the required knowledge on the impact of producing this energy. Engaging in these discussions will help the children to become responsible and individuals in the modern world who consider the impact of some of these associations.
Organisms	It is important that our children have a rich knowledge about all living things and how their survival is dependent on the environment that they live in. This means children will gain an understanding of how humans have a role in sustaining and protecting the world around them. The children will also explore the human body, such as the digestive system, the muscular-skeletal system, the circulatory system and the reproductive system. This is where our children will gain the knowledge needed in order to know how to make healthy lifestyle choices and the impact that these choices have on our bodies.
Matter	Studies about materials and their properties are important as they allow children to understand the world around them and the practicality of different materials which are used in everyday life. From studying materials, the children will be able to be analytical about matters involving relationships between the physical environment and society and make sensible judgements about the world they live in.
The Universe	Gaining a concept on the Universe and how expansive it is will provide children with an understanding on just how remarkable our existence is and gain a desire to protect and celebrate this. Through studying the solar system, the children will understand how the conditions on our planet support life and that these conditions should be protected to sustain our futures.

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Building substantive knowledge

We have designed a connected curriculum with links across the primary phase that allows knowledge to be sequenced and mapped coherently. Teachers know what learning has come before and what learning will come after, enabling them to utilise the knowledge that is in the children's long-term memory.



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Building disciplinary knowledge

To be successful scientists children need to use thier existing substantive knowledge to learn disciplinary knowledge through the process of classroom enquiry. Careful sequencing of lessons will ensure children have accquired the relevant substansive knowledge to successfully engage within an enquiry session, where the teaching focus can be on the associated disciplinary knowledge.

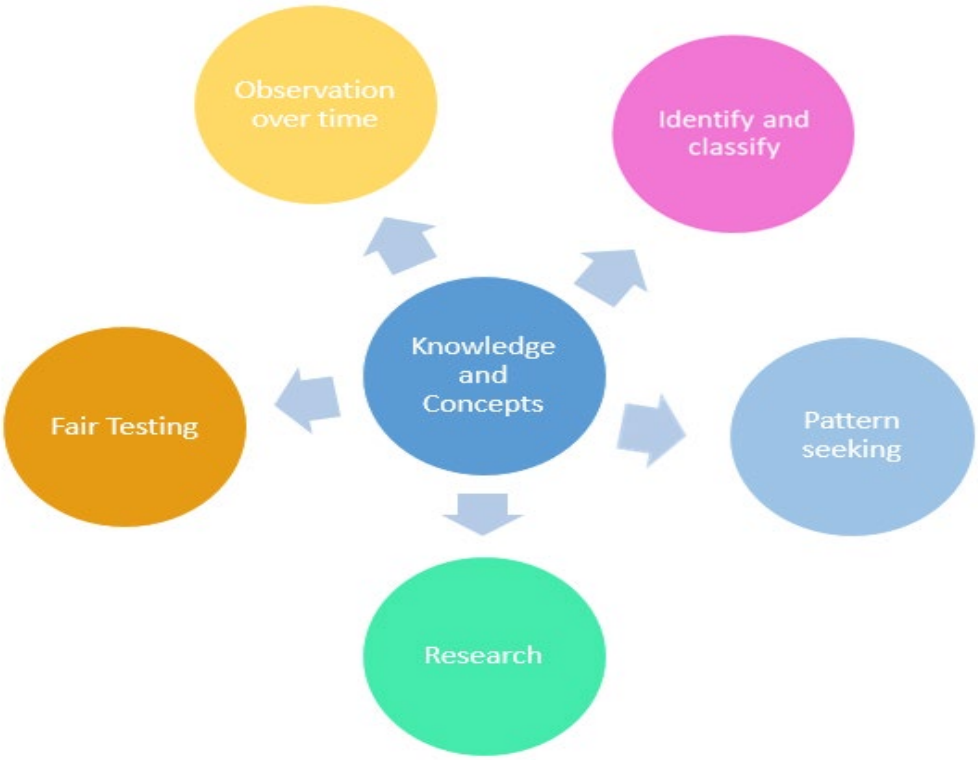
To develop this disciplinary knowledge we use an enquiry process that encourages the practical application of this knowledge. The process has been split into five different areas. Each part of the process carries equal importance and children need to experience all of the areas with similar frequency to ensure they acquire the knowledge of what it means to be a scientist. The disciplinary knowledge that the children need to acquire in each area has been mapped out to ensure its progressive across the phases. As the children move through the primary phase, they gain an understanding on what it is to be a scientist and what it is that scientisits do.



Enquiry Focus	KS1	Lower KS2	Upper KS2
Planning	Scientists ask questions that compare things, look for patterns, observe what happens over time and sorts things into groups. Scientists choose different equipment to help them observe or measure Scientists identify the headings for two classification groups (It is and It is not) Scientists research answers to questions they are interested in	Scientists ask relevant questions and use different types of scientific enquiries to answer them Scientists have to plan how to make their enquiries fair tests and how often to take measurements Scientists think of appropriate headings and diagrams to help them sort information Scientists research the answer to specific questions	Scientists ask a range of questions and identify what type of enquiry will help to answer the questions. Scientists plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary and how often to take measurements Scientists identify specific clear questions that will help them to sort without ambiguity When researching, Scientists ask a range of research questions around a chosen area
Observing/ Obtaining Evidence	Scientists observe closely and use equipment to help them answer questions Scientists use equipment to help them to measure accurately Scientists compare objects based on observable features Scientists use surveys, books and the internet to help them conduct research	Scientists make systematic and careful observations Scientists take accurate measurements using standard units and a range of equipment Scientists compare objects based on sophisticated observable features Scientists have to use scientific sources to find the answer when researching	Scientists make a range of relevant observations linked to the original enquiry question Scientists take measurements, using a range of scientific equipment, with accuracy and precision and take repeat readings where appropriate Scientists compare objects based on physical features and their own scientific knowledge Scientists have to choose suitable sources to find the answer to research questions
Recording	Scientists record their findings in pictures, photographs, pictograms and tally charts Scientist can sort objects and living things into two groups using a table Scientists can present their findings from research through discussion and pictures	Scientists recording findings through drawings, labelled diagrams, keys, bar charts and tables. Scientists can sort objects and living things into Carroll and Venn diagrams Scientists use branch databases and keys to identify objects and living things Scientists take notes when researching	Scientists record their data and results using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs Scientists take notes when researching and structure them under relevant headings
Concluding	Scientists use their observations and ideas to suggest answers to questions and identify: how things change over time, cause and effect, simple patterns in results and the number of objects in each classification group. Scientists present what they have learned verbally and using pictures.	Scientists use their observations and existing knowledge to spot patterns, explain cause and effect or classification and give reasons for changes over time using scientific evidence to support their findings. Scientists report on tier findings from enquiries, through oral and written explanations, diagrams, displays or presentations of results and conclusions. Scientists use results from the test to make a prediction about a further result within the same investigation	Scientists answer questions using scientific evidence gained from a range of sources to describe and explain casual relationships, change overtime and patterns identified. Scientists report and presenting findings from enquiries, including conclusions, causal relationships and explanations in oral and written forms such as displays and other presentations. Scientists use test results to make predictions about further investigations
Evaluating		Scientists suggest improvements to their investigation if they were to do it again with particular focus on the measurement method and equipment used. Scientists suggest limitations to their research and what they would want to research next	Scientists must explain their degree of trust in their results- e.g. precision in measurements, variables that may it have been controlled and accuracy of results. Scientist talk about their degree of trust in the sources they have used when researching

Progression in Disciplinary knowledge

To support this process, we have identified five different types of enquiries that we want the children to take part in. For each unit of work, we have created a document outlining what activities the children could do for each type of enquiry to ensure they learn and apply the relevant disciplinary knowledge.

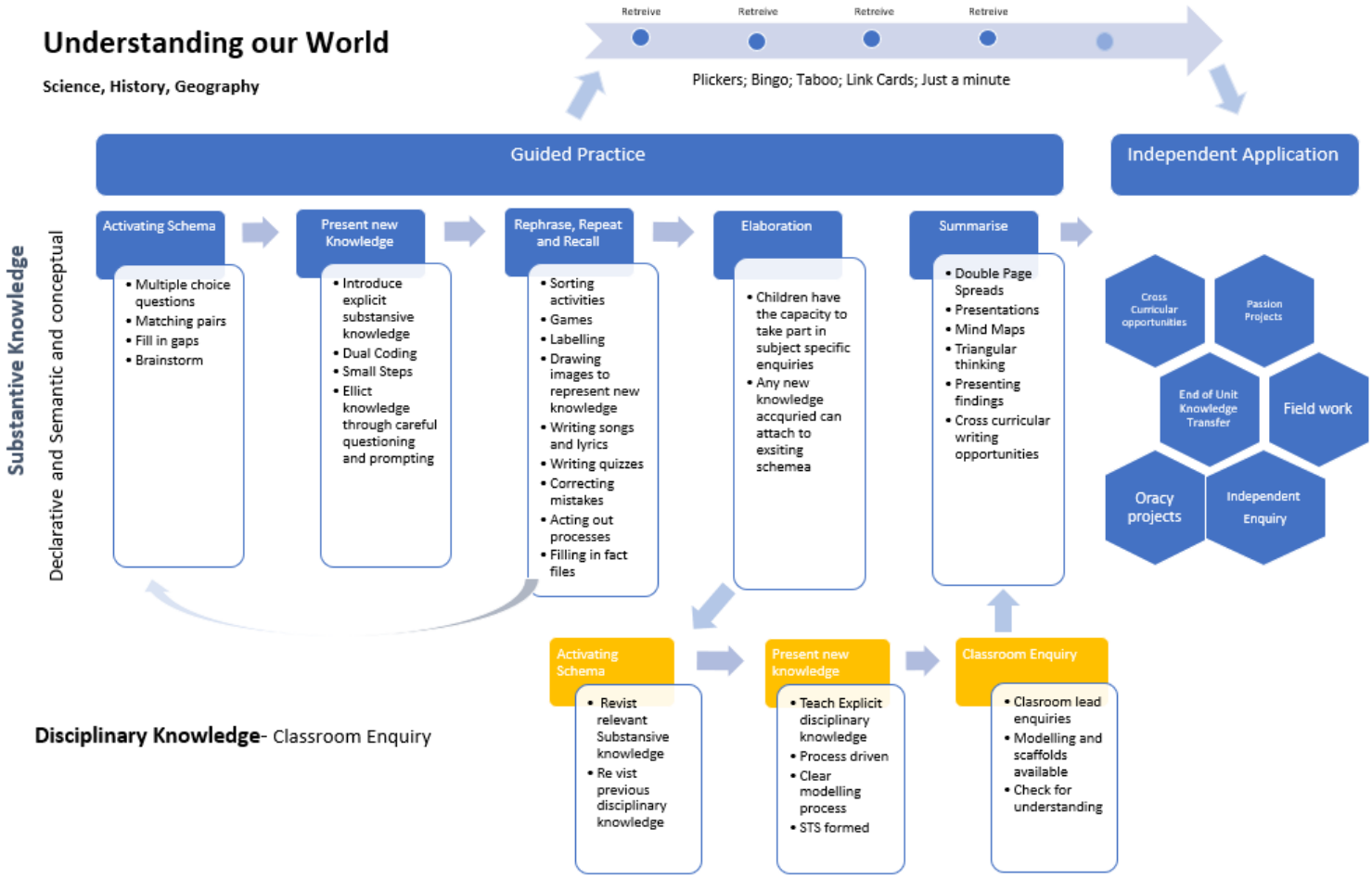


Enquiry Skill	**Unit 9** **Animals including Humans- Teeth and the Digestive System**
Observation over time	**Where is your breakfast/lunch at the moment?** Over the course of a day/two days discuss at what stage of the digestive process the pupil's breakfast/lunch is e.g. Food normally takes 1 – 3 hours to digest in the stomach. It then takes 6 – 8 hours to move through the small intestine. o What is left can then be in the large intestine for anywhere between 12 – 47 hours before being expelled. In total food takes on average between 19 and 58 hours to digest
Identify and Classify	**How can we organise teeth into groups?** Pupils use mirrors/photographs to identify/name their teeth. **By examining a photograph of this animals teeth can you identify whether it is a herbivore, omnivore or carnivore?** Identify whether an animal is a herbivore, omnivore or carnivore by examining a photograph of its teeth. **What food chains can we identify in our school grounds/local area?** Explore the school grounds/local area identifying plants/animals. Classify what pupils find as either producers, prey or predators and identify where they get their energy from. Based on their findings create food chains.
Pattern Seeking	**Are foods that are high in energy always high in sugar?** Explore sugar and energy content of different foods and identify patterns. **Does the average size of a mammal affect the average amount of faeces that it produces each day?** Explore the average size of different mammals and the average amount of faeces that they produce each day and identify simple patterns.
Fair Testing	**How are the teeth of herbivores, omnivores, and carnivores the same/different?** Compare the teeth of herbivores, omnivores and carnivores identifying similarities and differences.
Research	**What is the function of the parts of the human digestive system?** **Do other animals have a digestive system like humans?** **What are the functions of different teeth?**

Example of the Enquiry Mapping document for Unit 9

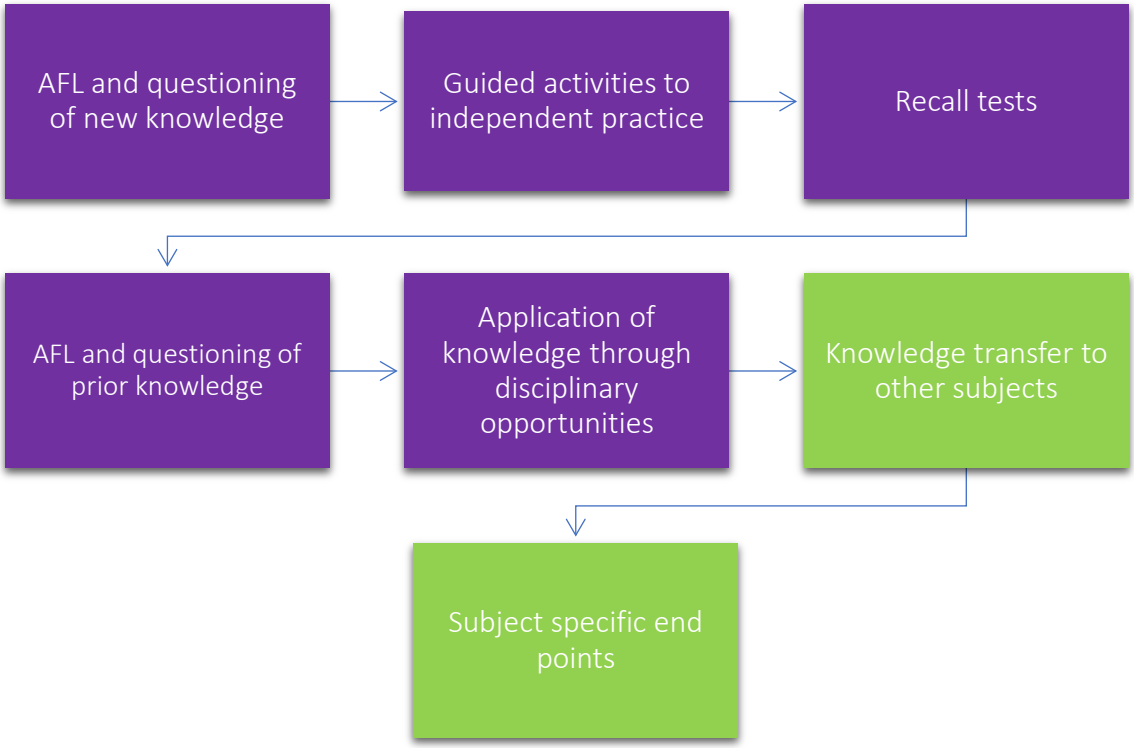
Knowledge teaching sequence

It is important that the children get the opportunity to explore notions more independently, find patterns and rules and develop original ideas. At the end of each unit, the children will have the opportunity to showcase their knowledge in the end of unit knowledge transfer. These projects also act as a platform for children to pursue areas of the curriculum in an extended fashion through projects that encourage them to practice higher order skills such as articulation, collaboration, organisation and reasoning. These projects will make links to the real world and by taking part in them the children will develop their confidence and aspiration. Therefore, opportunities for this kind of work needs to be sequenced and structured well so that new learning builds on secure foundations. Once the learners have accquired core subject knowledge both substantive and disciplinary, they will be able to utilise this to successfully take part in this independent application. To ensure this is done, science follows this lesson sequence. More information on this sequence can be found in our Pedagogy and Curriculum Guide.



Assessment of knowledge

Ongoing assessment of substantive knowledge is an essential component of the science curriculum. This enables the teacher to ensure that all children will obtain the knowledge needed for them to perform the desirable cognitive skills outlined in our pedagogical principles. We have built in several opportunities for informal and formal assessment of the substantive and disciplinary knowledge obtained. More information on this process can be found in the Curriculum and Pedagogy Guide.



Subject specific end points

In science we have developed assessment points at the end of each phase. These are a set of statements that the teachers can use to assess individual learners against in each subject. These statements have been written to assess how the children use their substantive knowledge to demonstrate an understanding of the subject specific concepts and how they use their disciplinary knowledge to help them behave like a scientist.

Year Group	Science- Substantive and Disciplinary Knowledge
Year 1	Children understand that humans are a type of animal and can name and describe the purpose of key body parts such as head, arms, legs, and senses. They know that humans and other animals belong to groups called vertebrates and can name and describe the five vertebrate groups. Children can explain that animals eat different things and can name herbivores, carnivores and omnivores. Children understand that objects are made from different materials and can describe these materials using simple vocabulary knowing that some materials are natural and others are man-made. They understand that some materials can be recycled and that we must use natural resources responsibly. They ask simple scientific questions and sort objects, materials and animals into groups based on their observable features. They make close observations using their senses and basic equipment and record their findings through drawings, photographs, tally charts or pictograms. Children reflect on their findings and can suggest what they would change or do differently if they did the investigation again.

Example of End point Documentation