

Science Handbook



Shoreditch Park
Primary School

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Science Intent

At Shoreditch Park Primary, we provide an inclusive science curriculum that encourages our children to understand, explore and question the natural and humanly constructed world around them.

In the EYFS, science is a key part of the specific area 'Understanding of the World' and provides important contexts for learning. It is also integral to the development of the unique child and provides effective learning opportunities for 'creating and thinking critically' and 'active learning'. Alongside specific scientific knowledge and vocabulary, children develop the concept of 'working scientifically' appropriate to their developmental stage.

In Key Stage 1 and 2, our approach to science teaching enables children to become more independent and autonomous, systematic, precise and evaluative, and to increasingly use their scientific knowledge in their explanations. We offer a thorough coverage of every topic within the National Curriculum, with a focus on enquiry, varied investigation, questioning and subsequent explanation of scientific phenomena through rational discussion.

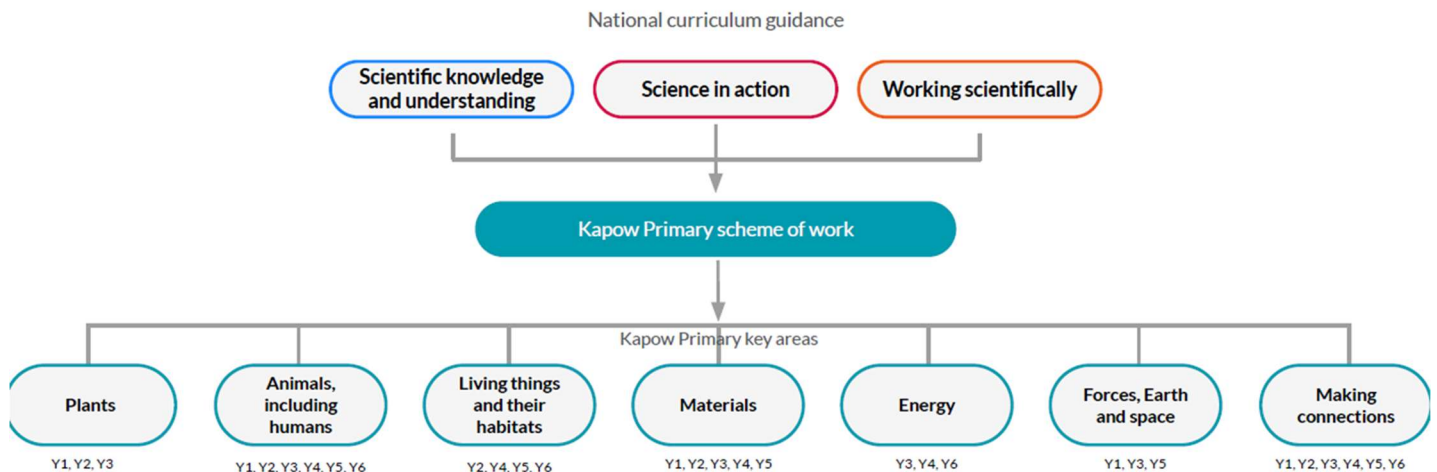
We use the Kapow Science programme to structure science lessons. This programme is designed to help teachers to deliver high quality and engaging lessons. The scheme has a strong focus on developing knowledge alongside scientific skills across biology, chemistry and physics. It also follows a spiral curriculum which means knowledge is revisited and built upon year after year and helps children to develop their critical thinking skills as well as their scientific literacy by using a wide-ranging and specialist vocabulary.

At Shoreditch Park we use three key strands which guide all science lessons:

- **Scientific knowledge and understanding of:**
 - o biology: living organisms and vital processes;
 - o chemistry: matter and its properties;
 - o physics: how the world we live in 'works'.
- **Working scientifically:** processes and methods of science to answer questions about the world around us.
- **Science in action:** uses and implications of science in the past, present and for the future.

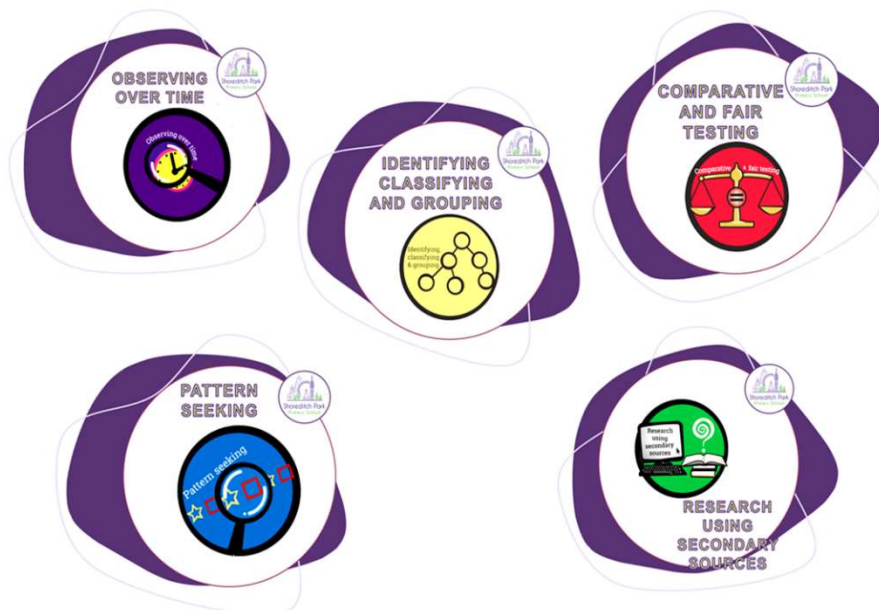
Scientific Knowledge and Understanding

The curriculum is designed to ensure full coverage of the National Curriculum, with a strong focus on developing pupils' scientific knowledge and understanding. Each unit is structured to introduce key concepts in a clear and engaging way, building progressively year on year. Pupils revisit important themes such as plants, animals, materials, and forces, but at greater depth as they move through the school. This spiral curriculum supports long-term retention and allows children to make meaningful connections between ideas.



Working Scientifically

At the heart of our curriculum is the balance between knowledge and working scientifically. Each unit covers essential scientific concepts, but learning is always grounded in enquiry. Pupils are not simply told facts; they are encouraged to ask questions, plan and carry out investigations, make observations, collect evidence, and draw conclusions. This ensures that scientific skills are taught through meaningful contexts, rather than as isolated add-ons.



We explicitly teach the five enquiry types set out in the National Curriculum. These enquiry types are distributed carefully across the curriculum so that pupils encounter a broad range of approaches throughout their primary journey. This avoids the common problem of over-reliance on fair testing alone and ensures a more rounded experience of science. Working scientifically skills are revisited and developed in increasing depth, enabling staff to track and support pupil development over time.

Practical learning is prioritized within the curriculum. Lessons are designed to get children actively involved in exploring, experimenting, and discovering. This practical emphasis helps to secure knowledge, develop critical thinking, and nurture a sense of curiosity and excitement about the subject. By regularly engaging in hands-on science, pupils are more likely to see themselves as capable scientists.

Science in action

We also go beyond curriculum coverage by ensuring science is experienced as a practical and engaging subject. Lessons are designed to be hands-on, encouraging pupils to explore, experiment, and problem-solve. This practical emphasis not only supports knowledge retention but also nurtures curiosity and excitement about the subject.

Through regular opportunities for active investigation, children begin to see themselves as scientists. They learn how science is relevant to everyday life, from exploring the properties of everyday materials to understanding how forces affect playground equipment. This helps pupils develop a sense of ownership over their learning and an appreciation for the role of science in the wider world.

Curriculum Maps – Year 1 to 6 and EYFS

EYFS

Development Matters	ELG	How this achieved in EYFS	By the end of EYFS the children will know...
Nursery: - Use a wider range of vocabulary. - Understand 'why' questions - Be able to express a point of view and to debate when they disagree with an adult or a friend, using words as well as actions. - Start a conversation with an adult or a friend and continue it for many turns. - Use all their senses in hands-on exploration of natural materials. - Explore collections of materials with similar and/or different properties. - Talk about what they see, using a wide vocabulary. Explore how things work. - Plant seeds and care for growing plants. Understand the key features of the life cycle of a plant and an animal. - Begin to understand the need to respect and care for the natural environment and all living things. - Explore and talk about different forces they can feel. - Talk about the differences between materials and changes they notice. Reception: - Learn new vocabulary - Ask questions to find out more and to check what has been said to them - Articulate their ideas and thoughts in well-formed sentences. - Describe events in some detail.	The Natural World - Explore the natural world around them, making observations and drawing pictures of animals and plants. - Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class. - Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter. Managing Self - Manage their own basic hygiene and personal needs, including dressing, going to the toilet and understanding the importance of healthy food choices. Listening, Attention and Understanding - Make comments about what they have heard and ask questions to clarify their understanding.	- Discussions around snack time and lunch time - healthy eating choices. - Discussions around healthy living choices including: washing hands, brushing teeth, eating and exercise. - Story time and circle time to explore books focusing on staying healthy and the human body: Funnybones, Germs, What makes me, me and The Little Book of Manners. - Naming body parts through songs: If you're happy and you know it and head, shoulders, knees and toes... - Talking about our pets at home and drawing out pets in our family portraits. <i>Seasonal changes – Autumn:</i> - Exploring woodland area, observing seasonal changes in the Autumn. - Exploring natural autumnal resources in a Tuff Tray, asking questions and making/drawing observations. - Explore hibernation and migration, looking at contrasting environments/animals around the world. - Explore harvest time in the UK and farming at harvest time. - Observe seasonal weather changes and longer nights in the autumn compared to the summer. - Observe and explain decomposition of pumpkins <i>Festivals:</i> - Explore festival origins/celebrations across the world, using a world map/globe. - Observe changes – light <i>Seasonal Changes – Winter & Spring:</i> - Exploring schools' grounds and observing seasonal changes in the winter/spring. - Explore compare/contrast our environment with other regions.	Knowledge: - I know some foods that are healthy and not healthy. - I know why we need to wash our hands and brush our teeth. - I know how to use the toilet. - I know how to get myself dressed. - I know some body parts and can say what they do. - I know who is in my family, including pets. - I know the difference between animals and plants. - I know the names of different animals: from our country and far away. - I know the names of the four seasons. - I know what the weather is like in each of the seasons. - I know the main changes that happen in Autumn, Winter, Spring and Summer. - I know that ice melts when it gets hot. - I know that water turns into ice when it freezes. - I know that some animals sleep during the winter. - I know that the weather is different in different parts of the world. - I know that a plant needs light, soil and water to grow. - I know that plants die if they don't have enough water. - I know that some food grows on trees and some comes from plants on and under the ground. - I know that a larva becomes a bee and a caterpillar becomes a butterfly. - I know that some materials float and some sink. - I know that some materials are more suited to jobs than others. - I know that my actions affect the world. - I know the name of some insects.

- Use talk to work out problems and organise thinking and activities. Explain how things work and why they might happen - Use new vocabulary in different contexts - Know and talk about different factors that support overall health and wellbeing such as: regular physical activity, healthy eating, toothbrushing, sensible amounts of screen time, having a good sleep routine - Being a safe pedestrian. - Explore the natural world around them - Describe what they see, hear and feel whilst outside. - Recognise some environments that are different to the one in which they live. - Understand the effect of changing seasons on the natural world around them.	- Discuss global warming and the impact on polar regions - Observe seasonal weather changes in the winter/spring (ice exploration) - Observe, question and draw spring plants/spring growth. - Explore natural spring resources in Tuff Tray, asking questions and making/drawing observations. - Spring walk around the woodland area describing and discussing what is found. - Explore the life cycle of bees and butterflies. - Explore the life cycle of plants - Still life observations and drawings of spring flowers. <i>Traditional Tales:</i> - Materials – what is the best material to build a house out of? <i>Food:</i> - Planting seeds and plants - Sort healthy and unhealthy food items. <i>Seasonal Changes – Summer:</i> - Exploring woodland area observing seasonal changes in the summer. - Observe seasonal weather changes in the summer <i>People who help us:</i> - Explore looking after our community environment and recycling. - Discuss how we can help look after our local and world environments. <i>Around the world:</i> - Observe, explore and compare contrasting natural environments around the world: rainforest, great barrier reef, Africa, Antarctica - Explore, compare, contrast, observe, draw and discuss animals native to different parts of the world. - Knowing where different animals come from. - Explore creatures that live in the sea. - Build a boat (floating and sinking exploration).	Vocabulary: - Healthy, unhealthy, germs, head, legs, arms, hands, feet, shoulders, face, eyes, ears, mouth, tongue, <u>teeth</u>, <u>heart</u>, brain, bones, skin. - Dog, cat, fish, hamster, <u>rabbit</u>, <u>cow</u>, horse, sheep, goat, elephant, tiger, lion, crocodile, giraffe. - Autumn, winter, spring, summer, weather, hot, cold, snowing, freezing, warm, wet, cloudy, harvest, farming, leaves, light, dark, desert, polar. - Plants, grow, soil, sunlight, fruit, vegetable, tree, flower, bush, water. - Life cycle, grow, change, larva, bee, caterpillar, chrysalis, cocoon. - Material, float, sink, plastic, fabric, wood, strong, waterproof, bendy, light, - Pollution, <u>recycle</u>, rubbish, environment, community. - Minibeast, ant, spider, worm, snail, habitat.
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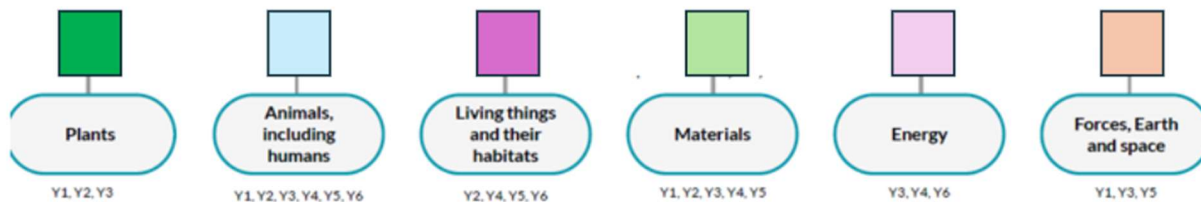
		- Explore steam power, petrol and electric vehicles. Discuss how vehicles have changed over time <i>Nature/Life Cycles:</i> - Explore, observe and identify UK minibeasts. - Look after our local environment – build minibeast houses	
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KS1 curriculum

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 1	Animals (vertebrates) Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals	Human body and the senses Identify, name, draw and label basic parts of the human body and say which part of the body is associated with each sense	Naming and describing materials 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	Properties and uses of materials Distinguish between an object and the material from which it is made Describe simple physical properties of everyday materials Compare and group together a variety of everyday materials based on their simple physical properties	Seasonal changes Observe changes across the four seasons Observe and describe weather associated with the seasons and how day length varies	Identifying plants and their parts Identify and name a variety of common wild and garden plants including deciduous and evergreen trees Identify and describe the basic structure of a variety of common flowering plants, including trees
Year 2	Growing up (animals and 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, air)	Choosing materials Identify and compare the suitability of a variety of everyday materials including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses.	Changing materials Find out about how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.	Local Habitats Explore and compare the difference between things that are living, dead and things that have never been alive. 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 kind of animals and plants, and how they depend on each other. Identify and name a variety of plants and animals in their habitats, including micro-habitats. 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.	Growing seeds and bulbs Observe and describe how seed and bulbs grow into mature plants. Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.	Growing healthy plants Observe and describe how seed and bulbs grow into mature plants. Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.

KS2 curriculum

Year 3	Movement and nutrition	Forces and magnets	Rocks and soil	Light and shadows	Plant reproduction	Sustainability Project – How can we use natural materials to clean and reuse water?
Year 4	Digestion and food	Electricity and circuits	States of matter	Sound and vibrations	Classification and changing habitats	Sustainability project – The plastic Free lunchbox
Year 5	Mixtures and separation	Properties and changes	Earth and space	Life cycles and reproduction	Unbalanced forces	Human timeline
Year 6	Classifying big and small	Light and reflection	Evolution and inheritance	Circuits, batteries and switches	Circulation and health	Sustainability project – The Sustainable Cities Challenge

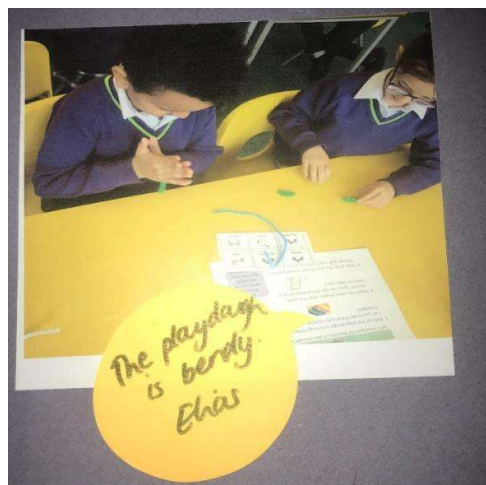
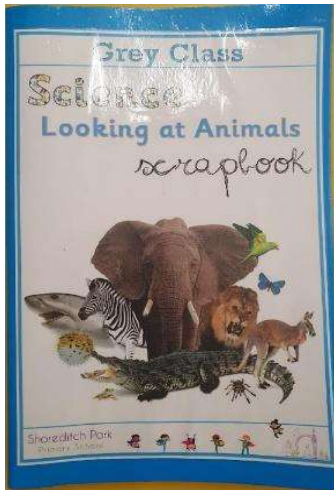


Science Books

At Shoreditch Park, we use multiple ways to evidence children's learning and progression. This is to ensure that our teaching is inclusive and fits the needs of our children efficiently.

In KS1 a whole class scrap book is used for evidence lessons and assessments are completed at the end of each unit of learning.

Year 1 and 2 Scrapbook Layout

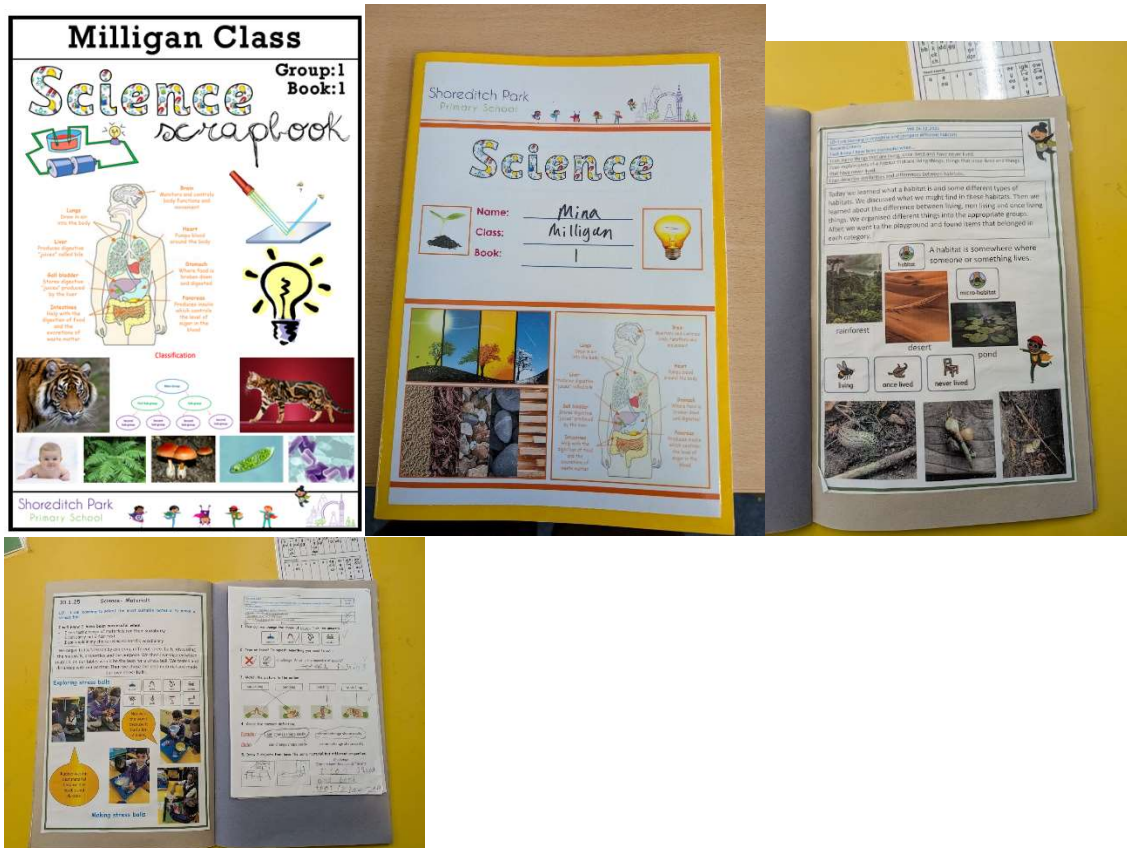


Expectations

- KWL Grids - Year 1 and 2 begin each unit with a whole class KWL grid which is stuck into scrap books.
- Lessons are recorded with a scrapbook page and images that illustrate the children's learning.
- Assessment also goes in the scrapbook.

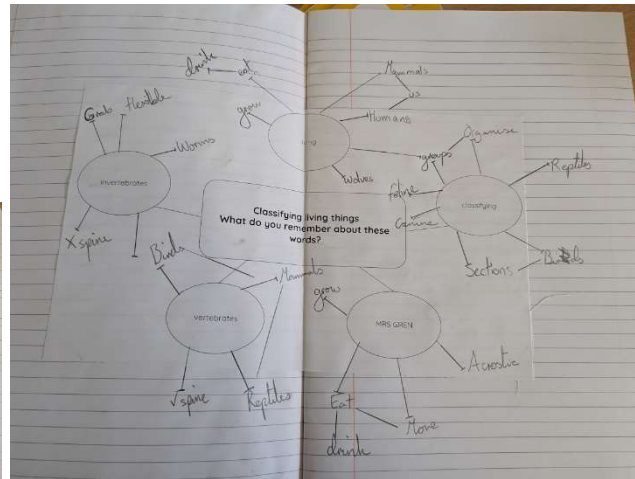
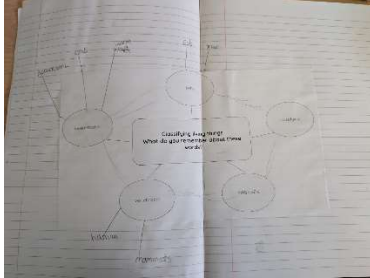
Year 3 – 6 Scrapbooks and Individual Books

In KS2 pupils have individual books as well as a whole class scrapbook. The individual books are used for independent work, explanations and experiment write ups. The class scrapbooks are for whole class activities; partner working and can be used to illustrate the working scientifically skills.



Expectations

- Each unit begins with a pre-unit mind map (see pictures below). These are completed at the start of a new unit to assess understanding and address any misconceptions. Pupils complete these individually in Years 5 and 6 and as a class in Years 3 and 4 (stuck into the class scrap books).



- Lessons are recorded with a scrapbook page and images that illustrate the children's learning.
- Each unit ends with an independent assessment. This goes into individual books.

Assessment

Pupils are assessed continuously throughout each science unit; each lesson begins with a recall activity in which they review learning from the previous unit. Mind maps begin each unit and allow teachers to monitor for prior knowledge and track progression. Furthermore, work in individual books is marked to track understanding and to monitor progress with working scientifically skills.

Date: 10.10.23		
LO: I can describe the differences and similarities in the life cycles of an amphibian and an insect.		
Success Criteria	Pupil assessment	Teacher assessment
I can identify the different stages in the life cycles of frogs and butterflies using scientific vocabulary.	✓	✓
I can create Venn diagram showing the differences between the life cycle of an amphibian (frog) and the life cycle of a insect (frog).	✓	✓
I can compare differences between the two life cycles.	✓	✓
I	TP	T/TA

End of Unit Assessment

At the end of each unit an individual assessment is completed. This is used to check understanding and progress, especially in terms of their understanding of scientific concepts.

At the end of every 2 units, we assess children using assessment software. We assess against the National Curriculum statements and steps for the science unit as well as working scientifically statements explicitly taught.

KS1 example:

WB 17.10.23
Teacher check

Success Criteria	
I will know I have been successful when...	
I know what a mammal is.	✓
I can name animal body parts.	✓
I can describe the way an animal moves.	✓
I	T/TA

1. Circle the mammal.

2. Circle the body parts.

3. Match the bird to its feather.

4. How does this animal move?

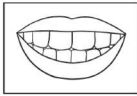
KS2 example:

Name:

Date:

Knowledge and skills catcher: Digestion and food

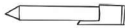
We want to find out which toothpaste is best at removing stains. We have a laminated picture of teeth that can be drawn on and wiped clean, a toothbrush, three different toothpastes (A, B and C) and a whiteboard pen.



teeth to clean (printed and laminated)



toothpaste



whiteboard pen



toothbrush

1

Which is the variable that we are going to change in this experiment?

2

What equipment shall we use to measure how long it takes to clean the teeth?

Displays

Each class should have one board designated for science. This should include the following:

- Title of the unit
- Vocabulary linking to the unit
- Records from lessons including children's work and pictures
- Key findings and facts related to the to

