Teaching of Science 2024-25

Updated – April 25

Review Date – September 25

Intent

The 2014 national curriculum for science aims to ensure that all pupils:

• Develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics

• Develop understanding of the nature, processes and methods of science through different types of science enquiries that help them to answer scientific questions about the world around them

• Are equipped with the scientific skills required to understand the uses and implications of science, today and for the future.

At Batley Parish CE Academy, we understand the importance for lessons to have a skills-based focus, and that the knowledge can be taught through this. At Batley Parish, we aim to equip children with the knowledge required to use and implement Science today, tomorrow and for their futures. A high-quality Science education provides foundations for understanding the world. Therefore, by ensuring our pupils are building key knowledge and understanding concepts within our Science curriculum, our pupils recognise the power of rational explanation, develop a sense of curiosity about natural phenomena and develop respect for the environment and living things, including themselves and each other. At Batley Parish, we are committed to delivering a high-quality science education that inspires curiosity and promotes a love for learning about the world. Our science policy is built around the principles of the White Rose Science Scheme, which provides a structured and progressive approach to teaching science, ensuring that all pupils have the opportunity to develop essential scientific knowledge and skills.

Implementation

Teachers create a positive attitude to science learning within their classrooms and reinforce an expectation that all pupils are capable of achieving high standards in science.

Our whole school approach to the teaching and learning of science involves the following;

• Explicitly teaching and revisiting key vocabulary

• Children are encouraged to ask their own questions and use their scientific skills and research to discover the answers. This curiosity is celebrated within the classroom.

• Planning involves teachers creating engaging lessons, often involving high-quality resources to aid understanding of conceptual knowledge. Teachers use precise questioning in class to test conceptual knowledge and skills, and assess pupils regularly to identify those children with gaps in learning, so that all pupils keep up.

• We build upon the knowledge and skill development of the previous years. As the children's knowledge and understanding increases, and they become more proficient in selecting, using scientific equipment, collating and interpreting results, they become increasingly confident in their growing ability to come to conclusions based on real evidence.

• Working Scientifically skills are embedded into all lessons to ensure these skills are being developed throughout the children's school career and new vocabulary and challenging concepts are introduced through direct teaching. This is developed through the years, in-keeping with the units ***(see appendix 3 and 4.)***

• Events, such as project days and British Science Week, provide a broader provision encouraging the acquisition and application of knowledge and skills. These are purposeful, linking with the knowledge being taught in class and where appropriate involve the wider community.

Vision and Aims

Our vision for science education at Batley Parish is to cultivate inquisitive, knowledgeable and responsible learners. We aim to:

• Foster a sense of wonder and curiosity about the natural world.

• Equip pupils with the skills and knowledge to explore scientific concepts and processes.

• Encourage critical thinking, problem-solving, and collaboration in scientific investigations.

• Provide an inclusive environment that meets the diverse needs of all learners.

Impact

The approach at Batley Parish results in a fun, engaging, high-quality science education that provides children with the foundations and knowledge for understanding the world. Our engagement with the local environment ensures that children learn through varied and first hand experiences of the world around them. Through engaging lessons and scientific enquiry, children have the understanding that science has changed our lives and that it is vital to the world's future prosperity. Children learn the possibilities for careers in science, from a range of different scientists from various backgrounds, allowing all children to feel they are scientists and capable of achieving. Through a positive caring environment, we provide the opportunity for children to reach their full potential.

Curriculum Framework

1. *Alignment with National Curriculum*

• Our science curriculum is aligned with the National Curriculum for England and follows the White Rose Science Scheme ***(see appendix 1),*** covering the core areas of:

- o Biology: Life processes, ecosystems, and human biology.
- o Chemistry: Properties of materials and changes in substances.
- o Physics: Forces, energy, light, sound, and Earth sciences.

• We ensure that all pupils engage with a wide range of scientific topics throughout their time at school.

2. *Progression and Continuity*

• The curriculum is designed to promote progression and continuity, with clear learning objectives for each year group.
• Yearly topics build upon prior knowledge, ensuring a coherent understanding of scientific concepts.
• Each lesson begins with a "flashback 4", allowing children to recall prior knowledge. These questions revisit concepts from previous lessons, previous units and learning from previous year groups.)
• To support pupils to remember the key knowledge and vocabulary, each unit has a knowledge organiser. To support pupils further, each word (where appropriate) has been paired with a picture of reference. ***(See appendix 7)***
• White Rose steps are condensed accordingly to ensure full curriculum coverage. The identified steps for each unit are located on the long term overview ***(see appendix 1.)***
• Vocabulary has been mapped out progressively to align with the "key knowledge" statements and the National Curriculum ***(see appendix 2.)***

3. *Cross-Curricular Links*

• Science is integrated with other subjects, such as mathematics and English, to create a cohesive learning experience.
• Opportunities for cross-curricular projects will be identified to reinforce scientific learning and promote collaborative skills.

Teaching and Learning

1. *Active Learning*

• We prioritise active learning strategies that engage pupils in hands-on experiments, investigations, and practical applications of scientific concepts.
• Pupils are encouraged to ask questions, hypothesise, and analyse results, fostering a culture of inquiry and exploration.
• Each lesson's objective is written an enquiry question, to encourage children to think and ask their own questions ***(see appendix 4.)***

2. *Adaptation*

• Teaching methods and resources will be adapted to cater to the diverse needs of all pupils, including those with special educational needs and disabilities (SEND).
• Teachers will employ a variety of instructional strategies to ensure that every child can access the curriculum.

3. Use of Technology

• Technology will be utilised to enhance learning, including interactive simulations, digital resources and data collection tools.
• Pupils will have access to a variety of online resources to support their scientific investigations and research (where appropriate.)

Assessment and Monitoring

1. Assessment

• Regular formative assessments will be conducted to monitor pupils progress and understanding, providing feedback to inform future teaching.
• Assessment sheets are available for each unit that identify the "key knowledge" pupils need to know ***(see appendix 5.)***
• Each key knowledge statement is paired with an "assessment indictator." These are used within lessons to identify whether pupils are secure with that statement ***(see appendix 6.)***
• Where gaps or misconceptions are identified, opportunities to address these are planned into future lessons by the class teacher. These decisions are recorded on the assessment grids.

2. Monitoring

• The science leader will monitor the implementation of the science curriculum and assess the quality of teaching and learning through lesson observations, pupils work scrutiny and feedback from staff and pupils.
• The impact of the science curriculum on pupils outcomes will be regularly evaluated, informing future planning and development.

Resources

1. Physical Resources

• A variety of high-quality resources, including scientific equipment, and materials for practical experiments, will be provided to support teaching and learning.
• Classrooms will be equipped with the necessary tools for effective science education.

2. Professional Development

• Ongoing professional development opportunities will be provided for staff to enhance their understanding of science teaching and the White Rose Science Scheme.
• Staff will attend staff meetings and will be encouraged to network with other schools to share best practice.

Health and Safety

• All science activities will be conducted following strict health and safety guidelines. Safety checks will be completed prior to experiments, and appropriate safety measures will be implemented.
• Pupils will be taught the importance of safety during science lessons and how to use equipment responsibly.

Parental and Community Engagement

• Parents will be informed about the science curriculum and encouraged to support their children's learning at home through various activities and resources.
• Opportunities for community involvement, such as science days, guest speakers and school trips, will be explored to enrich the science curriculum.

Review and Evaluation

• This science policy will be reviewed annually to ensure its effectiveness and relevance. Feedback from staff, pupils, and parents will be considered to make necessary updates.
• The impact of the science curriculum on pupils engagement and learning outcomes will be evaluated regularly to inform future planning.

Conclusion

At Batley Parish, we are dedicated to providing a high-quality science education that ignites curiosity, encourages inquiry, and prepares pupils to be informed and responsible citizens. By implementing the White Rose Science Scheme, we aim to foster a generation of enthusiastic and knowledgeable scientists who are ready to explore and understand the world around them.

Appendix 1 – Long Term Plan (Science Overview)

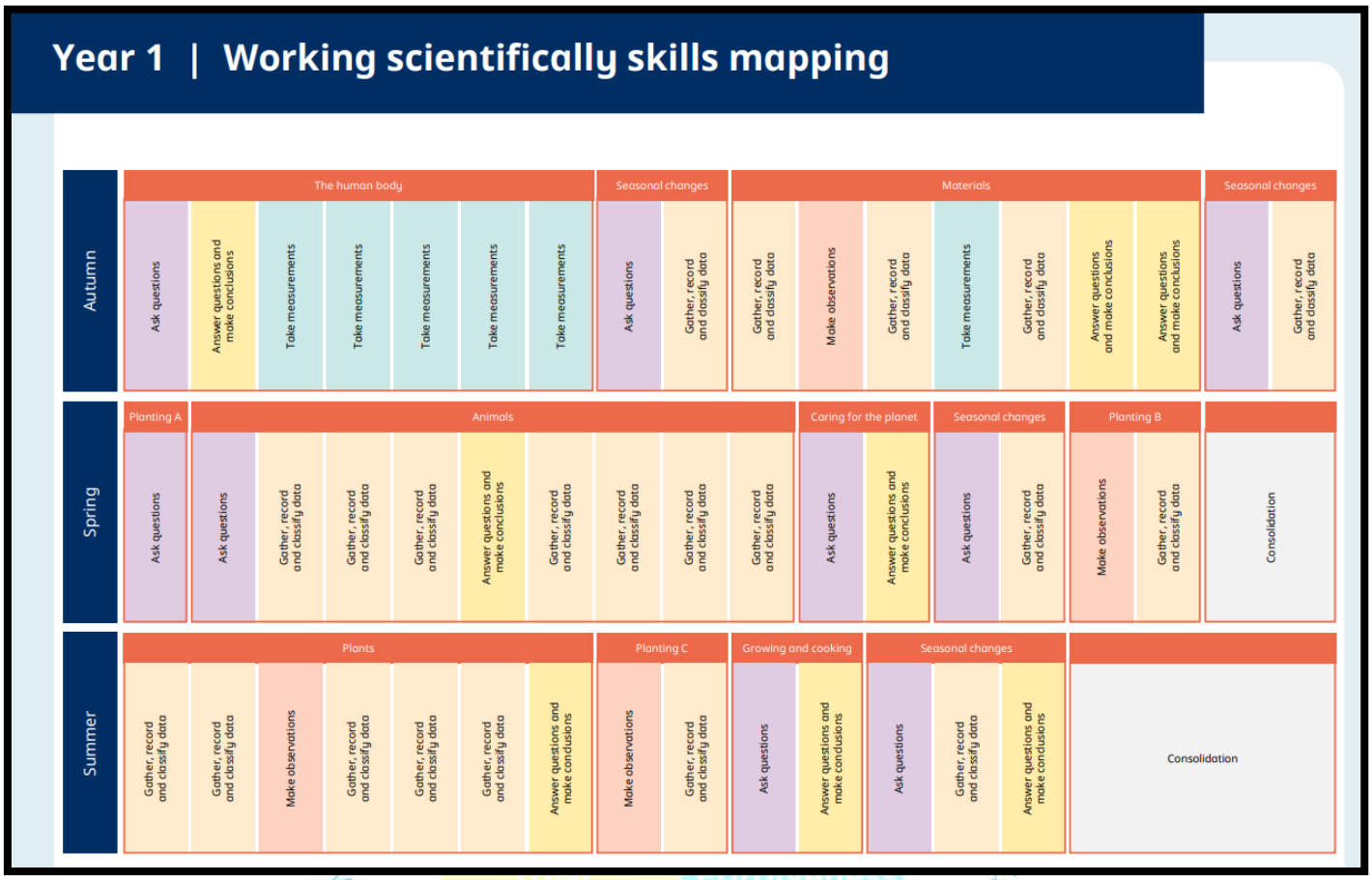
Year 1				
Unit	**Key Factual Knowledge**	**Vocabulary**	**National Curriculum links**	**Lesson Sequencing (WR Steps)**
The human body	• The body has lots of parts, each with a name • Humans use their eyes to see • We can sense touch using the skin on different body parts • Humans use their ears to hear sounds • The tongue helps humans to taste and the nose to smell	Senses Touch Smell Taste Sight Heating Skeleton	• Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense	Lesson 1 – step 1 and 2 Lesson 2 – step 3 Lesson 3 – step 4 Lesson 4 – step 5 and 7 Lesson 5 – step 6

Appendix 2 – Vocabulary progression

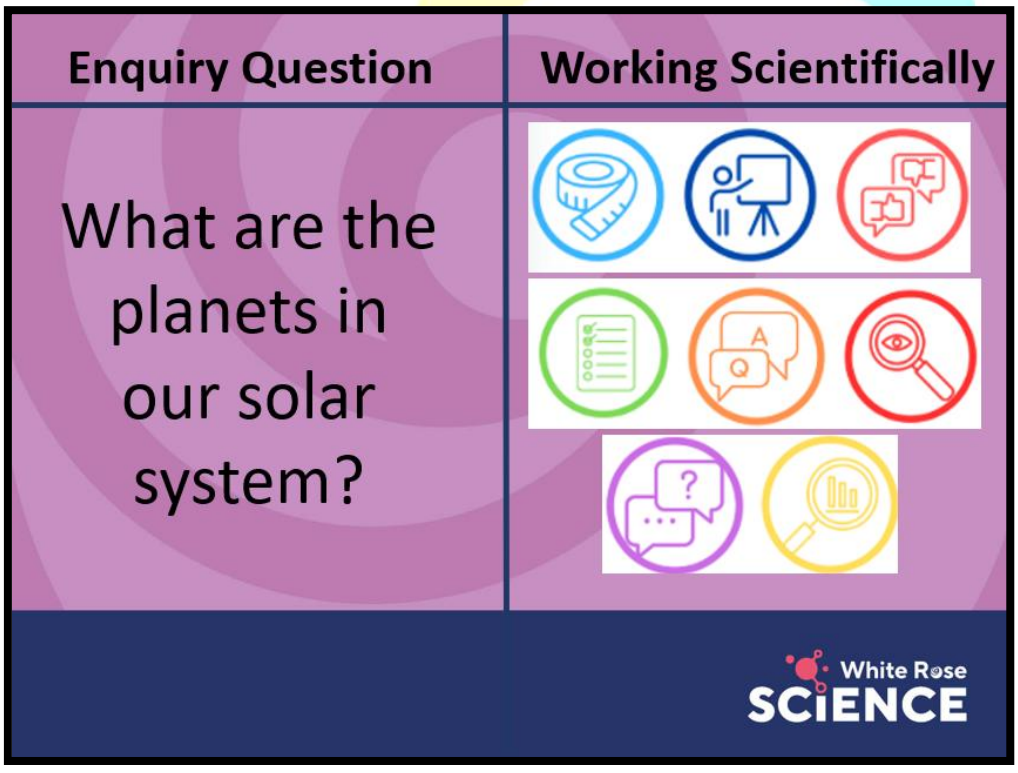
Science Vocabulary Progression

Year Group	Autumn		Spring		Summer	
Year 1	**Unit: The Human Body** Senses Touch Smell Taste Sight Heating Skeleton	**Unit: Materials** Hard/soft Stretchy/stiff Shiny/dull Rough/smooth Bendy Transparent Opaque Float Sink	**Unit: Animals** Mammal Fur Gills Beaks Amphibian Reptile Diet Carnivore Herbivore Omnivore	**Sustainability unit: Caring for the planet** Earth Plant Animal Harmful Reuse Recycle	**Unit: Plants** *(vocabulary consolidated through repeated planting units)* Flower Leaf Stem Petals Roots Trunk Branch Seed Deciduous Evergreen	**Sustainability unit: Growing and cooking** Crops Fruit Vegetable Seed Farmer
	Unit: Seasonal changes (unit visited 4 times throughout the year) Autumn Winter Spring Summer Weather Daylight Night Season					

Appendix 3 – Working Scientifically – Curriculum Mapping



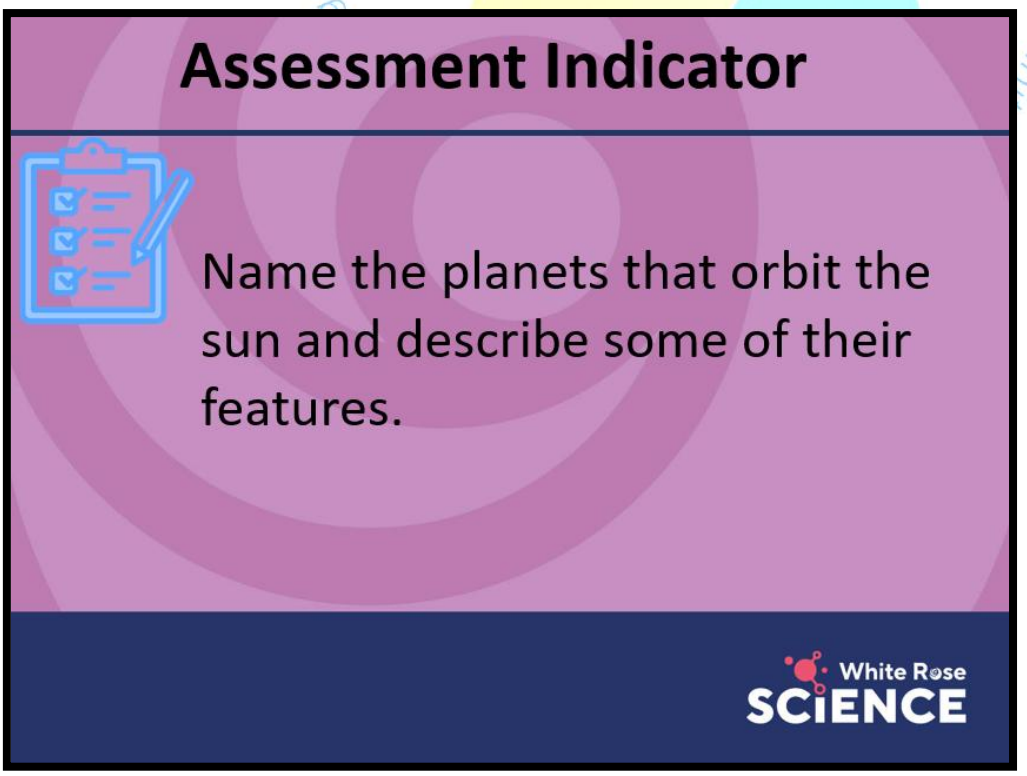
Appendix 4 – Working Scientifically Skills (Teaching slides)



Appendix 5 – Assessment Sheets

	Year Group	3	Unit	Light
Vocabulary		**National Curriculum link**		
Natural light Artificial light Light source Protect Reflection Opaque Translucent Transparent Shadow		• Recognise that they need light in order to see things and that dark is the absence of light • Notice that light is reflected from surfaces • Recognise that light from the sun can be dangerous and that there are ways to protect their eyes • Recognise that shadows are formed when the light from a light source is blocked by an opaque object • Find patterns in the way that the size of shadows change		
Key knowledge	**Assessment indicator**	**Assessment:** - *Identify children not meeting expectation* - *Identify children demonstrating a "greater depth" knowledge* - *Identify misconception or gaps in knowledge* - *Identify next steps - recall, retrieve, reteach?*		
Humans and other animals need light to see	What do we need to be able to see?			
Natural light sources are objects in nature that give out light, such as the Sun. Artificial light sources are made by humans	What is a natural light source? What is an artificial light source?			
Without the Sun, living things would not be able to live and grow on planet Earth	What would happen to living things without the sun?			
Shadows are formed when the light from a light source is blocked by an object	How are shadows formed?			
Light travels from a light source to an object and is then reflected from the object into our eyes.	How do we see?			
Reflection is the return light from a material or surface	What is a reflection?			

Appendix 6 – Assessment Indicator

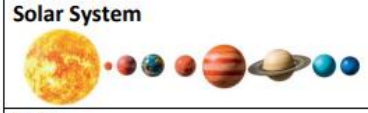


Appendix 7 – Knowledge Organisers

Year 5
Space

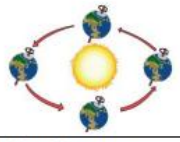
Key vocabulary:

Solar System



Planets

Orbit

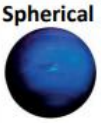


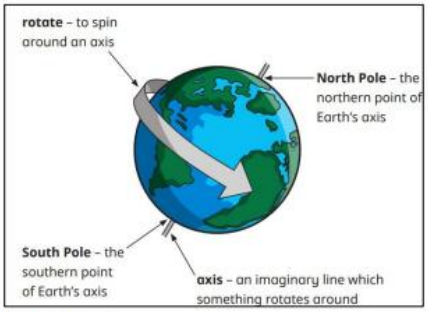
Surface

Gravitational Force

Satellite

Spherical





Key knowledge

- The Solar System is a collection of planets and moons which orbit the Sun and are all approximately spherical
- The Sun is a star which releases heat and light
- There are eight planets that orbit the Sun, some with solid surfaces, some with gas surfaces
- The Sun is the largest object in the Solar System and has the greatest gravitational pull. This keeps all the planets in orbit around the Sun
- The Earth takes 365 days, or one year, to complete one full orbit, but other planets take different amounts of time