Subject Leader Intent, Implementation and Impact Overview.

Subject: Science

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Intent	Research Links	Implementation	Impact
At Balksbury Federation we believe that science should be an engaging, hands-on quality experience. Through this, we provide the foundations of working scientifically in Physics, Biology and Chemistry through mapped skills. As children move on their journey through their time as Balksbury, they will develop a body of scientific knowledge and conceptual understanding in order to build a curiosity of the world around them. Children will experience and observe phenomena.	**Balksbury Federation** From pupil conferencing, science leaders have found that: • Children enjoy conducting investigations and experiments • Children were eager to discuss what they had learnt during Science Day and the investigations they carried out • Children enjoy observing and figuring out how things work • Children are excited and engaged in Science at Balksbury and enjoy their science lessons • Children's favourite lessons are where they can get involved and be active in their learning	Teaching staff use the NC and skill progression in order for them to teach confidently. Teachers use a variety of contexts to maximise the children's engagement and motivation to study science e.g. using stories in science to link context. **Learning values** **Perseverance:** Children are encouraged to persevere in science through investigative work where they may have to wait for results or repeat their measurements. The Longitudinal studies further encourages perseverance as the children may have several weeks to wait for any results or changes to occur. Each year group completes a longitudinal study; they work as a class to answer a posed question that requires perseverance to answer; in Year R, the children observe and record the changes in the school environment, throughout the year, looking at different trees and recording the changes that occur. **Respect:** Pupils are taught respect in and around the school. Their scientific studies teach them to become more aware of their surroundings and respect their environment as well as other children's projects. **Collaboration:** Science is an excellent opportunity for children to work collaboratively. They decide on investigations together, set up tasks and present findings often in small groups. **Science Leadership** Pupil conferencing, learning walks and staff training ensures the science curriculum at Balksbury Federation is always at its best. Teachers are supported in finding exciting ways for children to learn in a hands-on approach that ensures learning is embedded not forgotten.	Children will leave Balksbury Federation having developed the science knowledge and skills to lead them on to the next stage of their education. Children make sense of this new information through investigation and practical tasks. They begin to pose their own questions and apply the scientific skills and knowledge they have learnt. Children will have been presented with the opportunity to show what they have learnt at the end of a science topic giving them ownership of this knowledge. In turn this will deepen skills and knowledge. Through this, children will talk about their learning and be equipped with appropriate vocabulary and examples to demonstrate their understanding.

The Federation use questions to promote high order thinking in children. Children are equipped with scientific knowledge and skills to help them understand the uses of science today and for the future. The Federation provide challenging opportunities for all children through quality questioning, investigating and research.		Keystone 1- Engagement Children have opportunities for engaging hooks to engage, enthuse, and interest them in the upcoming unit. Each unit provides opportunity and encouragement to ask questions and explore the areas in which they are learning in depth. In Early Years, children are encouraged to explore the natural world around them, making observations and drawing pictures of both animals and plants. In Key Stage 1, the principal focus of science teaching is to enable children to experience and observe phenomena, looking more closely at the natural and humanly constructed world around them. They are encouraged to be curious and ask questions about what they notice. They are helped to develop their understanding of scientific ideas by using different types of scientific enquiry to answer their own questions. Most of the learning about science should be done through the use of first-hand practical experiences, but there is some use of appropriate secondary sources, such as books, photographs and videos. In Key Stage 2 children broaden their scientific view of the world around them and develop a deeper understanding of a wide range of scientific ideas. They do this through exploring and talking about their ideas; asking their own questions about scientific phenomena; and analysing functions, relationships and interactions more systematically.	Children can discuss different scientific concepts and give clear reasons for their results and explanations. The federation's biannual Science Fayre presents children with the opportunity to demonstrate, and extend their understanding and love for science. All children are encouraged to explore science through a project which is then shared with the federated community.

	Ofsted say that *'by learning about the products of science…pupils are able to… 'develop a sense of excitement and curiosity about natural phenomena'.* *'As pupils learn science, they also learn about its uses and significance to society and their own lives… pupils will also learn about the continuing importance of science in solving global challenges.'* *'Science education also provides the foundation for a range of diverse and valuable careers that are crucial for economic, environmental and social development.'* **Research review series: science** A review by Ofsted of research into factors that influence the quality of science education in schools in England. **Science Programmes of Study Key stages 1 and 2: The National Curriculum (2013)** *'A high-quality science education provides the foundations for understanding the world through the specific disciplines of biology, chemistry and physics. Science has changed our lives and is vital to the world's future prosperity, and all pupils should be taught essential aspects of the knowledge, methods, processes and uses of science. Through building up a body of key foundational knowledge and concepts, pupils should be encouraged to recognise the power of rational explanation and develop a sense of excitement and curiosity about natural phenomena.'* The National Curriculum has a large emphasis on working scientifically and what this means at each Key Stage. *''working scientifically' should be embedded…focusing on the key features of scientific enquiry, so that pupils learn to use a variety of approaches to answer relevant scientific questions.'*	Keystone 2- Developing knowledge and skills Children learn new scientific skills each year which build on previous learning. In Early Years children learn to explore the natural world around them, making observations and drawing pictures of animals and plants. They begin to know some similarities and differences between the natural world around them and contrasting environments, drawing on their own experiences and also drawing on what has been read to them in class. They also understand some important processes and changes in the natural world around them, including the seasons and changing states of matter. In KS1, children learn to make simple observations and ask questions; they will gather and record data from carrying out simple tests through encouraging them to be curious and experience the world around them. In Year Three and Four, children develop these skills to broaden their scientific view; exploring, talking about, testing and developing ideas about everyday phenomena. Children set up simple practical enquiries; gather, record and present their data in drawings, diagrams and tables. By the time children are in Year Five and Six they are able to develop a deeper understanding of scientific ideas; encounter more abstract ideas (e.g. Year Five who learn about Space) but bringing opportunities to make this accessible such as using VR headsets for exploration. Children plan different types of enquiries, recording data of increasing complexity e.g. drawing scientific diagrams with labels, classification keys, tables, scatter graphs, bar and line graphs. Children develop and build on key aspects through their Science learning such as: Encouraging open-mindedness, self-assessment, perseverance and developing the skills of	

	Ward and Roden, 2015 (Teaching Science in the Primary Classroom) *Developing Learners' Process Skills:* *'Instinctively, young learners make use of simple individual process skills all the time during their exploration of the world but, as they get older, individual skills become more important in formal education. The simpler skills involve observing, identifying, classifying, questioning and performing simple tests, but are fundamental to the development of more advanced skills such as planning, predicting and data interpretation.'* *Questioning and Question Raising:* *'In order to extend their knowledge further, learners should be encouraged to ask questions about the world around them.'* **Wilkinson and Stallard, 2020 (Mastery in Primary Science)** *'It is through working scientifically that children can be supported to evaluate their understanding of the world around them. Therefore, teaching science needs to involve more than just subject-knowledge input. Children need to work as scientists and should have the opportunity to test out and try ideas.'*	measuring, predicting, hypothesising, investigation, experimenting, communicating, interpreting, explaining and evaluating. **Safety** Linked to the Federation's Code of Conduct, children are taught the importance of safety in Science. Throughout their time at Balksbury, children learn about the importance of being safe and thus develop an awareness of possible risk factors in their science learning and the best way to avoid such risks. Keystone 3- Innovation Science provides the opportunity for creative, practical experiences that allow children to apply their knowledge, skills and understanding. With a greater emphasis on STEM, we can ensure that children are finding exciting ways to explore their thoughts and ideas. Children investigate child-led questions, enabling them to take ownership of their learning. They apply their knowledge and skills in real-life contexts and experiences. Children in Year 6 for example, make and explore model lungs to answer questions such as 'How does the size of a person affect their lung capacity?' Keystone 4- Expression Children have the opportunity to celebrate their learning and share and reflect on what they have learnt. Children discover new ideas and could have the option to present these in a final project	

	STEM *'Science, technology, engineering and mathematics are fundamental to meeting the challenges we face today and in the future. At STEM Learning, we believe every young person needs and deserves a world-leading STEM education, one that engages and nurtures their unique talents, and provides the knowledge and skills they will need to participate fully as the creators and citizens of tomorrow.'* *'Our vision is a world-leading STEM education for every young person in the UK because a world-leading STEM education combines knowledge-rich and effective teaching; thinking, investigative, creative and practical skills; with experiences which develop a lifelong love for STEM and where it can lead. It has economic, social, cultural and ethical value, with positive impacts on social mobility, and promotes equality in future careers.'*	or through the longitudinal study. Each child has a book to show evidence of the longitudinal study.	

Teaching Safeguarding and Wellbeing through Science

- Develop resilience and perseverance to keep trying and applying knowledge through practise
- Increase own self-esteem and achieve a personal best by not comparing themselves to others
- Solve problems through enquiry by working things through, based on knowledge known
- Listen, respect and reflect on other people's views and findings
- Make informed choices and decisions through using given information and observations
- Understand that science should be undertaken in safe way
- Develop confidence to express and voice own ideas
- Value personal hygiene and recognise the importance of personal space
- Work in diverse groups and partnerships, accepting children with specific needs
- Understand sex education and reproduction