# MENTOR DEVELOPMENT: Understanding the ITE Partnership Curriculum

## Science

Subject rationale

The science programme is organised so that it covers biology, chemistry and physics content related to each National Curriculum topic with working scientifically embedded throughout. We explore children’s early development of science concepts in relation to the EYFS Framework and progression through the primary years. Within each topic connections are made to scientists from diverse backgrounds, pedagogical approaches are explored and critiqued and links are made to further readings, resources and children’s literature. Sessions include approaches to introduce key scientific vocabulary and how this is built upon throughout primary school.

Sequencing the subject for each phase

Phase 1: Explore why science education is a core part of the curriculum, the importance of diverse role models and the concepts of ‘science capital’ & ‘scientific literacy’. Learn how perspectives about learning inform and inspire pedagogy and why teachers elicit children’s prior learning. Investigate approaches to developing scientific language and familiarity with a range of pedagogical approaches and activities to actively engage learners, introducing how to plan creatively using the ERCA framework whilst also making connections to current scientific issues. Explore different types of scientific enquiry and how modelling & scaffolding develops learning and addresses misconceptions. Adapt teaching to meet the needs of children with SEND and/or EAL.

Phase 2: Explore how to develop children’s disciplinary knowledge with a focus on observation, comparative testing, research, identifying and classifying. Make links to environmental issues. Explore creative ways to record learning in science.

Phase 3: Critique different ways to assess and evidence children’s learning and reflect on how formative and summative assessments can be adapted for all children. Explore the potential of the outdoor environment for learning with a focus on pattern seeking and classifying.

### How mentors can support BSTs in school

* ​​​​Model how elicitation is used to identify what children know, possible misconceptions and alternative frameworks. Deconstruct your practice with the BST so that the BST can start to learn how to teach science effectively.
* ​​​​​​​Explain how the school’s science curriculum includes essential concepts, knowledge, skills and principles, and model how your planning, teaching and assessment develops children’s science capital and how children are supported to develop scientific literacy across the curriculum.
* ​​​​​​​Provide opportunities for BSTs to observe and deconstruct how retrieval practice can be used to build automatic recall of key science knowledge and vocabulary and the different forms this can take.
* ​​​​​​​Model how to use concrete representations of abstract ideas in science.
* ​​​​​​​Discuss and analyse how the big ideas in science are revisited by using a range of examples to teach key concepts, modelling how they balance exposition, repetition, practice of critical skills and knowledge.
* ​​​​​​​Model how to plan formative assessments linked to lesson objectives and how learning can be evidenced. Discuss possible misconceptions and how these can be identified and challenged.
* ​​​​​​​Explore with the BST how to balance substantive and disciplinary science learning within a lesson.
* ​​​​​​​Model different ways to give children feedback and feedforward about their science learning.
* ​​​​​​​Support BSTs to draw conclusions about what pupils have learned by looking at patterns of performance over several assessments, including how the statutory science teacher assessments are completed.

### Indicative open access reading

1. Earle, S. (2022) Early Science research summary: use of play and role of the adult. Journal of Emergent Science, 22, pp.5-12. Available at: [https://www.ase.org.uk/system/files/Earle.pdf](https://www.ase.org.uk/system/files/Earle.pdf#:~:text=Abstract.%20The%20aim%20of%20this%20article%20is%20to)
2. McMahon, K., McKay, D. and Lee, A. (2021) The learning sciences and primary school science. BathSPA data: Wellcome Trust. Available at: [13965.pdf (bathspa.ac.uk)](https://researchspace.bathspa.ac.uk/13965/1/13965.pdf)
3. Ofsted (2021) Ofsted research review series: science. Available at: [Research review series: science - GOV.UK (www.gov.uk)](https://www.gov.uk/government/publications/research-review-series-science/research-review-series-science)
4. Ofsted (2023) Finding the optimum: the science subject report. Available at: [Finding the optimum: the science subject report - GOV.UK (www.gov.uk)](https://www.gov.uk/government/publications/subject-report-series-science/finding-the-optimum-the-science-subject-report--2)
5. Primary Science Teaching Trust. Teacher Assessment in Primary Science (TAPS). Available at: [TAPS - Primary Science Teaching Trust (pstt.org.uk)](https://pstt.org.uk/unique-resources/taps/)