# Primary PGCE Science sessions overview 2024-25

This document outlines the taught university sessions across the phases of the programme and illustrates the core content of the taught science strand. Supporting resources and reading can be found on Blackboard.
Note that the order of sessions may change in response to need. You will be advised as needed via email/BB.

## Phase 1

There is a block of 8 weeks of taught sessions in Phase 1, providing 5 days (in combination with the Broader Curriculum). Each day is usually split into two, three or four sessions as a carousel.

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| Wednesday 18th September | Session title | Introduction to science Learning and Teaching (MQ): Purpose of science education Course structure and content, expectations, processes/resources, roles/responsibilities.History, scope, ambition, curriculum and progression. Linked to recent EEF research output on quality Science Education in primary schools. |
| Learning intentions | * To consider the purposes of science education
* To consider the role of the science teacher and the qualities needed
* To reflect on personal science identities
* To identify the features of lessons which might support learning
* To understand the structure of the Primary PGCE science programme, Blackboard, expectations, support, CCF

CCF:1.1 Teachers have the ability to affect and improve the wellbeing, motivation and behaviour of their pupils.1.2. Teachers are key role models, who can influence the attitudes, values and behaviours of their pupils.1.6. High-quality teaching has a long-term positive effect on pupils’ life chances, particularly for children from disadvantaged backgrounds.3.1. A school’s curriculum enables it to set out its vision for the knowledge, skills and values that its pupils will learn, encompassing the national curriculum within a coherent wider vision for successful learning. 3.2. Secure subject knowledge helps teachers to motivate pupils and teach effectively 3.7. In all subject areas, pupils learn new ideas by linking those ideas to existing knowledge, organising this knowledge into increasingly complex mental models (or “schemata”); carefully sequencing teaching to facilitate this process is important. 4.1. Effective teaching can transform pupils’ knowledge, capabilities and beliefs about learning. 5.2. Seeking to understand pupils’ differences, including their different levels of prior knowledge and potential barriers to learning, is an essential part of teaching. 8.7. Engaging in high-quality professional development can help teachers improve. |
| Readings/resources | Department for Education (2013) Science Programmes of study: key stages 1 and 2, National curriculum in EnglandThe 10 Key Issues with Children’s Learning in Primary Science in England Report (March 2021)https://www.gov.uk/government/publications/subject-report-series-science/finding-the-optimum-the-science-subject-report--2#executive-summaryhttps://www.gov.uk/government/publications/research-review-series-scienceSEERIH (2023) Being focussed: Monitoring the 10 key issues to improve children’s learning experiences in primary science. |
| Notes | Builds on introduction to Professional and Academic strand |

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| Wednesday 18th September | Session title | Science Enquiry: An Introduction |
| Learning intentions | * Develop an understanding of Scientific Enquiry and its role in learning
* Reflect on an exploration task
* Identify key scientific enquiry skills

CCF: 1.2. Teachers are key role models, who can influence the attitudes, values and behaviours of their pupils. 2.1. Learning involves a lasting change in pupils’ capabilities or understanding. 2.7. Regular purposeful practice of what has previously been taught can help consolidate material and help pupils remember what they have learned. 2.9. Worked examples that take pupils through each step of a new process are also likely to support pupils to learn.3.1. A school’s curriculum enables it to set out its vision for the knowledge, skills and values that its pupils will learn, encompassing the national curriculum within a coherent wider vision for successful learning. 3.2. Secure subject knowledge helps teachers to motivate pupils and teach effectively3.5. Explicitly teaching pupils the knowledge and skills they need to succeed within particular subject areas is beneficial. 3.8. Practice is an integral part of effective teaching; ensuring pupils have repeated opportunities to practise, with appropriate guidance and support, increases success.6.1. Effective assessment is critical to teaching because it provides teachers with information about pupils’ understanding and needs.8.7. Engaging in high-quality professional development can help teachers improve. |
| Readings/resources | * Department for Education (2013) Science Programmes of study: key stages 1 and 2, National curriculum in England
* Harlen W. and Qualter A. (2018) The teaching of Science in Primary Schools (6th Ed). Abingdon: Routledge
* Moyles, J. (2014) The Excellence of Play. Maidenhead: OUP.
* PSTT (2019) Standing on the Shoulders of Giants. Bristol: PSTT.
* Robinson, W. (2004) The Inquiry wheel, an alternative to the scientific method Journal of Chemical Education, 81(6) pp.791-792.
* Turner, J., Keogh, B., Naylor, S. & Lawrence, L. (2011) It's Not Fair, or is It? London: Millgate House Publishers.

SCORE (Science Community Representing Education) (2008) Practical Work in Science: A report and proposal for a strategic framework, Gatsby Technical Education Projects. |
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| Wednesday 18th September | Session title | Self-directed task: ReachOut CPD module + science audit |
| Learning intentions | * Identify personal areas for development
* To develop an understanding of the resources available to support personal PD goals.

CCF:3.2. Secure subject knowledge helps teachers to motivate pupils and teach effectively. |
| Readings/resources |  |
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| Thursday 24th October | Session title | Lesson Planning in Science |
| Learning intentions | • Understand relationship between long, medium and short-term planning• Awareness of school approaches e.g. knowledge and mastery curriculum approaches• Understand differences between knowledge, understanding and skills, and the need to embed ‘Working Scientifically’• Intro to concept of pedagogy and PCK (linked to ideas about misconceptions and conceptual demand)• Able to identify SC rather than objectives alone to guide assessment• Shared understanding of the ‘lesson plan’ and specific requirements in science lessons (e.g. safety, transitions, resource management)CCF:2.7 Regular purposeful practice of what has previously been taught can help consolidate material and help pupils remember what they have learned.4.2 Effective teachers introduce new material in steps, explicitly linking new ideas to what has been previously studied and learned4.6. Questioning is an essential tool for teachers; questions can be used for many purposes, including to check pupils’ prior knowledge, assess understanding and break down problems.4.8 Practice is an integral part of effective teaching; ensuring pupils have repeated opportunities to practise, with appropriate guidance and support, increases success. 5.1 Pupils are likely to learn at different rates and to require different levels and types of support from teachers to succeed.5.2 Seeking to understand pupils’ differences, including their different levels of prior knowledge and potential barriers to learning, is an essential part of teaching.5.3 Adapting teaching in a responsive way, including by providing targeted support to pupils who are struggling, is likely to increase pupil success.5.4 Adaptive teaching is less likely to be valuable if it causes the teacher to artificially create distinct tasks for different groups of pupils or to set lower expectations for particular pupils.5.5 Flexibly grouping pupils within a class to provide more tailored support can be effective, but care should be taken to monitor its impact on engagement and motivation, particularly for low attaining pupils.5.6. There is a common misconception that pupils have distinct and identifiable learning styles. This is not supported by evidence and attempting to tailor lessons to learning styles is unlikely to be beneficial.5.7 Pupils with special educational needs or disabilities are likely to require additional or adapted support; working closely with colleagues, families and pupils to understand barriers and identify effective strategies is essential.6.1 Effective assessment is critical to teaching because it provides teachers with information about pupils’ understanding and needs.6.4. To be of value, teachers use information from assessments to inform the decisions they make; in turn, pupils must be able to act on feedback for it to have an effect. 8.7. Engaging in high-quality professional development can help teachers improve. |
| Readings/resources | National Curriculum ScienceBlack & Wiliam *Inside the Black Box*Rosenshine, B. (2012) Principles of Instruction. *American Educator.* Spring 2012, 12-39. |
| Notes | Wider ideas related to CCF include planning teaching strategies – including group work (CCF 4.9/10, practical work (CCF 4.3/8) and use of homework |

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| Thursday 24th October | Session title | Making Science Relevant (JH)  |
| Learning intentions |  |
| Readings/resources | Archer *et al.* (2015) Science CapitalArcher *et al.* (2014) Adolescent Boys’ Science Aspirations: Masculinity, Capital and PowerOfsted (2013) Maintaining Curiosity |
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| Thursday 24th October | Session title |  Microteach |
| Learning intentions | To plan a short teaching activity (topic indicated by audit outcome)* To accept feedback from peers
* To reflect on feedback and identify learning goals for next teaching event

CCF: 3.2. Secure subject knowledge helps teachers to motivate pupils and teach effectively. 3.5. Explicitly teaching pupils the knowledge and skills they need to succeed within particular subject areas is beneficial.4.2. Effective teachers introduce new material in steps, explicitly linking new ideas to what has been previously studied and learned. 4.8. Practice is an integral part of effective teaching; ensuring pupils have repeated opportunities to practise, with appropriate guidance and support, increases success. 6.5. High-quality feedback can be written or verbal; it is likely to be accurate and clear, encourage further effort, and provide specific guidance on how to improve 8.2. Reflective practice, supported by feedback from and observation of experienced colleagues, professional debate, and learning from educational research, is also likely to support improvement. 8.7. Engaging in high-quality professional development can help teachers improve. |
| Readings/resources | ReachOut CPD websiteScience reading list on BB |
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## Phase 2

* + There is 1+ weeks of taught sessions in Phase 2, providing 3 days (in combination with BC). Each day is usually split into two, three or four sessions and you will be advised of timings on the weekly timetable.

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| Wednesday 8th January | Session title | Modelling in Science |
| Learning intentions | CCF:2.9. Worked examples that take pupils through each step of a new process are also likely to support pupils to learn. 3.2. Secure subject knowledge helps teachers to motivate pupils and teach effectively.3.4. Anticipating common misconceptions within particular subjects is also an important aspect of curricular knowledge; working closely with colleagues to develop an understanding of likely misconceptions is valuable.4.3. Modelling helps pupils understand new processes and ideas; good models make abstract ideas concrete and accessible.4.4. Guides, scaffolds and worked examples can help pupils apply new ideas, but should be gradually removed as pupil expertise increases.5.1. Pupils are likely to learn at different rates and to require different levels and types of support from teachers to succeed.8.7. Engaging in high-quality professional development can help teachers improve. |
| Readings/resources | Wider ideas related to CCF include planning teaching strategies – including group work (CCF 4.9/10, practical work (CCF 4.3/8)  |
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| Wednesday 8th January | Session title | Talk and vocabulary in Science/Assessment/Misconceptions  |
| Learning intentions | Plenary of week’s learning, contextualised through the lens of PCK• Student explanations will develop self-awareness and identify any tutorial/wider support needed• Highlight importance of subject knowledge auditing throughout course, and the value of reflective practice• understanding of value and practical aspects of self- and peer-assessment; metacognitive aspects of learning to learn.• questioning as a core classroom skill• dealing with misconceptionsCCF:2.2. Prior knowledge plays an important role in how pupils learn; committing some key facts to their long-term memory is likely to help pupils learn more complex ideas. 3.2. Secure subject knowledge helps teachers to motivate pupils and teach effectively. 3.3. Ensuring pupils master foundational concepts and knowledge before moving on is likely to build pupils’ confidence and help them succeed.3.4. Anticipating common misconceptions within particular subjects is also an important aspect of curricular knowledge; working closely with colleagues to develop an understanding of likely misconceptions is valuable. 3.10. Every teacher can improve pupils’ literacy, including by explicitly teaching reading, writing and oral language skills specific to individual disciplines.4.7 High-quality classroom talk can support pupils to articulate key ideas, consolidate understanding and extend their vocabulary.5.1 Pupils are likely to learn at different rates and to require different levels and types of support from teachers to succeed.5.2 Seeking to understand pupils’ differences, including their different levels of prior knowledge and potential barriers to learning, is an essential part of teaching.5.3 Adapting teaching in a responsive way, including by providing targeted support to pupils who are struggling, is likely to increase pupil success.5.5 Flexibly grouping pupils within a class to provide more tailored support can be effective, but care should be taken to monitor its impact on engagement and motivation, particularly for low attaining pupils.6.1. Effective assessment is critical to teaching because it provides teachers with information about pupils’ understanding and needs.6.2. Good assessment helps teachers avoid being over-influenced by potentially misleading factors, such as how busy pupils appear.6.3. Before using any assessment, teachers should be clear about the decision it will be used to support and be able to justify its use.8.7. Engaging in high-quality professional development can help teachers improve. |
| Readings/resources | Schulman (1986) PCK |
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| Wednesday 8th January | Session title | RSE (\*Kerry Esgate Green) |
| Learning intentions | * To develop an understanding of RSE in the primary curriculum
* To develop an understanding of how to introduce sex education to children
* To consider some suitable resources to support children's understanding.
* To reflect on own subject knowledge

CCF:1.2. Teachers are key role models, who can influence the attitudes, values and behaviours of their pupils. 3.2. Secure subject knowledge helps teachers to motivate pupils and teach effectively.3.4. Anticipating common misconceptions within particular subjects is also an important aspect of curricular knowledge; working closely with colleagues to develop an understanding of likely misconceptions is valuable. |
| Readings/resources | Resources on Bb |
| Notes | \*Led by local teacher |

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| Wednesday 2nd April | Session title | Explorify and PSTT resources  |
| Learning intentions | To increase confidence in teaching primary science• To raise awareness of PSTT and the resources available• To take part in practical science lessons• To recognise the importance of talk and vocabulary in scienceCCF:2.7. Regular purposeful practice of what has previously been taught can help consolidate material and help pupils remember what they have learned. 2.8. Requiring pupils to retrieve information from memory, and spacing practice so that pupils revisit ideas after a gap are also likely to strengthen recall. 4.2. Effective teachers introduce new material in steps, explicitly linking new ideas to what has been previously studied and learned.4.6. Questioning is an essential tool for teachers; questions can be used for many purposes, including to check pupils’ prior knowledge, assess understanding and break down problems. 4.7. High-quality classroom talk can support pupils to articulate key ideas, consolidate understanding and extend their vocabulary. |
| Readings/resources | Resources on Bb |
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| Wednesday2nd April | Session title | Assessment in broader and science |
| Learning goals | * Reviewing the curriculum overview for your Phase 2 school
* Exploring planning and assessment in foundation subjects and science
* Expectations for Phase 3 in planning and assessment

CCF: 3.3. Ensuring pupils master foundational concepts and knowledge before moving on is likely to build pupils’ confidence and help them succeed.3.6. In order for pupils to think critically, they must have a secure understanding of knowledge within the subject area they are being asked to think critically about.4.2. Effective teachers introduce new material in steps, explicitly linking new ideas to what has been previously studied and learned. 4.5. Explicitly teaching pupils metacognitive strategies linked to subject knowledge, including how to plan, monitor and evaluate, supports independence and academic success. 6.1. Effective assessment is critical to teaching because it provides teachers with information about pupils’ understanding and needs.6.2. Good assessment helps teachers avoid being over-influenced by potentially misleading factors, such as how busy pupils appear. 6.7. Working with colleagues to identify efficient approaches to assessment is important; assessment can become onerous and have a disproportionate impact on workload.7.4. Teachers can influence pupils’ resilience and beliefs about their ability to succeed, by ensuring all pupils have the opportunity to experience meaningful success. |
| Reading/ resources | <https://www.planassessment.com/> |
| Notes |  |