**Primary Early Years 3-7 Curriculum Map: Understanding the World: The Natural World/Science**

***Year 1 Undergraduate***

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| **University Curriculum – Year 1** | | | | | |
| **Session Sequence** | **Session Content Subject Specific Components/s** | **Learn That**  **(****CCF reference in Numerics e.g., 1.1)** | **Learn How**  **(CCF reference bullets alphabetically e.g., 1c)** | **Links to Research and Reading** | **Formative Assessment mode** |
| **Session 1**    **2 hours in total as part of EYE1009 ‘Understanding the World’ sessions.** | To become familiar with and explore the statutory requirements of the Early Years Foundation Stage (EYFS) framework for Understanding the World: The Natural World, and the non-statutory documentation (Development Matters and Birth to Five Matters).  To begin to make connections to the National Curriculum subject area of science.  To recognise essential early scientific concepts, vocabulary, and skills within the EYFS curriculum, and begin to develop a secure subject knowledge.  To begin to develop a knowledge and understanding of how play and the early years environment, both indoors and outside, can support children’s learning and development of early scientific concepts.  To begin to understand the process for planning adult-led activities in Understanding the World: The Natural World, and enhancing child-initiated activities in continuous provision, including the role of the adult, adaptive teaching, and inclusion.  To begin to understand how to assess children’s learning and development in Understanding the World: The Natural World and use this to address misconceptions and inform future planning. | **2.1; 2.2; 2.6**  **3.1; 3.2; 3.3; 3.4; 3.5; 3.7;3.10**  **4.2; 4.3; 4.4; 4.6; 4.7; 4.9**  **5.1; 5.2; 5.3; 5.5; 5.7**  **6.1; 6.4; 6.7**  **8.3** | **2a; 2b; 2c; 2d; 2.e; 2.f; 2g; 2j**  **3a; 3c; 3d; 3g; 3j; 3t**  **4a; 4b; 4c; 4e; 4j**  **8a; 8b; 8d** | Primary Science Knowledge & Understanding, 2021. Peacock, Sharp, Johnsey, Write and Sewell.    Primary Science Theory & Practice, 2021. Sharp, Peacock, Johnsey, Simon, Smith, Cross, and Harris.  Research Review: Science, 2021. Ofsted.  The Teaching of Science in Primary Schools, 2017. Harlen and Qualter.  Maintaining Curiosity, 2013. Ofsted.  ASE: Guide to Primary Science, 2018. Serret and Earle  ASE materials  STEM learning centre materials  PSST (Primary Science Teaching Trust) materials  PLAN primary science  Early Years Foundation Stage Statutory Framework, 2021. DfE,  Development Matters, 2021. DfE.  Birth to Five Matters, 2021. Early Education. | Initial confidence and subject knowledge audit.  In-session retrieval activities/questioning.  In-session directed tasks.  Peer discussions and focused tasks.  Learning Journey – ongoing subject reflections in EYE1009 area. |

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| **School Based Curriculum – Year 1** | | | | |
| **Observing:** Observe how expert colleagues use and deconstruct approaches in this subject, in at least one lesson throughout school.  **Planning:** Observe how expert colleagues break tasks down into constituent components in this subject, for at least one lesson.  **Teaching:** Rehearse and refine approaches in this subject for a group/whole class. Deliver group/whole class teaching.  **Assessment:** Check prior knowledge and understanding during lessons.  **Subject Knowledge:** Discuss and analyse subject specific components with expert colleagues | | | | |
| **Subject Specific Components/s (know, understand, can do)** | **Learn That**  **(CCF reference in Numerics e.g., 1.1)** | **Learn How**  **(CCF reference bullets alphabetically e.g., 1c)** | **Links to Research and Reading** | **Formative Assessment** |
| To know that Understanding the World: The Natural World in the EYFS curriculum supports children’s development of the physical sense of the world around them.  To know some key features of planning, teaching, and assessing in Understanding the World: The Natural World.  To understand that Understanding the World: The Natural World involves learning and teaching of key early science ideas and concepts.  To understand some of the different pedagogical approaches that can be used to support learning in Understanding the World: The Natural World and how to adapt teaching to enable all children to make good progress.  To be able to plan quality Understanding the World: The Natural World adult-led opportunities and in continuous provision with the support of the mentor/class teacher that considers prior learning, adaptive teaching, subject-specific pedagogy, and assessment. | **2,2; 2.3; 2.4; 2.5; 2.7; 2.8**  **3.1; 3.2; 3.3; 3.4; 3.5; 3.7; 3.10**  **4.2; 4.3; 4.4; 4.6; 4.7**  **5.1; 5.2; 5.3; 5.5; 5.7**  **6.1; 6.4; 6.7**  **7.1** | **1a**  **2a; 2b; 2c; 2e; 2f; 2g; 2k**  **3a; 3c; 3d; 3e; 3f; 3g; 3h; 3i; 3j; 3l; 3n; 3o**  **4a; 4b; 4c; 4e; 4j**  **5b; 5c; 5e; 5g; 5j**  **6a; 6d; 6e; 6g**  **8a; 8d** | Early Years Foundation Stage Statutory Framework, 2021. DfE.  Development Matters, 2021. DfE.  Birth to Five Matters, 2021. Early Education.  [**Laying the Foundations**](https://www.stem.org.uk/resources/elibrary/resource/30469/science-3-6-laying-foundations-early-years#&gid=undefined&pid=1)– edited collection of chapters about the teaching of science to children aged three to six years. Published by the Association for Science Education (ASE) in 2000, now on the STEM Learning website.  Play, Observe, Ask: Effective Practice in Early Years: Focus on Learning Science. Published by the Primary Science Teaching Trust in 2022. Available to download from the Primary Science Teaching Trust website.  Creativity in Science and Mathematics Education for Young Children, Executive Summary from Creative Little Scientists project. Published in 2014. | Weekly Development Summary – subject specific comments.    Lesson Observations – subject specific feedback.  Mentor/Link Tutor.  Reflections in blue book.  Progress Report. |

***Year 2 Undergraduate***

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| **University Curriculum – Year 2** | | | | | |
| **Session Sequence** | **Session Content Subject Specific Components/s** | **Learn That**  **(CCF reference in Numerics e.g., 1.1)** | **Learn How**  **(CCF reference bullets alphabetically e.g., 1c)** | **Links to Research and Reading** | **Formative Assessment mode** |
| **Session 1**  **Subject Knowledge; National Curriculum; Underpinning principles; Working Scientifically.**  **3 hours** | To develop knowledge of the aims and purpose of the Science curriculum through exploration of the National Curriculum Programmes of Study.  To consider the OFSTED Science Review and Finding the Optimum: The Science Subject Report.  To begin to identify and develop both substantive and disciplinary knowledge of the Science National Curriculum.  To begin to understand the importance of research informed practice when teaching Science.  To begin to understand how children learn in science, including cognitive development and working memory, and strategies to support learning (including SEND and EAL pupils).  To identify common misconceptions in science and develop ideas in how to address these with pupils.  To develop knowledge and understanding if working scientifically through the exploration of enquiry skills and approaches. | **1.1; 1.2; 1.6**  **3.1; 3.2; 3.3; 3.5; 3.6**  **4.2; 4.3; 4.4; 4.6; 4.7**  **8.2** | **1b; 1d**  **2a; 2e; 2f; 2g**  **3a; 3c; 3d; 3e; 3f; 3j**  **4g**  **5e**  **6d**  **8a; 8b** | ALLEN, M., 2019 *Misconceptions in primary science.* 3rd edition.  BIANCHI, L, WHITTAKER. C and POOLE, A., 2021. *The 10 key issues with children’s learning in primary science in England.*  DfE. 2014. Science National Curriculum.  DUNNE, M and MAKLAD, R Doing Science. pp 47 – 68 in DUNNE, M. and PEACOCK, A. (eds) (2015)*Primary science: A guide to teaching practice.* 2nd edition.  OFSTED., 2021. *Research review series: science.* Available from: <https://www.gov.uk/government/publications/research-review-series-science>  OFSTED., 2023. *Finding the Optimum: The Science Subject Report*. Available from: [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#executive-summary)  SHARP, J., PEACOCK, G., JOHNSEY, R., SIMON, S., SMITH, R. J., CROSS, A., HARRIS, D., WILKINSON, D., and STALLARD, W., 2021. *Primary science: Teaching theory and practice*. 9th edition | Initial questionnaire/audit.  Self-assessment against session objectives. |
| **Session 2**  **Subject pedagogy: Learning Outside the Classroom.**  **Subject Knowledge: Plants, Living Things and their Habitats, and Seasonal Change.**    **3 hours** | To develop knowledge and understanding of the importance of Learning Outside the Classroom (LOtC) when teaching Science, based on research – considering the benefits to pupils, including SEND (Special Educational Needs and Disabilities) and EAL (English as an Additional Language) children; opportunities within the curriculum; connections to ‘working scientifically;’ health and safety/risk assessment; behaviour management.  Through exploration of the National Curriculum, begin to develop a secure subject and curriculum knowledge around the following Programmes of Study – Plants, Seasonal Changes, Living Things and their Habitats.  To understand the importance and develop further understanding of the importance of prior learning, sequencing learning, and addressing common misconceptions.  To engage in an approach to LOtC (Bucket School) to apply their curriculum knowledge and understanding, and to learn how to confidently deliver high quality science experiences outdoors that include opportunities to work scientifically. | **1.4**  **2.1; 2;2; 2.4**  **3.1; 3.2; 3.3**  **4.2; 4.3; 4.4; 4.6**  **5.5;**  **7.1; 7.2** | **2d; 2i**  **3a; 3f**  **4a**  **5a; 5b; 5e; 5g;**  **7b; 7d; 7e 7i**  **8b; 8d** | HOATH, L and SPRING, H., *Teaching in the Outdoor Setting.* Pp203 – 213 in SERRET, N and EARLE, S. (eds) 2018. *Ase Guide to Primary Science Education. Fourth edn.*  LOXLEY, P., 2021. *Big Ideas in Outdoor Primary Science: Understanding and Enjoying the Natural World.* 1st edn.  PEACOCK, G., JOHNSEY, R., SIMON, S., SMITH, R. J., CROSS, A., HARRIS, D., WILKINSON, D., and STALLARD, W., 2021. *Primary science: teaching theory and practice.* 9th edition. | In session tasks: Making connections to the National Curriculum during LOtC.  Self-assessment against session objectives. |
| **Session 3**  **Planning and Assessment**  **Subject Knowledge:**  **Materials;**  **Animals, including Humans.**  **3 hours** | To develop knowledge and understanding as to what high-quality science planning (long term, medium term, and short term) consists of, including the need to:   * build on prior learning; * show progression in knowledge, skills, and vocabulary; * make connections to substantive and disciplinary knowledge; * adopt different pedagogical approaches to teach science effectively; * adapt teaching to ensure progress for all children, including those with SEND and EAL, Pupil Premium and those who require challenge.   To develop knowledge and understanding as to what assessment in science (both formative and summative) consists of, including efficient strategies such as questioning, retrieval and feedback, and end of key stage assessments and exemplifications.  Through exploration of the National Curriculum, continue to develop a secure subject and curriculum knowledge around the following Programmes of Study – Materials, and Animals including Humans, to teach with confidence. | **2.1; 2.2; 2.4**  **3.1; 3.2; 3.3**  **4.2**  **6.1; 6.3; 6.4; 6.5; 6.7** | **2d**  **3a; 3f;**  **4a**  **6a; 6c 6d; 6e; 6f; 6g; 6h; 6j**  **8b; 8e; 8f; 8g** | JOHAL, K and SERRET, N., Planning for Primary Science. Pp82 – 91 in SERRET, N and EARLE, S. (eds) 2018. *ASE Guide to Primary Science Education.* Fourth edn.  SHERRINGTON, T. and CAVIGLIOLI, O., 2019. *Rosenshine's principles in action.*  TAIT, J., 2020. *Teaching Rebooted: Using the Science of Learning to Transform Classroom Practice,* | In session tasks:  Recap on working scientifically skills.  Identify and engage in different types of enquiry.  Match learning objectives to outcomes, identifying year group, substantive and disciplinary knowledge.  Explore content for focus Programmes of Study and identify component and composite knowledge, and connections to working scientifically.  Evaluate medium term plans based on high-quality planning principles.  Science audit:  Complete audit to develop subject knowledge and identify areas for professional development. |

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| **School Based Curriculum – Year 2** | | | | |
| **Observing:**  Observe how expert colleagues use and deconstruct approaches in this subject, in at least two lessons throughout school.  **Planning:**  Observe how expert colleagues break tasks down into constituent components over a sequence of lessons. Plan, as appropriate, for a sequence of lessons in all core and selected foundation subjects.  Plan, as appropriate, one lesson / group activity in all remaining subjects.  **Teaching:**  Rehearse and refine particular approaches in all core and selected foundation subjects.  **Assessment:**  Draw conclusions about what pupils have learnt in science by looking at patterns of performance over several assessments with support and scaffolding from expert colleagues.  **Subject Knowledge:** Discuss and analyse subject specific components with expert colleagues. | | | | |
| **Subject Specific Components/s (know, understand, can do)** | **Learn That**  **(CCF reference in Numerics e.g., 1.1)** | **Learn How**  **(CCF reference bullets alphabetically e.g., 1c)** | **Links to Research and Reading** | **Formative Assessment** |
| To know the key substantive and disciplinary knowledge required to support learning and teaching of NC (National Curriculum) science in specific programmes of study.  To know and apply features of effective planning, teaching, and learning such as questioning, addressing misconceptions and talk in science.  To know and use different pedagogical approaches to combine working scientifically knowledge and skills with subject content that can be used to support learning in specific programmes of study in science.  To understand how to adapt teaching in science to meet the needs of all children within the classroom, as well as providing stretch and challenge to enable all children to make good progress.  To be able to plan and teach quality science lesson/s, with initial support from a mentor, that integrates working scientifically and considers prior learning, adaptive teaching, subject specific pedagogy, and assessment opportunities. | **1.4**  **2.1; 2.2; 2.4; 2.6;**  **3.1; 3.2; 3.3; 3.4; 3.5; 3.6**  **4.2; 4.3; 4.4; 4.6; 4.7**  **5.1; 5.3; 5.4; 5.5; 5.7**  **6.1; 6.3; 6.4; 6.5; 6.7**  **7.1; 7.2; 7.4**  **8.5;** | **2a; 2d; 2e; 2f; 2i;**  **3a; 3c; 3d; 3f**  **4a; 4e; 4f; 4g**  **5a; 5b; 5e; 5g; 5l**  **6a; 6d; 6e; 6f; 6g; 6h; 6j**  **7a; 7b; 7i** | *Primary Science Knowledge & Understanding.* 2021. Peacock, Sharp, Johnsey, Write, and Sewell.  *Primary Science Theory & Practice*. 2021. Sharp, Peacock, Johnsey, Simon, Smith, Cross, and Harris  Research Review: Science. 2021. Ofsted  *Finding the Optimum: The Science Subject Report*. 2023. Ofsted.  *The Teaching of Science in Primary Schools.* 2017. Harlen and Qualter  Maintaining Curiosity. 2013. Ofsted  *ASE: Guide to Primary Science.* 2018. Serret and Earle  ASE materials  STEM learning centre materials  PSST materials  PLAN primary science  National Curriculum 2014 DfE. | Weekly Development Summary – subject specific comments.    Lesson Observations – subject specific feedback.  Mentor/Link Tutor.  Reflections in blue book.  Progress Report. |

**Year 3 Undergraduate**

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| **University Curriculum – Year 3** | | | | | |
| **Session Sequence** | **Session Content Subject Specific Components/s** | **Learn That**  **(CCF reference in Numerics e.g., 1.1)** | **Learn How**  **(CCF reference bullets alphabetically e.g., 1c)** | **Links to Research and Reading** | **Formative Assessment mode** |
| **Session 1**  **As part of EYE 3010: Understanding the World.** | To reflect on the teaching of science to date and identify areas for CPD (Continuing Professional Development).  To continue to develop knowledge and understanding of the holistic nature of Understanding the World: The Natural World in the EYFS.  To understand the importance of developing an enabling environment in the EYFS which supports the Characteristics of Effective Learning and provides opportunities for children to develop their knowledge of early scientific concepts, through learning both indoors and outside the classroom. Consider what this might look like in practice.  To consolidate knowledge and understanding that planning and teaching in Understanding the World: The Natural World must build on prior learning and understanding, while considering the progression to National Curriculum science.  To continue to develop an understanding that planning and teaching must be adapted to meet the needs of all learners such as providing targeted support e.g., for children with special educational needs or disabilities (SEND) and English as an additional language (EAL) with teacher and TA (Teaching assistant) support.  To have a knowledge of the ELGs (Early Learning Goals) for Understanding the World: The Natural World which helps to identify the expected level of development for children by the end of Reception through assessment of children's progress. | **1.1;**  **2.1; 2.2; 2.6;**  **3.1; 3.2; 3.3; 3.4; 3.7;**  **4.1; 4.6;**  **5.3; 5.7**  **6.1;**  **8.1; 8.2; 8.3; 8.7** | **2a; 2c; 2d; 2e**  **3a; 3c; 3d; 3f; 3u**  **4a; 4l; 4m; 4o**  **5a; 5b; 5e**  **8a; 8e; 8f; 8g** | *Primary Science Knowledge & Understanding.* 2021. Peacock, Sharp, Johnsey, Write and Sewell.  *Primary Science Theory & Practice.* 2021. Sharp, Peacock, Johnsey, Simon, Smith, Cross, and Harris.  OFSTED., 2021. *Research review series: science.* Available from: <https://www.gov.uk/government/publications/research-review-series-science>  OFSTED., 2023. *Finding the Optimum: The Science Subject Report*. Available from: [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#executive-summary)  *The Teaching of Science in Primary Schools.* 2017. Harlen and Qualter.  *Maintaining Curiosity.* 2013. Ofsted.  *ASE: Guide to Primary Science.* 2018. Serret and Earle.  ASE materials.  STEM learning centre materials.  PSST materials.  PLAN primary science.  *Early Years Foundation Stage Statutory Framework.* 2021. DfE.  *Development Matters.* 2021. DfE.  *Birth to Five Matters.* 2021. Early Education. | Tutor questioning.  Peer discussions and focused tasks.  Recall quizzes.  Reflecting and target setting in the electronic portfolio - Learning Journey. |

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| **School Based Curriculum – Year 3** | | | | |
| **Observing:**  Observe how expert colleagues use and deconstruct approaches, in this subject, in at least one lesson throughout school.  **Planning:**  Plan a sequence of lessons in all core and foundation subjects.  **Teaching:**  Rehearse and refine approaches in all core and selected foundation subjects.  **Assessment:**  Discuss with expert colleagues summative assessment, reporting and how data is used.  **Subject Knowledge:** Discuss and analyse subject specific components with expert colleagues | | | | |
| **Subject Specific Components/s (know, understand, can do)** | **Learn That**  **(CCF reference in Numerics e.g., 1.1)** | **Learn How**  **(CCF reference bullets alphabetically e.g., 1c)** | **Links to Research and Reading** | **Formative Assessment** |
| Through discussion with experienced members of staff, understand the importance of ensuring strong subject knowledge in science to impact on children’s learning and develop high-quality teaching.  To make informed decisions about planning, teaching, and assessing learning in Understanding the World: The Natural World for the phase in which they are teaching, based on the appropriate level of subject knowledge.  To develop the learning environment in different areas of continuous provision (both indoors and outdoors) to provide opportunities for early scientific development drawing on appropriate resources.  With the support of experienced staff, plan and teach for effective learning in Understanding the World:  The Natural World to develop early scientific skills, concepts, and knowledge by carefully sequencing learning to best facilitate transferal to long term memory.  To learn how to adapt teaching and plan for the needs of all learners within their school-based placement.  To use subject and curriculum knowledge to plan and teach Understanding the World: The Natural World lesson/s which use early science specific pedagogies and enquiry skills to facilitate progress that draws on children’s prior learning, addresses misconceptions, sequences learning and integrates formative assessment. | **2.1; 2.2; 2.4; 2.6; 2.7; 2.8**  **3.1; 3.2; 3.3; 3.4; 3.7**  **4.2; 4.6; 4.7**  **5.1; 5.2; 5.3**  **6.1; 6.3; 6.4** | **2a; 2c; 2d; 2e; 2f**  **3a; 3b; 3c; 3d; 3e; 3g; 3u**  **4a; 4b; 4f; 4m; 4o**  **5a; 5b; 5e; 5o**  **6a; 6b; 6c; 6d** | *Primary Science Knowledge & Understanding.* 2021. Peacock, Sharp, Johnsey, Write and Sewell.  *Primary Science Theory & Practice.* 2021. Sharp, Peacock, Johnsey, Simon, Smith, Cross, and Harris.  Research Review: Science. 2021. Ofsted.  *The Teaching of Science in Primary Schools.* 2017. Harlen and Qualter.  *Maintaining Curiosity.* 2013. Ofsted.  *ASE: Guide to Primary Science.* 2018. Serret and Earle.  ASE materials.  STEM learning centre materials.  PSST materials.  PLAN primary science.  *Early Years Foundation Stage Statutory Framework.* 2021. DfE.  *Development Matters.* 2021. DfE.  *Birth to Five Matters.* 2021. Early Education. | Weekly Development Summary – subject specific comments.    Lesson Observations – subject specific feedback.  Link Tutor/Mentor.  Reflections in blue book.  Progress Report. |