**Primary Early Years 3-7 Undergraduate Curriculum Map Mathematics**

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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****1 ½ hours** **Mathematics and mathematical play** | Understanding the need for developing strong subject knowledge in mathematics.Developing an awareness of the range of research that has been undertaken in early years mathematics.Knowing how mathematical concepts are promoted through and evident in early years mathematical play.Develop mathematical curriculum knowledge and identify and explore how they progress across the age phases in the EYFS using non-statutory guidance.   | **1.1, 1.2,** **1.3, 1.4, 1.6, 2.1, 3.2, 3.7, 3.10,** **4.3, 4.4, 4.7,**  | **3a, 3d, 8a, 8d** | Cotton, T. (2020) *Understanding and teaching primary mathematics.* Oxon: Routledge. Department for Education (2021) *Statutory framework for the early years foundation stage*. Available at: https://www.gov.uk/government/publications/early-years-foundation-stage-framework--2 (Accessed: 22 November 2021).Department for Education (2021) *Development Matters*. Available at: <https://www.gov.uk/government/publications/development-matters--2>Early Education (2021) *Birth to 5 Matters: Non-statutory guidance for the Early Years Foundation Stage*. Available at: <https://birthto5matters.org.uk/wp-content/uploads/2021/04/Birthto5Matters-download.pdf>Haylock, D. and Manning (2019) Mathematics Explained for Primary Teachers. Los Angeles: SAGE.Montague-Smith, A, Cotton, T, Hanson, A. and Price, A. (2018) Mathematics in Early Years Education. Oxon: Routledge. NCETM Progression Maps for EYFS.Available at:<https://www.ncetm.org.uk/in-the-classroom/early-years/>OFSTED. 2021. *Research Review Series: Mathematics.* Available at: https://www.gov.uk/government/publications/research-review-series-mathematics Pound, L. (2022) *Teaching Mathematics Creatively.* Oxon: Routledge | Numeracy Challenge Score and feedback.Trainee reflection in their learning journey.Key component tracker.Practical activity to review counting principles. BB Quiz to assess knowledge of the counting principlesExemplar lesson plans created by the trainees. Shape quiz on cahoot. |
| **Session 2** **1 ½ hours****Mathematics****Counting and Subitizing** | Knowing the importance of developing a positive attitude to mathematics.Knowing the counting principles and how they can be developed through adult led tasks.Knowing what subitizing is and developing their knowledge of how to plan to promote understanding of subitizing in adult led tasks.Be familiar with the NCETM progression grids for counting.Identify how adult-led learning and provision can be adapted and inclusive focusing on examples for SEND and EAL.  | **1.1, 1.2, 1.3, 1.4, 1.6, 2.1, 2.2, 3.5, 4.4, 5.2, 7.4** | **1b,** **4a, 4b, 4c, 4j,** **5a, 5b, 5h** |
| **Session 3****1 ½ hours****Mathematics early calculation** | Understanding the relationship between the four operations.Know the broad range of methods of calculation (mental, calculator, written methods).Know the structures related to addition.Know the structures related to subtraction. | **4.7, 8.4,** **3.5, 3.2, 3.7,** **3.4** | **2d** |
| **Session 4****1 ½ hours Mathematics shape and space** | Be aware of the place of shape and space within the EYFS and that there is no ELG to assess shape and space.Know the names and properties of common 2d and 3d shape (triangles, squares, rectangles and circles)Exploring the approaches to developing knowledge of shape in the EYFS.Unpicking a problem solving activity in terms of subject knowledge, adaptive teaching and progression in learning | **6.4, 6.5, 6.6, 3.2, 3.4, 3.3, 2.6, 4.2, 4.6,** **4.7, 4.8, 4.9, 4.10, 5.2, 5.7** | **3a, 3d, 3e, 3g, 5e, 5h, 6e** |
| **School Based Curriculum – Year 1** |
| **Observing :** Observe how expert colleagues use and deconstruct approaches, in mathematics, in at least one adult lesson.**Planning :** Observe how expert colleagues break tasks down into constituent components, in mathematics, for at least one adult lesson. Observe how expert colleagues plan for mathematical play experiences within the continuous provision environment.**Teaching :** Rehearse and refine particular approaches in mathematics for a group/whole class. Deliver group/whole class teaching in mathematics and support children in continuous provision as they engage in mathematical experiences.**Assessment :** Check prior knowledge and understanding during adult led lessons and continuous provision play.**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** |
| At the end of this phase students will **know**:  A range of strategies to support children’s mathematical playAt the end of this phase students will **understand:**  The importance of counting and early calculation as the foundations of number At the end of this phase students will **be able to**:  Plan, teach and assess high quality mathematical opportunities for both adult led and child-initiated play  | **1.6, 2.7, 3.3,** **2.2, 2.6, 2.8, 3.1, 3.4, 4.8, 4.9,** | **1a, 1b, 1c, 1d, 2a, 2b, 2g, 3a, 3b, 3c, 3l, 4a, 4b, 4c, 4d, 5f, 5c, 5g, 5i** | Cotton, T. (2020) *Understanding and teaching primary mathematics.* Oxon: Routledge. Department for Education (2021) *Statutory framework for the early years foundation stage*. Available at: https://www.gov.uk/government/publications/early-years-foundation-stage-framework--2 (Accessed: 22 November 2021).Department for Education (2021) *Development Matters*. Available at: <https://www.gov.uk/government/publications/development-matters--2>Early Education (2021) *Birth to 5 Matters: Non-statutory guidance for the Early Years Foundation Stage*. Available at: <https://birthto5matters.org.uk/wp-content/uploads/2021/04/Birthto5Matters-download.pdf>Haylock, D. and Manning (2019) Mathematics Explained for Primary Teachers. Los Angeles: SAGE. Montague-Smith, A, Cotton, T, Hanson, A. and Price, A. (2018) Mathematics in Early Years Education. Oxon: Routledge. pg 51-66NCETM Progression Maps for EYFS.Available at:<https://www.ncetm.org.uk/in-the-classroom/early-years/>OFSTED. 2021. *Research Review Series: Mathematics.* Available at: https://www.gov.uk/government/publications/research-review-series-mathematics Pound, L. (2022) *Teaching Mathematics Creatively.* Oxon: Routledge  | Weekly Development Summary Lesson ObservationsLink Tutor  |
| **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** **Mastery and Fluency** | Exploring trainee attitudes and confidence in mathematics. Developing their understanding of the programmes of study for Key Stage 1 mathematics.Exploring mathematical anxiety and the potential implications this can have on working and long-term memory.How children learn in mathematics and the implications for teaching.Develop their understanding of the mastery approach currently used within mathematics teachingIntroduce trainees to ideas on practising recall and mathematical reasoning and how they can be adapted for the classroom. | **1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 2.2, 2.3, 2.4, 2.5, 2.6, 2.7, 2.8, 3.1, 4.1, 4.2, 4.3, 4.4, 4.5, 4.8, 5.1, 8.1** | **1c, 4i, 5e, 8d, 8f,** | Department for Education (2013) The national curriculum in England: key stages 1 and 2 framework document. Available at: <https://www.gov.uk/government/publications/national-curriculum-in-england-primary-curriculum> (Accessed: 16 May 2022).Haylock, D. and Manning (2019) Mathematics Explained for Primary Teachers. Los Angeles: SAGE.NCETM. *Mastery Materials*.Available at: <https://www.ncetm.org.uk/teaching-for-mastery/mastery-materials/> NCETM. *Progression maps for Key Stages 1 and 2*.NCETM. *Progression maps for Key Stages 1 and 2*. Available at: <https://www.ncetm.org.uk/classroom-resources/progression-maps-for-key-stages-1-and-2/> NCETM. Various videos. Available from: <https://www.ncetm.org.uk/> NRICH. Available from <https://nrich.maths.org/> OFSTED. 2021. *Research Review Series: Mathematics.* Available at: <https://www.gov.uk/government/publications/research-review-series-mathematics> OFSTED, 2023. Coordinating Mathematical Success: The  Mathematics Subject Report. [Online]. Available from: <https://www.gov.uk/government/publications/subject-report-series-maths/coordinating-mathematical-success-the-mathematics-subject-report>  | Trainees complete confidence measure 1 (Likert scale) for confidence in their own subject knowledge and ability to teach mathematics. Numeracy Challenge Score and revision.Key component tracker |
| **Session 2** **Place Value** | Know that place value encompasses many aspects of knowledge that link together to give children good number senseKnowing the components and conventions around place value and associated common errors and misconceptionsBe familiar with the NCETM Ready to Progress materials for place value.Know how to use place value in calculation and how it underpins calculating at Key Stage 2. | **1.3, 3.2, 3.3, 3.4, 3.5, 3.7, 3.8, 4.2, 4.3, 5.2, 5.4** | **3g, 3h, 3i, 4b, 4d, 4f** |
| **Session 3****Geometry 2d and 3d shape, position and direction** | Knowing the progression in geometry from EYFS, into Key Stage and its future progression in Key Stage 2.The ability to recognise 2d and 3d shapes by name and identify some key properties.Being able to identify families of shapes and misconceptions associated with these. For example, knowing a square is a rectangle and the impact of orientation on a child’s ability to identify a shape.Develop their knowledge and use of terminology within geometry. For example congruency, similarity.Being aware of the range of language in position and direction and suitable pedagogical approaches that can be applied to the classroom.How we can develop children’s visualisation skills around geometry. | **2.6, 3.1, 3.2, 3.3, 3.4, 3.6, 4.2, 4.3, 4.6, 4.7, 5.3, 6.1** | **2e, 2f** |
| **Session 4****Time and Money** | Know the difference between the passage of time and telling the time.Know the likely difficulties that children may encounter with time.Know what equivalency is in relation to money.Be able to create word problems for time and money and understand the skills children require to solve them.Be able to plan a progression of activities around time and money, acknowledging adaptations required for different learners. | **2.2, 2.3, 2.4, 2.6, 2.8, 3.2, 3.3, 4.2, 4.8, 4.9, 4.10** | **6d, 6f** |
| **Session 5 Addition and Subtraction** | Know the difference between declarative, procedural and conditional knowledge.Understand that whilst spacing of practice is important, recall of bonds and counting patterns should be practiced dailyKnow the main structures for addition and subtraction.Know the mathematical laws that apply to addition and subtraction.Know appropriate ways to model addition and subtraction that builds on their understanding of the CPA approach.Deconstruct a video of a year 1 lesson on subtraction and extend their knowledge of planning through creating appropriate activities to support the focus of the independent learning within the lesson | **2.4, 2.6, 2.7, 2.8, 3.1, 3.2, 3.3, 3.4, 3.5, 3.6, 3.7, 5.3, 5.4, 5.5** | **3a, 3b, 3c, 3m, 3n, 4a** |
| **Session 6 Multiplication Division and Fractions** | Know that multiplication involves repeated addition and division involves repeated subtraction.Understand grouping and sharing as forms of division.Know appropriate models to support multiplication and division with a particular emphasis on arrays.The commutative property in relation to multiplication and division.Understand that a fraction is an equal amount.Know that children develop knowledge of fractions within number, measures and shape.Know the vocabulary associated with fractions | **3.2, 3.3, 3.4, 3.5, 3.7, 3.8, 4.2, 4.3, 4.7, 5.2, 5.4, 6.5** | **3c, 3m, 3n, 4a** |
| **Session 7 Teaching mathematics creatively** | How to use stories as a stimulus for developing mathematical learning. Stimulus used ‘Winnie the Witch’ potions and mocktailsKnow the difference between a standard and a non standard unit of measure.Know the common difficulties associated with measuring length.Raise their awareness of estimation skills and methods within the context of capacityBe familiar with tables and representations within statisticsDeconstruct the structure of a block graph and explore ways of introducing this to children, for example, a human graph | **1.1, 1.2, 1.6, 4.11, 2.7,** | **2h, 3b, 3c, 3h** |
| **School Based Curriculum Year 2** |
| **Observing :** Observe how expert colleagues use and deconstruct approaches, in mathematics, in at least one lesson throughout school.**Planning :** Observe how expert colleagues break tasks down into constituent components over a sequence of mathematics lessons.Plan, as appropriate, for a sequence of lessons in mathematics. **Teaching :** Rehearse and refine particular approaches in mathematics. **Assessment :** Draw conclusions about what pupils have learnt by looking at patterns of performance over a number of 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** |
| At the end of this phase students will **know**: Common errors and misconceptions across all areas of the Key Stage 1 mathematics curriculumAt the end of this phase students will **understand:** How to model mathematical concepts with the aim of addressing common errors and misconceptions At the end of this phase students will **be able to**: Plan, teach and assess a series of lessons that build children’s understanding of mathematical concepts in a secure manner  | **2.6, 2.9, 3.4, 2.2, 3.1, 3.5, 3,7, 4.8, 4.10, 6.1, 6.3,** | **3g, 3d, 2a, 2b, 2c, 6l, 6m** | Department for Education (2013) The national curriculum in England: key stages 1 and 2 framework document. Available at: <https://www.gov.uk/government/publications/national-curriculum-in-england-primary-curriculum> (Accessed: 16 May 2022).Haylock, D. and Manning (2019) Mathematics Explained for Primary Teachers. Los Angeles: SAGE.NCETM. *Mastery Materials*.Available at: <https://www.ncetm.org.uk/teaching-for-mastery/mastery-materials/> NCETM. *Progression maps for Key Stages 1 and 2*.NCETM. *Progression maps for Key Stages 1 and 2*. Available at: <https://www.ncetm.org.uk/classroom-resources/progression-maps-for-key-stages-1-and-2/> NCETM. Various videos. Available from: <https://www.ncetm.org.uk/> NRICH. Available from <https://nrich.maths.org/> OFSTED. 2021. *Research Review Series: Mathematics.* Available at: <https://www.gov.uk/government/publications/research-review-series-mathematics> OFSTED, 2023. Coordinating Mathematical Success: The  Mathematics Subject Report. [Online]. Available from: <https://www.gov.uk/government/publications/subject-report-series-maths/coordinating-mathematical-success-the-mathematics-subject-report>  | **WDS****Link Tutor****Lesson Observations** |
| **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**  | Be familiar with mathematics schemes (eg White Rose mathematics)How to adapt mathematics schemes for differing needs.Ways to teach mathematics creatively | **3.1, 3.8, 3.9, 3.10, 4.4, 5.1, 5.2, 5.3, 5.4, 5.5, 5.7, 6.1, 6.2, 6.3, 6.4, 6.5** | **3a, 3b, 3c, 5e, 5g, 5i, 6a, 6b** | Bird, R. (2021) *Dyscalculia Toolkit: supporting learning difficulties in maths*. London: Sage.Pound, L. and Lee, T. (2022) *Teaching mathematics creatively.* Oxon: Routledge.Turvill, R. (2020) *Making it Count: Thriving with maths schemes in Year 1.* ATM | Trainees complete confidence measure 1 (Likert scale) for confidence in their own subject knowledge and ability to teach mathematics. Numeracy Challenge Score and revision.Key component tracker |
| **Session 2**  | Being aware of the common difficulties children with dyscalculia experiencePlanning mathematical activities for continuous provision. Assessing mathematics within continuous provision | **1.1, 1.2, 1.3, 1.4, 1.6, 2.1, 3.10, 4.3, 4.4, 4.7,** **5.2, 6.1, 6.4, 6.5,** | **3a, 3d, 8a, 8d** |
| **School Based Curriculum Year 3** |
| **Observing :** Observe how expert colleagues use and deconstruct approaches, in mathematics, in at least one lesson throughout school.**Planning :** Plan a sequence of lessons in mathematics and enhancements to continuous provision.**Teaching :** Rehearse and refine particular approaches to teaching mathematics in both adult led lessons and whilst engaging in continuous provision. **Assessment :** Discuss with expert colleagues summative assessment, reporting and how data is used in mathematics.**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** |
| By the end of this phase trainees will **know:**approaches to teaching mathematics creatively both through adult led tasks and the development of mathematical learning within the continuous provision.By the end of this phase students will **understand:**a creative approach to mathematics teaching supports understanding of the relevance of mathematics in the real world, promotes engagement and develops enthusiasm.By the end of this phase trainees **will be able to:**confidently and effectively plan, teach and assess children’s mathematics skills and understanding through a series of learning opportunities. Through the identification of common errors and misconceptions students will be able to target learning and ensure progression. | **1.6, 2.7, 3.3,** **2.2, 2.6, 2.8, 3.1, 3.4, 4.8, 4.9,** | **1a, 1b, 1c, 1d, 2a, 2b, 2g, 3a, 3b, 3c, 3l, 4a, 4b, 4c, 4d, 5f, 5c, 5g, 5i** | Bird, R. (2021) *Dyscalculia Toolkit: supporting learning difficulties in maths*. London: Sage. Pound, L. and Lee, T. (2022) *Teaching mathematics creatively.* Oxon: Routledge. Turvill, R. (2020) *Making it Count: Thriving with maths schemes in Year 1.* ATM | Weekly Development Summary Lesson ObservationsLink Tutor  |