**Primary (3-7 phase) Initial Teacher Education: Curriculum Plan**

**Subject/Strand: Understanding the World: The Natural World and Science Undergraduate Programme**

**Links to Practical knowledge, Substantive/theory, Disciplinary**

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| **Curriculum Vision:****Through our Initial Teacher Education Curriculum, it is our intention that all Edge Hill Primary 3-7 teacher trainees will:** * have secure science subject and curriculum knowledge so that they can teach across the primary age range (3-7 phase) with confidence
* understand that science is the route to developing both an understanding of the world around them and the skills to become a logical thinker/problem solver
* develop competence, confidence and promote an enthusiasm and passion for science in the classroom
* have a secure understanding of early years and primary science pedagogy (specifically aged 3 – 7 phase), and for practical, first-hand experience to be the predominant approach they use in their own classrooms both through adult-led and child-initiated play
* believe that all children can be successful in science, regardless of social background (or other circumstances) and that this is their moral purpose as educator.
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| **Phase 1** |
| **University Based Learning** | **School/Practical Based Learning – Introductory** |
|  | **Learn That** | **Learn How** | **Learn That** | **Learn How** |  |
| **Component Knowledge** | * ‘Understanding the World: The Natural World’ (UtW:TNW) is one of the specific areas of learning in the Early Years Foundation Stage (EYFS) Statutory Framework with Early Learning Goals (ELGs) at the end of Reception which specifies the requirements for learning and development.

**LT 3.1, LT 3.3** | * UtW: TNW enables children to make sense of their physical world and supports making connections to their everyday lives.

**LH 3.1, LH 3.3** |  | * UtW: TNW is integrated as a specific area into the curriculum

**LH 3.3** | **Intent** |
| * The EYFS curriculum is underpinned by the Characteristics of Effective Learning (CoEL) and this should be reflected in children’s engagement in UtW: TNW

**LT 1.1, LT 1.5, LT 2.1 LT 3.6** | * The CoEL supports children’s learning and development through UtW:TNW

 **LH 1.1, LH1.2, LH 1.3, LH 1.4, LH 3.14** |   | * UtW: TNW and the CoEL are integrated within indoor and outdoor provision

 **LH 1.1, LH1.2, LH 1.3, LH 1.4, LH 3.14**  |  |
| * There is non-statutory curriculum guidance for UtW: TNW - Development Matters (DfE, 2021) and Birth to Five Matters (Early Education, 2021)

**LT 3.1, LT 3.5, LH 3.7** | * Non-statutory curriculum guidance can support sequencing learning and development in UtW: TNW

**LH 2.4 LH 3.1** |  | * The school’s curriculum materials shape teaching and learning in UtW: TNW

**LH 3.3** |  |
| * Foundational knowledge of early scientific concepts are built primarily through UtW: TNW and this is where children begin their formal science education.

**LT 2.2, LT 3.2, LT 4.2** | * To recognise essential early scientific concepts, knowledge, and skills.

**LH 3.1, LH 3.4, LH 4.1** |  |  |  |
| * Secure subject knowledge in early science is required to teach UtW: TNW

**LT 3.2** | * To develop subject knowledge in early science using available resources.

**LH 3.1, LH 8.1, LH 8.4** | * Subject knowledge is essential to inform planning, teaching and assessing in UTW: TNW.

**LT 3.2** | * To use science subject knowledge effectively to plan, teach, assess and evaluate an adult-led activity in a nursery setting.

**LH 2.1, LH 2.2, LH 2.3, LH 3.1, LH 3.4** |  |
| * Learning in UtW: TNW takes place through explicit teaching in adult-led focused activities through scaffolding and modelling and through well-planned continuous provision, alongside playful pedagogies.

**LT 3.5, LT 4.2, LT 4.3, LT 4.4, LT 4.9** | * Recognise that young children will learn through expert adult support to scaffold, model and guide combined with opportunities in play through continuous provision to promote inquiry and problem solve.

**LH 4.1, LH 4.2, LH 4.3, LH 4.10** |  | * An experienced teacher uses direct instruction to support children to develop early scientific concepts in UtW: TNW, alongside playful pedagogies.

**LH 4.1, LH 4.2, LH 4.3, LH 4.11** |  |
| * Observing children in continuous provision supports and develops learning in UtW: TNW by enabling prior learning to be identified and misconceptions to be anticipated and addressed.

**LT 2.2, LT 2.6, LT 4.4, LT 5.2** | * Observation of children supports identifying children’s prior knowledge and anticipating and addressing children’s misconceptions which are usually based on their experience.

**LH 2.1, LH 2.5, LH 2.6** |  | * An experienced teacher uses the observation, planning and assessment cycle to support children to develop early scientific concepts in UtW: TNW.

**LH 4.1, LH 4.2, LH 4.3, LH 4.11** |  |
| * Inclusive approaches in UtW: TNW adult-led and continuous provision activities will support all learners.

**LT5.3, LT 5.7** | * Adapting teaching in UtW: TNW supports different learners such as SEND and EAL as well as providing challenge.

**LH 2.11, LH 5.1, LH 5.2, LH 5.8** | UTW: TNW planning, and teaching needs to be adapted to the specific learners within their school-based placement (by discussing the cohort’s needs) to ensure their individual progress with mentor support initially.**LT 4.2, LT 5.2, LT 5.3, LH 5.5** | * To adapt planning and teaching to be inclusive for all learners with initial support from the mentor.

**LH 5.2, LH 5.5** |  |
| * It is essential to develop children’s vocabulary of the natural world through classroom talk and play.

**LT 3.10, LT 4.7** | * To provide contexts to develop children’s scientific and non-scientific vocabulary.

**LH 3.21, LH 4.13, LH 4.15** |  |  |  |
| * Use of questioning checks prior knowledge, assesses and scaffolds learning for early scientific concepts in UtW: TNW

**LT 4.6, LT 5.1, LT 6.1** | * Open questioning supports identifying prior-learning and scaffolding children’s knowledge and understanding to support scientific exploration of the natural world.

**LH 5.12, LH 6.6, LH 4.15** | * A teacher’s use of questioning can ascertain prior knowledge, further learning and assess children’s knowledge and understanding in UtW: TNW

**LT 4.6, LT 5.1, LT 6.1** | * With initial mentor support, use effective questioning to ascertain prior knowledge, further learning and support assessment UtW: TNW

**LT 4.6, LT 5.1, LT 6.1** |  |
| * Learning in UtW: TNW needs to be sequenced carefully to facilitate transferral to the long-term memory and this is supported by children learning new ideas by linking those ideas to existing knowledge and organising information (schemata), repeated practice, supporting retrieval and avoiding overloading working memory.

**LT 2.3, LT 2.4, LT 2.7, LT 2.8, LT 3.7, LT 4.2** | * The ways children learn impacts on progress and how relevant research and theory shapes classroom practice.

**LH 2.2, LH 2.3, LH 2.7, LH 2.10, LH 3.10, LH 4.5, LH 8.1**  | * A teacher carefully sequences their teaching to support schemata, repeated practice, retrieval and avoiding overloading working memory.

 **LT 2.3, LT 2.4, LT 2.7, LT 2.8, LT 3.7, LT 4.2**   | * With support from the mentor, begin to sequence teaching to reflect a developing understanding of how memory affects and supports learning.

 **LT 2.3, LT 2.4, LT 2.7, LT 2.8, LT 3.7, LT 4.2** |  |
| * Learning Outside the Classroom (LOtC) is an integral part of the curriculum for UtW: TNW and has benefits linked to research and theory.

**LT 2.1, LT 8.2** | * To identify opportunities for LOtC through adult-led and child-led learning provision and other opportunities such as Forest School for UtW: TNW.

**LH 8.1** | * Outdoor learning is an essential part of provision that can support working memory and long-term memory.

**LH 2.3, LH 2.4, LH 2.5**  | * To engage in outdoor learning through provision and/or adult led learning to identify and develop early science concepts.

**LH 2.7, LH 3.1** |  |
| * Health and Safety and risk assessment are essential in maintaining a safe outdoor learning environment.

**LT 8.3** | * To evaluate outdoor provision in order to complete a risk assessment.

**LH 8.2** |  |  |  |
| **Assessment** | **Assessment: University Based Learning** | **Assessment: School Based Learning** |  |
| Formative assessment approaches: * 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 of electronic portfolio

Summative approaches: * EYE 1009 - presenting two teaching resources for selected areas of learning supported by underpinning theoretical rationale
 | Assessed throughout Professional Practice 1: Introductory* Weekly Development Summary – assessing progress on a weekly basis focusing on key strands of the EHU curriculum which includes discussion focus tasks
* Lesson observations – subject specific feedback
* Progress report
* Reflections in blue book
 | **Impact** |
| **Composite Knowledge** | **Composite knowledge/understanding/skills** |
| *By the end of this phase trainees will* ***know:*** | *By the end of this phase trainees will* ***understand:*** | *By the end of this phase trainees will* ***be able to:*** |
| * That UtW: TNW in the EYFS curriculum supports children’s development of the physical sense of the world around them
* Some key features of planning, teaching and assessing in UtW:TNW
 | * That UtW: TNW involves learning and teaching of early science concepts
* Some different pedagogical approaches that can be used to support learning in UtW: TNW and how to adapt teaching to enable all children to make good progress
 | * Plan quality UTW: TNW adult led activity/ties and an aspect in continuous provision with the support of a mentor that considers prior learning, adaptive teaching, subject-specific pedagogy and assessment
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| **Research** | **KEY RESEARCH****That trainees will know that informs teaching and learning in Science**  |
| * 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
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| **Phase 2** |
| **University Based Learning** | **School/Practical Based Learning – Developmental** |
|  | **Learn That** | **Learn How** | **Learn That** | **Learn How** |  |
| **Component Knowledge** | * The National Curriculum (NC) (2014) Programme of Study (PoS) for science builds on the EYFS curriculum for UtW: TNW

**LT 3.1. LT 3.3** | * Science knowledge, skills and understanding progresses from the UtW: TNW to the NC

**LH 3.1, LH 3.3, LH 3.4** |  |  | **Intent** |
| * The science NC provides a programme of study for the knowledge (physics, chemistry and biology) and skills (working scientifically) which children learn aged 5-11 and that the spiral structure provides a minimum requirement and enables progression of substantive and disciplinary knowledge

**LT 3.1, LT 4.2** | * The science NC makes clear the expectations for outcomes for each PoS

**LH 3.1, LH 3.3** | * A school’s science curriculum encompasses the NC and is sequenced carefully and progressively to develop knowledge, skills and values

**LT 3.1, LT 4.2** | * The school’s curriculum materials shape teaching and learning in science.

**LH 3.3, LH 4.5** |
| * That secure subject knowledge and curriculum knowledge in science is essential for high-quality teaching and learning for the PoS of Plants, Seasonal Change, Animals including humans, Living Things and their Habitats, Everyday Materials and Uses of Everyday Materials

 **LT 3.2** | * To use available resources to develop and deepen their own subject knowledge and associated vocabulary for the PoS Plants, Seasonal Change, Animals including humans, Living Things and their Habitats and Materials and take ownership of this process

**LH 8.2** | * A secure level of subject knowledge is needed for the PoS being planned for and taught to impact on children’s learning

**LT 3.2** | * To plan science lesson/s using their developed science subject knowledge by identifying essential concepts, knowledge and skills

**LH 3.1**  |
| * Expertise in science is built through developing two forms of knowledge:

Substantive - Scientific knowledge and conceptual understanding Disciplinary - Working scientifically, knowledge of methods scientists use to answer questions, knowledge of apparatus and techniques, data analysis and knowledge of how science uses evidence to develop explanations**LT 3.2, LT 8.2** | * Both substantive and disciplinary knowledge are developed in the PoS and in planning

**LH 3.4, LH 3.5**  | * Substantive and disciplinary knowledge are incorporated into specific lesson plans

**LT 3.2** | * To combine substantive and disciplinary knowledge within a science lesson with mentor support

**LH 3.3** |
| * That disciplinary knowledge (focusing on working scientifically) needs to be taught explicitly rather than absorbed through practice, revisited, carefully sequenced and embedded with substantive content (where appropriate) as working scientifically underpins the nature, processes and methods of science

**LT 3.1, LT 3.2, LT 3.3, LT 3.5, LT 3.6** | * To identify appropriate disciplinary knowledge and how to recognise that Working scientifically can be embedded into teaching and learning in the science PoS

**LH 3.1, LH 3.3, LH 3.4, LH 3.5, LH 3.6, LH 3.10** | * Substantive and disciplinary knowledge are incorporated into effective lesson plans

**LT 3.2, LT 3.3, LT 3.5** | * To combine substantive and disciplinary knowledge within science lesson/s with initial mentor support

**LH 3.1, LH 3.3, LH 3.4, LH 3.6** |
| * There are 5 types of enquiry - observation over time; pattern seeking; identifying, sorting and classifying; comparative and fair testing, as well as research using secondary sources

**LT 3.2** | * To identify the 5 types of enquiry (observation, pattern seeking; sorting and classifying; fair testing and secondary sources) when planning and teaching

**LH 3.1, LH 3.4, LH 4.6** | * Science lessons will be planned using different types of enquiry

**LT 3.2** | * To plan and teach using one aspect of the 5 types of enquiry (observation, pattern seeking; sorting and classifying; fair testing and secondary sources) when planning and teaching

**LH 3.1, LH 3.4, LH 4.6** |
| * It is important to raise aspirations for all in science through connections to science capital and representation of a diverse range of scientists as it can contribute to a child’s engagement and relationship with the subject

**LT 1.1, LT 1.2, LT 1.6** | * To develop the teaching of science capital to widen children’s understanding of what science is and how it relates to their lives and promotes aspirations supported by representations of a diverse range of scientists

**LH 1. 2, LH 1.4** |  |  |
| * Good practice in science is based on evidence and research and is essential to inform high-quality teaching and learning

**LT 8.2** | * Research and evidence informs teaching and learning in science such as the use of learning theories and the OFSTED Research Review Series: Science (2021)

 **LH 5.5, LH 8.1** |  |  |
| * Different pedagogical approaches are needed for effective science teaching such as first-hand practical experiences that are supported by questioning, modelling and scaffolding

**LT 4. 2, LT 4.3, LT 4.4, LT 4.6** |  | * Supporting children to learn science through first hand practical activity and by questioning, modelling and scaffolding are essential to support recall and retrieval

**LT 4. 2, LT 4.3, LT 4.4, LT 4.6** | * Use practical methods, processes and skills to teach substantive and disciplinary content the PoS using effective questioning, modelling and scaffolding aiding learning and progress

**LH 3.1, LH 3.4, LH 4.6** |
| * Eliciting children’s ideas about science concepts, knowledge and skills is essential to ascertain prior knowledge and identify misconceptions

 **LT 2.2, LT 2.6, LT 3.4** | * There are a range of pedagogical approaches to elicit children’s prior knowledge, skills, ideas and misconceptions

**LH 2.1, LH 2.5, LH 2.6, LH 3.7, LH 6.4** | * When planning and teaching, time is built in for prior knowledge to be ascertained to support teachers to identify and address misconceptions

**LT 2.2, LT 2.6, LT 3.4** | * To plan and teach science lesson/s that elicit children’s prior knowledge, skills, ideas and misconceptions

**LH 2.1, LH 2.5, LH 2.6, LH 3.7, LH 6.4** |
| * Language is important for conceptual development in science including talk for science and the understanding of scientific vocabulary

**LT 4.7** | * Plan opportunities for children to talk in science in order to share ideas and build conceptual knowledge

**LH 4.1,** **LT 4.7** | * Planning for talk in science fosters development in scientific vocabulary

**LT 4.7** | * Plan and teach science lesson/s that promote talk to develop scientific vocabulary

**LH 4.1,** **LT 4.7** |
| * In high quality science curriculums knowledge is carefully sequenced to build on prior learning, connect to substantive and disciplinary knowledge and by clearly sequencing components to facilitate progress towards a composite outcome within a lesson and sequence of lessons

**LT 2.1, LT 2.2, LT 2.4, LT 3.1, LT 3. 3, LT 4.2** | * Single lessons and series of lessons in science are clearly sequenced to break down learning into components in order to support children’s progress such as involving prior learning, practice and retrieval of key concepts, knowledge and skills

**LH 2.4, LH 3.1, LH 3.6, LH 4.1** | * Teachers utilise strong subject and curriculum knowledge to plan science lessons by breaking key learning down into small steps

**LT 2.1, LT 2.2, LT 2.4, LT 3.1, LT 4.2** | * To sequence components of science learning that will support children to make progress and reach their composite outcomes across a lesson and/or sequence of lessons

**LH 2.4, LH 4.1** |
| * Ways of adapting teaching in science can include targeted support and deployment of teaching assistants (TAs) to ensure progress for all including children with SEND and EAL, those who are disadvantaged (pupil premium) and those who require stretch and challenge

**LT 5.1, LT 5.3, LT 5.4, LT 5.5, LT 5.7, LT 8.5** | * Adaptive teaching in science needs to be planned for in order to impact on all groups progress either to scaffold and challenge

**LH 5.1, LH 5.2, LH 5.12** | * Teachers plan for adaptive teaching such as deployment of TAs and also adapt during their lessons according to the needs of the particular groupings to be fully inclusive of all learners

**LT 5.1, LT 5.3, LT 5.4, LT 5.5, LT 5.7, LT 8.5**  | * To plan and teach science lesson/s that are reflective of adaptive teaching practice to impact on children’s progress

**LH 5.1, LH 5.2, LH 5.12** |
| * There are different ways to group the children to develop shared values for learning (inside and outside the classroom) reflect adaptive practice, enabling all children to succeed and support behaviour management

**LT 1.4, LT 5.5, LT 7.1. LT 7.2, LT 7.4** | * To make good use of the classroom and groups of children to promote positive behaviour and support children’s individual learning needs and promote independence

**LH 2.9, LH 5.1, LH 5.2, LH 5.5, LH 5.7, LH7.2, LH 7.9** | * Effective behaviour management and class grouping impacts on learning and progress

**LT 1.4, LT 5.5, LT 7.1. LT 7.2, LT 7.4** | * To plan and teach effective science lessons by considering appropriate behaviour management strategies and class groupings to organise practical lessons

**LH 2.9, LH 5.1, LH 5.2, LH 5.5, LH 5.7, LH7.2, LH 7.9** |
| * Learning Outside the Classroom (LOtC) is an integral part of NC science where many PoS can be taught and also supports closing the attainment gap and mental health

**LT 1.1, LT 2.1** | * To identify opportunities for LOtC when planning and teaching NC science such as Bucket School and Forest School and recognise the importance of LOtC

**LH 8.4**  |  | * If appropriate, to plan and teach NC science through LOtC to support children making connections which in turn will support learning and progress in the concept, knowledge or skills being taught

**LH 3.3, LH 3.4** |
| * Consistent behaviour management strategies, health and safety and risk assessment are necessary for practical science sessions, outdoor learning experiences and visits, outings and trips

**LT 7.1, LT 7.2** | * Make use of risk assessment procedures to ensure children are kept safe at all times such as predicting a range of risk indicators and taking remedial action to reduce the risk of harm

**LH 7. 4, LH 7.5** | * Each school will have a behaviour policy and approach to managing risks in science for practical experiences and LOtC

**LT 7.1, LT 7.2** | * With support from a mentor, recognise how to manage risk by applying the school’s behaviour policy, risk assessment and health and safety measures to LOtC and practical science sessions

**LH 7.1** |
| * Formative assessment in science includes efficient strategies such as identifying prior- learning, questioning, identifying misconceptions, retrieval exercises and verbal and written feedback

**LT 6.1, LT 6.3, LT 6.4, LT 6.5, LT 6.7** | * Formative assessment opportunities should be efficient, identified on planning and clearly link to lesson objectives and when teaching formative assessment information is gathered in readiness for the next lesson

**LH 6.1, LH 6.4, LH 6.5, LH 6.6, LH 6.7, LH 6.8, LH 6.10** | * Teachers use a variety of efficient formative assessment strategies to assess learning in science

**LT 6.1, LT 6.3, LT 6.4, LT 6.5, LT 6.7** | * To plan and teach science lesson/s that uses formative assessment effectively to inform future lessons

**LH 6.1, LH 6.4, LH 6.5, LH 6.6, LH 6.7, LH 6.8, LH 6.10** |
| * Science is summatively assessed and this includes end of key stage judgements

**LT 6.1, LT 6.3, LT 6.4** | * To use the end of key stage one science exemplification materials to make summative assessment judgements

**LH 6.2, LH 6.3** |  |  |
| * Their own CPD for science will grow by using research, support from science specific providers e.g. STEM learning centres, PSST, ASE and utilise this by setting their own targets based on their current development

**LT 8.1, LT 8.3, LT 8.7** | * Identify targets for their own professional development within science supported by research and subject-specific providers e.g. STEM learning centres, PSST, ASE

**LH 8.5, LH 8.6, LH 8.7** |  |  |
| **Assessment** | **Assessment** | **Assessment** |  |
| Formative assessment approaches:* Subject audit
* Tutor questioning
* Peer discussions and focused tasks
* Recall quizzes
* Reflecting and target setting in their electronic portfolio Learning Journey

Summative approaches: * EYE2007 - reflective account on how their subject knowledge related to the current national curriculum has developed and produce an action plan for addressing any identified gaps in their knowledge
 | Assessed throughout Professional Practice 2: Developmental* Weekly Development Summary – assessing progress on a weekly basis focusing on key strands of the EHU curriculum which includes discussion focus tasks
* Lesson observations – subject specific feedback
* Progress reports
* Reflections in blue book
 |
| **Composite Knowledge** | **Composite knowledge/understanding/skills** |
| *By the end of this phase trainees will* ***know:*** | *By the end of this phase trainees will* ***understand:*** | *By the end of this phase trainees will* ***be able to:*** |
| * Key substantive and disciplinary knowledge and pedagogical approaches required to support learning and teaching of science in Key Stage One
* Features of effective planning, teaching and learning in science such as questioning, addressing misconceptions and talk in science
 | * The different pedagogical approaches that can be used to support learning in science and how they can be adapted to enable all children to make good progress.
* How to adapt teaching to meet the needs of all children within any classroom as well as stretching pupils’ talents and interests
 | * 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
 |
| **Research** | **KEY RESEARCH****That Trainees will know that informs teaching and learning in Science** |
| * 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
* National Curriculum 2014 DfE
 |
| **Phase 3** |
| **University Based Learning** | **School/Practical Based Learning – Consolidation** |
|  | **Learn That** | **Learn How** | **Learn That** | **Learn How** |  |
|  | * The EYFS is holistic in nature and it is mainly through the UtW: TNW where formal science education is developed as early scientific concepts, skills and knowledge are built and established and this is carefully sequenced and progresses to the NC PoS

**LT 3.1, LT 3.3** | * To identify early scientific concepts, knowledge, and skills through UtW:TNW

**LH 3.1, LH 3.3, LH 3.4** |  | * To plan and teach UtW: TNW as a specific area of the curriculum through adult-led activities, playful pedagogies and through continuous provision activities.

**LH 3.3** |  |
|  | * Identifying prior learning of early science knowledge, skills and concepts through UtW: TNW and non-statutory documents such as Development Matters and Birth to Five Matters support this sequence and progression

**LT 2.2, LT 2.6, LT 3.7, LT 4.6** | * To identify key early science concepts, substantive and disciplinary knowledge and skills are carefully sequenced to build on prior learning

**LH 2.4, LH 3.1, LH 3.6** | * Non-statutory curriculum documents such as Development Matters and Birth to Five Matters support identification of prior-learning and progression alongside observation and adult-led activities

**LT 2.2, LT 2.6, LT 3.7, LT 4.6** | * To confidently plan for children’s UtW: TNW early scientific learning through adult-led activities, continuous provisionusing a range of starting points, e.g. children’s interests, stories and themes

**LH 3.1, LH 3.2. LH 3.3, LH 3.54. LH 3.5, LH 4.1, LH 4.2, LH 5.15** |  |
|  | * The ELGs for UtW:TNW identify the expected level of development for children by the end of Reception and these judgements are supported by assessments

**LT 3.1, LT 3.3, LT 6.1** |  | * Children will be assessed against the UtW: TNW ELGs as a summative form of assessment and observation and adult-led activities will support this summative judgement

**LT 6.1, LT 6.3, LT 6.4** | * With mentor support, make summative assessment judgements using the school’s available assessment and exemplification material

**LH 6.2, LH 6.3** |  |
|  | * The importance of developing an enabling environment supporting the CoEL by providing high quality UtW: TNW opportunities for children to develop early scientific concepts and where misconceptions can be addressed

**LT 2.6, LT 3.4** |  | * When developing and creating an enabling environment to develop children’s knowledge, skills and understanding in UtW:TNW, observation supports identification of misconceptions that can be addressed

**LT 2.6, LT 3.4** | * To plan for and develop an enabling environment that supports the CoEL by providing high quality UtW: TNW opportunities for children to develop early scientific concepts and where misconceptions can be addressed

**LH 2.5, LH 2.6, LH 3.7, LH 6.4** |  |
|  | * Secure subject, pedagogical and curriculum knowledge is essential to teach EYFS UtW:TNW

**LT 2.1, LT 3.2, LT 4.1** | * Single lessons and series of lessons in EYFS UtW:TNW are clearly sequenced to break down learning into components in order to support children’s progress such as involving prior learning, anticipating misconceptions, repeated practice and retrieval

 **LH 2.1, LH 2.3, LH 2.4, LH 2.5, LH 3.4, LH 4.1** | * Teachers utilise strong subject, curriculum and pedagogical knowledge to plan EYFS UtW:TNW lessons by breaking key learning down into small steps, checking prior learning, anticipating misconceptions, developing schemata alongside avoiding overloading working memory, repeated practice and developing recall and retrieval

**LT 2.1, LT 2.2, LT 2.4, LT 2.7, LT 2.8, LT 3.1, LT 3.2, LT 3.3, LT 4.2** | * To sequence components of essential concepts, knowledge and skills across a lesson and/or series of lessons in EYFS UtW:TNW that will support children to make progress and reach their composite outcomes by breaking key learning down into small steps, checking prior learning, anticipating misconceptions, developing schemata alongside avoiding overloading working memory, repeated practice and developing recall and retrieval

**LH 2.1, LH 2.3, LH 2.4, LH 2.5, LH 3.1, LH 3.4, LH 4.1** |  |
|  | * Planning and teaching in UtW:TNW is progressive and needs to 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 support

**LT 5.3, LT 5.7** | * Story is often used as a stimulus for adult-led activities and continuous provision for UtW: TNW and consider how it is progressive can be adapted to meet the needs of all learners

**LH 2.4, LH 5.1, LH 5.2** | * Their planning and teaching of UtW:TNW needs to be progressive and adapted to the specific learners within their school-based placement (by discussing the cohort’s needs) appropriate to their developmental stages to ensure their individual progress

**LT 4.2, LT 5.2, LT 5.3** | * To plan for progression in early scientific skills through thoughtful development of the environment including high quality resources and adapt adult-led activities to be inclusive for all learners appropriate to their developmental stages including using thoughtful interventions where appropriate with teacher or TA support

**LH 2.4, LH 5.2, LH 5.5** |  |
| **Component Knowledge** | * Effective questioning is essential to check prior knowledge, assess and scaffold learning for early scientific concepts in UtW: TNW

**LT 4.6, LT 5.1, LT 6.1** | * Effective questioning supports identifying prior-learning and scaffolding children’s knowledge and understanding to support scientific exploration of the natural world

**LH 5.12, LH 6.6, LH 4.15** | * a teacher’s use of questioning can ascertain prior knowledge, further learning and assess children’s knowledge and understanding in UtW:TNW

**LT 4.6, LT 5.1, LT 6.1** | * With initial mentor support, use effective questioning to ascertain prior knowledge, further learning and support assessment UtW:TNW

**LT 4.6, LT 5.1, LT 6.1** | **Intent** |
| * High-quality classroom talk is essential support children to articulate key ideas, consolidate understanding and extend their vocabulary of the natural world

 **LT 3.10, LT 4.7** | * To provide rich contexts to enrich and widen children’s scientific and non-scientific vocabulary as the beginnings of scientific concepts

**LH 3.21, LH 4.13, LH 4.15** | * Planning for talk in EYFS UtW: TNW science fosters development in scientific vocabulary

**LT 4.7** | * Plan and teach EYFS UtW: TNW lesson/s that promote talk to develop early scientific vocabulary

**LH 3.21, LH 4.13, LH 4.15**  |
| * Research and evidence-based practice is essential to inform high-quality teaching and learning

**LT 8.2** | * Use research and evidence-based practice to make informed decisions for planning, teaching and learning of early science in UtW:TNW such as the use of learning theories and the OFSTED Research Review Series: Science (2021)

**LH 5.5, LH 8.1** |  |  |
| * LOtC is integral to UtW:TNW to support effective teaching and children’s learning by supporting them in making sense of the world around them

**LT 1.1, LT 4.1** | * Developing LOtC supports development of key scientific concepts, knowledge and skills and co-operative learning

**LH 3.4, LH 4.12** |  |  |
| * Teaching and learning about sustainability in the early years is a crucial part of supporting children to connect with the environment around them

**LT 1.2, LT 8.3** | * Sustainability can be promoted in the classroom and that the UN 17 goals of sustainability can be developed through the curriculum

**LH 3.3, LH 8.1, LH 8.2, LH 8.13** |  |  |
| * A teacher’s own tacit, substantive and disciplinary knowledge for early science continues to develop as they gain experience and this should continuously be engaged with for example by setting their own targets based on their own development needs

**LT 8.1, LT 8.3, LT 8.7** | * Identify targets for their own professional development within early science, with awareness of potential CPD provision

**LH 8.5, LH 8.6, LH 8.7** |  |  |
| **Assessment** | **Assessment** | **Assessment** | **Impact** |
| Formative assessment approaches:* Subject audit
* Tutor questioning
* Peer discussions and focused tasks
* Recall quizzes
* Reflecting in their electronic portfolio

Summative approaches: * EYE 3001 PPD - assignment critically analysing learning in the outdoor environment and presenting a personal position statement and action plan
* EYE 3001/2 Curriculum - Portfolio tasks

a) a reflective diary b) an academic poster which will demonstrate learning across all seven areas of the EYFS curriculum and how this learning will positively impact provision for young children* Professional viva
 | Assessed throughout Professional Practice 3: Consolidation* Weekly Development Summary – assessing progress on a weekly basis focusing on key strands of the EHU curriculum which includes discussion focus tasks
* Lesson observations – subject specific feedback
* Progress reports
* Reflections in blue book
 |
| **Composite Knowledge** | **Composite knowledge/understanding/skills** |
| *By the end of this phase trainees will* ***know:*** | *By the end of this phase trainees will* ***understand:*** | *By the end of this phase trainees will* ***be able to:*** |
| * The importance of ensuring strong subject knowledge in science to impact on children’s learning and develop high-quality teaching
* Make informed decisions about EYFS UtW:TNW planning, teaching and assessing learning for the phase in which they are teaching based on the appropriate level of subject knowledge
 | * How to develop the environment in different areas of continuous provision (indoors and outdoors) to provide opportunities for early scientific development drawing on appropriate resources
* How to plan and teach for effective learning in UtW:TNW to develop early scientific skills, concepts and knowledge by carefully sequencing learning to best facilitate transferal to long term memory
* How to adapt teaching and plan for the needs of the learners within their school-based placement
 | * Use subject and curriculum knowledge to plan and teach UtW:TNW 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
* Take a holistic approach to planning for UtW:TNW learning in an enabling environment, where science works in conjunction with other areas of learning to support early scientific development
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| **Research** | **KEY RESEARCH****That Trainees will know that informs teaching and learning in Science** |
| * 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
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