

Science Feedback Prompts

Please refer to the **Science** section of Birmingham City University’s Subject Specific Development Journal for specific details of what the Associate Teacher has learned prior to their school-based training.

Curriculum Knowledge:

Associate Teachers will demonstrate their understanding of the requirements of **statutory curriculum frameworks**: NC and EYFS Specific Area, ‘Understanding of the World’; and know the aspects of science that are taught within and across all phases, and a secure understanding of knowledge progression.

A high-quality science education provides the foundations for understanding the world through the specific disciplines of biology, chemistry and physics. Science has changed our lives and is vital to the world’s future prosperity, and all pupils should be taught essential aspects of the knowledge, methods, processes and uses of science. Through building up a body of key foundational knowledge and concepts, pupils should be encouraged to recognise the power of rational explanation and develop a sense of excitement and curiosity about natural phenomena. They should be encouraged to understand how science can be used to explain what is occurring, predict how things will behave, and analyse causes. DfE (2015)

A thorough and secure knowledge and understanding of the purpose and aims of the NC will prepare Associate Teachers well, ensuring all pupils develop:

Substantive knowledge (scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics);

Disciplinary knowledge (an understanding of the nature, processes and methods of science) through providing opportunities for pupils to engage in different types of science enquiries, (*observing over time; pattern seeking; identifying, classifying and grouping; comparative and fair testing (controlled investigations); and researching using secondary sources*); helping them to answer scientific questions about the world around them;

Science Subject Knowledge Development:

Associate Teachers engage in a **robust auditing process**, prior to school based training. Audits and supporting notes should be available and referred to as part of weekly meetings and lesson feedback. If an Associate Teacher’s subject knowledge is identified as weak, they should be directed to address this through reading and research, and revisiting audit materials, within their targets. Further, they should have a good understanding of effective pedagogical knowledge, with a focus on the Constructivist Learning theory.

Observation prompts have been created in line with relevant and current reading and research in Primary Science Education. Associate teachers will have engaged with this during University taught module sessions. Planning and teaching a sequence of learning as part of their school-based experience will support all ATs in making strong links between taught content and classroom practice.

| Key Idea: | What to look for: |
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| <p>Curriculum Knowledge</p> <p>Associate Teachers should have a good knowledge of the Science National Curriculum, and EYFS Specific area, ‘Understanding The world’. and know the aspects of science that are taught within and across each key stage, and Early Years.</p> | <ul style="list-style-type: none"> ➤ Does the Associate Teacher identify what is being taught by making accurate and appropriate reference to curriculum frameworks in their planning? ➤ Are opportunities for retrieval practice planned and clearly explained? ➤ Does planning build on prior learning, and children’s existing ideas? ➤ Are contexts meaningful? ➤ Are key strategies planned to elicit initial ideas, eg. concept cartoon, questioning, etc? ➤ Are possible misconceptions anticipated in planning to support identifying these in children’s responses? ➤ Are there opportunities for pupils to play and explore? |

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| <p>Substantive Knowledge</p> <p>Across the year/phase: Life Processes and Living Things. Materials Physical Processes</p> | <ul style="list-style-type: none"> ➤ Is key knowledge and conceptual understanding identified and appropriate as part of the learning objective(s)? ➤ Do planned elicitation activities allow for the initial ideas to be identified about the topic? – and before presenting teachers' own idea or before studying ideas from textbook or other sources? ➤ Does the Associate Teacher explain clearly the new learning and outcomes to the pupils and refer back to this during the teaching? ➤ Are pupils provided with opportunities to observe phenomenon? ➤ Are pupils encouraged to describe and explain phenomenon, generating explanations and interpretations of their own? ➤ Do explanations and/or demonstrations demonstrate secure knowledge of the concept being taught? ➤ Does the Associate Teacher impart knowledge in a variety of ways, and key blocks of knowledge and concepts broken down into smaller parts, to support challenging scientific ideas? ➤ Are new ideas accessible in a variety of ways to pupils? ➤ Are pupils provided with 'hands on' opportunities that allows them to play and explore, and talk to their peers? ➤ Are pupils able to describe and explain understanding in common language? ➤ Does the Associate Teacher introduce and apply correct technical vocabulary and terminology accurately and precisely; and pupils encouraged to do the same in their talk and written work? ➤ Are pupils' answers and suggestions accepted and valued, and then built on to extend learning? ➤ Are questions incisive and based on pupils' responses? ➤ Are pupils encouraged to expand on their questions and justify their responses? ➤ Are pupils given opportunities to generate explanations and alternative interpretations? ➤ Does the Associate Teacher probe pupils' responses for clarification and justification? ➤ Are pupils' initial ideas revisited/challenged in the light of new learning? ➤ Are pupils given opportunities to explain contradictions and misconceptions? |
| <p>Disciplinary Knowledge 'Working Scientifically' Phases: KS1, Lower KS2, Upper KS2</p> | <ul style="list-style-type: none"> ➤ Does planning make explicit reference to the appropriate 'working scientifically' programmes of study for the age/phase being taught? ➤ Are key science process skills identified and explained as part of learning objectives? ➤ Are pupils provided with 'hands on' opportunities that allows them to play and explore, and talk to their peers? ➤ Are pupils given opportunities to apply skill(s) to new situations and/or real-life problems? ➤ Are pupils given appropriate resources and scientific equipment, and taught how to use it correctly? ➤ Are pupils provided with opportunities to: <ul style="list-style-type: none"> • ask their own questions? • plan and seek answers to questions? • collect, analyse and present data? • draw conclusions? • plan further investigative enquiry? ➤ Are links between these and other curriculum subjects ie. Maths, made to strengthen context and/or application? ➤ Are pupils involved in more sophisticated discussion of experimental design and control? ➤ Are Health and Safety considerations taken into account and a risk assessment carried out prior to practical activity? |
| <p>Target Setting: At least one subject specific target should be set following an observation. This should include what is the next step (to support Associate Teacher progress) why is this important (impact on pupil progress) and how will this be achieved (what actions are needed?)</p> <p>E.g. Develop skills in predicting to ensure children can test their own ideas by planning and delivering a Science investigation lesson.</p> | |