The Association for Science Education

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Best Practice Guidance

Guidance on Initial Teacher Education (ITE)

Context

The ASE's membership includes teachers, teacher educators and preservice teachers from across the UK, including representatives from all phases – from early years to further education. Requirements for ITE vary between the different nations of the UK, and between these different phases. Most primary school teachers enter the profession with little or no experience of science since their own secondary education. Secondary science teachers may be required to teach beyond their degree specialism and may not be confident in all areas of the school science curriculum. A significant minority of candidates for secondary science initial teacher education courses do not have science degrees. There is now a wealth of routes into teaching, particularly in England. A description of what is considered best practice through the HEI route can be found here**.**

The position of ASE

- The Association believes that preservice teachers are entitled to a professional education provided by partnerships between schools and other providers, such as universities. ITE courses need to meet the current national standards that apply in their part of the UK.
- The ASE aims to foster positive working relationships with all those involved in ITE to support the development of sufficient quantity and quality of science teachers to meet schools' needs, and hence to ensure high quality science education for all children and young people.
- ITE courses for beginning teachers in all phases should include subject-specific material which draws upon the body of science education research and the best professional guidance. Where well-qualified candidates have a non-specialist science background, e.g. in biomedical science, forensic science, psychology or sports science, they should take a high quality Subject Knowledge Enhancement (SKE) course before they start their secondary ITE course.
- It is essential for all those teaching science to children and young people in the UK to be qualified teachers, or to be in the process of gaining a relevant qualification.
- ITE is introductory, and should be considered to be only part of the teacher's professional learning journey, which continues throughout the teacher's career.

Best practice in ITE should seek to include opportunity to

- critically engage with ideas about the nature of science, and its implications for teaching and learning, including consideration of enquiry-based learning in science education and the purposes of practical work.
- be supported to become confident and competent in running practical activities, including health and safety induction and risk assessment, as well as aspects of behaviour for learning specific to practical subjects, for example managing resources and pupil movement.
- develop 'a commitment to teaching science for understanding', including critical consideration of how children learn in science, children's alternative conceptions and how they might be overcome.
- observe effective teaching and assessment practice, and to gain teaching experience, over an extended period of time and to obtain a broad range of experiences across the relevant age range.
- develop an understanding of effective assessment and formative feedback in science, going beyond statutory requirements and preparation for examinations.
- consider modes of communication in science, including talking, reading and writing science, as well as the use of representations such as symbols, tables, graphs and diagrams, and the language of mathematics in science.
- develop 'effective reflective practice' which may include activities such as peer observation and feedback.
- consider the purposes of science education, and what it means to be an educated citizen in an increasingly technological society and wider 'social and political frameworks, such as the under-representation of some groups in STEM-related careers and higher education courses.

For further information about some of the different routes into teaching see

HEI led

School Direct (and Teaching Schools)

School Centred Initial Teacher Training (SCITT)

Teach First

We recommend that prospective teachers of science should examine the specific offer from the provider to ensure sufficient focus on science pedagogy as outlined above.