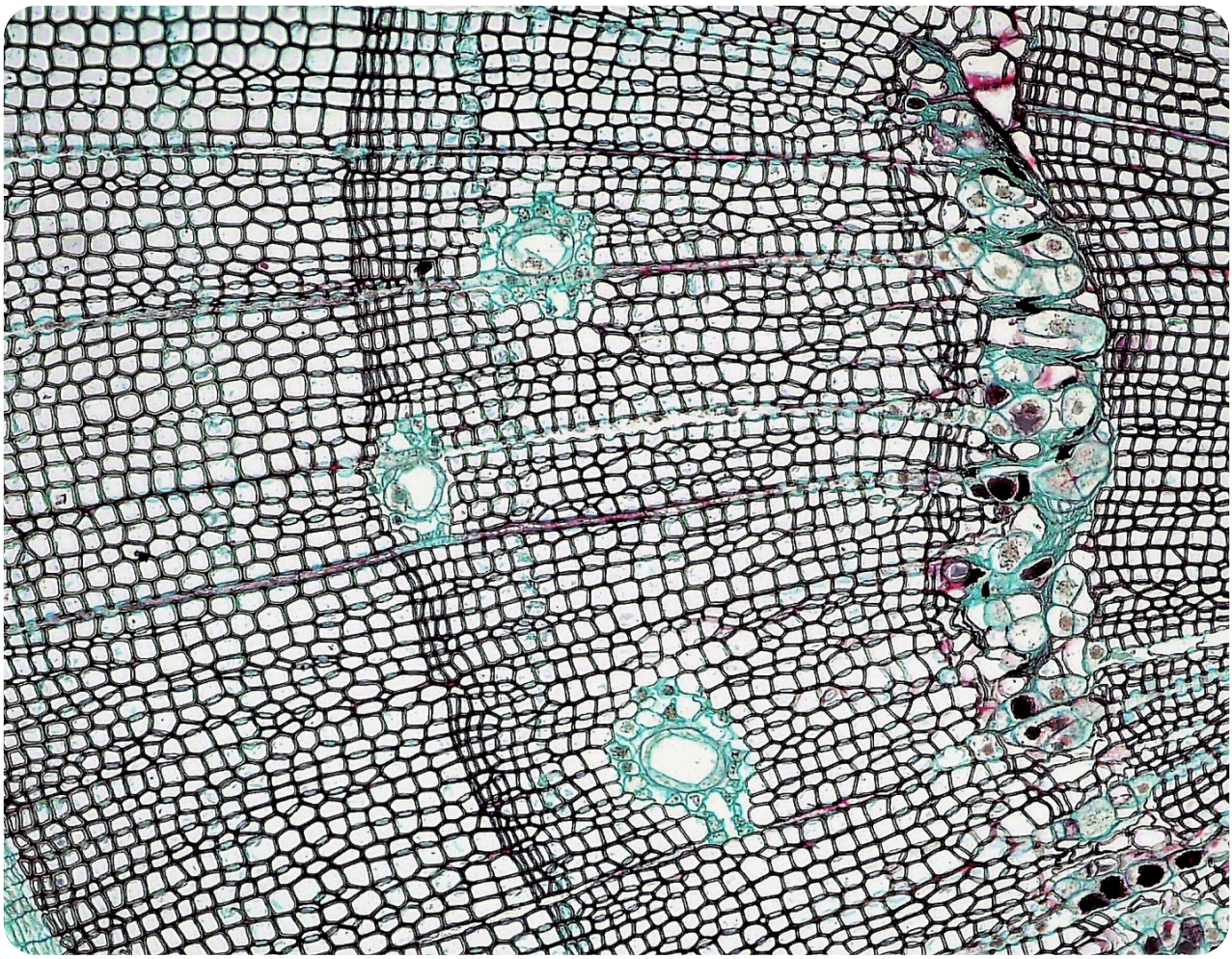
ASSOCIATION FOR SCIENCE EDUCATION



ASE POLICY PERSPECTIVES

The Purpose of Science Education

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About the ASE

The Association for Science Education (ASE) is the UK's largest community of science educators. We support science teaching and learning through professional development, a community of support, resources and advocacy. Our policy positions are informed by evidence, member expertise and our commitment to excellent science education for all learners.

Summary

The ASE believes that science is an essential part of the school curriculum in all of the nations of the UK. Its continued prominent position within the compulsory curriculum in primary and secondary schools is a deserved and vital one, as science education performs multiple important roles which positively impact both learners as individuals and society as a whole. The "purpose of science" should be understood and promoted by all key stakeholders in the science education of young people.

Background

The school curriculum meets a wide range of needs and the science community should not take its currently privileged position for granted. Science or "the sciences" should be on the curriculum, not only because of historical positioning and prominence, but for current and vital reasons.

In developing science curricula thought must be given to the purpose of the inclusion of science, its current relevance and how the content of the curricula should be adapted to meet a range of needs.

The sciences are diverse, in content and skills. There is far more excluded from curricula than is included, both in terms of substantive content and subject-specific skills, and so careful consideration must be given to what is in mandatory science curricula. ASE believes that the content should be viewed through four lenses: utility, curiosity, culture, and citizenship.

Key messages

The purpose of teaching science has multiple dimensions, these can be summarised through four distinct themes.

- **Culture**

The full range of sciences have been at the forefront of culture for over 400 years. Science is a cultural activity, shaping the way that we think and act. It demands creativity and drives creativity across the full range of human activity. It is impossible to imagine a rich cultural life in which science has not contributed a significant part.

- **Utility**

Teaching science equips young people with a range of important skills which are both beneficial in life and potentially within the workplace. Handling data, performing experiments, analysing and assessing evidence, and working with others are all important skills from which students will benefit in their future studies and work. In addition, there is some content matter which is also of use within the workplace.

- **Citizenship or 21st century scientific literacy**

Some of the most important aspects of lives in the 21st century rely on citizens being able to make balanced and informed judgments. Often these aspects of life have a strong scientific basis and can only be understood and critically appraised by those who possess a fundamental skill set based in science. This not only includes an understanding of data and experimentation, but also about the way in which the scientific community works to generate knowledge. The 21st century has and will continue to be dominated by global issues such as the climate emergency and public health crises. It is vital that all young people are empowered to properly understand and critically assess information in an age increasingly shaped by misinformation and generative artificial intelligence. Our science curriculum must equip young people with the analytical and critical skills that will help them to thrive in ever-changing societies.

- **Curiosity**

For as long as humans have walked the Earth they have sought explanations for natural phenomena, whether that is the motion of the stars and planets,

the behaviour of the materials around them, or the behaviour of their own bodies. Over many centuries the systematic study of natural phenomena became what we now call science. Humans are naturally inquisitive, they explore and discover, and in doing so can derive great joy along with a sense of awe and wonder, not necessarily at just the complexity of the universe and life within it, but also at our ability as human beings to create plausible explanations in rational terms which describe all of these phenomena. With curiosity comes innovation, and innovation is essential as societies face increasingly interconnected challenges and global risks such as climate change, inequalities and resource scarcity.

Key Recommendations

- To ensure that mandatory science curricula, across age ranges and nations, are developed to benefit all students, we recommend that "The purpose of science" or a philosophical position is stated in all curricula and then becomes a golden thread throughout the curriculum.

- To ensure that teachers address the purpose of science in their teaching we recommend that examination boards integrate the themes of "the purpose of science" into their specifications.

- To ensure that teachers are supported in addressing the purpose of science in their teaching we recommend that publishers of resources across the full range of ages and disciplines integrate the "purpose of science" themes into new and revised publications.

- To ensure that new teachers are confident and feel well equipped we recommend that all providers of science teaching initial teacher education provide training opportunities in this area.

ASE policy positions are developed through consultation with our members and advisory committees. For more information or to contribute to our policy work, visit: ase.org.uk/our-policy-work.

This policy perspective is applicable to: all schools (all phases, all sectors) in the UK

Thank you to the following contributing authors: Dr Mark Whalley, Caroline Smith, Marianne Cutler

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Supporting Evidence

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