

Necessary but not sufficient:

The role of science in teaching our young people about climate change

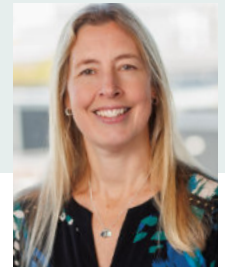
Climate change is no longer an abstract topic in the United Kingdom; it is a lived experience for young people, shaping daily life, future prospects and national priorities. Schools must prepare students not only to understand these changes but to navigate, manage and lead within them.



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The current review of the national curriculum in England is a significant opportunity to ensure that honest climate change education that cultivates hope, agency and resilience is available to all our young people. This has significant implications for school science, demands a whole curriculum response and requires a sustained programme of professional development for teachers.

Curriculum reform

Many young people report high levels of anxiety about climate change¹ but evidence suggests that 'new climate denial', which rejects the severity of the crisis and the solutions proposed to address it, is also increasing.² The school curriculum is seen by many, including parents³, as a vital resource in providing young people with the knowledge and skills to navigate their way through these issues, yet despite this, climate change and sustainability content is currently sparse.⁴

Science should provide critical foundational knowledge about climate change, alongside core skills of scientific enquiry. The important role of science in climate change education was recognised in the final report of the recent review of England's national curriculum.⁵ The report called for more attention to 'the scientific causes of, consequences of, and potential solutions to climate change' and a more coordinated approach 'across scientific disciplines, ensuring that environmental and climate-related content is integrated meaningfully and coherently rather than only being presented as a standalone topic'. We welcome the report and the

government's positive response, while also highlighting three priorities for creating and implementing a curriculum that responds effectively to the climate emergency.

What is the role of science in schools?

The first priority focuses on the science curriculum itself. The definition of 'potential solutions' above is open to interpretation, and there is a risk of focusing only on technological 'fixes' and neglecting multiple viewpoints and perspectives.

In their analysis of the current curriculum, Glackin and King argue that citizens need to 'understand that there are no environmental fixes and that all solutions have social, political, environmental impacts'.⁶ They illustrate this by comparing how different GCSE awarding bodies address energy management. One specification requires students to describe major energy sources and compare renewable and non-renewable uses, while another goes further, highlighting complex choices and competing messages from energy companies, environmental groups, the media, scientists and politicians, including proposals for more renewables, more nuclear power and lifestyle changes. In the first, students are required to learn about energy sources; in the second, students are prompted to apply this knowledge to consider and explain multiple perspectives and impacts.

We argue that the science curriculum must go beyond knowledge about climate change, vital though this is.

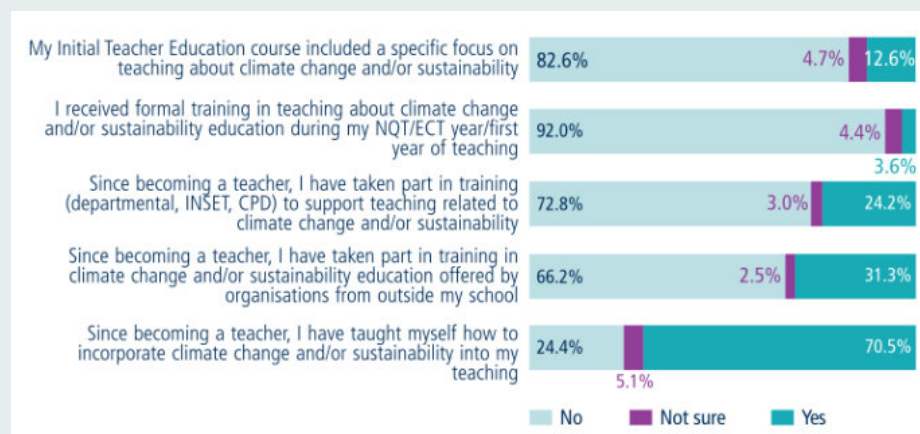
It should also build understanding of current debates and impacts, fostering agency and enabling young people to 'critically examine claims about environmental issues to distinguish between reliable information, disinformation and misinformation'.⁷

Science should support a whole curriculum approach

The second priority is to situate science's contribution within the whole curriculum. The example of energy management above demonstrates perfectly how climate change is not only a science problem. Alongside science, the curriculum review suggested that climate change should also feature in geography, citizenship and design and technology. We welcome this recognition that climate change has broad curricular relevance but would go further and argue that a holistic understanding of the climate (and nature) crisis should inform the aims of all subjects. In this context, science (and geography) can act as 'underpinning' disciplines, supporting wider curriculum thinking.⁷

A whole curriculum approach requires more creative thinking about how subjects can work together. One example developed by UCL's Centre for Climate Change and Sustainability Education is a module entitled 'Living Cities'.⁸ This explores the past, present and future of our cities, critical since the majority of the world's population is now urban. The enquiry combines history, geography and science, with huge potential to include English, mathematics and art. Although we present London as a case

Figure 1. Participation in types of professional development related to climate change and sustainability



study, schools are encouraged to localise the enquiry to a nearby town or city and build a rich understanding of how it could become more sustainable and biodiverse.

Innovation needs supporting

The final priority is to ensure that teachers are ready and supported to teach a revised curriculum, a critical dimension of any curriculum reform.⁹ A survey of 870 teachers carried out by UCL in 2022 suggested that they have received very little professional development about how to teach climate change unless it has been ‘self-taught’ (Figure 1).¹⁰ This is especially concerning as the majority of respondents taught science and geography. Also of concern was that only just over half (58.3% of secondary science respondents agreed that they include content related to climate change in their teaching, despite the wide range of topics across all three sciences that would be relevant.

Beyond the implementation of statutory content in the revised curriculum, the kind of local innovations encouraged in the curriculum report and illustrated by the ‘Living Cities’ enquiry are much less likely to happen in the absence of a sustained programme of teacher support. This needs to go beyond the provision of resources, where underpinning rationales, especially around teaching approaches, are hidden, to include opportunities for teachers to explore case studies of excellent practice, join communities of practice and be enabled and encouraged by their school leadership. There are some wonderful pockets of innovation but all young people deserve an engaging, relevant

and empowering curriculum that inspires them to participate in local and national efforts to protect the natural world, tackle climate change and adopt more sustainable lifestyles, including through a career in the ever-expanding green economy.

UCL is addressing this need through Teaching for Sustainable Futures [www.climateeducation.org.uk], a programme of free, accessible modules tailored by subject and age group. The programme is designed to stimulate conversations in schools, inspire curriculum change and support pedagogical innovation. These modules will be embedded in schools through the launch of our Schools for Sustainable Futures initiative in September. However, unless school leaders are obliged to prioritise climate change and sustainability, good practice will remain isolated. This makes getting the new curriculum right essential, alongside reform of national professional development and inspection frameworks, which currently contain no references to climate change, nature or sustainability.

This is urgent

Young people are already living with climate change, and its impacts on their lives will continue to grow. Scientific knowledge alone is not guaranteed to motivate them to act or demonstrate workforce readiness. Young people also need agency, resilience and problem-solving skills, alongside an understanding of both local and global perspectives. This requires a science curriculum that adopts more than a purely technological or knowledge-based lens, and which examines the wider impacts of and

responses to climate change while providing foundations for learning across other subjects. Crucially, it also requires teachers who are prepared to innovate in ways that are locally relevant and globally imperative.

References

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- ⁵ Curriculum and Assessment Review (2025). *Building a World-Class Curriculum for All: Final Report*, p15.
- ⁶ Glackin MA & King H. (2018). Understanding Environmental Education in Secondary Schools In England: Report 1. *Perspectives from Policy*. King’s College London.
- ⁷ Kitson A, et al. (2025). *The Key Contributions of Subjects to Climate Change and Nature Education: A Curriculum Policy Proposal*, Centre for Climate Change and Sustainability Education, University College London. p13.
- ⁸ See <https://climateeducation.org.uk/professional-development/subject-modules>
- ⁹ OECD (2020). *Curriculum Reform: A Literature Review to Support Effective Implementation*. OECD Education Working Paper No. 239.
- ¹⁰ Greer K, et al. (2023). *Teaching Climate Change and Sustainability: A Survey of Teachers in England*. University College London.