



**The role of subjects and
subject associations in
climate change and
sustainability education
in England**



ACKNOWLEDGEMENTS

This report, and the event that inspired it, was the result of a partnership between University College London, the Council for Subject Associations and the Natural History Museum. The main organisers of the event and contributors to this report were Dr Alison Kitson and Dr Kate Greer from UCL's Centre for Climate Change and Sustainability Education, Liz Moore and Patrice Baldwin from the Council for Subject Associations and Dr Jess Tipton and Georgia Prasad from the Natural History Museum. We would also like to thank all those who attended the event and contributed to this report. For a full list, please see page 16.



Contents

| | |
|--|----|
| Acknowledgements | 2 |
| Background and recommendations | 4 |
| Introduction | 5 |
| Part One: The contribution of all subjects to climate change and sustainability education | 7 |
| Part Two: The importance of subject-specific professional development | 13 |
| Contributors | 16 |
| Appendix One: What should climate change and sustainability education include? | 18 |

Background and recommendations

This report is the outcome of an event held on 16 July 2024 which brought subject associations together to discuss the roles that they, and the subjects they represent, play in climate change and sustainability education in schools. The event was organised by UCL's Centre for Climate Change and Sustainability Education in partnership with the Council for Subject Associations and the Natural History Museum and it launched SACEN, the Subject Association Climate Education Network.

Delegates made a strong case for embedding climate change and sustainability education across the whole curriculum and providing tailored support to teachers. Given that subject associations exist to promote subject specialisms, a strong case was also made for them to take a lead in supporting teachers to respond to the climate and nature crisis in age- and subject-appropriate ways.

Subject Associations are membership organisations, whose members are subject experts. Subject associations are independent of government and their mission is to further teaching and learning in a specific subject in schools, colleges and Initial Teacher Education in universities. In this document, the term 'subject associations' is inclusive of **Learned Societies**, which also participated in the event. This is in recognition of the important role they play in supporting teaching and learning within subjects, though we note that they have further roles beyond the scope of this definition. For a full list of the organisations that have contributed to this report, please see page 16.

Recommendations

1. **The revised school curriculum should build on the existing subject requirements in geography, science and citizenship that support climate change and sustainability education.**
2. **The revised school curriculum should identify new opportunities for teaching about climate change and sustainability across the curriculum by including clearly defined and specific teaching requirements in every subject.**
3. **High quality professional development about climate change and sustainability education is urgently needed for all teachers, tailored by subject and age phase and focused on subject knowledge and appropriate pedagogies.**
4. **Subject associations should continue to make climate change and sustainability education one of their priorities and be supported to help develop subject specific exemplification and guidance for teachers.**



Introduction

There has never been a more important time to focus attention on the climate and nature crisis. **As we write this, leading climate scientists are warning that many of Earth's 'vital signs' have hit record extremes and that the future of humanity therefore 'hangs in the balance'**.¹ Global warming projections for 2100 have not improved since 2021, and the world is currently on a path towards 2.7°C of warming.² This will lead to more extreme weather events and indeed, the Department for Education's (DfE) Sustainability and Climate Change Strategy in England identifies that over 10,000 English primary and secondary schools are *currently* facing flood risk, with the number of schools rising to between ~13,000 to ~16,000 schools by 2050.³ Closely connected with the climate crisis is the nature crisis. The WWF Living Planet Report 2024 reveals a catastrophic decline of 73% in wildlife populations over the last 50 years while recent analysis by scientists at the Natural History Museum shows that global biodiversity in 2020 stood at just 59.37% of pre-industrial levels.^{4,5}

Despite the overwhelming evidence of a planetary crisis, research into people's attitudes towards climate change in the UK suggests that a value-action gap persists, with most people agreeing that significant lifestyle changes are required whilst continuing to use a private car, eat unsustainable levels of meat and use electricity extensively.⁶ It is therefore hardly surprising that **in a recent survey of 11-14-year-olds, 87% of respondents expressed concern about what the world will be like in the future because of climate change**, expressing negative emotions such as sadness, anxiety, guilt and shame.⁷

In this context, questions about how we can best prepare our young people to navigate the challenges of a climate-altered present and future are both inevitable and vital but time is not on our side. **Whilst long term change to the education system is needed, there is much that can be done in the short term to help schools take curriculum focused actions.** The DfE's Sustainability and Climate Change Strategy, for example, proposes action across five strands, including climate education, green skills and careers and school estates, and has led to a number of important initiatives including the National Education Nature Park.⁸

The **National Education Nature Park** – commissioned by the Department for Education and led by the Natural History Museum in partnership with the Royal Horticultural Society and other partners – empowers children and young people to make a positive difference to both their own and nature's future. Designed to work for all primary and secondary schools, nurseries and colleges in England, learners lead the way in transforming their sites for both people and wildlife. A core programme aim is to put climate and nature at the heart of the curriculum. By establishing best practice in climate teaching and working with expert partners, the programme provides quality-assured resources which will span across all subject areas and key stages. These support educators to embed climate and nature across the curriculum.

Of note, however, is that the current National Curriculum in England (under review at the time of writing) pays limited explicit attention to the climate and nature crisis and the need for widespread change if we are to live more sustainability on Earth, with no explicit reference at all in subjects beyond the sciences, geography and citizenship.⁹

A recent report from OCR describes **climate change education for 11-16 year olds as one of two 'glaring omissions' from the current curriculum** (alongside digital literacy).¹⁰ Despite this lack of explicit attention in the National Curriculum, delegates to the event did note that there are opportunities to make links to the climate and nature crisis in classrooms, but that **this depends on the engagement and expertise of individual teachers who in turn depend on relevant professional development and appropriate resources.**¹¹

Teach the Future's **Tracked Changes** project works with academics and educators to review the current national curriculum and to embed sustainability and climate change across all subjects in a tracked changes version. These documents are practical tools to support teachers on the ground to embed climate in their teaching, enabling teachers to reframe existing subject content without deviating away from national requirements. They provide a stop gap measure until wider curriculum reform.

Unfortunately, however, **curricular limitations are reinforced by a lack of professional development opportunities to help teachers embed climate change and sustainability into their teaching**, with fewer than half of respondents in a recent survey having engaged in relevant, formal CPD (continuing professional development). Amongst those who have engaged in relevant CPD, the majority of this was 'self-taught'.¹² **This context does not support the embedding of high quality climate change and sustainability education across the whole curriculum for all children and young people.**

It was in this context of limited coverage of climate change and sustainability education in the current curriculum, coupled with evidence of restricted opportunities for teachers to develop relevant expertise and confidence, that the event was conceived. **By involving a wide range of subject associations, we were able to discuss the contribution of all subjects to this most interdisciplinary of challenges and consider the kinds of support most likely to engage and empower classroom teachers.** Throughout the day, delegates remained mindful of the urgency of the climate and nature crisis and the extent to which young people, in particular, will need to adapt to the challenges these issues pose to our planet.



Part One: The contribution of all subjects to climate change and sustainability education

What is climate change and sustainability education?

Delegates were asked to identify examples of what might feature as part of a curriculum oriented, at least partially, around the climate and nature crisis.¹³ The responses illustrate that climate change and sustainability education should include a broad range of knowledge, skills, competencies and values. **Knowledge about climate change itself was seen as critical alongside knowledge to support more sustainable and equitable futures.** Delegates highlighted the need to build student understanding of topics that are emerging because of the impacts of climate change, such as food and water security, alongside areas where change is vital, such as energy consumption. **Biodiversity was mentioned frequently**, reminding us that the nature crisis is a crucial dimension of planetary health and closely linked to climate change.

Climate change and sustainability is strongly represented in the **Royal Society of Biology's** framework with recommendations to improve biology education for all students and prepare them to make healthy and informed choices about their lives and the planet. The curriculum framework, *Evolving 5-19 Biology*, emphasises: human impact, both positive and negative; biodiversity and ecosystems; developing applications to promote human and environmental wellbeing; and influencing society by asking and answering big questions about biology.

The emphasis that delegates placed on the importance of empathy was striking, and many responses focused on the act of looking after others, including care, compassion and love. **Critical thinking featured prominently, as did imagination, curiosity and creative thinking**, all of which are vital to envisioning more sustainable futures and evaluating and interpreting information about the planetary crisis. Overall, there was strong support for a conception of climate change and sustainability education which includes but goes beyond knowledge and which also includes skills and values. There was also support for a broadening of what 'counts' as knowledge, for example by welcoming the inclusion of Indigenous knowledge.

Art and Design is naturally attuned to emphasising learner autonomy and innovation and solving problems through the application of learners' own imagination and agency. Not just problem solvers, but problem identifiers. In addition, the freedom of a curriculum that is concept- rather than content-driven provides the opportunity to explore socially engaged practice, the meaning of citizenship, and empathy as a design skill. These are all things that create a sound base for the green skills framework.

How do different subjects enhance climate change and sustainability education?

A clear implication of the wide range of knowledge, skills, competencies and values outlined above is that climate change and sustainability education can, and should, be taught in subject areas in addition to geography, science and citizenship. **A common thread running through the conference was a call for all subjects to contribute to climate change and sustainability education, in ways that respect subject specialisms, with environmental perspectives becoming part of all subjects' identities.** There was also broad agreement that incorporating a more explicit focus on climate change, biodiversity loss and the need for more sustainable futures would enrich and enhance subjects, increase their relevance to young people and open up rich teaching and learning opportunities.

Mathematics provides an ideal context for awakening students' sustainability consciousness, for example by calculating the amount of water used to manufacture clothing or the carbon footprint of food served in school canteen. Using data about the amount of energy generated by solar panels on a school's roof or about the biodiversity of a school's estate develops important mathematical skills while highlighting the impact that local action can have. Critical approaches to handling data are vital in shaping our young people's engagement with the climate and environmental emergency, including skills for green jobs.

The **contributions of the whole curriculum** were highlighted as supporting children and young people's development, enabling them to:

- value **accepted scientific understanding** about climate change, biodiversity loss and more sustainable futures;
- recognise and understand **the debates** that remain about how we should respond to the planetary crisis;
- envision different futures and support social transitions by drawing on **creative thinking and imagination**;
- develop their **sustainability consciousness**;
- exercise **agency** in order to bring about change, individually, collectively and systemically;
- explore their **responsibilities as citizens** in a globalised world;
- understand the climate and nature crisis through **multiple perspectives**, appreciating how we got here, what the alternatives are and why these are local and global issues;
- **comprehend and critique information** about climate change, including through social media;
- appreciate that **climate change affects some people disproportionately** at a local and global level;
- **connect with the natural world** across the whole curriculum, including by learning outdoors;
- **empathise** with the experiences of other communities, locally and globally, that are affected by the climate and nature crisis;
- **understand** that we are not separate from the rest of the natural world.

Design and technology focuses on problem-solving and creativity to provide thoughtfully designed products, systems, and services to suit a fast-changing and increasingly complex world. At some stage in its development, everything made by humans has been 'touched' by design, with the first concepts of good design being sustainability, equality of access, and circularity. The subject of design and technology aims to produce well-informed and eternally curious young people who will step confidently into life and work with an acute awareness of the planet and how they can leave the earth in a more positive place than they found it.

Underpinning the contributions of all school subjects is the knowledge and understanding of the climate and nature crisis that the sciences, geography and citizenship help to develop. These three subjects provide explanations of anthropogenic climate change and biodiversity loss that are vital for understanding the causes of this crisis, the scale of the challenges we face, their local and global impacts and the steps we can take to mitigate them. Delegates did note, however, that the curriculum in these subjects needs some updating to make climate change and sustainability education more explicit, and in some cases, more forward-looking.

Content addressing some aspects of sustainability and climate change already appears in the **physics curriculum**. For example, students are taught about the advantages and disadvantages of renewable and non-renewable energy stores and electricity topics address how appliances are being made more efficient. However, much more could be done to make the curriculum fit for purpose and cutting-edge. Students would benefit from being taught what advances have already been made in the technology to reduce global greenhouse gas emissions and what new, emerging technologies might mean for the future of energy generation.

Nevertheless, **the sciences, geography and citizenship provide important foundations that support the rest of the curriculum.** Without these foundations, students will lack an understanding of why we need to think differently, more creatively, more reflectively and more critically about the future of the planet. **Without the contributions of all subjects, however, the shift in mindset that we need to apply to all areas of our lives cannot be fully realised.** Appreciating that we live in a connected planetary system, that we are not separate from the rest of nature, and that we urgently need to live within planetary boundaries needs to infuse what we learn across the curriculum, from the poetry we read to the food we learn to cook.

Earlier this year, at St Claudine's School in north west London, year eight students were taught about the history of energy when studying the Industrial Revolution. They learnt about the long history of renewable energy and the much shorter history of fossil fuels and they used this knowledge to consider the possible future of energy use. **The teacher was able to build on knowledge and terminology developed in science lessons,** having spoken to the science department in advance.

The need for coherence and an awareness of green careers

Geography provides a unique contribution to young peoples' green skills through the use of geospatial data. The work of the **Geographical Association** – in partnership with the Ordnance Survey and Esri UK – has supported thousands of English primary and secondary schools to use geospatial technology to develop pupils' environmental understanding. Such use of geospatial technologies is at the heart of the Department for Education's National Education Nature Park, led by the Natural History Museum (see page 4 above), through which thousands of pupils have now mapped the biodiversity of their school estates and are now using their maps to support sustainable local actions.

Delegates were clear that while climate change and sustainability should be embedded across all subjects, a coherent approach is required to avoid repetition and fragmentation.

Opportunities do exist within the current curriculum to thread relevant themes coherently across subjects. In one multi academy trust, for example, the primary curriculum has been reviewed in order to highlight themes such as biodiversity, water, waste, energy, food, air, and climate science. The intention is not to add more content but to reframe existing content around these themes, with consistent stories of hope and action. In addition to reviewing geography units to highlight climate justice and river management, for example, the trust is also reviewing the use of texts in English to ensure that themes of sustainability are represented, for example in *The Great Kapok Tree*.

English has a distinct and vital role to play within climate change education. It enables young people to develop a critical awareness of the language in which climate change and sustainability are discussed and empowers them to speak out about nature, climate change and social injustice. Diverse and wide-ranging text choices can illustrate how different cultures across time and place relate to and are affected by their environments and help to cultivate empathy for others, including more-than-human communities.

Unfortunately, however, **recent surveys suggest that climate change and sustainability are not routinely embedded across the curriculum beyond geography and science** in all schools.¹⁴ Without a requirement to do so through the National Curriculum, delegates feared that these themes will remain peripheral to much classroom teaching. This situation is exacerbated by the lack of relevant subject-specific professional development for teachers.



Delegates made three specific suggestions to ensure that issues of climate change and sustainability are embedded across the whole curriculum and that a coherent approach is taken:

1. **The national curriculum would benefit from an overarching, more ambitious and aspirational vision statement which includes a reference to working towards a more sustainable future.**
2. **All subjects need to rise to the challenge of this ambition.**
3. **Inter-disciplinary initiatives are needed where subjects work together to address key themes such as food, energy, nature, futures and climate justice in a way that feels coherent for learners.**

The first suggestion would place greater responsibility on schools to track how this vision statement is realised through the whole curriculum and support conversations within and across years groups and subjects. The third suggestion requires models of collaborations that respect and harness subject identities and enhance student understanding. Teachers also need time to work across subjects, for example through dedicated INSET training.

A good example of the **potential of interdisciplinary learning** took place this year at Westminster Academy, in collaboration with UCL. The **geography, history and science departments** worked together to design a sequence of lessons for year eight about the past, present and future of sustainable cities. The lessons focused on the local area immediately surrounding the school and included a field trip to Hyde Park. The outcome was to present a possible regeneration project of a local space in order to improve its biodiversity and support more sustainable living.

The importance of pedagogy was emphasised throughout the conference. **Enquiry-led and action-focused pedagogies were favoured, underpinned by classrooms as places of discussion and informed debate.** Creative and playful approaches to learning, including the use of storytelling, were suggested as helpful ways to engage children and young people in these issues and the potential value of learning outside was noted as a way to encourage students to notice the natural world and to promote wellbeing.¹⁵ Common to all pedagogies, delegates argued, must be a commitment to make a range of ways of seeing the world visible to young people.

A group of **year three** learners are exploring the story 'Giant' by Juliet and Charles Snape in a **drama lesson**. Working in role as 'Mountain', their teacher tells them that she is leaving their village because she is strewn with litter. Trees have been destroyed. She and the rivers that cross her are not respected. 'Sort this out' she says. The learners work together to formulate plans for the present and future wellbeing of 'Mountain'. They present these plans to 'Mountain' using Drama conventions, posters, and song. Will she return?

Finally, it was argued that **a whole-curriculum approach will provide more frequent opportunities to signpost a broad spectrum of green employment opportunities.** This is noteworthy given that only 17% of students in a recent survey reported interest in pursuing a career linked to climate change and sustainability.¹⁶ This low figure suggests a lack of understanding about the breadth of 'green jobs' that will become available in the future even though, as the DfE Sustainability and Climate Strategy notes, '*Green Jobs will not be niche*'.¹⁷

PSHE education concerns young people's real lives and futures, so helping them navigate thoughts and feelings about the climate crisis is increasingly critical. This can be threaded throughout PSHE from emotional wellbeing and relationships to careers – in a complementary, but distinct way to other subjects. For example, the collaboration between the PSHE Association and the Environment Agency resulted in lessons **on aligning career goals and values**, promoting opportunities to support climate solutions and adaptation while maintaining a sense of agency in the face of the climate crisis.



Part Two: The importance of subject-specific professional development

While there are clearly opportunities within the architecture of a subject-based curriculum to integrate climate change and sustainability more extensively, this requires the mobilisation of existing networks to achieve it at a speed consistent with the scale of the challenge. These networks include those based around subject expertise in the form of subject associations which already have the infrastructure to support teacher development.

Professional development is a high priority given that most teachers report a lack of training about how to embed climate change and sustainability into their teaching.¹⁸ **Extended professional development opportunities, related to subjects, would help teachers identify the potential spaces in the current curriculum to explore and develop the kinds of knowledge, skills, competencies and values we have outlined.** Furthermore, if a revised curriculum, following the current review, requires teachers to embed these issues more frequently into their teaching, they will urgently need more support. Delegates noted that climate change and sustainability education does not currently feature in any framework of professional development, including the Initial Teacher Training and Early Career Framework, the Teachers' Standards and National Professional Qualifications.

Citizenship teachers engage students in the political literacy of climate change and sustainability education to enable change. The **Association for Citizenship Teaching** hosted their 2023 conference at UCL on climate and featured it in their journal for teachers, *Teaching Citizenship* Issue 58. This included contributions from schools that shared how to run a sustainability conference. At UCL the Citizenship PGCE is connected to ACT and leads relevant work with beginning teachers, sharing initiatives such as the *Teach the Teacher* scheme.

Currently, opportunities for teachers to explore how they can embed climate change and sustainability across all subjects appear to be limited.¹⁹ **This is a gap that subject associations are well placed to fill**, not least because they are authoritative voices within subject spaces and are likely to be trusted to provide independent and robust guidance and information. There are already examples where this is happening as demonstrated throughout this report.

The **Historical Association** (HA) made climate and environment the focus of its primary and secondary teacher journals, *Teaching History and Primary History*, in Spring 2024. Its annual conference in the same year featured a keynote and several workshops which explored ways to embed environmental perspectives in history classrooms. Building on the interest generated from this work, the HA is now supporting a teacher network which brings together practitioners who share a common interest in understanding the planetary crisis through school history.

The kinds of professional development that teachers will benefit from most were discussed at length at the conference and these are summarised below.

Aims



Teachers need greater confidence to embed climate change and sustainability education in their teaching in subject- and age-appropriate ways. This requires an understanding of how climate change and sustainability education can complement and enhance subject identities and how subjects can in turn broaden young people's perspectives about the climate and nature crisis and how we can build a more sustainable future together.

Teachers need to be empowered to find the spaces within the current subject-based curriculum to contribute to climate change and sustainability education and to relate this to their particular local contexts.

Teachers should be equipped to illuminate the range of 'green' career options relevant to diverse subject areas.

Content



Delegates suggested that the most useful content of relevant professional development for teachers would include:

- A guarantee of reliable, up to date information.
- High quality classroom and assessment resources.
- Guidance for teachers about handling sensitive issues, eco anxiety and being culturally responsive.
- Case studies and curriculum models, bespoke to specific subjects.
- More models about holistic approaches to curriculum planning, which include examples of subjects working together.
- Guidance about ways to collaborate with other colleagues in the most time efficient ways.
- Examples of how to embed examples of 'green' careers, including ways that teachers might collaborate with local employers to inspire and inform young people.

The importance of relevant, tailored professional development at all stages of teachers' careers was made clear, including for beginning and early career teachers, subject leads, curriculum and sustainability leads and headteachers.

Teaching for Sustainable Futures is a programme of research-informed professional development for teachers, developed by the **UCL Centre for Climate Change and Sustainability Education** and tailored by subject and phase. Developed in collaboration with subject associations and teachers, it supports teachers to embed climate change and sustainability education in their lessons in ways that do justice to the subject and enhances students' understanding that we are not separate from the rest of the natural world.

Mode of delivery



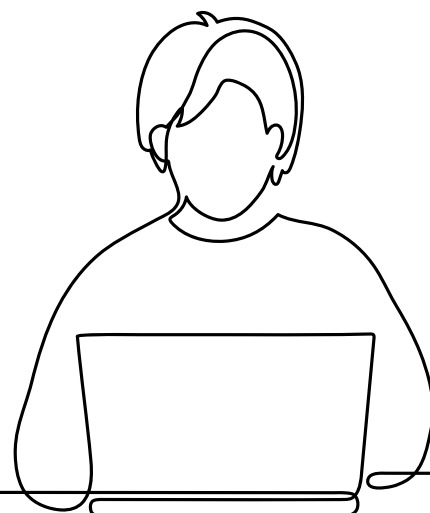
Delegates were mindful of teachers' workload and therefore there was considerable emphasis on making professional development opportunities easily accessible and low cost. Although face to face training was seen as the gold standard, it was recognised that relevant online training must also be made available because of its convenience.

The benefit of fostering communities of practice was also seen as a way of building capacity amongst subject teachers. **Subject associations have a particularly important role to play here.**

Music is an essential form of expression for young people, enabling them to connect with, and make sense of, a complex and changing world. Through 'earwitnessing', for example, we can develop our understanding of the experiences of vulnerable communities, habitats and animals and strengthen our connection to our local environments. Organisations like **Music Mark** will continue to support teachers through the development of resources linked to the climate crisis and sustainability and which nurture a range of skills including creative problem solving and critical thinking.

An entitlement for students and teachers

The strongest argument made at the conference was around entitlement, for both teachers and students. Delegates welcomed the new government's commitment to protecting teachers' entitlement to professional development, and they argued that this should include a focus on climate change and sustainability education. It was recognised that while there are examples of innovation and outstanding practice in schools, with some making climate change and sustainability education a front-page priority in their school improvement plans, access to such practice is not currently an entitlement for all children and young people. To address this, providing further support for teachers, alongside curriculum change, will be essential.



Contributors

This report – and the event which inspired it – was the result of a partnership between the UCL Centre for Climate Change and Sustainability Education, the Council for Subject Associations and the Natural History Museum.

The UCL Centre for Climate Change and Sustainability Education advocates for high quality climate change and sustainability education for all school-aged children through its research, support for teachers and policy engagement. The Centre’s research-informed professional development programme for teachers, *Teaching for Sustainable Futures*, is tailored by subject and age phase and is designed to help all teachers embed environmental sustainability into their teaching.

The Council for Subject Associations is an umbrella organisation, independent of Government, which represents subject associations nationally and allows them to speak with a single voice on key issues and consultations with policy makers and the media. Its main focus is on research- and professional practice-informed approaches to the curriculum, pedagogy, teacher training and professional development.

The Natural History Museum is a world-leading science centre and one of the most visited attractions in the UK. A global source of curiosity, inspiration and joy. Our vision is to build a future in which both people and the planet thrive. We aim to be a catalyst for change, engaging advocates for the planet in everything that we do. Our 370 scientists are finding solutions to the planetary emergency in all aspects of life.

The following organisations contributed to this report:

| | |
|--------------------------------------|---|
| AccessArt | National Society for Education in Art and Design |
| Association for Citizenship Teaching | PSHE Association |
| Association for Science Education | Royal Meteorological Society |
| The Classical Association | The Royal Society |
| Design and Technology Association | Royal Society of Biology |
| The English Association | Royal Society of Chemistry |
| Geographical Association | Students Organising for Sustainability – UK |
| Historical Association | Teach the Future |
| One Dance UK | The UK Association for Music Education – Music Mark |
| NALDIC | |
| National Drama | |



Endnotes

- 1 Ripple, W. J., Wolf, C., Gregg, J.W., Rockström, J., Mann, M.E., Oreskes, N., Lenton, T.M., Rahmstorf, S., Newsome, T.M., Xu, C., Svenning, J.-C., Cardoso Pereira, C., Law, B.E. & Crowther, T.W. (2024). 'The 2024 state of the climate report: Perilous times on planet Earth', *BioScience*, 74 (12), 812–824. Available at <https://doi.org/10.1093/biosci/biae087>
- 2 Climate Action Tracker: Warming Projections Global Update (2024). Available at https://climateactiontracker.org/documents/1277/CAT_2024-11-14_GlobalUpdate_COP29.pdf
- 3 Department for Education (DfE). (2022; updated 2023). *Sustainability & climate change: A strategy for the education & children's services systems*. Available at <https://www.gov.uk/government/publications/sustainability-and-climate-change-strategy/sustainability-and-climate-change-a-strategy-for-the-education-and-childrens-services-systems>.
- 4 WWF (2024). *Living Planet Report 2024: A Planet in Crisis*. Available at <https://www.arcticwwf.org/newsroom/features/wwf-living-planet-report-2024-a-planet-in-crisis/>
- 5 Natural History Museum (2024). *Towards 30by30: Balancing nature and people*. Available at <https://www.nhm.ac.uk/our-science/services/data/biodiversity-intactness-index/policy/30by30.html>
- 6 Hampton, S., & Whitmarsh, L. (2024). 'Carbon capability revisited: Theoretical developments and empirical evidence.' *Global Environmental Change*, 87, 102895. Available at www.sciencedirect.com/science/article/pii/S0959378024000992?via%3Dihub.
- 7 Walshe, N., Sheldrake, R., Healy, G., Edwards, R.C., Wale, W., & Hargreaves, E. (2024). *Climate change and sustainability education: A survey of students in England*. University College London. London, UK. Available at: <https://discovery.ucl.ac.uk/id/eprint/10195286/1/UCL%20Student%20Survey%20Report.pdf>
- 8 Department for Education (DfE). (2022; updated 2023). *Sustainability & climate change: A strategy for the education & children's services systems*. Available at <https://www.gov.uk/government/publications/sustainability-and-climate-change-strategy/sustainability-and-climate-change-a-strategy-for-the-education-and-childrens-services-systems>.
- 9 Greer, K. & Glackin, M. (2021). 'What counts' as climate change education? Perspectives from policy influencers'. *School Science Review*, 103 (383), 16-22.
- 10 OCR (2024). *Striking the balance: A review of 11–16 curriculum and assessment in England*. Available at: <https://teach.ocr.org.uk/striking-the-balance>.
- 11 Royal Meteorological Society (N.D.). *Opportunities for Enhanced Climate Change Education in Current English GCSE Specifications and KS3 Teaching*. Available at <https://www.metlink.org/wp-content/uploads/2023/06/Synthesis-Report-final.pdf>.
- 12 Greer, K., Sheldrake, R., Rushton, E., Kitson, A., Hargreaves, E., Walshe, N. (2023). *Teaching climate change and sustainability: A survey of teachers in England*. University College London. London, UK. Available at: www.ucl.ac.uk/ioe/departments-and-centres/centres/ucl-centre-climate-change-and-sustainability-education
- 13 See Appendix One for more detail
- 14 Walshe, N., Sheldrake, R., Healy, G., Edwards, R.C., Wale, W., & Hargreaves, E. (2024). *Climate change and sustainability education: A survey of students in England*. University College London. London, UK. Available at: <https://discovery.ucl.ac.uk/id/eprint/10195286/1/UCL%20Student%20Survey%20Report.pdf>
- 15 Evidence indicates that there is less learning outside the classroom in secondary schools than in primary schools, except in geography. Greer, K., Sheldrake, R., Rushton, E., Kitson, A., Hargreaves, E., Walshe, N. (2023). *Teaching climate change and sustainability: A survey of teachers in England*. University College London. London, UK. Available at: www.ucl.ac.uk/ioe/departments-and-centres/ucl-centre-climate-change-and-sustainability-education/research/teaching-climate-change-and-sustainability-survey-teachers-england
- 16 Walshe, N., Sheldrake, R., Healy, G., Edwards, R.C., Wale, W., & Hargreaves, E. (2024). *Climate change and sustainability education: A survey of students in England*. University College London. London, UK. Available at: www.ucl.ac.uk/ioe/departments-and-centres/ucl-centre-climate-change-and-sustainability-education/research/teaching-climate-change-and-sustainability-survey-teachers-england
- 17 Department for Education (DfE). (2022; updated 2023). *Sustainability & climate change: A strategy for the education & children's services systems*. Available at <https://www.gov.uk/government/publications/sustainability-and-climate-change-strategy/sustainability-and-climate-change-a-strategy-for-the-education-and-childrens-services-systems>.
- 18 SOS-UK. (2021). *Teach the Future: Teacher Training on Climate Education*. Available at: www.teachthefuture.uk/research#teachers-2022.
- 19 Greer, K., Sheldrake, R., Rushton, E., Kitson, A., Hargreaves, E., Walshe, N. (2023). *Teaching climate change and sustainability: A survey of teachers in England*. University College London. London, UK. Available at: www.ucl.ac.uk/ioe/departments-and-centres/ucl-centre-climate-change-and-sustainability-education/research/teaching-climate-change-and-sustainability-survey-teachers-england





UCL Centre for Climate Change and Sustainability Education
IOE, UCL's Faculty of Education and Society
University College London
20 Bedford Way
London
WC1H 0AL



ucl.ac.uk/ioe/departments-and-centres/centres/ucl-centre-climate-change-and-sustainability-education



climateeducation@ucl.ac.uk



[@UCL_CCCSE](https://twitter.com/UCL_CCCSE)