Curriculum for a Changing Climate:

a track changes review of the national curriculum for England

Final Report

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Acknowledgements

It is humbling to consider the number of committed professionals who have given up their time to contribute to this work. We could not have done this without you and we offer our heartfelt thanks.

Not all can be named; suggesting changes to Government documents is a sensitive business after all. However, we would like to acknowledge the following, in alphabetical order:

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1 Introduction

At the COP26 Climate Summit in November 2021, the then Secretary of State for Education, Nadhim Zahawi, declared the Government's intention to deliver 'world-leading climate change education'. Subsequently in April 2022, the Department for Education (DfE) published the Policy Paper, *Sustainability and climate change: a strategy for the education and children's services systems*. While this proposes a series of integrated activities, it does not contain a commitment to review or amend the national curriculum at secondary level. Many of the organisations that the Department is engaging with have fed back that the UK could not be world leading on climate education unless climate change and the ecological crises are integrated into all subjects across the national curriculum. This is an essential development task, a crucial step towards supporting wider educational change that will ultimately involve the education of teachers, the assessment of students and the allocation of resources to support learning for a more sustainable world.

1.1 The Brief

To address this need for curriculum development, the youth-led campaign group, Teach the Future, called for a review and re-draft of sections of the national curriculum covering key stages 3 and 4 to illustrate 'what these would need to look like in order to take climate change and the ecological crises seriously and help young people learn about them and how to take action to address them.' Using the revised national curriculum (2014/2017) as the baseline, the subjects selected for review were Science, Geography, Design and Technology (D&T), Art and Design, History, English, Religious Studies, Citizenship and Personal, Social, Health and Economic education (PSHE).

The outputs of the project were to be separate subject-focused PDF documents based on the existing national curriculum showing clearly any proposed changes. These should be supported by accompanying notes to contextualise and explain the changes, suggest any pedagogical and/or organisational recommendations that might accompany them and provide a brief overview of the work undertaken together with any limitations, problems encountered and recommendations for future activities.

At the time of writing, the subject-specific PDF documents are being finalised while this report comprises the accompanying notes and other information required by the brief.

Authors' Note: As the project coordinators and authors of this report, we would like to emphasise that the task we have undertaken is indeed a rudimentary version of the detailed and thorough approach that would normally be taken by a Government agency in collaboration with subject associations and other specialists. We see this work as initiating a conversation by showing what is possible within the existing structure of the national curriculum. Our hope is that this will serve to intensify national efforts to develop the knowledge, skills and confidence that our young people require in order to embrace current and future challenges with the urgency, positivity and creativity they demand.

2 The Project Process

Following the recommended track changes methodology, the project sought to remain as faithful to the current national curriculum as possible. This has the advantage of producing outputs that are familiar to all those who currently work with the curriculum, from teachers to examination boards and civil servants. This approach also demonstrates the way in which relatively minor changes can have a potentially profound impact and shows the way in which the current curriculum does indeed lend itself to interpretation and adaptation.

Over forty subject specialists worked on this project, coordinated by a team of three sustainability education specialists (the authors of this report). We adopted a four-part approach built around teams of people with specific tasks:

1. A *Reference Group* to guide the project from the outset
2. A *Jurisdiction Review Team* to help us explore national curricula elsewhere
3. *Subject Specialist Teams* to draft the subject-specific revisions
4. A *Review Group* to comment on the final outputs.

2.1 Stage 1: Reference Group

This group comprised a number of academics who specialise in learning for sustainability in primary, secondary and higher education. They met twice early in the process with the remit to:

i) Review and discuss the proposed project approach, suggest related initiatives and help identify fellow academics, teachers and teacher educators to join Subject Specialist Teams
ii) Discuss and suggest revisions to the overall aims of the national curriculum
iii) Develop guiding principles (See Table 1) that were used to support the Subject Specialist Teams drafting the curriculum changes
iv) Review final documents for coherence, consistency and relevance.

2.2 Stage 2: Jurisdiction Review Team

This small group of academics had a similar background to the Reference Group but came from outside of the English education system. The team shared advice and identified key policy documents and reviews of current practice in their education systems. This enabled us to see the extent and manner in which sustainability is embedded in curricula elsewhere. Although our focus was on the other UK jurisdictions, we also heard first-hand experience from Bangladesh and investigated the example of Norway. The findings of the Jurisdiction Review Report can be found in Appendix 1 and are summarised in our reflections.

2.3 Stage 3: Subject Specialist Teams

The bulk of the work was carried out by Subject Specialist Teams comprising a minimum of three specialists: a teacher, a teacher educator and a researcher. In this way we combined practical classroom experience with the wider academic context for each subject. Team members worked together online and asynchronously, suggesting edits and making comments throughout the curriculum documents related to their subject. These were then written up in a single draft for review by the group members before moving to Stage 4.

2.4 Stage 4: Final Review Group

A small number of academics and practitioners were asked to review the final versions of the curriculum documents along with the guiding principles. Based on these comments, final adjustments were made. Reviewers' feedback also highlighted more general concerns that are discussed in the Reflections section below.

3 Results

3.1 Aims of the National Curriculum

As mentioned above, an early task for the Reference Group was to consider changes to the two aims of the current national curriculum. The first of these suggests that pupils should be introduced to "the best that has been thought and said." This raises questions around what is meant by 'best' and who decides what this is. After some discussion, it was agreed to adopt the following wording:

> *The national curriculum provides pupils with an introduction to essential knowledge that they need to be educated citizens. It introduces pupils to what has been considered to be the best that has been thought and said, encouraging them to question this from different cultural, political, environmental and social perspectives, and helps engender a respect for our place in the natural world and an appreciation of human creativity and achievement in all its diverse forms.*

This echoes the original wording closely while embracing a more inclusive approach that also reflects the prime importance of the natural world that sustains us all.

The second aim states that there is more to learn beyond the statutory curriculum. This resonates with the whole school approach that is essential if learning for sustainability is to be truly transformative; we therefore saw no need to change the wording of this aim.

3.2 The Guiding Principles

Together with the Reference Group we developed ten principles in total; these can be grouped under three thematic headings: Linking thinking; Towards positive futures; Transformative Learning (see Table 1).

Table 1: Guiding Principles

Linking thinking*	**Principle 1** Systems thinking is essential to help students appreciate the interconnectedness of living and non-living things, including complex and non-linear interactions in time and space; it is also crucial to understanding pathways and possibilities that can address issues and provide positive ways forward.
	Principle 2 Opportunities are needed to build awareness of the interconnected nature of social injustice and the ecological crises and how these relate to climate change. Questions of environmental justice are also questions of social justice and amendments should seek to highlight this where possible.
	Principle 3 Sustainability has ethical and moral dimensions that are value-laden and inevitably have political and plural implications. Amendments should recognise that there is no universal definition or application of sustainability and provide opportunities for different priorities in relation to sustainability to be revealed and critically appraised.
	Principle 4 Sustainability is an interdisciplinary and transdisciplinary concern meaning that students will encounter it interpreted differently in each subject they do. Links to other disciplines, especially between Arts and Sciences should be identified, and teachers should seek to help students see how multiple perspectives can lead to a deeper understanding of sustainability issues.
Towards positive futures	**Principle 5** An awareness of eco-anxiety is critical - it needs to be acknowledged and its potentially negative impacts on learning and wellbeing should be recognised and addressed through providing spaces and means for articulating concerns and being heard (including through the arts).
	Principle 6 Our curriculum should engender a sense of awe and wonder both in nature and in human ingenuity. Students should have opportunities to learn about the ways in which humans are working with and through nature to resolve and adapt to complex issues including by scientists, engineers and social scientists. This will support them to develop resilience in the face of anxiety.
	Principle 7 Learning must support students to develop capabilities and dispositions for action. This will mean different things in different subjects but should include learning in collaboration with others and may often involve student-led action on locally and globally relevant issues within their own community, or working for wider system-level change. This will involve students understanding the difference between simple problem solving, and addressing wicked problems such as climate change.

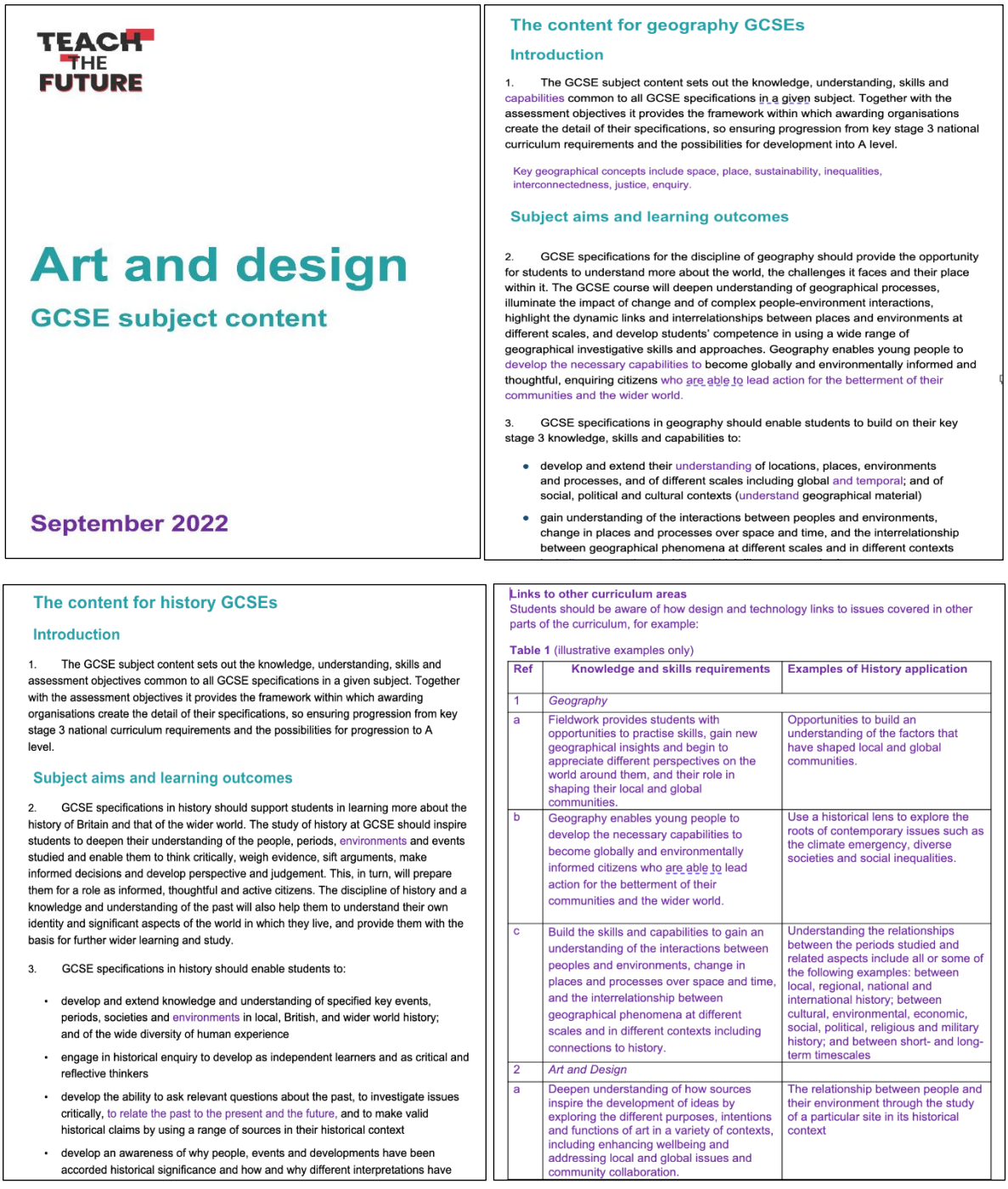
Transformative learning	**Principle 8** Encouragement of systemic, creative and critical thinking, as well as an understanding of – and preparedness to engage with – uncertain futures and potentially insoluble problems, should be foregrounded wherever possible; this requires caution bearing in mind Principle 5.
	Principle 9 Learning in/for/as/through sustainability can be transformative although it often involves more modest, incremental changes. In light of this, opportunities for outdoor learning of different kinds and for different purposes should be incorporated as much as possible. This will support the development of resilience and lay the foundations for action competence.
	Principle 10 Opportunities should be taken to encourage and welcome unforeseen learning that might emerge from the community beyond the school and from pupils' own questions. Space for community engagement and pupil-led debate needs to be encouraged.

* The term 'Linking Thinking' is borrowed from a resource pack written by Stephen Sterling with others for WWF Scotland in 2005. It is available as a PDF here: http://assets.wwf.org.uk/downloads/linkingthinking.pdf

3.2 The Subject Documents

The principal output of the project is a series of curriculum documents that mirror the national curriculum, even the typeface is the same. The shade of blue used for headings is different and distinctive and alterations to the text are highlighted using purple text. Where suggested changes are optional, these are presented in [square brackets], following the convention in the national curriculum. All branding is that of Teach the Future (Figure 1).

Figure 1: Examples of Track Changes Documents



TEACH THE FUTURE

Art and design

GCSE subject content

September 2022

The content for geography GCSEs

Introduction

1. The GCSE subject content sets out the knowledge, understanding, skills and capabilities common to all GCSE specifications in a given subject. Together with the assessment objectives it provides the framework within which awarding organisations create the detail of their specifications, so ensuring progression from key stage 3 national curriculum requirements and the possibilities for development into A level.

Key geographical concepts include space, place, sustainability, inequalities, interconnectedness, justice, enquiry.

Subject aims and learning outcomes

2. GCSE specifications for the discipline of geography should provide the opportunity for students to understand more about the world, the challenges it faces and their place within it. The GCSE course will deepen understanding of geographical processes, illuminate the impact of change and of complex people-environment interactions, highlight the dynamic links and interrelationships between places and environments at different scales, and develop students' competence in using a wide range of geographical investigative skills and approaches. Geography enables young people to develop the necessary capabilities to become globally and environmentally informed and thoughtful, enquiring citizens who are able to lead action for the betterment of their communities and the wider world.

3. GCSE specifications in geography should enable students to build on their key stage 3 knowledge, skills and capabilities to:

- develop and extend their understanding of locations, places, environments and processes, and of different scales including global and temporal; and of social, political and cultural contexts (understand geographical material)
- gain understanding of the interactions between peoples and environments, change in places and processes over space and time, and the interrelationship between geographical phenomena at different scales and in different contexts

The content for history GCSEs

Introduction

1. The GCSE subject content sets out the knowledge, understanding, skills and assessment objectives common to all GCSE specifications in a given subject. Together with the assessment objectives it provides the framework within which awarding organisations create the detail of their specifications, so ensuring progression from key stage 3 national curriculum requirements and the possibilities for progression to A level.

Subject aims and learning outcomes

2. GCSE specifications in history should support students in learning more about the history of Britain and that of the wider world. The study of history at GCSE should inspire students to deepen their understanding of the people, periods, environments and events studied and enable them to think critically, weigh evidence, sift arguments, make informed decisions and develop perspective and judgement. This, in turn, will prepare them for a role as informed, thoughtful and active citizens. The discipline of history and a knowledge and understanding of the past will also help them to understand their own identity and significant aspects of the world in which they live, and provide them with the basis for further wider learning and study.

3. GCSE specifications in history should enable students to:

- develop and extend knowledge and understanding of specified key events, periods, societies and environments in local, British, and wider world history; and of the wide diversity of human experience
- engage in historical enquiry to develop as independent learners and as critical and reflective thinkers
- develop the ability to ask relevant questions about the past, to investigate issues critically, to relate the past to the present and the future, and to make valid historical claims by using a range of sources in their historical context
- develop an awareness of why people, events and developments have been accorded historical significance and how and why different interpretations have

Links to other curriculum areas

Students should be aware of how design and technology links to issues covered in other parts of the curriculum, for example:

Table 1 (illustrative examples only)

Ref	Knowledge and skills requirements	Examples of History application
1	*Geography*	
a	Fieldwork provides students with opportunities to practise skills, gain new geographical insights and begin to appreciate different perspectives on the world around them, and their role in shaping their local and global communities.	Opportunities to build an understanding of the factors that have shaped local and global communities.
b	Geography enables young people to develop the necessary capabilities to become globally and environmentally informed citizens who are able to lead action for the betterment of their communities and the wider world.	Use a historical lens to explore the roots of contemporary issues such as the climate emergency, diverse societies and social inequalities.
c	Build the skills and capabilities to gain an understanding of the interactions between peoples and environments, change in places and processes over space and time, and the interrelationship between geographical phenomena at different scales and in different contexts including connections to history.	Understanding the relationships between the periods studied and related aspects include all or some of the following examples: between local, regional, national and international history; between cultural, environmental, economic, social, political, religious and military history; and between short- and long-term timescales
2	*Art and Design*	
a	Deepen understanding of how sources inspire the development of ideas by exploring the different purposes, intentions and functions of art in a variety of contexts, including enhancing wellbeing and addressing local and global issues and community collaboration.	The relationship between people and their environment through the study of a particular site in its historical context

As with the aims, we decided to stay as close as possible to the original text. Our specialist teams generally felt that the existing curriculum provided a fair coverage of the required knowledge and skills associated with their subject but also agreed that the curriculum neglected important dimensions of sustainability. The current curriculum tends to accept a human-nature separation and fails to present social, economic and environmental concerns as intimately inter-dependent.

A full review of the revised documents themselves is necessary in order to grasp the full extent of revisions; however, the following lines give a flavour of some of the key changes made within each subject. The subjects are listed in alphabetical order:

Art and Design
Working sustainably as well as creatively requires awareness of the provenance of materials and their safe disposal. Art can interpret ideas from other areas of the curriculum and include community collaboration. A diversity of artists including indigenous perspectives are researched, often highlighting sustainability issues.

Citizenship
All of the skills and forms of knowledge provided by Citizenship are essential for educating towards positive futures. The revisions are therefore largely focused on demonstrating how sustainability can be used to develop the skills in the guidelines such as making informed choices, debating and influencing others.

Design Technology
Sustainability is considered at all stages of the design process, the circular economy is emphasised, as is the need to involve end-users in the design process. Cooking takes account of the impact of different foodstuffs. Existing links to Mathematics and Science are expanded to other subjects.

English
Specific revisions include authentic tasks such as letter-writing to decision-makers and speaking skills that include expressing one's own feelings. The role of criticality is emphasised where stories and poetry provide a lens for critiquing society. We recommend finding authors who present a diversity of perspectives and who address the root causes of inequality and ecological destruction. This is emphasised because literature provides vicarious experiences that can connect people and groups; this can develop empathy which underpins social and environmental justice.

Geography
This acknowledges the accelerating nature of climate change and biodiversity loss; creative expression is included to support the healthy articulation of emotional responses. A significant change is that the labels 'physical' and 'human' geography have been removed; this is because they reinforce an artificial separation between human activity and the rest of the natural world.

History
Human-environment interactions are among the historical themes suggested under Key Stage 3 while at Key Stage 4, *all* thematic studies should include an environmental perspective. Indigenous perspectives on Europe's colonial past and issues of land

ownership and power relations are included, as is the Anthropocene.

PSHE
Here we advocate for safe and effective teaching that will support students to reflect upon values and feelings related to the environment and climate and develop their autonomy to make decisions and contribute to positive action both as an individual and as a member of a community.

Religious Studies
The spiritual and moral dimensions of human-nature connectedness are explored from the perspectives of institutional religions, indigenous religions, personal spiritualities and secular ethical positions to understand the importance of their impact on the physical and psychological well-being of communities and individuals.

Science
The knowledge within Science is interconnected more effectively with the wider curriculum and students' lives. As well as understanding processes, we focus on the practical implications of these including the effects on – and of – our actions. Scientific methods of enquiry are understood in relation to values and alternative ways of knowing are explored.

The current D&T curriculum includes an appendix in which links are shown with specific aspects of Mathematics and Science. We felt this was a useful way of conveying potential connections right across the curriculum and so we have added similar appendices to all subjects. It should be noted that these do not reflect recommendations from subject specialists, rather they are simply suggestions that often became apparent only by working across multiple subjects in a concentrated period; as such they appear in square brackets.

4 Reflections

4.1 A comprehensive overview

The opportunity to view the national curriculum across a wide range of subjects has provided a rare opportunity to discover ways in which the curriculum is already interconnected. This holistic view has enabled us to integrate climate change and the ecological crisis more coherently across the curriculum as a wealth of transdisciplinary connections became apparent. As stated above, we have shared examples of these links as an appendix of each subject document and we see potential here for further investigation.

4.2 A 'course correction'

The curriculum documents show that much of the original text remains unchanged. This project did not involve a comprehensive rewrite or restructuring of the curriculum. What

the changes do suggest is a course correction, steering the subjects, each with their own distinctive set of knowledge and skills, in a direction that offers a deeper understanding and greater hope with which to confront a future in which ecological crises loom ever larger.

4.3 The Jurisdiction Review

This investigation into approaches taken in other jurisdictions showed us the importance of adopting a whole-system approach to sustainability so that education is a lived experience for all stakeholders. There is much more to learning for sustainability than reviewing the content taught in the classroom. To equip students with an understanding of the complexity to co-create a sustainable future, the education system needs a coherent approach involving the physical estate, school organisation and assessment all supported by a relevant and coherent curriculum both for students and teachers; together they are interconnected parts of a whole dynamic system.

Through the Jurisdiction review, we noticed how, across Scotland, Wales and Northern Ireland, themes emerged that reflected our guiding principles, as did the more radical example of Norway that were advised to look at. These themes included:

- Encouraging active citizenship as a core purpose of the curriculum
- Presenting the curriculum as interconnected areas of learning as a counterweight to emphasising separate subjects
- Mentioning climate change explicitly as a crisis and an emergency that demands urgent attention
- Allowing greater teacher autonomy to translate the curriculum into classroom practice.

Of course, not everything is perfect in these jurisdictions. Discussions with researchers on the ground revealed how classroom practice has not kept pace with positive shifts in the policy architecture. A recurring theme was the importance of continuing professional development for teachers in support of curriculum change. Any curriculum is simply a text on the page until it is enacted as part of a wider system, especially in the case of addressing sustainability in schools. Without such support, teacher autonomy becomes double-edged in that practice can vary widely from school to school.

4.4 Tensions and dilemmas

Inevitably, this project required decisions to be taken where situations were not always clear-cut. The approaches taken raised a number of tensions and dilemmas as we discuss below.

4.4.1 Radical vs familiar

In the face of ecological breakdown, the need for whole system change is urgent. This would suggest the need to equip students with a level of ecological understanding and practice in enacting change that the current national curriculum cannot address. One approach would have been a wholesale restructuring of subjects as suggested by the jurisdiction review but this would have been a very different project.

Following the brief, we were able to use a frame of reference with which DfE, schools, teachers and others are familiar and which they understand well. As we stated at the end of Section One, we see this work as a positive contribution to an intensifying conversation about how to reform the curriculum in light of the changing and frankly dangerous situation in which we find ourselves.

4.4.2 Decision-maker vs practitioner focused

This work has two distinct audiences, those who draft and enact policy texts and those who put them into practice. By choosing to work closely with teachers and teacher educators as well as academics, we focused on changes that are achievable in classrooms now. Indeed, many suggestions were based on the current practice of our specialist team members, hence the project demonstrates a course correction rather than a *volte-face*. An alternative approach, and one that some of our reviewers might advocate, would be to argue for a complete re-shaping of policy and practice backed by rigorous academic argument. This would have produced an interesting position paper, to join the many others that are available, rather than something that a teacher could pick up and work with tomorrow.

4.4.3 Full details vs usability

Within the subject specialist teams, many changes were discussed, made, undone and re-made. The working documents were populated with comments, deletions and additions. While we would like to include the deletions in the final documents to show the process of our work, we found that this impacted their readability. We decided therefore to adopt a clean look to the documents with changed text highlighted in purple. Where we feel a significant change has taken place or an important aspect has been added, this is highlighted in the short account given for each subject as outlined under Section 3.3. These summary statements constitute a curriculum brief that is included in each subject document.

Another dimension of ‘detail’ is the level of prescription suggested by the changes. The national curriculum is written in a way that allows for significant interpretation, allowing teachers the freedom to address sustainability by, for example, carefully selecting themes, case studies or literature. Several contributors argued that few changes should be made in order to maintain this level of freedom. On the other hand, the jurisdiction review raised concerns about increased autonomy in relation to sustainability as this risked themes being overlooked. We therefore struck a balance between maintaining teacher autonomy and keeping the curriculum as open as possible while providing the impetus to explore sustainability through the various subject lenses.

4.5 Recommendations

In light of the experience and learning gained while coordinating this project we would suggest the following:

- Call for the changes suggested by this project to be considered by schools, multi-academy trusts, examination boards and the Department for Education as a matter of urgency – for the most part, they can be implemented now

- Ensure that any change in the curriculum be accompanied by a considered and enduring programme of teachers' continuing professional development as well as relevant programmes of initial teacher education

- Ensure that all such changes are part of a systemic approach that encompasses curriculum, campus, community and culture aligned with recently published advice from the NGA and NAEE for school governing bodies[1].

5 Conclusion

As we emphasised earlier, this work represents a single step and we trust that it will spark a wider conversation around possibilities for embedding sustainability in schools regardless of whether these changes find their way into a future iteration of the national curriculum.

We hope that these suggestions will in fact be considered by policy makers, decision-makers and subject associations across the education system and we recommend that other subjects be reviewed in this way; Mathematics, Economics, Business Studies and Modern Foreign Languages all urgently require this level of attention.

Ultimately, the national curriculum will have to change anyway because its current iteration has been written for a world that is already in the past. In the face of rapid and well documented change, young people are keenly aware that their schools could do so much more to prepare them for a challenging future; that is why Teach the Future commissioned this work. The many committed professionals who have given so freely of their time to contribute to this project did so because they recognise the importance and the urgency of that call. We ask that decision-makers across education join us to bring about these changes, sooner rather than later.

[1] Environmental sustainability in schools - National Governance Association (nga.org.uk)

Appendix

Jurisdiction Review Team Report

1. Introduction

At an early stage in the curriculum change project we called a meeting of key informants to determine how climate change and the ecological crisis is becoming embedded in the curriculum of jurisdictions outside England. Our focus was on the other UK jurisdictions (Northern Ireland, Scotland and Wales) although we were fortunate to have one participant from Bangladesh who provided another useful comparison. In addition, we were advised by our Reference Group to look at the way in which Norway references sustainability in its curriculum.

The meeting itself comprised brief presentations on participants' own jurisdictions, highlighting key ideas and useful resources as well as a discussion on the pros and cons of the approaches discussed.

2. Sustainability education in selected jurisdictions

2.1 Scotland

Sustainability occurs in four of the eight curriculum areas within Scotland's Curriculum for Excellence launched in 2010. The term *learning for sustainability* (LfS) covers outdoor learning, global citizenship and education for sustainable development for which there has been a long-standing commitment, particularly since 2012. Scotland takes a whole institutional approach covering the curriculum, school buildings and communities. LfS is written into frameworks including one for school self-evaluation complete with online guidance and case studies of good practice. Outdoor Education is written into the Scottish curriculum as an explicit student entitlement. There are examples of climate change being mentioned specifically such as in the outcome statement, *"I can explain some of the processes which contribute to climate change and discuss the possible impact of atmospheric change on the survival of living things."*

Despite this policy architecture, implementation has been patchy. A 2019 action plan that set out how to translate policy into practice is now being updated in an effort to improve the situation. Much of the curriculum is general in nature and the links to sustainability are not always clear. Research has shown that even where school leadership, ethos and culture are all in place, there are still human barriers to change. It would appear that LfS needs to be internalised at the individual level because teachers are expected to develop their own lessons. There is a need to better understand the links between social justice and sustainability issues; only then will LfS be fully translated into classroom practice. This calls for more detailed guidance in the curriculum itself as well as professional development to help teachers make links across issues and gain a deeper understanding of these. All of which requires greater boldness at the policy level to make the necessary financial commitment to support change at the classroom level.

2.2 Wales

Wales is currently experiencing similar reforms to those seen Scotland with a new curriculum being introduced in 2022. This calls for cross-curricular learning and increased autonomy for teachers to design their own content. The four key purposes of the new curriculum each reflect sustainability in different ways. These state that all children and young people will be:

1. Ambitious, capable learners who are ready to learn throughout their lives

2. Enterprising, creative contributors who are ready to play a full part in life and work
3. Ethical, informed citizens who are ready to be citizens of Wales and the world
4. Healthy, confident individuals who are ready to lead fulfilling lives as valued members of society.

The curriculum is divided into six Areas of Learning and Experience (AoLEs) with sustainability appearing explicitly in at least three of them. Where climate justice is discussed, Wales adopts the terms 'Climate Emergency' and 'Nature Emergency'. Social activism is also supported with one 'statement of what matters' under the Humanities AoLE stating:

"Informed, self-aware citizens engage with the challenges and opportunities that face humanity, and are able to take considered and ethical action."

Crucially this statement goes on to emphasise connections among issues:

"...encourage learners to understand the interconnected nature of economic, environmental and social sustainability; justice and authority; and the need to live and contribute to a fair and inclusive society that confronts and addresses racism."

The Science and Technology AoLE highlights the diversity and interdependence of living things, however, it does not make explicit link between such knowledge and taking action locally or otherwise. Other concerns reflect those in Scotland with higher levels of teacher autonomy leading to piecemeal efforts to address climate justice, which may not be understood coherently as a result. Similarly, while student action at community level is encouraged – and there are many organisations to support such projects – how this plays out in practice is reported as being piecemeal.

2.3 Northern Ireland

Last revised in 2008, the curriculum in Northern Ireland has three objectives:

1. Develop the individual
2. Develop the individual as a contributor to society
3. Develop the individual as a contributor to the economy and environment.

Education for sustainable development (ESD) is referenced as a 'key element' of the third objective.

There are nine areas of learning under Key Stages 3 and 4 and ESD appears in at least two of these: Environment & Societies and Science & Technology. There is an emphasis on skills that relate to ESD such as being creative, thinking, problem-solving and decision-making. Outdoor learning is mentioned but not mandatory hence there is piecemeal implementation.

As in Wales and Scotland, there has been an effort to give teachers greater autonomy with the expectation that they would design their own content. This has led to concerns about a lack of content from teachers, which in turn been addressed with more supporting documentation and some continuing professional development, although this is reported as being inadequate.

Case studies on issues are available for teachers to use but there is concern that these are not always relevant or local and the link to ESD is not always obvious; for example, links between flooding and climate justice are not made clear to teachers. This reflects a wider concern regarding connections not being made in the way that the curriculum is being interpreted and implemented.

A doctoral study into the attitudes of KS3 pupils towards sustainable citizenship in Northern Ireland is in progress; this suggests that better connections could be made between curriculum content and civic action. The economy is often emphasised at the expense of the environment and young people often feel that there is pressure on them to respond to the climate crisis as individuals but not enough focus on collective action. This leads to a proposed fourth curriculum objective to foster collective action for a sustainable future; this would underpin the three others.

2.4 Bangladesh

While there is a national level climate change mitigation plan, this does not specifically mention how it is embedded in education. That said, climate change is mentioned specifically in the curriculum and associated textbooks, particularly in Geography and Science textbooks where pupils learn about causes of climate change and ways to mitigate them at an individual level. There is little evidence of community-based pupil-led projects as an outcome of this embedded climate change and sustainability education. There is very little teacher autonomy and a strong focus on grades. Despite this, there is some evidence of climate action groups being formed by young people; this is associated with disaster and sustainability education at upper grades. The Government is examining building a blended learning experience using technology, which may offer opportunities to enhance sustainability education.

2.5 Norway

The Norwegian curriculum was brought to our attention; this lists six 'core values' all of which have relevance to sustainability:

1. Human dignity
2. Identity and cultural diversity
3. Critical thinking and ethical awareness
4. The joy of creating, engagement and the urge to explore
5. Respect for nature and environmental awareness
6. Democracy and participation

There are five principles for education including one called 'Interdisciplinary topics' which it lists as: health and life skills, democracy and citizenship and sustainable development. We did not have the resources to explore the way in which this is translated into practice, however, it does provide another model of a more integrated (i.e. less subject-focused) view of the curriculum.

3. Key observations

There are clear similarities across the UK jurisdictions beyond England, these include:

- Encouraging active citizenship (beyond economic engagement) as a core purpose of the curriculum
- Breaking the curriculum down into broad, interconnected areas of learning rather than emphasising separate subjects
- Explicit mention of climate change as a crisis or an emergency that demands urgent attention
- Allowing greater teacher autonomy to translate the curriculum into classroom practice.

On the first of these points, climate action can be a positive response to climate anxiety, particularly when working with others. The skills acquired through such efforts also map well on to employability skills.

Inter-connectivity across curriculum areas cannot be emphasised enough; seeing the world as a series of separate domains or subjects is a fundamental root of our unsustainable condition. Areas of learning can respect the different lenses that subjects while seeking to overcome the fatal flaw of not seeing the world as a whole. Learning beyond the classroom has a central role to play in helping pupils grasp the interconnectedness of the world. Outdoor learning needs to be both statutory and supported. This includes seeing the community as a resource with openness to the unexpected.

There is a balance to be struck between teacher agency, with its potential for creativity and motivation and its inherent danger of producing a patchy or incoherent translation of the curriculum into practice.

Finally, we should remember that a curriculum is simply text, it is part of a wider system for addressing sustainability in schools. It needs to be complemented by further resources, not least a coherent and on-going programme of teacher professional development.