



Grantham Research Institute on  
Climate Change and  
the Environment

# **Climate change in the National Curriculum in England: Submission to a consultation by the Department for Education**

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**Policy paper**

**April 2013**

**Grantham Research Institute on Climate Change and  
the Environment**

**in collaboration with**

**Grantham Institute  
for Climate Change**

An institute of Imperial College London

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This policy paper is intended to inform decision-makers in the public, private and third sectors. It has been reviewed by at least two internal referees before publication. The views expressed in this paper represent those of the author(s) and do not necessarily represent those of the host institutions or funders.

## **Submission in response to ‘The National Curriculum in England: Framework document for consultation’**

Submitted on 16 April 2013 in response to publication of ‘The National Curriculum in England: Framework document for consultation’ (<https://www.education.gov.uk/consultations/index.cfm?action=conResults&consultationId=1881&external=no&menu=3>)

Submitted by: Naomi Hicks, Bob Ward (Grantham Research Institute on Climate Change and the Environment, London School of Economics and Political Science) and Sarah Lester (Grantham Institute for Climate Change, Imperial College London).

*Do you have any comments on the proposed aims for the National Curriculum as a whole as set out in the framework document?*

We note that the Framework document proposes that the aim of the National Curriculum should be to provide pupils with “an introduction to the core knowledge that they need to be educated citizens”. However, we believe that the aim of the National Curriculum should be defined to provide pupils with the essential knowledge, skills and understanding that they need to be educated citizens.

In this respect, we are particularly concerned that the National Curriculum should provide pupils with the essential knowledge, skills and understanding about climate change, which could profoundly affect the lives of current and future generations. During the early stages of the Review, some media reports suggested that climate change would be excluded from the revised National Curriculum on the grounds that it is a “contemporary” issue. Such reasoning is fundamentally flawed. It is nearly 200 years since Joseph Fourier first observed that the Earth is warmer than it otherwise would be due to the trapping of heat by its atmosphere, more than 150 years since John Tyndall’s experiments showed that carbon dioxide and water vapour are greenhouse gases, and over 100 years since Svante Arrhenius published the first calculations of how much global warming might be caused by burning coal and releasing carbon dioxide into the atmosphere. Hence, the science of climate change is well-established and pre-dates other significant discoveries such as plate tectonics and the structure of DNA.

Therefore, there can be no justification for omitting climate change from the National Curriculum, and the education of pupils would be deficient if they did not receive teaching about it. Within the current National Curriculum, climate change is taught in Science, Geography and Citizenship. We note that the new Framework includes a less in-depth introduction of climate change, and is restricted to Key Stage 3 in Science only. We do not believe that this proposal would provide pupils with sufficient knowledge and understanding.

In particular, the subject content for Chemistry specifies only that pupils should be taught “the production of carbon dioxide by human activity and the impact on climate”. But this does not explicitly include an introduction to key

knowledge about the potential impacts of unmanaged climate change, as well as the options for mitigation (for instance through reducing greenhouse gas emissions), even though the “efficacy of recycling” is included in Chemistry.

These omissions would undermine the core knowledge base of pupils who will experience first-hand those impacts of climate change that are now unavoidable and who will be faced in their lifetimes with important decisions and choices about how to manage and respond to climate change risks.

It may be that the impacts and management of climate change risks are best taught as part of Geography, and should therefore be included within its subject content rather than within Science. However, these are essential issues and cannot be allocated to, for instance, Geography in Key Stage 4, which would not be compulsory, and would result in the majority of pupils being deprived of the necessary learning opportunities. We note that the draft programme of study for Key Stage 4 Science, which has been published for information only, omits any reference at all to climate change.

If the teaching of climate change is spread between more than one subject, for instance Science and Geography, it is important that the programmes of study are properly integrated. Pupils are likely to gain a complete understanding if issues such as climate change are taught within the context of the processes that operate within the Earth system, rather than as an isolated topic.

Overall, the proposed programmes of study in the new Framework are insufficiently ambitious in relation to the teaching of climate change and do not recognise the value of teaching both the basic science of climate change and the associated issues of impacts, mitigation and adaptation.

*Do you agree that instead of detailed subject-level aims, we should free teachers to shape their own curriculum aims based on the content in the programmes of study?*

We do not agree. The proposed content about climate change in the programmes of study is incomplete and does not enable students to formulate a sufficient understanding of climate change. We recognise the need to strike a balance between prescriptive guidance to ensure consistency and a minimum level of understanding, whilst also enabling sufficient freedom and flexibility in teaching to leverage the expertise and skills of education professionals.

Teachers should have the freedom to shape their teaching approach and lessons to best facilitate the learning of their students, but it is crucial that the National Curriculum provides sufficient guidance through curriculum aims and programmes of study, to ensure that all students receive a robust and sufficient level of knowledge and understanding of core issues including climate change. Freedom to teach does not equate with leaving key issues out of the curriculum.

Clear subject-level aims are needed to ensure each and every student receives, as part of their compulsory education, a strong grounding in, and core knowledge about, climate change. We observe, in the proposed revisions to the National Curriculum, that some aspects of the core building blocks of climate change knowledge have been removed and omitted. This risks undermining the core knowledge base of our younger generations; those young people who will experience first-hand the impacts of climate change and who will experience, in their lifetimes, the consequences of policy decisions made in response to climate change.

If core climate change teaching is not included as compulsory learning, and some aspects, such as the impacts of climate change, are left to non-compulsory disciplines from KS4, there is a risk that some students would not acquire essential basic knowledge about climate change. As the UK Youth Climate Coalition points out, “climate change is too important to be left to individual teacher choice”. The National Curriculum, through its aims and the content in the programmes of study should include climate change as a core element of compulsory education for under-14s.

*Do you have any comments on the content set out in the draft programmes of study?*

The science of climate change is well established, and has been documented by a significant body of scientific literature over the past 100 years. We note that the basic science of climate change is included in the Key Stage 3 programme of study for Science, which specifies that pupils should be taught “the production of carbon dioxide by human activity and the impact on climate”. Nevertheless, the existing proposals do not include sufficient content about climate change and ignore key building blocks of knowledge that all students should acquire through their studies in Key Stages 1-3.

Every student, as a citizen, will face important choices and decisions within their lifetime arising from climate change. Given the UK’s legally binding commitments to take action on climate change and to reduce greenhouse gas emissions, policy decisions are already being taken that will have important implications and consequences for younger generations. Young people must understand their role in creating emissions, and ways to mitigate climate change and adapt to those impacts of climate change that are now unavoidable. As such, the National Curriculum should ensure they are equipped with the core knowledge about climate change as part of their compulsory education. Teaching about the causes and consequences of climate change, including potential societal impacts, should form part of the core knowledge taught at school within Key Stages 1-3.

It is important that the teaching of climate change is not restricted to Key Stage 4; particularly if this content is taught in optional rather than compulsory subjects. Such an approach would risk creating core knowledge gaps for students who did not elect to study particular subjects, such as Geography. For instance, according to the latest statistics published by the Department for

Education, just 26% of pupils at the end of Key Stage 4 in schools in England attempted GCSE Geography in 2011-2012.

Under the proposed new Framework for the programmes of study, the core knowledge of pupils aged under 14 about climate change would be significantly diminished. No references are made to the key topics of climate impacts, sustainability and energy use. This marks a significant change from the current National Curriculum.

We recognise the challenges of effectively teaching a multi-disciplinary subject such as climate change, and the need for a clear distinction between, and clarity about, individual subject content to avoid duplication or the risk of content slipping through the gaps between subjects. We welcome the inclusion of some teaching about the basic science of climate change in the Science programme of study. Yet core knowledge that should be compulsory for all students is missing from the new Framework.

When pupils are learning about the science of climate change; it is logical that they should learn about the potential impacts of unmanaged climate change, as well as options for adaptation and mitigation, at the same time, to enable a complete and robust understanding. Teaching of climate change impacts should be made explicit in the curriculum and go beyond a basic understanding of how the climate system works. It must cover ways to reduce emissions (mitigation) and ways to respond to and manage the impacts of climate change (adaptation). Indeed, the building blocks of climate science and an understanding of the environmental and societal impacts complement each other and should go hand-in-hand, through an integrated and cross-disciplinary programme of study.

*Does the content set out in the draft programmes of study represent a sufficiently ambitious level of challenge for pupils at each key stage?*

The new Framework contains insufficient ambition in relation to the teaching of climate change – pupils are capable of learning and understanding more detailed information and gaining a comprehensive understanding of climate change and the impacts their actions have on the environment. The current National Curriculum seeks the teaching of climate change in an integrated manner across Science and Geography. We do not believe there is enough justification for altering this. Given the emphasis during the review process on learning from international examples, it is interesting to note the considerable focus given to climate change teaching in the USA (for example, see the recently published Next Generation Science Standards). The UK should seek to be as ambitious in its teaching of climate change.

*Who is best placed to support schools and/or develop resources that schools will need to teach the new National Curriculum?*

Basic knowledge about climate change, including both the science and its potential impacts, should be taught in an objective and evidence-based way in schools, to ensure all students understand the fundamentals.

Climate change knowledge is based on a very large body of evidence, which continues to grow at a rapid rate. It is important that the National Curriculum remains up to date. As such, strong, collaborative relationships are required to ensure that the National Curriculum remains informed by the most current and high-quality knowledge created in Universities and Research Institutes.

Outreach programmes to engage schools with research on climate change remain important and can also have a role to play in the provision of interactive and innovative resources with which to engage pupils. In particular, the Royal Geographical Society provides a range of high-quality information about climate change to schools. But it is a concern that a well-established and effective programme, the Climate Change Schools Programme in Durham, is no longer able to operate and support schools in the teaching of climate change due to a lack of financial support. Given the scaling back of such projects and the limited resources available, it is critical that the National Curriculum highlights the need for pupils at Key Stages 1-3 to gain a broad understanding of climate change – both in terms of the science and its environmental and societal impacts.