

Comments on the Feb 2013 draft **Geography** National Curriculum for England from the Royal Meteorological Society

Question 1: Do you have any comments on the proposed aims for the National Curriculum as a whole as set out in the framework document?

We welcome the aims of the National Curriculum, in particular the focus on geographical processes and the rebalancing between physical and human geographies. We also support the prominence of fieldwork in the curriculum.

We strongly advocate that the topic of climate change be added to the geography curriculum to complement coverage of the scientific basis of climate change in the science curriculum.

Question 2: 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?

Yes, as long as the PoS are set out with sufficient detail to prevent the more difficult topics being avoided by teachers or students. We are concerned that, because the draft curricula in the non-core subjects are so short, this will lead to head teachers regarding them as an acceptable provision for students, rather than basics to be built on, and hence cut teaching resources.

This proposed curriculum, with some changes, should give students the weather and climate knowledge that will allow teachers to develop their understanding of these topics and related ones, both at this level and beyond. For example, teachers can now teach about climate change drawing on the understanding of weather and climate developed by the core national curriculum.

Question 3: Do you have any comments on the content set out in the draft programmes of study?

We support the rebalancing of physical and human geography in the curriculum, and, in particular, the presence of weather and climate in all three Key Stages. In general, we support the progression from geographical 'words' in Key Stage 1, to 'features' in Key Stage 2 and 'processes' in Key Stage 3 although we note below some places where that progression is incomplete. If taught well, this should give students a sound basis for future study, and a good understanding of their physical and human environment.

We would like to preface our comments by pointing out that weather is important. A society well informed about weather and climate will be equipped to make the right decisions about the many weather-related challenges it is faced with, solutions to which may be unpalatable and expensive. At KS 1-3 weather is taught only in geography, not in science. Because weather is the most difficult aspect of the geography curriculum, and many teachers do not have a science background and are uncomfortable with it, there is a tendency for them to avoid weather topics, particularly the physical processes involved. We recognise DfE's wish to avoid being over-prescriptive, but we think sufficient detail should be given to ensure that weather topics are taught properly, and support them in doing so. This is the background to our comments below.

We believe that the geography curriculum as a whole is too short. We recognise that, as a foundation subject, it will not merit the detail afforded to science, but we think it should at least match that in other foundation subjects such as history to ensure that it is accorded as much time in the school timetable. Our proposals below will help to achieve this parity.

KS1

Bullet 4: Change to "identify daily and seasonal weather *cycles* in the United Kingdom...."

Bullet 5a: We welcome the spelling out in detail of key landscape features (beach, coast, forest, etc.). This should also be done in the case of weather features, so the second half should become "...vegetation, *and key weather features, including rainfall, wind speed, snow, cloud, sunshine, fog, frost, temperature*"

KS2

This Key Stage seems particularly weak, and there is room for more progression from ideas introduced in KS1.

Bullet 2: We would like to see climate added as an identifying physical factor. We suggest modifying this bullet to read: "...key topographical *and climate* features, land use patterns; understand how some of these aspects *can change over time.*"

Bullet 5a: We think it is important to add some weather-related features to the list of physical features to be described and understood, so that it ends: "...earthquakes, the water cycle, *tornadoes, hurricanes, microclimates, clouds, droughts, floods and climate change*" This would give the progression from KS1 to KS2 that is currently lacking.

Bullet 5a: specify which climate zones should be taught: *polar, tundra, temperate, equatorial and desert*

Bullet 8: We would like to see an addition to this fieldwork bullet to specifically refer to making weather observations, so that it reads:

- use fieldwork to observe, measure and record the human and physical features, *including weather*, in the local area using a range of methods, including sketch maps, plans and graphs, and digital technologies.

KS3

Bullet 3: We suggest it would be good progression from KS1 to further the notion of that all these change not only spatially but temporally, by adding to the general heading so that it becomes:

- Understand, through the use of detailed place-based exemplars at a variety of *space and time* scales, the key processes in:

Bullet 3a: We would like to see more detail on the topic of weather, to balance that given to geology and to supplement progression from KS1. We propose modifying this bullet so that it reads:

- Physical geography relating to: glaciation, plate tectonics, rocks, soils, weathering, geological timescales, rivers and coasts, *air masses, weather systems affecting the UK, rainfall, extreme weather, climate, and climate change.*

Bullet 4: We propose that this be added to, so that it reads:

- understand how human and physical processes interact to have an impact on and form distinctive landscapes *and climates*

This would allow discussion of, for example, the urban heat island and local school microclimates (which would naturally feed into fieldwork).

Bullet 6: We welcome the interpretation of OS maps, and propose the addition of a similar sentence covering weather maps. We suggest: "*Interpret weather charts and relate these to satellite images and weather on the ground*"

Bullet 8: Weather should be explicitly named as an aspect of geographical data which should be collected and analysed.

We realise that this consultation does not extend to KS4, but we strongly recommend that the topic of climate change, linking physical processes to human impacts be included in GCSE specifications as a compulsory topic,.

Question 4: Does the content set out in the draft programmes of study represent a sufficiently ambitious level of challenge for pupils at each key stage?

We would say that the current draft is not sufficiently ambitious, but with the changes we have proposed it would be.

Question 5: Do you have any comments on the proposed wording of the attainment targets?

We do not have the expertise to answer this question.

Question 6: Do you agree that the draft programmes of study provide for effective progression between the key stages?

In general, we support the progression from geographical 'words' in Key Stage 1, to 'features' in Key Stage 2 and 'processes' in Key Stage 3 although we note in our response to question 2 some places where that progression is incomplete and suggest ways of improving this.

Question 7: Do you agree that we should change the subject information and communication technology to computing, to reflect the content of the new programmes of study for this subject?

We do not have the expertise to answer this question.

Question 8: Does the new National Curriculum embody an expectation of higher standards for all children?

It has the potential so to do. If the changes we have proposed are incorporated then this expectation can be realised.

Question 9: What impact - either positive or negative - will our proposals have on the 'protected characteristic' groups? (these cover disability, ethnicity, gender, sexual identity, gender identity, religion or belief and, for workforce issues, age)

We do not have the expertise to answer this question.

Question 10: To what extent will the new National Curriculum make clear to parents what their children should be learning at each stage of their education?

The greater specificity that we have proposed in these comments would help in this aim.

Question 11: What key factors will affect schools' ability to implement the new National Curriculum successfully from September 2014?

In primary schools, teachers with limited subject knowledge will need considerable support to deliver high quality lessons, especially in the sciences and geography. In secondary schools, many geography teachers consider the weather to be one of the hardest topics. Geography teachers will need good, trustworthy, support in order to deliver the physical geography topics, which in the past they may have fought shy of.

Question 12: Who is best placed to support schools and/or develop resources that schools will need to teach the new National Curriculum?

To be credible, it is imperative that support has the backing of authoritative subject organisations such as the RGS, GA and ourselves, the Royal Meteorological Society, in association with publishers. We concur with others in suggesting that sources of support such as these should be named in the National Curriculum.

Question 13: Do you agree that we should amend the legislation to disapply the National Curriculum programmes of study, attainment targets and statutory assessment arrangements, as set out in section 12 of the consultation document?

We do not have the expertise to answer this question.

Comments on the Feb 2013 draft **Science** National Curriculum for England from the Royal Meteorological Society

Question 1:

In an accompanying response to this, we have advocated that the topic of climate change be added to the geography curriculum. This is on the basis that the complementary coverage of the scientific basis of climate change in the Feb 2013 DfE draft science curriculum **will remain**, and indeed be expanded as proposed below. These are the only comments we make on the science curriculum.

Question 3: Do you have any comments on the content set out in the draft programmes of study?

We support the proposal, on page 141 of the Feb 2013 DfE draft science curriculum, that “Pupils should be taught about the production of carbon dioxide by human activity and the impact on climate” but knowledge of the intermediate processes is necessary, and these need to be explicitly stated in the curriculum.

An understanding of increasing carbon dioxide concentration requires knowledge of the carbon cycle. The impact of carbon dioxide on climate comes about because of the greenhouse effect, an understanding of which requires, in turn, a knowledge (though not in great detail) of infra-red radiation. And to link these to the existing bullet in the DfE draft (i.e. the impact of carbon dioxide on climate) requires pupils to know that the earth’s temperature is determined by a balance between incoming energy, in the form of solar radiation, and outgoing energy, in the form of infra-red radiation. These are matters closely relating to the physics part of the science curriculum.

We propose, therefore, that;

1 A final bullet be added to the “Light waves” section of the current KS3 physics draft (page 144) which says:

- Radiation of longer and shorter wavelengths than visible light: infra-red and ultra-violet

The section heading might then need to be changed to something like: “Light waves and other radiation”

2 Under a new heading at KS3 “Earth and space”, already used in the existing draft at KS2, add two bullets:

- the temperature of the earth’s surface as a balance of visible energy received from the sun and infra-red energy emitted by the earth
- some gases in the atmosphere which partly absorb infra-red radiation from the earth, act to warm the earth (the greenhouse effect) and this can change over time

3...A change to the chemistry curriculum KS3 under Earth Science to read :

- the production of carbon dioxide by human activity and the carbon cycle

To be clear, we are not seeking to move the electromagnetic spectrum section of the draft KS4 physics curriculum, forward to KS3, nor do we think that greenhouse gases more generally should be removed from KS4 chemistry. We believe both areas can be expanded in KS4 to give a progression from the preliminary material we are proposing above for KS3.