



Department
for Education

Consultation Response Form

Consultation closing date: 20 August 2013
Your comments must reach us by that date

Reformed GCSE subject content consultation

If you would prefer to respond online to this consultation please use the following link: <https://www.education.gov.uk/consultations>

Publication

Information you provide in your response to this consultation may be subject to publication or disclosure in accordance with the Freedom of Information Act 2000.

Confidentiality

Please make it clear if you want all/any part of your response to be treated as confidential and explain why. If a request for disclosure of the information you have provided is received by DfE, your explanation will be taken into account, but no assurance can be given that confidentiality can be maintained. An automatic confidentiality disclaimer generated by your IT system will not, of itself, be regarded as binding on the Department.

Please tick if you want us to keep your response confidential.	
Reason for confidentiality:	

Personal data

For the purposes of the Data Protection Act, DfE is the data controller for any personal data you supply in response to this consultation. DfE will process all personal data (such as your name, address and any other identifying information) in accordance with the Data Protection Act 1998. In most circumstances, this means that your personal data will not be disclosed to third parties.

Please do **not**:

- provide information in comments boxes that might identify you unless you are content for that information to be released into the public domain; or
- provide information in your response that might lead to the identification of other living individuals

Name: Dr Rob Ward	
Please tick if you are responding on behalf of your organisation.	<input checked="" type="checkbox"/> X
Name of Organisation (if applicable): UK Groundwater Forum	
Address: UK Groundwater Forum Secretariat Maclean Building Wallingford Oxfordshire OX10 8BB	

Information sharing

The Office of Qualifications and Examinations Regulation (Ofqual) is undertaking a parallel consultation on regulatory conditions for GCSEs. Please tell us if you or your organisation has responded or is intending to respond, to Ofqual's consultation:

Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/> X	Don't know <input type="checkbox"/>
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Please only respond to the next statement if you have ticked 'no' or 'don't know' above:

If you provide comments to us that are relevant to Ofqual's consultation, we intend to forward your responses to them so they can be considered by Ofqual. If you do not want us to do this then please opt-out by ticking the box below:

I do <u>not</u> want DfE to forward my response to this consultation to Ofqual	
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Please mark the box that best describes you as a respondent.

<input type="checkbox"/> Academy and/or Free School	<input type="checkbox"/> Comprehensive School	<input type="checkbox"/> State Selective School
<input type="checkbox"/> Independent School	<input type="checkbox"/> Special School	<input type="checkbox"/> Sixth Form Only
<input type="checkbox"/> Subject Association	<input type="checkbox"/> Organisations representing teachers	<input type="checkbox"/> Parent
<input type="checkbox"/> Young Person	<input type="checkbox"/> Higher Education	<input type="checkbox"/> Further Education

<input type="checkbox"/>	Local Authority	<input type="checkbox"/>	Teacher	<input type="checkbox"/>	Governor
<input checked="" type="checkbox"/>	Employer/Business sector	<input type="checkbox"/>	Awarding Organisation		

Please Specify:

The UK Groundwater Forum is a non-profit making consortium of Governmental organisations, industry and higher education and research institutes. Its aim is to;

- Raise awareness of the importance of groundwater and the role it plays in supporting the environment, in water supply and the economy;
- Provide information on groundwater, targeted at specific groups such as decision makers, policy makers, industry and the public;
- Improve groundwater education in schools by providing educational resources, or links to existing resources

For further information see: www.groundwateruk.org.

If you have an enquiry which is related to the DfE e-consultation website or the consultation process in general, you can contact the Ministerial and Public Communications Division by e-mail: consultation.unit@education.gsi.gov.uk or by telephone: 0370 000 2288 or via the Department's '[Contact Us](#)' page.

Questions 1-6 below ask you to give your views with reference to a specific subject suite:

1. *English*,
2. *Mathematics*
3. *Sciences*
4. *Geography*
5. *History*
6. *Modern and ancient languages*.

You do not need to give answers for all the subject suites - please answer only with respect to those subjects on which you have a particular view.

Please ensure that you answer questions 7-11 as well – we would like responses from everyone on those.

Science, including biology, chemistry, physics and combined science

3a Do the **proposed subject content and assessment objectives** for science, which includes biology, chemistry, physics and combined science, cover the appropriate knowledge and understanding for GCSEs in these subjects?

<input type="checkbox"/>	Yes	<input checked="" type="checkbox"/>	No -insufficiently demanding	<input type="checkbox"/>	No- overly demanding
<input type="checkbox"/>	Not Sure				

Comments:

Chemistry

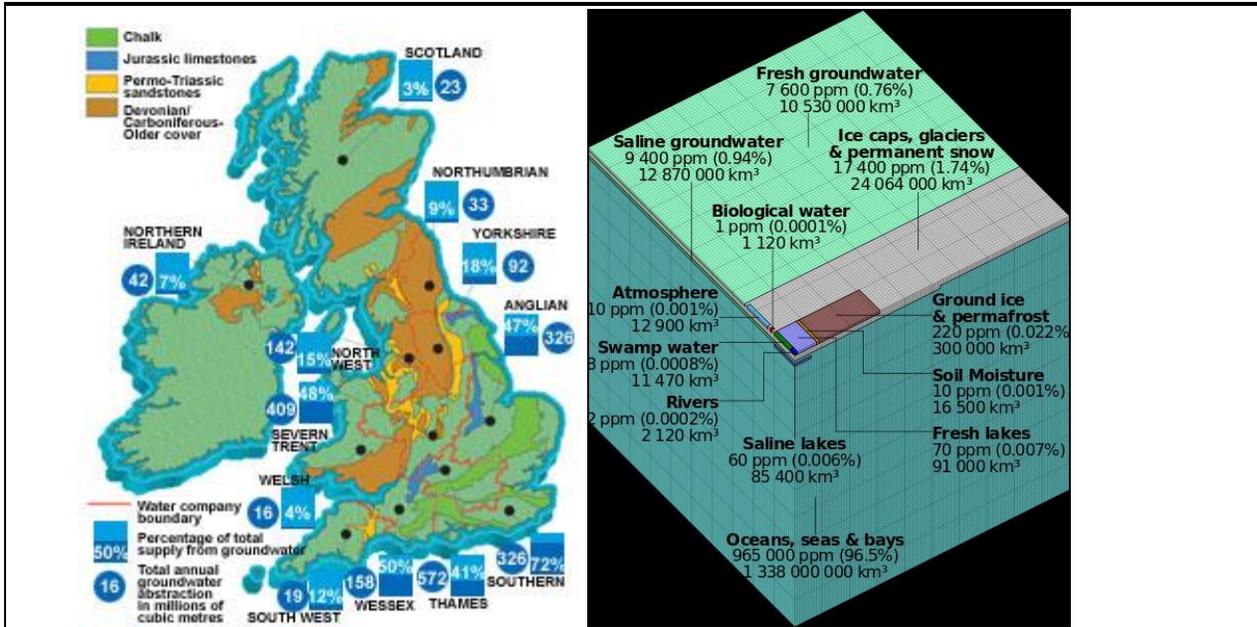
- Within the chemistry curriculum, we welcome the inclusion of the topic on *chemical changes* and its content. We feel that it would benefit from an additional requirement to link the topic to real world issues, as has been done for the *Energy changes* and *Chemical and allied industries* topics. In particular, naturally occurring chemical changes in the environment such as the development of hard/soft water and the introduction of potentially harmful chemicals into groundwater, for example arsenic in Bangladesh. This could also be linked to other topic areas such as *Chemical analysis*.
- We also welcome the inclusion of agricultural productivity, and the use of fertilisers (as part of *Chemical and allied industries* topics). However, there needs to be an important link made between the use of these fertilisers, especially nitrate, and the impact on the environment and groundwater. Nitrate is the most widespread groundwater pollutant in the UK and

significant investment is required to treat groundwater to drinking water standards.

- Case studies could be used to join up several components of the chemistry curriculum and the UK Groundwater Forum would be happy to help in this respect.

Earth and atmospheric science

- The inclusion of '*The Earths water resources and obtaining potable water*' is a welcome inclusion, but compared with the other topics it is given disproportionately small recognition. This is surprising considering the global importance of water resources and the broad range of pressures being exerted on its quantity and quality. We recommend that more consideration is given to the water cycle, the accumulation and utilisation of water resources and that the topic specifically includes modification of the water cycle by human activities, as suggested by the Earth Science Education Forum. It is important that the wording of this section is also changed to include the correct terminology of 'groundwater', and that groundwater is specifically mentioned as a water resource. Globally, 97% of freshwater available for human use is groundwater; see image below of water apportionment. Aquifers in the UK and around the world are essential when addressing the challenge of sustaining potable water availability.
- With regard to terminology, the correction to groundwater should also be accompanied by clarification on those waters considered for treatment, that is, surface water (rivers, lakes), waste water and salt (brackish & saline) water.
- It is also important to stress that groundwater plays a major part in the balance of water resources and potable water supply in the UK, and it is not just in developing countries where groundwater is used (see image below of water supply percentages from groundwater across the UK).



- It should be mentioned that the UK suffers from drought and water shortages, therefore the human impact on this underground resource forms a crucial understanding that is essential for future generations. The importance of climatic stresses on the availability of potable water would also be a welcome inclusion and would align with the proposed Science specification ‘*description of the potential effects of climate change*’.

Physics

- We welcome the inclusion of ‘*National and global energy sources*’ in the draft National Curriculum, although groundwater again, impacts significantly on this area of science. For example energy can be generated from geothermal sources such as ground source heat pumps which utilise groundwater. There are also risks to groundwater such as the potential impacts of shale gas exploitation. These are important technologies, which are used worldwide, and their consideration in the curriculum is a good way to include groundwater in the energy mix.

3b Is the relative weighting of the assessment objectives right for sciences, which includes biology, chemistry, physics and combined science?

Yes

No

Not Sure

Comments:

3c Has the right **practical content** for science been identified to allow students to gain the skills to progress in the subject?

Yes

No

Not Sure

Comments:

3d Do the proposed subject content and assessment objectives for sciences, which includes biology, chemistry, physics and combined science, provide **assurance that**

essential knowledge taught at the earlier key stages is built upon and represented adequately?

<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input checked="" type="checkbox"/> Not Sure
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Comments:

3e Will the proposed qualifications in sciences, which includes biology, chemistry, physics and combined science, secure **sound progression for the purposes of further academic and vocational study?**

<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> Not Sure
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Comments:

- It is reassuring that many of the basic scientific skills that are required to have a good understanding of groundwater at a higher level are covered in the science syllabus, although there is a lack of linkages between these basic skills and the wider environment.
- Scientific understanding and basic scientific principals have huge implications for wider environmental processes, including the exploitation of natural resources for the benefit of the general UK population, e.g. water supply and quality, geothermal energy (shallow and deep) and unconventional hydrocarbons. These linkages therefore need to be explicitly mentioned in the curriculum, so that students can identify the importance of this precious resource.

3f Will the combined science double award provide students with a sufficiently secure basis for progression to A level study of each of biology, chemistry and physics?

Yes

No

Not Sure

Comments:

1. Geography

4a Do **the proposed subject content and assessment objectives** for geography cover the appropriate knowledge and understanding for GCSEs in this subject?

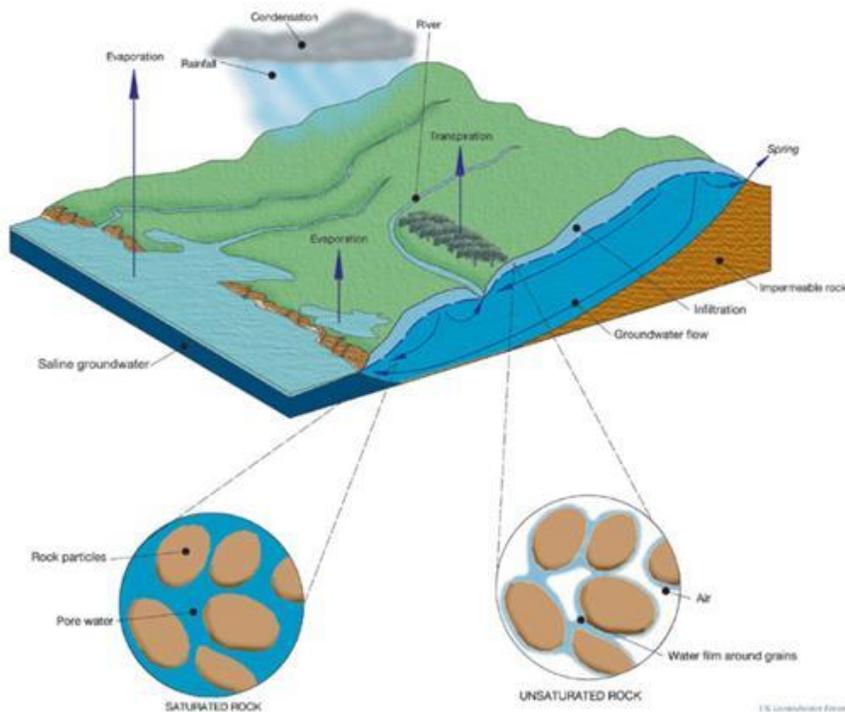
<input type="checkbox"/>	Yes	<input checked="" type="checkbox"/>	No -insufficiently demanding	<input type="checkbox"/>	No- overly demanding
<input type="checkbox"/>	Not Sure				

Comments:

The Geography draft curriculum is less descriptive than the Science one, but it needs to be explicit that groundwater is an important part of the water cycle, in the UK and the rest of the world. Some parts of the world are totally dependent on groundwater for their drinking water and in the UK around 30% of public supply (on average) comes from groundwater. Groundwater is an often overlooked resource as it is **not** usually visible, therefore effort has been made to encourage children to conceptualise what is under the ground, and how important groundwater is as a resource that needs to be protected. It is especially important for students to understand the role of groundwater supporting river flows and water supplies, its vulnerability to pollution and how human activities modify the water cycle resulting in both positive and negative societal impacts.

Key Groundwater Learning points which we recommended are covered in the curriculum:

- Groundwater is found within the pore spaces, fractures and dissolution features within rocks, **not** in underground rivers or lakes;
- Basic understanding of rock and soil porosity and permeability – some of the key controls on storage and movement of groundwater in aquifers and non-aquifers;
- How groundwater resources are replenished (recharged) and the effects of lack of rainfall
- How groundwater can be contaminated and how difficult it is to clean up if polluted. Hence protection is better than cure;
- The importance of groundwater in maintaining river flow (and associated ecosystems) and water supply. Around 60% of the freshwater in the River Thames is derived from groundwater, while in some of its tributaries this can be as much as 90%.



These learning points should be included in the suggested theme of '*Geomorphic Processes and Landscape*', where the water cycle needs to be explicitly mentioned, and expanded on to include groundwater.

Groundwater should also be mentioned in the '*Changing weather and climate*' theme, especially in discussions about storms, flooding and drought. As extreme weather conditions in the UK are bringing about droughts and groundwater flooding etc, and to understand the link between lack of rainfall and a shortage in potable water supply, the relationship between groundwater and the rest of the water cycle needs to be understood.

The water cycle, including groundwater, should also form an important component in the consideration of '*Cities and urban society in the 21st century*'. Rapid urbanisation can place significant pressures on water resources as well as waste water infrastructure, the effect potentially being the over-exploitation and pollution of the resource. The integration of surface and underground water issues, along with waste water, into the consideration of the cause and effect of urban development would be a valuable addition to the curriculum.

Mapping exercises, fieldwork, use of GIS and data collection and analyse are essential skills for those employed in the (ground)water resource sector and we welcome their inclusion. Groundwater-related activities may easily be developed for each of these skills areas and the UK Groundwater Forum would be happy to

assist with this.

4b Is **the relative weighting of the assessment objectives** right for geography?

Yes

No

Not Sure

Comments:

4c We are working on options to ensure that fieldwork takes place. One option might be a letter, submitted to AOs and signed by the head teacher and head of geography, which states that fieldwork has taken place beyond the classroom and school grounds. Do you think this would be **an effective measure to demonstrate that fieldwork has taken place beyond the classroom and school grounds?**

Yes

No

Not Sure

Do you have any other suggestions to verify that fieldwork has taken place beyond the classroom and school grounds?

4d Do the proposed subject content and assessment objectives for geography provide **assurance that essential knowledge taught at the earlier key stages is built upon and represented adequately?**

Yes

No

Not Sure

Comments:

- In KS3, key processes in the water cycle are taught (rivers, climate etc), but this needs to be developed at KS4 and links made between the different parts of the cycle, and the relationships between them.
- An essential development is understanding that the water cycle is not just influenced by natural processes, but that it is impacted by human modification and exploitation. For example, our use of groundwater as a potable water resource and our contamination of water through agricultural processes and waste disposal. The implications of this modification and exploitation on the wider environment need to be discussed.
- It is also important to build on the implications of dynamic processes such as climate change, population growth etc, and how this will affect demand for water and food in the future.

4e Will the proposed qualifications in geography secure **sound progression for the purposes of further academic and vocational study?**

Yes

No

Not Sure

Comments:

- Links between scientific content/understanding and its application to the environmental sciences/geography need to be emphasised, to develop a robust technical background in this area. Jobs in the groundwater industry (water companies, regulators, research etc) need students who have a solid scientific background, combined with an understanding of how to conceptualise and apply these skills to real life problems. This is why an understanding of the complexities of the water cycle and its role in a broad range of issues; health, economics and the environment, is essential as a platform for future development of these important topics.

Please answer all the remaining questions, which include questions on literacy, numeracy and impact on specific groups of students.

7 Does the English language content cover the **key elements of literacy needed for employment or further study?**

Yes

No

Not Sure

Comments:

8 Does the mathematics content cover **the key elements of numeracy needed for employment or further study?**

Yes

No

Not Sure

Comments:

9 Do any of the proposals have potential to have a **disproportionate impact, positive or negative, on specific pupil groups**, in particular the 'protected characteristic' groups? (The relevant protected characteristics are disability, gender reassignment, pregnancy and maternity, race, religion or belief, sex and sexual orientation); if they have potential for an adverse impact, how can we reduce this?

Yes - Positive impact

Yes - Negative impact

No

Not Sure

Comments:

10 Have you any further comments?

Comments:

11 Please let us have your views on responding to this consultation (e.g. the number and type of questions, whether it was easy to find, understand, complete etc.).

Comments:

Thank you for taking the time to let us have your views. We do not intend to acknowledge individual responses unless you place an 'X' in the box below.

Please acknowledge this reply.	<input type="checkbox"/>
E-mail address for acknowledgement:	

Here at the Department for Education we carry out our research on many different topics and consultations. As your views are valuable to us, please confirm below if you

would be willing to be contacted again from time to time either for research or to send through consultation documents.

Yes

No

All DfE public consultations are required to meet the Cabinet Office [Principles on Consultation](#)

The key Consultation Principles are:

- departments will follow a range of timescales rather than defaulting to a 12-week period, particularly where extensive engagement has occurred before
- departments will need to give more thought to how they engage with and consult with those who are affected
- consultation should be 'digital by default', but other forms should be used where these are needed to reach the groups affected by a policy; and
- the principles of the Compact between government and the voluntary and community sector will continue to be respected.

Responses should be completed on-line or emailed to the relevant consultation email box. However, if you have any comments on how DfE consultations are conducted, please contact Carole Edge, DfE Consultation Coordinator, tel: 0370 000 2288 / email: carole.edge@education.gsi.gov.uk

Thank you for taking time to respond to this consultation.

Completed responses should be sent to the address shown below by 20 August 2013

Send by post to:

Qualification and Assessment Division

Department for Education

L2

Sanctuary Buildings

Great Smith Street

London

SW1P 3BT

Send by e-mail to: GCSEcontent.consultation@education.gsi.gov.uk