Draft National Curriculum for science Key Stages 1-2: Response from the British Humanist Association (BHA)

15 August 2012

About the BHA

The British Humanist Association (BHA) is the national charity working on behalf of non-religious people who seek to live ethical and fulfilling lives on the basis of reason and humanity. We promote Humanism, support and represent the non-religious, and promote a secular state and equal treatment in law and policy of everyone, regardless of religion or belief. Founded in 1896, we have around 30,000 members and supporters, and over 70 local and special interest affiliates.

The BHA is an active member of many organisations working in education, including the National Children's Bureau Sex Education Forum (SEF) and the Children's Rights Alliance for England. We also provide materials and advice to parents, governors, students, teachers and academics. We have made detailed responses to all recent reviews of the school curriculum, and submit memoranda of evidence to parliamentary select committees on a range of education issues.

Summary

Our interests in the science curriculum lie around evolution, pseudoscience, sex education and teaching of the scientific method, and as a result, our response will focus on those three areas. Taking each in turn:

- **Evolution:** We very much welcome the inclusion of sections on evolution for the first time. Scientists and educational experts tell us that evolution is such a core topic in biology that it should be taught at this stage, and not from year ten, as is currently the case.
- **Pseudoscience:** We would be concerned about any school teaching creationism or pseudoscience in any subject. With the Government's de facto withdrawal of its guidance on creationism and intelligent design, we would welcome additions to the science curriculum to make it clear that such teaching is unacceptable.
- **Sex education:** We are concerned that the proposed sex education elements of the curriculum are insufficient to meet pupils' needs, and in fact actively discourage adequate education in this area. It is vital that sex education is age appropriate, but we believe that by year six, pupils should understand the basics of anatomy, puberty and sexual reproduction. It is important that pupils are equipped with the knowledge and skills to deal with the changes brought on by puberty, prior to puberty occurring.
- **Scientific method:** We welcome the support for teaching the scientific method in the aims, and the presence of the 'Working scientifically' sections. However, we believe that the application of these sections needs to be better reflected in the other sections. We also believe that there needs to be more on why science works, as well as how.

Evolution

We welcome the addition of sections on evolution and inheritance in both year four and year six, when previously, evolution was not taught before year ten. We are also pleased to see the inclusion of education about Charles Darwin.

Evolution is widely regarded to be the core topic within the life sciences, and it is difficult to see how pupils can be expected to understand much of biology without having learnt about evolution. As a

result, we have long campaigned for the teaching of evolution from a younger age, with support from leading scientists and educational experts.

In July 2009, a letter from twenty-six of the UK's top scientists and science educators called for evolution to be added to the primary school science curriculum.[1] Signatories included Sir Paul Nurse, Professor Richard Dawkins, Revd Professor Michael Reiss and three Nobel laureates. As a result of this pressure, the then-Labour Government subsequently proposed to include evolution in the primary national curriculum. However, the new curriculum was subsequently abandoned due to the 2010 general election.

Following on from this, in June 2010, another twenty-six scientists wrote to Michael Gove with a similar call.[2] This was supported by an Early Day Motion tabled by Julian Huppert MP, signed by 103 MPs, calling for 'the Government to ensure that all schools… include the theory of evolution in the science curriculum at both primary and secondary levels'.[3]

In September 2011, the BHA came together with 30 leading scientists and educators and four other organisations to launch the 'Teach evolution, not creationism!' campaign.[4] Sir David Attenborough was a supporter, along with the Association for Science Education, the British Science Association, the Campaign for Science and Engineering and Ekklesia. This called for 'The teaching of evolution should be included at both primary and secondary levels in the National Curriculum and in all schools', and was supported by a similar Government e-petition which garnered almost 25,000 signatures.[5]

Pseudoscience

We would be concerned about the teaching of pseudoscience in any subject, including creationism and 'intelligent design'. This is a problem which is most prominent in religious education, personal, social, health and economic education, and assemblies. However, it is also a problem in science. For example, Creation Ministries International has confirmed to us that it has addressed students in science lessons.

In September 2007, the Department for Education issued 'Guidance on the Place of Creationism and Intelligent Design in Science Lessons', which stated that 'Creationism and intelligent design are not part of the science National Curriculum programmes of study and should not be taught as science… Any questions about creationism and intelligent design which arise in science lessons, for example as a result of media coverage, could provide the opportunity to explain or explore why they are not considered to be scientific theories and, in the right context, why evolution is considered to be a scientific theory.'[6] We welcomed this guidance, and the line taken.

However, shortly after the 2010 election, the new Government removed this guidance from the Department for Education's website. This was justified to us by the Department with the explanation that 'As part of a Department wide exercise to reduce bureaucracy on schools the Department's formal guidance on creationism and intelligent design was removed from the website, along with much other guidance, but we continue to draw on it. We make clear that creationism and intelligent design are not scientific theories and do not form part of the science National Curriculum or the

[1] http://www.humanism.org.uk/_uploads/documents/BHA-Scientists-letter-to-DCSF-FINAL.pdf
[2] http://www.humanism.org.uk/_uploads/documents/1LettertoGoveonEvolutioninCurriculumFINAL.pdf
[3] http://www.parliament.uk/edm/2010-12/243
[4] http://evolutionnotcreationism.org.uk/
[5] http://epetitions.direct.gov.uk/petitions/1617
[6] http://www.humanism.org.uk/_uploads/documents/1sja-creationism-guidance-180907-final.pdf

GCSE and GCE A level subject criteria and should not be taught as science. This, together with the Secretary of State's very clear and public stance on this matter, provides a very strong message to all schools, including free schools.'

We welcome the strong line the Government have taken on this issue, however are seriously concerned that there is now no guidance for schools on this matter, and instead the Department's line in the media is being relied upon.

We would therefore welcome an addition to the science national curriculum to make clear that teaching pseudoscience is unacceptable. This could draw upon the 2007 guidance, for example the portion quoted above. Or, it could have a wider requirement along the lines of section 24A of the Free School model funding agreement, which states that schools 'shall not make provision in the context of any subject for the teaching, as an evidence-based view or theory, of any view or theory that is contrary to established scientific and/or historical evidence and explanation.'

Sex education

We believe that all children of all backgrounds are entitled to full, accurate and age-appropriate sex education, which should equip them with the knowledge and skills they need to prepare them for puberty, make informed decisions about relationships and to effectively safeguard children from sexual exploitation. At a primary age, this means educating younger children about different external body parts and what constitutes inappropriate touching on the part of adults. Older primary children should begin to learn about puberty and the basics of sexual reproduction.

Much of this material should also be covered in sex and relationships education (SRE), and we have made similar points in our response to the PSHE Review. However, as things stand, there is no requirement for primary schools to provide any kind of education in SRE at all, and parents can legally opt out their children from any education which is provided. As a result, SRE cannot be relied upon to provide the knowledge that children need and are entitled to in this area.

The BHA supports the relevant portions of the primary curriculum set out by the Sex Education Forum on their website (in as far as it applies to the science curriculum).[7]

As things stand, we believe the draft primary curriculum will result in many children not being provided with adequate knowledge in this area.

For example, in Key Stage 1, the current programme of study says that 'Pupils should be taught to recognise and compare the main external parts of the bodies of humans and other animals'. The draft programme of study says that 'Pupils should be taught to identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense… The basic parts of the body to be introduced here can include: head, neck, arms, elbows, legs, knees, face, ears, eyes, hair, mouth, teeth, etc.' This implicitly excludes the external sexual organs, more so than the previous curriculum. It is important that the penis and vulva/vagina are included at this stage not because pupils should learn about their sexual functions, but because pupils need to learn about their other functions, and for safeguarding purposes.

In year 2, education about reproduction is actively discouraged, with the statement that pupils 'should not be expected to understand how reproduction occurs.' In year 5, human reproduction is mentioned for the first time; however, it is stated that 'In Year 6, pupils will be taught more about

[7] http://www.ncb.org.uk/sef/resources/curriculum-design

reproduction', discouraging teaching at this stage. And year 6 is also sparse on details: 'Pupils should be taught to compare the life process of reproduction amongst plants and animals… Examples that can be used include… humans: eggs are internally fertilised and young are born alive.' None of this requires teaching about sexual intercourse, and there is no mention of puberty.

We are concerned that the lobbying of unrepresentative, ideologically driven pressure groups such as the Society for the Protection of Unborn Children (SPUC) has had an undue influence on the drafting of the primary science national curriculum. Conversely, UNESCO's 2009 report, 'International Technical Guidance on Sexuality Education: An evidence-informed approach for schools, teachers and health educators' recommends that the topics of sexual and reproductive anatomy, reproduction, puberty, privacy and bodily integrity are covered from ages 5-8.[8]

Scientific method

We believe that it is vital that young people not only learn scientific facts and theories, but understand what the scientific method is, why it works and the positive impact it has had on human society. It is only by understanding science as a process that people will be able to understand how science reaches the conclusions it reaches, and appreciate the veracity of those conclusions.

As such, we are pleased to see the aims of the curriculum include 'ensur[ing] that pupils… develop understanding of the nature, processes and methods of science through practical activity', and 'understand its uses and implications today and for the future.'

We are also pleased to see the 'Working scientifically' section throughout each year's programme of study, and the explanation that this section should be embedded throughout the rest of the learning and not taught separately. However, we are concerned that the present separation within the document between these sections and others does not emphasise strongly enough how important it is to include the scientific method and the benefits of science throughout the curriculum. Further work to show in other sections how they can be integrated with the 'Working scientifically' sections would go some way to ensure that every teacher appreciates how core this section is to teaching.

We are also concerned that the 'Working scientifically' sections do not sufficiently explore why the scientific method works, in addition to how they work. This should include the nature of evidence, whether evidence is reliable and why it might not be, causation and correlation. Further exploration of why it works would be welcome.

For more details, information and evidence, contact the British Humanist Association:

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[8] http://unesdoc.unesco.org/images/0018/001832/183281e.pdf – see Key Concept 4