Department for Education

Reform of the National Curriculum in England: new programme of study for science at key stage 4

Equality analysis

December 2014

Contents

Introduction

This document assesses the impact of the new national curriculum programme of study for science for pupils at key stage 4. It considers whether and how the proposed changes to the programme of study may impact – positively or negatively – in relation to those with 'relevant protected characteristic' groups. Section 149 of the Equality Act 2010 requires the Secretary of State, when exercising functions, to have due regard to the need:

- to eliminate unlawful discrimination, harassment and victimisation and other conduct prohibited by the Act;
- to advance equality of opportunity between people who share a protected characteristic and those who do not; and
- to foster good relations between people who share a protected characteristic and those who do not.

The relevant protected characteristics are disability, gender reassignment, pregnancy and maternity, race, religion or belief, sex and sexual orientation. Although the national curriculum is not specifically covered by the Equality Act 2010, the Government is required to give due regard to the need to eliminate discrimination, advance equality of opportunity and foster good relations when carrying out its activities. In addition, one of the objectives of the review of the national curriculum - launched in January 2011 - has been to ensure that opportunities are more equal for every child, including pupils with special educational needs. We have sought views through a statutory consultation on the proposals for the new programme of study for key stage 4 science between 11 June and 23 July 2014.

A paper setting out an assessment of the potential impact on equalities covering all national curriculum programmes of study except those for English, mathematics and science was published in July 2013, and for English and mathematics in July 2014 – both are available from GOV.UK

This analysis should be read in conjunction with the equality analysis undertaken for the subject content of new GCSEs in science – available here. The national curriculum programme of study for key stage 4 science has been developed in tandem, and is consistent with the content for Combined Science GCSE. This is because schools pay attention to both the GCSE subject content and the programme of study in preparing pupils for the end of key stage 4 examinations.

Policy Context

In January 2011, the government launched a review of the national curriculum with the following aims:

- to ensure that the new national curriculum embodies rigour and high standards and creates coherence in what is taught in schools

- to ensure that all pupils are taught the essential knowledge in the key subject disciplines

- beyond that core, to allow teachers greater freedom to use their professionalism and expertise to help all pupils realise their potential

The review has been informed by evidence on curricula in high-performing educational jurisdictions internationally.

On 11 June 2012 we announced decisions on the proposed primary national curriculum. On 7 February 2013 we announced proposals about the new secondary national curriculum and launched a formal consultation on draft programmes of study for all national curriculum subjects, except for English, mathematics and science at key stage 4. The consultation ended on 16 April 2013.

On 8 July 2013 we published updated programmes of study for all national curriculum subjects at all four key stages except for English, mathematics and science at key stage 4, and we published the final programmes of study on 11 September 2013. In July 2014 a revised national curriculum framework document was published which included the final programmes of study for English and mathematics for key stage 4. The final key stage 4 programme of study for science was published in a revised national curriculum framework document on 2 December 2014.

The majority of the new national curriculum programmes of study came into force in September 2014. At key stages 1 and 2, the new national curriculum for English, mathematics and science for years 2 and 6 pupils will be taught from September 2015 to underpin existing statutory end of key stage assessments in summer 2015. English and mathematics for key stage 4 will be phased in from September 2015 and science for key stage 4 will be phased in from September 2016, alongside the timetable for introducing new GCSEs in these subjects.

The evidence base

Our analysis of the potential impact of the proposed programme of study for science for key stage 4 pupils has been informed by responses to the consultation on the programme of study which ran from 11 June to 23 July 2014 attracting a total of 54 responses.

The following summary of evidence draws on responses to the public consultation on the new programme of study.

The Consultation responses and possible impact

The statutory consultation on the proposed programme of study for key stage 4 science asked respondents what impact - positive or negative - the proposals would have on pupils from groups with relevant protected characteristics. Out of 54 responses to the consultation, there were 8 responses in relation to possible impact on pupils with disability. Four of these responses were concerned that some low ability pupils may struggle with a more demanding curriculum that includes more detail and content than the previous key stage 4 science curriculum. The other four responses were about the need to make adjustments for SEND pupils including those with dyslexia. This includes making sure that teachers have the necessary skills and knowledge to recognise when a specific need requires specialist intervention. One respondent said there would be a need to provide specially adjusted facilities and provision for aspects of practical and fieldwork for those pupils with specific disabilities.

There were seven responses on the possible impact on pupils with protected characteristics of gender reassignment, sex and sexual orientation. These responses concerned the need to teach more about sex and relationships education, especially sexual health. There was concern that if sexual health is only taught by reference to reproduction then pupils who identify as being gay, lesbian, bisexual and transgender would be left without vital information about their bodies and health.

There was one response on the possible impact on pupils with protected characteristics of race, religion or belief. This response thought there would a disproportionate impact on pupils of a certain race, religion or belief which could be reduced significantly by enabling the science curriculum to be devised by schools to mirror the particular culture and beliefs and support the ethos of their pupils and the local community.

Our response to these points is set out in the next section on subject content.

Subject content

Key characteristics of the programme of study:

- Focuses on the big ideas in science such as evolution and inheritance, the atomic structure and energy and forces;
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- Subject knowledge content is clearly set out under the three disciplines of biology, chemistry and physics.

- Contains more content and detail than the previous curriculum.

- Includes new content on developing areas such as the human genome.

- Provides clear progression from the key stage 3 programme of study.

- Includes a new section on working scientifically which should be taught across all three disciplines

The science programme of study mirrors very closely the subject content for the new Combined Science GCSE that was published in April 2014. A good science education that covers appropriate subject content across biology, chemistry and physics can only help to advance equality of opportunity as it will equip pupils with the essential knowledge and skills they need to understand the world they live in and to make sense of important scientific developments that will affect their lives. It will also provide them with the firm foundation they need to progress to study science at a higher level.

It is important that all pupils of all abilities including those with special education needs are able to access the science curriculum which will provide them with access to wide range of education and employment opportunities in the future. Much of this will be down to schools making sure they have flexible approaches to teaching in place to achieve this. This is reflected in the national curriculum inclusion statement that makes clear teachers have an obligation to plan lessons so that there are no barriers to every pupil achieving. This includes pupils who have low levels of prior attainment and those who need access to specialist equipment and different approaches. Support will be available to schools in the form of professional development for teachers through the National Science Learning Network and other networks of schools. This will include developing and sharing good practice that will enable teachers to set high expectations for all pupils and to teach a rigorous and challenging science curriculum across the ability range.

It is important too that pupils do not feel excluded from the science curriculum because of their sexual orientation. We have considered carefully the arguments put forward by the responses on this issue and have now included sexually transmitted infections (STIs)

including HIV/AIDs as part of what is taught about communicable diseases which is relevant to all pupils, but particularly for gay and bisexual pupils who are at a disproportionate risk of sexual ill health[1]. This will, for example, help ensure that pupils understand that some forms of contraception are not just used to prevent conception but can protect against STIs. More generally lesbian, gay, bisexual and transgender relationships are best covered in Sex and Relationships Education (SRE), the objective of which is to help and support all young people through their physical, emotional and moral development. All maintained schools have a statutory requirement to have regard to the Secretary of State's *Sex and Relationship Education Guidance* which sets out clearly that schools should consider the needs of all pupils including taking account of sexual identity and sexual orientation, learning difficulties and ethnicity.

We appreciate that there are pupils, and teachers, for whom areas of the key stage 4 science curriculum such as contraception and evolution, inheritance and variation raise questions of religious conscience. Schools should deal sensitively with these concerns. It is important, however, that all pupils should be taught the fundamental concepts and theories of science which are an essential part of any high quality science education.

[1]There are numerous sources supporting this including: "New HIV diagnoses: Men who have sex with men 2012 Part 2", HPA 2013; and "HIV in the United Kingdom: 2013 Report", Public Health England 2013;

Teaching the new programme of study

The new programmes of study set out the matters, skills and processes to be taught by the end of each key stage, with a change in emphasis towards essential knowledge in each subject area. One of the key objectives of the review is to ensure that all pupils – irrespective of their background or circumstances – have the opportunity to acquire the essential knowledge and skills they need to succeed in life. This is particularly true of the science curriculum which will equip pupils with the knowledge and understanding that will enable them consider a wide range of interesting and exciting opportunities, including many outside of the scientific sector. It is our belief that the new national curriculum programmes of study democratise knowledge by ensuring that as many children as possible can access a rich intellectual and cultural inheritance.

Evidence is clear that setting higher expectations for all pupils, regardless of background or circumstances, is a key driver in improving standards.[2] International evidence is also clear that the best-performing education systems set the highest standards in core subjects[3] and embrace diversity in pupils' capacities, interests and social background.[4] Furthermore, evidence shows that raising the level of challenge and rigour in the curriculum does not automatically mean wider gaps in pupil attainment: there are examples of high-performing educational jurisdictions (including Finland, Canada and Japan) that set high expectations and reduce the spread of attainment amongst pupils[5], with significant proportions of disadvantaged pupils exceeding internationally comparable benchmarks.[6]

The national curriculum makes it clear that teachers should set high expectations for all pupils, including disabled pupils and pupils with EAL, and reaffirms the need for schools to take account of their duties under equalities legislation that covers disability, sex, sexual orientation, gender identity, and religion or belief. We understand that some pupils will access the national curriculum in ways that are different to others, and will progress at different rates. This, however, is a matter of pedagogy and good teachers will always adapt their teaching approach to meet the needs of their pupils. In practice this means

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[2] P. Sammons, J. Hillman & P. Mortimore (1995), *Key characteristics of effective schools* (London, Institute of Education/OFSTED); Ofsted. (2009), *Twelve outstanding secondary schools: Excelling against the odds*.

[3] Department for Education (2011), *Review of the national curriculum in England: what can we learn from the English, mathematics and science curricula of high-performing jurisdictions?*

[4] OECD (2010), *PISA 2009 Results: What makes a school successful? – resources, policies and practices* (Volume IV);

[5] Analysis of 2009 PISA data indicates that in a number of countries (including Finland, Canada, Japan, Korea and Norway), students perform higher and are less affected by their home background than the OECD average. Equitable education systems are fair and inclusive and support their students to reach their learning potential without either formally or informally pre-setting barriers or lowering expectations. OECD (2012), *Equity and Quality in Education: Supporting Disadvantaged Students and Schools*, OECD Publishing. http://dx.doi.org/10.1787/9789264130852-en

[6] OECD (2011), *Against the Odds: Disadvantaged Students Who Succeed in School*, OECD Publishing. http://dx.doi.org/10.1787/9789264090873-en

ensuring that the national curriculum is taught in ways that enable all pupils to have an equal opportunity to succeed.

Conclusion

37 of the 54 respondents to the consultation answered the question about disproportionate impact. Of these the majority were either unsure or did not think that the programme of study would have potential for adverse impact on pupils with protected characteristics.

One of the key aims of the national curriculum review has been to raise expectations of what all pupils should know and be able to do by the time they leave school. We believe that the more challenging programmes of study and GCSE subject content, coupled with more rigorous assessment characteristics, will give more confidence to pupils and employers, and access to further and higher education institutions.

We are confident that the new national curriculum sets appropriately high expectations for all pupils, and that the content of the programmes of study will give all pupils, regardless of background and circumstances, the essential knowledge and skills that they need to succeed in education and life. We believe there is flexibility to deliver a personalised curriculum to meet the individual needs of pupils including those with protected characteristics. In keeping with the objectives of the review, we believe that teachers are best placed to decide how to teach the programmes of study. Teachers should be able to use their professional judgement to address the needs of all children and have flexibility on the time and other resource allocation needed to teach them effectively.

The national curriculum inclusion statement reaffirms schools' duties under equalities legislation. It sets out that teachers must determine the support and teaching interventions their pupils need to participate fully in all parts of the school curriculum including the national curriculum. The statement also gives teachers and teaching staff the freedom to teach the national curriculum in line with pupils' specific and individual needs and to make reasonable adjustments where appropriate.

In keeping with our commitment to system-led educational reform, we expect schools to work in partnership, locally and nationally, to implement the new national curriculum and develop effective ways of meeting the particular needs of all their pupils - including those with protected characteristics. We also anticipate, and will work to encourage, those organisations that represent those with relevant protected characteristics to help schools fulfil their equalities duties in delivering the new national curriculum and ensure that all pupils are able to achieve.

The key stage 4 curriculum for science, in tandem with the new science GCSEs, is an essential part of our education system. Improving standards in science is ultimately beneficial to all students, enabling them to understand the world they live in, and providing the best possible opportunities for progression into further and higher education and employment.

Department for Education

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