1 MAY 2013

SECONDARY SCHOOL ACCOUNTABILITY

RESPONSE TO THE
DEPARTMENT FOR EDUCATION CONSULTATION

GATSBY

SUMMARY

We urge the Department to ensure that the core status of science is reflected throughout the performance measures. As the Government has rightly recognised, performance measures drive behaviours in schools. The measures proposed in the consultation document might well have the perverse effect of reducing the numbers of students studying GCSE sciences with catastrophic results not only for those young people but also for employers who are desperate for STEM skills. We therefore recommend:

- that the floor standard should include a threshold measure for the percentage of pupils achieving a good standard in science GCSEs (alongside English and maths);
- that two slots in both the '8 point score' attainment and progression measures should be reserved for the sciences;
- that any performance measure for science should reflect attainment across all of physics, chemistry and biology, whether taken as a combined science (double award) option or three separate GCSEs ('Triple Science').

INTRODUCTION

1 Gatsby is a foundation set up in 1967 by David Sainsbury (now Lord Sainsbury of Turville) to realise his charitable objectives. We focus our support on the following areas:

- Plant science research
- Neuroscience research
- Science and engineering education
- Economic development in Africa
- Public policy research and advice
- The Arts

THE PURPOSES OF ACCOUNTABILITY MEASURES

2 There are three main purposes for 'accountability' measures in secondary education:

- for the Department for Education to be held to account by Parliament and wider society for the impacts of their policies on the English education system;
- to enable the Department for Education to identify, and intervene with, schools that are underperforming against an appropriate benchmark;
- to give parents, Governors, staff and senior leadership teams information that will enable them to improve the quality of educational provision in that school.

3 Our response to this consultation focuses on the use of accountability measures for the first two of these rather than the third. For the latter we feel a raft of measures could be considered in terms of improving the quality of science education in schools – particularly regarding the provision of practical work and the use of Labour Market Information – and we would welcome the opportunity to participate in further discussions about these measures.

4 Accountability measures at Key Stage 4 need to be seen in a context where Academies – more than 50% of state schools and rising – are no longer required to deliver the statutory National Curriculum requirements. The role of these measures in setting out clear expectations as to the floor standards for all schools is therefore crucial.

THE PLACE OF SCIENCE IN HEADLINE ACCOUNTABILITY MEASURES

5 Gatsby is very concerned that the suggested accountability measures do not reflect the core status of science within the National Curriculum. This sends a message to schools and parents that the Government has reduced the importance it attaches to attainment in science. Not only is this in conflict with the government's own statements of priorities, it places the prospects of young people at risk.

6 The proposed new '8 point score' accountability measures, designed to reward schools offering a broader range of quality provision at Key Stage 4, is achievable without any science GCSE. Again, this will be taken as a signal by some schools that science is not considered as important by government as it once was.

7 If the accountability measures do not place sufficient emphasis on science there is every reason to suppose that many students in Academies will no longer be offered the opportunity to study all three sciences at Key Stage 4.

8 For these reasons we recommend that the floor standard should include a threshold measure for the percentage of pupils achieving a good standard in science GCSEs, alongside English and mathematics. This measure should reflect attainment across all of physics, chemistry and biology, whether taken as a combined science (double award) option or three separate GCSEs.

9 The imperative to ensure that all students study all three sciences is stronger today than it has ever been. The breadth of knowledge and skills resulting from studying physics, chemistry and biology at Key Stage 4 are in high demand from employers and it is expected that this need will continue to grow. Maintaining progression into A level in these subjects and into university is also essential.

10 One of the great successes of the National Curriculum and more recent accountability measures has been to increase the numbers studying all three sciences at KS4. In Appendix 1 we have included a short history of how changes to the curriculum have impacted on the uptake of the sciences and an overview of what the proposed changes might mean in the current context.

11 We want to draw particular attention to the inclusion of computing into the EBacc as a fourth science, meaning it would be possible for students following the separate sciences at Key Stage 4 to drop one of physics, chemistry or biology GCSE and still count towards the EBacc. This could potentially incentivise some schools to offer students computing instead of, say, physics. We value computing as a subject and welcome the increased emphasis on programming skills, but positioning it in competition with physics, chemistry and biology is unhelpful.

12 In order to ensure that breadth of study across the sciences remains an entitlement for all and not a luxury for some, we recommend that two slots in the eight point measures should be reserved for the sciences. In a similar way to the floor standard measure this would have to be based on performance across the three natural sciences.

CONCLUSION

13 We urge the Department to ensure that the core status of science is reflected throughout the performance measures. As the Government has rightly recognised, performance measures drive behaviours in schools. The measures proposed in the consultation document might well have the perverse effect of reducing the numbers of students studying GCSE sciences with catastrophic results not only for those young people but also for employers who are desperate for STEM skills.

14 We would welcome the opportunity to discuss with the Department the points raised in this submission. Any questions regarding its content should be directed to:

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APPENDIX 1: A BRIEF HISTORY OF GCSE SCIENCE

The role of the National Curriculum in ensuring breadth of study at Key Stage 4

The National Curriculum, introduced in 1988, made science a core subject until the age of 16. This meant that all students in state schools had to follow a programme of study for science including physics and chemistry and biology. Overnight, this corrected the huge gender imbalance of science lessons; at age 14 girls could no longer give up physics and boys could not give up biology. It meant that every pupil, if they were successful at GCSE, had the choice of continuing with biology, chemistry and physics at A-level.

For the next 15 years or so, the vast majority (80%+) of state school students met this requirement to study physics, chemistry and biology by following Double Award science (2 GCSEs of combined science).

The rise of Triple Science GCSE

The shift away from Double Award began in earnest with the publication of the government's 'Science & innovation Framework: Next Steps' document in March 2006. This set out, for the first time, a government commitment to ensure all pupils had the opportunity to study Triple Science (3 individual GCSEs in biology, chemistry and physics).

The effect of this policy announcement in the intervening years has been dramatic. In 2006, around 56,000 UK pupils studied Triple Science, by 2012 the number was 157,000 and it continues to rise. Whereas less than a third of state schools used to offer Triple Science, now it is over 80%. The 'Triple Science effect' has also had an impact on A-level numbers: since 2006 physics A-level numbers are up 26%, chemistry is up 22% and biology is up 15%.

Triple Science has now become for many the preferred route to A levels in the sciences. It has also set an expectation for schools to employ specialist teachers in each of the sciences in order to offer quality provision at Key Stage 4. Rarely has an education policy been more effective in achieving its stated aims over a sustained period.

The mass expansion of Academies and their freedoms from the National Curriculum

Academies were introduced under the Labour government. The Academies programme was designed to sit outside of local government control, and Academies were given certain freedoms which were intended to drive improvements in performance. One such freedom is that Academies did not have to follow the National Curriculum, only teach a "broad and balanced curriculum". Under Labour this did not have any significant implications for science as there were so few (~200) Academies, most in challenging circumstances. However, the current government has expanded the programme massively: more than 50% of state schools have become Academies or Free Schools (which have the same freedoms) since May 2010 and the aim of Ministers is to have all secondary schools within the programme as soon as feasible. Their ability to disapply the National Curriculum means Academies are under no legal requirement to teach all three of physics, chemistry and biology to their pupils.

The introduction of the EBacc as a powerful influence on school science provision

The English Baccalaureate (EBacc) was introduced as a performance measure in the 2010 performance tables. It is not a qualification in itself. The measure recognises where pupils have secured a C grade or better across a core of academic subjects – English, mathematics, history or geography, the sciences and a language. The introduction of the EBacc initially helped to cement the position of science at GCSE by specifying:

> "*To get the science element of the English Baccalaureate you either need to get an A*-C pass in core and additional science [today's Double Science], or you must take all of the three single sciences [Triple Science] and get an A*-C pass in two of them.*"

However, this situation has recently altered. In a drive to raise the status of computing in schools, DFE proposes to classify computing as a 'science' for the purposes of the EBacc. The DFE now says that:

> "*From 2014 computer science will be added to the list of separate science options (so there are now four separate sciences instead of the traditional three) in the EBacc. Pupils who sit any three of the four separate sciences and get at least a C in two of them will get the EBacc.*"

These changes mean that it will be possible for Key Stage 4 students to drop one of the natural sciences for computing and still achieve the EBacc. Notwithstanding the issue with Academies' freedoms to disapply the National Curriculum (see above), this will be the first time since 1988 that the requirement to study physics, chemistry and biology to age 16 will have been formally removed.