

### The Science Council

1. The Science Council is a membership organisation representing 42 learned societies and professional bodies drawn from across science and its applications. Collectively our members represent almost 500,000 individuals including scientists, teachers and senior executives in industry, academia and the public sector.
2. In addition to providing a mechanism for the sector to work collectively, the Science Council develops and leads collaborative projects working with member organisations and the wider scientific community: examples include LMI analysis of the UK Science Workforce and Diversity, Equality and Inclusion.<sup>1</sup>
3. The Science Council's principal area of work is to advance the professional practice of science across the breadth of the science workforce, including science teachers in schools, further education and higher education. The Science Council upholds the standards for Chartered Science Teacher (CSciTeach). Member organisations are granted Licensed Body status: current Licensed Bodies for CSciTeach are the Association for Science Education, Royal Society of Biology and Royal Society of Chemistry.
4. In preparing this submission we have consulted with member organisations to identify areas of common interest.

### Professional charterships recognise high standards in science teaching

5. The Science Council welcomes the government's ambition to raise the status of the teaching profession. We support the view that the UK must have a highly-skilled science teaching workforce that can attract, educate, enthuse and inspire future generations of scientists. To ensure the UK can meet today's global challenges, such as climate change, food security, and an increasing and aging population, the government must ensure that the country has a science workforce with the appropriate knowledge, skills and experience. High standards in teachers and scientists will support the use of science to enable us to find ways of increasing global standards of living both now and in the future.
6. Teaching quality and standards have a profoundly positive effect on quality of education and therefore engagement, attainment and progression of young people, especially those from disadvantaged backgrounds.<sup>2</sup> Teaching must be by qualified teachers with appropriate subject knowledge in their discipline at each education level, especially post-16. However, degree class is not the sole indicator of a teacher's ability to develop their students<sup>3</sup>. Using only degree class as a proxy for teaching aptitude and ability may:
  - Discourage graduates with lower class degrees from the profession. This loss of possible talent could worsen the gap between supply and demand in the shortage subjects and deny children the science education they need.
  - Allow graduates with high class degrees whose skills lie outside teaching to enter the teaching profession and so fail to provide students with what they need to learn effectively.
7. **Chartered Science Teacher is a single benchmark designed to embrace standards of excellence in science teaching in primary, secondary and further and higher education settings.** Achievement and retention of the award confirms an individual's public commitment to the highest levels of professionalism and competence through ongoing development of their skills and knowledge.

<sup>1</sup> <http://www.sciencecouncil.org/content/diversity-equality-and-inclusion>

<sup>2</sup> <http://www.suttontrust.com/wp-content/uploads/2011/09/2teachers-impact-report-final.pdf>

<sup>3</sup> <http://www.centerforpubliceducation.org/Main-Menu/Staffingstudents/How-good-are-your-teachers-Trying-to-define-teacher-quality/Does-highly-qualified-mean-highly-effective.html>

8. While teachers leaving their initial training will be up-to-date, even the most effective can, over time fail to maintain high levels of skill and knowledge. CSciTeach builds in annual CPD monitoring so all Chartered Science Teachers maintain up-to-date skills and knowledge, and are able to support this attestation with evidence of CPD activities. To achieve CSciTeach, registrants must:
- Demonstrate that their CPD activities are a mixture of learning activities relevant to current or future practice
  - Seek to ensure that their CPD has benefited the quality of their practice;
  - Seek to ensure that their CPD has benefited the users of their work (employee, customer, student etc)<sup>4</sup>

CSciTeach gives education leaders, parents and the wider public confidence in science teachers,<sup>5</sup> and should be an aspiration for all science teachers and trainers of science teachers.

9. **The Science Council calls on the government and educational institutions to drive improved professionalism and standards in science teaching at all levels and settings through support for CSciTeach. The Department for Education and training organisations such as TeachFirst and Schools Direct should work in partnership with the Science Council to encourage all science teachers to apply for CSciTeach and communicate its benefits to aspiring teachers and to education leaders.**

### **Ensuring teachers' access to continuous professional development activities**

10. Science teachers across all levels, disciplines and settings should be encouraged and supported by their employer to undertake regular CPD activities to achieve and maintain standards for CSciTeach. They must be given appropriate time and resources to undertake regular CPD activities, and given time to reflect and review on what they have learned in order to put it into practice.
11. Science teachers should be entitled to subject-specific CPD, through a variety of provision and experiences in order to share best practice. This should include a mixture of learning activities<sup>6</sup>, in-house and inter-school activities, as well as regular interactions with higher education and industry. Professional bodies in science are in a strong position to ensure that CPD activities are evidence-based, and provide teachers with opportunities to network and share good teaching practice.
12. Teacher-industry placements<sup>7</sup> can provide workplace opportunities for teachers to update their knowledge, skills and better understanding of the range of qualifications and career pathways in science. It is essential that teachers, as well as other influencers, recognise and convey to young people the wide range of career options available to them; this must be a key aim for the UK if it is to encourage more young people to pursue a science career.
13. Modern science is increasingly utilising digital infrastructure and new digital technologies to tackle global challenges. The integration of technology within education settings therefore has the potential to enhance students' learning activities and help them operate in a high-tech global economy. However, research suggests that, despite teachers' strong desire to integrate technology into science education, barriers remain, such as teachers' lack of confidence, competence and access to resources.<sup>8</sup>
14. It will be essential that all young people have the opportunity to access high-quality digital skills teaching and learning so that they become confident users of digital technologies. Regular CPD activities can provide science teachers with opportunities to upskill, become more familiar with new technologies and confident in teaching digital skills in an education setting.

<sup>4</sup> <http://www.charteredscientist.org/about-csci/cpd-standards>

<sup>5</sup> <http://www.sciencecouncil.org/content/chartered-science-teacher-csciteach>

<sup>6</sup> <http://www.charteredscientist.org/about-csci/cpd-standards>

<sup>7</sup> <https://www.sciencelearningcentres.org.uk/consortia/national/teacher-industrial-partners-scheme/>

<sup>8</sup> [http://www.eimste.com/v5n3/eurasia\\_v5n3\\_binqimlas.pdf](http://www.eimste.com/v5n3/eurasia_v5n3_binqimlas.pdf)

## **Making science teaching an attractive career option**

15. The Science Council is committed to supporting a more diverse science workforce.<sup>9</sup> Increasing diversity will make use of a wider pool of talent and has been shown to improve decision-making in teams.<sup>10</sup> To help ensure that the science teaching profession is seen as an attractive career option in which all individuals are welcome and supported, there are a number of relatively low-cost actions that the government, in partnership with professional bodies, could take. These include:

- Auditing school text books, teaching materials and school policies for potential diversity bias
- Adopting the model used by Lord Davies 'Women on Boards' report and review teacher promotions and appointments to ensure they are proportional to the diversity at junior levels
- Recognising and rewarding education institutions that report on the diversity of their teaching workforce and take action to address under-representation of particular social groups in teaching. The Institute of Physics' Project Juno<sup>11</sup> is a model used currently in HE that could be extended into schools and FE
- Encouraging teaching bodies and teaching unions to make a public commitment to improve the diversity of the teaching workforce
- Encouraging education institutions to undertake unconscious bias training among their workforce to recognise and work towards eliminating bias against particular groups

16. However, the science subjects suffer from a lack of subject-qualified teachers<sup>12</sup>. Ensuring there that are a range of appropriate training routes into the profession, appropriate financial incentives and mechanisms for new graduates, those returning from career breaks and those changing career can help attract and retain more people in the science teaching workforce. **Government support for CSciTeach as a framework for professional development will help ensure there is a clear progression route within the teaching profession. This will be key to retaining the current workforce and attracting aspiring science teachers.**

17. A number of the Science Council's professional body members<sup>13, 14</sup> offer attractive scholarships for prospective teachers in their respective subjects. These are limited but attractive opportunities. Government and the teaching profession could support further incentives through the Science Council and with others to attract more science graduates into the profession, such as reducing the size of individual science graduate student loans if they enter the profession and achieve CSciTeach.

## **Supporting the wider science teaching workforce**

18. Science and maths teaching is supported by a range of non-teaching staff, such as laboratory technicians, who are essential to the smooth running and effective operation of science and maths teaching. Appropriate training and career development opportunities will enable support staff to provide better support to teachers, who in turn can be freed from the burden of non-teaching work, and focus more on improving pupil attainment. **The Science Council calls on the government and educational institutions to offer opportunity for non-teaching science staff such as laboratory technicians, to undertake CPD activities and link such activities to standards for Registered Scientist and Registered Science Technician.**

<sup>9</sup> <http://www.sciencecouncil.org/content/diversity-equality-and-inclusion>

<sup>10</sup> [http://insight.kellogg.northwestern.edu/article/better\\_decisions\\_through\\_diversity](http://insight.kellogg.northwestern.edu/article/better_decisions_through_diversity)

<sup>11</sup> <http://www.iop.org/policy/diversity/initiatives/iuno/index.html>

<sup>12</sup> [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/440577/Text\\_SFR21-2015.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/440577/Text_SFR21-2015.pdf)

<sup>13</sup> [http://www.ima.org.uk/careers/teacher\\_scholarships.cfm.html](http://www.ima.org.uk/careers/teacher_scholarships.cfm.html)

<sup>14</sup> [http://www.iop.org/education/teach/itts/page\\_52632.htm](http://www.iop.org/education/teach/itts/page_52632.htm)

## **Member Organisations of the Science Council**

Association for Clinical Biochemistry and Laboratory Medicine  
Association of Neurophysiological Scientists  
Association for Science Education  
British Academy of Audiology  
British Association of Sport and Exercise Science  
British Computer Society  
British Psychological Society  
British Society of Soil Scientists  
Chartered Institution of Water and Environmental Management  
College of Podiatry  
Energy Institute  
Geological Society of London  
Institute of Animal Technology  
Institute of Biomedical Science  
Institute of Brewing and Distilling  
Institute of Corrosion  
Institute of Food Science and Technology  
Institute of Marine Engineering, Science and Technology  
Institute of Materials, Minerals and Mining  
Institute of Mathematics and its Applications  
Institute of Measurement and Control  
Institute of Physics and Engineering in Medicine  
Institute of Physics  
Institute of Science and Technology  
Institute of Water  
Institution of Chemical Engineers  
Institution of Environmental Sciences  
London Mathematical Society  
Mineralogical Society  
Nuclear Institute  
Oil and Colour Chemists' Association  
Operational Research Society  
Physiological Society  
Royal Astronomical Society  
Royal Meteorological Society  
Royal Society of Chemistry  
Royal Statistical Society  
Society for Cardiological Science and Technology  
Society for General Microbiology  
Society of Biology  
Society of Dyers & Colourists  
The Organisation for Professionals in Regulatory Affairs