

# Increasing the uptake of science in schools

Science and engineering are vital contributors to the UK economy. The UK is the world's sixth largest manufacturer, with a turnover in engineering estimated to around £800 billion per year. A healthy engineering and science sector is dependent on new generations of science and engineering graduates - and yet the uptake of these subjects in school is low.

Sixty-six per cent of Year 9 students and 58 per cent of Year 11 students agree that they learn interesting things in science - but just 14 per cent aspire to be a scientist.

The ASPIRES 2 study is tracking the science and career aspirations of young people aged 10-19. Two of the areas the researchers are looking at is the impact of 'Triple Science' (the route to three separate science GCSEs), and the under-representation of girls in Physics and Engineering.

Triple Science is strongly championed by government and industry, but most students have little choice over which science option they take at GCSE, and students in less affluent schools have the least choice. Selective practices around Triple Science perpetuate social inequalities which narrow, rather than broaden, the science 'pipeline'.

The lack of female students taking up post-compulsory Physics and Engineering is an ongoing issue. These subjects are perceived as masculine and Physics is seen as a 'hard' subject to study. Girls who despite these barriers choose to continue with Physics are highly exceptional and have been strongly supported to continue by their families and school.

## Key findings

- About three quarters of all students nationally do not take Triple Science and, as a result of this 'streaming', perceive post-16 science as 'not for me'.
- Participation in Triple Science is heavily influenced by cultural capital, ethnicity and school set. The most socially disadvantaged students are almost three times less likely to study Triple Science compared to the most advantaged.
- Students in top sets are much more likely than those in middle or bottom sets to take Triple Science.
- Most students did not choose whether they took Double or Triple Science – their schools decided for them.
- There is considerable variation between schools in how they select students for Triple Science.
- Gender differences in students' attitudes to science emerge much more clearly from age 14 upwards, particularly in relation to the separate sciences.
- Boys are significantly more likely than girls to say that Physics is their best subject, and girls are much more likely to identify Physics as 'hard'.
- Physics and engineering is widely seen as 'masculine' by both boys and girls.
- Girls tend to express lower self-confidence in their science abilities than boys.

## Policy relevance and implications

- The stratification of science at KS4 should be removed. Students should follow a common award route (eg 'Science'), similar to most other subjects at GCSE. This would help keep more students' options open for continuing with science.
- A review should evaluate whether a narrow, specialist education system (eg A levels) is the best option to serve the needs of the modern economy.
- More diverse options for studying science at A level (beyond A levels in the single sciences) could help broaden participation and highlight that studying science is not just about becoming a future research scientist.
- Co-educational schools should provide more explicit encouragement and motivation for girls to continue with Physics and Engineering.

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### BRIEF DESCRIPTION OF THE PROJECT

ASPIRES and its successor ASPIRES 2 are ESRC-funded studies of young people's science and career aspirations, led by Professor Louise Archer at King's College London. ASPIRES 2 uses large-scale surveys along with in-depth longitudinal interviews to track a cohort from the end of primary (Y6 to the end of secondary, Y13).

Web: [www.kcl.ac.uk/sspp/departments/education/research/aspires/index.aspx](http://www.kcl.ac.uk/sspp/departments/education/research/aspires/index.aspx)

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