Under-representation in physics

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Gender Balance Manager
Girls perform just as well as boys in physics at GCSE. However, in 2016, only 1.9% of girls chose A-level physics, compared to 6.5% of boys. This is 5,669 girls compared to 21,032 boys.

68% of all schools with girls send fewer than two girls to A-level physics. 44% of schools send no girls at all. By comparison, 28% of all schools with boys send fewer than two boys to A-level physics.

65% of girls have physics in their top four grades at GCSE. Of these students, only 8% progress to A-level. When chemistry and biology were in a girl’s top four GCSE subjects, 25% and 32% progressed to the respective A-level.
Unlocking the Future

Three challenges

The strategy identifies three key challenges that present the greatest barriers to unlocking the potential of physics and its impact in society:

1. **Diversity and skills:** We want to build a thriving, diverse physics community and play our part in solving the science, technology, engineering and maths (STEM) skills shortage by ensuring that people, no matter their background or where they live, have access to world-class physics education and training.

2. **Unlocking capability:** We want to ensure that the UK and Ireland are able to realise the full societal and economic benefits of the new industrial era.

3. **Public dialogue:** We want to show the impact of physics on people’s lives, enabling informed public debate about funding and policy in areas including healthcare, climate change and cyber security.

We want our physics community to represent the society it serves.
Gender imbalance: IOP research base @ iop.org/genderbalance
Results of choices

Early Years Educators

- Men (3%)
- Women (97%)

Engineering Workforce

- Men (38%)
- Women (12%)

Early Years Educator data from MITEY UK and Engineering Workforce Data from the WISE campaign
Findings – Aspires

- Students with low Science Capital are unlikely to see science as 'for me'
- Enjoyment of science doesn't translate into science aspirations
- Current careers education is patterned by existing social inequalities
- Girls pursuing the physical sciences post-16 are exceptional
- Young people’s career aspirations are relatively unchanged over time
A transformational finding

Pilot project KPI: Increase in A-Level physics uptake among girls

Number of girls studying AS-Level physics in pilot project

- 2014: 15
- 2016: 50

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Randomised Control Trial

Improving Gender Balance

- Conducting pupil pursuit
- Surveying parents
- Meeting governors
- Looking at school data and publications through a ‘gender lens’
- Joining any options and parents’ evenings
- Focusing on physics and science department

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1. Use everyday language

2. Avoid asking for volunteers

3. Assign roles for practical work

4. Use examples that show how your subject links to their experience

5. Use gender-neutral contexts whenever possible

6. Allow time for pair or group discussions

7. Challenge discriminatory language

8. Monitor your interactions with different genders

9. Regularly refer to a range of careers that use skills from your subject

10. Ensure that your students are exposed to a diverse range of role models in your subject

These tips were developed from our research into gender and behaviour patterns. We recognise that there are variants and these behaviours are not the experience of all individuals. Inclusive teaching is therefore intended to support all students.

Useful for teaching and outreach professionals
Making a sustained and systemic difference

- Highly consequential reframing from encouraging girls to take physics -> removing barriers to non-stereotypical subject choice for all
- Growing and building consensus around role of societal biases and stereotypes affecting subject choice
- Shift of emphasis from one-off events (role models, careers) to whole-school culture change
- Growing acknowledgement of need to work with all staff in a school; not just physics teachers
- Challenging notions of physics as ‘too hard’ and an elitist subject
- Starting early!
Thank you

Any questions?

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