CRESTEM Keynote Lecture, 4 March 2025

The Science Education Tracker:

A tool for capturing young people's perceptions

David Montagu, Senior Policy Adviser, Royal Society
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About the Royal Society

Founded in 1660, the Royal Society:

- Is a Fellowship of many of the world's most distinguished scientists drawn from all areas of science and engineering.
- Is the independent scientific academy of the UK, dedicated to recognising, promoting and supporting excellence in science for the benefit of humanity.
- Champions education because it is the foundation of scientific discovery, innovation and informed citizenship. By inspiring and equipping the next generation, it ensures science thrives as a positive force for progress and global wellbeing.

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About EngineeringUK

EngineeringUK is a not-for-profit that drives change so that more young people choose engineering and technology careers.

Our strategy is based on our mission to enable more young people from all backgrounds to be informed, inspired and progress into engineering and tech. We do this through research and evidence, leadership, activities for schools, and advocacy, with a focus on long-term sustainability.

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Methodology

- First launched in 2016 by Wellcome, surveying c.4,000 young people aged 14-18.
- Ran for the second time in 2019, with c.6,000 young people aged 11-18.
- We surveyed over 7,000 young people aged 11-18 in summer 2023.
- Uses National Pupil Database (NPD) and Individualised Learner Record (ILR).
- Push-to-web methodology
- £10 incentive
- NPD-linkage

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Key trends in science education

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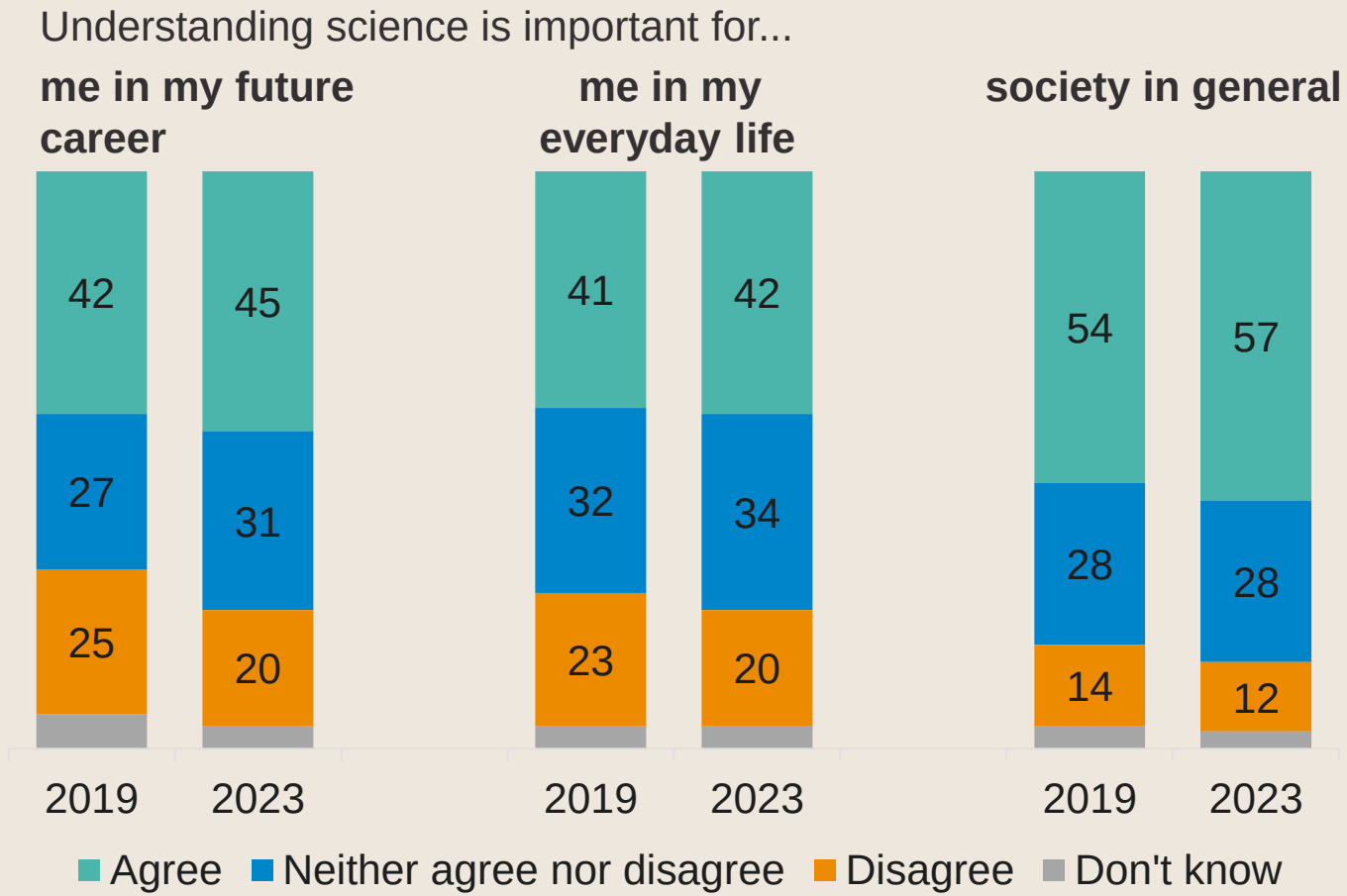
Positive developments



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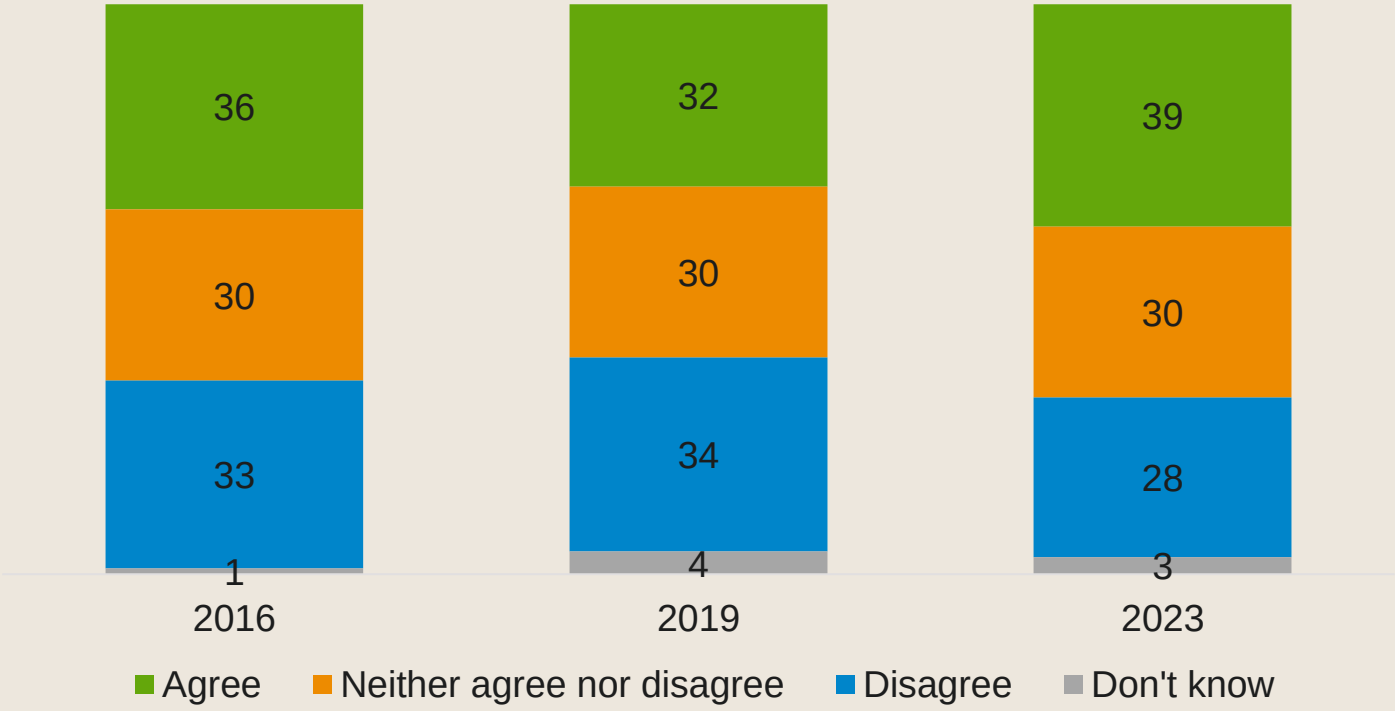
Key trends in science education:
Positive developments

% of year 10-13s who agree or disagree that "careers that use science are suitable for someone like me"



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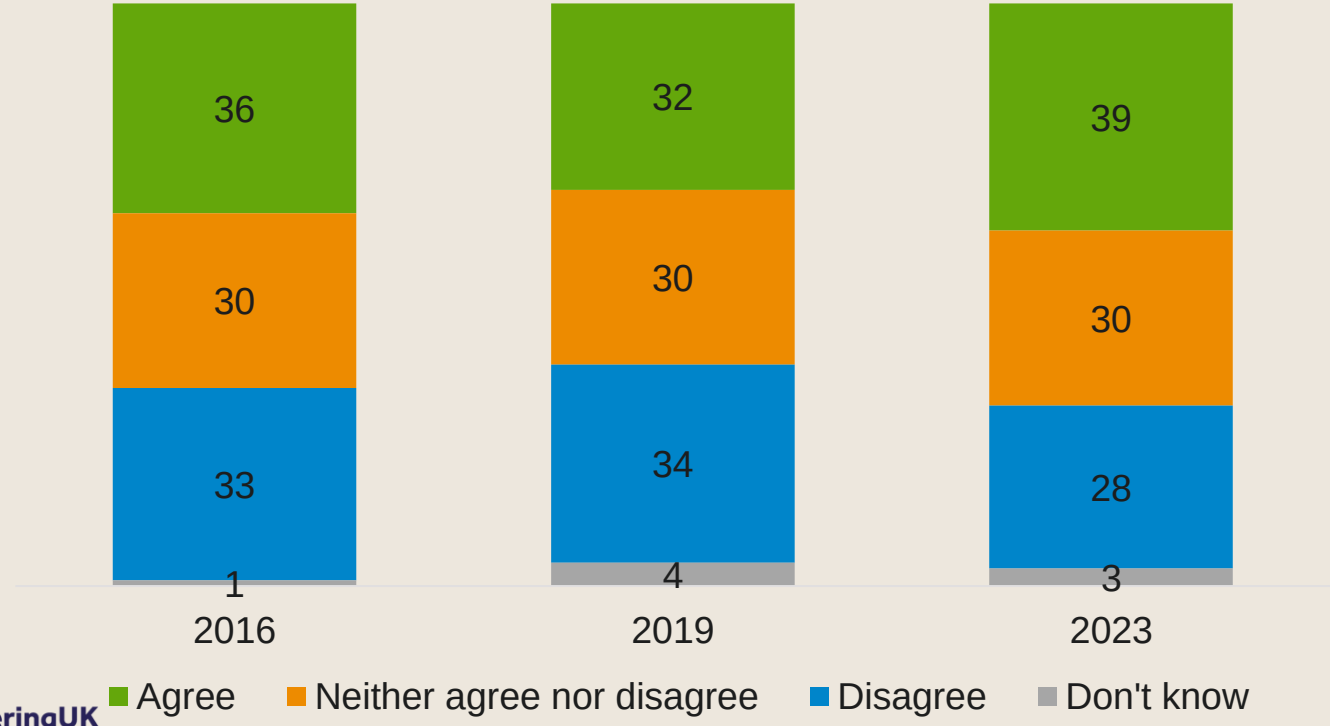
Key trends in science education:
Positive developments

% of year 10-13s who agree or disagree that "careers that use science require high grades"



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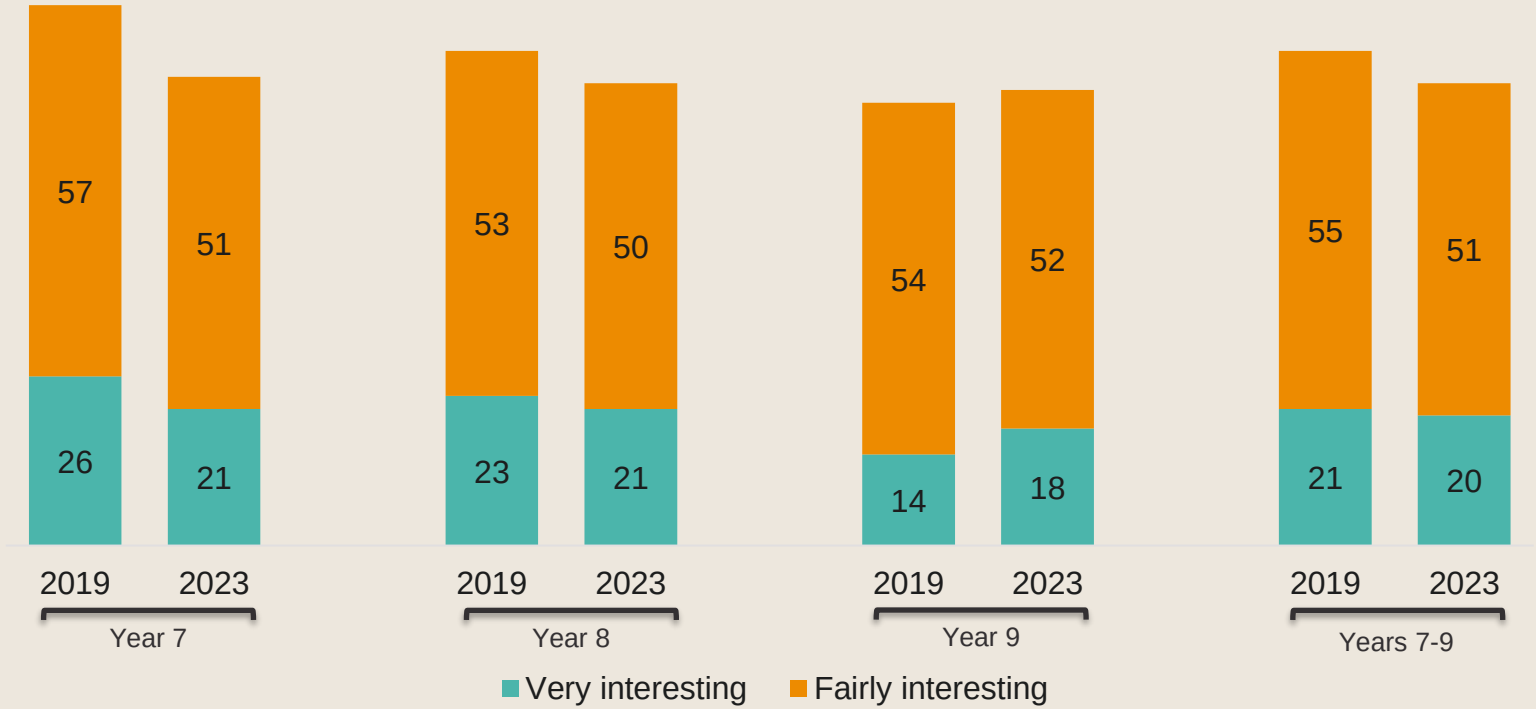
Key trends in science education:
Challenges

% very or fairly interested in science



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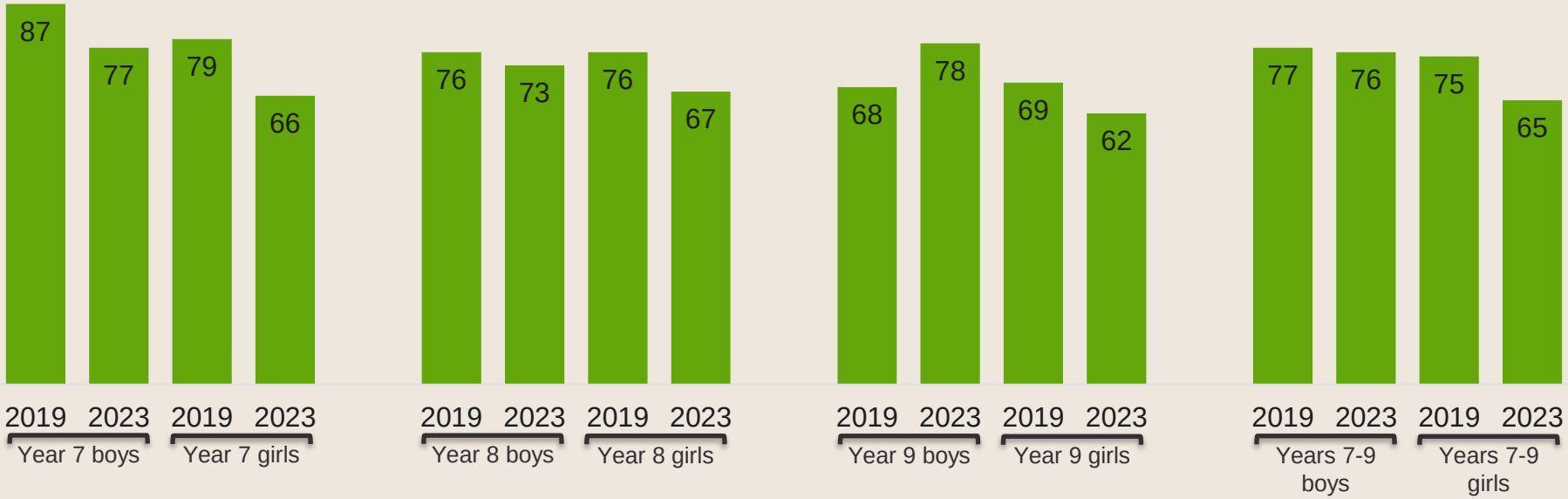
Key trends in science education:
Challenges

Proportion of years 7-9 interested in science



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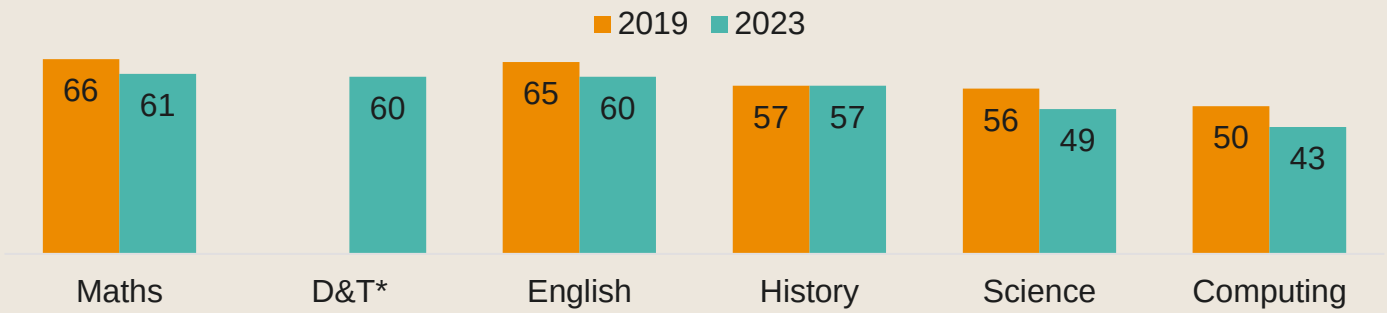
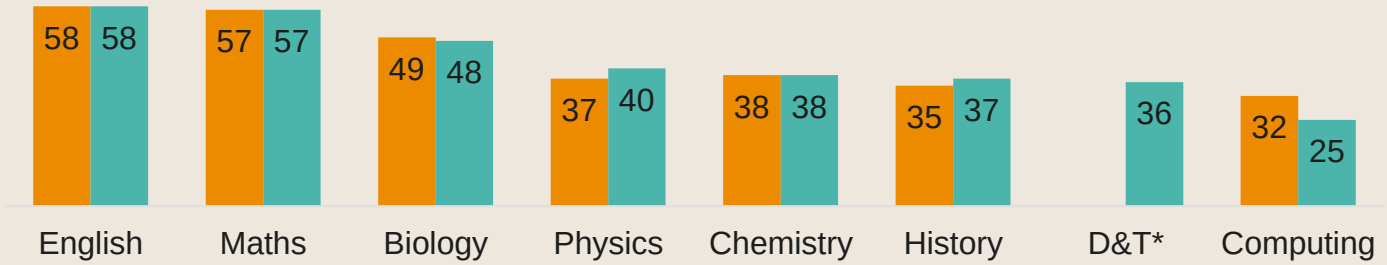
Key trends in science education: Challenges

Proportion of year 7-9s who think they are “good” at each subject



Proportion of year 10-13s who think they are “good” at each subject



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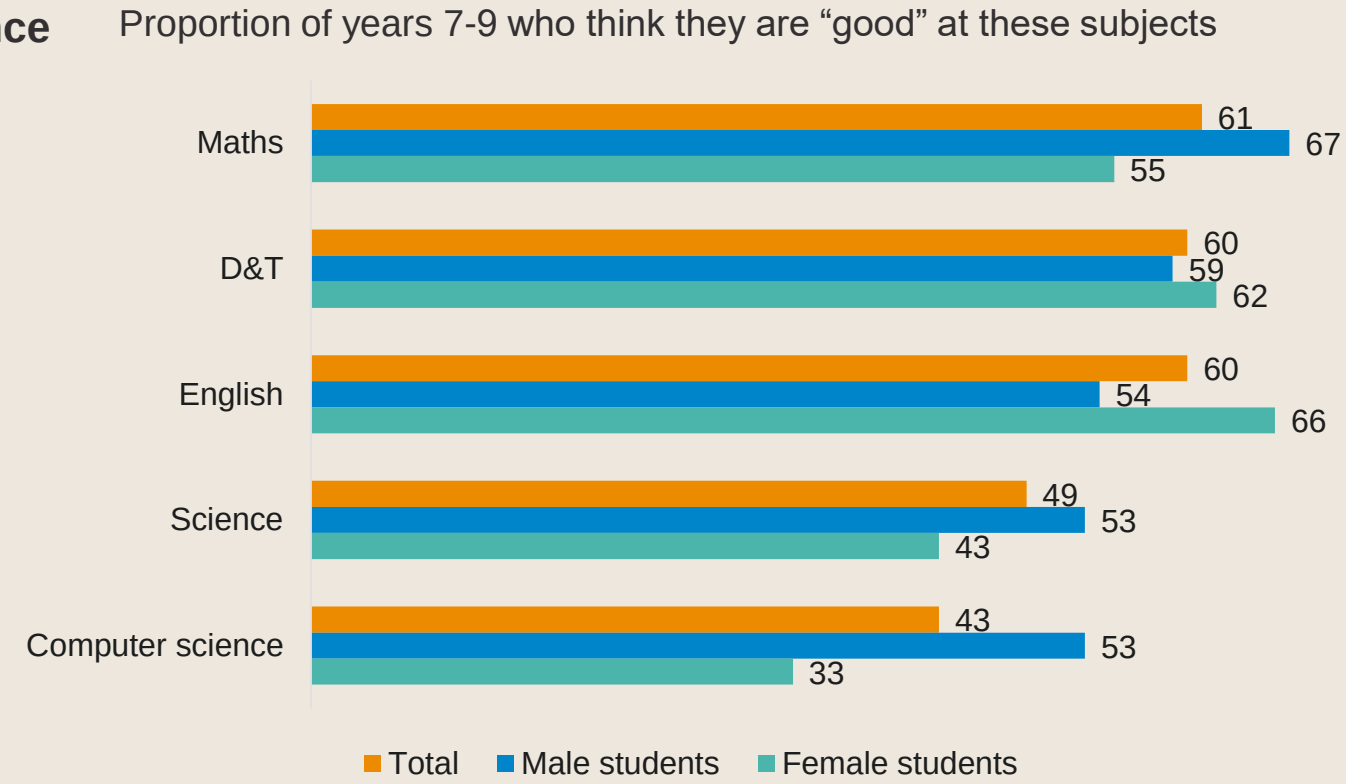

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Key trends in science education:
Challenges

Gender and socio-economic disparities persist

- Interest
- Enjoyment
- Confidence
- Science and engineering "for me"
- Likelihood to study
- Career aspirations

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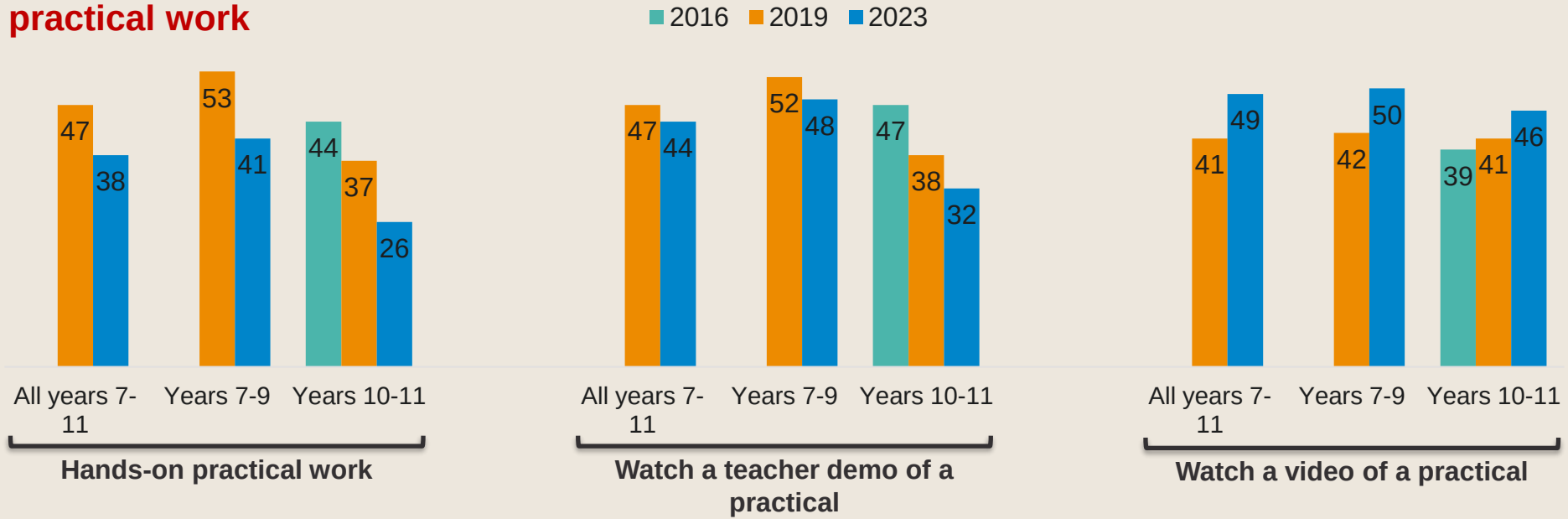
Key trends in science education:
Curriculum and practical work

Proportion of students participating in practical science at least once a format, by type and year group.



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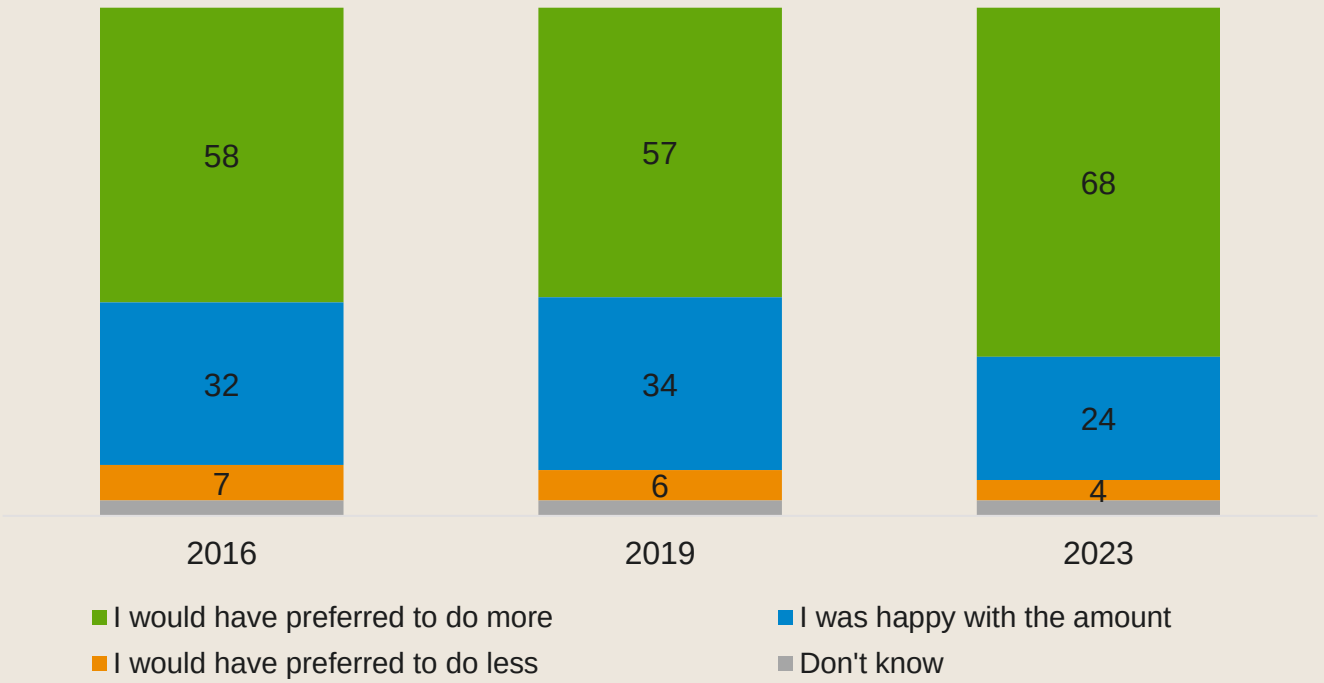
Key trends in science education:
Curriculum and practical work

GCSE students (years 10-11) and appetite for more practical science



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Students' engagement with science

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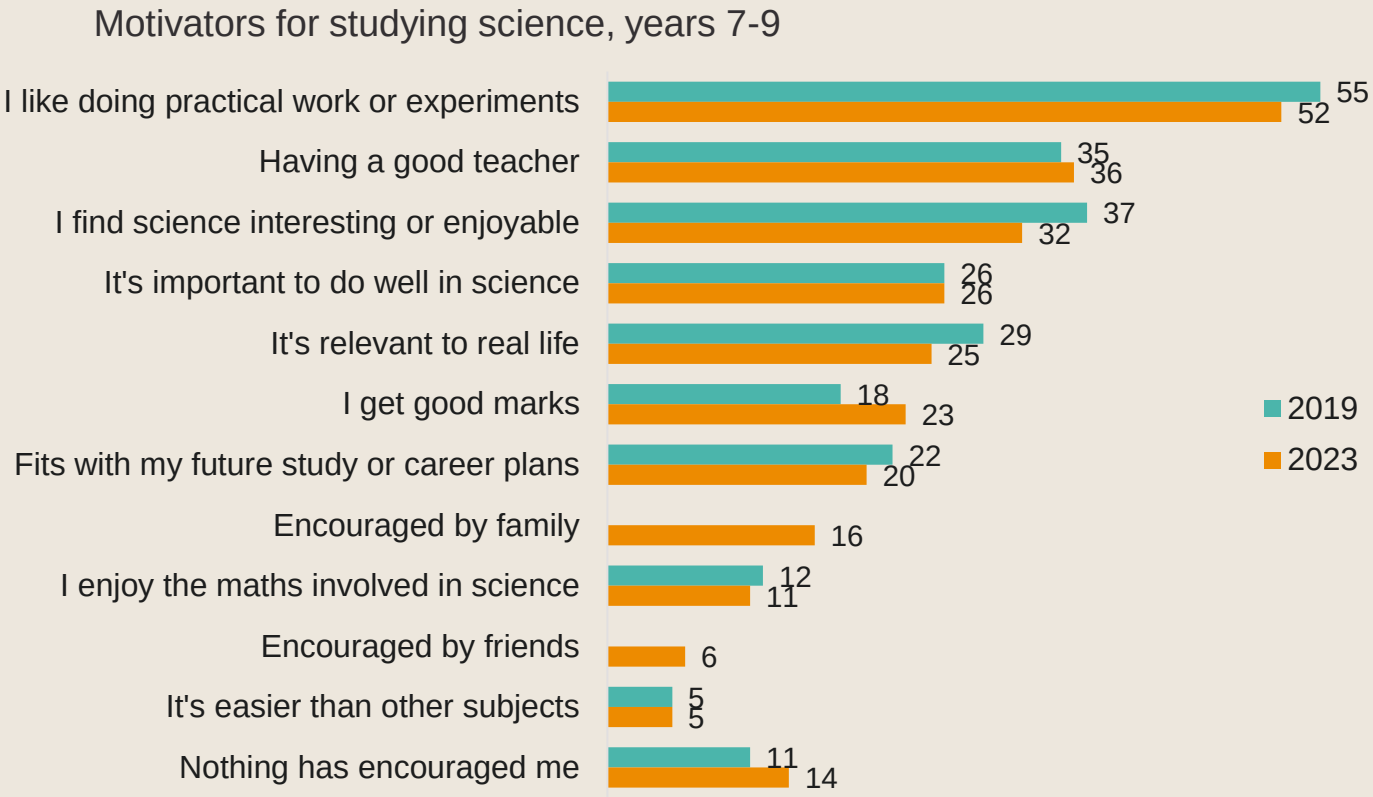
Deeper dive:
Students' engagement with science



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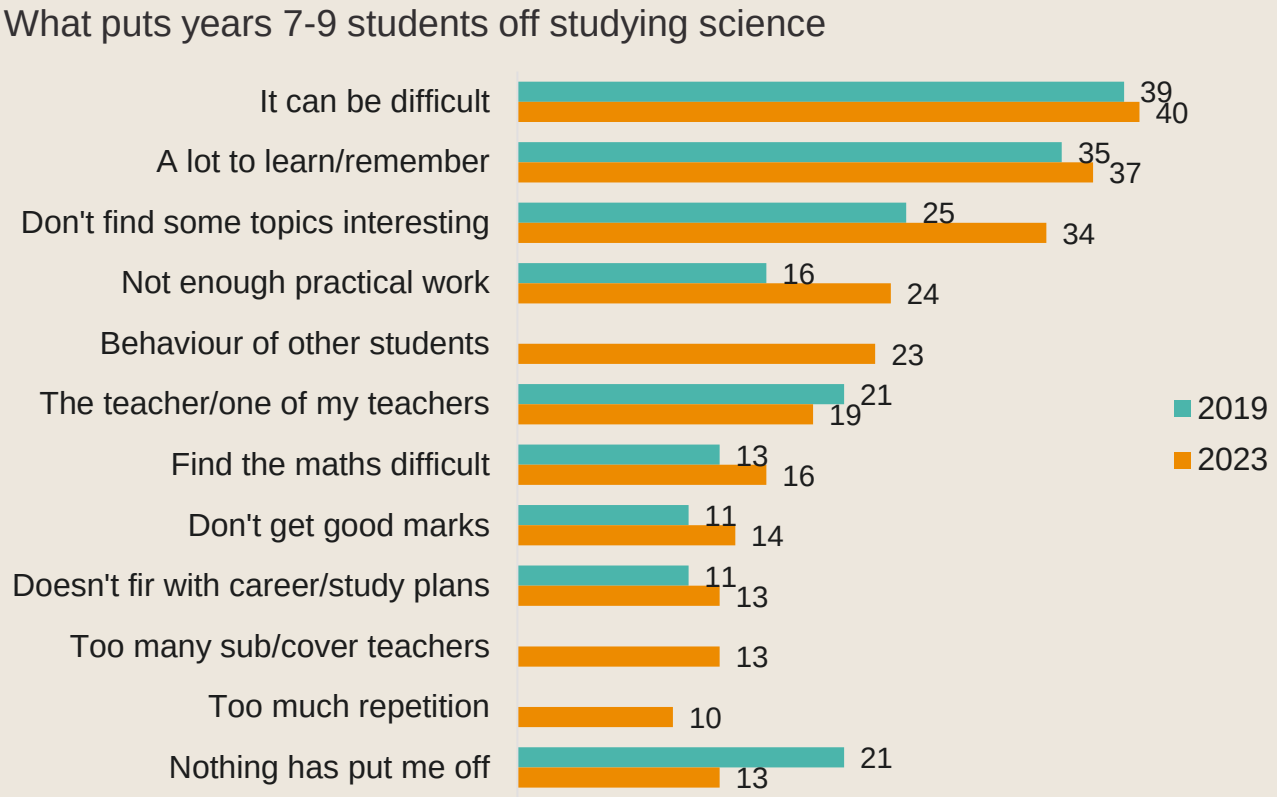

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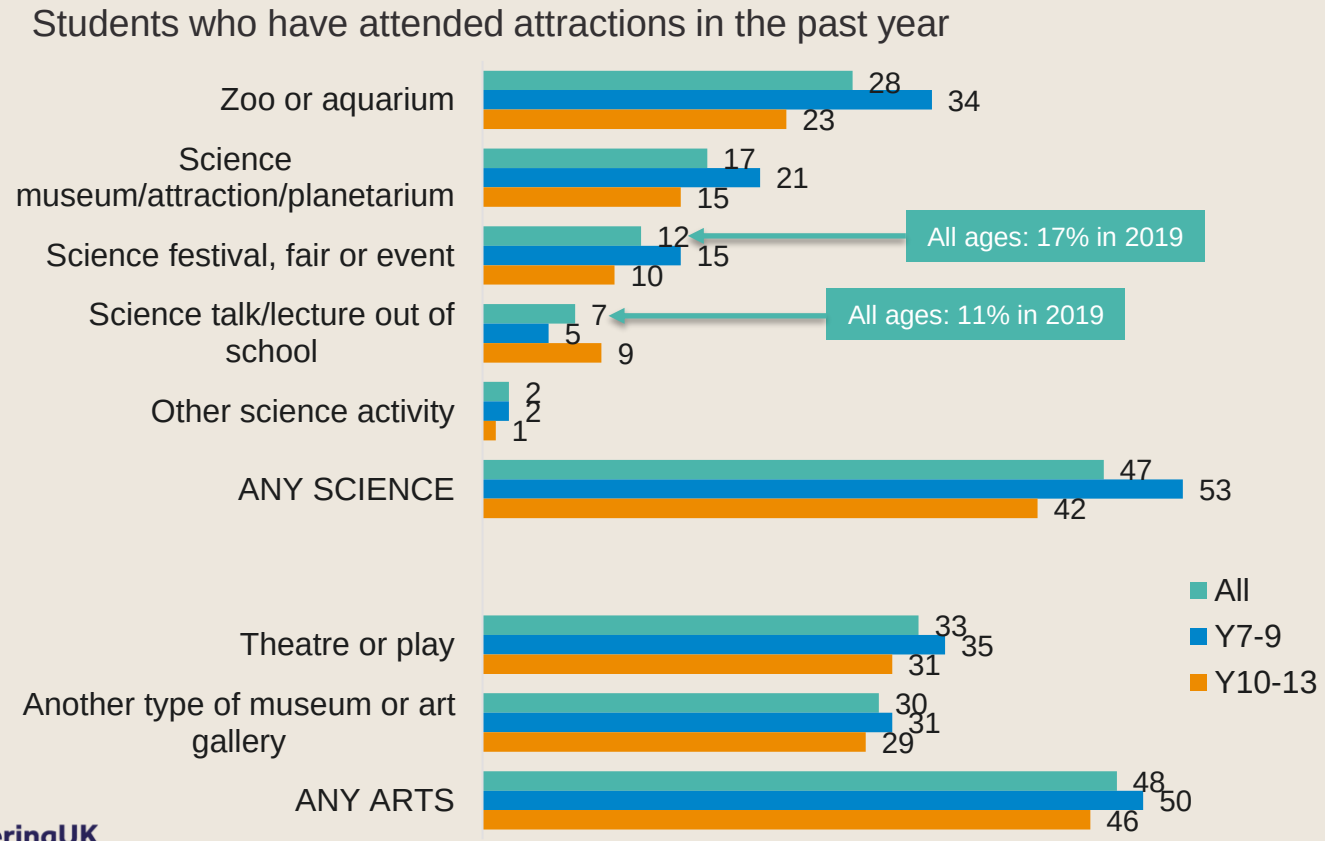

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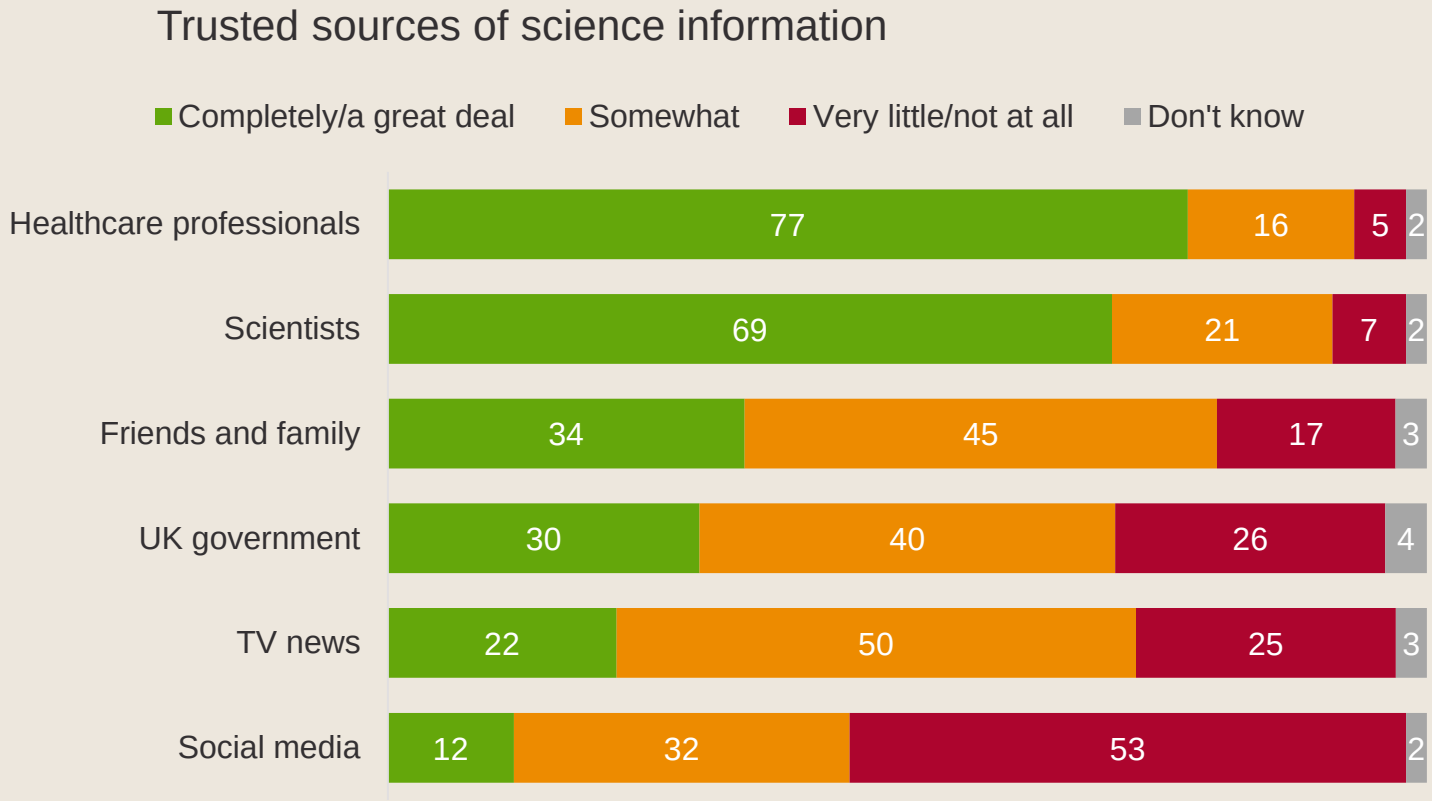

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Diversity and equity in STEM

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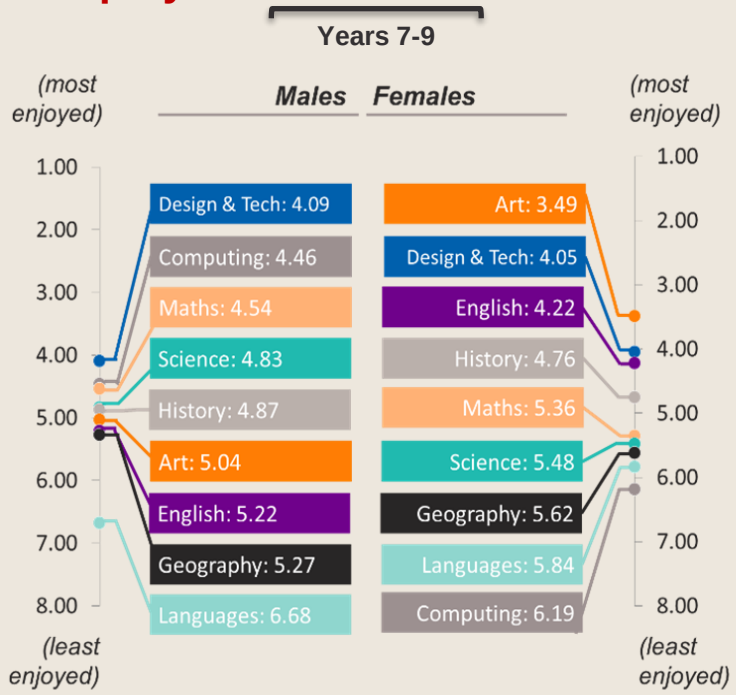
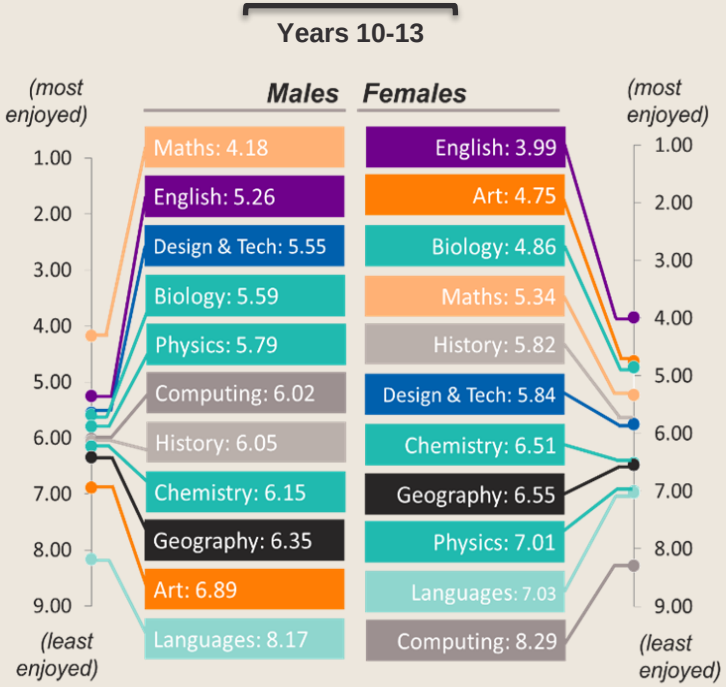
Deeper dive:
Diversity and equity in STEM

Gender imbalances: difference in subject enjoyment





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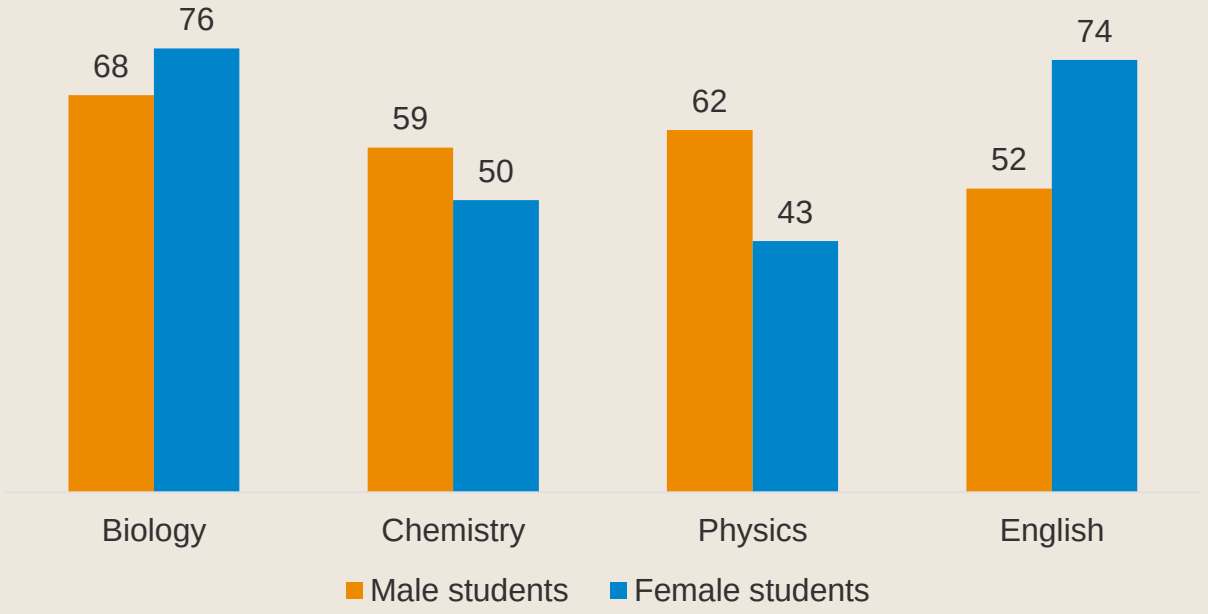
Deeper dive:
Diversity and equity in STEM

Gender imbalances: differences in science subject interest, years 10-13



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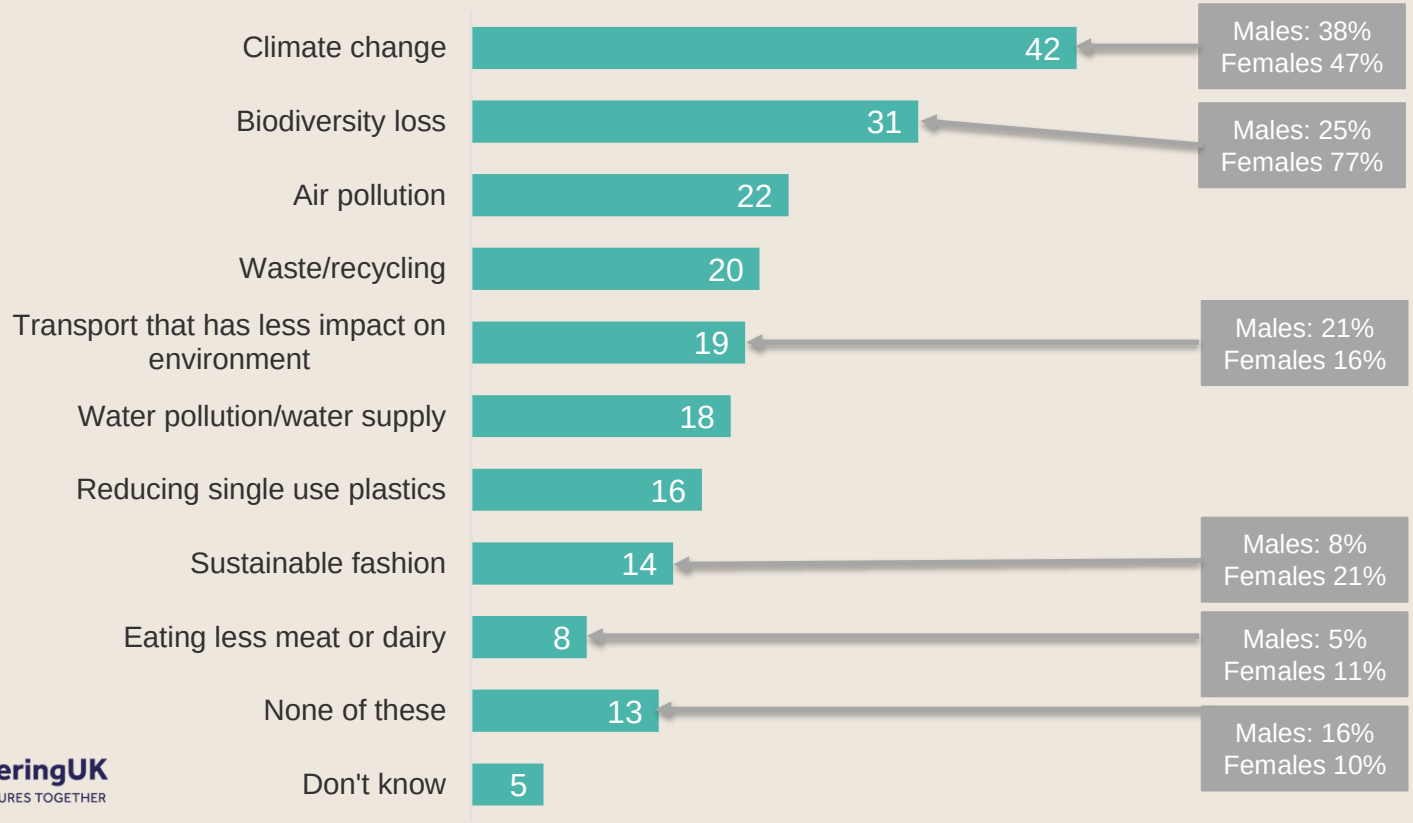
Deeper dive:
Diversity and equity in STEM

Gender imbalances: Interest in issues related to the environment



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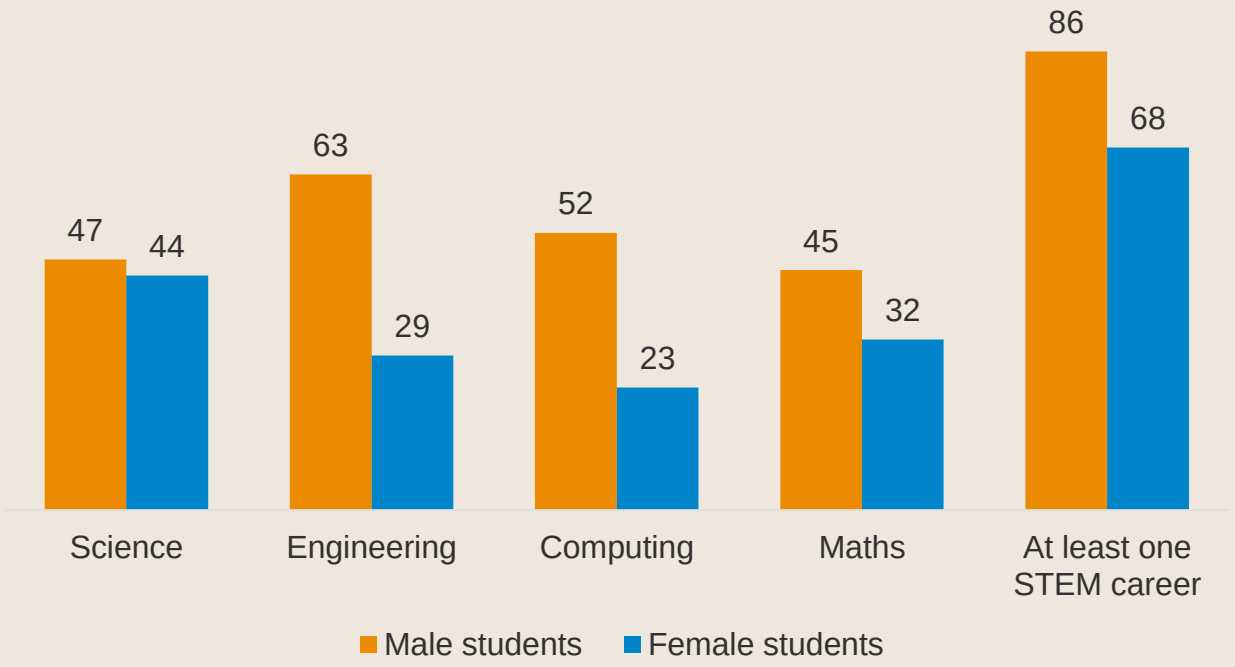
Deeper dive:
Diversity and equity in STEM

Gender imbalances: difference in interest in STEM careers



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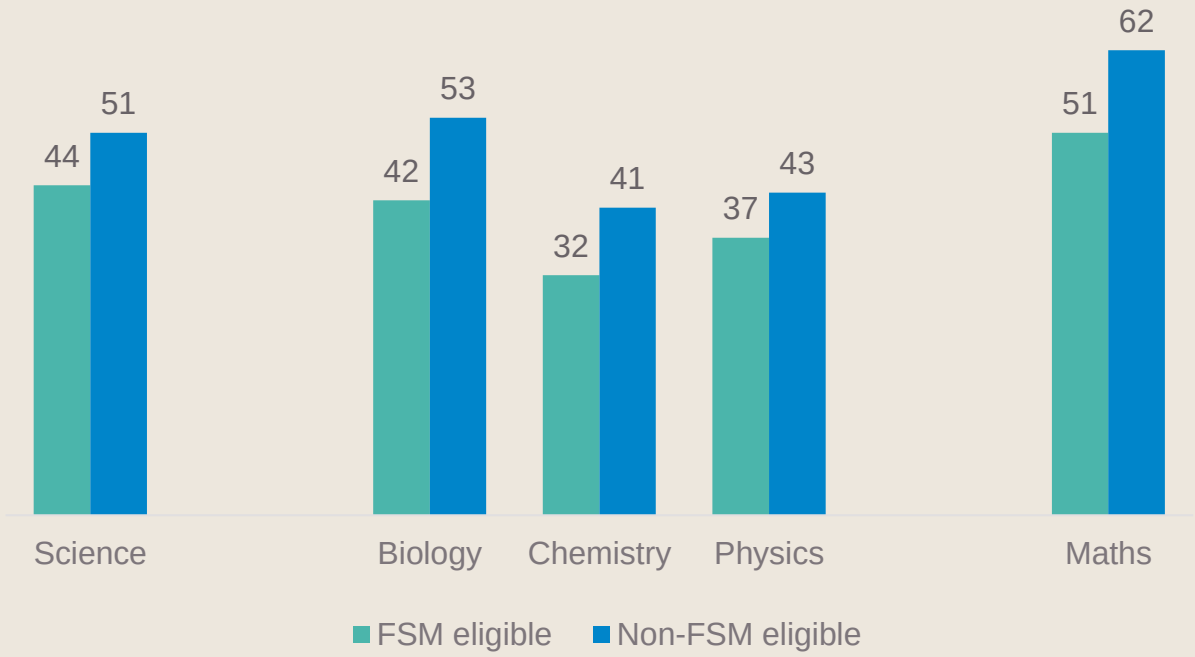
Deeper dive:
Diversity and equity in STEM

Socio-economic disparities: confidence in STEM subjects



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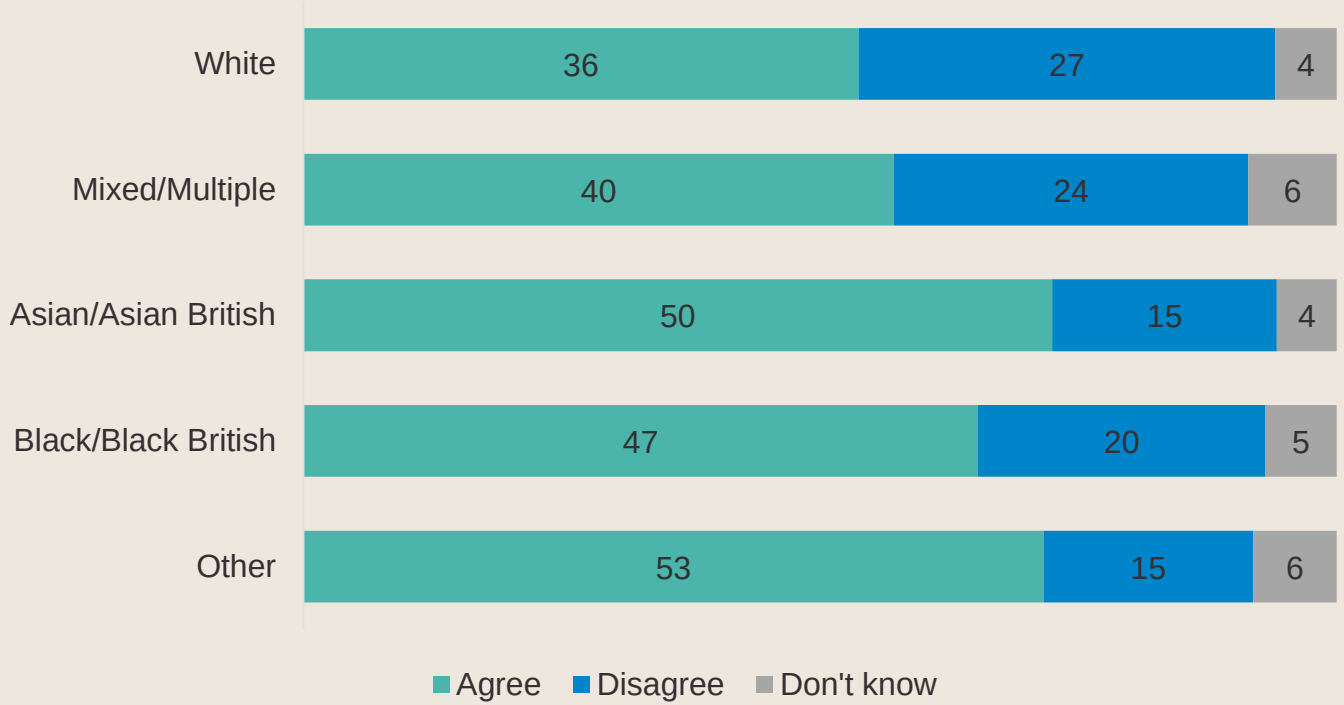
Deeper dive:
Diversity and equity in STEM

Ethnicity differences: Science as ‘suitable for someone like me’



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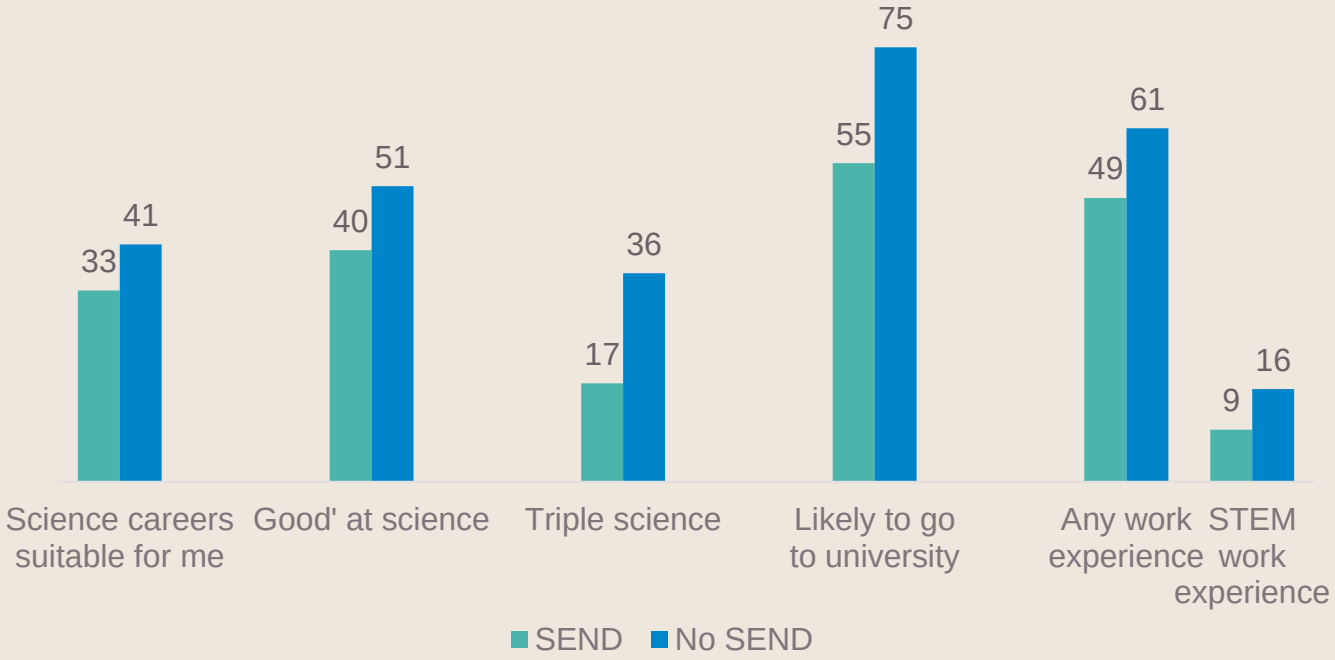
Deeper dive:
Diversity and equity in STEM

SEND barriers: no less interest in science than other students, but more likely to face barriers



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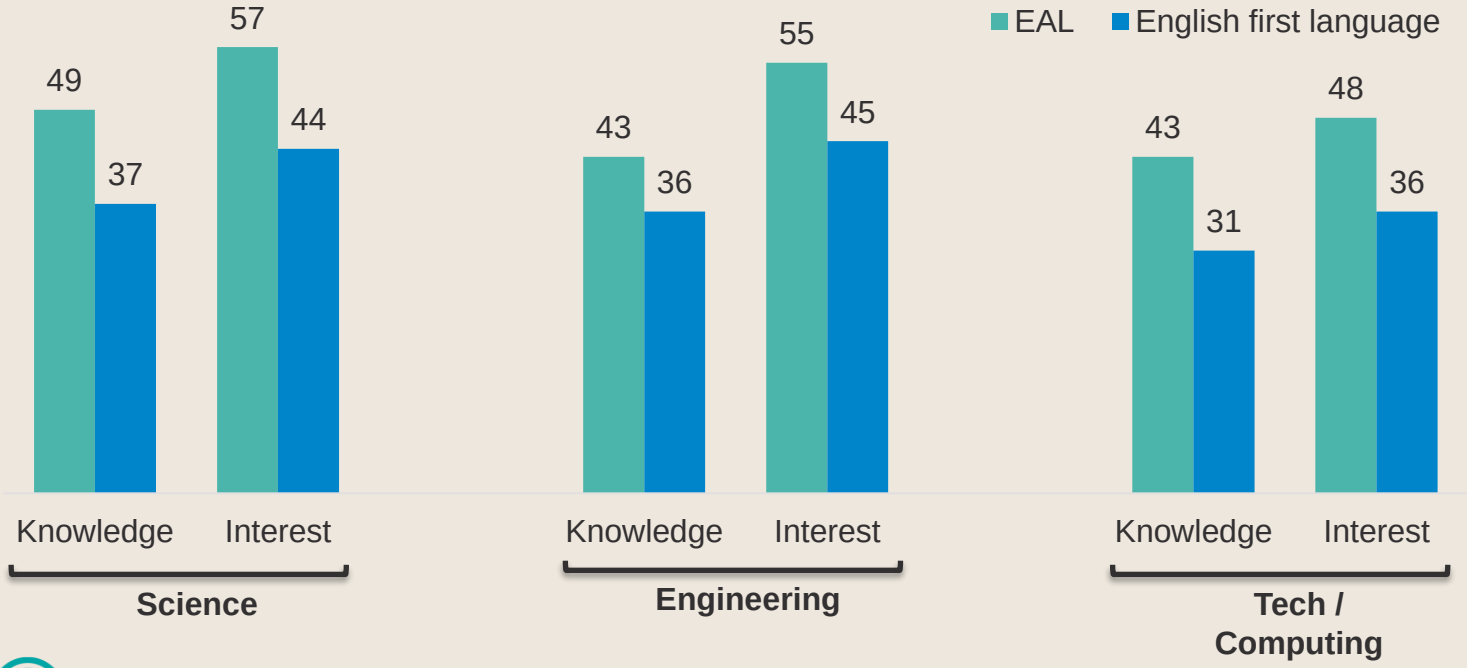
Deeper dive:
Diversity and equity in STEM

English as a second language – more likely to be interested in science and have STEM career aspirations



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Practical science

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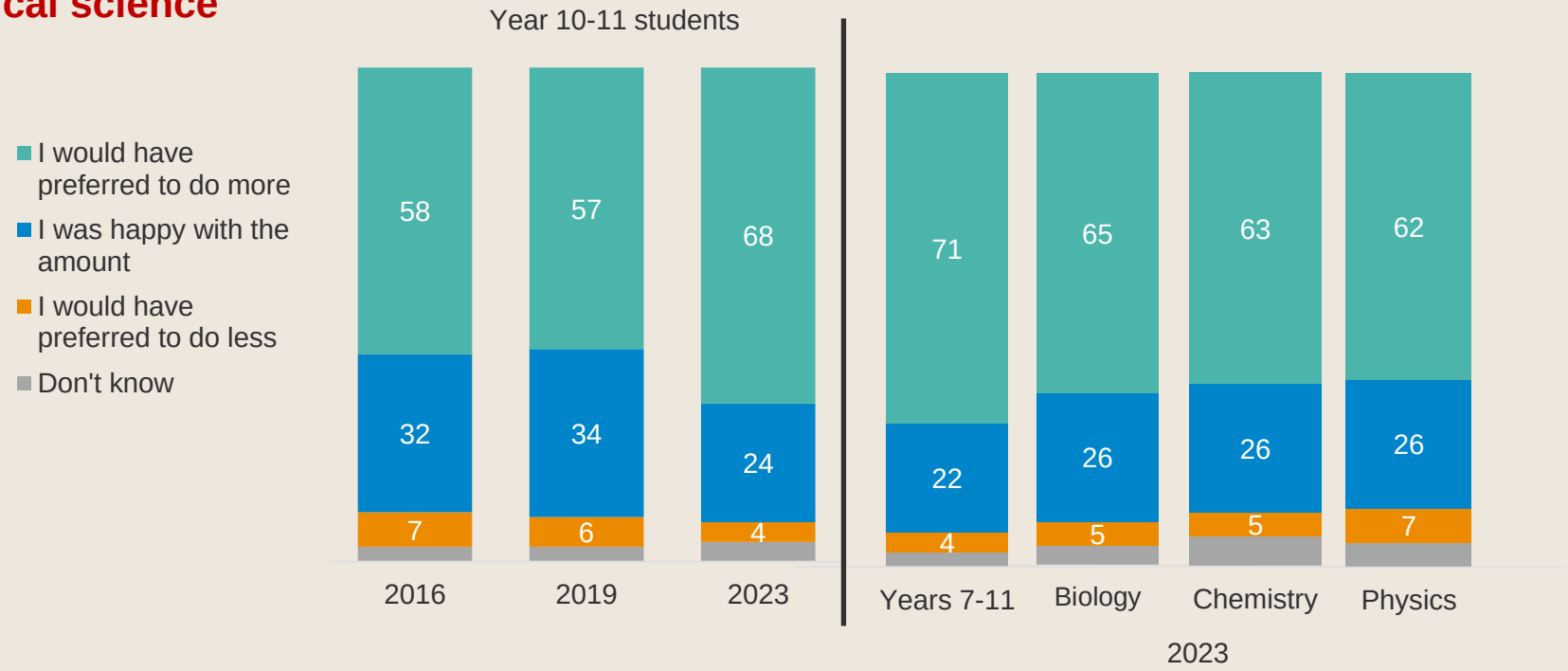
Deeper dive:
Practical science

Desire to do more practical work (%)



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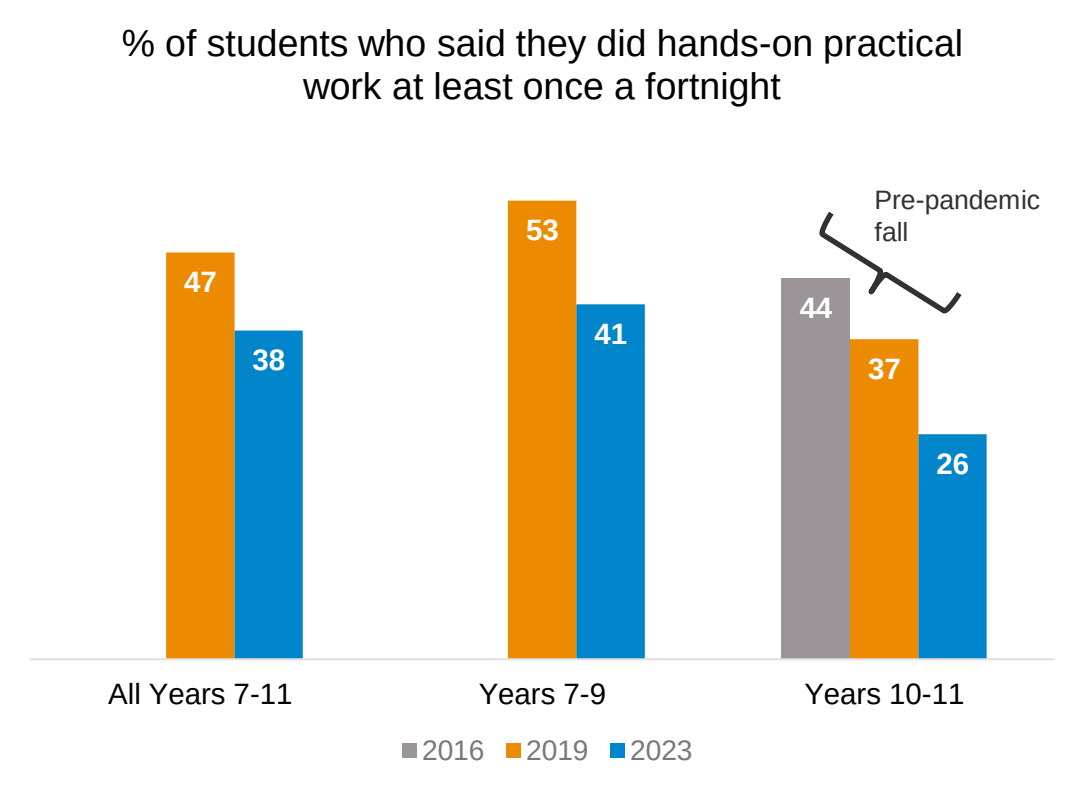

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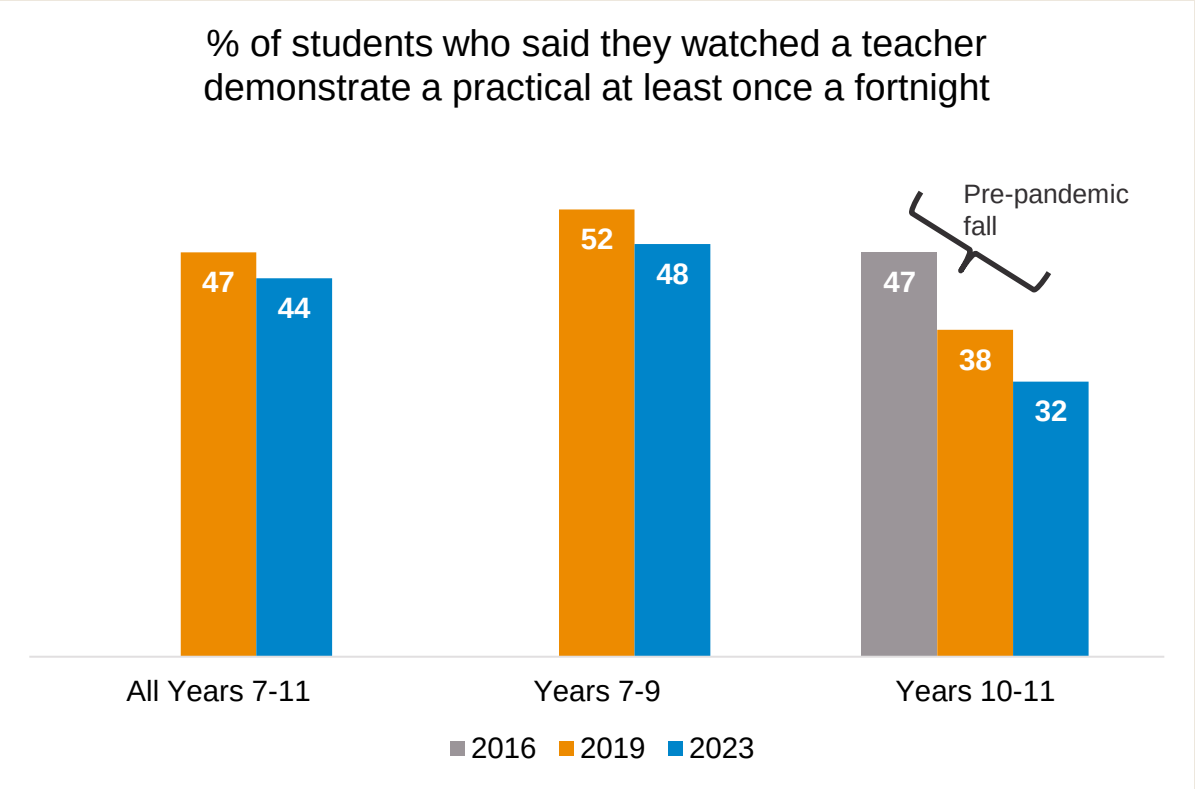

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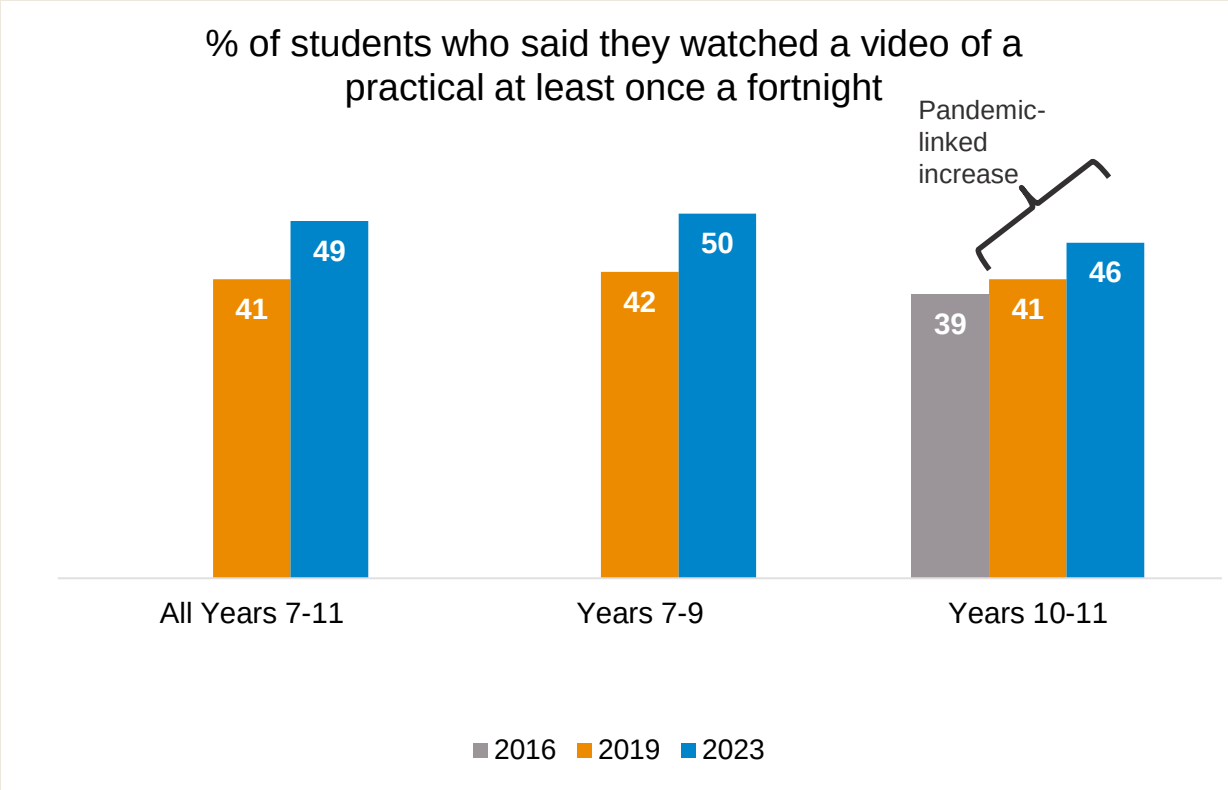

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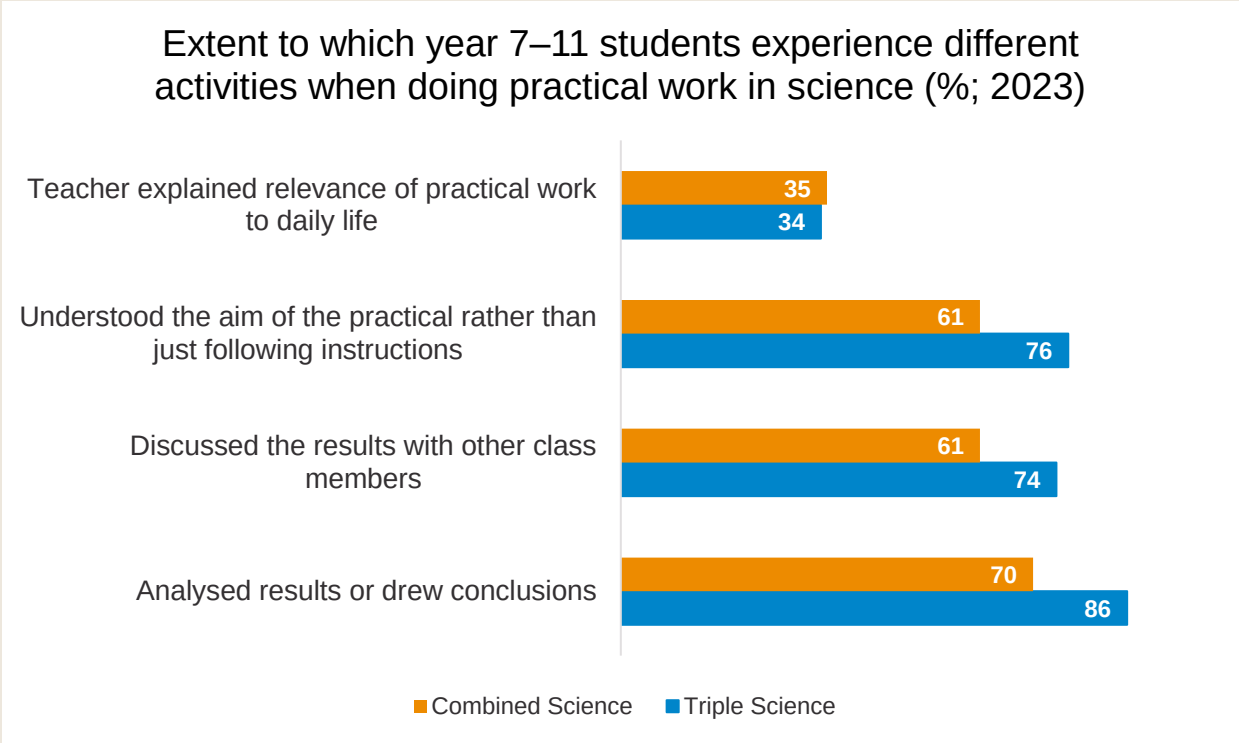

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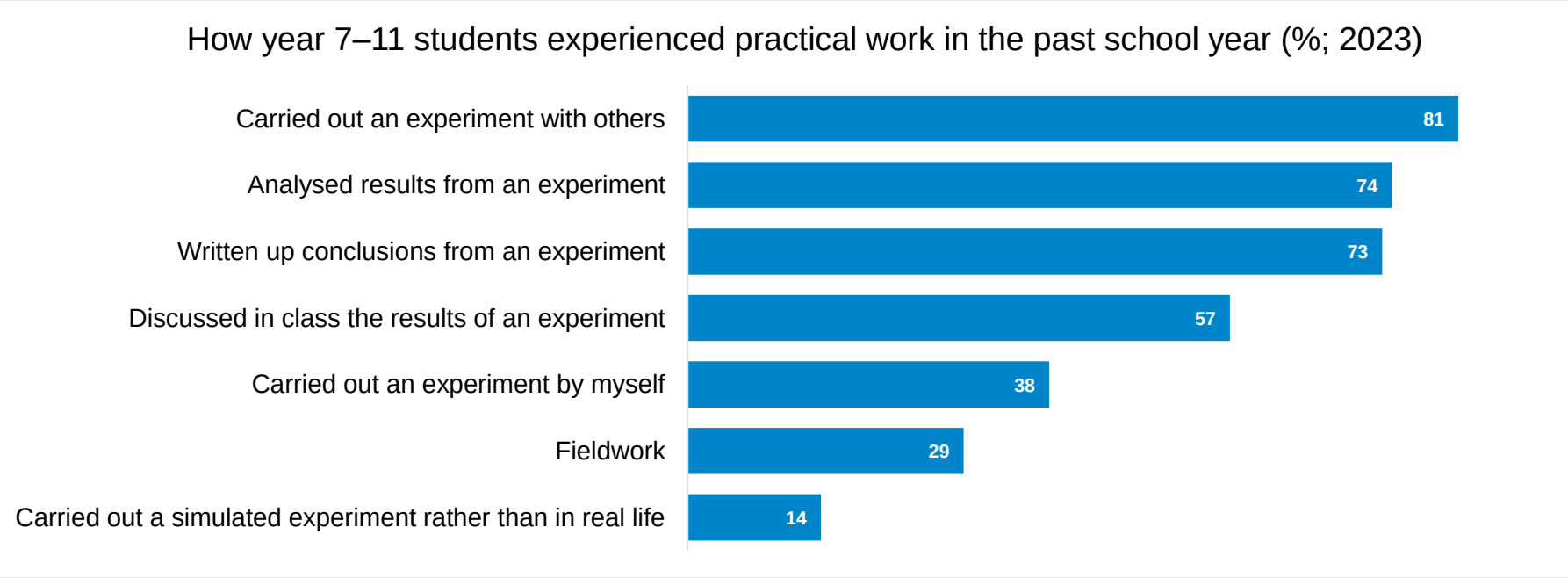

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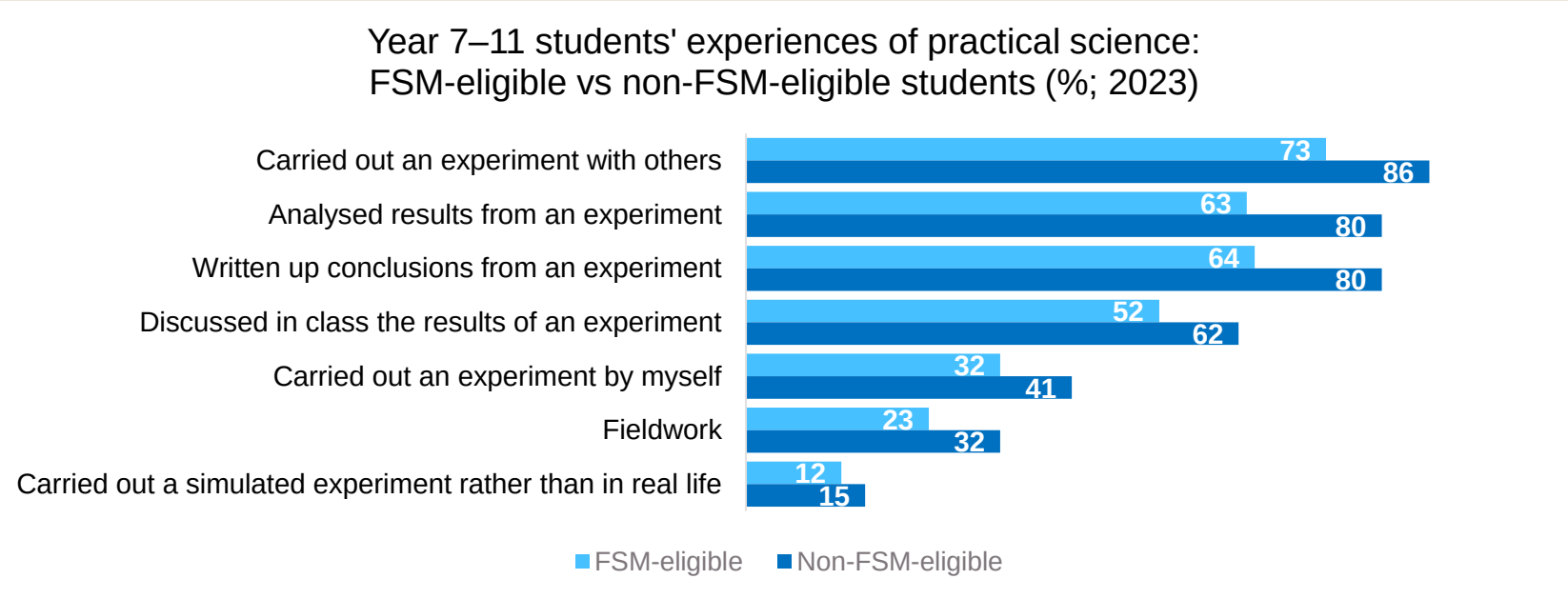

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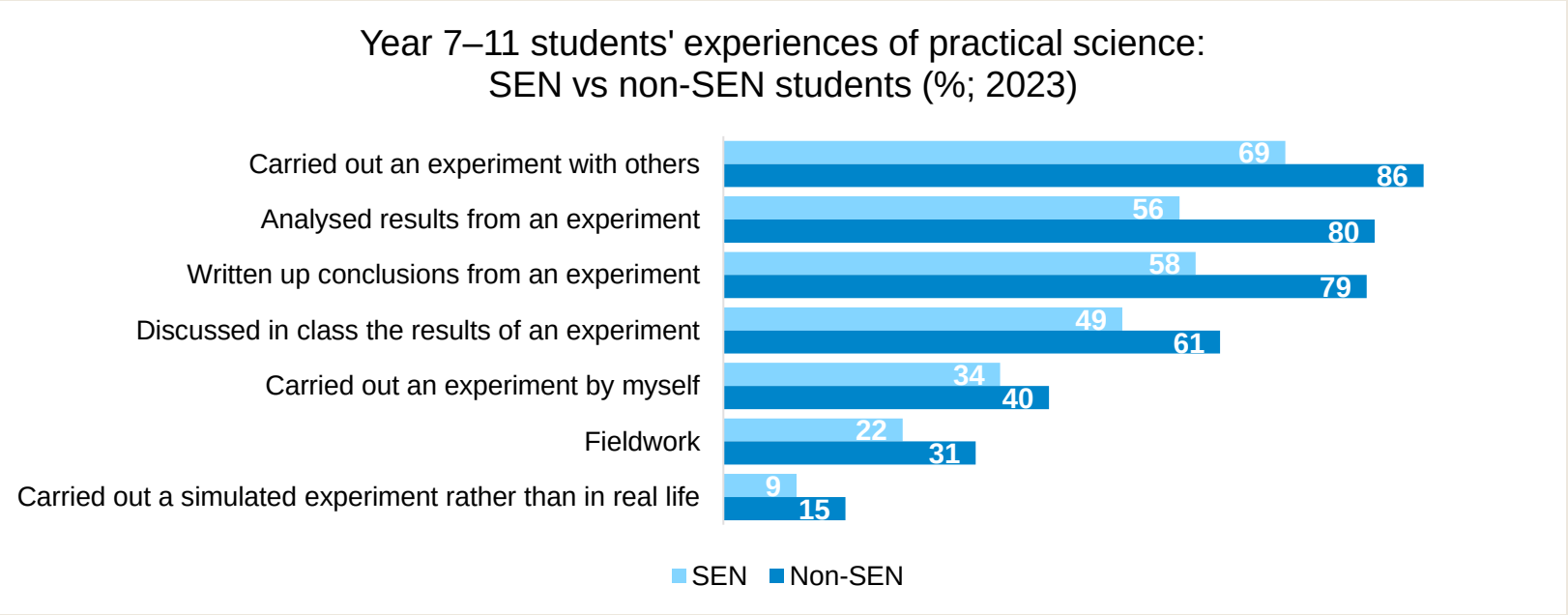

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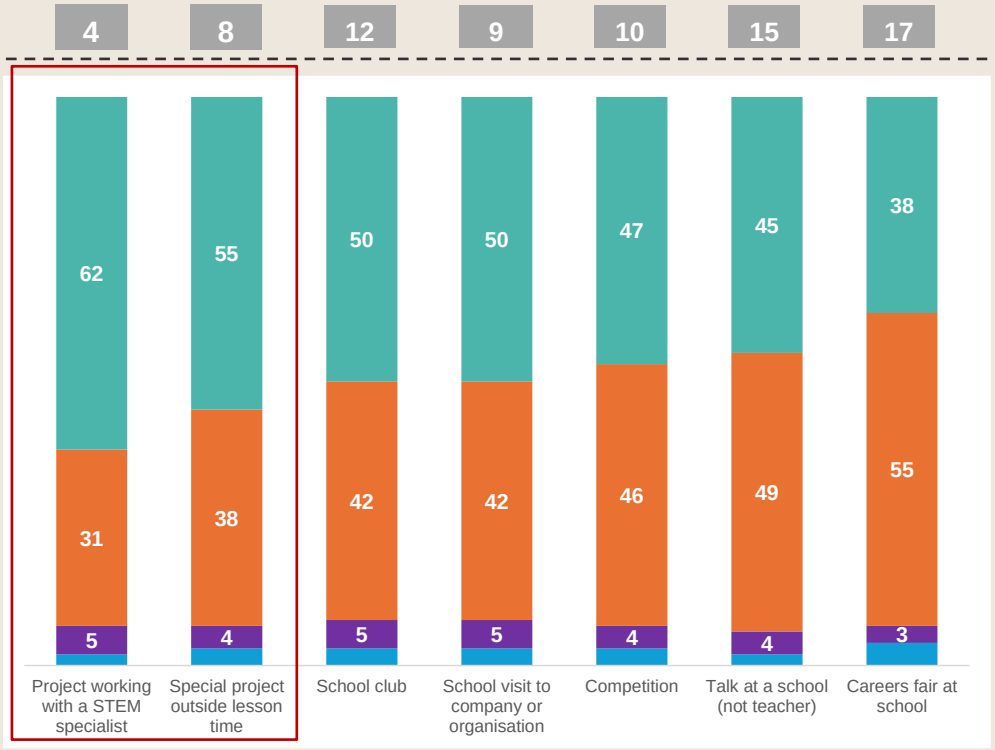
Engagement in **extracurricular** STEM activities

Deeper dive:
Practical science



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STEM pathways and career aspirations

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Deeper dive:
STEM pathways and career aspirations

Intention to learn science beyond GCSE

	2019	2023
Year 7	70%	64%
Year 8	64%	65%
Year 9	55%	59%

A-level subject choices

2023	Only STEM	Only non-STEM	Mixed
Years 11–13	14%	43%	42%

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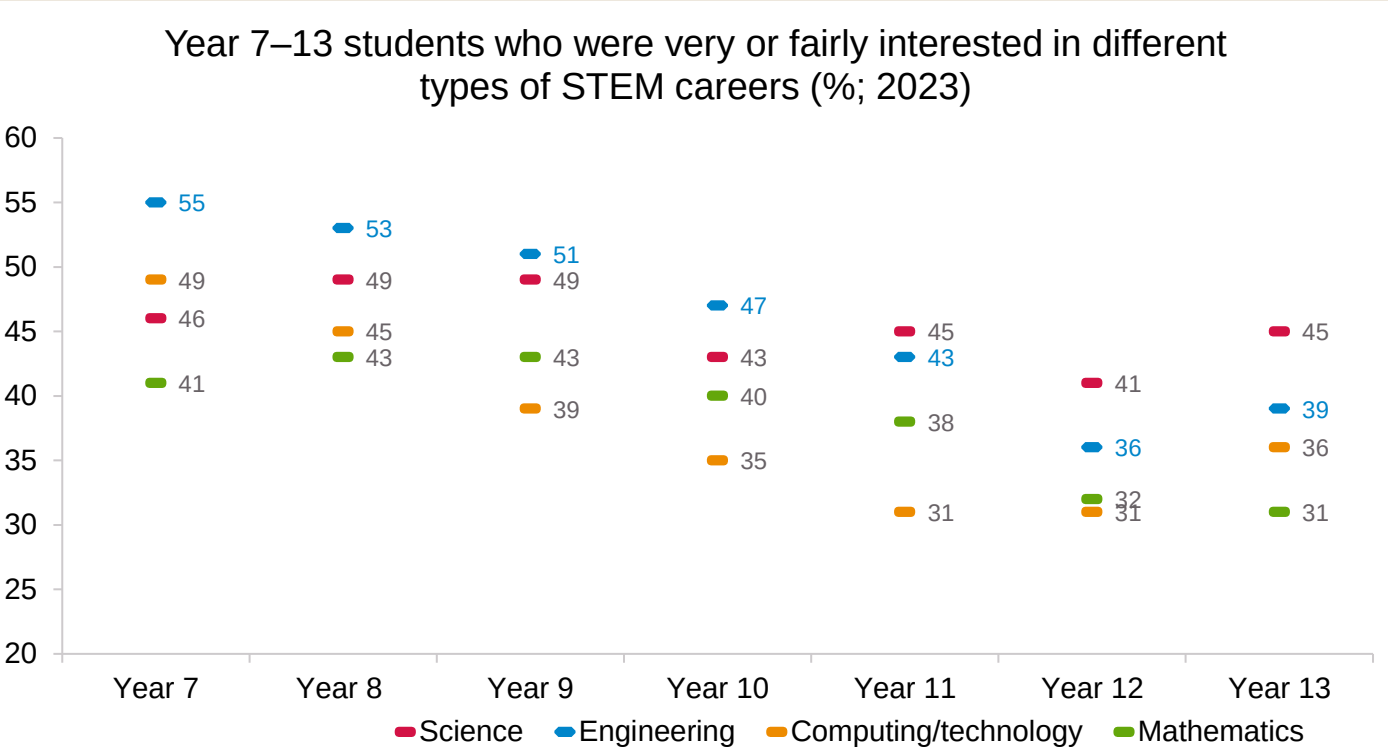
Deeper dive:
STEM pathways and career aspirations



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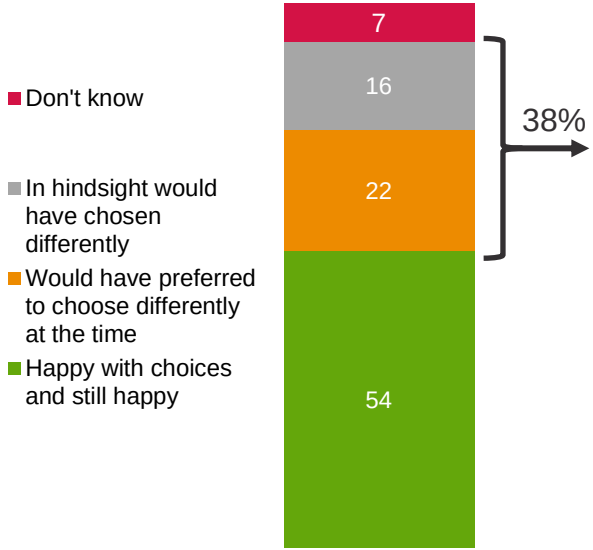
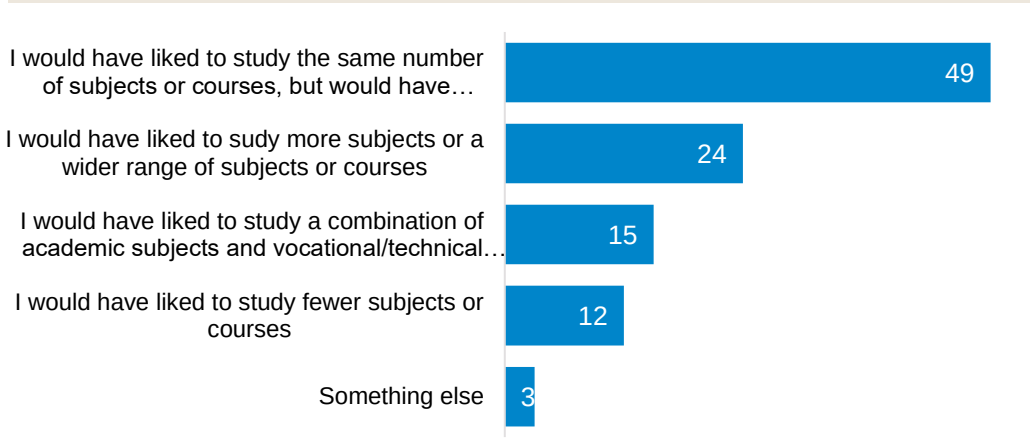
Deeper dive:
STEM pathways and career aspirations

Extent to which year 12–13 students were happy with their post-16 choices (%; 2023)





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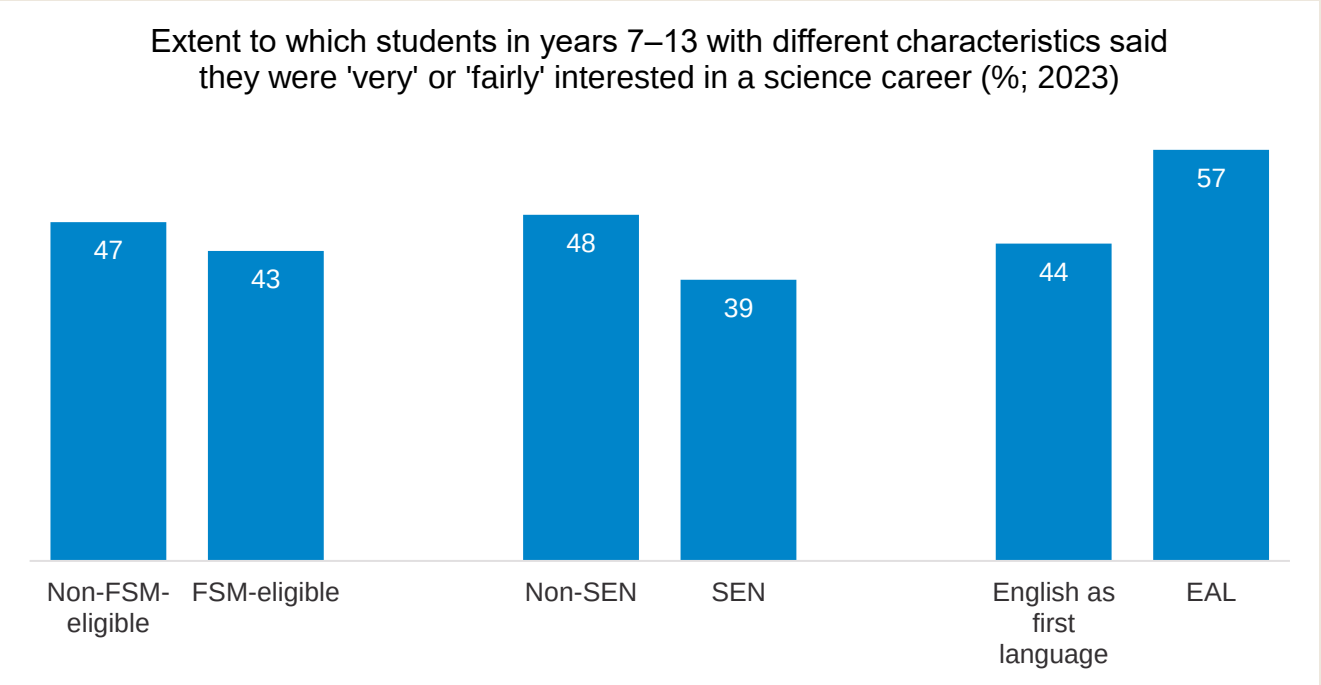

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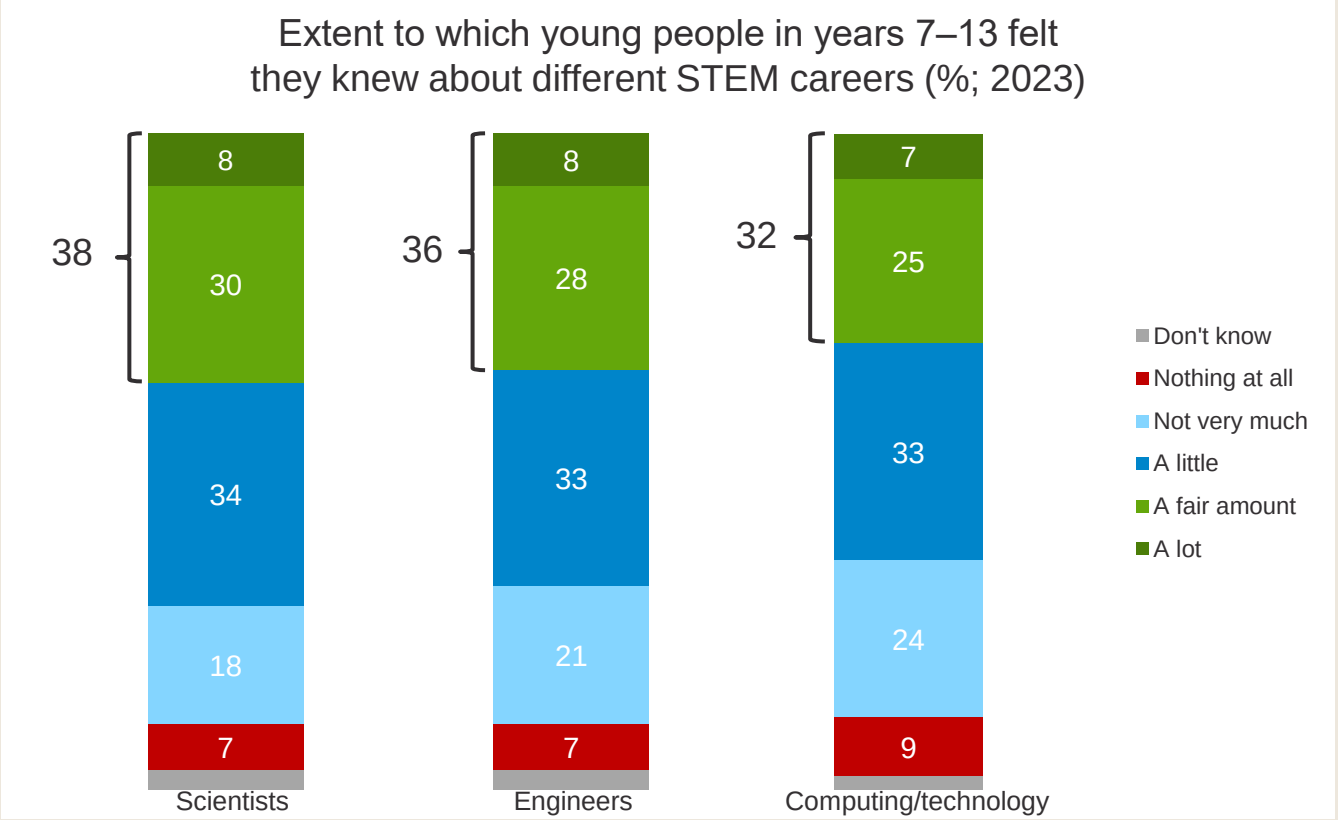

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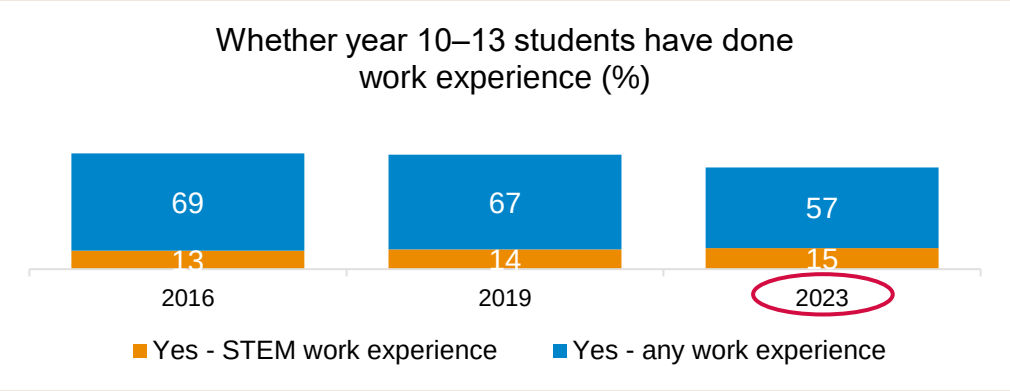

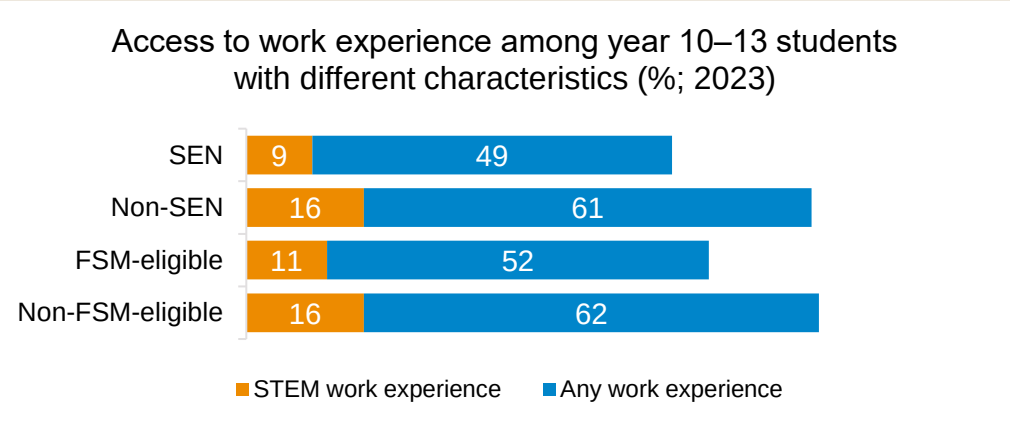

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Why the Science Education Tracker matters

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Why the Tracker matters:
A sign of trouble ahead

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What needs to change

What needs to change

Revamp the science curriculum ensuring it has a greater focus on practical learning and relevance to students

- Reduce content overload to allow deeper engagement with key scientific concepts
- Bring the subject to life through real world applications
- Promote hands-on practical science for deeper understanding of key concepts, to inspire choices around future STEM career paths and to provide experiences of how science is done.
- Integrate climate change, sustainability, and biodiversity topics throughout the curriculum to link science learning with pressing global challenges.
- Foster interdisciplinary approaches by linking science education to mathematics, computing, and engineering to prepare students for modern STEM careers.

What needs to change

Reform science assessments to encourage inquiry-based learning and applied skills

- Invest in innovation in assessment that extends beyond knowledge recall to incorporate methods that promote students' longer -term scientific capabilities such as problem-solving, practical and inquiry-based learning skills, and their ability to apply their knowledge to unfamiliar contexts.
- Introduce competency-based assessments in STEM subjects, ensuring students can demonstrate understanding through experimentation, collaborative project work, and the application to real-world settings.
- Address the inequities created by the existing triple and combined science pathways, to ensure equitable access to a rigorous science education and STEM pathways post-16.

What needs to change

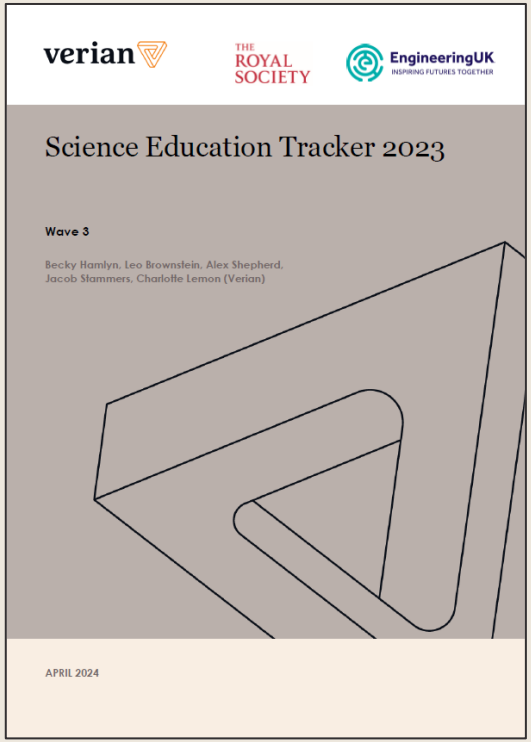
Recognise teachers' professionalism

- Invest deeply and sustainably over the long-term in subject-specific professional development for STEM teachers.
- Introduce longer-term incentives, such as salary enhancements and retention bonuses, to attract more graduates into science, mathematics and computing teaching, particularly in disadvantaged areas, and retain more qualified teachers of these subjects in the profession across the country.
- Endorse at the highest level the vital importance of (science) teachers' professional learning, including seeking through the inspection process an inventory of the type of CPD undertaken by schools.

What needs to change

Expand access to high-quality STEM work experience and careers guidance

- Mandate and support work experience opportunities in STEM, ensuring equitable access for students from lower-income backgrounds.
- Strengthen partnerships between schools, universities and industry to provide students with real-world exposure to STEM careers.
- Embed careers education within the STEM curriculum to showcase diverse career paths and demystify the sector, particularly for underrepresented groups such as girls and students from disadvantaged backgrounds.



Comments?

Questions?

Follow-up?

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