

POST-ELECTION BRIEFING: IMPROVING PUBLIC UNDERSTANDING OF STATISTICS AND DATA

RSS manifesto ask

A new approach to mathematics education with a more fulfilling curriculum placing a greater emphasis on data. Alternative methods of assessment should be explored including considering whether non-examination assessments might be appropriate.

Summary

There are a range of challenges with the current curriculum, including students not being equipped with the skills they need to navigate daily life or for the world of work. Many students are not enjoying learning maths, statistics, and data science, and are not seeing the useful applications of these disciplines. The curriculum currently focuses on dated examples and manual calculations rather than engaging, relevant examples and data – when knowing how to interpret and work with data from the youngest years of life is key to navigating and thriving in this data-driven era.

We discuss these challenges in our [note on statistics and data in the curriculum](#) (2023) and have recently published recommendations on statistics and data in the UK curriculum. We recommend incorporating real-world, relevant, engaging examples in the curriculum, and increasing the focus on data, statistical thinking, and critical evaluation. We propose that non-examination assessment – ie project- or coursework – should be considered, as statistics is a practical subject and this may better allow students to develop and demonstrate statistical thinking.

What's the problem?

The current system is not equipping students with relevant skills – citizens face a data deluge and need to be able to interpret data, work with AI and critically evaluate health, climate and political claims (among others) in order to navigate daily life, be informed citizens and thrive in the world of work.

Many students are not enjoying studying maths, statistics and data science, and are not realising the range of pertinent applications that these subjects can offer. The curriculum uses dated and often unstimulating examples and due to the quantity of content to be covered in the curriculum, there is little room for exploration for students to learn within topics of interest to them. There is an overly strong focus on manual calculations and not enough focus on skills relevant to our current era, for example the investigative/statistical cycle (planning and answering questions using data).

Assessment does not currently reflect the practical nature of statistics, and the current exam-based assessment restricts the types of skills tested and impedes students' ability to demonstrate investigative skills that may be better assessed through project- or coursework.

Current assessment does not capture specific skills (for example, it is possible to pass Maths GCSE by skipping many statistics questions), meaning that pupils cannot evidence their specific skills to future employers. Limitless resits of GCSE Maths for students who have not passed ('the forgotten

third') only demotivate students further and widen inequalities – this is not a recipe for success to equip this population with the skills they need to navigate life. Current assessment practices place large amounts of stress on pupils, leaving little time for teachers and students to explore areas of interest.

We set out further detail on the challenges in the education system in our [thinking about statistics and data in the curriculum](#) (originally published in response to then-Prime Minister Rishi Sunak's 'Maths to 18' proposals). At the RSS, a key goal of ours is to [support public understanding and engagement](#), including through education, by advocating to improve statistics and data content across the curriculum and considering the best methods by which to assess these subjects.

How to fix it

We have recently published a set of recommendations on statistics and data within the curriculum. We recommend that real-world, relevant examples are used to engage students. We call for more emphasis on interpreting data, for example allowing students to answer questions using real-world interesting datasets (eg on gender inequality, migration, climate change, social media, sports, etc). Many datasets are freely available online and are interactive. The importance of relevant, real-world understanding of data and maths is also reflected in the Royal Society's [A Manifesto for Science](#) and the Council for the Mathematical Sciences' [Maths Manifesto](#).

We propose several options to improve the teaching of statistics and data within the current curriculum structure, including separating out statistics and data from maths, or increasing the focus on statistics and data within the maths stream. Our preferred option includes providing students with a choice at GCSE – so students could either take two GCSEs (one in maths and one in statistics and data) or one dual GCSE, composed of proportionate components of maths and statistics/data. We also advocate for the joining-up of statistics and data across different disciplines (eg geography, biology, psychology, business studies etc).

We believe that it is necessary to [first consider the skills](#) we want children to leave school with before considering how this translates to interesting topics, coherent content, engaging delivery and assessment of relevant skills. We should assess the skills we value; not value the skills we happen to be assessing. Incorporating coursework into assessment practices could allow for better assessment of practical statistical and data skills, allowing students to plan and answer questions of interest, and may better prepare students for future real-world projects. However, care must be taken to tackle issues including bias in teacher assessment, varying levels of parent or teacher support (which can exacerbate inequalities) and plagiarism, especially given the widespread popularity of AI and chatbots.

We welcome the recently-launched [Curriculum and Assessment Review](#) and the opportunity to improve the teaching and assessment of maths, statistics and data. In [our letter to then-Shadow Secretary of State for Education Bridget Phillipson](#) we also welcomed her focus on the importance of real-world, relevant maths education, and the importance of looking to improve maths education from an early age (pre-16).

