

## The key recommendations for the UK statistics curriculum

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The Royal Statistical Society (RSS) has a core focus on [supporting public understanding and engagement](#) around statistics and data, working to ensure that people – of all ages – can understand the data and statistics around them and are empowered to meaningfully engage with them.

As part of this, the RSS [Education Policy Advisory Group \(EPAG\)](#) seeks to influence the education curriculum and education policy to improve the quality of the teaching, learning and assessment of statistics and data.

Data and statistics are ubiquitous, and statistical and data literacy is essential to navigate everyday life as well as in a broad range of job and career pathways. School education must equip young people with the skills to navigate and thrive in the 21<sup>st</sup> century data landscape. Here, we set out key recommendations to improve statistics and data education in the UK curriculum. Many of our recommendations are UK-wide, while those relating to the GCSE and A-level system are relevant for England, Wales and Northern Ireland. You can read our full paper, with more detail, [here](#).

### The need

Current challenges in the UK education system include students not leaving school with the statistical and data skills they need to navigate daily life; students not enjoying statistics and statistics having a negative reputation; and challenges around assessment – which does not reflect the practical nature of the subject. We have set out more information on the challenges we see in the system and our recommendations – about the mathematics education system more broadly – in our [response to the government's 2023 'Maths to 18' proposals](#).

### Improving the curriculum

Looking across the globe, other countries have been recognised for their approaches to statistics education, which emphasise engaging real-world applications, data analysis, and problem-solving. Two examples of this include the USA and New Zealand (NZ). While acknowledging structural and societal differences between these countries and the UK, in this work we use guidance documents from these countries (USA Guidelines for Assessment and Instruction in Statistics Education, [GAISE II, 2020](#) and [NZ curriculum refresh, 2023](#)) to make recommendations for the UK curriculum.

### Recommendations

1. A stronger emphasis on **real-world contexts**, with engaging and cultural examples, in both teaching and assessment. Teachers should be supported to provide interesting and relevant examples.
2. Increased focus on **statistical literacy skills** and the **investigative cycle** (also known as the Problem, Plan, Data, Analysis, Conclusion – PPDAC – cycle) and greater use of **information communication technologies** (computing, for example using visualisation software); less focus on manual calculations.
3. **Better connections** between statistics and all other disciplines in the teaching of statistical concepts, data collection and analysis.
4. **Assessment** should use engaging real-world topics and include more focus on the investigative cycle and statistical literacy skills. At mid-secondary level (age 14 and above) assessment should involve the production of statistical **reports** that involve the development of quantitative reasoning skills; AI assisted software could be explored to assist in the prevention of plagiarism and to enable this form of assessment to be adopted.

5. **Progression** in the statistics curriculum is patchy and statistics has a poor subject identity, often leaving young people feeling unprepared when encountering statistics at university or later in life. If statistics was taught as a separate discipline, this would allow for a coherent curriculum enabling progression and recognition of the discipline, as well as allowing the linking of statistics to other disciplines. This should start at the secondary level (age 11+). There are three ways this could be achieved within the GCSE system:
  - a. Mathematics and statistics are split and **taught as separate disciplines**, with statistics (and GCSE Statistics) being **compulsory**. Teachers from a range of disciplines could contribute to teaching statistics.
  - b. There is a **greater emphasis on statistical education within mathematics education** and GCSE Mathematics, including on the investigative cycle, statistical literacy and quantitative reasoning.
  - c. A third option combining elements of the former options and providing students **choice at GCSE level** – students could choose whether to take **two** separate GCSEs in mathematics and statistics (as in option a), or a **combined** GCSE (as in option b). This option has similarities to the double/triple science system and is the **RSS's preferred option**. We recognise that this requires wholesale curriculum reform – not a single change in isolation – to allow students to continue to study a breadth of topics at GCSE level. We hope that providing this choice of combined or separate GCSEs ensures that statistics is seen to have equal status with mathematics.
6. At **A-level** (age 16 to 18) the statistical elements within A-level Mathematics are procedural and formulaic. **Quantitative reasoning, using the PPDAC investigative cycle, and statistical literacy skills** – skills that are in demand for a range of careers as well as being necessary to navigate daily life – should be given more emphasis.