

Statistics Rationale

Maths is a compulsory subject at GCSE. It has long been seen as important, as it is used so much in everyday life and supports problem solving and logic. Within school, maths is used in other subjects too. Looking more closely at what is required in these other subjects, a couple, such as science and engineering use elements covered within the number topics in the maths GCSE course, but most use predominantly topics taught as part of the statistics strand.

The use of statistics ranges from interpreting tables and graphs, detailing and/or calculating averages or probabilities, through to using quartiles, Spearman's rank, histograms and standard deviation. The first are taught to all students, some of the later ones only to students sitting higher tier, others are not met unless the students sit GCSE Statistics or A-Level maths. This is too late to support students in the other subjects, which require that students are familiar with these aspects.

The number of subjects which use statistics is surprisingly large. Science, engineering, design and technology, computer science, food technology and business studies require it as would be expected, but it also contributes 10% to GCSE Citizenship, interpreting and analysing tables and graphs comes up in humanities subjects, but further the geography field work paper is predominantly statistical calculations and awareness. At GCSE, students even need an understanding of averages and probability to support their persuasive writing in English, and in media studies to a larger extent.

When you look at A-Level subjects, the list grows even longer and the depth of understanding required is even greater. In addition to all of those named above, psychology, sociology and sports science can be added.

To support these subjects, students meet blocks of statistics in maths across years 7 to 10. Starting with Averages and Probability in Year 7 and Graphs (drawing and interpreting) in Year 8, taught using the mastery approach. In Year 9, they meet harder graphs and calculations (such as cumulative frequency and box plots) and then in Year 10, the block covers the remaining topics required for GCSE statistics. This means that students have learnt, revised and applied statistics, in time for it to benefit their other subjects.

To further support this, a cross-curricular project is planned with geography. The maths team will deliver it at the end of year 8. The data and a selection of geography questions will be provided by geography, to be used as part of an investigation in maths. This will be in place by the academic year 2020-21. We will also review the timings of when we teach the blocks of statistics, once the transition to a three year key stage 3 is complete, so as to best support the other subjects.

Having entered students for GCSE Statistics first in 2019, we found that there was an additional benefit to students sitting the exam at the end of Year 10, namely that all students experienced an external exam, realised the work and revision required and were less apprehensive about what to expect at the end of Year 11. The whole cohort was entered for and all sat the exam. Students with anxiety and other mental health issues were generally shaky and needed support and encouragement prior to paper 1, but afterwards, all expressed relief that they had done it. All went in to paper 2.

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