



Department
for Education

Methodology for obtaining mean GCSE grades for English language and mathematics

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Methodology

This Schools White Paper sets a new ambition to “increase the national GCSE average grade in both English language and in maths from 4.5 in 2019¹ to 5 by 2030”.

This short methodology paper communicates the method we have used to derive this new measure. To calculate the average (mean) grade for either English language or mathematics for state-funded pupils in 2019, we used the following formula:

Formula

$$\text{Average (mean) grade} = \frac{\text{Sum total of numeric grades in the subject}}{\text{Number of KS4 pupils at state funded schools nationally}}$$

State-funded schools include academies, free schools, city technology colleges, further education colleges with provision for 14 to 16 year-olds and state-funded special schools. They exclude independent schools, independent special schools, non-maintained special schools, hospital schools, pupil referral units and alternative provision. Note that pupils achieving a U (ungraded) or not entering a relevant English or mathematics qualification by the end of key stage 4 are assigned a score of zero for that component; “no entry” grades are counted as achieving a zero for the purpose of deriving the average. This reflects the expectation that all pupils should study these subjects.²

How to calculate the 2019 average (mean) GCSE grade in English language and mathematics

Although DfE does not currently published average (mean) English language or mathematics grades as a headline measure, the 2019 figures can be derived from published data. Because of the way the published 2019 data is presented, it is a slightly cumbersome process to calculate these figures so for transparency we set out how to do this below.

The 2019 KS2 to KS4 transition matrices (Table 7, reproduced below)³ show the numbers of pupils in state-funded schools achieving each GCSE grade for English (referring to English Language) and mathematics broken down by KS2 grade. Note that

¹ DfE, [Key stage 4 performance 2019 \(revised\)](#). 2019.

² DfE, [Measuring disadvantaged pupils' attainment gaps over time \(updated\)](#). 2014

³ DfE, Table 7, National tables, [Key stage 4 performance 2019 \(revised\)](#). 2019

the KS2 information is irrelevant for the calculation, but is included here to be clear about how the data is currently displayed in the publication.

Table 7 from published data (2018/19):⁴ Transition matrices in English and mathematics state funded schools showing attainment at key stage 4 by key stage 2 attainment level.

		State-funded schools									
		GCSE English grade									
		9	8	7	6	5	4	3	2	1	No entry
Key stage 2 Reading attainment level	W	3	0	0	4	12	21	48	42	24	2,870
	1	0	1	5	10	33	73	207	229	197	2,132
	2	2	13	29	155	422	1,003	4,185	4,638	2,293	4,850
	3	4	18	96	554	2,022	4,602	11,851	6,430	2,125	2,592
	4	453	1,923	6,084	20,350	40,736	48,341	56,258	15,554	4,509	7,325
	5	13,044	24,668	39,167	61,115	57,088	33,744	20,325	3,914	1,181	3,243
	No valid KS2 level	735	1,318	2,103	3,430	4,474	4,120	5,881	2,741	1,201	3,748
		GCSE mathematics grade									
		9	8	7	6	5	4	3	2	1	No entry
		W	0	3	2	3	4	6	11	25	10
Key stage 2 mathematics attainment level	1	0	0	4	6	3	8	22	51	119	2,025
	2	4	14	30	53	125	274	627	1,672	4,227	5,816
	3	0	8	44	123	1,052	5,111	10,912	15,314	11,941	4,471
	4	176	1,447	5,773	14,248	46,322	76,042	46,891	23,548	8,431	4,610
	5	18,481	34,025	42,162	43,336	45,947	26,870	5,228	1,162	305	967
		No valid KS2 level	1,318	2,094	2,541	2,922	4,241	5,083	3,603	2,833	2,254

To obtain the mean GCSE grade for either English or mathematics from this data, the calculation is as follows:

- Sum the number achieving each GCSE grade. For example, the number of pupils achieving a 9 was 14,241 in English and 19,979 pupils in mathematics.
- For each grade outcome separately, divide these sums by the total entries (542,568) to obtain the percentage of pupils achieving each grade outcome. For example, 2.6% of pupils achieved a 9 in English and 3.7% achieved a 9 in mathematics.
- Multiply each numeric grade outcome by the percentage of entries achieving that grade (counting "No entry" as numeric grade 0), and then sum these results to obtain the average (mean) grade for the subject. The average in both English and mathematics was 4.5 for 2019 state-funded pupils.

⁴ DfE, Table 7, National tables, [Key stage 4 performance 2019 \(revised\)](#). 2019

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