



Department
for Education

Post-16 maths participation in 2014 to 2015

Ad-hoc Notice

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Introduction

This report includes new analysis of post-16 maths participation in 2014/15 based on prior attainment in the subject. This analysis was produced to help inform the Industrial Strategy Green Paper and the forthcoming report of Sir Adrian Smith's review of post-16 mathematics.

Methodology

The data used in this release is from the department's Young Person's Matched Administrative Dataset (YPMAD) which is the source of the [Level 2 and 3 attainment by young people aged 19 in 2015 Statistical First Release](#). A [technical document](#) is published alongside that release which explains the concepts, methods and data sources used in collating the dataset and the Statistical First Release. This is not the source of the [Official Statistics on post-16 participation](#) but the data can be used as a proxy. Information about a young person's highest level of participation during the academic year is derived from the school census, Individualised Learner Record (ILR) and awarding body datasets (attainment data).

For analysis of A level entries and higher education participation based on prior maths attainment, the YPMAD has been joined to DfE's 16-18 attainment data and Higher Education Statistics Agency (HESA) data.

The YPMAD data (including when it is joined to other sources) in this release covers those in the state sector in England at academic age 15. The 16-18 attainment data coverage is England, irrespective of education sector at age 15.

Analysis

The table below shows that the higher the maths GCSE grade achieved at 15, the higher the level of maths participation at academic age 16.

Table 1: Maths participation at academic age 16 by GCSE maths attainment at academic age 15

GCSE maths grade at 15	Number	A Level	AS Level	Other Level 3	GCSE	Below GCSE	None
A*	38,300	6%	81%	1%	0%	0%	12%
A	64,600	1%	60%	1%	0%	0%	38%
B	107,800	0%	21%	0%	0%	1%	77%
C	177,600	0%	1%	0%	2%	3%	93%
A*-C	388,300	1%	24%	0%	1%	2%	72%
D	62,000	0%	0%	0%	61%	30%	8%
E and below	109,800	0%	0%	0%	15%	66%	18%
Total	560,100	1%	17%	0%	11%	18%	54%

Source: DfE Matched Administrative Dataset, cohort academic age 16 in 2014/15

This table also shows that those with a grade C in GCSE maths are the most likely to stop studying the subject at 16. Those with a D are most likely to retake the subject due to the [maths and English condition of funding](#) which requires those on a study programme of 150 hours or more without an A*-C to continue studying the subject. Sub-national level 3 maths participation at academic age 16 for those with A*/A and A*-C GCSE maths at age 15 is shown in the Annex.

As Table 1 focuses on participation at 16 it does not show the extent of A level maths participation, so Table 2 shows the highest maths participation at either academic age 16 or 17. This shows that over three quarters (76 per cent) of those with an A* GCSE at 15 study maths A level and just under a third (32 per cent) of those with an A GCSE at 15 do. Only 5 per cent of those with a B grade at 15 study A level maths at 16 or 17.

Table 2: Highest maths participation at academic age 16/17 by GCSE maths attainment at academic age 15

GCSE maths grade at 15	Number	A Level	AS Level	Other Level 3	GCSE	Below GCSE	None
A*	37,000	76%	12%	1%	0%	0%	11%
A	69,400	32%	28%	1%	0%	1%	38%
B	110,400	5%	16%	0%	0%	2%	76%
C	189,300	0%	1%	0%	3%	8%	89%
A*-C	406,100	14%	11%	0%	1%	4%	70%
D	58,400	0%	1%	0%	56%	33%	10%
E and below	108,700	0%	1%	0%	17%	63%	19%
Total	573,200	10%	8%	0%	10%	18%	54%

Source: DfE Matched Administrative Dataset, cohort academic age 17 in 2014/15

Table 3 shows whether students that studied maths at 16 progressed to a higher level in the subject at 17 by their GCSE grade at 15. This shows that 38% progress to a higher level of maths participation and 36% stop studying the subject at 17.

Table 3: Maths participation at academic age 17 for those that studied the subject at academic age 16 by GCSE maths attainment at academic age 15

GCSE maths grade at 15	Number	Higher level at 17	Same level or lower at 17	No maths at 17
A*	32,300	78%	10%	12%
A	42,000	51%	12%	36%
B	24,500	21%	15%	64%
C	16,100	8%	13%	79%
A*-C	114,900	46%	12%	41%
D	45,400	23%	43%	34%
E and below	73,600	35%	37%	27%
Total	233,900	38%	26%	36%

Source: DfE Matched Administrative Dataset, cohort academic age 17 in 2014/15

Table 4 shows the highest overall study aim at 16 by GCSE maths grade at 15. This shows that those with higher GCSE maths attainment at 15 are more likely to study academic level 3 qualifications at age 16 and those with lower attainment are more likely to study

level 2 qualifications or below.

Table 4: Highest study aim at academic age 16 by GCSE maths attainment at academic age 15

GCSE maths grade at 15	Number	Academic Level 3	L3 App*	Other Level 3	L2 App*	Other Level 2	Below Level 2	None
A*	38,300	96%	1%	2%	0%	0%	0%	1%
A	64,600	93%	1%	4%	0%	1%	0%	1%
B	107,800	78%	2%	13%	2%	3%	1%	1%
C	177,600	45%	2%	29%	5%	14%	3%	2%
A*-C	388,300	67%	2%	18%	3%	7%	2%	1%
D	62,000	16%	1%	23%	8%	43%	5%	3%
E and below	109,800	4%	0%	9%	6%	40%	33%	8%
Total	560,100	49%	1%	17%	4%	18%	8%	3%

* App = Apprenticeship

Source: DfE Matched Administrative Dataset, cohort academic age 16 in 2014/15

The next table shows the highest study aim at academic age 16 for those not studying any form of maths. In comparison with the figures in Table 4, this shows that those with A*-B grades at 15 but not studying maths at 16 are less likely to be studying academic level 3 courses compared to everyone with those grades.

Table 5: Highest study aim at academic age 16 for those not studying maths by GCSE maths attainment at academic age 15

GCSE maths grade at 15	Number	Academic Level 3	L3 App*	Other Level 3	L2 App*	Other Level 2	Below Level 2	None
A*	4,600	80%	2%	5%	1%	1%	1%	10%
A	24,800	84%	2%	9%	1%	1%	0%	2%
B	83,500	74%	2%	17%	2%	4%	1%	1%
C	166,000	46%	2%	30%	4%	13%	3%	2%
A*-C	278,900	58%	2%	24%	3%	9%	2%	2%
D	5,000	4%	2%	9%	18%	13%	10%	44%
E and below	20,000	1%	0%	3%	3%	9%	41%	43%
Total	303,800	54%	2%	22%	3%	9%	5%	5%

* App = Apprenticeship

Source: DfE Matched Administrative Dataset, cohort academic age 16 in 2014/15

The following table shows where pupils study at academic age 16 based on their maths attainment at academic age 15.

Table 6: Main institution type at academic age 16 by GCSE maths attainment at academic age 15

GCSE maths grade at 15	Number	School	Sixth form college	FE college	Apprenticeship	Other	None
A*	38,300	76%	17%	5%	1%	0%	1%
A	64,600	67%	19%	11%	1%	1%	1%
B	107,800	55%	19%	21%	3%	1%	1%
C	177,600	37%	14%	40%	7%	1%	2%
A*-C	388,300	51%	16%	27%	4%	1%	1%
D	62,000	22%	9%	54%	9%	3%	3%
E and below	109,800	18%	4%	57%	7%	7%	8%
Total	560,100	41%	13%	36%	5%	2%	3%

Source: DfE Matched Administrative Dataset, cohort academic age 16 in 2014/15

This shows that those with higher grades at 15 tend to study at a school or sixth form college at 16 and those with lower prior attainment are more likely to study in a FE college.

As can be seen in Table 1, those with A* to B GCSE grades in maths at 15 are those most likely to study AS/A level maths at 16. Table 7 shows that the proportion of those going on to study these qualifications differs depending on the characteristics of the pupils.

Table 7: Proportion studying AS/A level maths at academic age 16 by pupil characteristic and GCSE maths attainment at academic age 15

	A*	A	B
Total	87%	61%	21%
Gender			
Male	91%	71%	27%
Female	81%	50%	14%
Free School Meal (FSM) eligibility			
Not eligible for FSM	87%	60%	20%
Eligible for FSM	91%	68%	24%
Income Deprivation Affecting Children Index			
25% most deprived	88%	70%	27%
Lower middle	90%	63%	22%
Upper middle	86%	59%	19%
25% least deprived	86%	57%	18%
Special Educational Needs (SEN)			
No Identified SEN	87%	60%	21%
School Action	86%	65%	22%
School Action +	85%	59%	21%
Statement of SEN	87%	65%	20%
Ethnic Group			
White summary ethnic group	85%	56%	18%
Mixed summary ethnic group	86%	64%	22%
Asian summary ethnic group	94%	80%	38%
Black summary ethnic group	90%	77%	32%
Chinese	93%	81%	38%
Other	90%	78%	40%

Source: DfE Matched Administrative Dataset, cohort academic age 16 in 2014/15

Table 8 shows the number of entries in A level subjects that include an assessment of mathematics and quantitative skills.

Table 9 shows the type of level 3 study at age 17 for those that had achieved A*-C maths at 15. This shows that 56 per cent of those with A*-C in maths at academic age 15 in 2012/13 had a level 3 academic qualification as their highest study aim at age 17 in 2014/15. Just under a quarter of these (23 per cent) entered maths A level and a further 12 per cent entered another STEM A level.

Table 8: Number of entries in selected A level subjects, 2014/15

Subject	Number of entries
Accounting	2,500
Biology	55,200
Business	24,300
Chemistry	46,600
Computer Science	4,800
Design and technology	11,300
Economics	26,200
Electronics	900
Environmental science	1,000
Geography	33,200
Geology	2,000
Physical Education	11,000
Physics	31,900
Psychology	53,500

Source: 16-18 attainment data

Table 9: Academic level 3 study aims for those with A*-C maths GCSE

	Number
Total in cohort (state sector at 15)	573,200
Achieved A*-C maths GCSE at 15	406,100
Academic L3 highest study aim at 17 (A*-C group)	227,600
Maths A level entry	52,600
Other STEM A level entry	27,600
Other A level that includes an assessment of mathematics and quantitative skills	58,800
Other A level entry	57,600
Other academic L3 aim (see below)	31,100
Maths split of the Other academic L3 aims:	31,100
AS level maths	6,500
Maths A level aim but not maths entry	900
Other maths study	500
No maths study	23,200

Source: DfE Matched Administrative Dataset and 16-18 Attainment data, cohort academic age 17 in 2014/15

Table 10 shows the most popular A levels for pupils that had achieved A*/A GCSE maths at academic age 15 and had entered an A level at academic age 17 in 2014/15 but had not entered maths or further maths. This shows that English, Biology and Psychology were the most popular subjects for those with high maths attainment who didn't enter a maths A level.

Table 10: Most popular A levels for pupils that had achieved A*/A GCSE maths at academic age 15 and had entered an A level at academic age 17 in 2014/15 but had not entered maths or further maths

Subject	Percentage
English	35%
Biology	33%
Psychology	28%
History	27%
Chemistry	20%
Geography	19%
General Studies	11%
Art and Design	11%
Economics	10%

Source: 16-18 Attainment data

Table 11 shows the proportion of A level entries by GCSE grade for some selected subjects. This shows that a far higher proportion of maths entries are by pupils with A*/A grades at GCSE when compared with History and English Literature.

Table 11: Proportion of A level entries in 2014/15 by subject GCSE grade in 2012/13

	Maths	History	English Literature
A*	58%	25%	19%
A	36%	36%	36%
A*/A	94%	61%	55%
B	5%	26%	31%
C	0%	8%	9%
D and below	0%	5%	5%
Total	100%	100%	100%

Source: 16-18 attainment data and key stage 4 attainment data

The following table shows the relationship between GCSE grade and the proportion that go on to enter the subject at A level. This shows that a high proportion of A* grade maths students entered an A level in the subject, but a very low proportion of students that achieved a B grade or below do compared to other subjects.

Table 12: Proportion entering A levels in the same subject in 2014/15 by subject GCSE grade in 2012/13

	Maths	History	English Literature
A*	70%	41%	30%
A	28%	35%	19%
A*/A	45%	37%	22%
B	3%	23%	10%
C	0%	8%	2%
D and below	0%	1%	0%

Source: 16-18 attainment data and key stage 4 attainment data

Table 13 shows the highest prior maths attainment of students studying mathematical science degrees. Those at Russell Group universities were more likely to have achieved further maths A level compared to those in non-Russell Group institutions.

Table 13: Highest prior maths attainment for those studying mathematical science degrees

Institution type	Number	Further Maths A level	Maths A level	Other
Russell Group	3,200	66%	32%	1%
Non Russell Group	3,000	34%	57%	9%
Total	6,200	51%	44%	5%

Source: DfE Matched Administrative Dataset and HESA, cohort academic age 19 in 2014/15

Annex

Table A1: Participation in level 3 maths at academic age 16 by GCSE attainment at academic age 15 by local authority

ONS LA code	Old LA code	Name	A*/A at 15	A*-C at 15
E08000020	390	Gateshead	63%	17%
E08000021	391	Newcastle upon Tyne	66%	16%
E08000022	392	North Tyneside	73%	24%
E08000023	393	South Tyneside	73%	24%
E08000024	394	Sunderland	61%	17%
E06000001	805	Hartlepool	71%	22%
E06000002	806	Middlesbrough	59%	12%
E06000003	807	Redcar and Cleveland	78%	30%
E06000004	808	Stockton-on-Tees	75%	29%
E06000047	840	Durham	65%	17%
E06000005	841	Darlington	69%	23%
E06000048	929	Northumberland	73%	25%
		North East	68%	20%
E08000011	340	Knowsley	44%	7%
E08000012	341	Liverpool	75%	26%
E08000013	342	St. Helens	78%	32%
E08000014	343	Sefton	71%	20%
E08000015	344	Wirral	67%	25%
E08000001	350	Bolton	72%	22%
E08000002	351	Bury	63%	21%
E08000003	352	Manchester	68%	25%
E08000004	353	Oldham	77%	26%
E08000005	354	Rochdale	66%	18%
E08000006	355	Salford	56%	13%
E08000007	356	Stockport	65%	21%
E08000008	357	Tameside	70%	19%
E08000009	358	Trafford	71%	37%
E08000010	359	Wigan	73%	28%
E06000006	876	Halton	68%	17%
E06000007	877	Warrington	72%	20%
E10000017	888	Lancashire	69%	25%
E06000008	889	Blackburn with Darwen	65%	14%
E06000009	890	Blackpool	67%	18%
E06000049	895	Cheshire East	64%	22%
E06000050	896	Cheshire West and Chester	69%	26%
E10000006	909	Cumbria	70%	27%
		North West	69%	24%
E08000016	370	Barnsley	66%	13%
E08000017	371	Doncaster	71%	21%
E08000018	372	Rotherham	59%	18%
E08000019	373	Sheffield	69%	23%
E08000032	380	Bradford	74%	24%

ONS LA code	Old LA code	Name	A*/A at 15	A*-C at 15
E08000033	381	Calderdale	73%	23%
E08000034	382	Kirklees	71%	30%
E08000035	383	Leeds	69%	23%
E08000036	384	Wakefield	60%	15%
E06000010	810	Kingston Upon Hull, City of	63%	12%
E06000011	811	East Riding of Yorkshire	73%	23%
E06000012	812	North East Lincolnshire	70%	16%
E06000013	813	North Lincolnshire	70%	23%
E10000023	815	North Yorkshire	71%	29%
E06000014	816	York	56%	15%
		Yorkshire and the Humber	68%	22%
E10000007	830	Derbyshire	71%	26%
E06000015	831	Derby	65%	16%
E10000018	855	Leicestershire	77%	33%
E06000016	856	Leicester	82%	30%
E06000017	857	Rutland	56%	19%
E10000024	891	Nottinghamshire	71%	27%
E06000018	892	Nottingham	68%	20%
E10000019	925	Lincolnshire	68%	24%
E10000021	928	Northamptonshire	71%	22%
		East Midlands	72%	25%
E08000025	330	Birmingham	77%	27%
E08000026	331	Coventry	77%	22%
E08000027	332	Dudley	72%	24%
E08000028	333	Sandwell	77%	21%
E08000029	334	Solihull	72%	31%
E08000030	335	Walsall	74%	24%
E08000031	336	Wolverhampton	69%	22%
E10000028	860	Staffordshire	69%	18%
E06000021	861	Stoke-on-Trent	70%	18%
E06000019	884	Herefordshire	67%	25%
E10000034	885	Worcestershire	70%	24%
E06000051	893	Shropshire	71%	27%
E06000020	894	Telford and Wrekin	70%	24%
E10000031	937	Warwickshire	68%	25%
		West Midlands	72%	24%
E06000032	821	Luton	77%	25%
E06000055	822	Bedford	70%	22%
E06000056	823	Central Bedfordshire	73%	27%
E10000003	873	Cambridgeshire	74%	30%
E06000031	874	Peterborough	71%	24%
E10000012	881	Essex	72%	25%
E06000033	882	Southend-on-Sea	65%	21%
E06000034	883	Thurrock	71%	29%
E10000015	919	Hertfordshire	72%	29%
E10000020	926	Norfolk	68%	19%
E10000029	935	Suffolk	71%	21%

ONS LA code	Old LA code	Name	A*/A at 15	A*-C at 15
		East of England	71%	25%
E09000001	201	City of London	-	-
E09000007	202	Camden	70%	23%
E09000011	203	Greenwich	84%	30%
E09000012	204	Hackney	82%	30%
E09000013	205	Hammersmith and Fulham	70%	30%
E09000019	206	Islington	79%	24%
E09000020	207	Kensington and Chelsea	79%	36%
E09000022	208	Lambeth	85%	32%
E09000023	209	Lewisham	80%	25%
E09000028	210	Southwark	78%	34%
E09000030	211	Tower Hamlets	79%	26%
E09000032	212	Wandsworth	85%	31%
E09000033	213	Westminster	76%	25%
E09000002	301	Barking and Dagenham	85%	28%
E09000003	302	Barnet	81%	45%
E09000004	303	Bexley	69%	33%
E09000005	304	Brent	84%	42%
E09000006	305	Bromley	71%	25%
E09000008	306	Croydon	71%	25%
E09000009	307	Ealing	82%	38%
E09000010	308	Enfield	85%	40%
E09000014	309	Haringey	71%	25%
E09000015	310	Harrow	84%	45%
E09000016	311	Havering	72%	20%
E09000017	312	Hillingdon	79%	28%
E09000018	313	Hounslow	82%	35%
E09000021	314	Kingston upon Thames	79%	37%
E09000024	315	Merton	78%	38%
E09000025	316	Newham	86%	37%
E09000026	317	Redbridge	85%	43%
E09000027	318	Richmond upon Thames	76%	31%
E09000029	319	Sutton	80%	46%
E09000031	320	Waltham Forest	84%	32%
		London	79%	33%
E10000002	825	Buckinghamshire	70%	39%
E06000042	826	Milton Keynes	74%	25%
E10000011	845	East Sussex	65%	20%
E06000043	846	Brighton and Hove	72%	31%
E10000014	850	Hampshire	70%	28%
E06000044	851	Portsmouth	62%	16%
E06000045	852	Southampton	66%	18%
E06000036	867	Bracknell Forest	70%	18%
E06000040	868	Windsor and Maidenhead	72%	26%
E06000037	869	West Berkshire	70%	30%
E06000038	870	Reading	84%	57%
E06000039	871	Slough	86%	40%

ONS LA code	Old LA code	Name	A*/A at 15	A*-C at 15
E06000041	872	Wokingham	77%	42%
E10000016	886	Kent	72%	29%
E06000035	887	Medway	67%	20%
E06000046	921	Isle of Wight	79%	24%
E10000025	931	Oxfordshire	73%	26%
E10000030	936	Surrey	70%	29%
E10000032	938	West Sussex	73%	25%
		South East	72%	28%
E06000053	420	Isles of Scilly	-	-
E06000022	800	Bath and North East Somerset	72%	21%
E06000023	801	Bristol, City of	71%	25%
E06000024	802	North Somerset	74%	24%
E06000025	803	South Gloucestershire	73%	24%
E10000009	835	Dorset	74%	29%
E06000029	836	Poole	69%	22%
E06000028	837	Bournemouth	74%	34%
E06000054	865	Wiltshire	73%	28%
E06000030	866	Swindon	71%	22%
E10000008	878	Devon	66%	22%
E06000026	879	Plymouth	71%	25%
E06000027	880	Torbay	66%	25%
E06000052	908	Cornwall	71%	21%
E10000013	916	Gloucestershire	69%	28%
E10000027	933	Somerset	67%	22%
		South West	70%	24%
		England	71%	25%

Source: DfE Matched Administrative Dataset, cohort academic age 16 in 2014/15

Note: Pupil's assigned to the Local Authority of study at academic age 16



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