Department for Education

Understanding Progress in the 2020/21 Academic Year

Extension report covering the first half of the autumn term 2021/22

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Renaissance Learning, Education Policy Institute

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Summary

This report presents the Education Policy Institute and Renaissance Learning's most recent assessment of the learning loss and recovery experienced by pupils in England as a result of the COVID-19 pandemic. It is based on assessment data from Renaissance Learning's Star Reading and Star Maths. Star Assessments are computer-adaptive in nature and adapt to the individual, providing an assessment that identifies gaps in learning from the entirety of the curriculum independent of their current year group. Star Assessments also include a standardised measure which takes account of the pupil's age in years and months.

This data has been linked with data held by the Department for Education in the National Pupil Database which has enabled us to carry out analysis by pupil characteristics. In this report we provide estimates of the overall level of learning loss by the end of the first half-term of the 2021/22 academic year which is then broken down by various characteristic groups.

In our previous reports we gradually built a picture of how the degree of learning loss changed over the course of the 2020/21 academic year by restricting our analysis to a consistent group of pupils for whom we had assessment data across the academic year.

In this report we analyse the results of all pupils at the start of the 2021/22 academic year for whom we can calculate a learning loss estimate. Not all of these pupils would have been included in previous analyses. This is primarily to ensure sufficient sample sizes but also reflects that we are interested in producing the best estimate of the current situation in schools. However, we know that there is naturally a keen interest in how the situation has changed since the summer, so we present additional analysis of how outcomes have changed during this time using a consistent group of pupils.

Extent of learning loss and recovery

The first national lockdown and the lack of in-person learning for most children was associated with pupils making less progress in reading and mathematics compared with previous cohorts of pupils.

During the academic year 2020/21 there were periods of recovery and further losses, with recovery being seen when schools were open to in person teaching. We estimated that by the end of the academic year, learning losses in reading amongst primary-aged pupils (years 3 to 6) amounted to around 0.9 months, and learning losses in reading amongst secondary-aged pupils (years 7 to 9) amounted to around 1.8 months.[1]

[1] In our previous report we published both cross-sectional analysis, as presented here (the results for all pupils in the summer term), and longitudinal analysis that covered pupils who had results in the summer term and earlier in the academic year. For this restricted group the results were 0.9 months in primary reading, 1.2 months in secondary reading, and 2.2 months in primary mathematics.

Learning losses in primary mathematics, at 2.8 months, were larger than reading losses. Sample sizes meant that it was not possible to provide robust estimates for secondary mathematics.

Data from the first half of the 2021/22 autumn term shows that:

- primary-aged pupils were, on average, 0.8 months behind where we would have expected them to be in reading;
- primary-aged pupils were, on average, 1.9 months behind where would have expected them to be in mathematics; and
- secondary-aged pupils were, on average, 2.4 months behind where we would have expected them to be in reading.

When we compare the learning loss estimates of pupils in the autumn term 2021/22 with learning loss estimates in the summer term 2020/21 (restricting to those pupils who had results in both) we find that:

- the learning loss estimates for primary-aged pupils in reading were largely unchanged between summer 2020/21 and autumn 2021/22;
- whilst the scale of learning loss in primary mathematics remained larger than in primary reading the trend seen in the summer term for recovery continued into the new academic year with a reduction in the size of learning loss of 0.4 months; and
- there was a significant increase in the degree of learning loss amongst secondary-aged pupils in reading of 0.5 months.

The effect of economic disadvantage

Throughout the academic year 2020/21, we found that pupils from disadvantaged backgrounds (primarily those eligible for free school meals at some point in the last six years) experienced greater learning losses than their more affluent peers as a result of the pandemic. As we observed in the overall results, there were periods of recovery and further losses during 2020/21 but the extent of this recovery and further losses were not always consistent between the two groups.

Our latest analysis shows that, by the autumn term 2021/22, the gap in learning loss between disadvantaged pupils and their more affluent peers in reading was around 0.9 months for primary-aged pupils and around 1.5 months for secondary-aged pupils. The gap in mathematics for primary-aged pupils was 0.6 months. These gaps are in addition to the disadvantage gap (the difference in outcomes between disadvantaged pupils and their peers) that was evident prior to the pandemic.

When we compare the learning loss estimates of pupils in the autumn term 2021/22 with learning loss estimates in the summer term 2020/21 (restricting to those pupils who had

results in both) we find that the disadvantage gap in primary reading has widened since the summer term. While pupils from disadvantaged backgrounds experienced further losses since the summer (0.2 months) pupils from non-disadvantaged backgrounds showed a very small amount of recovery (0.1 months).

In secondary reading, both non-disadvantaged and disadvantaged pupils experienced further losses but these were greater for disadvantaged pupils (0.8 months versus 0.4 months) leading to a widening of the gap.

In primary mathematics, both non-disadvantaged and disadvantaged pupils experienced some recovery and in fact these were greater for disadvantaged pupils (0.6 months versus 0.3 months), though disadvantaged pupils have still lost a greater amount of learning since the start of the pandemic.

As well as variation by pupil disadvantage, we continue to find variation by the level of deprivation of the area in which pupils live. In both primary and secondary reading, non-disadvantaged pupils in areas with medium and high levels of deprivation experienced a similar degree of learning loss to disadvantaged pupils in areas with low levels of deprivation. This suggests disadvantage impacts learning losses at both an area level as well as at pupil level.

Regional variation

We continue to find substantial regional disparities in the level of learning loss experienced by pupils in both primary and secondary schools. It should be noted however that there is a great deal of uncertainty around estimates by region in both the modelling of predicted scores and in how that then translates into learning loss. While pupil counts can appear substantial, they may be drawn from a limited number of schools. Where the number of schools is limited any analysis may reflect the circumstances of those schools rather than being representative of the region. For that reason, we only include results in reading and do not present analysis of learning losses in mathematics by region in this report.

The greatest learning losses have been experienced by pupils in the North East (1.3 months), the North West (1.2 months), and Yorkshire and the Humber (1.1 months). Pupils in the South West (0.3 months) and London (0.3 months) have outcomes that are only just below expectations.

For secondary-aged pupils in reading, we find that the greatest learning losses have been experienced by pupils in the North West (3.2 months), the North East (3.1 months), and Yorkshire and the Humber (3.0 months). The smallest learning losses were for pupils in London (1.8 months) – though the learning loss in London represents a significant increase on what we saw in the summer.

Conclusion

Our previous reports showed that periods in which there were restrictions to in-person learning were associated with learning loss in reading and mathematics whilst there tended to be recovery once in person teaching was available for all pupils.

The analysis presented in this report shows that there has been some further recovery amongst some primary-aged pupils in reading though overall the total learning loss is similar to that seen in the summer, and results in mathematics suggest further recovery.

There have been further losses amongst secondary-aged pupils in reading since the summer. In addition, the differential effects of the pandemic on pupils from disadvantaged backgrounds and from particular parts of the country persist.

Table S.1: Summary of learning loss in primary reading by autumn 2021/22 and change since summer 2020/21 (for pupils with outcomes at both points)

	Primary reading					
	Months			Change since summer 2021		
	N	Mean	CI[2]	N	Change[3]	Significance[4]
All pupils	142,046	-0.8	*0.1*	115,609	0.0	-
Female	71,763	-1.0	*0.1*	58,531	+0.1	-
Male	70,283	-0.5	*0.1*	57,078	-0.1	-
Non-ever6 FSM[5]	107,534	-0.5	*0.1*	88,238	+0.1	*Sig reduction*
Ever6 FSM	34,512	-1.4	*0.1*	27,371	-0.2	*Sig increase*
First language known or believed to be English (non-EAL)	115,717	-0.7	*0.1*	94,781	0.0	-
First language known or believed to be other than English (EAL)	26,329	-0.9	*0.1*	20,828	+0.2	*Sig reduction*
Pupils with no identified special educational need (non SEN)	125,050	-0.7	*0.1*	102,151	+0.1	-
Pupils with identified special educational needs (SEN)	16,996	-1.2	*0.2*	13,458	-0.3	*Sig increase*
Children in Need[6]	4,733	-1.1	*0.3*			
Any other ethnic group	2,134	-0.2	*0.4*	1,639	+1.1	*Sig reduction*

[2] This is the 95% confidence interval around the mean. A value of 0.1 here means the confidence interval around the mean is +/-0.1.
[3] A positive change means that the degree of learning loss has reduced (i.e. recovery) whilst a negative change means further losses were seen.
[4] This column shows whether there has been a statistically significant change in the level of learning loss since summer term 2020/21.
[5] Ever6 FSM means that the pupil has been eligible for free school meals at some point in the previous six years.
[6] We are unable to provide a robust estimate for the change for this group.

	Primary reading					
	Months			Change since summer 2021		
	N	Mean	CI[2]	N	Change[3]	Significance[4]
Asian	14,834	-0.9	*0.2*	11,757	+0.2	-
Black	5,755	-0.8	*0.3*	4,374	-0.1	-
Chinese	558	1.7	*0.9*	454	+2.0	*Sig reduction*
Mixed	7,814	-0.8	*0.2*	6,275	0.0	-
White	109,842	-0.7	*0.1*	90,192	0.0	-
East Midlands	11,566	-1.0	*0.2*	9,259	-0.1	-
East of England	19,037	-0.5	*0.1*	14,892	0.0	-
London	12,405	-0.3	*0.2*	9,254	+0.1	-
North East	10,639	-1.3	*0.2*	8,464	-0.4	*Sig increase*
North West	16,831	-1.2	*0.2*	13,734	0.0	-
South East	25,795	-0.7	*0.1*	22,553	0.0	-
South West	20,311	-0.3	*0.1*	16,645	+0.3	*Sig reduction*
West Midlands	15,339	-0.9	*0.2*	12,621	+0.4	*Sig reduction*
Yorkshire and the Humber	10,123	-1.1	*0.2*	8,187	-0.4	*Sig increase*
FSM pupil in low IDACI area[7]	4,650	-0.7	0.3	3,742	0.0	-
FSM pupil in medium IDACI area	13,246	-1.3	0.2	10,670	-0.2	-
FSM pupil in high IDACI area	16,616	-1.7	0.2	12,959	-0.3	*Sig increase*
non-FSM pupil in low IDACI area	40,111	-0.1	0.1	33,231	+0.1	-
non-FSM pupil in medium IDACI area	44,234	-0.8	0.1	36,581	+0.1	-
non-FSM pupil in high IDACI	23,189	-0.9	0.1	18,426	+0.2	-

[7] IDACI denotes Income Deprivation Affecting Children Index score, which can be interpreted as the proportion of families in a local area, with children aged under 16, which are income deprived. We define the levels of deprivation in the area as follows: Low IDACI area (0-12.5%), Medium IDACI area (12.5%-30%) and High IDACI area (30%+).

Table S.2: Summary of learning loss in secondary reading by autumn 2021/22 and change since summer 2020/21 (for pupils with outcomes at both points)[8]

	Secondary reading					
	Months			Change since summer 2021		
	N	Mean	CI	N	Change	Significance
All pupils	110,022	-2.4	0.1	69,862	-0.5	*Sig increase*
Female	54,698	-2.8	0.1	34,956	-0.5	*Sig increase*
Male	55,324	-2.1	0.1	34,906	-0.5	*Sig increase*
Non-ever6 FSM	78,725	-2	0.1	50,900	-0.4	*Sig increase*
Ever6 FSM	31,297	-3.5	0.2	18,962	-0.8	*Sig increase*
First language known or believed to be English (non-EAL)	92,024	-2.6	0.1	58,552	-0.5	*Sig increase*
First language known or believed to be other than English (EAL)	17,998	-1.9	0.3	11,310	-0.5	*Sig increase*
Pupils with no identified special educational need (non SEN)	93,088	-2.2	0.1	59,381	-0.4	*Sig increase*
Pupils with identified special educational needs (SEN)	16,934	-3.7	0.3	10,481	-1.1	*Sig increase*
Children in need	4,396	-4.1	0.5			
Any other ethnic group	1,603	-1.6	0.8	1,002	-1.1	-
Asian	10,848	-2.1	0.3	6,608	-0.4	-
Black	4,738	-2	0.5	2,974	-1.2	*Sig increase*

[8] For detailed footnoted please see the first table above.

	Secondary reading					
	Months			Change since summer 2021		
	N	Mean	CI	N	Change	Significance
Chinese	334	1.8	1.8	216	+0.3	-
Mixed	5,950	-2.0	0.4	3,692	+0.1	-
White	85,197	-2.6	0.1	54,560	-0.5	*Sig increase*
East Midlands	9,979	-2.6	0.3	6,670	-0.6	*Sig increase*
East of England	13,768	-2.2	0.3	8,408	-0.5	*Sig increase*
London	10,947	-1.8	0.3	6,593	-1.1	*Sig increase*
North East	7,954	-3.1	0.4	4,476	-0.8	*Sig increase*
North West	11,624	-3.2	0.3	7,089	-1.1	*Sig increase*
South East	19,859	-2.2	0.2	14,638	0.0	-
South West	13,435	-2.2	0.3	8,786	-0.4	-
West Midlands	12,479	-2.4	0.3	7,678	-0.7	*Sig increase*
Yorkshire and the Humber	9,977	-3.0	0.3	5,524	+0.1	-
FSM pupil in low IDACI area	4,913	-2.8	0.5	2,943	-0.6	-
FSM pupil in medium IDACI area	12,390	-3.6	0.3	7,788	-0.8	*Sig increase*
FSM pupil in high IDACI area	13,994	-3.8	0.3	8,231	-0.8	*Sig increase*
non-FSM pupil in low IDACI area	32,892	-1.5	0.2	21,291	-0.5	*Sig increase*
non-FSM pupil in medium IDACI area	31,150	-2.4	0.2	20,413	-0.4	*Sig increase*
non-FSM pupil in high IDACI	14,683	-2.5	0.3	9,196	-0.3	-

Table S.3: Summary of learning loss in primary mathematics by autumn 2021/22 and change since summer 2020/21 (for pupils with outcomes at both points)[9]

	Primary mathematics					
	Months			Change since summer 2021		
	N	Mean	CI	N	Change	Significance
All pupils	8,592	-1.9	0.2	7,923	+0.4	*Sig reduction*
Female	4,377	-2.2	0.2	3,990	0.0	-
Male	4,215	-1.6	0.2	3,933	0.0	-
Non-ever6FSM	6,579	-1.8	0.2	6,077	+0.3	*Sig reduction*
Ever6FSM	2,013	-2.2	0.3	1,846	+0.6	*Sig reduction*
First language known or believed to be English (non-EAL)	7,024	-2.0	0.2	6,517	0.0	-
First language known or believed to be other than English (EAL)	1,568	-1.4	0.4	1,406	+0.7	*Sig reduction*
Pupils with no identified special educational need (non SEN)	7,599	-1.9	0.2	7,004	+0.4	*Sig reduction*
Pupils with identified special educational needs (SEN)	993	-1.7	0.5	919	-0.2	-

[9] For detailed footnoted please see the first table above.

Background: Star Assessments from Renaissance Learning

The data analysed in this report is drawn from assessment data from Renaissance Learning's Star Reading and Star Maths. These provide criterion-based scores that run on a singular scale from Year 1 to Year 13. Star Assessments are computer-adaptive in nature and adapt to the individual, providing an assessment that identifies gaps in learning from the entirety of the curriculum independent of their current year group. Star Assessments also include a standardised measure which takes account of the pupil's age in years and months.

The Star Reading assessment measures students' performance on key reading skills via a brief standards-based test of general reading achievement, administering 34 questions that students complete, on average, in less than 20 minutes. The Star Maths assessment similarly comprises a brief assessment of 24 questions that students complete, on average, in less than 25 minutes. Reading draws on item banks of just under 4,000 items and under 2,000 items for mathematics.[10]

In November 2021, Renaissance Learning provided data comprising all assessments undertaken in England in the first half of the 2021/22 autumn term, adding to the data already held covering the previous four academic years. The data was then subsequently matched by the Department for Education to data held in the National Pupil Database to enable us to take account of contextual pupil information.[11]

[10] A more detailed discussion of Star Assessments is available in *'Research Foundation for Star Adaptive Assessments – Science of Star'*, Renaissance White Paper, September 2020.

[11] The data provided includes a 'date of test' field which is used as a control in our modelling. Due to what appears to have been a date conversion issue where month and day were switched this field was missing for around half of pupils on the file provided to the Education Policy Institute. Pupils who took assessments after the 12th in each month have had the assessment date set as being 26 September. This is based on the average date of test for pupils in the first half of autumn term 2017/18 to 2019/20 if that assessment was after the 12th of the month.

Chapter 1: Learning loss methodology in the autumn term, 2021/22

Method for estimating expected progress and learning loss

In our analysis of Star Assessments in the autumn term of last year, we calculated an expected outcome for pupils based on what they had previously achieved (broadly at the same point in the previous academic year) and the historic rates of progress for pupils with similar prior attainment and pupil characteristics. We used the first half of the autumn term in 2019/20 as our measure of prior attainment and our counterfactual group of pupils that we were comparing against was the progress of pupils between autumn 2018/19 and autumn 2019/20.[12]

This year, we were constrained by the effects of the first period of restrictions on in-person teaching on our preferred measure of prior attainment and the model for calculating expected progress. Outcomes at the start of the 2020/21 academic year were themselves affected by the pandemic and restrictions to in-person learning that we know resulted in learning loss. Because of this, for pupils in 2021/22 we have again used results in the first half of the autumn term in 2019/20 to measure prior attainment (i.e. two years previously) to ensure we are measuring the total effect of the pandemic on pupils outcomes. Similarly, we need to compare the progress of these pupils to similar pupils over a period that was not affected by the pandemic. Therefore, the progress of pupils between autumn 2019/20 and autumn 2021/22 is compared with the progress of pupils between autumn 2017/18 and autumn 2019/20.[13]

We present measures of learning loss in terms of a 'scaled score' and in terms of months of progress.[14]

Limitations of estimates of learning loss

The key limitations are:

- We have used a counterfactual group that is two years prior to the progress we are now assessing. Progress has continually increased year-on-year for Renaissance assessments, hence the progress that pupils have made during the

[12] See our first report for full explanation of our methodology for estimates of learning loss by the first half term of the autumn term.
[13] A full set of regression outputs is provided in Annex 3.
[14] The Star Assessments 'scaled score' is a continuous scale where pupil scores increase as they move through the school system. At the start of Key Stage 2, pupils taking an assessment typically achieve around 250 points on this scale. By the final year of primary school (year 6) this increases to around 550 points, and by year 9 to around 750 points on this scale.

academic year historically may be slightly lower than the progress they may have gone on to make had the pandemic not occurred.

- Because we have moved to progress over a two-year period, we see a greater fall off in achieved sample size than in our previous analysis. This particularly affects pupils in year 3 and in year 8. For year 3 pupils this is because we would need to link with outcomes in year 1 and only a small number of assessments are taken at this age. For year 8 pupils this is because we link back to their results in year 6, for most pupils this is only possible if they attended both a primary and secondary school that participated in Star Assessments (this was already the case for pupils in year 7).
- Our most robust estimates relate to primary-aged pupils. Our analysis for reading shows results for both primary and secondary-aged pupils with key differences between them, but we cannot produce reliable estimates in mathematics for secondary-aged pupils.
- Our estimates of learning loss only relate to learning losses in reading and mathematics. We cannot conclude anything about learning loss in other subjects.

Chapter 2: Average outcomes across all pupils at the start of the academic year, 2017/18 to 2021/22

In this section we consider the raw scaled score outcomes in Star Reading and mathematics in the first half of the autumn term by comparing outcomes in 2021/22 with those in earlier years. These are not our estimates of learning loss as they:

- do not account for any changes in the pupil population who are taking Star Assessments;
- take no account of the prior attainment of pupils taking assessments (e.g. we may have expected overall results to increase given previous outcomes); and
- in terms of the distribution of all assessments we do not remove cases where pupils have taken multiple assessments in the same half-term.

However, they do provide a simple benchmark of the outcomes that pupils achieved in this academic year in comparison to previous years and highlight any year groups or pupil groups where results differ from years prior to the pandemic.

Distribution of results from all assessments

We begin by looking at all assessments taken during the first half of the autumn term in each of the last five years. In the first half of the autumn term 2021/22 pupils in years 3 to 9 completed just over 1.5 million assessments in reading and around 70,000 assessments in mathematics.

Figure 2.1 and Figure 2.2 show the distribution of scaled score outcomes in reading and mathematics respectively by national curriculum year group for 2017/18 to 2021/22. The vertical bars show the interquartile range (the range between the lower and upper quartile) and the horizontal lines show the median outcome. A full set of values is provided in Annex 1.

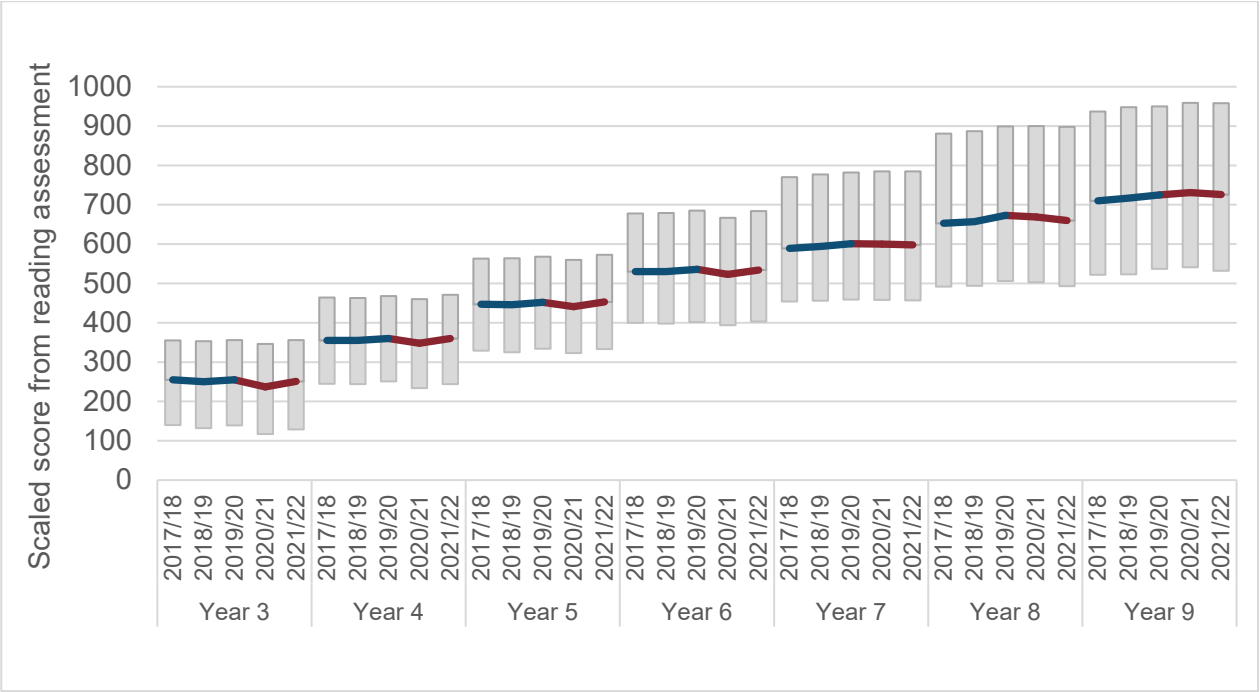
Amongst primary-aged pupils in reading there was a fall in median outcomes between 2019/20 and 2020/21 in all year groups. These ranged from a fall of 11 scaled score points amongst year 5 pupils to 18 scaled score points for pupils in year 3. Median outcomes in 2021/22 were much closer to those seen in 2019/20. In fact, median outcomes for year 4 and year 5 pupils are in line with those in 2019/20, median outcomes for year 6 pupils and year 3 pupils remained behind but to a much lesser extent than seen last year (4 scaled score points and 2 scaled score points respectively). Results in mathematics followed a similar pattern but the overall falls were larger.

The pattern of falls and then recovery is less clear amongst secondary-aged pupils in reading. Between 2019/20 and 2020/21, median outcomes fell amongst year 8 pupils (4 scaled score points) but were broadly flat for year 7 pupils (1 scaled score point) and increased for year 9 pupils (6 scaled score points). But in 2021/22 median outcomes fell

back so that in year 7 they were 3 scaled score points behind where they were in 2019/20, and in year 8 they were 13 scaled score points behind.

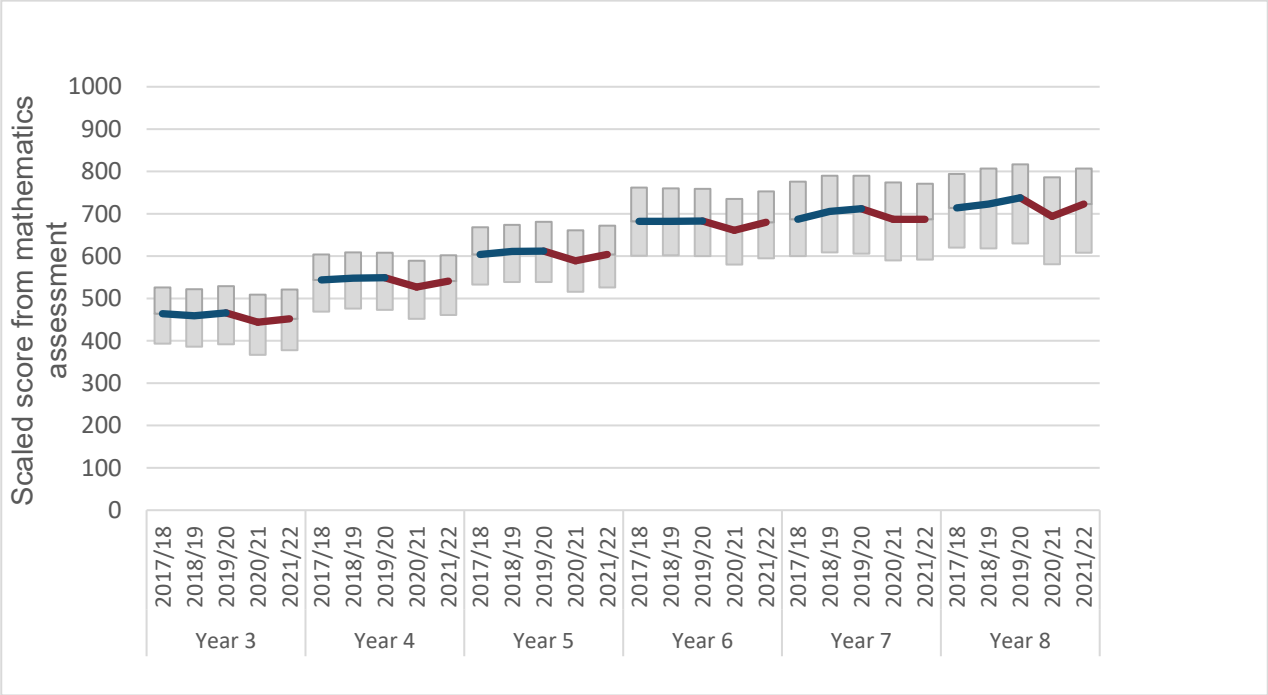
Interpreting these results in terms of 'lost learning' is not straightforward. Primarily this is because we should not assume that results in 2021/22 would have been the same as in 2019/20 in the absence of the pandemic. For example, if we look at the results of some year groups leading up to the pandemic, we can see that median results were increasing, as the same pupils continued through school we might have then expected results in older year groups to increase too. This is why in our estimates of learning loss we focus on the expected progress of pupils rather than their raw outcomes.

Figure 2.1: Distribution of assessments in Star Reading in the first half of the autumn term 2017/18 – 2021/22 by national curriculum year group[15]



[15] In these charts the vertical bars represent the range between the upper and lower quartiles of all assessment outcomes. The horizontal lines represent the median outcomes with colours highlighting assessments taken before and after the start of the pandemic.

Figure 2.2: Distribution of assessments in Star Maths in the first half of the autumn term 2017/18 – 2021/22 by national curriculum year group



Average outcomes by pupil characteristics

We now examine some of the outcomes by pupil characteristics. In doing so we also start to reduce our dataset to be closer to our core learning loss dataset. Whereas before we used all assessments taken during the first half of the autumn term we now:

- remove duplicate cases where a pupil has sat multiple assessments, we take the last assessment in the half term;
- restrict analysis to those pupils for whom it has been possible to match a record in the National Pupil Database (this is our source of pupil characteristics); and
- restrict further to those pupils who also have an assessment outcome in the equivalent half term two years ago, this is because later we will control for their prior attainment.

These all have the effect of reducing the overall sample size. The condition to have outcomes data from two years ago being the most significant as it removes pupils in year 3 from our analysis (since very few pupils take assessments in year 1). We also remove secondary-aged pupils from our mathematics analysis since the numbers are too small. In total there were around 270,000 pupils in reading and 10,000 pupils in mathematics who met all of the conditions above.

A full set of breakdowns by pupil characteristics is presented in Annex 2, we illustrate some of the key trends by examining results in reading for pupils in year 4, year 6, and year 8.

Figure 2.3, Figure 2.4, and Figure 2.5 plot the mean outcomes in reading by key pupil characteristics for pupils in year 4, year 6, and year 8 respectively. The horizontal axis represents results at the start of the 2019/20 academic year (i.e. pre-pandemic) and the vertical axis represents results at the start of the 2020/21 academic year. Note that the mean averages for this restricted set of pupils are higher than the medians seen in the previous section. The differences between 2019/20 and 2021/22 are also greater.

The diagonal line represents cases where, on average, outcomes in 2021/22 are the same as in 2019/20. In nearly all cases the plots appear below this line, this means that on average results were lower in 2021/22 than they were in 2019/20. Amongst pupils in year 4, scaled score results in reading were 4.3 points lower in 2021/22 than in 2019/20, for pupils in year 5 this was slightly more at 5.6 points and for pupils in year 8 it was 8.4 points.

Pupils from disadvantaged backgrounds typically saw the largest falls between 2019/20 and 2021/22. Amongst year 4 pupils the average results fell by 10.3 scaled score points for this group, amongst year 6 pupils results fell by 8.6 points, and for year 8 pupils results were 13.1 points lower than in 2019/20.

As in the previous section, these results do not represent our best estimates of learning loss since they are comparing two different sets of pupils – those in the 2019/20 cohort and those in the 2021/22 cohort.

Figure 2.3: Mean scaled score in reading by pupil characteristics 2019/20 and 2021/22 – pupils in year 4

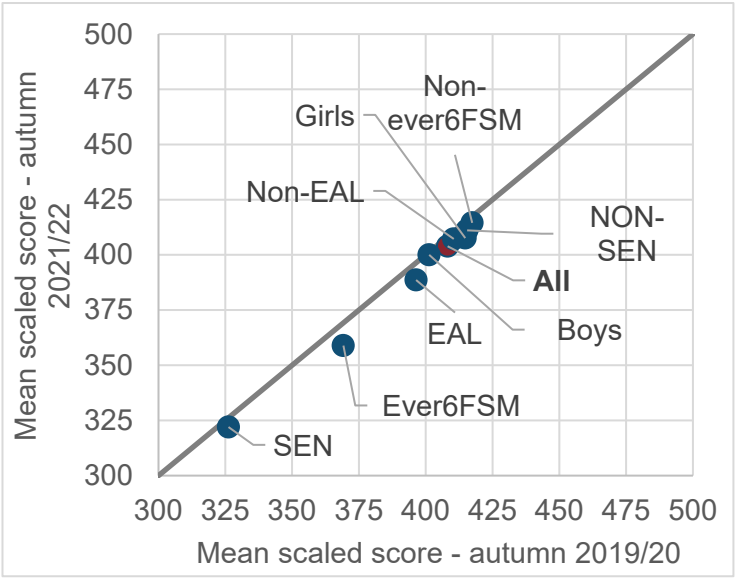


Figure 2.4: Mean scaled score in reading by pupil characteristics 2019/20 and 2021/22 – pupils in year 6

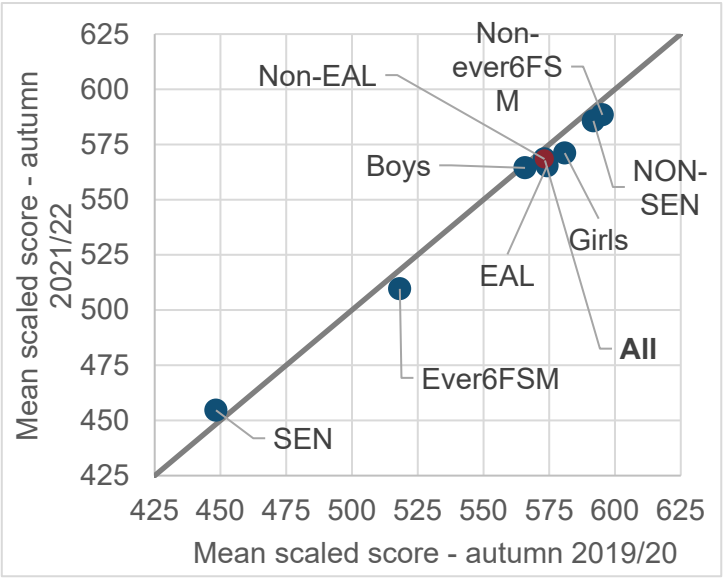
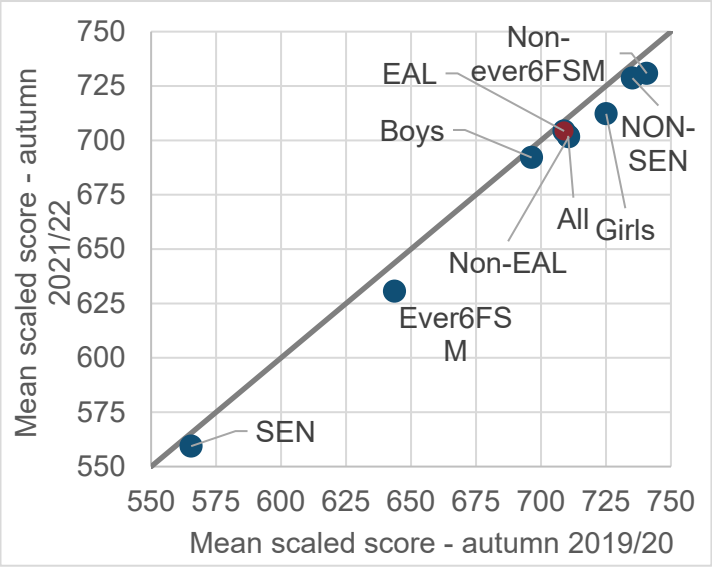


Figure 2.5: Mean scaled score in reading by pupil characteristics 2019/20 and 2021/22 – pupils in year 8



Chapter 3: Estimated learning loss by autumn 2021/22

Figures 3.1 to 3.3 show the estimated learning loss in reading for primary (figure 3.1) and secondary (figure 3.2) aged pupils and in mathematics for primary-aged pupils (figure 3.3) in terms of months of learning. Table 3.4 provides a summary across both phases and subjects as well as estimates of learning loss in scaled score terms.

Overall estimates of learning loss

In Star Reading, in autumn 2021/22:

- primary-aged pupils achieved 3.6 scaled score points lower than similar pupils at the start of 2019/20; this is equivalent to a learning loss of 0.8 months and a shift in the primary attainment distribution of 0.02 standard deviations;
- secondary-aged pupils achieved 17.7 scaled score points lower than similar pupils at the start of 2019/20; this is equivalent to a learning loss of 2.4 months and a shift in the primary attainment distribution of 0.07 standard deviations;

In Star Maths, in autumn 2021/22:

- primary-aged pupils achieved 13.8 scaled score points lower than similar pupils at the start of 2019/20; this is equivalent to a learning loss of 1.9 months and a shift in the primary attainment distribution of 0.12 standard deviations;

Estimates of learning loss by pupil characteristics

Results by pupil characteristics show the ongoing disparities in how the pandemic has affected pupil outcomes – though in a limited number of groups, outcomes are on average at or around where would be expected given their previous outcomes. It should be noted however that for some groups the underlying sample sizes are small and hence the measures have a great deal of uncertainty.

We find that amongst primary-aged pupils in reading in autumn 2021/22:

- Pupils from disadvantaged backgrounds (defined as pupils eligible for free school meals at any point in the last six years) achieved 11.2 scaled score points lower than similar pupils at the start of 2019/20; this is equivalent to a learning loss of 1.4 months. Non disadvantaged pupils achieved 1.2 scaled score points lower than similar pupils at the start of 2019/20; this is equivalent to a learning loss of 0.5 months. The gap in learning loss between disadvantaged pupils and their peers was 0.9 months.
- Pupils with English as an additional language (EAL pupils) achieved 5.2 scaled score points lower than similar pupils at the start of 2019/20; this is equivalent to a learning loss of 0.9 months. Learning loss for these pupils was slightly higher than

learning losses for non-EAL pupils (3.2 scaled score points, equivalent to 0.7 months).

- Pupils with an identified special educational need (SEN pupils) achieved 9.4 scaled score points lower than similar pupils at the start of 2019/20; this is equivalent to a learning loss of 1.2 months. Non-SEN pupils achieved 2.8 scaled score points lower than similar pupils at the start of 2019/20; this is equivalent to a learning loss of 0.7 months.
- Pupils identified as children in need achieved 9.1 scaled score points lower than similar pupils at the start of 2019/20; this is equivalent to a learning loss of 1.1 months.

Amongst secondary-aged pupils in reading in autumn 2021/22:

- Pupils from disadvantaged backgrounds (defined as pupils eligible for free school meals at any point in the last six years) achieved 25.4 scaled score points lower similar pupils at the start of 2019/20; this is equivalent to a learning loss of 3.5 months. Non disadvantaged pupils achieved 14.7 scaled score points lower than similar pupils at the start of 2019/20. The gap in learning loss between disadvantaged pupils and their peers was 1.5 months.
- EAL pupils achieved 12.4 scaled score points lower than similar pupils at the start of 2019/20; this is equivalent to a learning loss of 1.9 months. Learning loss for these pupils was lower than learning losses for non-EAL pupils (18.8 scaled score points or 2.6 months).
- SEN pupils achieved 25.0 scaled score points lower than similar pupils at the start of 2019/20; this is equivalent to a learning loss of 3.7 months. Non-SEN pupils achieved 16.4 scaled score points lower than similar pupils at the start of 2019/20; this is equivalent to a learning loss of 2.2 months.
- Pupils identified as children in need achieved 29.8 scaled score points lower than similar pupils at the start of 2019/20; this is equivalent to a learning loss of 4.1 months.

Amongst primary-aged pupils in mathematics in autumn 2021/22, the sample sizes are significantly smaller than for reading (for example the number of pupils with an identified special educational need is under 300). This means that there is a wide degree of uncertainty in these estimates and robust estimates cannot be produced for all breakdowns. These uncertainties have also been apparent in previous analyses. We find that:

- Pupils from disadvantaged backgrounds (defined as pupils eligible for free school meals at any point in the last six years) achieved 15.8 scaled score points lower than similar pupils at the start of 2019/20; this is equivalent to a learning loss of 2.2 months. Non disadvantaged pupils achieved 13.1 scaled score points lower

than similar pupils at the start of 2019/20. The gap in learning loss between disadvantaged pupils and their peers was 0.4 months.

- EAL pupils achieved 9.2 scaled score points lower than similar pupils at the start of 2019/20; this is equivalent to a learning loss of 1.4 months. Learning loss for these pupils was lower than learning losses for non-EAL pupils (14.8 scaled score points or 2.0 months).
- SEN pupils achieved 12.7 scaled score points lower than similar pupils at the start of 2019/20; this is equivalent to a learning loss of 1.7 months. Non-SEN pupils achieved 13.9 scaled score points lower than similar pupils at the start of 2019/20; this is equivalent to a learning loss of 1.9 months.

Estimates of learning loss by area level disadvantage

The second parts of Figure 3.1 and Figure 3.2 present estimates of learning loss for pupils from disadvantaged backgrounds and their more affluent peers split by the level of deprivation within the local area (defined by IDACI score).[16]

For primary-aged pupils in reading, we find:

- Non-disadvantaged pupils in areas with medium and high levels of deprivation experienced a similar degree of learning loss (0.8 months and 0.9 months respectively) to disadvantaged pupils in areas with low levels of deprivation (0.7 months);[17]
- Non-disadvantaged pupils within areas with a low level of deprivation achieved outcomes that were broadly in line with expectations given their previous outcomes – in other words, on average they are showing limited signs of lost learning (0.1 months) suggesting that losses experienced during the pandemic have been recovered.[18]

For secondary-aged pupils in reading, we find:

- Non-disadvantaged pupils in areas with medium and high levels of deprivation experienced a similar degree of learning loss (2.4 months and 2.5 months

[16] IDACI score denotes Income Deprivation Affecting Children Index score, which can be interpreted as the proportion of families in a local area, with children aged under 16, which are income deprived. We define the levels of deprivation in the area as follows: Low IDACI area (0-12.5%), Medium IDACI area (12.5%-30%) and High IDACI area (30%+).
[17] The estimates for these groups are higher than for disadvantaged pupils but the small sample sizes lead to a degree of uncertainty and caution should be applied to comparing differences.
[18] In scaled score terms our estimates suggest that this group is, on average, scoring slightly above what would be expected given prior outcomes. This apparent oddity can occur because our approach to converting to months relies on the expected progress of each individual pupil (based on the modelling) rather than a simple mapping between scaled scores and months of progress. So, for example, one scaled score lost for one pupil does not necessarily balance one scaled score gained for another pupil once each is converted to months of progress.

respectively) to disadvantaged pupils in areas with low levels of deprivation (2.8 months).

- Disadvantaged pupils within areas with a high level of deprivation experienced greater learning losses than disadvantaged pupils in areas of low deprivation (3.8 months and 2.8 months respectively.

This analysis suggests that the mixture of disadvantage at the pupil and area-level results in greater learning losses for the most disadvantaged pupils. Furthermore, both pupil and area level deprivation have an influence on the level of learning loss experienced by pupils as seen in the results

Estimates of learning loss by region

Results by region show the ongoing disparities in how the pandemic has affected outcomes in different parts of the country. For the first time we see that outcomes for some regions are on average, at or around where would be expected given their previous outcomes. It should be noted however that there is a great deal of uncertainty around estimates by region in both the modelling of predicted scores and in how that then translates into learning loss. While pupil counts can appear substantial, they may be drawn from a limited number of schools. Where the number of schools is limited, any analysis may reflect the circumstances of those schools rather than being representative of the region. For that reason, we only include results in reading and do not present analysis of learning losses in mathematics by region in this report.

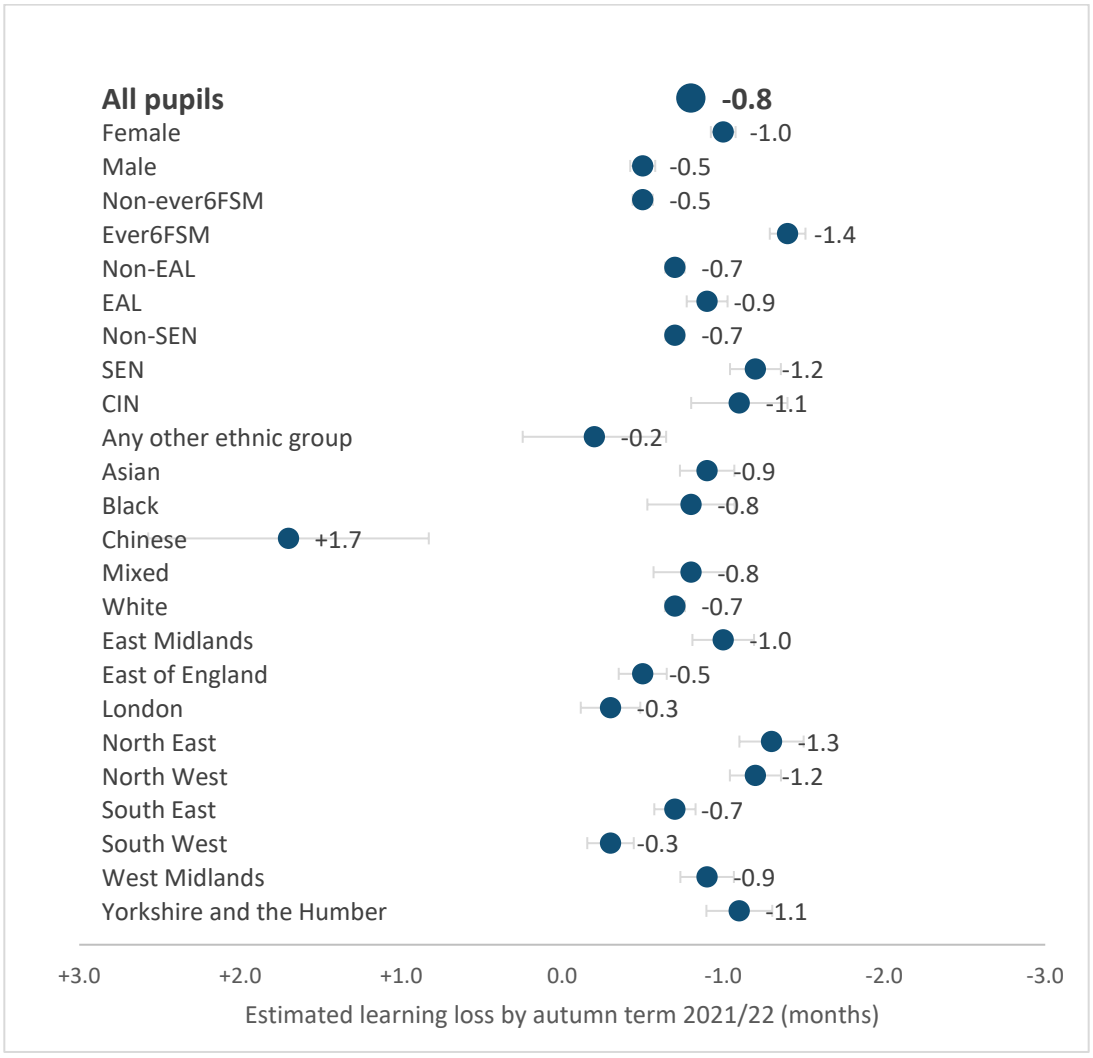
For primary-aged pupils in reading, we find:

- The greatest learning losses have been experienced by pupils in the North East (1.3 months), the North West (1.2 months), and Yorkshire and the Humber (1.1 months).
- Pupils in the South West (0.3 months) and London (0.3 months) have outcomes that are only just below expectations given previous outcomes.

For secondary-aged pupils in reading, we find:

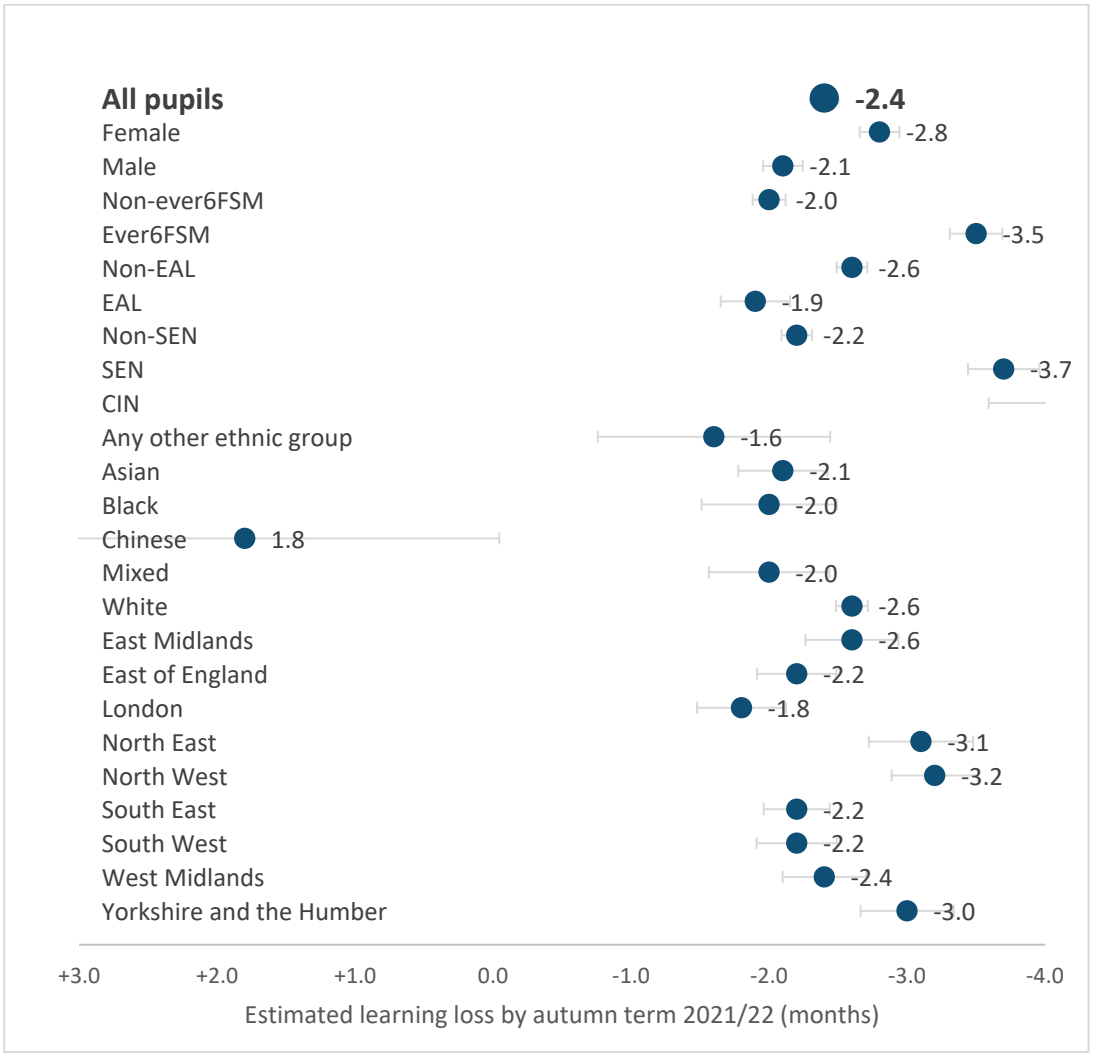
- The greatest learning losses have been experienced by pupils in the North West (3.2 months), the North East (3.1 months), and Yorkshire and the Humber (3.0 months).
- The smallest learning losses were for pupils in London (1.8 months).

Figure 3.1 Estimated mean learning loss in months by characteristics and area deprivation – primary reading[19]



[19] Negative numbers represent learning loss. The horizontal / vertical lines represent the 95% confidence interval for the estimate of learning loss.

Figure 3.2: Estimated mean learning loss in months by characteristics and area deprivation – secondary reading



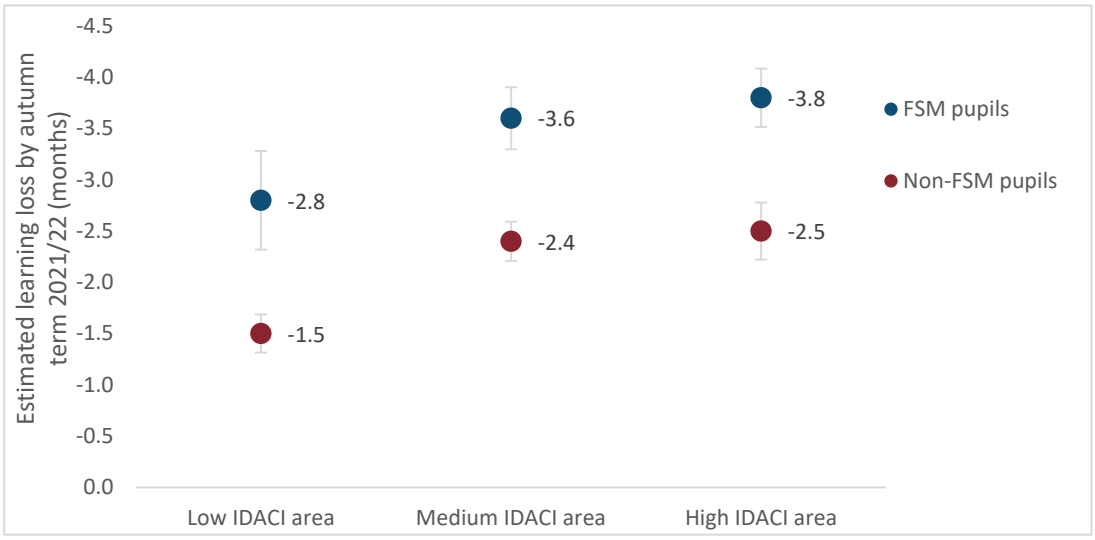


Figure 3.3: Estimated mean learning loss in months by characteristics – primary mathematics

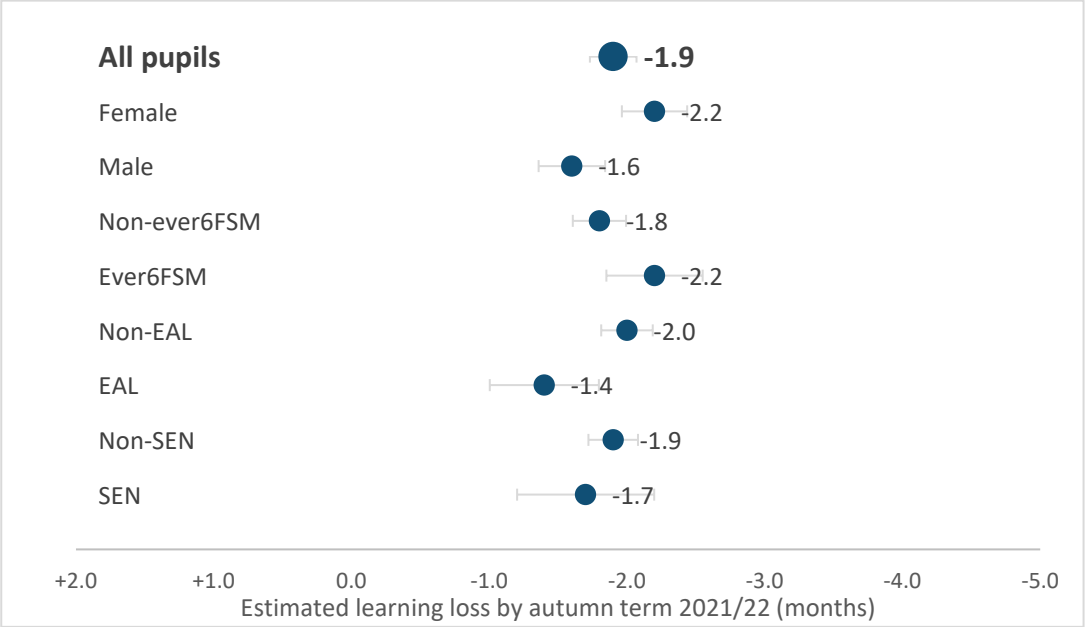


Table 3.1: Summary of all learning loss estimates in reading for autumn 2021/22 in months and scaled score terms

	Primary reading					Secondary reading				
		Months		Scaled score			Months		Scaled score	
	N	Mean	CI[20]	Mean	CI	N	Mean	CI	Mean	CI
All pupils	142,046	-0.8	*0.1*	-3.6	*0.6*	110,022	-2.4	0.1	-17.7	1.0
Female	71,763	-1.0	*0.1*	-6.5	*0.9*	54,698	-2.8	0.1	-21.3	1.4
Male	70,283	-0.5	*0.1*	-0.6	*0.9*	55,324	-2.1	0.1	-14.2	1.4
Non-ever6 FSM	107,534	-0.5	*0.1*	-1.2	*0.7*	78,725	-2.0	0.1	-14.7	1.2
Ever6 FSM	34,512	-1.4	*0.1*	-11.2	*1.3*	31,297	-3.5	0.2	-25.4	1.8
First language known or believed to be English (non-EAL)	115,717	-0.7	*0.1*	-3.2	*0.7*	92,024	-2.6	0.1	-18.8	1.1
First language known or believed to be other than English (EAL)	26,329	-0.9	*0.1*	-5.2	*1.5*	17,998	-1.9	0.3	-12.4	2.4
Pupils with no identified special educational need (non SEN)	125,050	-0.7	*0.1*	-2.8	*0.7*	93,088	-2.2	0.1	-16.4	1.1
Pupils with identified special educational needs (SEN)	16,996	-1.2	*0.2*	-9.4	*1.8*	16,934	-3.7	0.3	-25	2.5
Children in Need	4,733	-1.1	*0.3*	-9.1	*3.4*	4,396	-4.1	0.5	-29.8	4.9
Any other ethnic group	2,134	-0.2	*0.4*	2.4	*5.1*	1,603	-1.6	0.8	-12.5	8.1
Asian	14,834	-0.9	*0.2*	-4.0	*1.9*	10,848	-2.1	0.3	-13.5	3.1
Black	5,755	-0.8	*0.3*	-4.9	*3.1*	4,738	-2.0	0.5	-13.7	4.7
Chinese	558	1.7	*0.9*	27.7	*10.0*	334	1.8	1.8	20.5	17.8

[20] This is the 95% confidence interval around the mean. A value of 0.1 here means the confidence interval around the mean is +/-0.1.

	Primary reading					Secondary reading				
		Months		Scaled score			Months		Scaled score	
	N	Mean	CI[20]	Mean	CI	N	Mean	CI	Mean	CI
Mixed	7,814	-0.8	*0.2*	-4.0	*2.7*	5,950	-2.0	0.4	-14.2	4.2
White	109,842	-0.7	*0.1*	-3.7	*0.7*	85,197	-2.6	0.1	-19.0	1.1
East Midlands	11,566	-1.0	*0.2*	-6.3	*2.2*	9,979	-2.6	0.3	-19.3	3.3
East of England	19,037	-0.5	*0.1*	-1.0	*1.7*	13,768	-2.2	0.3	-13.7	2.8
London	12,405	-0.3	*0.2*	2.4	*2.1*	10,947	-1.8	0.3	-12.5	3.1
North East	10,639	-1.3	*0.2*	-9.7	*2.3*	7,954	-3.1	0.4	-22.7	3.6
North West	16,831	-1.2	*0.2*	-8.8	*1.8*	11,624	-3.2	0.3	-24.5	3.0
South East	25,795	-0.7	*0.1*	-3.0	*1.5*	19,859	-2.2	0.2	-15.4	2.3
South West	20,311	-0.3	*0.1*	1.9	*1.7*	13,435	-2.2	0.3	-16.5	2.8
West Midlands	15,339	-0.9	*0.2*	-5.2	*1.9*	12,479	-2.4	0.3	-17.1	2.9
Yorkshire and the Humber	10,123	-1.1	*0.2*	-7.6	*2.4*	9,977	-3.0	0.3	-22.6	3.3
FSM pupil in low IDACI area[21]	4,650	-0.7	0.3	-4.4	3.5	4,913	-2.8	0.5	-20.5	0.5
FSM pupil in medium IDACI area	13,246	-1.3	0.2	-10.2	2.1	12,390	-3.6	0.3	-26.4	0.3
FSM pupil in high IDACI area	16,616	-1.7	0.2	-13.8	1.8	13,994	-3.8	0.3	-26.3	0.3
non-FSM pupil in low IDACI area	40,111	-0.1	0.1	4.4	1.2	32,892	-1.5	0.2	-10.8	0.2
non-FSM pupil in medium IDACI area	44,234	-0.8	0.1	-3.9	1.1	31,150	-2.4	0.2	-17.6	0.2
non-FSM pupil in high IDACI	23,189	-0.9	0.1	-5.5	1.6	14,683	-2.5	0.3	-17.1	0.3

[21] IDACI denotes Income Deprivation Affecting Children Index score, which can be interpreted as the proportion of families in a local area, with children aged under 16, which are income deprived. We define the levels of deprivation in the area as follows: Low IDACI area (0-12.5%), Medium IDACI area (12.5%-30%) and High IDACI area (30%+).

Table 3.2: Summary of all learning loss estimates in mathematics for autumn 2021/22 in months and scaled score terms

	Primary mathematics				
		Months		Scaled score	
	N	Mean	CI[22]	Mean	CI
All pupils	8,592	-1.9	0.2	-13.8	1.5
Female	4,377	-2.2	0.2	-15.8	2.1
Male	4,215	-1.6	0.2	-11.6	2.1
Non-ever6 FSM	6,579	-1.8	0.2	-13.1	1.7
Ever6 FSM	2,013	-2.2	0.3	-15.8	3.1
First language known or believed to be English (non-EAL)	7,024	-2.0	0.2	-14.8	1.6
First language known or believed to be other than English (EAL)	1,568	-1.4	0.4	-9.2	3.5
Pupils with no identified special educational need (non SEN)	7,599	-1.9	0.2	-13.9	1.6
Pupils with identified special educational needs (SEN)	993	-1.7	0.5	-12.7	4.4

[22] This is the 95% confidence interval around the mean. A value of 0.1 here means the confidence interval around the mean is +/-0.1.

Chapter 4: Understanding changes in learning loss between summer 2020/21 and autumn 2021/22

We now consider how the degree of learning loss has changed over time. In our previous report we presented analysis that showed our estimates of learning loss changed at key points during the 2020/21 academic year based on pupils that had assessment data at each of those points.

The results for autumn 2021/22 presented in Chapter 3 are not directly comparable to these results. There are a number of reasons for this:

- We do not look at exactly the same set of pupils in autumn as we did in summer and do not control for the fact that they may have different characteristics or profile of outcomes.
- There are pupils in the secondary group who were previously included in analysis of primary schools (i.e. year 7 pupils) – and indeed their results may reflect activity whilst in primary school.
- We do not include results for year 3 pupils in our 2021/22 results as only a limited number have the necessary prior attainment (so the primary estimates are for a slightly older set of pupils than previously).
- Our move to needing prior attainment data from two years previously disproportionately affects our year 8 cohort (since they would now have needed to be in a primary school that used Star Assessments) and so the year group mix is slightly different.

In order to mitigate these effects, we can restrict analysis to only those pupils for whom we have been able to estimate learning loss in both the autumn term 2021/22 and the summer term 2020/21. Note that this latter group is all pupils with results in the summer, this is not the same as the "summer" group in our analysis covering the whole of 2020/21. In that analysis we had restricted the "summer to those who had also had results earlier in the academic year.

In Table 4.1 we present estimates of how learning loss has changed between summer 2020/21 and autumn 2021/22 based on including the same set of pupils at each point. A negative value indicates that the degree of learning loss increased between summer and autumn and we highlight where these changes are statistically significant.

Amongst primary-aged pupils in reading:

- Overall, there was no change in the overall level of learning loss across all pupils between summer and autumn.
- Pupils from non-disadvantaged backgrounds saw a slight continuation of recovery (0.1 months) as did EAL pupils (0.2 months), pupils in the South West (0.3

months), and pupils the West Midlands (0.4 months). Pupils in London saw a slight reduction but this was not statistically significant.

- Pupils from disadvantaged backgrounds saw an increase in their degree of learning loss (0.2 months) as did SEN pupils (0.3 months), pupils in the North East (0.4 months) and pupils in the Yorkshire and the Humber (0.4 months).
- Disadvantaged pupils living in highly deprived areas also saw increases in learning loss (0.3 months). More broadly, disadvantaged pupils were already amongst the biggest losers as a result of the pandemic and that pattern has continued for primary-aged pupils in reading.

Amongst primary-aged pupils in mathematics:

- Overall, there was a significant reduction in the degree of learning loss across all pupils between the summer and autumn terms (0.4 months).
- Pupils from disadvantaged backgrounds saw larger reductions (0.6 months) in the degree of learning loss than pupils from non-disadvantaged backgrounds (0.3 months), but overall the total learning loss for these pupils remains above average.

Amongst secondary-aged pupils in reading:

- Overall, there was a significant increase in the level of learning loss across all pupils between summer and autumn (0.5 months).
- Almost all of the groups in our analysis saw increases but the size of these increases did vary. Learning losses for disadvantaged pupils increased by 0.8 months compared with 0.4 months for non-disadvantaged pupils and losses for pupils with an identified special educational need increased by 1.1 months compared with 0.4 months for pupils without an identified special educational need.
- Pupils in London and the North West saw the greatest increases in learning loss (both were 1.1 months) followed by those in the North East at 0.8 months. The results for London are particularly stark as the learning loss had previously been very low (around 0.2 months) though London remained the region with the lowest learning loss overall.

Whilst there are some signs of ongoing recovery in primary schools, particularly in mathematics, the picture is far from consistent with some groups – particularly those from disadvantaged backgrounds – falling further behind in reading than they had been in the summer.

Amongst secondary-aged pupils learning losses increased on average between summer and autumn by 0.5 months. The increases were larger for disadvantaged pupils than non-disadvantaged pupils and this comes on top of existing disparities in the degree of learning loss, and the large attainment gap that existed before the beginning of the pandemic. By autumn 2021/22 the total learning loss for disadvantaged secondary pupils

in reading was 3.5 months, compared with 2.0 months for non-disadvantaged pupils (see Chapter 3).

Table 4.1: Change in learning loss between summer 2020/21 and autumn 2021/22[23]

	Primary reading				Secondary reading				Primary mathematics		
	N	Change	Significance		N	Change	Significance		N	Change	Significance
All pupils	115,609	0.0	-		69,862	-0.5	*Sig increase*		7,923	+0.4	*Sig reduction*
Female	58,531	+0.1	-		34,956	-0.5	*Sig increase*		3,990	0.0	-
Male	57,078	-0.1	-		34,906	-0.5	*Sig increase*		3,933	0.0	-
Non-ever6FSM	88,238	+0.1	*Sig reduction*		50,900	-0.4	*Sig increase*		6,077	+0.3	*Sig reduction*
Ever6FSM	27,371	-0.2	*Sig increase*		18,962	-0.8	*Sig increase*		1,846	+0.6	*Sig reduction*
First language known or believed to be English (non-EAL)	94,781	0.0	-		58,552	-0.5	*Sig increase*		6,517	0.0	-
First language known or believed to be other than English (EAL)	20,828	+0.2	*Sig reduction*		11,310	-0.5	*Sig increase*		1,406	+0.7	*Sig reduction*
Pupils with no identified special educational need (non SEN)	102,151	+0.1	-		59,381	-0.4	*Sig increase*		7,004	+0.4	*Sig reduction*
Pupils with identified special educational needs (SEN)	13,458	-0.3	*Sig increase*		10,481	-1.1	*Sig increase*		919	-0.2	-

[23] A positive change means that the degree of learning loss has reduced (i.e. recovery) whilst a negative change means further losses were seen. The "Significance" columns show whether there has been a statistically significant change in the level of learning loss since summer term 2020/21.

	Primary reading				Secondary reading				Primary mathematics		
	N	Change	Significance		N	Change	Significance		N	Change	Significance
Any other ethnic group	1,639	+1.1	*Sig reduction*		1,002	-1.1	-				
Asian	11,757	+0.2	-		6,608	-0.4	-				
Black	4,374	-0.1	-		2,974	-1.2	*Sig increase*				
Chinese	454	+2.0	*Sig reduction*		216	+0.3	-				
Mixed	6,275	0.0	-		3,692	+0.1	-				
White	90,192	0.0	-		54,560	-0.5	*Sig increase*				
East Midlands	9,259	-0.1	-		6,670	-0.6	*Sig increase*				
East of England	14,892	0.0	-		8,408	-0.5	*Sig increase*				
London	9,254	+0.1	-		6,593	-1.1	*Sig increase*				
North East	8,464	-0.4	*Sig increase*		4,476	-0.8	*Sig increase*				
North West	13,734	0.0	-		7,089	-1.1	*Sig increase*				
South East	22,553	0.0	-		14,638	0.0	-				
South West	16,645	+0.3	*Sig reduction*		8,786	-0.4	-				
West Midlands	12,621	+0.4	*Sig reduction*		7,678	-0.7	*Sig increase*				
Yorkshire and the Humber	8,187	-0.4	*Sig increase*		5,524	+0.1	-				

	Primary reading				Secondary reading				Primary mathematics		
	N	Change	Significance		N	Change	Significance		N	Change	Significance
FSM pupil in low IDACI area[24]	3,742	0.0	-		2,943	-0.6	-				
FSM pupil in medium IDACI area	10,670	-0.2	-		7,788	-0.8	*Sig increase*				
FSM pupil in high IDACI area	12,959	-0.3	*Sig increase*		8,231	-0.8	*Sig increase*				
non-FSM pupil in low IDACI area	33,231	+0.1	-		21,291	-0.5	*Sig increase*				
non-FSM pupil in medium IDACI area	36,581	+0.1	-		20,413	-0.4	*Sig increase*				
non-FSM pupil in high IDACI	18,426	+0.2	-		9,196	-0.3	-				

[24] IDACI denotes Income Deprivation Affecting Children Index score, which can be interpreted as the proportion of families in a local area, with children aged under 16, which are income deprived. We define the levels of deprivation in the area as follows: Low IDACI area (0-12.5%), Medium IDACI area (12.5%-30%) and High IDACI area (30%+).

Annex 1: Distribution of assessment scores

Table A.1: Distribution of all assessments by year and national curriculum year group – reading

		Number of assessments	Lower quartile	Median	Upper quartile
Year 3	**2017/18**	77,684	140	255	355
	2018/19	100,987	132	250	353
	2019/20	128,833	139	255	356
	2020/21	134,204	117	237	346
	2021/22	215,279	129	251	356
Year 4	**2017/18**	80,809	245	355	464
	2018/19	102,861	244	355	463
	2019/20	132,462	251	360	468
	2020/21	147,362	234	348	460
	2021/22	238,724	244	360	471
Year 5	**2017/18**	89,082	329	447	563
	2018/19	110,087	325	446	564
	2019/20	137,479	334	452	568
	2020/21	156,059	323	441	560
	2021/22	253,496	333	453	573
Year 6	**2017/18**	83,688	400	530	678
	2018/19	106,803	398	530	679
	2019/20	132,219	402	536	685
	2020/21	148,967	394	523	667
	2021/22	249,233	403	534	684
Year 7	**2017/18**	200,643	454	589	770
	2018/19	217,201	456	594	777
	2019/20	245,900	459	601	782
	2020/21	374,334	458	600	785
	2021/22	265,260	457	598	785
Year 8	**2017/18**	158,366	492	653	881
	2018/19	169,523	494	657	887
	2019/20	193,584	506	673	899
	2020/21	145,745	503	669	900
	2021/22	228,504	493	660	898
Year 9	**2017/18**	67,726	522	710	937
	2018/19	68,928	523	717	948
	2019/20	76,669	537	725	950
	2020/21	60,668	541	731	959
	2021/22	108,347	532	726	958

Table A.2: Distribution of all assessments by year and national curriculum year group – mathematics

		Number of assessments	Lower quartile	Median	Upper quartile
Year 3	**2017/18**	4,200	394	464	526
	2018/19	7,413	386	459	522
	2019/20	9,312	392	466	529
	2020/21	10,032	367	444	509
	2021/22	14,196	378	452	521
Year 4	**2017/18**	4,220	469	544	604
	2018/19	7,535	476	548	609
	2019/20	9,923	473	549	608
	2020/21	10,789	452	527	589
	2021/22	14,030	461	541	602
Year 5	**2017/18**	5,137	533	604	668
	2018/19	8,065	539	611	674
	2019/20	9,873	539	612	681
	2020/21	10,897	516	589	661
	2021/22	15,626	526	604	672
Year 6	**2017/18**	4,495	601	682	762
	2018/19	8,221	602	682	760
	2019/20	9,366	600	683	759
	2020/21	10,290	580	661	735
	2021/22	14,893	595	680	753
Year 7	**2017/18**	5,869	600	687	776
	2018/19	4,244	609	706	790
	2019/20	5,460	606	712	790
	2020/21	8,552	590	687	774
	2021/22	6,014	592	687	771
Year 8	**2017/18**	3,211	620	714	794
	2018/19	2,687	618	723	807
	2019/20	2,747	630	738	817
	2020/21	2,747	581	694	786
	2021/22	4,258	608	723	807

Annex 2: Mean assessment scores by pupil characteristics

Table A.1: Mean scores in reading assessments by pupil characteristics and year group – autumn 2019/20

Year	All	Girls	Boys	Non-ever6 FSM	Ever6 FSM	Non-EAL	EAL	Non-SEN	SEN	Any Other Ethnic Group	Asian	Black	Chi-nese	Mixed	White
4	408.2	414.8	401.3	417.4	369.2	410.5	396.4	415.5	326.2	385.5	400.5	409.5	450.5	415.6	408.5
5	480.5	487.8	473.1	495.7	434.5	481.2	477.5	494.4	372.4	448.1	488.2	470.9	565.2	496.1	479.3
6	573.4	580.9	565.8	595.2	518.2	573.2	574.2	591.8	448.3	553.8	586.8	570.2	666.4	584.2	570.8
7	635.6	648.2	623.1	660.2	580.3	635.7	634.8	656.3	506.8	624.2	645.2	638.0	773.5	650.0	633.1
8	710.4	725.1	696.4	740.7	643.7	710.7	708.9	735.2	565.4	720.1	714.7	715.6	790.5	739.6	707.5
9	777.3	793.4	761.6	808.2	712.0	780.3	759.4	803.5	631.9	770.9	771.4	781.2	826.2	791.6	777.4

Table A.2: Mean scores in reading assessments by pupil characteristics and year group – autumn 2021/22

Year	All	Girls	Boys	Non-ever6 FSM	Ever6 FSM	Non-EAL	EAL	Non-SEN	SEN	Any Other Ethnic Group	Asian	Black	Chi-nese	Mixed	White
4	403.9	407.6	400.0	414.5	358.9	407.2	388.6	411.1	322.0	376.3	395.5	401.7	466.9	415.9	404.3
5	476.5	480.4	472.5	492.6	425.0	479.1	465.1	490.6	369.2	454.2	474.0	470.7	564.5	489.7	476.1
6	567.8	571.1	564.4	588.4	509.6	568.4	565.3	585.7	454.6	539.2	575.0	571.1	667.6	583.9	565.7
7	630.7	636.7	624.7	654.9	568.4	630.6	631.0	651.4	509.5	624.1	638.3	636.1	698.1	647.0	628.4
8	702.1	712.2	692.1	730.8	630.6	701.6	704.3	728.6	559.4	684.4	710.6	717.7	837.9	712.1	699.3
9	773.9	788.3	759.8	801.2	704.5	775.3	765.8	799.8	632.6	765.3	776.6	772.7	886.1	788.0	772.2

Table A.3: mean scores in mathematics assessments by pupil characteristics and year group – autumn 2019/20

Year	All	Girls	Boys	Non-ever6 FSM	Ever6 FSM	Non-EAL	EAL	Non-SEN	SEN
4	557.4	555.2	559.4	566.6	522.8	555.7	570.5	565.8	485.7
5	635.3	630.6	639.8	645.5	602.1	629.5	662.4	645.6	555.5
6	702.1	700.2	704.1	714.9	672.2	699.0	717.2	714.9	616.8

Table A.4: mean scores in mathematics assessments by pupil characteristics and year group – autumn 2021/22

Year	All	Girls	Boys	Non-ever6 FSM	Ever6 FSM	Non-EAL	EAL	Non-SEN	SEN
4	549.4	545.6	553.2	558.6	515.3	547.3	559.5	555.3	492.0
5	617.4	609.6	625.6	627.3	579.8	615.6	625.3	626.2	548.0
6	685.2	681.5	689.0	695.2	652.8	680.5	706.6	695.5	610.6

Annex 3: Regression models for expected progress

Table A.1: Regression model for calculating expected progress in primary reading

Source	SS	df	MS
Model	1.68E+09	35	48022585.4
Residual	1.24E+09	88,879	13996.2
Total	2.92E+09	88,914	32894.2

Number of observations	88,915
F (35,88879)	3431.12
Prob > F	0.00
R-squared	0.575
Adj R-squared	0.575
Root MSE	118.31

	Coef.	Std Er-ror	t	P>t	(95% conf.	interval)
Constant	279.558	6.848	40.820	0.000	266.136	292.980
Year group						
4	-22.646	7.081	-3.200	0.001	-36.524	-8.768
5	-30.091	6.913	-4.350	0.000	-43.640	-16.542
6	-57.451	6.994	-8.210	0.000	-71.159	-43.742
Interaction between year group and prior attainment						
3	1.067	0.056	19.040	0.000	0.957	1.176
4	1.023	0.012	88.270	0.000	1.000	1.045
5	0.961	0.006	173.020	0.000	0.950	0.972
6	1.037	0.005	209.630	0.000	1.027	1.047
Male	4.505	0.802	5.620	0.000	2.934	6.077
Spring	1.291	0.972	1.330	0.184	-0.615	3.197
Summer	-0.324	0.973	-0.330	0.739	-2.232	1.584
Days between tests	0.506	0.018	27.660	0.000	0.470	0.542
Major ethnic group						
Any Other Ethnic Group	-8.649	3.376	-2.560	0.010	-15.266	-2.032
Asian	3.102	1.702	1.820	0.068	-0.234	6.438
Black	1.902	2.053	0.930	0.354	-2.122	5.926
Chinese	29.484	6.327	4.660	0.000	17.083	41.885
Mixed	9.165	1.841	4.980	0.000	5.556	12.774
Unclassified	9.868	4.633	2.130	0.033	0.787	18.949
SEN	-25.488	1.318	-19.340	0.000	-28.071	-22.904
EAL	8.545	1.375	6.210	0.000	5.850	11.240

	Coef.	Std Er-ror	t	P>t	(95% conf.	interval)
EAL recent arrival	49.427	5.005	9.880	0.000	39.617	59.237
Children in need	-11.667	2.272	-5.140	0.000	-16.120	-7.214
Children looked after	6.731	6.724	1.000	0.317	-6.448	19.909
Ever6FSM	-24.893	2.398	-10.380	0.000	-29.593	-20.193
Persistent FSM	-5.253	2.584	-2.030	0.042	-10.318	-0.188
IDACI score	-70.198	3.744	-18.750	0.000	-77.535	-62.860
Interaction between Ever6FSM and IDACI score	43.719	6.729	6.500	0.000	30.530	56.909
Reading progress score at KS2 (school level)	1.863	0.179	10.430	0.000	1.513	2.213
East Midlands	-4.654	1.739	-2.680	0.007	-8.062	-1.247
East of England	-6.553	1.408	-4.660	0.000	-9.312	-3.794
London	-0.509	1.660	-0.310	0.759	-3.762	2.744
North East	-3.750	1.750	-2.140	0.032	-7.180	-0.320
North West	-1.726	1.548	-1.110	0.265	-4.760	1.309
South West	-7.331	1.374	-5.340	0.000	-10.024	-4.639
West Midlands	-8.174	1.576	-5.190	0.000	-11.263	-5.085
Yorkshire and the Humber	-12.702	1.829	-6.950	0.000	-16.287	-9.118

Table A.2: Regression model for calculating expected progress in secondary reading

Source	SS	df	MS
Model	2.67E+09	32	83320183.3
Resid-ual	2.06E+09	75,305	27405.0
Total	4.73E+09	75,337	62784.3

Number of observations	75,338
F (32,75305)	3040.33
Prob > F	0.00
R-squared	0.564
Adj R-squared	0.564
Root MSE	165.54

	Coef.	Std Er-ror	t	P>t	(95% conf.	interval)
Constant	192.61	4.67	41.26	0.00	183.46	201.76
Year group						
8	-22.06	6.14	-3.60	0.00	-34.09	-10.04
9	-1.09	4.86	-0.23	0.82	-10.62	8.43
Interaction between year group and prior attainment						
7	1.04	0.01	119.49	0.00	1.02	1.06
8	1.04	0.01	122.66	0.00	1.02	1.05
9	1.02	0.00	216.53	0.00	1.01	1.03
Male	-10.84	1.22	-8.91	0.00	-13.23	-8.46
Spring	3.92	1.49	2.62	0.01	0.99	6.85
Summer	3.40	1.48	2.31	0.02	0.51	6.30
Days between tests	-0.01	0.03	-0.20	0.84	-0.07	0.06
Major ethnic group						
Any Other Ethnic Group	7.44	5.55	1.34	0.18	-3.43	18.31
Asian	2.39	2.48	0.96	0.34	-2.47	7.26
Black	9.87	3.23	3.05	0.00	3.54	16.20
Chinese	42.27	11.31	3.74	0.00	20.10	64.43
Mixed	10.37	2.89	3.59	0.00	4.70	16.03
Unclassified	0.02	5.90	0.00	1.00	-11.54	11.58
SEN	-18.01	1.81	-9.97	0.00	-21.55	-14.47
EAL	13.96	2.17	6.44	0.00	9.71	18.20
EAL recent arrival	83.02	7.08	11.72	0.00	69.14	96.91

	Coef.	Std Er-ror	t	P>t	(95% conf.	interval)
Children in need	-11.16	3.27	-3.42	0.00	-17.56	-4.76
Children looked after	-2.98	8.08	-0.37	0.71	-18.81	12.85
Ever6FSM	-18.56	3.18	-5.84	0.00	-24.79	-12.33
Persistent FSM	-17.78	3.61	-4.93	0.00	-24.84	-10.71
IDACI score	-67.03	6.06	-11.07	0.00	-78.90	-55.16
Interaction between Ever6FSM and IDACI score	27.16	9.73	2.79	0.01	8.08	46.23
East Midlands	9.46	2.63	3.60	0.00	4.30	14.61
East of England	0.84	2.40	0.35	0.73	-3.86	5.55
London	20.85	2.62	7.96	0.00	15.72	25.99
North East	-2.94	2.67	-1.10	0.27	-8.17	2.28
North West	0.94	2.33	0.40	0.69	-3.64	5.51
South West	7.43	2.19	3.39	0.00	3.13	11.73
West Midlands	10.88	2.21	4.92	0.00	6.55	15.22
Yorkshire and the Humber	-4.72	2.64	-1.79	0.07	-9.89	0.45

Table A.3: Regression model for calculating expected progress in primary mathematics

Source	SS	df	MS
Model	25422975.8	35	726370.7
Resid-ual	16486212.4	3,282	5023.2
Total	41909188.2	3,317	12634.7

Number of observations	3318.0
F (35,3282)	144.60
Prob > F	0.00
R-squared	0.607
Adj R-squared	0.602
Root MSE	70.88

	Coef.	Std Er-ror	t	P>t	(95% conf.	interval)
Constant	351.52	32.09	10.96	0.00	288.61	414.44
Year group						
4	-14.14	33.75	-0.42	0.68	-80.30	52.02
5	-35.64	34.43	-1.04	0.30	-103.14	31.87
6	-56.62	35.34	-1.60	0.11	-125.91	12.67
Interaction between year group and prior attainment						
3	0.54	0.11	4.93	0.00	0.32	0.75
4	0.64	0.03	20.78	0.00	0.58	0.70
5	0.69	0.03	25.04	0.00	0.64	0.75
6	0.76	0.03	27.22	0.00	0.71	0.82
Male	8.44	2.52	3.36	0.00	3.51	13.38
Spring	-2.89	3.06	-0.94	0.35	-8.89	3.11
Summer	-1.28	3.05	-0.42	0.68	-7.26	4.70
Days between tests	0.36	0.07	4.75	0.00	0.21	0.50
Major ethnic group						
Any Other Ethnic Group	0.50	9.78	0.05	0.96	-18.68	19.67
Asian	18.98	6.37	2.98	0.00	6.48	31.47
Black	11.63	5.99	1.94	0.05	-0.11	23.38
Chinese	57.21	18.79	3.04	0.00	20.36	94.06
Mixed	3.96	5.62	0.70	0.48	-7.06	14.97
Unclassified	12.66	16.03	0.79	0.43	-18.77	44.10
SEN	-40.88	4.24	-9.65	0.00	-49.19	-32.58
EAL	7.24	4.74	1.53	0.13	-2.06	16.54

	Coef.	Std Er-ror	t	P>t	(95% conf.	interval)
EAL recent arrival	-19.63	13.65	-1.44	0.15	-46.40	7.14
Children in need	-9.27	7.66	-1.21	0.23	-24.29	5.76
Children looked after	34.02	17.49	1.95	0.05	-0.27	68.30
Ever6FSM	-11.93	7.75	-1.54	0.12	-27.12	3.26
Persistent FSM	-16.32	8.01	-2.04	0.04	-32.02	-0.61
IDACI score	-43.69	13.68	-3.19	0.00	-70.51	-16.87
Interaction between Ever6FSM and IDACI score	22.49	23.93	0.94	0.35	-24.43	69.41
Mathematics progress score at KS2 (school level)	-1.26	0.90	-1.39	0.16	-3.02	0.51
East Midlands	7.26	5.13	1.42	0.16	-2.80	17.32
East of England	13.33	4.77	2.79	0.01	3.98	22.68
London	6.89	4.96	1.39	0.17	-2.84	16.62
North East	-6.45	7.89	-0.82	0.41	-21.92	9.03
North West	11.69	15.18	0.77	0.44	-18.07	41.45
South West	0.89	3.64	0.24	0.81	-6.25	8.02
West Midlands	-37.47	15.78	-2.37	0.02	-68.42	-6.53
Yorkshire and the Humber	16.51	5.90	2.80	0.01	4.94	28.08

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