

# Recovering from the Covid-19 pandemic: analysis of Star Assessments

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EDUCATION  
POLICY  
INSTITUTE

Research Area:  
School Performance,  
Admissions,  
and Capacity



**Renaissance**  
*See Every Student.*

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## About the Education Policy Institute

The Education Policy Institute is an independent, impartial, and evidence-based research institute that promotes high quality education outcomes, regardless of social background. We achieve this through data-led analysis, innovative research and high-profile events.

Education can have a transformative effect on the life chances of young people, enabling them to fulfil their potential, have successful careers, and grasp opportunities. As well as having a positive impact on the individual, good quality education and child wellbeing also promotes economic productivity and a cohesive society.

Through our research, we provide insight, commentary, and a constructive critique of education policy in England – shedding light on what is working and where further progress needs to be made. Our research and analysis spans a young person’s journey from the early years through to entry to the labour market.

Our core research areas include:

- Benchmarking English Education
- School Performance, Admissions, and Capacity
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Our experienced and dedicated team works closely with academics, think tanks, and other research foundations and charities to shape the policy agenda.

## About Renaissance

Renaissance is a leading provider of assessment and practice solutions that put learning analytics to work for teachers, saving hours of preparation time while making truly personalised learning possible.

Since 1986, our mission has remained the same: To accelerate learning for all children and adults of all ability levels and ethnic and social backgrounds, worldwide.

Today, almost 8,000 schools nationwide and more than 40 percent of US schools rely on Renaissance solutions for data and insights to equitably move learning forward. As technology continues to change, and as teachers and students connect in new ways, our commitment to accelerate learning in unwavering – both inside and outside the classroom.

This research, an extension of the work we started in 2020 on behalf of the Department for Education, is testament to our commitment to our mission – providing unique insights into student performance since the pandemic for educators and policymakers alike.

Thanks to the millions of Renaissance Star Assessments administered every year, we can provide the data for this analysis without increasing teacher workload or asking students to take additional tests.

Together, Star Reading and Star Maths streamline the assessment process with valid, reliable data to deliver the right instruction, at the right time, for the right reason. They provide a complete view of student progress, including achievement and growth measures.

- **Purposeful:** Star provides the data and insight needed to inform instructional decisions, whether assessing in school or remotely.
- **Proven:** Star data is valid and reliable, backed by research, validity studies, and millions of data points.
- **Powerful:** Star utilises cutting-edge learning science, data analytics, and test design to deliver maximum impact in minimal time.
- **Predictive:** Star is highly predictive of performance on key stage 2 assessments and other high-stakes tests thanks to statistical linking.

Star Assessments are aligned to the national curriculum, and in addition to this research we have made available Focus Skills Teacher Workbooks that help educators identify the skills a student should prioritise and master in order to progress. These are available from the Renaissance website.

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## Background and summary

This analysis is the first in a series of reports that will be produced by the Education Policy Institute, working in partnership with Renaissance, over the coming year. The purpose of this research programme is to ensure that policy makers and schools have access to robust data on the performance of different pupil groups, so that support is targeted effectively to those who need it most as we continue to recover from the pandemic.

The effects of the pandemic are likely to be felt for some time yet. DfE data, from 2022 key stage 2 and key stage 4 assessments, show a decline in outcomes at key stage 2 and the gap between disadvantaged pupils and their peers at its widest since 2012 in both phases.<sup>1,2</sup> This analysis will also provide Renaissance customers with the tools that they need to help them to understand the progress of their pupils, where outcomes are in line with what may be expected, or where they are at risk of falling behind and who might be in need of intervention.

In this first analysis we present simple descriptive statistics of outcomes in Renaissance's Star Reading and Star Maths assessments up to, and including, the autumn term of 2022/23. We compare these outcomes to what we saw prior to the pandemic to provide a broad, up-to-date, assessment of how the pandemic has affected pupil outcomes and whether we are seeing recovery.

In this initial analysis we find that:

- Outcomes in reading appear to have recovered for most year groups. This is consistent with national curriculum assessments at the end of key stage 2 in the spring of 2022.
- Outcomes in primary mathematics have not recovered to pre-pandemic levels. This is consistent with national curriculum assessments at the end of key stage 2 in the spring of 2022, where there were falls in the proportion of pupils achieving the expected in mathematics. The lower outcomes are equivalent to a loss of between 1.3 and 1.4 months of learning.
- Prior to the pandemic, the gap in outcomes in reading between primary schools with high and low levels of disadvantage was equivalent to around 11.7 months of learning.<sup>3</sup> This grew over the course of the pandemic to 13.0 months but has narrowed slightly so that the gap between such schools is equivalent to just under 12.3 months of learning.
- This means that the gap in outcomes between primary schools with high and low levels of disadvantage was around 6 per cent wider by the end of the 2022/23 autumn term compared with the start of the pandemic.

In future reports we will link this assessment data with data held in the National Pupil Database so that we can produce more robust estimates of lost learning that control for a range of pupil characteristics and provide results for different pupil groups. It is hoped that by doing so, and within

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<sup>1</sup> Department for Education, "Key stage 2 attainment (revised): 2022", December 2022. <https://www.gov.uk/government/statistics/key-stage-2-attainment-provisional-2022>

<sup>2</sup> Department for Education, "Key stage 4 performance 2022", February 2023. <https://www.gov.uk/government/statistics/key-stage-4-performance-2022>

<sup>3</sup> We define low disadvantage as schools where fewer than 12.5 per cent of pupils are eligible for free school meals and high disadvantage as schools where more than 25 per cent of pupils are eligible for free school meals. We do not present breakdowns for secondary schools here due to concerns over sample sizes.

increasing volumes of Renaissance data, we will also be able to see how results vary in different regions of the country.

## Part 1: Context

It is now three years since the Covid-19 pandemic first led to restrictions to in-person learning for schools in England. In the autumn of 2020, the Education Policy Institute partnered with Renaissance to provide the Department for Education with timely analysis of how such restrictions had affected children's learning in reading and mathematics.<sup>4</sup>

The first national lockdown and the lack of in-person learning for the majority of children was associated with pupils making less progress in reading and mathematics compared with previous cohorts. 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 for all pupils. 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. Learning losses in primary mathematics, at 2.8 months, were larger than reading losses. By the start of the 2021/22 academic year, pupils remained, on average, behind where we would have expected them to be. We found that the pandemic's effects were not felt evenly with larger losses for those from economically disadvantaged backgrounds (pupils eligible for the pupil premium) and larger losses in parts of the north and midlands than in London and the south. Indeed, by the start of the 2021/22 academic year, results in reading for primary aged pupils in London and the south-west were broadly in line with pre-pandemic levels.

Since our last report there has been a return to national assessments at both key stage 2 and key stage 4. They show that the proportion of pupils achieving the expected standard in reading, writing and mathematics at the end of primary school in 2022 was 59 per cent, down 6 percentage points from the last pre-pandemic assessments in 2019.<sup>5</sup> This fall was driven by lower attainment in both writing and mathematics. Results in reading were slightly up on their pre-pandemic levels. This differential effect between subjects is consistent with our analysis over the course of the pandemic, though that analysis had still suggested a loss in reading.

Comparing pre- and post-pandemic results at key stage 4 is not as straightforward. In 2020 and 2021, qualifications were awarded through centre and teacher-assessed grades with an associated noticeable upward shift in the grades awarded between 2019 and 2021. The proportion of entries amongst 16-year-olds awarded a grade 4 or above increased from 70 per cent to 79 per cent in that time.<sup>6</sup>

In September 2021, Ofqual confirmed a move back to pre-pandemic grade levels and that grades in 2022 would be around the midpoint of those in 2019 and 2021.<sup>7</sup> This did not mean that results would necessarily be *exactly* at the midpoint of the two years given the professional judgement involved in setting grade boundaries, but it did mean that overall attainment levels were, broadly,

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<sup>4</sup> Department for Education, "Pupil progress in the 2020 to 2022 academic years", February 2021. <https://www.gov.uk/government/publications/pupils-progress-in-the-2020-to-2022-academic-years>

<sup>5</sup> Department for Education, "Key stage 2 attainment (revised): 2022", December 2022. <https://www.gov.uk/government/statistics/key-stage-2-attainment-provisional-2022>

<sup>6</sup> Jon Andrews and Robbie Cruikshanks, "Analysis: GCSE results day 2022", August 2022. <https://epi.org.uk/publications-and-research/analysis-gcse-results-day-2022/>

<sup>7</sup> Ofqual, "Ofqual's approach to grading exams and assessments in summer 2022 and autumn 2021", September 2021. <https://www.gov.uk/government/speeches/ofquals-approach-to-grading-exams-and-assessments-in-summer-2022-and-autumn-2021>



predetermined and direct comparisons between years would not provide a reliable measure of relative performance.

A better way to track performance over time is to look at the results from the National Reference Test in English and mathematics taken by a representative sample of year 11 pupils. These suggested that outcomes in English were maintained despite the disruption of the pandemic with no statistically significant change in outcomes between 2019 and 2022.<sup>8</sup> However, there was a statistically significant decline in mathematics performance at all grades. It is difficult to draw direct comparisons with assessments earlier for younger pupils, but again this suggests that the pandemic effects were not felt evenly across subjects.

These national results also confirmed that the pandemic effects were not felt evenly across different pupil groups. The gap between disadvantaged pupils and their peers widened over the course of the pandemic such that the disadvantage gap in 2022 was the highest it had been in a decade at both key stage 2 and key stage 4.

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<sup>8</sup> Bethan Burge and Louise Benson, "National reference test results digest 2022", August 2022

## Part 2: The data used in this report

### Background

The data analysed in this report is drawn from assessment data from Renaissance'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 in 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 15 minutes. The assessments draw on banks of just over 4,000 items in each of reading and mathematics.<sup>9</sup>

In spring 2023, Renaissance provided the Education Policy Institute with data comprising assessments undertaken in England between the start of the 2017/18 of the academic year and the end of the autumn term of 2022/23.<sup>10</sup> The Education Policy Institute has further linked this with institution-level information relating to the level of disadvantage in the school.

### Differences from previous reports

There are number of differences in the data used in this report from those used in the analysis for the Department for Education.

In our previous reports, the scaled score provided by Renaissance was on what is known as the Star Enterprise Scale Score, running from 0 to 1,400. Renaissance customers in the UK are now on the new Star Unified Scale Score which, for Star Reading and Star Maths, runs from 600 to 1,400. There is a direct mapping between the two scores, and it has been possible to place historic assessments on this new scale, but it does mean that results based on scaled scores in this and subsequent reports will not be directly comparable with earlier studies.

For future reports, we hope to link the data further with data held in the National Pupil Database to enable us draw on contextual pupil information and provide a wider range of breakdowns for different pupil groups, but that has not been possible within the timescales of this report. Our modelling approach in previous reports controlled for a wide range of these pupil characteristics and this is not possible within this report, which makes direct comparison with outputs more difficult.

Finally, the modelling approach in previous reports has involved a regression analysis where we predict an outcome for a pupil based on their prior attainment and historic, pre-pandemic, rates of progress. It is now four years since an academic year that wasn't affected in some way by the

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<sup>9</sup> A more detailed discussion of Star Assessments is available in '*Research Foundation for Star Adaptive Assessments – Science of Star*', Renaissance White Paper, September 2020.

<sup>10</sup> The data provided for this analysis was restricted to those institutions who instructed Renaissance to conduct the analysis.

pandemic and its aftermath. For many pupils we simply do not have data that has not been affected by the pandemic in some way and for those we do, the prior attainment is now some time ago meaning we do not have models that can reasonably estimate what we would “expect” them to be achieving at this stage.

In this report we instead present simple descriptive statistics of outcomes in Star Assessments in reading and mathematics and compare these outcomes to pre-pandemic averages at population level (e.g. we look at the average for all year 6 pupils in reading pre and post pandemic). This does not control for any differences that may have occurred in the Renaissance population as a whole (e.g. changes in the proportion of pupils who are disadvantaged, or in the overall performance of the schools taking part). We plan to do more to control for these differences when we have data matched to the National Pupil Database in subsequent reports.

In this report we break down analysis by the school term of assessment. In some instances, pupils will take more than one assessment in the same term. We are able to identify these pupils through a unique identifier and, in our analysis, we use the last assessment taken in any term. As pupils progress throughout the school year, assessments taken at the end of term are typically higher than those at the start, and our full analysis in subsequent reports will aim to control for this.

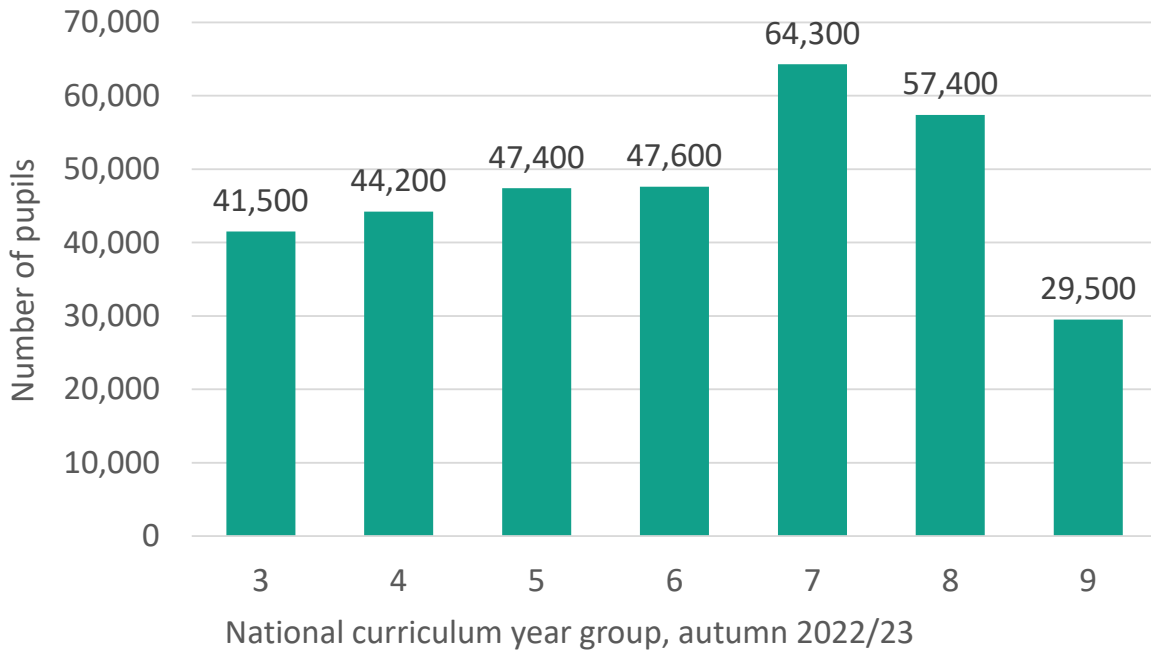
## Data volumes

Renaissance assessments cover all national curriculum year groups; however, the vast majority of tests are completed in year 3 to year 9, and older pupils tend to be atypical of the pupil population as a whole. Therefore, as with previous reports, our analysis focusses on this age range.

Figure 2.1 shows the number of pupils in each group who took at least one assessment in reading in the 2022/23 autumn term by year group. Each primary year group has between 40 and 50,000 pupils, and there is a large spike in year 7 (64,300) which is likely to be associated with the transition from primary to secondary school and the new school looking to benchmark attainment on entry, though the number of pupils in year 8 is also well above the rates for younger pupils.

As expected, the number of pupils with assessments in mathematics is much lower. Figure 2.2 shows how this breaks down by national curriculum year group in the 2022/23 autumn term. Amongst the primary age year groups, the number of pupils is around 6,000. However, this drops to around 2,000 in secondary and these pupils are not randomly distributed but clustered in a small number of schools. Therefore, any analysis is likely to reflect the circumstances of those schools rather than be representative of the population as a whole and so we exclude analysis of secondary mathematics in this report.

**Figure 2.1: Number of pupils in the autumn 2022/23 by year group, reading**



**Figure 2.2: Number of pupils in the autumn 2022/23 by year group, mathematics**

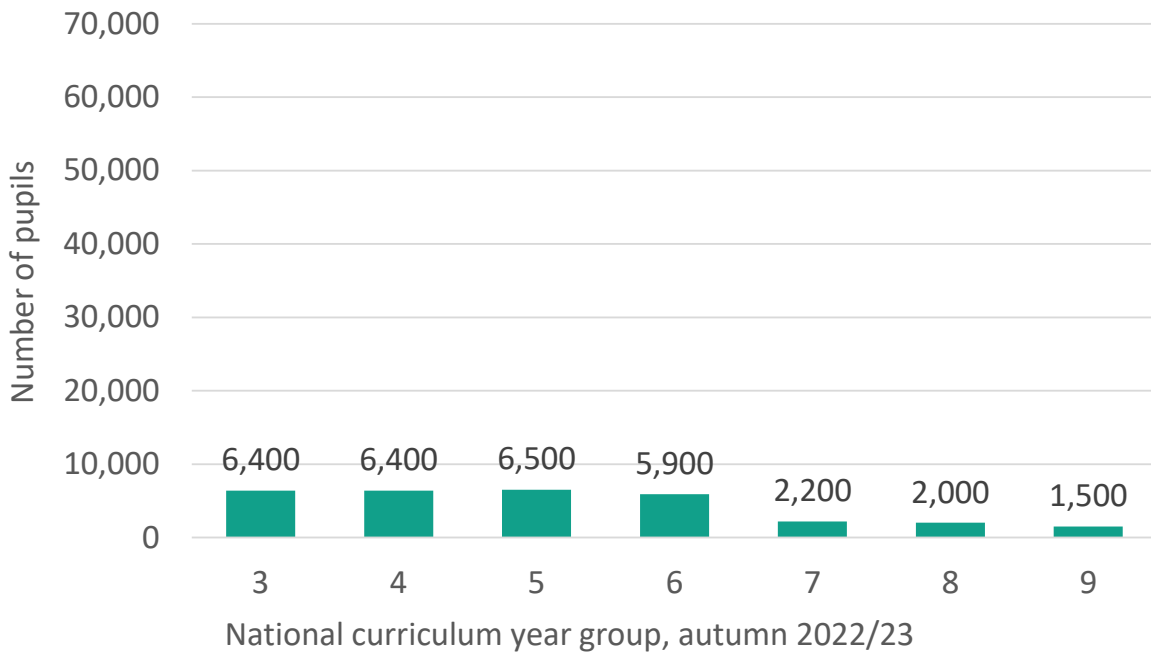
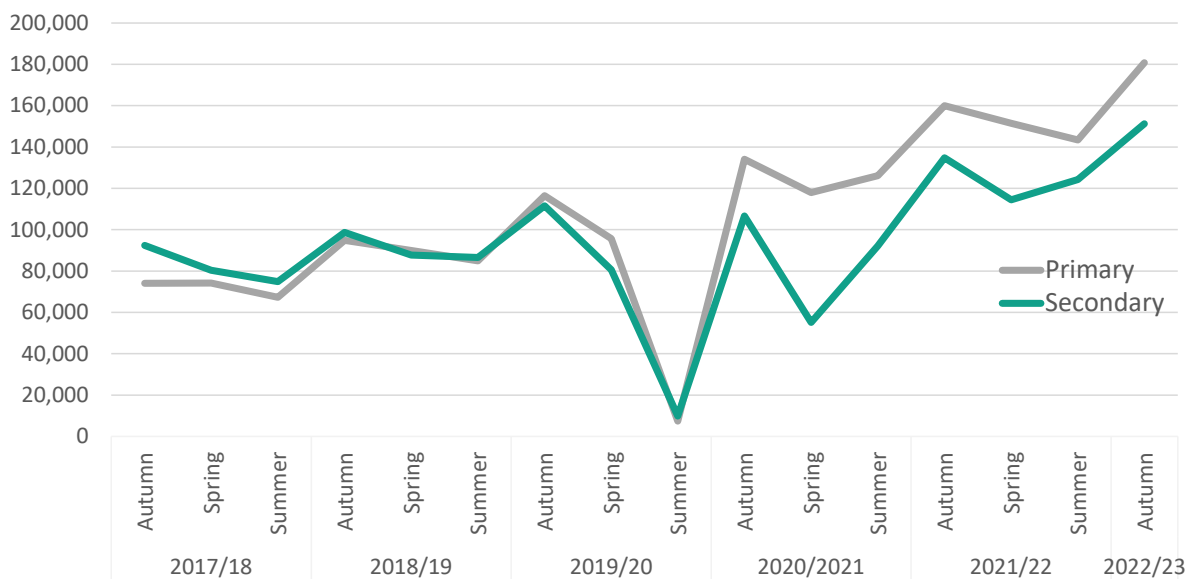


Figure 2.3 shows the number of pupils by phase who took at least one assessment in reading in each term in the dataset and Figure 2.4 shows the same analysis for assessments in mathematics. It shows that in any school year the highest numbers in reading are seen in the autumn term, though the fluctuations between terms are relatively modest. The number of assessments in mathematics is lower overall though there is a less clear relationship with the term within year.

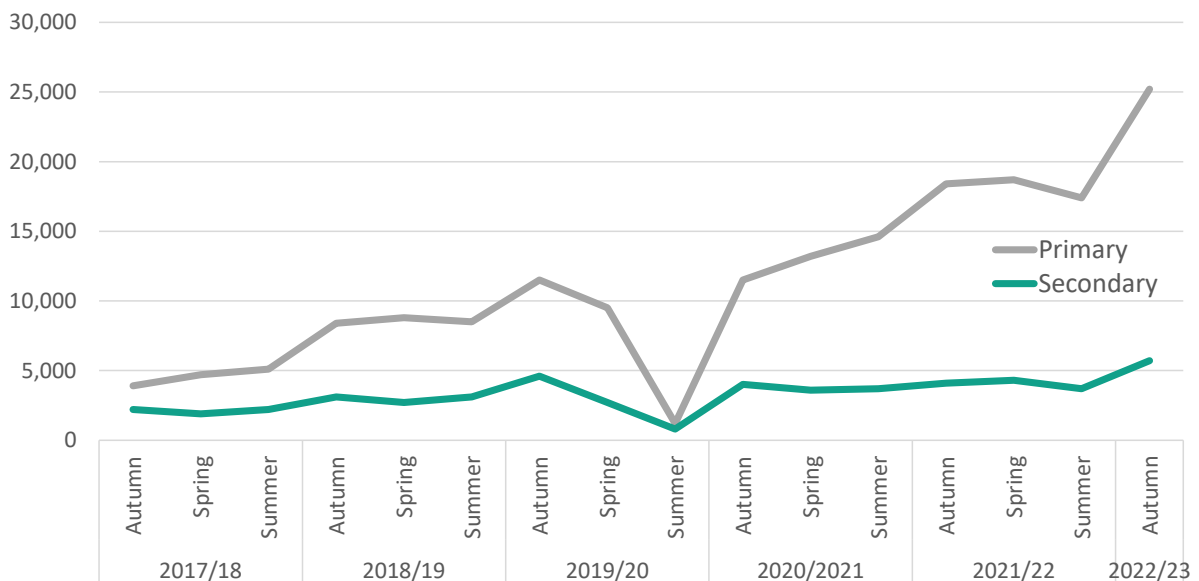
Both charts show greater numbers in the most recent year. There are likely two contributing factors to this. The first is that the number of Renaissance customers using Star Assessments has grown over this period. The second is that inclusion in the dataset was dependent on the school signing up to Renaissance’s new terms and conditions. This creates a bias towards active schools and the earlier years in the time series will only include those schools that are still participating and who have agreed to the new terms and conditions.

Also note the fall in assessments in spring 2020 and then the subsequent collapse in the summer of the same year. These relate to the closure of schools for in person teaching for the majority of pupils towards the end of the spring term 2019/20, and that they did not re-open fully to all year groups until the start of the following academic year.

**Figure 2.3: Number of pupils by term by phase, reading**



**Figure 2.4: Number of pupils by half term by phase, mathematics**



## Part 3: Analysis of outcomes in Star Reading and Star Maths up to and including the autumn term of 2022/23

### Outcomes in the autumn term 2022/23 and understanding “typical” progress

The Star Unified Scale score, for Star Reading and Star Maths, runs from 600 to 1,400. Figure 3.1 and Figure 3.2 show how scores were distributed by year group in the autumn term of 2022/23 in reading and mathematics - the bars show the 25<sup>th</sup>, 50<sup>th</sup>, and 75<sup>th</sup> percentiles of the distribution.

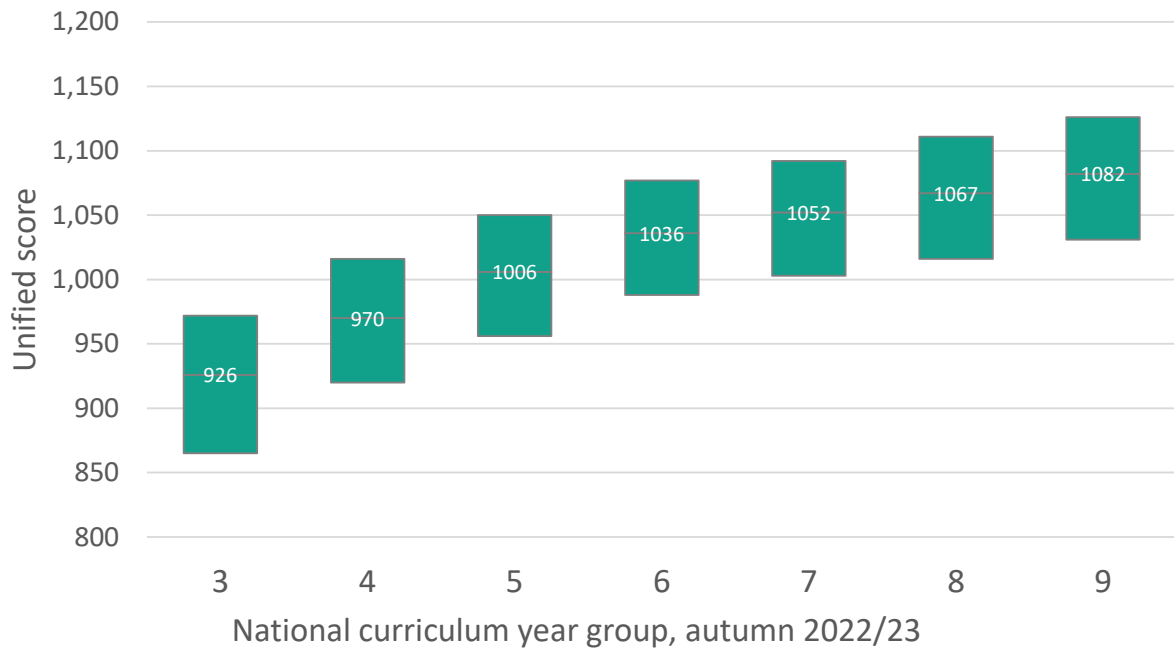
Pupils at the start of key stage 2 (year 3) typically scored in the range 850 to 975, and pupils at the start of key stage 3 (year 7) typically scored in the range 1,000 to 1,110. Note that we do not present analysis for key stage 3 in mathematics due to small sample sizes.

The differences between year groups are not uniform and, in the analysis of reading outcomes, the differences between year groups are greater amongst younger than older year groups. In reading, the difference between the median in year 3 and in year 4 was 44 points on the unified scale. Between year 7 and year 8 it was 15 points. This implies that younger pupils make, on average, faster progress on these scales than older pupils do. However, it should be remembered that these are snapshots of different cohorts rather than tracking the same group of pupils over time and there may be other differences between year groups in other ways such as differences in prior attainment (which itself also affects average progress), different schools using the assessments, and different characteristics amongst the pupil population.

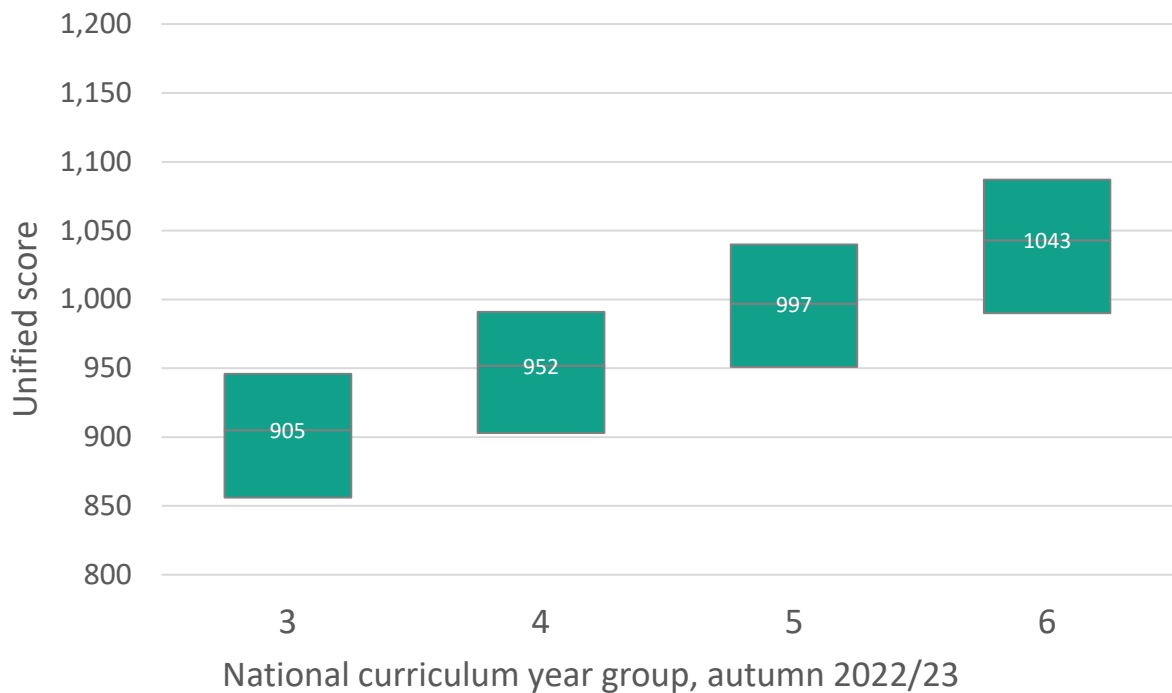
In our previous reports we have controlled for these differences by calculating an “expected” progress for individual pupils based on the progress of pupils with similar characteristics in the past, and then translated this into a months of progress measure. We are not able to do that in this report as we have not yet carried out the necessary data matching. In addition, for many pupils we simply do not have data that has not been affected by the pandemic in some way and for those we do, the prior attainment is now some time ago meaning we do not have models that can reasonably estimate what we would “expect” them to be achieving at this stage.

However, based on the historic patterns of outcomes we make a very broad assumption about the rates of progress pupils make each year and use these to convert any learning loss on this scale into months of progress. These are set out in Annex 2. These conversions to months should be taken as an illustration of the overall picture, but they may under or over-estimate the effect for some groups.

**Figure 3.1: Distribution of unified scores in autumn 2022/23 by year group, reading**



**Figure 3.2: Distribution of unified scores in autumn 2022/23 by year group, mathematics**



**Distribution of outcomes in the autumn term over time**

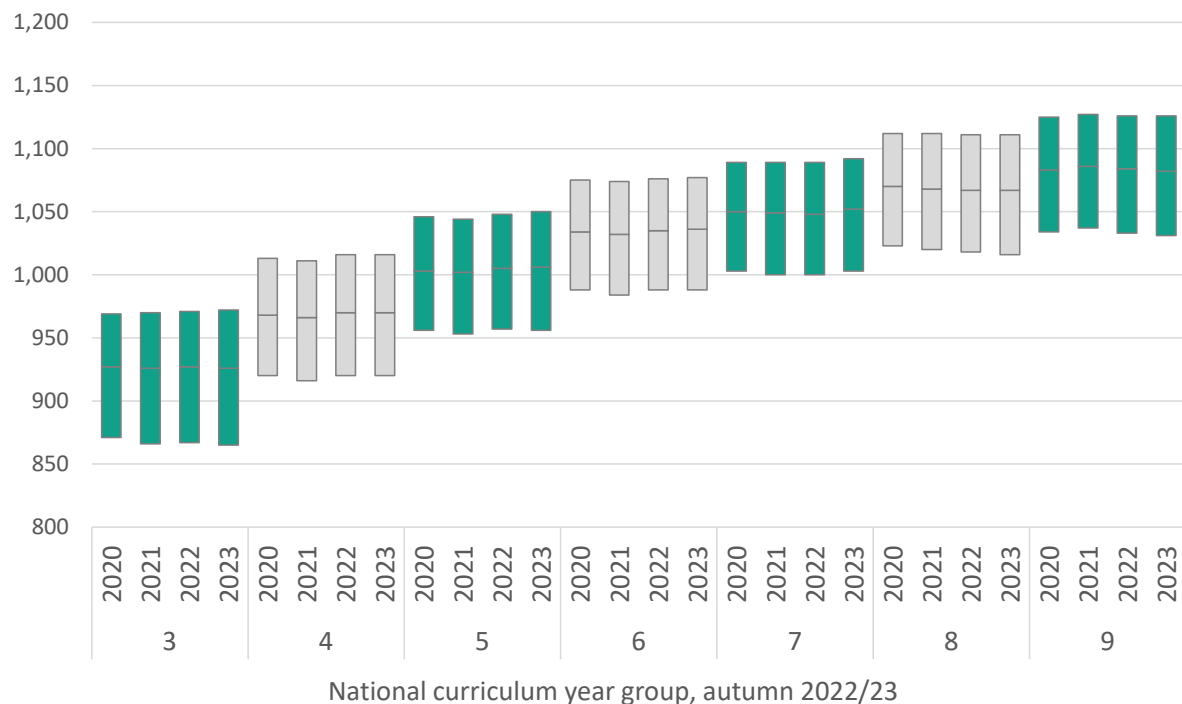
Figure 3.3 (reading) and Figure 3.4 (mathematics) show how the distribution of scores in the autumn term has changed over time, examining points pre-, during, and post-pandemic. This is not intended as a direct measure of learning loss since we use no controls for any differences in the pupil populations in each year. However, it does allow us to see whether overall, outcomes this year are similar to pre-pandemic levels. A full table of quartile values is provided in Figure 3.5.

In reading, the differences between the pre and post pandemic distributions are relatively modest across all year groups and average scores are now at or above pre-pandemic levels. The median score in each year group typically fell by between 1 and 3 points on the unified scale over the course of the pandemic with slightly larger falls seen amongst older pupils and around the lower quartile – in other words, it was lower-attaining pupils that appear to have been more affected by the pandemic in reading.

In mathematics, the differences between the pre and post pandemic distributions are more pronounced and it would appear that these differences have been sustained. For example, the median score for this year’s year 6 pupils (who will sit key stage 2 assessments in spring 2023), was 7 scaled score points lower than year 6 pupils achieved in 2019/20. At the lower quartile the difference was 11 points.

This is not a direct measure of lost learning given there are no controls for the other factors that we know affect attainment. But under our broad assumptions of pupil progress, 7 scaled score points is equivalent to “lost learning” of around 2 months.<sup>11</sup>

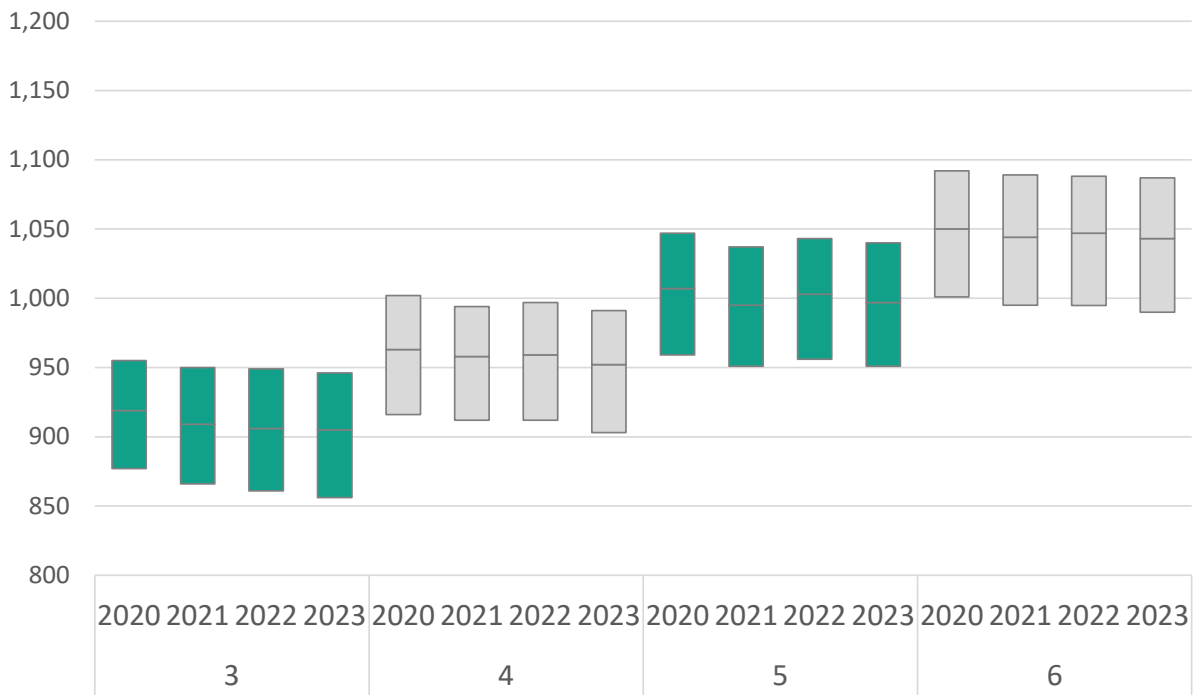
**Figure 3.3: Distribution of unified scores in the autumn term by year group, 2019/20 to 2022/23 – reading**



<sup>11</sup> Note however that analysis in the following section suggests that this analysis may be affected by a number of new schools in the dataset where outcomes are below average and so it potentially overestimates the size of learning loss.



**Figure 3.4: Distribution of unified scores in the autumn term by year group, 2017/18 to 2022/23 – mathematics**



National curriculum year group, autumn 2022/23

**Figure 3.5: Lower quartile, median, and upper quartile of unified scores in the autumn term by year group, 2017/18 to 2022/23, in reading and mathematics**

Year group	Academic year ending	Reading			Mathematics		
		Lower quartile	Median	Upper quartile	Lower quartile	Median	Upper quartile
3	2020	871	927	969	877	919	955
	2021	866	926	970	866	909	950
	2022	867	927	971	861	906	949
	2023	865	926	972	856	905	946
4	2020	920	968	1013	916	963	1002
	2021	916	966	1011	912	958	994
	2022	920	970	1016	912	959	997
	2023	920	970	1016	903	952	991
5	2020	956	1003	1046	959	1007	1047
	2021	953	1002	1044	951	995	1037
	2022	957	1005	1048	956	1003	1043
	2023	956	1006	1050	951	997	1040
6	2020	988	1034	1075	1001	1050	1092
	2021	984	1032	1074	995	1044	1089
	2022	988	1035	1076	995	1047	1088
	2023	988	1036	1077	990	1043	1087
7	2020	1003	1050	1089			
	2021	1000	1049	1089			
	2022	1000	1048	1089			
	2023	1003	1052	1092			
8	2020	1023	1070	1112			
	2021	1020	1068	1112			
	2022	1018	1067	1111			
	2023	1016	1067	1111			
9	2020	1034	1083	1125			
	2021	1037	1086	1127			
	2022	1033	1084	1126			
	2023	1031	1082	1126			

## Tracking cohorts over the course of the pandemic

In the following analysis we track cohorts over time, and more specifically over the course of the pandemic. While we are unable to track outcomes for individual pupils, we can calculate averages for the cohort they are in as a whole and compare those scores to average pre-pandemic outcomes (the baseline).

We group cohorts by their national curriculum year group in 2022/23 and construct a time series for each by picking out the relevant year group in the historic data.

For example, for the current year 6 we:

- compare 2022/23 outcomes for year 6 pupils with the baseline year 6 pupils;
- compare 2021/22 outcomes for year 5 pupils with the baseline year 5 pupils; and
- compare 2020/21 outcomes for year 4 pupils with the baseline year 4 pupils.

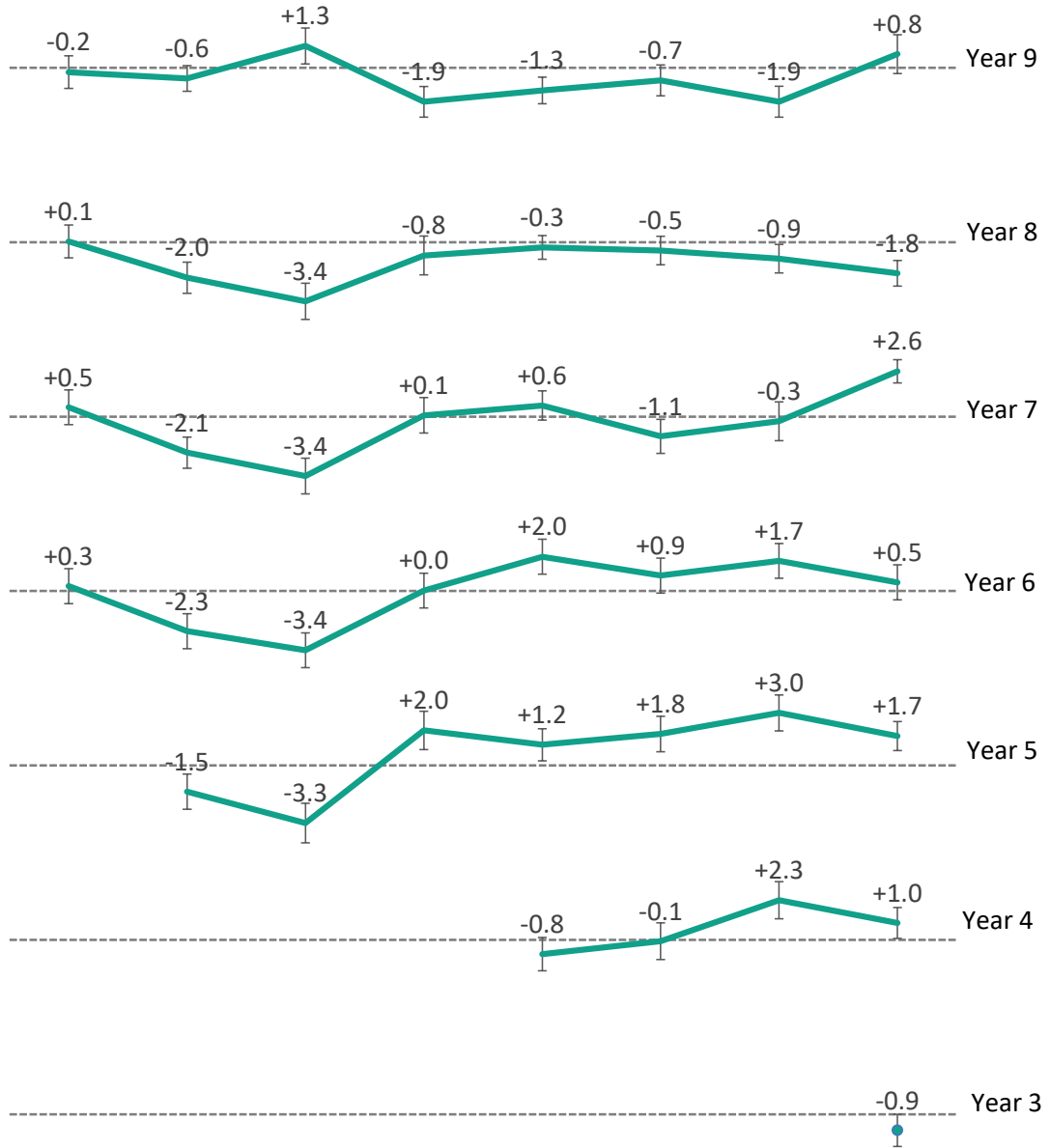
For each year group we can see how their outcomes compared with what would have been “expected” of their year group at each point in time. For the baseline scores we calculate averages of outcomes in 2017/2018, 2018/19, and the autumn term of 2019/20. We do not use data from the spring and summer terms in 2019/20 as these were affected by the initial closure of schools to in person teaching for the majority of pupils.

Figure 3.6 shows average outcomes in reading for each year group over time relative to pre-pandemic outcomes, in other words a simple measure of learning loss and recovery. It shows that:

- At the end of the autumn term 2020/21, pupil outcomes were typically around 2 score points below the pre-pandemic averages. Using our broad assumption of progress for primary aged pupils this equates to between 0.5 and 0.8 months of learning (note that all of the pupils would have been in primary year groups in 2020/21).
- At the end of the spring term 2020/21 (after further disruption to learning at the start of 2021), pupil outcomes were typically around 3.4 points below pre-pandemic averages. This equates to between 0.9 and 1.4 months of learning.
- The exception to this pattern was the current year 9 pupils who experienced much smaller losses and were only slightly below expectations at the end of the autumn term in 2020/21. There may be many explanations for this pattern but the relatively small learning loss for this group is consistent with our first report. In that report we hypothesised that this group (who were in year 6 at the start of the pandemic) had experienced lower losses as their return to in person teaching had been prioritised in the summer of 2020.
- The pattern of results was less consistent over the course of 2021/22, but the picture now is one where almost all year groups (with the exceptions of the current year 8 and year 3) are at or above pre-pandemic levels.

Our reports later in the year will provide more robust estimates of learning loss and recovery as we will be able to control for a wide range of pupil characteristics, but this initial analysis suggests that, overall, average reading have been recovered. This would be consistent with national curriculum assessments at the end of key stage 2 in the spring of 2022.

**Figure 3.6: Outcomes over time relative to pre-pandemic averages by national curriculum year group in 2022/23 - reading**



Pre-Covid	Autumn	Spring	Summer	Autumn	Spring	Summer	Autumn
		2020/21			2021/22		2022/23

Figure 3.7 shows average outcomes in mathematics for each year group over time relative to pre-pandemic outcomes, in other words a simple measure of learning loss and recovery. Our analysis is restricted to year groups 3-6 due to small sample sizes in years 7-9. We are hopeful that we will have more data available in later reports.

The significantly smaller sample sizes, both in terms of the number of pupils and the number of participating schools, in mathematics than in reading mean that the results are more vulnerable to the particular schools included in the analysis at any point. We found for example that the schools that were new to the dataset in 2022/23 (i.e. they did not have mathematics results in earlier years) had systematically lower outcomes than other schools and therefore distort the pattern of results over time. We have therefore presented analysis with and without these schools in autumn 2023. Note throughout the wide range of uncertainty in these estimates (as illustrated by the confidence intervals on the chart).

We find that:

- At the end of the autumn term 2020/21, pupil outcomes were around 6 or 7 score points below the pre-pandemic averages. Using our broad assumption of pupils progressing around 45 points per year, this equates to between 1.6 and 1.9 months of learning.<sup>12</sup>
- At the end of the spring term 2020/21 (after further disruption to learning at the start of 2021), pupil outcomes were between 12 and 15 points below pre-pandemic averages. This equates to up to 4.0 months of learning.
- By the end of the summer term 2020/21 and over the course of 2021/22, losses were lower but still evident to varying degrees.
- At the start of the 2022/23 academic year, results were below pre-pandemic levels equating to around 1.3 and 1.4 months of learning for pupils in years 5 and 6 but potentially larger losses evident amongst younger year groups.<sup>13</sup>

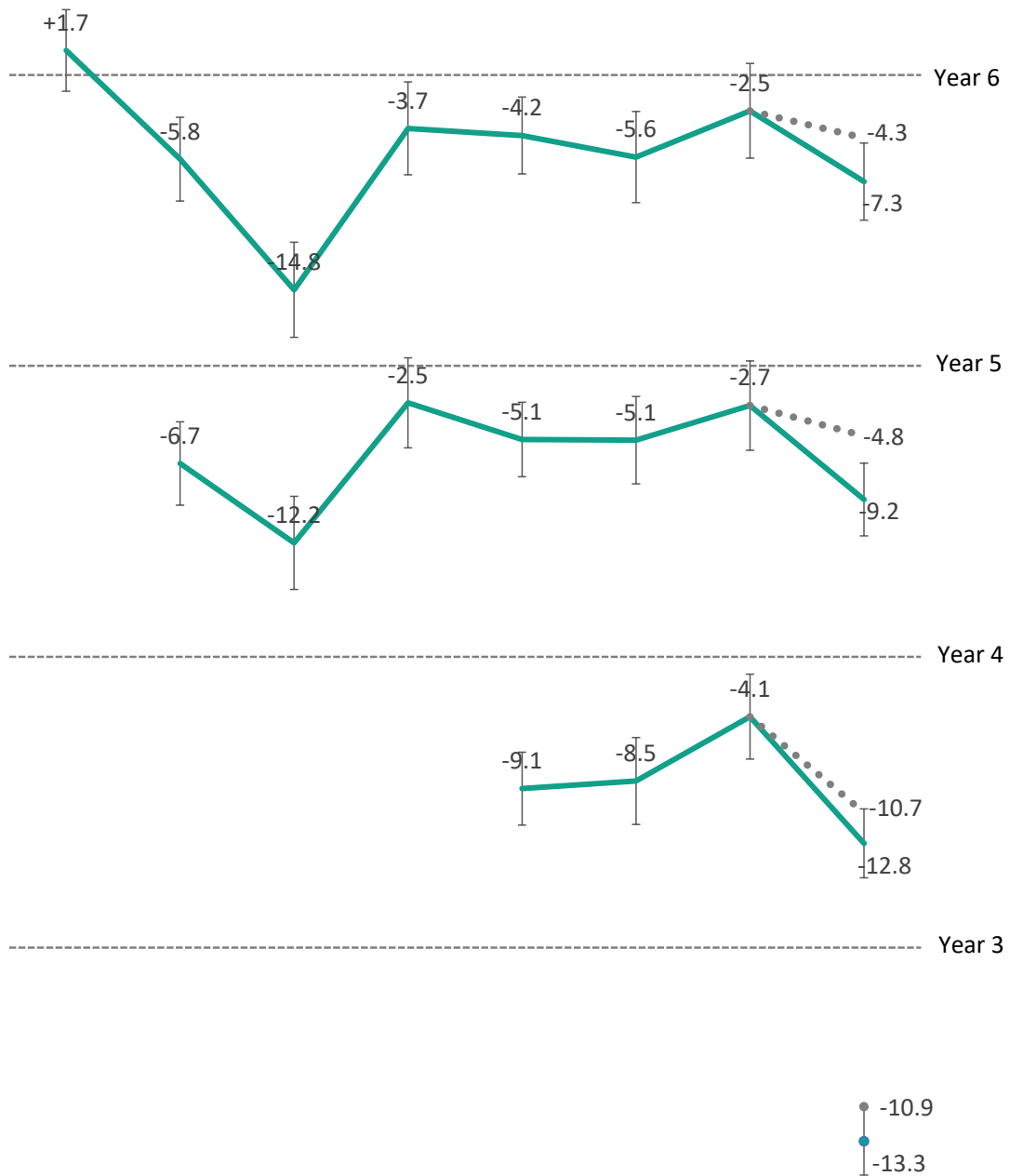
Our reports later in the year will provide more robust estimates of learning loss and recovery as we will be able to control for a wide range of pupil characteristics, but this initial analysis suggests that, overall, outcomes in mathematics have not been recovered to pre-pandemic levels. This is consistent with national curriculum assessments at the end of key stage 2 in the spring of 2022 which saw a fall in the proportion of pupils achieving the expected in mathematics.

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<sup>12</sup> Note that the analysis here examines pupils who were in year 5 and year 6 in 2022/23. These pupils were in year 3 and year 4 in 2020/21 hence we use the assumed rates of progress for those year groups.

<sup>13</sup> We do not have pre-pandemic estimates for these pupils to compare against, so these pupils may have achieved systematically lower outcomes in the absence of the pandemic. However, their results are still well behind the averages seen for those year groups pre-pandemic.

**Figure 3.7: Outcomes over time relative to pre-pandemic averages by national curriculum year group in 2022/23 - mathematics<sup>14</sup>**



<sup>14</sup> Analysis for autumn 2022/23 includes results based on all assessments (solid green line) and having excluded schools that were new to the dataset in 2022/23 (broken grey line). This is because these schools had results that were well below the average of other schools and so would lead to overestimates of further losses.

## Outcomes by economic disadvantage

Our previous reports have shown that pupils from disadvantaged backgrounds experienced a larger degree of learning loss than their more affluent peers. These effects have also been seen in key stage 2 assessments and GCSE outcomes where the disadvantage gap has widened over the course of the pandemic to its highest level since 2012.

In this report we do not have access to the pupil level information on disadvantage, so are unable to produce directly equivalent measures. However, we do have school identifiers, so we are able to link the data with the school level measure of disadvantage (percentage of pupils eligible for free school meals) in the Department for Education's "Get Information About Schools" service. Sample sizes mean that we are only able to do this analysis for results in reading.

In Figure 3.8 we show the average outcome in Star Reading for pupils in Years 3 to 6, split by academic year, term, and the proportion of pupils in the school that are eligible for free school meals.<sup>15</sup> In Figure 3.9 we show the difference in average outcomes between the schools with the highest and lowest levels of disadvantage by year group. Note that this is not a direct measure of the disadvantage gap, and there is uncertainty in estimates broken down to this degree, but it should give some indication as to trends. We define low disadvantage as schools where less than 12.5 per cent of pupils are eligible for free school meals and high disadvantage as schools where more than 25 per cent of pupils are eligible for free school meals. Clearly, the size of the "gap" is going to be affected by where those thresholds are set and so this analysis should be taken as indicative of trends rather than as a measure of what we usually mean by the disadvantage gap.

The analysis shows:

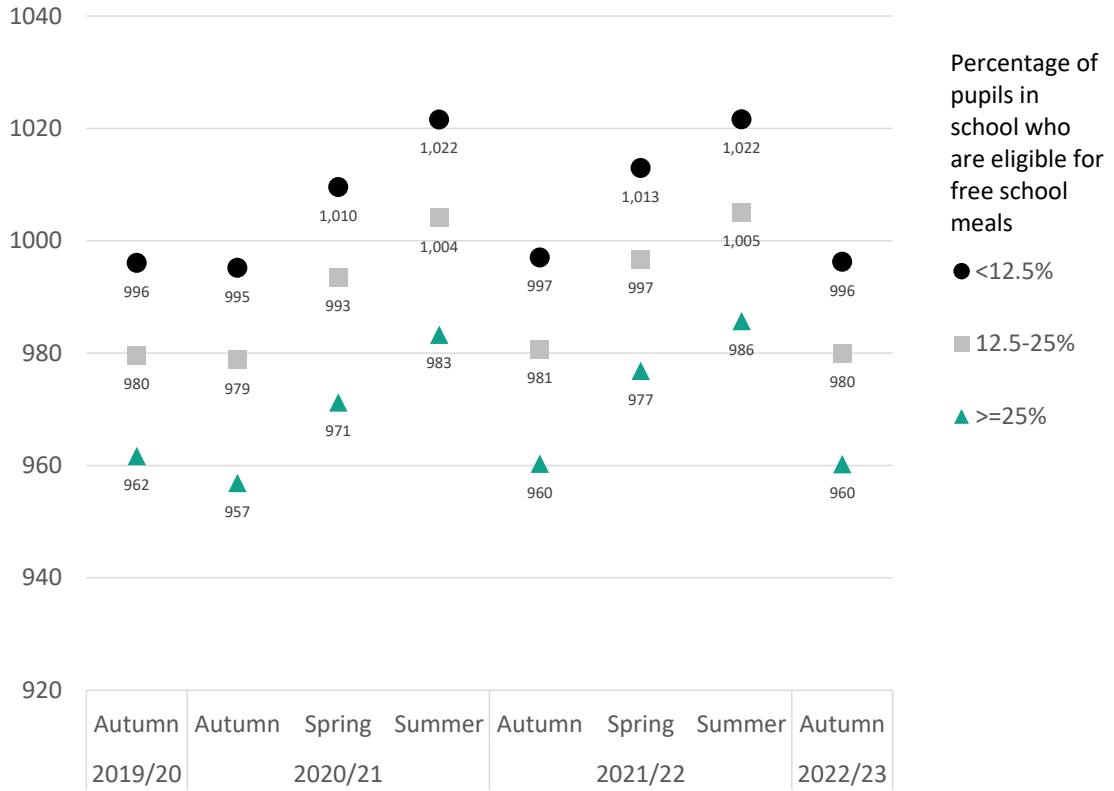
- Prior to the pandemic there was already a considerable gap in outcomes between schools with the highest and lowest levels of disadvantage. Pupils in schools with more than a quarter of pupils eligible for free school meals achieved a mean score of 962 compared with a mean score of 996 in schools where less than 12.5 per cent of pupils were eligible for free school meals.
- The gap in mean outcomes between schools with high and low levels of disadvantage prior to the pandemic was 34 points. Using our broad estimate of 35 points of progress per year for primary aged pupils, this is equivalent to just under 11.7 months of learning.
- Over the course of the pandemic this gap appeared to widen, reaching a peak of 38 points by the end of the spring term of 2020/21. This is equivalent to a gap of around 13.0 months of learning.
- The gap does appear to have narrowed slightly over the course of 2021/22 and the start of 2021/22 but still stood at 36 points by the end of the autumn term in 2021/22. This is equivalent to 12.3 months of learning.

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<sup>15</sup> In this analysis we have first calculated these figures by year group and then taken an average of all relevant year groups. We have done this rather than just aggregating the pupil level data by phase to protect against different year group mixes in different academic years, terms, and levels of disadvantage (e.g. if highly disadvantaged schools had a disproportionate number of younger children, then this would artificially inflate the apparent gap). In this report we restrict analysis to primary year groups due to concerns over sample sizes amongst secondary schools.

- This means that since the start of the pandemic, the gap in outcomes between the most and least disadvantaged schools in Star Reading has grown by about 6 per cent.

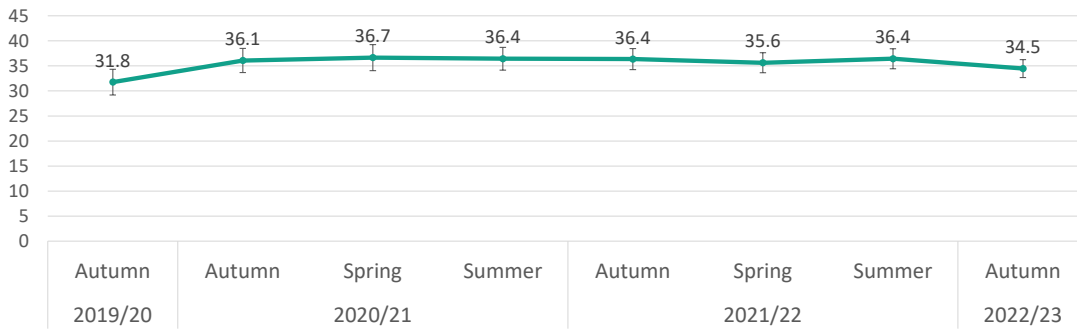
**Figure 3.8: Mean outcomes in Star Reading in primary schools by term and percentage of pupils in school that are eligible for free school meals**



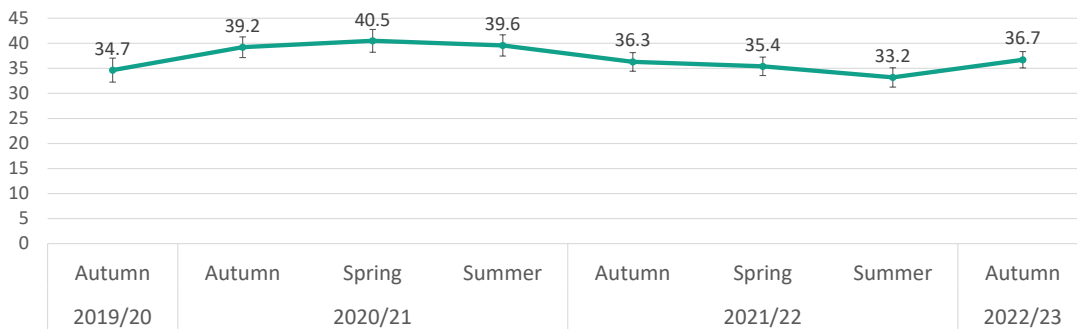


**Figure 3.9: Difference in mean unified scale score outcomes in Star Reading in primary schools by term between schools where more than 25 percent of pupils are eligible for free school meals and where less than 12.5 per cent of pupils are eligible for free school meals by national curriculum year group:**

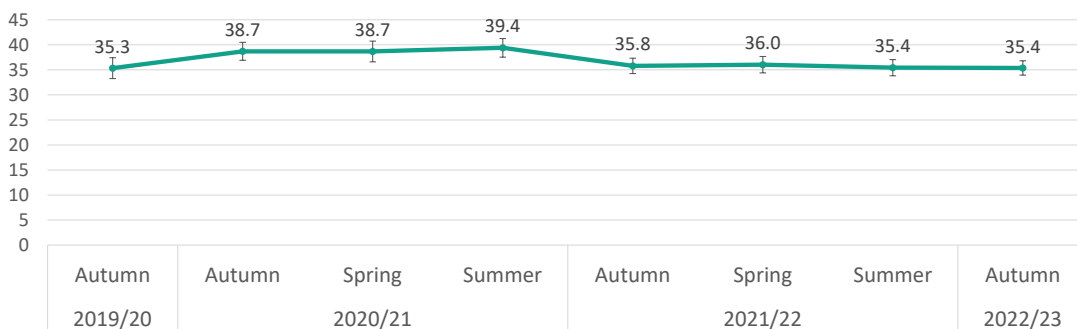
**Year 3**



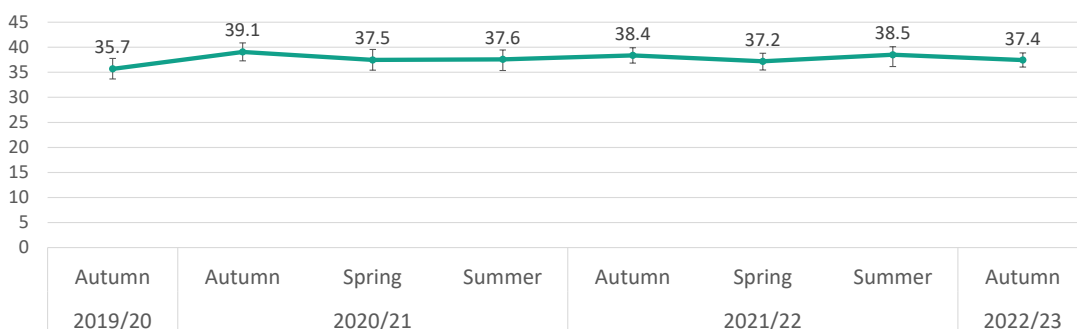
**Year 4**



**Year 5**



**Year 6**



## Conclusion

This has been the first in a series of reports that will be produced by the Education Policy Institute, working in partnership with Renaissance, over the coming year as we ensure that policy makers and schools have access to robust data on the performance of different pupil groups, so that support is targeted effectively to those who need it most as we continue to recover from the pandemic.

We have shown that the effects of the pandemic are still being felt in terms of pupil outcomes. While, on average, outcomes in reading have largely been recovered to pre-pandemic levels we still find evidence of a wider gap in attainment between schools with high and low levels of disadvantage than was seen before the pandemic. In addition, outcomes in primary mathematics have not recovered to pre-pandemic levels.

In future reports we will link this assessment data with data held in the National Pupil Database so that we can produce more robust estimates of lost learning that control for a range of pupil characteristics and provide results for different pupil groups. It is hoped that by doing so, and within increasing volumes of Renaissance data, we will also be able to see how results vary in different regions of the country.

## Annex 1 – underlying tables

**Figure A.1: Number of pupils who took assessments in Star Reading by term and national curriculum year group**

Year group	2017/18			2018/19			2019/20			2020/2021			2021/22			2022/23
	Autumn	Spring	Summer	Autumn	Spring	Summer	Autumn	Spring	Summer	Autumn	Spring	Summer	Autumn	Spring	Summer	Autumn
3	17,100	17,800	16,500	22,100	21,800	21,400	27,100	22,800	1,600	30,200	27,500	30,800	36,300	35,900	36,200	41,500
4	18,100	18,700	17,300	23,400	22,600	22,200	28,800	24,300	1,700	33,200	29,700	32,400	39,000	37,700	37,300	44,200
5	19,600	19,800	18,400	24,600	23,400	22,800	30,200	25,000	1,900	35,900	30,800	33,800	42,200	39,900	39,800	47,400
6	19,300	18,000	15,100	24,800	22,200	18,400	30,200	23,400	2,200	34,800	29,900	29,000	42,400	38,000	30,000	47,600
7	41,000	36,100	34,600	45,300	39,800	39,800	50,000	35,200	4,400	47,400	24,600	40,100	58,700	48,800	52,600	64,300
8	35,700	31,900	29,000	37,300	33,700	33,600	42,900	31,600	3,700	40,900	21,700	36,500	51,900	44,700	48,200	57,400
9	15,600	12,500	11,300	16,100	14,300	13,200	18,600	13,900	1,800	18,300	8,800	15,400	24,100	20,900	23,500	29,500
Primary	74,100	74,200	67,300	94,800	89,900	84,900	116,400	95,600	7,400	134,100	117,900	126,100	160,000	151,500	143,400	180,700
Secondary	92,400	80,400	74,900	98,700	87,700	86,600	111,500	80,600	9,900	106,600	55,200	92,100	134,700	114,400	124,200	151,200

**Figure A.2: Number of pupils who took assessments in Star Maths by term and national curriculum year group**

Year group	2017/18			2018/19			2019/20			2020/2021			2021/22			2022/23
	Autumn	Spring	Summer	Autumn	Spring	Summer	Autumn	Spring	Summer	Autumn	Spring	Summer	Autumn	Spring	Summer	Autumn
3	800	1,000	1,300	1,900	2,100	2,300	2,800	2,400	200	2,700	3,300	3,600	4,400	4,600	4,700	6,400
4	800	1,100	1,400	2,100	2,100	2,100	2,900	2,500	200	2,900	3,300	3,800	4,500	4,700	4,600	6,400
5	1,000	1,300	1,500	2,100	2,300	2,300	3,000	2,500	300	3,000	3,300	3,800	4,800	4,900	4,700	6,500
6	1,300	1,300	900	2,300	2,200	1,900	2,900	2,200	500	2,900	3,300	3,400	4,700	4,400	3,300	5,900
7	1,100	900	1,200	1,500	1,300	1,600	2,100	1,400	400	1,700	1,400	1,500	1,600	1,700	1,500	2,200
8	700	700	600	900	800	800	1,800	900	300	1,600	1,400	1,400	1,500	1,600	1,300	2,000
9	400	400	400	600	600	600	800	400	100	600	800	900	1,000	1,000	1,000	1,500
Primary	3,900	4,700	5,100	8,400	8,800	8,500	11,500	9,500	1,200	11,500	13,200	14,600	18,400	18,700	17,400	25,200
Secondary	2,200	1,900	2,200	3,100	2,700	3,100	4,600	2,700	800	4,000	3,600	3,700	4,100	4,300	3,700	5,700

**Figure A.3: Pupil counts, mean, standard deviation, lower quartile, median, and upper quartile of unified scores in by term and national curriculum year group, 2017/18 to 2022/23: reading**

National curriculum year group	Academic year	Term	Count	Mean	Standard deviation	Lower quartile	Median	Upper quartile
3	2017/18	autumn	17,100	919.1	72.6	872	927	969
3	2018/19	autumn	22,100	916.5	73.9	868	925	969
3	2019/20	autumn	27,100	918.1	73.5	871	927	969
3	2020/21	autumn	30,200	916.3	76.0	866	926	970
3	2021/22	autumn	36,300	917.0	76.8	867	927	971
3	2022/23	autumn	41,500	916.9	77.6	865	926	972
4	2017/18	autumn	18,100	961.9	72.4	920	967	1,013
4	2018/19	autumn	23,400	960.3	72.7	918	966	1,011
4	2019/20	autumn	28,800	961.9	73.0	920	968	1,013
4	2020/21	autumn	33,200	959.0	74.2	916	966	1,011
4	2021/22	autumn	39,000	962.5	76.2	920	970	1,016
4	2022/23	autumn	44,200	962.3	76.9	920	970	1,016
5	2017/18	autumn	19,600	997.5	69.4	956	1,004	1,046
5	2018/19	autumn	24,600	995.6	71.0	954	1,003	1,046
5	2019/20	autumn	30,200	996.5	70.4	956	1,003	1,046
5	2020/21	autumn	35,900	994.4	71.5	953	1,002	1,044
5	2021/22	autumn	42,200	998.4	71.9	957	1,005	1,048
5	2022/23	autumn	47,400	998.2	74.2	956	1,006	1,050
6	2017/18	autumn	19,300	1027.4	69.7	988	1,035	1,076
6	2018/19	autumn	24,800	1027.1	69.9	987	1,035	1,075
6	2019/20	autumn	30,200	1026.8	70.0	988	1,034	1,075
6	2020/21	autumn	34,800	1025.0	70.6	984	1,032	1,074
6	2021/22	autumn	42,400	1027.7	71.2	988	1,035	1,076
6	2022/23	autumn	47,600	1027.6	72.8	988	1,036	1,077
7	2017/18	autumn	41,000	1039.0	70.2	1,001	1,048	1,087
7	2018/19	autumn	45,300	1040.7	69.7	1,002	1,049	1,088
7	2019/20	autumn	50,000	1041.6	70.1	1,003	1,050	1,089
7	2020/21	autumn	47,400	1039.9	71.7	1,000	1,049	1,089
7	2021/22	autumn	58,700	1040.2	71.7	1,000	1,048	1,089
7	2022/23	autumn	64,300	1043.1	71.7	1,003	1,052	1,092
8	2017/18	autumn	35,700	1058.1	72.3	1,017	1,066	1,109
8	2018/19	autumn	37,300	1059.4	72.8	1,018	1,067	1,110
8	2019/20	autumn	42,900	1062.7	72.1	1,023	1,070	1,112
8	2020/21	autumn	40,900	1060.7	72.6	1,020	1,068	1,112
8	2021/22	autumn	51,900	1058.9	75.5	1,018	1,067	1,111
8	2022/23	autumn	57,400	1058.4	76.3	1,016	1,067	1,111
9	2017/18	autumn	15,600	1068.5	76.9	1,026	1,079	1,122
9	2018/19	autumn	16,100	1072.8	76.1	1,032	1,083	1,125
9	2019/20	autumn	18,600	1073.8	75.5	1,034	1,083	1,125
9	2020/21	autumn	18,300	1077.2	73.3	1,037	1,086	1,127

<b>National curriculum year group</b>	<b>Academic year</b>	<b>Term</b>	<b>Count</b>	<b>Mean</b>	<b>Standard deviation</b>	<b>Lower quartile</b>	<b>Median</b>	<b>Upper quartile</b>
9	2021/22	autumn	24,100	1073.9	76.9	1,033	1,084	1,126
9	2022/23	autumn	29,500	1072.6	78.7	1,031	1,082	1,126
3	2017/18	spring	17,800	940.4	71.1	898	948	990
3	2018/19	spring	21,800	938.2	72.5	893	946	988
3	2019/20	spring	22,800	938.6	72.3	896	946	988
3	2020/21	spring	27,500	935.9	75.9	888	944	989
3	2021/22	spring	35,900	939.1	75.2	894	948	992
4	2017/18	spring	18,700	978.2	71.3	936	985	1,028
4	2018/19	spring	22,600	978.0	71.2	938	984	1,027
4	2019/20	spring	24,300	976.8	71.5	937	982	1,027
4	2020/21	spring	29,700	974.7	74.0	933	981	1,026
4	2021/22	spring	37,700	979.9	74.0	938	987	1,032
5	2017/18	spring	19,800	1012.2	68.4	971	1,019	1,060
5	2018/19	spring	23,400	1010.3	69.9	969	1,017	1,059
5	2019/20	spring	25,000	1009.4	69.5	969	1,016	1,058
5	2020/21	spring	30,800	1007.8	70.5	966	1,014	1,056
5	2021/22	spring	39,900	1012.0	71.0	972	1,019	1,060
6	2017/18	spring	18,000	1040.1	68.9	1,001	1,049	1,087
6	2018/19	spring	22,200	1039.2	69.0	1,001	1,048	1,086
6	2019/20	spring	23,400	1037.2	69.5	999	1,046	1,085
6	2020/21	spring	29,900	1036.3	69.7	997	1,044	1,084
6	2021/22	spring	38,000	1038.5	70.8	1,000	1,047	1,086
7	2017/18	spring	36,100	1049.7	70.5	1,011	1,057	1,098
7	2018/19	spring	39,800	1049.5	71.2	1,010	1,058	1,098
7	2019/20	spring	35,200	1050.1	71.5	1,011	1,058	1,099
7	2020/21	spring	24,600	1050.9	75.5	1,009	1,059	1,103
7	2021/22	spring	48,800	1049.1	73.3	1,007	1,057	1,100
8	2017/18	spring	31,900	1068.0	72.7	1,029	1,076	1,118
8	2018/19	spring	33,700	1067.3	72.9	1,027	1,075	1,118
8	2019/20	spring	31,600	1069.7	73.3	1,029	1,078	1,120
8	2020/21	spring	21,700	1069.4	75.6	1,028	1,078	1,121
8	2021/22	spring	44,700	1066.9	75.8	1,026	1,076	1,119
9	2017/18	spring	12,500	1077.8	77.4	1,036	1,088	1,130
9	2018/19	spring	14,300	1080.0	76.4	1,040	1,090	1,131
9	2019/20	spring	13,900	1079.6	76.2	1,039	1,089	1,131
9	2020/21	spring	8,800	1082.9	77.8	1,041	1,094	1,135
9	2021/22	spring	20,900	1079.7	77.2	1,038	1,089	1,133
3	2017/18	summer	16,500	951.3	71.6	910	958	1,001
3	2018/19	summer	21,400	949.3	72.9	907	956	1,001
3	2019/20	summer	1,600	977.7	82.9	926	984	1,034
3	2020/21	summer	30,800	952.2	74.2	910	959	1,004
3	2021/22	summer	36,200	952.5	75.3	910	960	1,005

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<b>National curriculum year group</b>	<b>Academic year</b>	<b>Term</b>	<b>Count</b>	<b>Mean</b>	<b>Standard deviation</b>	<b>Lower quartile</b>	<b>Median</b>	<b>Upper quartile</b>
4	2017/18	summer	17,300	987.0	71.4	945	995	1,037
4	2018/19	summer	22,200	986.3	71.9	946	994	1,036
4	2019/20	summer	1,700	1012.5	75.2	970	1,021	1,064
4	2020/21	summer	32,400	986.6	73.2	946	994	1,037
4	2021/22	summer	37,300	989.6	74.4	948	998	1,041
5	2017/18	summer	18,400	1018.3	69.5	978	1,025	1,067
5	2018/19	summer	22,800	1017.2	70.8	976	1,025	1,067
5	2019/20	summer	1,900	1035.6	72.3	995	1,042	1,084
5	2020/21	summer	33,800	1017.8	70.4	976	1,025	1,066
5	2021/22	summer	39,800	1019.4	71.5	979	1,027	1,068
6	2017/18	summer	15,100	1042.3	70.1	1,003	1,051	1,089
6	2018/19	summer	18,400	1042.8	70.6	1,004	1,052	1,090
6	2019/20	summer	2,200	1061.0	66.5	1,022	1,068	1,106
6	2020/21	summer	29,000	1041.8	70.4	1,003	1,049	1,089
6	2021/22	summer	30,000	1042.3	73.0	1,003	1,051	1,091
7	2017/18	summer	34,600	1053.9	72.4	1,014	1,063	1,104
7	2018/19	summer	39,800	1057.0	71.5	1,016	1,065	1,106
7	2019/20	summer	4,400	1080.8	68.4	1,045	1,089	1,127
7	2020/21	summer	40,100	1053.6	74.0	1,011	1,061	1,106
7	2021/22	summer	52,600	1054.6	75.1	1,012	1,062	1,107
8	2017/18	summer	29,000	1072.8	73.7	1,033	1,081	1,123
8	2018/19	summer	33,600	1074.7	73.7	1,035	1,083	1,125
8	2019/20	summer	3,700	1097.0	72.4	1,061	1,108	1,145
8	2020/21	summer	36,500	1073.8	74.5	1,033	1,083	1,125
8	2021/22	summer	48,200	1071.9	76.7	1,031	1,081	1,124
9	2017/18	summer	11,300	1081.6	77.9	1,039	1,091	1,135
9	2018/19	summer	13,200	1085.2	76.7	1,044	1,095	1,137
9	2019/20	summer	1,800	1115.5	66.4	1,080	1,122	1,160
9	2020/21	summer	15,400	1085.0	76.5	1,043	1,094	1,138
9	2021/22	summer	23,500	1085.2	77.8	1,044	1,095	1,138

**Figure A.4: Pupil counts, mean, standard deviation, lower quartile, median, and upper quartile of unified scores in by term and national curriculum year group, 2017/18 to 2022/23: mathematics**

<b>National curriculum year group</b>	<b>Academic year</b>	<b>Term</b>	<b>Count</b>	<b>Mean</b>	<b>Standard deviation</b>	<b>Lower quartile</b>	<b>Median</b>	<b>Upper quartile</b>
3	2017/18	autumn	800	914.5	58.0	878	917	956
3	2018/19	autumn	1,900	906.9	64.9	869	913	950
3	2019/20	autumn	2,800	912.6	60.6	877	919	955
3	2020/21	autumn	2,700	904.2	64.0	866	909	950
3	2021/22	autumn	4,400	901.8	64.6	861	906	949
3	2022/23	autumn	6,400	897.6	66.6	856	905	946
4	2017/18	autumn	800	960.1	62.7	921	966	1,000
4	2018/19	autumn	2,100	957.8	65.2	918	963	998
4	2019/20	autumn	2,900	956.7	66.0	916	963	1,002
4	2020/21	autumn	2,900	951.8	64.0	912	958	994
4	2021/22	autumn	4,500	952.6	66.5	912	959	997
4	2022/23	autumn	6,400	944.8	68.5	903	952	991
5	2017/18	autumn	1,000	1005.5	70.5	962	1,009	1,057
5	2018/19	autumn	2,100	997.3	71.3	958	999	1,046
5	2019/20	autumn	3,000	1000.8	70.0	959	1,007	1,047
5	2020/21	autumn	3,000	991	69.2	951	995	1,037
5	2021/22	autumn	4,800	996.2	69.0	956	1,003	1,043
5	2022/23	autumn	6,500	991.2	72.3	951	997	1,040
6	2017/18	autumn	1,300	1045.5	74.1	1,001	1,054	1,096
6	2018/19	autumn	2,300	1040.5	76.4	998	1,050	1,092
6	2019/20	autumn	2,900	1042.2	74.6	1,001	1,050	1,092
6	2020/21	autumn	2,900	1037.1	75.8	995	1,044	1,089
6	2021/22	autumn	4,700	1037.5	74.6	995	1,047	1,088
6	2022/23	autumn	5,900	1034.9	74.8	990	1,043	1,087
3	2017/18	spring	1,000	933.2	62.0	894	936	973
3	2018/19	spring	2,100	932	65.8	896	938	975
3	2019/20	spring	2,400	928.6	61.2	891	935	970
3	2020/21	spring	3,300	920.2	66.1	881	925	965
3	2021/22	spring	4,600	923.9	66.4	884	930	968
4	2017/18	spring	1,100	977	66.7	936	979	1,019
4	2018/19	spring	2,100	979.3	66.9	941	982	1,023
4	2019/20	spring	2,500	972.6	68.6	931	978	1,019
4	2020/21	spring	3,300	963.7	68.8	920	968	1,012
4	2021/22	spring	4,700	973.4	67.8	932	978	1,021
5	2017/18	spring	1,300	1026.7	74.2	983	1,029	1,080
5	2018/19	spring	2,300	1021.9	73.5	979	1,025	1,075
5	2019/20	spring	2,500	1021.1	73.4	979	1,027	1,072
5	2020/21	spring	3,300	1006.5	75.1	961	1,010	1,059
5	2021/22	spring	4,900	1018	72.7	975	1,024	1,069

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<b>National curriculum year group</b>	<b>Academic year</b>	<b>Term</b>	<b>Count</b>	<b>Mean</b>	<b>Standard deviation</b>	<b>Lower quartile</b>	<b>Median</b>	<b>Upper quartile</b>
6	2017/18	spring	1,300	1064.3	76.4	1,020	1,076	1,116
6	2018/19	spring	2,200	1069	75.8	1,033	1,083	1,120
6	2019/20	spring	2,200	1060.3	75.9	1,022	1,072	1,111
6	2020/21	spring	3,300	1046.8	74.8	1,002	1,055	1,098
6	2021/22	spring	4,400	1058.3	73.4	1,017	1,070	1,108
3	2017/18	summer	1,300	943.5	66.4	903	951	987
3	2018/19	summer	2,300	943.4	67.3	904	950	988
3	2019/20	summer	200	971.6	73.8	922	974	1,020
3	2020/21	summer	3,600	940.9	66.8	900	948	987
3	2021/22	summer	4,700	939.3	67.5	895	947	986
4	2017/18	summer	1,400	986.6	69.6	947	989	1,035
4	2018/19	summer	2,100	989.1	69.8	951	992	1,038
4	2019/20	summer	200	990.8	85.0	946	995	1,048
4	2020/21	summer	3,800	984.4	68.5	945	991	1,032
4	2021/22	summer	4,600	985.4	69.7	945	992	1,035
5	2017/18	summer	1,500	1033.3	77.8	984	1,039	1,089
5	2018/19	summer	2,300	1033	76.6	986	1,037	1,090
5	2019/20	summer	300	1038	83.3	982	1,037	1,098
5	2020/21	summer	3,800	1026.3	74.8	979	1,031	1,080
5	2021/22	summer	4,700	1030.7	75.3	987	1,039	1,083
6	2017/18	summer	900	1068.9	77.9	1,024	1,083	1,119
6	2018/19	summer	1,900	1071.2	77.4	1,029	1,086	1,123
6	2019/20	summer	500	1067.7	70.7	1,028	1,076	1,110
6	2020/21	summer	3,400	1059.5	73.4	1,021	1,071	1,107
6	2021/22	summer	3,300	1064.7	76.5	1,022	1,078	1,118



Figure A.5: Pupil counts, mean and standard deviation unified scores by term, national curriculum year group, and percentage of pupils in school eligible for free school meals 2019/20 to 2022/23: reading

	National curriculum year group	2019/20	2020/21			2021/22			2022/23
		autumn	autumn	spring	summer	autumn	spring	summer	autumn
<b>Pupil counts</b>									
FSM <12.5%	3	6,300	7,200	6,700	7,300	8,400	8,600	8,500	10,500
	4	6,500	8,000	7,400	7,700	9,400	9,000	8,600	11,200
	5	6,900	8,400	7,300	8,000	10,300	9,300	9,400	11,800
	6	7,200	8,400	7,400	6,400	10,100	8,700	6,700	11,700
FSM >=12.5 & <25%	3	9,400	10,700	9,900	10,800	12,700	12,400	12,400	14,000
	4	10,100	11,400	10,400	11,200	13,400	13,000	12,900	14,700
	5	10,200	12,200	10,800	11,500	14,400	13,500	13,300	15,900
	6	10,200	11,600	10,300	10,000	14,400	12,800	10,300	15,900
FSM >=25%	3	11,300	12,000	10,600	12,500	14,700	14,500	14,800	16,400
	4	12,000	13,600	11,600	13,300	15,700	15,200	15,300	17,700
	5	12,800	14,800	12,300	14,000	17,000	16,500	16,600	18,900
	6	12,500	14,500	11,900	12,500	17,200	15,900	12,600	19,300
<b>Mean unified score</b>									
FSM <12.5%	3	936.5	935.4	955.3	972.2	936.6	958.8	972.9	935.8
	4	981.9	981.1	996.5	1009.2	982.9	1000.0	1008.4	981.9
	5	1017.7	1016.5	1029.2	1040.3	1019.0	1032.8	1039.9	1018.3
	6	1048.1	1047.6	1057.2	1064.5	1049.6	1060.1	1065.3	1049.0
FSM >=12.5 & <25%	3	922.2	922.5	941.1	957.6	922.8	943.7	957.1	920.5
	4	966.2	963.9	979.7	991.0	966.6	983.7	993.7	967.5
	5	1000.2	999.5	1012.7	1022.0	1001.6	1016.2	1023.2	1001.0
	6	1029.6	1029.3	1040.2	1045.6	1031.6	1043.1	1046.3	1030.8

	National curriculum year group	2019/20	2020/21			2021/22			2022/23
		autumn	autumn	spring	summer	autumn	spring	summer	autumn
FSM >=25%	3	904.7	899.3	918.6	935.7	900.3	923.2	936.5	901.3
	4	947.2	941.9	956.0	969.7	946.6	964.6	975.2	945.2
	5	982.3	977.8	990.5	1000.9	983.2	996.8	1004.5	982.9
	6	1012.4	1008.6	1019.7	1026.9	1011.2	1022.9	1026.8	1011.6
<b>Standard deviation of unified score</b>									
FSM <12.5%	3	70.6	71.8	71.5	69.5	73.0	70.9	70.4	74.5
	4	67.2	68.7	68.5	67.2	70.4	68.6	69.5	72.0
	5	64.0	64.3	64.3	63.2	66.3	65.1	66.0	68.3
	6	63.1	63.8	64.4	63.4	64.3	64.1	65.0	66.9
FSM >=12.5 & <25%	3	71.8	74.4	74.9	72.2	74.7	73.4	73.5	76.0
	4	71.1	71.7	71.2	70.0	74.8	72.5	72.7	74.7
	5	68.9	69.0	67.2	67.2	69.2	68.1	69.1	72.8
	6	67.8	68.2	67.0	67.9	67.6	67.0	69.8	69.7
FSM >=25%	3	73.9	76.3	75.7	75.1	77.3	76.0	76.3	77.6
	4	74.4	75.5	75.3	75.1	77.3	75.3	75.9	78.2
	5	71.7	73.4	72.7	72.7	73.8	73.1	73.0	75.6
	6	72.0	72.3	71.3	72.2	73.9	73.8	75.7	75.0

## Annex 2 – typical rates of progress

In order to translate differences in uniform scale scores to months of learning we require estimates of the progress that pupils typically make over a year. As set out in Part 3 this can vary by:

- the age of the pupil (the year group they are in);
- whether the assessments are in reading or mathematics;
- the prior attainment of the pupil; and
- pupil and school characteristics.

In our previous reports we have controlled for these differences by calculating an “expected” progress for individual pupils based on the progress of pupils with similar characteristics in the past, and then translated this into a months of progress measure. We are not able to do that in this report as we have not yet carried out the necessary data matching. In addition, for many pupils we simply do not have data that has not been affected by the pandemic in some way and for those we do, the prior attainment is now some time ago meaning we do not have models that can reasonably estimate what we would “expect” them to be achieving at this stage.

Instead, we look at the pre-pandemic averages in each subject and in each year group to identify broad typical rates of progress in each.

Figure A.6 and Figure A.7 draw on the mean scores from Figure A.3 and Figure A.4 to show the difference in mean scores between each year group in the autumn term in reading and mathematics. We do this both within academic year (for example comparing year 4 in 2019/20 with year 3 in 2019/20) and with the preceding academic year (for example comparing year 4 in 2019/20 with year 3 in 2018/19). This is because the sample in the preceding year is drawn from the same cohort of pupils.

Figure A.8 then provides our assumed rates of progress by year group, phase, and subject based on these historic averages. Note that these are broad estimates that rounded to the nearest 5 due to the variation in estimates between year groups. The month estimates are intended to give a broad sense of scale of learning loss.

**Figure A.6: Mean of unified scores in the autumn term by national curriculum year group, 2017/18 to 2019/20 with comparison with the preceding year group<sup>16</sup>: reading**

	<b>Year group</b>	<b>Mean score</b>	<b>Difference from year group below</b>	<b>Difference from year group below in previous year</b>
2017/18	3	919	-	
	4	962	43	-
	5	998	36	-
	6	1027	29	-
	7	1039	12	-
	8	1058	19	-
	9	1068	10	-
2018/19	3	916	-	-
	4	960	44	41
	5	996	36	34
	6	1027	31	29
	7	1041	14	14
	8	1059	18	20
	9	1073	14	15
2019/20	3	918	-	-
	4	962	44	46
	5	997	35	37
	6	1027	30	31
	7	1042	15	15
	8	1063	21	22
	9	1074	11	15

<sup>16</sup> For example, taking year pupils in year 4 in 2019/20, their average score of 962 is 44 points higher than the 918 scored by pupils in year 3 in the same academic year, and 46 points more than the 916 scored by year 3 pupils in 2018/19 (i.e. pupils drawn from the same cohort of pupils).

**Figure A.7: Mean of unified scores in the autumn term by national curriculum year group, 2017/18 to 2019/20 with comparison with the preceding year group<sup>17</sup>: mathematics**

	Year group	Mean score	Difference from year group below	Difference from year group below in previous year
2017/18	3	914	-	
	4	960	46	-
	5	1005	45	-
	6	1045	40	-
2018/19	3	907	-	-
	4	958	51	44
	5	997	39	37
	6	1040	43	35
2019/20	3	913	-	-
	4	957	44	50
	5	1001	44	43
	6	1042	41	45

**Figure A.7: Assumed typical annual rates of progress on the unified scale, used to provide estimates of learning loss in months<sup>18</sup>**

Year	Reading	Mathematics
4	45	45
5	35	40
6	30	40
Primary	35	40
Secondary	20	-

<sup>17</sup> For example, taking year pupils in year 4 in 2019/20, their average score of 957 is 44 points higher than the 913 scored by pupils in year 3 in the same academic year, and 50 points higher than the 907 scored by year 3 pupils in 2018/19 (i.e. pupils drawn from the same cohort of pupils).

<sup>18</sup> For pupils in year 3 we use the estimate for year 4.