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Impact of school closures in Key Stage 1 on attainment and social skills of pupils in Year 3 and Year 4 in academic year 2022/2023
Report

October 2023

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Embargoed for 00.01 Thursday 5th October 2023



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About the evaluator

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Acknowledgements

We would like to express our gratitude to all participating staff and pupils in the schools involved for their willingness to take part in the research during a particularly challenging period. Without them this research would not have been possible.

We are particularly grateful to Ignacia Valenzuela and Celeste Cheung at the Education Endowment Foundation for their valuable feedback, support, understanding, and flexibility in this longitudinal study.

Executive summary

About the study

This longitudinal observational study follows a group of the youngest school-aged children during the Covid-19 partial school closures in 2020. The study aims to understand the long-term impact of Covid-19 and closures on pupils' attainment and social skills. The youngest children in this study had not completed their Reception year before the first set of partial school closures. Similarly, Year 1 children moving into Year 2 missed much of their first year of formal education. The study builds on findings from a previous study (Rose *et al.*, 2021) and tracks the same pupils for a further two years, once in 2021/2022 when they were in Year 2 and Year 3 and again in 2022/2023 when they are in Year 3 and Year 4. This report covers the results from the second year of the two-year follow up.

The research aims to estimate the 'Covid-19 gap' and the 'disadvantage gap' and track these changes over time to gain an understanding of how quickly pupils' attainment catches up to where it might be expected to be, had the pandemic not happened.

Attainment outcomes of pupils in Year 3 and Year 4 in spring 2023, measured by the National Foundation for Educational Research (NFER) assessments of reading and mathematics, are compared with attainment outcomes for a representative sample of pupils assessed in 2017 before the pandemic. Additionally, the study utilises a repeated measures design such that the reading and mathematics outcomes from pupils in Year 3 and Year 4 are compared with their outcomes from the two previous academic years, when the same pupils were in Year 1 and Year 2 in 2021 and Year 2 and Year 3 in 2022.

A total of 6,157 pupils in Year 3 and Year 4 in 82 schools were followed up, which was a similar number of schools to 2021/2022. This was around half of the 168 schools who participated in the baseline study as many withdrew after the first year in 2020/2021 due to continuing Covid-19-related pressures on schools. The analysis was weighted to school-level Key Stage 2 performance to ensure that the retained sample remained representative and comparable to the standardisation sample and the general population in terms of attainment. In addition to measuring reading and mathematics attainment, teachers completed a measure of social skills for a subsample of 12 pupils within each year group in each school. Contextual information about the challenges facing schools, school practices, and any support activities being undertaken with the pupils was also collected through a survey of 65 headteachers.

Findings

Table 1 highlights the key findings from the study relating to the impact of partial school closures on the Covid-19 attainment gap, disadvantage gap, children's social skills, and schools' strategies to support pupils.

Key terminology

- **Covid-19 gap:** The difference between the mean scores of pupils in the 2022/2023 academic year and those of pre-pandemic samples.
- **Disadvantage gap:** The difference between the mean scores of pupils eligible for free school meals (FSM) and those of their peers not eligible for FSM.
- **Very low-attaining pupils:** Pupils who score fewer raw marks than that required to be awarded a standardised score.

Table 1: Summary of study findings

Research question	Finding
<p>1. To what extent does pupils' attainment in reading and mathematics recover by spring 2023?</p>	<p>Overall, the Covid-19 gap appears to have closed for Year 3 and Year 4 pupils on average in both reading and mathematics. Indeed, in Year 3 reading and Year 4 mathematics there was no significant difference in pupils' performance compared with the 2017 pre-pandemic standardisation sample (ES = 0.05 and 0.13, respectively) i.e. their reading and mathematics was at a similar level to where we would expect them to be. Moreover, in Year 3 mathematics, pupils were two months ahead and in Year 4 reading, pupils were three months ahead of expectations compared with the 2017 pre-pandemic standardisation sample (ES = 0.16 and 0.25, respectively).</p> <p>For both reading and mathematics, in Year 3 and Year 4, the Covid-19 gap significantly reduced compared with spring 2021 and spring 2022 (i.e. on average, pupils scores improved between spring 2021, spring 2022 and spring 2023).</p> <p>There was a notable proportion of very low-attaining pupils in Year 3 reading: larger than that seen before the pandemic (4.9% compared with 2.5% in the 2017 standardisation sample).</p>
<p>2. To what extent do different groups recover by spring 2023; in particular, how is the gap between disadvantaged children and their peers changing over time?</p>	<p>The disadvantage gaps for reading in spring 2023 for Year 3 and Year 4 are both around seven months' progress. Although disadvantaged pupils scored significantly higher in spring 2023 than in spring 2021, the change in scores was at the same rate as for pupils not eligible for free school meals, i.e. these gaps have not decreased since spring 2021. These gaps remain wider than gaps reported pre-pandemic (in Key Stage 2 data, for example).</p> <p>The disadvantage gaps for mathematics in spring 2023 for Year 3 and Year 4 are both around six month's progress. These gaps have significantly reduced since we measured them in spring 2021 but remain wider than gaps reported before the pandemic.</p>
<p>3. Is attainment in some domains in reading and mathematics changing or recovering at a different rate from others?</p>	<p>Year 3 pupils' performance was similar to, or indeed better than, their pre-pandemic counterparts across a number of domains of learning. However, Year 3 pupils appeared to struggle (and scored lower than their pre-pandemic peers) in giving the meaning of words in context in reading, and in geometry and statistics in mathematics.</p> <p>Year 4 pupils' performance was higher than, or similar to, their pre-pandemic counterparts across the majority of domains of learning. In reading, there were no domains where pupils appeared to struggle and scored lower; however, in mathematics, they scored lower in geometry.</p>
<p>4. What practices have been adopted and what learning opportunities have been provided by schools to help pupils catch up; and what challenges have been faced by staff?</p>	<p>The vast majority of schools continued with a number of strategies they had developed during the pandemic, including increased wellbeing support, and provision for home learning, which most schools felt they were able to support well.</p> <p>For those schools that reported disruption to learning, the most commonly reported reasons related to pupils' behaviour and wellbeing (a much more commonly reported challenge than in previous years of our study), and insufficient funding to support pupils who had missed learning. Schools were also less affirmatory about parental engagement this year: whilst the majority of schools felt that parents were as capable of providing support in 2022/2023 as they had been in the previous academic year, they felt parents were less willing to do so.</p> <p>Nearly all schools were prioritising additional support for very low-attaining pupils, and three-quarters were doing so for disadvantaged pupils.</p>
<p>5. Are social skills at or behind expectations, and to what extent do they improve between subsequent academic years?</p>	<p>On average, the social maturity of pupils in 2022/2023 was not significantly different to that seen in 2021/2022. Most pupils were broadly average in terms of their social maturity, although disadvantaged pupils, and boys, were assessed as having significantly lower social skills than non-disadvantaged pupils and girls, respectively.</p>

Implications for schools and teachers

The results of the study indicate that the negative impact of school closures seen in the immediate years after the pandemic has started to wane. Three years on from the first school closures, the positive findings (i.e. closing of gaps on average) in reading and mathematics for both Year 3 and Year 4 pupils, suggest that the strategies, which schools have been putting in place to support recovery appear to be reducing the impact of the disruption to pupils' learning. However, our study does not collect the context in schools pre-pandemic, and so there may be other factors at play that we have not captured that are contributing to these trends.

However, our study continues to raise concerns about the very lowest attainers, in particular in Year 3 reading. This cohort of pupils would have been in Reception during the first school closures, and the proportion of very low attainers is nearly twice as high as the pre-pandemic sample. Interestingly, we know from our school survey this year that teachers paid particular attention to providing additional support for lower attaining pupils, but even more so in mathematics than in reading. In the coming year, schools may want to increase their focus on reading support, and especially in schools in disadvantaged areas that are more likely to have higher proportions of lower performing pupils (Julius and Ghosh, 2022).

In addition to this, a substantial disadvantage gap remains despite both disadvantaged and non-disadvantaged pupils increasing their scores significantly when compared to the 2021 cohort. Schools in our study were focusing additional support, including tutoring via the National Tutoring Programme, on disadvantaged pupils; but it is clear that disadvantaged pupils have been worse affected by the disruption caused by the pandemic, suggesting that continued targeted approaches are needed in order to close this gap.

Whilst our study did not suggest that pupils' social maturity *per se* was an issue, the main challenges reported by schools in the 2022/2023 academic year, related to pupils' behaviour and wellbeing—reported more so than in previous years where staff's key concern had been pupil and staff absences. It will be important to gauge from school leaders, teachers, and support staff whether they feel able to address these challenges, or whether some supported interventions are required.

Implications for policymakers

The signs of recovery seen in Year 3 and Year 4 reading and mathematics suggest that with long-term support for pupils, learning recovery is possible. However, key areas of learning remain challenging for schools (including supporting very low attainers, learning geometry in mathematics, and the meaning of words in reading). This study highlights the importance of policymakers ensuring that schools have the appropriate resources to identify their pupils struggling with learning, and indeed behaviour, and provide targeted support as they progress through primary school. Our evidence suggests that catch-up support seems to be having an effect on pupils, but that the focus should be on very low-attaining pupils and closing the disadvantage gap. It is essential that schools are both adequately funded and supported, including on issues wider than academic learning, to ensure that the required long-term support can be delivered.

Implications for future research

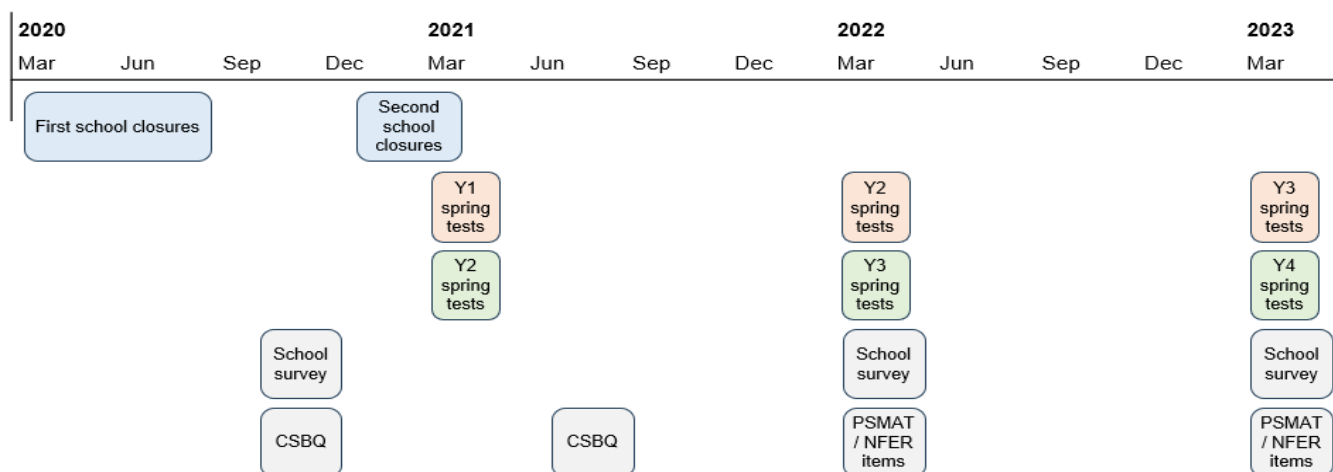
Although this current study shows some promising reduction, even closing, of the gaps in attainment compared with pupils before the pandemic, it is not yet clear if this is an embedded trend. Indeed, looking at other studies, the evidence is mixed and not yet conclusive about recovery across subjects and year groups (Andrews, 2023; Kennedy and Strietholt, 2023). A number of issues remain, including the disadvantage gap, which remains wider than pre-pandemic levels, a concern from school staff about the impact of the pandemic on children's wellbeing and behaviour (emphasised particularly in this year's school survey), and a continuing proportion of low attainers unable to access the assessments (particularly younger children in reading). These all highlight the importance of continuing to track the pupils involved in this study so that interventions and resources based on the learning they have missed are appropriately targeted as they move through school.

Introduction

Background and policy relevance

In this report, we analyse the attainment and social skills of pupils in Year 3 and Year 4 in the 2022/2023 academic year; the youngest school-aged children affected by the pandemic. This longitudinal study, with a baseline established during the pandemic and comparisons to pre-pandemic standardisation samples, aims to understand how quickly pupils catch up to the level that might be expected, had the pandemic not happened. The pupils in the sample were in Reception and Year 1 when schools in England were closed to most children from March 2020 until June 2020, and in Year 1 and Year 2 when schools were closed again to most pupils from January 2021 until March 2021. Figure 1 shows the timeline of events for this study.

Figure 1: Timeline of school closures and data collections for analysis in this longitudinal study.



Note that during the partial schools' closures, schools were open to key workers and vulnerable children. CSBQ=Child Self-regulation and Behaviour Questionnaire; NFER= National Foundation for Educational Research; PSMAT=Peer Social Maturity Scale; Y=Year.

As a result of the disruption caused by the pandemic, pupils' opportunities for formal learning and social interaction were reduced for a significant part of two school years. NFER was appointed by EEF to conduct research on the impact of Covid-19 school closures and subsequent support strategies on attainment and socio-emotional wellbeing in Key Stage 1 during the 2020/2021 academic year (Rose *et al.*, 2021). This baseline study found that the disruption to Key Stage 1 pupils' education during the pandemic resulted in significantly lower achievement in reading and mathematics compared with pupils before the pandemic. In addition, the partial closures of schools led to an increase in the disadvantage gap (i.e. the gap between pupils eligible for free school meals [FSM] and their peers). However, there was some evidence of the first steps of recovery in mathematics toward the end of the 2020/2021 academic year (Rose *et al.*, 2021). In the second year of the study, we found that whilst pupils had on average caught up in mathematics in Year 2 and Year 3, and in reading in Year 3, the negative impact of school closures on learning was still evident in Year 2 pupils' reading (Wheater *et al.*, 2022). In addition, the disadvantage gap remained wide, and there was a higher proportion of very low-attaining pupils who were unable to access the assessments effectively in both subjects and both year groups (compared to the pre-pandemic standardisation sample).

Despite these signs of some recovery, the evidence indicates that there are still concerns by age and subject, and the evidence for recovery is mixed. Review and summary of evidence from this study and other studies on the impact of Covid-19 on pupil attainment and the disadvantage gap indicate that pupils' learning recovery in reading and in mathematics at primary schools remains a concern, and that the disadvantage gap remains wide (Rose *et al.*, 2021; Wheeler *et al.*, 2022; Twist *et al.*, 2022; EEF 2022a; Andrews, 2023). In the immediate year after the pandemic, evidence suggested that for pupils in Key Stage 1, their reading attainment was particularly affected compared with attainment before the pandemic (Rose *et al.*, 2021; Blainey and Hannay, 2021); whereas mathematics attainment was most affected in Key Stage 2 pupils (Blainey and Hannay, 2021; Renaissance Learning, Education Policy Institute, 2021), with evidence also of a decrease in writing attainment at Key Stage 2 (Christodoulou, 2021). Indeed, the percentage of pupils meeting the expected standard in Key Stage 1 teacher assessments in 2021/2022 were all down from 2019 levels (i.e. in the phonics screening check, reading, writing, and mathematics) (DfE, 2022a); and Key Stage 2 headline attainment results from 2021/2022 showed results staying below pre-pandemic levels (DfE, 2022b).

Three years on from the first school closures, the evidence on recovery remains mixed. The latest Key Stage 2 results indicate that overall there are good signs of learning recovery: 73% of pupils met the expected standards in mathematics, up from 71% in 2022, but still below the 79% in pre-pandemic standards in 2019; and whilst pupils who met the expected standard in reading is down from 75% in 2022 to 73% in 2023, this is in line with pre-pandemic standards (where 73% met the expected standard in reading in 2019) (DfE, 2023). However, there is also evidence that primary school pupils have not yet recovered in mathematics (with average scores below pre-pandemic levels) (Andrews, 2023) and that there are more lower attainers in reading (Andrews, 2023) (we note that this study used a different sample of schools and different year groups to our current study). More widely, an international review of trend data from more than 300,000 pupils in 29 countries found a substantial negative effect of school closures on student reading achievement (Kennedy and Strietholt, 2023). Our current study reported here, provides further findings for this growing body of evidence.

The pandemic has affected disadvantaged pupils disproportionately; the disadvantage gap—wide before the pandemic—has widened further and remains wide (Rose *et al.*, 2021; Blainey and Hannay, 2021; Wheeler *et al.*, 2022; Andrews, 2023). The international review by Kennedy and Strietholt (2023) particularly highlighted that the learning 'loss' was most pronounced for socioeconomically disadvantaged pupils and those without home computer access. Weidmann *et al.* (2021) also found a widening of the disadvantage gap in mathematics, but not reading in Key Stage 2. There has also been some discussion in the research about the changing characteristics of pupil disadvantage, related for example to changes in family circumstances in light of the pandemic. A study by Julius and Ghosh (2022) found that more children (some 300,000) were being drawn into FSM status between January 2000 and January 2021 (e.g. through roll out of Universal Credit, with the trend amplified by the pandemic); and that the pupils who became newly eligible for FSM during the pandemic were disproportionately drawn from more disadvantaged areas. These trends are important to be aware of, as our current study explores results by FSM status. We use pre-pandemic FSM status to track the same pupils over time, and within-year FSM status to explore the disadvantage gap in any given particular academic year. We discuss this further in this report, in terms of tracking disadvantaged pupils' attainment over time.

The 2021/2022 academic year continued to present challenges for schools with high levels of pupil and staff absences persisting (Morton, 2022), indicating that the 2021/2022 academic year remained unlike the pre-pandemic school experience for children in education. In 2022/2023, whilst the very high levels of pupil and staff absence seen previously appear to have much reduced, behavioural and wellbeing issues are now more commonly reported by schools (see section 'Results' subsection 'Research question 4: What practices have been adopted and what learning opportunities have been provided by schools to help pupils catch up; and what challenges have been faced by staff?'), suggesting that school life for teachers and pupils has not yet returned to a pre-pandemic experience.

The children involved in this longitudinal study missed an important time at school, when they would have learned about how a school works including a stage when phonics is a focus of learning (as part of the Early Years Foundation Stage Framework and Key Stage 1 national curriculum) and covered rapidly; and they continued to have their education disrupted due to sickness particularly still in 2021/2022 but less so in 2022/2023.

This current study continues to track the progress of pupils as they moved into Year 3 and Year 4, in 2022/2023, alongside findings about their schools' contexts and their social skills. The cross-sectional analysis compares the current spring 2023 cohort with the standardisation sample. The repeated measures analysis uses the assessment data for each cohort of children in spring 2021, spring 2022 and spring 2023.

Research objectives

The longitudinal study is based on a combination of quantitative research looking at pupil attainment derived from NFER assessments completed in the spring term 2023, supplemented with evidence of school practices (collected through a headteacher survey) and teachers' perspectives of pupils' social skills (teacher-scored measure of a subsample of pupils). The same pupils were assessed in Spring 2022, when they were in Year 2 and Year 3.

The focus of this report is the measurement of two attainment gaps:

- The 'Covid-19 gap': The extent of the impact on pupils' attainment in reading and mathematics by partial school closures. This is measured by the difference between pupil performance in spring 2023 compared with the performance of the pre-Covid-19 standardisation sample of the equivalent year group.
- The 'disadvantage gap': The extent to which pupils eligible for FSM show lower reading and mathematics performance compared to their peers who are not eligible. This is measured by the

difference in attainment between pupils who are eligible and not eligible for FSM. The analysis in this report compares the gap in spring 2023 with spring 2021 and spring 2022.

This study provides a deeper understanding of the long-term impact of school closures on pupil attainment, and the support this cohort needs.

Research questions

The study seeks to answer the following five research questions listed below in relation to assessments taken by pupils in spring 2023:

1. To what extent does pupils' attainment in reading and mathematics recover by spring 2023?
2. To what extent do different groups recover by spring 2023; in particular, how is the gap between disadvantaged children and their peers changing over time?
3. Is attainment in some domains in reading and mathematics changing or recovering at a different rate from others?
4. What practices have been adopted and what learning opportunities have been provided by schools to help pupils catch up; and what challenges have been faced by staff?
5. Are social skills at or behind expectations, and to what extent do they improve between subsequent academic years?

Ethics and data protection

This research project received ethical approval during NFER's standard project start-up procedures and from the Code of Practice group. The study was conducted following NFER's data protection principles. NFER was responsible for all communications with schools, data collection, and analysis of the data. Further details are in Appendix A.

The legal basis for processing personal data is covered by the General Data Protection Regulation (GDPR) Article 6 (1) (f). We carried out a legitimate interest assessment, which demonstrated that the research fulfils one of our core business purposes (undertaking research, evaluation, and information activities). The research project has broader societal benefits and will contribute to improving the lives of learners by identifying if any pupil-level factors are associated with the degree of impact of the Covid-19 school closures on pupils' attainment and their recovery over the academic year.

Methods

Study design

This study uses a cross-sectional and repeated measures design, which follows a sample of pupils who have been affected by Covid-19 partial school closures. It compares their reading and mathematics attainment outcomes with a representative sample assessed before Covid-19 over three academic years between 2021 and 2023, as well as looking at the change over this time period. This report focuses on the assessment data from all three years.

NFER assessment data for reading and mathematics were collected for Year 1 and Year 2 pupils in spring 2021, for pupils in Year 2 and Year 3 in the same schools in spring 2022 and for pupils in Year 3 and Year 4 in spring 2023. These were compared against a standardisation sample from before the Covid-19 pandemic to estimate the 'Covid-gap'. A standardisation sample is a large group of individuals that is representative of the entire population of potential assessment takers.¹ The performance of this group on the assessment being standardised is used to estimate the average performance level and its distribution. Any difference between the scores in the 2022/2023 academic year and the standardisation sample for that assessment is the Covid-19 gap and will be referred to as such throughout the report. The standardisations were carried out in 2017 for both Year 3 and Year 4 spring assessments (see previous reports for results when the study cohort was in Year 1 and Year 2). The standardisation sample was restricted to state schools, and independent schools were removed since independent schools were not included in the sample for this study. More information about the assessments used (including their duration and number of marks available) can be found in Appendix C.

Further analysis compared the scores of pupils eligible for FSM and those not eligible to determine the disadvantage gap between these two groups in 2022/2023. Our estimates of the disadvantage gap for each assessment are contextualised with a best estimate for before the pandemic (as FSM identifiers are not available for the standardisation sample). We can then estimate the effect of the pandemic on the size of this gap.

In addition to comparing scores obtained in 2023 with the standardisation sample of 2017 (Covid-19 gap) and comparing 2023 FSM to 2023 non-FSM scores (disadvantage gap), a repeated measures analysis was undertaken to quantify how the Covid-19 gap and disadvantage gap changed between spring 2021, spring 2022 and spring 2023. This informs whether we can see any significant reductions or significant increases between 2021, 2022, and 2023, which could be taken to indicate a change in the magnitude of the Covid-19 and the disadvantage gaps.

All cross-sectional analyses report both standardised scores and raw scores. Standardised scores are reported because their original means of 100 and standard deviations (SDs) of 15 points make them more interpretable and comparable across year and subject and because they are more familiar for educators. More importantly, standardised scores allow for the reporting of the number of pupils unable to fully access the assessments, namely, those who did not score sufficient raw marks to gain the minimum available standardised score and were therefore awarded a score of 69. The proportion of pupils unable to fully access the assessment is an important indicator of differences between samples as it indicates changes in the proportion of students that were unable to perform at a minimum level. Nevertheless, since standardised scores restrict the score range from a minimum of 69 to a maximum of 141 points for the lowest and highest achievers, there is a risk that this restriction can distort group mean comparisons; particularly when the proportion of pupils below 69 or above the cut-off of 141 differ between the groups being compared. To address the potential effect of censoring, all statistical significance tests for the Covid-19 and disadvantage gaps are generated using raw assessment scores. Raw assessment scores are simple summations of the number of questions responded correctly. Consequently, when assessing, for example, whether the 2023 Year 3 mathematics pupil sample differed significantly from the 2017 benchmarking sample used to standardise the assessment (the Covid-19 gap), the statistical significance is based on the comparison of the mean raw scores for these two samples. Moreover, the significance of the t-tests for the raw scores incorporates the effect of school clustering. Mean group comparisons that do not incorporate the clustering effect that result from sampling schools versus sampling pupils directly overestimate the p-values of comparisons when intracluster correlation coefficients (ICCs) are high. The significance and confidence intervals (CIs) of raw scores is obtained using complex survey analysis methodology, which uses inverse-probability weighting and design-based standard errors (Lumley, 2004).

¹ Technical manuals, which include steps taken to ensure the standardisation sample was nationally representative, can be available at: <https://www.nfer.ac.uk/for-schools/products-services/nfer-tests/technical-manuals/>.

Whereas cross-sectional analyses report both standardised and raw scores, longitudinal analyses report only standardised scores. Since the psychometric properties of the assessments are different, raw scores cannot be used. Consequently, there is no way of avoiding the potential effects of standardised score censoring when comparing the performance of pupils across time. Furthermore, all repeated measures analyses were produced using multilevel modelling regressions. Multilevel modelling takes into account the effect of school clustering and thus the significance of regression coefficients is robust against the effect of sampling schools instead of sampling pupils directly.

Besides assessments measuring reading and mathematics attainment, teachers completed a measure of social skills development for a randomly selected subsample of pupils within each school. The measure used was different from that used in 2021, as the original measure was not suitable for use with older children (for details see section ‘Results’ subsection ‘Research question 5: Are social skills at or behind expectations, and to what extent do they improve between subsequent academic years?’). Subsequently, comparisons could not be made between social skills development of pupils in 2021 and 2022 but could be made with the pre-pandemic validation sample of the measure. However, the same measure was used in both 2022 and 2023 and therefore comparisons can be made between social skills development of pupils in these years.

Additional contextual information was also collected to identify school practices and any catch-up activities being undertaken with the pupils. The study design is described in Table 2.

Table 2: Study design

Design		Longitudinal observational study
Unit of analysis		Schools, pupils, and timepoint
Number of units included in analysis		82 schools and 6,157 pupils (3,079 in Year 3 and 3,078 in Year 4)
Primary outcome 1	Variable	Mathematics attainment
	Measure (instrument, scale, source)	NFER standardised assessment scores, 69–141
Primary outcome 2	Variable	Reading attainment
	Measure (instrument, scale, source)	NFER standardised assessment scores, 69–141
Secondary outcome	Variable	Social skills and wellbeing
	Measure (instrument, scale, source)	Peer Social Maturity Scale (PSMAT), 1–7 for each scale

Participants

All 168 schools, which participated in the baseline research into the impact of school closures in 2020/2021, were invited to continue taking part in this study in October 2021 and in October 2022. The 168 schools were a self-selecting sample from 1,775 schools invited to participate in the baseline study. The invited schools were state schools in England who were NFER assessment customers. School engagement was very good during the 2020/2021 academic year; 155 of the 168 schools, which took part in the autumn 2020 data collection were involved in the summer 2021 data collection.

The autumn term 2021 was very challenging for schools as they faced high staff and pupil absences. In 2023, a total of 82 schools agreed to take part in the study and submitted attainment data. In 2022/2023, 69 of these schools agreed to continue in the study and submitted their assessments. In addition to this, a further 13² schools from the baseline study, re-engaged as a result of reduced requirements resulting in a total of 82 schools taking part in 2022/2023. Weighting was used to address the self-selection nature of the sample and is explained below.

To note, the longitudinal analysis compared only those schools involved in 2021, 2022, and 2023, so that the different wave samples were more comparable to each other. Notwithstanding only using the subset of schools that participated in all waves of the study, for longitudinal analyses purposes, we included all pupils available in those schools, even if they had left or were new to the school for a particular wave. Consequently, the participants were all pupils in Year 3 (seven to eight years old) and Year 4 (eight to nine years old) in participating schools. Further details about the sample can be found in section 'Research findings' subsection 'Pupil and school characteristics'.

There were some changes to the experience for participating schools and data collection compared with the 2021/2022 year to make the study less burdensome on schools. Assessments were marked and uploaded to the NFER progress tool by NFER. This matched the process of the baseline study but in 2021/2022 the assessments were marked by teachers in schools at the request of a number of schools. It was felt that the change to teacher marking for one year of the study was not a big risk to the reliability; the NFER mark schemes are designed to be used by teachers, we provided a webinar to support teachers with the marking and provided a helpdesk in case of any queries.

Additionally, the following factors were employed to incentivise participation:

- provision of free spring assessments to schools as a pre-incentive;
- a discount for future NFER assessments for participating schools; and
- summary results and recommendations for teaching practice based on schools' item-level domain analysis disseminated through a school feedback leaflet.

This is a different incentive package from the baseline study, which provided diagnostic information, and required NFER to mark the assessments in order to do that. Part of the rationale for this package for schools in 2020/2021 was so that any additional burdens on schools were minimised. Despite it being at the request of a number of schools who wanted to mark their own assessments, the additional burden in 2021/2022 of marking and providing their data may have contributed to schools being unable to participate. In 2022/2023, in response to schools' feedback about the burden of having to provide item-level data in a relatively short time period, it was decided to return to NFER marking for this cycle. However, as schools were still facing a number of challenges due to the pandemic and as it was important to maintain participation in the study, it was decided to retain the other incentives listed. This proved effective in not only retaining the majority of schools from 2021/2022 in the study, but also in 12 schools who had participated in the baseline study returning.

Participating schools received sets of NFER assessments (mathematics and reading) to be used during the second half of the Spring Term. Schools were asked to administer the assessments to all pupils in each year within the testing window. Where a pupil missed a paper through absence they were not included.

Measures

Outcome measures

The main outcome measures were attainment data from NFER assessments in reading and mathematics for individual pupils.³ Assessment data was collected during the second half of the Spring Term for Year 3 and Year 4 pupils in 2023 (20 February 2023 – 31 March 2023). Schools were provided with spring Year 3 and spring Year 4 assessment papers from the NFER Key Stage 2 suite of assessments. All assessments were marked by NFER.

² One of the 12 schools, which re-engaged was restructured into two, and therefore a total of 13 schools can be said to have re-engaged.

³ Information on NFER assessments for Key Stage 1 assessments (Year 2) are available at: <https://www.nfer.ac.uk/for-schools/products-services/nfer-tests/key-stage-1-assessments/> and for KS2 assessments (Year 3) available at: <https://www.nfer.ac.uk/for-schools/products-services/nfer-tests/key-stage-2-assessments/>

The NFER assessments have a strong alignment to the English national curriculum in reading and mathematics and have robust technical properties,⁴ including good reliability (e.g. the Year 3 spring assessments all have Cronbach's alphas between 0.83 and 0.92 and the Year 4 spring assessments between 0.88 and 0.93). Outcomes include standardised scores and age standardised scores (i.e. scores based on large, nationally representative samples). Standardised scores compare a pupil's performance to that of a nationally representative sample of pupils from the relevant year group, who will have all taken the same assessment at the same time of year. Raw scores on NFER assessments were transformed to produce standardised scores ranging from 69 to 141 using look-up tables from the pre-pandemic standardisation. NFER assessments were standardised so that the average, nationally standardised score is 100 and the SD is 15. This means that a pupil scoring 100 on NFER assessments is obtaining the national average score.⁵

Each NFER assessment used in our study was previously standardised on a representative sample of schools (in terms of Key Stage 2 overall performance, primary school type, school governance, urban/rural classification, and region for NFER assessments) following the introduction of the 2014 national curriculum and at the same time of the academic year as the study assessments were scheduled. This was 2017 for Year 3 and Year 4 spring assessments.

These historical reference points allowed us to assess the Covid-19 gap by comparing the performance of pupils with the performance of other pupils in previous standardisation years. However, since no independent schools were included in this study's sample, the historical reference point was recalculated excluding independent schools, which resulted in a slight reduction of the expected mean of 100. Furthermore, similar comparisons for the disadvantage gap in reference to previous standardisation years was not possible as no data was available on the performance of FSM and non-FSM pupils in those earlier standardisation years. Nevertheless, attainment of FSM and non-FSM pupils was compared with Spring Term 2021 and Spring Term 2022 to analyse the change in the disadvantage gap.

Non-attainment outcomes: survey of social skills development

Alongside attainment outcomes, pupils' social skills and level of wellbeing are important to capture. This is particularly relevant for pupils in Key Stage 1 during partial school closures, as they may have missed opportunities for communication, social skills, and emotional development. School staff have reported challenges with pupil wellbeing over the course of the 2020/2021 academic year (Rose *et al.*, 2021; Lucas *et al.*, 2020; Nelson *et al.*, 2021).

In the 2020/2021 baseline study (Rose *et al.*, 2021), the Child Self-regulation and Behaviour Questionnaire (CSBQ; Howard and Melhuish, 2017) was used to measure the social skills of pupils. The CSBQ was designed for use with children aged three to six years, which is younger than the cohort included in the present study. A number of alternatives were considered, with the criteria that the scale should not be burdensome to complete, not require training to complete, be completed by an adult rather than self-report (due to the age of the pupils involved), should not collect special category data (which has implications for gaining consent), have an appropriate granular scale, and should be validated with an appropriately aged cohort for this study.

The Peer Social Maturity Scale (PSMAT) by Peterson *et al.* (2007) was selected. The PSMAT, like the CSBQ, included items examining group entry, interactive social play, self-assertion, tolerance, leadership, social sensitivity, and overall skill maturity. However, unlike the CSBQ, the PSMAT did not include items covering attention/focus, interactions with relevant adults, independence, persistence, and emotional regulation. It was decided therefore to supplement the seven items of the PSMAT with a further seven bespoke items written by NFER. Response options were anchored on a 1 to 7 scale denoting respectively 'very much less mature than the average child' to 'very much more mature than the average child'. Table 3 shows the PSMAT items and the supplementary items and includes the constructs that the new items were designed to measure.

⁴ Technical manuals, which include steps taken to ensure the standardisation sample was nationally representative, are available at: <https://www.nfer.ac.uk/for-schools/products-services/nfer-tests/technical-manuals/>

⁵ In order to make the standardisation sample comparable to the study sample, the standardisation sample was restricted to state schools and thus slightly differed from 100.

Table 3: Items of the Peer Social Maturity Scale (PSMAT) and supplementary items

PSMAT items	
The child's skill and willingness to make social overtures, join groups, or welcome others into own activities	
The child's skill at asserting him/herself appropriately to express opinions or convince peers	
The child's leadership skills with peers	
The maturity of the child's everyday modes of playing sociably with peers	
The child's skills in coping with peers who frustrate or interfere with the group's goals and activities	
The child's ability to understand the needs of peers who differ from the norm	
The overall maturity of the child's social skills	
Supplementary items	Related construct
The child's ability to focus on an activity or task	Attention/focus
The child's ability to deal with minor conflict and disappointment	Emotional regulation
The child's ability to initiate and maintain appropriate interactions with relevant adults in school	Interactions with relevant adults
The child's ability to undertake appropriate tasks independently	Independence
The child's willingness to persist with a task or activity after a setback	Persistence
The child's ability to make choices for themselves	Independence
The child's ability to manage their own feelings	Emotional regulation

The validation of the PSMAT (Fink *et al.*, 2013) is two-fold: one study based on a sample of 145 pupils in Australia, and another longitudinal study based on 114 pupils in Australia starting in Kindergarten and tracking to Grade 2. (Details on the validation, including age of pupils; along with the results for Year 2 and Year 3 pupils in this study; and the performance of the bespoke items can be found in section 'Results' subsection 'Research question 5: Are social skills at or behind expectations, and to what extent do they improve between subsequent academic years?').

As with the baseline study and Spring Term 2022, to minimise burden, we selected a subsample of 12 pupils per year group for whom teachers completed the questionnaire. The subsample was randomly selected by NFER from the full pupil list.

Survey data: Contextual factors

In addition to attainment outcomes and social skills outcomes, we collected data about recovery approaches, support, and challenges.

The school-level survey (see Appendix E) was sent to headteachers for completion during March 2023. The survey was different from the ones used in the baseline study and in Spring Term 2022, though it had similar themes. The results from the school-level survey were intended to be used cross-sectionally and collected information about:

- remote learning, including how schools are supporting vulnerable children not in school or those missing large periods of school-based learning;
- new practices following partial school closures (divided into):
 - enforced practices and their impact; and
 - practices schools have chosen to retain because they have found they are a better way of working.
- challenges for staff, for instance, coping with staff absences and any additional continuing professional development (CPD) requirements as a result of the pandemic;
- social and emotional support for pupils;

- how schools are approaching tutoring;
- an overview of catch-up strategies/recovery actions;
- specific support provided for disadvantaged pupils or very low-attaining pupils;
- parental engagement and whether it has been sustained (both in terms of capability and willingness); and
- an open question to allow headteachers to tell us about anything additional happening in their school, which they think is relevant.

The online survey software Questback was used for developing and hosting the school-level survey.

Additional data collections

Pupil background data

Schools were asked to provide basic pupil background data, which included: name; date of birth; unique pupil number; gender; year group; and FSM status.

The baseline study asked schools to provide the status of the pupils' FSM eligibility in the January census before lockdown (i.e. January 2020) as well as at each academic term during the 2020/2021 academic year. We therefore have a pre-pandemic FSM status, FSM Spring Term 2021, FSM Spring Term 2022, and FSM Spring Term 2023. The aim of the planned analysis on the change in the disadvantage gap over the 2021, 2022, and 2023 academic years was to identify the impact of school closure on those pupils who were considered disadvantaged prior to school closure. However, the Covid-19 gap analysis undertaken at each term considered FSM status as it was in that specific term. In both of these cases, if the FSM status of the pupil was missing at the necessary timepoint but available at a different timepoint, the information available was utilised.

School background data

School background characteristics such as the proportion of children eligible for FSM, the proportion of pupils meeting the expected standard in reading, writing, and mathematics at Key Stage 2 in 2019, the proportion of pupils with special educational needs and disability (SEND), the proportion of pupils with English as an Additional Language (EAL), the academy status of the school, whether the school is in an urban or rural area, and the geographical region in which a school is located were obtained from the Department for Education (DfE) website.

Sample size

To estimate the power of the study to detect standardised mean difference effect sizes, a power analysis by simulation was undertaken (Arnold *et al.*, 2011). Power was calculated separately for the Covid-19 gap and the disadvantage gap, for all combinations of 80 to 150 schools (after attrition) and effect sizes between 0.01 and 0.3 in intervals of 0.01 (i.e. 0.01, 0.02, 0.03... 0.28, 0.29, 0.3). For each of the N/effect size combinations, 1,000 data sets were simulated in the proposed longitudinal design of three timepoints (baseline, plus Year 1 and Year 2 of the current project) and 38 pupils per school. The ICC was taken to be 0.12. The number of pupils per school and the ICC were calculated from a preliminary analysis of the 2020/2021 data as this was considered to most closely represent the future data that would be collected. Setting the sum of the school level and residual variances to be 1 meant that the school level and residual variances used to simulate the variability in the data were the ICC and 1-ICC, respectively. This also ensured that the coefficients of models were on the effect size scale.

For the Covid-19 gap, a difference of the desired size was induced at one of the post-baseline timepoints. A linear mixed-effects model was fitted to each of the simulated data sets with school as the random effect and timepoint as the fixed effect. All between timepoint contrasts were tested for significance at a 5% significance threshold. For the disadvantage gap, 16% of simulated pupils were labelled as FSM and the desired effect size was induced in the FSM pupils at one of the timepoints. A linear mixed-effects model was fitted to each of the simulated data sets with school as the random effect and timepoint, FSM, and their interaction as the fixed effects. The difference between FSM and non-FSM pupils was compared between all pairwise combinations of timepoints and tested for significance at a 5% significance threshold. Although the national FSM percentage in the sample is slightly higher, our previous study indicated an FSM of 19%. Moreover, for simulation purposes assuming a slightly smaller FSM percentage is more conservative for purposes of statistical power calculation.

For both the Covid-19 gap and the disadvantage gap, the power for a given combination of number of schools and effect size was calculated as the proportion of the 1,000 simulated data sets where all comparisons involving the timepoint where the effect was induced were declared as significant. The minimum detectable effect size (MDES) for a particular number of schools was the smallest effect size where the power was greater than 80%.

The simulations indicated that, even with 80 schools, the project would allow the detection of educationally relevant changes in the Covid-19 gap but unlikely to detect the changes we expect to see in the disadvantage gap, not because they were comparably smaller, but due to the imbalance between FSM and non-FSM pupils and thus the loss in effective sample size.

Table 4: MDES for the Covid-19 gap analysis at protocol stage (anticipated number of schools, number of pupils, and ICC) and analysis stage (actual number of schools, number of pupils, and ICC)

	Protocol	Analysis – Reading	Analysis – Mathematics
MDES	0.08	0.09	0.09
Number of schools	80	75	75
Average number of pupils per school	38	34.7	34.6
ICC	0.12	0.13	0.13

ICC=intracluster correlation coefficient; MDES=minimum detectable effect size.

Sample representativeness

When estimating national population parameters of attainment, such as the Covid-19 gap, representativeness is critical. The longitudinal sample comprises 59 schools, which took part in the Covid-19 baseline study. In the 59 schools, which took part in the 2021, 2022, and 2023 waves of the project, approximately 14% of pupils were eligible for FSM in 2022/2023 academic year. Given that FSM eligibility changed after the pandemic, we decided to use pre-closure school percentage FSM to assess representativeness. Representativeness of the sample is less critical for the attainment gap between disadvantaged and non-disadvantaged pupils as it is a relative measure, and we are interested in seeing how this gap changes between the two timepoints of assessment.

It is important to check the representativeness of our achieved sample of schools for Key Stage 2 performance,⁶ in particular, for our estimation of the Covid-19 gap. Other school-level variables were also investigated, including characteristics such as school type, geographical location, and academy status. If and when required, we weighted the results by Key Stage 2 performance, which is discussed in the section below on ‘Statistical analysis’.

Statistical analysis

Weighting

Particular attention was given to ensuring our sample was as close to the standardisation sample, particularly for the analysis, which estimated the Covid-19 gap. We wanted to ensure the sample of participating schools was representative based on school-level performance at Key Stage 2 in 2019. The variable ‘KS2rwmExp_19’, the proportion of pupils meeting the expected standard in reading, writing, and mathematics available from the DfE website,⁷ was used to determine the representativeness of the sample of the population of primary schools.⁸ To address the issue of analysis being undertaken at pupil level but information on the sample being at school level, the analysis to determine representativeness was also weighted by the number of pupils in the school. Therefore, for Year 3, the population was weighted by the number of pupils on roll in Year 3 in the spring census of 2023 and the schools in our sample were weighted by the number of pupils who took the assessment within each school. Whilst not producing analysis ensuring the sample of pupils is representative of pupil population characteristics, this ensured the sample did not introduce bias because of too many pupils from schools with particular characteristics, for example, too many pupils from high-performing schools. This procedure was replicated for the Year 4 assessments.

⁶ Key Stage 2 was used here as the DfE does not release school-level Key Stage 1 data. Key Stage 2 therefore, remains the best way to differentiate schools by the performance of pupils in these schools.

⁷ <https://www.compare-school-performance.service.gov.uk/download-data>

⁸ The Key Stage 2 variable has been put into quintiles of school performance with a further category that identifies schools with missing data.

The Covid-19 gap (research question 1)

We estimated the Covid-19 gap (research question 1) counterfactual using the standardisation sample for the spring Year 3 and Year 4 assessments. By taking the weighted mean raw score for our sample along with its standard error, we determined whether the sample mean was different from the mean of the standardisation sample having excluded independent schools. Independent sample t-tests accounting for clustering effects were run to compare the mean of the sample at each timepoint for each subject to the corresponding mean in previous standardisation years. The effect size estimates were converted to additional months' progress using the EEF toolkit.⁹

The disadvantage gap (research question 2)

For Year 3 and Year 4, we calculated the disadvantage gap by comparing the mean raw scores for FSM pupils with their non-FSM peers obtained in 2023. Clustered t-tests were carried out to compare means, and the effect size estimates were converted into months of progress using the EEF toolkit.⁹

The Covid-19 and disadvantage gap over time (research questions 1 and 2)

In order to monitor change in both the Covid-19 and disadvantage gaps between the 2020/2021, the 2021/2022 and the 2022/2023 academic years, we used a multilevel structure to the models and a repeated measures design. The models had three levels: time; pupil; and schools, and these were run separately for each year group (Year 3 or Year 4) and subject (reading or mathematics), resulting in four individual models. These were run to identify how any Covid-19 gap at the first timepoint changed between Spring Term 2021, Spring Term 2022, and Spring Term 2023. The outcome variable was the reading or mathematics standardised score. The predictors entered into the model were time to identify whether there was a significant difference in the change in standardised score between the Spring Term 2021 baseline, Spring Term 2022, and Spring Term 2023 (indicated with values 0, 1, and 2, respectively) and FSM status 2020. An interaction between time and FSM status would indicate whether the disadvantaged pupils are changing at a different rate than their non-disadvantaged peers.

The repeated measures analysis used the FSM status of a pupil prior to school closures (i.e. FSM2020) as the FSM eligibility indicator variable; this ensured we tracked the same pupils over time, as we know that eligibility can change over time and avoided us having to take account of new trends affected by the pandemic (Julius and Ghosh, 2022; discussed further in section 'Limitations'). (Note: the cross-sectional analysis uses FSM data at the time of the assessment.) The analysis was also weighted by pupil headcount at school and Key Stage 2 performance for the population and sample at the start of the study in Autumn Term 2020. The percentage of pupils eligible for FSM, gender, percentage of pupils with EAL, percentage of pupils with SEND, academy status, and geographical region of the school were included as covariates in the disadvantage gap models. Percentage of pupils eligible for FSM, academy status, and geographical region of the school were included as covariates in the Covid-19 gap models. The 2021 means were recalculated to include only those schools that took part in 2022 and 2023. Therefore, changes to the sample composition are not a limitation to the findings.

All analyses were run in R version 4.1.2 (The R Foundation, 2023) and using the lme4 package version 1.1-34 (Bates, *et al.*, 2015).

Analysis of reading and mathematics domain performance (research question 3)

The reading and mathematics items are grouped within particular domains for each subject. Each domain contains a number of individual items that can provide greater information on a particular area of learning.

Analysis looked to identify differences in performance between domains and whether pupil factors (i.e. gender and FSM eligibility) were associated with variation in domain scores. The analysis compared domain performance of the standardisation sample, the baseline in Spring Term 2021 and Spring Term 2022 with Spring Term 2023 to determine whether particular domains have seen a bigger change than other domains.

⁹ <https://educationendowmentfoundation.org.uk/evidence-summaries/about-the-toolkits>

Analysis of contextual data (research question 4)

Analysis of contextual data from the headteacher survey was descriptive in order to give an indication of what schools focused on in the 2022/2023 academic year.

Analysis of social skills development (research question 5)

We report descriptive information on social skills development for the PSMAT and additional bespoke items from a subsample of approximately 12 pupils from Year 3 and 12 pupils from Year 4 in each school, and report by pupils eligible for FSM and those not eligible for FSM. FSM eligibility is considered at January 2020 (i.e. before school closures). The results were compared to the results from the original measure validation. The bespoke items were assessed for reliability using Cronbach's alpha, using the absolute cut-off score of at least 0.7 (deemed acceptable; Bland and Altman, 1997). The mean of the sumscores for these items were also reported in Spring Term 2022. The means of the sumscores were sufficiently reliable that they formed a baseline, which has been compared to pupils in Year 3 and Year 4 in Spring Term 2023, to track progress in their social skills and wellbeing recovery/development.

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Research findings

Participant flow and attrition

The recruitment to the longitudinal study took place during a very challenging time for schools. The 168 schools, which had participated in the baseline study were approached in September 2021. Schools were facing very high rates of staff and pupil absence and were providing online learning, and many felt unable to commit to the study for a further two years. The attrition rates for the 2021/2022 and 2022/2023 studies are shown in Table 5.

Table 5: Attrition rates from the baseline study for each subject and each year group in 2022 and 2023

	Attrition rate from baseline study	
	Mathematics	Reading
Spring Term 2022 Year 2	51.0%	48.9%
Spring Term 2022 Year 3	50.6%	51.4%
Spring Term 2023 Year 3	56.8%	59.1%
Spring Term 2024 Year 4	55.3%	56.6%

The number of schools participating in the project in 2022 and in 2023 across all year groups and subjects was 82.

As noted previously, the analysis was weighted to Key Stage 2 attainment and only compared schools involved in 2021, 2022, and 2023 ensuring that the smaller sample of schools involved in the longitudinal analysis (compared with the baseline assessment) did not have an impact on the representativeness.

Table 6 shows the number of schools involved at the three timepoints.

Table 6: Number of schools and analysed for each subject and year group in Spring Term 2021, Spring Term 2022, and Spring Term 2023

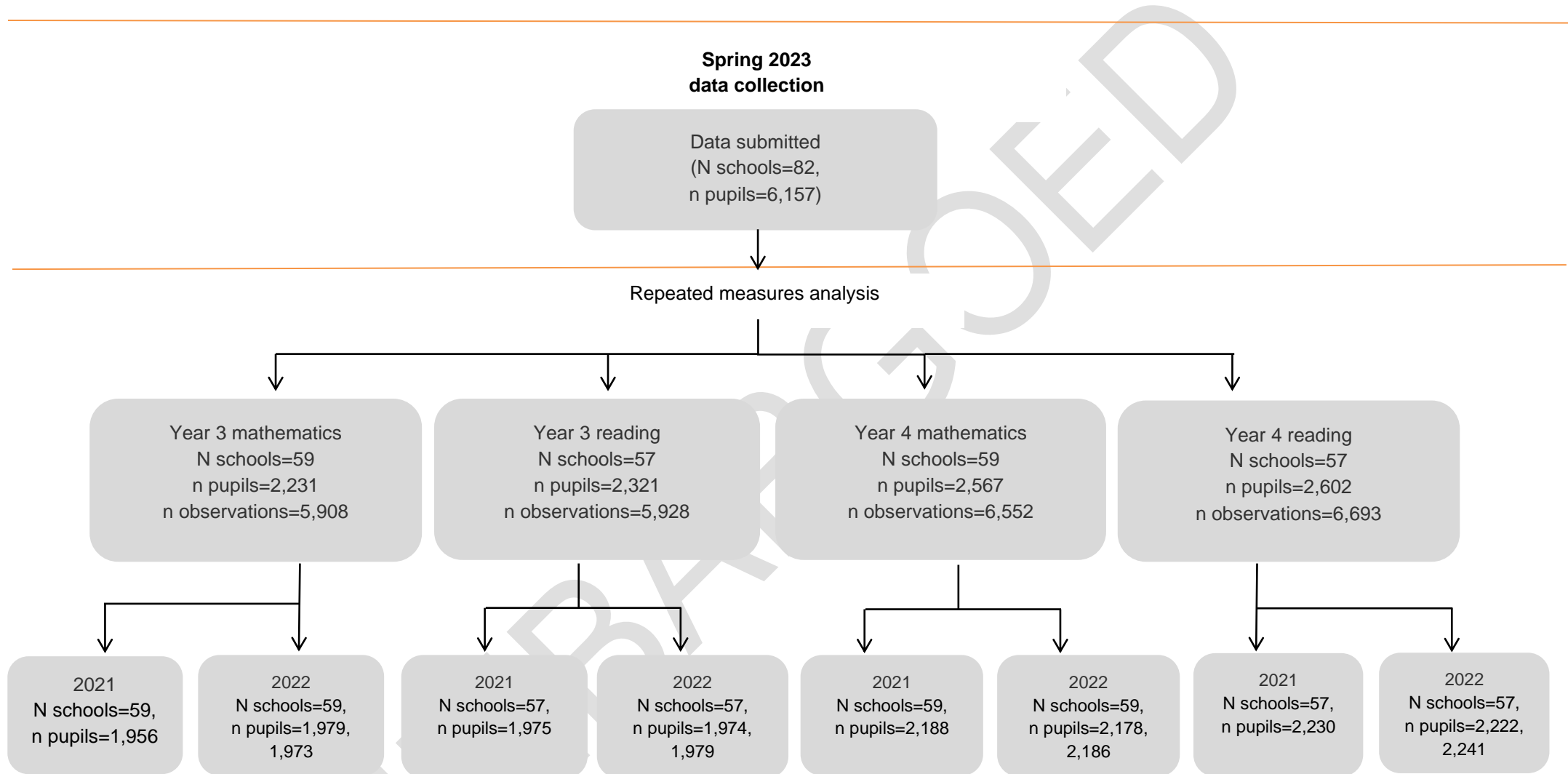
Academic year	Year group	Subject	Number of schools
Spring Term 2021	Year 1	Mathematics	148
		Reading	150
	Year 2	Mathematics	152
		Reading	155
Spring Term 2022	Year 2	Mathematics	75
		Reading	75
	Year 3	Mathematics	75
		Reading	75
Spring Term 2023	Year 3	Mathematics	81
		Reading	81
	Year 4	Mathematics	82
		Reading	82

Figure 2 shows the number of pupils included in the attainment outcome analysis looking at the change of the Covid-19 and disadvantage gaps over time (i.e. repeated measures analysis).

Pupil and school characteristics

Here we present the characteristics of the samples entered for the repeated measures analysis (Tables 7 to 11). The differences between the population (standardisation sample) and the repeated measures samples can be seen under the differences column as well as in the averaged differences column for each characteristic (FSM percentage in a school, Key Stage 2 2019 attainment, academy/non-academy status, urban/rural classification, SEND %, EAL %, and region). As can be seen in Table 7, for all the samples (Year 3 mathematics, Year 3 reading, Year 4 mathematics, and Year 4 reading), weighting was successful in reducing the Key Stage 2 2019 attainment differences between the population and the samples. Weighting also reduced the averaged differences between the population and the FSM and EAL school percentages. Although weighting increased some differences between the population and samples in regard to academy/non-academy status, urban/rural, EAL, and region, most differences stayed close to the unweighted differences or only slightly increased. Overall, all averaged differences between the population and samples were below 11 percentage points.

Figure 2: Participant flow diagram for the repeated measures attainment outcome analysis



Note: Only pupils with a total raw score were included.

Table 7: Averaged differences between population and the unweighted and weighted samples

Variable	Average differences							
	Year 3 Reading		Year 4 Reading		Year 3 Mathematics		Year 4 Mathematics	
	Unweighted	Weighted	Unweighted	Weighted	Unweighted	Weighted	Unweighted	Weighted
Key Stage 2 2019 attainment	4.63	1.85	3.93	0.69	3.57	0.59	3.77	0.51
FSM %	4.19	4.11	2.63	3.29	3.29	3.73	2.74	3.40
Academy status	13.31	12.00	12.15	10.68	13.75	12.47	12.23	10.75
Rural / urban classification	8.11	9.25	5.60	4.70	5.46	4.30	5.54	4.61
SEND %	6.68	8.18	6.49	7.63	6.50	8.13	6.24	7.43
EAL %	6.55	8.05	5.17	6.61	4.63	6.85	5.24	6.67
Region	6.99	7.49	3.33	3.38	3.08	3.11	3.36	3.32

EAL=English as an Additional Language; FSM=free school meals; SEND=special educational needs and disability.

Table 8: Characteristics of the Year 3 reading sample for the repeated measures analysis

Variable	Level	Population		Sample		Weighted sample	Percentage differences (absolute)			
		N	%	n	%	%	Population – sample	Average	Population – weighted sample	Average
Key Stage 2 2019 attainment	Lowest 20%	15,925	19.61	546	18.12	17.91	1.48		1.69	
	Second lowest 20%	16,183	19.92	716	23.76	21.41	3.84		1.49	
	Middle 20%	14,719	18.12	574	19.05	19.71	0.93		1.59	
	Second highest 20%	14,049	17.30	796	26.42	19.29	9.12		1.99	
	Highest 20%	13,939	17.16	340	11.28	17.64	5.88		0.48	
	Missing	6,412	7.89	41	1.36	4.03	6.53	4.63	3.86	1.85
FSM %	Lowest 20%	16,986	20.91	556	18.45	19.97	2.46		0.94	
	Second lowest 20%	15,629	19.24	663	22.00	23.07	2.76		3.83	
	Middle 20%	14,585	17.96	748	24.83	23.34	6.87		5.38	
	Second highest 20%	14,538	17.90	628	20.84	21.01	2.95		3.12	
	Highest 20%	17,290	21.29	389	12.91	11.62	8.38		9.67	
	Missing	2,199	2.71	29	0.96	1.00	1.74	4.19	1.71	4.11
Academy status	Academy	33,511	41.26	842	27.95	29.25	13.31		12.00	
	Non-academy	47,716	58.74	2,171	72.05	70.75	13.31	13.31	12.00	12.00
Rural / urban classification	Urban	24,380	30.01	660	21.91	20.76	8.11		9.25	
	Rural	56,846	69.98	2,353	78.09	79.24	8.11	8.11	9.25	9.25
SEND %	First quartile	19,501	24.01	607	20.15	18.07	3.86		5.94	
	Second quartile	20,040	24.67	775	25.72	25.61	1.05		0.93	
	Third quartile	21,011	25.87	1,152	38.23	41.34	12.37		15.48	
	Fourth quartile	20,581	25.34	479	15.90	14.99	9.44	6.68	10.35	8.18
	Missing	21,443	26.40	491	16.30	15.47	10.10		10.93	
EAL %	Second quartile	20,968	25.81	689	22.87	20.83	2.95		4.99	
	Third quartile	20,769	25.57	1,117	37.07	41.73	11.50		16.16	
	Fourth quartile	17,955	22.10	716	23.76	21.97	1.66	6.55	0.14	8.05
	Missing	21,443	26.40	491	16.30	15.47	10.10		10.93	
Region	East Midlands	1,521	1.87	278	9.23	10.88	7.35		9.01	
	East of England	3,716	4.57	365	12.11	12.04	7.54		7.47	
	London	5,220	6.43	434	14.40	15.37	7.98		8.95	
	North East	3,388	4.17	30	1.00	0.73	3.18		3.44	
	North West	12,070	14.86	706	23.43	23.12	8.57		8.26	
	South East	13,650	16.80	333	11.05	12.19	5.75		4.61	
	South West	12,698	15.63	190	6.31	5.58	9.33		10.05	
	West Midlands	13,664	16.82	443	14.70	12.85	2.12		3.97	
	Yorkshire and the Humber	15,300	18.84	234	7.77	7.23	11.07	6.99	11.60	7.49

Table 9: Characteristics of the Year 3 mathematics sample for the repeated measures analysis

Variable	Level	Population		Sample		Weighted sample %	Percentage differences (absolute)			
		N	%	n	%		Population - sample	Average	Population - weighted sample	Average
Key Stage 2 2019 attainment	Lowest 20%	109,324	17.41	540	17.94	17.52	0.53		0.12	
	Second lowest 20%	131,105	20.87	710	23.59	21.06	2.71		0.18	
	Middle 20%	122,252	19.46	577	19.17	19.92	0.29		0.45	
	Second highest 20%	119,249	18.99	796	26.45	19.29	7.46		0.30	
	Highest 20%	110,923	17.66	347	11.53	18.38	6.13		0.72	
	Missing	35,243	5.61	40	1.33	3.84	4.28	3.57	1.78	0.59
FSM %	Lowest 20%	111,230	17.71	560	18.60	20.41	0.90		2.70	
	Second lowest 20%	117,190	18.66	664	22.06	23.03	3.40		4.38	
	Middle 20%	121,047	19.27	748	24.85	23.22	5.58		3.95	
	Second highest 20%	129,348	20.59	617	20.50	20.77	0.10		0.18	
	Highest 20%	134,307	21.38	392	13.02	11.56	8.36		9.82	
	Missing	14,974	2.38	29	0.96	1.00	1.42	3.29	1.38	3.73
Academy status	Academy	261,008	41.56	837	27.81	29.09	13.75		12.47	
	Non-academy	367,087	58.44	2,173	72.19	70.91	13.75	13.75	12.47	12.47
Rural / urban classification	Urban	103,413	16.46	660	21.93	20.77	5.46		4.30	
	Rural	524,673	83.53	2,350	78.07	79.23	5.46	5.46	4.30	4.30
SEND %	First quartile	160,142	25.50	600	19.93	17.90	5.56		7.60	
	Second quartile	166,231	26.47	778	25.85	25.73	0.62		0.74	
	Third quartile	158,974	25.31	1,156	38.41	41.66	13.09		16.35	
	Fourth quartile	141,622	22.55	476	15.81	14.72	6.73	6.50	7.83	8.13
EAL %	First quartile	103,651	16.50	504	16.74	15.91	0.24		0.60	
	Second quartile	144,898	23.07	684	22.72	20.64	0.35		2.43	
	Third quartile	174,248	27.74	1,109	36.84	41.54	9.10		13.79	
	Fourth quartile	204,172	32.51	713	23.69	21.92	8.82	4.63	10.59	6.85
Region	East Midlands	55,252	8.80	277	9.20	10.88	0.41		2.08	
	East of England	71,825	11.44	359	11.93	11.72	0.49		0.29	
	London	94,275	15.01	442	14.68	15.92	0.33		0.91	
	North East	28,938	4.61	33	1.10	0.80	3.51		3.81	
	North West	87,076	13.86	699	23.22	22.88	9.36		9.02	
	South East	99,938	15.91	335	11.13	12.32	4.78		3.59	
	South West	57,561	9.16	187	6.21	5.46	2.95		3.71	
	West Midlands	70,118	11.16	445	14.78	12.87	3.62		1.70	
Yorkshire and the Humber	63,113	10.05	233	7.74	7.16	2.31	3.08	2.89	3.11	

Table 10: Characteristics of the Year 4 reading sample for the repeated measures analysis

Variable	Level	Population		Sample		Weighted sample	Percentage differences (absolute)			
		N	%	n	%	%	Population – sample	Average	Population – weighted sample	Average
Key Stage 2 2019 attainment	Lowest 20%	109,330	17.41	581	19.19	17.67	1.79		0.26	
	Second lowest 20%	131,111	20.87	685	22.63	21.52	1.76		0.65	
	Middle 20%	122,249	19.46	533	17.61	20.03	1.86		0.56	
	Second highest 20%	119,249	18.99	824	27.22	19.59	8.24		0.61	
	Highest 20%	110,916	17.66	363	11.99	17.61	5.67		0.05	
	Missing	35,244	5.61	41	1.35	3.58	4.26	3.93	2.03	0.69
FSM %	Lowest 20%	111,226	17.71	551	18.20	19.43	0.49		1.72	
	Second lowest 20%	117,189	18.66	617	20.38	21.26	1.73		2.60	
	Middle 20%	121,047	19.27	751	24.81	24.25	5.54		4.97	
	Second highest 20%	129,359	20.60	627	20.71	21.16	0.12		0.57	
	Highest 20%	134,304	21.38	452	14.93	12.82	6.45		8.57	
	Missing	14,974	2.38	29	0.96	1.09	1.43	2.63	1.29	3.29
Academy status	Academy	261,013	41.56	890	29.40	30.88	12.15		10.68	
	Non-academy	367,085	58.44	2,137	70.60	69.12	12.15	12.15	10.68	10.68
Rural / urban classification	Urban	103,413	16.46	668	22.07	21.17	5.60		4.70	
	Rural	524,676	83.53	2,359	77.93	78.83	5.60	5.60	4.70	4.70
SEND %	First quartile	160,149	25.50	598	19.76	17.75	5.74		7.75	
	Second quartile	166,228	26.47	768	25.37	25.78	1.09		0.68	
	Third quartile	158,970	25.31	1,162	38.39	40.65	13.08		15.34	
	Fourth quartile	141,625	22.55	499	16.48	15.82	6.06	6.49	6.73	7.63
EAL %	First quartile	103,638	16.50	520	17.18	16.39	0.68		0.11	
	Second quartile	144,903	23.07	644	21.28	19.34	1.79		3.73	
	Third quartile	174,256	27.74	1,135	37.50	41.04	9.75		13.30	
	Fourth quartile	204,175	32.51	728	24.05	23.23	8.46	5.17	9.28	6.61
Region	East Midlands	55,253	8.80	269	8.89	9.75	0.09		0.95	
	East of England	71,831	11.44	394	13.02	13.45	1.58		2.01	
	London	94,267	15.01	453	14.97	15.83	0.04		0.82	
	North East	28,935	4.61	42	1.39	1.00	3.22		3.61	
	North West	87,083	13.86	731	24.15	23.93	10.28		10.07	
	South East	99,936	15.91	286	9.45	10.90	6.46		5.01	
	South West	57,564	9.16	191	6.31	5.53	2.85		3.63	
	West Midlands	70,116	11.16	430	14.21	12.50	3.04		1.34	
	Yorkshire and the Humber	63,114	10.05	231	7.63	7.11	2.42	3.33	2.94	3.38

Table 11: Characteristics of the Year 4 mathematics sample for the repeated measures analysis

Variable	Level	Population		Sample		Weighted sample	Percentage differences (absolute)			
		N	%	n	%	%	Population – sample	Average	Population – weighted sample	Average
Key Stage 2 2019 attainment	Lowest 20%	112,776	17.51	580	19.40	17.94	1.89		0.43	
	Second lowest 20%	134,986	20.96	672	22.47	21.11	1.52		0.15	
	Middle 20%	125,290	19.45	522	17.46	19.58	1.99		0.12	
	Second highest 20%	122,703	19.05	806	26.96	19.10	7.91		0.05	
	Highest 20%	113,896	17.68	368	12.31	18.44	5.37		0.76	
	Missing	34,466	5.35	42	1.40	3.83	3.95	3.77	1.52	0.51
FSM %	Lowest 20%	112,400	17.45	536	17.93	19.17	0.48		1.72	
	Second lowest 20%	120,298	18.68	606	20.27	21.20	1.59		2.52	
	Middle 20%	124,038	19.26	748	25.02	24.27	5.76		5.01	
	Second highest 20%	133,497	20.73	631	21.10	21.66	0.38		0.93	
	Highest 20%	138,911	21.57	441	14.75	12.65	6.82		8.92	
	Missing	14,973	2.32	28	0.94	1.05	1.39	2.74	1.27	3.40
Academy status	Academy	267,917	41.59	878	29.36	30.85	12.23		10.75	
	Non-academy	376,199	58.41	2,112	70.64	69.15	12.23	12.23	10.75	10.75
Rural / urban classification	Urban	105,180	16.33	654	21.87	20.94	5.54		4.61	
	Rural	538,927	83.67	2,336	78.13	79.06	5.54	5.54	4.61	4.61
SEND %	First quartile	161,611	25.09	583	19.50	17.40	5.59		7.69	
	Second quartile	170,834	26.52	768	25.69	26.16	0.84		0.36	
	Third quartile	163,972	25.46	1,137	38.03	40.41	12.57		14.95	
	Fourth quartile	146,573	22.76	502	16.79	16.03	5.97	6.24	6.72	7.43
EAL %	First quartile	105,052	16.31	522	17.46	16.50	1.15		0.20	
	Second quartile	148,295	23.02	640	21.40	19.53	1.62		3.49	
	Third quartile	180,543	28.03	1,120	37.46	41.26	9.43		13.23	
	Fourth quartile	209,100	32.46	708	23.68	22.71	8.78	5.24	9.75	6.67
Region	East Midlands	56,245	8.73	270	9.03	9.96	0.30		1.23	
	East of England	72,945	11.32	388	12.98	13.41	1.65		2.09	
	London	96,634	15.00	438	14.65	15.59	0.35		0.59	
	North East	29,804	4.63	44	1.47	1.04	3.16		3.58	
	North West	89,299	13.86	723	24.18	23.89	10.32		10.02	
	South East	103,157	16.02	292	9.77	11.39	6.25		4.62	
	South West	58,136	9.03	187	6.25	5.47	2.77		3.56	
	West Midlands	72,724	11.29	423	14.15	12.31	2.86		1.02	
Yorkshire and the Humber	65,173	10.12	225	7.53	6.94	2.59	3.36	3.18	3.32	

Results

The results are presented in this chapter covering each of the five research questions in turn.

Research question 1: To what extent does pupils' attainment in reading and mathematics recover by spring 2023?

Summary

Year 3

- There was no significant difference in the overall performance of pupils in reading in Spring Term 2023 and the standardisation sample in 2017.
- The overall performance of pupils in mathematics in Spring Term 2023 was significantly higher than the standardisation sample in 2017, representing an improvement of around an additional two months' progress.
- In the reading assessment in Spring Term 2023, the proportion of pupils who scored below the lowest standardised score was greater than the standardisation sample in 2017, rising from 2.54% to 4.91%. In the mathematics assessment in Spring Term 2023, the proportion of pupils who scored below the lowest standardised score was broadly similar to that seen in the standardisation sample, rising from 2.35% to 2.56%.
- For both reading and mathematics, the repeated measures regressions provided evidence for an increase in scores between 2021, 2022, and 2023.

Year 4

- The overall performance of pupils in reading in Spring Term 2023 was significantly higher than the standardisation sample in 2017, representing an improvement of around an additional three months' progress.
- There was no significant difference in the overall performance of pupils in mathematics in Spring Term 2023 and the standardisation sample in 2017.
- In the reading assessment in Spring Term 2023, the proportion of pupils who scored below the lowest standardised score was slightly lower than the standardisation sample in 2017, falling from 1.96% to 1.52%. In the mathematics assessment in Spring Term 2023, the proportion of pupils who scored below the lowest standardised score, at 2.74%, was the same as that seen in the standardisation sample, at 2.71%.
- For both reading and mathematics, the repeated measures regressions provided evidence for an increase in scores between 2021, 2022, and 2023.

Pupils' raw scores from the Spring Term 2023 assessments were converted into standardised scores using the NFER conversion table,¹⁰ which was created during the 2017 standardisation for Year 3 and Year 4. This enables their performance to be compared with the standardisation sample.

Almost all pupils fall within the standardised score range of 70 and 140 and scores outside of this range can be considered exceptional. Pupils who score fewer raw marks than that required to be awarded a standardised score using the conversion tables are therefore awarded a raw score of 69. This is due to the fact that their standardised scores cannot be calculated with the necessary statistical reliability and a score of 0 would distort the mean unduly. Similarly, pupils who score above the highest possible standardised score are awarded a score of 141.

¹⁰ This table is provided to schools using NFER assessments.

Year 3 attainment in reading and mathematics: Covid-19 gap

Year 3 attainment in reading: Covid-19 gap

In Year 3, the reading assessment consists of one paper, which was taken by all participants. The total number of Year 3 pupils included in the reading analysis was 3,013 from 81 schools.

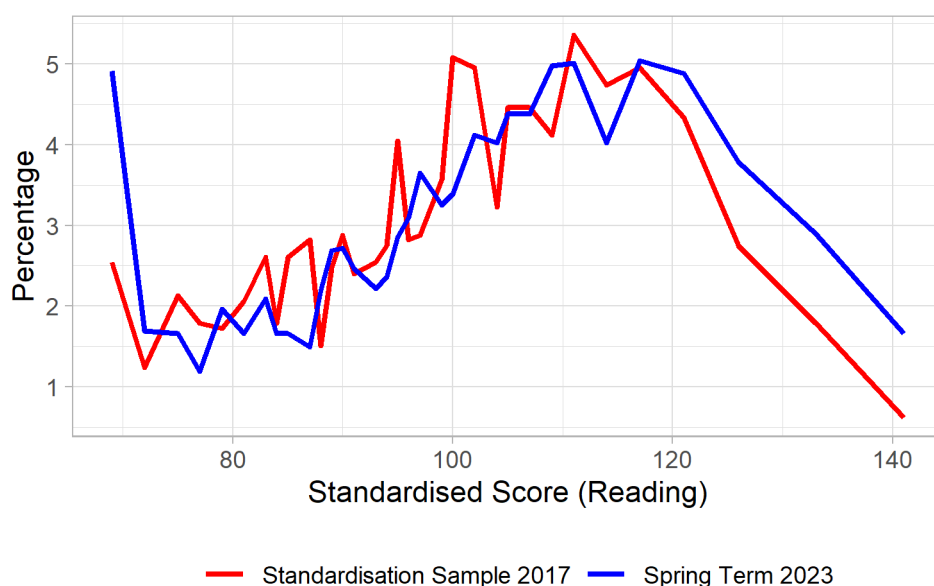
Table 12: Year 3 reading standardised scores

Measure	Standardised scores	
	Standardisation sample 2017	Spring Term 2023
Mean	99.64	100.82
95% confidence interval	98.33–100.95	99.29–102.35
Standard deviation	14.61	16.38
N pupils ^a	1,456	3,013

^a The mathematics and reading Spring Term 2023 samples were weighted by Key Stage 2 performance. Data relating to pupils from independent schools in the 2017 standardisation samples were removed.

The SD of the study sample is larger, at 16.38, than that of the standardisation sample. This is due in part to a larger proportion of pupils scoring at the lower end of the range. Figure 3 shows a large proportion of the pupils in our Spring Term 2023 sample scored at the lowest end of the possible standardised scores. It also shows more pupils toward the top of the distribution in Spring Term 2023.

Figure 3: Distribution of reading standardised scores for the Spring Term 2023 sample of Year 3 pupils



It is noteworthy that a higher-than-expected proportion of pupils, 4.91%, scored too few marks on the reading assessment to achieve a standardised score of 70, resulting in a standardised score of 69 being awarded. This indicated that a number of pupils were unable to engage effectively with the assessment. In the standardisation sample, the percentage of pupils being awarded this standardised score was 2.54%.

The standardised score analysis has allowed us to identify the larger proportion of pupils who are unable to engage effectively with the assessment. However, in order to test whether the mean differences in performance are significant, without the use of potentially inflated scores for these low achievers, and in order to account for the clustering of the sample, we also carried out analysis of the raw scores.

Table 13: Year 3 reading raw scores

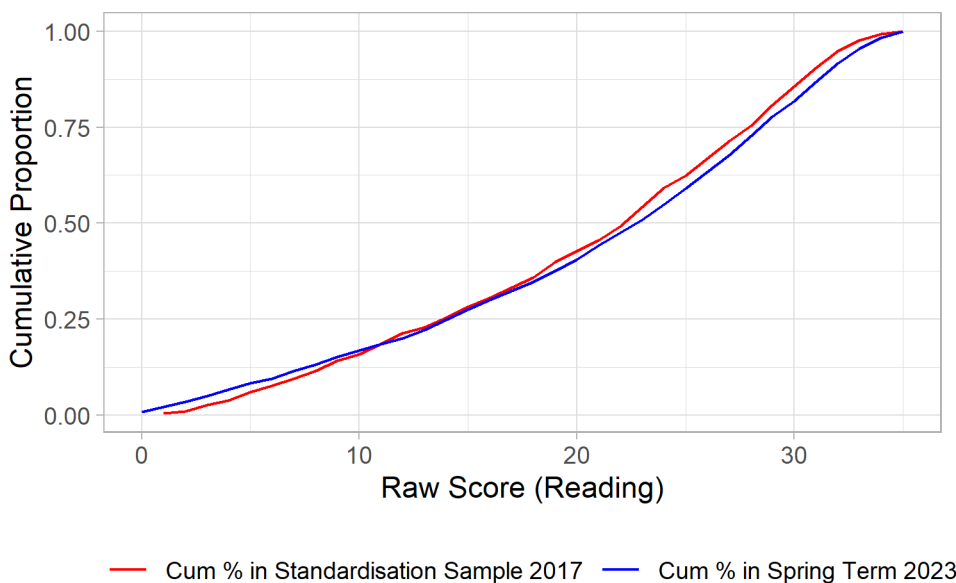
Measure	Raw scores	
	Standardisation sample 2017	Spring Term 2023
Mean	20.96	21.38
95% confidence interval	20.19–21.74	20.49–22.27
Standard deviation	8.71	9.32
N pupils ^a	1,456	3,013

^a The mathematics and reading Spring Term 2023 samples were weighted by Key Stage 2 performance. Data relating to pupils from independent schools in the 2017 standardisation samples were removed.

There was no significant difference between the overall performance of Year 3 pupils in reading in Spring Term 2023 and the standardisation sample. The mean raw score across the Spring Term 2023 sample was 21.38 compared to 20.96 at standardisation. This equates to an effect size¹¹ of 0.048 or around zero months' progress using the EEF conversion table from the Early Years Toolkit.¹²

Figure 4 shows the cumulative proportions for the Year 3 raw reading scores, with the blue line representing the Spring Term 2023 data and the red line representing the 2017 standardisation sample. It reflects the higher mean score seen in Table 13, with slightly higher proportions of pupils achieving higher raw scores in Spring Term 2023, and also slightly higher proportions of pupils achieving low raw scores within the standardisation sample.

Figure 4: Cumulative distribution of reading raw scores for 2017 standardisation sample and Spring Term 2023 sample of Year 3 pupils

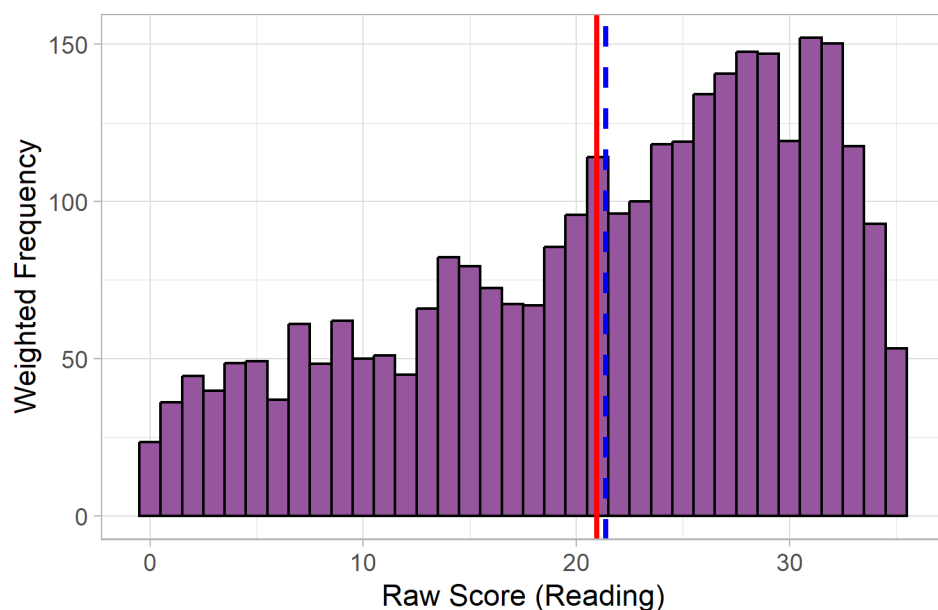


In Figure 5, the red line represents the expected mean if the sample performed exactly as the standardisation sample had, and the blue dotted line represents the observed mean for the sample in Spring Term 2023. The distribution shows a negative skew, namely, overall fewer lower scores and more high scores than expected, compared to the standardisation sample, however, as noted earlier, this masks the greater proportion of very low scores.

¹¹ Covid-19 gap effect sizes were calculated by dividing the difference in standardised score points between the samples by the SD of the standardisation sample.

¹² <https://educationendowmentfoundation.org.uk/education-evidence/using-the-toolkits>

Figure 5: Distribution of Year 3 reading raw scores for Spring Term 2023 sample



Year 3 reading repeated measures analysis

In order to assess the longitudinal change in the Covid-19 gap, we compared Year 3 pupils' 2023 reading scores with their scores in 2022 (when in Year 2) and in 2021 (when in Year 1). A total of 2,321 pupils (from 57 schools that participated in 2021, 2022, and 2023 for the reading assessment for this cohort) were entered into the Year 3 reading repeated measures multilevel models. Out of these 2,321 pupils, 1,622 pupils took the three assessments, 363 took two assessments, and 336 took only one assessment. Table 14 shows the detail for longitudinal participation.

Table 14: Year 3 reading longitudinal participation

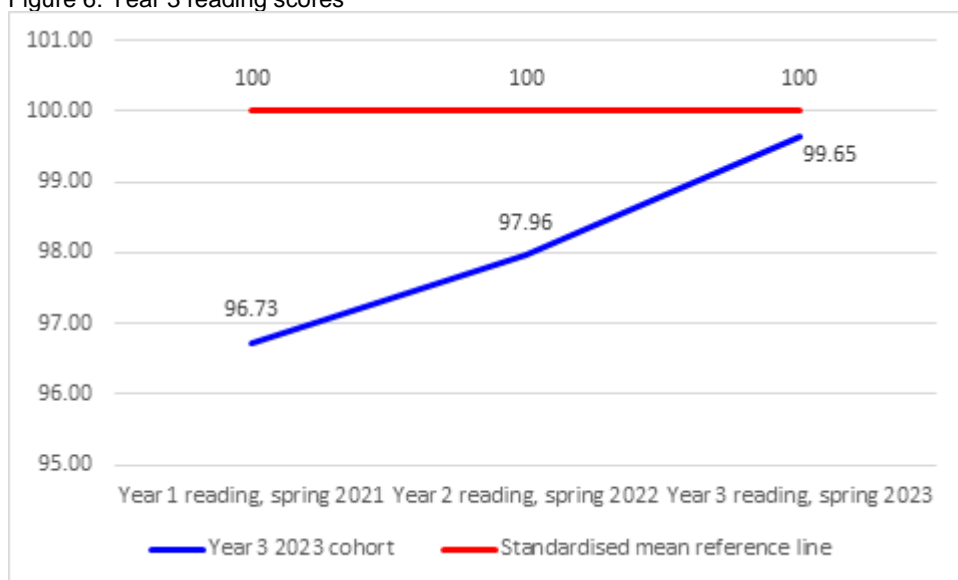
Longitudinal participation	Number of pupils
Spring Term 2021 only	124
Spring Term 2022 only	59
Spring Term 2023 only	153
Spring Term 2021 and Spring Term 2022	159
Spring Term 2022 and Spring Term 2023	134
Spring Term 2021 and Spring Term 2023	70
Spring 2021, Spring Term 2022, and Spring Term 2023	1,622

Table 15: Year 3 reading standardised means

Outcome	Standardised means											
	Spring Term 2021				Spring Term 2022				Spring Term 2023			
	n	Weighted n	Mean (95% CI)	SD	n	Weighted n	Mean (95% CI)	SD	n	Weighted n	Mean (95% CI)	SD
Year 3 reading	1,980	1,634	96.73 (95.99–97.46)	15.17	1,952	1,638	97.96 (97.18–98.74)	16.07	1,996	1,629	99.65 (98.84–100.46)	16.68

Table 15 presents the standardised means of the Year 3 reading responses in Spring Term 2021, Spring Term 2022, and Spring Term 2023. Reading results are higher in 2023 than in 2022 and results are higher in 2022 than in 2021. These are further displayed in Figure 6.

Figure 6: Year 3 reading scores



Year 3 reading Covid-19 gap model

Table 16: Year 3 reading Covid-19 gap model

Coefficients	Model coefficients				Effect size	
	Estimate (95% CI)	SE	Degrees of freedom	P-value	Hedge's g (95% CI)	
(Intercept)	106.67 93.91 119.43	6.51	36.72	0.000		
Timepoint	1.70 1.45 1.96	0.13	3773.38	0.000	0.06 0.05 0.07	
FSM second lowest 20%	-1.34 -6.57 3.88	2.67	42.76	0.617	-0.05 -0.25 0.15	
FSM middle 20%	-7.35 -11.86 -2.83	2.30	43.94	0.003	-0.28 -0.45 -0.11	
FSM second highest 20%	-8.29 -12.90 -3.67	2.35	40.87	0.001	-0.31 -0.49 -0.14	
FSM highest 20%	-10.72 -17.16 -4.28	3.29	39.20	0.002	-0.41 -0.65 -0.16	
FSM missing	-1.72 -9.93 6.50	4.19	33.40	0.685	-0.07 -0.38 0.25	
Non-academy	1.37 -2.43 5.16	1.94	42.33	0.484	0.05 -0.09 0.20	
East of England	-6.59 -18.10 4.91	5.87	35.45	0.269	-0.25 -0.69 0.19	
London	-7.01 -19.25 5.23	6.24	36.33	0.269	-0.27 -0.73 0.20	
North East	-7.06 -19.47 5.35	6.33	36.09	0.272	-0.27 -0.74 0.20	
North West	-5.37 -17.56 6.81	6.22	35.54	0.393	-0.20 -0.67 0.26	
South East	-5.21 -17.53 7.11	6.29	36.38	0.413	-0.20 -0.67 0.27	
South West	-4.75 -17.50 8.00	6.50	35.69	0.470	-0.18 -0.66 0.30	
West Midlands	-3.90 -16.53 8.74	6.45	37.22	0.549	-0.15 -0.63 0.33	
Yorkshire and the Humber	-3.76 -16.66 9.14	6.58	37.70	0.571	-0.14 -0.63 0.35	

Note: The reference group for this model was Spring Term 2021 scores, lowest 20% FSM quintile, academy schools, and the East Midlands region. The number of schools is 57, the number of pupils is 2,321. The ICC was 0.09 at school level and 0.65 at pupil level. Significant effects are in bold. CI=confidence interval; FSM=free school meals; ICC=intracluster correlation coefficient; SE=standard error.

The analysis of the Year 3 reading scores used a three-level multilevel model (school, pupil, and timepoint) in which Spring Term 2021, Spring Term 2022, and Spring Term 2023 scores were regressed on time, FSM quintiles, academy status, and region. Table 16 presents the results from the model, which measures the impact of time on pupil outcomes. The Covid-19 gap is represented as the difference in the measured reading attainment from the standardised average of 100. The model ascertains whether there was a significant change in this gap between Spring Term 2021, Spring Term 2022, and Spring Term 2023.

There was a significant positive effect of time on Year 3 pupils' reading scores, with an effect size of 0.06 (0.05, 0.07). This means that throughout 2021, 2022, and 2023, reading scores showed a positive trend. Consequently, the Covid-19 reading attainment gap was reduced. This significant increase was found whilst controlling for FSM quintiles, academy status, and region. Effect size and CIs are presented in Table 16.

It is worth noting that being in a school in the highest three quintiles of FSM (i.e. schools with the highest proportion of FSM pupils) was associated with a medium to large effect on lowering attainment.

Year 3 attainment in mathematics: Covid-19 gap

In Year 3, mathematics assessments consisted of three papers, one arithmetic paper and two reasoning papers. All papers are suitable for, and should be taken by, all pupils. Pupils needed to sit all three of the papers in order to be included in the study. The total number of Year 3 pupils included in the mathematics analysis was 3,010 from 81 schools.

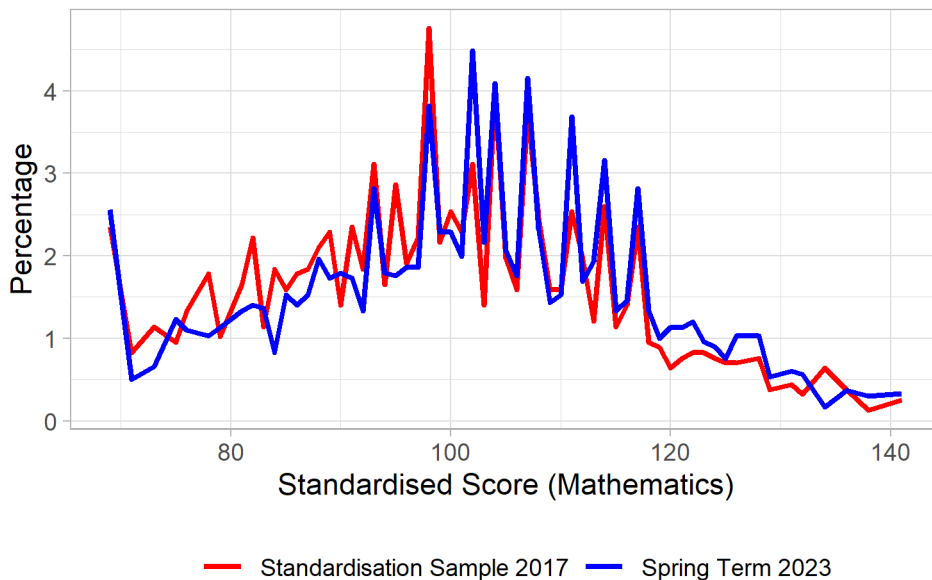
Table 17: Year 3 mathematics standardised scores

Measure	Standardised scores	
	Standardisation sample 2017	Spring Term 2023
Mean	99.59	101.83
95% confidence interval	98.17–101.01	100.33–103.32
Standard deviation	14.60	14.77
N pupils ^a	1,574	3,010

^a The mathematics and reading Spring Term 2023 samples were weighted by Key Stage 2 performance. Data relating to pupils from independent schools in the 2017 standardisation samples were removed.

The SD of the study sample is very similar, at 14.77, to that of the standardisation sample. This reflects the similarity in the distributions of their scores.

Figure 7: Distribution of mathematics standardised scores for the Spring Term 2023 sample of Year 3 pupils



The proportion of pupils (2.56%) scoring too few marks on the mathematics assessment to achieve a standardised score of 70, resulting in a standardised score of 69, was similar to that of the standardisation sample (2.35%). These are pupils who are unable to engage effectively with the mathematics assessments.

Table 18: Year 3 mathematics raw scores

Measure	Raw scores	
	Standardisation sample 2017	Spring 2023
Mean	35.58	38.25
95% confidence interval	33.95–37.20	36.54–39.96
Standard deviation	16.73	17.03
N pupils ^a	1,574	3,010

^a The mathematics and reading Spring Term 2023 samples were weighted by Key Stage 2 performance. Data relating to pupils from independent schools in the 2017 standardisation samples were removed.

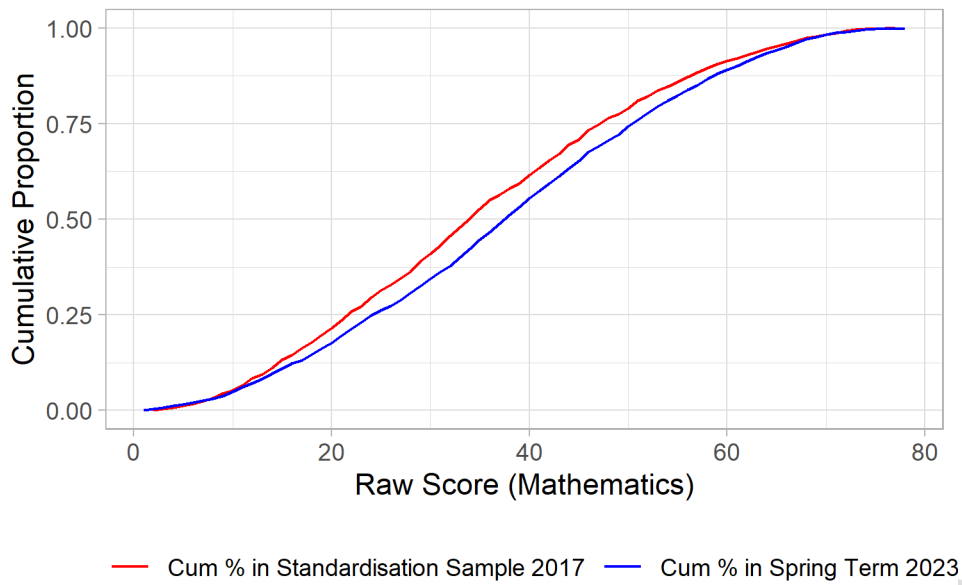
The overall performance of Year 3 pupils in mathematics in Spring Term 2023 was significantly higher than the standardisation sample. The mean raw score across the Spring Term 2023 sample was 38.25, compared to 35.58 at standardisation. This equates to an effect size¹³ of 0.160 or around an additional two months' progress using the EEF conversion table from the Early Years Toolkit.¹⁴

Figure 8, which shows the cumulative percentage of mathematics standardised scores distribution in both Spring Term 2023 and the standardisation sample, shows the proportion of pupils scoring at the lower and upper end of the range are very similar but improved performance in Spring Term 2023 away from these extremes.

Figure 8: Cumulative distributions of mathematics raw scores for 2017 standardisation sample and Spring Term 2023 sample of Year 3 pupils

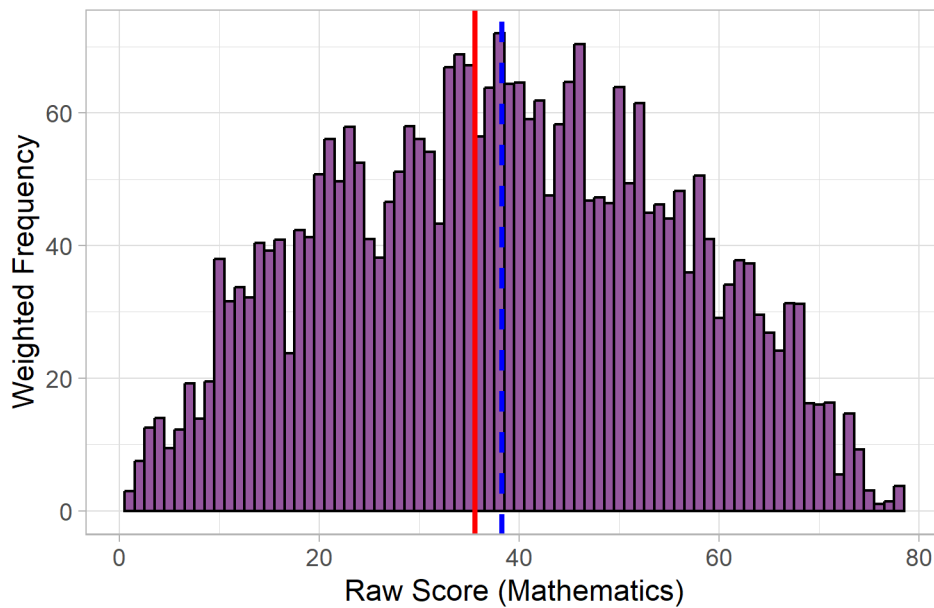
¹³ Covid-19 gap effect sizes were calculated by dividing the difference in standardised score points between the samples by the SD of the standardisation sample.

¹⁴ <https://educationendowmentfoundation.org.uk/education-evidence/using-the-toolkits>



In Figure 9, the red line represents the expected mean if the sample performed exactly as the standardisation sample had, and the blue dotted line represents the observed mean for the sample in Spring Term 2023. The distribution shows that the raw scores are normally distributed.

Figure 9: Distribution of Year 3 mathematics raw scores for Spring Term 2023 sample



Year 3 mathematics repeated measures analysis

In order to assess the longitudinal change in the Covid-19 gap, we compared Year 3 pupils' 2023 mathematics scores with their scores in 2022 (when in Year 2) and in 2021 (when in Year 1). A total of 2,321 pupils (from 57 schools that participated in 2021, 2022, and 2023 for the mathematics assessment for this cohort) were entered into the Year 3 reading repeated measures multilevel models. Out of these 2,321 pupils, 1,595 pupils took the three assessments, 397 took two assessments, and 329 took only one assessment. Table 19 shows the detail for longitudinal participation.

Table 19: Year 3 mathematics longitudinal participation

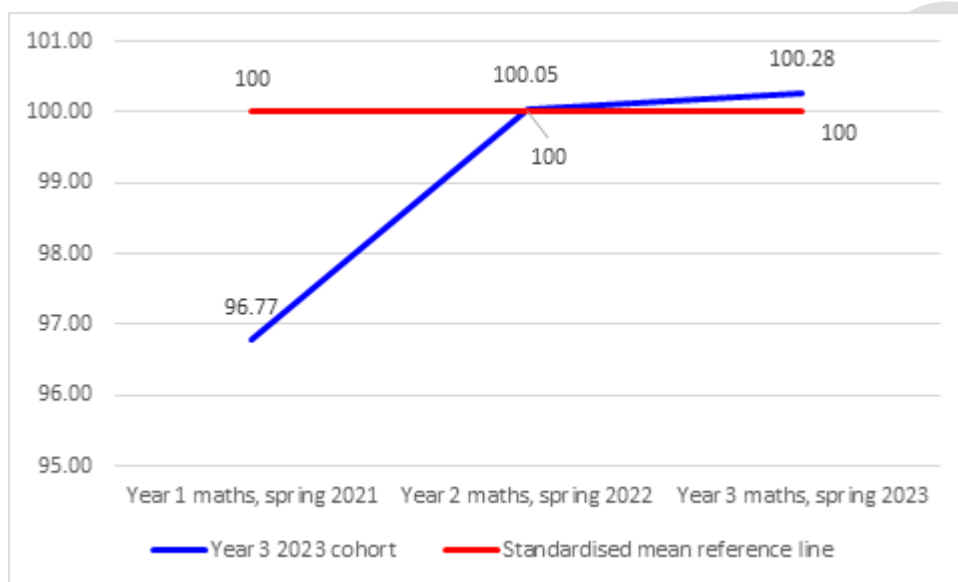
Longitudinal participation	Number of pupils
Spring Term 2021 only	118
Spring Term 2022 only	55
Spring Term 2023 only	156
Spring Term 2021 and Spring Term 2022	175
Spring Term 2022 and Spring Term 2023	154
Spring Term 2021 and Spring Term 2023	68
Spring 2021, Spring Term 2022, and Spring Term 2023	1,595

Table 20: Year 3 mathematics standardised means

Outcome	Standardised means											
	Spring Term 2021				Spring Term 2022				Spring Term 2023			
	n	Weighted n	Mean (95% CI)	SD	n	Weighted n	Mean (95% CI)	SD	n	Weighted n	Mean (95% CI)	SD
Year 3 mathematics	1,957	1,624	96.77 (96.06–97.49)	14.72	1,962	1,648	100.05 (99.29–100.81)	15.68	1,989	1,631	100.28 (99.55–101.01)	14.99

Table 20 presents the standardised means of the Year 3 mathematics responses split by term. For pupils overall, Year 3 mathematics results are higher in Spring Term 2022 than in Spring Term 2021 and higher in Spring Term 2023 than in Spring Term 2022. These are further displayed in Figure 10.

Figure 10: Year 3 mathematics scores



Year 3 mathematics Covid-19 gap model

The analysis of the Year 3 mathematics scores used a three-level multilevel model (school, pupil, and timepoint) in which Spring Term 2021, Spring Term 2022, and Spring Term 2023 scores were regressed on time, FSM quintiles, academy status, and region. Table 21 presents the results from the model, which measures the association between time and pupil outcomes. The Covid-19 gap is represented as the difference between the measured mathematics attainment and the standardised average of 99.48. The model ascertains whether there was a significant change in this gap between Spring Term 2021, Spring Term 2022, and Spring Term 2023.

There was a significant positive effect of time on Year 3 pupils' mathematics scores, with an effect size of 0.07 (0.06, 0.08). This means that throughout 2021, 2022, and 2023, mathematics scores showed a positive trend, and there was a reduction in the Covid-19 mathematics attainment gap. It is worth noting that being in a school in the highest three quintiles of FSM (i.e. schools with the highest proportion of FSM pupils) was associated with a large effect on lowering attainment. This effect was significant whilst controlling for FSM quintiles, academy status, and region. Effect size and CIs are presented in Table 21.

Table 21: Year 3 mathematics Covid-19 gap model

Coefficients	Model coefficients				Effect size	
	Estimate (95% CI)	SE	Degrees of freedom	P-value	Hedge's <i>g</i> (95% CI)	
(Intercept)	111.81 99.19 124.42	6.44	38.97	0.000		
Timepoint	1.77 1.54 1.99	0.12	3724.94	0.000	0.07 0.06 0.08	
FSM second lowest 20%	-1.36 -6.52 3.80	2.63	45.31	0.607	-0.05 -0.26 0.15	
FSM middle 20%	-7.55 -12.01 -3.09	2.28	46.51	0.002	-0.30 -0.48 -0.12	
FSM second highest 20%	-8.10 -12.66 -3.54	2.33	43.28	0.001	-0.33 -0.51 -0.14	
FSM highest 20%	-11.77 -18.14 -5.40	3.25	41.71	0.001	-0.47 -0.73 -0.22	
FSM missing	-0.81 -8.95 7.33	4.15	35.85	0.847	-0.03 -0.36 0.29	
Non-academy	1.03 -2.72 4.78	1.91	44.82	0.593	0.04 -0.11 0.19	
East of England	-10.26 -21.64 1.12	5.81	37.67	0.085	-0.41 -0.87 0.04	
London	-10.08 -22.18 2.02	6.17	38.58	0.111	-0.40 -0.89 0.08	
North East	-10.45 -22.72 1.82	6.26	38.34	0.103	-0.42 -0.91 0.07	
North West	-10.45 -22.50 1.60	6.15	37.79	0.097	-0.42 -0.90 0.06	
South East	-10.28 -22.46 1.91	6.22	38.65	0.106	-0.41 -0.90 0.08	
South West	-8.03 -20.64 4.58	6.43	37.93	0.220	-0.32 -0.83 0.18	
West Midlands	-8.56 -21.06 3.93	6.38	39.55	0.187	-0.34 -0.85 0.16	
Yorkshire and the Humber	-7.43 -20.17 5.32	6.50	39.95	0.260	-0.30 -0.81 0.21	

Note: The reference group for this model was Spring Term 2021 scores, lowest 20% FSM quintile, academy schools, and the East Midlands region. The number of schools is 57, the number of pupils is 2,321. The ICC was 0.10 at school level and 0.69 at pupil level. Significant effects are in bold.

Year 4 attainment in reading and mathematics: Covid-19 gap

Year 4 attainment in reading: Covid-19 gap

In Year 4, the reading assessment consists of one paper, which is suitable for all pupils. The total number of Year 4 pupils included in the reading analysis was 3,027 from 82 schools.

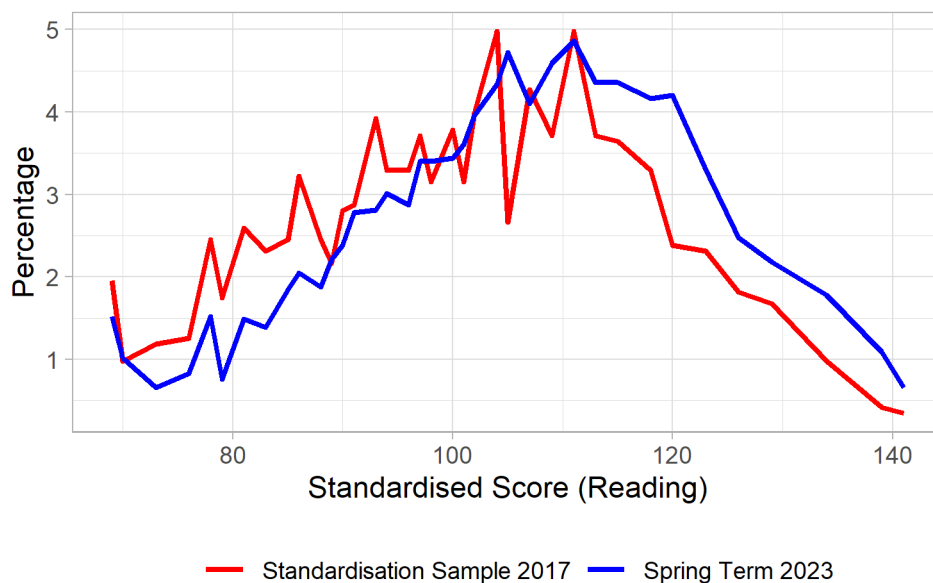
Table 22: Year 4 reading standardised scores

Measure	Standardised scores	
	Standardisation sample 2017	Spring Term 2023
Mean	99.87	103.64
95% confidence interval	98.40–101.34	102.38–104.90
Standard deviation	14.71	15.10
N pupils ^a	1,427	3,027

^a The mathematics and reading Spring Term 2023 samples were weighted by Key Stage 2 performance. Data relating to pupils from independent schools in the 2017 standardisation samples were removed.

The SD of the study sample is slightly larger, at 15.10, than that of the standardisation sample. This is due in part to a larger proportion of pupils achieving at the higher end of the range of scores.

Figure 11: Distribution of reading standardised scores for the Spring Term 2023 sample of Year 4 pupils



In Spring Term 2023, the proportion of pupils scoring too few marks on the reading assessment to achieve a standardised score of 70, resulting in a standardised score of 69, was slightly lower at 1.52% in Spring Term 2023 than in the standardised sample at 1.96%.

The standardised score analysis has allowed us to identify the pupils who were unable to engage effectively with the assessment. A raw score analysis was also carried out in order to test whether the mean differences in performance are significant, without the use of potentially inflated scores for these low achievers, and in order to account for the clustering of the sample.

Table 23: Year 4 reading raw scores

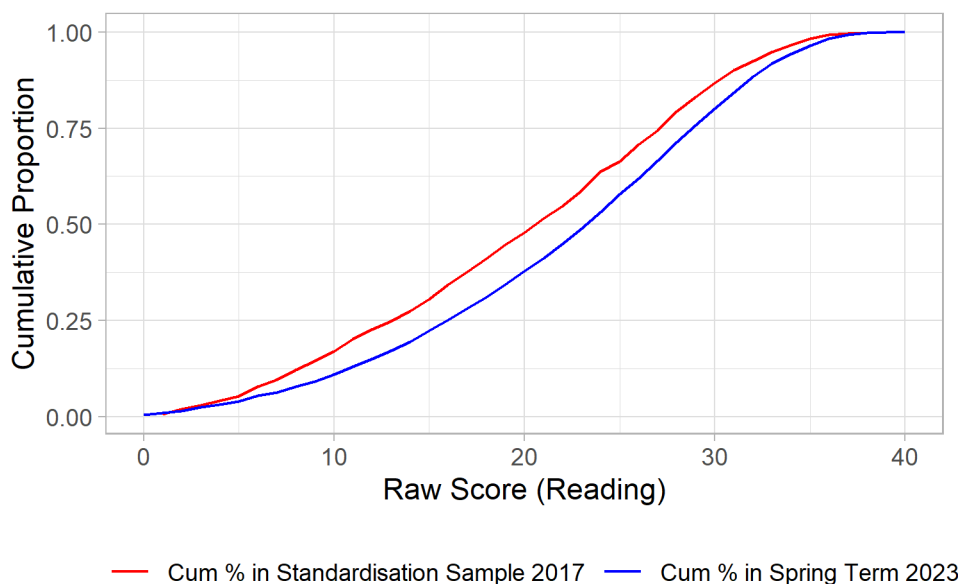
Measure	Raw scores	
	Standardisation sample 2017	Spring Term 2023
Mean	20.32	22.53
95% confidence interval	19.43–21.20	21.81–23.26
Standard deviation	8.88	8.75
N pupils ^a	1,427	3,027

^a The mathematics and reading Spring Term 2023 samples were weighted by Key Stage 2 performance. Data relating to pupils from independent schools in the 2017 standardisation samples were removed.

The overall performance of Year 4 pupils in reading in Spring Term 2023 was significantly higher than the standardisation sample. The mean raw score across the Spring Term 2023 sample was 22.53, compared to 20.32 at standardisation. This equates to an effect size¹⁵ of +0.249 or around an additional three months' progress using the EEF conversion table from the Early Years Toolkit.¹⁶

Figure 12, which shows the cumulative percentage of mathematics standardised scores distribution in both Spring Term 2023 and the standardisation sample, shows the proportion of pupils scoring at the lower and upper end of the range are very similar but improved performance away from these extremes in Spring Term 2023.

Figure 12: Cumulative distributions of reading raw scores for 2017 standardisation sample and Spring Term 2023 sample of Year 4 pupils

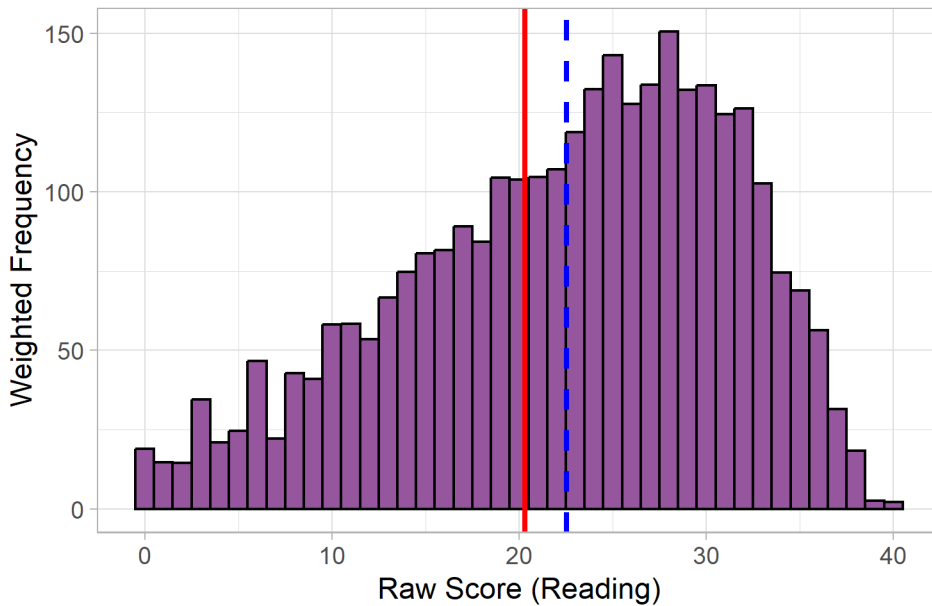


In Figure 13, the red line represents the expected mean if the sample performed exactly as the standardisation sample had, and the blue dotted line represents the observed mean for the sample in 2023. The distribution shows a negative skew, namely, fewer lower scores and more high scores than expected, compared to the standardisation sample.

Figure 13: Distribution of Year 4 reading raw scores for Spring Term 2023 sample

¹⁵ Covid-19 gap effect sizes were calculated by dividing the difference in standardised score points between the samples by the SD of the standardisation sample.

¹⁶ <https://educationendowmentfoundation.org.uk/education-evidence/using-the-toolkits>



Year 4 reading repeated measures analysis

In order to assess the longitudinal change in the Covid-19 gap, we compared Year 4 pupils' 2023 reading scores with their scores in 2022 (when in Year 3) and in 2021 (when in Year 2). A total of 2,602 pupils (from 59 schools that participated in 2021, 2022, and 2023 for the reading assessment for this cohort) were entered into the Year 4 reading repeated measures multilevel models. Out of these 2,602 pupils, 1,841 pupils took the three assessments, 409 took two assessments, and 352 took only one assessment. Table 24 shows the detail for longitudinal participation:

Table 24: Year 4 reading longitudinal participation

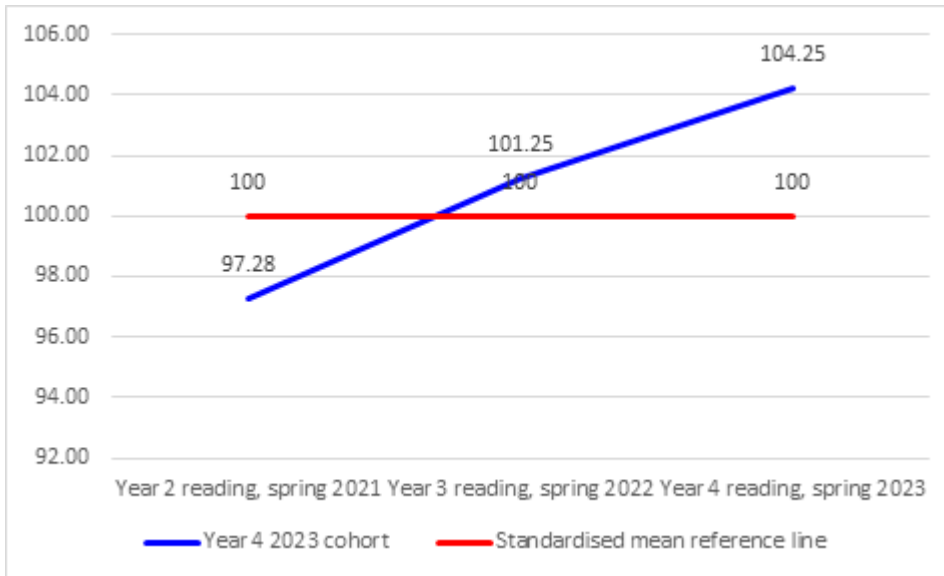
Longitudinal participation	Number of pupils
Spring Term 2021 only	158
Spring Term 2022 only	53
Spring Term 2023 only	141
Spring Term 2021 and Spring Term 2022	150
Spring Term 2022 and Spring Term 2023	178
Spring 2021 and Spring Term 2023	81
Spring 2021, Spring Term 2022, and Spring Term 2023	1,841

Table 25: Year 4 reading standardised means

Outcome	Standardised means											
	Spring Term 2021				Spring Term 2022				Spring Term 2023			
	n	Weighted n	Mean (95% CI)	SD	n	Weighted n	Mean (95% CI)	SD	n	Weighted n	Mean (95% CI)	SD
Year 4 reading	2,235	2,161	97.28 (96.61–97.94)	15.82	2,218	2,149	101.25 (100.57–101.93)	15.98	2,240	2,170	104.25 (103.63–104.88)	14.89

Table 25 presents the standardised means of the Year 4 reading scores split by year. For all pupils, 2,023 reading results are higher than in the 2022 and results in 2022 are higher than in 2021. These are further displayed in Figure 14.

Figure 14: Year 4 reading scores



Year 4 reading Covid-19 gap model

Table 26: Year 4 reading Covid-19 gap model

Coefficients	Model coefficients				Effect size	
	Estimate (95% CI)	SE	Degrees of freedom	P-value	Hedge's g (95% CI)	
(Intercept)	103.76 93.65 113.86	5.16	38.95	0.000		
Timepoint	3.51 3.28 3.75	0.12	4245.10	0.000	0.14 0.13 0.15	
FSM second lowest 20%	-0.27 -4.19 3.64	2.00	48.66	0.892	-0.01 -0.16 0.14	
FSM middle 20%	-3.08 -6.68 0.52	1.84	47.44	0.100	-0.12 -0.26 0.02	
FSM second highest 20%	-5.82 -9.87 -1.76	2.07	42.21	0.007	-0.23 -0.39 -0.07	
FSM highest 20%	-7.87 -13.09 -2.65	2.66	41.49	0.005	-0.31 -0.51 -0.10	
FSM missing	-0.52 -6.97 5.93	3.29	34.09	0.875	-0.02 -0.27 0.23	
Non-academy	1.79 -1.40 4.97	1.63	48.78	0.277	0.07 -0.05 0.20	
East of England	-6.50 -15.40 2.39	4.54	37.15	0.160	-0.26 -0.60 0.09	
London	-6.06 -15.64 3.52	4.89	38.45	0.222	-0.24 -0.61 0.14	
North East	-8.70 -18.36 0.95	4.92	38.19	0.085	-0.34 -0.72 0.04	
North West	-4.22 -13.60 5.16	4.78	37.33	0.383	-0.17 -0.53 0.20	
South East	-4.75 -14.40 4.90	4.92	38.33	0.341	-0.19 -0.56 0.19	
South West	-3.22 -13.07 6.62	5.02	36.92	0.525	-0.13 -0.51 0.26	
West Midlands	-6.35 -16.05 3.35	4.95	38.34	0.207	-0.25 -0.63 0.13	
Yorkshire and the Humber	-4.17 -14.31 5.97	5.17	41.48	0.425	-0.16 -0.56 0.23	

Note: The reference group for this model was Spring Term 2021 scores, lowest 20% FSM quintile, academy schools, and the East Midlands region. The number of schools is 59 and the number of pupils is 2,602. The ICC was 0.05 at school level and 0.70 at pupil level. Significant effects are in bold. The analysis of the Year 4 reading scores was a three-level multilevel model (school, pupil, and timepoint) in which Spring Term 2021, Spring

Term 2022, and Spring Term 2023 scores were regressed on time, FSM quintiles, academy status, and region. Table 26 presents the results from the model, which measures the impact of time on pupil outcomes. The Covid-19 gap is represented as the difference between the measured reading attainment and the standardised average of 100. The model ascertains whether there was a significant change in this gap between Spring Term 2021, Spring Term 2022, and Spring Term 2023.

There was a significant positive effect of time on Year 4 pupils' reading scores, with an effect size of 0.14 (0.13, 0.15). This means that throughout 2021, 2022, and 2023, reading scores showed a positive trend, and there was a decrease in the Covid-19 reading attainment gap. This effect was significant whilst controlling for FSM quintiles, academy status, and region. It is worth noting that being in a school in the highest two quintiles of FSM (i.e. schools with the highest proportion of FSM pupils) was associated with a medium effect on lowering attainment. Effect size and CIs are presented in Table 26.

Year 4 attainment in mathematics: Covid-19 gap

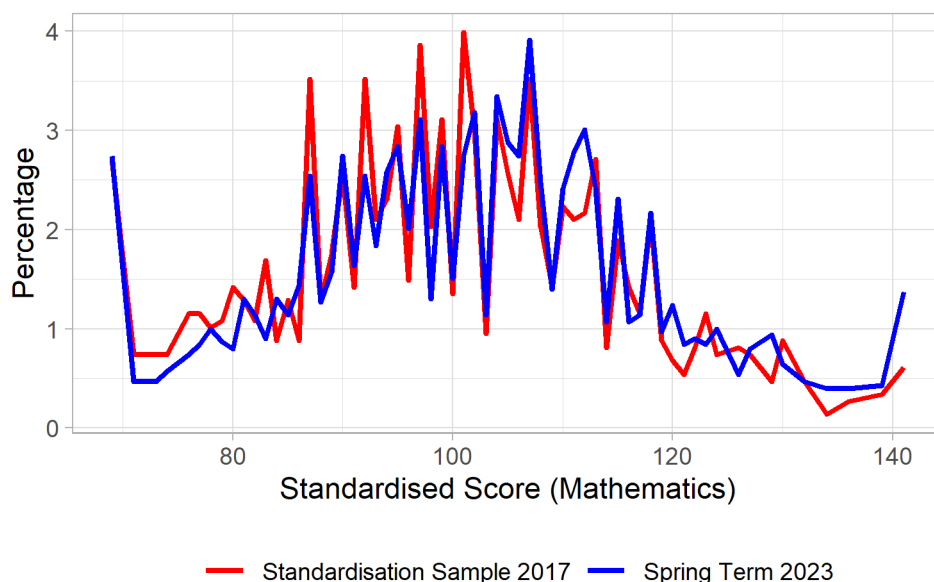
In Year 4, mathematics assessments consist of three papers, one arithmetic paper and two reasoning papers. All three papers are suitable for, and should be taken by, all pupils. Pupils needed to sit all of the papers in their respective assessments in order to be included in the study. The total number of Year 4 pupils included in the mathematics analysis was 2,990 from 82 schools.

Table 27: Year 4 mathematics standardised scores

Measure	Mathematics	
	Standardisation sample 2017	Spring Term 2023
Mean	99.77	101.69
95% confidence interval	98.29–101.25	100.32–103.05
Standard deviation	14.80	15.11
N pupils ^a	1,478	2,990

^a The mathematics and reading Spring Term 2023 samples were weighted by Key Stage 2 performance. Data relating to pupils from independent schools in the 2017 standardisation samples for Year 3 and Year 4 were removed.

Figure 15: Distribution of mathematics standardised scores for the Spring Term 2023 sample of Year 4 pupils



The SD of the study sample is slightly larger, at 15.11, than that of the standardisation sample at 14.80 (Table 27). The proportion of pupils scoring at the very lowest end of the range, with 2.74% in Spring Term 2023 compared to 2.71% in the standardisation sample, is very similar however in Spring Term 2023 there was a greater proportion of higher marks.

In Figure 15, the distribution of scores shows that a very similar proportion of the Spring Term 2023 pupils were awarded the lowest possible score of 69 but a slightly larger proportion scored the highest possible score of 141.

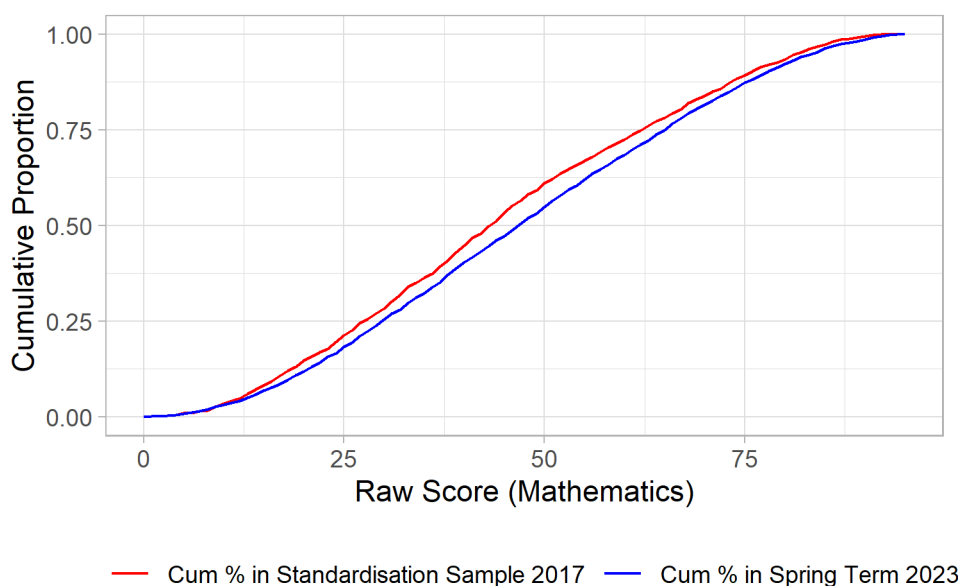
The standardised score analysis allowed us to identify the pupils who were unable to engage effectively with the assessment along with those scoring at the very highest end of the range. However, in order to test whether the mean differences in performance are significant, without the use of potentially inflated scores for these low attainers and limits on the scores of the very highest attainers, and in order to account for the clustering of the sample, we also carried out analysis of the raw scores.

Table 28: Year 4 mathematics raw score analysis for Spring Term 2023 sample and 2017 standardisation sample

Measure	Raw scores	
	Standardisation sample 2017	Spring Term 2023
Mean	45.32	48.08
95% confidence interval	43.17–47.47	46.09–50.06
Standard deviation	21.65	21.95
N pupils ^a	1,478	2,990

^a The mathematics and reading Spring Term 2023 samples were weighted by Key Stage 2 performance. Data relating to pupils from independent schools in the 2017 standardisation samples for Year 3 and Year 4 were removed.

Figure 16: Cumulative distributions of mathematics raw scores for 2017 standardisation sample and Spring Term 2023 sample of Year 4 pupils



There was no significant difference in the overall performance of Year 4 pupils in mathematics in Spring Term 2023 and the standardisation sample. The mean raw score across the Spring Term 2023 sample was 48.08, compared to 45.32 at standardisation (Table 28). This equates to an effect size¹⁷ of +0.127 or around an additional two months' progress using the EEF conversion table from the Early Years Toolkit.¹⁸

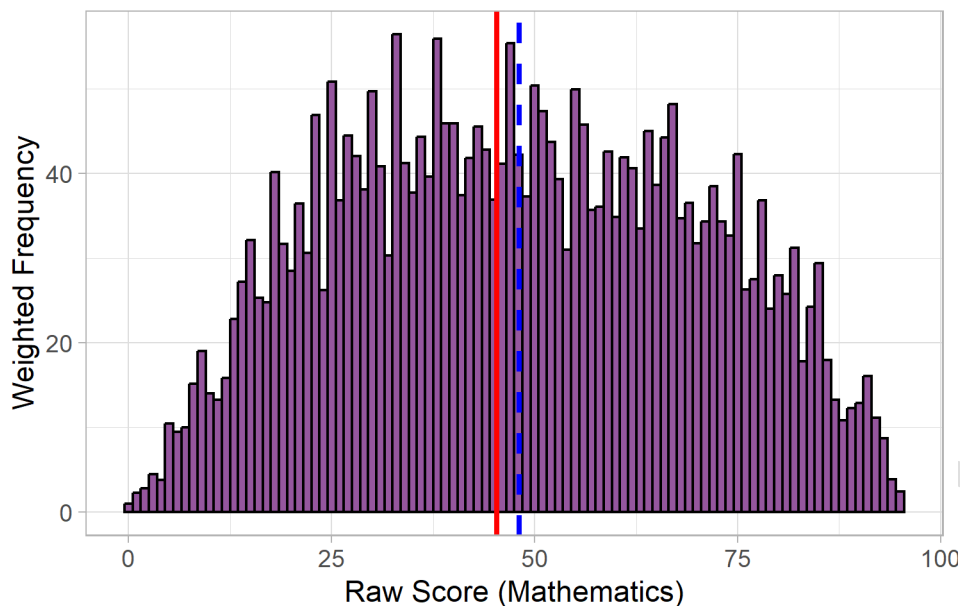
Figure 16 shows that the proportion of pupils scoring at the very lowest and highest ends of the range are very similar but with overall improved performance in the Spring Term 2023 assessment away from these extremes.

¹⁷ Covid-19 gap effect sizes were calculated by dividing the difference in standardised score points between the samples by the SD of the standardisation sample.

¹⁸ <https://educationendowmentfoundation.org.uk/education-evidence/using-the-toolkits>

In Figure 17, the red line represents the expected mean if the sample performed exactly as the standardisation sample had, and the blue dotted line represents the observed mean for the sample in Spring Term 2023. The distribution shows that the raw scores are normally distributed.

Figure 17: Distribution of Year 4 mathematics raw scores for Spring Term 2023 sample



Year 4 mathematics repeated measures analysis

In order to assess the longitudinal change in the Covid-19 gap, we compared Year 4 pupils' 2023 mathematics scores with their scores in 2022 (when in Year 3) and in 2021 (when in Year 2). A total of 2,567 pupils (from 59 schools that participated in 2021, 2022, and 2023 for the reading assessment for this cohort) were entered into the Year 4 mathematics repeated measures multilevel models. Out of these 2,567 pupils, 1,765 pupils took the three assessments, 455 took two assessments, and 347 took only one assessment. Table 29 shows the detail for longitudinal participation:

Table 29: Year 4 mathematics longitudinal participation

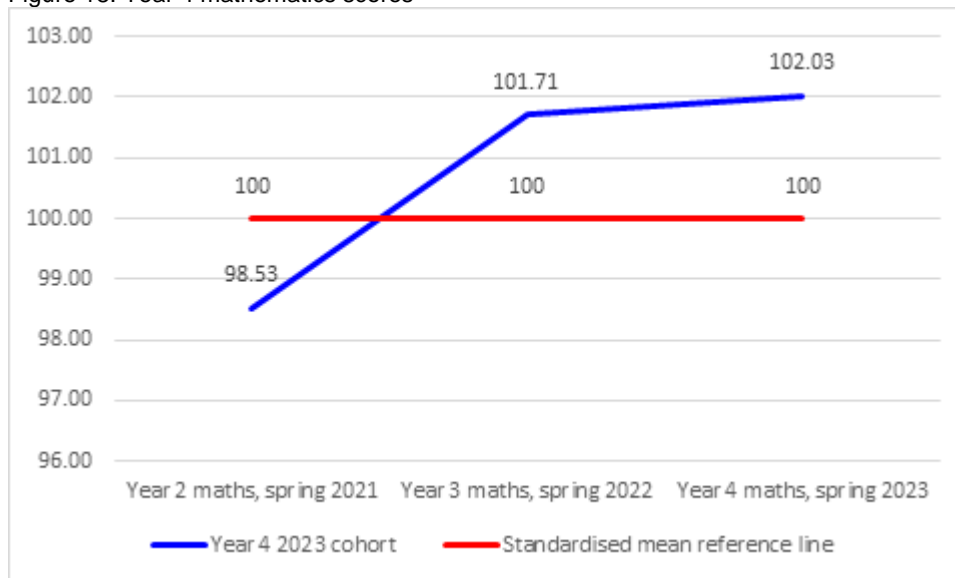
Longitudinal participation	Number of pupils
Spring Term 2021 only	148
Spring Term 2022 only	57
Spring Term 2023 only	142
Spring Term 2021 and Spring Term 2022	176
Spring Term 2022 and Spring Term 2023	180
Spring Term 2021 and Spring Term 2023	99
Spring 2021, Spring Term 2022, and Spring Term 2023	1,765

Table 30: Year 4 mathematics standardised means

Outcome	Standardised means											
	Spring Term 2021				Spring Term 2022				Spring Term 2023			
	n	Weighted n	Mean (95% CI)	SD	n	Weighted n	Mean (95% CI)	SD	n	Weighted n	Mean (95% CI)	SD
Year 4 mathematics	2,191	2,084	98.53 (97.87–99.19)	15.33	2,181	2,073	101.71 (101.05–102.37)	15.38	2,180	2,083	102.03 (101.39–102.67)	14.89

Table 30 presents the standardised means of the Year 3 mathematics responses split by year. For all pupils, 2023 mathematics results are higher than in 2022 and 2021. These are further displayed in Figure 18 below.

Figure 18: Year 4 mathematics scores



Year 4 mathematics Covid-19 gap model

The analysis of the Year 4 mathematics scores was a three-level multilevel model (school, pupil, and timepoint) in which Spring Term 2021, Spring Term 2022, and Spring Term 2023 scores were regressed on time, FSM quintiles, academy status, and region. Table 31 presents the results from the model, which measures the impact of time on pupil outcomes. The Covid-19 gap is represented as the difference between the measured mathematics attainment and the standardised average of 100. The model ascertains whether there was a significant change in this gap between Spring Term 2021, Spring Term 2022, and Spring Term 2023.

There was a significant positive effect of time on Year 4 pupils' mathematics scores, with an effect size of 0.07 (0.07, 0.08). Throughout 2021, 2022, and 2023, mathematics standardised scores showed a positive trend, and there was a decrease in the Covid-19 mathematics attainment gap. This means that Year 4 pupils' mathematics attainment was closer to a mean of 100 in 2023 than in 2022 and 2021. It is worth noting that being in a school in the highest two quintiles of FSM (i.e. schools with the highest proportion of FSM pupils) was associated with a medium effect on lowering attainment. This effect was significant whilst controlling for FSM quintiles, academy status, and region. Effect size and CIs are presented in Table 31.

Table 31: Year 4 mathematics Covid-19 gap model

Coefficients	Model coefficients				Effect size		
	Estimate (95% CI)		SE	Degrees of freedom	P-value	Hedge's <i>g</i> (95% CI)	
(Intercept)	108.68 98.19 119.17		5.35	41.46	0.000		
Timepoint	1.79 1.61 1.98		0.09	4074.83	0.000	0.07	0.08
FSM second lowest 20%	1.02 -3.00 5.03		2.05	51.94	0.621	0.04	-0.12 0.21
FSM middle 20%	-3.11 -6.90 0.68		1.93	51.12	0.114	-0.13	-0.29 0.03
FSM second highest 20%	-6.74 -10.83 -2.65		2.09	46.42	0.002	-0.28	-0.45 -0.11
FSM highest 20%	-5.88 -11.21 -0.55		2.72	45.48	0.036	-0.24	-0.47 -0.02
FSM missing	-0.05 -6.87 6.77		3.48	37.10	0.988	0.00	-0.28 0.28
Non-academy	3.96 0.58 7.34		1.72	53.38	0.026	0.16	0.02 0.30
East of England	-11.94 -21.29 -2.60		4.77	38.85	0.017	-0.50	-0.88 -0.11
London	-11.57 -21.59 -1.56		5.11	40.16	0.029	-0.48	-0.90 -0.06
North East	-12.78 -22.91 -2.65		5.17	40.14	0.018	-0.53	-0.95 -0.11
North West	-9.15 -18.96 0.66		5.01	39.03	0.075	-0.38	-0.79 0.03
South East	-10.07 -20.17 0.04		5.16	40.25	0.058	-0.42	-0.84 0.00
South West	-9.24 -19.58 1.10		5.28	38.99	0.088	-0.38	-0.81 0.05
West Midlands	-10.90 -21.03 -0.76		5.17	40.18	0.041	-0.45	-0.87 -0.03
Yorkshire and the Humber	-10.33 -21.00 0.34		5.44	43.61	0.064	-0.43	-0.87 0.01

Note: The reference group for this model was Spring Term 2021 scores, lowest 20% FSM quintile, academy schools, and the East Midlands region. The number of schools is 59 and the number of pupils is 2,567. The ICC was 0.06 at school level and 0.79 at pupil level. Significant effects are in bold.

Research question 2: To what extent do different groups recover by spring 2023; in particular, how is the gap between disadvantaged children and their peers changing over time?

Summary

- In Spring Term 2023, the disadvantage gap for Year 3 reading was around seven months' progress, and for Year 3 mathematics was around six months' progress.
- In Spring Term 2023, the disadvantage gap for Year 4 reading was around seven months' progress, and for Year 4 mathematics around six months' progress.
- The repeated measures models for mathematics provided evidence for a reduction in the disadvantage gap for Year 3 and Year 4 pupils.
- There was no evidence of change in the disadvantage gap in reading for Year 3 and Year 4 pupils.

Year 3 attainment in reading and mathematics: The disadvantage gap

Within the Spring Term 2023 sample, approximately 20% of pupils in Year 3 were classed as disadvantaged (i.e. eligible for FSM as reported by schools). For a small number of pupils (11 pupils in reading, which corresponds to 0.37% of the sample, and 12 pupils in mathematics, which corresponds to 0.40% of the sample), no FSM eligibility was provided, and these pupils have been excluded from the following calculations. The standardisation sample does not provide data on the performance of disadvantaged and non-disadvantaged pupils.

Analysis of the Covid-19 gap showed that for both year groups in reading and in mathematics, there are a number of pupils who were unable to engage effectively with the assessments. In analysing the disadvantage gap, the use of standardised scores, with the potentially inflated scores for these lowest achievers, would not have been appropriate given that it may have a greater impact on the performance of disadvantaged pupils than their peers. Analysis of the disadvantage gap in Spring Term 2023 was therefore carried out with raw scores. However, it was necessary to work with standardised scores in the repeated measures analysis to allow comparison between different assessments and timepoints.

Year 3 reading attainment: The disadvantage gap

Table 32 shows a summary of the performance of disadvantaged pupils compared to those pupils within the cohort who are not disadvantaged (i.e. eligibility for FSM as reported by schools).

Table 32: Performance of Year 3 pupils in reading for Spring Term 2023

Measure	Standardisation sample 2017	Spring Term 2023 all pupils	Spring Term 2023 FSM	Spring Term 2023 non-FSM
Mean	20.96	21.38	17.21	22.41
95% confidence interval	20.19–21.74	20.49–22.27	15.81–18.60	21.63–23.19
Standard deviation	8.71	9.32	9.65	8.95
N pupils	1,456	3,013	610	2,392

For the Year 3 reading assessments, 20.3% of the cohort were classed as being disadvantaged. The difference between the mean raw scores of disadvantaged pupils and non-disadvantaged is 5.20 points and represents a significant difference in performance (Table 32). The effect size for this data is 0.558,¹⁹ which using the EEF table,²⁰ equates to seven months' progress.

¹⁹ Disadvantage gap effect sizes were calculated by dividing the standardised score point difference between FSM and non-FSM pupils by the overall Spring Term 2023 SD.

²⁰ <https://educationendowmentfoundation.org.uk/evidence-summaries/about-the-toolkits/attainment/>

Year 3 reading repeated measures analysis

In order to assess the longitudinal change in the disadvantage gap, we compared how Year 3 FSM and non-FSM pupils' reading scores changed from Spring Term 2021 (when in Year 1) to Spring Term 2022 (when in Year 2) and Spring Term 2023. A total of 2,321 pupils (from 57 schools that participated in 2021, 2022, and 2023 for the reading assessment for this cohort) were entered into the Year 3 reading repeated measures multilevel models. Out of these 2,321 pupils, 1,622 pupils took the three assessments, 363 took two assessments, and 336 took only one assessment. Table 33 shows the detail for longitudinal participation.

Table 33: Year 3 reading longitudinal participation

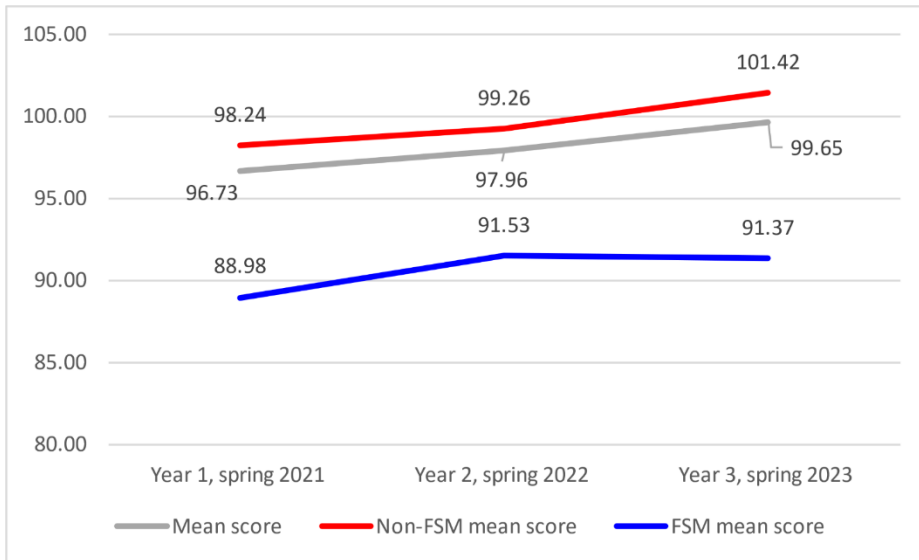
Longitudinal participation	Number of pupils
Spring Term 2021 only	124
Spring Term 2022 only	59
Spring Term 2023 only	153
Spring Term 2021 and Spring Term 2022	159
Spring Term 2022 and Spring Term 2023	134
Spring Term 2021 and Spring Term 2023	70
Spring 2021, Spring Term 2022, and Spring Term 2023	1,622

Table 34 presents the standardised mean reading scores of the Year 3 group as a whole, for the non-FSM pupils, and for the FSM pupils in the longitudinal analysis. Each group's scores are split by term. For pupils overall and non-FSM pupils, 2023 reading results are higher than in 2022, and results in 2022 are higher than in 2021. Following the common trend, non-FSM pupils have higher scores at both timepoints than FSM pupils. However, for FSM pupils, 2023 results are lower than for 2022. These mean differences are further displayed in Figure 19 below.

Table 34: Reading standardised score mean

Outcome	Standardised means											
	Spring Term 2021				Spring Term 2022				Spring Term 2023			
	n	Weighted n	Mean (95% CI)	SD	n	Weighted n	Mean (95% CI)	SD	n	Weighted n	Mean (95% CI)	SD
Year 3 reading	1,980	1,634	96.73 (95.99–97.46)	15.17	1,952	1,638	97.96 (97.18–98.74)	16.07	1,996	1,629	99.65 (98.84–100.46)	16.68
Year 3 reading (FSM only)	324	248	88.98 (87.21–102.28)	16.27	318	255	91.53 (89.62–93.45)	15.49	342	257	91.37 (89.40–93.33)	15.98
Year 3 reading (non-FSM only)	1,657	1,388	98.24 (97.45–99.03)	14.91	1,610	1,366	99.26 (98.41–100.10)	15.92	1,642	1,367	101.42 (100.56–102.28)	16.27

Figure 19: Year 3 reading scores



Year 3 reading disadvantage gap model

Table 35: Year 3 reading disadvantage gap model

Coefficients	Model coefficients				Effect size	
	Estimate (95% CI)	SE	Degrees of freedom	P-value	Hedge's <i>g</i> (95% CI)	
(Intercept)	105.52 93.51 117.53	6.13	36.45	0.00		
Timepoint	1.78 1.50 2.06	0.14	3708.84	0.00	0.07 0.06 0.08	
FSM2020 yes	-6.02 -7.75 -4.29	0.88	3248.44	0.00	-0.23 -0.29 -0.16	
FSM2020 missing	-1.48 -18.85 15.90	8.86	3016.30	0.87	-0.06 -0.72 0.60	
Wave*FSM2020 yes	0.21 -0.50 0.92	0.36	3885.59	0.56	0.01 -0.02 0.03	
Wave*FSM2020 missing	4.02 -9.09 17.12	6.69	3036.02	0.55	0.15 -0.34 0.65	
Gender female	3.46 2.34 4.58	0.57	2235.68	0.00	0.13 0.09 0.17	
Gender missing	-1.69 -8.11 4.73	3.28	3396.74	0.61	-0.06 -0.31 0.18	
EAL yes	-1.49 -18.12 5.18	1.05	2269.95	0.16	-0.06 -0.13 0.02	
EAL missing	-6.09 -7.92 -4.25	0.94	2690.52	0.00	-0.23 -0.30 -0.16	
FSM second lowest 20%	-1.00 -5.92 3.92	2.51	42.41	0.69	-0.04 -0.22 0.15	
FSM middle 20%	-5.85 -10.11 -1.59	2.18	44.13	0.01	-0.22 -0.38 -0.06	
FSM second highest 20%	-6.72 -11.08 -2.36	2.22	41.15	0.00	-0.26 -0.42 -0.09	
FSM highest 20%	-7.78 -13.87 -1.70	3.11	39.43	0.02	-0.30 -0.53 -0.06	
FSM missing	-1.34 -9.04 6.36	3.93	32.67	0.74	-0.05 -0.34 0.24	
Non-academy	0.78 -2.79 4.35	1.82	42.00	0.67	0.03 -0.11 0.17	

East of England	-6.04		5.51	34.83	0.28	-0.23	
	-16.83	4.76				-0.64	0.18
London	-5.84		5.86	35.75	0.33	-0.22	
	-17.32	5.65				-0.66	0.21
North East	-6.47		5.94	35.47	0.28	-0.25	
	-18.12	5.18				-0.69	0.20
North West	-5.63		5.83	34.91	0.34	-0.21	
	-17.06	5.80				-0.65	0.22
South East	-4.25		5.90	35.81	0.48	-0.16	
	-15.82	7.32				-0.60	0.28
South West	-3.50		6.13	35.69	0.57	-0.13	
	-15.52	8.52				-0.59	0.32
West Midlands	-3.66		6.05	36.65	0.55	-0.14	
	-15.53	8.20				-0.59	0.31
Yorkshire and the Humber	-3.84		6.18	37.16	0.54	-0.15	
	-15.95	8.28				-0.61	0.31

Note: The reference group for this model was Spring Term 2021 scores, non-FSM pupils, males, non-EAL pupils, lowest 20% FSM quintile, academy schools, and the East Midlands region. The number of schools is 57, the number of pupils is 2,321. The ICC was 0.09 at school level and 0.65 at pupil level. Significant effects are in bold.

The analysis of the Year 3 reading scores was a three-level multilevel model (school, pupil, and timepoint) in which Spring Term 2021, Spring Term 2022, and Spring Term 2023 standardised scores were regressed on time, FSM eligibility of pupils in January 2020 (i.e. before school closures), FSM quintiles of schools, EAL status, gender, academy status, and region. Table 35 presents the results from the model, which measures the impact of FSM pupil outcomes as a function of time. The disadvantage gap is represented as the difference in the measured reading attainment between FSM and non-FSM pupils. The model ascertains whether there was a significant change in this gap between Spring Term 2021, Spring Term 2022, and Spring Term 2023.

There was no significant interaction between time and FSM eligibility on Year 3 pupils' reading scores. This means that between 2021, 2022, and 2023, FSM pupils' scores did not improve more or less than those of non-FSM pupils. Consequently, although reading attainment improved between 2021, 2022, and 2023 for both groups, there was not a reduction in the disadvantage gap for reading attainment. This result was obtained whilst controlling for FSM quintiles, gender, EAL status, academy status, and region. It is worth noting that being in a school in the highest three quintiles of FSM (i.e. schools with the highest proportion of FSM pupils) was associated with a medium effect on lowering attainment. Effect size and CIs are presented in Table 35.

Year 3 mathematics attainment: The disadvantage gap

Table 36 shows a summary of the performance of disadvantaged pupils compared to those pupils within the cohort who are not disadvantaged (i.e. eligibility for FSM as reported by schools).

Table 36: Performance of Year 3 pupils in mathematics for Spring Term 2023

Measure	Standardisation sample 2017	Spring Term 2023 all pupils	Spring Term 2023 FSM	Spring Term 2023 non-FSM
Mean	35.58	38.25	31.59	39.86
95% confidence interval	33.95–37.20	36.54–39.96	28.71–34.47	38.25–41.48
Standard deviation	16.73	17.03	16.55	16.75
N pupils	1,574	3,010	606	2,392

For the Year 3 mathematics assessments, 20.2% of the cohort were classed as being disadvantaged. The difference between the mean raw scores of disadvantaged pupils and non-disadvantaged pupils is 8.27 points and represents a significant difference in performance (Table 36). The effect size for this data is 0.486, which using the EEF table,²¹ equates to six months' progress.

Year 3 mathematics repeated measures analysis

In order to assess the longitudinal change in the mathematics disadvantage gap, we compared how Year 3 FSM and non-FSM pupils' scores changed from Spring Term 2021 (when in Year 1) to Spring Term 2022 (when in Year 2) to Spring Term 2023. A total of 2,321 pupils (from 57 schools that participated in 2021, 2022, and 2023 for the mathematics assessment for this cohort) were entered into the Year 3 mathematics repeated measures multilevel models. Out of these 2,321 pupils, 1,595 pupils took the three assessments, 397 took two assessments, and 329 took only one assessment. Table 37 shows the detail for longitudinal participation.

Table 37: Year 3 mathematics longitudinal participation

Longitudinal participation	Number of pupils
Spring Term 2021 only	118
Spring Term 2022 only	55
Spring Term 2023 only	156
Spring Term 2021 and Spring Term 2022	175
Spring Term 2022 and Spring Term 2023	154
Spring Term 2021 and Spring Term 2023	68
Spring Term 2021, Spring Term 2022, and Spring Term 2023	1,595

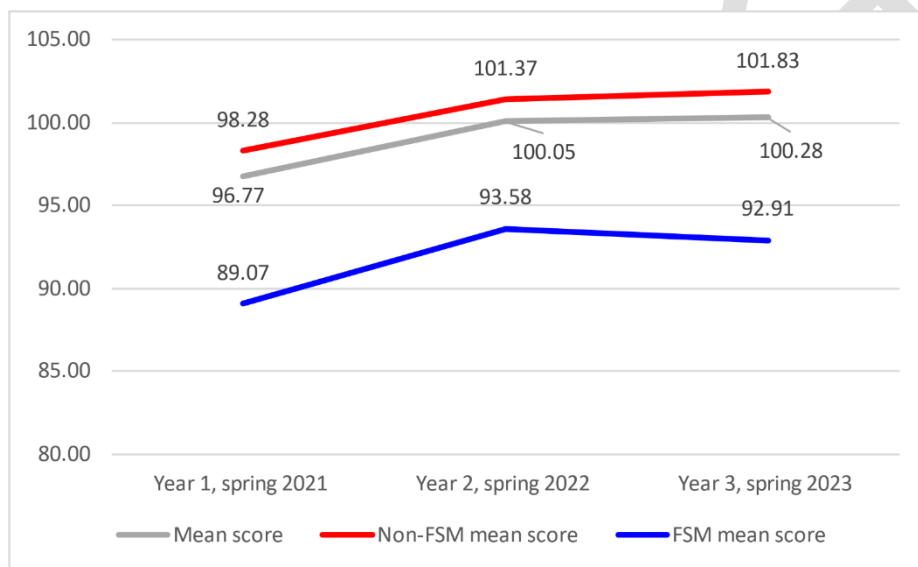
²¹ <https://educationendowmentfoundation.org.uk/evidence-summaries/about-the-toolkits/attainment/>

Table 38 presents the standardised mathematics mean scores of the Year 3 group as a whole, for the non-FSM pupils, and for the FSM pupils in the longitudinal analysis. Each group's scores are split by term. For pupils overall, Year 3 mathematics results are higher in Spring Term 2023, higher than in Spring Term 2022 and higher than in Spring Term 2021 term, and non-FSM pupils have higher scores at both timepoints than FSM pupils. However, for FSM pupils, results in 2023 are lower than in 2022. These differences are further displayed in Figure 20.

Table 38: Year 3 mathematics standardised means

Outcome	Standardised means											
	Spring Term 2021				Spring Term 2022				Spring Term 2023			
	n	Weighted n	Mean (95% CI)	SD	n	Weighted n	Mean (95% CI)	SD	n	Weighted n	Mean (95% CI)	SD
Year 3 reading	1,957	1,624	96.77 (96.06–97.49)	14.72	1,962	1,648	100.05 (99.29–100.81)	15.68	1,989	1,631	100.28 (99.55–101.01)	14.99
Year 3 mathematics (FSM only)	321	246	89.07 (87.27–102.59)	14.41	326	259	93.58 (91.71–95.46)	15.29	341	257	92.91 (91.01–94.80)	15.43
Year 3 mathematics (non-FSM only)	1,636	1,380	98.28 (97.53–99.04)	14.33	1,608	1,369	101.37 (100.56–102.19)	15.40	1,637	1,368	101.83 (101.06–102.59)	14.41

Figure 20: Year 3 mathematics scores



Year 3 mathematics disadvantage gap model

The analysis of the Year 3 mathematics scores used a three-level multilevel model (school, pupil, and timepoint) in which Spring Term 2021, Spring Term 2022, and Spring Term 2023 scores were regressed on time, FSM eligibility of pupils in January 2020 (i.e. before school closures), FSM quintiles of schools, EAL status, gender, academy status, and region. Table 39 presents the results from the model, which measures the impact of FSM pupil outcomes as a function of time. The disadvantage gap is represented as the difference in the measured mathematics attainment between FSM and non-FSM pupils. The model ascertains whether there was a significant change in this gap between Spring Term 2021, Spring Term 2022, and Spring Term 2023.

There was a significant positive interaction between time and FSM eligibility on Year 3 pupils' mathematics scores. This means that after controlling for all variables in the model, there was a reduction in the disadvantage gap for mathematics attainment. This result was obtained controlling for FSM quintiles, gender, EAL status, academy status, and region. It is worth noting that being in a school in the highest three quintiles of FSM (i.e. schools with the highest proportion of FSM pupils) was associated with a medium to large effect on lowering attainment. Effect size and CIs are presented in Table 39.

Table 39: Year 3 mathematics disadvantage gap model

Coefficients	Model coefficients				Effect size	
	Estimate (95% CI)	SE	Degrees of freedom	P-value	Hedge's <i>g</i> (95% CI)	
(Intercept)	114.04 101.84 126.24	6.22	38.82	0.00		
Timepoint	1.69 1.44 1.94	0.13	3660.64	0.00	0.07 0.06 0.08	
FSM2020 yes	-6.20 -7.85 -4.54	0.84	3061.07	0.00	-0.25 -0.31 -0.18	
FSM2020 missing	-1.28 -17.04 14.48	8.04	2849.13	0.87	-0.05 -0.68 0.58	
Wave*FSM2020 yes	0.89 0.27 1.51	0.32	3808.98	0.00	0.04 0.01 0.06	
Wave*FSM2020 missing	3.37 -8.64 15.37	6.13	2907.38	0.58	0.14 -0.35 0.62	
Gender female	-2.57 -3.65 -1.49	0.55	2234.75	0.00	-0.10 -0.15 -0.06	
Gender missing	-5.46 -11.52 0.60	3.09	3159.31	0.08	-0.22 -0.46 0.02	
EAL yes	0.08 -22.14 1.54	1.01	2268.91	0.94	0.00 -0.08 0.08	
EAL missing	-3.48 -5.19 -1.77	0.87	2583.41	0.00	-0.14 -0.21 -0.07	
FSM 2nd lowest 20%	-1.42 -6.40 3.56	2.54	44.91	0.58	-0.06 -0.26 0.14	
FSM middle 20%	-6.64 -10.96 -2.32	2.20	46.56	0.00	-0.27 -0.44 -0.09	
FSM 2nd highest 20%	-7.14 -11.56 -2.72	2.25	43.51	0.00	-0.29 -0.46 -0.11	
FSM highest 20%	-9.97 -16.15 -3.78	3.15	41.98	0.00	-0.40 -0.65 -0.15	
FSM missing	-0.88 -8.73 6.97	4.01	35.28	0.83	-0.04 -0.35 0.28	
Non-academy	0.81 -2.81 4.43	1.85	44.40	0.66	0.03 -0.11 0.18	
East of England	-10.30 -21.29 0.68	5.60	37.24	0.07	-0.41 -0.85 0.03	
London	-9.62 -21.30 2.06	5.96	38.15	0.11	-0.39 -0.85 0.08	
North East	-10.30 -22.14 1.54	6.04	37.88	0.10	-0.41 -0.89 0.06	
North West	-10.89 -22.51 0.74	5.93	37.32	0.07	-0.44 -0.90 0.03	
South East	-10.17 -21.93 1.59	6.00	38.24	0.10	-0.41 -0.88 0.06	
South West	-7.84 -20.05 4.37	6.23	37.98	0.22	-0.31 -0.80 0.18	
West Midlands	-8.83 -20.90 3.23	6.15	39.11	0.16	-0.35 -0.84 0.13	
Yorkshire and the Humber	-8.16 -20.47 4.14	6.28	39.54	0.20	-0.33 -0.82 0.17	

Note: The reference group for this model was Spring Term 2021 scores, non-FSM pupils, males, non-EAL pupils EAL, lowest 20% FSM quintile, academy schools, and the East Midlands region. The number of schools is 57, the number of pupils is 2,321. The ICC was 0.10 at school level and 0.69 at pupil level. Significant effects are in bold.

Year 4 attainment in reading and mathematics: The disadvantage gap

Within the Spring Term 2023 sample, approximately 21% of pupils in Year 4 were classed as disadvantaged (i.e. eligible for FSM as reported by schools). For a small number of pupils (11 pupils in reading, which corresponds to 0.36% of the sample, and 12 pupils in mathematics, which corresponds to 0.40% of the sample), no FSM data was provided, and these pupils have been excluded from the following calculations. The standardisation sample does not provide data on the performance of disadvantaged and non-disadvantaged pupils.

Year 4 reading attainment: The disadvantage gap

Table 40 shows a summary of the performance of disadvantaged pupils compared with those pupils in the cohort who are not disadvantaged (i.e. eligibility for FSM as reported by schools).

Table 40: Performance of Year 4 pupils in reading for Spring Term 2023

Measure	Standardisation sample 2017	Spring Term 2023 all pupils	Spring Term 2023 FSM	Spring Term 2023 non-FSM
Mean	20.32	22.53	18.92	23.53
95% confidence interval	19.43–21.20	21.81–23.26	17.81–20.04	22.84–24.22
Standard deviation	8.88	8.75	8.99	8.40
N pupils	1,427	3,027	644	2,372

For the Year 4 reading assessments, 21.4% of the cohort were classed as being disadvantaged. The difference between the mean raw scores of disadvantaged pupils and non-disadvantaged pupils is 4.61 points and represents a significant difference in performance (Table 40). The effect size for these data is 0.527,²² which using the EEF table,²³ equates to seven months' progress.

Year 4 reading repeated measures analysis

In order to assess the longitudinal change in the reading disadvantage gap of Year 4 pupils, we compared how Year 4 FSM and non-FSM pupils' reading scores changed from Spring Term 2021 (when in Year 2) to Spring Term 2022 (when in Year 3) to Spring Term 2023. A total of 2,602 pupils (from 59 schools that participated in 2021, 2022, and 2023 for the reading assessment for this cohort) were entered into the Year 4 reading repeated measures multilevel models. Out of these 2,602 pupils, 1,841 pupils took the three assessments, 409 took two assessments, and 352 took only one assessment. Table 41 shows the detail for longitudinal participation.

Table 41: Year 4 reading longitudinal participation

Longitudinal participation	Number of pupils
Spring Term 2021 only	158
Spring Term 2022 only	53
Spring Term 2023 only	141
Spring 2021 and Spring Term 2022	150
Spring Term 2022 and Spring Term 2023	178
Spring Term 2021 and Spring Term 2023	81
Spring Term 2021, Spring Term 2022, and Spring Term 2023	1,841

²² Disadvantage gap effect sizes were calculated by dividing the standardised score point difference between FSM and non-FSM pupils by the overall Spring Term 2022 SD.

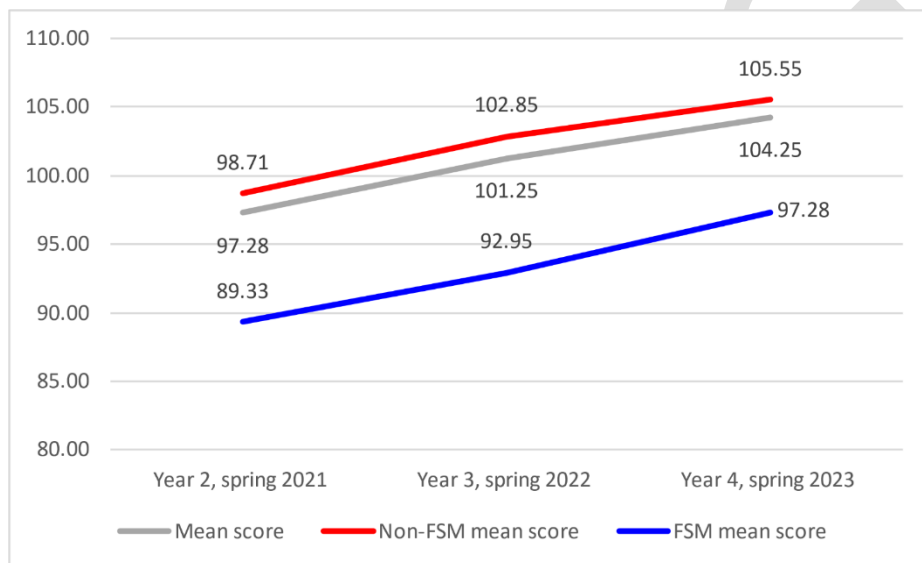
²³ <https://educationendowmentfoundation.org.uk/evidence-summaries/about-the-toolkits/attainment/>

Table 42 presents the standardised means of the Year 4 reading responses for the group as a whole, for non-FSM pupils, and for FSM pupils in the longitudinal analysis. Each groups' scores are split by term. For all pupils, 2023 reading results are higher than in 2022 and 2021. Furthermore, non-FSM pupils have higher scores at both timepoints than FSM pupils. These mean differences are further displayed in Figure 21 below.

Table 42: Year 4 reading standardised mean scores

Outcome	Standardised means											
	Spring Term 2021				Spring Term 2022				Spring Term 2023			
	n	Weighted n	Mean (95% CI)	SD	n	Weighted n	Mean (95% CI)	SD	n	Weighted n	Mean (95% CI)	SD
Year 4 reading	2,235	2,161	97.28 (96.61–97.94)	15.82	2,218	2,149	101.25 (100.57–101.93)	15.98	2,240	2,170	104.25 (103.63–104.88)	14.89
Year 4 reading (FSM only)	341	340	89.33 (87.75–106.23)	14.64	328	332	92.95 (91.40–94.50)	14.32	346	350	97.28 (95.78–98.78)	14.26
Year 4 reading (non-FSM only)	1,893	1,820	98.71 (98.00–99.43)	15.55	1,869	1,798	102.85 (102.12–103.58)	15.76	1,887	1,815	105.55 (104.88–106.23)	14.64

Figure 21: Year 4 reading scores



Year 4 reading disadvantage gap model

The analysis of the Year 4 reading scores was a three-level multilevel model (school, pupil, and timepoint) in which Spring Term 2021, Spring Term 2022, and Spring Term 2023 scores were regressed on time, FSM eligibility of pupils in January 2020 (i.e. before school closures), FSM quintiles of schools, EAL status, gender, academy status, and region. Table 43 presents the results from the model, which measures the impact of FSM pupil outcomes as a function of time. The disadvantage gap is represented as the difference in the measured reading attainment between FSM and non-FSM pupils. The model ascertains whether there was a significant change in this gap between 2021, 2022, and 2023.

There was no significant interaction between time and FSM eligibility on Year 4 pupils' reading scores. This means that between 2021, 2022, and 2023, the disadvantage gap for reading attainment remained stable. This analysis controlled for FSM quintiles, gender, EAL status, academy status, and region. It is worth noting that being in a school in the second highest quintile of FSM (i.e. schools with the second highest proportion of FSM pupils) was associated with a small effect on lowering attainment. Effect size and CIs are presented in Table 43.

Table 43: Year 4 reading disadvantage gap model

Coefficients	Model coefficients				Effect size		
	Estimate (95% CI)		SE	Degrees of freedom	P-value	Hedge's g (95% CI)	
(Intercept)	102.44		4.84	38.27	0.00		
	92.96	111.92					
Timepoint	3.55		0.13	4179.93	0.00	0.14	
	3.29	3.81				0.13	0.15
FSM2020 yes	-7.68		0.84	3646.28	0.00	-0.30	
	-9.32	-6.04				-0.37	-0.24
FSM2020 missing	-3.43		7.25	3646.59	0.64	-0.13	
	-17.63	10.77				-0.69	0.42
Wave*FSM2020 yes	0.46		0.34	4357.50	0.18	0.02	
	-0.22	1.13				-0.01	0.04
Wave*FSM2020 missing	-1.51		5.95	3624.46	0.80	-0.06	
	-13.18	10.16				-0.52	0.40
Gender female	2.65		0.54	2513.29	0.00	0.10	
	1.59	3.71				0.06	0.15
Gender missing	2.25		3.08	3405.22	0.47	0.09	
	-3.79	8.28				-0.15	0.32
EAL yes	-1.92		0.87	2453.61	0.03	-0.08	
	-15.68	2.42				-0.14	-0.01
EAL missing	-6.73		0.88	2973.04	0.00	-0.26	
	-8.47	-5.00				-0.33	-0.20
FSM second lowest 20%	-0.23		1.88	47.96	0.90	-0.01	
	-3.90	3.45				-0.15	0.14
FSM middle 20%	-2.27		1.73	47.00	0.20	-0.09	
	-5.66	1.12				-0.22	0.04
FSM second highest 20%	-4.29		1.95	42.06	0.03	-0.17	
	-8.11	-0.47				-0.32	-0.02
FSM highest 20%	-4.46		2.51	41.82	0.08	-0.18	
	-9.39	0.47				-0.37	0.02
FSM missing	0.17		3.08	33.18	0.96	0.01	
	-5.87	6.21				-0.23	0.24
Non-academy	1.74		1.53	48.21	0.26	0.07	
	-1.26	4.74				-0.05	0.19
East of England	-5.04		4.25	36.34	0.24	-0.20	
	-13.38	3.29				-0.52	0.13
London	-4.08		4.58	37.74	0.38	-0.16	
	-13.06	4.90				-0.51	0.19
North East	-6.63		4.62	37.45	0.16	-0.26	
	-15.68	2.42				-0.62	0.09
North West	-2.96		4.48	36.59	0.51	-0.12	
	-11.75	5.83				-0.46	0.23
South East	-3.58		4.61	37.59	0.44	-0.14	
	-12.63	5.46				-0.50	0.21
South West	-1.13		4.73	37.03	0.81	-0.04	
	-10.41	8.15				-0.41	0.32
West Midlands	-5.25		4.64	37.57	0.27	-0.21	
	-14.34	3.84				-0.56	0.15
Yorkshire and the Humber	-3.31		4.85	40.72	0.50	-0.13	
	-12.82	6.19				-0.50	0.24

Note: The reference group for this model was Spring Term 2021 scores, non-FSM pupils, males, non- EAL pupils, lowest 20% FSM quintile, academy schools, and the East Midlands region. The number of schools is 59 and the number of pupils is 2,602. The ICC was 0.04 at school level and 0.70 at pupil level. Significant effects are in bold.

Year 4 mathematics attainment: The disadvantage gap

Table 44 shows a summary of the performance of disadvantaged pupils compared to those pupils within the cohort who are not disadvantaged (i.e. eligibility for FSM as reported by schools).

Table 44: Performance of Year 4 pupils in mathematics for Spring Term 2023

Measure	Standardisation sample 2017	Spring Term 2023 all pupils	Spring Term 2023 FSM	Spring Term 2023 non-FSM
Mean	45.32	48.08	39.55	50.44
95% confidence interval	43.17–47.47	46.09–50.06	36.36–42.74	48.62–52.26
Standard deviation	21.65	21.95	21.46	21.47
N pupils	1,478	2,990	631	2,347

For the Year 4 mathematics assessments, 21.2% of the cohort were classed as being disadvantaged. The difference between the mean standardised scores of disadvantaged pupils and non-disadvantaged is 10.89 and represents a significant difference in performance (Table 44). The effect size for this data is 0.496, which using the EEF table,²⁴ equates to six months' progress.

Year 4 mathematics repeated measures analysis

In order to assess the longitudinal change in the mathematics disadvantage gap of Year 4 pupils, we compared how Year 4 FSM and non-FSM pupils' mathematics scores changed from Spring Term 2021 (when in Year 2) to Spring Term 2022 (when in Year 3) to Spring Term 2023. A total of 2,567 pupils (from 59 schools that participated in 2021, 2022, and 2023 for the mathematics assessment for this cohort) were entered into the Year 4 mathematics repeated measures multilevel models. Out of these 2,567 pupils, 1,765 pupils took the three assessments, 455 took two assessments, and 347 took only one assessment. Table 45 shows the detail for longitudinal participation.

Table 45: Year 4 mathematics longitudinal participation

Longitudinal participation	Number of pupils
Spring Term 2021 only	148
Spring Term 2022 only	57
Spring Term 2023 only	142
Spring Term 2021 and Spring Term 2022	176
Spring Term 2022 and Spring Term 2023	180
Spring Term 2021 and Spring Term 2023	99
Spring Term 2021, Spring Term 2022, and Spring Term 2023	1,765

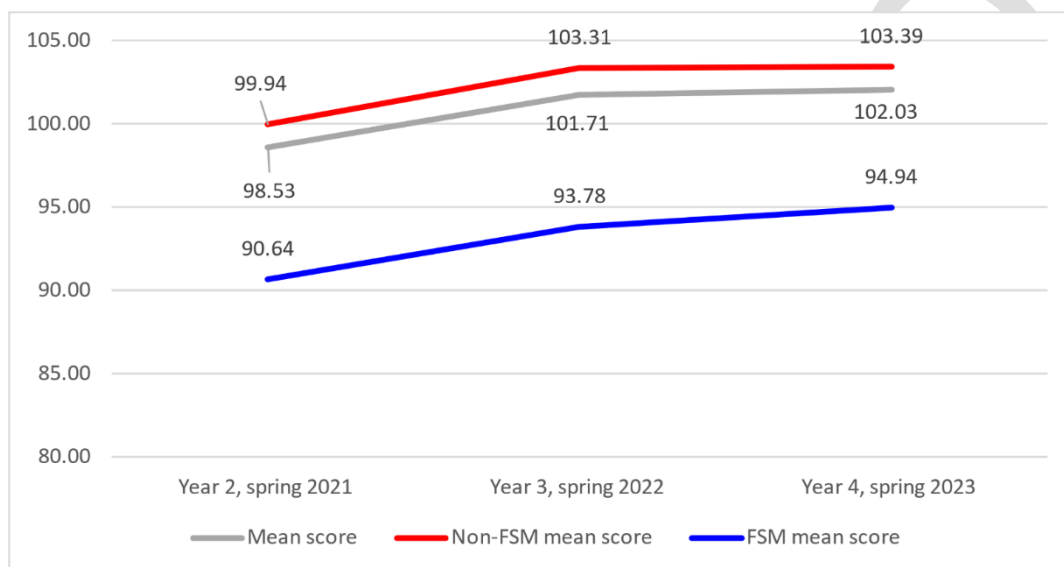
Table 46 presents the standardised mathematics mean scores of the Year 4 group as a whole, for non-FSM pupils, and for FSM pupils in the longitudinal analysis. Each groups' scores are split by term. For all pupils, 2023 mathematics results are higher than in 2022 and 2021. Furthermore, non-FSM pupils have higher scores at both timepoints than FSM pupils. These mean differences are further displayed in Figure 22 below.

²⁴ <https://educationendowmentfoundation.org.uk/evidence-summaries/about-the-toolkits/attainment/>

Table 46: Year 4 mathematics standardised mean scores

Outcome	Standardised means											
	Spring Term 2021				Spring Term 2022				Spring Term 2023			
	n	Weighted n	Mean (95% CI)	SD	n	Weighted n	Mean (95% CI)	SD	n	Weighted n	Mean (95% CI)	SD
Year 4 mathematics	2,191	2,084	98.53 (97.87–99.19)	15.33	2,181	2,073	101.71 (101.05–102.37)	15.38	2,180	2,083	102.03 (101.39–102.67)	14.89
Year 4 mathematics (FSM only)	336	332	90.64 (89.07–104.08)	14.61	333	329	93.78 (92.14–95.41)	15.09	345	345	94.94 (93.43–96.45)	14.26
Year 4 mathematics (non-FSM only)	1,854	1,752	99.94 (99.24–100.65)	15.01	1,821	1,717	103.31 (102.60–104.01)	14.93	1,830	1,733	103.39 (102.70–104.08)	14.61

Figure 22: Year 4 mathematics scores



Year 4 mathematics disadvantage gap model

The analysis of the Year 4 mathematics scores was a three-level multilevel model (school, pupil, and timepoint) in which Spring Term 2021, Spring Term 2022, and Spring Term 2023 scores were regressed on time, FSM eligibility of pupils in January 2020 (i.e. before school closures), FSM quintiles of schools, EAL status, gender, academy status, and region. Table 47 presents the results from the model, which measures the impact of FSM pupil outcomes as a function of time. The disadvantage gap is represented as the difference in the measured mathematics attainment between FSM and non-FSM pupils. The model ascertains whether there was a significant change in this gap between 2021, 2022, and 2023.

There was a statistically significant positive interaction between time and FSM eligibility on Year 4 pupils' mathematics scores. This means that between 2021, 2022, and 2023, FSM pupils' scores changed in relation to non-FSM pupils and the disadvantage gap for mathematics was reduced. This result was obtained whilst controlling for FSM quintiles, gender, EAL status, academy status, and region. It is worth noting that being in a school in the second highest quintile of FSM (i.e. schools with the second highest proportion of FSM pupils) was associated with a small effect on lowering attainment. Effect size and CIs are presented in Table 47.

Table 47: Year 4 mathematics disadvantage gap model

Coefficients	Model coefficients				Effect size	
	Estimate (95% CI)	SE	Degrees of freedom	P-value	Hedge's g (95% CI)	
(Intercept)	110.81 101.07 120.56	4.97	40.56	0.00		
Timepoint	1.75 1.55 1.95	0.10	4033.46	0.00	0.07 0.06 0.08	
FSM2020 yes	-8.39 -9.97 -6.82	0.81	3173.95	0.00	-0.35 -0.41 -0.28	
FSM2020 missing	2.66 -12.15 17.47	7.56	3135.01	0.72	0.11 -0.50 0.72	
Wave*FSM2020 yes	0.62 0.10 1.13	0.26	4143.27	0.02	0.03 0.00 0.05	
Wave*FSM2020 missing	-6.89 -19.20 5.42	6.28	3116.56	0.27	-0.29 -0.80 0.22	
Gender female	-4.71 -5.78 -3.64	0.54	2494.55	0.00	-0.20 -0.24 -0.15	
Gender missing	-1.35 -7.02 4.33	2.90	2981.70	0.64	-0.06 -0.29 0.18	
EAL yes	0.08 -19.89 -1.08	0.87	2463.98	0.93	0.00 -0.07 0.07	
EAL missing	-4.79 -6.49 -3.08	0.87	2762.20	0.00	-0.20 -0.27 -0.13	
FSM second lowest 20%	1.04 -2.69 4.78	1.91	51.14	0.59	0.04 -0.11 0.20	
FSM middle 20%	-1.90 -5.44 1.63	1.80	50.67	0.30	-0.08 -0.23 0.07	
FSM second highest 20%	-4.76 -8.57 -0.94	1.95	46.24	0.02	-0.20 -0.36 -0.04	
FSM highest 20%	-2.72 -7.71 2.28	2.55	45.68	0.29	-0.11 -0.32 0.09	
FSM missing	0.20 -6.12 6.52	3.22	36.01	0.95	0.01 -0.25 0.27	
Non-academy	3.45 0.30 6.60	1.61	52.77	0.04	0.14 0.01 0.27	
East of England	-10.26 -18.92 -1.59	4.42	37.82	0.03	-0.43 -0.78 -0.07	
London	-10.03 -19.33 -0.73	4.74	39.24	0.04	-0.42 -0.80 -0.03	
North East	-10.48 -19.89 -1.08	4.80	39.17	0.04	-0.43 -0.83 -0.04	
North West	-7.97 -17.08 1.13	4.65	38.05	0.09	-0.33 -0.71 0.05	
South East	-8.80 -18.18 0.58	4.79	39.29	0.07	-0.37 -0.75 0.02	
South West	-7.67 -17.31 1.97	4.92	38.76	0.13	-0.32 -0.72 0.08	
West Midlands	-9.22 -18.63 0.19	4.80	39.20	0.06	-0.38 -0.77 0.01	
Yorkshire and the Humber	-9.34 -19.25 0.57	5.06	42.64	0.07	-0.39 -0.80 0.02	

Note: The reference group for this model was Spring Term 2021 scores, non-FSM pupils, males, non-EAL pupils, lowest 20% FSM quintile, academy schools, and the East Midlands region. The number of schools is 59 and the number of pupils is 2,567. The ICC was 0.05 at school level and 0.79 at pupil level. Significant effects are in bold.

Research question 3: Is attainment in some domains in reading and mathematics changing or recovering at a different rate from others?

Summary

Year 3

- On three of the six reading domains, pupils' performance in 2023 was not significantly different from the standardisation sample. Compared to the standardisation sample, pupils in 2023 scored significantly higher in two of the reading domains but significantly lower in another.
- The performance of Year 3 pupils in Spring Term 2023 was compared to Year 3 pupils who sat the same assessment in 2022. For five out of six reading domains, the performance of pupils in Spring Term 2023 was not significantly different from that of pupils in 2022. However, pupils in 2023 scored significantly lower than the 2022 cohort in the key domain of vocabulary.
- In mathematics, compared to the standardisation sample, pupils in 2023 scored significantly higher in two domains, significantly lower in two domains and there was no significant difference in the remaining two domains.
- In five of the six mathematics domains, there was no significant difference in the performance of pupils in Spring Term 2023 compared to that of pupils sitting the same assessment in 2022, however performance in statistics was significantly lower.
- In both reading and mathematics, disadvantaged pupils scored significantly lower than their peers in all domains.
- Girls performed significantly better than boys in all reading domains and boys performed significantly better than girls in five of the six mathematics domains.

Year 4

- For five out of six reading domains, the performance of pupils in Spring Term 2023 was significantly higher than that of the standardisation sample. There was no significant difference in the performance of the final domain.
- The performance of pupils in Spring Term 2023 in mathematics was significantly higher than the performance of pupils in the standardisation sample in four of the six domains including the two largest domains assessed: number and place value; and calculations.
- In both reading and mathematics, disadvantaged pupils scored significantly lower than their peers in all domains.
- Girls performed significantly better than boys in four out of six reading domains with the other two showing no significant difference. Boys performed significantly better than girls in all mathematics domains.

The aim of research question 3 is to investigate whether certain areas of the curriculum have been affected by the school disruption more than others and, if so, whether the gaps in performance are significant.

The items in the Year 3 and Year 4 assessments have been classified in line with the Key Stage 2 assessment frameworks for reading and for mathematics.

For each subject in Year 3, we made two comparisons:

- Spring Term 2023 cohort with the 2017 standardisation sample; and
- Spring Term 2023 cohort with the Spring Term 2022 cohort.

The assessments were standardised before the start of the pandemic with nationally representative samples of pupils in schools in England. The performance of this sample across the different domains is compared with that of pupils taking the same assessments in Spring Term 2023.

The pupils who were part of the Year 3 Spring Term 2022 cohort and the pupils who are part of the Year 3 Spring Term 2023 cohort have all taken exactly the same assessment at the same point in the school year. Both cohorts taking the assessment experienced disruption to their schooling as a result of the pandemic.

For each subject in Year 4 we were only able to compare the Spring Term 2023 cohort to the 2017 standardisation sample. This is because Year 4 was not assessed during Spring Term 2022.

Year 3 reading

Out of 29 questions in the Year 3 reading assessment, the majority focus on two of the domains in the Key Stage 2 reading assessment framework: retrieve and record information or key details (ten questions testing pupils' retrieval skills); and make inferences from the text, which includes explaining and justifying inferences with evidence from the text (nine questions). There are seven questions that assess vocabulary skills: give/explain the meaning of words in context (five questions); and identify/explain how meaning is enhanced through choice of words and phrases (two questions). In addition to these domains, two questions assess the related retrieval skill of how children summarise main ideas and one question assesses a related inference skill, how content is related to meaning (identify/explain how information/narrative content is related and contributes to meaning as a whole).

Table 48: Comparison between the standardisation sample and the Spring Term 2023 cohort for reading

Domain	Mean total mark for domain			
	Standardisation 2017	Spring Term 2023	Difference	Significance
Give / explain the meaning of words in context (vocabulary)	2.94	2.56	-0.38	Significantly lower
Retrieve and record information / identify key details from texts (retrieval)	6.85	8.05	+1.20	Significantly higher
Summarise main ideas from more than one paragraph (retrieval)	1.45	1.43	-0.01	Not significant
Make inferences from the text / explain and justify inferences with evidence from the text	6.66	6.83	+0.18	Not significant
Identify / explain how content is related and contributes to meaning (inference)	1.22	1.18	-0.04	Not significant
Identify / explain how meaning is enhanced through choice of words and phrases (vocabulary)	1.09	1.20	+0.11	Significantly higher

* Two curriculum domains were not tested in the Year 3 assessment: predict what might happen from details stated and implied; and make comparisons within the text.

As discussed in research question 1, there was no significant difference in the overall performance of Year 3 pupils in reading in spring 2023 compared to the standardisation sample. This is reflected in the domains tested in the assessments. Pupils did not perform significantly differently from the standardisation sample on summarising main ideas, making inferences or identifying/explaining how information or narrative content is related. Whilst performance on two of the domains was significantly higher in spring 2023 (identifying key details and identifying/explaining how meaning is enhanced), performance on giving or explaining the meaning of words in context was significantly lower.

Comparison between the spring 2022 cohort and the spring 2023 cohort

In addition to comparing the 2023 Year 3 cohort with the standardisation sample that took the same assessment before the Covid-19 pandemic, we can compare them with the Year 3 cohort from 2022. Unlike the standardisation sample, both of the cohorts of Year 3 children from 2022 and 2023 have had their schooling impacted upon by the pandemic.

They are different children who have taken exactly the same assessment at the same point in the year in 2022 and 2023, respectively.

Table 49: Comparison between the spring 2022 and the spring 2023 cohorts for reading

Mean total mark for domain				
Domain	Spring Term 2022	Spring Term 2023	Difference	Significance
Give / explain the meaning of words in context (vocabulary)	3.30	2.56	-0.74	Significantly lower
Retrieve and record information / identify key details from texts (retrieval)	7.72	8.05	+0.33	Not significant
Summarise main ideas from more than one paragraph (retrieval)	1.47	1.43	-0.04	Not significant
Make inferences from the text / explain and justify inferences with evidence from the text	6.74	6.83	+0.09	Not significant
Identify / explain how content is related and contributes to meaning (inference)	1.13	1.18	+0.05	Not significant
Identify / explain how meaning is enhanced through choice of words and phrases (vocabulary)	1.25	1.20	-0.05	Not significant

For all but one of the reading domains, the performance of Year 3 pupils in Spring Term 2023 was not significantly different from that of Year 3 pupils in 2022. Overall, most aspects of reading skills of the Year 3 cohorts in 2022 and 2023 have been similarly affected by the disruption caused by the pandemic. However, for pupils in Year 3 in Spring Term 2023, comparisons with the standardisation sample as well as the Year 3 pupils in Spring Term 2022 suggest that the domain assessing vocabulary may have been adversely affected.

Table 50: Comparison between pupils eligible and not eligible for FSM, Year 3 Spring Term 2023 cohort for reading

Mean total mark for domain				
Domain	Spring Term 2023 non-FSM pupils	Spring Term 2023 FSM pupils	Difference	Significance
Give / explain the meaning of words in context (vocabulary)	2.68	2.05	-0.63	Significantly lower
Retrieve and record information / identify key details from texts (retrieval)	8.42	6.51	-1.91	Significantly lower
Summarise main ideas from more than one paragraph (retrieval)	1.49	1.21	-0.28	Significantly lower
Make inferences from the text / explain and justify inferences with evidence from the text	7.16	5.48	-1.67	Significantly lower
Identify / explain how content is related and contributes to meaning (inference)	1.26	0.85	-0.41	Significantly lower
Identify / explain how meaning is enhanced through choice of words and phrases (vocabulary)	1.27	0.95	-0.32	Significantly lower

Year 3 pupils eligible for FSM performed significantly less well in the Spring Term 2023 reading assessments compared with pupils not eligible for FSM. This difference applies across all of the reading domains. The same disadvantage-related difference was also found for the Spring Term 2022 sample.

Table 51: Comparison between genders for the Year 3 Spring Term 2023 cohort for reading

Mean total mark for domain				
Domain	Spring Term 2023 Boys	Spring Term 2023 Girls	Difference	Significance
Give / explain the meaning of words in context (vocabulary)	2.49	2.64	+0.15	Girls significantly higher
Retrieve and record information / identify key details from texts (retrieval)	7.66	8.47	+0.81	Girls significantly higher
Summarise main ideas from more than one paragraph (retrieval)	1.39	1.48	+0.08	Girls significantly higher
Make inferences from the text / explain and justify inferences with evidence from the text	6.43	7.25	+0.82	Girls significantly higher
Identify / explain how content is related and contributes to meaning (inference)	1.09	1.27	+0.19	Girls significantly higher
Identify / explain how meaning is enhanced through choice of words and phrases (vocabulary)	1.13	1.28	+0.15	Girls significantly higher

Similarly, there was a consistent difference between Year 3 boys and girls. In both the Spring Term 2023 and Spring Term 2022 reading assessments, on average, girls had significantly higher mean scores on each reading domain than boys.

Year 3 mathematics

In Year 3, a large proportion of the assessment is focused on two domains; these are number and place value, and calculations. However, the proportion of questions from the domains of fractions, measurement, and statistics is slightly higher than in Year 2.

Table 52: Comparison between the standardisation sample and the Spring Term 2023 cohort for mathematics

Mean total mark for domain				
Domain	Standardisation 2017	Spring Term 2023	Difference	Significance
Number and place value	10.10	10.95	+0.85	Significantly higher
Calculations	12.17	14.26	+2.09	Significantly higher
Fractions	4.23	4.48	+0.25	Not significant
Measurement	3.10	3.08	-0.02	Not significant
Geometry	1.84	1.43	-0.41	Significantly lower
Statistics	3.40	2.95	-0.45	Significantly lower

As discussed in research question 1, the overall performance of Year 3 pupils in Spring Term 2023 was significantly higher than the standardisation sample in 2017. Although the domain analysis shows that performance of Year 3 pupils in Spring Term 2023 is significantly higher in only two out of six of the domains (number and place value, and calculations), the contribution of these domains to the overall finding reflects the higher number of questions testing these skills in the assessment. There are no significant differences in the performance of pupils in two domains (fractions

and measurement) and Year 3 pupils in Spring Term 2023 performed significantly lower than the standardisation sample in geometry and statistics.

Unlike the standardisation sample, both of the cohorts of Year 3 children from 2022 and 2023 have had their schooling disrupted by the pandemic. They are different children who have taken exactly the same assessment at the same point in the year in 2022 and 2023, respectively.

Table 53: Comparison between the Spring Term 2022 cohort and the Spring Term 2023 cohort for mathematics

Mean total mark for domain				
Domain	Spring Term 2022	Spring Term 2023	Difference	Significance
Number and place value	10.80	10.95	+0.15	Not significant
Calculations	14.08	14.26	+0.18	Not significant
Fractions	4.37	4.48	+0.11	Not significant
Measurement	3.20	3.08	-0.12	Not significant
Geometry	1.53	1.43	-0.10	Not significant
Statistics	3.60	2.95	-0.65	Significantly lower

In five of the six of the mathematics domains the performance of Year 3 pupils in Spring Term 2023 was not significantly different from that of Year 3 pupils in 2022. This suggests that the mathematics skills of the Year 3 cohorts in 2022 and 2023 have been similarly affected by the disruption caused by the pandemic. However, the Spring Term 2023 pupils did score significantly lower in the domain of statistics.

Table 54: Comparison between pupils eligible and not eligible for FSM, Year 3 Spring Term 2023 cohort for mathematics

Mean total mark for domain				
Domain	Spring Term 2023 non-FSM pupils	Spring Term 2023 FSM pupils	Difference	Significance
Number and place value	11.26	9.59	-1.67	Significantly lower
Calculations	14.88	11.64	-3.24	Significantly lower
Fractions	4.76	3.24	-1.51	Significantly lower
Measurement	3.24	2.40	-0.84	Significantly lower
Geometry	1.48	1.24	-0.24	Significantly lower
Statistics	3.04	2.54	-0.51	Significantly lower

Pupils eligible for FSM achieved significantly lower in all six of the domains in the Spring Term 2023 assessments compared with pupils not eligible for FSM. The same disadvantage-related difference was also found for the Spring Term 2022 sample.

Table 55: Comparison between genders for the Year 3 Spring Term 2023 cohort for mathematics

Mean total mark for domain				
Domain	Spring Term 2023 Boys	Spring Term 2023 Girls	Difference	Significance
Number and place value	11.63	10.30	-1.33	Girls significantly lower
Calculations	15.28	13.28	-2.00	Girls significantly lower
Fractions	4.89	4.07	-0.81	Girls significantly lower
Measurement	3.54	2.63	-0.91	Girls significantly lower
Geometry	1.43	1.43	0.00	Not significant
Statistics	3.05	2.86	-0.20	Girls significantly lower

In Year 3 mathematics, in Spring Term 2023, girls scored significantly lower than boys in five of the six domains. There was no difference in the performance of boys and girls in geometry. These findings mirror those reported last year for the Year 3 cohort in Spring Term 2022.

Year 4 reading

As in last year's report, there is no comparable data from Year 4 pupils in Spring Term 2022 with which the Year 4 Spring Term 2023 data can be compared. For this reason, we have only compared the Year 4 Spring Term 2023 data with the 2017 standardisation sample only.

Table 56: Comparison between the 64 standardization sample and spring 2023 cohort for reading

Mean total mark for domain				
Domain	Standardisation 2017	Spring Term 2023	Difference	Significance
Give / explain the meaning of words in context (vocabulary)	1.68	2.11	+0.43	Significantly higher
Retrieve and record information / identify key details from texts (retrieval)	7.68	8.49	+0.82	Significantly higher
Summarise main ideas from more than one paragraph (retrieval)	2.30	2.81	+0.51	Significantly higher
Make inferences from the text / explain and justify inferences with evidence from the text	7.14	8.09	+0.96	Significantly higher
Identify / explain how content is related and contributes to meaning (inference)	1.08	1.07	-0.01	Not significant
Identify / explain how meaning is enhanced through choice of words and phrases (vocabulary)	1.75	2.09	+0.34	Significantly higher

* As in the Year 3 assessment, two curriculum domains were not tested in the Year 4 assessment: predict what might happen from details stated and implied; and make comparisons within the text.

As reported in research question 1, pupils in Year 4 in Spring Term 2023 performed significantly higher overall than the standardisation sample in 2017. The domain analysis reflects this finding with pupils in Year 4 in Spring Term 2023 scoring significantly higher in five out of six domains, compared to pupils in the standardisation sample. There was no significant difference between the performance of pupils for the domain assessing a related inference skill (how content is related to meaning).

Table 57: Comparison between pupils eligible and not eligible for FSM, Year 4 Spring Term 2023 cohort for reading

Mean total mark for domain				
Domain	Spring Term 2023 non-FSM pupils	Spring Term 2023 FSM pupils	Difference	Significance
Give / explain the meaning of words in context (vocabulary)	2.22	1.73	-0.50	Significantly lower
Retrieve and record information / identify key details from texts (retrieval)	8.83	7.32	-1.51	Significantly lower
Summarise main ideas from more than one paragraph (retrieval)	2.93	2.40	-0.52	Significantly lower
Make inferences from the text / explain and justify inferences with evidence from the text	8.48	6.71	-1.77	Significantly lower
Identify / explain how content is related and contributes to meaning (inference)	1.13	0.83	-0.30	Significantly lower
Identify / explain how meaning is enhanced through choice of words and phrases (vocabulary)	2.18	1.78	-0.40	Significantly lower

Pupils eligible for FSM performed significantly less well in the Year 4 Spring Term 2023 reading assessments than pupils not eligible for FSM.

Table 58: Comparison between genders for the Year 4 Spring Term 2023 cohort for reading

Mean total mark for domain				
Domain	Spring Term 2023 Boys	Spring Term 2023 Girls	Difference	Significance
Give / explain the meaning of words in context (vocabulary)	2.06	2.14	+0.14	Girls significantly higher
Retrieve and record information / identify key details from texts (retrieval)	7.66	8.47	+0.23	Not significant
Summarise main ideas from more than one paragraph (retrieval)	1.39	1.48	+0.23	Girls significantly higher
Make inferences from the text / explain and justify inferences with evidence from the text	6.43	7.25	+0.46	Girls significantly higher
Identify / explain how content is related and contributes to meaning (inference)	1.09	1.27	+0.12	Girls significantly higher
Identify / explain how meaning is enhanced through choice of words and phrases (vocabulary)	1.13	1.28	+0.08	Not significant

Year 4 girls in Spring Term 2023 performed significantly higher than boys in the same cohort for four out of six reading domains: giving the meaning of words; summarising main ideas; making inferences; and identifying how content is related. The differences in performance for Year 4 girls and boys was not found to be significant for the other two domains (retrieving and recording information, and identifying how meaning is enhanced through word choice).

Year 4 mathematics

There is no Year 4 Spring Term 2022 data with which the Year 4 Spring Term 2023 data can be compared. We have therefore compared it to the 2017 standardisation sample only.

Table 59: Comparison between the standardisation sample and Spring Term 2023 cohort for mathematics

Mean total mark for domain				
Domain	Standardisation 2017	Spring Term 2023	Difference	Significance
Number and place value	14.03	15.03	+1.00	Significantly higher
Calculations	8.81	11.10	+2.29	Significantly higher
Fractions	10.44	11.62	+1.17	Significantly higher
Measurement	4.37	4.62	+0.24	Not significant
Geometry	4.27	3.78	-0.49	Significantly lower
Statistics	1.70	1.93	+0.22	Significantly higher

In the Year 4 mathematics assessment, the domains of number and place value, and calculations form the majority of the assessment as in the Year 3 mathematics assessment. However, the proportion of questions from the domains of fractions, measurement, and statistics is slightly higher than in Year 3.

When compared to the standardisation sample, there was no significant difference in the overall performance of the Year 4 pupils in Spring Term 2023. Nevertheless, the Year 4 pupils in Spring Term 2023 scored significantly higher in four out of six of the domains, compared to the standardisation sample: number and place value; calculations; fractions; and statistics. Although the score for the domain of geometry was significantly lower, it is the domain assessed by the fewest questions in the assessment. There was no significant difference in the performance of pupils in the domain of measurement.

Table 60: Comparison between pupils eligible and not eligible for FSM, Year 4 Spring Term 2023 cohort for mathematics

Mean total mark for domain				
Domain	Spring Term 2023 non-FSM pupils	Spring Term 2023 FSM pupils	Difference	Significance
Number and place value	15.73	12.70	-3.03	Significantly lower
Calculations	11.76	8.84	-2.93	Significantly lower
Fractions	12.18	9.63	-2.55	Significantly lower
Measurement	4.84	3.90	-0.93	Significantly lower
Geometry	3.97	3.13	-0.84	Significantly lower
Statistics	2.01	1.64	-0.37	Significantly lower

Pupils eligible for FSM achieved significantly lower mean scores in all six of the domains in the Spring Term 2023 assessments compared with pupils not eligible for FSM.

Table 61: Comparison between genders for the Year 4 Spring Term 2023 cohort for mathematics

Mean total mark for domain				
Domain	Spring Term 2023 Boys	Spring Term 2023 Girls	Difference	Significance
Number and place value	16.70	13.31	-3.39	Girls significantly lower
Calculations	11.67	10.54	-1.13	Girls significantly lower
Fractions	12.79	10.39	-2.40	Girls significantly lower
Measurement	5.04	4.19	-0.85	Girls significantly lower
Geometry	3.94	3.63	-0.31	Girls significantly lower
Statistics	2.07	1.78	-0.29	Girls significantly lower

In Year 4 mathematics, in Spring Term 2023, girls scored significantly lower than boys across all domains with the largest difference in the domain of number and place value.

Research question 4: What practices have been adopted and what learning opportunities have been provided by schools to help pupils catch up; and what challenges have been faced by staff?

Summary

- Challenges faced by schools have decreased since 2022. Most schools reported challenges from increased workload due to catch-up/recovery needs and difficulty in getting external support for pupils, and just under half of schools reported that staff absence continued to be high.
- The 2022/2023 academic year continued to be disrupted for a large minority of schools, mainly due to challenges with pupils' behaviour and wellbeing, and insufficient funding to support pupils who had missed learning.
- The vast majority of schools have retained increased wellbeing support and increased hand washing since implementation during the 2020/2021 academic year.
- The top strategies for social or wellbeing support were small group wellbeing sessions and extra personal, social, health, and economic (PSHE) education sessions.
- Nearly all schools provided support for very low-attaining pupils and nearly three-quarters of schools had done so for disadvantaged pupils. The most common areas for support were mathematics support, one to one catch-up support, and reading support.
- Most schools felt they were able to support home learning 'quite well' or 'very well'. The most common support measures were educational software/apps, online resources, and physical resources. Challenges with online learning had decreased since 2022.
- For both mathematics and reading, the top three strategies implemented for learning recovery were small group work, one to one catch-up support, and staff redeployment.
- Nearly half of schools reported that they provided tutoring through the National Tutoring Programme, with most using school-led tuition.
- The vast majority of schools felt that parents were as capable of providing support in 2022/2023 as they had been in the previous academic year but were less willing to do so.

The headteacher survey collected information from schools about the situation in schools following the disruption caused by the Covid-19 pandemic, the challenges faced in the current school year, and how well they were able to support children's learning. The survey is updated each year to reflect previous responses.

Disruption to learning in the 2022/2023 academic year

As shown in Figure 23, no schools reported that the learning of Year 3 and Year 4 pupils was very disrupted during the 2022/2023 academic year and over half (56%) reported that it was a normal year with no disruption at all. Of the 44% that reported some disruption, the most commonly given reasons for the disruption were challenges with behaviour/wellbeing (63%) and insufficient funding to support pupils who have missed learning (52%) (as proportions of all the headteachers participating in the study, these represents 27% and 23%, respectively). Four in ten headteachers (41%) that reported disruption said that it was caused by the need to cover material from previous years, and three in ten headteachers (30%) said that it was due to a lack of parental engagement.

In Spring Term 2022, (which involved pupils in Year 2 and Year 3) in contrast, over half of headteachers said that pupils' learning was somewhat disrupted and 15% very disrupted, with the Covid-related absences of pupils and staff being the most common reason for the disruption. This year, those absences were less prominent, with a third of headteachers (33%) listing Covid-19-related staff absences as a cause of disruption and a fifth (19%) saying so for pupil absences related to Covid-19. Figure 24 presents the other reasons for disruption selected by headteachers.

Figure 23: How would you rate the level of disruption to learning this academic year to date?

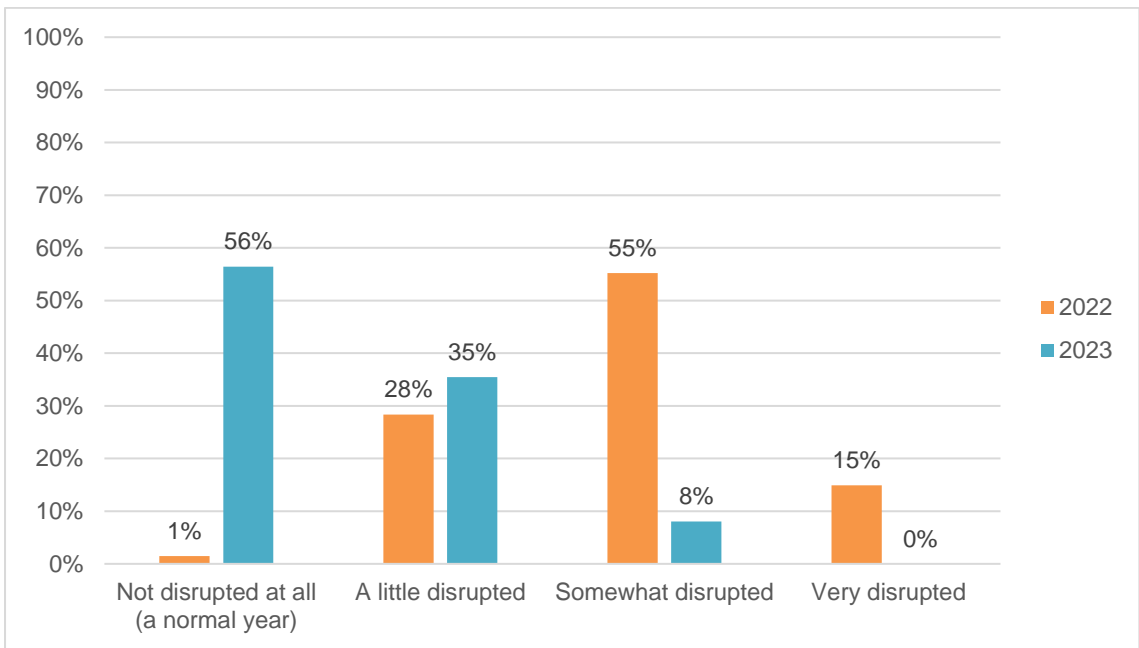
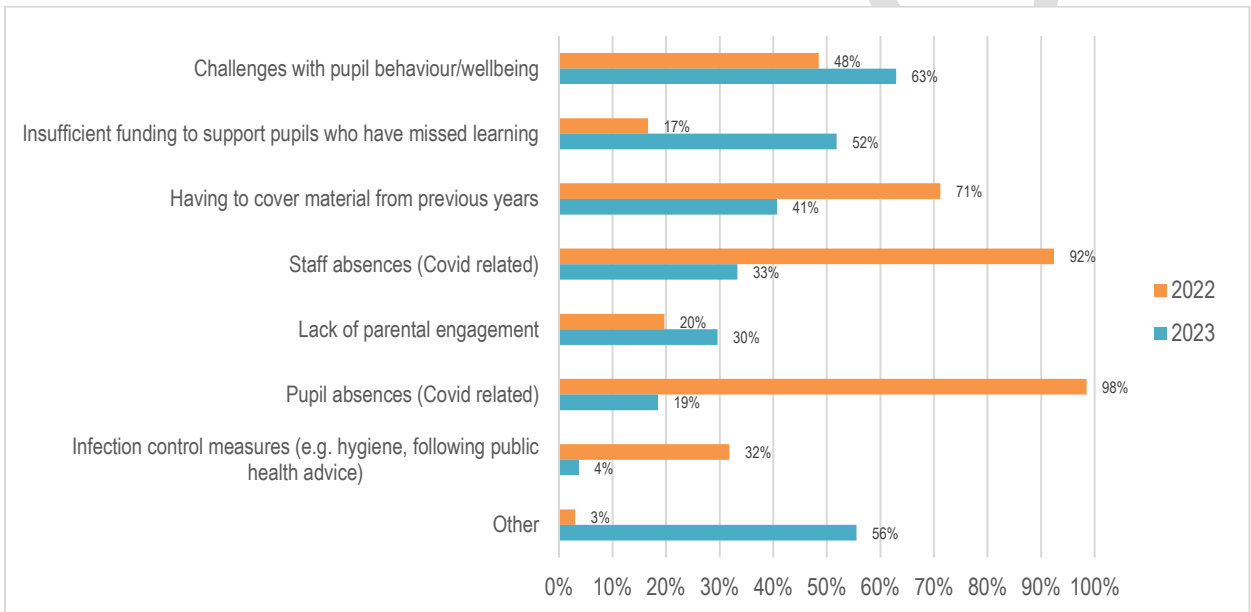


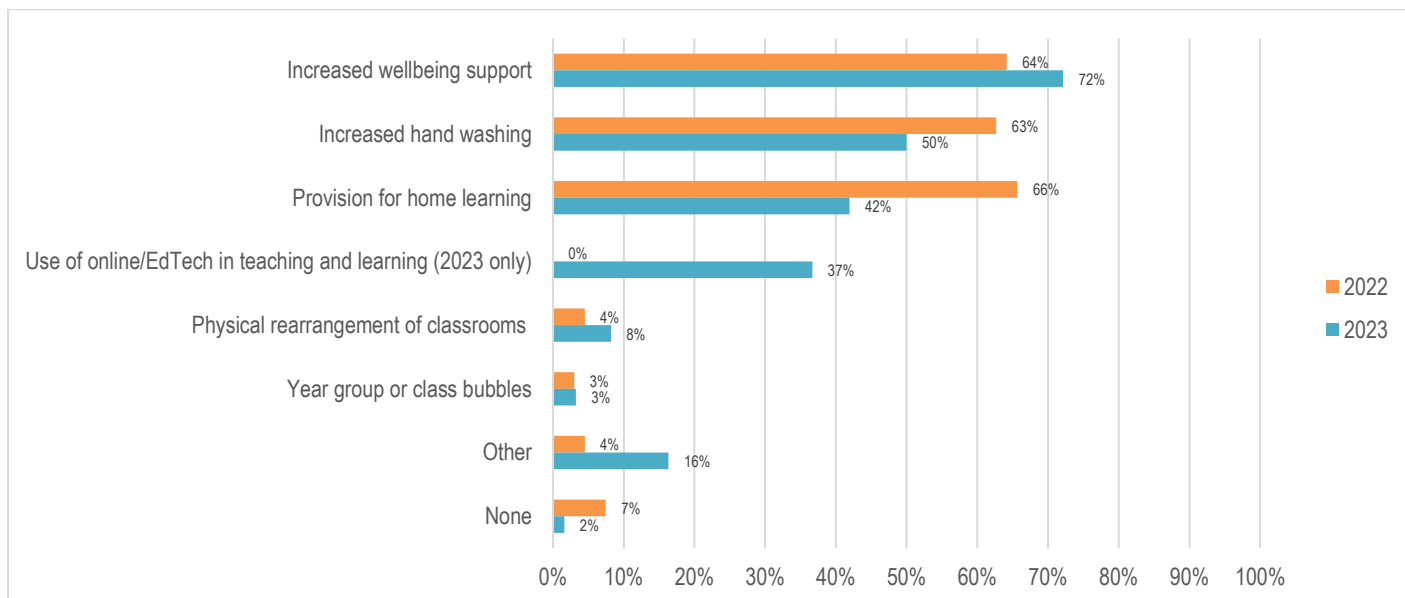
Figure 24: For those reporting disruption: What are the main reasons for this disruption?



Practices retained after the end of Covid-19-related school closures

During the academic years 2019/2020 to 2020/2021, the vast majority of headteachers introduced practices to their schools as a result of Covid-19. In Spring Term 2022, over 90% of schools were found to have introduced year group or class bubbles, increased hand washing, provision for home learning, reduced extracurricular activities, rearranged classrooms, and increased wellbeing support. In 2023, increased wellbeing support and increased hand washing were retained by the majority of schools because they had been found to be an improvement to pre-pandemic practices. Provision for home learning and use of online/EdTech (education technology) in teaching and learning were also retained by a large minority of schools (42% and 37%, respectively). The level of retention of Covid-19-related measures is shown in Figure 25.

Figure 25: Are there any practices that your school has found to be an improvement to pre-pandemic practices and therefore chosen to retain for the future?

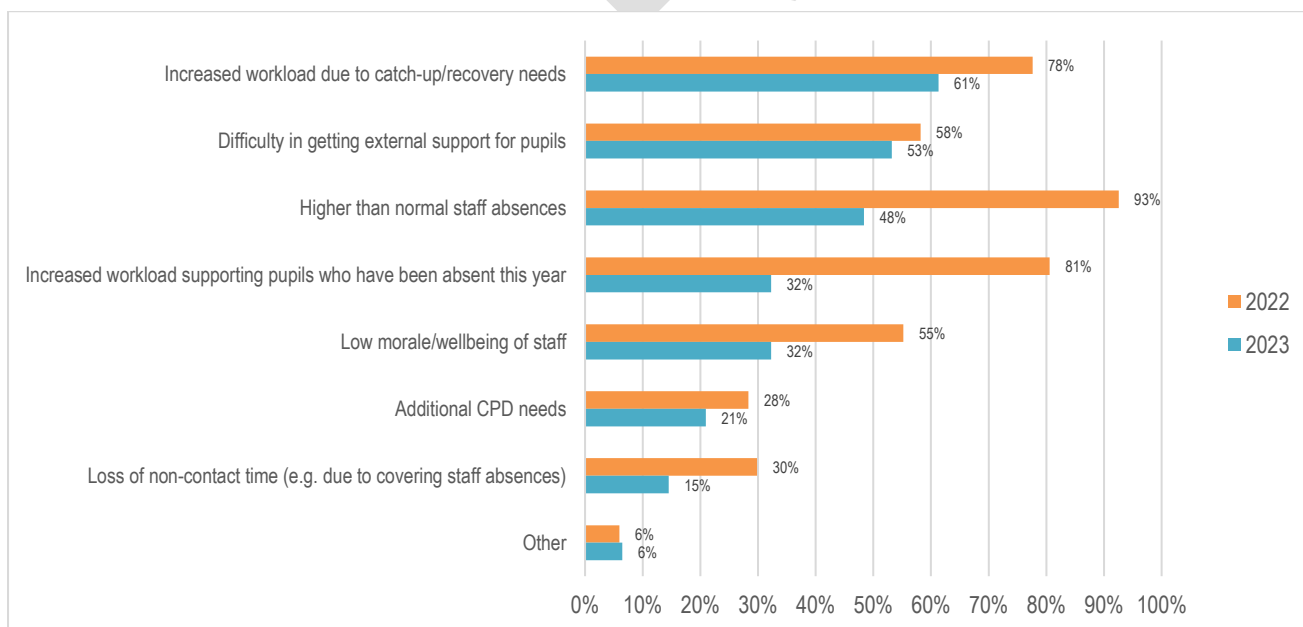


Challenges for school staff in 2022/2023

The challenges of increased workload due to catch-up/recovery needs and difficulty in getting external support for pupils were each reported by a majority of schools as faced by staff in Year 3 and Year 4 (61% and 53%, respectively). Just under half of schools (48%) reported higher than normal staff absences. Figure 26 presents this information.

Compared with Spring Term 2022, there was a decrease in the proportions of headteachers reporting that their staff faced each challenge. Most notably, in Spring Term 2023 the proportion reporting that 'higher than normal staff absence' was a challenge (for Year 3 and Year 4 staff) was 44 percentage points lower at 48%, similarly the figure for 'increased workload supporting pupils who have been absent this year' was 48 percentage points lower, at 32%.

Figure 26: Have any of the following challenges been faced by Year 3 and Year 4 school staff this academic year?



Provision of remote learning for Year 3 and Year 4 pupils

The vast majority of schools indicated that they feel able to support pupils in home learning regardless of whether that is the result of a partial school closure or on an individual basis. However, the proportion of schools using each of the various methods for providing this support has fallen suggesting that the need is not as great as it has been previously. This is also suggested by the reduction in the proportion of schools facing challenges in supporting home. Where home learning is taking place, online and physical resources are now much more widely used than other methods.

Nearly a quarter of headteachers (24%) in 2023 said that they felt 'very well' able to support home learning for pupils absent from school (e.g. those isolating at home because of infection). A further 55% reported they felt 'quite well' able to support home learning, as shown in Figure 27. These figures in 2022 were 31% and 52%, respectively.

When asked how well prepared they felt their school was to deliver effective home learning for all pupils in the event of further school closures, nearly a third of headteachers (31%) said they were 'very well prepared' with only 8% of headteachers saying they were 'somewhat prepared', as shown in Figure 28.

Figure 27: How well do you feel you are currently able to support home learning for pupils who are absent from in-school learning (e.g. when isolating)?

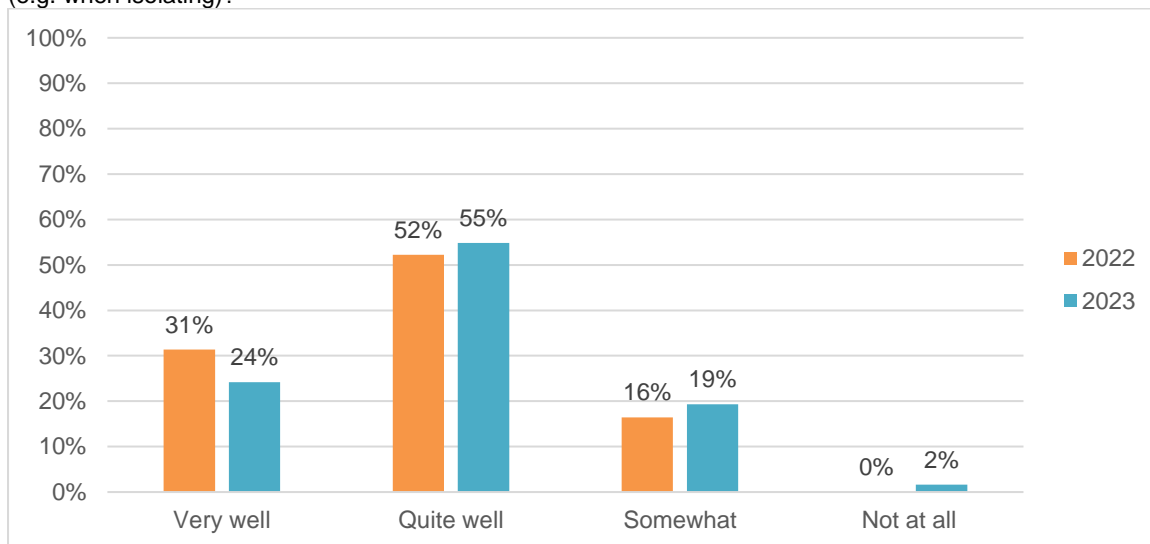
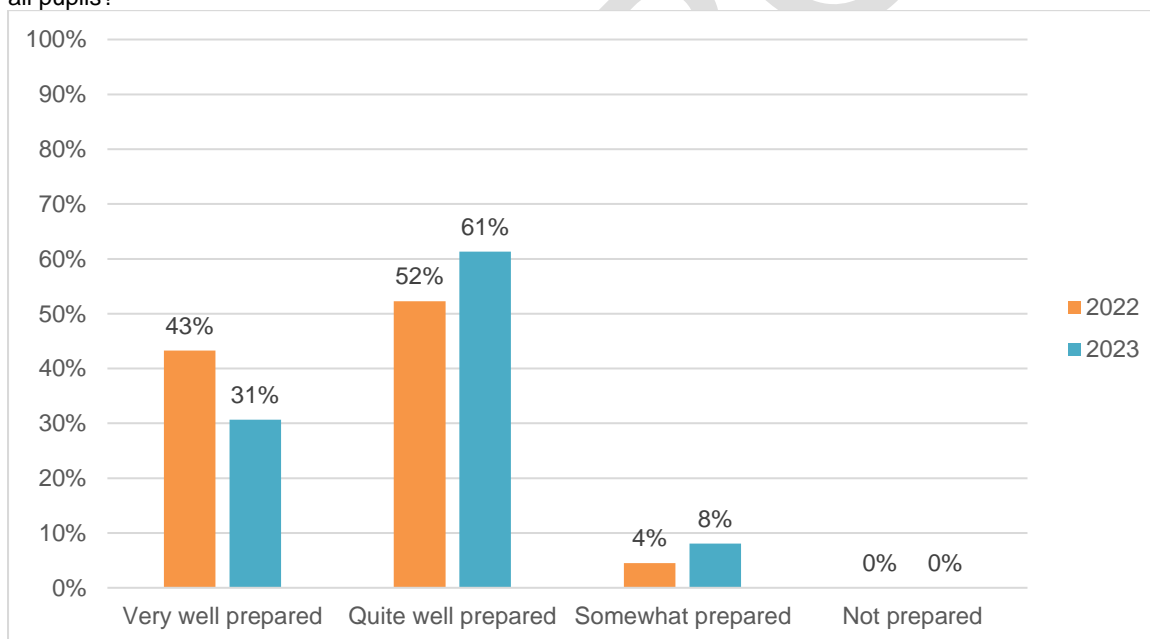
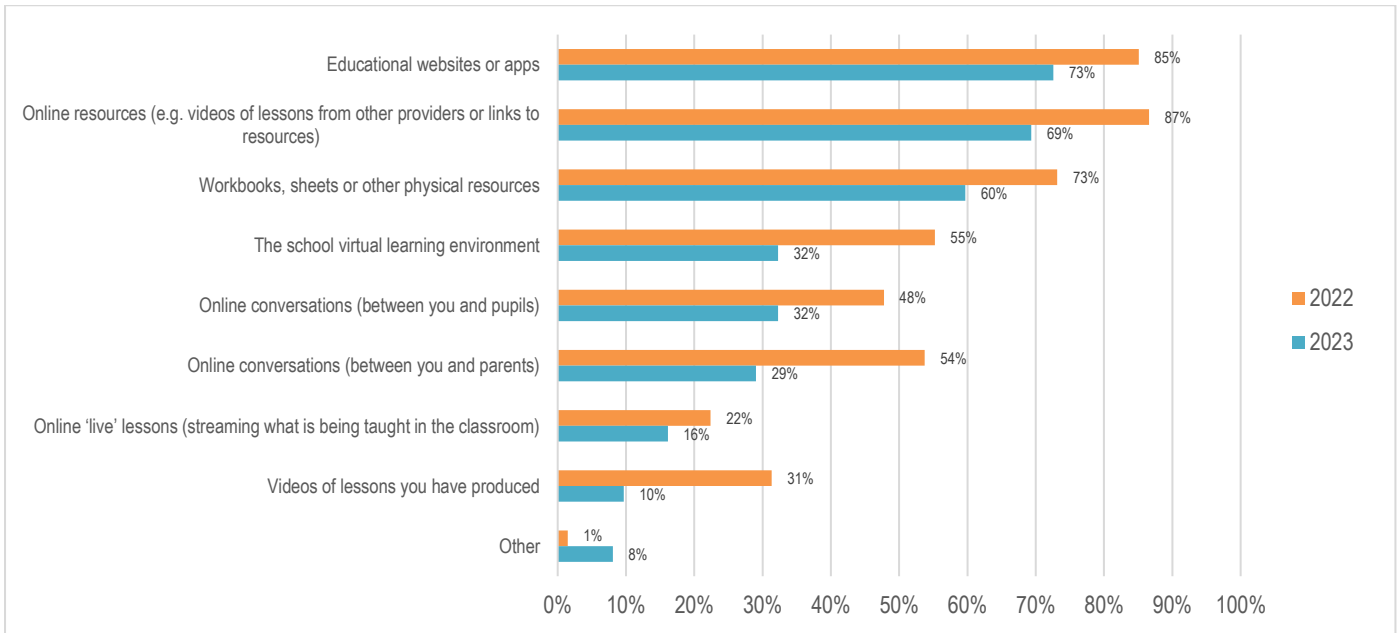


Figure 28: In the event of further school closures, how well prepared do you feel your school is to deliver effective home learning for all pupils?



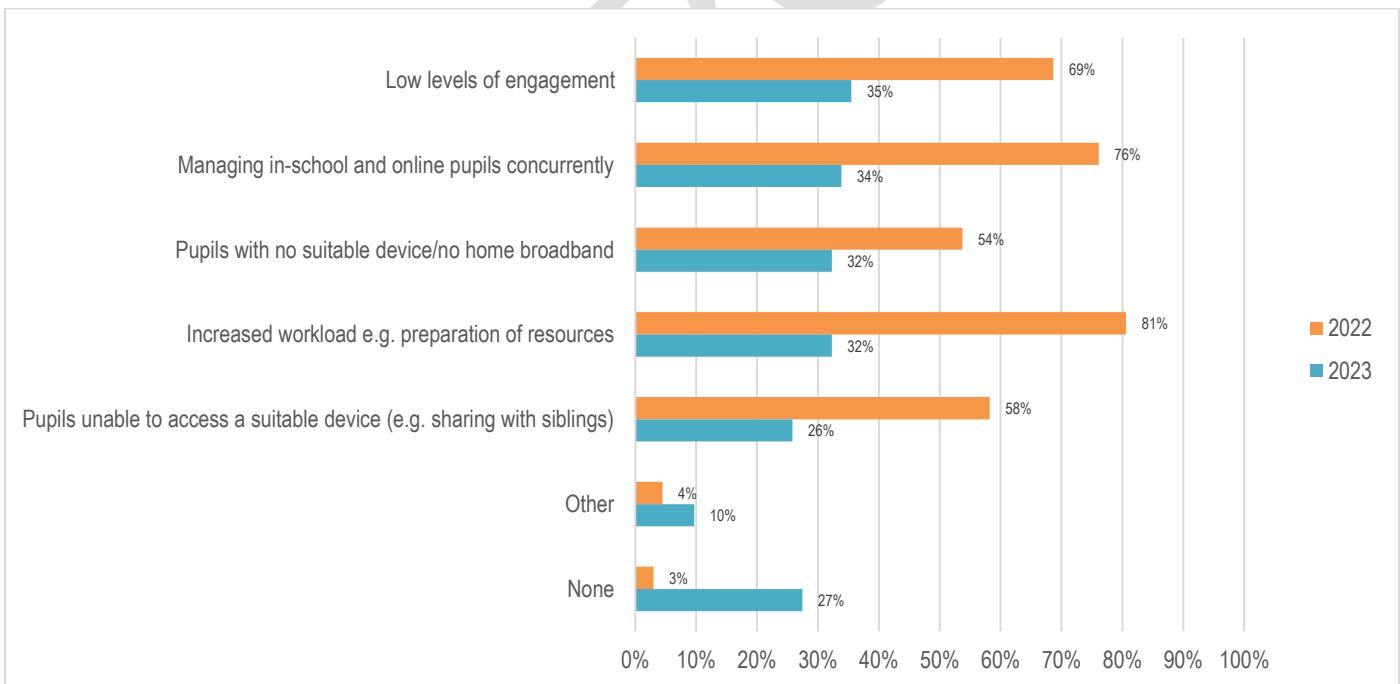
The most common methods for supporting home learning were internet-based: educational websites or apps (73%); and online resources (69%). Workbooks, sheets, or other physical resources were also common, reported by 60% of headteachers. Figure 29 presents this information. In comparison with Spring Term 2022, fewer headteachers reported using these options than in Spring Term 2023. Notably, the use of the school virtual learning environment, online conversations with parents, and videos of lessons each declined by around a quarter compared with Spring Term 2022 findings.

Figure 29: How does your school support home learning for pupils who are absent from in-school learning (e.g. when isolating)?



The proportion of headteachers reporting challenges in providing online learning reduced greatly from 2022 with almost one-third (27%) reporting no challenges at all. In 2022, the greatest challenge reported was that of increased workload for teachers in preparing appropriate resources, closely followed by difficulties in managing in-school and online pupils concurrently. In 2023, these two areas remain two of the greatest challenges, along with pupils not having access to a suitable device or broadband, however all of these affected a much smaller proportion of schools than seen in 2022. Figure 30 shows these findings.

Figure 30: What challenges have you encountered with online learning this year?



Catch-up strategies in 2022/2023 for Year 3 and Year 4

The strategies implemented in schools to aid pupils' learning recovery were similar for both mathematics and reading, as shown in Figure 31 and Figure 32. For mathematics, the most common strategy was small group work (94%); for reading the proportion of headteachers reporting this was 84%. The most common strategy for reading was one to one catch-up support (85%), which was the second most popular strategy for mathematics (66%). The proportions of teachers reporting use of the other strategies were similar for mathematics and reading, except for tutoring through the National Tutoring Programme, which was reported by 45% of teachers for mathematics compared with 37% of teachers for reading.

When compared with Spring Term 2022, the biggest differences were for the strategy of implementing a revised curriculum (down 40 percentage points for mathematics to 26% and down by 29 percentage points for reading to 29%) and staff redeployment (down 12 percentage points for mathematics to 56% and down by 23 percentage points for reading to 55%). In 2022, the option ‘one to one catch-up support’ was not offered; the greater proportions of headteachers selecting ‘Other tutoring’ in 2022 than in 2023 may be a consequence of this difference for both mathematics and reading.

Figure 31: Mathematics: What strategies has your school implemented this academic year to aid Year 3 and Year 4 learning recovery?

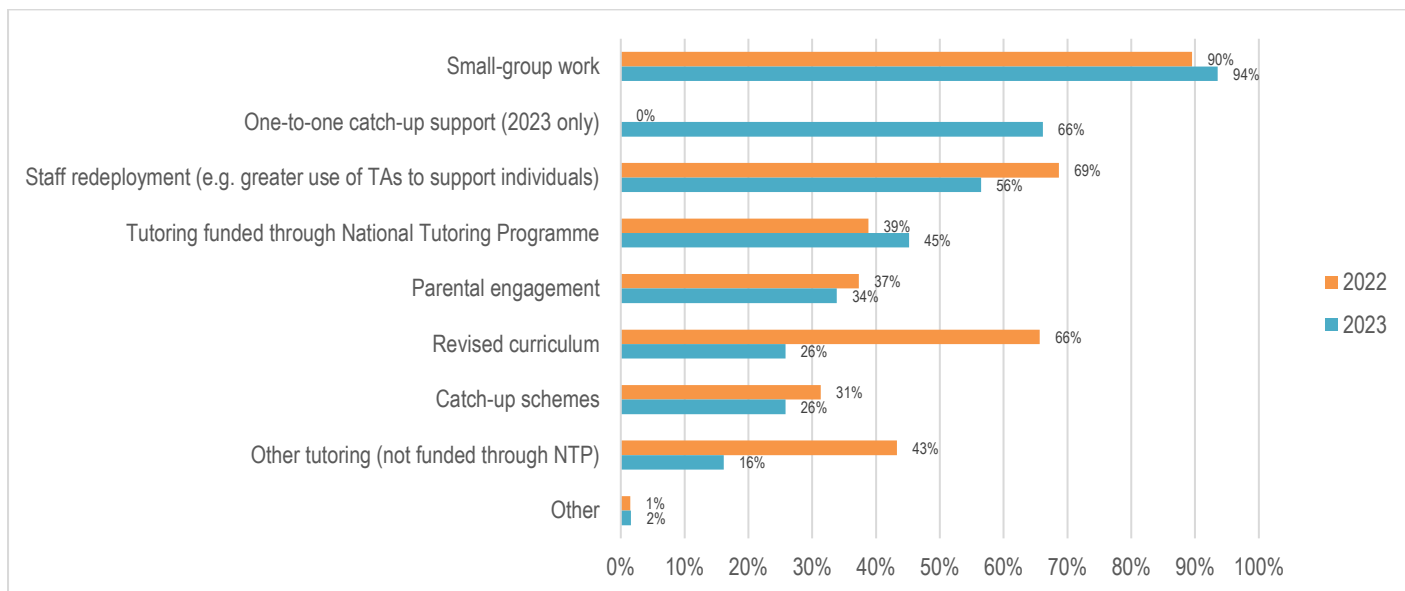
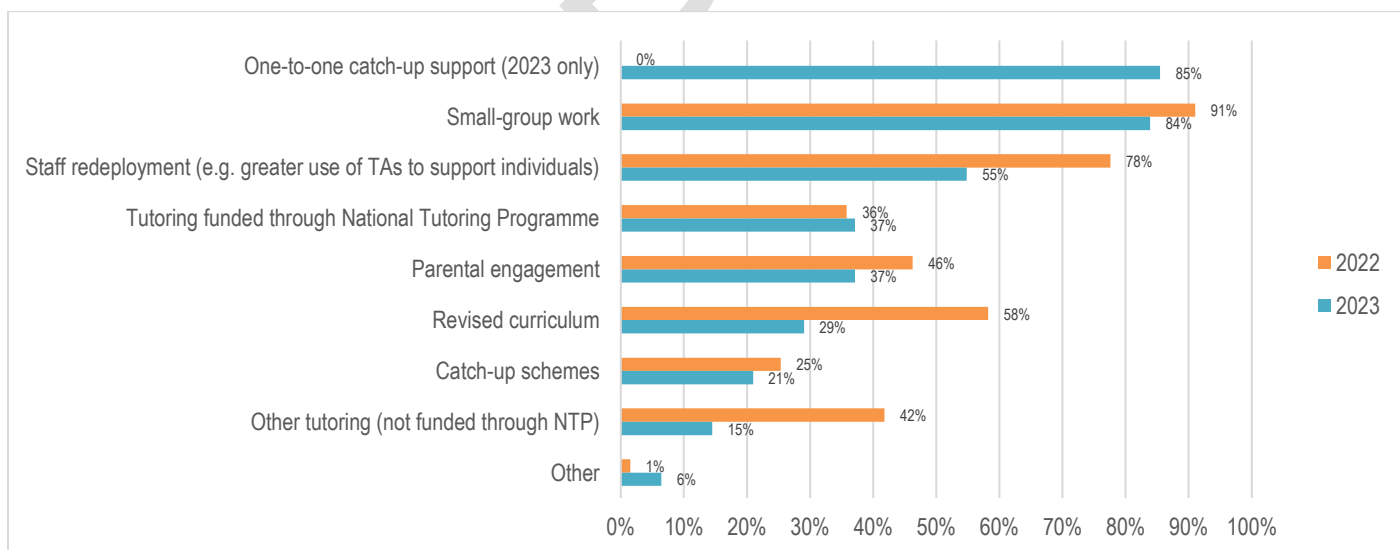


Figure 32: Reading: What strategies has your school implemented this academic year to aid Year 3 and Year 4 learning recovery?



Support for disadvantaged pupils and for low-attaining pupils

Nearly all schools (94%) had provided support for, or had a focus on, aiding learning recovery for very low-attaining pupils this year and nearly three-quarters (74%) had done so for disadvantaged pupils. Of these schools, the type of support most commonly provided for low-attaining pupils was very similar to that provided for disadvantaged pupils. For both groups of pupils, the most popular were mathematics support (95% for low-attaining pupils and 87% for disadvantaged pupils), one to one catch-up support (84% and 80%, respectively) and reading support (74% and 54%, respectively). In most instances, each type of support was more likely to be provided to low-attaining pupils than for disadvantaged pupils. The notable exceptions were small group work and tutoring through the National Tutoring Programme, which were both reported by 48% of schools for disadvantaged pupils compared with 34% for both for low-attaining pupils. The proportions are reported in Figure 33 and Figure 34. These questions were introduced for the first time in Spring Term 2023 in response to the Spring Term 2022 findings.

Figure 33: Which areas has support for disadvantaged pupils focused on?

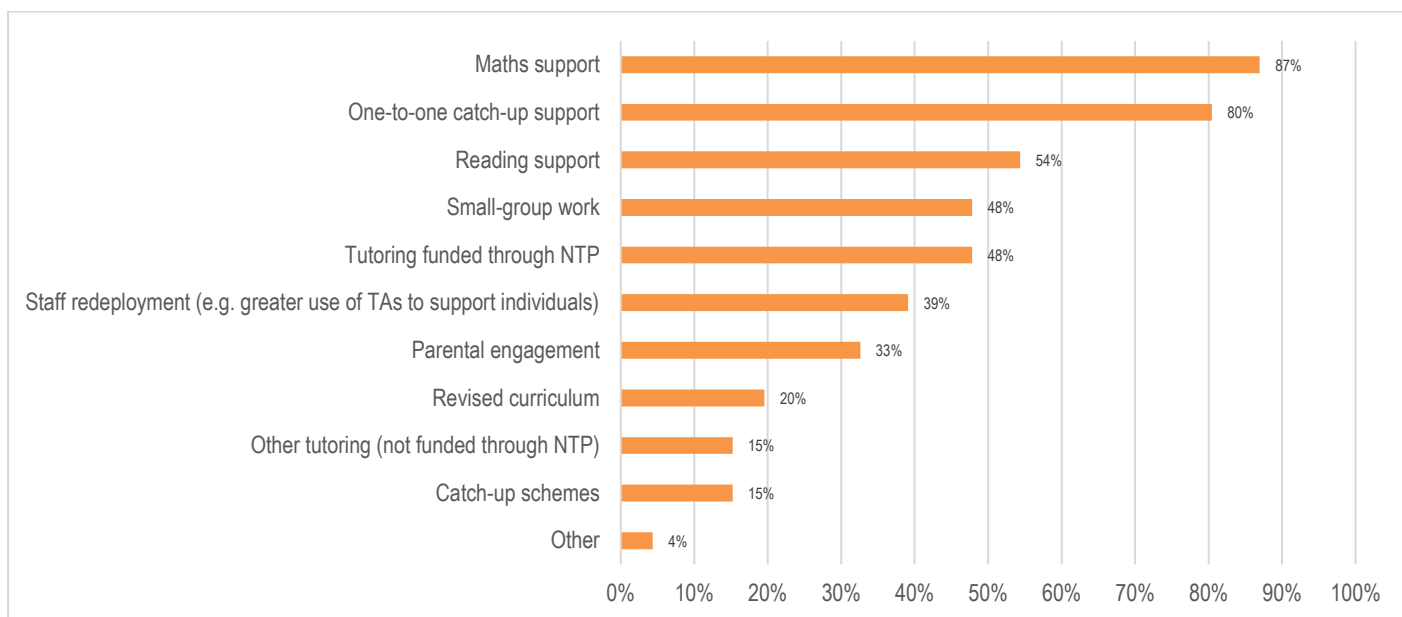
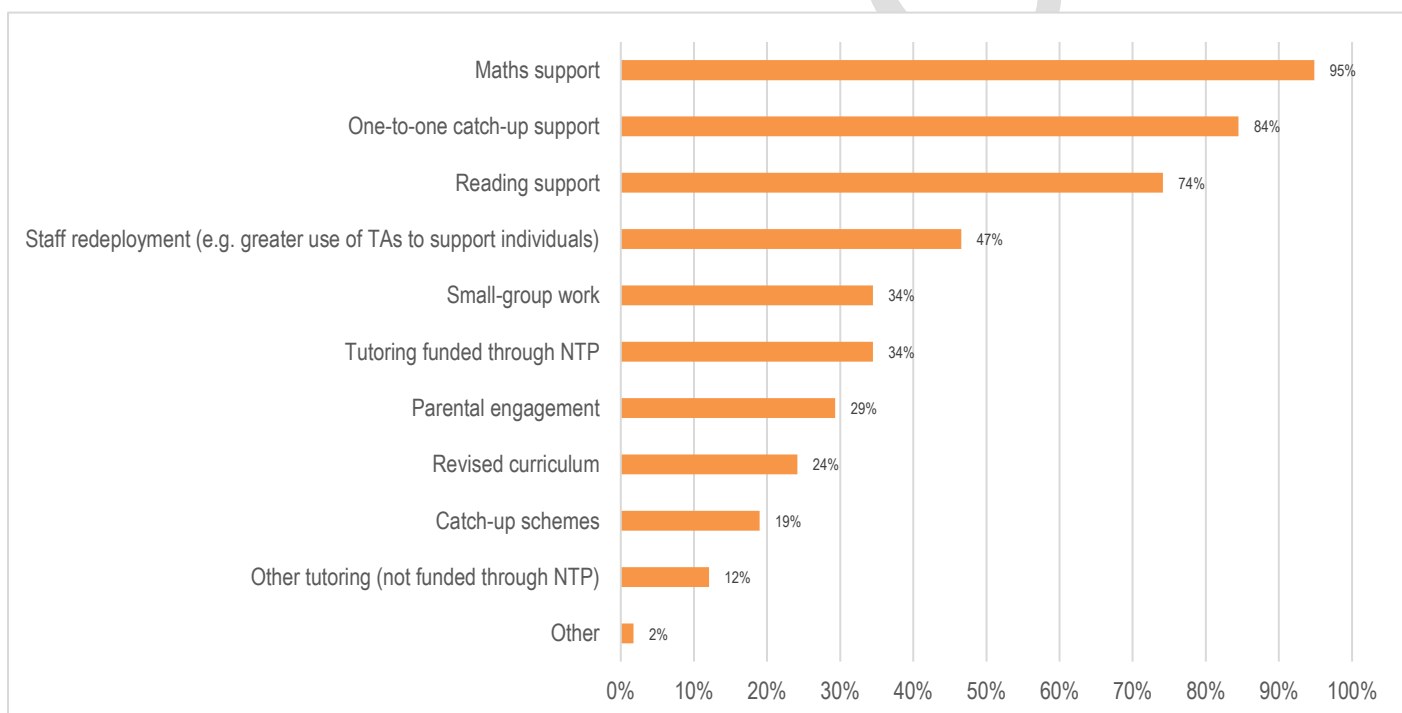


Figure 34: Which areas has support for very low-attaining pupils focused on?



Tutoring funded through the National Tutoring Programme

Nearly half of schools (48%) reported that they were providing tutoring through the National Tutoring Programme for pupils in Year 3 and Year 4 for mathematics and/or reading. (The proportions for each subject were 45% mathematics and 37% reading). Of these schools, a large proportion (83%) were using school-led tuition (existing staff/external tutors with relevant National Tutoring Programme training and employed by the school). Approved Tuition Partners provided tuition in 13% of schools and 13% of schools hosted Academic Mentors in their school.

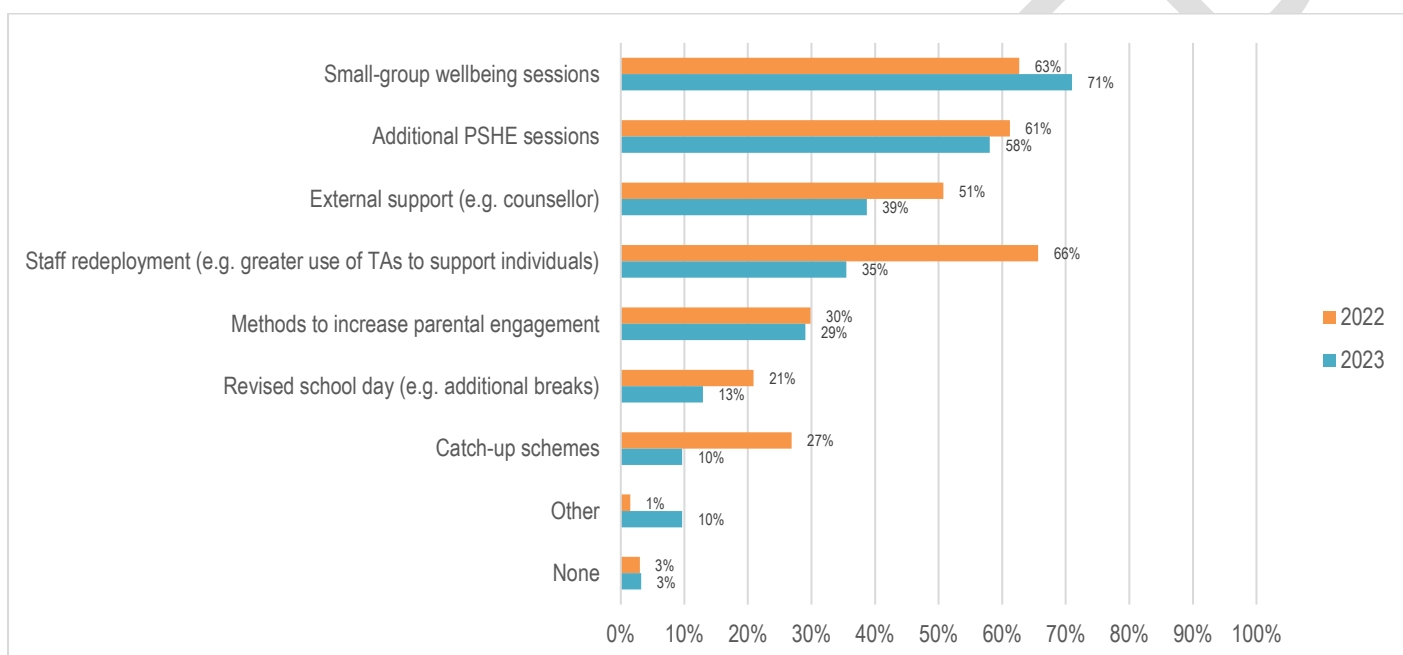
Less than a fifth of schools (16%) reported that they were providing tutoring that was **not** funded through the National Tutoring Programme. Of these, 80% of schools reported using internal tutors or existing staff and 30% of schools reported using external tutors instead of or in addition to internal tutors.

Support for social skills and wellbeing for Year 3 and Year 4

The headteacher responses highlight areas of concern for pupils' wellbeing. As reported in this chapter, 27% of schools reported disruption in the 2022/2023 academic year due to challenges with pupil behaviour and wellbeing, and 53% of schools were struggling to obtain the external support they needed for pupils.

The most common strategy for providing social skills or wellbeing support for pupils was small group wellbeing sessions, reported by over two-thirds of headteachers (71%). Additional PSHE sessions were also reported by more than half of schools (58%). This information is shown in Figure 35. Compared with Spring Term 2022, staff redeployment was less commonly reported, down 30 percentage points to 35%. Catch-up schemes and external support were also reported at a lower level than in Spring Term 2022, down 17 percentage points to 10% and 12 percentage points to 39%, respectively.

Figure 35: What strategies has your school implemented this academic year to provide social skills/wellbeing support for Year 3 and Year 4?



Nearly three in ten headteachers (28%) reported that the level of support most parents were providing to their children in terms of their learning was high, whilst nearly a quarter of headteachers (23%) said it was low. The remaining half of headteachers (50%) said it was neither high nor low. These proportions are similar to those found in Spring Term 2022.

As shown in Figure 36, four-fifths of headteachers (81%) rated the capability of parents to support their children's learning, for example, having the time or resources to support, as the same as that in the previous academic year; and 15% of headteachers reported that it was lower than the previous year. However, when asked about parents' willingness to support their children's learning, just over a quarter of headteachers (27%) said that it was lower than the previous academic year (Figure 37). These figures reflect the pattern found in Spring Term 2022.

Figure 36: How would you rate the level of parental support, in terms of capability compared to the last academic year?

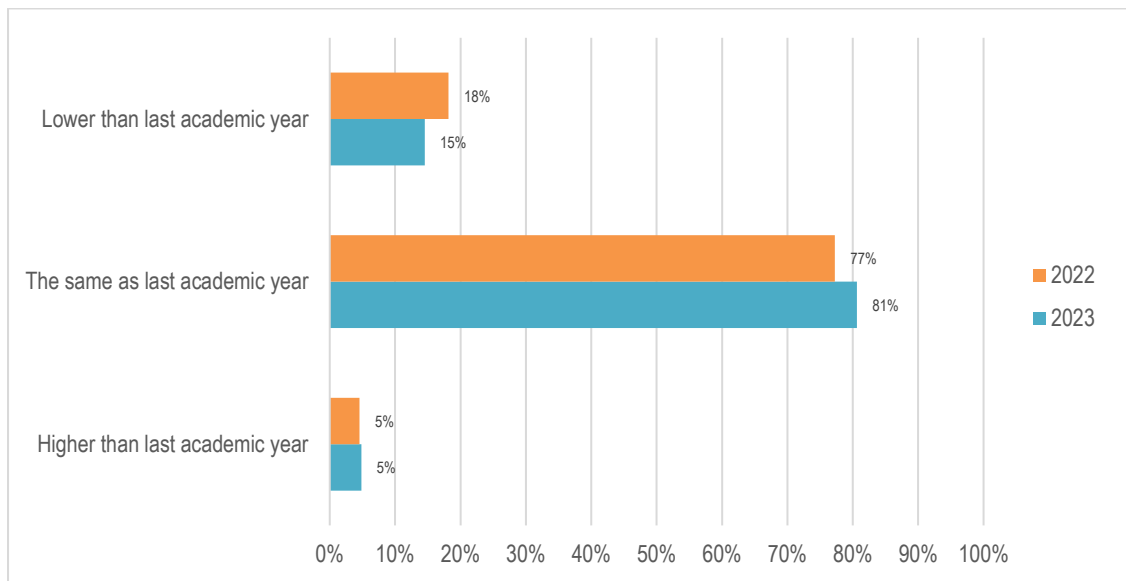
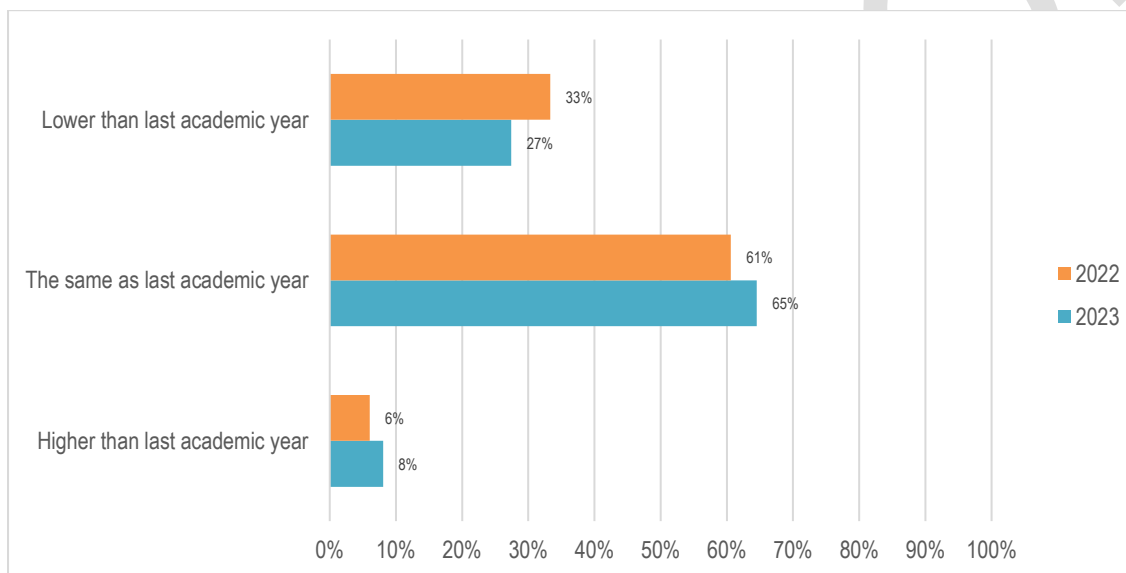


Figure 37: How would you rate the level of parental support, in terms of willingness compared to the last academic year?



Headteachers were asked in an open question whether there was anything further that they would like to report about the learning and recovery of Year 3 and Year 4 pupils in their school for this academic year. Although these mainly related to issues already highlighted, 10% of respondents raised the need for further resilience and self-regulation support and 7% of respondents said that sufficient funding for SEND and availability of appropriate support is an issue.

Research question 5: Are social skills at or behind expectations, and to what extent do they improve between subsequent academic years?

Summary

- PSMAT was found to be a reliable measure, as were the bespoke supplementary items written to investigate a broader range of social skills.
- On average, the social maturity of pupils this year was not different to that found in 2022. Most pupils in Spring Term 2023 were broadly average in terms of their social maturity when compared to the average child of the same age in 2022.
- Pupils eligible for FSM were assessed as having significantly lower social skills than pupils not eligible for FSM.
- Boys were assessed as having significantly lower social skills than girls.

The social skills of pupils in Year 3 and Year 4 in 2022/2023 were measured using PSMAT (Peterson *et al.*, 2007) and bespoke items written for this study. Year 3 and Year 4 teachers were asked to rate 12 randomly selected pupils on the seven PSMAT items and seven bespoke items using a 7-point scale. The centre of the scale (4) represents a rating of 'about average for children this age'. Responses 1 to 3 represent 'less mature than the average child of this age' (from 'very much less' [1] to 'a little less' [3]). Responses 5 to 7 represent 'more mature than the average child of this age' (from 'a little more' [5] to 'very much more' [7]). As discussed in the 'Methods' section of this report, the CSBQ was used to measure the social skills of pupils in the 2020/2021 baseline study (Rose *et al.*, 2021). In the 2021/2022 study (Wheater *et al.*, 2022), the PSMAT was also used to measure social skills, and we are therefore able to make direct comparisons between the social skills of pupils in Spring Term 2022 and Spring Term 2023. In this section of the chapter, we present data on the performance of the PSMAT and bespoke items as a measure of social skills, compare social skills of pupils in Spring Term 2023 with both Spring Term 2022 and with the validation of the PSMAT (with caveats), and analyse the differences in social skills of pupils by gender and FSM eligibility.

Performance of the PSMAT and bespoke items

As found in Spring Term 2022, the PSMAT showed excellent internal consistency for our sample: Cronbach's alpha = 0.97. The supplementary items performed similarly: Cronbach's alpha = 0.97. The sets of items were highly correlated (0.9) and, together, the 14-item scale had a Cronbach's alpha of 0.98. The range of scores for each of the items indicated that teachers were differentiating between children in their responses to the items.

The validation study of the PSMAT was carried out in Australia and reported by Fink *et al.* (2013). It established the convergent validity of the PSMAT with a norm referenced scale, the Social Skills Rating System (SSRS) (Gresham and Elliott, 1990). The first part of the validation study (Study 1) assessed a sample of 145 pupils in Sydney, Australia, with a mean age of six years and six months. The second part of the validation study (Study 2) assessed a separate sample of children on the PSMAT and SSRS longitudinally in Kindergarten, Grade 1, and Grade 2. From an original sample of 114 children in Kindergarten, 96 remained in the Grade 2 group. The sampling in the validation study was poorly documented and appeared non-random.

The mean scores and SDs for pupils assessed in Spring Term 2022 and Spring Term 2023 for the PSMAT and supplementary items, are reported in Table 62 including scores broken down by year group. The mean score for pupils assessed in Spring Term 2022 and the validation mean score in Fink's *et al.*, (2013) validation study were very similar. Fink's *et al.*, (2013) score of 27.26 was within the CI around the mean for the whole sample in 2022 but the average age in the validation study was lower than the Spring Term 2022 cohort. In this study, the mean score from the validation study is just outside the higher limit of the CI around the mean score for all pupils. As noted above, there is insufficient evidence on the quality of the sampling for the validation study. However, if these were reasonable estimates of the pre-pandemic population of Australian children at this age, this comparison suggested that English children post-pandemic are less mature socially.

Comparing findings from Spring Term 2022 with Spring Term 2023, the mean scores are very similar for the whole sample comparisons, within Year 3 (the common year group across samples), within cohorts (e.g. comparing Year 2 in

2022 with Year 3 in 2023), and for both the PSMAT and supplementary items. For each of these comparisons the CIs overlap considerably, suggesting that the level of social maturity of the pupils has not changed.

Table 62: Total mean scores for the PSMAT scale from Spring Term 2022 and Spring Term 2023, plus supplementary items, by year group

Year	Age range (years)	Spring Term 2022				Spring Term 2023			
		PSMAT		Supplementary items		PSMAT		Supplementary items	
		Mean (95% CI)	SD	Mean (95% CI)	SD	Mean (95% CI)	SD	Mean (95% CI)	SD
Year 2	6–7	27.07 (26.47–27.68)	8.53	27.49 (26.89–28.10)	8.55				
Year 3	7–8	26.95 (26.39–27.51)	7.90	27.45 (26.87–28.03)	8.14	26.70 (26.14–27.27)	8.0	27.10 (26.53–27.68)	8.1
Year 4	8–9					26.51 (25.86–27.16)	8.8	27.04 (26.36–27.72)	9.1
Year 2 and Year 3	6–8	27.01 (26.60–27.42)	8.22	27.47 (27.06–27.89)	8.35				
Year 3 and Year 4	7–9					26.61 (26.18–27.04)	8.4	27.07 (26.63–27.51)	8.6

Social skills of pupils measured by the PSMAT and bespoke items

As discussed in the previous section, the mean scores for pupils (in Year 3 and Year 4 combined) in Spring Term 2023 are very similar to those of the pupils (in Year 2 and Year 3 combined) in Spring Term 2022.

There are seven items in the PSMAT scale and seven supplementary items. For each item, a rating of 3 or below indicates the child is less socially mature than children of the age, and a rating of 5 or above indicates the child is more socially mature. A score of 28 (7×4) is representative of a child who, on average, had the expected level of maturity for children of the same age. Using this approach, a score of 21 (7×3) can be taken as a cut-off point, and children scoring 21 or below can be considered to be, on average, not yet at the expected level of social maturity for children of the same age. Similarly, a score of 35 (7×5) and over would indicate that a child was more mature than a child of the same age. We can therefore, use these cut-off points to look in more detail at the social skills of pupils.

Table 63: Percentages of children rated as less, more, or about average in terms of their social maturity, as measured by the PSMAT

		Less mature than average child	About average	More mature than average child
Spring Term 2022	PSMAT	22%	60%	18%
	Supplementary items	21%	59%	20%
Spring Term 2023	PSMAT	25%	60%	16%
	Supplementary items	24%	57%	19%

The majority of pupils were rated as having the same level of social maturity as average children of the same age, with the proportion rated as less mature being slightly larger than those rated as more mature. This gap was greater than that found in Spring Term 2022, as shown in Table 63. Teachers indicated that 60% of pupils had an average level of social maturity for children of the same age on the PSMAT (the same proportion as in Spring Term 2022). Pupils were rated similarly on the supplementary items, with 57% of teachers indicating pupils had an average level of social maturity for children on the same age, two percentage points lower than the percentage in 2022 (at 59%). The differences in the proportions of pupils rated as less than, more than, or about average between the two studies were not statistically significant. For example, the increase in those rated as less mature on the PSMAT (from 22% to 25%) was not statistically significant.

Figure 38A and 38B and Figure 39A and 39B present the proportions of ratings of pupils across both year groups on the PSMAT and supplementary items, respectively. It shows the proportions of pupils rated as less mature than the average child, about average, and more mature. The PSMAT item for which the greatest proportion of pupils were rated as being less mature than the average child of the same age was, 'The child's leadership skills with peers' (44% of pupils).

Of the supplementary items, an item intended to measure emotional regulation, 'The child's ability to deal with minor conflict and disappointment', was the item for which the greatest proportion of pupils were rated as less mature than an average child (38% of pupils) and only 20% were rated as more mature than average. The item, 'The child's ability to make choices for themselves', had the lowest proportion of pupils rated as less mature (28%).

Compared with Spring Term 2022, for each item on the PSMAT scale, the percentage of pupils rated as less mature than average was greater in Spring Term 2023. For the item, 'The overall maturity of the child's social skills', the difference was 5 percentage points greater in Spring Term 2023 (at 37%) compared with Spring Term 2022. The same pattern was seen for the supplementary items, with the percentage of pupils rated as less mature in Spring Term 2023 exceeding that found in Spring Term 2022. The greatest difference (4 percentage points) was for the item 'The child's ability to focus on an activity or task', for which 38% of pupils in Spring Term 2023 were rated as less mature than the average child.

Figure 38: Maturity ratings of pupils on the PSMAT scale, Spring Term 2022 and Spring Term 2023

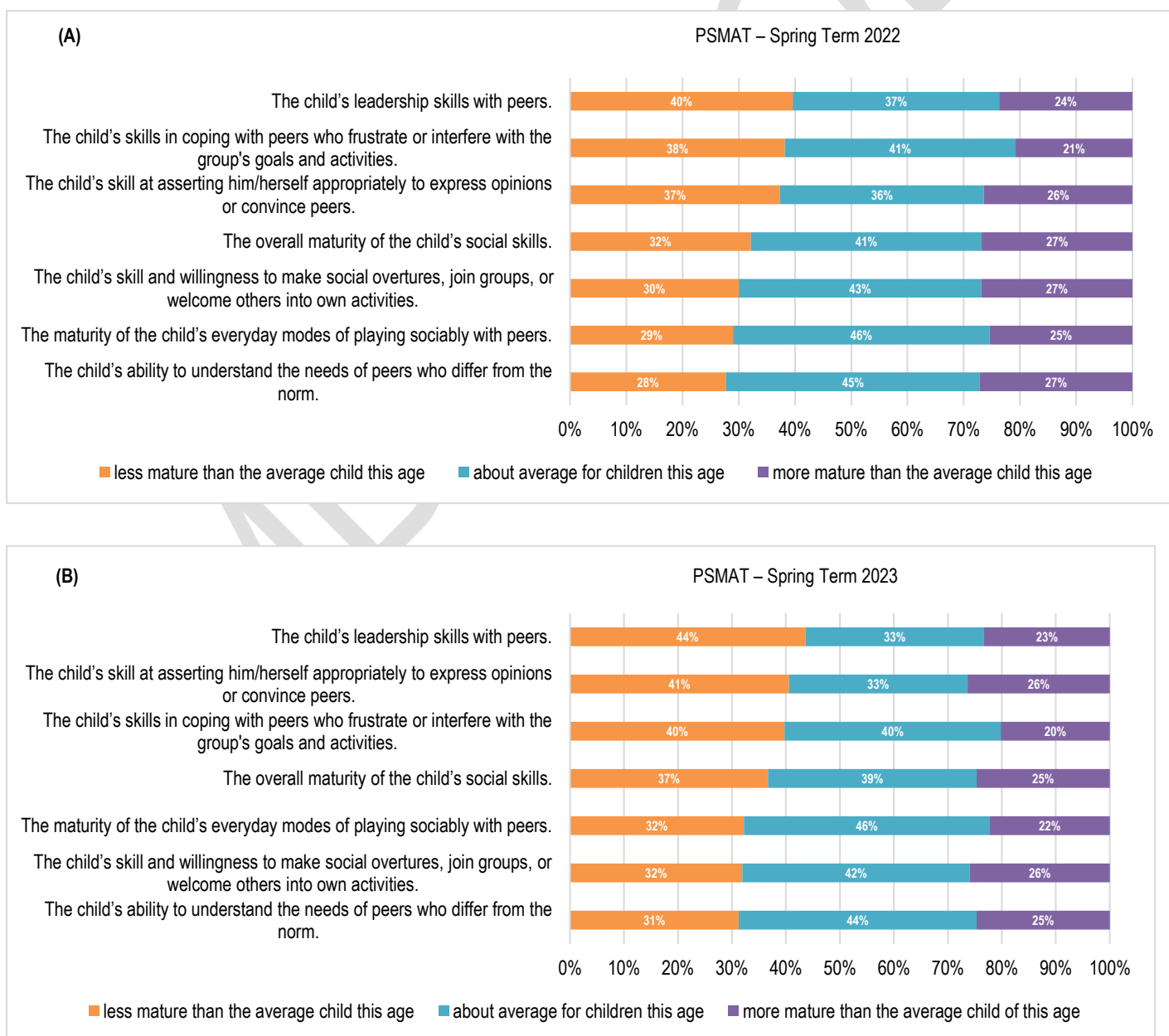
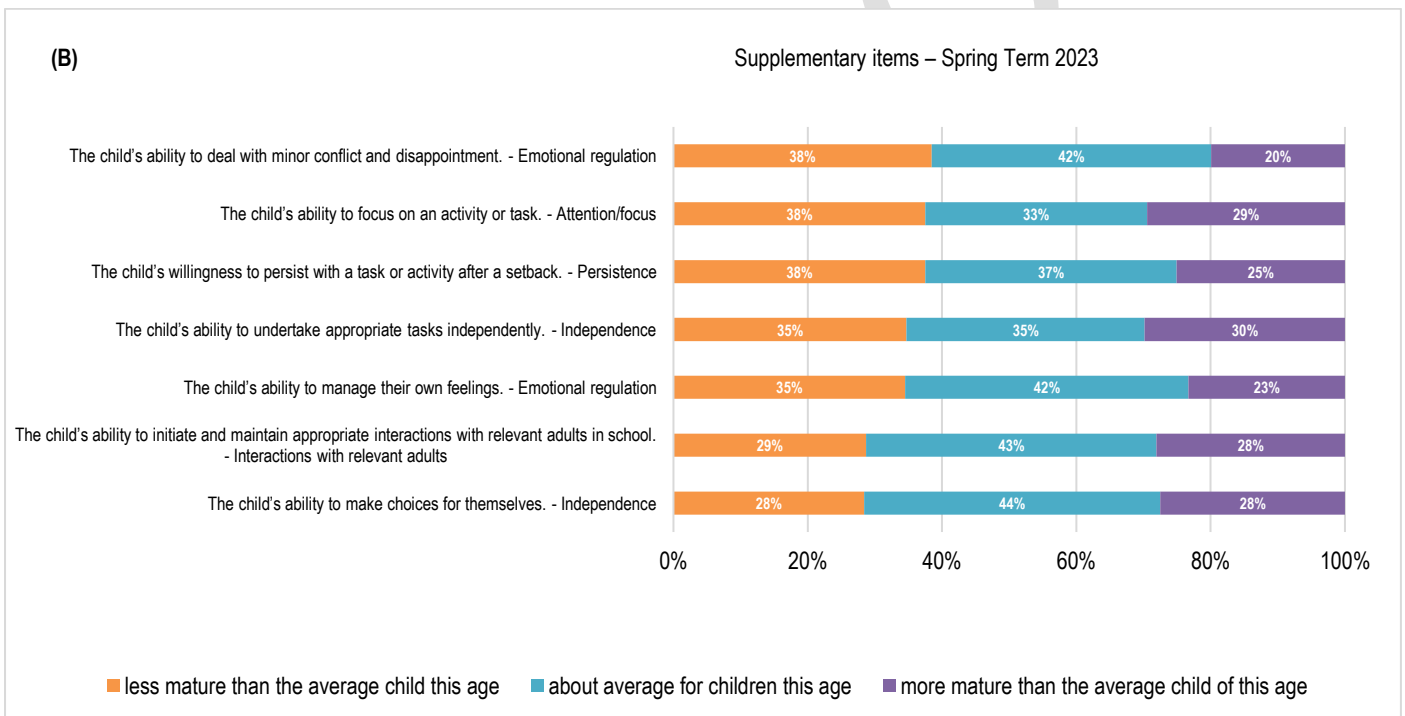
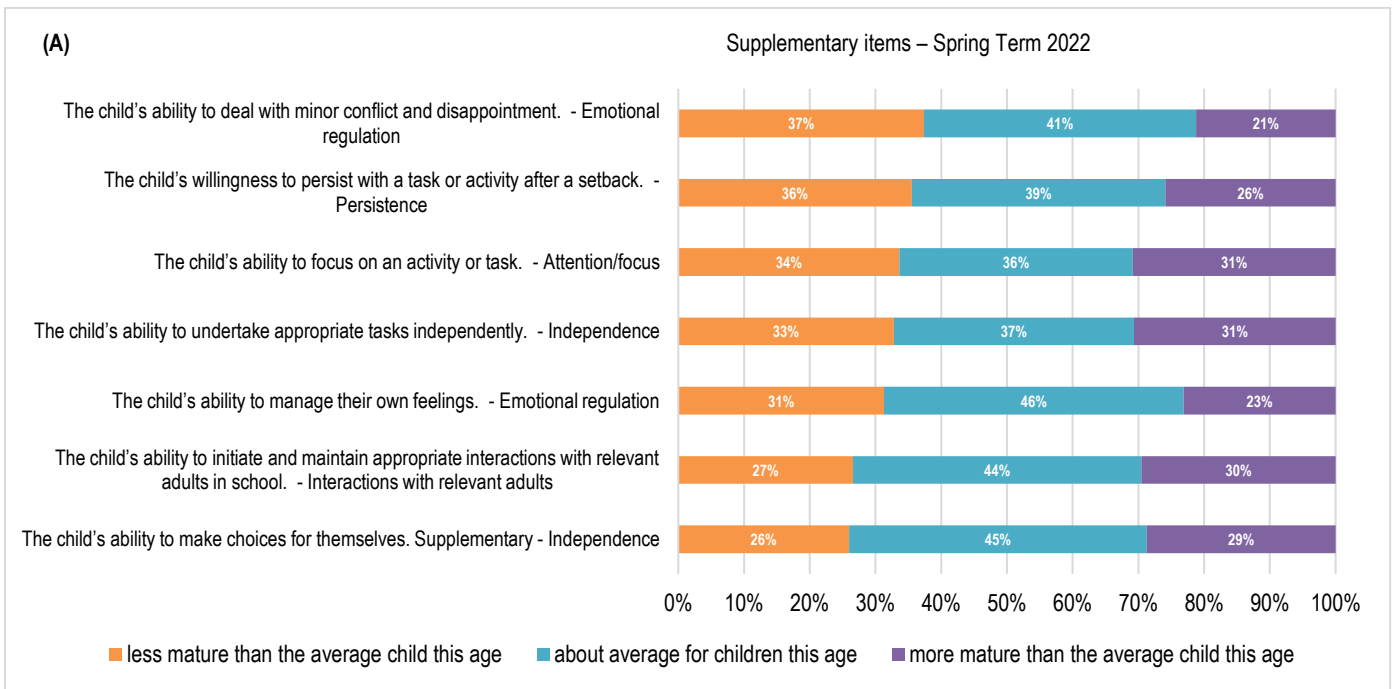


Figure 39: Social skills ratings of pupils on the supplementary items, Spring Term 2022 and Spring Term 2023



Teachers' assessments of their pupils did not indicate areas for concern in the social skills of pupils in Year 3 and Year 4. It should be noted that we do not have a baseline for English pupils established before the Covid-19 pandemic with which to compare these findings with the PSMAT.

Differences in social skills by eligibility for FSM

As found in Spring Term 2022, pupils eligible for FSM were found by teachers to have lower social skills than pupils not eligible for FSM in both the PSMAT and the bespoke supplementary items in Spring Term 2023. These differences were significant. This finding was also found in the baseline study, using a different measure (the CSBQ) when pupils were in Year 1 and Year 2 in the 2020/2021 academic year. On both the PSMAT and supplementary items, pupils entitled to FSM in Spring Term 2023 scored lower on average than in Spring Term 2022, but this difference does not appear to be significant.

Table 64: Total mean scores for the PSMAT scale and supplementary items, by eligibility for FSM

Measure	FSM eligibility	Spring Term 2023		Spring Term 2022	
		Mean (95% CI)	SD	Mean (95% CI)	SD
PSMAT	Eligible for FSM	23.71** (22.77–24.65)	8.43	24.69** (23.52–25.86)	8.90
	Not eligible FSM	27.23 (26.76–27.70)	8.09	27.80 (27.34–28.26)	7.85
Supplementary items	Eligible for FSM	23.93** (22.96–24.90)	8.66	24.82** (23.68–25.96)	8.67
	Not eligible for FSM	27.8 (27.31–28.29)	8.37	28.36 (27.89–28.83)	8.02

** Significantly different at 1% level (comparing pupils eligible for FSM with those who were not).

Differences in social skills by gender

As found in Spring Term 2022, boys in Spring Term 2023 were rated as having lower social skills than girls in the PSMAT and the supplementary items, and these differences were significant.

Table 65: Total mean scores for the PSMAT scale and supplementary items, by gender

Measure	Gender	Spring Term 2023		Spring Term 2022	
		Mean (95% CI)	SD	Mean (95% CI)	SD
PSMAT	Female	28.37** (27.78–28.96)	8.05	28.73** (28.13–29.33)	8.04
	Male	24.95 (24.36–25.54)	8.32	25.67 (25.08–26.26)	8.06
Supplementary items	Female	28.92** (28.31–29.52)	8.25	29.29** (28.69–29.89)	8.10
	Male	25.33 (24.72–25.94)	8.59	26.08 (25.28–26.68)	8.20

** Significantly different at 1% level.

Limitations

The results of this study should be interpreted with some important limitations in mind.

For the cross-sectional analyses, any sample representation checks and weighting that resulted were based on school-level data weighted to pupil numbers. This is not as good as true pupil-level representativeness comparisons.

Additionally, when checking the assumptions for running our linear mixed-effects multilevel models, we observed instances of violation of the normality of residuals assumption. However, given our large sample size, such a violation is not a cause of concern. In fact, studies have shown robustness of linear mixed-effects models to violations of distributional assumptions. Estimates from such models are at worst imprecise in their CIs, but not biased (e.g. see, Schielzeth *et al.*, 2020).

Clearly there are several different reasons why the sample mean and/or distribution shape for different assessments in our study are different from previous standardisation samples, aside from school closures. For example, each assessment in the NFER assessment suite is standardised as a standalone assessment. For both Year 3 and Year 4 the standardisation sample was standardised relatively soon after a new curriculum was introduced, some of the changes observed may, in part, be attributed to the sawtooth effect (i.e. the decrease in performance when a new curriculum is introduced and then improvements in subsequent years). This means that we may be underestimating the Covid-19 gap. We also acknowledge the limitation that this is not conceptually a pure indication of the Covid-19 gap, as schools have implemented a range of additional support strategies and activities prior to the pupils sitting these assessments. The school-level survey was used, as appropriate, to help us interpret the results.

For the analyses that compare assessment scores by FSM eligibility, there is some variation in how that eligibility is defined. For the comparison of standardised overall means at each of the three timepoints (Spring Term 2021, Spring Term 2022, and Spring Term 2023), a pupil's FSM eligibility is defined as it was reported by the school in each of these timepoints. Where FSM eligibility is missing, we refer back to an earlier timepoint and assume it has not changed. We know from Julius and Ghosh (2022) that pupils FSM status may be more likely to change in recent years than previously (relating to changes to Universal Credit and amplified by changes in family circumstances relating to the pandemic), and hence it is sensible that our analysis at each timepoint takes into account FSM status at the time of the assessment.

For the repeated measures analysis however, we use FSM eligibility from January 2020 (i.e. before school closures), to ensure we are tracking the same sample of pupils over time. We believe treating our FSM sample in this way is reasonable for this study, and as such places few limitations on the validity of these results.

In the baseline study, researchers at NFER marked the assessments, using coding, in order to be able to provide detailed diagnostic information to schools. However, in 2021/2022, in response to a number of schools wishing to mark their own assessments, teachers were asked to mark and upload their own assessment data. In 2022/2023, again in response to schools' feedback, we reverted to the assessments being marked by NFER researchers. It was decided that the change to teacher marking in 2021/2022 was not a big risk to the reliability; the mark schemes are specifically designed to be used by teachers and a webinar and helpdesk were provided to help with queries.

Many statistical tests were carried out in the section 'Results' subsection 'Research question 3: Is attainment in some domains in reading and mathematics changing or recovering at a different rate from others?' They were useful in providing some context around the importance of the domain differences seen. However, given the number carried out, the results in the chapter are vulnerable to the family-wise error rate whereby the chance of a Type 1 error (rejecting the null hypothesis when it is, in fact, true) increases well above 5%.

The PSMAT has limitations as a measure of social skills and wellbeing. It is validated for a small sample of Australian children and does not have norms. It was validated longitudinally, but again with a small potentially unrepresentative sample of pupils and, therefore, there is a limit to the conclusions that can be drawn on whether pupils were at 'expected' standards. However, the PSMAT and bespoke supplementary items performed well as a scale. It also identified differences in the social skills of pupils eligible and not eligible for FSM, and differences between girls and boys. The change in measure from the CSBQ in the baseline study to the PSMAT with additional bespoke items means that comparisons cannot be made to the baseline. However, this study compares its findings with those from the 2021/2022 study, which does enable valid comparisons to be made.

Discussion and implications

The disruption faced by schools between Spring Term 2020 and Summer Term 2021 was unprecedented, with partial school closures and a move to online learning. Our study shows that in 2023, disruption overall was much reduced from 2021/2022 but that schools are still facing challenges as a result of the pandemic. Whilst some of the key challenges from last year, such as high levels of pupil and staff absence, were reported by a smaller proportion of schools this year, a greater proportion of schools in 2022/2023 than in 2021/2022 reported challenges with pupil behaviour and wellbeing along with insufficient funding to support pupils who have missed learning.

Previous evidence on recovery in the 2020/2021 academic year, immediately after the pandemic, highlighted the different challenges faced by pupils at different stages of education (such as reviewed by Twist *et al.*, 2022; and EEF, 2022b). All age groups had lower attainment, but within primary school, for Key Stage 1 pupils, reading was the subject most affected. For Key Stage 2 pupils, mathematics attainment and writing were most affected; this persisted into the 2021 academic year as demonstrated by the 2022 Key Stage 2 data (DfE, 2022b). In the second year of the study, we found that whilst pupils had on average caught up in mathematics in Year 2 and Year 3, and in reading in Year 3, the negative impact of school closures on learning was still evident in Year 2 pupils' reading (Wheater *et al.*, 2022).

Now three years on from the first school closures, the evidence on recovery, whilst promising, remains mixed. Our study shows positive results for the 2022/2023 academic year for both Year 3 and Year 4 pupils in both subjects, indicating that the strategies, which schools have put in place, appear to be supportive of reducing the impact of the disruption to learning of pupils in our study. In Year 3, there was no significant difference in the reading performance compared with the pre-pandemic 2017 standardisation sample and in mathematics they performed significantly higher than the pre-pandemic 2017 standardisation sample. In Year 4, the reading performance was significantly higher than before the pandemic whilst in mathematics there was no significant difference. These results suggest that the strategies implemented by teaching staff, such as small group learning, one to one support, and effective use of Teaching Assistants to support pupils in their recovery have been well targeted.

However, other recent studies using different samples of schools and including different year groups find other trends in the data. A study by Andrews (2023) has found a slightly different trend in children's assessment scores (using Renaissance Learning, Education Policy Institute, 2021), with readers (from Year 3 to Year 9) having caught up on average to pre-pandemic levels, whilst pupils' mathematics learning (Year 3 to Year 6) had on average not yet caught up. The latest Key Stage 2 results in 2023 show that the proportion of children who met expected standards in mathematics was up from the previous year but is below pre-pandemic levels, and those meeting expected standards in reading was slightly down from the previous year but is similar to pre-pandemic levels (DfE, 2023).

Our study does still raise concerns as behind the success of the average attainment of the overall cohort are two worrying findings. These are the numbers of very low attainers in Year 3 reading, and the wide disadvantage gap in all areas. There is an element of overlap in these two groups (i.e. low attainers and disadvantaged pupils). In our study, around 20% of the whole cohort of pupils are disadvantaged but they are over-represented within the very lowest attainers with around half of these being disadvantaged.

In Spring Term 2022, we saw an increased proportion of very low attainers in both subjects in both year groups when compared with before the pandemic. These were pupils who were unable to engage effectively with the assessments. Headteachers in the vast majority of schools indicated that they had implemented strategies this year to specifically target this cohort of pupils and the results suggest that this has been very effective. In Year 3 mathematics and Year 4 reading, the proportions of low attainers is now comparable to pre-pandemic figures and in Year 4 mathematics has decreased to below that seen before the pandemic. However, in Year 3 reading, the cohort of pupils who would have been in Reception during the school closures, the proportion of very low attainers is nearly twice as high as the pre-pandemic sample. This represents a substantial challenge for teachers and support staff in each class and particularly in schools in disadvantaged areas who are more likely to have higher proportions of lower performing pupils (Julius and Ghosh, 2022).

Research into the impact of the pandemic on attainment has found that the disadvantage gap widened further (Rose *et al.*, 2021; Blainey and Hannay, 2021). Our study shows that the disadvantage gap in reading in both year groups is wider than before the pandemic and has not decreased since Spring Term 2021. In both year groups, although reading attainment improved between 2021 and 2023 for both disadvantaged and non-disadvantaged pupils, there was not a reduction in the disadvantaged gap for reading. However, the disadvantage gap in mathematics in both Year 3 and Year

4 has reduced since 2021 despite still being wider than pre-pandemic estimates. Other studies also highlight the continued disparity between disadvantaged pupils and their peers (Andrews, 2023; Kennedy and Strietholt, 2023).

The impact of the wide disadvantage gap in both year groups and subjects and the increased number of low-attaining pupils in Year 3 reading will continue to be demanding of both teacher and support staff time. The vast majority of schools indicated they had provided additional mathematics support for both disadvantaged pupils and low attainers and the improvements seen in these areas suggest this is starting to positively impact their recovery. Whilst the majority of schools had also implemented additional support in reading, the proportion was lower than for mathematics. This study highlights the importance of policymakers ensuring that schools have the appropriate resources to identify these pupils and provide targeted support as they progress through primary school. This is particularly important as schools' budgets are squeezed and are having to make difficult decisions about how to allocate funding.

As was the case in the 2021/2022 study, we found that headteachers continue to be concerned for the wellbeing of pupils. This remained an area of increased focus for schools in 2023 with the majority reporting that they had implemented small group wellbeing sessions as well as additional PSHE education sessions for pupils. Pupil behaviour and their wellbeing was identified as the challenge faced by the greatest number of schools. Whilst the social skills of pupils do not appear to be a concern overall, disadvantaged pupils are significantly below their peers.

This study has followed children from the point in Key Stage 1 in 2020 when they were in Year 1 and Year 2 and first returned to school following the first set of partial school closures. It shows that, whilst there are some encouraging signs of recovery, there are still groups of pupils where the disruption to their learning continues to impact on their attainment. It raises particular concerns about the impact disadvantaged pupils and on the lowest attainers in Year 3 reading, and about the impact of the pandemic on children's wellbeing and behaviour (emphasised particularly in this year's school survey).

Despite the signs of recovery, it is not yet clear if these are embedded trends, or how long catch-up support may be needed for, for recovery to be sustained. This year's findings (in 2023) all highlight the importance of continuing to track the pupils involved in this study so that interventions and resources based on the learning they have missed can be appropriately targeted as they continue to move through school.

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Appendix A: Ethics, data protection, and team

Ethics

Ethical approval

This research project received ethical approval through NFER's standard project start-up procedures and Code of Practice group.

Ethical agreement from schools to take part

NFER was responsible for recruiting schools for this research. Schools that had taken part in the last two years of the study were contacted via email in late November 2022. This communication was addressed to the study contact person from the 2021/22 academic year. Since these schools had signed a Memorandum of Understanding (MOU) in 2021/22 for two years, they were asked to confirm the contact person at the school, rather than for their agreement to participate, by completing a short online survey. Schools that had participated in the first year only were also invited to take part again and asked to complete a MOU should they wish to re-engage with the study. This communication was addressed to the headteacher and sent to the school email address. The letter gave information on the aims of the research, what the school would be required to do before and after completing assessments and surveys, and the benefits of the research. At the invitation stage, all schools were sent a link to the published report from the previous academic year to encourage their participation by demonstrating the importance of the study. Schools had access to a dedicated project page on the NFER website and the School and Parent 20, which were updated from 2021/22 to reflect the study was entering its third year and now focused on pupils in Year 3 and 4.

Once schools had completed the online survey/MOU to indicate their participation, they were asked to check and update details of their Year 3 and Year 4 pupils that had been collected in previous years of the study (name, date of birth, unique pupil number (UPN), gender, free school meals (FSM) status, year group, and class), to indicate any pupils that had left the school and to add any new pupils. A parent information sheet and withdrawal letter were uploaded to the school portal for schools to share with their Year 3 and Year 4 parents. This gave parents the option to prevent their child's data from being shared, stored, or used in this research. Forty-one pupils were withdrawn by their parents during the pupil data collection process and a further five later on in the project.

Copies of these documents are included in Appendix B.

Data protection

Data protection statement

All data gathered during the research was and will be held in accordance with the data protection framework created by the Data Protection Act 2018 and the General Data Protection Regulation (GDPR) 2016/679 and was and will be treated in the strictest confidence by the NFER. No individual or school will be identified in any report.

Legal basis for processing personal data

NFER was the data controller during this research. Our legal basis for processing teachers' and pupils' personal data is covered by GDPR Article 6 (1) (f) which states that 'processing is necessary for the purposes of legitimate interests unless there is a good reason to protect the individual's personal data which overrides those legitimate interests'.

We carried out a legitimate interest assessment, which demonstrated that the research fulfilled one of NFER's core business purposes (undertaking research, evaluation, and information activities). The research project has broader societal benefits and contributes to improving the lives of learners by identifying whether any pupil-level factors are associated with the degree of impact of the Covid-19 school closures on pupils' attainment and their recovery over the 2021/22 academic year. We considered and balanced any potential impact on the data subjects' rights and found that our activities will not do the data subject any unwarranted harm. Therefore, it was in our legitimate interest to process and analyse the personal data described below in order to administer the research.

Personal data processed

The personal data processed for this research was:

- Name, job title and contact details for a nominated named teacher within a participating school to liaise with about this research.
- Pupil name, date of birth, gender, UPN, year group, class name, school name, and FSM status. This data was required for survey weblinks, analysis and to match their personal data to background data from the National Pupil Database (NPD) for archiving.
- Teachers provided information about a sample of pupils' social skills to explore what impact the school closures may have had on the social skills development.
- The nominated teacher was also asked to complete a voluntary survey providing feedback of their experience of the project and working with NFER. The School Privacy Notice was updated in June 2023 to reflect this request.

No special category data was processed in this research.

Data security/transfer

All personal data provided electronically was done using the NFER's secure school portal. All researchers involved directly with pupils and their data had up-to-date DBS (Disclosure and Barring Service) checks. NFER survey administrations obtained personal data in accordance with the GDPR and other applicable legislation.

Data sharing

For the purposes of research archiving, school-level data and pupils' test data and survey responses will be linked with information from the NPD and shared with the Department for Education (DfE), the EEF's archive manager and in an anonymised form, with the Office for National Statistics (ONS), and potentially other research teams. Further matching to NPD and other administrative data may take place during subsequent research. No individual or school will be named by NFER in any report for this research and individual views from teacher interview data will not be shared.

Data retention and deletion

Data collected for this research will be stored securely in NFER systems until the final report in this research project is published. This is currently expected to be September 2024. NFER will securely delete all personal data from its systems within one year of publication of this final report. After three months from the completion of the research, all of the de-identified matched pupil data will be added to the EEF archive. At this point, EEF becomes fully responsible for the data (sole data controller) and NFER is no longer the data controller. Other research teams may use the de-identified data as part of subsequent research through the ONS Approved Researcher Scheme²⁵.

Right to withdraw

Schools and parents were provided with privacy notices explaining how their data will be collected, used, and how they can withdraw from the research project at any time. Schools were asked to make the Parent Privacy Notice and Parent Opt-out/Withdrawal form available to parents using their usual channels. Both Privacy Notices (see Appendix B) were available via links on the project pages of the NFER website and also uploaded to the school portal.

Project team

NFER

Susan Rose	Project leader
Pippa Lord	Project director
Ben Styles	Project consultant

²⁵ <https://www.ons.gov.uk/aboutus/whatwedo/statistics/requestingstatistics/approvedresearcherscheme>

Liz Twist	Project consultant
Rob Ager	Researcher
Tara Paxman	Researcher
Jose Liht	Statistician
Gemma Schwendel	Statistician
Simon Rutt	Statistician
Sarah Millar	Test and school administration lead
Rob Green	Data manager
The EEF	Ignacia Valenzuela

EMBARGOED

Appendix B: Recruitment documents

Invitation letter to schools that participated in 2021/2022



RPO/LLON/41713/2

School Name:

NFER No:

Dear School Contact,

Impact of Key Stage 1 school closures on later attainment and social skills: findings from 2021/22 and next steps for 2022/23

Over the last two years, you and your pupils have taken part in a unique longitudinal study. It follows the youngest school-aged children during the Covid-19 pandemic to understand the long-term impact of covid and school closures on their attainment and social skills.

We are delighted to share the findings from the study in the 2021-2022 academic year. Your and your pupils' participation in this research has shown that many pupils have caught up, but that the pandemic has led to a large increase in very low attainers and that the disadvantage gap remains wide. We, EEF and the teaching unions are using this research to highlight the importance that schools are both adequately funded and supported to ensure that the required long-term support can be delivered.

<https://www.nfer.ac.uk/impact-of-covid-19-related-school-closures-in-key-stage-1-on-attainment-and-social-skills-of-pupils-in-year-2-and-year-3-in-academic-year-20212022/>

Thank you for your support. We look forward to continuing to work with you, following your agreement in Autumn 2021 to participate in this important study in two academic years (2021-2022 and 2022-2023).

Following your feedback, we have made some improvements to your experience of participating in 2022/23

We ask you to assess your Year 3 and Year 4 pupils with NFER spring tests, complete a school-level questionnaire and a social skills survey for a sample of 12 pupils per year group.

We are mindful of the pressures and challenges schools face. Last year we asked you to mark and upload your pupils' data. This year, NFER will mark the tests and provide you with your pupils' item level outcomes.

We are providing you with the same benefits of taking part, in addition to NFER completing your marking

- Free mathematics and reading assessments for your Year 3 and Year 4 pupils in spring 2023.
- Free marking service and upload of results to the NFER Tests Analysis Tool (if your pupil data is online).
- A discount of 20% on any two year-groups worth of assessments, purchased between April 2023 and December 2023.

- Feedback on the project findings.

Additional information on this study, and a privacy notice, can also be found here - <https://www.nfer.ac.uk/for-schools/participate-in-research/impact-of-ks1-school-closures-on-later-attainment-and-social-skills-study/>.

Next Steps

We are looking forward to working with you again on this important research. Please follow this link to confirm your contact details by **Friday, 9 December 2022**.

«Participation_Survey»

We are also keen to understand your experience of taking part in the research last academic year to improve our processes. We would appreciate you completing this short feedback survey, which should take you no longer than five minutes.

«Feedback_Survey»

We are very grateful for your continued participation in this study. Your assistance will enable us to provide strong evidence for the support pupils and schools need. Please be assured, that we will do everything we can to help you participate.

If you have any queries, please contact my colleague Jessica Fathers on 01753 637 033 or via email at KS1AttainmentResearch@nfer.ac.uk.

Yours sincerely,

Kathryn Hurd
Evaluation and Survey Operations Lead, Research and Product Operations

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Online participation survey for schools that participated in 2021/2022

INTRODUCTION – Show to all	
<p>Impact of Key Stage 1 school closures on later attainment and social skills (a longitudinal study)</p> <p>This research project, now in its third year, is the continuation of a National Foundation for Educational Research (NFER) project which ran in the 2020/2021 and 2021/2022 academic years.</p> <p>In this survey, we would like you to confirm or update the details of your school's key contact to ensure we can communicate with you effectively. It also allows you to confirm the current number of pupils in Year 3 and 4. This survey should take no longer than 5 minutes to complete.</p> <p>Please use the buttons at the bottom of the page to move through the survey; <u>do not use your browser's forward and back buttons.</u></p>	
<p>If the survey is left inactive for over 20 minutes you will be timed out. Please use the personalised link in your email to resume completion.</p>	

QX – SR, Ask all, Mandatory				
QX	Could you confirm you are completing this form for <<School Name>>?	(Please select one only)	1	Yes
			2	No

Submit page – Text, Show IF QX=2	
<p>Thank you for your interest in completing this form. Unfortunately, you might have received this link in error. Please contact KS1AttainmentResearch@nfer.ac.uk to request the correct link. Thank you for your support.</p>	

Q2a – SR, Ask all, Mandatory (all rows)			
2a	Please confirm you are the member of staff that will act as a point of contact throughout this project and the following details are correct.	(Please confirm or indicate you would like to amend)	
	Full Name	(pre-populate)	1 Confirm (route to Submit page)
	Job Title	(pre-populate)	
	Email address	(pre-populate)	2 Amend
	Telephone Number	(pre-populate)	

Q2b – OR, Show IF Q2=2									
2b	<p>Please amend the fields below to update your own contact details or provide details of a different member of staff who will act as the key point of contact throughout this project.</p> <p>(Please amend the fields below as relevant)</p>								
	<table border="1"> <tr> <td>Full Name</td> <td><i>(pre-populate but enable editing)</i></td> </tr> <tr> <td>Job Title</td> <td><i>(pre-populate but enable editing)</i></td> </tr> <tr> <td>Email address</td> <td><i>(pre-populate but enable editing)</i> <i>(check for valid email address)</i></td> </tr> <tr> <td>Telephone Number</td> <td><i>(pre-populate but enable editing)</i> <i>(check for phone number format)</i></td> </tr> </table>	Full Name	<i>(pre-populate but enable editing)</i>	Job Title	<i>(pre-populate but enable editing)</i>	Email address	<i>(pre-populate but enable editing)</i> <i>(check for valid email address)</i>	Telephone Number	<i>(pre-populate but enable editing)</i> <i>(check for phone number format)</i>
Full Name	<i>(pre-populate but enable editing)</i>								
Job Title	<i>(pre-populate but enable editing)</i>								
Email address	<i>(pre-populate but enable editing)</i> <i>(check for valid email address)</i>								
Telephone Number	<i>(pre-populate but enable editing)</i> <i>(check for phone number format)</i>								

Q3– OR, Ask all, Mandatory	
3	<p>Please could you confirm how many pupils you currently have on roll in Year 3?</p> <p><i>If you do not have pupils in this year group enter a zero</i></p>

Q4– OR, Ask all, Mandatory	
4	<p>Please could you confirm how many pupils you currently have on roll in Year 4?</p> <p><i>If you do not have pupils in this year group enter a zero</i></p>

SUBMIT PAGE
<p>You have reached the end of the survey. Thank you for answering our questions. Please click 'Next' to send your response. Once submitted, you will not be able to go back and change any of your answers.</p>

FINAL PAGE
<p>Your response has been submitted. Thank you again for taking the time to complete the survey. You may close this page.</p>



Invitation letter to schools that participated in 2020/2021 only



RPO/LLON/41714/2

School Name:
NFER No:

Dear Headteacher,

Impact of Key Stage 1 school closures on later attainment and social skills of Year 3 and Year 4 pupils

In the 2020-2021 academic year, your school kindly participated in research on the impact of school closures on the attainment and social skills of the very youngest school-aged children during the Covid-19 pandemic.

The most recent findings from the 2021-2022 academic year show that many pupils have caught up, but that the pandemic has led to a large increase in very low attainers and that the disadvantage gap remains wide.

<https://www.nfer.ac.uk/impact-of-covid-19-related-school-closures-in-key-stage-1-on-attainment-and-social-skills-of-pupils-in-year-2-and-year-3-in-academic-year-20212022/>

We, EEF and the teaching unions are using this research to highlight the importance that schools are both adequately funded and supported to ensure that the required long-term support can be delivered.

Last year, your school chose not to participate in year 2 of the study. We would like to invite you to participate in year 3 of the study to ensure that the study continues to be representative of all schools and we have sufficient data to highlight the needs of this group of pupils.

What will participating in the study involve?

We are mindful of the pressures and challenges schools face, therefore the requirements for this study have been significantly reduced since 2020/2021.

We ask you to assess your Year 3 and Year 4 pupils with NFER spring tests, complete a school-level questionnaire and a social skills survey for a sample of 12 pupils per year group. Questionnaires will be completed once, in the spring term.

NFER will mark the tests and provide you with your pupils' item level outcomes within a short time frame.

What will be the benefits of participating?

In return for your school's participation in this project NFER will provide the following:

- Free mathematics and reading assessments for your Year 3 and Year 4 pupils in spring 2023.
- Free marking service and upload of results to the NFER Tests Analysis Tool (if your pupil data is online).

- A discount of 20% on any two-year groups' worth of assessments, purchased between April 2023 and December 2023.
- Feedback on the project findings.

Additional information on this study, and a privacy notice, can also be found here -

<https://www.nfer.ac.uk/for-schools/participate-in-research/impact-of-ks1-school-closures-on-later-attainment-and-social-skills-study/>

Next Steps

In order to confirm your participation, we ask your headteacher to sign an online Memorandum of Understanding (MoU). We very much hope that you will support us in this important piece of research. Your assistance will enable us to provide strong evidence for the support pupils and schools need. Please be assured, that we will do everything we can to help you participate.

Please follow the link below to complete the online reply form by **Friday, 16 December 2022**.

«MOU_Link»

If you have any queries, please contact my colleague Jessica Fathers on 01753 637 033 or via email at KS1AttainmentResearch@nfer.ac.uk.

Yours sincerely,

Kathryn Hurd
Evaluation and Survey Operations Lead, Research and Product Operations

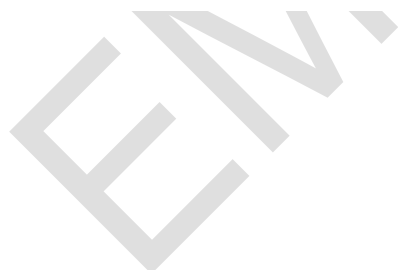
National Foundation for Educational Research (NFER)
The Mere, Upton Park, Slough SL1 2DQ, United Kingdom
Reg No 900899 (England and Wales). Reg Address as above.

Switchboard: + 44 (0) 1753 574123

Web: www.nfer.ac.uk

Twitter: [@TheNFER](https://twitter.com/TheNFER)

This e-mail is restricted to the addressee and may contain privileged information. If you are not the addressee, you are not permitted to use or copy this e-mail or its attachments nor may you disclose the same to any third party. If this has been sent to you in error please notify us as soon as possible. The NFER reserves the right to intercept and read e-mails sent or received by our employees. If you do not wish for your communications to be subjected to such scrutiny, you should not communicate via this e-mail system. The Foundation endeavours to exclude viruses from our data but it is the obligation of the recipient to check any attachments for viruses. Opinions, conclusions and other information contained in this message that do not relate to the official business of the NFER, or are personal to the individual sender, shall not be understood as endorsed by the Foundation and no liability will be accepted. Any legally binding agreement resulting from its content must be made separately in a mutually agreed medium which may only be signed by duly authorised signatories.



Online Memorandum of Understanding for schools that participated in 2020/2021 only

INTRODUCTION – Show to all
<p>Impact of Key Stage 1 school closures on later attainment and social skills - Memorandum of Understanding</p>
<p>This form sets out the responsibilities of The National Foundation for Educational Research (NFER) and schools that participate in this research. Please read the school information sheet and Privacy Notices provided by NFER before signing this Memorandum of Understanding (MoU) which can be found here - https://www.nfer.ac.uk/for-schools/participate-in-research/impact-of-ks1-school-closures-on-later-attainment-and-social-skills-study/</p> <p>If you have any questions, please contact us at KS1AttainmentResearch@nfer.ac.uk.</p> <p>This longitudinal study is following the youngest school-age children affected by the school closures due to the pandemic.</p> <p>As this form asks for agreement on behalf of your school to share data, we request that the headteacher completes this form.</p> <p><u>I would like to sign my school up. What do I do now?</u></p> <p>Please click 'next' to start filling in the form. It will take around 10 minutes to complete.</p> <p>Kind regards NFER Key Stage 1 Longitudinal Recovery Study Team</p>
<p>Please use the buttons at the bottom of the page to move through the form, do not use your browser's forward and back buttons.</p> <p>If the form is left inactive for over 20 minutes you will be timed out. Please use your personalised link in your email to resume completion.</p>

QX – SR, Ask all, Mandatory							
QX	Could you confirm you are completing this form for <<School Name>>?	(Please select one only)	<table border="1" style="width: 100%;"> <tr> <td style="width: 5%;">1</td> <td style="width: 45%;">Yes</td> </tr> <tr> <td>2</td> <td>No</td> </tr> </table>	1	Yes	2	No
1	Yes						
2	No						

Submit page – Text, Show IF QX=2
<p>Thank you for your interest in completing this form. Unfortunately, you might have received this link in error. Please contact KS1AttainmentResearch@nfer.ac.uk to request the correct link. Thank you for your support.</p>

QA – QR, Ask all, Mandatory											
QA	<p>Please confirm the name, role, and email address of a contact person for this project.</p> <p>All correspondence for this project will be sent to you via your email address</p>		<table border="1" style="width: 100%;"> <tr> <td style="width: 15%;">Name</td> <td style="width: 35%;"></td> </tr> <tr> <td>Role</td> <td></td> </tr> <tr> <td>Email Address</td> <td></td> </tr> <tr> <td>Please confirm Email Address</td> <td></td> </tr> </table>	Name		Role		Email Address		Please confirm Email Address	
Name											
Role											
Email Address											
Please confirm Email Address											

Q1– OR, Ask all, Mandatory			
Q1	<p>How many pupils do you currently have on roll in Year 3?</p> <p><i>If you do not have pupils in this year group enter a zero</i></p>		

Q2– OR, Ask all, Mandatory			
Q2	<p>How many pupils do you currently have on roll in Year 4?</p> <p><i>If you do not have pupils in this year group enter a zero</i></p>		

Q3 – SR, Ask all, Mandatory – must tick all options to confirm				
Memorandum of Understanding: Responsibilities				
The NFER will:				
<ul style="list-style-type: none"> • Provide a key project contact who will be available to support schools with the project. • Provide a parent withdrawal letter (to be sent to schools upon receipt of this MoU). • Provide a secure means and templates for schools to provide all requested data including teacher data and updated/new pupil data. • Analyse all data from the project using secure systems. • Provide schools with the use of the online NFER Tests Analysis Tool. • Provide schools with complimentary spring NFER assessments in mathematics and reading for those pupils in Y3 and Y4 in Spring 2023. • Provide marking services for the assessments described above. • Provide schools with assessment results, via the NFER Tests hubAnalysis Tool, or via the secure school portal. • Provide schools with research findings. 				
Our overall expectations of your school:				
<p>The following outlines our expectations from schools and teachers taking part in the project. Please read the following statements and confirm below that you agree to them by ticking the corresponding boxes. Please also print and keep a copy of this form for your own reference.</p>				
For your school to be eligible to participate, you must agree to the following for the 2022/2023 academic year:				
	Confirmation		1	We have nominated a school contact (note: usually Y3 or Y4 class teacher) who has sufficient capacity to liaise with NFER to provide the information required for the project. We will inform NFER if this contact needs to change, for instance leaves the school.
			2	We will be a point of contact for parents/carers, including providing them with information about the project and

				inform NFER about any pupil withdrawal requests from parents.
			3	<p>We will provide the following information for all participating pupils, when not known by NFER:</p> <ul style="list-style-type: none"> • pupil name • date of birth • unique pupil number (UPN) • gender • Free School Meals status (FSM) • class • year group
			4	We will administer NFER mathematics and reading assessments for Y3 and Y4 pupils in spring 2023. We will return the assessment papers to NFER by the 2023 Easter holidays.
			5	We will provide research data by way of surveys as requested.
			6	I confirm that I have read and understood the information provided about the study and I have passed a copy of the school information sheet to my designated named contact. I have had the opportunity to ask <u>questions</u> and have had these answered satisfactorily.
			7	I understand that my school's participation is voluntary and that I am free to withdraw my school at any time. I will let NFER know if I choose to withdraw from the research.
			8	I will contact KS1AttainmentResearch@nfer.ac.uk if I have any concerns about the project.

SUBMIT PAGE

You have reached the end of your online Memorandum of Understanding (MoU). Thank you for sharing your school details. Please click 'Submit' to send your response. Once submitted, you will not be able to go back and change any of your answers. We look forward to working with your school.

Thank you

NFER Key Stage 1 School Closures Longitudinal Study Team

Impact of KS1 school closures on later attainment and social skills of pupils in Year 3 and Year 4 in 2022/23

School Information Sheet – 2022/2023

What is the research project?

This research project, now in its third year, is the continuation of a National Foundation for Educational Research (NFER) project, 'Impact of Key Stage 1 school closures on later attainment and social skills (a longitudinal study)', which ran in the 2020/2021 and 2021/2022 academic years. In its second year, the study focussed on Year 2 and Year 3 pupils. This year we will focus on those same pupils, in Year 3 and Year 4. By following the same pupils as they move through the school system, this longitudinal study will continue to explore the impact of the Covid-19 related school closures on the attainment gap of those pupils who were in Key Stage 1 (KS1) during the 2020/2021 academic year and the impact of school closures on their ongoing socio-emotional development. This study will also explore how quickly children reach where they might be expected to be had the pandemic not happened.

Who is conducting the study?

NFER has been commissioned to carry out this research by the Education Endowment Foundation (EEF).

Which schools can take part?

All schools, or their linked junior schools, who took part in the project during the 2020/2021 academic year.

What will the project involve for teachers, schools and pupils?

We will ask schools to test pupils in the spring term, using NFER assessments in mathematics and reading. NFER will provide schools with the assessments for their Year 3 and Year 4 pupils. NFER will arrange to collect and mark the assessments and will share pupil outcomes with schools, along with the test papers, once marking is complete.

In addition to these assessments, in the spring term of 2023 the headteacher or KS2 lead will be requested to complete a school-level survey on their approach to on-going support and recovery activities, such as small-group work, tutoring and parental engagement. Teachers will also need to complete one survey in the spring term, on the socio-emotional development for a subsample of 12 pupils per year group.

When will the assessments take place?

Schools will be asked to test their Year 3 and Year 4 pupils during March 2023. You will receive your assessments after the February half term and complete them before the start of the Easter break. Schools will then be asked to send their assessments to NFER before the Easter break.

Data

NFER will share the most recent information we hold about pupils collected during the project with schools via the secure school portal. Schools will be asked to check and confirm this data, identify pupils who have left the school and add data for any pupils new to Years 3 and 4. This will include names of pupils and UPN. We will ask you to provide FSM details for pupils.

What will my school need to do?

Date	Activity
November/December 2022	Schools confirm school contact for this year. Any school re-joining the project from the 2020/2021 academic year will be asked to sign an online Memorandum of Understanding (MoU).
February/early March 2023	NFER sends Year 3 and Year 4 assessments to schools. School questionnaire and social skills survey links shared with schools.
March 2023	Schools sit Year 3 and Year 4 spring assessments. NFER collect assessments and mark. Schools continue to complete questionnaire and social skills survey.
March – May 2023 <i>Note - Dates dependent on when we receive the tests for marking</i>	NFER shares pupil results to schools and returns test papers. This will include item level data for the assessments. These results can be used to inform the school's understanding of where pupils may need support and their strengths and weaknesses across different areas of the curriculum.

A link to the final evaluation report and school feedback will be sent to schools on publication. This report will include key findings as well as domain information.

What benefits will my school receive?

All schools will receive complimentary assessments for the year groups participating in the project and these assessments will also be marked by NFER staff. In addition, schools will receive a 20 per cent discount off the purchase of NFER assessments on any two year-groups worth of assessments. These can be purchased between April and December 2023, once NFER has received assessments from schools as well as all completed surveys.

How will the findings be used?

The findings from the study provide evidence of the impact on the attainment and socio-emotional skills of the youngest school age children affected by the disruption to education during the pandemic. The study will report, each year, on how quickly these children recover their learning and are able to reach where they might be expected to be had the pandemic not happened. This series of reports will be available to primary schools to assist and develop their support of their pupils, particularly those from disadvantaged backgrounds.

What happens if a school, teacher, or pupils want to withdraw from the research project?

A school, teacher or pupil can withdraw from the research project and/or from their data being used in the research project at any time. Schools must notify NFER of any pupils or teachers who wish to withdraw from the project.

Parents can choose to withdraw their child from the data collection of the research project at any time. They can do this by returning the form on the bottom of the parent letter to their school. Schools must not provide data about children whose parents withdraw them from the data collection. If the withdrawal takes place after the study commences, schools must notify NFER of such pupils, and these pupils will be removed from the project's datasets and subsequent analysis immediately.

How will NFER use and protect the data collected?

All data gathered during the research project will be held in accordance with the data protection framework set out in UK GDPR and Data Protection Act 2018. It will be treated in the strictest confidence by NFER. No pupil-level data will be shared with the EEF.

All teacher and pupil-level data shared by schools with NFER will be done so via a secure school portal. For the purposes of the research project, all pupils will have an ID number. **No school, teacher or pupil will be named in any report arising from this work.**

A School Privacy Notice for the research project is available here:
https://www.nfer.ac.uk/media/4653/llon_schools_privacy_notice.pdf

A Parent Privacy Notice for the research project is available here and should be shared with parents prior to data collection:
https://www.nfer.ac.uk/media/4652/llon_parent_privacy_notice.pdf

Who can I contact for more information?

For further information, please contact Sarah Millar or Jessica Fathers via email at KS1AttainmentResearch@nfer.ac.uk.

EMBA



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Impact of KS1 school closures on later attainment and social skills– Year 3 and Year 4 pupils

Privacy Notice for Teachers or School staff – 2022/2023

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1 Why are we collecting this data?

The Education Endowment Foundation (EEF) has commissioned the National Foundation for Educational Research (NFER) to continue its research into the impact of Covid-19 related school closures on attainment in primary schools. The research looks at how quickly the youngest pupils affected by partial school closures recover from the learning they have missed. This three-year, longitudinal study will follow pupils who were in Key Stage 1 in 2020/2021 and investigate the impact of school closures, looking at pupil attainment, school practices and teachers' perspectives.

This document outlines how school staff's personal data will be collected and processed as part of the project.

The research also collects and analyses pupil data. For information about how it is processed please see the privacy notice covering pupil data here:

https://www.nfer.ac.uk/media/4652/llon_parent_privacy_notice.pdf

NFER is the data controller for the project.

2 What is the legal basis for processing activities?

The legal basis for processing personal data is covered by GDPR Article 6 (1) (f):

Legitimate interests: the processing is necessary for your (or a third party's) legitimate interests unless there is a good reason to protect the individual's personal data which overrides those legitimate interests.

We have carried out a legitimate interest assessment, which demonstrates that the research fulfils one of our core business purposes (undertaking research, evaluation, and information activities). The research project has broader societal benefits and will contribute to improving the lives of learners by identifying if any pupil level factors are associated with the degree of impact of the Covid-19 school closures on pupils' attainment and their recovery over the academic year.

The research cannot be done without processing personal data, but processing does not override the data subject's interests. To mitigate the risks to the rights and freedoms of the individual data subjects, as far as possible, NFER has put in place the technical and organisational measures set out in this privacy notice.

3 How will personal data be obtained?

Personal data about school staff will be collected directly from participating schools and teachers.

4 What personal data is being collected by this project?

The NFER will collect data (name, job title and contact details) about a nominated named teacher within a participating school so that we can liaise with them about this research. This may be the same contact as in previous years or a newly nominated teacher.

The NFER will ask teachers to complete online surveys on school practices and teachers' perspectives including information on support strategies such as groupwork, tutoring and parental engagement by class, year group and at a school level.

The NFER will also ask the nominated teacher in each participating school to complete an evaluation survey about their experience of the project and working with NFER.

5 Who will personal data be shared with?

No individual will be named in any report for this project.

The surveys will be managed and run using Questback software. Their privacy policy can be found here: <https://www.questback.com/data-privacy/privacy-policy/>

6 Is personal data being transferred outside of the European Economic Areas (EEA)?

No personal data is stored or transferred outside of the EEA.

7 How long will personal data be retained?

Data collected for the project, will be stored securely in the NFER systems until the final report in this research project is published. This is currently expected to be September 2024. NFER will delete all personal data from its systems within one year of publication of this final report.

After three months from the completion of the study, all of the de-identified matched pupil data will be added to the EEF archive. The EEF archive is hosted by the Office for National Statistics (ONS) and managed by the EEF archive manager. This data is archived to allow for further research. At this point, EEF becomes fully responsible for the data (sole data controller) and the NFER are no longer the data controllers. Other research teams may use the de-identified data as part of subsequent research through the ONS Approved Researcher Scheme¹. The Approved Researcher Scheme is used by the ONS to grant secure access to data that cannot be published openly, for statistical research purposes, as permitted by the Statistics and Registration Service Act 2007 (SRSA).

¹ <https://www.ons.gov.uk/aboutus/whatwedo/statistics/requestingstatistics/approvedresearcherscheme>

8 How is the security of my data maintained?

The NFER have put in place appropriate measures to prevent your personal information from being accidentally lost, used, or accessed in an unauthorised way, altered, or disclosed. NFER has been certified to ISO / IEC 27001 2013 (GB17/872763) the international standard for information security and holds Cyber Essentials Plus (2dac9450-5174-4c60-9c88-8cb88c7a4090 - recertification due 3 October 2023). NFER operates Microsoft Windows Operating Systems and industry standard enterprise software such as databases and email, all managed to recognised industry standards with a full patching regime. All NFER laptops and mobile storage devices are encrypted and accessed with PIN-codes and strong passwords. Annual penetration tests are carried out by a CHECK-accredited supplier and remediation undertaken. We use a replicated disaster recovery service (RDRS) which allows the business to continue to operate in the event of failure. Any personal data which is shared with us is transferred using our secure portal and is encrypted in transit (HTTPS and TLS 1.2).

9 Can I stop my personal data being used?

School staff can withdraw from the project and/or from their data being used in the project at any time by contacting NFER.

However, the NFER appreciates schools' and participants' support in collecting the data since it is very important for the validity of the results. If your school/you withdraw from the research, unless otherwise instructed, we will use any data we have collected up to that point in our analysis.

Under certain circumstances, you have the right:

- to request access to information that we hold about you (subject access request)
- to have your personal data rectified, if it is inaccurate or incomplete
- to request the deletion or removal of personal data where there is no compelling reason for its continued processing
- to restrict our processing of your personal data (for example, permitting its storage but no further processing)
- to object to our processing
- not to be subject to decisions based purely on automated processing where it produces a legal or similarly significant effect on you.

To exercise these rights, please contact our Compliance Officer, compliance@nfer.ac.uk

10 Who can I contact about this project?

To talk to someone about the day to day management of this research or question about it, please contact Sarah Millar via the following email address: KS1AttainmentResearch@nfer.ac.uk.

If you have a concern about the way this project processes personal data, we request that you raise your concern with us in the first instance (see the details above). If you remain dissatisfied, you can contact the Information Commissioner's Office, the body responsible for enforcing data protection legislation in the UK, at <https://ico.org.uk/concerns/>.



11 Updates

We keep this privacy notice under review to make sure it is up to date and accurate. Any changes will be noted. The date when this privacy notice was last updated is shown in the footer at the bottom of this document.

This privacy notice has been updated from those used in previous years of this longitudinal study.

In November 2022, the privacy notice was updated to say that the study was entering its third year and now focussed on pupils in Year 3 and 4. We also updated information about NFER's Cyber Essentials Plus certification.

Further changes were made in June 2023, when project personnel were updated and details of the feedback survey added.

EMBARGOED



Impact of KS1 school closures on later attainment and social skills– Year 3 and Year 4 pupils

Privacy Notice for Parents – 2022/2023

1 Why are we collecting this data?

The Education Endowment Foundation (EEF) has commissioned the National Foundation for Educational Research (NFER) to continue its research into the impact of Covid-19 related school closures on attainment in primary schools. The research looks at how quickly the youngest pupils affected by partial school closures recover from the learning they have missed. This is the third year of a three-year longitudinal study started in 2020/2021 and focuses on pupils as they reach Year 3 or Year 4 (having been in Year 1 or Year 2 when the study started). It investigates the impact of school closures, looking at pupil attainment, school practices and teachers' perspectives.

This document outlines how your child's personal data will be collected and processed as part of the project.

NFER is the data controller for the project.

2 What is the legal basis for processing activities?

The legal basis for processing personal data is covered by GDPR Article 6 (1) (f):

Legitimate interests: the processing is necessary for your (or a third party's) legitimate interests unless there is a good reason to protect the individual's personal data which overrides those legitimate interests.

We have carried out a legitimate interest assessment, which demonstrates that the research fulfils one of our core business purposes (undertaking research, evaluation and information activities). The research project has broader societal benefits and will contribute to improving the lives of learners by identifying if any pupil level factors are associated with the degree of impact of the Covid-19 school closures on pupils' attainment and their recovery over the academic year.

The research cannot be done without processing personal data, but processing does not override the data subject's interests. To mitigate the risks to the rights and freedoms of the individual data subjects, as far as possible, NFER has put in place the technical and organisational measures set out in this privacy notice.

3 How will personal data be obtained?

If your school participated in the first and second year of our study, we will use data collected as part of those projects and add to them pupil assessment data and findings from a social skills survey for a sample of pupils for both the 2021/22 and 2022/23 academic years. We will only collect data for pupils who were in Key Stage 1 during the 2020/2021 and 2021/2022 academic years. For any pupil or school who did not participate in the first and second years of this study, personal data detailed in section 4 below will be collected from their school.

4 What personal data is being collected by this project?

The NFER will collect personal data about pupils from participating schools. This includes

- pupil name
- date of birth
- gender
- unique pupil number (UPN)
- class name
- school name
- Free School Meals status (FSM)

Teachers will provide information about a sample of pupils' socio-emotional skills. The social skills survey will be used with a sample of 12 pupils from Year 3 and 12 pupils from Year 4 in the school to assess levels of self-regulation and social development (including sociability, pro-social behaviour, externalising and internalising problems).

5 Who will personal data be shared with?

No individual will be named in any report for this project.

For the purpose of research archiving, the responses will be linked with information about the pupils from the National Pupil Database (NPD) and shared with the Department for Education, the EEF's archive manager and in an anonymised form, with the Office for National Statistics and potentially other research teams.

Other research teams may use de-identified data as part of subsequent research through the ONS Approved Researcher Scheme¹. The Approved Researcher Scheme is used by the ONS to grant secure access to data that cannot be published openly, for statistical research purposes, as permitted by the Statistics and Registration Service Act 2007 (SRSA).

More information can be found at: <https://educationendowmentfoundation.org.uk/projects-and-evaluation/evaluation/evaluation-guidance-and-resources/archiving-evaluation-data>

¹ <https://www.ons.gov.uk/aboutus/whatwedo/statistics/requestingstatistics/approvedresearcherscheme>

The Social Skills survey will be managed and run using Questback software. Their privacy policy can be found here: https://www.questback.com/assets/uploads/Survey_Privacy_Policy.pdf

6 Is personal data being transferred outside of the European Economic Areas (EEA)?

No personal data is stored or transferred outside of the EEA.

7 How long will personal data be retained?

Data collected for the project will be stored securely in the NFER systems until the final report in this research project is published. This is currently expected to be September 2024. NFER will then delete all pupil personal data within one year of publication of this final report.

After three months from the completion of the study, all of the de-identified matched pupil data will be added to the EEF archive. The EEF archive is hosted by the Office for National Statistics (ONS) and managed by the EEF archive manager. This data is archived to allow for further research. At this point, EEF becomes fully responsible for the data (sole data controller) and the NFER are no longer the data controllers.

8 How is the security of my child/children's data maintained?

The NFER have put in place appropriate technical and organisational measures to prevent your child's personal information from being accidentally lost, used or accessed in an unauthorised way, altered or disclosed. NFER has been certified to ISO / IEC 27001 2013 (GB17/872763) the international standard for information security and holds Cyber Essentials Plus (2dac9450-5174-4c60-9c88-8cb88c7a4090 - recertification due 3 October 2023). NFER operates Microsoft Windows Operating Systems and industry standard enterprise software such as databases and email, all managed to recognised industry standards with a full patching regime. All NFER laptops and mobile storage devices are encrypted and accessed with PIN-codes and strong passwords. Annual penetration tests are carried out by a CHECK-accredited supplier and remediation undertaken. We use a replicated disaster recovery service (RDRS) which allows the business to continue to operate in the event of failure. Any personal data which is shared with us is transferred using our secure portal and is encrypted in transit (HTTPS and TLS 1.2).

9 Can I stop my child/children's data being used?

Your child can be withdrawn from the project and/or from their data being used in the project at any time. You will be provided with a parent letter about the project explaining how your child's data will be collected and used and how they can be withdrawn from data processing. However, the NFER appreciates schools' and participants' support in collecting the data since it is very important for the validity of the results. If you withdraw your child from the project, unless otherwise instructed, we will use any data we have collected up to that point in our analysis.



The NFER will handle your child/children's personal data in accordance with the rights given to individuals under data protection legislation. If at any time, you wish to withdraw your child/children's data from this research project or correct errors in it, please contact NFER at KS1AttainmentResearch@nfer.ac.uk

Under certain circumstances, you have the right:

- to request access to information that we hold about you (subject access request)
- to have your personal data rectified, if it is inaccurate or incomplete
- to request the deletion or removal of personal data where there is no compelling reason for its continued processing
- to restrict our processing of your personal data (for example, permitting its storage but no further processing)
- to object to our processing
- not to be subject to decisions based purely on automated processing where it produces a legal or similarly significant effect on you.

To exercise these rights, please contact our Compliance Officer, compliance@nfer.ac.uk

10 Who can I contact about this project?

To talk to someone about the day-to-day management of this research or ask a question about it, please contact Sarah Millar via the following email address: KS1AttainmentResearch@nfer.ac.uk

If you have a concern about the way this project processes personal data, we request that you raise your concern with us in the first instance (see the details above). If you remain dissatisfied, you can contact the Information Commissioner's Office, the body responsible for enforcing data protection legislation in the UK, at <https://ico.org.uk/concerns/>.

11 Updates

We keep this privacy notice under review to make sure it is up to date and accurate. Any changes will be noted. The date when this privacy notice was last updated is shown in the footer at the bottom of this document.

This privacy notice has been updated from those used in previous years of this longitudinal study.

In November 2022, the privacy notice was updated to say that the study was entering its third year and now focussed on pupils in Year 3 and 4. We also updated information about NFER's Cyber Essentials Plus certification.

Further changes were made in June 2023, when project personnel were updated.



Appendix C: NFER assessment duration and scores

The Year 3 reading assessment and the Year 4 reading assessment each have one paper. The Year 3 mathematics assessments and the Year 4 mathematics assessment each have three assessment papers. Individuals obtain a raw score on each of these papers based on the number of questions they answer correctly.

For the mathematics papers, assessment takers must sit all three papers, arithmetic and reasoning paper 1, and reasoning paper 2 to get a total raw score.

The table below identifies the time required to complete each assessment paper and the number of raw marks available on each paper.

Assessment		Paper 1	Paper 2	Paper 3
Mathematics Year 3 spring	Duration (mins)	25 (arithmetic)	30 (reasoning 1)	30 (reasoning 2)
	Maximum score	30	25	25
Reading Year 3 spring	Duration (mins)	75	N/A	N/A
	Maximum score	35	N/A	N/A
Mathematics Year 4 spring	Duration (mins)	25 (arithmetic)	35 (reasoning 1)	35 (reasoning 2)
	Maximum score	35	30	30
Reading Year 4 spring	Duration (mins)	75	N/A	N/A
	Maximum score	40	N/A	N/A

Appendix D: PSMAT and supplementary items

Social Skills Questionnaire

Introduction

The Education Endowment Foundation (EEF) has commissioned NFER to track the progress of the pupils who were in Key Stage 1 during the Covid-19 school closures. We are tracking the attainment and socioemotional skills of these pupils as they move through primary school, to determine any ongoing impact of the closures and provide information to support schools and pupils.

The purpose of this survey is to explore the socioemotional skills of pupils in this academic year. This data will be used alongside attainment data to provide a broad picture of Covid-19 recovery in Year 3 and Year 4 pupils.

Please complete the questionnaire in relation to each child as they are now, in the spring term. The rating is compared to an average child (**pre-pandemic**) of the same age.

If a child has left your class or the school, please answer the first two questions, after which the survey will close for this pupil. Please **do not** answer the questionnaire for any other child to replace them.

The privacy notices are available at <https://www.nfer.ac.uk/for-schools/participate-in-research/impact-of-ks1-school-closures-on-later-attainment-and-social-skills-study/>

If you have any queries about the completion of this questionnaire or would like further information about the evaluation, please do not hesitate to email KS1attainmentresearch@nfer.ac.uk.

The questionnaire will take about 5 minutes to complete per child.

Please use the buttons at the bottom of the page to move through the questionnaire, please do not use your browser's forward and back buttons.

Please note that if a questionnaire is left inactive for over 20 minutes you will be timed out. Please use the original link again to return to the questionnaire.

Thank you very much for your help with this questionnaire.

Ask All, Single Code, Must provide an answer to each question

Confirmation Details

A					
A.1	Please confirm that you work at [insert school name].	Yes (1)	No (2)		If A.1 = No (2) then the survey should be closed – please see close screen A.1 below.
A.2	This survey is about [insert pupils name], please confirm that you are their current teacher.	Yes (1)	No, they have recently left the school (2)	No, they are still at the school but no longer in my class (3)	If A.2 = (2) then the survey should be closed – close screen A.2. If A.2 = (3) the survey should be closed – close screen A.3.

CLOSE SCREEN = A.1 = No (2)

We have now closed this survey. Thank you for your time.

CLOSE SCREEN = A.2 = Have left school (2)

Thank you for letting us know that the child has left the school, you will no longer be required to complete the survey for this child.

CLOSE SCREEN = A.3 = Have a different teacher (3)

Thank you for letting us know that the child is now in a different class. We will follow up with the school. You can now close this survey.

SHOW AT TOP OF SCREEN

Please rate the child as compared to an *average child (pre-pandemic)* of the same age. Provide a rating on the scale from 1 to 7.



PSMAT

Please select one choice in each row.

		<i>Please select one choice in each row.</i>						
		Very much less mature than the average child this age	Less mature than the average child this age	A little less mature than the average child this age	About average for children this age	A little more mature than the average child this age	More mature than the average child this age	Very much more mature than the average child this age
1	The child's skill and willingness to make social overtures, join groups, or welcome others into own activities.	1	2	3	4	5	6	7
2	The child's skill at asserting him/herself appropriately to express opinions or convince peers.	1	2	3	4	5	6	7
3	The child's leadership skills with peers.	1	2	3	4	5	6	7
4	The maturity of the child's everyday modes of playing sociably with peers.	1	2	3	4	5	6	7
5	The child's skills in coping with peers who frustrate or interfere with the group's goals and activities.	1	2	3	4	5	6	7
6	The child's ability to understand the needs of peers who differ from the norm.	1	2	3	4	5	6	7

7	The overall maturity of the child's social skills.	1	2	3	4	5	6	7
Supplementary questions								
8	The child's ability to focus on an activity or task.	1	2	3	4	5	6	7
9	The child's ability to deal with minor conflict and disappointment.	1	2	3	4	5	6	7
10	The child's ability to initiate and maintain appropriate interactions with relevant adults in school.	1	2	3	4	5	6	7
11	The child's ability to undertake appropriate tasks independently.	1	2	3	4	5	6	7
12	The child's willingness to persist with a task or activity after a setback.	1	2	3	4	5	6	7
13	The child's ability to make choices for themselves.	1	2	3	4	5	6	7
14	The child's ability to manage their own feelings.	1	2	3	4	5	6	7

SUBMIT PAGE

Please click 'Submit' to send your response. Once submitted, you will not be able to go back and change any of your answers.

Appendix E: School survey

Learning recovery – School Questionnaire

The Education Endowment Foundation (EEF) has commissioned NFER to track the progress of the pupils who were in Key Stage 1 during the Covid-19 school closures. We will track the attainment and social skills of these pupils as they move into Years 3 and 4, to determine any ongoing impact of the closures and provide information to support schools and pupils.

The purpose of this survey is to understand recovery approaches, challenges and specific support given to pupils, to inform the assessment results. This survey is to be completed by the head teacher or a senior leader.

Your views are invaluable to us so please take the time to complete this survey. All responses will be treated in confidence and reported only in aggregated or anonymised form. If you exit the survey before the end, your partial answers (i.e. any answers that you have given before exiting the survey) may still be analysed. The information collected will be used for research purposes only and will not be shared with EEF.

The privacy notice is available at <https://www.nfer.ac.uk/for-schools/participate-in-research/impact-of-ks1-school-closures-on-later-attainment-and-social-skills-study/>.

This survey will take up to 10 minutes to complete and only needs to be completed once by your school. Unless specified, questions in the survey are asking about the whole cohort of pupils in the year groups mentioned.

If you have any queries, please contact Sarah Millar or Jessica Fathers via email at KS1AttainmentResearch@nfer.ac.uk. Thank you very much for your help with this survey.

About your experience of this academic year

All questions refer to pupils who are in Year 3 and Year 4 in this current academic year (i.e. 2022-2023).

Q1, SR, ASK ALL, NUDGE

1 How would you rate the level of disruption to learning in this academic year to date?

- | | | |
|--------------------------------------|--------------------------|---|
| Not disrupted at all (a normal year) | <input type="checkbox"/> | 1 |
| A little disrupted | <input type="checkbox"/> | 2 |
| Somewhat disrupted | <input type="checkbox"/> | 3 |
| Very disrupted | <input type="checkbox"/> | 4 |

Q2, MR, ASK IF Q1 = 2, 3 or 4, NUDGE, Randomise except 'Other'

2 What are the main reasons for this disruption? Please select all options that apply.

Pupil absences (Covid related)	<input type="checkbox"/>	1
Staff absences (Covid related)	<input type="checkbox"/>	2
Challenges with pupil behaviour/wellbeing	<input type="checkbox"/>	3
Lack of parental engagement	<input type="checkbox"/>	4
Having to cover material from previous years	<input type="checkbox"/>	5
Insufficient funding to support pupils who have missed learning	<input type="checkbox"/>	6
Infection control measures (e.g. hygiene, following public health advice)	<input type="checkbox"/>	7
Other (please specify)	<input type="checkbox"/>	8

[free text box for 'other' mandatory if 'Other' ticked]

[100 characters]

About new school practices

Q3, MR (except 'None' and 'I don't know' are mutually exclusive), ASK ALL, NUDGE [do not nudge if 'I don't know' is selected], Randomise except 'Other' and 'None' and 'I don't know'. Route round for those completed in 2022 so that the responses from 2022 can be used for applicable 2023 respondents (new items not included in 2022 version are 10 and 11) [needs to be flagged in QB sample file and data spec]

3 What practices did your school introduce during the 19/20 and 20/21 academic years as a result of Covid-19? Please select all options that apply.

Year group or class bubbles	1	<input type="checkbox"/>
Physical rearrangement of classrooms (e.g. no group tables, increased distance between tables)	2	<input type="checkbox"/>
Increased hand washing	3	<input type="checkbox"/>
Provision for home learning	4	<input type="checkbox"/>
Use of online/EdTech in teaching and learning	11	<input type="checkbox"/>
Fewer interactions between pupils and staff	5	<input type="checkbox"/>
Increased wellbeing support	6	<input type="checkbox"/>
Reduced extra-curricular activities	7	<input type="checkbox"/>
None	8	<input type="checkbox"/>

Other (please specify) 9

I don't know 10

[free text box for 'other' questions Mandatory if ticked 'Other']

[100 characters]

Q4, MR, ASK ALL (For respondents shown Q3, only show options selected in Q3. For 2022 respondents, who don't see Q3, show all options. Do NOT show options 5, 7 and 10), NUDGE, Randomise except 'Other' and 'None'

4 Are there any practices that your school has found to be an improvement to pre-pandemic practices and therefore chosen to retain for the future? *Please select all options that apply.*

-
- | | | |
|--------------------------------------------------------------------------------------------------------|---|--------------------------|
| Year group or class bubbles | 1 | <input type="checkbox"/> |
| Physical rearrangement of classrooms (<u>e.g.</u> no group tables, increased distance between tables) | 2 | <input type="checkbox"/> |
| Increased hand washing | 3 | <input type="checkbox"/> |
| Provision for home learning | 4 | <input type="checkbox"/> |
| Use of online/EdTech in teaching and learning | 5 | <input type="checkbox"/> |
| Increased wellbeing support | 6 | <input type="checkbox"/> |
| Other - INSERT TEXT FROM Q3 <u>other</u> | 7 | <input type="checkbox"/> |
| None | 8 | <input type="checkbox"/> |

About staff challenges

Q5, MR, ASK ALL, NUDGE, Randomise except 'Other'

5 Have any of the following challenges been faced by Year 3 and/or 4 school staff this academic year? *Please select all options that apply.*

-
- | | | |
|------------------------------------------------------------------------|---|--------------------------|
| Higher than normal staff absences | 1 | <input type="checkbox"/> |
| Increased workload supporting pupils who have been absent this year | 2 | <input type="checkbox"/> |
| Increased workload due to catch-up/recovery needs | 3 | <input type="checkbox"/> |
| Loss of non-contact time (<u>e.g.</u> due to covering staff absences) | 4 | <input type="checkbox"/> |
| Low morale/wellbeing of staff | 5 | <input type="checkbox"/> |

- | | | |
|---------------------------------------------------|---|--------------------------|
| Difficulty in getting external support for pupils | 6 | <input type="checkbox"/> |
| Additional CPD needs | 7 | <input type="checkbox"/> |
| Other (please specify) | 8 | <input type="checkbox"/> |

[free text box for 'other' Mandatory if ticked 'Other']

[100 characters]

About remote learning

Q6, SR, ASK ALL, NUDGE

6 How well do you feel you are currently able to support home learning for pupils who are absent from in-school learning (e.g. when isolating)?

- | | | |
|------------|--------------------------|---|
| Very well | <input type="checkbox"/> | 1 |
| Quite well | <input type="checkbox"/> | 2 |
| Somewhat | <input type="checkbox"/> | 3 |
| Not at all | <input type="checkbox"/> | 4 |

Q7, MR, ASK ALL, NUDGE, Randomise except 'Other'

7 How does your school support home learning for pupils who are absent from in-school learning (e.g. when isolating)? *Please select all options that apply.*

- | | | |
|----------------------------------------------------------------------------------------------|--------------------------|---|
| The school virtual learning environment | <input type="checkbox"/> | 1 |
| Educational websites or apps | <input type="checkbox"/> | 2 |
| Workbooks, <u>sheets</u> or other physical resources | <input type="checkbox"/> | 3 |
| Online resources (<u>e.g.</u> videos of lessons from other providers or links to resources) | <input type="checkbox"/> | 4 |
| Videos of lessons you have produced | <input type="checkbox"/> | 5 |
| Online 'live' lessons (streaming what is being taught in the classroom) | <input type="checkbox"/> | 6 |
| Online conversations (between you and pupils) | <input type="checkbox"/> | 7 |
| Online conversations (between you and parents) | <input type="checkbox"/> | 8 |
| Other (please specify) | <input type="checkbox"/> | 9 |

[free text box for 'other' question. Mandatory if ticked 'Other']

[100 characters]

Q8, MR (except 'None' is mutually exclusive), ASK ALL, NUDGE, Randomise except 'Other' and 'None'

8 What challenges have you encountered with online learning this year? Please select all options that apply.

- | | | |
|------------------------------------------------------------------------|--------------------------|---|
| Managing in-school and online pupils concurrently | <input type="checkbox"/> | 1 |
| Pupils with no suitable device/no home broadband | <input type="checkbox"/> | 2 |
| Pupils unable to access a suitable device (e.g. sharing with siblings) | <input type="checkbox"/> | 3 |
| Increased workload (e.g. preparation of resources) | <input type="checkbox"/> | 4 |
| Low levels of engagement | <input type="checkbox"/> | 5 |
| None | <input type="checkbox"/> | 6 |
| Other (please specify) | <input type="checkbox"/> | 7 |

[free text box for 'other'. Mandatory if 'Other' ticked]

[100 characters]

Q9, SR, ASK ALL, NUDGE

9 In the event of further school closures, how well prepared do you feel your school is to deliver effective home learning for all pupils?

- | | | |
|---------------------|--------------------------|---|
| Very well prepared | <input type="checkbox"/> | 1 |
| Quite well prepared | <input type="checkbox"/> | 2 |
| Somewhat prepared | <input type="checkbox"/> | 3 |
| Not prepared | <input type="checkbox"/> | 4 |

About catch-up strategies this academic year

Q10, MR each column, ASK ALL, NUDGE,

- 10 What strategies has your school implemented this academic year to aid Y3/Y4 maths and reading learning recovery? *Please select all options that apply.*

	Maths	Reading
One-to-one catch-up support	<input type="checkbox"/> 1	10 <input type="checkbox"/>
Small-group work	<input type="checkbox"/> 2	11 <input type="checkbox"/>
Tutoring funded through the National Tutoring Programme (NTP)	<input type="checkbox"/> 3	12 <input type="checkbox"/>
Other tutoring (not funded through the NTP)	<input type="checkbox"/> 4	13 <input type="checkbox"/>
Parental engagement	<input type="checkbox"/> 5	14 <input type="checkbox"/>
Revised curriculum	<input type="checkbox"/> 6	13 <input type="checkbox"/>
Staff redeployment (<u>e.g.</u> greater use of TAs to support individuals)	<input type="checkbox"/> 7	15 <input type="checkbox"/>
Catch-up schemes	<input type="checkbox"/> 8	16 <input type="checkbox"/>
Other (please specify)	<input type="checkbox"/> 9	17 <input type="checkbox"/>

[free text box for 'other' questions. Mandatory if ticked 'Other']

Maths	[100 characters]
Reading	[100 characters]

Q11, SR, ASK ALL, NUDGE,

- 11 Has your school provided any particular support for, or focus on, aiding learning recovery for disadvantaged pupils this academic year?

Yes 1
No 2

Q12, MR, ASK IF Q11 = 1, NUDGE,

12 Which areas has support for disadvantaged pupils focused on? Please select all options that apply.

-
- | | | |
|---------------------------------------------------------------------|--------------------------|----|
| Maths support | <input type="checkbox"/> | 1 |
| Reading support | <input type="checkbox"/> | 2 |
| One-to-one catch-up support | <input type="checkbox"/> | 3 |
| Small-group work | <input type="checkbox"/> | 4 |
| Tutoring funded through the National Tutoring Programme (NTP) | <input type="checkbox"/> | 5 |
| Other tutoring (not funded through the NTP) | <input type="checkbox"/> | 6 |
| Parental engagement | <input type="checkbox"/> | 7 |
| Revised curriculum | <input type="checkbox"/> | 8 |
| Staff redeployment (e.g. greater use of TAs to support individuals) | <input type="checkbox"/> | 9 |
| Catch-up schemes | <input type="checkbox"/> | 10 |
| Other (please specify) | <input type="checkbox"/> | 11 |

[free text box for 'other' questions. Mandatory if ticked 'Other']

[100 characters]

Q13, SR, ASK ALL, NUDGE,

13 This academic year, has your school provided any particular support for, or focus on, aiding learning recovery for very low attaining pupils?

- Yes 1
No 2

Q14, MR, ASK IF Q13 = 1, NUDGE,

14 Which areas has support for very low attaining pupils focused on? Please select all options that apply.

-
- | | | |
|---------------------------------------------------------------------|--------------------------|----|
| Maths support | <input type="checkbox"/> | 1 |
| Reading support | <input type="checkbox"/> | 2 |
| One-to-one catch-up support | <input type="checkbox"/> | 3 |
| Small-group work | <input type="checkbox"/> | 4 |
| Tutoring funded through the National Tutoring Programme (NTP) | <input type="checkbox"/> | 5 |
| Other tutoring (not funded through the NTP) | <input type="checkbox"/> | 6 |
| Parental engagement | <input type="checkbox"/> | 7 |
| Revised curriculum | <input type="checkbox"/> | 8 |
| Staff redeployment (e.g. greater use of TAs to support individuals) | <input type="checkbox"/> | 9 |
| Catch-up schemes | <input type="checkbox"/> | 10 |
| Other (please specify) | <input type="checkbox"/> | 11 |

[free text box for 'other' questions. Mandatory if ticked 'Other']

[100 characters]

Q15, MR, ASK IF Q10 EITHER MATHS OR READING = 3 or 12, NUDGE,

15 How are you providing tutoring funded through the National Tutoring Programme (NTP)? Please select all options that apply.

- | | | |
|-----------------------------------------------------------------------------------------------------------------|---|--------------------------|
| Using Tuition Partners (TP) (tutoring provided by approved TPs) | 1 | <input type="checkbox"/> |
| Using Academic Mentor(s) (hosting Academic Mentor(s) in your school) | 2 | <input type="checkbox"/> |
| Using school-led tuition (existing staff/external tutors with relevant NTP training and employed by the school) | 3 | <input type="checkbox"/> |

Q16, MR, ASK IF Q10 EITHER MATHS OR READING = 4 or 13, NUDGE,

16 How are you providing tutoring that is NOT funded through the National Tutoring Programme (NTP)? Please select all options that apply.

- | | | |
|-----------------------------------------------------------------|---|--------------------------|
| Using external tutors (not funded by the NTP) | 1 | <input type="checkbox"/> |
| Using internal tutors or existing staff (not funded by the NTP) | 2 | <input type="checkbox"/> |
| Other approach (please specify) | 3 | <input type="checkbox"/> |

[free text box for 'other'. Mandatory if ticked 'Other']

[100 characters]

Q17, MR (except 'None' is mutually exclusive), ASK ALL, NUDGE, Randomise except 'Other' and 'None'

17 What strategies has your school implemented this academic year to provide social skills/wellbeing support for Y3/Y4? Please select all options that apply.

-
- | | | |
|-----------------------------------------------------------------------------|---|--------------------------|
| Small-group wellbeing sessions | 1 | <input type="checkbox"/> |
| External support (<u>e.g.</u> counsellor) | 2 | <input type="checkbox"/> |
| Methods to increase parental engagement | 3 | <input type="checkbox"/> |
| Revised school day (<u>e.g.</u> additional breaks) | 4 | <input type="checkbox"/> |
| Staff redeployment (<u>e.g.</u> greater use of TAs to support individuals) | 5 | <input type="checkbox"/> |
| Catch-up schemes | 6 | <input type="checkbox"/> |
| Additional PSHE sessions | 7 | <input type="checkbox"/> |
| None | 8 | <input type="checkbox"/> |
| Other (please specify) | 9 | <input type="checkbox"/> |

[free text box for 'other' Mandatory if ticked 'Other']

[100 characters]

About parental engagement

Q18, SR, ASK ALL, NUDGE

- 18 How would you describe levels of Year 3/4 parental support in the current academic year (i.e. 2022/2023)? Please select one option.

	[1] <u>Very high</u>	[2] High	[3] Neither high nor low	[4] Low	[5] Very low
The level of support most parents are providing to their children in terms of their learning is...	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Q19, SR for each line, ASK ALL, NUDGE

- 19 How would you rate this level of parental support, in terms of *capability* (e.g. time, resources to support) and *willingness* compared to last academic year (i.e. 2021/2022)? Please select one option per row.

	Lower than last academic year	The same as last academic year	Higher than last academic year
Capability	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3
Willingness	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6

Q20, free text, ASK ALL, NUDGE

- 20 Is there anything further you would like to tell us about Year 3 / Year 4 learning and recovery in your school this academic year? We are particularly interested in wellbeing support, for example if there are any barriers you are facing in providing adequate support.

[300 characters]

SUBMIT PAGE

Please click 'Submit' to send your response. Once submitted, you will not be able to go back and change any of your answers.

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