Education
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Impact of School Closures and subsequent support strategies on attainment and socio-emotional wellbeing in Key Stage 1

Research Report

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NFER

National Foundation for
Educational Research

The Education Endowment Foundation (EEF) is an independent grant-making charity dedicated to breaking the link between family income and educational achievement, ensuring that children from all backgrounds can fulfil their potential and make the most of their talents.

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- identifying promising educational innovations that address the needs of disadvantaged children in primary and secondary schools in England;

- evaluating these innovations to extend and secure the evidence on what works and can be made to work at scale; and

- encouraging schools, government, charities and others to apply evidence and adopt innovations found to be effective.

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About the research organisation

The National Foundation for Educational Research (NFER) is the leading independent provider of education research. Our unique position and approach delivers evidence-based insights designed to enable education policy makers and practitioners to take action to improve outcomes for children and young people. Our key topic areas are: accountability, assessment, classroom practice, education to employment, social mobility, school funding, school workforce and systems and structures. As a not-for-profit organisation, we re-invest any surplus funds into self-funded research and development to further contribute to the science and knowledge of education research.

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Acknowledgements

Executive summary

About the study

- **Aims:** This study investigated the impact of school closures[1] for Covid-19 on the attainment of pupils in Key Stage 1 in reading and maths, and on the gap between the attainment of disadvantaged and non-disadvantaged children. It explored pupils' attainment compared with pre-pandemic samples, as well as any changes in attainment over the course of the academic year 2020/21 (see Key Terminology box below). It also investigated schools' strategies and approaches to learning during closures and reopening for Year 1 and Year 2 pupils. It aimed to determine the parts of the curriculum that children are struggling with, and also explored pupils' social skills and wellbeing.

Key terminology

- **Covid-19 gap**: The difference between the mean scores of pupils in the 2020/21 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 counterpart peers not eligible for FSM.

- **Timeline:** The research was carried out over the course of the academic year 2020/21, using termly assessments (autumn 2020,[2] spring 2021, summer 2021). Interim papers were published on the results of the autumn and spring assessments (Rose *et al.*, 2021a and 2021b).

- **Age and school year of children included in the study:** This study focused on children in Key Stage 1. The youngest children in our study had not completed their Reception year before the first set of school closures. Similarly, Year 1 children moving into Year 2 missed much of their first year of formal education.

- **Number of children and schools:** The study involved a total of 12,311 pupils[3] from 168 primary schools (or schools with Key Stage 1) in England. School retention in the sample was high over the three terms: 168 took part in autumn, 155 took part in the spring term and 152 in the summer term.

- **The study design explored attainment outcomes and social and emotional outcomes.**

    This was an observational study in which the samples' attainment outcomes were compared to standardisation samples from previous years using NFER reading and mathematics assessments (as well as a 2019 national curriculum assessment paper in summer for Year 2 pupils[4]). For each NFER assessment, comparisons were made between the 2020/21 scores and the standardisation sample scores from previous years (and for the national curriculum assessments to the 2016 national assessment scaled scores) – to identify any gap in scores – i.e., **the Covid-19 gap**.

    Further analysis compared the scores of pupils eligible for free school meals (FSM pupils) and those not eligible (non-FSM pupils) to explore **the disadvantage gap**.

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[1] Schools were closed in England from 20 March 2020 to all pupils apart from vulnerable pupils and the children of keyworkers. The partial reopening of schools took place from 1 June 2020 to pupils in Years 1 and 6 (and GCSE and A level students). However, most pupils remained at home until schools fully reopened in September 2020. A further set of school closures occurred from 4 January 2021 until 8 March 2021.

[2] Autumn assessments were taken by Year 2 children only; there is no Year 1 autumn assessment as this time is often used to allow children to settle into school routines.

[3] 12,311 pupils' results were analysed in the repeated measure analysis looking at the change in attainment over the academic year 2020/21.

[4] We had originally intended to explore Key Stage 1 2021 national curriculum assessments. Following the cancellation of these assessments, the 2019 Key Stage 1 assessment was administered for this study instead.

In addition, we analysed how the Covid-19 gap and the disadvantage gap changed from one term to another using a **repeated measures analysis**.

We explored the impact of school closures on pupils' social skills using the teacher-completed Child Self-Regulation and Behaviour Questionnaire (CSBQ) with a sub-sample of pupils in the autumn and summer terms (during 2020/21). Additionally, we collected information and views on strategies schools used during closures and reopening via a school survey and in-depth teacher telephone interviews. We also invited schools to provide pupil-level information on catch-up support.

- **Organisations involved:** This is the final report from year one of NFER's Covid Recovery Study, funded by EEF. This report covers the impact of Covid-19 school closures on children's progress in Year 1 and Year 2 in reading and mathematics and on their social and emotional skills.

Findings

Figures 1 and 2 present the findings relating to the Covid-19 and disadvantage gaps. Table 1 highlights the key findings from the study relating to the impact of partial school closures on the Covid-19 attainment gap, disadvantage gaps, children's social skills, and schools' strategies to support their Key Stage 1 pupils' learning during the pandemic.

Table 1: Summary of study findings.

Research question	Finding
RQ1 and RQ2: To what extent has pupils' attainment in reading and mathematics been impacted by school closures (the Covid-19 gap)? And how does the Covid-19 gap change over the 2020/21 academic year?	There were attainment gaps in reading and mathematics, in each of the terms, for both Year 1 and Year 2 pupils. Key Stage 1 children's learning as a result of the Covid-19 pandemic was disrupted in the order of one to three months progress when compared to pre-pandemic standardisation samples (see Figure 1). When explored over time over the 2020/21 academic year, from autumn to spring, the Covid-19 gap increased for Year 2 children for both maths and reading. From spring to summer, the Covid-19 gap for Year 1 children remained stable for reading and decreased for maths.
RQ3 and RQ4: Are FSM children disproportionately affected (the disadvantage gap)? And does the disadvantage gap change over time?	In both reading and mathematics, in each of the terms in the 2020/21 academic year, and for both year groups, there was a substantial difference in attainment between FSM children and their peers; around seven months' progress. The disadvantage gap increased for Year 2 pupils in mathematics and remained stable for reading between autumn and spring. For Year 1 pupils, the disadvantage gap in both maths and reading reduced from spring to summer.
RQ5: How has attainment in certain curriculum domains changed over the 2020/21 academic year?	The analysis of this research question was changed to diagnostic analysis in order to make the findings as useful as possible to teachers as a formative tool. We explored patterns and trends in a descriptive way rather than quantifying aspects of performance.
RQ6: What practices have been adopted by schools during closures and reopening?	To support recovery in Key Stage 1, schools were focusing on small group work in reading and mathematics, curriculum revisions and staff (re)deployment. They had a notable focus on wellbeing and personal, social, health and economic education (PSHE). Schools felt more prepared for the second set of closures than the first, reporting better access to IT and interactive learning.

Research question	Finding
RQ7: Is there an association between pupil-level support activities and progress? Does this differ for subgroups?	This research question could not be answered due to low response rates to pupil-level participation records (PPRs).
RQ8: Have school closures affected children's social skills? How does this change over time?	Pupils' social skills were rated by teachers to be, on average, at or above expected levels (compared to the CSBQ norms available, which are for 3–6 year old Australian children and therefore limited). Pupils' scores on the CSBQ were overall higher in summer 2021 than in autumn 2020. Note that, due to the limitations of the measure, results on social skills should be interpreted with caution.

Despite schools being open in the autumn and summer terms during the 2020/21 academic year, children had not recovered from the learning they had missed during 2020 and 2021. There is still much to do to support their learning, with a particular focus on the groups and subjects which have been most affected.

By the end of the summer term, Year 1 children remained 3 months behind where we would expect them to be in reading. However, there was some recovery in maths, with children being only 1 month behind expectations by the end of the summer term. Year 2 children were still 2 months behind in reading at the end of the summer term, but had recovered to above expected standards in maths. In both subjects, larger proportions of children were unable to access the assessments fully compared to pre-pandemic levels.

There was very little improvement in the disadvantage gap, which remained at 7 months by the summer term (although there was a small improvement for Year 1 reading and mathematics). NFER's diagnostic tests were used to determine if children were struggling with particular areas of the curriculum. We found that children from disadvantaged backgrounds were more likely to find all parts of the maths and reading curriculum harder.

Figure 1: Attainment compared to pre-pandemic standardisation samples: the Covid-19 gap.
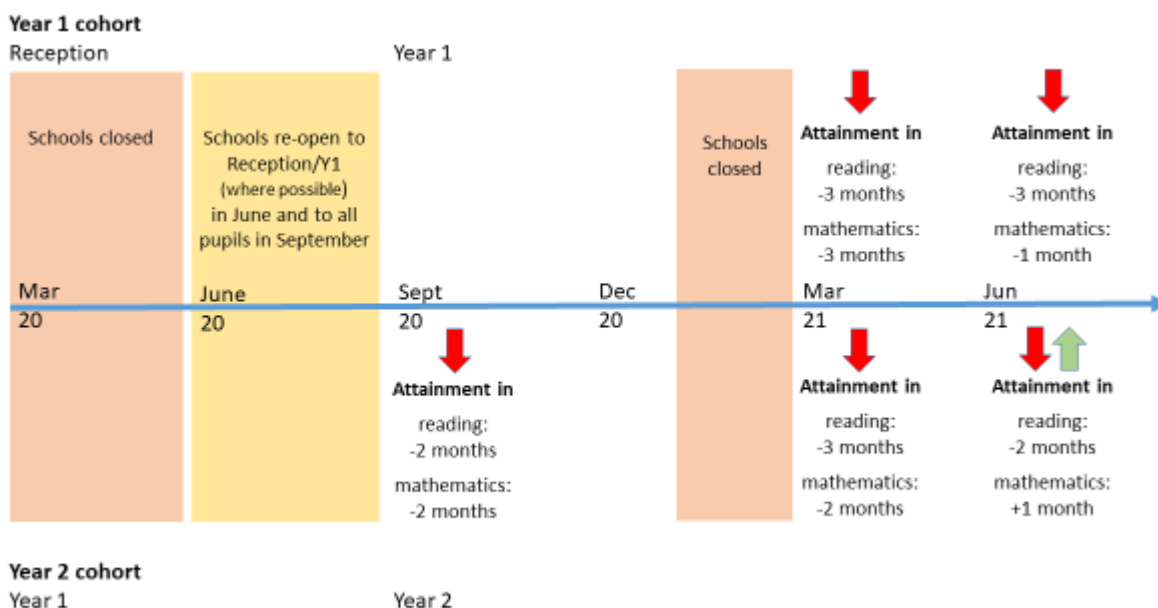
Exploring the Covid-19 gap: each term, pupils' attainment was below that of their pre-pandemic peers, but there was some evidence of Year 1 children catching up in the summer in mathematics.

We observed that pupils were behind their pre-pandemic peers in reading and maths attainment at all time points, except for Year 2 pupils in mathematics in summer 2021. However, we did see some evidence for recovery for Year 1 pupils in mathematics, as the Covid-19 gap seemed to start shrinking at that time.

Why might mathematics be improving but not reading?

We looked at the extent to which the Covid-19 gap in learning was driven by higher, middle or lower attainers falling behind. For reading, there was minimal impact on the higher attainers but more impact on the lower attainers. For mathematics, it appeared that progress was impacted for a wider ability group. It is probable that the higher attainers in that group could catch up quickly in the summer. We produced detailed diagnostic reports for schools that were intended to help them identify learning gaps that need to be addressed in both reading and mathematics.

The disadvantage gap and increasing inequalities

Unfortunately, our evidence shows that there was a wide disadvantage gap in autumn 2020, potentially wider than pre-pandemic levels. There continued to be a large disadvantage gap after the second set of school closures, and indeed this increased for mathematics in Year 2. We know from other studies that access to IT and parental engagement were challenging during school closures and children from disadvantaged homes in particular experienced a number of challenges not conducive to learning at home (Cullinane and Montacute, 2020; Moss, 2020). There is some evidence of a narrowing of the disadvantage gap in mathematics by summer 2021, illustrated in Figure 2.

Figure 2: Gaps in attainment between disadvantaged children in 2020/21 and their peers (the Disadvantage gap).
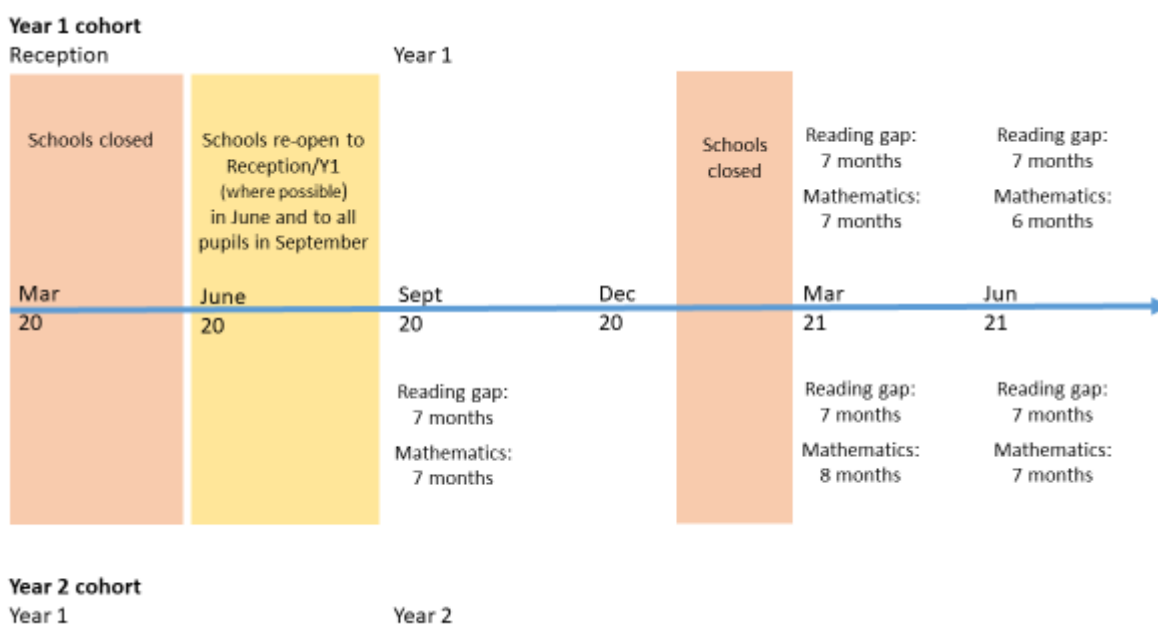
School staff reported concerns over wellbeing, although the CSBQ instrument did not find a negative impact on social skills.

Staff reports

Some head teachers and teachers in this study felt that pupils' social skills and wellbeing were below their previous year's cohort, citing for example reduced play/interactions with peers and lack of consistent structure as affecting pupils' social development; and on returning from the second set of school closures, teachers noted more anxiety issues amongst their children. However, in autumn 2020, between 30% and 40% of head teachers rated their pupils as the same as last year's cohort with regard to social skills and 41–55% rated their pupils as the same as last year's cohort in terms of wellbeing. This indicates a less stark picture than other existing research (see Nelson, Lynch and Sharp, 2021), which may be due to the different samples used; disadvantaged pupils are likely to be worse affected than their peers.

Social skills (CSBQ)

Teachers rated a sample of their pupils' social skills in autumn 2020 and summer 2021. When compared to the instrument norms, these ratings were, on average, at or above expected levels. Disadvantaged pupils performed

significantly worse on the subscales compared to their non-disadvantaged peers. Note, however, that the CSBQ sample norms are for Australian children aged 3–6 years, and there were some ceiling effects for our study sample. On average, older children would be expected to have better developed social skills than younger children. Therefore, the comparison with the present sample (age range: 5–8 years) should be considered with some caution. This highlights the need for high quality, reliable and valid measures of socio-emotional skills for this age group. Furthermore, the level of social skills of these pupils before the autumn time point is not known and therefore it cannot be concluded that there was no reduction in score between first closures and autumn, although scores generally improved between autumn and summer.

Due to these sources providing mixed results, the impact on social skills and wellbeing appears to be a complicated picture, meaning no firm conclusions can be drawn, though further investigation is recommended, and the development of robust measures is advised.

Implications for policy

The results of this study indicate that there has been a negative impact of school closures on Key Stage 1 pupils' learning in reading and maths (the Covid-19 gap). However, there is some evidence that recovery is already beginning, and through suitably funded long-term support, learning recovery is possible. The results also suggest that recovery support should encompass all pupils, including both higher and lower attainers. Disadvantaged pupils have been the worst affected by school closures, suggesting that specific targeted approaches should be employed for disadvantaged pupils, in order to close this gap. Recovery support should also be informed by diagnostic assessments as were used in this study, alongside the repeated assessments.

Although the study did not gather as much information on IT access as intended, the contextual information from school staff indicates that recovery programmes must enable IT access for all, both in school and at home. If digital delivery is utilised to support recovery, a strong digital inclusion strategy will be required, particularly if school closures were to occur again.

Regarding socio-emotional outcomes, this study indicates the need for further work to understand the long-term impacts of school closures. For this sample, which was largely representative of the population, we did not find a significant impact on social skills, as measured by the CSBQ. However, the results showed that disadvantaged children performed worse on the social skills measure, as would be expected from the literature (see Nelson, Lynch and Sharp, 2021). The development of valid and reliable measures of socio-emotional skills for this age group is crucial to facilitate future work in this area. As school staff reported concerns about wellbeing and social skills, there needs to be adequate funding for wellbeing support, and further investigation into innovative and effective support strategies.

Introduction

Background evidence

Schools closed to the majority of pupils on 20 March 2020, opening only for vulnerable pupils and the children of keyworkers. Remote learning was introduced by schools, and projects such as the Oak National Academy were launched to aid pupils in learning from home. The partial reopening of schools took place from 1 June 2020 to pupils in Years 1 and 6, and GCSE and A Level students. However, most pupils remained at home until schools fully reopened in September 2020. A further set of school closures occurred from 4 January 2021 until 8 March 2021.

Despite the introduction of remote learning to the majority of pupils, early estimates by teachers of the Covid-19 gap were an average of three months for all pupils and four months for pupils in the most disadvantaged schools, whilst the disadvantage gap was projected by EEF to widen by 36% during the first lockdown, likely reversing progress made to narrow the gap since 2011. Concerns were widely shared and debated with regards to a 'digital divide' caused by the lack of devices and access to broadband for some pupils, and the differing levels of engagement in remote learning. The government-funded National Tutoring Programme was introduced in the 2020/21 academic year (AY) to provide additional support for pupils who had missed out the most as a result of school closures.

The study examines the impact of the disruption to learning caused by the Covid-19 pandemic on the children at the start of their educational journeys, both in terms of their academic progress and their development of social skills. The focus of this study is Key Stage 1 as we considered that the age of the pupils may make independent learning more challenging and therefore sought to investigate the impact of school closures and remote learning on the attainment of these pupils.

The youngest pupils had not completed their Reception year before the first set of schools' closures in March 2020. At this stage, pupils learn school routines and expectations; crucially, for Reception children moving into Year 1, Covid-19 has disrupted this transition phase, which is usually carefully managed by schools (Children's Commissioner, 2020). Children also begin to develop skills, both academic and social, that will be the foundation of future learning (Sylva *et al.*, 2004). Similarly, Year 1 children moving into Year 2 would have missed much of their first year of formal education where many of the foundations for future learning are laid.

Existing research shows schools' choice of support strategies during the first lockdown varied according to levels of disadvantage, with access to technology, links with parents, provision of food boxes (Cullinane and Montacute, 2020) and physical resources contributing to the home learning environment (Outhwaite, UCL, 2020). Such factors, alongside other research (Coe *et al.,* 2020), pointed to the importance of establishing targeted and effective catch-up strategies and provision across the following 2020/21 AY. Researchers suggested that future contributions to the field should take into account absences beyond September 2020, patterns of recovery over time (Kuhfeld *et al.*, 2020), and assumptions about different support strategies, such as the weight given to online learning (Moss, 2020).

This study sought to examine both the impact of school closures and continued disruption to learning throughout the AY due to Covid-19 on Key Stage 1 children's overall attainment, and whether these had a disproportionate impact on children from disadvantaged backgrounds. It also looked at other factors which may have impacted on pupils' attainment, such as the practices put in place by schools, the children's development of social skills, and the recovery strategies that were employed. The study began at the point where children returned to school in the autumn term of 2020 but included a retrospective view of the previous AY March–July 2020. During the course of the study, in January 2021, a further set of school closures took place, which had the potential to further impact on the attainment and development of the children.

Research objectives

The study is based on a combination of quantitative research looking at pupil attainment derived from NFER assessments and data available by reusing national curriculum tests, supplemented with quantitative (survey) and qualitative (interview) evidence of school practices and teachers' perspectives on pupils' wellbeing and social skills.

Assessments for Year 2 took place in the autumn term 2020 after children had returned to school, in the spring term 2021 as soon as they returned after the second set of school closures, and in the summer term 2021. Year 1 assessments took place in spring 2021, immediately following the second set of school closures, and in summer 2021

but there was no autumn 2020 assessment available for Year 1 as this period is often used to allow children to settle into school routines.

These assessments were taken from the NFER suite of assessments for Key Stage 1 and were standardised using a nationally representative sample of schools prior to the start of the pandemic. Assuming limited change over time in terms of the ability of different cohorts, we can compare the mean standardised score in our sample to the standardisation mean of 100. This will be referred to as the Covid-19 gap.

The summer Year 2 national curriculum tests for both 2020 and 2021 did not take place. The study therefore reused the 2019 national curriculum papers to provide data for the Year 2 summer assessment. This was compared to the 2016 data which was used to calculate the scaled scores in order to identify the Covid-19 gap.

Further analysis makes comparisons between pupils in our sample who are eligible for FSM and those who are not eligible enabling us to identify whether the gap between the two groups is narrowing, remaining stable or increasing. This will be referred to as the disadvantage gap.

The study seeks to answer the eight research questions (RQs) listed below:

RQ1 To what extent has pupils' attainment in reading and mathematics been impacted by school closures in 2020? This is the Covid-19 gap.

RQ2 How does any attainment gap, i.e., any Covid-19 gap, change over the 2020/21 academic year?

RQ3 Are different groups disproportionately affected? This is the disadvantage gap for pupils who are eligible and not eligible for FSM.

RQ4 How well do these groups recover over the 2020/21 academic year? Does any disadvantage gap change over time?

RQ5 How has attainment in certain curriculum domains changed over the 2020/21 academic year?

RQ6 What practices have been adopted and learning opportunities provided by schools during school closures and after reopening, and can effective practices be identified?

RQ7 Is there an association between pupil-level support activities and progress? Does this differ for subgroups?

RQ8 Have school closures affected children's social skills? How does this change over the 2020/21 academic year?

Ethics

Ethical approval

This research project received ethical approval through NFER's standard project start-up procedures and Code of Practice group on 28 September 2020.

Ethical agreement from schools to take part

The NFER was responsible for recruiting schools for this research. A letter for head teachers was emailed on 6 October 2020 to all schools who had ordered at least one NFER assessment, asking if they would like to take part in the research. 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. The letter also provided instructions on how to access the secure school portal to access an online reply form. Also included were the Memorandum of Understanding (MOU) setting out expectations for both the NFER and the school, a School Information Sheet showing the research at its various stages and the School and Parent Privacy Notices. Headteachers were asked to complete the online reply form, which incorporated their acceptance of the terms of the MOU.

Once schools had completed the online reply form confirming their interest, they provided details of Year 1 and Year 2 pupils (forename, surname, date of birth, unique pupil number (UPN), gender, English as an Additional Language (EAL) information, FSM status), year group and class). A Parent Opt-out/Withdrawal letter was uploaded to the school portal for schools to share with their Year 1 and Year 2 cohort parents. This gave parents the option to withdraw their child's data from being shared, stored or used in this research.

Copies of these documents are included in Appendix A.

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

The 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 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 AY. 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 and conduct a sample of interviews with.

- Pupil name, date of birth, gender, UPN, class name, school name, EAL information, FSM status, information on support activities that pupils have taken part in (such as 1:1 or small group support). This data was required for assessment booklets, 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' socio-emotional development and social skills to explore what impact the school closures may have had on the social skills development of Key Stage 1 pupils.

No special category data was processed in this research.

Data security/transfer

All personal data provided electronically was done so using the NFER's secure school portal. All researchers involved directly with pupils and their data had up-to-date DBS 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 the 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, including audio-recordings of the interviews, will be stored securely in the NFER systems until the final report in this research project is published. This is currently expected to be December 2021. The 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 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 Scheme.[5]

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. There were 55 pupil withdrawals in total across all waves of data collection. 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 A) were available via links on the project pages of the NFER website and also uploaded to the school portal.

Project team

At NFER

Susan Rose	Project leader
Pippa Lord	Project director
Ben Styles	Project consultant
Liz Twist	Project consultant
Lydia Fletcher	Researcher
Tara Paxman	Researcher
Karim Badr	Psychometrician
Afrah Dirie	Statistician
Simon Rutt	Statistician

At EEF

Diotima Rapp

Jamila Boughelaf

Celeste Cheung

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[5] https://www.ons.gov.uk/aboutus/whatwedo/statistics/requestingstatistics/approvedresearcherscheme

Methods

Study design

This study had an observational design in which attainment outcomes in reading and mathematics were compared to attainment outcomes for the same subjects in previous years. Additionally, the study utilised a repeated measures design in which attainment outcomes for the same sample of pupils were compared between terms. The attainment in reading and mathematics of the same sample of pupils in Year 1 and Year 2 was tracked throughout the 2020/21 AY.

The Year 1 NFER assessment data was collected in the spring and summer terms of 2021 and the Year 2 NFER assessment data was collected in autumn 2020 and spring 2021. There are no NFER assessments for the summer term of Year 2 because children normally complete national curriculum assessments at that time. However, as these assessments were cancelled in summer 2021, instead we used the 2019 Key Stage 1 national curriculum assessments, as the most recent available assessment. This was administered to Year 2 pupils in the study sample in summer 2021. NFER do not produce an autumn assessment for Year 1, as this period is often used to allow children to settle into school routines.

For each NFER assessment, comparisons of reading and mathematics scores in our sample were made to that of the standardisation sample from previous years. A standardisation sample is a large group of individuals that is representative of the entire population of potential test takers. The performance of this group on the test being standardised is used to ascertain the average performance level and the relative frequency of each deviation from the mean. For Year 1 and Year 2 spring assessments, comparisons of reading and mathematics standardised scores were made to the 2019 standardised means for reading and mathematics (i.e., the year when these NFER assessments were standardised) to identify the impact of school closures. Similar comparisons were made for the Year 1 summer and Year 2 autumn assessments to the 2017 standardised means (i.e., the year when these NFER assessments were standardised) to identify the impact of school closures. As the NFER suite of tests is large, it is not possible to standardise all of the tests at the same time. It is for this reason that some of the Year 1 and Year 2 NFER assessments were standardised in different years (i.e., 2017 and 2019). As for the Year 2 summer assessments (i.e., 2019 Key Stage 1 national curriculum assessments), comparisons were made to the Key Stage 1 2016 scaled score means, as this was the most recently available information about Key Stage 1 test performance. Any difference between the scores in the 2020/21 academic year and previous standardisation years is the Covid-19 gap and will be referred to as such throughout the report. Table 2 summarises all assessments administered for each year group at each time point and the historical reference point used for each assessment to carry out comparisons. More information about the tests used (including their duration, number of marks available, and scoring) can be found in Appendix B.

Table 2: Assessments and their historical reference points used in this study.

Test in this study	Sample for comparison
Year 2 autumn assessment [NFER]	2017 Standardisation sample
Year 1 spring assessment [NFER]	2019 Standardisation sample
Year 2 spring assessment [NFER]	2019 Standardisation sample
Year 1 summer assessment [NFER]	2017 Standardisation sample
Year 2 summer assessment [2019 Key Stage 1 Test]	2016 Sample[6]

Further analysis compared the scores of pupils eligible for FSM and those not eligible (non-FSM pupils) at each academic term and across the AY to identify whether the gap between these two groups narrowed, remained stable, or increased. This will be referred to as the disadvantage gap.

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[6] The 2016 sample was a one-off data collection carried out by STA in 2016, rather than a standardisation sample.

We realise that the disadvantage gap is one that has existed prior to the occurrence of the Covid-19 pandemic. As such, our estimates of the disadvantage gap for each assessment at each time point should be contextualised within what we would expect the disadvantage gap to have been despite the pandemic and then estimate the effect of the pandemic on the possible widening of this gap. To be able to do this, we relied on teachers' assessment at the end of Key Stage 1 (i.e., for Year 2) in 2019 for the percentage of pupils reaching expected standard or above in reading and mathematics for both disadvantaged pupils (i.e. FSM) and all other pupils.[7] We first convert this difference in percentage points between FSM and other pupils into an effect size and then to a month's progress measure for the pre-pandemic estimations. We then compare this to the month's progress estimate in our current sample to ascertain whether the disadvantage gap, in months, has increased. There are some limitations to this method that are covered in the conclusions and limitations section of this report.

Additionally, analysis was undertaken to identify how the Covid-19 gap and the disadvantage gap changed from one term to another in the 2020/21 AY. This is a repeated measures analysis and will be referred to as such throughout the report. The Covid-19 gap is represented by the difference between the termly scores and the standardised average of 100. A significant change between terms would reflect a reduction or increase in the gap between the scores in 2020/21 AY and the standardised average. As for the disadvantage gap, a significant change in the difference between the mean scores of FSM pupils and non-FSM pupils between terms would reflect a reduction or increase in the disadvantage gap.

Besides assessments measuring reading and mathematics attainment, a teacher-completed pupil-level self-regulation and social skills development survey was administered to a sub-sample of pupils within each school in the autumn term of 2020 and summer term of 2021. The change in pupil-level self-regulation and social skills development across the AY (i.e., change from autumn 2020 to summer 2021) was investigated using repeated measures multilevel models.

Additional information was also collected to identify school practices and any catch-up activities being undertaken with the pupils. Whilst it was planned to test whether there is an association between certain support activities and progress in attainment and social skills and wellbeing, a low response rate resulted in this not being possible. Instead, the information derived from these data collection exercises was used in a contextual manner rather than inferentially to further qualify the findings of this study. The study design is described in Table 3.

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[7]
**https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/851296/Phonics_scree
ning_check_and_key_stage_1_assessments_in_England_2019.pdf**

Table 3: Study design.

Design		Observational study
Unit of analysis		Pupils, schools and time point
Number of units included in analysis		168 schools and all pupils in Years 1 and 2, 12,311 pupils, and 3 time points (autumn 2020, spring 2021 and summer 2021)
Primary outcome 1	Variable	Mathematics attainment
	Measure (instrument, scale, source)	NFER standardised test scores, 69–141 Key Stage 1 2019 test scaled scores, 84–115
Primary outcome 2	Variable(s)	Reading attainment
	Measure(s) (instrument, scale, source)	NFER standardised test scores, 69–141 Key Stage 1 2019 test scaled scores, 84–115
Secondary outcome	Variable	Self-regulation and social development scales: • Sociability • Cognitive self-regulation • Behavioral self-regulation • Emotional self-regulation • Prosocial behavior • Externalising problems • Internalising problems
	Measure (instrument, scale, source)	CSBQ, 1–5 for each scale, Howard and Melhuish (2017) Early Years Toolbox

Participants

The participants of this study were all pupils in Year 1 (5–6 years old) and Year 2 (6–7 years old) in participating schools.

This project used the data from the cohort of primary schools that used NFER assessments in the 2020/21 AY. It was decided to use this cohort of schools as it would not require approaching new schools during the pandemic. Contact with schools is something NFER had considered very carefully during trying times when school management were under additional pressures to ensure they remained open.

In October 2020, 561 schools, who were NFER customers, were invited to participate. 225 schools were approached in a second sample, making a total of 786 schools invited to participate. 989 schools were approached in a third sample, making a total of 1,775 schools invited to participate. The study began in autumn 2020 with 168 schools and of these, by the end of the third wave, we had 155 participating schools. Communications highlighted the importance of the research and benefits to schools.

We scheduled reminder strategies where completed assessments were not forthcoming. Additionally, the following factors were employed to incentivise participation:

- provision of free marking

- testing in October/November (not September with its inherent logistical challenges)

- leaflets showing implications for teaching from item-level diagnostic analysis

- use of progress tool (NFER inputted total test scores and provided schools with item level data)

Participating schools received sets of NFER assessments (mathematics and reading) to be used at three time points in the 2020/21 AY. To reduce burden, NFER pre-populated test papers with pupil details and scored the assessments in-house. Assessment results were shared with schools and all data was transferred through NFER's secure data portal. All assessments received were scored and reported to schools. However, only pupils with a total raw score were included in the analysis. The mathematics and reading assessments each consist of two papers. Schools were asked to administer the assessments to all pupils in each year and, where possible within the testing window, to give absent pupils the opportunity to complete them on their return.

Only those who attempted both papers in mathematics and at least the first paper in reading received a total score and were considered for later analysis. The Year 2 reading assessments consists of two papers. Following the model of Key Stage 1 national assessment, both papers are intended for all pupils. However, as it is slightly higher in difficulty, it is expected that paper 2 may be unsuitable for some pupils and the NFER teacher guide advises that it is not suitable to administer the second paper in such cases. The majority of pupils sat both papers; however, a small number of pupils sat only paper 1 in reading for this reason and were therefore still included in the study. Where a pupil missed a paper through absence they were not included.

Measures

Primary outcome measures

The primary outcome measures were attainment data from NFER assessments in reading and mathematics for individual pupils.[8] NFER test data was collected in autumn (late October/November) 2020 and spring (March) 2021 for Year 2 pupils and in spring (March) 2021 and summer (June/July) 2021 for Year 1 pupils. Additionally, the 2019 Key Stage 1 national curriculum assessment papers were administered in the summer term of 2021 for Year 2 pupils. All assessments took place during periods when schools were open, were administered by the schools following the usual NFER guidance on how to administer the assessments and, once returned to NFER, were marked by NFER markers. The markers used coding to enable diagnostic information to be produced and disseminated to schools to inform teaching.

The NFER assessments have a strong alignment to the English national curriculum in reading and mathematics and have robust technical properties,[9] including good reliability (e.g. the Year 1 spring tests all have Cronbach's alphas between 0.81 and 0.92 and the Year 2 spring tests' between 0.86 and 0.91); outcomes include standardised scores and age-standardised scores (i.e. scores based on large, nationally representative samples) for NFER assessments and scaled scores for the 2019 Key Stage 1 assessments. 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. On the other hand, scaled scores show whether a pupil has met an expected standard or not. Raw scores on NFER assessments were transformed to produce standardised scores ranging from 69 to 141. The raw scores on the 2019 Key Stage 1 assessments were transformed to produce scaled scores ranging from 84–115.[10] NFER assessments are standardised so that the average, nationally standardised score is 100 and the standard deviation is 15. This means that a pupil scoring 100 on NFER assessments is obtaining the national average score. On the Key Stage 1 national curriculum 2019 assessments, a score of 100 implies that the pupil has met the expected standard on the test. Unlike NFER tests, the average on these national curriculum assessments is not necessarily 100 and is usually above 100.

Schools can use these different assessments to monitor termly and yearly progress of their pupils and to identify misconceptions and gaps in learning. This study used data from the autumn 2020 cohort onwards since the historical data from NFER assessments was not available for use due to GDPR restrictions. Each NFER assessment used in our

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[8] Information on NFER assessments can be found in the following locations:
https://www.nfer.ac.uk/for-schools/products-services/nfer-tests/key-stage-1-assessments/ and https://www.nfer.ac.uk/for-schools/products-services/nfer-tests/nfer-tests-development/
[9] Technical manuals can be found here: https://www.nfer.ac.uk/for-schools/products-services/nfer-tests/technical-manuals/
[10] The actual scaled score range for the 2019 Key Stage 1 papers is 85–115. Pupils need to have a raw score of at least 3 marks to be awarded the minimum scaled score. For the purposes of facilitating the calculation of means and SDs, raw scores below 3 were assigned a scaled score of 84.

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 tests) following the introduction of the new (2014) national curriculum and at the same time of the academic year as the study assessments were scheduled. The STA KS1 2019 national curriculum tests were trialled with pupils in a stratified sample of schools by school attainment and region.[11] Our historical reference points for these tests and assessments are mentioned in Table 2 above.

These historical reference points allowed us to assess the Covid-19 gap by comparing the performance of pupils at each academic term to the performance of other pupils in previous standardisation years. However, similar comparisons for the disadvantage gap in reference to previous standardisation years were not possible as no data was available on the performance of FSM and non-FSM pupils in those earlier standardisation years. Nevertheless, comparisons between FSM and non-FSM pupils were carried out for each term in our 2020/21 AY and the change in the disadvantage gap throughout this AY was also investigated.

By collecting termly standardised scores from a sample of schools, we obtained two data points for Year 1 and two data points for Year 2 based on the same individuals as they progressed through Years 1 and 2 in the 2020/21 AY. This does not include the scaled scores for Year 2 collected in summer 2021. This allowed us to track the change in the Covid-19 gap and the disadvantage gap through the 2020/21 AY.

Secondary outcome measures

Alongside attainment outcomes, pupils' social skills and wellbeing at the time of their return to school, and learning recovery are important to capture. This is particularly relevant for Key Stage 1 pupils, as they may have missed opportunities for communication, social skills and emotional development due to school closures.

To explore these non-attainment outcomes, we collected data on pupil wellbeing/social skills via a pupil-level survey completed by teachers in autumn 2020 and summer 2021 using a validated instrument. To minimise burden, we selected a sub-sample of around 12 pupils per year group. The sub-sample was randomly selected by NFER from the full pupil list.

Several measures were considered for the assessment of social skills and wellbeing. These included The Social Aptitude Scale (SAS; Liddle, Batty and Goodman, 2009), Elementary Social Behavior Assessment (ESBA; Pennefather and Smolkowski, 2015), Teacher Observation of Classroom Adaptation—Checklist (TOCA-C; Koth, Bradshaw and Leaf, 2009), Social Skills Improvement System Rating Scales (Gresham and Elliot, 2008) and the Strengths and Difficulties Questionnaire (SDQ; Goodman, 1997).

The SAS was developed to index increased risks of Autism Spectrum Disorder and therefore was deemed to be less appropriate for the measurement of a typical cohort. The ESBA and TOCA-C were discounted due to not having appropriate norms. The Social Skills Improvement System Rating Scales requires additional training to conduct, which we could not guarantee class teachers would have, and therefore was not used. The SDQ is measured on a 3-point scale which was judged as not suitably sensitive to detect changes over time. Furthermore, use of the SDQ results in Special Data and therefore due to feasibility of gaining consent, this measure was not used.

The CSBQ was chosen due to its strong psychometric properties (all subscales having a reliability of $\alpha > 0.80$) and a suitably granular scale, which we anticipated would allow the research team to see any change in pupils over time. The CSBQ is a 34-item teacher-completed (or parent-completed) questionnaire that captures a child's ability to manage their feelings and demonstrate appropriate social behaviours in the school environment. The CSBQ produces scores on seven subscales. These subscales are cognitive self-regulation, behavioural self-regulation, emotional self-regulation, sociability, prosocial behaviour, internalising problems and externalising problems. A short description of each subscale is given in Table 4. The full CSBQ instrument can be found in Appendix C. The reliability coefficients (Cronbach's alphas) for each CSBQ subscale were all above 0.7 and can be found in Table 4.

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[11] https://www.gov.uk/government/publications/2019-national-curriculum-test-handbook

As the CSBQ is on a 5-point scale, as compared to the 3-point scale of the SDQ, this gave more opportunity for change over time to be detected. Although the norms are from an Australian sample (n=414) and for children slightly lower in age than our sample (3–6 years), it was anticipated that pupils may be below expected levels due to a lack of social interactions throughout the pandemic. Furthermore, as the CSBQ authors note, social skills do not necessarily increase linearly with age, although general age-related improvements in social skills would be expected. Therefore, the CSBQ was chosen as the most appropriate measure of social skills for this study. We acknowledge that there are limitations with this measure, such as that children in England may have different levels of social skills as compared to Australian children, and the norms have not been validated on the exact age of our sample.

Table 4: Description of CSBQ subscales and their reliabilities.

Subscale	Definition	Reliability (Cronbach's α)
Cognitive self-regulation	Regulation of cognition e.g., focusing attention on the current task	0.92
Behavioural self-regulation	Behaving appropriately in situations	0.87
Emotional self-regulation	Managing emotions and feelings	0.78
Sociability	Being social with others	0.87
Prosocial behaviour	Behaviour benefitting others, e.g., sharing, showing empathy	0.88
Internalising problems	Depression/anxiety behaviours	0.74
Externalising problems	Antisocial behaviours	0.86

Additional measures

In addition to attainment outcomes (primary outcomes) and social skills outcomes (secondary outcomes), we collected data around support strategies and learning practices through surveys completed by head teachers, and pupil-level records completed by teachers. Ten follow-up telephone interviews were also scheduled with class teachers to provide information and context on the time points within the study. Together, these were planned to facilitate an understanding of what measures were in place as well as assess the relationship between practices, pupil-level support, and attainment and non-attainment outcomes. Due to low response rates to the pupil-level participation record (PPR) and surveys being at the school level and thus not comparable to pupil assessment results, inferential analysis of the link between practices, support and outcomes was not possible. Thus, the additional measures are used for contextual data only. The online survey software Questback (QB) was used for developing and hosting the school-level survey along with collecting the teacher-completed pupil-level record. This method for the pupil-level record allowed for any pre-collected information to be included (i.e., teachers could include information on support/catch-up activities for their pupils from earlier in the term).

School-level survey

The school-level survey was sent to 168 head teachers on 2 November 2020, and asked schools about provision during the initial school closure period from March 2020 as well as strategies used to support pupils on their return to school. This survey was completed at an early time point during our study to capture retrospective data on the first closures accurately. Responses were then used to inform the teacher interviews at the end of the academic year, to provide more in-depth data at this later time point. There was no follow up survey as this would have increased the demands of the study and therefore the burden on head teachers. The full survey instrument can be found in Appendix D.

The online school-level survey gathered key stage specific responses and was routed for differing Year 1 and Year 2 recovery responses. This enabled head teachers to reflect on children's attainment and the strategies implemented during the first closures, summer 2020 and across the first half of the autumn term. This collection included:

- strategies for home learning

- information on parental engagement during closures

- information on the return to school for most pupils in June 2020 (i.e., amount of face-to-face provision and changes affecting pupils)

- head teacher views on the reading and mathematics ability of their cohort for the whole year group/specific groups of pupils (FSM and EAL) on return to school in autumn

- head teacher views on the social skills/wellbeing of their cohort, for whole year group/specific groups of pupils (FSM and EAL) on return to school in autumn

- head teacher-reported support strategies for learning/wellbeing throughout return to school

- future plans for support strategies.

Pupil-level activity/support record

A pupil-level participation record (PPR) was designed to be completed by teachers for each of their pupils, which was intended to allow links between pupil activities/support and individual assessment results. The PPR was also intended to provide information on the digital divide. It consisted of online[12] teacher-completed pupil-level activity records to provide data about pupil participation in pre-specified categories such as the NTP/1:1/small group tuition, reading support and mathematics support. These categories were informed by data from the autumn school-level survey. The document for spring term 2021 also included information on home learning strategies, IT access and engagement. Schools were sent this online data collection tool on 17 March 2021. This was intended to be sent to schools in January 2021. However, dispatch to schools was delayed due to the second school closures in order to reduce teacher burden. Respondents were asked to complete the activity records for the autumn (retrospectively), spring, and summer terms of the 2020/21 AY. The full instruments can be found in Appendices E (autumn/spring) and F (spring/summer).

This instrument gathered pupil-level data on activities completed and support received by individual pupils for the 2020/21 AY, which would have allowed for contextual factors around participation in a particular provision to be included in the analysis of changing attainment gaps. However, due to very low response rates, the inclusion of these factors in the analysis of changing attainment gaps was deemed not feasible. Similarly, an exploration of the digital divide was not possible due to the low response rates.

Pupil background data

Schools were asked to provide basic pupil background data which included; name, DOB, UPN, gender, year group, class name, school name, FSM status and EAL information.

The variable used for EAL indicates whether a pupil has English as an additional language or not. The status of this information means we were not able to collect the level of fluency in English and thus not able to identify differences between those who are bilingual and those pupils who are new to English. However, it is a variable that is pragmatic to collect from schools, and pertains to personal (rather than special category) data.

The proportion of pupils eligible for FSM was expected to increase in the 2020/21 AY due to Covid-19-induced job losses. This would likely affect analysis of the disadvantage gap and how it begins to close as the characteristics of the children from disadvantaged backgrounds may have changed. Schools were, therefore, asked to provide the FSM status of the pupils in the January census before lockdown (i.e., January 2020) as well as at each academic term since schools reopened in September 2020: autumn 2020, spring 2021, and summer 2021. The aim of the planned analysis on the disadvantage gap over the 2020/21 AY was to identify the impact of school closure on those pupils who were considered disadvantaged prior to school closure. However, the analysis undertaken at each term considered FSM status as it was at that specific term.

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[12] Teachers were provided with a link to a prepopulated document in the form of a questionnaire-style record.

School background data

School background characteristics such as the proportion of children eligible for FSM were obtained from the NFER Register of Schools database and the Department for Education's website. School background data included Key Stage 2 attainment in reading and mathematics from 2017 and 2019, the percentage of pupils eligible for FSM, the percentage of pupils with EAL, the percentage of pupils with special educational needs and disabilities (SEND), academy status, whether a school is urban or rural, and the geographical region of the school.

Teacher interviews

Ten follow-up telephone interviews with teachers were carried out in June 2021 to understand more about the experience of pupils, teachers and parents during periods of school closure and when most pupils returned to school. These interviews asked the class teacher to comment on practices during the initial (March 2020) school closures, levels of engagement and the reasons for this, as well as catch-up strategies when the children returned to school. Additionally, the interviews enabled us to ask teachers about their experience of the second period of school closures beginning in January 2021, and the subsequent reopening, which was not anticipated and therefore not covered in detail by other research instruments. The full interview schedule can be found in Appendix G.

As these interviews were intended to explore the experience of a range of schools, teachers were selected based on their school's responses to the survey (completed by head teachers in autumn 2020) in key areas of interest, primarily practices for home learning, strategies for reading, mathematics and pupil wellbeing, and levels of engagement. Initially, ten head teachers were contacted to provide contact details of the requested teacher based on this sampling criteria. Those who did not respond or declined to take part were replaced with schools who provided similar interview responses in the category of interest. This process was repeated until ten interviews with teachers were completed. The data was then analysed qualitatively, using both inductive and deductive methods, to draw out themes which provided further insight into the areas of interest for the two periods of partial school closure and subsequent returns to school.

Sample size

Assuming the overall Covid-19 gap is larger than any changes in the disadvantage gap, changes in the disadvantage gap should drive sample size. As the disadvantage gap tends to be measured in terms of differences in the proportions achieving the expected standard, we based our sample size calculations on changes in percentage points. We were looking to detect changes in the disadvantage gap of the order of three percentage points. This seemed a reasonable minimum of percentage points we would be able to detect, given the disadvantage gap itself tends to be around 17 percentage points. When originally designed, it was proposed that a sample of 158 schools, where all pupils in either year group (Year 1 or Year 2) sat the relevant tests, was required to detect a 3.4 percentage point change in the disadvantage gap for each year group. This sample size calculation assumed no design effect and the intra-cluster correlation was therefore set to zero. It also assumed that the percentage change is based on the proportion of pupils meeting the expected standard of attainment. Other assumptions required for calculations included a school year group size of 38 pupils in Year 1 and 39 pupils in Year 2 with six and seven of these pupils respectively to be eligible for FSM.

At the analysis stage, for the repeated measures analysis looking at the change in attainment over the 2020/21 AY, 168 schools and 12,311 pupils were analysed. Such figures varied by both subject (i.e., mathematics or reading) and academic term (i.e., autumn, spring, or summer). In terms of the repeated measures analysis looking at the change in the social and self-regulation skills of pupils, 3,532 pupils from 159 schools were analysed. These 159 schools were the schools that had pupils sitting assessments in at least one time point.

A sample of 168 head teachers were sent the questionnaire, of whom 140 responded (83% of the sample). For teacher interviews, the sample consisted of ten teachers. For the CSBQ, 3,454 pupils were sampled (12 per class). The two PPRs were sent to teachers to be completed for each pupil. This was actually completed by teachers for 16% of Year 1 pupils and 17% of Year 2 pupils (16.4% across the total sample) for the autumn/spring PPR and 7% of Year 1 and 2 pupils for the spring/summer PPR, so results are indicative only, rather than fully representative.

Sample representativeness

When estimating national population parameters of attainment, such as the Covid-19 gap, representativeness is critical. Checks on the representativeness of assessment orders received for the 2020/21 AY were carried out. When designing this study, analysis found that 39 per cent of primary schools in England have a greater than average percentage of

pupils eligible for FSM[13] (as the distribution has a strong skew). Of the schools that ordered at least one year group's worth of NFER assessments for use in the 2020/21 AY, 39% had a greater than average FSM percentage and the distribution shape was very similar to that of England. Given the nature of FSM eligibility and its association with academic performance, a decision was made to measure eligibility in schools prior to school closure and use that for sample representativeness. As for the attainment gap between disadvantaged and non-disadvantaged pupils, representativeness of the sample is less critical as it is a relative measure, and we are interested in seeing how this gap changes between the two time points of assessment. It is still important to check the representativeness of our achieved sample of schools for Key Stage 2[14] performance in particular. 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 statistical analysis section below.

Statistical analysis

Analysis at each academic term in the 2020/21 AY (RQ1, RQ3 and RQ8)

By taking the mean standardised score (or scaled scores, for the Year 2 summer tests) for our sample along with its standard error, and comparing that to the mean of the standardisation sample for the relevant assessment paper (as shown in Table 2), we were able to determine if the sample mean is different from the mean in previous years and therefore able to measure the Covid-19 gap (RQ1). This was undertaken on the autumn, spring and summer assessments for Year 2 pupils, and the spring and the summer assessments for Year 1 pupils. Independent sample t-tests were run to compare the mean of the sample at each time point for each subject to the corresponding mean in previous standardisation years. Effect sizes for these t-tests were converted to additional months' progress using the EEF toolkit.[15]

Particular attention was given to ensuring our sample was not biased, and accounting for that when necessary. For the comparisons done at each academic term (RQ1 and RQ3), we wanted to ensure that the sample of participating schools was representative, based on school-level performance at Key Stage 2 in 2019. The variable "Key Stage 2rwmExp_19", the proportion of pupils meeting the expected standard in reading, writing and mathematics, available from Department for Education's website,[16] was used to determine the representativeness of the sample to the population of primary schools at the time of analysis at each academic term. This was the best attainment variable we could use to weight the data, but it was limited by being for a different year group and by not being at pupil-level. To address this issue of the 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. The population was weighted by the number of pupils on roll in each school for each year group according to the census at the time of analysis, and the sample was weighted by the number of pupils who took the assessment within each school.

In terms of the disadvantage gap, independent samples t-tests were also run to compare the mean performance scores for the two groups of pupils: those eligible for FSM and those not eligible. This was carried out for each academic term in 2020/21 AY, and FSM eligibility was determined by the FSM status of the pupil at that particular academic term. Similarly, to the Covid-19 gap, effect sizes for these t-tests were converted to additional months' progress using the EEF toolkit.

Regarding the evaluation of social skills development, we report descriptive information for each of the seven subscales at two academic terms (autumn 2020 and summer 2021) for all pupils who were assessed using the CSBQ and for pupils eligible for FSM and those not eligible for FSM. FSM eligibility is considered at January 2020 (i.e. before school closures). We compared these results to the Australian norms. As noted above, these norms are for younger children (age 3–6) and therefore are not directly comparable to our sample, which limits this analysis. We considered pupils younger than 8 years old eligible for inclusion in this analysis, to limit the extent to which our sample was older than the

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[13] FSM used here is the proportion of pupils eligible for FSM in 2020.
[14] Key Stage 2 was used here as the Department for Education 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.
[15] https://educationendowmentfoundation.org.uk/evidence-summaries/about-the-toolkits/attainment/
[16] https://www.compare-school-performance.service.gov.uk/download-data

norm sample. We wanted to include as much of our sample as possible in our analysis and thus decided to keep students who are 7 years old as they represented Year 2 students and removing them would mean excluding a considerable part of our sample. As such, only 63 pupils (1.78% of the sample the CSBQ was completed for) who were 8 years or older were excluded from the analysis. This analysis addresses the first part of RQ8, which looks at how school closures affected children's social skills.

Repeated measures analysis for the 2020/21 AY (RQ2, RQ4 and RQ8)

As we carried out termly data collection sweeps, both the Covid-19 and disadvantage gaps were tracked over the AY (RQ2 and RQ4). For both reading and mathematics, both gaps were measured in spring 2021 and summer 2021 for Year 1 and in autumn 2020 and spring 2021 for Year 2. We decided to exclude the Year 2 summer tests from this analysis over the 2020/21 AY as the scores produced by these assessments (i.e. scaled scores) reflect different information than standardised scores do and thus cannot be compared to one another. Standardising the scores obtained from such a test was not feasible as it is not designed for producing norm-referenced standardised scores.

In order to monitor change over these time periods, we used a multilevel structure to the models and a repeated-measures design. The models had three levels: time, pupil and school. They were run separately for each year group (Year 1 or Year 2), subject (reading or mathematics), and gap (Covid-19 gap represented by time and disadvantage gap represented by FSM eligibility), which resulted in eight individual models. These were run to identify how any gap at the first time point changed over the AY (RQ2). The dependent variable was the reading or mathematics outcome score. In the Covid-19 gap multilevel models, the independent variable entered into the model was a time variable to identify if there was a significant difference in the change in outcome score between the two time points. The same model was run again including FSM eligibility, and an interaction term for time FSM eligibility was used to identify whether any gap between disadvantaged and non-disadvantaged pupils had changed between the two assessment time points (RQ4). EAL and gender were controlled for in the latter model to account for any variability associated with these factors. Data on FSM eligibility was collected directly from the schools and did result in an amount of missing data. To maintain the size of the analytical dataset, an additional variable that identified cases with missing data for FSM was included within the models. The level of missing FSM data, depending on year group and model, ranged between 2 and 8 per cent, Whilst the higher level could be replaced with alternative imputation methods, we felt it necessary to take a pragmatic approach to ensure results could be reported in a timely manner.

Unlike the analysis done at each term, which used the FSM status of the pupil at each term, the repeated measures analysis used the FSM status of a pupil prior to school closures (i.e., FSM2020) as the FSM eligibility indicator variable. The analysis was also weighted by pupil head count at school and Key Stage 2 performance for the population and sample at the start of the study in autumn 2020. Further chi-square tests were run to identify whether the sample used in the analysis for the multilevel models is different from the population on any of the following factors in a school: percentage of pupils eligible for FSM, percentage of pupils with EAL, percentage of pupils with SEND, academy status, whether a school is urban or rural, and the geographical region of the school. Any bias was accounted for by including the factors as covariates in the multilevel models. Pupils with at least one time point (i.e., term) measurement were included in the analysis.

Similar analysis was conducted for the CSBQ subscales (second part of RQ8, assessing change in social skills over time). No weighting was carried out for this analysis. One multilevel model looked at the change in scores over time for each of the seven subscales. In such models, the dependent variable was the subscale score, and the independent variable was time. Year group of the pupil was accounted and controlled for. The other multilevel models looked at the change in the disadvantage gap over time for each of the seven subscales. In such models, the dependent variable was the subscale score, and the independent variables were time and FSM eligibility (at January 2020), along with the interaction between them. Gender and pupils with EAL were controlled for. Overall, this resulted in 14 repeated measures multilevel models (one model for each of the seven subscales looking at change in time and one model for each of the seven subscales looking at the change in the disadvantage gap). Pupils who had at least one time point measurement (i.e., at autumn or at summer or at both terms) were included in this analysis. As a robustness check, the reliabilities of the subscales were checked before any multilevel modelling was undertaken.

All analyses were run in R (R Core Team, 2021) and using the lme4 package (Bates *et al.*, 2015).

Analysis of contextual data and analysis of school-level and pupil-level surveys (RQ6 and RQ7)

The research team intended to explore if any pupil-level factors were associated with the degree of impact Covid-19 school closures had on a pupil's performance, and on their recovery over the 2020/21 AY, including for example participation in 1:1/small group tuition and specific catch-up interventions. However, due to low response rates to the PPRs, this analysis was not appropriate. Therefore, no inferential analysis was carried out on contextual data, meaning that the association between pupil-level support and progress (RQ7) could not be ascertained. Instead, descriptive data was produced for responses to the school survey and the PPRs. Inductive and deductive qualitative analysis was carried out on the ten teacher interviews to provide further contextual data in combination with the descriptive findings from the school survey and the PPRs. This allows a partial answer to RQ6; data was gathered on what practices were adopted by schools, but effective practices are not able to be statistically identified (though teachers reported on this anecdotally).

Diagnostic analysis of assessment domains (RQ5)

The aim of this analysis was to provide information to support teachers as they planned the teaching for pupils in Year 1 and Year 2. Whereas diagnostic assessment is often used in the classroom to identify the strengths and weaknesses of individual pupils, in this case the focus was on comparing performance with what had been seen when the assessments were standardised, assuming that one reason for any observed difference was likely to be the disruption to schooling experienced by the pupils.

Each item in the assessments used is aligned to a particular element of the national curriculum in England. For each subject, in this case reading and mathematics, the curriculum is comprised of a series of domains. One aspect of the diagnostic analysis, using autumn and spring term assessments responses, was to look at patterns in performance within these domains. Consideration of performance across groups of items can provide more useful information for teachers than consideration of single items.

Pupil responses in the autumn and spring term tests were coded in addition to being marked. Coded marking refers to the identification of the content of the response rather than simply whether it was correct or not. This enabled information about the nature of pupils' responses, including common errors and misconceptions, to be collected as frequency data. The findings were considered for all pupils and for subgroups based on gender and on FSM eligibility. This was then used to form the basis of the diagnostic reports for teachers, published in the term following the completion of the assessments.

Timeline

Table 5 shows the timeline for this study. A schematic version of the timeline is presented in Figure 3.

Table 5:   Timeline.

Dates	Activity	Covid-19 events
October/November 2020	School engagement and recruitment	
November 2020	Year 2 autumn assessment School-level survey CSBQ autumn	
November/December 2020	Marking and coding of Year 2 autumn assessments	
January 2021	Feedback (diagnostics) to schools	Schools closed to majority of pupils
March/April 2021	Year 1 spring assessment Year 2 spring assessment Pupil Participation Records (PPRs) sent to school (autumn, spring, summer)[17]	
April 2021	Marking and coding of Year 1 and Year 2 spring assessments	
May 2021	Feedback (diagnostics) to schools	
June 2021	Year 1 summer assessment Year 2 Key Stage 1 2019 national curriculum assessment CSBQ summer Teacher interviews	
June/July 2021	Marking of Year 1 and Year 2 summer assessments	
August/September 2021	Feedback to schools Analysis	

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[17] This was intended to be shared with schools in January 2021, but due to school closures, contact with schools was kept to a minimum during this period and this was sent to schools in March 2021.

Figure 3: The timeline of events for this study, including school closures and reopening, the collection of assessment data, and the collection of IPE (Implementation and Process Evaluation) data.
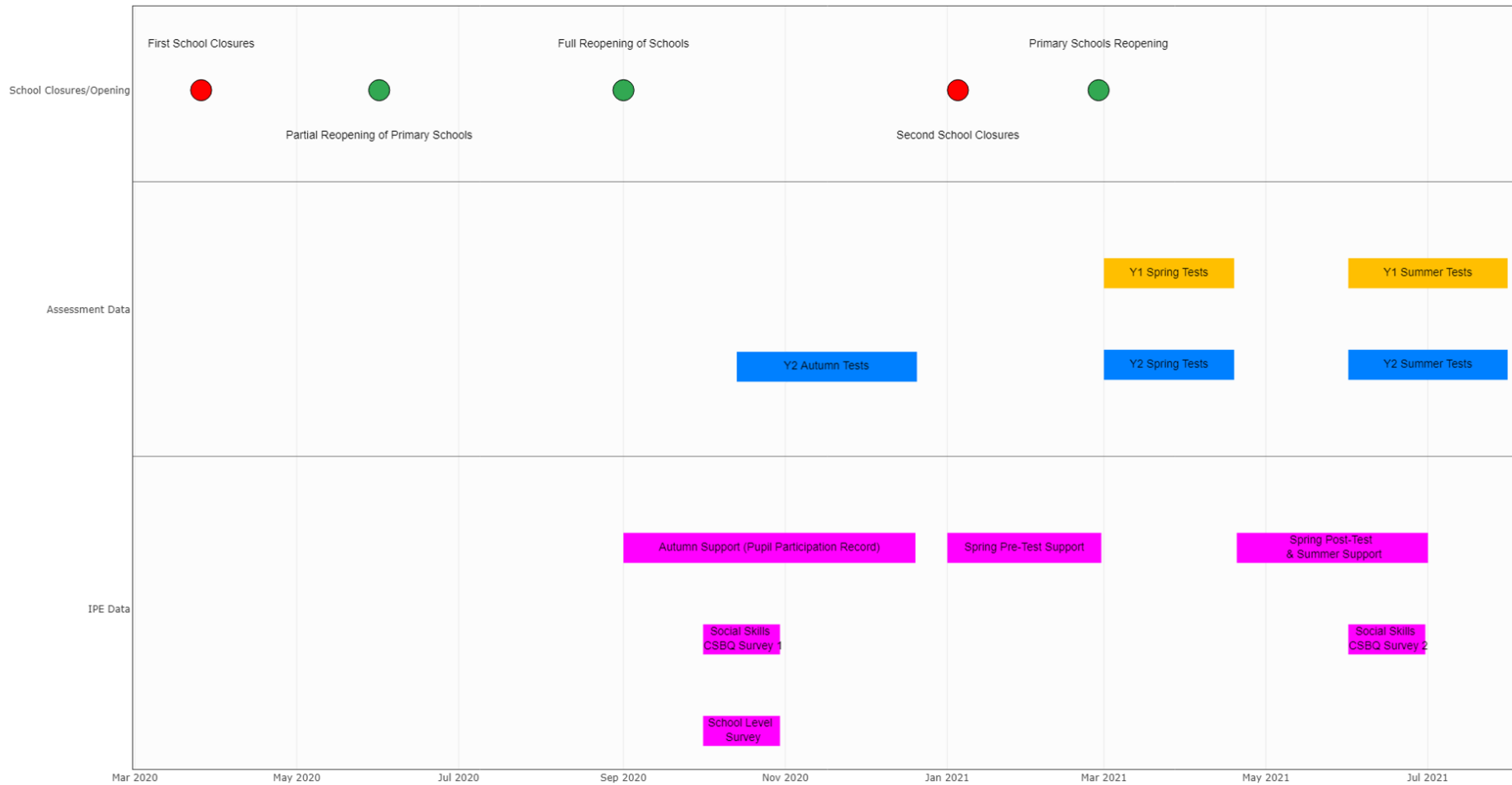
Research findings

Participant flow and attrition

The study took place during an academic year that was particularly challenging for schools. It began with 168 schools in autumn 2020 and, of these schools, 155 were still participating in the study in summer 2021. However, schools were faced with many issues, such as much higher rates of student and staff absence, a second set of school closures and plans needing to be revised when further restrictions were necessary. For these reasons, some schools were not able to return all surveys and, occasionally, were not able to run the assessments within the testing window. For Year 1 maths, we had an attrition rate of 3.4% from spring 2021 to summer 2021. For Year 1 reading, we had an attrition rate of 3.3% from spring 2021 to summer 2021. For Year 2 maths, we had an attrition rate of 12.6% from autumn 2020 to summer 2021. For Year 2 reading, we had an attrition rate of 11.3% from autumn 2020 to summer 2021.

Table 6 shows the number of schools and pupils by subject and academic term throughout the study.

Table 6:   Number of schools and pupils analysed for each subject and year group in every term of 2020/21 AY**.**

Academic term	Year group	Subject	Number of schools	Number of pupils
Autumn 2020	Year 2	Mathematics	167	5936
		Reading	168	5931
Spring 2021	Year 1	Mathematics	148	5101
		Reading	150	5303
	Year 2	Mathematics	152	5349
		Reading	155	5408
Summer 2021	Year 1	Mathematics	152	5367
		Reading	152	5456
	Year 2	Mathematics	138	4685
		Reading	138	4714

The flow diagram (Figure 4) shows the number of pupils throughout the study for the primary outcome analysis looking at the change of the Covid-19 and disadvantage gaps over time (i.e., repeated measures analysis).

Figure 4: Participant flow diagram for the repeated measures primary outcome analysis.
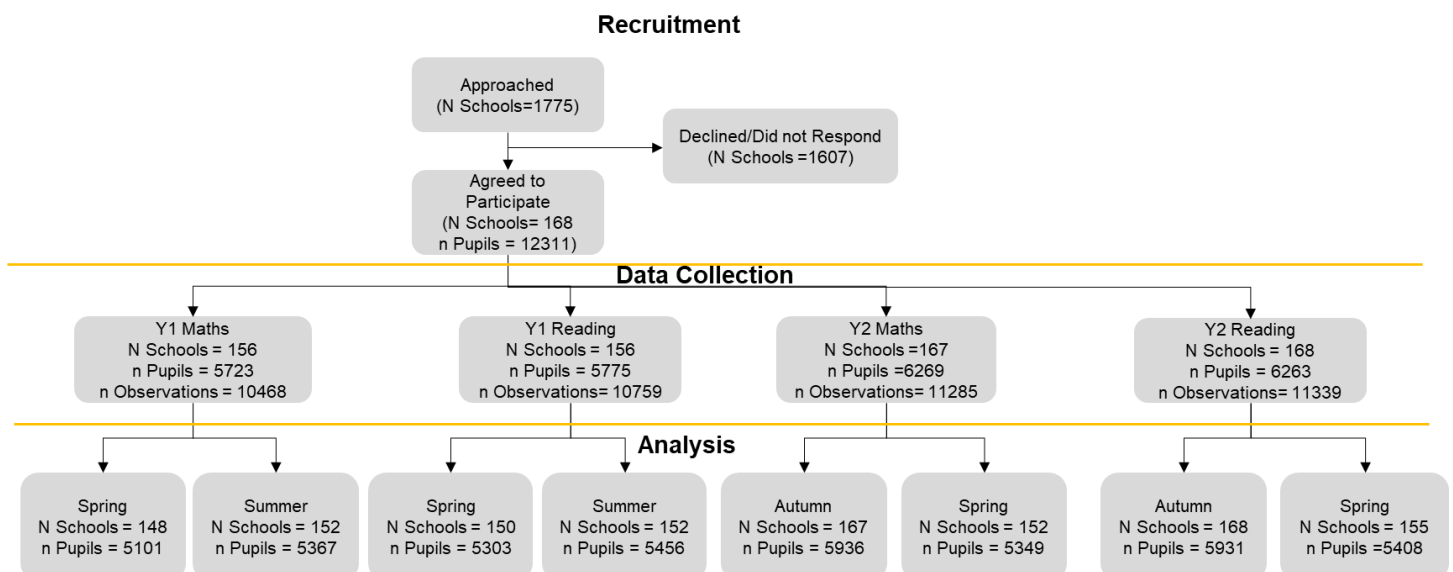
N.B. Only pupils with a total raw score were included.

Pupil and school characteristics

In Tables 7 to 10 we present the characteristics of the sample entered for the repeated measures analysis. For all the samples below (Year 1 mathematics, Year 1 reading, Year 2 mathematics, and Year 2 reading), our samples were representative in terms of Key Stage 2 2019 attainment, rural/urban classification, SEN percentage in the school, and EAL percentage in the school. Sample bias in terms of FSM percentage in a school, Academy/Non academy status, and region was accounted for in the repeated measures multilevel models that were run.

Table 7:   Year 1 mathematics school characteristics – weighted by pupil numbers.

Variable	Level	Population		Sample	
		n	%	n	%
FSM %	Lowest 20%	110,417	17.1	1126	19.7
	2nd lowest 20%	120,742	18.7	1210	21.1
	Middle 20%	134,148	20.7	1424	24.8
	2nd highest 20%	140,277	21.7	1385	24.2
	Highest 20%	130,804	20.2	548	9.6
	Missing	10,726	1.7	30	0.5
Key Stage 2 2019 attainment	Lowest 20%	102,874	15.9	1130	19.7
	2nd lowest 20%	104,210	16.1	825	14.4
	Middle 20%	122,920	19	1199	21
	2nd highest 20%	105,233	16.3	1255	21.9
	Highest 20%	99,127	15.3	892	15.6
	Missing	112,749	17.4	422	7.4
Academy status	Academy	239,832	37.1	1594	27.9
	Non-academy	407,282	62.9	4129	72.1
Rural urban classification	Urban	543,849	84	4597	80.3
	Rural	103,265	16	1126	19.7
SEN %	First quartile	165,377	25.6	1570	27.4
	Second quartile	168,743	26.1	1220	21.3
	Third quartile	158,232	24.5	1859	32.5
	Fourth quartile	141,495	21.7	1036	18.1
	Missing	13,267	2.1	38	0.7
EAL %	First quartile	100,996	15.6	920	16.1
	Second quartile	145,646	22.5	1539	26.9
	Third quartile	177,341	27.4	1521	26.6
	Fourth quartile	209,864	32.4	1705	29.8
	Missing	13,267	2.1	38	0.7

Region					
	East Midlands	55,390	8.6	460	8
	East of England	72,789	11.2	609	10.6
	London	100,648	15.6	968	16.9
	North East	29,620	4.6	89	1.6
	North West	87,412	13.5	1411	24.7
	South East	103,294	16	648	11.3
	South West	60,584	9.4	549	9.6
	West Midlands	72,300	11.2	613	10.7
	Yorkshire and the Humber	65,077	10	376	6.6
Total		647,114	100	5723	100

N.B. Totals may not add up to 100 due to rounding.

Table 8: Year 1 reading **school** characteristics – weighted by pupil numbers.

Variable	Level	Population		Sample	
		n	%	n	%
FSM %	Lowest 20%	110,417	17.1	1131	19.6
	2nd lowest 20%	120,742	18.7	1198	20.7
	Middle 20%	134,148	20.7	1470	25.46
	2nd highest 20%	140,277	21.7	1387	24
	Highest 20%	130,804	20.2	559	9.7
	Missing	10,726	1.7	30	0.5
Key Stage 2 2019 attainment	Lowest 20%	102,874	15.9	1153	20
	2nd lowest 20%	104,210	16.1	823	14.6
	Middle 20%	122,920	19	1243	21.5
	2nd highest 20%	105,233	16.3	1265	22
	Highest 20%	99,127	15.3	869	15
	Missing	112,749	17.4	422	7.3
Academy status	Academy	239,832	37.1	1637	28.3
	Non academy	407,282	62.9	4138	71.7
Rural urban classification	Urban	543,849	84	4640	80.3
	Rural	103,265	16	1135	19.7
SEN %	First quartile	165,377	25.6	1583	27.4
	Second quartile	168,743	26.1	1245	21.6
	Third quartile	158,232	24.5	1862	32.2
	Fourth quartile	141,495	21.9	1047	18.1
	Missing	13,267	2.1	38	0.7
EAL %	First quartile	100,996	15.6	928	16.1
	Second quartile	145,646	22.5	1551	26.9
	Third quartile	177,341	27.4	1529	26.5
	Fourth quartile	209,864	32.4	1729	29.9
	Missing	13,267	2.1	38	0.7
Region	East Midlands	55,390	8.6	493	8.5
	East of England	72,789	11.2	614	10.6
	London	100,648	15.6	948	16.4
	North East	29,620	4.6	90	1.6
	North West	87,412	13.5	1419	24.6
	South East	103,294	16	658	11.4
	South West	60,584	9.4	556	9.6
	West Midlands	72,300	11.2	616	10.7
	Yorkshire and the Humber	65,077	10.1	381	6.6
Total		647,114	100	5775	100

N.B. Totals may not add up to 100 due to rounding.

Table 9: Year 2 mathematics school characteristics – weighted by pupil numbers.

Variable	Level	Population		Sample	
		N	%	n	%
FSM %	Lowest 20%	112,692	17	1196	19.1
	2nd lowest 20%	123,518	18.6	1317	21
	Middle 20%	137,066	20.7	1459	23.3
	2nd highest 20%	143,990	21.7	1578	25.2
	Highest 20%	135,021	20.4	669	10.7
	Missing	11,053	1.7	50	0.8
Key Stage 2 2019 attainment	Lowest 20%	106,898	16.1	1233	19.7
	2nd lowest 20%	107,224	16.2	827	13.2
	Middle 20%	126,198	19	1525	24.3
	2nd highest 20%	107,568	16.2	1370	21.9
	Highest 20%	100,641	15.8	916	14.6
	Missing	114,812	17.3	398	6.3
Academy status	Academy	246,451	37.2	1904	30.4
	Non-academy	416,891	62.8	4365	69.6
Rural urban classification	Urban	557,106	84	5082	81.1
	Rural	106,236	16	1187	18.9
SEN %	First quartile	168,930	25.5	1578	25.2
	Second quartile	172,617	26	1425	22.7
	Third quartile	162,467	24.5	2033	32.4
	Fourth quartile	146,031	22	1195	19.1
	Missing	13,297	2	38	0.6
EAL %	First quartile	103,985	15.7	1028	16.4
	Second quartile	150,025	22.6	1644	26.2
	Third quartile	181,681	27.4	1624	25.9
	Fourth quartile	214,353	32.3	1935	30.9
	Missing	13,297	2	38	0.6
Region	East Midlands	57,176	8.6	450	7.2
	East of England	74,447	11.2	630	10
	London	102,580	15.5	1057	16.9
	North East	30,492	4.6	104	1.7
	North West	89,327	13.5	1540	24.6
	South East	106,494	16.1	751	12
	South West	62,082	9.4	586	9.3
	West Midlands	73,794	11.1	665	10.6
	Yorkshire and the Humber	66,950	10.1	486	7.8
Total		663,342	100	6269	100.000

N.B. Totals may not add up to 100 due to rounding.

Table 10: Year 2 Reading School Characteristics – Weighted by Pupil Numbers

Variable	Level	Population		Sample	
		N	%	n	%
FSM %	Lowest 20%	112,692	17	1196	19.1
	2nd lowest 20%	123,518	18.6	1310	20.9
	Middle 20%	137,066	20.7	1468	23.4
	2nd highest 20%	143,990	21.7	1575	25.1
	Highest 20%	135,021	20.4	669	10.7
	Missing	11,053	1.7	45	0.7
Key Stage 2 2019 attainment	Lowest 20%	106,898	16.1	1229	19.6
	2nd lowest 20%	107,224	16.1	821	13.1
	Middle 20%	126,198	19	1536	24.5
	2nd highest 20%	107,568	16.2	1353	21.6
	Highest 20%	100,641	15.2	923	14.7
	Missing	114,812	17.3	401	6.4
Academy status	Academy	246,451	37.1	1915	30.6
	Non-academy	416,891	62.8	4348	69.4
Rural urban classification	Urban	557,106	84	5078	81.1
	Rural	106,236	16	1185	18.9
SEN %	First quartile	168,930	25.5	1570	25.1
	Second quartile	172,617	26	1424	22.7
	Third quartile	162,467	24.5	2032	32.4
	Fourth quartile	146,031	22	1199	19.1
	Missing	13,297	2	38	0.6
EAL %	First quartile	103,985	15.7	1024	16.4
	Second quartile	150,025	22.6	1632	26
	Third quartile	181,681	27.4	1626	26
	Fourth quartile	214,353	32.3	1943	31
	Missing	13,297	2	38	0.6
Region	East Midlands	57,176	8.6	476	7.6
	East of England	74,447	11.2	627	10
	London	102,580	15.5	1054	16.8
	North East	30,492	4.6	104	1.7
	North West	89,327	13.5	1526	24.4
	South East	106,494	16.1	747	11.9
	South West	62,082	9.4	582	9.2
	West Midlands	73,794	11.1	657	10.5
	Yorkshire and the Humber	66,950	10.1	490	7.8
Total		663,342	100	6263	100

N.B. Totals may not add up to 100 due to rounding.

Results

The results are presented here in eight chapters, each covering a time point in the research study and arranged chronologically. The chapters are:

- Chapter 1 – First set of school closures in March 2020

- Chapter 2 – Partial reopening of schools in June 2020 through to the autumn term of 2020

- Chapter 3 – Autumn assessments for Year 2

- Chapter 4 – Second set of partial school closures in January 2021 to March 2021

- Chapter 5 – Spring assessments for Year 1 and Year 2

- Chapter 6 – Summer term 2021

- Chapter 7 – Summer assessments for Year 1 and Year 2

- Chapter 8 – Repeated measures for assessments over time.

For those who prefer not to view the results chronologically, we have provided the following summaries of the findings relating to each research question below, with hyperlinks to the relevant chapter for more detailed information.

Research Question 1:

To what extent has pupils' attainment in reading and mathematics been impacted by school closures in 2020?

<u>**Year 1**</u>

Spring 2021 assessment

- The overall performance of pupils in **reading** in spring 2021 was significantly lower than the standardisation sample in 2019, representing a Covid-19 gap of around three months' progress. (See **reading link.**)

- The overall performance of pupils in **mathematics** in spring 2021 was significantly lower than the standardisation sample in 2019, representing a Covid-19 gap of around three months' progress. (See **maths link.**)

- On both the **reading and mathematics** assessments in spring 2021, the proportion of pupils who scored below the lowest standardised score was higher than the standardisation sample in 2019.

Summer 2021 assessment

- The overall performance of pupils in **reading** in summer 2021 was significantly lower than the standardisation sample in 2017, representing a Covid-19 gap of around three months' progress. (See **reading link.**)

- The overall performance of pupils in **mathematics** in summer 2021 was significantly lower than the standardisation sample in 2017, representing a Covid-19 gap of around one months' progress. (See **maths link.**)

- On both the **reading and mathematics** assessments in summer 2021, the proportion of pupils who scored below the lowest standardised score was higher than the standardisation sample in 2017.

Year 2

Autumn 2020 assessment

- The overall performance of pupils in **reading** in autumn 2020 was significantly lower than the standardised sample in 2017, representing a Covid-19 gap of around two months' progress. (See **reading link.**)

- The overall performance of pupils in **mathematics** in autumn 2020 was significantly lower than the standardised sample in 2017, representing a Covid-19 gap of around two months' progress. (See **maths link.**)

- On both the **reading and mathematics** assessments in autumn 2020, the proportion of pupils who scored below the lowest standardised score was higher than the standardisation sample in 2017.

Spring 2021 assessment

- The overall performance of pupils in **reading** in spring 2021 was significantly lower than the standardisation sample in 2019, representing a Covid-19 gap of around three months' progress. (See **reading link.**)

- The overall performance of pupils in **mathematics** in spring 2021 was significantly lower than the standardisation sample in 2019, representing a Covid-19 gap of around two months' progress. (See **maths link.**)

- On both the **reading and mathematics** assessments in spring 2021, the proportion of pupils who scored below the lowest standardised score was higher than the standardisation sample in 2019.

Summer 2021 assessment (KS1 national curriculum 2019 assessment)

- The overall performance of pupils in **reading** in summer 2021 was significantly lower than the 2016 sample representing a Covid-19 gap of around two months' progress. (See **reading link**.)

- The overall performance of pupils in **mathematics** in summer 2021 was significantly higher than the 2016 sample, representing an improvement of around one months' progress. (See **maths link.**)

Research Question 2:

How does any attainment gap, i.e., any Covid-19 gap, change over the 2020/21 academic year?

Year 1

- The performance of pupils in **reading** did not change significantly between spring 2021 and summer 2021, and the Covid-19 gap remained stable between the two time points. (See **reading repeated measures link**.)

- The performance of pupils in **mathematics** was significantly higher in summer 2021 than in spring 2021 and there was a reduction in the Covid-19 gap between the two time points. (See **maths repeated measures link**.)

Year 2

- The performance of pupils in **reading** was significantly lower in spring 2021 than in autumn 2020 and there was an increase in the Covid-19 gap between the two time points. (See **reading repeated measures link.**)

- The performance of pupils in **mathematics** was significantly lower in spring 2021 than in autumn 2020 and there was an increase in the Covid-19 gap between the two time points. (See **maths repeated measures link**.)

Research Question 3:

Are different groups disproportionately affected?

This is the disadvantage gap for pupils who are eligible and not eligible for FSM.

Year 1

Spring 2021 assessment

- The disadvantage gap for both reading and mathematics was around seven months' progress. (See **spring reading disadvantage link** and **maths link.**)

Summer 2021 assessment

- The disadvantage gap was around seven months' progress for reading and six months' progress for mathematics. (See **summer reading disadvantage link** and **maths link**).

Year 2

Autumn 2020 assessment

- The disadvantage gap for both reading and mathematics was around seven months' progress, representing a widening as compared to Key Stage 1 in 2019. (See **autumn reading disadvantage link** and **maths link**).

Spring 2021 assessment

- The disadvantage gap was around seven months' progress for reading and eight months' progress for mathematics, representing a widening as compared to Key Stage 1 in 2019. (See **spring reading disadvantage link** and **maths link**.)

Summer 2021 assessment (KS1 national curriculum 2019 assessment)

- The disadvantage gap for both reading and mathematics was around seven months' progress. (See **summer reading disadvantage link** and **maths link**.)

Research Question 4:

How well do these groups recover over the 2020/21 academic year? Does any disadvantage gap change over time?

Year 1

- For both reading and mathematics, the performance of children from disadvantaged backgrounds was significantly higher in summer 2021 than in spring 2021, and there was a reduction in the disadvantage gap

between the two time points. (See **reading disadvantage gap link** and **mathematics disadvantage gap link.**)

Year 2

- For **reading**, the performance of children from disadvantaged backgrounds did not significantly change between autumn 2020 and spring 2021 and the disadvantage gap remained stable. (See **reading disadvantage link**.)

- For **mathematics**, the performance of children from disadvantaged backgrounds significantly declined between autumn 2020 and spring 2021, and there was an increase in the disadvantage gap between the two time points. (See **maths disadvantage link.**).

Research Question 5:

How has attainment in certain curriculum domains changed over the 2020/21 academic year?

Note: The analysis of this research question was changed to diagnostic analysis in order to make the findings as useful as possible to teachers as a formative tool. We explored patterns and trends in a descriptive way rather than quantifying aspects of performance.

Year 1

Spring 2021 assessment

- Across both reading and mathematics, although children performed less well than the pupils in the standardisation sample in 2019, the areas they struggled with were broadly similar.

- Children from disadvantaged backgrounds found all assessed areas harder, in both subjects, than their non-disadvantaged peers in spring 2021. (See **reading diagnostic analysis link** and **maths link.**)

Year 2

Autumn 2020 assessment

- Across both reading and mathematics, although children performed less well than the pupils in the standardisation sample in 2017, the curriculum areas they struggled with were broadly the same.

- Children from disadvantaged backgrounds found all curriculum areas harder, in both subjects, than their non-disadvantaged peers in autumn 2020. (See **reading diagnostic analysis link** and **maths link.**)

Spring 2021 assessment

- Across both subjects, although children performed less well than the pupils in the standardisation sample in 2019, the curriculum areas they struggled with were broadly similar.

- Children from disadvantaged backgrounds found all curriculum areas harder, in both subjects, than their non-disadvantaged peers in spring 2021. (See **reading diagnostic analysis link** and **maths link.**)

Research Question 6:

What practices have been adopted by schools during closures and reopening?

- During school closures, many schools used educational websites and online resources (see **first closures link** and **second closures link**). During the second closures, there were more online live lessons than in the first closures (see **second closures link**).

- Offline (paper) resources were used by some schools and for pupils that lacked access to IT.

- Many school staff reported contact with parents (see **parental engagement first closures link** and **second closures link**) and pupils (see **pupil engagement first closures link**) during remote learning.

- When pupils returned to school, there was a focus on small group work in reading and mathematics, curriculum revisions and staff (re)deployment, as well as continued parental engagement (see **first return link** and **second return link**).

- There was a focus on wellbeing and PSHE, such as additional talking time and check-ins (**first return link** and **second return link**).

Research Question 7:

Is there an association between pupil-level support activities and progress? Does this differ for subgroups?

- This research question was not able to be answered due to low response rates to PPRs.

Research Question 8:

Have school closures affected children's social skills? How does this change over the 2020/21 academic year?

<u>Child Self-Regulation and Behaviour Questionnaire (CSBQ)</u>

- The CSBQ norms were for children aged 3–6 and therefore below the age group of this study. The results should be interpreted with caution, and the development of valid and reliable measures of socio-emotional skills for this age group is crucial.

Autumn 2020 (**CSBQ autumn link**)

- The CSBQ was completed for a random sample of 12 pupils per class. Results indicate that, on average, pupils were at or above expected levels for social skills and self-regulation, compared to the limited (3–6-year-olds) norms available.

- Distributions indicate that most pupils' scored at the top end of the distribution, apart from cognitive self-regulation.

Summer 2021 (**CSBQ summer link**)

- The CSBQ was repeated for the same sample of 12 pupils per class. Pupils were generally performing at or above expected levels, compared to limited norms available.

- Distributions show that most pupils scored at the upper end of the scale on all subscales except cognitive self-regulation.

Changes over the 2020/21 academic year (**CSBQ changes link**)

- Pupils were performing significantly above autumn levels on 4 subscales, with no significant change on the remaining 3 subscales in summer 2021.

- The disadvantage gap in social skills narrowed for 3 subscales and remained stable on 4 subscales.

School staff perceptions (teacher surveys and interviews)

Autumn 2020

- The social skills of Year 1 and Year 2 overall were rated as below last year's cohort by around half of 140 head teachers, with 34–41% rating them as the same as last year's cohort at this point in the year, and 8% as above the previous cohort (**Year 1 perceived social skills link** and **Year 2 link**).

- Wellbeing was rated by 49–56% of head teachers as the same as last year's cohort, with 38–42% rating it as below last year's cohort and 6–8% as above.

- The most common factors perceived as affecting social skills and wellbeing in the autumn term were: reduced or limited play/interactions with peers, lack of consistent structure, levels of independence, increased anxiety, demographics and parent factors (**Year 1 factors link** and **Year 2**).

- The main catch-up strategy reported by head teachers and interviewed teachers for social skills and wellbeing was an additional focus on PSHE.

Summer 2021

- Teachers reported increased issues with social skills and wellbeing on the second return to school (see **transition link**) and were therefore implementing additional PSHE.

- The most common support strategy implemented over the AY for social skills and wellbeing was a focus on PSHE. The emphasis on supporting children's social skills/wellbeing is likely to remain an important focus into the 2021/22 AY.

Chapter 1 – School closures March 2020 to July 2020

Summary

- A majority of head teachers and interviewed teachers reported using virtual learning environments, educational websites and online resources during this period of school closures. Some schools produced online lessons, but very few delivered 'live' lessons.

- Some teachers reported IT access issues or a lack of clarity around what devices were available to pupils.

- Head teacher perceptions of parental engagement were mixed. Reasons for varying parental engagement were thought to be related to parental attitudes/confidence and teacher support/resources provided.

- Just under half of head teachers surveyed felt that Reception or Year 1 pupils were highly or very highly engaged at this time.

Schools closed due to Covid-19 on 20 March 2020, resulting in a period of home/remote learning for all pupils except the children of keyworkers and vulnerable children.[18] The research team used two instruments to gather data on practices and engagement during this time period: a survey of head teachers and retrospective interviews with a sample of ten teachers, as described in the methods section. Tables in this section present percentages unless the majority of counts are lower than 30, in which case percentages can be misleading, therefore frequencies are presented.

Practices during the first school closures

During the initial period of school closures, almost all schools surveyed used educational websites and online resources, some used videos and virtual learning environments (VLE), but the use of live lessons was very low.

Head teachers (n=140) reported on practices that took place during home learning for the cohort in Reception during the first closures (note these pupils were Year 1 in the 2020/21 AY), and for the cohort in Year 1 during the first closures (note these pupils were Year 2 in the 2020/21 AY). Over half of head teachers indicated that the school VLE was used during the closures (for Reception: 59.7% of respondents; for Year 1: 61.9% of respondents). A majority of head teachers reported using educational websites (for Reception: 92.1% of respondents; for Year 1: 92.8% of respondents) and online resources from other providers (Reception: 88.5%; Year 1: 91.4%). This was echoed in the teacher interviews (n=10). Half of teachers also reported using an online system or app for uploading resources and assessing work, for example Class Dojo and Google Classroom.

Over a third of head teachers in the survey reported that their school was producing videos of lessons during these school closures for Key Stage 1 pupils (Reception: 37.4%; Year 1: 36%), whilst reports of online 'live' lessons were very low (Reception: 5%; Year 1: 8.6%).

Around a third of head teachers reported that their school staff had online conversations with Reception pupils (34.5%) and Year 1 pupils (38.1%). This may have been as a class, or individually.

Several interviewed teachers said they taught mathematics and English daily. However, the majority also explained that they had amended work and expectations based on what could be done at home. For example, one teacher said '[…] rather than teaching new material, we focused purely on things they had already learnt as [we were] thinking that was probably the best situation for parents as well because we weren't sure at the time how much interaction parents were having'.

IT access

In the interviews, some teachers reported that some of their pupils only had a mobile phone to access online learning. Teachers from three schools also reported sending pupils physical packs of work if they could not access online learning. Several teachers mentioned that they were unsure what devices pupils had at home during the first school closures, which made home learning more challenging in some cases.

Parental engagement

Around half of schools reported using online conversations to engage parents. Perceived parental engagement was mixed, with the most common response being that it was neither high nor low during this period. The reasons for varying parental engagement included parental attitudes and the teacher support/resources (for example, clear guidance and expectations around learning activities at home or, conversely, a struggle for parents to recreate learning environments at home without the same resources). Detailed research on parental engagement during the first school closures is available from other studies (see Lucas, Nelson and Sims, 2020).

Just under half of head teachers surveyed reported having online conversations with parents (Reception: 48.2%; Year 1: 46%) and a minority had phone calls with parents (Reception: 17.1%; Year 1: 16.4%). Half of the teachers interviewed also reported that they actively contacted parents, and some teachers also made themselves available for parents to contact, sometimes extending to out of normal school hours.

Head teachers' perceptions of parental engagement were mixed, with the most common response being 'Neither high nor low' for both Reception (45%) and Year 1 (47.1%). Figure 5 shows the distribution of responses. Head teachers each gave one rating of their perceptions of parental engagement as a whole for each year group.

Figure 5: Head teachers' perception of parental engagement in Reception and Year 1 (n=140 head teachers).
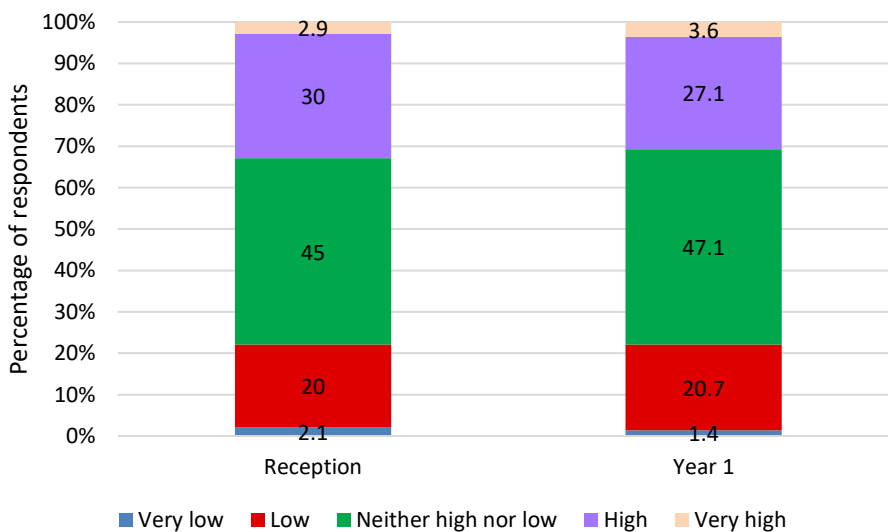
The most common reasons given (via an open question) for levels of parental engagement are shown in Table 11.

Table 11: Head teachers' perceptions of factors influencing levels of parental engagement for Reception and Year 1 (n=140 head teachers).

Factor	Frequencies: Reception	Frequencies: Year 1
Parental attitudes and motivation/confidence	29	26
Teacher support/resources provided	23	27
The time parents had available for support	23	19
Parental knowledge	18	14
Technology/internet access	12	12

Interviewed teachers also reported a mixed picture of parental engagement, and in some cases reported challenges with parents using alternative or incorrect teaching methods, such as using lower level materials or correcting everything their child had done before submitting work.

Pupil engagement – Reception

Some schools used online conversations to engage Reception children, and overall the level of engagement for this cohort was rated as 'High', with some head teachers reporting 'Neither high nor low' engagement.

Levels of Reception pupil engagement with resources was rated overall as 'High' by a majority of surveyed head teachers. However, this varied across groups, with pupil premium (PP) pupil engagement most often reported as 'Low', and the engagement of pupils with EAL most often reported as 'Neither high nor low'. Figure 6 shows the distribution of responses regarding perceived levels of engagement for the three groups, for Reception pupils. This graph shows responses from head teachers about their Reception pupils at a class level, rather than per-pupil engagement.

Figure 6: Head teachers' perceptions of level of pupil engagement for Reception (n=140 head teachers).
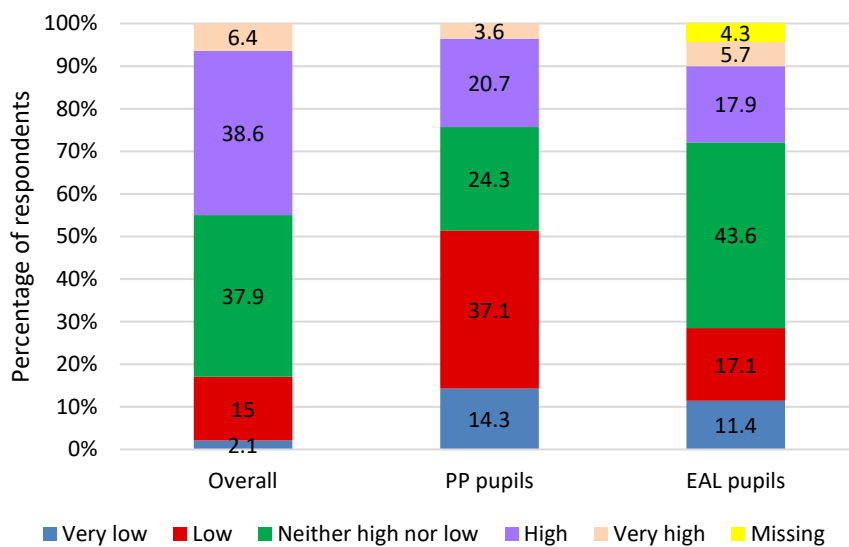
Pupil engagement – Year 1

Perceived Year 1 engagement was mixed. Most head teachers reported engagement to be 'Neither high nor low', but over a third reported it to be 'High'.

Levels of Year 1 pupil engagement with resources was rated overall as 'Neither high nor low' by a majority of surveyed head teachers. This varied slightly across groups, with PP pupil engagement most often reported as 'Low', and the engagement of pupils with EAL most often reported as 'Neither high nor low'. Figure 7 shows the distribution of head teacher responses to levels of engagement for the three groups, for Year 1 pupils.

Figure 7: Head teachers' perceptions of level of pupil engagement for Year 1 (n=140 head teachers).
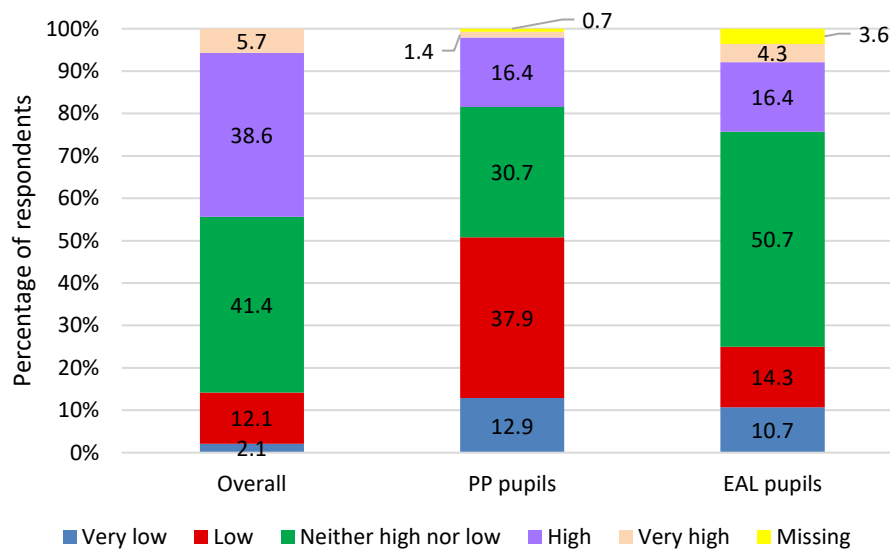
The data from the head teacher survey therefore suggests that perceived levels of engagement were mixed, with most head teachers rating engagement as 'High' or 'Neither high nor low' for Reception and Year 1. There was also generally lower perceived engagement among PP pupils in both cohorts.

The findings in this chapter together provide some context about how schools and pupils were engaging with remote learning during this first period of school closures.

Chapter 2 – Return to school: summer and autumn term 2020

Summary

- Year 1 and Year 2 were rated as below last year's cohort in reading and mathematics by over 70% of 140 head teachers in the survey – this was similar for subgroups PP and EAL.

- The most common factors perceived as affecting attainment in the autumn term were challenges in the provision of home learning, low levels of parental engagement, lack of IT access, demographic factors and home learning delivered by the school.

- The social skills of Year 1 and Year 2 overall were rated as below last year's cohort by around half of 140 head teachers, with 34–41% rating them as the same as last year's cohort at this point in the year, and 8% as above the previous cohort.

- Wellbeing was rated by 49–56% of head teachers as the same as last year's cohort, with 38–42% rating it as below last year's cohort and 6–8% as above.

- The most common factors perceived as affecting social skills and wellbeing in the autumn term were reduced or limited play/interactions with peers, lack of consistent structure, levels of independence, increased anxiety, demographics and parent factors (e.g., benefitting from additional family time).

- CSBQ: this was completed for a random sample of 12 pupils per class. Results indicate that, on average, pupils were at or above expected levels for social skills and self-regulation, compared to the limited (3–6-year-olds) norms available. Distributions indicate that most pupils scored at the top end of the distribution, apart from cognitive self-regulation.

- The most common catch-up strategies reported by head teachers and interviewed teachers for reading and mathematics were small-group work, a revised curriculum and staff deployment.

- The main catch-up strategy reported by head teachers and interviewed teachers for social skills and wellbeing was an additional focus on PSHE.

Summer term

In June 2020, some schools reopened to a limited group of pupils. The school survey captured data on this early return to school within the current sample.

Time of reopening

Figure 8 shows the time that schools reopened to Reception and Year 1 pupils in the summer term, or whether they did not reopen at all. Note that due to rounding, figures may not sum to 100.

Figure 8: School reopening for Reception and Year 1 pupils (n=140 head teachers).

Month of reopening for Reception and Year 1
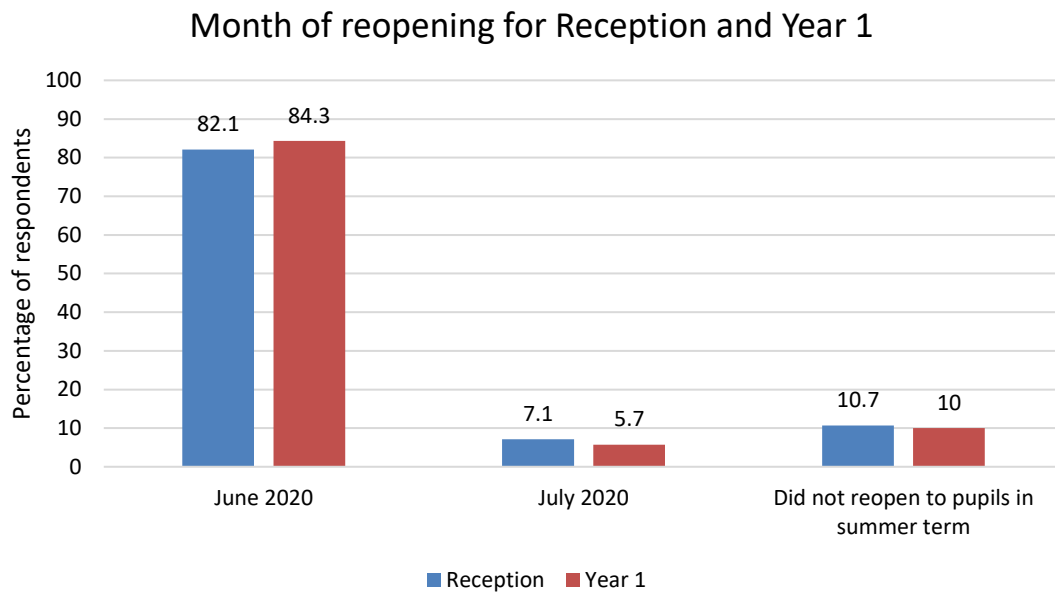
The total number of respondents to the following questions (those schools that did reopen to some pupils) was 125 for Reception and 126 for Year 1.

Expected attendance (of those that reopened)

Table 12 shows how often Reception and Year 1 pupils were expected to attend school during the summer term, for the schools that had reopened to these pupils. This shows that the majority were expecting pupils to attend four days or more per week.

Table 12: Expected attendance for Reception and Year 1, of schools that reopened (Reception n=125 and Year 1 n=126 head teachers).

How many days per week pupils were expected to be in	Reception (n=125)	Year 1 (n=126)
4 days or more	78.4%	78.6%
More than 2.5 but less than 4	7.2%	7.1%
2.5 days or less	14.4%	14.3%

Overall levels of attendance (of those that reopened)

Figure 9 shows overall levels of actual attendance (i.e., what percentage of pupils were attending the number of days expected) of Reception and Year 1 pupils during the summer term, for those schools that reopened to these pupils. Head teachers gave rough estimates for the whole cohort of pupils and these should therefore be used for context only – no statistical interpretation of these figures was intended.

Figure 9: Overall level of attendance for Reception and Year 1, of schools that reopened (Reception n=125 and Year 1 n=126 head teachers).
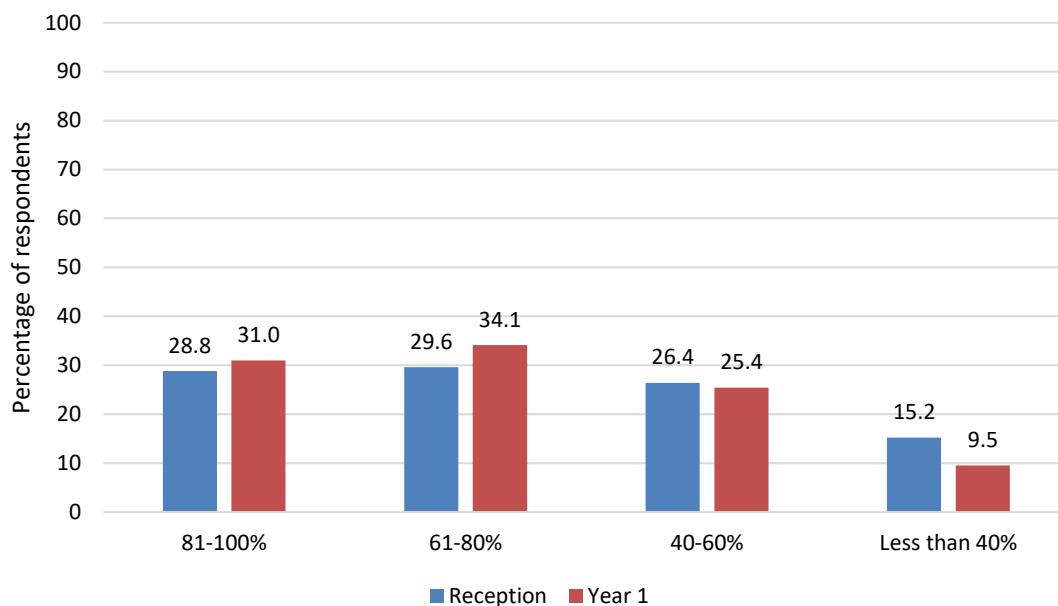
Perceived changes affecting attainment in summer term 2020

Head teachers reported on changes to the school that they believe affected levels of attainment in the summer term 2020 (Reception n=125, Year 1 n=126; Table 13). Note that the question did not ask in which direction these changes were thought to impact on attainment and respondents could tick as many factors as was appropriate.

Table 13: Changes perceived as affecting levels of attainment in the summer term (Reception n=125 and Year 1 n=126 head teachers).

Change	Reception (total n=125)	Year 1 (total n=126)
Use of resources	72%	68%
Classroom layout	70%	77%
Restricted movement around classroom and/or school	65%	77%
Reduced class size	61%	68%
Change in curriculum focus	57%	55%
Restricted informal interaction between staff	55%	59%
Taught by a different teacher/TA	50%	47%
Pace of lessons	28%	31%

Perceived changes affecting wellbeing in summer term 2020

Head teachers also reported on changes to the school that they believe affected levels of wellbeing in the summer term 2020 (Reception n=125, Year 1 n=126; Table 14). Note that the question did not ask in which direction these changes were thought to impact on wellbeing and respondents could tick as many factors as was appropriate.

Table 14: Changes perceived as affecting levels of wellbeing in the summer term (Reception n=125 and Year 1 n=126 head teachers).

Change	Reception (total n=125)	Year 1 (total n=126)
Reduced interaction with a range of adults	66%	68%
Restricted movement around classroom and/or school	62%	71%
Classroom layout	57%	64%
Reduced class size	48%	52%
Use of resources	42%	43%
Taught by a different teacher/TA	35%	40%
Change in curriculum focus	26%	25%
Pace of lessons	14%	16%

Autumn term

After the summer, schools reopened for autumn term. The research team used four instruments to collect information on return-to-school practices: head teacher surveys, teacher interviews, PPR and CSBQ, as detailed in the Methods section.

Note that the pupils discussed in this section of the report are Year 1 pupils (who were in Reception during the first spring school closures and summer reopening) and Year 2 pupils (who were in Year 1 during the first spring school closures and summer reopening).

Initial impression of impact on pupils

The survey of head teachers asked respondents to compare the reading, mathematics, social skills and wellbeing levels of the cohort in September 2020 to the last year's cohort. Overall, Year 1 and Year 2 were rated as below last year's cohort in reading and mathematics by over 70% of head teachers – this was similar for subgroups (PP and EAL). Around 14–25% of head teachers rated the overall cohort as the same as last year and 4–7% rated the cohort as above last year's. The social skills of Year 1 and Year 2 overall were also rated as below last year's cohort by around half of head teachers, with 34–41% rating them as the same as last year's cohort at this point in the year, and 8% as above the previous cohort. Wellbeing was rated by 49–56% of head teachers as the same as last year's cohort, with 38–42% rating it as below last year's cohort and 6–8% as above.

Year 1
Mathematics

Figure 10 shows the reported mathematics ability of the whole cohort (Year 1) and of different groups (PP and EAL). This shows that the majority of head teachers believed the current cohort were, on average, below the last year's cohort at this point in the year. There was a slightly lower percentage of respondents rating PP pupils and pupils with EAL as below last year's cohort, compared to the whole cohort.

Figure 10:   Perceived mathematics ability of Year 1 compared to previous cohort (n=140 head teachers)

Mathematics ability of whole cohort, PP pupils and EAL pupils (Year 1)

Legend: ■ Better than last year's cohort ■ About the same as last year's cohort ■ Below last year's cohort ■ Missing
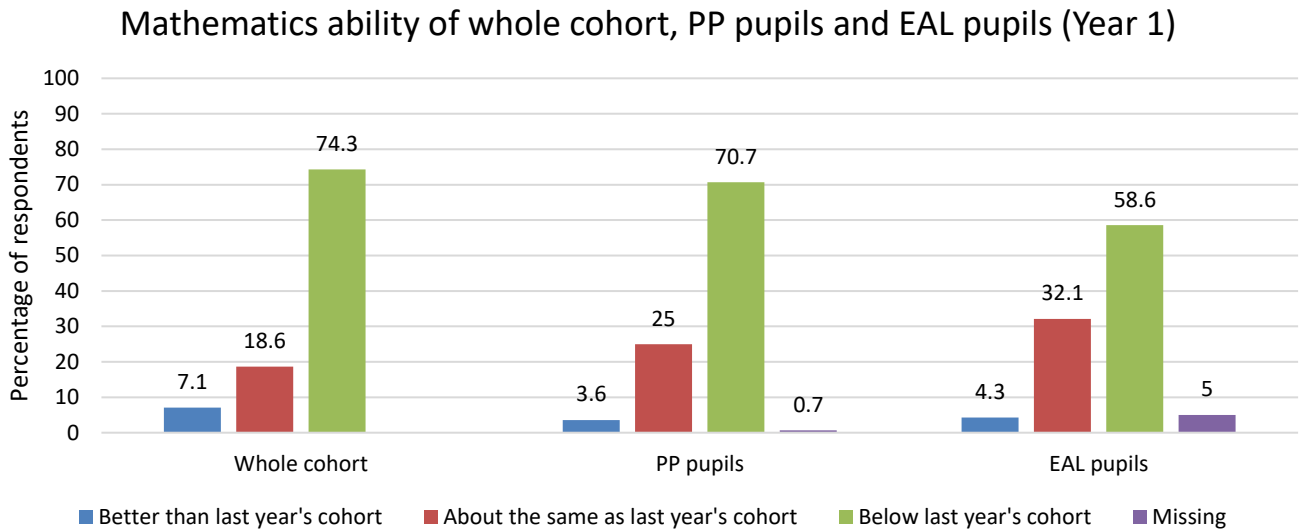
Reading

Figure 11 shows the reported reading ability of the whole cohort (Year 1) and of different groups (PP and EAL). This shows that the majority of head teachers believed the current cohort were, on average, below the last year's cohort at this point in the year. There was a slightly lower percentage of respondents rating PP pupils and pupils with EAL as below last year's cohort, compared to the whole cohort.

Figure 11:   Perceived reading ability of Year 1 compared to previous cohort (n=140 head teachers).

Reading ability of whole cohort, PP pupils and EAL pupils (Year 1)

Legend: ■ Better than last year's cohort ■ About the same as last year's cohort ■ Below last year's cohort ■ Missing

Main factors affecting attainment

A total of 133 head teachers reported a perceived difference in attainment. These respondents were asked about factors that they perceived had affected the attainment of the Year 1 cohort. The responses of these head teachers are presented in Table 15. Note that respondents could tick as many factors as was appropriate.

Table 15: Main factors perceived as affecting attainment of Year 1 in the autumn term (n=133 head teachers).

Factor	Percentage (n=133)
Challenges in provision of home learning	72.9%
Low levels of parental engagement	64.7%
Lack of IT access	42.1%
Different demographic	37.6%
Home learning delivered by school	26.3%
Greater parental involvement	12%
'Other' includes missed interactions in school, independence/maturity of children, parents struggling due to time/knowledge	9.3%

Note: 'Home learning delivered by school' was a positive factor, whilst 'Challenges in provision of home learning' was a negative factor.

Social skills

Figure 12 shows the reported social skills of the whole cohort (Year 1) and of different groups (PP and EAL). This shows that around half of head teachers believed the current cohort were, on average, below the last year's cohort in social skill development. A further 34% perceived them to be the same as last year's cohort. There was a slightly lower percentage of respondents rating PP pupils and pupils with E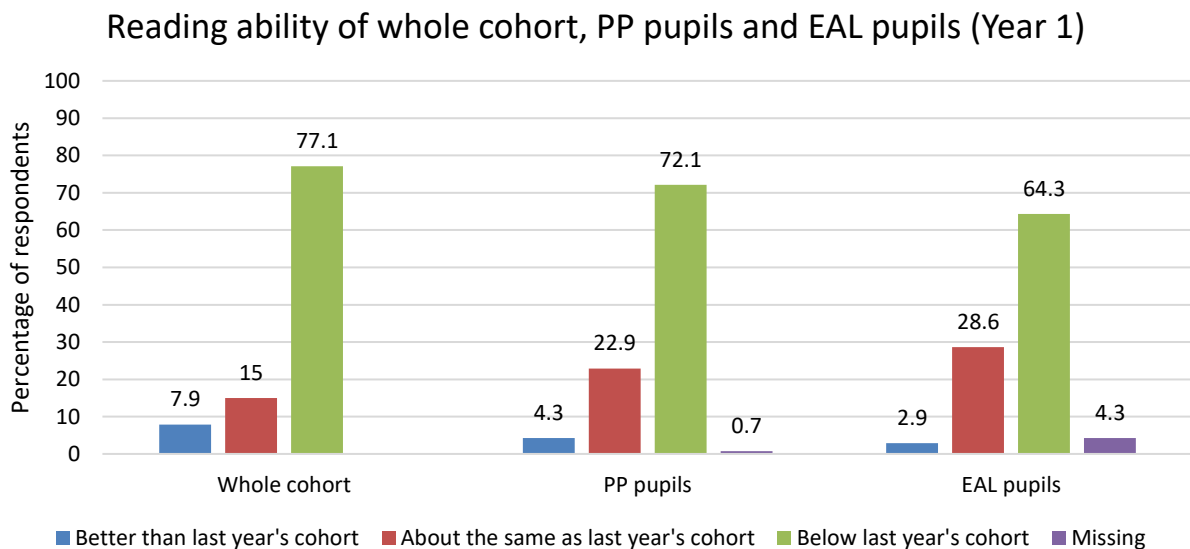AL as below last year's cohort, compared to the whole cohort, with similar numbers rating these groups as the same as last year's cohort. However, it should be noted that 5.7% of head teachers did not provide a response for pupils with EAL. Therefore, these percentages should be interpreted with caution.

Figure 12: Perceived social skills of Year 1 compared to previous cohort (n=140 head teachers).

Social skills of whole cohort, PP pupils and EAL pupils (Year 1)
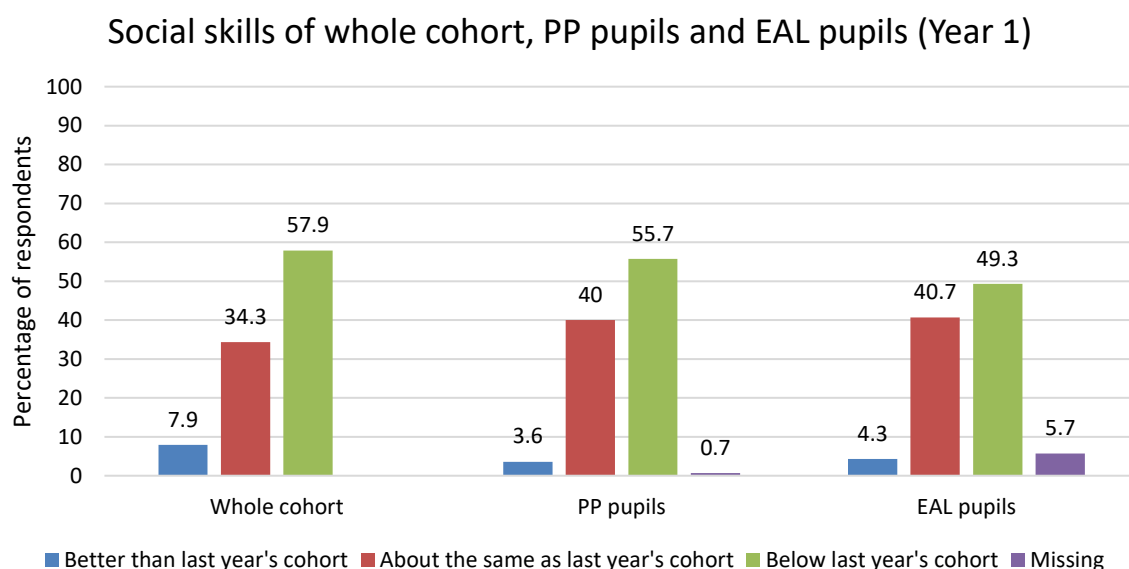
Wellbeing

Figure 13 shows the reported wellbeing of the whole cohort (Year 1) and of different groups (PP and EAL). This shows that over half of head teachers believed the current cohort were about the same in terms of wellbeing as the last year's cohort and around 38% thought they were below. There was a slightly higher percentage of respondents rating PP pupils as below last year's cohort, compared to the whole cohort, but a slightly lower percentage rating pupils with EAL as

below last year's cohort, compared to the whole cohort. As with social skills, 5.7% of head teachers did not provide a response for pupils with EAL, therefore percentages should be interpreted with caution.

Figure 13:   Perceived wellbeing of Year 1 compared to previous cohort (n=140 head teachers).

Wellbeing of whole cohort, PP pupils and EAL pupils (Year 1)

- Better than last year's cohort
- About the same as last year's cohort
- Below last year's cohort
- Missing
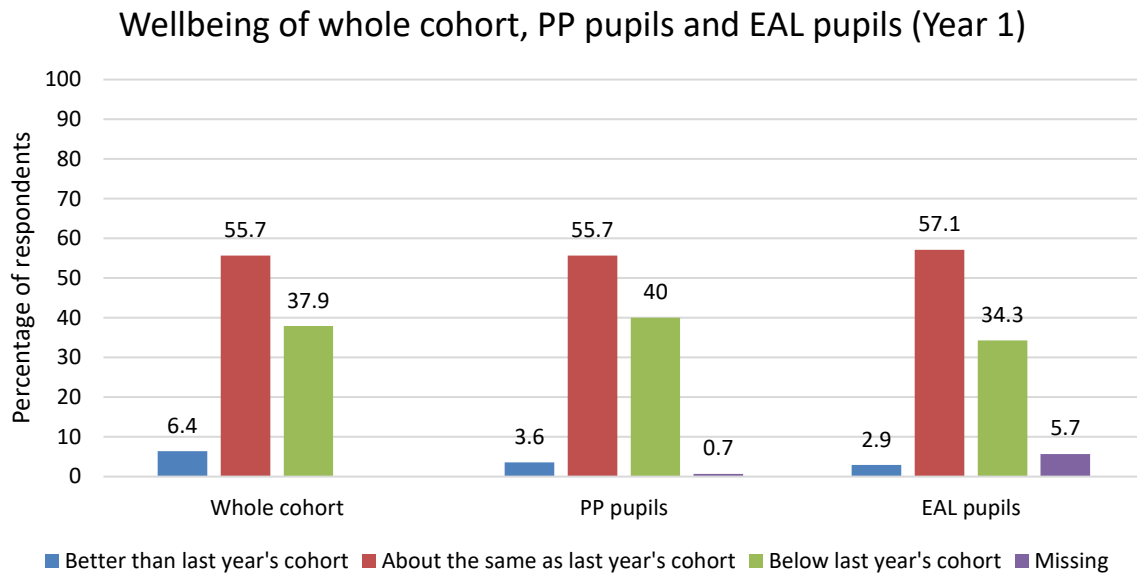
Main factors affecting social skills and wellbeing

103 head teachers gave reasons for changes in social skills and wellbeing compared to the previous year's cohort, as shown in Table 16. This data was gathered from an open question and coded. Therefore, respondents could give as many factors as was appropriate.

Table 16: Main factors perceived to be affecting social skills and wellbeing of Year 1 in the autumn term (n=103 head teachers).

Factor	Frequency (n=103)
Reduced or limited play/interactions/socialising with peers/friends due to school closures	50
Lack of consistent structure/missed learning opportunities from school	44
Levels of independence and maturity/attachment to home adults due to extended time at home	14
Increased anxiety in children, e.g., over Covid-19/feelings of loss/uncertainty	13
Different demographic/cohort factors, e.g., more SEN, more children attending school due to being keyworker children	13
Parental issues, e.g., financial pressures, poor mental health, issues with supporting home learning	11
Lack of wider interaction with family/different adults/other teachers	9
Positive impact from more time at home	5
More screen time	5
Other	4

Year 2

Mathematics

Figure 14 shows the reported mathematics ability of the whole cohort (Year 2) and of different groups (n=140). This shows that the majority of head teachers believed the current cohort were, on average, below the last year's cohort at this point in the year. There was a slightly lower percentage of respondents rating PP pupils and pupils with EAL as below last year's cohort, compared to the whole cohort.

Figure 14:   Perceived mathematics ability of Year 2 compared to previous cohort (n=140 head teachers).
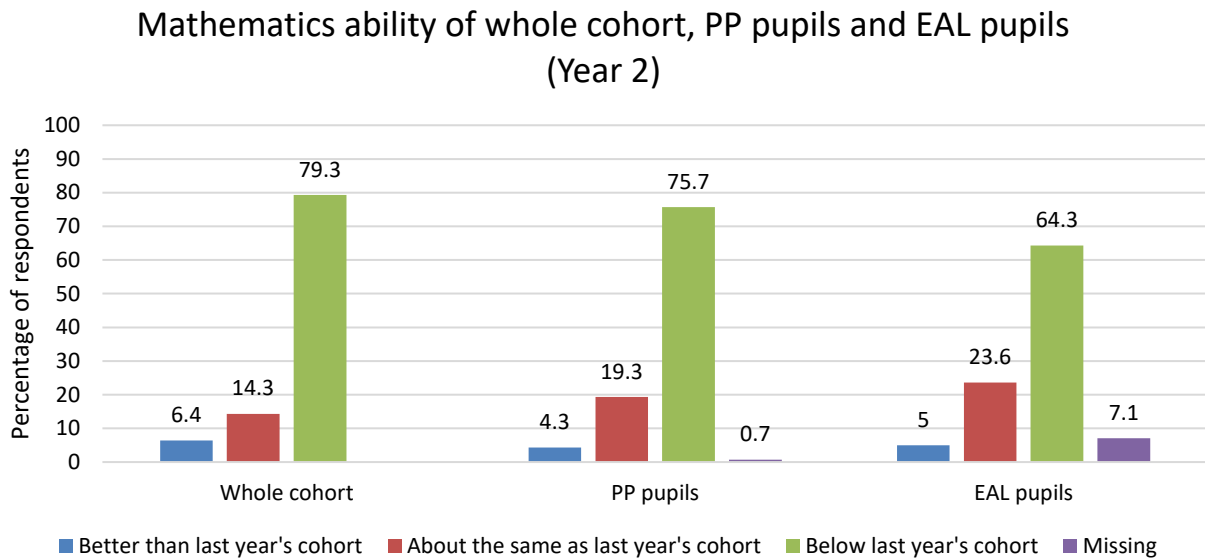
Reading

Figure 15 shows the reported reading ability of the whole cohort (Year 2) and of different groups (n=140). This shows that the majority of head teachers believed the current cohort were, on average, below the last year's cohort at this point in the year. There was a slightly lower percentage of respondents rating PP pupils and pupils with EAL as below last year's cohort, compared to the whole cohort.

Figure 15:   Perceived reading ability of Year 2 compared to previous cohort (n=140 head teachers).
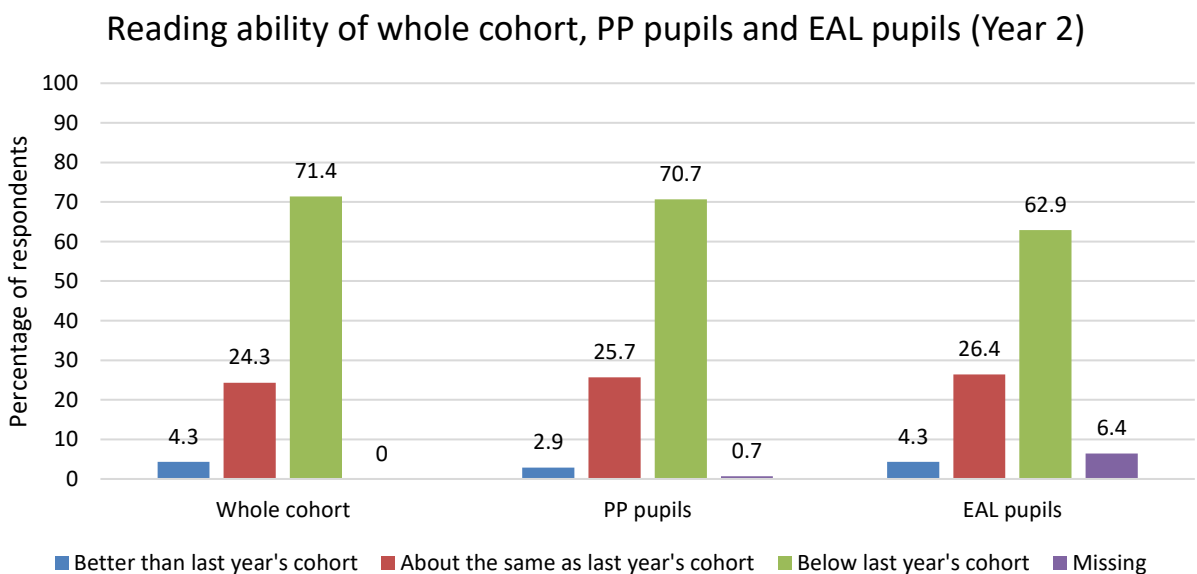
Main factors affecting attainment

A total of 129 head teachers reported a perceived difference in attainment. These respondents were asked about factors that they believed had affected the attainment of the Year 2 cohort. The responses of these head teachers are presented in Table 17. Note that respondents could tick as many factors as was appropriate.

Table 17: Main factors perceived as affecting attainment of Year 2 in the autumn term (n=129 head teachers).

Factor	Percentage (n=129)
Challenges in provision of home learning	71.3%
Low levels of parental engagement	65.1%
Lack of IT access	41.9%
Different demographic	37.2%
Home learning delivered by school	26.4%
Greater parental involvement	14.7%
'Other' includes missed learning opportunities/interactions in the school environment, independence/maturity of children, parents struggling due to time/knowledge	11.4%

Note: 'Home learning delivered by school' was a positive factor, whilst 'Challenges in provision of home learning' was a negative factor.

Social skills

Figure 16 shows the reported social skills of the whole cohort (Year 2) and of different groups (n=140). This shows that around half of head teachers believed the current cohort had less well-developed social skills than the last year's cohort, with around 40% indicating they were the same as last year's cohort. There was a slightly higher percentage of respondents rating PP pupils as below last year's cohort, compared to the whole cohort. For pupils with EAL, around half of head teachers rated their social skills as the same as last year's cohort. As for Year 1, there were 6.4% of head teachers who did not respond for pupils with EAL.

Figure 16:   Perceived social skills of Year 2 compared to previous cohort (n=140 head teachers).
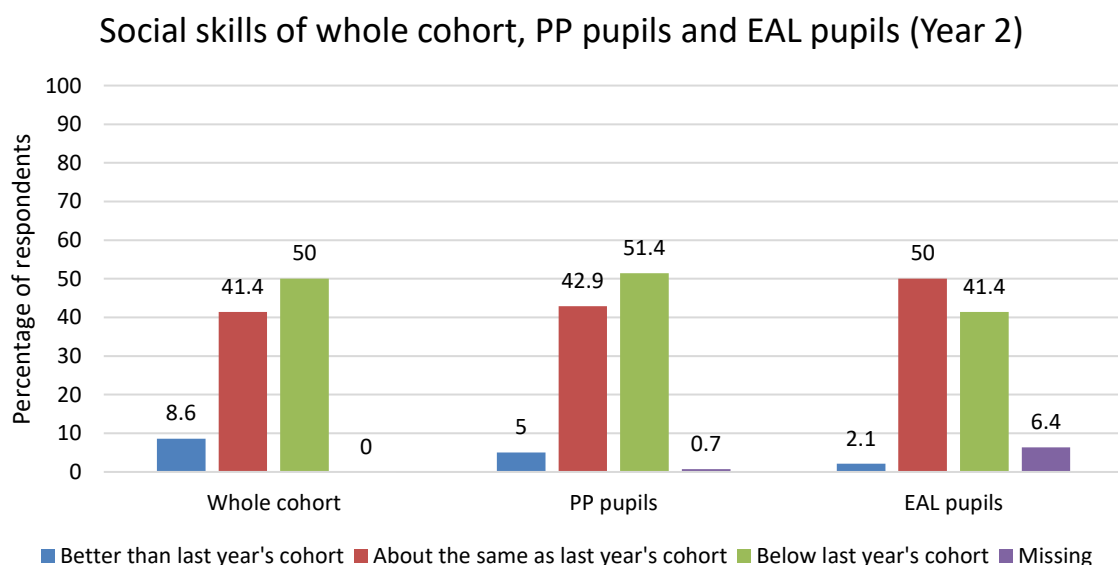
Wellbeing

Figure 17 shows the reported wellbeing of the whole cohort (Year 1) and of different groups (PP and EAL). This shows that around half of head teachers believed the current cohort were about the same in terms of wellbeing as the last year's cohort, and just over 40% perceived them to be below the last year's cohort. There was a slightly higher percentage of respondents rating PP pupils as below last year's cohort, as well as a slightly higher percentage rating them as the same as last year, compared to the whole cohort. There was a slightly lower percentage of head teachers rating pupils with EAL as below last year's cohort, as more EAL pupils were rated as the same as last year, compared to the whole cohort. Again, there was missing data for pupils with EAL.

Figure 17:   Perceived wellbeing of Year 2 compared to previous cohort (n=140 head teachers).

Wellbeing of whole cohort, PP pupils and EAL pupils (Year 2)
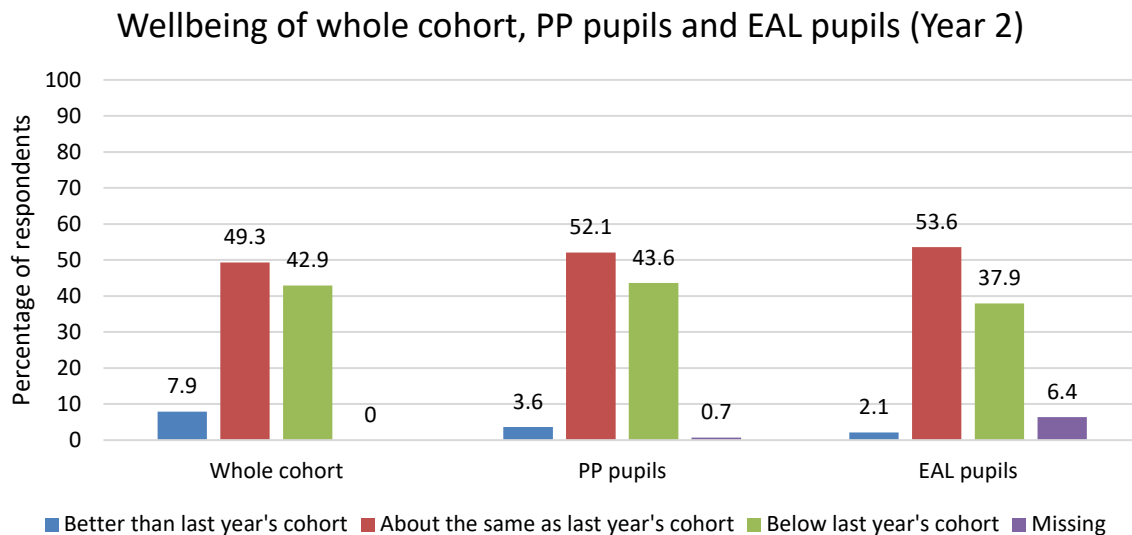
Main factors perceived as affecting social skills and wellbeing

91 head teachers gave reasons for changes in social skills and wellbeing compared to the previous year's cohort (Table 18). This data was gathered from an open question and coded; therefore, respondents could give as many factors as was appropriate.

Table 18: Main factors perceived as affecting wellbeing of Year 2 in the autumn term (n=91 head teachers).

Factor	Frequency (n=91)
Reduced or limited play/interactions/socialising with peers/friends due to school closures	44
Lack of consistent structure/missed learning opportunities from school	29
Parental issues, e.g., financial pressures, poor mental health, issues with supporting home learning	17
Different demographic/cohort factors, e.g., more SEN, more children attending school due to being keyworker children	13
Levels of independence and maturity/attachment to home adults due to extended time at home	9
Increased anxiety in children, e.g., over Covid-19/feelings of loss/uncertainty	8
Other	8
Lack of wider interaction with family/different adults/other teachers	5
More screen time	4
Positive impact from more time at home	2

These findings give some insight into head teachers' perceptions of the cohort when they returned in autumn 2020 as compared to the previous year's cohort. The results for Year 1 and 2 are very similar and suggest that for reading and mathematics, a large majority of head teachers felt their pupils were lower than the previous year's cohort. The main reasons for these attainment differences were reported to be challenges with home learning and parental engagement.

For social skills and wellbeing, the majority of head teachers felt their cohort was the same or worse than the previous year's cohort. Where the cohort differed to last year's in terms of social skills and wellbeing, the most frequently cited reasons were reduced play/socialising with peers and lack of structure at home.

Social skills, as measured by the Child Self-Regulation and Behaviour Questionnaire (CSBQ)

The results from the autumn CSBQ can be compared to norms provided by the original research. Note that these norms are from a sample of 414 Australian children aged between 3 and 6, and therefore may not be completely representative of our UK sample. However, they are a useful benchmark to tentatively ascertain whether the present sample of pupils have self-regulation and social skills at roughly expected levels.

Age standardisation and distribution

The CSBQ scores were not age-standardised due to a lack of age-appropriate norms for the present sample; the norms are for up to age six, whilst the current sample included pupils up to the age of eight. Distributions of scores on all subscales except cognitive self-regulation show a ceiling effect: most pupils were rated at the upper end of the scale, or a floor effect for the negatively scored subscales (internalising and externalising problems). This could be due to interpretations from teachers – they may have expected their pupils to be negatively impacted by the pandemic and therefore judged them with a consideration of the circumstances, rather than an 'absolute' judgement. However, it may also imply that the CSBQ as used here is not capturing fully the social skills of this age group and there is no certainty over how teachers used the rating scale. Therefore, these results should be interpreted with caution and considered alongside the other evidence on social skill levels. Additionally, it is clear that the development of valid and reliable measures of socio-emotional skills for this age group is crucial.

Table 19 presents the autumn CSBQ scores (mean, confidence interval and standard deviation) for each subscale, for all pupils and split by FSM pupils and non-FSM pupils. Each subscale is on a scale from 1 to 5.

Table 19: CSBQ scores on each subscale for all pupils (n=3454 pupils), and subgroup scores for FSM and non-FSM pupils.

Scale	Overall (all pupils)			FSM pupils			Non-FSM pupils		
	Mean (95% CI)	SD	N	Mean (95% CI)	SD	N	Mean (95% CI)	SD	N
Cognitive self-regulation	3.23 (3.19–3.26)	1.09	3454	2.75 (2.65–2.84)	1.07	502	3.32 (3.28–3.36)	1.08	2588
Behavioural self-regulation	3.92 (3.89–3.95)	0.94	3454	3.61 (3.52–3.70)	1.06	502	3.98 (3.94–4.01)	0.91	2588
Emotional self-regulation	4.022 (4.00–4.05)	0.765	3454	3.84 (3.76–3.92)	0.88	502	4.06 (4.03–4.09)	0.75	2588
Sociability	3.91 (3.89–3.94)	0.80	3454	3.73 (3.66–3.80)	0.84	502	3.94 (3.91–3.97)	0.79	2588
Prosocial behaviour	3.95 (3.92–3.98)	0.86	3454	3.69 (3.61–3.77)	0.95	502	4.00 (3.97–4.04)	0.84	2588
Internalising problems	1.64 (1.61–1.66)	0.73	3454	1.84 (1.77–1.91)	0.81	502	1.6 (1.57–1.63)	0.71	2588
Externalising problems	1.51 (1.49–1.54)	0.77	3454	1.68 (1.59–1.76)	0.94	502	1.49 (1.46–1.51)	0.73	2588

Table 20 shows the norms from the Australian sample (Howard and Melhuish, 2017). As mentioned above, these norms were derived from a sample of 414 Australian 3–6-year-olds. It should be noted that, on average, older children would be expected to have better developed social skills than younger children; therefore, the comparison with the present sample (age range: 5–8 years) should be considered with some caution. However, as the original authors note (Howard and Melhuish, 2017), social skills do not necessarily increase linearly and yearly with age and therefore a general comparison can still be considered useful.

Scores are presented in quintiles. Scores in the middle three bands (yellow, green, light blue) can roughly be considered within age expectations (characterising the middle 60% of children that age). A score in the dark blue can be considered above age expectations (the top 20% of children that age). Scores in the orange are below age expectations (the bottom 20% of children that age). Note that for the subscales internalising problems and externalising problems, a lower score indicates higher social skills.

Table 20: CSBQ norms provided by Howard and Melhuish (2017) with mean and standard deviation of study sample (autumn).

Subscale	M(SD) norms	M (SD) in this study, autumn	<20th percentile		20th-39th percentile		40th-59th percentile		60th-79th percentile		80th+ percentile	
			Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper
Cognitive Self-Regulation	3.41 (0.84)	3.23 (1.09)	1.00	2.82	2.83	3.16	3.17	3.66	3.67	3.99	4.00	5.00
Behavioural Self-Regulation	3.54 (0.90)	3.92 (0.94)	1.00	2.74	2.75	3.24	3.25	3.87	3.88	4.49	4.50	5.00
Emotional Self-Regulation	3.48 (0.67)	4.022 (0.77)	1.00	2.85	2.86	3.33	3.34	3.71	3.72	3.99	4.00	5.00
Sociability	3.62 (0.80)	3.91 (0.80)	1.00	2.99	3.00	3.59	3.60	3.99	4.00	4.39	4.40	5.00
Prosocial Behaviour	3.54 (0.84)	3.95 (0.86)	1.00	2.85	2.86	3.42	3.43	3.85	3.86	4.28	4.29	5.00
Internalizing Problems	1.85 (0.73)	1.64 (0.73)	5.00	2.40	2.39	2.01	2.00	1.49	1.48	1.21	1.20	1.00
Externalizing Problems	1.91 (0.98)	1.51 (0.77)	5.00	2.60	2.59	1.81	1.80	1.41	1.40	1.20	1.19	1.00

These results indicate that the pupils in our sample were performing at or above what would be expected (in the 40th–59th percentile bracket or above) when compared to these norms, on all subscales. This broadly indicates that, in autumn 2020, Key Stage 1 pupils in this sample had social skills at expected levels when compared to existing norms. These norms are, however, are for Australian pupils slightly younger than the current sample, so the comparison has limitations. Furthermore, the level of social skills of these pupils before this point is not known and therefore it cannot be concluded that there was no reduction in score.

FSM compared to non-FSM pupils

When comparing the CSBQ scores of FSM and non-FSM pupils, there is a gap. On all subscales, FSM pupils have worse scores than non-FSM pupils. However, it should be noted that the mean score for FSM pupils is still within the normal range, when compared to the Australian norms, for all subscales except cognitive self-regulation. Therefore, whilst there is a gap between the groups, the FSM pupils in our sample are broadly not below expectations with regard to their social skills, using the Australian CSBQ norms as reference.

Overall, the data from the CSBQ suggests that, in autumn 2020, the social skills of the pupils in the sample were not significantly worse than would be expected based on a comparison to the CSBQ norms. As mentioned, CSBQ scores for the previous cohort are not available and the comparative norms have limitations. However, tentatively, these findings

suggest that social skills had not been severely impacted by the school closures when reported by teachers in autumn 2020.

Strategies on return

Based on their perception of the impact of the school closures on their pupils, schools began to implement specific catch-up strategies in the first period of reopening. Survey data from head teachers (n=140) details the strategies undertaken during this time.

Mathematics

Table 21 shows which strategies head teachers reported their school as using in the autumn term to aid Key Stage 1 catch-up in mathematics. Note that respondents could tick as many strategies as was appropriate. This shows that a revised curriculum, small-group work and staff deployment (including re-deployment) were the most used catch-up strategies.

Table 21: Strategies reported for catch-up in mathematics for Key Stage 1 (n=140 head teachers).

Strategy	Percentage (n=140)
Revised curriculum	87%
Small-group work	83%
Staff deployment (e.g., greater use of TAs to support individuals)	72%
Encouraging a higher level of parental engagement	45%
Tutoring	16%
Other (includes subscriptions to additional resources, gap analysis of needs, targeted interventions and revised class groupings)	8%

Reading

Table 22 shows which strategies head teachers reported their school using in the autumn term to aid Key Stage 1 catch-up in reading. Note that respondents could tick as many strategies as was appropriate. This shows that, similar to mathematics, a revised curriculum, small-group work and staff deployment were the most used catch-up strategies.

Table 22: Strategies reported for catch-up in reading for Key Stage 1 (n=140 head teachers).

Strategy	Percentage (n=140)
Small-group work	88%
Revised curriculum	85%
Staff deployment (e.g., greater use of TAs to support individuals)	79%
Encouraging a higher level of parental engagement	56%
Tutoring	18%
Other (includes subscriptions to additional resources, gap analysis of needs, targeted interventions and revised class groupings)	8%

Preparedness

Head teachers were asked how prepared they felt, were there to be another lockdown. The results are presented in Figure 18. Note, there was an option 'Not prepared' that was not selected by any respondents.

Figure 18:   Preparedness of head teachers for home learning (n=140 head teachers).
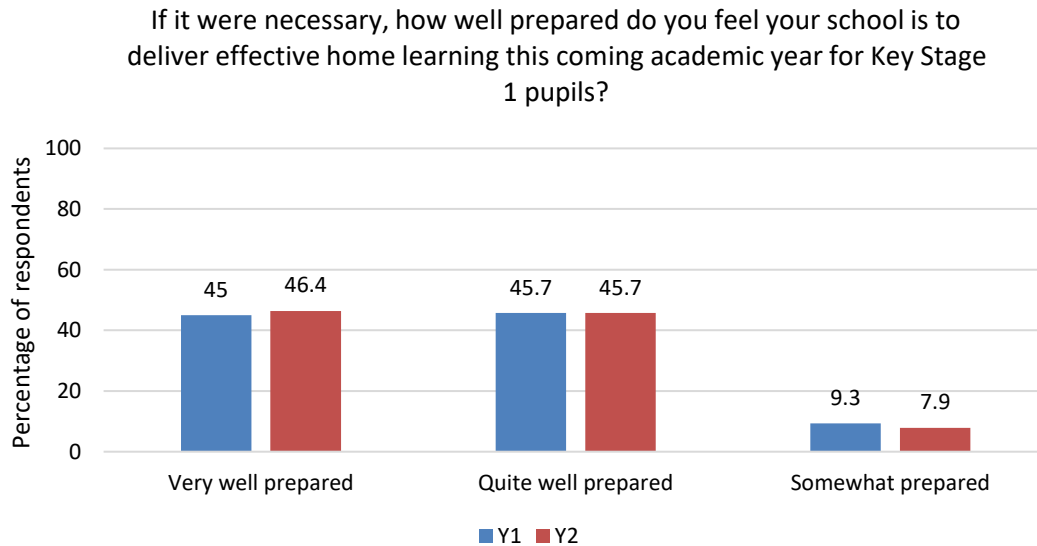
This indicates that most schools felt at least quite well prepared, with many feelings very well prepared for this second period of school closures and the associated home learning.

Social skills and wellbeing

Table 23 shows which strategies head teachers reported that their school was using in the autumn term to aid Key Stage 1 catch-up in social skills and wellbeing. Note that this was an open question so respondents could provide as many strategies as was appropriate. This shows that an additional focus on PSHE, a recovery curriculum, and a revised school day were the most used catch-up strategies.

Table 23: Strategies reported for catch-up in social skills and wellbeing of Key Stage 1 (n=138 head teachers).

Strategy	Frequency (n=138)
Additional/focus on PSHE sessions/teaching/mindfulness/wellbeing, e.g., extended talking time/circle time	85
Recovery/adapted curriculum in terms of learning	42
Revised school day – longer break times/free-flow play/reduced curriculum	26
Identifying pupils and targeted support, e.g., screening tools, 1:1 support	24
Additional staff employed/deployed	21
Parent engagement/home learning	13
Extended support for transition, e.g., whole school project or more time spent between classes	11
Other	11
Additional PE sessions or additional extra-curricular activities	8
Additional staff training	6

Teacher interviews

This focus on social skills and wellbeing catch-up as reported in the surveys was echoed in the teacher interviews (n=10). In the first full school reopening, a few teachers reported the need to re-establish routines and behaviours for learning. A few also mentioned revisiting lower levels of the curriculum and conducting smaller group work in class. One teacher reported Saturday school running during the autumn term.

Some teachers reported a necessary focus on writing when pupils first returned to schools. Several teachers also conducted phonics catch-up sessions outside of the class and indicated that these had been successful. There were also several reports of additional reading with targeted pupils both within and outside of class, and general reference to catch-up groups.

With regards to mathematics teaching, several teachers reported revisiting material from an earlier point in the curriculum and made general reference to catch-up groups. A few reported differentiation within class time, and a few teachers used assessments to check gaps in mathematics knowledge.

Considering pupil wellbeing during the first return, the majority of teachers reported increasing time and space for children to reflect, feel safe and focus on social activities, as this is what they felt pupils needed after the disruption to schooling. Several teachers also reported an increased focus on guiding children through the transitions between school and home or between terms, such as the end of the summer term in July 2020 and the beginning of the autumn term. A small number of teachers increased direct staff involvement, for example recording each child's wellbeing or having focused time outside of class. Two teachers mentioned a whole school approach, such as assemblies which were focused on wellbeing or through a shared whole school project. Finally, a few teachers told us that they had focused on physical education (PE) as a way to support pupil wellbeing during the return to school.

Pupil participation record (PPR)

The PPR also gathered some information on support given to pupils. The response rate for the autumn term PPR was low, with data provided for around 16%–17% of the total sample, so results should be interpreted with caution. These results show that 32.1% of Year 1 pupils received additional reading support, 20% received additional mathematics support and 14.8% had social skills/wellbeing support. For Year 2 pupils, 36.6% received additional reading support, 26.7% additional mathematics support and 15.3% social skills/wellbeing support. Teachers were also asked to report the intensity of interventions, and which interventions were given to each child. However, due to the very low numbers of responses, this data will not be presented in this report.

Overall, the data from the autumn return to school indicates that most head teachers perceived their Key Stage 1 pupils to be below expectations in mathematics and reading, to some extent in social skills, but to a lesser extent in terms of wellbeing. The CSBQ indicates that the social skills of the surveyed pupils were at expected levels (when compared to existing, limited Australian norms), though there was a gap between the social skills of FSM compared to non-FSM children. Frequently used catch-up strategies in the autumn term included small-group work, staff deployment and revised curricula, as well as additional PSHE and a revised school day to aid wellbeing.

Chapter 3 – Autumn 2020 assessment

Summary

Attainment data

- The overall performance of Year 2 pupils in reading in autumn 2020 was significantly lower than the standardised sample in 2017, representing a Covid-19 gap of around two months' progress.

- The overall performance of Year 2 pupils in mathematics in autumn 2020 was significantly lower than the standardised sample in 2017, representing a Covid-19 gap of around two months' progress.

- On both the reading and mathematics assessments in autumn 2020, the proportion of pupils who scored below the lowest standardised score was higher than the standardisation sample in 2017.

- The disadvantage gap for both reading and mathematics was around seven months' progress, representing a widening from 6 months as compared to Key Stage 1 in 2019.

Diagnostic analysis

- Across both subjects, although children performed less well than their peers in 2017, the curriculum areas they struggled with were broadly the same.

- Children from disadvantaged backgrounds found all curriculum areas harder, in both subjects, than their non-disadvantaged peers in autumn 2020.

The assessment window for schools, for the first set of assessments in autumn 2020, was open between 1 and 30 November 2020. Schools were asked to administer the assessments to all Year 2 pupils and, where possible within the testing window, to give absent pupils a further opportunity to complete their assessments. Schools were provided with autumn Year 2 assessment papers from the NFER Key Stage 1 suite of assessments. There were no Year 1 assessments administered at this time point. All assessments were marked by NFER. Coded marking, which identifies the type of response rather than simply whether it was correct, was used in order to be able to provide diagnostic information to schools.

The Year 2 mathematics assessments consisted of two papers, one in arithmetic and the other in reasoning. Both papers are suitable for all pupils and should be taken by all. Pupils needed to sit both papers in order to be included within the study. The total number of pupils included in the mathematics analysis was 5,936 from 168 schools.

The Year 2 reading assessments also consisted of two papers. Following the model of Key Stage 1 national assessment, both papers are intended for all pupils. However, as it is slightly higher in difficulty, it is expected that paper 2 may be unsuitable for some pupils and the NFER teacher guide advises that it is not suitable to administer this paper in such cases. The majority of pupils sat both papers; however, a small number of pupils who sat only paper 1 were also included in the study. The total number of pupils included in the reading analysis was 5,931 from 168 schools.

Pupils' raw scores from the autumn 2020 assessments were converted into standardised scores using the NFER conversion table, which was created during the 2017 standardisation. This enables their performance to be compared to the standardisation sample.

The data from pupils taking assessments in autumn 2020 as part of this study was weighted using Key Stage 2 attainment quintiles. This was done to ensure the sample in autumn 2020 was representative of the population quintiles at school-level. This was the best attainment variable we could use to weight the data, but it was limited by being for a different year group and by not being at pupil-level.

Year 2 attainment in reading and mathematics – Covid-19 gap

Table 24: Summary of results for autumn 2020.

Measure	Reading		Mathematics	
	Standardisation sample 2017	Autumn term 2020	Standardisation sample 2017	Autumn term 2020
Mean	99.58	97.53	99.44	98.06
95% confidence interval	98.98–100.18	97.13–97.92	98.85–100.03	97.71–98.42
Standard deviation	14.54	15.52	14.41	13.95
N pupils[19]	2268	5931	2307	5936

Reading

The overall performance of pupils in reading in autumn 2020 was significantly lower than the standardisation sample. The mean standardised score across the autumn 2020 sample was 97.53 compared to 99.58 at standardisation. This equates to an effect size of −0.14[20] or around −2 months' progress using EEF's conversion table in their Early Years Toolkit.[21]

The standard deviation of the study sample is slightly larger, at 15.52, 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 19 shows a smaller proportion of pupils scoring above 115 and a larger proportion scoring below 85. This can also be seen in Figure 20, which shows the cumulative percentage of reading standardised scores distribution in both autumn 2020 and the standardisation sample. It shows that overall more pupils in our sample scored towards the lower end of the possible standardised scores.

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[19] The autumn 2020 samples for reading and mathematics were weighted by Key Stage 2 performance. For the 2017 standardisation samples, the samples were representative in terms of Key Stage 2 performance after removing independent schools from the sample and required no weighting.
[20] Covid-19 gap effect sizes were calculated by dividing the difference in standardised score points between the samples by the standard deviation of the standardisation sample.
[21] https://educationendowmentfoundation.org.uk/education-evidence/using-the-toolkits

Figure 19:   Distributions of reading standardised scores for standardisation sample and autumn 2020 sample.
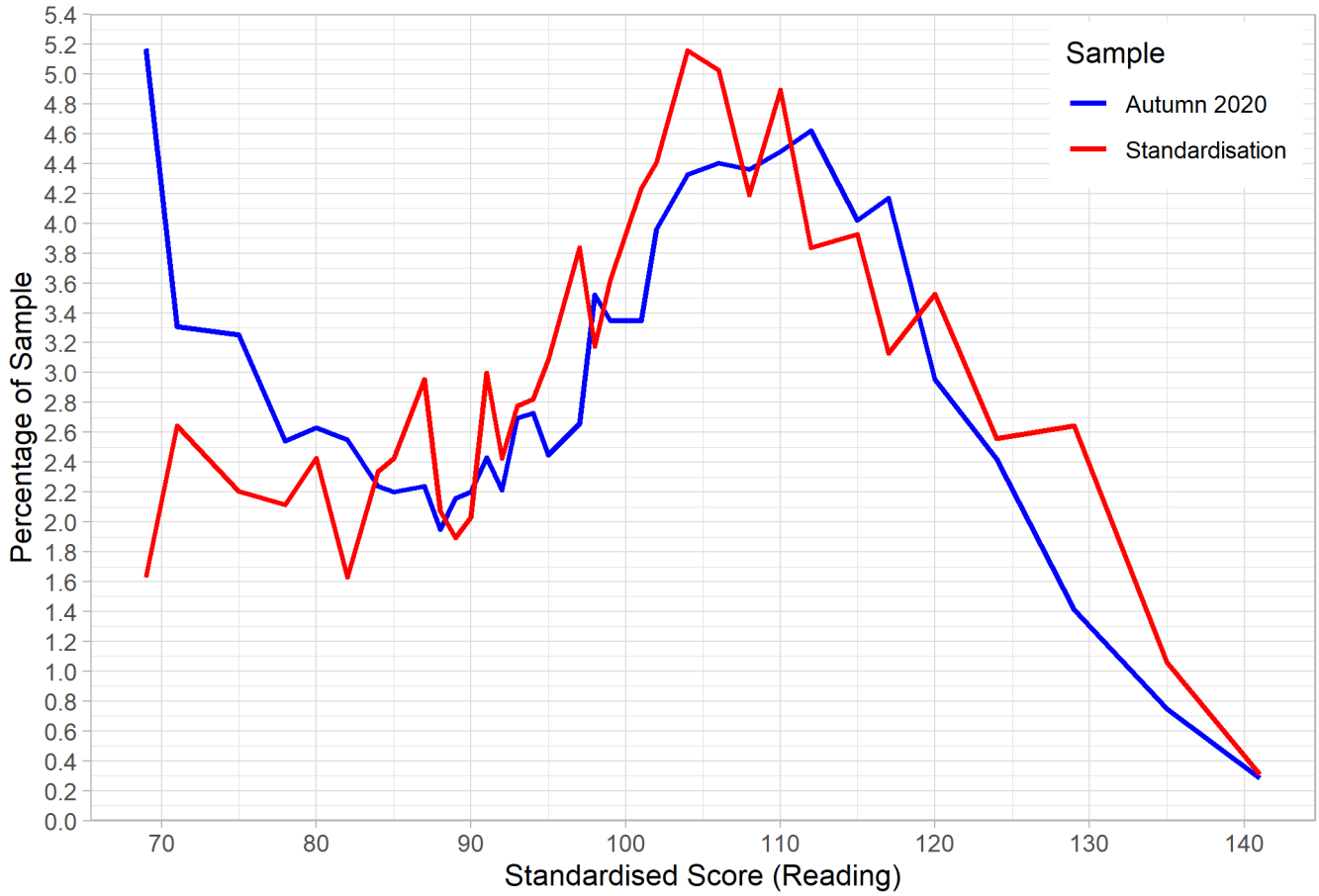
Figure 20:   Distribution of cumulative reading standardised scores for standardisation sample and autumn 2020 sample.
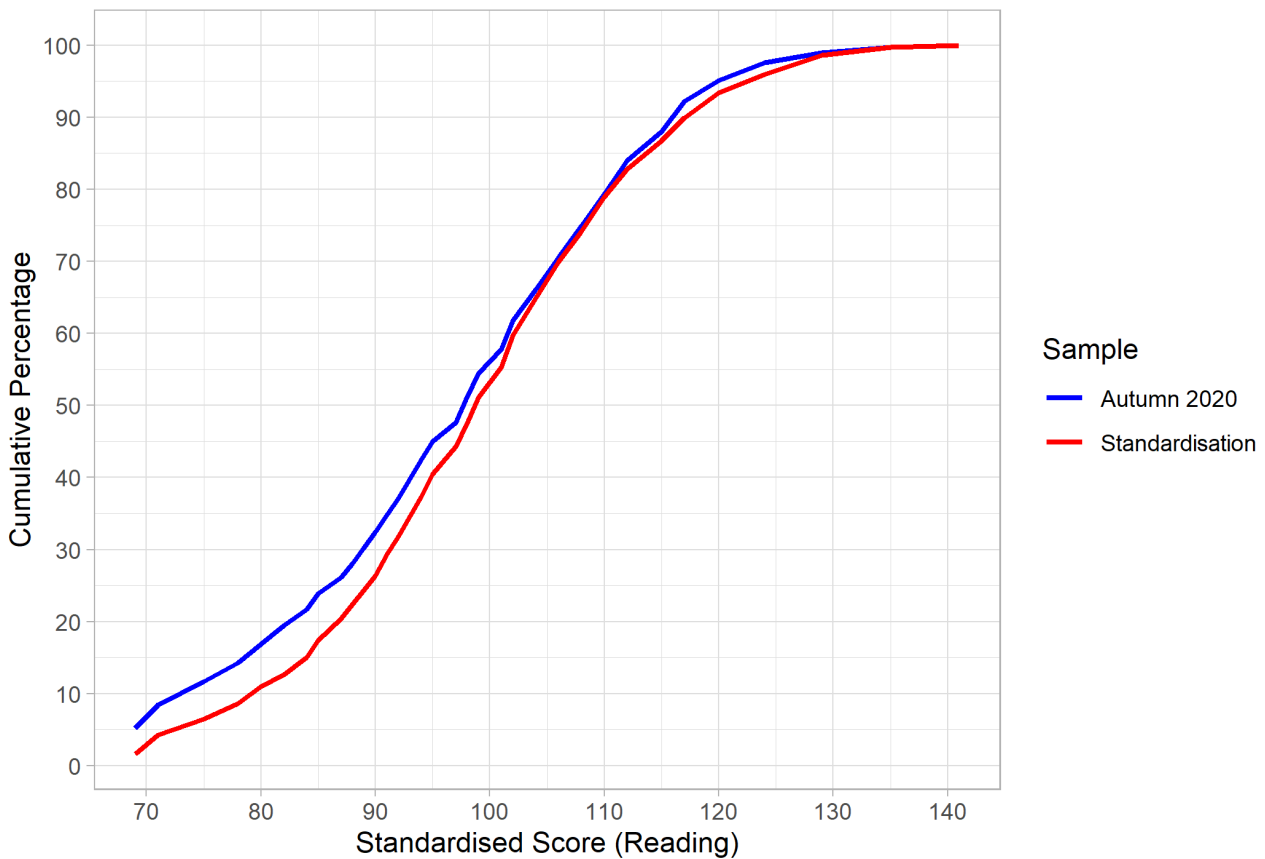
It is noteworthy that a higher proportion of pupils (307 or 5.2%) than the standardisation sample scored fewer than two marks on the reading assessment, resulting in a standardised score of 69. This indicated that a large number of pupils were unable to engage effectively with the assessments. In the standardised sample, the percentage of pupils being awarded this score was 1.6%. The gap in attainment here is being driven by a reduction in the attainment levels of pupils who are at the earliest stages of learning to read.

Figure 21:   Distribution of reading standardised scores for the autumn 2020 sample.
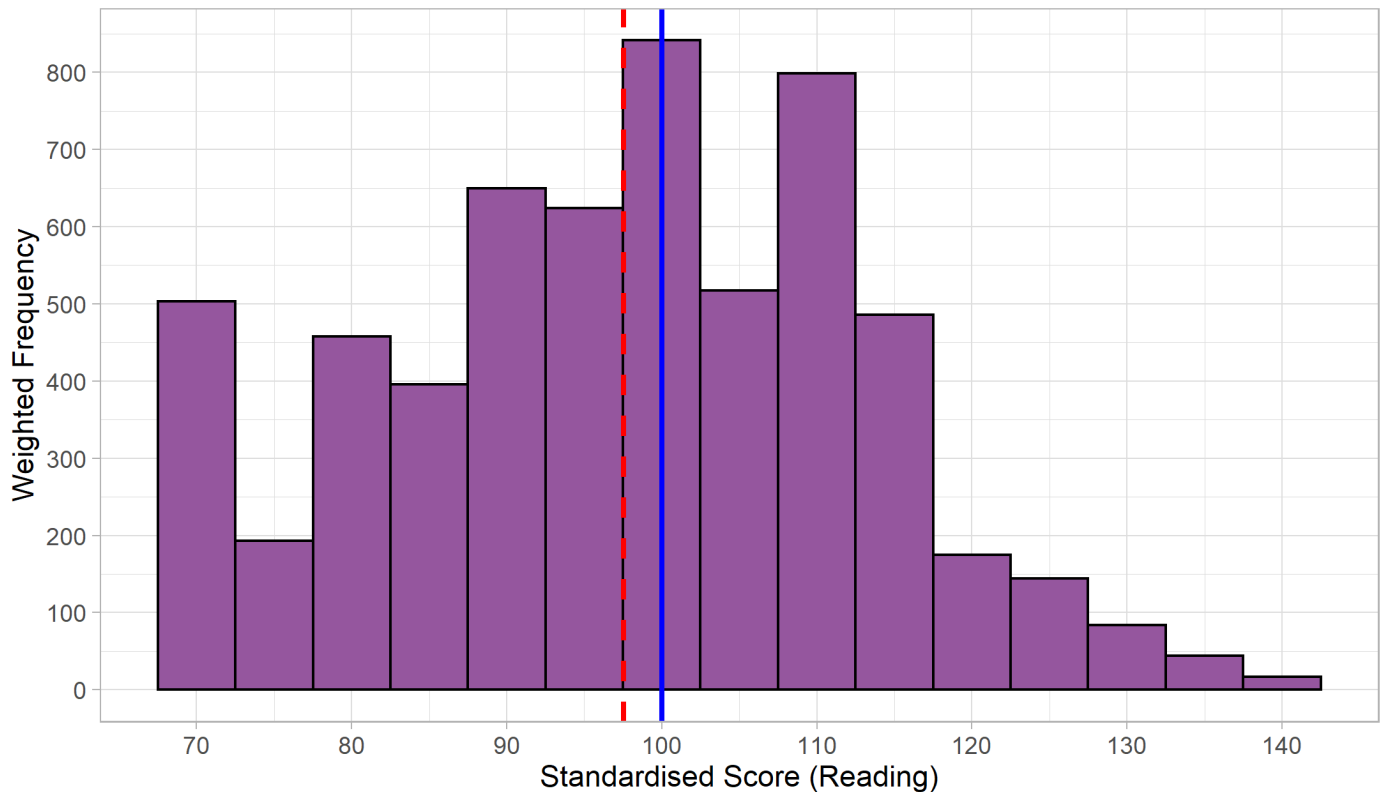
In Figure 21, the blue line represents the expected mean if the sample performed exactly as the standardisation sample, and the red dotted line represents the observed mean for the sample in autumn 2020. The distribution shows a positive skew, i.e., more lower scores and fewer higher scores than expected, compared to the 2017 standardisation sample.

Mathematics

The overall performance of pupils in mathematics in November 2020 was also significantly lower than the standardisation sample. The mean standardised score across the autumn 2020 sample was 98.06 compared to 99.44 at standardisation. This equates to an effect size of –0.10 or around –2 months' progress.

The standard deviation of the study sample is smaller at 13.95 than that of the standardisation sample, indicating a narrower range of scores. This is largely due to a reduction in pupils achieving high standardised scores.

Figure 22 shows a smaller proportion of pupils scoring above 115 and a higher proportion scoring below 85. This can also be seen in Figure 23, which shows the cumulative percentage of mathematics standardised scores distribution in both autumn 2020 and the standardisation sample. It shows that overall more pupils in our sample scored towards the lower end of the possible standardised scores.

Figure 22: Distributions of mathematics standardised scores for standardisation sample and autumn 2020 sample.

Figure 23: Distribution of cumulative mathematics standardised scores for standardisation sample and autumn 2020 sample.
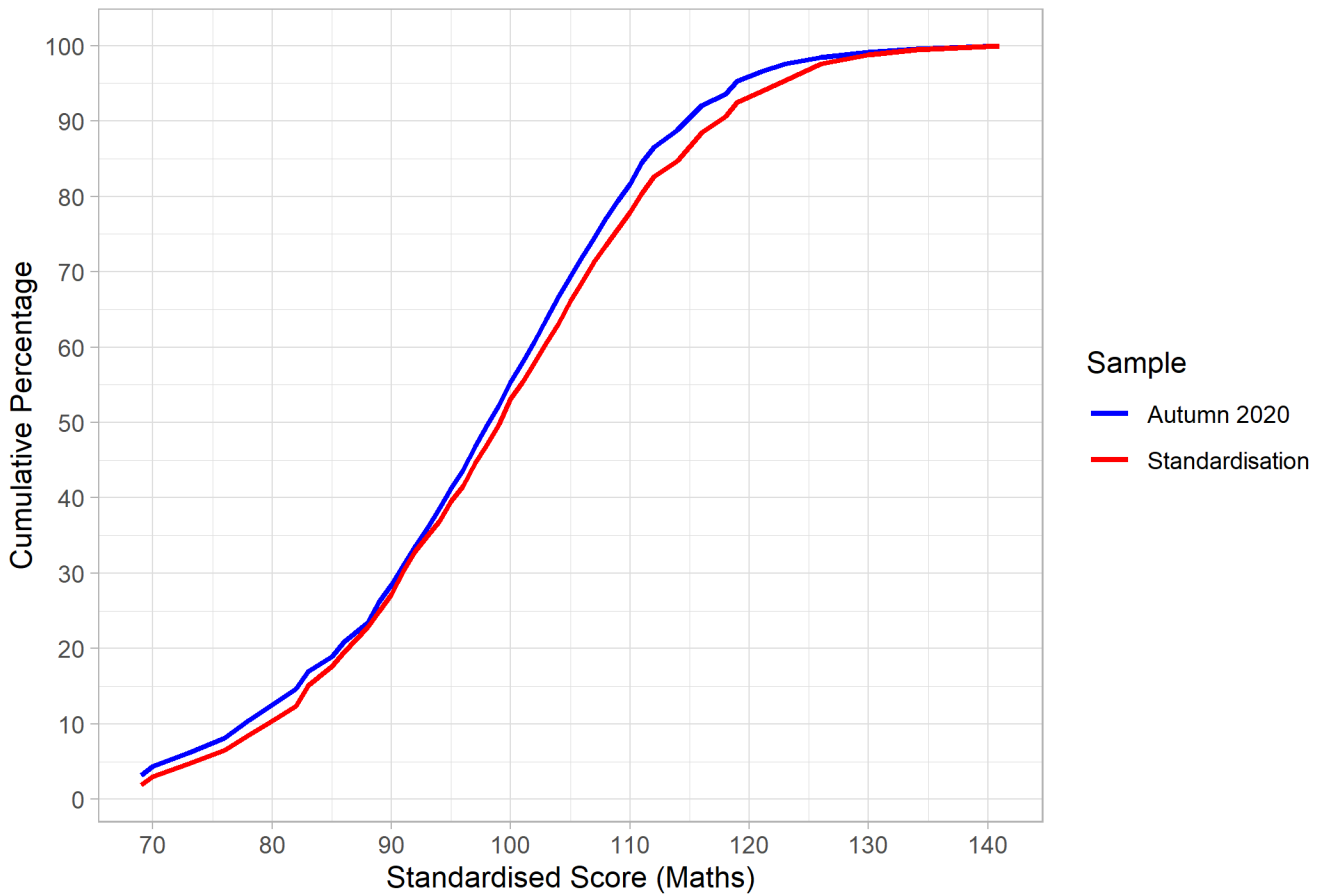
All pupils included in the analysis study showed evidence of having engaged with both mathematics papers, since those pupils who sat only one paper have been excluded. As in the reading assessment, a higher proportion of pupils (187 or 3.1%) than the standardisation sample scored fewer than five marks on the mathematics assessment, resulting in a standardised score of 69. A large number of pupils were therefore unable to engage effectively with the content of the assessments. In the standardisation sample, the percentage of pupils being awarded this score was lower, at 1.9%. However, in contrast to reading, the reduction in average attainment levels in mathematics is largely driven by a reduction in the attainment of high performing pupils.

Figure 24:   Distribution of mathematics standardised scores for the autumn 2020 sample.
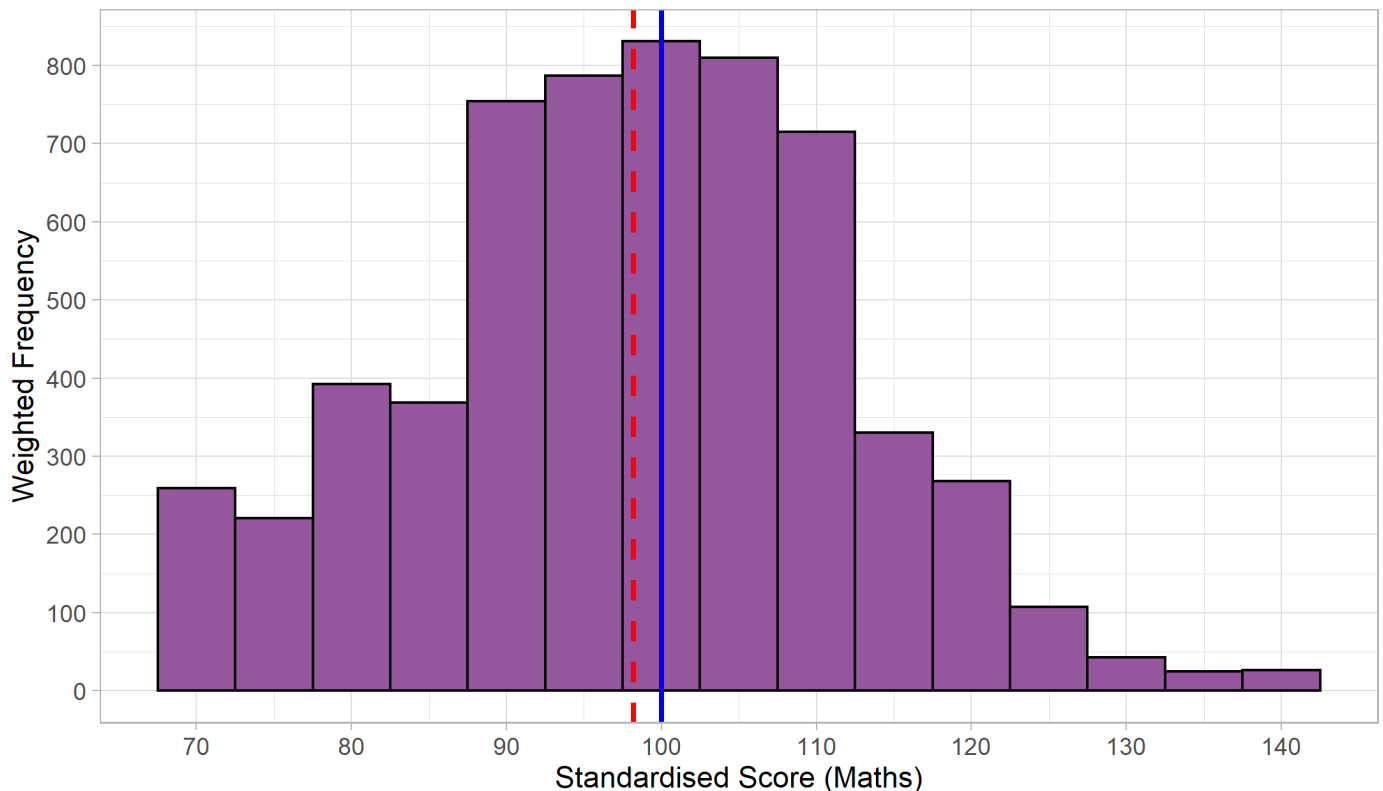
In Figure 24 the blue line represents the expected mean if the sample performed exactly as the standardisation sample and the red dotted line represents the observed mean for the sample in autumn 2020. The distribution shows a positive skew, i.e., more lower scores and fewer higher scores than expected, compared to the 2017 standardisation sample.

Year 2 attainment in reading and mathematics – disadvantage gap

Within the autumn 2020 sample, approximately 18% of the pupils were classed as being from disadvantaged backgrounds in September 2020 (i.e., eligible for FSM as reported by schools). For a very small number of pupils,[22] 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.

Reading

Table 25 shows a summary of the performance of disadvantaged pupils compared to those pupils who are not disadvantaged (i.e., eligibility for FSM as reported by schools).

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[22] Pupil numbers are weighted by Key Stage 2 performance.

Table 25: Performance of disadvantaged pupils in reading for autumn 2020.

Measure	Standardisation sample 2017	Autumn 2020 all pupils	Autumn 2020 FSM	Autumn 2020 Non-FSM
Mean	99.58	97.53	90.75	99.03
95% confidence interval	98.98–100.18	97.13–97.92	89.83–91.67	98.60–99.45
Standard deviation	14.54	15.52	15.35	15.15
N pupils[23]	2268	5931	1061	4861

The difference between the mean standardised scores of disadvantaged pupils and non-disadvantaged pupils is large at 8.28 standardised score points and, using NFER's table of age standardised scores, represents a gap of eight months of learning. The effect size for this data is 0.53[24] which, using EEF's table,[25] equates to seven months of learning.

To put this in context, without school closures, we would have expected the disadvantage gap to be around 0.47 standard deviations or six months' progress. This means that the disadvantage gap, now with an effect size of 0.53 or seven months' progress, has widened from what might be predicted without school closures. Given the forecast that the disadvantage gap might increase by 0.022 standard deviations per month of closures, our findings on the disadvantage gap are not unexpected given the uncertainties in these measures.

Mathematics

Table 26 shows a summary of the performance of disadvantaged pupils compared to those pupils who are not disadvantaged (i.e., eligibility for FSM as reported by schools).

Table 26: Performance of disadvantaged pupils in mathematics for autumn 2020.

Measure	Standardisation sample 2017	Autumn 2020 all pupils	Autumn 2020 FSM	Autumn 2020 Non-FSM
Mean	99.44	98.06	91.43	99.57
95% confidence interval	98.85–100.03	97.71–98.42	90.64–92.22	99.16–99.95
Standard deviation	14.41	13.95	13.27	13.65
N pupils[26]	2307	5936	1085	4839

The difference between the mean standardised scores of disadvantaged pupils and non-disadvantaged pupils is large at 8.14 standardised score points and, using NFER's table of age standardised scores, represents a gap of eight months of learning. The effect size for this data is 0.58 which, using EEF's table, equates to seven months of learning. Both of these calculations indicate a large gap but the results, expressed in terms of months of learning, should be interpreted

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[23] All pupil numbers, besides the 2017 standardisation sample, were weighted by Key Stage 2 performance.
[24] Disadvantage gap effect sizes were calculated by dividing the standardised score point difference between FSM and non-FSM by the overall autumn 2020 standard deviation.
[25] https://educationendowmentfoundation.org.uk/evidence-summaries/about-the-toolkits/attainment/
[26] All pupil numbers, besides the 2017 standardisation sample, were weighted by Key Stage 2 performance.

with caution due to the unreliability of the conversion table itself, or the inherent uncertainty in reading/mathematics ages.

To put this in context, without school closures we would have expected the disadvantage gap to be six months. This means that the disadvantage gap, now with an effect size of 0.58- or seven-months' progress, has widened from what might be predicted without school closures. Given the forecast that the disadvantage gap might increase by 0.022 standard deviations per month of closures, our findings on the disadvantage gap are not unexpected given the uncertainties in these measures.

Year 2 attainment in reading and mathematics for autumn 2020 – diagnostic analysis

The study recognises that, in addition to measuring the gaps in attainment, information required to help close those gaps should also be considered. Diagnostic analysis was carried out to support teachers in their planning by identifying the strengths and weaknesses of the cohort across different domains. The focus was on comparing performance with what had been seen when the assessments were standardised, assuming that one reason for any observed difference was likely to be the school closures experienced by most pupils. This information was provided digitally as a series of practical leaflets in response to the autumn and spring data collections.

This diagnostic analysis looked at patterns in children's responses to identify common strategies, underlying misconceptions or errors. This was done through the coding of responses to individual questions to categorise the type of answers given. Researchers then analysed this data, alongside assessment-level information and the results from the standardisation in 2017, to build a more detailed picture of children's performance. It is important to note that this analysis is descriptive and has not been tested for statistical significance. This is because the analysis was done for the purpose of being a formative tool for teachers and schools and, as such, aspects of performance are deliberately not quantified and are talked about as trends and patterns. A limitation of this is that it is not possible to compare the extent of the difference between individual findings. Also, while it is interesting to speculate on the possible reasons behind the patterns observed, no relevant contextual data was collected on this, and it is outside the scope of the diagnostic analysis.

The NFER reading and mathematics assessments carried out in autumn 2020 captured Year 2 children's performance across the programmes of study, through a variety of question types, such as multiple choice, matching and those which required written responses. For reading in Year 2, the primary areas of the curriculum assessed are inferring from a text, retrieving information and understanding vocabulary. For mathematics in Year 2, these are number, calculation, measures and statistics.

Interestingly, across both reading and mathematics, although Year 2 children in autumn 2020 performed less well than their peers in 2017, diagnostic analysis revealed that the curriculum areas they struggled with were broadly the same. Children from disadvantaged backgrounds found all curriculum areas harder than their non-disadvantaged peers in 2020. The sections below present the diagnostic information about the curriculum areas for both reading and mathematics.

Reading

Inference

Children in both 2017 and 2020 found inference questions the hardest of the three areas. However, those in 2020 found them more difficult. Children in 2020 were more likely to miss out inference questions in comparison to retrieval and vocabulary questions, and this level of omission was higher than children in 2017. Therefore, it is perhaps unsurprising that further diagnostic analysis identified patterns relating to how children struggled to infer information from the texts in the assessments. These related to particular difficulties with inferring events and emotions and understanding characters' motivation.

In 2020, some children gave generic answers to inference questions which were not specific enough to be credited. More specific answers were generally those which had used the information in the text to infer other pieces of information.

This difficulty was related to their performance on questions where children had to identify a character's emotion or understand their motivation. For questions which required children to identify a character's emotion, diagnostic coding identified where children gave a correct simple emotion, such as happy or sad, or a correct developed emotion, such as

lonely or relieved. Whilst both types of responses, simple and developed, were awarded a mark, analysis of children's performance across the whole assessment showed that those children who gave developed emotion words were more likely to perform better on the assessment. There could be a range of reasons why children may struggle in these areas, such as their inference skills, emotion vocabulary or emotional literacy.

Vocabulary

Children in 2020 and 2017 found vocabulary questions easier than inference but harder than retrieval. Whilst the other two curriculum areas showed a drop in performance, vocabulary was an area of the curriculum which seemed to be less affected by school closures. Unlike the other curriculum areas, which showed drops in performance from 2017 to 2020, on vocabulary questions children in 2020 performed almost as well as their peers in 2017.

Whilst this was the case, it was girls who showed a trend towards improvement from 2017 to 2020 which kept overall performance broadly in line with the standardisation sample, whilst boys performed less well than the standardised sample. Children in 2020 were also no more likely to miss out these types of questions than those children in 2017.

Children from disadvantaged backgrounds performed less well than their non-disadvantaged peers in this curriculum area, as they did across all curriculum areas. Whilst they also found inference the hardest curriculum area assessed, they found vocabulary questions easier than retrieval – unlike their non-disadvantaged peers.

Retrieval

Questions focusing on retrieval were those which children in 2020 and 2017 found the easiest. However, children in 2020 still found this area more difficult than their peers in 2017, suggesting it is a skill which may have been affected by school closures. Children in 2020 were also more likely to miss out these questions than the standardisation sample. In 2020, children from disadvantaged backgrounds found these questions comparatively hard, and were also more likely to miss out these types of questions than their non-disadvantaged peers. Again, further diagnostic analysis identified patterns related to how children retrieve information from non-fiction and fiction texts; including children's understanding of non-fiction texts, difficulties organising and utilising key information, and sequencing narratives.

A common error identified was where children incorrectly answered retrieval questions with other prominent information in the text. This suggests children are able to pick out the key information but struggle to organise or utilise it to answer specific questions. Whilst these types of responses were usually associated with children who scored lower on the assessment, this also affected children who performed better on the assessment, suggesting that this may be something with which children of all abilities struggle. Interestingly, this may suggest that children may be able to identify key information but struggle to apply it to specific questions.

In 2020, another common area of difficulty was understanding a narrative sequence within fiction texts. This encompasses a range of reading skills and is not just illustrated by children's difficulty with retrieving key events and information from a plot line. Some children misunderstood when events occurred, with their knowledge of what happened later in the story confusing how they recalled information from the beginning of the text. Children who demonstrated this type of misunderstanding tended to perform less well on the assessment overall.

Mathematics

Number

Number was an area of the curriculum in which children in 2020 performed as well as, or better than, their peers in 2017. Children in 2020 showed a secure understanding of sequences, basic number work and counting forwards and backwards in steps. However, children in 2020 found it more difficult to count in steps of 3, which is an area introduced by the Year 2 curriculum. With most areas of number, including number recognition and placing a number on a number line, there was no drop in performance since standardisation, suggesting this may be an area less affected by school closures. In 2020, children found it more difficult to recognise odd and even numbers.

Calculation

Addition and subtraction

Addition was an area of the curriculum where children in 2020 performed better than children in 2017. This may be because whilst children in 2020 were more likely to be successful when given a visual aid to add, the most common

strategy shown was that of using marks to support counting. Children in 2020 were confident adding two two-digit numbers and could apply this to word problems. However, common errors seen when bridging through ten was required, suggested that they may struggle with calculating through ten barriers. In 2020, more children also missed out these types of questions which may indicate a lack of confidence in this area.

As with addition, subtraction was an area of the curriculum where children in 2020 performed as well as or better than the standardisation sample. In 2020, children were more likely to use written working for subtraction questions in comparison to other calculations, and this was usually a successful counting strategy. Both cohorts found it very difficult to place missing signs into a subtraction sum and had a tendency to ignore the order of the numbers. This was also seen in children's responses to a subtraction word problem where the numbers appeared in the opposite order to how they should be calculated. The concept of subtraction not being commutative is new to Year 2, and therefore may not yet have been covered.

Multiplication and division

Unlike addition and subtraction, children in 2020 found it more difficult to answer multiplication and division questions compared to 2017. However, with division questions, children were equally successful when presented with a calculation, word problem or matching exercise, suggesting that those children who are able to divide are confident in their conceptual understanding. In 2020, a common error identified across both multiplication and division calculations were using an incorrect operation, for multiplication this was adding and for division this was adding or subtracting.

Fractions

Fractions was an area of the curriculum which children in 2020 found more challenging than their peers in 2017. In 2020, many children struggled with all aspects of fractions including identifying fractions of collections and shaded shapes, often confusing halves and quarters. As the school closures interrupted the education of these children when they were in Year 1, when fractions are introduced, it is likely that foundational teaching of fractions was also disrupted. Children in 2020 particularly struggled with finding a quarter of a collection, which is also part of the Year 1 curriculum. A common error identified was where children were asked to give their response as a fraction but gave a number instead.

Measures

Both cohorts found working with money a difficult area of the curriculum, in particular recognising the same amount made by different coins and calculating the total cost of different objects.

Children in 2020 found telling the time to half past the hour on an analogue clock comparatively harder than their peers in 2017. This may suggest that this is an aspect of the curriculum which may have been more affected by the school closures. In 2020, a common error identified was that children confused the minute and hour hands and some children also demonstrated the misconception that the hour hand should be on the hour mark rather than past it.

Statistics

Children in both 2017 and 2020 demonstrated a good understanding of bar charts. However, children in 2020 found tally charts comparatively harder. In 2020, most children correctly interpreted that they needed to add two of the four categories with tally counts, yet incorrectly identified which two categories these were. This may suggest that children know how to calculate with tallies but struggled to interpret the chart and headings in order to answer the question correctly.

Chapter 4 – School closures January 2021 to March 2021

Summary

- Schools felt more prepared for the second period of school closures, including being able to provide IT devices to pupils who needed them.

- From teacher interviews, pupil engagement was mixed, with some reports of challenges stemming from emotional wellbeing. From the limited PPR sample, engagement with online and offline resources was generally rated as 'Medium' or 'High'.

- Teachers reported conducting more 'live' lessons during this period of school closures, and reported that this generally improved engagement and encouraged social interactions between pupils.

- Similarly, to the first period of school closures, parental engagement was reported to be mixed.

- Some pupils were receiving additional support in mathematics, reading and social skills, but this was limited.

On 6 January 2021, schools partially closed for a second time, until all primary schools reopened on 8 March 2021. Several instruments yield data on this period of home learning, as described in the Methods section.

Attendance

The PPR (responses relating to around 16–17% of the sample of pupils) indicated that 29.4% of Year 1 and 25.6% of Year 2 pupils were in school during this period of school closures.

Home learning, including changes between the first and second closures

Around half of teachers reported feeling better prepared for the second period of partial school closures in comparison to the first. One teacher explained 'we had more time to prepare for the second lockdown, so we had a lot more systems in place'. Around half of teachers reported increased engagement and success with home learning; however, the other half reported ongoing or further challenges with engagement.

Some teachers reported specific challenges with teaching younger children, such as needing practical resources or behaviour management issues, primarily because some young children struggled to view home as a place for learning. A few teachers reported that pupils' poor emotional wellbeing had a negative impact on learning.

The majority of teachers interviewed also reported particular difficulty with teaching writing through home learning activities, and this is supported by other evidence from the interviews and the diagnostic analysis documents which suggest writing is something which children have struggled with when they returned to school.

When asked about home learning during this period, the majority of teachers reported using online software such as Zoom or Microsoft Teams for 'live' learning. Teachers who were interviewed explained these methods imitated the experience of face-to-face learning, for example one teacher said, 'we thought that if they saw us as teachers it would encourage them more – which it did – we felt that there was much more engagement in the second lockdown'. Another teacher explained that the pupils felt that the '[…] teacher has looked at my work and that this teacher is there and is listening to me.' A few teachers also mentioned that this form of pupil contact benefited pupils' wellbeing, particularly those which encouraged social interaction between pupils. The PPR suggests that of teachers responding for Year 1 (n=37), 89.3% were providing online lessons for Year 1, and of those responding for Year 2 (n=37) 88.5% were providing these for Year 2. Levels of engagement with online lessons (of those pupils who received them) are shown in Table 27.

Table 27: Level of engagement with online lessons for Year 1 and Year 2 (n = 37 class teachers).

Level of engagement	Year 1	Year 2
Low	19.9%	18.6%
Medium	26.4%	26.4%
High	53.7%	54.9%

A few teachers reported increased face-to-face contact with pupils during this period, with more coming into school than in the first period of school closures. Some teachers provided pre-recorded lessons for pupils to watch at home. As in the first closures, some teachers used an online system or app for uploading resources and assessing work. Most teachers reported that more online resources from external providers were available for the second period of closures. From the PPR responses, levels of engagement with online resources (of pupils who received them) are shown in Table 28.

Table 28: Level of engagement with online resources for Year 1 and Year 2 (n = 37 class teachers).

Level of engagement	Year 1	Year 2
Low	23%	20.9%
Medium	29.7%	31.1%
High	47.3%	48%

From the PPR responses, levels of engagement with offline resources such as worksheets (of pupils who received them) are shown in Table 29.

Table 29: Level of engagement with offline resources for Year 1 and Year 2 (n = 37 class teachers).

Level of engagement	Year 1	Year 2
Low	22.5%	16.9%
Medium	33.3%	36%
High	44.2%	47.1%

IT access and workspace

The general feeling that schools were better prepared for the second period of school closures was echoed in the responses referencing support for IT access during this time. The majority of teachers interviewed stated that technology or internet access was able to be given out by schools to pupils who needed it, including as a result of government funding. Several schools also reported providing technical support to families. Nevertheless, issues persisted as some teachers reported technology access issues for families with multiple children at home, without enough devices for each child. Teachers reported trying to address this by having recorded lessons or videos that could be watched at any time, later due dates for work, or lending additional laptops.

The PPR responses from 16–17% of the total sample indicated that 83.4% of Year 1 pupils and 80.3% of Year 2 pupils had good IT access. Good IT access was defined as access to a reliable internet connection and use of a device other than a smartphone. Around a third of pupils for which PPR responses were gathered were reported to have a quiet workspace (Year 1: 32.9%, Year 2: 38.7%). Note that for 30.6% of Year 1 and 29.6% of Year 2 pupils, the teacher did not know.

Parental involvement

Some teachers also reported higher parental engagement with home learning during this period of closures, with reasons for this being that parents were more invested or more comfortable with the resources. However, as in the first closures, the picture of parental engagement was mixed. The reasons given for varying levels of parental support included parents' working patterns, the number of children at home and increased remote capabilities. As in the first period of school closures, just under half of the ten teachers interviewed reported active communication with parents.

Reading strategies

The spring pre-test PPR indicated that 23.8% of Year 1 pupils and 30.9% of Year 2 pupils were receiving additional reading support in this period. This was likely to be remote support, though may have been face-to-face for those pupils in school during this time. Specific catch-up strategies during this period of school closure were not mentioned frequently in the teacher interviews. However, one teacher reported that, in both lockdowns, children read online and had fortnightly book swaps. One teacher also reported that teaching assistants phoned children to hear them read. It is likely that catch-up strategies were limited due to the nature of remote learning and the requirement to cover core learning.

Mathematics strategies

The PPR indicated that 14.1% of Year 1 pupils and 16.3% of Year 2 pupils were receiving additional mathematics support in this period. This was likely to be remote support, though may have been face-to-face for those pupils in school during this time. As for reading strategies above, there were no significant mentions of specific catch-up strategies in the teacher interviews.

Wellbeing during the second closures

The PPR indicated that 13.5% of Year 1 pupils and 17% of Year 2 pupils were receiving additional social skills/wellbeing support in this period. This was likely to be remote support, though may have been face-to-face for those pupils in school during this time. Again, there was minimal mention of specific wellbeing support in the teacher interviews.

Overall, the data gathered on the second set of school closures is somewhat limited by the small number of interview respondents and low response rate for the PPR. However, from this available data it appears that online and live lessons were much more common than in the first closures, and that schools generally felt more prepared. Among the respondents to the PPR, engagement with remote learning was generally high. Some pupils were receiving additional support during the closures.

Chapter 5 – Spring 2021 assessment

Summary

Attainment data – Year 1

- The overall performance of pupils in reading in spring 2021 was significantly lower than the standardisation sample in 2019, representing a Covid-19 gap of around three months' progress.

- The overall performance of pupils in mathematics in spring 2021 was significantly lower than the standardisation sample in 2019, representing a Covid-19 gap of around three months' progress.

- On both the reading and mathematics assessments in spring 2021, the proportion of pupils who scored below the lowest standardised score was higher than the standardisation sample in 2019.

- The disadvantage gap for both reading and mathematics was around seven months' progress.

Diagnostic analysis – Year 1

- Across both subjects, although children performed less well than their peers in 2019, the areas they struggled with were broadly similar.

- Children from disadvantaged backgrounds found all assessed areas harder, in both subjects, than their non-disadvantaged peers in spring 2021.

Attainment data – Year 2

- The overall performance of pupils in reading in spring 2021 was significantly lower than the standardisation sample in 2019, representing a Covid-19 gap of around three months' progress.

- The overall performance of pupils in mathematics in spring 2021 was significantly lower than the standardisation sample in 2019, representing a Covid-19 gap of around two months' progress.

- On both the reading and mathematics assessments in spring 2021, the proportion of pupils who scored below the lowest standardised score was higher than the standardisation sample in 2019.

- The disadvantage gap was around seven months' progress for reading and eight months' progress for mathematics, representing a widening as compared to Key Stage 1 in 2019.

Diagnostic analysis – Year 2

- Across both subjects, although children performed less well than their peers in 2019, the curriculum areas they struggled with were broadly similar.

- Children from disadvantaged backgrounds found all curriculum areas harder, in both subjects, than their non-disadvantaged peers in spring 2021.

The test window for schools for the spring assessments was open between 8 and 31 March 2021. Schools were asked to administer the assessments to all Year 1 and Year 2 pupils and, where possible within the testing window, to give absent pupils a further opportunity to complete their assessments. Schools were provided with spring Year 1 and spring Year 2 assessment papers from the NFER Key Stage 1 suite of assessments. All assessments were marked by NFER. Coded marking, which also identifies the type of response rather than simply whether it was correct, was used in order to be able to provide diagnostic information to schools.

In both Year 1 and Year 2, mathematics assessments consisted of two papers, one in arithmetic and the other in reasoning. Both papers are suitable for all pupils and should be taken by all. Pupils needed to sit both papers in order

to be included within the study. The total number of Year 1 pupils included in the mathematics analysis was 5,101 from 148 schools. The total number of Year 2 pupils included in the mathematics analysis was 5,349 from 152 schools.

In both Year 1 and Year 2, reading assessments also consisted of two papers. Following the model of Key Stage 1 national tests, both papers are intended for all pupils. However, as it is slightly higher in difficulty, it is expected that paper 2 may be unsuitable for some pupils and the NFER teacher guide advises that it is not suitable to administer this paper in such cases. The majority of pupils sat both papers; however, a small number of pupils who sat only paper 1 were also included in the study. Two schools did not administer paper 2 to any of their Year 1 pupils for logistical, rather than accessibility, reasons and these were not included in the results. The total number of Year 1 pupils included in the reading analysis was 5,303 from 150 schools. The total number of Year 2 pupils included in the reading analysis was 5,408 from 155 schools.

Pupils' raw scores from the spring 2021 assessments were converted into standardised scores using the NFER conversion table,[27] which was created during the 2019 standardisation. This enables their performance to be compared to the standardisation sample.

Year 1 attainment in reading and mathematics – Covid-19 gap

Table 30: Summary of results for Year 1 in spring 2021.

Measure	Reading		Mathematics	
	Standardisation sample 2019	Spring term 2021	Standardisation sample 2019	Spring term 2021
Mean	99.79	96.36	99.53	96.68
95% confidence interval	99.28–100.31	95.93–96.78	98.95–100.11	96.28–97.08
Standard deviation	14.60	15.80	14.61	14.53
N pupils[28]	3126	5303	2445	5101

Reading

The overall performance of Year 1 pupils in reading in spring 2021 was significantly lower than the standardisation sample. The mean standardised score across the spring 2021 sample was 96.36, compared to 99.79 at standardisation. This equates to an effect size of −0.24[29] or around −3 months' progress using EEF's conversion table in the Early Years Toolkit.[30]

The standard deviation of the study sample is slightly larger, at 15.80, 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 25 shows a smaller proportion of pupils scoring above 115 and a larger proportion scoring below 85. This can also be seen in Figure 26 which shows the cumulative percentage of reading standardised scores distribution in both

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[27] This table is provided to schools using NFER assessments.
[28] The mathematics and reading spring 2021 samples were weighted by Key Stage 2 performance. Following the exclusion of independent schools from the 2019 standardisation samples, only the reading sample required weighting by Key Stage 2 performance.
[29] Covid-19 gap effect sizes were calculated by dividing the difference in standardised score points between the samples by the standard deviation of the standardisation sample.
[30] https://educationendowmentfoundation.org.uk/education-evidence/using-the-toolkits

spring 2021 and the standardisation sample. It shows that overall, many more pupils in our sample scored towards the lower end of the possible standardised scores.

Figure 25:   Distributions of reading standardised scores for standardisation sample and spring 2021 sample of Year 1 pupils.

Figure 26:   Distribution of cumulative reading standardised scores for standardisation sample and spring 2021 sample of Year 1 pupils.
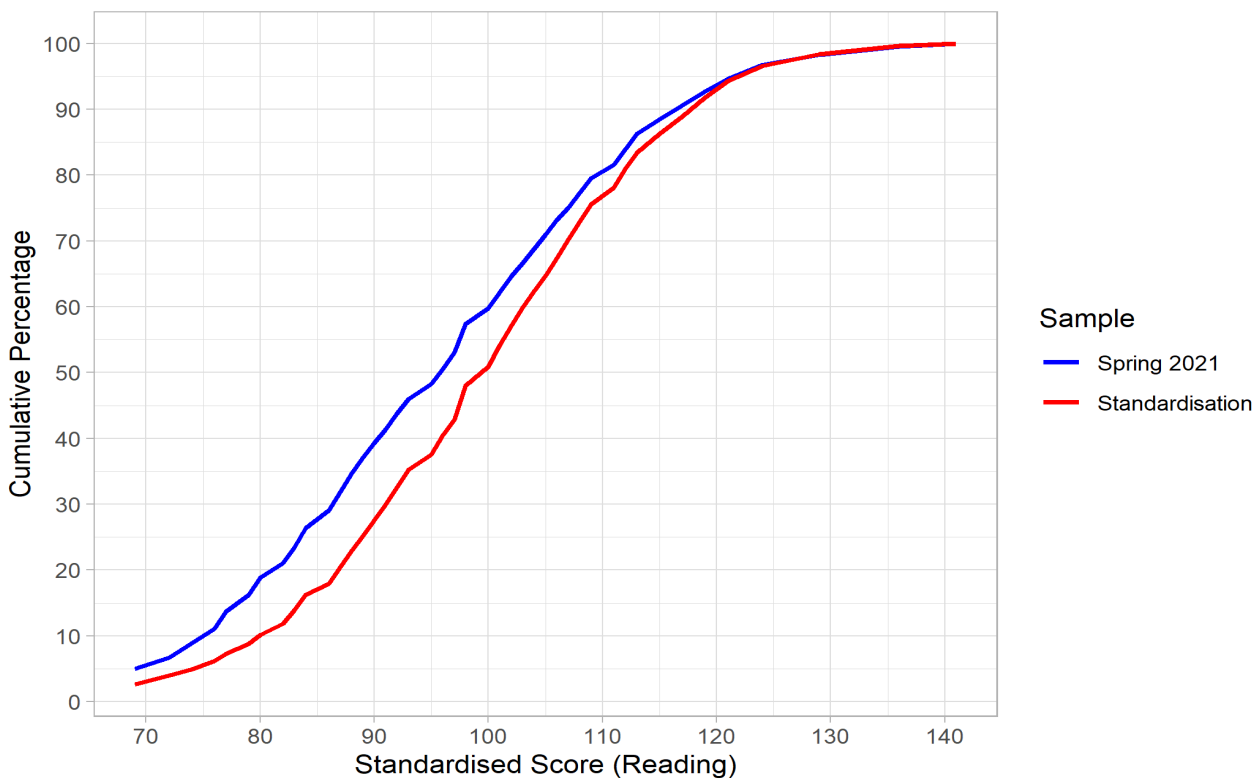
It is noteworthy that a higher than expected proportion of pupils (267 or 5.0%) scored fewer than five marks on the reading assessment resulting in a standardised score of 69. This indicated that a large number of pupils were unable to engage effectively with the assessments. In the standardisation sample, the percentage of pupils being awarded this score was 2.6%.

In Figure 27, the blue line represents the expected mean if the sample performed exactly as the standardisation sample, and the red dotted line represents the observed mean for the sample in spring 2021. The distribution shows a positive skew, i.e., more lower scores and fewer higher scores than expected, compared to the 2019 standardisation sample.

Figure 27:   Distribution of reading standardised scores for the spring 2021 sample of Year 1 pupils.
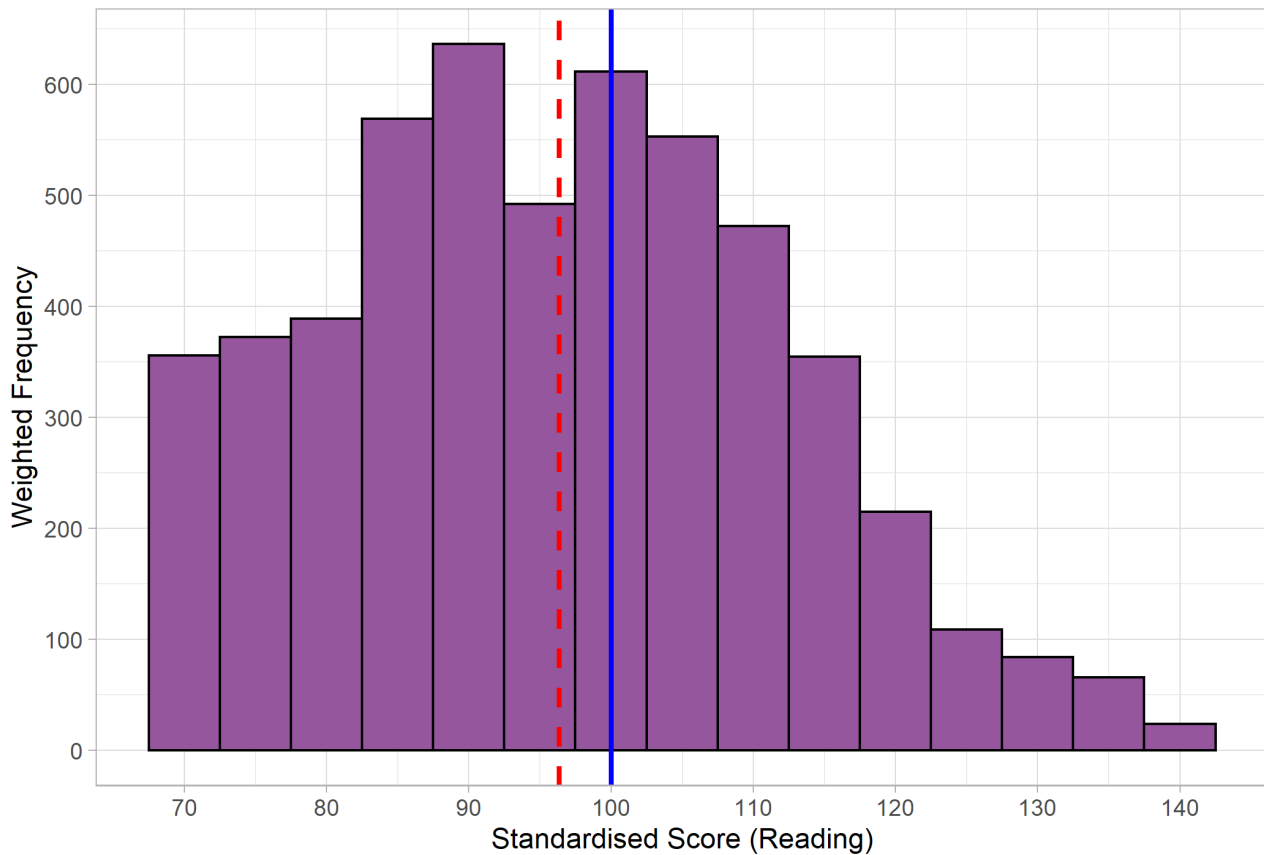
Mathematics

The overall performance of pupils in mathematics in spring 2021 was also significantly lower than the standardisation sample. The mean standardised score across the spring 2021 sample was 96.68 compared to 99.53 at standardisation. This equates to an effect size of −0.19 or around −3 months' progress.

The standard deviation of the study sample is smaller at 14.53 than that of the standardisation sample indicating a narrower spread of scores.

Figure 28 shows a smaller proportion of pupils scoring above 115 and a higher proportion scoring below 85. This can also be seen in Figure 29 which shows the cumulative percentage of mathematics standardised scores distribution in both spring 2021 and the standardisation sample. It shows that overall more pupils in our sample scored towards the lower end of the possible standardised scores.

Figure 28:   Distributions of mathematics standardised scores for standardisation sample and spring 2021 sample of Year 1 pupils.
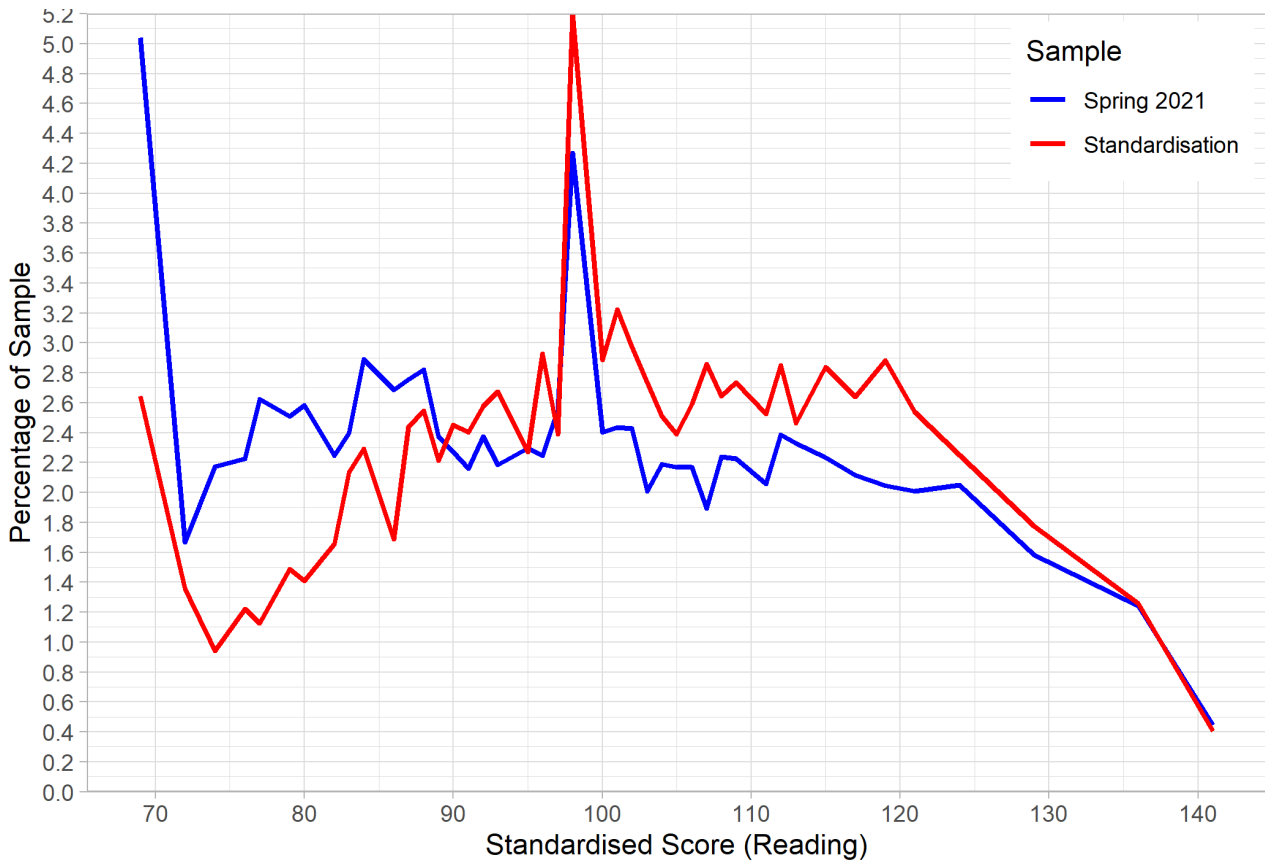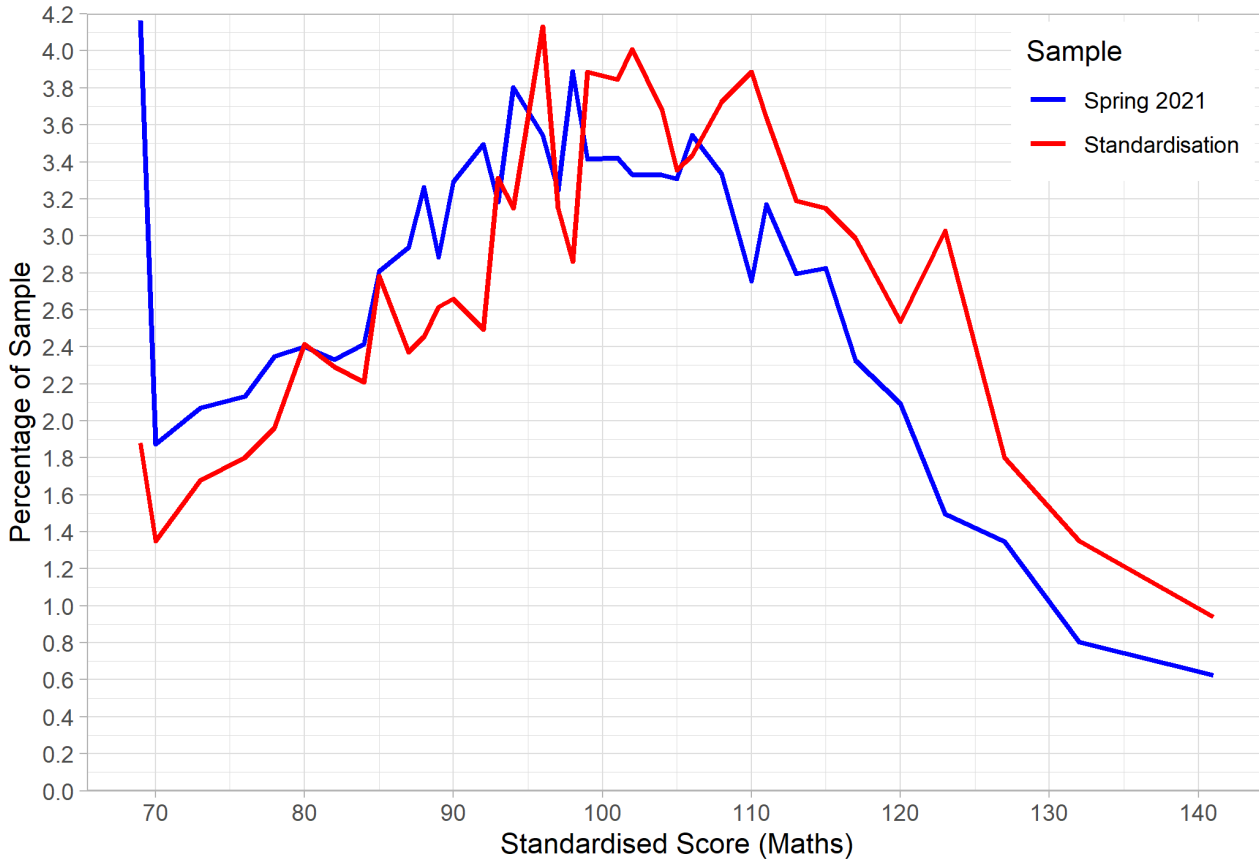

Figure 29:   Distribution of cumulative mathematics standardised scores for standardisation sample and spring 2021 sample of Year 1 pupils.
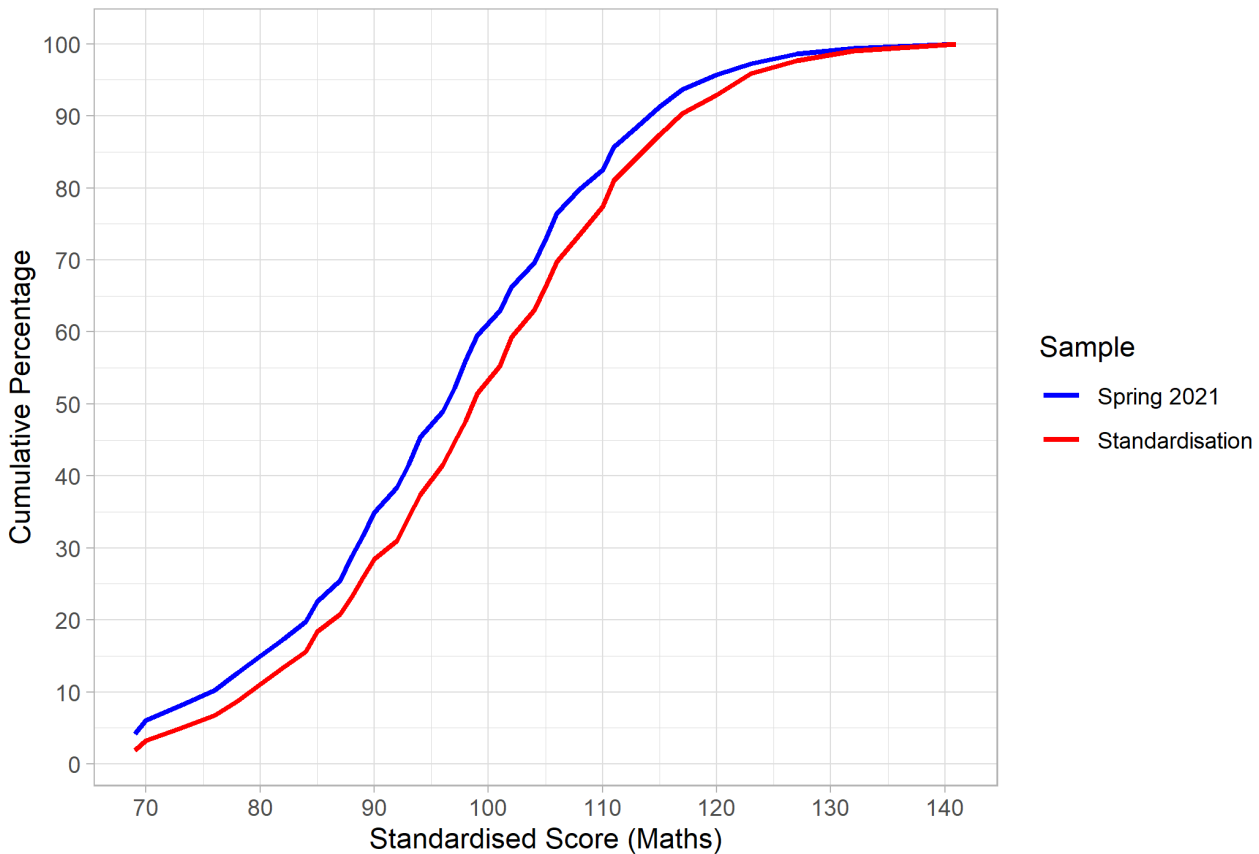
All pupils included in the analysis had shown evidence of having engaged with both mathematics papers since those pupils who sat only one paper have been excluded.

As in the reading assessment, a higher than expected proportion of pupils (212 or 4.2%), scored fewer than five marks on the mathematics assessment, resulting in a standardised score of 69. A large number of pupils were therefore unable to engage effectively with the content of the assessments. In the standardisation sample, the percentage of pupils being awarded this score was lower, at 1.9%.

In Figure 30 the blue line represents the expected mean if the sample performed exactly as the standardisation sample and the red dotted line represents the observed mean for the sample in spring 2021. The distribution shows a positive skew, i.e., more lower scores and fewer higher scores than expected, compared to the 2019 standardisation sample.

Figure 30:   Distribution of mathematics standardised scores for the spring 2021 sample of Year 1 pupils.
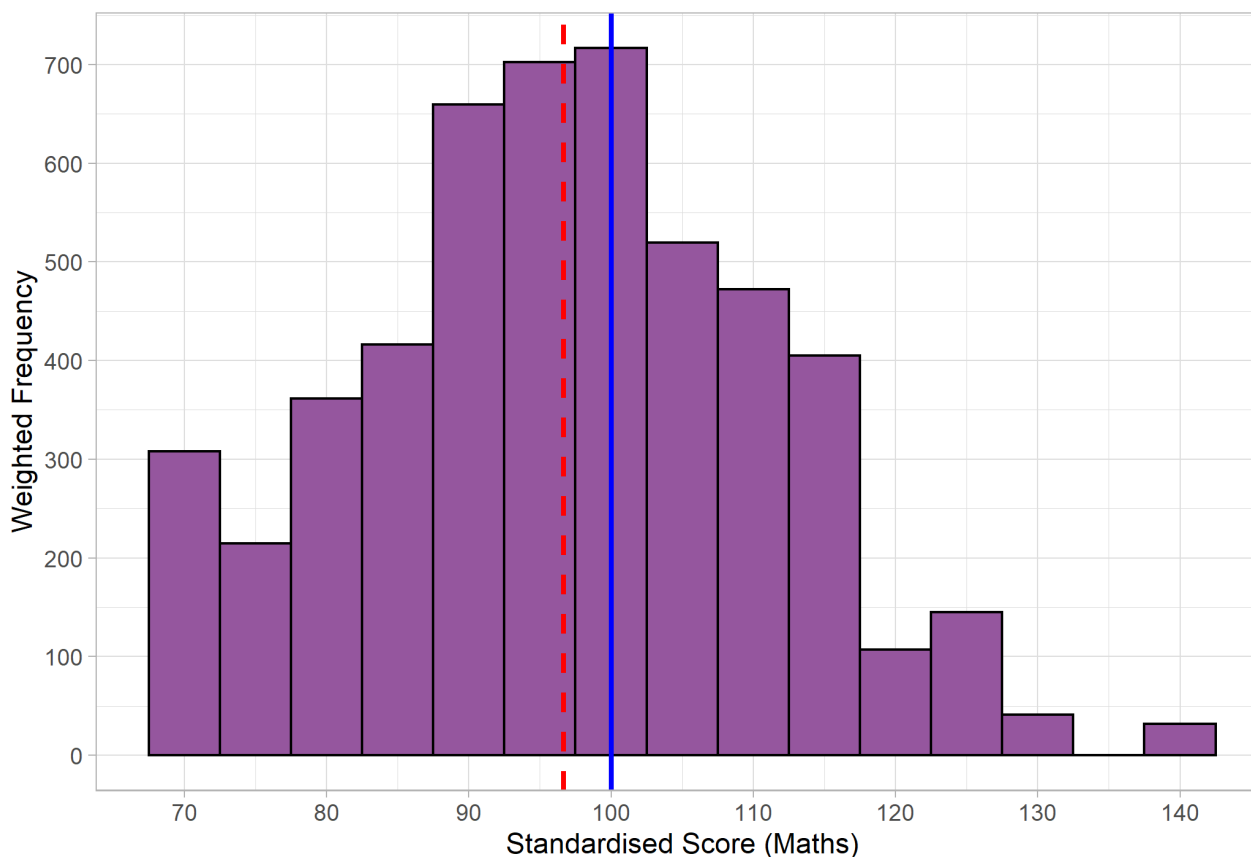
Year 1 attainment in reading and mathematics – disadvantage gap

Within the spring 2021 sample, approximately 18% of the pupils in Year 1 were classed as disadvantaged in spring 2021 (i.e., eligible for FSM as reported by schools). For a small number of pupils[31] (i.e., 60 pupils in reading which corresponds to 1.1% of the sample, and 15 pupils in maths which corresponds to 0.3% 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.

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[31] The number of pupils were weighted by Key Stage 2 performance.

Reading

Table 31 shows a summary of the performance of disadvantaged pupils compared to those pupils who are not disadvantaged (i.e., eligibility for FSM as reported by schools).

Table 31: Performance of Year 1 disadvantaged pupils in reading for spring 2021.

Measure	Standardisation sample 2019	Spring 2021 all pupils	Spring 2021 FSM	Spring 2021 Non-FSM
Mean	99.79	96.36	89.02	97.99
95% confidence interval	99.28–100.31	95.93–96.78	88.13–89.90	97.52–98.46
Standard deviation	14.60	15.80	13.82	15.74
N pupils[32]	3126	5303	934	4309

The difference between the mean standardised scores of disadvantaged pupils and non-disadvantaged pupils is large, at 8.97 standardised score points. The effect size for this data is 0.57[33] which, using EEF's table,[34] equates to seven months of learning.

Mathematics

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

Table 32: Performance of Year 1 disadvantaged pupils in mathematics for spring 2021.

Measure	Standardisation sample 2019	Spring 2021 all pupils	Spring 2021 FSM	Spring 2021 Non-FSM
Mean	99.53	96.68	90.17	98.07
95% confidence interval	98.95–100.11	96.28–97.08	89.28–91.06	97.64–98.51
Standard deviation	14.61	14.53	13.61	14.36
N pupils[35]	2445	5101	897	4189

The difference between the mean standardised scores of disadvantaged pupils and non-disadvantaged pupils is large, at 7.90 standardised score points. The effect size for this data is 0.54 which, using EEF's table, equates to seven months of learning.

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[32] All samples were weighted by Key Stage 2 performance.
[33] Disadvantage gap effect sizes were calculated by dividing the standardised score point difference between FSM and non-FSM pupils by the overall spring 2021 standard deviation.
[34] https://educationendowmentfoundation.org.uk/evidence-summaries/about-the-toolkits/attainment/
[35] All samples, besides the 2019 standardisation samples, were weighted by Key Stage 2 performance.

Year 2 attainment in reading and mathematics – Covid-19 gap

Table 33: Summary of results for Year 2 in spring 2021.

Measure	Reading		Mathematics	
	Standardisation sample 2019	Spring term 2021	Standardisation sample 2019	Spring term 2021
Mean	100.02	96.78	99.48	97.59
95% confidence interval	99.38–100.66	96.35–97.20	98.84–100.13	97.18–98.00
Standard deviation	14.69	15.81	14.48	15.22
N pupils[36]	2019	5408	1911	5349

Reading

The overall performance of Year 2 pupils in reading in spring 2021 was significantly lower than the standardisation sample. The mean standardised score across the spring 2021 sample was 96.78 compared to 100.02 at standardisation. This equates to an effect size of −0.22, or around −3 months' progress using EEF's conversion table in their Early Year Toolkit.[37]

The standard deviation of the study sample is slightly larger at 15.81 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 31: Distributions of reading standardised scores for standardisation sample and spring 2021 sample of Year 2 pupils.


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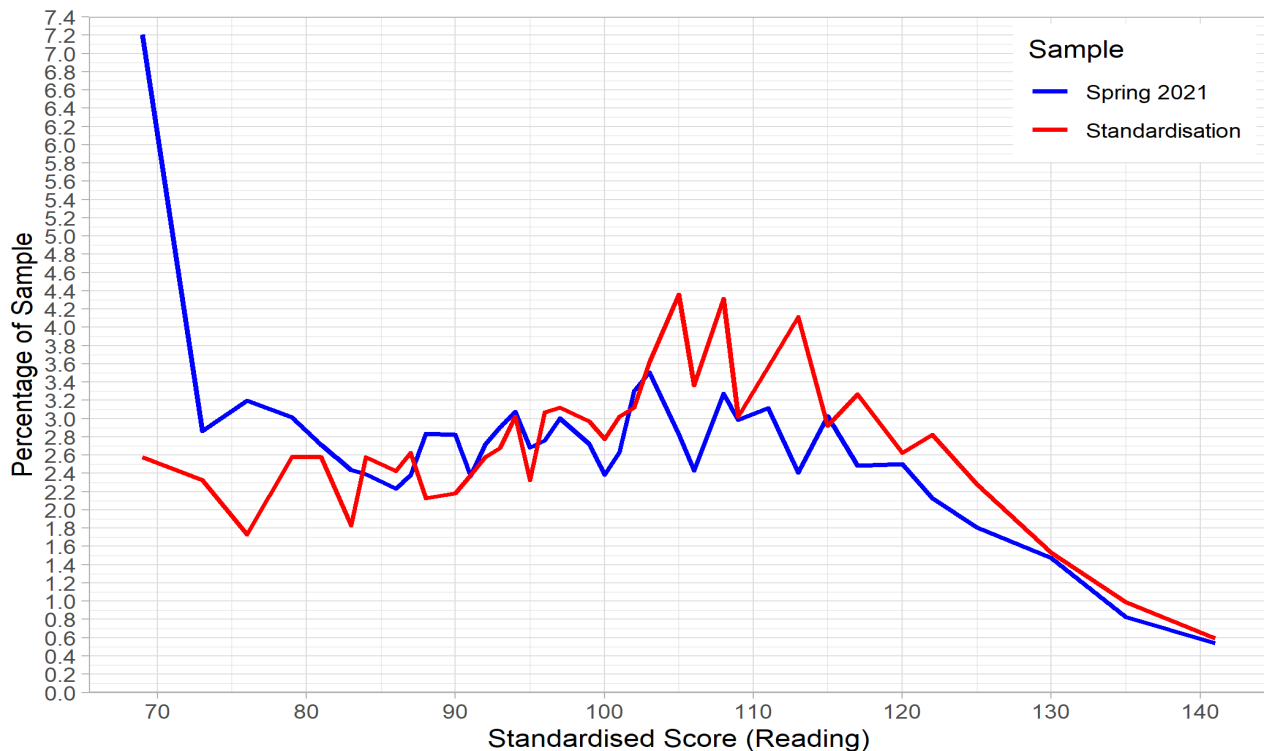
[36] All samples, besides the 2019 mathematics standardisation sample, were weighted by Key Stage 2 performance.
[37] https://educationendowmentfoundation.org.uk/education-evidence/early-years-toolkit

Figure 31 shows that, although a smaller proportion of pupils scored above 115, a much larger proportion of pupils scored below 85. This can also be seen in Figure 32, which shows the cumulative percentage of reading standardised scores distribution in both autumn 2020 and the standardisation sample. It shows that, overall, many more pupils in our sample scored towards the lower end of the possible standardised scores.

Figure 32: Distribution of cumulative reading standardised scores for standardisation sample and spring 2021 sample of Year 2 pupils
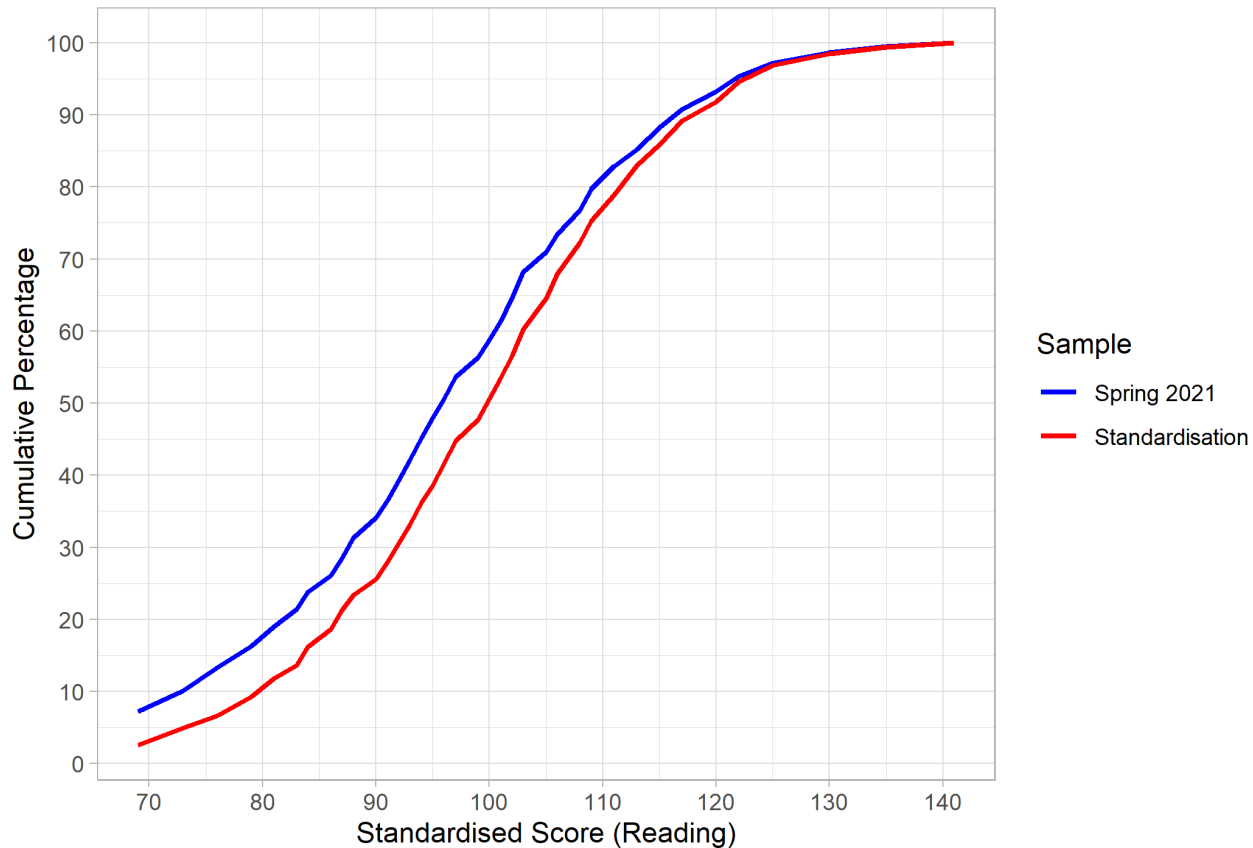
It is noteworthy that a higher proportion of pupils (390 or 7.2%) than the standardisation sample scored fewer than four marks on the reading assessment resulting in a standardised score of 69. This indicated that a large number of pupils were unable to engage effectively with the assessments. In the standardisation sample, the percentage of pupils being awarded this score was 2.6%. The attainment gap for reading is still being driven by a reduction in the attainment levels of children at the earliest stages of learning to read.

In Figure 33 the blue line represents the expected mean if the sample performed exactly as the standardisation sample, and the red dotted line represents the observed mean for the sample in spring 2021. The distribution shows a positive skew, i.e., more lower scores and fewer higher scores than expected, compared to the 2019 standardisation sample.

Figure 33: Distribution of reading standardised scores for the spring 2021 sample of Year 2 pupils.
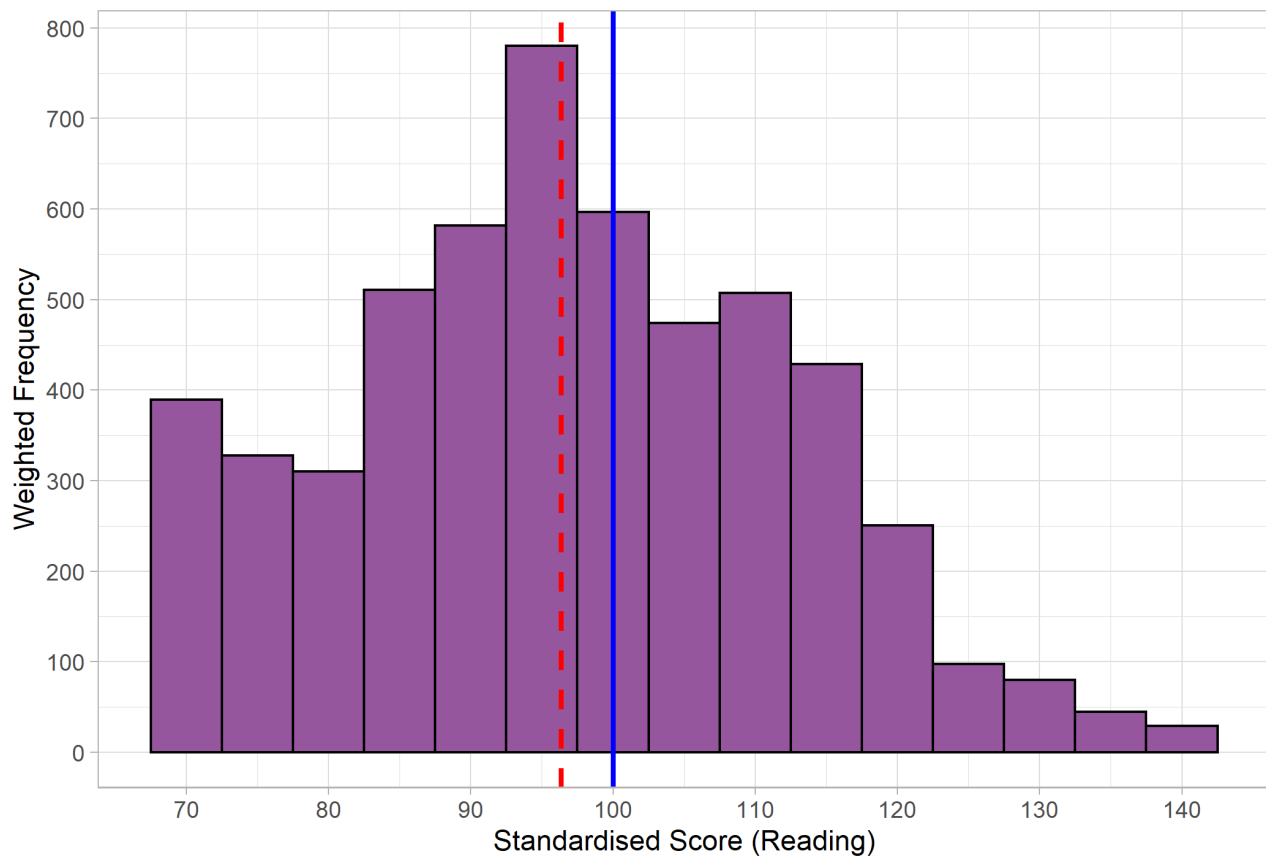
Mathematics

The overall performance of pupils in mathematics in spring 2021 was also significantly lower than the standardisation sample. The mean standardised score across the spring 2021 sample was 97.59 compared to 99.48 at standardisation. This equates to an effect size of −0.13, or around −2 months' progress.

The standard deviation of the study sample is larger at 15.22 than that of the standardisation sample indicating a broader range of scores.

Figure 34 shows a smaller proportion of pupils scoring above 115. However, the proportion of the spring 2021 sample scoring 130 or above is slightly higher. A higher proportion of pupils scored below 85. This can also be seen in Figure 35, which shows the cumulative percentage of reading standardised scores distribution in both spring 2021 and the standardisation sample. It shows that overall, more pupils in our sample scored towards the lower end of the possible standardised scores.

Figure 34: Distributions of mathematics standardised scores for standardisation sample and spring 2021 sample of Year 2 pupils.
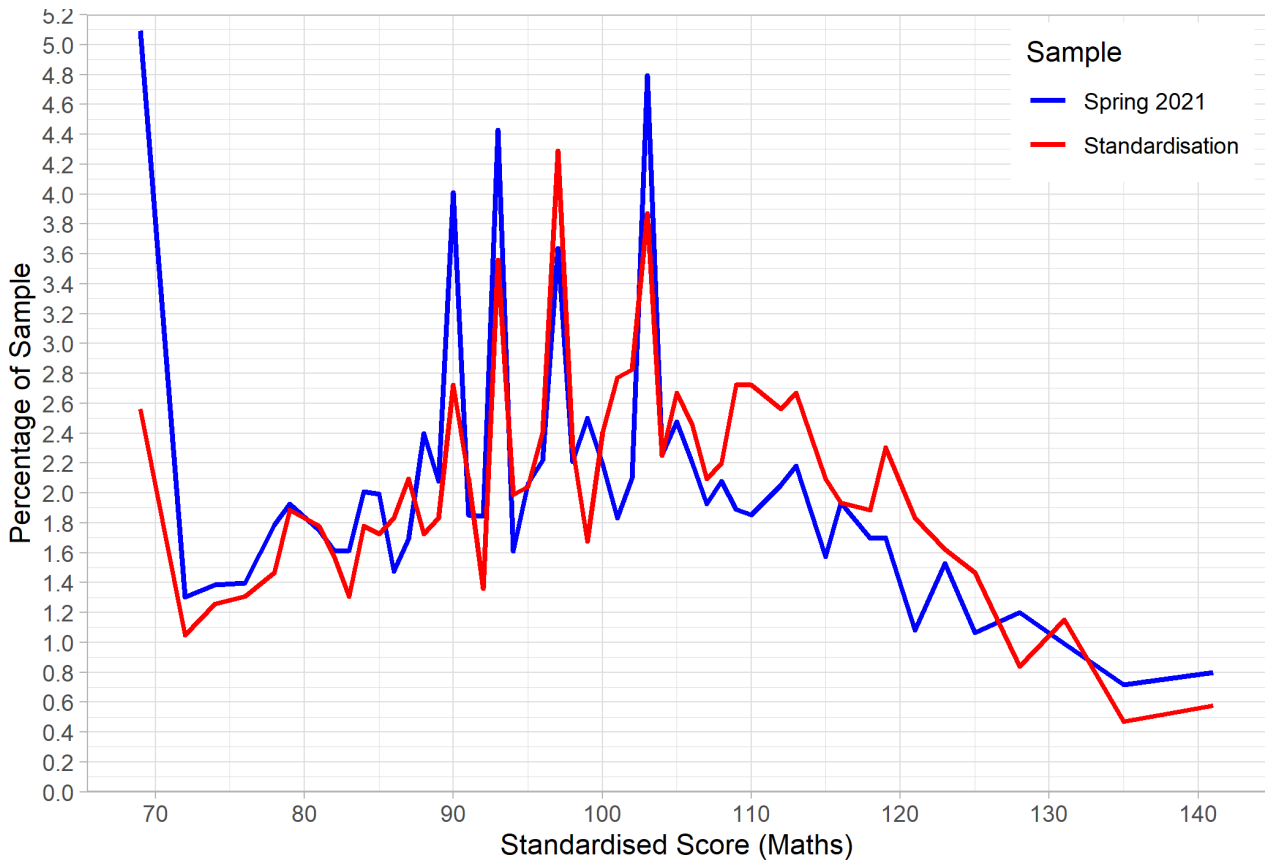
Figure 35: Distribution of cumulative mathematics standardised scores for standardisation sample and spring 2021 sample of Year 2 pupils.
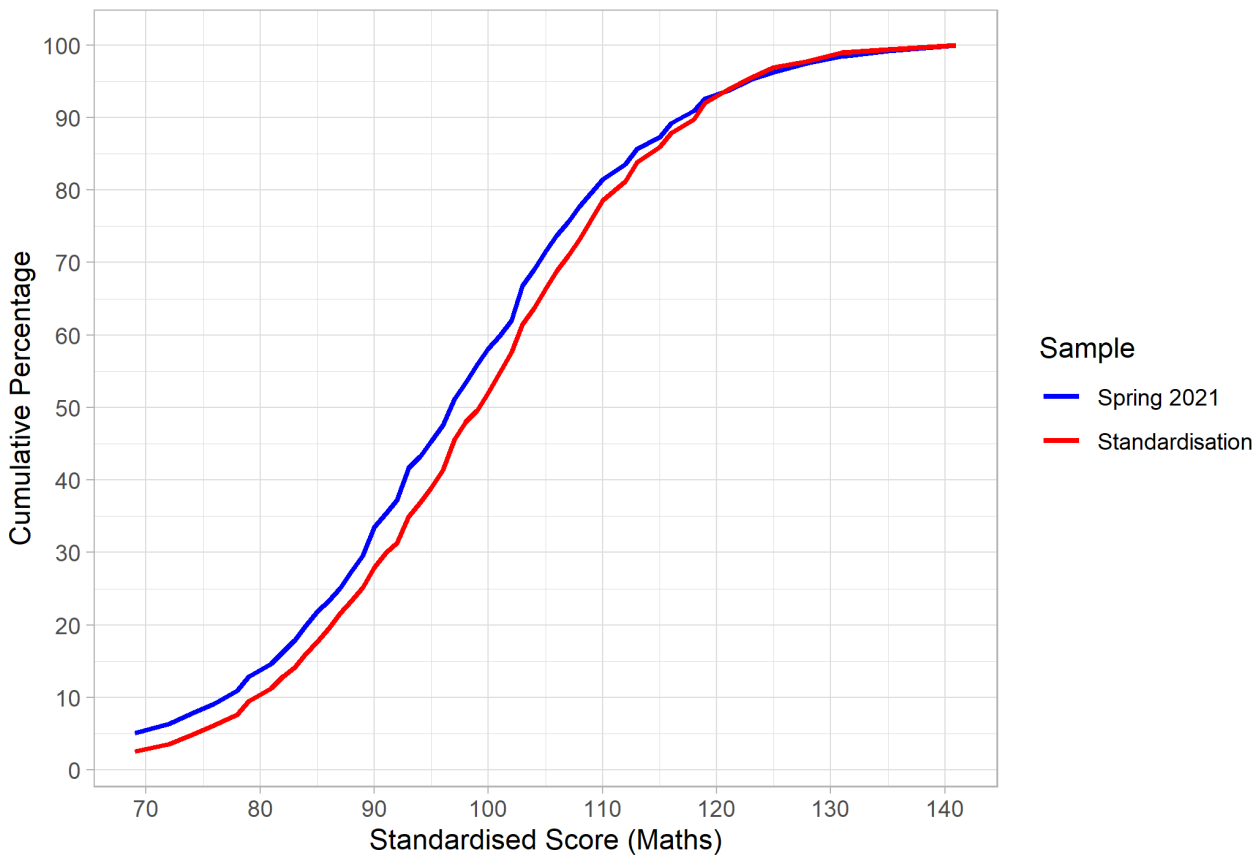
All pupils included in the study had shown evidence of having engaged with both mathematics papers, since those pupils who sat only one paper have been excluded.

As in the reading assessment, a higher proportion of pupils (272 or 5.1%) than in the standardisation sample scored fewer than seven marks on the mathematics assessment resulting in a standardised score of 69. A large number of pupils were therefore unable to engage effectively with the content of the assessments. In the standardisation sample, the percentage of pupils being awarded this score was lower, at 2.6%.The attainment gap in mathematics is now being driven by a reduction in the attainment levels of lower attaining pupils, which is a change from what was observed in the autumn term.

Figure 36: Distribution of mathematics standardised scores for the spring 2021 sample of Year 2 pupils.
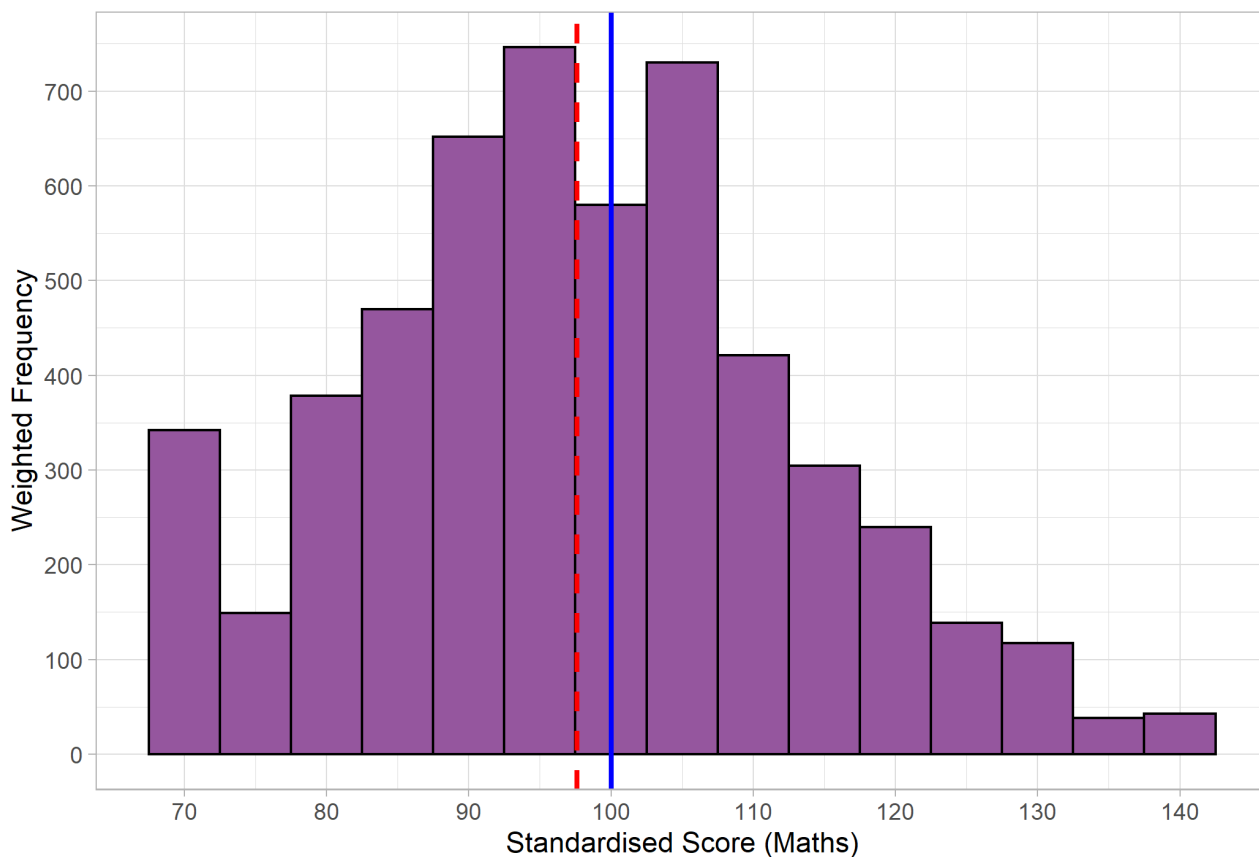
In Figure 36 the blue line represents the expected mean if the sample performed exactly as the standardisation sample and the red dotted line represents the observed mean for the sample in spring 2021. The distribution shows a positive skew, i.e., more lower scores and fewer higher scores than expected, compared to the 2019 standardisation sample.

Year 2 attainment in reading and mathematics – disadvantage gap

Within the spring 2021 sample, approximately 18% of the pupils in Year 2 were classed as disadvantaged in spring 2021 (i.e., eligible for FSM as reported by schools).

Reading

Table 34 shows a summary of the performance of disadvantaged pupils compared to those pupils who are not disadvantaged (i.e., eligibility for FSM as reported by schools).

Table 34: Performance of Year 2 disadvantaged pupils in reading for spring 2021.

Measure	Standardisation sample 2019	Spring 2021 all pupils	Spring 2021 FSM	Spring 2021 non-FSM
Mean	100.02	96.78	89.07	98.44
95% confidence interval	99.38–100.66	96.35–97.20	88.16–89.98	97.98–98.90
Standard deviation	14.69	15.81	14.51	15.54
N pupils[38]	2019	5408	970	4403

The difference between the mean standardised scores of disadvantaged pupils and non-disadvantaged pupils is large, at 9.37 standardised score points. The effect size for this data is 0.59 which, using EEF's table, equates to seven months of learning.

To put this in context, without school closures, we would have expected the disadvantage gap to be six months. This means that the disadvantage gap, now with an effect size of 0.59, or seven months' progress, has widened from what might be predicted without school closures. Given the forecast that the disadvantage gap might increase by 0.022 standard deviations per month of closures, our findings on the disadvantage gap are not unexpected given the uncertainties in these measures.

Mathematics

Table 35 shows a summary of the performance of disadvantaged pupils compared to those pupils who are not disadvantaged (i.e., eligibility for FSM as reported by schools).

Table 35: Performance of Year 2 disadvantaged pupils in mathematics for spring 2021.

Measure	Standardisation sample 2019	Spring 2021 all pupils	Spring 2021 FSM	Spring 2021 non-FSM
Mean	99.48	97.59	89.61	99.38
95% confidence Interval	98.84–100.13	97.18–98.00	88.75–90.48	98.93–99.82
Standard deviation	14.48	15.22	13.84	14.93
N pupils[39]	1911	5349	976	4367

The difference between the mean standardised scores of disadvantaged pupils and non-disadvantaged pupils is large, at 9.77 standardised score points. The effect size for this data is 0.64 which, using EEF's table, equates to eight months of learning.

To put this in context, without school closures we would have expected the disadvantage gap to be six months. This means that the disadvantage gap, now with an effect size of 0.64 or eight months' progress, has widened from what might be predicted without school closures. Given the forecast that the disadvantage gap might increase by 0.022 standard deviations per month of closures, our findings on the disadvantage gap are not unexpected given the uncertainties in these measures.

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[38] All samples, besides the 2019 standardisation sample, were weighted by Key Stage 2 performance.
[39] All samples, besides the 2019 standardisation sample, were weighted by Key Stage 2 performance.

Year 1 and 2 attainment in reading and mathematics for spring 2021 – diagnostic analysis

Diagnostic analysis was carried out using the NFER reading and mathematics assessments completed in spring 2021 which captured Year 1 and Year 2 children's performance. More information about the methods and context of this analysis can be found in Chapter 3 (**diagnostics link**).

Year 1 attainment in reading and mathematics for spring 2021 – diagnostic analysis

The NFER Year 1 spring reading assessments are designed differently to the rest of the NFER assessment range. This is to ensure they are accessible and capable of delineating specific aspects of performance for children at the earliest stages of learning to read. Subsequently, although they do assess the same three curriculum areas as Year 2 – inference, retrieval and vocabulary – they are best understood as three progressive sections across both paper 1 and paper 2:

- aural comprehension, the first section of paper 1, where the story and questions are read to the child, assessing their comprehension skills in isolation with no demand on their decoding skills;

- sentence comprehension, the second section of paper 1, which assesses children's ability to read a sentence and match it to a picture or complete a gap in a sentence with a word or picture, assessing basic decoding and comprehension of sentences;

- text comprehension, the third section of paper 1, is a teacher-supported comprehension whereas paper 2 is an independent comprehension. These sections assess children's decoding and comprehension skills of longer texts with gradually decreasing support from both the format of the paper and the teacher.

The NFER Year 1 spring mathematics assessments capture children's performance on different topics within the mathematics curriculum, including number, calculation and measures. The arithmetic and reasoning papers are progressive and present a variety of contexts to assess how children can apply their knowledge to less familiar formats. The sections below present the diagnostic information about the curriculum areas describing the performance of Year 1 children in spring 2021 for both reading and mathematics.

Reading

Children in spring 2021 performed less well than their peers in the standardisation sample in 2019 across all sections of the assessment. As these sections are progressive, it is unsurprising that the order they appear in the booklets describes children's performance.

Aural comprehension

In spring 2021, children found aural comprehension the easiest of the sections and evidence suggests this was the area least affected by school closures. This section places the least demand on children's emerging reading skills, with no decoding required from the child. Children from disadvantaged backgrounds also found this section easiest, and this was the section where the attainment gap between these children and their non-disadvantaged peers was the smallest. In 2021, boys performed less well than girls in this section, and there was some evidence that boys' aural comprehension may have been more impacted by the school closures. Further diagnostic analysis of children's responses to the questions in this section revealed difficulties linked to their comprehension skills.

In spring 2021, children found it more difficult to identify and infer character's emotions compared to children in 2019. Children tended to select a more familiar or general emotion rather than more complex emotions supported by the text. Whilst this is not due to decoding, there could be a range of underlying reasons such as familiarity with emotion vocabulary, difficulties inferring or processing the question whilst considering the information in the text in their working memory.

Relatedly, children in 2021 also found it more difficult than their peers in 2019 to integrate information. As the children had the story read to them, they did not have the same reference points which reading a written text would usually give them, requiring them to hold and process more in their working memory.

Sentence comprehension

On the sentence comprehension section, children in spring 2021 performed less well than their peers in 2019. Both cohorts found this section easier than text comprehension but harder than aural comprehension. This may suggest that the requirement for independent decoding in this section has increased the level of difficulty for all children, particularly those in 2021 who had a larger drop in performance on this section than on the aural comprehension section. This was supported by evidence which shows that in this section, children in 2019 and 2021 found questions which required the children to respond with a word more difficult than responding with a picture. Moreover, children in 2021 found questions with words comparatively harder than those with pictures, perhaps suggesting that decoding is a skill which was affected by the school closures. Overall, boys performed less well than girls in this section. Children from disadvantaged backgrounds also found this section easier than text comprehension and harder than aural comprehension. However, when compared to their non-disadvantaged peers, children from disadvantaged backgrounds found sentence comprehension comparatively harder than the other sections as it had the largest difference in performance in 2021.

Further diagnostic analysis suggested that children in spring 2021 also found it difficult to integrate information when reading short sentences, in particular understanding multiple parts of a sentence and monitoring their comprehension. When reading a sentence with multiple key elements, e.g., an activity and a location, children commonly selected answers which only considered the activity or the location. Likewise, children struggled to fill a gap in a sentence with a picture or word, often considering only part of the sentence to inform their answer. There may be different reasons for these errors, children may not be: reading the whole sentence; adapting their understanding of what they have read based on later information; or able to retain all parts of the sentences for comprehension.

Text comprehension

These sections place a new demand on children's reading skills; following a narrative with and without teacher support. Both cohorts in 2021 and 2019 found these sections the most difficult, with independent comprehension being the hardest. However, children in spring 2021 performed less well on these sections than children in 2019. Independent comprehension was the section with the largest drop in performance from 2019 to 2021, suggesting that this is the area most affected by the school closures. Like the other sections, boys performed lower than girls in 2019 and 2021. However, unlike the other sections, this gap remained stable between 2019 and 2021. Children from disadvantaged backgrounds also found independent comprehension the most difficult section and were more likely to miss out questions in the text comprehension sections compared to their non-disadvantaged peers. Specific aspects of this section which children in 2021 struggled with were questions which required a written response, and their understanding of key concepts in a narrative.

With written questions, some children in 2021 struggled to give answers with readable letters or comprehensible words. This could be due to difficulties with letter formation, transcription, low confidence, self-regulation when writing, or reading fluency. Whilst some children were able to form letters, they simply copied out the question suggesting they may be struggling with the content of their answer rather than transcription skills. In spring 2021, diagnostic analysis at a question level also suggested that children over-applied the theme of a text to all questions, rather than understanding distinct key concepts in a narrative.

Mathematics

In spring 2021, Year 1 performed less well than their peers in the standardisation sample in 2019, and diagnostic analysis revealed that the curriculum areas they struggled with remained broadly similar. In particular, those curriculum areas with a greater focus in Year 1, such as addition and subtraction, tended to have a smaller drop in performance compared to others with less focus, such as multiplication, division and measures. Children from disadvantaged backgrounds found all curriculum areas harder than their non-disadvantaged peers in 2021. In particular, children from disadvantaged backgrounds struggled with some aspects of number and calculation.

Number

Number recognition and counting

Children in 2021 were secure in number recognition, counting forwards in steps of 1 and identifying one more or one less than a number, in line with children in 2019. However, children in spring 2021 found it harder to identify a number on a number line with unmarked intervals. This area was one of the areas where the difference between the performance of children from disadvantaged background and their peers was the greatest, particularly across questions assessing

number recognition, identifying one more or one less, and counting in steps of 10 and 2. A common error was being one off the correct response or the nearest marked interval, suggesting miscounting or not engaging with the unmarked intervals.

Both cohorts in 2019 and 2021 were more confident in counting forwards in steps of 1 than backwards. However, children in 2021 found counting in steps of 2 and 10 more difficult and some confused tens numbers with those ending in 'teen'. With the partial school closures, it is possible that counting in 2s and 10s was not covered.

Fractions

In spring 2021, children's ability to recognise fractions of a shape was similar to children in 2019. However, they found working out a fraction of a quantity harder and were far more likely to omit the question. When finding fractions of a shape, children in 2021 performed in line with the standardisation sample when finding half and a quarter of a shape, although both cohorts found finding quarters more difficult. However, when finding half of a group of objects, which was supported visually, children in 2021 struggled. The most common error was answering with a number given in the question, which may suggest that children struggled to interpret the question. This may be due to not understanding fractions of groups of objects as their performance on other questions suggests that they do understand fractions.

Calculation

For both addition and subtraction, children performed almost as well as children in 2019 where there were visual aids, such as objects that could be counted or crossed out, or for addition where the sum was less than 10. Addition and subtraction was one of the curriculum areas where the difference in performance between children from disadvantaged backgrounds and their peers was greatest. Children in 2021 found addition and subtraction word problems which bridged ten more difficult than their peers in 2019, even when presented with visual aids. When required to identify the operation and the final answer for a word problem, more children identified the correct operation than the final answer, suggesting that children could interpret the problem but struggled with the calculation. Children in 2021 also found unconventional formats comparatively harder than their peers, particularly calculations where the answer involved zero.

Although both cohorts found multiplication and division difficult, children in 2021 found these areas comparatively more difficult, even though all questions were presented with visual aids. A common error was giving one of the numbers in the problem as a final answer, which may suggest that children found it difficult to interpret the question. This was supported with further evidence that children were using an incorrect operation when interpreting a problem, e.g., adding instead of multiplying. Although children were unlikely to use a strategy, they were more likely to use grouping with images for multiplication than division.

Measures

In spring 2021, children performed nearly as well as the standardisation sample on questions related to capacity and length. However, children in 2021 found questions on clocks and money recognition comparatively harder. Although most children in 2021 could tell time to the hour on an analogue clock, they struggled with telling the time to the half hour. Children in 2021 also struggled when recognising the value of coins. Some children interpreted the value of a coin as being related to its physical size.

Year 2 attainment in reading and mathematics for spring 2021 – diagnostic analysis

As in autumn 2020, across both reading and mathematics, although Year 2 children in spring 2021 performed less well than their peers in 2019, diagnostic analysis revealed that the curriculum areas they struggled with were broadly the same, and there were areas of relative strength. Children from disadvantaged backgrounds found all curriculum areas harder than their non-disadvantaged peers in 2021. The sections below present the diagnostic information about the curriculum areas describing the performance of Year 2 children in spring 2021 for both reading and mathematics.

Reading

In spring 2021, the two reading assessments (paper 1 and paper 2) showed slightly different patterns amongst performance. Diagnostic analysis revealed that in spring 2021, performance on paper 2 showed a greater fall in the proportion of children answering correctly compared to the standardisation sample. This suggests that children's ability to read longer, less scaffolded texts has also been affected by the school closures. This was not the same pattern seen

in autumn 2020, where the performance of children taking paper 2 appeared to be less affected. This may be due to the progression between the autumn and spring papers, as the format of the NFER assessments moves closer towards that of the Key Stage 1 national curriculum assessments. Nevertheless, the proportion of children also achieving very low scores on the assessments also greatly increased since 2019, suggesting that those children at the earliest stages of learning to read also found these papers difficult.

Inference

Like autumn 2020, children in spring 2021 found inference one of the most difficult curriculum areas assessed. However, whilst performance on paper 1 showed the largest drop in these types of questions, performance on inference questions in paper 2 actually showed a trend towards improvement between 2019 and 2021. This may suggest that children who are at the earliest stages of learning to read find these questions more difficult than those children who are working at or above the expected level for their age. In spring 2021, children on both papers were more likely than in 2019 to miss out inference questions, with more omission seen in paper 1. In spring 2021, the difference between girls' and boys' performance overall increased from 2019, because whilst girls' performance was in line with 2019, boys showed a trend towards decreased performance on inference questions.

Further diagnostic analysis at a question level suggested that children's difficulties in this curriculum area may come from them struggling with abstract ideas in fiction texts. This refers to ideas which are not physical events or may not be directly stated, which means they rely on children's ability to infer from what is in the text. In spring 2021, children from disadvantaged backgrounds were more likely to give answers which indicated a literal understanding of abstract ideas in fiction texts.

Vocabulary

As with children's performance on inference questions in spring 2021, questions which assessed children's understanding of vocabulary showed a different pattern across the two papers. For paper 1, children found vocabulary questions easier than inference questions, but harder than retrieval, whereas in paper 2 vocabulary was the hardest curriculum area assessed. For both papers, this was the same pattern seen for the curriculum areas in the standardisation sample in 2019. Interestingly, for paper 1 children in 2021 performed better than their counterparts in 2019, suggesting that vocabulary may be an area of strength for early readers and was not as affected by the school closures. However, for paper 2 children in 2021 performed less well on vocabulary questions than in 2019 and were more likely to omit these types of questions than those in paper 1 in 2021 or their counterparts in 2019. Overall, whilst boys in 2021 performed in line with boys in 2019, girls in 2021 showed a trend towards improvement – performing better than the standardisation sample in 2019.

Diagnostic analysis at a question level showed that a common error amongst some children in 2021 was a tendency to rely on guessing the meaning of words based on the subject of the sentence, or the nearest similar word (e.g., another adjective) rather than using the surrounding context of the target word or phrase to be defined. There was some evidence that this type of error was more common in children from disadvantaged backgrounds. Nevertheless, when taken with the findings from autumn 2020, spring 2021 also suggests the vocabulary was an area of the curriculum less affected by the school closures.

Retrieval

As in autumn 2020, retrieval was the curriculum area which children in 2021 and 2019 found the easiest. However, children in 2021 found this area more difficult than those children in 2019, with it showing the largest drop in performance in comparison to the other curriculum areas. Like autumn 2020, children in spring 2021 were more likely to miss out these types of questions. Children from disadvantaged backgrounds also found this area difficult as the gap with their non-disadvantaged peers was largest compared to the other areas of the curriculum. Further diagnostic analysis revealed that children may be struggling with some areas related to this curriculum area: namely difficulties with non-fiction texts, use of extrinsic knowledge, and narrative sequencing.

As in autumn 2020, children in spring 2021 continued to struggle with non-fiction texts, with specific difficulties related to retrieving factual information from across the text and showing an over-reliance on the general topic of a text rather than retrieving more specific information. This may be due to children not reading the text closely and mixing up key information which, as in autumn 2020, suggests that they are able to identify key information but struggle to apply it.

However, where some children's answers indicated an over-reliance on the general theme of the information text, this may suggest difficulties identifying key information to begin with.

In spring 2021 and 2019, a common error that was also seen across non-fiction texts was where children were not locating their answer in the events of the texts, and instead using their extrinsic knowledge to respond. In 2021, this type of response was more common among children who performed less well on the assessment as a whole.

As in autumn 2020, children in spring 2021 also continued to find it difficult to sequence the narrative in fiction texts. Whilst these questions utilised some aspects of children's retrieval skills, they also challenged their ability to infer abstract events and integrate actions and events across the whole text. In spring 2021, there was evidence that sequencing was difficult for children of all abilities, with boys particularly struggling with this skill.

Mathematics

In spring 2021, children performed less well than their peers in 2019 across both papers. Although children in 2021 performed equally well across arithmetic and reasoning, they were more likely to miss out questions in the reasoning paper. Diagnostic analysis revealed that, in spring 2021, the biggest drop in performance from 2019 was in those curriculum areas which children generally find more challenging. This may suggest that these more difficult curriculum areas are the ones which have been more affected by the school closures. In 2021, children were able to answer questions in familiar or more standard formats. However, they found it comparatively harder to answer those in less familiar formats. Nevertheless, encouragingly, by 2021 children demonstrated progression in some areas of the curriculum they found difficult in autumn 2020, and there were other areas where they continued to perform as well as, or better than, the standardisation sample. Whereas in autumn 2020 and spring 2019 the performance of boys and girls was broadly similar, boys performed better than girls in spring 2021. Children from disadvantaged backgrounds performed less well across all curriculum areas, compared to their non-disadvantaged peers, and were also more likely to miss out questions across both papers.

Number

As in autumn 2020, number was again an area of the curriculum where children in spring 2021 performed in line with their peers in 2019. By spring 2021, children demonstrated some progression in different topic areas. However, some areas of difficulty still persist. For example, in autumn 2020 children found it more difficult to count in 3s but by spring they were able to demonstrate a secure understanding in this area. However, in autumn 2020 children found it difficult to recognise odd and even numbers, and this was still the case in spring 2021. Children's responses in autumn 2020 suggested they were using the tens digit to determine whether the number was odd or even and this still appeared to be the case in spring 2021.

Fractions

In autumn 2020, children struggled with all aspects of fractions. However, by spring 2021, the majority of children demonstrated a good understanding of fractions as diagrams, even when the shaded sections were not adjacent to each other. Nevertheless, this topic area showed a large drop in performance in 2021 compared to 2019 as, without diagrams, only a small proportion of children were able to answer correctly. Children in 2021 were also more likely to miss out fraction questions in this curriculum area. On fraction questions with a missing number, whilst some children did not get the correct answer they did recognise that a fraction was required. This differs from autumn 2020 when integers were given as answers, which could suggest children had become more confident with the concept of fractions.

Calculation

Addition and subtraction

Addition and subtraction were areas of the curriculum where children in 2021 continued to perform well in comparison to the standardisation sample in 2019. Whereas in autumn 2020 children performed better when given a visual aid in both topics, in spring 2021 this did not appear to make a difference to performance, which may suggest children are more secure in this area. Boys performed better than girls across both topics and were more successful with larger numbers.

As in autumn 2020, counting was a popular strategy for addition calculations, although increasingly the column method and, to a lesser extent, partitioning was used with larger numbers, again showing progression in this area

despite the second period of school closures. Questions which were asked in a less familiar way, such as missing number problems, matching calculations or multi-stage word problems, had the largest drop in performance when compared to 2019. This may suggest that answering questions in unfamiliar formats was more affected than conventional problems.

Children in 2021 were more likely to use written strategies when subtracting a two-digit number, and whereas counting was popular when subtracting smaller numbers, children preferred the column method when subtracting larger two-digit numbers. As with addition, some children's responses were often one off the answer, possibly when counting was used as a strategy. As in autumn 2020, there was also evidence that children may still be unfamiliar with the concept of subtraction not being commutative.

Multiplication and division

Multiplication and division were two areas where children struggled in autumn 2020 in comparison to 2019. Whilst by spring 2021, children performed as well or better than the standardisation sample on multiplication questions, they continued to struggle with division. Boys did better than girls in both these areas of the curriculum and the gap has widened since 2019.

Children in 2021 showed good recall of the 2 and 5 multiplication tables but struggled to divide a small two-digit number by 2 or 5. A common error, particularly with division word problems, was to give the divisor as the answer, which may suggest children's concept of division is insecure. Like autumn 2020, in spring 2021 a common error also identified was that some children tended to carry out a multiplication calculation instead, which again may suggest an insecure understanding of the concept.

Measures and geometry

In 2021, children appeared to be secure with measures, with all questions being answered at least as well as in 2019. Unlike autumn 2020, in spring 2021 children performed well when answering questions involving money, including identifying coin recognition, finding a total cost and calculating change. An area of the curriculum where children in 2021 performed better than the standardisation sample was geometry, in particular on questions comparing volumes using images and recognising 2D faces on 3D shapes.

Statistics

This topic takes up a smaller proportion of the curriculum and, as such, a smaller proportion of the NFER assessments. Nevertheless, both cohorts in 2019 and 2021 performed well on these questions. Whereas in autumn 2020 children struggled with tally charts, by spring 2021 they performed as well as the standardisation sample, suggesting an improvement despite the second period of school closures. Children in 2021 performed better than the standardisation sample on questions involving a pictogram. However, a common error identified was that some children gave their final answer as the correct total for one of the rows required, rather than the difference between them. This may suggest children were able to interpret the diagram but may have misread the question, struggled to find the difference, or found it difficult to process multiple pieces of information.

Chapter 6 – Summer term 2021

Summary

- Teachers reported increased issues with social skills and wellbeing on the second return to school and were therefore implementing additional PSHE.

- Some teachers commented that learning gaps seen for their pupils were not as large as they had anticipated.

- CSBQ: this was repeated for the same sample of 12 pupils per class. Pupils were performing significantly above autumn levels on 4 subscales, with no significant change on the remaining 3 subscales. The disadvantage gap in social skills narrowed for 3 subscales and remained stable on 4 subscales. Pupils were generally performing at or above expected levels, compared to limited norms available. Distributions show that most pupils scored at the upper end of the scale on all subscales except cognitive self-regulation.

- The most common support strategies implemented were small group work, staff deployment and a revised curriculum, in addition to a focus on PSHE for social skills/wellbeing.

Schools were fully reopen in summer term 2021. The summer PPR, interviews and second CSBQ, as described in the Methods section, provide data on this time period.

Transition back to school

When pupils returned to school in March 2021, the majority of the ten teachers interviewed reported increased issues with pupils' social skills and wellbeing, such as pupils lacking in confidence, independence or appearing more anxious. One teacher explained 'children have missed out on so much more than school, they have missed out on socialising with friends, they've missed out on sports clubs, they've missed out on art and drama and going on the stage and putting a performance on…'. As a result, nearly all interviewed teachers were implementing extra PSHE after the second return to school. Some held nurture and inclusion groups or increased opportunities for PE, play, singing and crafts.

Some teachers also reported that some pupils struggled with routines and behaviour or concentration when schools reopened to all pupils, echoing the findings from pupils' first return to school. Nevertheless, half of teachers interviewed explained that the gaps in pupils' learning were not as large as anticipated when most pupils returned to school. For example, one teacher stated 'I think from the assessment papers we've realised that our children haven't perhaps got as many gaps as we thought they might have done.' Indeed, some teachers reported a general reduction in the intensity of interventions with pupils after the second return to school, although a minority of teachers reported conducting out-of-hours interventions for English and mathematics. A few teachers also indicated that they maintained channels for parental involvement after the return to school.

Social skills and wellbeing

The CSBQ was repeated with the same sample of 12 pupils per class in summer 2021 (at the end of June). The reliability (Cronbach's alphas) for each CSBQ subscale can be found in Appendix C. The results, along with the autumn CSBQ results as presented in Chapter 2, are presented in Table 36.

Table 36: CSBQ results for each subscale, for Key Stage 1 in autumn 2020 (n=3454) and summer 2021 (n=2289).

Scale	Autumn 2020									Summer 2021								
	Overall (all pupils)			FSM pupils			Non-FSM pupils			Overall (all pupils)			FSM pupils			Non-FSM pupils		
	Mean (95% CI)	SD	N	Mean (95% CI)	SD	N	Mean (95% CI)	SD	N	Mean (95% CI)	SD	N	Mean (95% CI)	SD	N	Mean (95% CI)	SD	N
Cognitive self-regulation	3.23 (3.19–3.26)	1.09	3454	2.75 (2.65–2.84)	1.07	502	3.32 (3.28–3.36)	1.08	2588	3.42 (3.37–3.5)	1.07	2289	2.98 (2.87–3.1)	1.107	370	3.49 (3.45–3.54)	1.05	1872
Behavioural self-regulation	3.92 (3.89–3.95)	0.94	3454	3.61 (3.52–3.70)	1.06	502	3.98 (3.94–4.01)	0.91	2588	4.00 (3.97–4.04)	0.93	2289	3.74 (3.63–3.84)	1.00	370	4.05 (4.01–4.1)	0.91	1872
Emotional self-regulation	4.02 (4.00–4.05)	0.77	3454	3.84 (3.76–3.92)	0.88	502	4.06 (4.03–4.09)	0.75	2588	4.05 (4.02–4.08)	0.81	2289	3.85 (3.76–3.95)	0.92	370	4.09 (4.05–4.12)	0.78	1872
Sociability	3.91 (3.89–3.94)	0.8	3454	3.73 (3.66–3.80)	0.84	502	3.94 (3.91–3.97)	0.79	2588	3.99 (3.96–4.02)	0.78	2289	3.82 (3.74–3.91)	0.82	370	4.02 (3.99–4.06)	0.77	1872
Prosocial behaviour	3.95 (3.92–3.98)	0.86	3454	3.69 (3.61–3.77)	0.95	502	4.00 (3.97–4.04)	0.84	2588	4.03 (4.00–4.07)	0.87	2289	3.82 (3.73–3.91)	0.93	370	4.07 (4.03–4.11)	0.85	1872
Internalising problems	1.64 (1.61–1.66)	0.73	3454	1.84 (1.77–1.91)	0.81	502	1.6 (1.57–1.63)	0.71	2588	1.63 (1.6–1.66)	0.74	2289	1.85 (1.77–1.94)	0.87	370	1.59 (1.55–1.62)	0.71	1872
Externalising problems	1.51 (1.49–1.54)	0.77	3454	1.68 (1.59–1.76)	0.94	502	1.49 (1.46–1.51)	0.73	2588	1.52 (1.49–1.55)	0.78	2289	1.68 (1.59–1.77)	0.91	370	1.48 (1.45–1.52)	0.75	1872

This shows that pupils were performing above autumn levels on all subscales. The Australian norms are shown in Table 37, for comparison. As outlined in Chapter 2, scores are presented in quintiles. Scores in the middle three bands (yellow, green, light blue) can roughly be considered within age expectations (characterising the middle 60% of children that age). A score in the dark blue can be considered above age expectations (the top 20% of children that age). Scores in the orange are below age expectations (the bottom 20% of children that age). Note that for the subscales internalising problems and externalising problems, a lower score indicates higher social skills. Table 37 contains means from summer with the CSBQ norms.

Table 37: CSBQ norms provided by Howard and Melhuish (2017) with mean and standard deviation of study sample (summer).

Subscale	M(SD) norms	M (SD) in this study, summer	<20th percentile		20th-39th percentile		40th-59th percentile		60th-79th percentile		80th+ percentile	
			Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper
Cognitive Self-Regulation	3.41 (0.84)	3.42 (1.07)	1.00	2.82	2.83	3.16	3.17	3.66	3.67	3.99	4.00	5.00
Behavioural Self-Regulation	3.54 (0.90)	4.00 (0.93)	1.00	2.74	2.75	3.24	3.25	3.87	3.88	4.49	4.50	5.00
Emotional Self-Regulation	3.48 (0.67)	4.05 (0.81)	1.00	2.85	2.86	3.33	3.34	3.71	3.72	3.99	4.00	5.00
Sociability	3.62 (0.80)	3.99 (0.78)	1.00	2.99	3.00	3.59	3.60	3.99	4.00	4.39	4.40	5.00
Prosocial Behaviour	3.54 (0.84)	4.03 (0.87)	1.00	2.85	2.86	3.42	3.43	3.85	3.86	4.28	4.29	5.00
Internalizing Problems	1.85 (0.73)	1.63 (0.74)	5.00	2.40	2.39	2.01	2.00	1.49	1.48	1.21	1.20	1.00
Externalizing Problems	1.91 (0.98)	1.52 (0.78)	5.00	2.60	2.59	1.81	1.80	1.41	1.40	1.20	1.19	1.00

The summer results, as with autumn, are in the expected range or above on all subscales. This indicates that the sample of pupils had not suffered any reduction in social skills scores and had improved slightly over the AY, to remain at expected or above expected levels with reference to these norms.

As with autumn CSBQ scores, distributions of scores on all subscales except cognitive self-regulation show a ceiling effect; most pupils were rated at the upper end of the scale, or a floor effect for the reverse coded subscales (internalising and externalising). As discussed in Chapter 2, this could be due to interpretations from teachers but may also imply that the CSBQ as used here is not capturing fully the social skills of this age group and there is no certainty over how teachers used the rating scale. Therefore, these results should be interpreted with caution and considered alongside the other evidence on social skill levels.

Repeated measures analysis of CSBQ

We followed the change in the social skills of pupils over the 2020/21 AY. This was investigated for all pupils within the accepted age range (< 8 years) who had at least one time point observation (i.e. autumn 2020 or summer 2021 or both). We also looked at the differences between FSM and non-FSM pupils and how the disadvantage gap changed over the AY. Both Year 1 and Year 2 pupils were entered into the same models, with a factor for year group to control for differences between year groups. Due to time constraints, gender was not included in the model. To check for robustness, it was ensured that the subscales of the CSBQ were reliable before proceeding with any inferential analysis. Table 4 shows the reliabilities (Cronbach's alphas) of each of the seven subscales of the CSBQ in our study.

Cognitive self-regulation repeated measures analysis

Table 36 presents the means of the pupils responses on the cognitive self-regulation for the group as a whole, for the non-FSM pupils, and for FSM pupils. Each group's scores are split by term. For pupils overall, the mean scores on the cognitive self-regulation scale are higher in the summer term than in the autumn term. Furthermore, non-FSM pupils have higher scores at both time points than FSM pupils. The change in scores by time and for different FSM groups are shown in Figure 37.

Figure 37: Cognitive self-regulation scores.
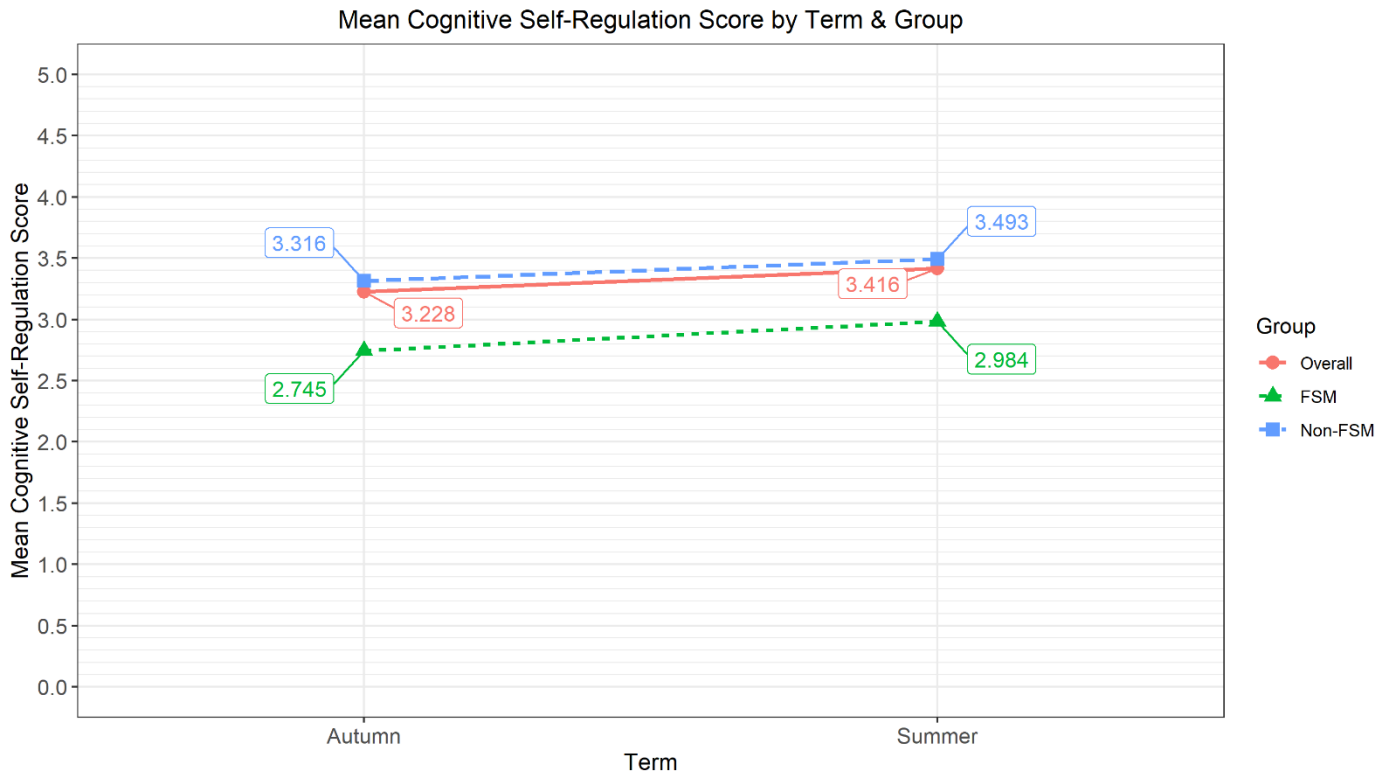
Cognitive self-regulation by time model

The analysis of the cognitive self-regulation scores was a three level model (school, pupil, time point) in which autumn and summer scores were regressed on time and year group. Table 38 presents the results from the model, which measures the impact of time on pupil outcomes. The model ascertains whether there was a significant change in pupils' cognitive self-regulation scores between the autumn and summer terms.

There was a significant positive impact of time on pupils' cognitive self-regulation scores, with an effect size of 0.10 (0.08, 0.12). This means that between autumn and summer, cognitive self-regulation scores improved. This effect was significant while controlling for year group. Effect size and confidence intervals are presented in Table 38.

Table 38: Cognitive self-regulation by time repeated measures multilevel model results.

Coefficients	Model coefficients				Effect size
	Estimate (95% CI)	Std. error	Degrees of freedom	P value	Hedge's G (95% CI)
(Intercept)	**3.21 (3.15, 3.26)**	**0.03**	**355.98**	**<0.001**	
Summer	**0.17 (0.14, 0.21)**	**0.02**	**2365.56**	**<0.001**	**0.10 (0.08, 0.12)**
Year group 2	0.06 (−0.01, 0.13)	0.03	3414.23	0.09	0.03 (−0.005, 0.08)

N.B. The reference group for this model was autumn scores, and year group 1. The number of schools is 159, the number of pupils is 3,532, and the number of observations is 5,743. Significant effects are in bold.

Cognitive self-regulation disadvantage gap model

The analysis of the cognitive self-regulation scores was a three level model (school, pupil, time point) in which autumn and spring scores were regressed on time, FSM eligibility of pupils in 2020, and year group. 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 cognitive self-regulation scores between FSM and non-FSM pupils. The model ascertains whether there was a significant change in this gap between the autumn and summer terms.

There was a significant positive interaction between time and FSM eligibility on pupils' cognitive self-regulation scores, with an effect size of 0.05 (0.005, 0.1). This means that between autumn and summer, their disadvantage gap for cognitive self-regulation decreased. This analysis controlled for year group. Effect sizes and confidence intervals are presented in Table 39.

Table 39: Cognitive self-regulation disadvantage gap repeated measures multilevel model results.

| Coefficients | Model coefficients | | | | Effect size |
	Estimate (95% CI)	Std. error	Degrees of freedom	P value	Hedge's G (95% CI)
(Intercept)	**3.29 (3.23, 3.35)**	**0.03**	**410.26**	**<0.001**	
Summer	**0.16 (0.13, 0.19)**	**0.02**	**2362.05**	**<0.001**	**0.1 (0.08, 0.12)**
FSM2020 yes	**−0.58 (−0.68, −0.47)**	**0.05**	**3896.34**	**<0.001**	**−0.35 (−0.41, −0.28)**
FSM2020 missing	−0.03 (−0.18, 0.11)	0.07	284.08	0.648	−0.02 (−0.11, 0.07)
Year group 2	0.07 (−0.00004, 0.13)	0.03	3415.19	0.052	0.04 (−0.00003, 0.08)
Summer*FSM2020 yes	**0.09 (0.01, 0.17)**	**0.04**	**2384.74**	**0.031**	**0.05 (0.005, 0.1)**
Summer*FSM2020 missing	0.05 (−0.18, 0.28)	0.12	2605.91	0.691	0.03 (−0.11, 0.16)

N.B. The reference group for this model was autumn scores, non-FSM pupils, and year group 1 pupils. Number of schools is 159, number of pupils is 3,532, and number of observations is 5,743. Significant effects are in bold.

Effect sizes

Effect sizes and their corresponding confidence intervals were calculated using the unconditional variance from a null model with no covariates. The ICCs from this model at different levels, and the parameters used to calculate effect sizes are displayed in Table 40.

Table 40: ICC and effect size parameters from the null model.

Level	Variance	Standard deviation	ICC	Total variance from a model without covariates
School	0.04661	0.2159	0.04	1.18208
Pupil	0.8419	0.9175	0.71	1.18208
Time point	0.29357	0.5418	–	1.18208

Behavioural self-regulation repeated measures analysis

Table 36 presents the means of the pupils' responses on the behavioural self-regulation for the group as a whole, for the non-FSM pupils, and for the FSM pupils. Each group's scores are split by term. For pupils overall, the mean scores on the behavioural self-regulation scale are higher in the summer term than in the autumn term. Furthermore, non-FSM pupils have higher scores at both time points than FSM pupils. The change in scores by time and for different FSM groups are shown in Figure 38.

Figure 38:   Behavioural self-regulation scores.
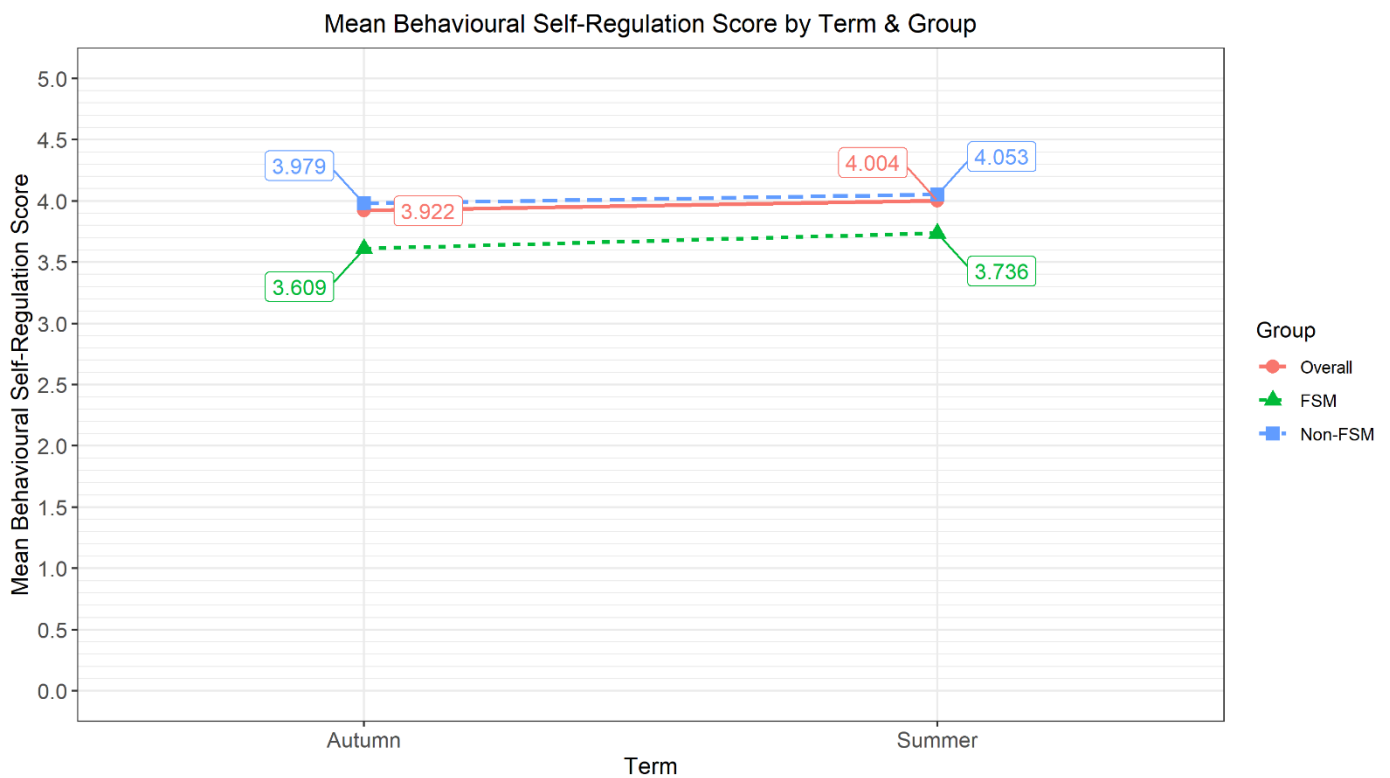
Behavioural self-regulation by time model

The analysis of the behavioural self-regulation scores used a three level model (school, pupil, time point) in which autumn and summer scores were regressed on time and year group. Table 41 presents the results from the model, which measures the impact of time on pupil outcomes. The model ascertains whether there was a significant change in pupils' behavioural self-regulation scores between the autumn and summer terms.

There was a significant positive impact of time on pupils' behavioural self-regulation scores, with an effect size of 0.05 (0.03, 0.07). This means that, between autumn and summer, behavioural self-regulation scores improved. This effect was significant while controlling for year group. Effect size and confidence intervals are presented in Table 41.

Table 41: Behavioural self-regulation by time repeated measures multilevel model results.

Coefficients	Model coefficients				Effect size
	Estimate (95% CI)	Std. error	Degrees of freedom	P value	Hedge's G (95% CI)
(Intercept)	**3.87 (3.82, 3.92)**	**0.03**	**324.45**	**<0.001**	
Summer	**0.07 (0.05, 0.09)**	**0.01**	**2339.06**	**<0.001**	**0.05 (0.03, 0.07)**
Year group 2	**0.11 (0.05, 0.17)**	**0.03**	**3421.47**	**<0.001**	**0.08 (0.04, 0.12)**

N.B. The reference group for this model was autumn scores, and year group 1. The number of schools is 159, the number of pupils is 3,532, and the number of observations is 5,743. Significant effects are in bold.

Behavioural self-regulation disadvantage gap model

The analysis of the behavioural self-regulation scores used a three level model (school, pupil, time point) in which autumn and spring scores were regressed on time, FSM eligibility of pupils in 2020, and year group. Table 42 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 behavioural self-regulation scores between FSM and non-FSM pupils. The model ascertains whether there was a significant change in this gap between the autumn and summer terms.

There was a significant positive interaction between time and FSM eligibility on pupils' behavioural self-regulation scores, with an effect size of 0.05 (0.005, 0.09). This means that between autumn and summer, the disadvantage gap for behavioural self-regulation decreased. This analysis controlled for year group. Effect size and confidence intervals are presented in Table 42.

Table 42: Behavioural self-regulation disadvantage gap repeated measures multilevel model results.

Coefficients	Model coefficients				Effect size
	Estimate (95% CI)	Std. error	Degrees of freedom	P value	Hedge's G (95% CI)
(Intercept)	**3.93 (3.87, 3.98)**	**0.03**	**364.14**	**<0.001**	
Summer	**0.06 (0.03, 0.08)**	**0.01**	**2333.47**	**<0.001**	**0.04 (0.02, 0.06)**
FSM2020 yes	**−0.37 (−0.46, −0.29)**	**0.05**	**3946.29**	**<0.001**	**−0.26 (−0.32, −0.2)**
FSM2020 missing	−0.04 (−0.17, 0.10)	0.07	316.98	0.589	−0.03 (−0.12, 0.07)
Year group 2	**0.11 (0.06, 0.17)**	**0.03**	**3421.97**	**<0.001**	**0.08 (0.04, 0.12)**
Summer*FSM2020 yes	**0.07 (0.01, 0.14)**	**0.03**	**2359.64**	**0.029**	**0.05 (0.005, 0.09)**
Summer*FSM2020 missing	0.09 (−0.10, 0.27)	0.1	2633.41	0.336	0.06 (−0.07, 0.19)

N.B. The reference group for this model was autumn scores, non-FSM pupils, and year group 1 pupils. The number of schools is 159, the number of pupils is 3,532, and the number of observations is 5,743. Significant effects are in bold.

Effect sizes

Effect sizes and their corresponding confidence intervals were calculated using the unconditional variance from a null model with no covariates. The ICCs from this model at different levels and the parameters used to calculate effect sizes are displayed in Table 43.

Table 43: ICC and effect size parameters from the null model.

Level	Variance	Standard deviation	ICC	Total variance from a model without covariates
School	0.04533	0.2129	0.05	0.87532
Pupil	0.65292	0.808	0.75	0.87532
Time point	0.17707	0.4208	–	0.87532

Emotional self-regulation repeated measures analysis

Table 36 presents the means of the pupils' responses on the emotional self-regulation for the group as a whole, for the non-FSM pupils, and for the FSM pupils. Each group's scores are split by term. For pupils overall, the mean scores on the emotional self-regulation scale are higher in the summer term than in the autumn term. Furthermore, non-FSM pupils have higher scores at both time points than FSM pupils. The change in scores by time and for different FSM groups are shown in Figure 39.

Figure 39: Emotional self-regulation scores.
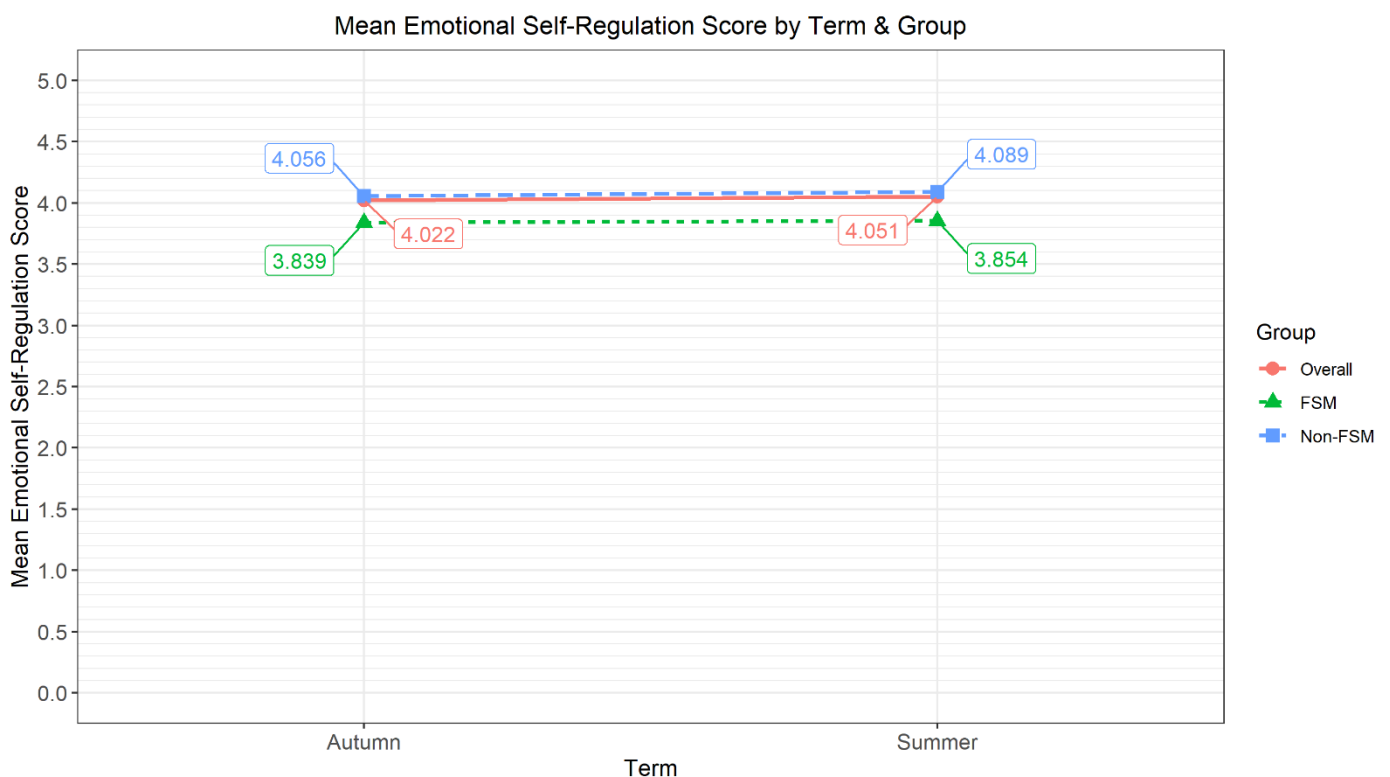
Emotional self-regulation by time model

The analysis of the emotional self-regulation scores used a three level model (school, pupil, time point) in which autumn and summer scores were regressed on time and year group. Table 44 presents the results from the model, which measures the impact of time on pupil outcomes. The model ascertains whether there was a significant change in pupils' emotional self-regulation scores between the autumn and summer terms.

There was no significant impact of time on pupils' emotional self-regulation scores, with an effect size of 0.016 (−0.003, 0.04). This means that between autumn and summer, mean emotional self-regulation scores did not significantly change. This analysis controlled for year group. Effect size and confidence intervals are presented in Table 44.

Table 44: Emotional self-regulation by time repeated measures multilevel model results.

| Coefficients | Model coefficients | | | | Effect size |
	Estimate (95% CI)	Std. error	Degrees of freedom	P value	Hedge's G (95% CI)
(Intercept)	**4.00 (3.96, 4.05)**	**0.023**	**310.27**	**<0.001**	
Summer	0.02 (−0.003, 0.04)	0.01	2388.36	0.092	0.016 (−0.003, 0.04)
Year group 2	0.04 (−0.01, 0.09)	0.02	3424.003	0.105	0.03 (−0.007, 0.07)

N.B. The reference group for this model was autumn scores, and year group 1. The number of schools is 159, the number of pupils is 3,532, and the number of observations is 5,743. Significant effects are in bold.

Emotional self-regulation disadvantage gap model

The analysis of the emotional self-regulation scores used a three level model (school, pupil, time point) in which autumn and spring scores were regressed on time, FSM eligibility of pupils in 2020, and year group. Table 45 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 emotional self-regulation scores between FSM and non-FSM pupils. The model ascertains whether there was a significant change in this gap between the autumn and summer terms.

There was no significant interaction between time and FSM eligibility on pupils' emotional self-regulation scores, with an effect size of −0.0002 (−0.05, 0.05). This means that between autumn and summer, the disadvantage gap for emotional self-regulation remained stable. This analysis controlled for year group. Effect size and confidence intervals are presented in Table 45.

Table 45: Emotional self-regulation disadvantage gap repeated measures multilevel model results.

| Coefficients | Model coefficients | | | | Effect size |
	Estimate (95% CI)	Std. error	Degrees of freedom	P value	Hedge's G (95% CI)
(Intercept)	**4.04 (3.99, 4.08)**	**0.02**	**348.59**	**<0.001**	
Summer	0.02 (−0.01, 0.04)	0.01	2383.07	0.164	0.01 (−0.006, 0.04)
FSM2020 yes	**−0.21 (−0.28, −0.13)**	**0.04**	**4180.62**	**<0.001**	**−0.17 (−0.23, −0.11)**
FSM2020 missing	−0.04 (−0.16, 0.07)	0.06	346.61	0.476	−0.03 (−0.13, 0.06)
Year group 2	0.04 (−0.01, 0.09)	0.02	3422.90	0.087	0.03 (−0.005, 0.07)
Summer*FSM2020 yes	−0.0003 (−0.06, 0.06)	0.03	2422.51	0.993	−0.0002 (−0.05, 0.05)
Summer*FSM2020 missing	0.12 (−0.06, 0.29)	0.09	2729.39	0.199	0.09 (−0.05, 0.24)

N.B. The reference group for this model was autumn scores, non-FSM pupils, and year group 1 pupils. The number of schools is 159, the number of pupils is 3,532, and the number of observations is 5,743. Significant effects are in bold.

Effect sizes

Effect sizes and their corresponding confidence intervals were calculated using the unconditional variance from a null model with no covariates. The ICCs from this model at different levels, and the parameters used to calculate effect sizes are displayed in Table 46.

Table 46: ICC and effect size parameters from the null model.

Level	Variance	Standard deviation	ICC	Total variance from a model without covariates
School	0.03738	0.1933	0.06	0.60862
Pupil	0.40892	0.6395	0.67	0.60862
Time point	0.16232	0.4029	–	0.60862

Sociability repeated measures analysis

Table 36 presents the means of the pupil's responses on the sociability for the group as a whole, for the non-FSM pupils, and for the FSM pupils. Each group's scores are split by term. For pupils overall, the mean scores on the sociability scale are higher in the summer term than in the autumn term. Furthermore, non-FSM pupils have higher scores at both time points than FSM pupils. The change in scores by time and for different FSM groups are shown in Figure 40.

Figure 40: Sociability scores.
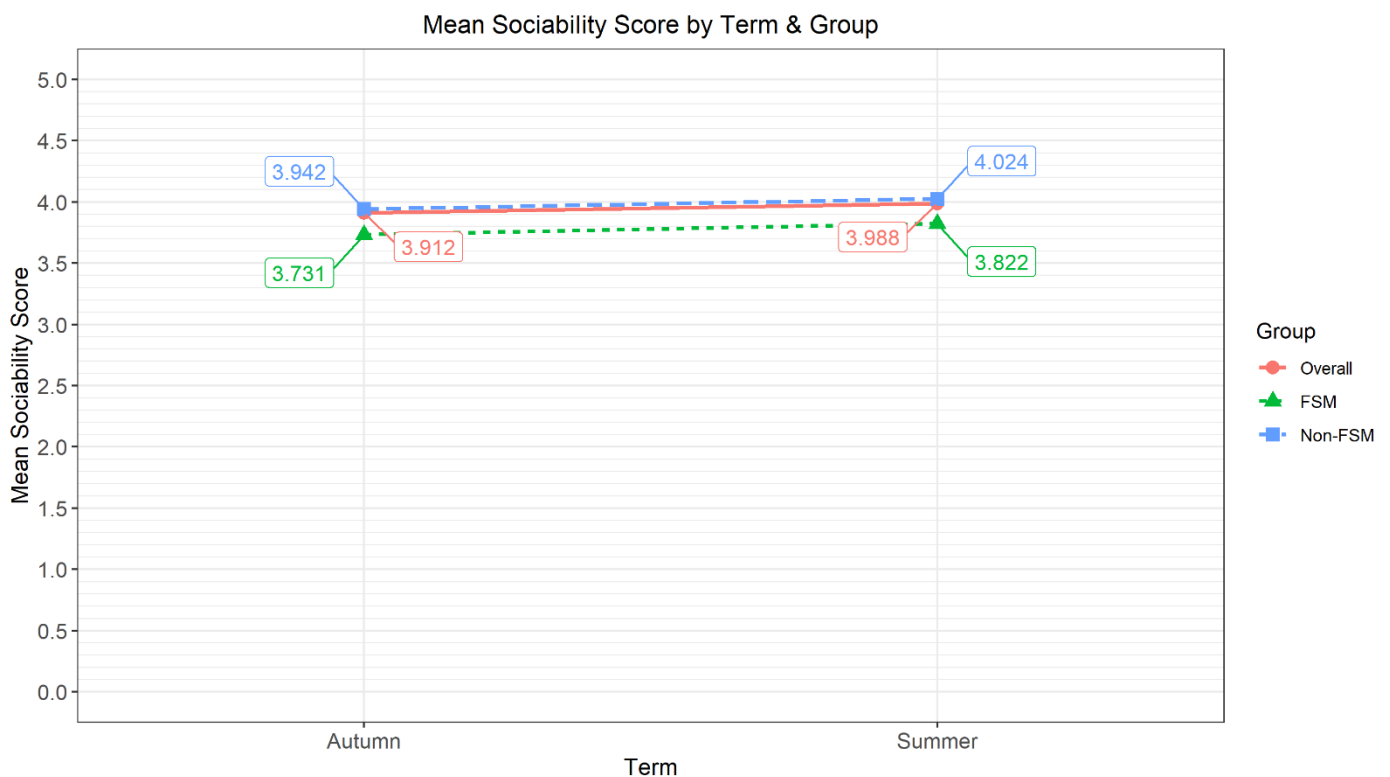
Sociability by time model

The analysis of the sociability scores was a model (school, pupil, time point) in which autumn and summer scores were regressed on time and year group. Table 47 presents the results from the model, which measures the impact of time on pupil outcomes. The model ascertains whether there was a significant change in pupils' sociability scores between the autumn and summer terms.

There was a significant positive impact of time on pupils' sociability scores, with an effect size of 0.06 (0.04, 0.08). This means that between autumn and summer, sociability scores improved. This effect was significant while controlling for year group. Effect size and confidence intervals are presented in Table 47.

Table 47: Sociability by time repeated measures multilevel model results.

	Model coefficients				Effect size
Coefficients	Estimate (95% CI)	Std. error	Degrees of freedom	P value	Hedge's G (95% CI)
(Intercept)	**3.90 (3.85, 3.95)**	**0.03**	**259.26**	**<0.001**	
Summer	**0.08 (0.05, 0.10)**	**0.01**	**2348.25**	**<0.001**	**0.06 (0.04, 0.08)**
Year group 2	0.03 (−0.01, 0.08)	0.02	3386.16	0.157	0.03 (−0.01, 0.06)

N.B. The reference group for this model was autumn scores, and year group 1. The number of schools is 159, the number of pupils is 3,532, and the number of observations is 5,743. Significant effects are in bold.

Sociability disadvantage gap model

The analysis of the sociability scores was a three level model (school, pupil, time point) in which autumn and spring scores were regressed on time, FSM eligibility of pupils in 2020, and year group. Table 48 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 sociability scores between FSM and non-FSM pupils. The model ascertains whether there was a significant change in this gap between the autumn and summer terms.

There was no significant interaction between time and FSM eligibility on pupils' sociability scores, with an effect size of 0.01 (−0.04, 0.06). This means that between autumn and summer, the disadvantage gap for sociability remained stable. This analysis controlled for year group. Effect size and confidence intervals are presented in Table 48.

Table 48: Sociability disadvantage gap repeated measures multilevel model results.

	Model coefficients				Effect size
Coefficients	Estimate (95% CI)	Std. error	Degrees of freedom	P value	Hedge's G (95% CI)
(Intercept)	**3.92 (3.87, 3.98)**	**0.03**	**293.79**	**<0.001**	
Summer	**0.08 (0.05, 0.10)**	**0.01**	**2347.90**	**<0.001**	**0.06 (0.04, 0.08)**
FSM2020 yes	**−0.20 (−0.28, −0.12)**	**0.04**	**4207.84**	**<0.001**	**−0.16 (−0.21, −0.1)**
FSM2020 missing	0.02 (−0.11, 0.15)	0.06	369.10	0.765	0.01 (−0.08, 0.11)
Year group 2	0.04 (−0.01, 0.09)	0.02	3386.26	0.118	0.03 (−0.008, 0.07)
Summer*FSM2020 yes	0.01 (−0.05, 0.08)	0.03	2394.56	0.668	0.01 (−0.04, 0.06)
Summer*FSM2020 missing	−0.06 (−0.24, 0.12)	0.09	2721.68	0.486	−0.05 (−0.19, 0.09)

N.B. The reference group for this model was autumn scores, non-FSM pupils, and year group 1 pupils. The number of schools is 159, the number of pupils is 3,532, and the number of observations is 5,743. Significant effects are in bold.

Effect sizes

Effect sizes and their corresponding confidence intervals were calculated using the unconditional variance from a null model with no covariates. The ICCs from this model at different levels and the parameters used to calculate effect sizes are displayed in Table 49.

Table 49: ICC and effect size parameters from the null model.

Level	Variance	Standard deviation	ICC	Total variance from a model without covariates
School	0.05407	0.2325	0.09	0.63328
Pupil	0.409	0.6395	0.65	0.63328
Time point	0.17021	0.4126	–	0.63328

Prosocial behaviour repeated measures analysis

Table 36 presents the means of the pupils' responses on the prosocial behaviour for the group as a whole, for the non-FSM pupils, and for the FSM pupils. Each group's scores are split by term. For pupils overall, the mean scores on the prosocial behaviour scale are higher in the summer term than in the autumn term. Furthermore, non-FSM pupils have higher scores at both time points than FSM pupils. The change in scores by time and for different FSM groups are shown in Figure 41.

Figure 41: Prosocial behaviour scores.
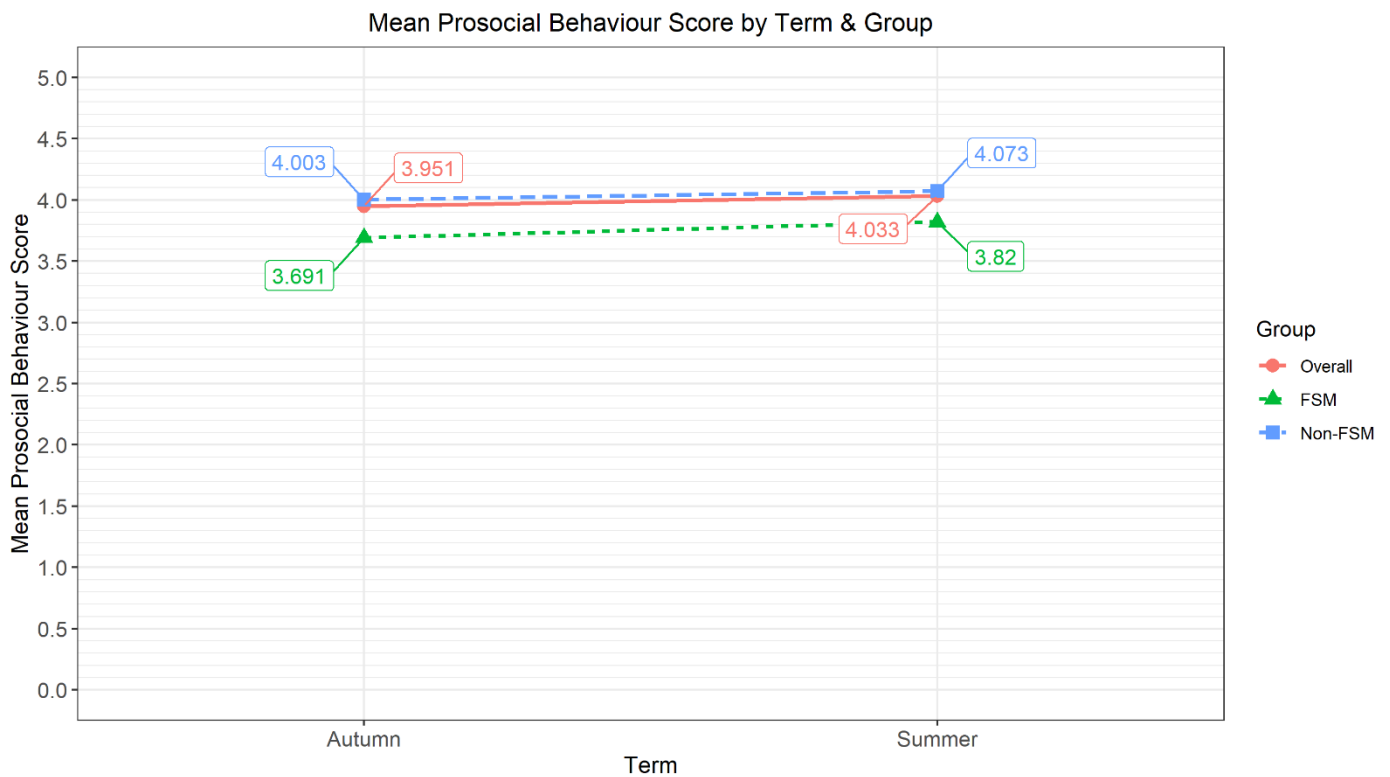
Prosocial behaviour by time model

The analysis of the prosocial behaviour scores used a three level model (school, pupil, time point) in which autumn and summer scores were regressed on time and year group. Table 50 presents the results from the model, which measures the impact of time on pupil outcomes. The model ascertains whether there was a significant change in pupils' prosocial behaviour scores between the autumn and summer terms.

There was a significant positive impact of time on pupils' prosocial behaviour scores, with an effect size of 0.05 (0.03, 0.07). This means that between autumn and summer, prosocial behaviour scores improved. This effect was significant while controlling for year group. Effect size and confidence intervals are presented in Table 50.

Table 50: Prosocial behaviour by time repeated measures multilevel model results.

| Coefficients | Model coefficients | | | | Effect size |
	Estimate (95% CI)	Std. error	Degrees of freedom	P value	Hedge's G (95% CI)
(Intercept)	**3.92 (3.87, 3.98)**	**0.03**	**277.55**	**<0.001**	
Summer	**0.07 (0.04, 0.09)**	**0.01**	**2349.77**	**<0.001**	**0.05 (0.03, 0.07)**
Year group 2	**0.06 (0.01, 0.12)**	**0.03**	**3410.36**	**0.017**	**0.05 (0.008, 0.09)**

N.B. The reference group for this model was autumn scores, and year group 1. The number of schools is 159, the number of pupils is 3,532, and the number of observations is 5,743. Significant effects are in bold.

Prosocial behaviour disadvantage gap model

The analysis of the prosocial behaviour scores used a three level model (school, pupil, time point) in which autumn and spring scores were regressed on time, FSM eligibility of pupils in 2020, and year group. Table 51 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 prosocial behaviour scores between FSM and non-FSM pupils. The model ascertains whether there was a significant change in this gap between the autumn and summer terms.

There was a significant positive interaction between time and FSM eligibility on pupils' prosocial behaviour scores, with an effect size of 0.06 (0.01, 0.10). This means that between autumn and summer, the scores of FSM pupils increased and the disadvantage gap for prosocial behaviour narrowed. This analysis controlled for year group. Effect size and confidence intervals are presented in Table 51.

Table 51: Prosocial behaviour disadvantage gap repeated measures multilevel model results.

| Coefficients | Model coefficients | | | | Effect size |
	Estimate (95% CI)	Std. error	Degrees of freedom	P value	Hedge's G (95% CI)
(Intercept)	**3.97 (3.91, 4.03)**	**0.03**	**313.45**	**<0.001**	
Summer	**0.05 (0.03, 0.08)**	**0.01**	**2346.64**	**<0.001**	**0.04 (0.02, 0.06)**
FSM2020 yes	**−0.31 (−0.39, −0.23)**	**0.04**	**4117.62**	**<0.001**	**−0.23 (−0.29, −0.17)**
FSM2020 missing	−0.04 (−0.18, 0.09)	0.07	356.58	0.519	−0.03 (−0.13, 0.07)
Year group 2	**0.07 (0.02, 0.12)**	**0.03**	**3409.57**	**0.011**	**0.05 (0.01, 0.09)**
Summer*FSM2020 yes	**0.08 (0.01, 0.14)**	**0.03**	**2385.56**	**0.022**	**0.06 (0.01, 0.10)**
Summer*FSM2020 missing	−0.04 (−0.22, 0.15)	0.09	2690.34	0.693	−0.03 (−0.16, 0.11)

N.B. The reference group for this model was autumn scores, non-FSM pupils, and year group 1 pupils. The number of schools is 159, the number of pupils is 3,532, and the number of observations is 5,743. Significant effects are in bold.

Effect sizes

Effect sizes and their corresponding confidence intervals were calculated using the unconditional variance from a null model with no covariates. The ICCs from this model at different levels and the parameters used to calculate effect sizes are displayed in Table 52.

Table 52: ICC and effect size parameters from the null model.

Level	Variance	Standard deviation	ICC	Total variance from a model without covariates
School	0.05694	0.2386	0.08	0.74914
Pupil	0.51521	0.7178	0.69	0.74914
Time point	0.17699	0.4207	–	0.74914

Internalising problems repeated measures analysis

Table 36 presents the means of the pupils' responses on the Internalising problems for the group as a whole, for the non-FSM pupils, and for the FSM pupils. Each group's scores are split by term. Internalising problems is a negatively scored subscale, which means that higher scores on this scale indicate poorer social skills. For pupils overall, the mean scores on the internalising problems scale are lower in the summer term than in the autumn term. Furthermore, non-FSM pupils have lower scores (i.e., better social skills) at both time points than FSM pupils. The change in scores by time and for different FSM groups are shown in Figure 42.

Figure 42: Internalising problems scores.
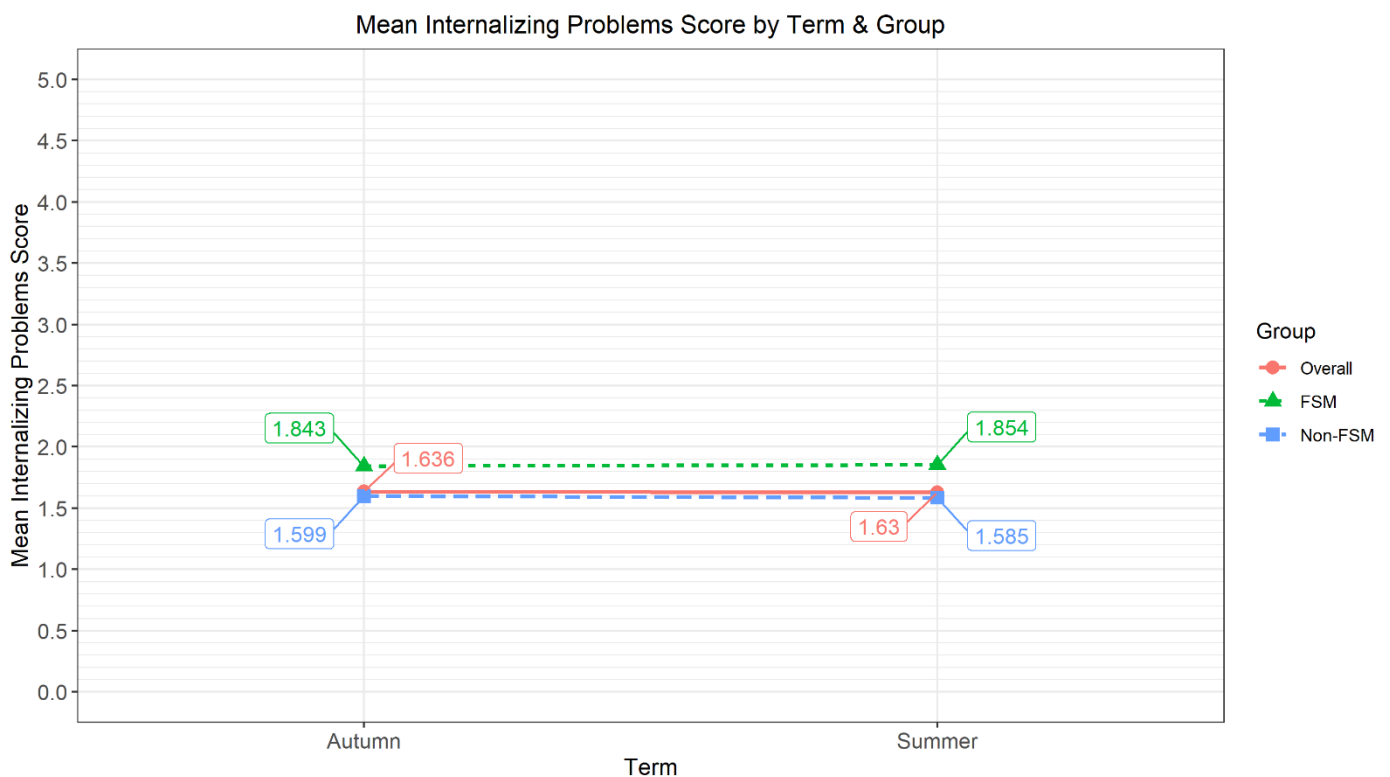
Internalising problems by time model

The analysis of the Internalising problems scores was a three level model (school, pupil, time point) in which autumn and summer scores were regressed on time and year group. Table 53 presents the results from the model, which measures the impact of time on pupil outcomes. The model ascertains whether there was a significant change in pupils' internalising problems scores between the autumn and summer terms.

There was no significant impact of time on pupils' internalising problems scores, with an effect size of −0.001 (−0.02, 0.02). This means that between autumn and summer, mean internalising problems scores did not significantly change. This analysis controlled for year group. Effect size and confidence intervals are presented in Table 53.

Table 53: Internalising problems by time repeated measures multilevel model results.

| Coefficients | Model coefficients | | | | Effect size |
	Estimate (95% CI)	Std. error	Degrees of freedom	P value	Hedge's G (95% CI)
(Intercept)	**1.64 (1.59, 1.69)**	**0.02**	**262.74**	**<0.001**	
Summer	−0.001 (−0.03, 0.02)	0.01	2389.40	0.926	−0.001 (−0.02, 0.02)
Year group 2	−0.01 (−0.05, 0.03)	0.02	3374.19	0.697	−0.007 (−0.04, 0.03)

N.B. The reference group for this model was autumn scores, and year group 1. The number of schools is 159, the number of pupils is 3,532, and the number of observations is 5,743. Significant effects are in bold.

Internalising problems disadvantage gap model

The analysis of the Internalising problems scores used a three level model (school, pupil, time point) in which autumn and spring scores were regressed on time, FSM eligibility of pupils in 2020, and year group. Table 54 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 Internalising problems scores between FSM and non-FSM pupils. The model ascertains whether there was a significant change in this gap between the autumn and summer terms.

There was no significant interaction between time and FSM eligibility on pupils' Internalising problems scores, with an effect size of 0.01 (−0.05, 0.06). This means that between autumn and summer, the disadvantage gap for Internalising problems remained stable. This analysis controlled for year group. Effect size and confidence intervals are presented in Table 54.

Table 54: Internalising problems disadvantage gap repeated measures multilevel model results.

| Coefficients | Model coefficients | | | | Effect size |
	Estimate (95% CI)	Std. error	Degrees of freedom	P value	Hedge's G (95% CI)
(Intercept)	**1.60 (1.55, 1.65)**	**0.03**	**297.21**	**<0.001**	
Summer	−0.001 (−0.03, 0.03)	0.01	2391.36	0.939	−0.0008 (−0.02, 0.02)
FSM2020 yes	**0.23 (0.16, 0.30)**	**0.04**	**4441.17**	**<0.001**	**0.19 (0.14, 0.25)**
FSM2020 missing	0.02 (−0.10, 0.14)	0.06	420.29	0.698	0.02 (−0.08, 0.12)
Year group 2	−0.01 (−0.05, 0.03)	0.02	3370.75	0.605	−0.01 (−0.05, 0.03)
Summer*FSM2020 yes	0.01 (−0.05, 0.08)	0.03	2454.67	0.73	0.01 (−0.05, 0.06)
Summer*FSM2020 missing	−0.15 (−0.34, 0.03)	0.09	2838.25	0.101	−0.13 (−0.28, 0.03)

N.B. The reference group for this model was autumn scores, non-FSM pupils, and year group 1 pupils. The number of schools is 159, the number of pupils is 3,532, and the number of observations is 5,743. Significant effects are in bold.

Effect sizes

Effect sizes and their corresponding confidence intervals were calculated using the unconditional variance from a null model with no covariates. The ICCs from this model at different levels, and the parameters used to calculate effect sizes are displayed in Table 55.

Table 55:   ICC and effect size parameters from the null model.

Level	Variance	Standard deviation	ICC	Total variance from a model without covariates
School	0.05162	0.2272	0.1	0.53897
Pupil	0.30535	0.5526	0.57	0.53897
Time point	0.182	0.4266	–	0.53897

Externalising problems repeated measures analysis

Table 36 presents the means of the pupils' responses on the externalising problems for the group as a whole, for the non-FSM pupils, and for the FSM pupils. Each group's scores are split by term. Externalising problems is a negatively scored subscale, which means that higher scores on this scale indicate poorer social skills. For pupils overall, the mean scores on the externalising problems scale are lower in the summer term than in the autumn term. Furthermore, non-FSM pupils have lower scores (i.e., better social skills) at both time points than FSM pupils. The change in scores by time and for different FSM groups are shown in Figure 43.

Figure 43: Externalising problems scores.
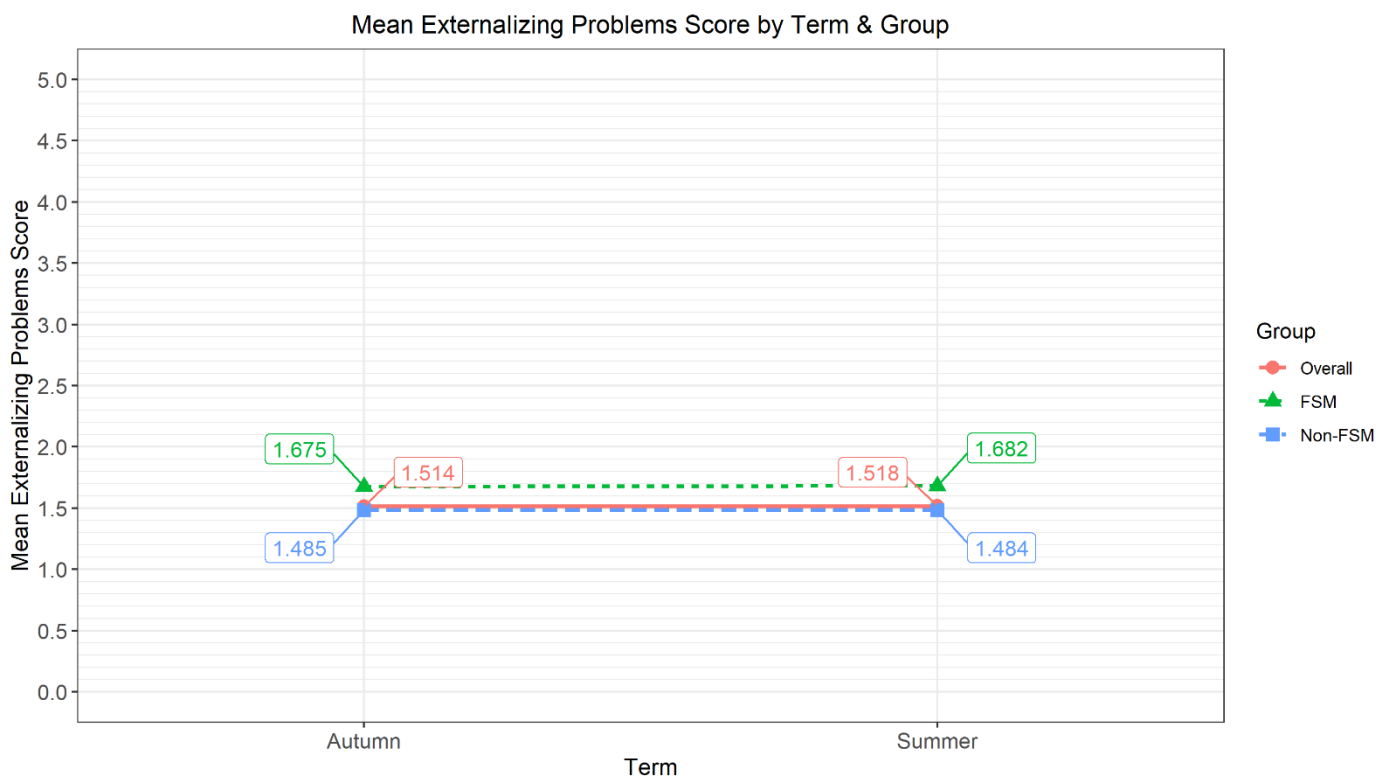
Externalising problems by time model

The analysis of the externalising problems scores used a three level model (school, pupil, time point) in which autumn and summer scores were regressed on time and year group. Table 56 presents the results from the model, which measures the impact of time on pupil outcomes. The model ascertains whether there was a significant change in pupils' externalising problems scores between the autumn and summer terms.

There was no significant impact of time on pupils' externalising problems scores, with an effect size of 0.01 (−0.01, 0.02). This means that between autumn and summer, mean externalising problems scores did not significantly change. This analysis controlled for year group. Effect size and confidence intervals are presented in Table 56.

Table 56: Externalising problems by time repeated measures multilevel model results.

| Coefficients | Model coefficients | | | | Effect size |
	Estimate (95% CI)	Std. error	Degrees of freedom	P value	Hedge's G (95% CI)
(Intercept)	**1.54 (1.49, 1.58)**	**0.02**	**323.41**	**<0.001**	
Summer	0.01 (−0.01, 0.03)	0.01	2366.03	0.503	0.01 (−0.01, 0.02)
Year group 2	−0.04 (−0.09, 0.01)	0.02	3418.92	0.091	−0.03 (−0.07, 0.01)

N.B. The reference group for this model was autumn scores, and year group 1. The number of schools is 159, the number of pupils is 3,532, and the number of observations is 5,743. Significant effects are in bold.

Externalising problems disadvantage gap model

The analysis of the externalising problems scores used a three level model (school, pupil, time point) in which autumn and spring scores were regressed on time, FSM eligibility of pupils in 2020, and year group. Table 57 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 externalising problems scores between FSM and non-FSM pupils. The model ascertains whether there was a significant change in this gap between the autumn and summer terms.

There was no significant interaction between time and FSM eligibility on pupils' externalising problems scores, with an effect size of −0.02 (−0.07, 0.03). This means that between autumn and summer, the disadvantage gap for externalising problems remained stable. This analysis controlled for year group. Effect size and confidence intervals are presented in Table 57.

Table 57: Externalising problems disadvantage gap repeated measures multilevel model results.

| Coefficients | Model coefficients | | | | Effect size |
	Estimate (95% CI)	Std. error	Degrees of freedom	P value	Hedge's G (95% CI)
(Intercept)	**1.51 (1.46, 1.55)**	**0.02**	**356.46**	**<0.001**	
Summer	0.01 (−0.01, 0.04)	0.01	2357.44	0.328	0.01 (−0.01, 0.03)
FSM2020 yes	**0.19 (0.12, 0.27)**	**0.04**	**4076.91**	**<0.001**	**0.16 (0.10, 0.22)**
FSM2020 missing	0.05 (−0.06, 0.16)	0.06	329.91	0.377	0.04 (−0.05, 0.14)
Year group 2	−0.04 (−0.09, 0.005)	0.02	3417.01	0.078	−0.04 (−0.07, 0.004)
Summer*FSM2020 yes	−0.02 (−0.08, 0.04)	0.03	2390.70	0.494	−0.02 (−0.07, 0.03)
Summer*FSM2020 missing	−0.07 (−0.24, 0.09)	0.08	2684.13	0.388	−0.06 (−0.20, 0.08)

N.B. The reference group for this model was autumn scores, non-FSM pupils, and year group 1 pupils. The number of schools is 159, the number of pupils is 3,532, and the number of observations is 5,743. Significant effects are in bold.

Effect sizes

Effect sizes and their corresponding confidence intervals were calculated using the unconditional variance from a null model with no covariates. The ICCs from this model at different levels, and the parameters used to calculate effect sizes are displayed in Table 58.

Table 58: ICC and effect size parameters from the null model.

Level	Variance	Standard deviation	ICC	Total variance from a model without covariates
School	0.03178	0.1783	0.05	0.59133
Pupil	0.41608	0.6450	0.7	0.59133
Time point	0.14347	0.3788	–	0.59133

Impact of age

The CSBQ scores were not age-standardised due to a lack of age-appropriate norms and expected distribution for the present sample; the norms are for up to age 6, whilst the current sample included pupils up to the age of 8. General increases in social skills would be expected with age though, as the CSBQ authors note, this increase is not necessarily linear. Some subscales demonstrated a significant effect of age, with Year 2 pupils scoring higher than Year 1 pupils. However, as discussed above, means and distributions both indicate that the whole sample were performing at high levels on the CSBQ.

Support strategies

As with the first return, schools in the summer term were implementing strategies to support their Key Stage 1 pupils in mathematics, reading and social skills/wellbeing. In the school survey, completed in autumn 2020, head teachers were asked what strategies their school planned to implement over the remainder of the AY. The responses for mathematics, reading and wellbeing/social skills are shown in Table 59, Table 60 and Table 61 respectively.

Table 59: Strategies planned for the 2020/21 AY to support Key Stage 1 mathematics (n=140 head teachers).

Strategy	Percentage (n=140)
Small group work	97%
Staff deployment (e.g., greater use of TAs to support individuals)	83%
Revised curriculum	71%
Parental engagement	70%
Catch-up schemes	57%
Other tutoring	33%
Tuition through NTP (National Tutoring Programme)	19%
NTP academic mentors	9%
Other (including subscriptions to additional resources)	5%

Table 60: Strategies planned for the 2020/21 AY to support Key Stage 1 reading.

Strategy	Percentage (n=140)
Small group work	97%
Staff deployment (e.g., greater use of TAs to support individuals)	86%
Parental engagement	74%
Revised curriculum	71%
Catch-up schemes	59%
Other tutoring	36%
Tuition through NTP (National Tutoring Programme)	20%
NTP academic mentors	7%
Other (including targeted interventions)	3%

Table 61: Strategies planned for the 2020/21 AY to support Key Stage 1 social skills and wellbeing (note this is frequency of response).

Strategy	Frequency (n=140)
Maintaining or increasing focus on PSHE	83
Targeted support	42
Additional staff deployment/employment	31
Recovery/adapted curriculum	27
Other	15
Revised school day	12
Parent engagement/home learning	11
Additional PE / extra-curricular activities	11
Additional staff training	8
Extended or supported transition	2

The teacher interviews, though only with a sample of ten teachers, gave some indication that some of these strategies had indeed been implemented over the AY.

To support pupils in English when they returned to school, some teachers reported using small group work or booster groups, phonics interventions, focusing on writing, and teaching a revised curriculum. To support pupils in mathematics during this period, the majority of teachers interviewed reported teaching a revised curriculum, with some also using specific catch-up schemes such as White Rose Mathematics, small group work or booster sessions.

The PPR indicated that (for the limited sample of respondents) 40% of Year 1 pupils and 43.9% of Year 2 pupils received additional reading support in the summer term. Additional mathematics support was given to 22.7% of Year 1 pupils and 27.3% of Year 2 pupils. Finally, additional social skills/wellbeing support was provided to 26.6% of Year 1 pupils and

19.8% of Year 2 pupils in the summer term. For each topic, these levels of catch-up support are the highest seen across autumn, spring and summer. This is likely due to schools having more experience with the catch-up strategies and more interventions already in place, in addition to the pupils seeing school staff face-to-face. As previously mentioned, data was gathered on the intensity and specific types of intervention, but due to extremely low response rates, reporting on these even smaller sub-categories would not be appropriate.

Future support

Beyond June 2021, the majority of interviewed teachers indicated that they would be focusing on social skills, creativity and PSHE. Some mentioned more detailed transitions in the next AY, continued small group work, an increased focus on phonics and targeted support for pupils. A few teachers intended to use assessments to check gaps in learning in order to support targeted teaching.

This data gives some insight into what schools and teachers were experiencing and implementing in the summer term. The anecdotal reports of social skills and wellbeing issues by teachers in the interviews is not mirrored in the CSBQ scores. This could be due to the fact that the CSBQ, although covering items such as internalising problems, does not specifically measure wellbeing in detail, and is intended for use in children below the age of the present sample. Distributions indicate a ceiling effect on the majority of subscales, which could indicate that the CSBQ is not fully capturing the level of social skills in this sample. This indicates the need for valid and reliable measures of socio-emotional skills in this age group. Additionally, head teachers and teachers were asked to compare the cohort to last year's cohort directly, whereas the CSBQ completion was not given this instruction. The CSBQ therefore may have been answered with an implication of how the pupils are performing 'under the circumstances', rather than a more absolute comparison. Alternatively, the teachers may have seen reduced social skills at the start of term, but worked hard to bring pupils to expected levels by the end of June when the CSBQ was administered (although social skills were at expected level in autumn). Finally, sample sizes for teacher interviews (n=10) and CSBQ measures (n=12 per class) are relatively small. Due to this complicated picture, results on social skills and wellbeing should be treated tentatively.

Teachers were also reporting catch-up strategies for mathematics and reading that had been highlighted by head teachers in the autumn survey, such as small-group work and revised curricula. Future plans are to continue with additional support where necessary in order to give all Key Stage 1 pupils the best chance of success in the 2021/22 AY.

Chapter 7 – Summer 2021 assessment

Summary

Attainment data – Year 1

- The overall performance of pupils in reading in summer 2021 was significantly lower than the standardisation sample in 2017, representing a Covid-19 gap of around three months' progress.

- The overall performance of pupils in mathematics in summer 2021 was significantly lower than the standardisation sample in 2017, representing a Covid-19 gap of around one months' progress.

- On both the reading and mathematics assessments in summer 2021, the proportion of pupils who scored below the lowest standardised score was higher than the standardisation sample in 2017.

- The disadvantage gap was around seven months' progress for reading and six months' progress for mathematics.

Attainment data – Year 2 (Key Stage 1 national curriculum test 2019)

- The overall performance of pupils in reading in summer 2021 was significantly lower than the 2016 sample, representing a Covid-19 gap of around two months' progress.

- The overall performance of pupils in mathematics in summer 2021 was significantly higher than the 2016 sample, representing an improvement of around one months' progress.

- The disadvantage gap for both reading and mathematics was around seven months' progress.

The assessment window for schools for the summer assessments was open between 8 June and 1 July 2021. Schools were asked to administer the assessments to all Year 1 and Year 2 pupils. Schools were provided with summer Year 1 NFER assessments for reading and mathematics and, for Year 2, the 2019 Key Stage 1 national curriculum test papers for reading and mathematics. A very small number of schools had previously administered the 2019 Key Stage 1 national curriculum test papers with their Year 2 pupils and these pupils were therefore excluded from the analysis. All assessments were marked by NFER.

In both Year 1 and Year 2, mathematics assessments consisted of two papers, one in arithmetic and the other in reasoning. Both papers are suitable for all pupils and should be taken by all. Pupils needed to sit both papers in order to be included within the study. The total number of Year 1 pupils included in the mathematics analysis was 5,456 from 148 schools. The total number of Year 2 pupils included in the mathematics analysis was 4,714 from 152 schools.

In both Year 1 and Year 2, reading assessments also consisted of two papers. The Year 1 NFER assessments follow the model of Key Stage 1 national assessment; both papers are intended for all pupils. However, as it is slightly higher in difficulty, it is expected that paper 2 may be unsuitable for some pupils and the NFER teacher guide advises that it is not suitable to administer this paper in such cases. The majority of pupils sat both papers; however, a small number of pupils who sat only paper 1 were also included in the study. No schools who did not administer paper 2 to any of their pupils for logistical, rather than accessibility, reasons were included in the results. The total number of Year 1 pupils included in the reading analysis was 5,367 from 150 schools. The same process was followed for Year 2 pupils taking the 2019 Key Stage 1 national curriculum assessment and the total number of Year 2 pupils included in the reading analysis was 4,685 from 155 schools.

Pupils' raw scores from the summer 2021 assessments were converted into standardised scores using the NFER conversion table,[40] which was created during the 2017 standardisation. This enables their performance to be compared to the standardised sample.

Year 1 attainment in reading and mathematics – Covid-19 gap

Table 62: Summary of results for Year 1 in summer 2021.

Measure	Reading		Mathematics	
	Standardisation sample 2017	Summer term 2021	Standardisation sample 2017	Summer term 2021
Mean	99.31	95.96	99.59	98.95
95% confidence interval	98.76–99.86	95.53–96.39	99.05–100.14	98.55–99.35
Standard deviation	14.60	16.24	14.44	14.86
N pupils[41]	2692	5456	2682	5367

Reading

The overall performance of Year 1 pupils in reading in summer 2021 was significantly lower than the standardised sample. The mean standardised score across the summer 2021 sample was 95.96 compared to 99.31 at standardisation. This equates to an effect size of −0.23,[42] or around −3 months' progress using EEF's conversion table in their Early Years Toolkit.[43]

The standard deviation of the study sample is larger, at 16.24, 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 44 shows a larger proportion of pupils in summer 2021 scoring below 85, although the proportion of pupils scoring above 115 is relatively similar to the standardisation sample. This can also be seen in Figure 45, which shows the cumulative percentage of reading standardised scores distribution in both summer 2021 and the standardisation sample. It shows that, overall, many more pupils in our sample scored towards the lower end of the possible standardised scores.

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[40] This table is provided to schools using NFER assessments.
[41] All samples were weighted by Key Stage 2 performance.
[42] Covid-19 gap effect sizes were calculated by dividing the difference in standardised score points between the samples by the standard deviation of the standardisation sample.
[43] https://educationendowmentfoundation.org.uk/education-evidence/using-the-toolkits

Figure 44: Distributions of reading standardised scores for standardisation sample and summer 2021 sample of Year 1 pupils.

Figure 45: Distribution of cumulative reading standardised scores for standardisation sample and summer 2021 sample of Year 1 pupils.
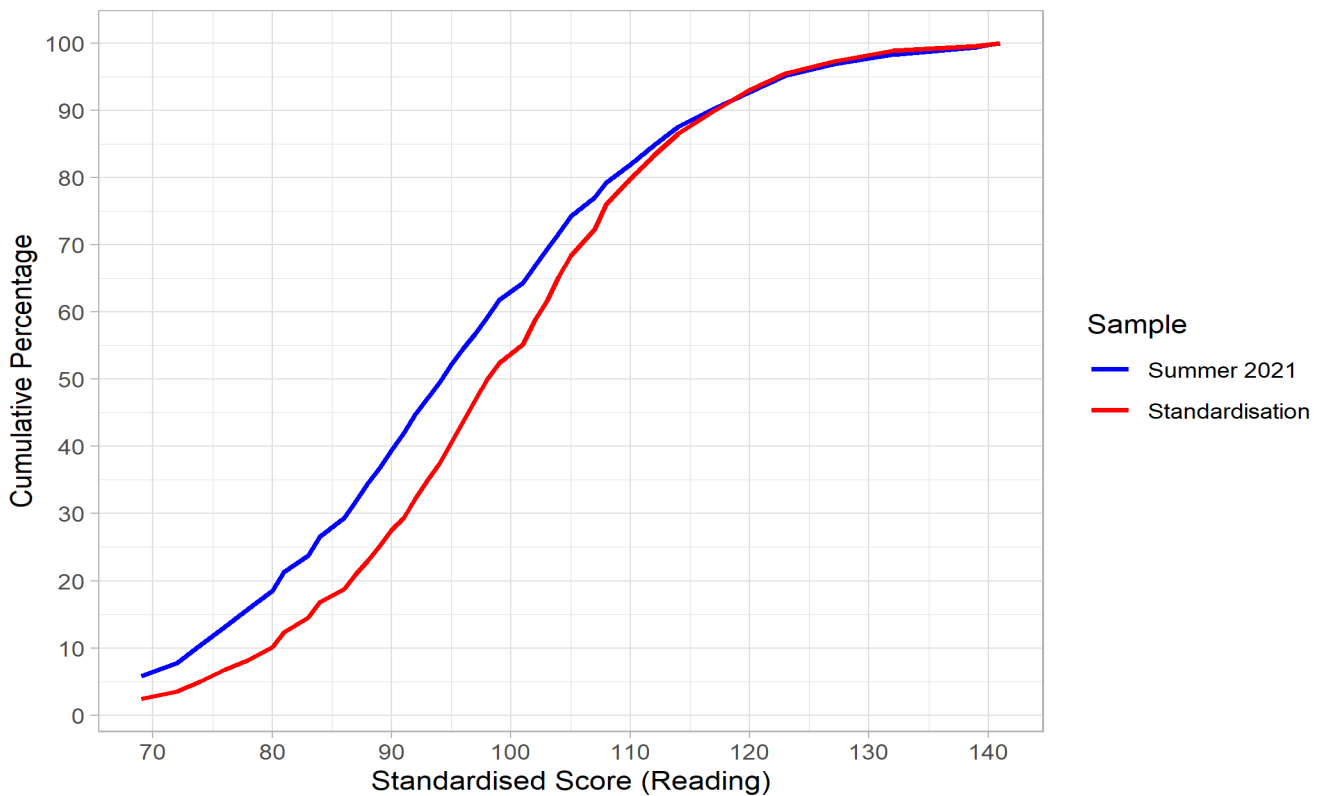
It is noteworthy that a higher proportion of pupils (319 or 5.8%) than the standardisation sample scored fewer than five marks on the reading assessment, resulting in a standardised score of 69. This indicated that a large number of pupils were unable to engage effectively with the assessments. In the standardisation sample, the percentage of pupils being awarded this score was 2.4%.

Figure 46: Distribution of reading standardised scores for the summer 2021 sample of Year 1 pupils.
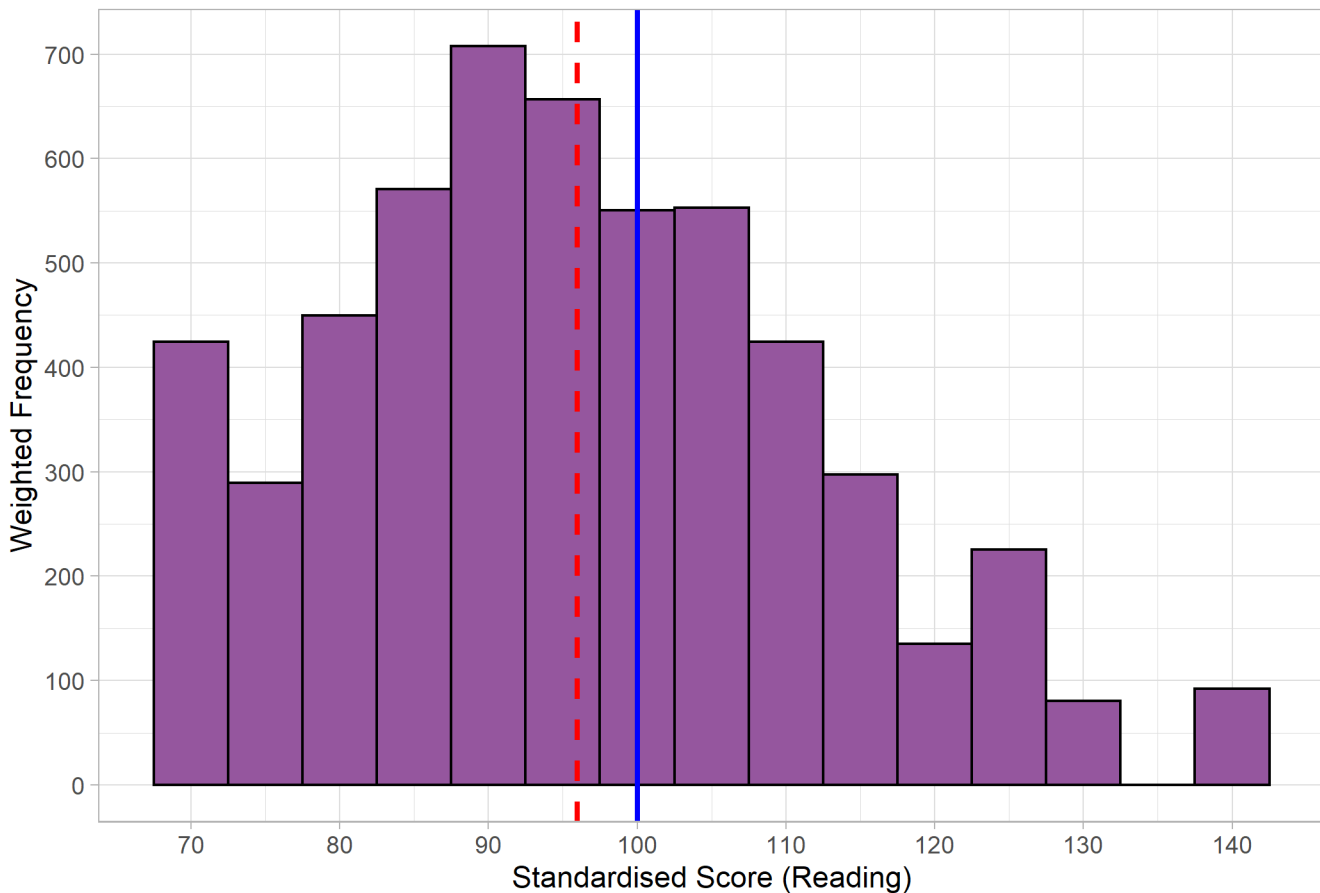
In Figure 46, the blue line represents the expected mean if the sample performed exactly as the standardisation sample, and the red dotted line represents the observed mean for the sample in summer 2021. The distribution shows a positive skew, i.e., more lower scores and fewer higher scores than expected, compared to the 2017 standardisation sample.

Mathematics

Although the overall performance of Year 1 pupils in mathematics in summer 2021 was lower than the standardisation sample, it was not significantly so. The mean standardised score across the spring 2021 sample was 98.95, compared to 99.59 at standardisation. This equates to an effect size of −0.04, or around −1 month's progress.

The standard deviation of the study sample is larger than that of the standardisation sample, at 14.86, indicating a slightly wider spread of scores.

Figure 47 shows a smaller proportion of pupils scoring above 115 and a higher proportion scoring below 85. This can also be seen in Figure 48, which shows the cumulative percentage of mathematics standardised scores distribution in both summer 2021 and the standardisation sample. It shows that overall the pupils in our sample had a relatively similar distribution of standardised scores to the standardisation sample.

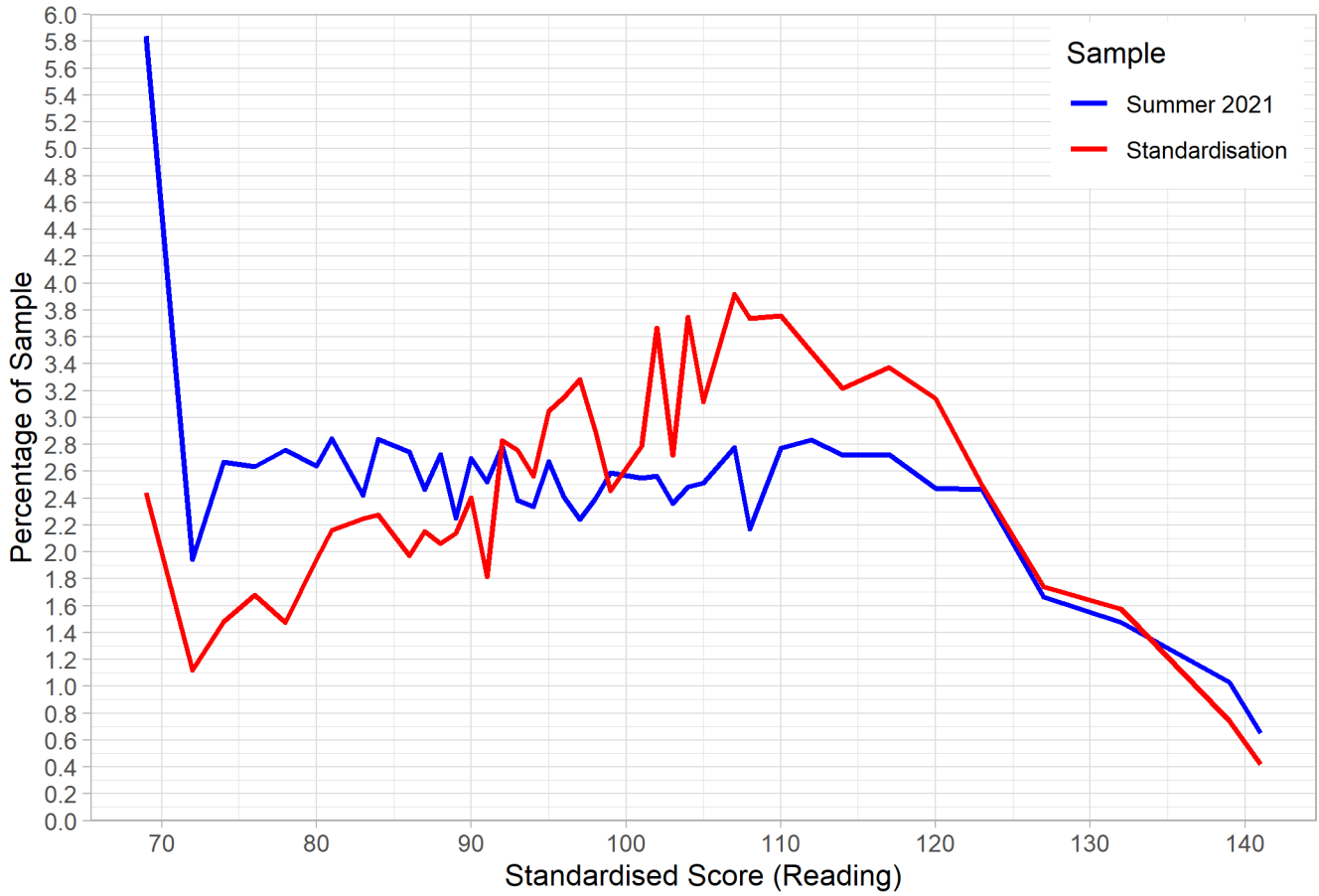Figure 47: Distributions of mathematics standardised scores for standardisation sample and summer 2021 sample of Year 1 pupils.
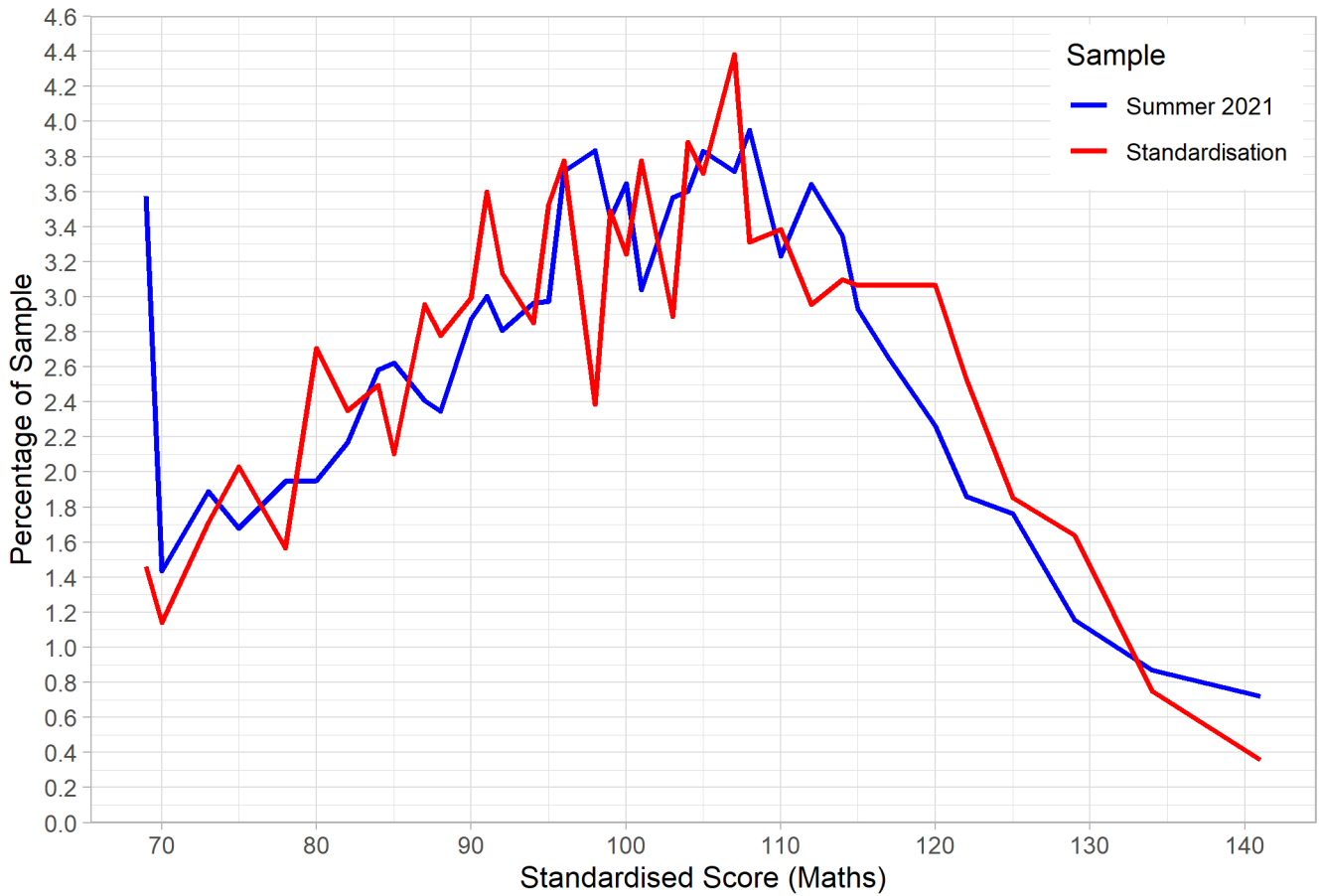
Figure 48: Distribution of cumulative mathematics standardised scores for standardisation sample and summer 2021 sample of Year 1 pupils.
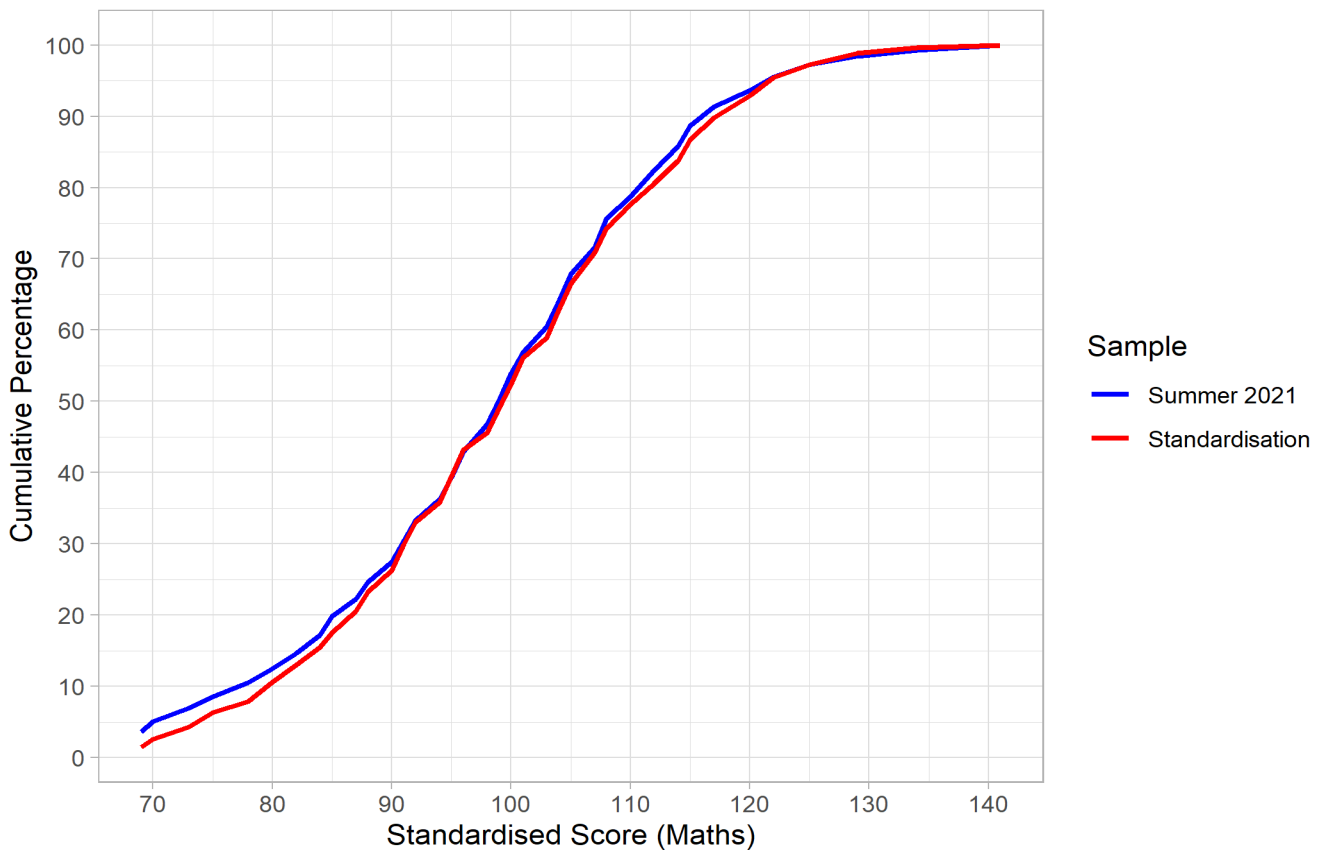
All pupils included in the analysis had shown evidence of having engaged with both mathematics papers, since those pupils who sat only one paper have been excluded.

As in the reading assessment, a higher proportion of pupils (192 or 3.6%) than in the standardisation sample scored fewer than five marks on the mathematics assessment, resulting in a standardised score of 69. A number of pupils were therefore unable to engage effectively with the content of the assessments. In the standardisation sample, the percentage of pupils being awarded this score was lower, at 1.5%.

Figure 49: Distribution of mathematics standardised scores for the summer 2021 sample of Year 1 pupils.
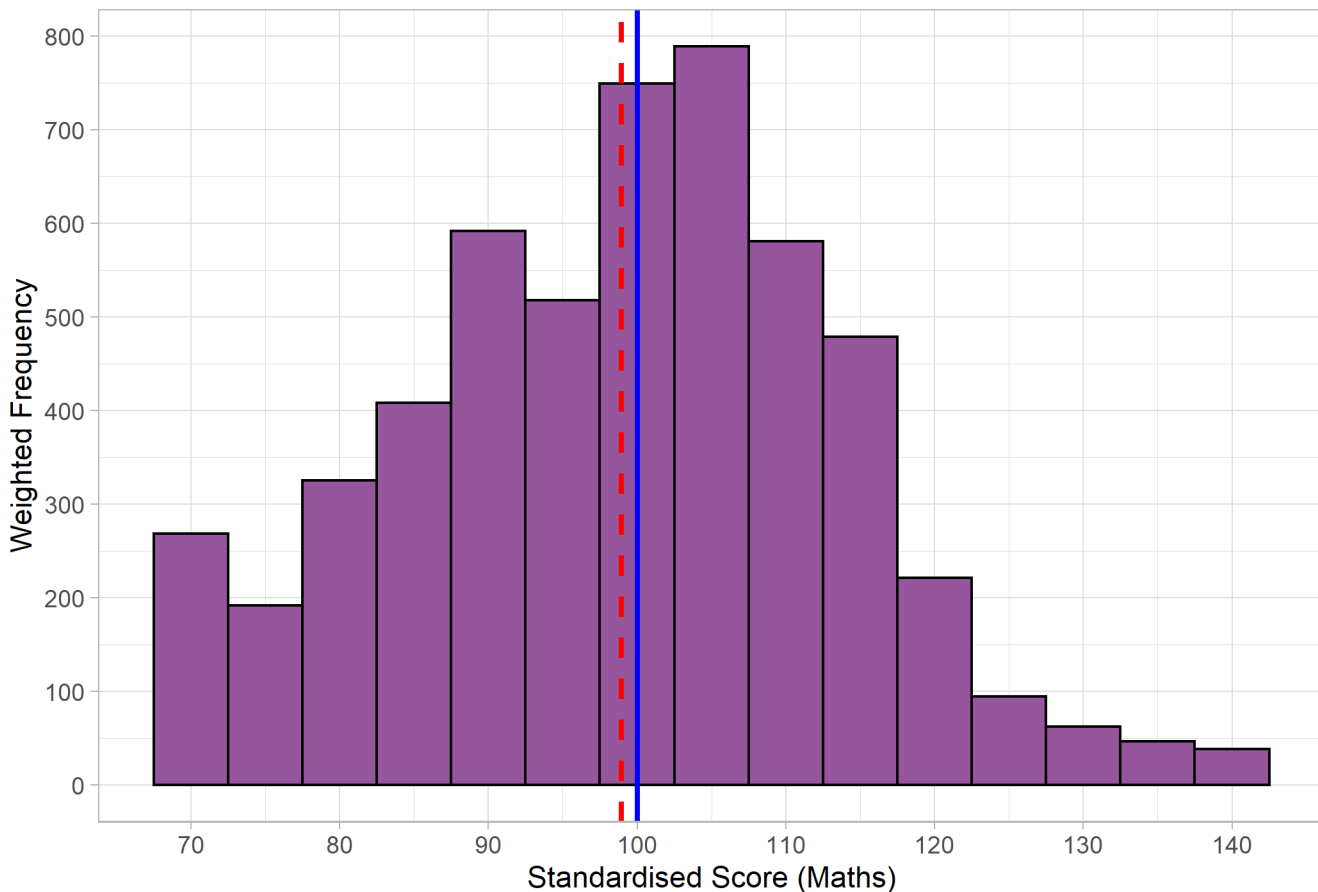
In Figure 49, the blue line represents the expected mean if the sample performed exactly as the standardisation sample and the red dotted line represents the observed mean for the sample in summer 2021. The distribution shows a positive skew, i.e., more lower scores and fewer higher scores than expected, compared to the 2017 standardised sample.

Year 1 attainment in reading and mathematics – disadvantage gap

Within the summer 2021 sample, approximately 18% of the pupils in Year 1 were classed as disadvantaged in spring 2021 (i.e., eligible for FSM as reported by schools).

Reading

Table 63 shows a summary of the performance of disadvantaged pupils compared to those pupils who are not disadvantaged (i.e., eligibility for FSM as reported by schools).

Table 63: Performance of Year 1 disadvantaged pupils in reading for summer 2021.

Measure	Standardisation sample 2017	Summer 2021 all pupils	Summer 2021 FSM	Summer 2021 non-FSM
Mean	99.31	95.96	88.90	97.59
95% confidence Interval	98.76–99.86	95.53–96.39	88.01–89.79	97.11–98.07
Standard deviation	14.60	16.24	14.45	16.20
N pupils[44]	2692	5456	1014	4431

The difference between the mean standardised scores of disadvantaged pupils and non-disadvantaged pupils is large, at 8.69 standardised score points. The effect size for this data is 0.53 which, using EEF's table, equates to seven months of learning.

Mathematics

Table 64 shows a summary of the performance of disadvantaged pupils compared to those pupils who are not disadvantaged (i.e., eligibility for FSM as reported by schools).

Table 64: Performance of Year 1 disadvantaged pupils in mathematics for summer 2021.

Measure	Standardisation sample 2019	Summer 2021 all pupils	Summer 2021 FSM	Summer 2021 non-FSM
Mean	99.59	98.95	93.08	100.26
95% confidence Interval	99.05–100.14	98.55–99.35	92.17–93.99	99.83–100.69
Standard deviation	14.44	14.86	14.53	14.63
N pupils[45]	2682	5367	973	4384

The difference between the mean standardised scores of disadvantaged pupils and non-disadvantaged pupils is large at 7.18 standardised score points. The effect size for this data is 0.48 which, using EEF's table, equates to six months of learning.

Year 2 attainment in reading and mathematics

There is no NFER assessment available for Year 2 as, under normal circumstances, they would be sitting the Key Stage 1 national curriculum assessment. Due to the pandemic, no national curriculum assessments were available for 2020 or 2021. The 2019 papers, being the last available, were used as the summer assessment for Year 2.

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[44] All samples were weighted by Key Stage 2 performance.
[45] All samples were weighted by Key Stage 2 quintiles.

Key Stage 1 national curriculum assessments

The Key Stage 1 national curriculum assessments are criterion referenced rather than norm referenced and raw scores are converted to a scaled score rather than a standardised score. The national curriculum assessment changes each year and, whilst they are developed to the same specification, the use of different questions means that the difficulty of the assessment may vary slightly each year. All raw scores are, therefore, converted into a scaled score to enable comparison of pupil performance between different assessments. Pupils who achieve a scaled score of 100 or more have met the expected standard on the assessment regardless of the year taken, but the number of raw marks needed to achieve this will change. The standard was set in 2016 by the Department for Education.

The range of available scaled scores for each assessment remains consistent for each year, with 85 being the lowest scaled score that can be awarded and 115 being the highest available scaled score. Scores falling outside of this range would be considered exceptional and cannot be scored with the necessary reliability. Where an exact score is needed for these pupils, for example in order to calculate a mean, a value of 84 or 115 is used. In both reading and mathematics, pupils who scored less than 3 marks across both papers were awarded a scaled score of 84.

Table 65: Summary of results for Year 2 in summer 2021.

Measure	Reading		Mathematics	
	2016 sample	Summer term 2021	2016 sample	Summer term 2021
Mean	100.81	99.92	100.51	100.78
95% confidence interval	100.71–100.91	99.67–100.16	100.41–100.61	100.56–101.00
Standard deviation	8.19	8.59	8.00	7.67
N pupils[46]	26,739	4714	25,759	4685

Pupils reaching the expected standard

In 2016, the percentage of pupils achieving a scaled score of 100 and thus reaching the expected standard in reading was 61.88%. In 2021, the percentage of pupils achieving a scaled score of 100 was lower, at 57.89%.

In 2016, the percentage of pupils achieving a scaled score of 100 and thus reaching the expected standard in mathematics was 57.59%. In 2021, the percentage of pupils achieving a scaled score of 100 was higher, at 59.05% (Figure 50).

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[46] Only the summer 2021 reading and mathematics samples required weighting by Key Stage 2 performance.

Figure 50: Percentage of pupils reaching the expected standard in reading and mathematics.
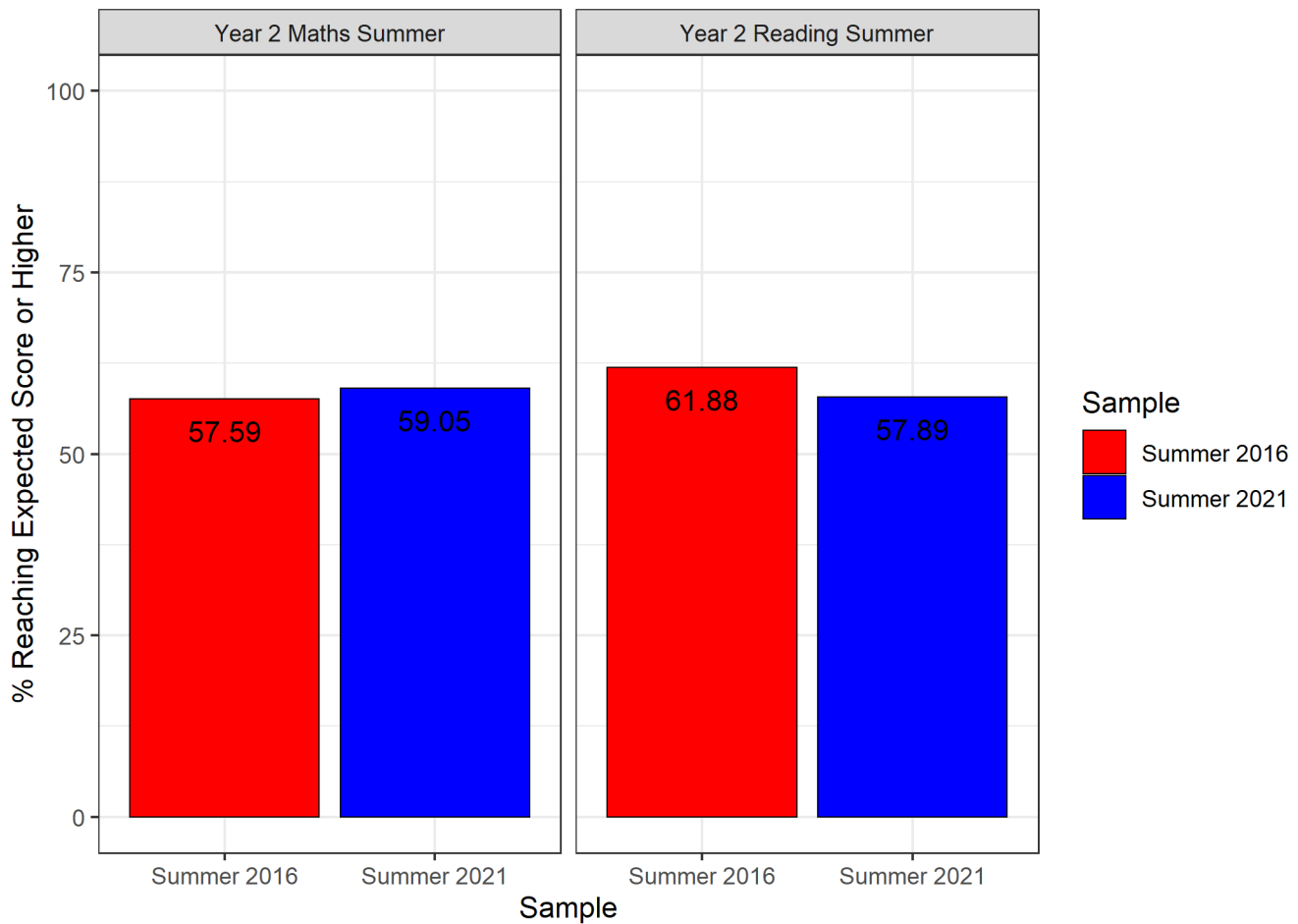
Reading

The overall performance of Year 2 pupils in reading in summer 2021 was significantly lower than the 2016 sample. The mean scaled score across the summer 2021 sample was 99.92 compared to 100.81 in 2016. This equates to an effect size of −0.11,[47] or around −2 months' progress using EEF's conversion table in their Early Years Toolkit.[48]

The standard deviation of the study sample is slightly larger at 8.59 than that of the 2016 sample. This is due in part to a larger proportion of pupils scoring at the lowest end of the range.

Figure 51 shows that a larger proportion of pupils scored at the lower end of the distribution in 2021 as compared to 2016. This can also be seen in Figure 52, which shows the cumulative percentage of reading scaled scores distribution in both summer 2021 and the standardisation sample. It shows that, overall, more pupils in our sample scored towards the lower end of the possible standardised scores.

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[47] Covid-19 gap effect sizes were calculated by dividing the difference in scaled score points between the samples by the standard deviation of the 2016 sample.
[48] https://educationendowmentfoundation.org.uk/education-evidence/using-the-toolkits

Figure 51: Distributions of reading scaled scores for 2016 sample and summer 2021 sample of Year 2 pupils.
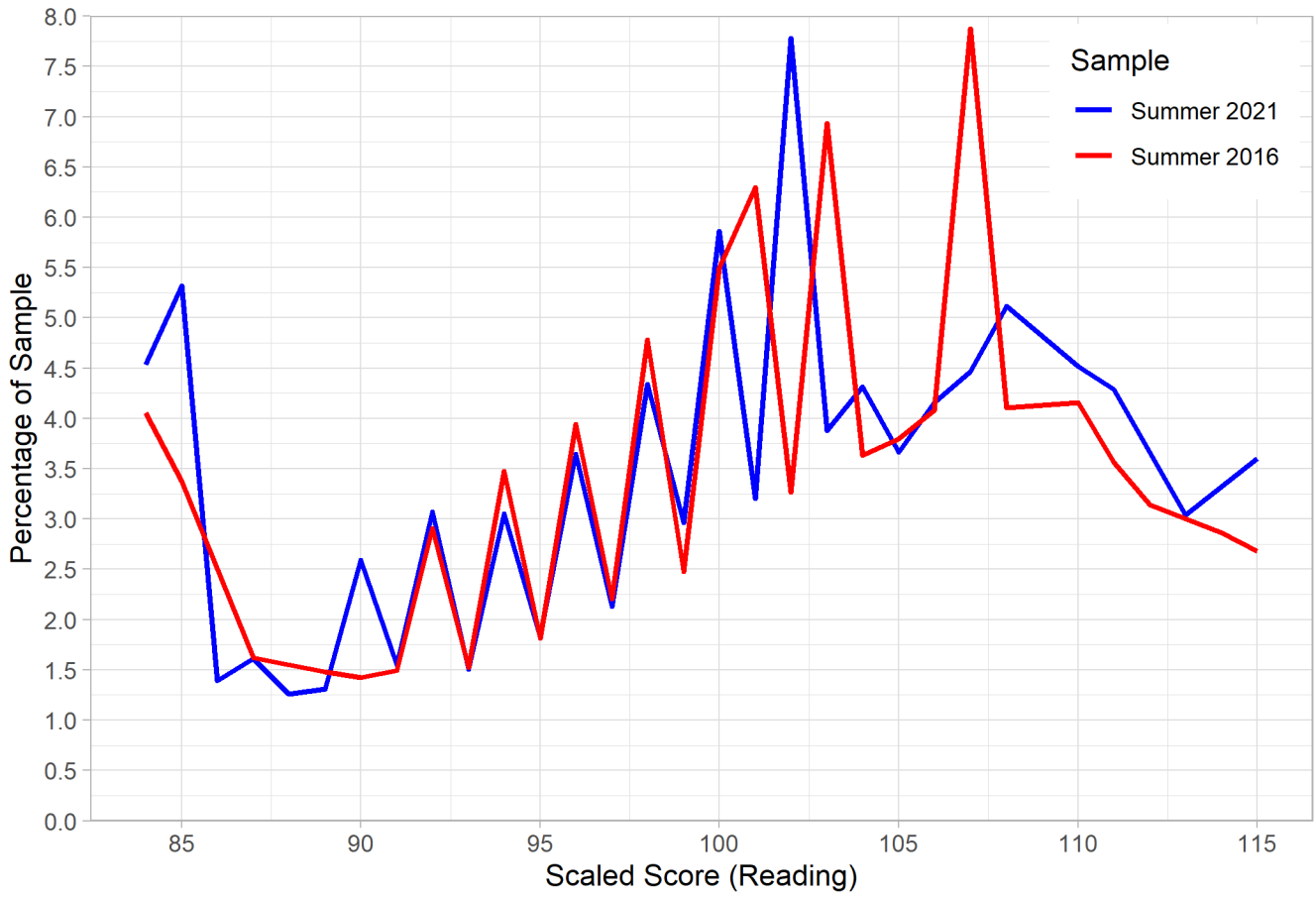
Figure 52: Distribution of cumulative reading scaled scores for 2016 sample and summer 2021 sample of Year 2 pupils.
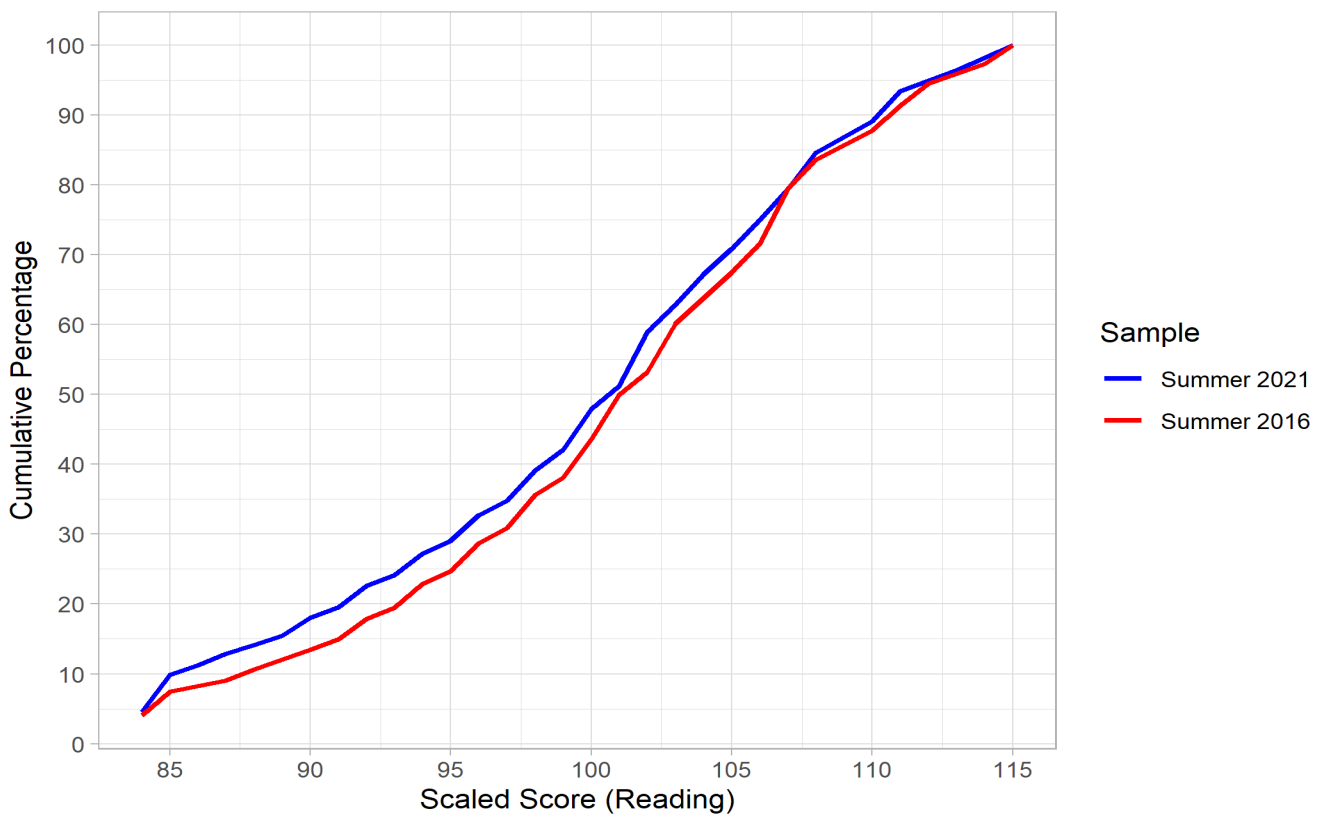
As explained earlier, scores falling outside of the expected range of scaled scores (85 to 115) are considered exceptional. It is noteworthy that, whilst a relatively high proportion of pupils (214 or 4.5%) scored fewer than three marks on the reading assessment resulting in a scaled score of 84, this was similar to that of the 2016 sample of 4.1%. This indicated that a number of pupils in both the 2016 cohort and the 2021 cohort were unable to engage effectively with the assessments.

In Figure 53, the blue line represents the expected mean if the sample performed exactly as the 2016 sample, and the red dotted line represents the observed mean for the sample in summer 2021. The distribution of the scaled scores shows a slight negative skew of the scores. In comparison to the 2016 sample, we observe a lower mode, i.e., the most frequent scaled score, and a larger proportion of pupils scoring at the lower end of the range of possible scaled scores.

Figure 53: Distribution of reading standardised scores for the summer 2021 sample of Year 2 pupils.
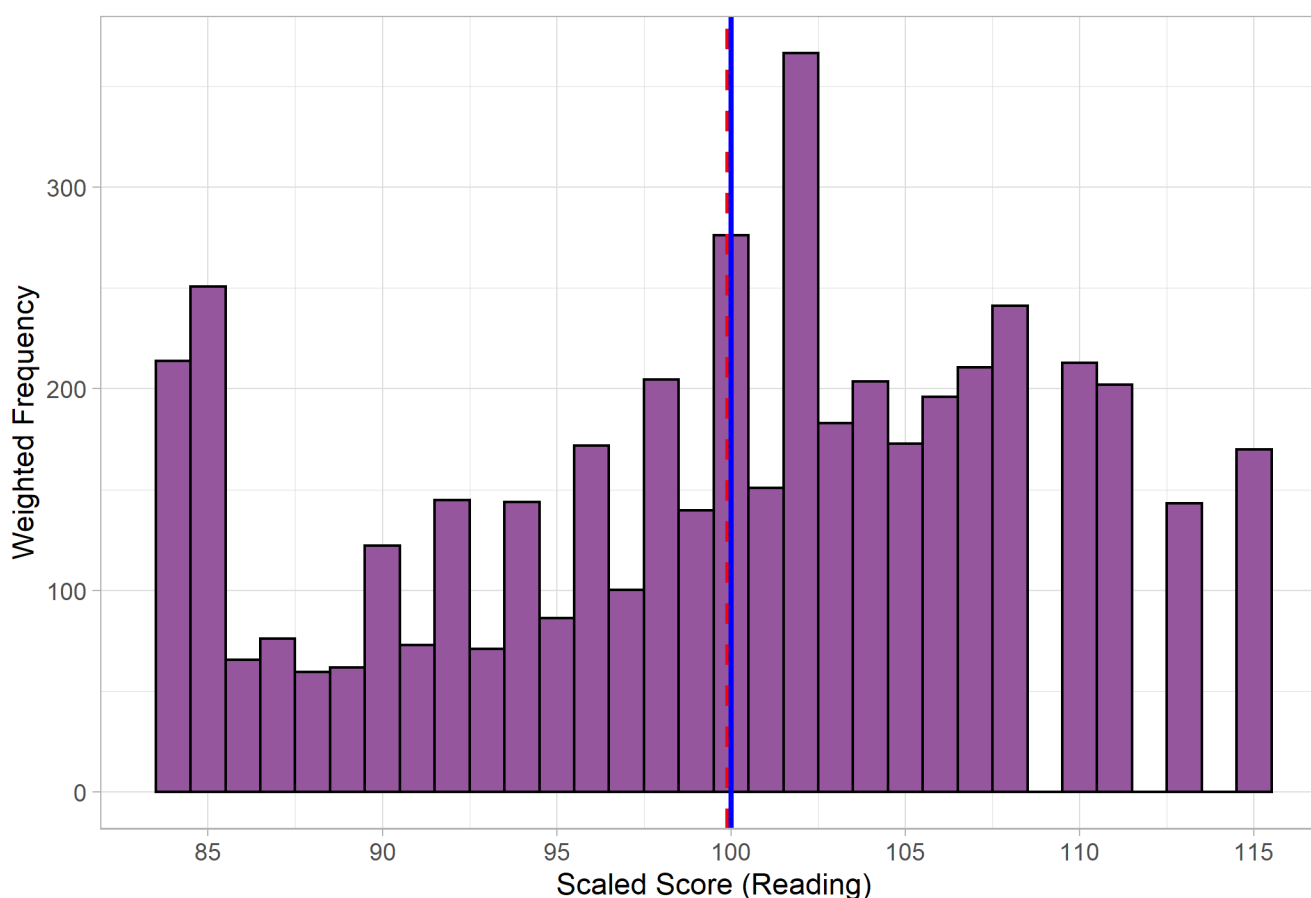
Mathematics

Unlike all of our other findings from the assessments, the overall performance of pupils in mathematics in summer 2021 was significantly higher than the 2016 sample. The mean scaled score across the summer 2021 sample was 100.78 compared to 100.51 in 2016. This equates to an effect size of +0.03 or around +1 months' progress.

The 'sawtooth effect' is a pattern of change caused by assessment reform, following which results are adversely affected before an improvement in performance is seen, as teachers and pupils become more familiar with the curriculum and assessment requirements. The sample used for comparison was standardised in 2016 following a change in the national curriculum. It is difficult to distinguish between the improvement made by the 2021 sample, in comparison to the 2016 sample, and that which might be expected as a result of the sawtooth effect.

The standard deviation of the study sample is smaller at 7.67 than that of the 2016 sample, indicating a narrower range of scores.

Figure 54 shows a similar proportion of pupils scoring at the upper end of the range and a slightly smaller proportion of pupils scoring at the lower end of the distribution. This can also be seen in Figure 55, which shows the cumulative percentage of mathematics scaled scores distribution in both summer 2021 and the standardisation sample. It shows that, overall, the pupils in our sample had a relatively similar distribution of scaled scores to the standardisation sample.

Figure 54:   Distributions of mathematics scaled scores for 2016 sample and summer 2021 sample of Year 2 pupils.
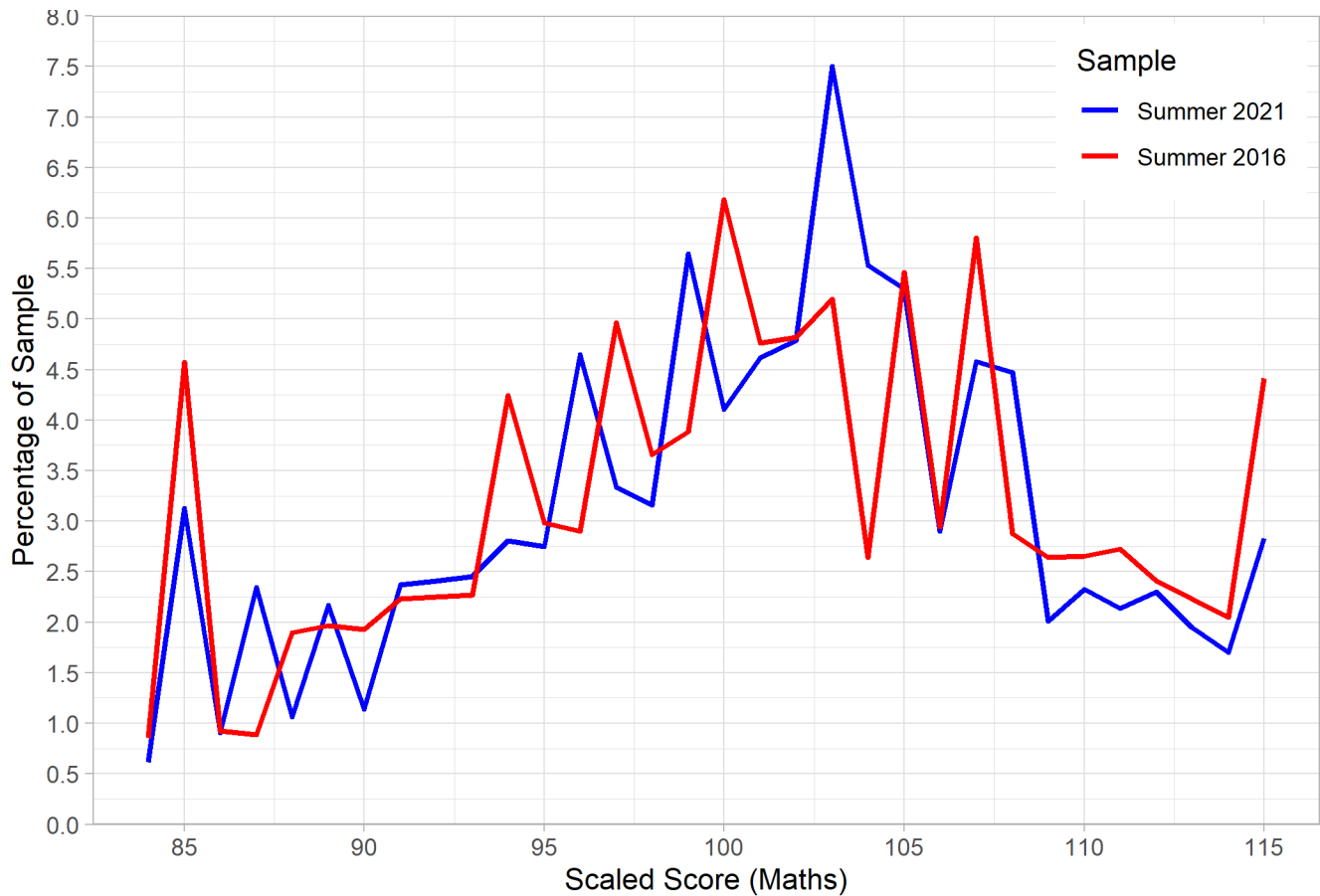
Figure 55: Distribution of cumulative mathematics scaled scores for 2016 sample and summer 2021 sample of Year 2 pupils.
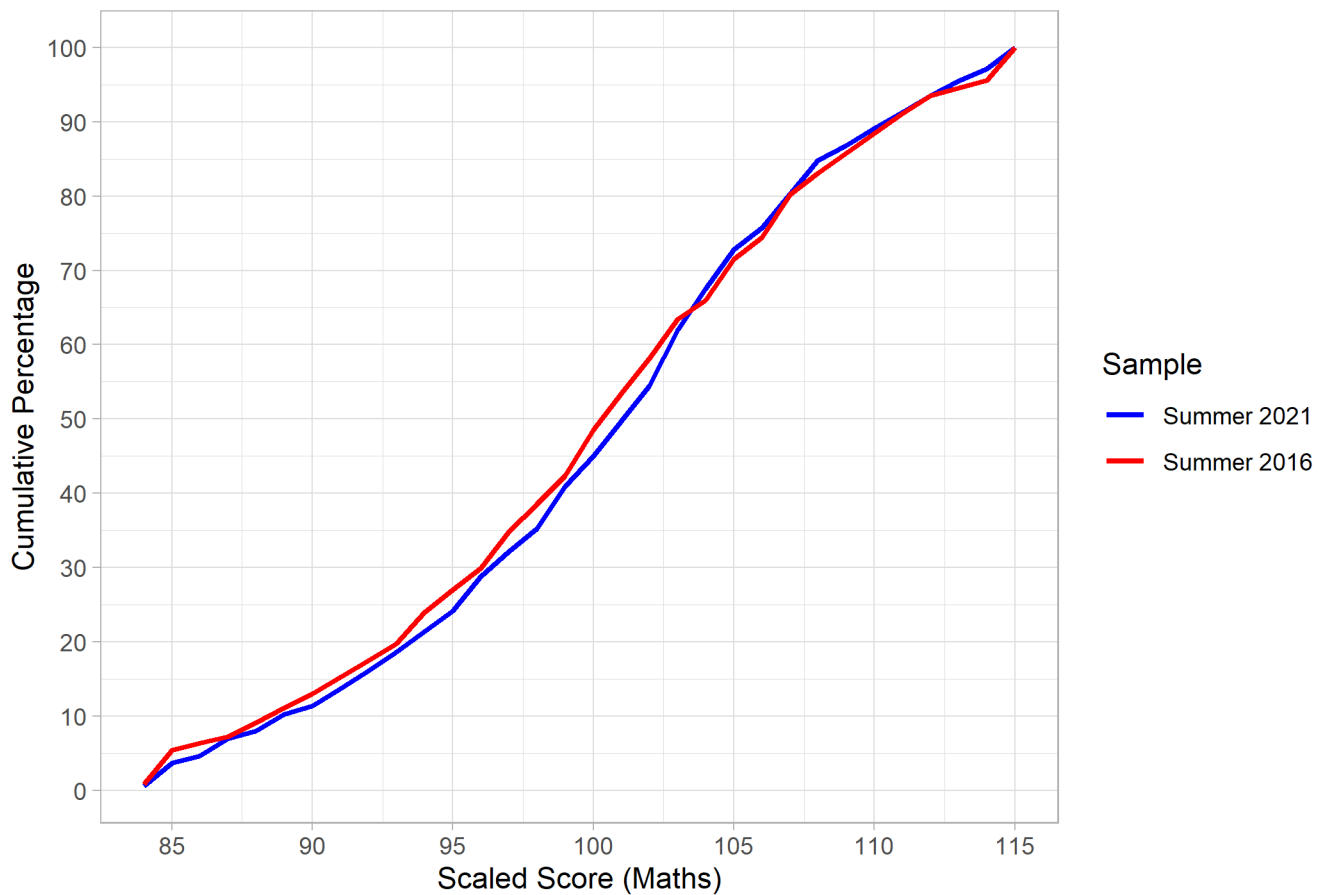
All pupils included in the study had shown evidence of having engaged with both mathematics papers since those pupils who sat only one paper have been excluded.

In the mathematics assessment, a slightly smaller proportion of pupils in the summer 2021 sample, 0.6%, scored fewer than three marks than in the 2016 sample, 0.9%, and were awarded a scaled score of 84. This shows that most pupils were able to engage with some of the content of the assessments.

In Figure 56 the blue line represents the expected mean if the sample performed exactly as the 2016 sample and the red dotted line represents the observed mean for the sample in summer 2021. The distribution shows a slight negative skew of the scores. In comparison to the 2016 sample, we observe a higher mode, i.e., the most frequent scaled score, and a smaller proportion of pupils scoring on the lower end of the range of possible scaled scores. However, in summer 2021, we also observed a lower proportion of pupils scoring at the upper end of the range of possible scaled scores, i.e., attaining high scaled scores.

Figure 56: Distribution of mathematics scaled scores for the summer 2021 sample of Year 2 pupils.
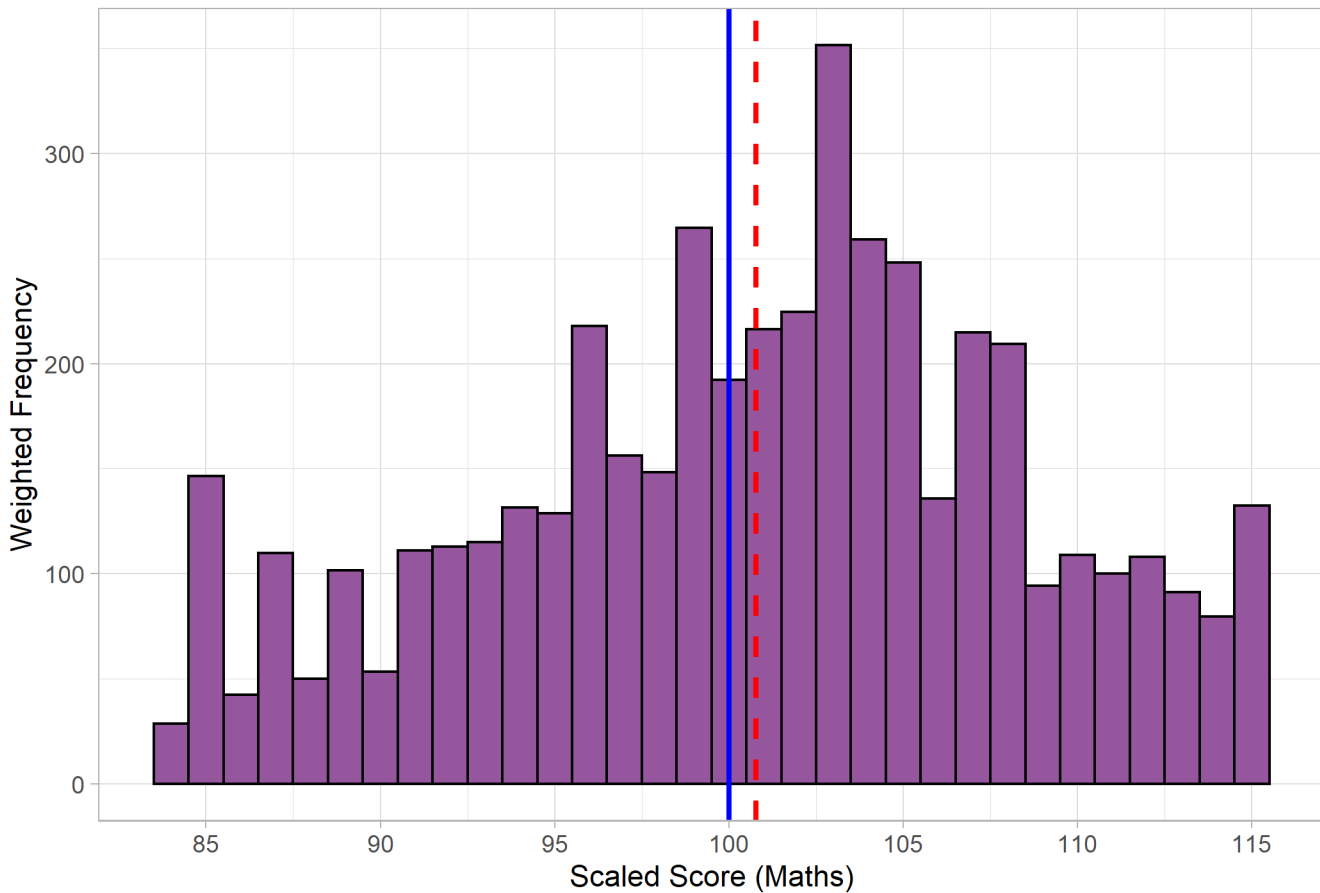
Year 2 attainment in reading and mathematics – disadvantage gap

Within the summer 2021 sample, approximately 19% of the pupils in Year 2 were classed as disadvantaged in summer 2021 (i.e., eligible for FSM as reported by schools).

Reading

Table 66 shows a summary of the performance of disadvantaged pupils compared to those pupils who are not disadvantaged (i.e., eligibility for FSM as reported by schools).

Table 66: Performance of Year 2 disadvantaged pupils in reading for summer 2021.

Measure	2016 sample	Summer 2021 all pupils	Summer 2021 FSM	Summer 2021 non-FSM
Mean	100.81	99.92	95.77	100.91
95% confidence interval	100.71–100.91	99.67–100.16	95.22–96.32	100.64–101.17
Standard deviation	8.19	8.59	8.45	8.32
N pupils[49]	26,739	4714	912	3798

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[49] All samples, besides the 2016 sample, were weighted by Key Stage 2 performance.

The performance of pupils from disadvantaged backgrounds is significantly lower than that of their peers. The difference between the mean scaled scores of disadvantaged pupils and non-disadvantaged pupils is large at 5.14 scaled score points. The effect size for this data is 0.60[50] which, using EEF's table,[51] equates to seven months of learning.

To put this in context, without school closures, we would have expected the disadvantage gap to be six months. This means that the disadvantage gap, now with an effect size of 0.60 or seven months, has widened from what might have been predicted without school closures. Given the forecast that the disadvantage gap might increase by 0.022 standard deviations per month of closures, our findings on the disadvantage gap are not unexpected given the uncertainties in these measures.

Mathematics

Table 67 shows a summary of the performance of disadvantaged pupils compared to those pupils who are not disadvantaged (i.e., eligibility for FSM as reported by schools).

Table 67: Performance of Year 2 disadvantaged pupils in mathematics for summer 2021.

Measure	2016 Sample	Summer 2021 all pupils	Summer 2021 FSM	Summer 2021 non-FSM
Mean	100.51	100.78	97.17	101.64
95% confidence interval	100.41–100.61	100.56–101.00	96.68–97.66	101.40–101.88
Standard deviation	8.00	7.67	7.52	7.45
N pupils[52]	25,759	4685	907	3774

The performance of pupils from disadvantaged backgrounds is significantly lower than that of their peers. The difference between the mean scaled scores of disadvantaged pupils and non-disadvantaged pupils is large, at 4.47 scaled score points. The effect size for this data is 0.58 which, using EEF's table, equates to seven months of learning.

To put this in context, without school closures we would have expected the disadvantage gap to be six months' progress. This means that the disadvantage gap, now with an effect size of 0.58 or seven months' progress, has widened from what might be predicted without school closures. Given the forecast that the disadvantage gap might increase by 0.022 standard deviations per month of closures, our findings on the disadvantage gap are not unexpected given the uncertainties in these measures.

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[50] Disadvantage gap effect sizes were calculated by dividing the scaled score point difference between FSM and non-FSM pupils by the overall summer 2021 standard deviation.
[51] https://educationendowmentfoundation.org.uk/evidence-summaries/about-the-toolkits/attainment/
[52] All samples, besides the 2016 sample, were weighted by Key Stage 2 performance.

Chapter 8 – Assessment through the academic year

Summary

Attainment data – Year 1

- The performance of pupils in mathematics was significantly higher in summer 2021 than in spring 2021 and there was a reduction in the Covid-19 gap between the two time points.

- The performance of pupils in reading did not change significantly between spring 2021 and summer 2021, and the Covid-19 gap remained stable between the two time points.

- For both reading and mathematics, the performance of children from disadvantaged backgrounds was significantly higher in summer 2021 than in spring 2021, and there was a reduction in the disadvantage gap between the two time points.

Attainment data – Year 2

- The performance of pupils in mathematics was significantly lower in spring 2021 than in autumn 2020 and there was an increase in the Covid-19 gap between the two time points.

- For mathematics, the performance of children from disadvantaged backgrounds was significantly lower in spring 2021 than in autumn 2020, and there was an increase in the disadvantage gap between the two time points.

- The performance of pupils in reading was significantly lower in spring 2021 than in autumn 2020 and there was an increase in the Covid-19 gap between the two time points.

- For reading, the performance of children from disadvantaged backgrounds did not significantly change between autumn 2020 and spring 2021 and the disadvantage gap remained stable.

Following our analysis undertaken in each academic term to investigate the Covid-19 gap by comparing assessment results to previous years, as well as the disadvantage gap, we followed the variation in these two gaps throughout the 2020/21 AY, from autumn 2020 to summer 2021. We wanted to find out whether these gaps would close, remain stable or widen further.

We used only the NFER assessment results to track these gaps as the Key Stage 1 2019 national curriculum assessments produced scaled scores that are not comparable to NFER standardised scores. Hence, we followed the Covid-19 and disadvantage gaps through spring 2021 and summer 2021 for Year 1 reading and mathematics. For Year 2, we followed the Covid-19 and disadvantage gaps through autumn 2020 to spring 2021. It is noteworthy here to turn the reader's attention to the time at which the follow ups are being made. For the Year 1 repeated measures analysis, this happened from spring to summer, at a time when students were back to school and, as such, we would have expected some sort of improvement. On the other hand, the comparisons between time points made for Year 2 happened from autumn and spring, during which school closures did occur, and we would have expected this to have some sort of negative impact on student attainment. Therefore, we draw caution to drawing erroneous conclusions from comparisons between Year 1 and Year 2 when it comes to the closing of the Covid-19 attainment gap as those comparisons were made for different time points for different year groups (i.e., autumn 2020 to spring 2021 for Year 2 and spring 2021 to summer 2021 for Year 1).

Year 1 reading repeated measures analysis

5,775 pupils were entered into the Year 1 reading repeated measures multilevel models. Out of these 5,775 pupils, 319 pupils took the Year 1 spring reading assessment but not the summer one, 472 took the Year 1 summer reading assessment but not the spring one, and 4,984 pupils took both.

Table 68: Reading standardised means.

| | Standardised means | | | | | | | |
| | Spring 2021 | | | | Summer 2021 | | | |
Outcome	n	Weighted n	Mean (95% CI)	SD	n	Weighted n	Mean (95% CI)	SD
Year 1 reading	5303	5322	96.33 (95.9, 96.76)	15.77	5456	5481	95.94 (95.50, 96.37)	16.22
Year 1 reading (FSM only)	809	806	88.37 (87.41, 89.32)	13.9	806	800	88.85 (87.84, 89.85)	14.48
Year 1 reading (non-FSM only)	4432	4465	97.80 (97.34, 98.26)	15.66	4343	4389	97.29 (96.81, 97.77)	16.17

Table 68 presents the standardised means of the Year 1 reading responses for the group as a whole, for the non-FSM pupils, and for the FSM pupils. Each group's scores are split by term. For pupils overall and non-FSM pupils, Year 1 reading results are lower in the summer term than in the spring term. Following the common trend, non-FSM pupils have higher scores at both time points than FSM pupils. However, in this cohort, there was a small increase in the average scores of FSM pupils from spring to summer. These mean differences are further displayed in Figure 57.

Figure 57:   Year 1 reading scores.
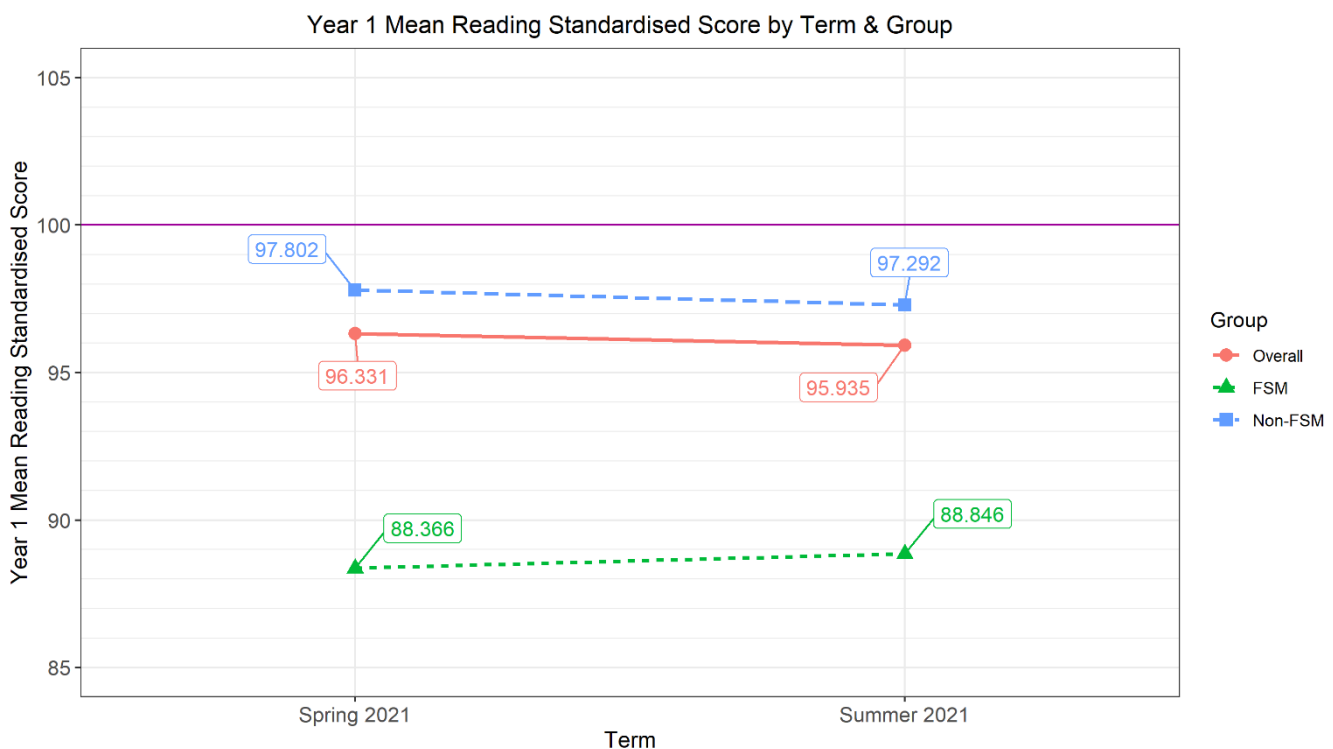
The distributions of the Year 1 reading scores in spring and summer are presented in Figure 27 and Figure 46.

Year 1 reading Covid-19 gap model

The analysis of the Year 1 reading scores used a three-level multilevel model (school, pupil, time point) in which spring and summer scores were regressed on time, FSM quintiles, academy status and region. Table 69 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 and the standardised average of 100. The model ascertains whether there was a significant change in this gap between the spring and summer terms.

There was no significant impact of time on Year 1 pupils' reading scores, with an effect size of −0.01 (−0.02, 0.0002). This means that, between spring and summer, reading scores did not significantly change. The Covid-19 reading

attainment gap remained stable. This analysis controlled for FSM quintiles, academy status and region. Effect size and confidence intervals are presented in Table 69.

Table 69: Year 1 reading Covid-19 gap model.

Coefficients	Model coefficients				Effect size
	Estimate (95% CI)	Std. error	Degrees of freedom	P value	Hedge's G (95% CI)
(Intercept)	**101.89 (98.58, 105.20)**	**1.69**	**150.80**	**<0.001**	
Summer	−0.23 (−0.47, 0.01)	0.12	5053.17	0.06	−0.01 (−0.02, 0.0002)
FSM 2nd lowest 20%	**−5.73 (−8.27, −3.19)**	**1.30**	**142.89**	**<0.001**	**−0.22 (−0.32, −0.12)**
FSM middle 20%	**−6.64 (−9.16, −4.11)**	**1.29**	**135.58**	**<0.001**	**−0.26 (−0.36, −0.16)**
FSM 2nd highest 20%	**−9.51 (−11.94, −7.07)**	**1.24**	**136.03**	**<0.001**	**−0.37 (−0.47, −0.28)**
FSM highest 20%	**−12.16 (−15.47, −8.85)**	**1.69**	**144.69**	**<0.001**	**−0.48 (−0.61, −0.35)**
FSM missing	2.66 (−7.75, 13.06)	5.31	137.32	0.62	0.10 (−0.3, 0.51)
Non-academy	0.30 (−1.69, 2.28)	1.01	131.22	0.77	0.01 (−0.07, 0.09)
East of England	−0.41 (−3.87, 3.06)	1.77	141.66	0.82	−0.02 (−0.15, 0.12)
London	2.30 (−1.1, 5.7)	1.74	129.73	0.19	0.09 (−0.04, 0.22)
North East	1.93 (−4.61, 8.47)	3.34	145.18	0.56	0.08 (−0.18, 0.33)
North West	0.27 (−2.72, 3.26)	1.53	145.27	0.86	0.01 (−0.11, 0.13)
South East	−0.31 (−3.94, 3.31)	1.85	140.59	0.87	−0.01 (−0.15, 0.13)
South West	0.95 (−2.64, 4.55)	1.83	150.95	0.60	0.04 (−0.10, 0.18)
West Midlands	0.78 (−2.75, 4.31)	1.80	137.75	0.67	0.03 (−0.11, 0.17)
Yorkshire and the Humber	0.01 (−3.9, 3.92)	1.99	147.30	1.00	0.00 (−0.15, 0.15)

N.B. The reference group for this model was spring scores, lowest FSM quintile, academy schools and the East Midlands region. The number of schools is 156, the number of pupils is 5,775, and the number of observations is 10,759. Significant effects are in bold.

Year 1 reading disadvantage gap model

The analysis of the Year 1 reading scores was a three-level multilevel model (school, pupil, time point) in which spring and summer 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 70 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 the spring and summer terms.

There was a significant positive interaction between time and FSM eligibility on Year 1 pupils' reading scores, with an effect size of 0.03 (0.01, 0.06). This means that, between spring and summer, FSM pupils' scores improved, and there was a reduction in the disadvantage gap for reading attainment. This effect was significant while controlling for FSM quintiles, gender, EAL status, academy status, and region. Effect size and confidence intervals are presented in Table 70.

Table 70: Year 1 reading disadvantage gap model.

Coefficients	Model coefficients				Effect size
	Estimate (95% CI)	Std. error	Degrees of freedom	P value	Hedge's G (95% CI)
(Intercept)	**101.35 (98.10, 104.60)**	**1.66**	**154.23**	**<0.001**	
Summer	**−0.36 (−0.62, −0.10)**	**0.13**	**5040.44**	**0.006**	**−0.01 (−0.02, 0.00)**
FSM2020 yes	**−7.19 (−8.35, −6.03)**	**0.59**	**6694.16**	**<0.001**	**−0.28 (−0.33, −0.24)**
FSM2020 missing	**−6.74 (−10.10, −3.39)**	**1.71**	**1712.25**	**<0.001**	**−0.26 (−0.40, −0.13)**
Summer*FSM2020 yes	**0.85 (0.19, 1.51)**	**0.34**	**5068.86**	**0.012**	**0.03 (0.01, 0.06)**
Summer*FSM2020 missing	1.82 (−0.57, 4.2)	1.22	5339.52	0.14	0.07 (−0.02, 0.16)
Gender female	**3.61 (2.86, 4.36)**	**0.38**	**5656.29**	**<0.001**	**0.14 (0.11, 0.17)**
Gender missing	−5.59 (−22.92, 11.74)	8.84	5869.50	0.53	−0.22 (−0.90, 0.46)
EAL yes	−3.64 (−4.81, −2.46)	0.60	5491.66	<0.001	−0.14 (−0.19, −0.10)
EAL missing	1.40 (−10.27, 13.07)	5.96	5762.06	0.81	0.05 (−0.40, 0.51)
FSM 2nd lowest 20%	**−5.75 (−8.23, −3.28)**	**1.26**	**141.25**	**<0.001**	**−0.23 (−0.33, −0.14)**
FSM middle 20%	**−5.90 (−8.35, −3.45)**	**1.25**	**133.87**	**<0.001**	**−0.23 (−0.33, −0.14)**
FSM 2nd highest 20%	**−8.24 (−10.61, −5.86)**	**1.21**	**135.92**	**<0.001**	**−0.32 (−0.42, −0.23)**
FSM highest 20%	**−9.26 (−12.49, −6.03)**	**1.65**	**145.09**	**<0.001**	**−0.36 (−0.49, −0.24)**
FSM missing	2.01 (−8.05, 12.07)	5.13	133.19	0.70	0.08 (−0.32, 0.47)
Non-academy	0.17 (−1.74, 2.09)	0.98	126.86	0.86	0.01 (−0.07, 0.08)
East of England	−0.35 (−3.70, 3.01)	1.71	138.01	0.84	−0.01 (−0.15, 0.12)
London	**4.07 (0.73, 7.4)**	**1.70**	**132.99**	**0.017**	**0.16 (0.03, 0.29)**
North East	0.37 (−5.95, 6.69)	3.23	141.20	0.91	0.01 (−0.23, 0.26)
North West	0.16 (−2.73, 3.05)	1.47	140.94	0.91	0.01 (−0.11, 0.12)
South East	−0.40 (−3.9, 3.1)	1.79	136.39	0.82	−0.02 (−0.15, 0.12)
South West	0.64 (−2.84, 4.12)	1.77	146.88	0.72	0.03 (−0.11, 0.16)
West Midlands	0.10 (−3.32, 3.52)	1.75	134.21	0.95	0.00 (−0.13, 0.14)
Yorkshire and the Humber	−0.03 (−3.81, 3.75)	1.93	142.77	0.99	0.00 (−0.15, 0.15)

N.B. The reference group for this model was spring scores, non-FSM pupils, males, non-pupils with EAL, lowest FSM quintile, academy schools and the East Midlands region. The number of schools is 156, the number of pupils is 5,775, and the number of observations is 10,759. Significant effects are in bold.

Effect sizes

Effect sizes and their corresponding confidence intervals were calculated using the unconditional variance from a null model with no covariates. The ICCs from this model at different levels, and the parameters used to calculate effect sizes are displayed in Table 71.

Table 71: ICC and effect size parameters from the null model.

Level	Variance	Standard deviation	ICC	Total variance from a model without covariates
School	30.87	5.556	0.12	260.34
Pupil	192.32	13.868	0.74	260.34
Time point	37.15	6.095	–	260.34

Year 1 mathematics repeated measures analysis

5,723 pupils were entered into the Year 1 mathematics repeated measures multilevel model. Out of these 5,723 pupils, 356 pupils took the Year 1 spring mathematics assessment but not the summer one, 622 took the Year 1 summer mathematics assessment but not the spring one, and 4,745 pupils took both.

Table 72: Year 1 mathematics standardised means.

	Standardised means							
	Spring 2021				Summer 2021			
Outcome	n	Weighted n	Mean (95% CI)	SD	n	Weighted n	Mean (95% CI)	SD
Year 1 mathematics	5101	5140	96.67 (96.27, 97.07)	14.56	5367	5372	98.94 (98.54, 99.34)	14.86
Year 1 mathematics (FSM only)	766	769	89.33 (88.35, 90.31)	13.82	777	773	92.97 (91.95, 93.99)	14.5
Year 1 mathematics (non-FSM only)	4312	4355	97.97 (97.5, 98.4)	14.31	4316	4341	100.11 (99.67, 100.54)	14.69

Table 72 presents the standardised means of the Year 1 mathematics responses for the group as a whole, for the non-FSM pupils, and for the FSM pupils. Each group's scores are split by term. For pupils overall, Year 1 mathematics results are higher in the summer term than in the spring term and non-FSM pupils have higher scores at both time points than FSM pupils. These mean differences from 100 are further displayed in Figure 58.

Figure 58: Year 1 mathematics scores.
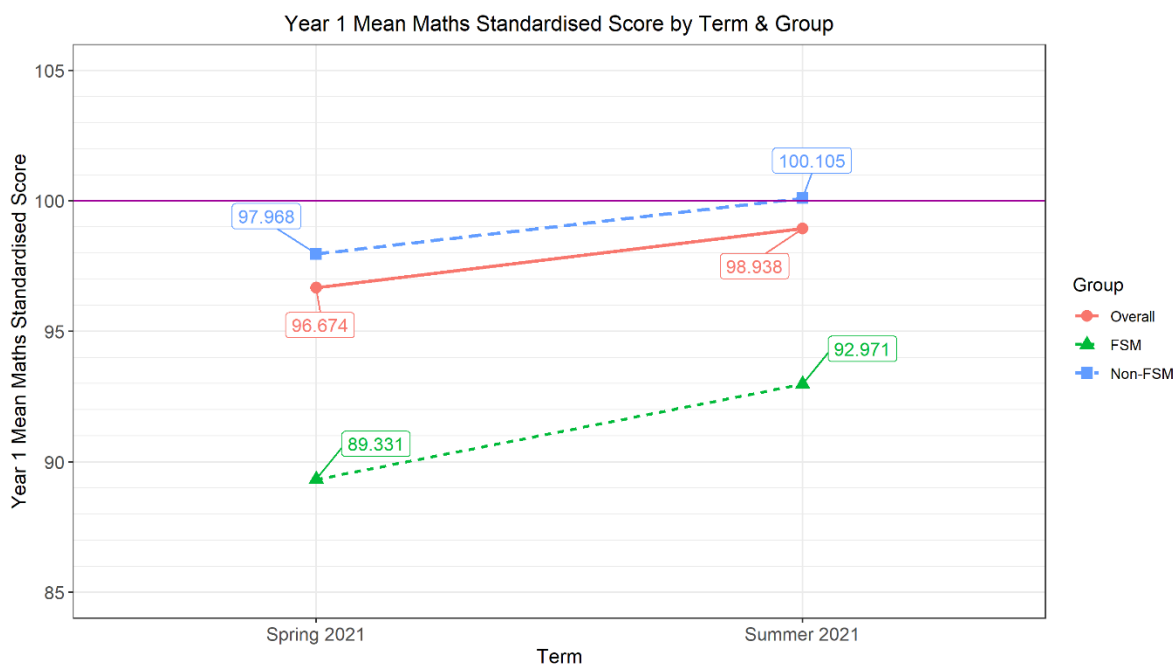
The distributions of the Year 1 mathematics scores in spring and summer are presented in Figure 30 and Figure 49.

Year 1 mathematics Covid-19 gap model

The analysis of the Year 1 mathematics scores used a three-level multilevel model (school, pupil, time point) in which spring and summer scores were regressed on time, FSM quintiles, academy status, and region. Table 73 presents the results from the model, which measures the association between time and pupil outcomes. The Covid-19 gap is represented as the difference in the measured mathematics attainment and the standardised average of 100. The model ascertains whether there was a significant change in this gap between the spring and summer terms.

There was a significant positive impact of time on Year 1 pupil's mathematics scores, with an effect size of 0.10 (0.09, 0.11). This means that between spring and summer, mathematics scores improved, and there was a reduction in the Covid-19 mathematics attainment gap. This effect was significant while controlling for FSM quintiles, academy status and region. Effect size and confidence intervals are presented in Table 73.

Table 73: Year 1 mathematics Covid-19 gap model.

Coefficients	Model coefficients				Effect size
	Estimate (95% CI)	Std. error	Degrees of freedom	P value	Hedge's G (95% CI)
(Intercept)	**102.00 (98.47, 105.53)**	**1.80**	**153.37**	**<0.001**	
Summer	**2.43 (2.19, 2.66)**	**0.12**	**4856.23**	**<0.001**	**0.10 (0.09, 0.11)**
FSM 2nd lowest 20%	**−4.69 (−7.34, −2.03)**	**1.35**	**147.31**	**0.001**	**−0.19 (−0.3, −0.08)**
FSM middle 20%	**−4.93 (−7.6, −2.27)**	**1.36**	**140.84**	**<0.001**	**−0.20 (−0.32, −0.09)**
FSM 2nd highest 20%	**−9.48 (−12.04, −6.91)**	**1.31**	**141.46**	**<0.001**	**−0.39 (−0.5, −0.29)**
FSM highest 20%	**−10.28 (−13.76, −6.8)**	**1.77**	**149.83**	**<0.001**	**−0.43 (−0.57, −0.28)**
FSM missing	1.53 (−9.39, 12.46)	5.57	139.44	0.783	0.06 (−0.39, 0.52)
Non-academy	1.00 (−1.10, 3.1)	1.07	137.84	0.350	0.04 (−0.05, 0.13)
East of England	−1.24 (−4.93, 2.45)	1.88	147.03	0.509	−0.05 (−0.2, 0.1)
London	−0.12 (−3.70, 3.46)	1.83	138.67	0.948	0.00 (−0.15, 0.14)
North East	−0.58 (−7.45, 6.28)	3.50	147.83	0.867	−0.02 (−0.31, 0.26)
North West	−0.61 (−3.79, 2.57)	1.62	149.20	0.708	−0.03 (−0.16, 0.11)
South East	−0.71 (−4.55, 3.13)	1.96	146.38	0.716	−0.03 (−0.19, 0.13)
South West	1.07 (−2.74, 4.88)	1.94	154.23	0.581	0.04 (−0.11, 0.2)
West Midlands	−0.66 (−4.43, 3.12)	1.92	143.45	0.734	−0.03 (−0.18, 0.13)
Yorkshire and the Humber	−0.34 (−4.48, 3.79)	2.11	151.57	0.871	−0.01 (−0.19, 0.16)

N.B. The reference group for this model was spring scores, lowest FSM quintile, academy schools and the East Midlands region. The number of schools is 156, the number of pupils is 5,723, and the number of observations is 10,468. Significant effects are in bold.

Year 1 mathematics disadvantage gap model

The analysis of the Year 1 mathematics scores used a three-level multilevel model (school, pupil, time point) in which spring and summer 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 74 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 the spring and summer terms.

There was a significant positive interaction between time and FSM eligibility on Year 1 pupils' mathematics scores, with an effect size of 0.06 (0.03, 0.09). This means that, between spring and summer, FSM pupils' scores improved, and there was a reduction in the disadvantage gap for mathematics attainment. This effect was significant while controlling for FSM quintiles, gender, EAL status, Academy status and region. Effect size and confidence intervals are presented in Table 74.

Table 74: Year 1 mathematics disadvantage gap model.

Coefficients	Model coefficients				Effect size
	Estimate (95% CI)	Std. error	Degrees of freedom	P value	Hedge's G (95% CI)
(Intercept)	**103.01 (99.56, 106.46)**	**1.76**	**156.45**	**<0.001**	
Summer	**2.24 (1.99, 2.49)**	**0.13**	**4841.90**	**<0.001**	**0.09 (0.08, 0.10)**
FSM2020 yes	**−6.60 (−7.68, −5.53)**	**0.55**	**6821.33**	**<0.001**	**−0.27 (−0.32, −0.23)**
FSM2020 missing	−1.04 (−5.59, 3.51)	2.32	4655.81	0.66	−0.04 (−0.23, 0.15)
Summer*FSM2020 yes	**1.46 (0.81, 2.12)**	**0.33**	**4899.99**	**<0.001**	**0.06 (0.03, 0.09)**
Summer*FSM2020 missing	−3.58 (−7.46, 0.31)	1.98	5351.95	0.07	−0.15 (−0.31, 0.01)
Gender female	−0.43 (−1.11, 0.25)	0.35	5601.95	0.22	−0.02 (−0.05, 0.01)
Gender missing	−7.94 (−24.66, 8.78)	8.53	5667.91	0.35	−0.33 (−1.02, 0.36)
EAL yes	**−1.77 (−2.85, −0.69)**	**0.55**	**5627.40**	**0.001**	**−0.07 (−0.12, −0.03)**
EAL missing	−2.35 (−15.34, 10.65)	6.63	5696.80	0.72	−0.10 (−0.64, 0.44)
FSM 2nd lowest 20%	**−4.71 (−7.3, −2.12)**	**1.32**	**148.62**	**<0.001**	**−0.20 (−0.30, −0.09)**
FSM middle 20%	**−4.67 (−7.27, −2.06)**	**1.33**	**142.59**	**<0.001**	**−0.19 (−0.30, −0.09)**
FSM 2nd highest 20%	**−8.58 (−11.09, −6.07)**	**1.28**	**143.66**	**<0.001**	**−0.36 (−0.46, −0.25)**
FSM highest 20%	**−8.13 (−11.53, −4.72)**	**1.74**	**152.90**	**<0.001**	**−0.34 (−0.48, −0.20)**
FSM missing	0.72 (−9.89, 11.32)	5.41	138.23	0.90	0.03 (−0.41, 0.47)
Non-academy	0.91 (−1.12, 2.95)	1.04	136.21	0.38	0.04 (−0.05, 0.12)
East of England	−1.06 (−4.64, 2.52)	1.83	145.93	0.56	−0.04 (−0.19, 0.10)
London	1.10 (−2.42, 4.62)	1.80	143.86	0.54	0.05 (−0.10, 0.19)
North East	−0.88 (−7.55, 5.79)	3.40	146.84	0.80	−0.04 (−0.31, 0.24)
North West	−0.40 (−3.49, 2.68)	1.58	148.19	0.80	−0.02 (−0.14, 0.11)
South East	−0.43 (−4.16, 3.30)	1.90	144.97	0.82	−0.02 (−0.17, 0.14)
South West	1.00 (−2.70, 4.70)	1.89	152.98	0.60	0.04 (−0.11, 0.20)
West Midlands	−0.87 (−4.53, 2.79)	1.87	142.12	0.64	−0.04 (−0.19, 0.12)
Yorkshire and the Humber	0.06 (−3.95, 4.08)	2.05	150.61	0.98	0.00 (−0.16, 0.17)

N.B. The reference group for this model was spring scores, non-FSM pupils, males, non-pupils with EAL, lowest FSM quintile, academy schools, and the East Midlands region. The number of schools is 156, the number of pupils is 5,723, and the number of observations is 10,468. Significant effects are in bold.

Effect sizes

Effect sizes and their corresponding confidence intervals were calculated using the unconditional variance from a null model with no covariates. The ICCs from this model at different levels, and the parameters used to calculate effect sizes are displayed in Table 75.

Table 75: ICC and effect size parameters from the null model

Level	Variance	Standard deviation	ICC	Total variance from a model without covariates
School	32.45	5.696	0.15	220.49
Pupil	150.56	12.27	0.68	220.49
Time point	37.48	6.122	–	220.49

Year 2 reading repeated measures analysis

6,263 pupils were entered into the Year 2 reading repeated measures multilevel models. Out of these 6,263 pupils, 855 pupils took the Year 2 autumn reading assessment but not the spring one, 332 took the Year 2 spring reading assessment but not the spring one, and 5,076 pupils took both.

Table 76: Year 2 reading standardised means.

	Standardised means							
	Autumn 2020				Spring 2021			
Outcome	n	Weighted n	Mean (95% CI)	SD	n	Weighted n	Mean (95% CI)	SD
Year 2 reading	5931	5940	97.53 (97.14, 97.93)	15.52	5408	5515	96.7 (96.28, 97.12)	15.77
Year 2 reading (FSM only)	840	851	89.72 (88.7, 90.73)	14.97	847	859	89.263 (88.27, 90.26)	14.75
Year 2 reading (non-FSM only)	4480	4590	98.97 (98.53, 99.42)	15.17	4529	4628	98.1 (97.61, 98.52)	15.53

Table 76 presents the standardised means of the Year 2 reading responses for the group as a whole, for the non-FSM pupils, and for the FSM pupils. Each group's scores are split by term. For all pupils, Year 2 reading results are lower in the spring term than in the autumn term. Furthermore, non-FSM pupils have higher scores at both time points than FSM pupils. These mean differences are further displayed in Figure 59.

Figure 59:   Year 2 reading scores.
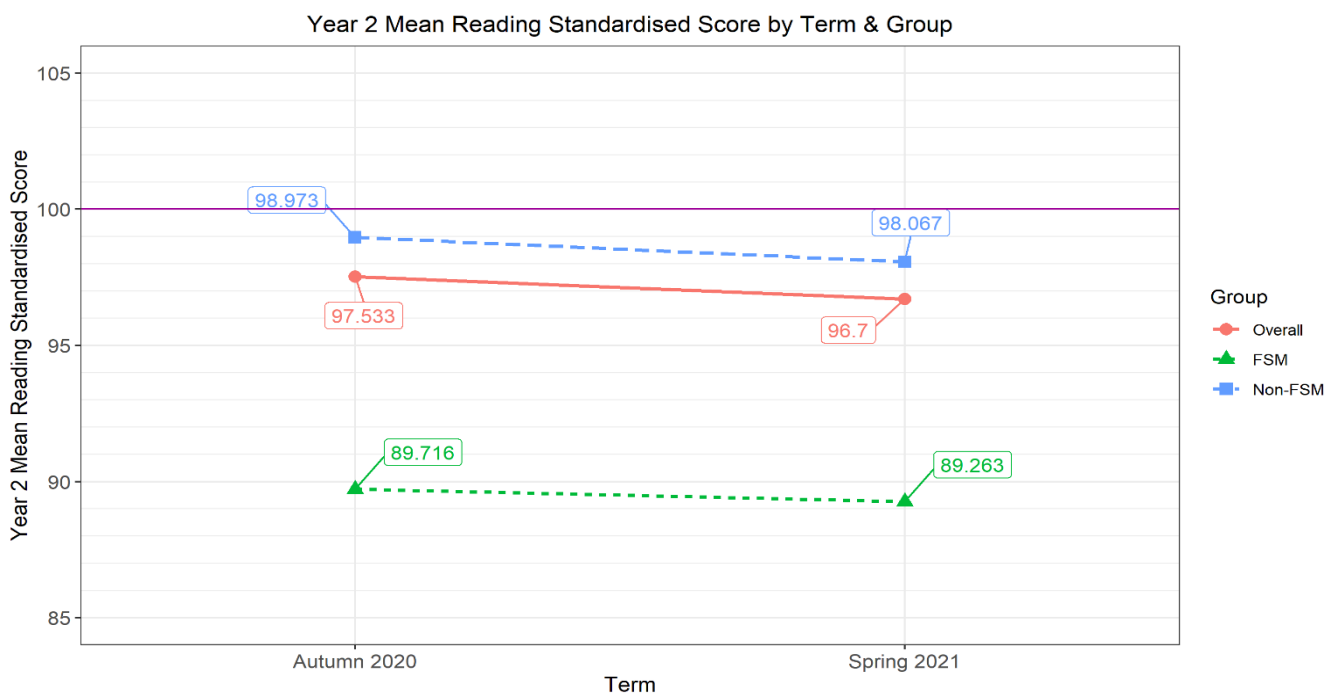
The distributions of the Year 2 reading scores in autumn and spring are presented in Figure 24 and Figure 33.

Year 2 reading Covid-19 gap model

The analysis of the Year 2 reading scores was a three-level multilevel model (school, pupil, time point) in which autumn and spring scores were regressed on time, FSM quintiles, academy status, and region. Table 77 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 and the standardised average of 100. The model ascertains whether there was a significant change in this gap between the autumn and spring terms.

Table 77: Year 2 reading Covid-19 gap model.

Coefficients	Model coefficients				Effect size
	Estimate (95% CI)	Std. error	Degrees of freedom	P value	Hedge's G (95% CI)
(Intercept)	**100.71 (97.44, 103.99)**	**1.67**	**165.57**	**<0.001**	
Spring	**−0.88 (−1.11, −0.64)**	**0.12**	**5185.30**	**<0.001**	**−0.04 (−0.04, −0.03)**
FSM 2nd lowest 20%	**−3.55 (−6.01, −1.10)**	**1.25**	**159.46**	**0.005**	**−0.14 (−0.24, −0.04)**
FSM middle 20%	**−5.11 (−7.61, −2.61)**	**1.27**	**149.64**	**<0.001**	**−0.20 (−0.30, −0.10)**
FSM 2nd highest 20%	**−8.19 (−10.55, −5.82)**	**1.21**	**148.53**	**<0.001**	**−0.33 (−0.42, −0.23)**
FSM highest 20%	**−11.18 (−14.36, −8.01)**	**1.62**	**154.13**	**<0.001**	**−0.45 (−0.57, −0.32)**
FSM missing	4.09 (−3.72, 11.90)	3.99	183.19	0.31	0.16 (−0.15, 0.47)
Non-academy	0.84 (−1.04, 2.72)	0.96	144.88	0.38	0.03 (−0.04, 0.11)
East of England	0.61 (−2.86, 4.07)	1.77	157.37	0.73	0.02 (−0.24, 0.27)
London	2.14 (−1.18, 5.47)	1.70	147.47	0.21	0.09 (−0.05, 0.22)
North East	0.44 (−6.00, 6.88)	3.29	152.71	0.89	0.02 (−0.24, 0.27)
North West	0.86 (−2.08, 3.80)	1.50	164.14	0.57	0.03 (−0.08, 0.15)
South East	−0.02 (−3.52, 3.47)	1.78	155.88	0.99	0.00 (−0.14, 0.14)
South West	1.66 (−1.95, 5.27)	1.84	167.50	0.37	0.07 (−0.08, 0.21)
West Midlands	1.15 (−2.31, 4.60)	1.76	159.17	0.52	0.05 (−0.09, 0.18)
Yorkshire and the Humber	1.66 (−2.05, 5.37)	1.89	159.38	0.38	0.07 (−0.08, 0.21)

There was a significant negative impact of time on Year 2 pupils' reading scores, with an effect size of −0.04 (−0.04, −0.03). This means that, between autumn and spring, reading scores decreased and there was an increase in the Covid-19 reading attainment gap. This effect was significant while controlling for FSM quintiles, academy status and region. Effect size and confidence intervals are presented in Table 77.

N.B. The reference group for this model was autumn scores, lowest FSM quintile, academy schools and the East Midlands region. The number of schools is 168, the number of pupils is 6,263, and the number of observations is 11,339. Significant effects are in bold.

Year 2 reading disadvantage gap model

The analysis of the Year 2 reading scores was a three-level multilevel model (school, pupil, time point) in which autumn and spring 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 78 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 the autumn and spring terms.

There was no significant interaction between time and FSM eligibility on Year 2 pupils' reading scores, with an effect size of 0.01 (−0.01, 0.04). This means that between autumn and spring, the disadvantage gap for reading attainment remained stable. This analysis controlled for FSM quintiles, gender, EAL status, academy status and region. Effect size and confidence intervals are presented in Table 79.

Table 78: Year 2 reading disadvantage gap model.

Coefficients	Model coefficients				Effect size
	Estimate (95% CI)	Std. error	Degrees of freedom	P value	Hedge's G (95% CI)
(Intercept)	**99.89 (96.64, 103.14)**	**1.66**	**172.55**	**<0.001**	
Spring	**−0.94 (−1.19, −0.68)**	**0.13**	**5156.40**	**<0.001**	**−0.04 (−0.05, −0.03)**
FSM2020 yes	**−7.90 (−9.01, −6.79)**	**0.57**	**7277.41**	**<0.001**	**−0.32 (−0.36, −0.27)**
FSM2020 missing	−1.74 (−4.31, −0.83)	1.31	223.40	0.19	−0.07 (−0.17, 0.03)
Spring*FSM2020 yes	0.37 (−0.29, 1.02)	0.33	5217.76	0.27	0.01 (−0.01, 0.04)
Spring*FSM2020 missing	1.08 (−2.79, 4.96)	1.98	6027.45	0.58	0.04 (−0.11, 0.20)
Gender female	**3.08 (2.37, 3.78)**	**0.36**	**6144.98**	**<0.001**	**0.12 (0.09, 0.15)**
Gender missing	**23.74 (8.85, 38.62)**	**7.59**	**6549.50**	**0.002**	**0.95 (0.35, 1.54)**
EAL yes	**−1.15 (−2.20, −0.09)**	**0.54**	**5875.47**	**0.034**	**−0.05 (−0.09, 0.00)**
EAL missing	**−19.88 (−30.59, −9.16)**	**5.47**	**6239.63**	**<0.001**	**−0.79 (−1.22, −0.37)**
FSM 2nd lowest 20%	**−3.19 (−5.60, −0.79)**	**1.23**	**160.54**	**0.009**	**−0.13 (−0.22, −0.03)**
FSM middle 20%	**−4.28 (−6.73, −1.83)**	**1.25**	**151.33**	**0.001**	**−0.17 (−0.27, −0.07)**
FSM 2nd highest 20%	**−6.86 (−9.18, −4.53)**	**1.19**	**151.13**	**<0.001**	**−0.27 (−0.37, −0.18)**
FSM highest 20%	**−8.17 (−11.30, −5.03)**	**1.60**	**159.69**	**<0.001**	**−0.33 (−0.45, −0.20)**
FSM missing	4.48 (−3.20, 12.17)	3.92	183.29	0.25	0.18 (−0.13, 0.49)
Non-academy	0.84 (−1.02, 2.71)	0.95	146.70	0.38	0.03 (−0.04, 0.11)
East of England	0.49 (−2.91, 3.89)	1.73	158.64	0.78	0.02 (−0.12, 0.16)
London	2.48 (−0.83, 5.78)	1.69	154.99	0.14	0.10 (−0.03, 0.23)
North East	−0.21 (−6.54, 6.11)	3.23	154.57	0.95	−0.01 (−0.26, 0.24)
North West	0.83 (−2.06, 3.72)	1.47	165.01	0.57	0.03 (−0.08, 0.15)
South East	−0.11 (−3.54, 3.32)	1.75	156.76	0.95	0.00 (−0.14, 0.13)
South West	1.27 (−2.27, 4.81)	1.81	168.80	0.48	0.05 (−0.09, 0.19)
West Midlands	1.00 (−2.39, 4.39)	1.73	159.82	0.56	0.04 (−0.10, 0.18)
Yorkshire and the Humber	1.73 (−1.91, 5.38)	1.86	160.38	0.35	0.07 (−0.08, 0.21)

N.B. The reference group for this model was autumn scores, non-FSM pupils, males, non-pupils with EAL, lowest FSM quintile, academy schools and the East Midlands region. The number of schools is 168, the number of pupils is 6,263, and the number of observations is 11,339. Significant effects are in bold.

Effect sizes

Effect sizes and their corresponding confidence intervals were calculated using the unconditional variance from a null model with no covariates. The ICCs from this model at different levels, and the parameters used to calculate effect sizes are displayed in Table 79.

Table 79: ICC and effect size parameters from the null model.

Level	Variance	Standard deviation	ICC	Total variance from a model without covariates
School	28.85	5.371	0.12	250.19
Pupil	183.36	13.541	0.73	250.19
Time point	37.98	6.163	–	250.19

## Year 2 mathematics repeated measures analysis

6,269 pupils were entered into the Year 2 mathematics repeated measures multilevel models. Out of these 6,269 pupils, 920 pupils took the Year 2 autumn mathematics assessment but not the spring one, 333 took the Year 2 spring mathematics assessment but not the autumn one, and 5,016 pupils took both.

Table 80: Year 2 mathematics standardised means.

	Standardised means							
	Autumn 2020				Spring 2021			
Outcome	n	Weighted n	Mean (95% CI)	SD	n	Weighted n	Mean (95% CI)	SD
Year 2 mathematics	5936	5943	98.1 (97.72, 98.43)	13.95	5349	5429	97.58 (97.17, 97.99)	15.28
Year 2 mathematics (FSM only)	857	868	90.86 (89.96, 91.75)	13.38	845	852	89.49 (88.53, 90.44)	14.18
Year 2 mathematics (non-FSM only)	4510	4611	99.48 (99.08, 99.87)	13.55	4498	4569	99.1 (98.66, 99.53)	14.99

Table 80 presents the standardised means of the Year 2 mathematics responses for the group as a whole, for the non-FSM pupils, and for the FSM pupils. Each group's scores are split by term. For all pupils, Year 2 mathematics results are lower in the spring term than in the autumn term. Furthermore, non-FSM pupils have higher scores at both time points than FSM pupils. These mean differences are further displayed in Figure 60.

Figure 60: Year 2 mathematics scores.
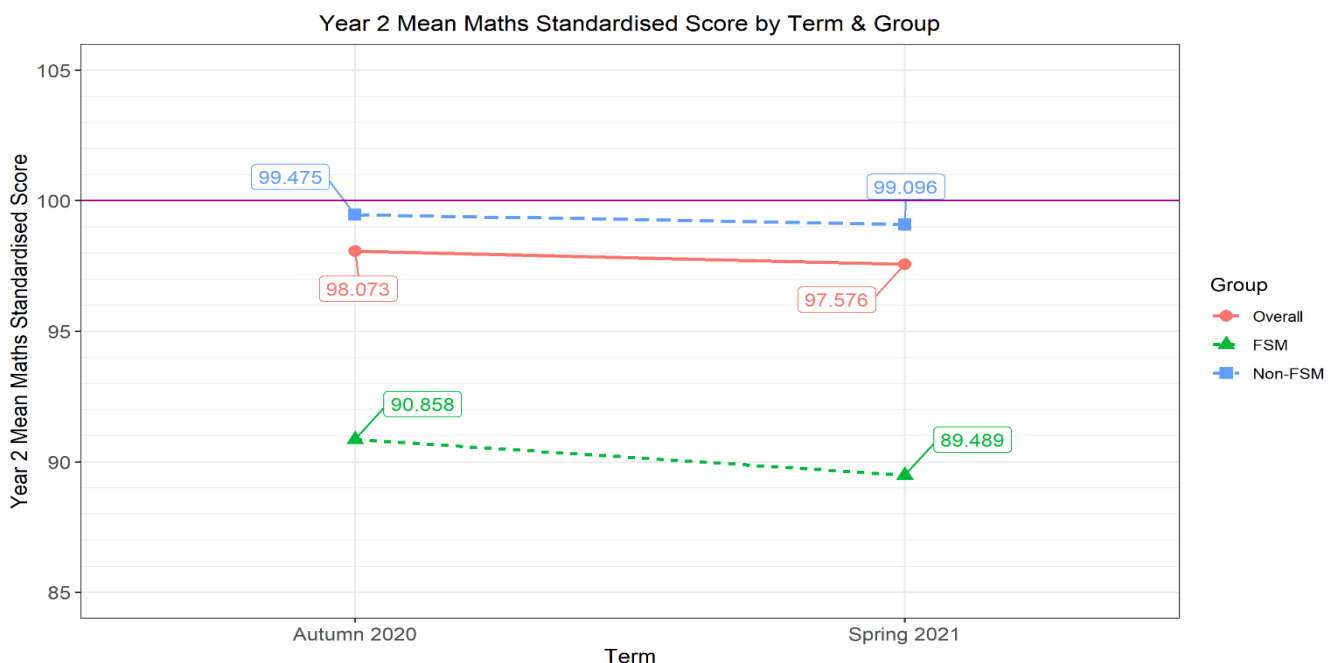
The distributions of the Year 2 mathematics scores in autumn and spring are presented in Figure 24 and Figure 36.

Year 2 mathematics Covid-19 gap model

The analysis of the Year 2 mathematics scores was a three-level multilevel model (school, pupil, time point) in which autumn and spring scores were regressed on time, FSM quintiles, academy status and region. Table 81 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 mathematics attainment and the standardised average of 100. The model ascertains whether there was a significant change in this gap between the autumn and spring terms.

Table 81: Year 2 mathematics Covid-19 gap model.

Coefficients	Model coefficients				Effect size
	Estimate (95% CI)	Std. error	Degrees of freedom	P value	Hedge's G (95% CI)
(Intercept)	**99.08 (95.75, 102.41)**	**1.70**	**163.06**	**<0.001**	
Spring	**−0.72 (−0.93, −0.52)**	**0.11**	**5142.56**	**<0.001**	**−0.03 (−0.04, −0.02)**
FSM 2nd lowest 20%	−2.20 (−4.65, 0.25)	1.25	157.32	0.08	−0.10 (−0.20, 0.01)
FSM middle 20%	**−3.81 (−6.32, −1.31)**	**1.28**	**148.30**	**0.003**	**−0.16 (−0.27, −0.06)**
FSM 2nd highest 20%	**−6.23 (−8.59, −3.87)**	**1.20**	**147.66**	**<0.001**	**−0.27 (−0.37, −0.17)**
FSM highest 20%	**−10.03 (−13.19, −6.86)**	**1.61**	**152.87**	**<0.001**	**−0.43 (−0.57, −0.30)**
FSM missing	0.61 (−7.02, 8.24)	3.89	166.07	0.88	0.03 (−0.30, 0.36)
Non-academy	**2.01 (0.12, 3.89)**	**0.96**	**144.66**	**0.037**	**0.09 (0.01, 0.17)**
East of England	0.15 (−3.36, 3.66)	1.79	156.14	0.93	0.01 (−0.15, 0.16)
London	1.41 (−1.96, 4.78)	1.72	147.48	0.41	0.06 (−0.08, 0.21)
North East	2.46 (−3.99, 8.91)	3.29	151.56	0.46	0.11 (−0.17, 0.38)
North West	1.39 (−1.59, 4.36)	1.52	161.82	0.36	0.06 (−0.07, 0.19)
South East	0.64 (−2.89, 4.16)	1.80	155.19	0.72	0.03 (−0.12, 0.18)
South West	2.78 (−0.87, 6.42)	1.86	165.06	0.14	0.12 (−0.04, 0.28)
West Midlands	1.15 (−2.35, 4.65)	1.78	157.74	0.52	0.05 (−0.10, 0.20)
Yorkshire and the Humber	1.51 (−2.24, 5.25)	1.91	158.80	0.43	0.07 (−0.10, 0.23)

There was a significant negative impact of time on Year 2 pupils' mathematics scores, with an effect size of −0.03 (−0.04, −0.02). Between autumn and spring, mathematics standardised scores decreased, and there was an increase in the Covid-19 mathematics attainment gap. This means that Year 2 pupils' mathematics attainment was even further away from a mean of 100 in spring than in autumn. This effect was significant while controlling for FSM quintiles, academy status, and region. Effect size and confidence intervals are presented in Table 81.

N.B. The reference group for this model was autumn scores, lowest FSM quintile, academy schools and the East Midlands region. The number of schools is 167, the number of pupils is 6,269, and the number of observations is 11,285. Significant effects are in bold.

Year 2 mathematics disadvantage gap model

The analysis of the Year 2 mathematics scores was a three-level multilevel model (school, pupil, time point) in which autumn and spring 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 82 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 the autumn and spring terms.

There was a significant negative interaction between time and FSM eligibility on Year 2 pupils' mathematics scores, with an effect size of −0.04 (−0.07, −0.02). This means that, between autumn and spring, FSM pupils' scores declined, and there was an increase in the disadvantage gap for mathematics attainment. This effect was significant while controlling for FSM quintiles, gender, EAL status, academy status and region. Effect size and confidence intervals are presented in Table 82.

Table 82: Year 2 mathematics disadvantage gap model.

| Coefficients | Model coefficients | | | | Effect size |
	Estimate (95% CI)	Std. error	Degrees of freedom	P value	Hedge's G (95% CI)
(Intercept)	**100.43 (97.17, 103.69)**	**1.66**	**167.60**	**<0.001**	
Spring	**−0.57 (−0.80, −0.35)**	**0.12**	**5122.66**	**<0.001**	**−0.02 (−0.03, −0.01)**
FSM2020 Yes	**−7.07 (−8.09, −6.05)**	**0.52**	**7134.91**	**<0.001**	**−0.31 (−0.35, −0.26)**
FSM2020 Missing	−2.11 (−4.70, 0.48)	1.32	233.91	0.11	−0.09 (−0.20, 0.02)
Spring*FSM2020 Yes	**−1.00 (−1.58, −0.43)**	**0.29**	**5161.72**	**0.001**	**−0.04 (−0.07, −0.02)**
Spring*FSM2020 Missing	1.48 (−6.19, 9.14)	3.91	8142.51	0.71	0.06 (−0.27, 0.40)
Gender female	**−1.84 (−2.50, −1.19)**	**0.33**	**6167.17**	**<0.001**	**−0.08 (−0.11, −0.05)**
Gender missing	10.52 (−2.09, 23.14)	6.43	6602.02	0.10	0.45 (−0.09, 1.00)
EAL Yes	−0.08 (−1.06, 0.91)	0.50	6045.75	0.88	0.00 (−0.05, 0.04)
EAL missing	**−13.36 (−22.86, −3.86)**	**4.85**	**6830.50**	**0.006**	**−0.58 (−0.99, −0.17)**
FSM 2nd lowest 20%	−1.82 (−4.20, 0.56)	1.21	157.92	0.14	−0.08 (−0.18, 0.02)
FSM middle 20%	**−3.13 (−5.57, −0.69)**	**1.24**	**149.65**	**0.012**	**−0.14 (−0.24, −0.03)**
FSM 2nd highest 20%	**−4.86 (−7.17, −2.56)**	**1.18**	**149.70**	**<0.001**	**−0.21 (−0.31, −0.11)**
FSM highest 20%	**−7.29 (−10.39, −4.19)**	**1.58**	**157.47**	**<0.001**	**−0.32 (−0.45, −0.18)**
FSM missing	0.99 (−6.48, −8.46)	3.81	166.79	0.79	0.04 (−0.28, 0.37)
Non-academy	**1.88 (0.02, 3.74)**	**0.95**	**146.15**	**0.047**	**0.08 (0.00, 0.16)**
East of England	0.18 (−3.24, 3.60)	1.74	156.97	0.92	0.01 (−0.14, 0.16)
London	1.48 (−1.85, 4.81)	1.70	154.03	0.38	0.06 (−0.08, 0.21)
North East	2.36 (−3.93, 8.65)	3.21	152.85	0.46	0.10 (−0.17, 0.37)
North West	1.53 (−1.38, 4.44)	1.48	162.18	0.31	0.07 (−0.06, 0.19)
South East	0.65 (−2.79, 4.10)	1.76	155.74	0.71	0.03 (−0.12, 0.18)
South West	2.65 (−0.90, 6.20)	1.81	165.52	0.15	0.11 (−0.04, 0.27)
West Midlands	1.17 (−2.24, 4.58)	1.74	157.50	0.50	0.05 (−0.10, 0.20)
Yorkshire and the Humber	1.65 (−2.01, 5.32)	1.87	159.50	0.38	0.07 (−0.09, 0.23)

N.B. The reference group for this model was autumn scores, non-FSM pupils, males, non-pupils with EAL, lowest FSM quintile, academy schools and the East Midlands region. The number of schools is 167, the number of pupils is 6,269, and the number of observations is 11,285. Significant effects are in bold.

Effect sizes

Effect sizes and their corresponding confidence intervals were calculated using the unconditional variance from a null model with no covariates. The ICCs from this model at different levels, and the parameters used to calculate effect sizes, are displayed in Table 83.

Table 83: ICC and effect size parameters from the null model.

Level	Variance	Standard deviation	ICC	Total variance from a model without covariates
School	26.62	5.16	0.12	214.06
Pupil	158.26	12.58	0.74	214.06
Time point	29.18	5.402	–	214.06

Conclusions and limitations

The initial period of school closures, from March 2020 to July 2020, was unprecedented in modern times, and schools had little time to prepare for the national lockdown. Our study found that whilst many schools (head teachers and teachers) reported using VLEs and online resources, fewer were using online lessons and very few were providing 'live' lessons with their Key Stage 1 pupils (RQ6). IT issues were reported (lack of access), and parental engagement to support their child's remote learning was felt to be mixed – issues reflected elsewhere in the research literature covering this period (Sharp *et al.*, 2020).

When schools reopened to all pupils in September 2020, head teachers felt that both Year 1 and Year 2 children's levels of ability in reading and mathematics were below their previous year's cohort. These views were indeed reflected in the Covid-19 gaps seen in this study of around two months' progress in both reading and mathematics for children in Year 2.

Some head teachers also felt that pupils' social skills and wellbeing were below the previous year's cohort, citing for example reduced play and interactions with peers, and lack of consistent structure (RQ8), although between 40% and 50% rated them as the same as last year's cohort. Results from the social skills survey showed that the children were, on average, at or above expected levels for social skills and self-regulation (compared to the limited CSBQ norms available). Disadvantaged pupils scored significantly worse on the CSBQ. This study has highlighted the need for valid and reliable measures of socio-emotional skills in this age group, and further work is needed to fully assess the long-term impact of school closures on social skills. To support recovery in the autumn term, schools were focusing on small group work in reading and mathematics as well as curriculum revisions and redeployment of staff, and they had a notable focus on wellbeing and PSHE (RQ6).

Schools felt more prepared for the second period of closures from January 2021 to March 2021, reporting greater IT support (for example, devices given directly to pupils), live lessons and interactions between pupils (RQ6), although there were some reports of children's lower emotional wellbeing and anxieties (RQ8). Schools reopened in March 2021 and assessed their pupils in this study: Covid-19 attainment gaps remained (RQ1 and RQ2).

In the summer term 2021, whilst schools were open, many still experienced disruption related to Covid-19, for example pupil and staff absences, and whole classes/year groups learning remotely due to cases of Covid-19. Again, common support strategies included small group work, staff re-deployment, and a focus on social skills/wellbeing (RQ6). Covid-19 attainment gaps remained (RQ1 and RQ2).

Across all terms of the study, the attainment gap between disadvantaged pupils and their peers was notable – around seven months behind their peers (RQ3 and RQ4). Furthermore, children from disadvantaged backgrounds found all curriculum areas harder, in both subjects and both year groups each term, than their non-disadvantaged peers. Teachers also felt that children from disadvantaged backgrounds experienced greater challenges relating to social and emotional wellbeing – although it is worth noting that their scores were not unduly concerning when compared to the average norms for the scale used (RQ8). It is also not possible to directly assess the extent to which this was influenced by Covid-19.

Most notably, with each subject, there was also a large proportion of children unable to access the assessments fully; a much larger proportion than in the standardisation samples (RQ1 and RQ2).

When explored over time, the worsening of the Covid-19 attainment gap for Year 2 children from autumn to spring is worth highlighting (RQ1 and RQ2). In addition, over time, the disadvantage gap appears particularly concerning for Year 2 pupils, where children from disadvantaged backgrounds fared even worse in the spring term – especially in mathematics – than they had done in the autumn. It is possible that the second set of school closures exacerbated challenges to all children's learning, and particularly to those from disadvantaged backgrounds, despite schools being better prepared for remote learning including using interactive approaches (RQ3 and RQ4). It could be that the disruption was still felt strongly by pupils or, also likely, that it takes time for young pupils to re-settle back into school routines. Some teachers particularly mentioned children's anxieties after this second lockdown, for example RQ8.

The upturn for Year 1 pupils from spring to summer – in mathematics for all children, and in reading and mathematics for those from disadvantaged backgrounds, possibly indicates a less starkly disrupted school experience during this time for these pupils (RQ1 and RQ2). Schools reported greater confidence with strategies for focusing on recovery as well

as a continued focus on PSHE (RQ6), and indeed rated their pupils well in terms of social skills and wellbeing (RQ8). This may be testament to the efforts of schools throughout the year to support Key Stage 1 pupils' wellbeing and learning. That said, the Covid-19 attainment gaps evidenced in this study will require further input, both from schools themselves and through national recovery efforts to reduce them. The disadvantage gaps, even if less stark in the summer (for Year 1 pupils) are large and it will require specific targeted and continued input to support these children's learning in their next years of schooling.

The results of this study should be interpreted with some limitations in mind. Clearly, there are a number of 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, our samples for comparison come from different years (i.e., 2016, 2017 and 2019). Additionally, each assessment in the NFER assessment suite is standardised as a standalone assessment. Furthermore, particular attention must be given here to the 2016 sample, which was a one-off data collection exercise run by the Standards and Testing Agency. At that time, the new curriculum was introduced and the differences observed when comparing the summer results for Year 2 with those in 2016 might be attributed to the sawtooth effect. We also acknowledge the limitation that this is not conceptually a pure indication of the Covid-19 gap, as schools will clearly have implemented some support activities prior to the pupils sitting these assessments. The school-level survey and pupil-level activity and support record were used, as appropriate, to help us interpret the results.

The interim reports, partially reproduced here in Chapters 3 and 5, along with the summer results in Chapter 7, assumed random samples of the pupil population when making parameter estimates such as differences in means. All samples were drawn at the school-level so the confidence intervals reported in these chapters are likely to be under-estimates due to the fact that pupils in the same schools are more similar in attainment than pupils in different schools. Furthermore, these chapters contain only point estimates and do not allow useful comparisons between time points. On both counts, the multilevel models of Chapter 8 are more robust and any conclusions about changes over time should be drawn from the analysis in this chapter rather than the interim snapshots.

When comparing the disadvantage gap to pre-pandemic levels, we used 2019 Key Stage 1 teacher assessments to estimate the gap in terms of an effect size. Whilst these teacher assessments were based on test scores, they formed a threshold measure. When comparing with the disadvantage gap seen in this study's assessments, based on two mean scores, we were therefore not comparing like with like. Whilst providing useful context, these comparisons should therefore be treated with caution. 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 remarkable robustness of linear mixed-effects models to violations of distributional assumptions. Estimates from such models are at worst imprecise in their confidence intervals, but not biased (see, for example, Schielzeth *et al.*, 2020).

The CBSQ has limitations as a measure of social skills and wellbeing. Norms are only available for a sample of Australian children aged between 3 and 6; the present sample included pupils up to age 8. Pupils above age 8 were excluded to limit the effect of this. However, this left some pupils above the norm range. Scores could not be age-standardised, and conclusions on whether pupils were at 'expected' standards are limited. However, the time-point analysis shows that pupils did improve between autumn and summer. Aside from the inherent difficulties in using the CSBQ, it is also worth drawing attention to the possibility that teachers might have rated the pupils leniently and considered how they are performing 'under the circumstances', rather than a more absolute comparison. Additionally, it is possible that the teachers had concerns about the social skills of the pupils in autumn and worked hard on improving them, which could explain the increase we saw in summer on many social skills' subscales. Social skills and wellbeing results should be interpreted with caution, and used alongside other contextual data. As mentioned, it is clear that valid and reliable measures of socio-emotional skills for this age group are needed.

This study has followed Key Stage 1 children across the 2020/21 AY and the results indicate that, for many children, recovery from the impact of school closures on pupils' attainment and development will need to continue beyond this point. An extension to this study has now been commissioned to continue to track the performance and social skills development of the same cohort of children until the end of the AY 2022/23.

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Appendix A: Recruitment documents

School Invitation letter

School Invitation letter

RPO/LENT/41693/2   NFER No: «NFER_No»

Dear Headteacher

Research on the impact of Covid-19 school closures and support strategies on pupils' learning and social wellbeing in Key Stage 1

The National Foundation for Educational Research (NFER) is embarking on a research project on behalf of the Education Endowment Foundation (EEF) using NFER's reading and mathematics assessments for Year 1 and Year 2. We are very much hoping that your school might be interested in participating in this research which will explore how Covid-19 related school closures and recovery has affected and supported disadvantaged children, as well as how they access this support.

The aims of the research project

The EEF and NFER are interested to learn more about the impact of Covid-19 related school closures on attainment, and schools' responses during closures and reopening on Year 1 and Year 2 pupils. The project will use NFER Optional Tests and the Key Stage 1 National Curriculum assessment in summer 2021.

What we would like your school to do

- Provide NFER with a list of pupils who you would like to complete the assessments in Years 1 and 2.
- Your pupils will complete their NFER Optional tests as planned, using bespoke pre-populated tests provided by NFER for the purpose of this project. We ask that you complete these assessments as follows:
    - **Y2 Autumn tests: between 2 and 13 November 2020**
    - **Y1 and Y2 Spring tests: March 2021***
    - **Y1 Summer tests: June 2021***

* Spring and Summer test dates will be confirmed nearer the time

Schools taking part in this research project will be sent bespoke pre-populated tests for all three terms. If you have already received your assessment order, you will be able to keep these assessments for use in the next academic year.

- Once you have completed the assessments you would return them to NFER using a secure courier provided by NFER, and we would mark the papers.
- We would ask that the headteacher or KS1 lead completes a survey in the autumn term on strategies implemented during school closures and any planned recovery activities such as small-group work, tutoring and parental engagement.
- Classroom teachers will also be asked to complete a brief record of pupil-level support (for example where pupils have received 1:1 or small group support) over the course of the year.

We would request that the classroom teachers complete short surveys in the autumn and summer terms giving an insight into a sample of their pupils' socio-emotional development surrounding the return to school and learning recovery.

We appreciate that all schools are facing a challenging year ahead, with a great deal of uncertainty, NFER will work closely with you to make participation in this project as easy as possible. We will support you throughout to ensure that the impact on pupils and members of staff is minimal and that participation is a positive experience.

What will be the benefit to participating schools?

In return for your school participating in this research project NFER will provide:

- free marking for all your completed assessments
- leaflets showing the implications for teaching from an item level diagnostic analysis
- feedback on each term's findings

How to let us know if you can help

If you feel you would be able to assist us with this project we would be delighted to hear from you, please log on to our secure 'school portal' at www.nfer.ac.uk/portal and complete the online reply form. To log in you will need your NFER number, project number and password provided below:

- NFER number: <<NFER No>>

- Project number: 41693

- Password: To be sent in a separate email (sent directly after this one)

We very much hope that you can help with this project. If you have any queries please do not hesitate to contact me or my colleague Robert Weeks on 01753 637142 or by email to KS1AttainmentResearch@nfer.ac.uk.

Yours faithfully

Kathryn Hurd
Head of Survey Operations, Research and Product Operations

Memorandum of Understanding

Research on the impact of Covid-19 school closures and support strategies on pupils' learning and social wellbeing in Key Stage 1
Memorandum of Understanding

This form sets out the responsibilities of The National Foundation for Educational Research (NFER) and schools that participate in this research. Please read this summary of the project before agreeing to participate in the research using our school portal. If you have any questions please contact KS1AttainmentResearch@nfer.ac.uk.

Participation in this project should be agreed by the headteacher. For your school to be eligible to participate, your school must agree to the following for this academic year (2020/2021):

- the headteacher will identify the key stage 1 (KS1) teachers and share their contact details with the NFER
- the school will have ordered at least one set of the NFER Optional tests for use this academic year
- complete a school-level survey in the Autumn term
- complete teacher-completed social wellbeing surveys in the Autumn and Summer terms for a subset of pupils
- complete pupil-level support records, completed by the teacher during the year and sent to NFER in the Summer term
- participate in telephone interviews in the Summer term if invited
- NFER will upload your completed test data, post marking, to the NFER progress tool.

The project

The Research on the impact of school closures project is exploring the impact of the school closures initiated in March 2020 on Year 1 and 2 pupils, in terms of their socio-emotional development and attainment. The project will be using the NFER Optional Tests for Years 1 and 2, and we will provide these to you overprinted with your pupils' names. We would invite you to keep any of these tests you have already purchased for use in the next academic year.

We would like your school's help with this project this academic year. If you take part, we would request that all your KS1 pupils sit the NFER Optional tests as planned. We ask that you complete these assessments as follows:

- **Y2 Autumn tests: between 2 and 13 November 2020**
- **Y1 and Y2 Spring tests: in March 2021***
- **Y1 Summer tests in June 2021***

* Spring and Summer test dates will be confirmed nearer the time

We would then arrange for these to be returned to NFER for marking. We would also request that the classroom teachers complete short surveys in the Autumn and Summer terms with the headteacher or KS1 lead completing a survey in the Autumn term.

Use of data

All data gathered during the research project will be held in accordance with the Data Protection Act 2018, and GDPR, and will be treated in the strictest confidence by the 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 individual ID number.

No school, teacher or pupil will be named in any report arising from this work.

A Privacy Notice for the study is available here:

https://www.nfer.ac.uk/for-schools/participate-in-research/research-on-the-impact-of-school-closures-and-recovery-strategies-in-key-stage-1/

Who to contact at NFER

For any questions about the project, please contact Robert Weeks on 01753 637142 or email KS1AttainmentResearch@nfer.ac.uk

Memorandum of Understanding: Responsibilities
The NFER will:

- provide a key project contact who will be available to support schools with the project
- provide a secure means and templates for schools to provide all requested data including a list of participating pupils and teacher data
- analyse all data from the project using secure systems
- mark all your completed assessments
- provide leaflets showing the implications for teaching from an item level diagnostic analysis following the Autumn and Spring term assessments
- provide use of the NFER progress tool
- provide research findings

Our overall expectations of your school:

The following outlines our expectations from schools and teachers taking part in the project.

The school will:

- Be a point of contact for parents/carers, including providing them with full information about the project and inform NFER about any pupil withdrawal requests from parents
- Provide:
    - pupil name
    - date of birth
    - unique pupil number (UPN)
    - gender
    - English as an Additional Language information (EAL)
    - Free School Meals status (FSM)
    - class
    - year group
- Confirm the engagement of all Year 1 and 2 pupils in the mathematics and reading assessments
- Provide research data by way of surveys and interviews as requested

School Information Sheet

Education Endowment Foundation

NFER National Foundation for Educational Research

Research on the impact of Covid-19 school closures and support strategies on pupils' learning and social wellbeing in Key Stage 1

School Information Sheet

What is the research project?

The research project is exploring the impact of the Covid-19 related school closures on the attainment gap of key stage 1 (KS1) pupils and their socio-emotional development. It will explore how support is accessed for pupils from disadvantaged backgrounds, school practices and teachers' perspectives including information on pupil-level support strategies such as small-group work, tutoring and parental engagement. The research project will be completed through teacher questionnaires and the results from sitting the NFER optional tests in mathematics and reading.

Who is conducting the study?

The National Foundation for Educational Research (NFER) has been commissioned to carry out this research by the Education Endowment Foundation (EEF).

Which schools can take part?

A sample of schools have been contacted who have ordered at least one set of the NFER Optional tests for use this academic year. Any of these schools can take part in this research project.

When will the tests take place?
The testing windows are:

Y2 Autumn tests: between 2 and 13 November 2020

Y1 and Y2 Spring tests: March 2021*

Y1 Summer tests: June 2021*

* Spring and Summer test dates will be confirmed nearer the time

What will the evaluation involve for teachers and schools?

The research will require schools to return their assessments to NFER for free marking after each test period. KS1 teachers will be required to complete a questionnaire in the autumn and summer terms for a small number of pupils covering the socio-emotional development. They will also need to complete a record of support for individual pupils throughout the academic year, and submit to NFER in the Summer term.

Year 1 pupils will be required to sit both the Spring and Summer tests, and year 2 pupils the Autumn and Spring tests, in order to complete the full suite of materials and enable an assessment to be made of their progress and attainment over the academic year.

The completed tests will be required to be submitted to the NFER, for marking, who will then provide the results to the schools via the NFER Progress Tool, as well as copies of all tests electronically via the school portal.

In the Autumn term the headteacher or KS1 lead will be required to complete a school-level survey on how they approached support in lockdown and their planned recovery activities such as small-group work, tutoring and parental engagement. Teachers will also need to complete two surveys across the academic year, as detailed above, on socio-emotional development for a sample of their pupils.

Joining the research project: Each school headteacher will sign the online Memorandum of Understanding (MoU) and nominate their school's point of contact for the research project.

Data: The NFER will provide a template on the secure school portal for teachers to provide the data required for the research project. This will include contact information as well as some information on the pupils, for example names, UPN.

When will my school need to get involved and what is required?

Date	Activity
September 2020	Sign-up to the project with the NFER, and identify teachers to be involved. The NFER will provide an online data template for schools to complete the required data. Schools provide: • Contact name and contact details, • Pupil names, date of birth, gender, class, year group, UPN, EAL and FSM The NFER will also provide schools with a letter for parents that explains the research and gives them the opportunity to withdraw their child from the data collection for the study. This should be shared with all parents in the relevant class in advance.
October - November 2020	Schools sit Year 2 Autumn tests and return them to the NFER
November 2020	Teachers complete pupil level socio-emotional development surveys online for Year 1 and Year 2 for a subset of pupils. Headteacher/KS1 lead completes school-level survey
December 2020	Results and diagnostic analysis to schools for the autumn tests
January 2021	Feedback to schools for the Autumn term. Access to teacher completed pupil-level participation support record for Year 1 and Year 2 available.
March 2021	Schools sit Year 1 and Year 2 Spring tests and return them to the NFER
April 2021	Results and diagnostic analysis to schools for the Spring tests
May 2021	Feedback to schools for the Spring term
June 2021	Schools sit Year 1 Summer tests and return them to the NFER. Teachers complete pupil level socio-emotional development surveys online for a subset of Year 1 and Year 2. Teachers complete pupil-level participation support record for Year 1 and Year 2.
July 2021	Follow up telephone interviews with selected teachers Results to schools for the Summer tests. Schools provide Y2 National Curriculum Test data

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The final report will be sent to schools on publication.

How will my school benefit from taking part?

The school will receive a complimentary marking service for all assessments and will also have access to the feedback tool.

The marking will use diagnostic coding to help identify common errors and misconceptions. We will develop short leaflets identifying these and their implications for teaching.

How will the findings be used?

The findings will be used to provide a report to the EEF on the impact of the school closures on the attainment gap within KS1 and the socio-emotional development of pupils. This report will also include how Covid-19 related school closures and recovery has affected and supported disadvantaged children, as well as how they access this support. This report will be available to primary schools to assist and develop their support of disadvantaged pupils at KS1.

Who needs to give agreement for participation in the research project?

Schools will join the research project via their headteacher.

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 the NFER of any pupils or teachers who withdraw from the research 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 the NFER of such pupils to be removed from datasets and subsequent analysis immediately.

How will the NFER use and protect the data collected?

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

All teacher and pupil-level data shared by schools with the 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 Privacy Notice for the research project is available here:

https://www.nfer.ac.uk/for-schools/participate-in-research/research-on-the-impact-of-school-closures-and-recovery-strategies-in-key-stage-1/

Who can I contact for more information?

For further information, please contact Robert Weeks on 01753 637142 or email KS1AttainmentResearch@nfer.ac.uk.

School Privacy Notice

Research on the Impact of Covid-19 school closures and support strategies on pupils' learning and social wellbeing in Key Stage 1 Privacy notice for school staff

1   Why are we collecting this data?

The Education Endowment Foundation (EEF) has commissioned the National Foundation for Educational Research (NFER) to undertake research into the impact of Covid-19 related school closures on attainment in key stage one (KS1). It will investigate the impact of school closures on KS1 pupils, 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 see the privacy notice covering pupil data here:
https://www.nfer.ac.uk/media/4149/lent_parent_privacy_notice.pdf

The 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.

3   How will personal data be obtained?

Personal data about school staff will be collected directly from participating schools and through short telephone interviews with a small number of 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.

The NFER will conduct interviews with teachers and ask them to complete online surveys on school practices and teachers' perspectives including information on additional pupil-level support strategies such as small-group work, tutoring and parental engagement.

LENT   **10 May 2021**

Public

5   Who will personal data be shared with?

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

For the purposes of research archiving, school-level data will be linked with information about 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. Further matching to NPD and other administrative data may take place during subsequent research.

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

Individual views from interview data will not be shared.

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, including audio-recordings of the interviews, will be stored securely in the NFER systems until the final report in this research project is published. This is currently expected to be October 2021. 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 Scheme[1]. 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).

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. In addition, each organisation involved will limit access to your personal information to their staff members who have a business need to see it.

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[1] https://www.ons.gov.uk/aboutus/whatwedo/statistics/requestingstatistics/approvedresearcherscheme

9   Can I stop my personal data being used?

A school, teacher or pupil can withdraw from the project and/or from their data being used in the project at any time. Parents will be provided with a parent letter about the project and explaining how their child's data will be collected, used and how they can withdraw from data sharing.

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 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 Robert Weeks 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). Alternatively, 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 may need to update this privacy notice periodically so we recommend that you revisit this information from time to time. This privacy notice was last updated in May 2021 to clarify how data from teacher interviews will be processed, recorded and stored. The date when this privacy notice was last updated is shown in the footer at the bottom of this document.

Parent Privacy Notice

Research on the Impact of Covid-19 school closures and support strategies on pupils' learning and social wellbeing in Key Stage 1 Parent Privacy Notice

1   Why are we collecting this data?

The Education Endowment Foundation (EEF) has commissioned the National Foundation for Educational Research (NFER) to undertake research into the impact of Covid-19 related school closures on attainment in key stage one (KS1). It will investigate the impact of school closures on KS1 pupils, looking at pupil attainment, school practices and teachers' perspectives on pupils' socio-emotional development and social skills.

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

The 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. Personal data is required for the research and its processing will not cause damage or distress to the data subjects.

3   How will personal data be obtained?

Personal data about KS1 pupils will be collected directly from participating schools using forms and online surveys.

:·NFER
National Foundation for
Educational Research

4   What personal data is being collected by this project?

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

- pupil name,
- date of birth,
- gender
- unique pupil number (UPN)
- class name
- school name
- English as an Additional Language information (EAL)
- Free School Meals status (FSM)
- attainment information for all pupils in KS1 participating in this research
- information on support activities that pupils' have taken part in (such as 1:1 or small group support)

We will also collect Year 2 National Curriculum Test (NCT) data for all participating pupils.

Teachers will provide information about a sample of pupils' socio-emotional development and social skills. The Child self-regulation and behaviour questionnaire will be used with a sample of 12 pupils from each year group 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. Further matching to NPD and other administrative data may take place during subsequent research.

The 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 December 2021. 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. Other research teams may use the de-identified data as part of subsequent research through the ONS Approved Researcher Scheme[1]. 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).

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

The NFER have put in place appropriate measures to prevent your child's personal information from being accidentally lost, used or accessed in an unauthorised way, altered or disclosed. In addition, each organisation involved will limit access to your child's personal information to their staff members who have a business need to see it.

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 and explaining how you child's data will be collected, 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 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.

In certain circumstances, data subjects have the right to restrict or object to any processing of their data. They have the right to withdraw consent to processing that they have given at any time. They also have the right to make a subject access request to see all information held about them. To exercise any of these rights, please contact NFER's Compliance Officer at 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 Robert Weeks 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). Alternatively, 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/.

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[1] https://www.ons.gov.uk/aboutus/whatwedo/statistics/requestingstatistics/approvedresearcherscheme

11 Updates

We may need to update this privacy notice periodically so we recommend that you revisit this information from time to time. The date when this privacy notice was last updated is shown in the footer at the bottom of this document.

Parent Opt-out Letter

Education Endowment Foundation

NFER
National Foundation for Educational Research

RPO/LENT/41693

NFER No:
October 2020

Dear Parent/Guardian,

Research on the impact of Covid-19 school closures and support strategies on pupils' learning and social wellbeing in Key Stage 1

We are writing to you to let you know that your child's school has been selected to participate in a research project to determine the impact of the school closures during the current Covid-19 lockdown period. This is an exciting study and all the children in your child's year group have been selected to take part.

The National Foundation for Educational Research (NFER) has been commissioned to carry out this research by the Education Endowment Foundation (EEF) to learn more about the impact of Covid-19-related school closures on the attainment gap, and schools' responses during closures and reopening.

The research is due to take place termly, during the 2020/2021 academic year and will begin in November 2020. The children will complete a mathematics and a reading assessment already planned by their school; no additional unplanned assessments will be carried out. Their individual responses will be kept completely confidential and will not be shared with anyone outside of the NFER.

We very much appreciate your and your child's participation. Enclosed with this letter you will find a 'School Information Sheet' with more information about the research and our commitment to the General Data Protection Regulations (GDPR), including where you can access the privacy notice.

If you are happy for your child's data to be used for this project, **you do not need to return the enclosed reply slip**. However, please inform your child's teacher if you would like to withdraw your child's data from this project at any subsequent stage. If you would prefer your child's data <u>not</u> to be shared, stored and used for this project, please complete the enclosed form and return it to your child's school.

If you have any queries please contact my colleague Robert Weeks on 01753 637142 or via email at KS1AttainmentResearch@nfer.ac.uk.

Yours sincerely,

Kathryn Hurd
Head of Survey Operations, Research and Product Operations
National Foundation for Educational Research

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Research into the Impact of School Closures – withdrawal from data processing.

You only need to complete this form if you <u>DO NOT</u> wish your child's data to be shared, stored and used for this research.

I **DO NOT** give permission for data about my child that is collected as part of the above research project to be shared, stored or used for research purposes.

Child's name…………………………………………….Child's class:……………………..

Name of school……………………………………………………………………………....

Your full name……………………………………………………………………………...

Your telephone number (optional)....……………………………………………………

Your signature……………………………………………. Date…………………………

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Appendix B: NFER Test Duration and Scores

Both the NFER tests and the KS1 2019 national curriculum assessments have two individual papers for each subject. Individuals obtain a raw score on each of these papers based on the number of questions they answer correctly.

The total raw score for the mathematics paper necessitates that the individual has sat both papers 1 and 2. For reading, a total raw score is obtained if the individual has sat paper 1 or both papers 1 and 2. Should an individual sit paper 2 for reading without sitting paper 1, a total raw score is not calculated.

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

Assessment	Duration of paper 1 (mins)	Number of marks available for paper 1 (raw score)	Duration of paper 2 (mins)	Number of marks available for paper 2 (raw score)
Maths Year 2 Autumn	20 (arithmetic)	20	30 (reasoning)	30
Reading Year 2 Autumn	50	20	30	15
Maths Year 1 Spring	30 (arithmetic)	25	20 (arithmetic)	15
Reading Year 1 Spring	60	36	30	12
Maths Year 2 Spring	20 (arithmetic)	25	35 (reasoning)	35
Reading Year 2 Spring	40	20	50	20
Maths Year 1 Summer	30 (arithmetic)	25	20 (arithmetic)	15
Reading Year 1 Summer	60	36	30	12
Maths Year 2 Summer	20 (arithmetic)	25	35 (arithmetic)	35
Reading Year 2 Summer	30	20	40	20

Appendix C: CSBQ

Child Self-Regulation and Social Behaviour Questionnaire

Child's name...

Boy/Girl..Age...................................(to nearest month).

Please circle the number that best fits what the child is like.

What is the child like?	Not True		Partly True		Very True
1. Chosen as a friend by others	1	2	3	4	5
2. Is calm and easy going	1	2	3	4	5
3. Aggressive to children	1	2	3	4	5
4. Is popular with children	1	2	3	4	5
5. Persists with difficult tasks	1	2	3	4	5
6. Chooses activities on their own	1	2	3	4	5
7. Regularly unable to sustain attention	1	2	3	4	5
8. Does not need much help with tasks	1	2	3	4	5
9. Interacts freely with adults	1	2	3	4	5
10. Gets over being upset quickly	1	2	3	4	5
11. Easily upset over small events	1	2	3	4	5
12. Persists with tasks until completed	1	2	3	4	5
13. Waits their turn in activities	1	2	3	4	5
14. Gets over excited	1	2	3	4	5
15. Good at following instructions	1	2	3	4	5
16. Rarely plays with other children	1	2	3	4	5
17. Most days distressed or anxious	1	2	3	4	5
18. Likes to work things out for self	1	2	3	4	5
19. Happy to share	1	2	3	4	5
20. Disagrees with or challenges people	1	2	3	4	5
21. Often stares into space	1	2	3	4	5
22. Is shy when meeting new children	1	2	3	4	5
23. Most days will lose temper	1	2	3	4	5
24. Helps others	1	2	3	4	5
25. Most days says feeling unwell	1	2	3	4	5
26. Shows wide mood swings	1	2	3	4	5
27. Plays easily with other children	1	2	3	4	5
28. Disrupts the play of other children	1	2	3	4	5
29. Not able to sit still when necessary	1	2	3	4	5
30. Is cooperative	1	2	3	4	5
31. Is impulsive	1	2	3	4	5
32. Sociable with new children	1	2	3	4	5
33. Frequently sad or miserable	1	2	3	4	5
34. Will wander around aimlessly	1	2	3	4	5

Appendix D: School Survey

About remote learning when schools were closed to most pupils

All questions refer to pupils who are in Key Stage 1 (i.e. Year 1 and Year 2) in this current academic year (i.e. 2020-2021). These pupils would have been in their Reception year and Year 1 during the period when schools were closed to most pupils.

1. What strategies did your school employ to support home learning for pupils who were in Reception and Year 1 between 20th March 2020 and the end of May 2020 (i.e. the time schools were closed to most pupils)? *Please select all options that apply.*

	Reception pupils	Year 1 pupils
The school virtual learning environment	☐	☐
Educational websites or apps	☐	☐
Workbooks, sheets or other physical resources	☐	☐
Online resources (e.g. video lessons from other providers or links to resources)	☐	☐
Videos of lessons you have produced	☐	☐
Online 'live' lessons	☐	☐
Online conversations (between you and pupils)	☐	☐
Online conversations (between you and parents)	☐	☐
Other (please specify)	☐	☐

2. For those pupils who were being educated at home, how would you describe levels of engagement for the following areas between 20th March 2020 and the end of May 2020 (i.e. the time schools were closed to most pupils)?

	Reception pupils					Year 1 pupils				
	very high	high	Neither high nor low	low	very low	very high	high	Neither high nor low	low	very low
The level of engagement **of most**	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

pupils with the learning resources provided was…..

The level of engagement of **pupils eligible for pupil premium** with the learning resources provided was…..

☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐

The level of engagement of **pupils who have English as an Additional Language** with the learning resources provided was…..

☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐

The level of **support most parents were able to provide** their children in terms of their learning was…..

☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐

3. **What do you think the main reasons are for this level of parental support?**

Reception   [100 characters]

Year 1   [100 characters]

About Reception and Year 1 pupils and their return to school (summer 2020)

All questions refer to pupils who are in Key Stage 1 in this current academic year (i.e. 2020-2021). These pupils would have been in their Reception year and Year 1 during the period when schools were closed to most pupils.

4. **When did your current school reopen to the whole cohort of Reception and Year 1 pupils in the summer term 2020?** *Please select one option for each year group.*

	Reception	Year 1
June 2020	☐	☐
July 2020	☐	☐
My school did not reopen to the whole cohort of pupils in summer term 2020	☐	☐

5a. **After your school reopened to the whole cohort of <u>Reception pupils</u> in the summer term 2020, how many days a week were pupils expected to be in school?** *Where pupils were expected in school for reduced hours or half days, please give the full day equivalent. Please select one option.*

	Reception pupils
4 days or more	☐
More than 2.5 days but less than 4 days	☐
1-2 days a week	☐

5b. **After your school reopened to the whole cohort of <u>Year 1 pupils</u> in the summer term 2020, how many days a week were pupils expected to be in school?** *Where pupils were expected in school for reduced hours or half days, please give the full day equivalent. Please select one option.*

	Year 1 pupils
4 days or more	☐
More than 2.5 days but less than 4 days	☐
2.5 days or less	☐

1.

5c. After your school reopened to the whole cohort of <u>Reception and Year 1 pupils</u> in the summer term 2020, how many days a week were pupils expected to be in school? *Where pupils were expected in school for reduced hours or half days, please give the full day equivalent. Please select one option for each year group.*

	Reception pupils	Year 1 pupils
4 days or more	☐	☐
More than 2.5 days but less than 4 days	☐	☐
2.5 days or less	☐	☐

6a. From when your school reopened for the whole cohort of <u>Reception pupils</u> until the end of summer term 2020, what was the overall level of attendance? *Please select one option.*

	Reception pupils
81-100%	☐
61-80%	☐
40-60%	☐
Less than 40%	☐

6b. From when your school reopened for the whole cohort of <u>Year 1 pupils</u> until the end of summer term 2020, what was the overall level of attendance? *Please select one option.*

	Year 1 pupils
81-100%	☐
61-80%	☐
40-60%	☐
Less than 40%	☐

6c. From when your school reopened for whole cohorts of <u>Reception and Year 1 pupils</u> until the end of summer term 2020, what was the overall level of attendance for each year group? *Please select one option for each year group.*

	Reception pupils	Year 1 pupils
81-100%	☐	☐
61-80%	☐	☐

	Reception pupils		
40-60%	☐		☐
Less than 40%	☐		☐

7ai. Were there any changes to school organisation/procedures in place that you feel may have affected levels of attainment when your school reopened for the whole cohort of Reception pupils in the summer term 2020? *Please select all options that apply.*

	Reception pupils
Reduced class size	☐
Being taught by a different teacher/HLTA	☐
Change in curriculum focus	☐
Classroom layout	☐
Restricted movement around classroom and/or school	☐
Use of resources	☐
Pace of lessons	☐
Restricted informal interaction between staff	☐
Other (please specify)	☐

7aii. Were there any changes to school organisation/procedures in place that you feel may have affected levels of wellbeing when your school reopened for the whole cohort of Reception pupils in the summer term 2020? *Please select all options that apply.*

	Reception pupils
Reduced class size	☐
Being taught by a different teacher/HLTA	☐
Change in curriculum focus	☐
Classroom layout	☐
Restricted movement around classroom and/or school	☐
Use of resources	☐
Pace of lessons	☐
Reduced interaction with a range of adults	☐
Other (please specify)	☐

7bi. Were there any changes to school organisation/procedures in place that you feel may have affected levels of attainment when your school reopened for the whole cohort of Year 1 pupils in the summer term 2020? *Please select all options that apply.*

	Year 1 pupils
Reduced class size	☐
Being taught by a different teacher/HLTA	☐
Change in curriculum focus	☐
Classroom layout	☐
Restricted movement around classroom and/or school	☐
Use of resources	☐
Pace of lessons	☐
Restricted informal interaction between staff	☐
Other (please specify)	☐

7bii. Were there any changes to school organisation/procedures in place that you feel may have affected levels of wellbeing when your school reopened for the whole cohort of Year 1 pupils in the summer term 2020? *Please select all options that apply.*

	Year 1 pupils
Reduced class size	☐
Being taught by a different teacher/HLTA	☐
Change in curriculum focus	☐
Classroom layout	☐
Restricted movement around classroom and/or school	☐
Use of resources	☐
Pace of lessons	☐
Reduced interaction with a range of adults	☐
Other (please specify)	☐

7c. Were there any changes to school organisation/procedures in place that you feel may have affected levels of attainment when your school reopened for whole cohorts of pupils in the summer term 2020? *Please select all options that apply for each year group.*

	Reception pupils	Year 1 pupils

Reduced class size	☐	☐
Being taught by a different teacher/HLTA	☐	☐
Change in curriculum focus	☐	☐
Classroom layout	☐	☐
Restricted movement around classroom and/or school	☐	☐
Use of resources	☐	☐
Pace of lessons	☐	☐
Restricted informal interaction between staff	☐	☐
Other (please specify)	☐	☐

7cii. Were there any changes to school organisation/procedures in place that you feel may have affected levels of wellbeing when your school reopened for whole cohorts of pupils in the summer term 2020? *Please select all options that apply for each year group.*

	Reception pupils	Year 1 pupils
Reduced class size	☐	☐
Being taught by a different teacher/HLTA	☐	☐
Change in curriculum focus	☐	☐
Classroom layout	☐	☐
Restricted movement around classroom and/or school	☐	☐
Use of resources	☐	☐
Pace of lessons	☐	☐
Reduced interaction with a range of adults	☐	☐
Other (please specify)	☐	☐

About Year 1 and Year 2 pupils this academic year (autumn 2020)

All questions refer to pupils who are in Key Stage 1 in this current academic year (i.e. 2020-2021).

8. Comparing pupils in the current Year 1 cohort to those in the Year 1 cohort that entered last academic year (2019), please complete each statement below.

	Better than last year's cohort	About the same as last year's cohort	Below last year's cohort

In September 2020, the **maths ability** of this year's whole cohort was… ☐ ☐ ☐

In September 2020, the **maths ability** of this year's cohort of pupils eligible for pupil premium was… ☐ ☐ ☐

In September 2020, the **maths ability** of this year's cohort of pupils who have English as an Additional Language was… ☐ ☐ ☐

In September 2020, the **reading ability** of this year's whole cohort was… ☐ ☐ ☐

In September 2020, the **reading ability** of this year's cohort of pupils eligible for pupil premium was… ☐ ☐ ☐

In September 2020, the **reading ability** of this year's cohort of pupils who have English as an Additional Language was… ☐ ☐ ☐

In September 2020, the **social skills** of this year's whole cohort were… ☐ ☐ ☐

In September 2020, the **social skills** of this year's cohort of pupils eligible for pupil premium were… ☐ ☐ ☐

In September 2020, the **social skills** of this year's cohort of pupils who have English as an Additional Language were… ☐ ☐ ☐

In September 2020, the **wellbeing** of this year's whole cohort was… ☐ ☐ ☐

In September 2020, the **wellbeing** of this year's cohort of pupils eligible for pupil premium was… ☐ ☐ ☐

In September 2020, the **wellbeing** of this year's cohort of pupils who have English as an Additional Language was… ☐ ☐ ☐

9a. **What do you think are the main factors that have affected the attainment of this year's cohort in this way (please note this is for the current Year 1)?** *Please select all that apply.*

Different demographic ☐

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Home learning delivered by school	☐
Greater parental involvement	☐
Lack of IT access	☐
Challenges in the provision of home learning	☐
Low level of parental engagement in/support with learning	☐
Other (please specify)	☐

9b. **What main factors do you think have affected the wellbeing and social skills of this year's cohort in this way (please note this is for the current Year 1)?**

[150 characters]

10. **Comparing pupils in the current Year 2 cohort to those in the Year 2 cohort that entered last academic year (2019), please complete each statement below.**

	Better than last year's cohort	About the same as last year's cohort	Below last year's cohort
In September 2020, the **maths ability** of this year's whole cohort was…	☐	☐	☐
In September 2020, the **maths ability** of this year's cohort of pupils eligible for pupil premium was…	☐	☐	☐
In September 2020, the **maths ability** of this year's cohort of pupils who have English as an Additional Language was…	☐	☐	☐
In September 2020, the **reading ability** of this year's whole cohort was…	☐	☐	☐
In September 2020, the **reading ability** of this year's cohort of pupils eligible for pupil premium was…	☐	☐	☐
In September 2020, the **reading ability** of this year's cohort of pupils who have English as an Additional Language was…	☐	☐	☐

In September 2020, the **social skills** of this year's whole cohort were…

☐ ☐ ☐

In September 2020, the **social skills** of this year's cohort of pupils eligible for pupil premium were…

☐ ☐ ☐

In September 2020, the **social skills** of this year's cohort of pupils who have English as an Additional Language were…

☐ ☐ ☐

In September 2020, the **wellbeing** of this year's whole cohort was…

☐ ☐ ☐

In September 2020, the **wellbeing** of this year's cohort of pupils eligible for pupil premium was…

☐ ☐ ☐

In September 2020, the **wellbeing** of this year's cohort of pupils who have English as an Additional Language was…

☐ ☐ ☐

11a. **What do you think are the main factors that have affected the attainment of this year's cohort in this way (please note this is for the current Year 2)?** *Please select all that apply.*

Different demographic	☐
Home learning delivered by school	☐
Greater parental involvement	☐
Lack of IT access	☐
Challenges in the provision of home learning	☐
Low level of parental engagement in/support with learning	☐
Other (please specify)	☐

11b. **What main factors do you think have affected the wellbeing and social skills of this year's cohort in this way (please note this is for the current Year 2)?**

[150 characters]

12. **What strategies has your school implemented in the first few weeks/months of this term to support Key Stage 1 pupils in their immediate return to school in maths and reading (please note, a separate question will ask you about strategies for the coming year)?**

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	Maths	Reading
Small-group work	☐	☐
Tutoring	☐	☐
Parental engagement	☐	☐
Revised curriculum	☐	☐
Staff deployment (e.g. greater use of TAs to support individuals	☐	☐
Other (please specify)	☐	☐

13. **What strategies has your school implemented in the first few weeks/months of this term to support pupils in their immediate return to school in terms of social skills and wellbeing for Key Stage 1 pupils (please note, the next question will ask you about strategies for the coming year)?**

[150 characters]

14. **What strategies does your school currently plan to implement <u>over the remainder of the academic year</u> to support Key Stage 1 pupils' learning in maths and reading?**

	Maths	Reading
Small-group work	☐	☐
Tutoring through NTP Tuition Partners	☐	☐
Other tutoring	☐	☐
Parental engagement	☐	☐
Revised curriculum	☐	☐
Staff deployment (e.g. greater use of TAs to support individuals	☐	☐
NTP Academic Mentors	☐	☐
Catch-up schemes	☐	☐

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Other (please specify) ☐ ☐

15. **What strategies does your school currently plan to implement <u>over the remainder of the academic year</u> to support wellbeing and development of social skills for Key Stage 1 pupils?**

_____

[150 characters]

16. **If it were necessary, how well prepared do you feel your school is to deliver effective home learning this coming academic year for Key Stage 1 pupils?** _Please select one option for each year group._

	Year 1 pupils	Year 2 pupils
Very well prepared	☐	☐
Quite well prepared	☐	☐
Somewhat prepared	☐	☐
not prepared	☐	☐

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Appendix E: Autumn and Spring PPR

Instructions:

School name:		Research on the impact of school closures and subsequent support strategies on attainment and socio-emotional wellbeing in Key Stage 1
NFER no.		Autumn term & spring pre-test pupil activity

The first worksheet/tab covers the whole autumn term. For each pupil, please enter an estimate for the intensity of additional support they received in each of the different categories in the autumn term. By 'additional' we mean any support that takes place over and above standard classroom teaching. Please enter H (high intensity: daily), M (medium intensity: weekly) or L (low intensity: monthly). If the pupil did not receive the support listed, please enter N (No).

The second worksheet/tab is labelled 'Spring term 2021 PRE TEST' and covers the time period from January until the pupils sat their assessments in the spring term. There are questions about learning provision, IT access of each pupil, workspace, pupil engagement and additional support received. Please complete it to the best of your knowledge, following the instructions on each question.

If you have any questions contact KS1AttainmentResearch@nfer.ac.uk.

Many thanks for your support.

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Autumn term 2020

Research on the impact of school closures in KS1: Autumn term pupil activity

School name:	
NFER no.	
Time period:	autumn term 2020
Year group:	
Class:	

For each pupil, please enter an estimate for the intensity of additional support. Please enter H (high intensity: daily), M (medium intensity: weekly) or L (low intensity: monthly). If the pupil did not receive the support listed, please enter N (No).

By 'additional' we mean any support that takes place over and above standard classroom teaching. If you have any questions contact KS1AttainmentResearch@nfer.ac.uk.

Many thanks for your participation.

Pupil name	Pupil ID	Class	Reading				Maths			Social skills and Wellbeing				
			Did this pupil receive additional support in reading? Please enter Y (yes) or N (no).	If Y, please rate the intensity of support: H (high: daily), M (medium: weekly) or L (low: monthly). If the pupil did not receive the support listed, please enter N (No).			Did this pupil receive additional support in maths? Please enter Y (yes) or N (no).	If Y, please rate the intensity of support: H (high: daily), M (medium: weekly) or L (low: monthly). If the pupil did not receive the support listed, please enter N (No).		Did this pupil receive additional support with social skills/wellbeing? Please enter Y (yes) or N (no).	If Y, please rate the intensity of support: H (high: daily), M (medium: weekly) or L (low: monthly). If the pupil did not receive the support listed, please enter N (No).			
				additional phonics support/catch-up scheme	additional reading/guided reading/catch-up scheme	tutoring		additional numeracy support/catch-up scheme	tutoring		additional speech and language support (e.g NELI, Talk time, oracy)	additional social skills support	additional mental health/wellbeing support (e.g ELSA/counsellor support, THRIVE activites, nurture group, art/play therapy)	additional PE or additional time outside (e.g. lessons outside, forest school activities)

Spring term 2021 Pre Test

Research on the impact of school closures in KS1: Spring term pre-test pupil activity

School name:	
NFER no.	
Time period:	start of spring term until assessments
Year group:	
Class:	

By 'additional' we mean any support that takes place over and above standard classroom teaching.
There is a box for additional comments.
If you have any questions contact KS1AttainmentResearch@nfer.ac.uk.
Many thanks for your participation.

Pupil name	Pupil ID	Class	Work provision	IT access	School/home learning	Work space	Engagement (lessons)	Engagement (work)	Engagement (work)	Reading				Maths				Social skills and Wellbeing				Additional comments (optional)
			Were online lessons (either live or prerecorded) produced by the teacher/school for this class? Please enter Y (yes) or N (no). You only need to respond once for the whole class.	Does the pupil have good access to IT when needed for remote learning? Please enter Y (yes) or N (no). By 'good' we mean access to a laptop or pc and broadband connection.	Was this pupil predominantly in school during the period 5th January to 8th March? Please enter Y (yes) or N (no).	Does the pupil have a quiet place to work at home? Please enter Y, N or U (Unsure/don't know)	Please rate the level of pupil engagement with school-provided online lessons.	Please rate the level of pupil engagement with online resources (e.g cbeebies, MyMaths)	Please rate the level of pupil engagement with offline resources (e.g worksheets) Please enter H (high), M (medium) or L (low). Enter N (no) if they did not receive any.	Did this pupil receive additional support in reading? Please enter Y (yes) or N (no).	If Y, please rate the intensity of support: H (high: daily), M (medium: weekly) or L (low: monthly). If the pupil did not receive the support listed, please enter N (No).			Did this pupil receive additional support in maths? Please enter Y (yes) or N (no).	If Y, please rate the intensity of support: H (high: daily), M (medium: weekly) or L (low: monthly). If the pupil did not receive the support listed, please enter N (No).			Did this pupil receive additional support in social skills and wellbeing? Please enter Y (yes) or N (no).	If Y, please rate the intensity of support: H (high: daily), M (medium: weekly) or L (low: monthly). If the pupil did not receive the support listed, please enter N (No).			
											additional phonics support/catch-up scheme	additional reading/guided reading/catch-up scheme	tutoring		additional numeracy support/catch-up scheme	tutoring			additional speech and language support (e.g NELI, Talk time, oracy)	additional social skills support	additional mental health/wellbeing support (e.g ELSA/counsellor support, THRIVE activites, nurture group, art/play therapy)	

Appendix F: Spring–Summer PPR

Instructions

School name:		Research on the impact of school closures and subsequent support strategies on attainment and socio-emotional wellbeing in Key Stage 1
NFER no.		Spring post-test and summer pre-test pupil activity

During the remainder of this academic year, you should update this log to show any additional resources that pupils have accessed to support their reading, maths, social skills development and their wellbeing.

For each pupil, please enter an estimate for the intensity of additional support they received in each of the different categories. By 'additional' we mean any support that takes place over and above standard classroom teaching. Please enter H (high intensity: daily), M (medium intensity: weekly) or L (low intensity: monthly). If the pupil did not receive the support listed, please enter N (No).

It covers the time period after taking spring assessments up until summer assessments.
If you have any questions contact KS1AttainmentResearch@nfer.ac.uk.

Many thanks for your support.

Spring–summer 2021

Research on the impact of school closures in KS1													
Spring post-test and summer pre-test pupil activity													
School name:			By 'additional' we mean any support that takes place over and above standard classroom teaching. If you have any questions contact KS1AttainmentResearch@nfer.ac.uk. Many thanks for your participation.										
NFER no.													
Time period:	after spring assessments until summer assessments												
Year group:													
Class:													
			Reading				**Maths**			**Social skills and Wellbeing**			
Pupil name	Pupil ID	Class	Did this pupil receive additional support in reading? Please enter Y (yes) or N (no).	If Y, please rate the intensity of support: H (high: daily), M (medium: weekly) or L (low: monthly). If the pupil did not receive the support listed, please enter N (No).			Did this pupil receive additional support in maths? Please enter Y (yes) or N (no).	If Y, please rate the intensity of support: H (high: daily), M (medium: weekly) or L (low: monthly). If the pupil did not receive the support listed, please enter N (No).		Did this pupil receive additional support in social skills and wellbeing? Please enter Y (yes) or N (no).	If Y, please rate the intensity of support: H (high: daily), M (medium: weekly) or L (low: monthly). If the pupil did not receive the support listed, please enter N (No).		
				additional phonics support/catch-up scheme	additional reading/guided reading/catch-up scheme	tutoring		additional numeracy support/catch-up scheme	tutoring		additional speech and language support (e.g NELI, Talk time, oracy)	additional social skills support	additional mental health/wellbeing support (e.g ELSA/counsellor support, THRIVE activites, nurture group, art/play therapy)	additional PE or additional time outside (e.g. lessons outside, forest school activities)

Appendix G: Telephone interview schedule

1   Home learning

Q1a. We understand that in the first period of school closures *[response given by head teacher in survey]* was used to support home learning. Can you tell me a bit more about these strategies and if they were effective in supporting your pupils' learning?

Q1b. Can you tell me about the strategies you employed to support home learning for pupils in the **second** period of school closures and if they were effective in supporting your pupils' learning?

Prompt: Why were these strategies different to/the same as those used after the first period of school closures? Were certain strategies more or less effective for certain groups of pupils?

Q1c. Did access to IT affect pupils' experience of home learning in the first and second period of school closures? How?

Prompt: Was this different for different groups of pupils? Were there any changes in the impact of IT access between the first and second lockdown?

Q1d. Can you tell me about parental engagement during periods of school closure?

Prompt: Do you feel that parents were successfully engaged with children's learning during the closures? Why/why not? Was this different for different groups of pupils?

Q1e. We understand that in the first period of school closures, pupil engagement was *[response given by head teacher in survey]* with home learning. Can you tell me about pupil engagement with home learning during the **second** period of school closures?

Prompt: What do you think are the reasons for this? Was this different for different groups of pupils?

Q1f. Do you think the second period of school closures had an impact on the learning recovery of your pupils?

Prompt: To what extent? Why/why not? Was this different for different groups of pupils?

2   Maths and Reading

Q2a. We understand that when pupils returned to school after the first period of school closures, *[response given by head teacher in survey]* were employed to support pupils' maths and reading. Can you tell me a bit more about these strategies and if they were effective in supporting your pupils' learning?

Probe to separate strategies for maths and reading.

Q2b. Can you tell me about the strategies you employed to support pupils' maths and reading for pupils after the **second** period of school closures and if they were effective in supporting your pupils' learning?

Prompt: Why were these strategies different to/the same as those used after the first period of school closures? Was this different for different groups of pupils?

Probe to separate strategies for maths and reading.

Q2c. We understand that in the autumn term, *[response given by head teacher in survey]* was planned to support pupils' maths and reading for the remainder of this year. Were these strategies implemented? Why/why not?

Prompt: Were these strategies effective in supporting pupils' learning? Was this different for different groups of pupils?

Probe to separate strategies for maths and reading.

Q2d Thinking more generally, were there any other factors affecting pupils' attainment in maths and reading?
Prompt: Was this different for different groups of pupils?

3   Wellbeing and social skills

Q3a. We understand that when pupils returned to school after the first period of school closures, *[response given by head teacher in survey]* were employed to support pupils' wellbeing and social skills. Can you tell me a bit more about these strategies and if they were effective in supporting your pupils' learning?

Q3b. Can you tell me about the strategies you employed to support pupils' wellbeing and social skills for pupils after the **second** period of school closures and if they were effective in supporting your pupils' learning?

Prompt: Why were these strategies different to/the same as those used after the first period of school closures? Was this different for different groups of pupils?

Q3c. We understand that in autumn, *[response given by head teacher in survey]* was planned to support pupils' social skills and wellbeing for the remainder of this year. Were these strategies implemented? Why/why not?

Prompt: Were these strategies effective in supporting pupils' learning? Was this different for different groups of pupils?

Q3d. Thinking more generally, were there any other factors affecting pupils' wellbeing and social skills?
Prompt: Was this different for different groups of pupils?

3

4   Next steps

Q4. What is your plan for the remainder of this academic year/next academic year with regards to strategies to support pupils?

Prompt: Do you plan to continue/stop strategies? Will this be different for different groups of pupils?

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