Impact of school closures on KS1: Spring 2021

Potential implications for practice in year 2

This diagnostic information is part of the second wave of a study investigating the impact of school closures on children in Key Stage 1 (KS1), conducted by the National Foundation for Educational Research (NFER) and funded by the Education Endowment Foundation. As part of this second wave in spring 2021, standardised assessments in reading and mathematics were used to explore the performance of more than 5100 year 1 children and 5200 year 2 children. Performance was compared to a standardisation sample from spring 2019. The findings from the first wave of this study in autumn 2020 can be found in Interim Paper 1. This study has its final wave of data collection planned for summer 2021, involving both year 1 and year 2 children.

The interim findings from spring 2021, published as paper 2, confirmed that year 2 children still have significantly lower achievement in both subjects and that the disadvantage gap remains wider than the results of the KS1 national curriculum assessments in 2019. These findings also confirmed that year 1 children have significantly lower achievement in both reading and mathematics in comparison to the standardisation sample, and that children from disadvantaged backgrounds are around seven months behind their peers. For more information, please see the Interim Paper 2 available on the EEF website.

Although these findings about overall attainment are concerning, this document is intended to equip teachers with evidence to inform their practice so they can support children's academic progress which may have been impacted by partial school closures. The diagnostic information given in this document is based on the analysis of the responses of the children in this study, and while there are themes, schools may find it useful to carry out their own diagnostic assessment to decide where suggestions for practice may be applicable to their pupils. The potential implications for practice outlined are intended to put the findings from the study into context, offering ideas for learning rather than being explicit and definitive activities. They are intended to complement and work in partnership with broader school efforts, to support wellbeing and ensure progress for children, such as targeted catch-up, cross-curricular learning and the development of a broad and balanced curriculum.

This document contains:

- a summary of the headlines across both reading and mathematics
- an overview of the key findings for reading and mathematics
- further information and potential implications for the eight key findings in reading, including ideas for activities
- further information and potential implications for the eight key findings in mathematics, including ideas for activities.

The following documents from EEF provide further useful information and support the implications for practice in this document:

Improving Literacy in Key Stage 1

Improving Mathematics in the Early Years and Key Stage 1

Metacognition and Self-regulated Learning

Summary – Year 2

Both subjects

- Overall, year 2 children did less well in spring 2021 than year 2 children did in 2019.
- In general, the curriculum areas that children found challenging in spring 2021 were those found challenging in 2019.
- Children from disadvantaged backgrounds performed less well than other children on all questions, across both subjects, and were less likely to attempt questions towards the end of the assessments.
- Data suggests that the gender gap, the performance difference between boys and girls in reading has remained broadly stable since 2019 however boys still do less well than girls in reading. In mathematics, boys do slightly better than girls and this gap has widened since 2019.

Reading

- In spring 2021, the proportion of children with very low scores on the assessment overall has greatly increased compared to 2019. These children are still at the earliest stages of learning to read.
- When looking at performance on individual questions across the assessment, questions on paper 2 (the harder paper) tended to show a greater fall in the proportion of children answering correctly. This suggests that children's ability to read longer, less scaffolded texts has also been affected.
- Children in spring 2021 were more likely to miss out questions and far less likely than children in 2019 to reach the end of the papers. In spring 2021, these patterns were particularly true for boys and children from disadvantaged backgrounds.
- Of the curriculum areas assessed, inference remained one of the hardest and retrieval the easiest.

Mathematics

- Pupils performed equally well on the arithmetic and reasoning papers although overall performance was lower than 2019. Overall children were less likely to leave out questions on the reasoning paper.
- Children in spring 2021 were usually able to answer questions in familiar contexts as well as those in 2019 however they performed less well with more unusual formats.
- Children were more likely to omit questions they found challenging in spring 2021 especially towards the end of a paper, however, the overall omission rate was only slightly higher. The biggest drop in performance between 2019 and 2021 was seen in those curriculum areas which children tend to find more challenging.
- In 2019, the performance of boys and girls was very similar, however in spring 2021, boys performed better than girls.

Subject overviews – Year 2

Reading

- Children need support to understand abstract ideas in fiction texts.
- Children struggle with narrative sequence, particularly in more complex narratives.
- Vocabulary questions may be a strength, but children struggle to use a wider context.
- Children struggle to interpret question words across fiction and non-fiction texts.
- Children find it harder to provide longer written responses.
- Children from disadvantaged backgrounds may need additional support with early writing skills.
- Children would benefit from more experience with non-fiction texts.
- Children may benefit from guidance when using extrinsic knowledge to support reading comprehension.

Mathematics

- Children have developed secure addition skills, particularly with familiar question formats.
- Children are able to subtract numbers effectively, but struggle with less familiar formats.
- Children's multiplication skills are good and are broadly comparable to 2019.
- Children find it difficult to divide numbers.
- Children appear to be secure in most areas of numbers skills.
- Children performed particularly well in measures and geometry.
- Children appear to understand the foundations of fractions but need support to use them within calculations.
- Children appear secure with interpreting tally charts and pictograms.

Reading – Year 2

Children need support to understand abstract ideas in fiction texts.

In 2021, evidence suggests that children struggled to fully understand abstract ideas in stories. This refers to ideas in fiction texts that are not physical actions or events, or directly stated, e.g. keeping something a secret or losing something. This was related to children misunderstanding different characters' thoughts, motives and actions.

Analysis of responses in 2021 showed children from disadvantaged backgrounds were more likely to give answers which suggested a partial understanding of fiction texts, particularly those which involved abstract ideas. This may have affected their ability to infer, as patterns in responses suggested children from disadvantaged backgrounds often opted for the most obvious or shallow explanation of characters' motives or actions, e.g. frowning due to anger rather than confusion.

Potential implications for practice

Children's understanding and inference of abstract ideas in fiction texts could be supported by:

- exploring a rich and broad range of texts to develop children's familiarity with abstract story plots, different genres and conventions
- using role play to allow children to match abstract ideas or inferred events with concrete experiences
- targeted interventions and shared reading sessions which scaffold children's understanding of more complex narratives
- modelling comprehension monitoring strategies, such as predicting, questioning and summarising, particularly around abstract ideas in stories – more information can be found in EEF's guidance on Improving Literacy in KS1.

Children struggle with narrative sequence, particularly in more complex narratives.

As was identified in autumn, children found understanding the narrative sequence of fiction texts challenging. The fiction text in spring paper 1 included repeated events, in this case multiple sports matches as well as abstract elements, which may have led to children's confusion with the overall narrative structure.

The fiction text in paper 2 demonstrated an increase in challenge as children had to read the text as a whole, rather than in short sections. This longer narrative created additional demand on children's reading fluency and working memory, making it harder for children to integrate information across the text, potentially leading to some children's misunderstandings about the point at which particular key events occurred. There was some evidence that boys in particular struggled with the sequence of this more challenging text.

Potential implications for practice

To support children in their understanding of more complex narratives, activities could include:

- reading a rich and broad range of texts with longer, more complex narratives including those with less conventional structures, through shared and independent reading
- story mapping which summarises key events and emphasises cause and effect relationships throughout stories
- modelling comprehension monitoring and metacognition strategies which support children when reading longer texts independently, e.g. sense checking and recapping - more information can be found in EEF's guidance on Metacognition and Self-regulated Learning.

Reading – Year 2

Vocabulary questions may be a strength, but children struggle to use a wider context.

Although questions assessing understanding of vocabulary were challenging compared to retrieval in both 2019 and 2021, this area was the least affected by partial school closures, with evidence indicating a trend towards improved performance, particularly in girls. Despite this, children tended to rely on guessing the meaning of words based on the subject of the sentence, rather than using the surrounding context of the particular term.

Potential implications for practice

Children who rely on guessing the meaning of words to define them may benefit from:

- comprehension monitoring strategies related to vocabulary, e.g. substituting the predicted meaning of a word back into a text to sense check it
- support to read more widely around unknown words to check understanding against the surrounding sentences, paragraphs and theme of the text
- explicit teaching of vocabulary, across subjects, which is regularly revisited and applied to other contexts, e.g. using word walls where words collected from stories are used in children's writing – more information can be found in EEF's guidance on Improving Literacy in KS1.

Children struggle to interpret question words across fiction and non-fiction texts.

As in autumn 2020, some children still struggled to interpret question words. Children's responses suggested they confused questions asking 'what' a character was doing with 'why' a character was doing that, as well as those asking 'how you can tell' a character's emotions / motivations and 'why' a character was feeling a specific emotion / completing a specific action. Children tended to make this error on written questions and may do this if their expectation about what question will be asked about a text does not match the actual question asked.

Potential implications for practice

Suggestions for practice may vary depending on why children are struggling with question words but could include:

- building children's question vocabulary through explicit teaching as well as across subjects and contexts
- modelling questioning and metacognitive strategies to check understanding through high-quality language interactions about texts
- supporting children in monitoring and checking their written responses, to ensure their answer fits with the question.

Reading – Year 2

Children find it harder to provide longer written responses.

As in autumn 2020, children in 2021 continued to find questions which require a longer written response harder than in 2019. These types of questions experienced the largest difference between 2019 to 2021 in comparison to closed questions and shorter response questions, suggesting they have been more affected by school closures. Although this pattern is true for all groups, evidence suggests that boys particularly struggled with these questions. Some children gave more general answers such as 'nice' or 'good' instead of more specific adjectives or phrases to describe the content of the story.

As with year 1 pupils, there may be different underlying reasons why children struggle with longer written responses, including confidence, reading or handwriting fluency and self-regulation of planning, monitoring and writing responses.

Potential implications for practice

Suggestions for practice will depend on the underlying reasons for children's difficulties with written responses, but could include:

- scaffolding children's responses to texts, e.g. through templates or verbally modelling extended responses to texts before writing
- supporting stamina in transcription, e.g. through extended writing activities, explicit handwriting or spelling practice
- modelling how writing can be planned, monitored, written, checked and shared – more information can be found in recommendation 5 of EEF's guidance on Improving Literacy in KS1.

Children from disadvantaged backgrounds may need additional support with early writing skills.

In autumn 2020 and spring 2021, children from disadvantaged backgrounds were more likely to give written responses which were not comprehensible, either because not enough letters were clear or the response did not make sense. In spring 2021, boys were also more likely to give answers which were not comprehensible in comparison to girls.

There may be different underlying reasons why children might struggle to provide a comprehensible response. This could be related to difficulties with letter formation, transcription fluency, low confidence or children's self-regulation when planning, monitoring and writing responses. Whilst these children are struggling with their writing skills, they are attempting these questions in some form which shows engagement with the assessment.

Potential implications for practice

Suggestions for practice depend on the underlying reasons for children's difficulties with written responses, but could include:

- supporting fine motor, letter formation and transcription skills, such as 'finger spaces' between words and pencil grip
- supporting transcription fluency with practice regularly and at length, with specific high quality teacher feedback
- modelling metacognitive strategies which support children in answering the question to planning their response and writing it.

Reading – Year 2

Children would continue to benefit from more experience with non-fiction texts.

As in autumn 2020, children continued to struggle with non-fiction comprehension in 2021. Although these texts overall appeared to be slightly easier than the fiction texts, non-fiction showed the greatest difference from 2019, suggesting a greater impact from school closures on these types of text. Children from disadvantaged backgrounds found non-fiction texts comparatively harder than their peers.

Common errors identified included children mixing up factual information from across the text, particularly where this information was prominent, and showing an over-reliance on the general topic or theme of an information text. It is possible that children were not always practising close reading, leading to either misidentification of competing facts from the text or an inability to locate key information. This was particularly the case in the more challenging text, where information was less scaffolded. There was some evidence that this error was more likely to be made by boys and children from disadvantaged backgrounds.

Potential implications for practice

Children may continue to benefit from more experience with non-fiction texts, which could be done through:

- sharing and discussing more complex non-fiction texts, to help children become more familiar with different conventions and structures
- explicitly teaching comprehension monitoring and metacognitive strategies which support children in managing competing information, e.g. clarifying and reviewing
- engaging with non-fiction texts through a variety of activities that require children to reorganise and sort specific information.

Children may benefit from guidance when using extrinsic knowledge to support reading comprehension.

Although using wider knowledge to aid understanding is an important skill in reading comprehension, over-reliance on expectations of what might happen may impact understanding. There was some evidence in this 2021 that children were using their extrinsic knowledge to answer questions, rather than basing them on information in the text.

This pattern was found across all texts, but was more common in non-fiction - inevitably where some children will have prior knowledge. This pattern was also found in 2019 and in both instances, was more common among children who performed less well on the assessment as a whole. It is important that children learn to monitor their use of prior knowledge to ensure that it is in line with information provided in the text, particularly when this is limited by their age and experience.

Potential implications for practice

Children could be supported to monitor their use of prior knowledge through teaching which includes:

- modelling how and when to use prior knowledge, particularly through scaffolding in shared and guided reading sessions, e.g. using stepped questioning such as 'what is the character thinking?', 'how do you know this?' and 'can you underline the part of the text that tells you this?'
- teaching metacognitive strategies which support children in reviewing their prior knowledge or predictions about a text, against the information they have read –information can be found in EEF's guidance on Metacognition and Self-regulated Learning.

Mathematics – Year 2

Children have developed secure addition skills, particularly with familiar question formats.

In 2021, children performed as well as children in 2019 across the majority of addition questions, particularly where questions were asked in a familiar format including word problems. The provision of visual aids was limited in this assessment but this did not seem to affect children's performance which may suggest they are confident with this skill.

When adding two-digit numbers, children were more likely to use a written strategy in comparison to single-digit addition. As in autumn 2020, counting is a popular strategy, although increasingly the column method and, to a lesser extent, partitioning was used with larger numbers. However, some children are still using the counting method with large numbers which may account for a number of children giving a response that was one off the correct answer. Although boys and girls performed similarly overall, boys coped better with addition involving larger numbers.

Questions which were asked in a less conventional way included missing number problems, matching calculations or multi-stage word problems. These question types had the largest drop in performance when compared to 2019, which suggests that answering questions in unfamiliar formats was more affected than conventional problems.

Potential implications for practice

Children could be supported to develop these skills by helping them to explore different and appropriate methods. Activities could include:

- practise writing different calculations that have the same result
- using the bar model which shows how different numbers can be partitioned to create 'number families', e.g. 7 separated into 4 and 3 and then rearranged to give 7 − 4 = 3 and 7 − 3 = 4
- modelling metacognitive strategies and high quality spoken language to support children in how they approach problems.

Children are able to subtract numbers effectively, but struggle with less familiar formats.

Children in 2021 performed as well as children in 2019 with subtraction questions in conventional formats including basic word problems, which was consistent with addition. Children in 2021 appeared to be unaffected by having fewer visual aids in questions. When subtracting a two-digit number, children were more likely to use written strategies, with counting still being popular when subtracting smaller numbers but children preferring 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, or the tens digit was incorrect. There was also evidence of children subtracting the smaller digit in each column regardless of where it appears. Boys performed better overall in subtraction than girls in both 2019 and 2021 and were more successful with larger numbers.

In line with addition, less conventional problems saw the biggest drop in performance since 2019, suggesting they have been more affected by the disruption to schooling. Even on areas that children had found challenging in 2019, there was clear evidence that they were more likely to leave out these questions in 2021.

Potential implications for practice

Children who struggled with subtraction could be supported by:

- finding the most efficient strategy, especially when the numbers are larger
- representing calculations in different ways, such as using physical objects to illustrate what happens when you try to subtract 7 from 6
- increasing familiarity with less conventional formats and exploring different ways of representing the same number through calculations, e.g. 7 could be 4 + 3 or 10 − 3.

Mathematics – Year 2

Children's multiplication skills are good and are broadly comparable to 2019.

This is an area of strength with children in 2021 doing as well as or better than their counterparts in 2019 across many questions, particularly when they were asked in a familiar way. However, they found word problems more difficult and with these some children added rather than multiplied the numbers. Boys did better than girls in this area of the curriculum and the gap has widened since 2019.

Children showed good recall of the 2 and 5 multiplication tables but sometimes struggled when the calculations were reversed, such as 5 times a number rather than a number times 5. Although the performance on questions involving recall of the 10 multiplication table was only slightly lower than in 2019, children were much more likely to leave out these questions in 2021. They also had difficulty in multiplying by 10 when the answer bridged 100.

The majority of the questions appear to have been answered using recall or mental calculation as very little written working was observed, however, where a written strategy was used the majority of children drew an array or grouped the numbers efficiently.

Potential implications for practice

Activities which could build children's multiplication understanding, particularly with word problems, include:

- exploring multiplication word problems through real life contexts, role play, stories and cross-curricular contexts to support children in reasoning about language
- using the bar model or arrays to investigate commutativity, i.e. 4 × 5 is the same as 5 × 4
- regular and varied recall of multiplication tables, ensuring children count past 100 when counting in 10s and are challenged by reversing the order of calculations.

Children find it difficult to divide numbers.

Compared to 2019, this area of the curriculum saw one of the biggest drops in performance in 2021, with girls more affected than boys. Children in 2021 were also more likely to leave out questions. Children appeared to find all styles of question more difficult including dividing a small two-digit number by 2 or 5.

A common error, particularly with word problems, was to give the divisor as the answer which may suggest children's concept of division is insecure. Some children tended to carry out a multiplication calculation instead which again may suggest an insecure understanding of the concept or issues interpreting the language.

Children found word problems which required them to give an answer easier than those where they were asked to identify which calculation needed to be carried out. When used, the most popular written strategy for the word problems was to draw marks onto images to facilitate sharing and grouping.

Potential implications for practice

Children's concept of division could be supported through teaching which reinforces key qualities and language. Activities could include:

- using physical resources to support children's understanding of division, e.g. how objects can be shared and grouped
- modelling how to solve division problems and using scaffolding to support increasingly independent problem solving
- exploring the inverse principle to show how division and multiplication are linked so that recall can be used.

Mathematics – Year 2

Children appear to be secure in most areas of numbers skills.

Children in 2021 showed a secure understanding of counting in steps of 2 and 3, number recognition and ordering numbers. They were also able to recognise numbers that were one less than or one more than a number, however, a common error when the question had two parts was to repeat one more or one less for both parts rather than the different steps required. Although children in 2021 performed well overall on place value questions, many children were not able to distinguish between tens and units.

Children in 2021 found identifying odd numbers harder than 2019. Children were very successful at recognising odd and even two-digit numbers when both digits were one or the other but a large proportion failed to recognise that a number was odd when the tens digit was even.

Children in 2021 struggled to identify values on a number line in intervals of 10. A common error was for children to opt for the nearest marked interval above or below, and girls found this question particularly difficult.

Potential implications for practice

Children's understanding of number could further be developed through:

- using practical resources to illustrate the concept of odd and even numbers, i.e. odd numbers cannot be halved evenly
- extending children's understanding of odd and even numbers to include two- and three-digit numbers
- exploring number lines with varying intervals, both in real life scenarios and mathematical contexts, changing the start and end number to emphasise that they can have different properties.

Children performed particularly well in measures and geometry.

In 2021, children appeared to be secure with the measures and geometry topic, with all questions being answered at least as well as in 2019. Children in 2021 were very successful in answering questions involving money, including coin recognition, finding a total cost and calculating change.

Two other particular areas of strength for children in 2021 were comparing volumes using images and recognising 2D faces on 3D shapes, although a number of children did confuse a square with a rectangle. In both of these areas, children in 2021 scored higher and were also much less likely to omit the question.

Although children were also successful when asked to continue a sequence of shapes, a large proportion repeated the start of the sequence rather than continuing it. As in 2019, the question they found hardest involved identifying shapes with more than one property. Many children chose shapes which satisfied only one condition suggesting that they understood the property but only answered one element of the question.

Potential implications for practice

Children's understanding of measures and geometry could be maintained and developed further by teaching which:

- emphasises the distinction between squares and rectangles, i.e. that squares are a special type of rectangle, and explores their 2D use in 3D shapes
- explores the properties of different shapes, sorting these by their features to illustrate how some may overlap but not look the same, e.g. shapes with 4 or more corners or a line of symmetry.

Mathematics – Year 2

Children appear to understand the foundations of fractions but need support to use them within calculations.

The vast majority of children in 2021 showed a good understanding of fractions as diagrams, even when the shaded sections were not adjacent to each other. However, overall 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 and children were more likely to miss out fraction questions than other topic areas.

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 where numbers were given as answers, which could suggest children are now more confident with the concept of fractions. However, when asked to apply their understanding to show their working, many children struggled to successfully complete a fraction calculation suggesting that they may still struggle to apply their understanding to problem solve.

Potential implications for practice

Children may still benefit from some foundational teaching of fractions, as well as support to develop and apply this understanding. This could be done through:

- practical activities which illustrate objects and quantities divided into quarters
- equipping children with different strategies for dividing numbers up, e.g. through objects, images, multiplication tables and partitioning models
- activities to draw out and challenge misconceptions, e.g. quarter divisions which create 4 unequal parts
- using high quality language interactions to support children's understanding of key qualities and the features of quarters and other fractions, i.e. "sharing equally" "denominator is 4" "3 out of 4 parts".

Children appear secure with interpreting tally charts and pictograms.

In both 2019 and 2021, children did well on this area of the curriculum although there were only a very small number of questions. The question on tally charts was answered as well as in 2019 although there appeared to be an element of miscounting with several children being one off the total. Both boys and girls improved their performance in this area and more children attempted the questions than in 2019.

In 2021, children performed better than their counterparts in 2019 on a question involving a pictogram, despite children having to identify information and find the difference between rows. A common error observed was where 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.

Potential implications for practice

Children would benefit from opportunities to look at a range of tables and charts to continue to develop their applied understanding across a range of contexts. Activities could include:

- applying other mathematical skills to tables, i.e. finding the difference or ordering values
- cross-curricular opportunities for children to create their own charts and diagrams
- modelling metacognitive strategies which support children in how to approach more complex problems associated with tables and charts.