PIRLS 2021
Reading results for Ireland

Emer Delaney, Sarah McAteer, Mary Delaney,
Gráinne McHugh & Brendan O'Neill

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Acronyms and abbreviations

CI	Confidence interval
CLASS	Covid Learning and Support Scheme
DCYA	Department of Children and Youth Affairs
DEIS	Delivering Equality of Opportunity in Schools
DES	Department of Education and Science / Department of Education and Skills
DoE	Department of Education
End G4	Tested at the end of Fourth grade
ERC	Educational Research Centre
ICT	Information and Communications Technology
IEA	International Association for the Evaluation of Educational Achievement
IQCM	International Quality Control Monitor
NAMER	National Assessments of Mathematics and English Reading
NCCA	National Council for Curriculum and Assessment
NQCM	National Quality Control Monitor
OECD	Organisation for Economic Cooperation and Development
PIRLS	Progress in International Reading Literacy Study
PISA	Programme for International Student Assessment
SD	Standard deviation
SE	Standard error
SES	Socioeconomic status
Start G5	Tested at the start of Fifth grade
TIMSS	Trends in International Mathematics and Science Study

Executive Summary

The *Progress in International Reading Literacy Study* (PIRLS) assesses the reading literacy of primary school pupils in participating countries around the world. Ireland has participated in three cycles of PIRLS to date, in 2011, 2016, and 2021, with the Educational Research Centre (ERC) administering the study on behalf of the Department of Education (DoE). This report provides initial results for Ireland from the 2021 cycle.

PIRLS was one of two large-scale studies to take place in primary schools in Ireland in 2021, the other being the National Assessments of Mathematics and English Reading (NAMER). Together, Ireland's outcomes in PIRLS and NAMER provide important insights about pupils' achievement and experiences following the disruption to education systems caused by COVID-19. Findings across PIRLS countries situate these outcomes in a global context. Readers may find it helpful to consult the overall NAMER performance report (Kiniry et al., 2023), the companion report that focuses on DEIS Urban schools in NAMER (Nelis & Gilleece, 2023), the international PIRLS 2021 report (Mullis et al., 2023), and the PIRLS 2021 Encyclopedia (Reynolds et al., 2022) alongside this report.

Background

Introduction (Chapter 1)

PIRLS aims to assess the reading literacy of pupils at the end of Fourth grade (Fourth Class, in Ireland). Each participating pupil is asked to read two texts and respond to the accompanying questions (items). Texts used in PIRLS are classified by the main purpose for which they are read: for *Literary* experience (typically narrative, fictional texts) or to acquire and use *Information* (factual or instructional texts).

PIRLS also administers questionnaires to gather contextual information from the pupils, their parents, their class teachers, and their school principals. This allows us to examine how demographics, home resources, classroom experiences, and school characteristics may be associated with reading achievement within and across countries.

New features of PIRLS 2021

Test mode: paper-based versus digital

PIRLS 2021 marked a partial transition to digital testing, as countries could choose to administer the assessment on paper or on computer. Ireland had planned to administer on computer, but reverted to paper-based testing due to challenges associated with the COVID-19 pandemic.

Countries opting for computer-based administration were required to administer some trend items on paper to an additional, smaller "bridge" sample. This allowed for results from computer-based testing to be placed on the trend (paper-based) PIRLS scale. Broadly speaking, the digital format of assessment proved somewhat more difficult than the paper format, and this was adjusted for in the scaling (at international level, rather than for individual countries) (von Davier et al., 2023).

For countries that administered PIRLS on paper, including Ireland, there were 18 texts in the rotation. For countries that administered on computer, the rotation included the same 18 texts (presented on screen) as well as five additional "ePIRLS" Informational tasks. The ePIRLS tasks assessed digital literacy by requiring pupils to read in a hyperlinked, online-like environment.[1] In most instances, each pupil received one Literary and one Informational text.[2]

[1] In PIRLS 2016, ePIRLS was an optional add-on assessment in which 14 PIRLS countries participated, including Ireland (Eivers et al., 2017). In contrast, in 2021 the ePIRLS tasks were incorporated into the PIRLS rotation for countries administering on computer, and were not available for countries administering on paper.

[2] In countries that tested on computer, a minority of pupils received two Informational texts that included at least one ePIRLS task.

Group adaptive testing

A second innovation in PIRLS 2021 involved the use of "group adaptive testing". This meant that the difficulty level of the assessment could be tailored to the proficiency levels of different populations. PIRLS texts were classified as *easy*, *medium*, or *difficult*, and were arranged into booklets designated as either *less difficult* or *more difficult*. In most countries, the *less difficult* and *more difficult* booklets were assigned in equal proportions (50:50). However, in countries that had previously achieved high mean scores in PIRLS (565 and above), the *less difficult* booklets were assigned to 30% of pupils and the *more difficult* booklets to 70%. Ireland and six other countries were in this category. Conversely, in countries that had previously achieved low mean scores (435 and below), the *less difficult* booklets were assigned to 70% of pupils and the *more difficult* booklets to 30%.

Group adaptive design was adjusted for as part of the PIRLS scaling so that there was no untoward advantage associated with distributing proportionally more of the *less difficult* booklets. In Ireland, the estimated mean achievement of pupils assigned *less difficult* versus *more difficult* booklets was virtually identical.

It is important to note that this design is "adaptive" only in a broad sense (i.e., at country level). Within each country, any two pupils had the same chance of receiving a given PIRLS booklet, regardless of their individual reading proficiency.

Changes necessitated by COVID-19

The COVID-19 pandemic created unanticipated challenges for PIRLS. Internationally, the pandemic resulted in an interrupted field trial (spring 2020) and a main data collection that extended across a year and a half (with the first countries testing in autumn 2020 and the last testing in spring 2022). Most countries tested pupils at the end of Fourth grade and at the planned time. A few countries tested pupils at the end of Fourth grade but one year later than planned. However, some countries, including Ireland, tested pupils at the start of Fifth grade instead due to the impact of pandemic-related school closures.

Who took part in PIRLS 2021?

A total of 57 countries took part in the study. PIRLS was administered on paper in 32 countries (including Ireland) and on computer in 25 countries.[3]

PIRLS was administered to Fourth grade pupils at the planned time in 37 countries, and one year later than planned in six countries. We refer to all these countries as having tested at "End G4" (end of Grade 4). In 14 countries, including Ireland, PIRLS was administered half a year later than planned to pupils at the start of Fifth grade ("Start G5").

In this report, 10 other participating countries are selected as being of particular interest to readers in Ireland, due to relatively high performance in PIRLS and/or cultural or linguistic similarities with Ireland. These are: Northern Ireland, Croatia, and Lithuania (which, like Ireland, tested at Start G5); Australia, England, Hong Kong, Poland, Finland, New Zealand, and Singapore (which tested at End G4, and, in the case of Australia and England, one year later than planned). In addition to being split across different test times, some of these countries administered PIRLS on paper while others did so on computer. Northern Ireland is the only selected participant that shares both time and mode of testing with Ireland (Start G5, paper).

Caveats when interpreting PIRLS 2021 data

Due to the impact of COVID-19 on PIRLS 2021 administration, **important caveats** must be considered when interpreting the data.

In particular, considerable caution is needed to interpret comparisons:

- **between the results of countries that tested at Start G5 (such as Ireland) and countries that tested at End G4.**
- **between the 2021 data of Start G5 countries and their data from previous cycles (when testing took place at End G4).**

[3] The US administered PIRLS on computer but opted to report results from its paper "bridge" study. Therefore, it is treated here as a paper-based participant.

The Start G5 pupils in 2021 were, on average, six months older than the End G4 pupils in 2021 and in previous cycles. The relationship of age with achievement at a given grade level is complex and varies across countries (Martin et al., 2008). However, in Ireland, analysis of data from the previous PIRLS cycle (2016) shows that *younger* pupils were at a small but significant disadvantage relative to their peers of *medium* age (and this disadvantage was maintained when gender and level of home resources were controlled for). At the time of testing in 2021, almost all PIRLS pupils in Ireland were within or above what was the *medium* age bracket in 2016.

As well as being older, pupils tested in autumn had recently experienced the summer break, were starting a new grade level, were often taught by a teacher who was new to them, and were sometimes part of a new (reconstituted) class group. In an Irish context, when standardised reading tests were normed both in spring (at the end of one grade level) and autumn (at the start of another), pupils consistently found the same test a little easier in autumn (ERC, 2007a, 2007b, 2007c). The extent to which this can be attributed to increased age/maturation and/or to other factors, such as additional experience of reading gained over the summer break, is not known. However, putting the available evidence together, **we can reasonably expect that the pupils who took part in PIRLS 2021 at Start G5 in Ireland *probably* performed somewhat better, on average, than they would have if they had been tested the previous spring.**

There are additional complicating considerations, including the fact that testing at a different time of the school year may impact differently on different subgroups. For example, pupils with fewer home resources may be more likely than others to experience learning loss over the summer break (e.g., Alexander et al., 2007; Cooper et al., 1996). Thus, it is possible for an overall mean advantage associated with autumn testing to conceal a disadvantage for particular subgroups.

Another complication is introduced by the atypical nature of the 2020/21 school year. If spring testing had gone ahead, pupils in Ireland would have been assessed shortly after they returned to classrooms following a period of remote learning (as was the case in a number of End G4 countries). This could have created a disadvantage. On the other hand, measures were introduced between spring and autumn 2021 to try to mitigate negative effects of school closures. For example, school-based summer programmes in Ireland were expanded. At least some Start G5 pupils may have benefited from mitigation measures ahead of their PIRLS testing. Therefore, if we would expect autumn testing to produce slightly higher results than spring testing in a "normal" year, this advantage might be a little larger in 2021.

While the issues above apply specifically to Start G5 countries such as Ireland, a more general caveat applies to *all* trend comparisons using PIRLS 2021 data. Pupils in many countries had experienced long periods of school closures/remote learning, in many cases both in Third and Fourth grade. This was not the case for their counterparts in previous cycles. The timing of PIRLS 2021 administration relative to closure periods varied across countries (including among the End G4 countries). National policies and resources for remote learning also varied widely. It is difficult to say to what extent these factors have impacted on trends in PIRLS achievement. However, the particular context of 2021 testing in each participating country should be considered when interpreting results.[4]

PIRLS 2021 in Ireland (Chapter 2)

Originally, PIRLS in Ireland was planned as a digital assessment in spring 2021. With this in mind, a digital field trial was scheduled for spring 2020. The field trial was interrupted by the onset of the COVID-19 pandemic. In Ireland, an extended period of school closures/remote learning (March-June 2020) meant that field trial data was collected from only one-quarter of sampled schools. Many other countries were in a similar position. Overall, however, the field trial data collected internationally were deemed of sufficient quality to permit the selection of texts and items for the main study.

A decision was taken to revert to paper-based testing in Ireland for the main data collection, as the logistical challenges of computer-based testing became increasingly problematic due to the pandemic. Internationally, countries were offered the option of autumn testing on an exceptional basis in this cycle of PIRLS. In light of a second protracted period of school closures/remote learning (January-March 2021), the DoE chose to avail of this option in order to provide certainty and reduce stress for pupils and school staff. The NAMER study proceeded in the spring as planned, although with some adaptations to reduce the burden for participants (Kiniry et al., 2023). As such, NAMER provides a useful correlative to PIRLS in the Irish context.

[4] The PIRLS 2021 Encyclopedia (Reynolds et al., 2022) includes useful synopses of how COVID-19 affected each country's education system and PIRLS administration.

Between spring and autumn 2021, initiatives implemented to attempt to mitigate the impact of closure periods included the expansion of school-based summer programmes and the allocation of additional teaching hours to schools via the COVID Learning and Support Scheme (CLASS).

PIRLS data collection in Ireland took place between September 27 and October 21 in 2021.

Who took part in PIRLS 2021 in Ireland?

The target population was pupils completing Fourth Class in 2021. Sampling was conducted by Statistics Canada and occurred in two stages.

First, a representative sample of 151 schools was drawn, stratified by DEIS status, language of instruction, and gender intake. Of these schools, 148 had pupils at the target grade and all agreed to participate, giving a school response rate of 100%.

Next, up to two Fourth Class groups in each school were randomly selected. When the decision was taken to move to autumn testing, class groups remained intact in over four-fifths of participating schools and so were not re-sampled. In remaining schools, classes were reconstituted between spring and autumn and were re-sampled. The final sample consisted of 228 Fifth Class groups, all of which participated, giving a class response rate of 100%.

There were 5,160 pupils listed in sampled classes. Between sampling and testing, 130 pupils left their schools. A small number (53) were exempted by their teachers due to disabilities and/or limited English language proficiency. This left 4977 eligible pupils. Of these, 303 were absent on the test day and 11 were withdrawn from the study by their parents. In total, 4663 pupils participated in the PIRLS test in Ireland, which represents a weighted response rate of 94.1%. Slightly more boys than girls participated, and the average age of pupils at the time of testing was 11.0 years (compared to 10.5 years in PIRLS 2016).

For large majorities of the pupils who completed the test, data were also available for the context questionnaires (99.6% for the Pupil Questionnaire, 93.2% for the Home Questionnaire, 97.2% for the Teacher Questionnaire, and 99.2% for the School Questionnaire). This represents a very high response rate across the board, meaning that Ireland's data can be considered representative of the population.

Test and questionnaire administration

Each school nominated a School Coordinator to liaise with the ERC. Members of school staff acted as Test Administrators, as in previous PIRLS cycles. However, the requirement for a Test Administrator to be someone other than the usual class teacher was relaxed in 2021 to take account of schools' COVID-19 protocols. For a majority of pupils in Ireland, PIRLS 2021 was administered by their class teacher.

Testing was conducted in the morning. Pupils had 40 minutes to read their first text and respond to the related items. Following a short break, they had another 40 minutes for the second text and its items. After another short break, they responded to the Pupil Questionnaire (presented on paper, like the test).

Home Questionnaires, Teacher Questionnaires, and School Questionnaires were completed by parents, Fifth Class teachers, and principals respectively. A supplementary Teacher Questionnaire for Fourth Class teachers from 2020/21 was also administered in Ireland. Most parents, teachers, and principals completed their questionnaires on paper, with a minority completing them online.

Quality monitoring

International standard operating procedures were followed in Ireland at all stages of PIRLS 2021. As per international guidelines, testing was observed by International Quality Control Monitors in 10% of schools and by National Quality Control Monitors (from the DoE Inspectorate) in another 10%. Reports from Quality Control Monitors in Ireland indicated that international procedures were adhered to during test administration.

Achievement results

Overall results in reading (Chapter 3)

PIRLS results are reported on a scale with a centrepoint of 500 (corresponding to the international average from the first cycle in 2001) and a standard deviation of 100. For context, Ireland's mean reading achievement in previous PIRLS cycles was 552 (in 2011, when five countries achieved significantly higher scores) and 567 (in 2016, when two countries achieved significantly higher scores) (Eivers & Clerkin, 2012; Eivers et al., 2017).

As discussed, PIRLS 2021 data must be interpreted in the context of **important caveats**, particularly for Start G5 countries like Ireland.

Overall reading performance in PIRLS 2021

Pupils in Ireland achieved a mean reading score of 577 in 2021. This was significantly higher than the mean scores of all other Start G5 countries and most End G4 countries. Two End G4 exceptions were Singapore, which achieved the highest score of all participating countries and significantly outperformed Ireland (587), and Hong Kong, which achieved a mean score not significantly different to Ireland's (573).

When comparing Ireland's results with those of End G4 countries, it is important to remember that pupils in Ireland would probably have performed somewhat less well if they had been tested in spring (as explained earlier). Therefore, we **cannot** conclude strongly that pupils in Ireland are more proficient at reading than peers in all but two other PIRLS countries. However, the findings do indicate that Ireland retains a place among a set of very high-achieving PIRLS countries.

Trends in achievement

The mean achievement of Start G5 pupils in Ireland in 2021 was 11 points higher (rounded) than that of End G4 pupils in 2016, a statistically significant increase. Again, the effect of the move to autumn testing is likely to be a contributing factor, so we **cannot** conclude definitively that reading achievement in Ireland truly improved between 2016 and 2021. However, while we expect that average performance would have been somewhat lower in spring, it seems unlikely that this difference would have been extreme. Therefore, a cautious interpretation is that average reading achievement in Ireland has at least remained roughly stable between 2016 and 2021.

Internationally, the majority of trend countries that tested at End G4 saw significant declines in achievement relative to previous cycles, while very few saw significant increases (Singapore, Oman, and Egypt). There was a more varied pattern among Start G5 trend countries, with achievement declining significantly in 3/13 and increasing significantly in 6/13 (Ireland, Qatar, United Arab Emirates, Saudi Arabia, Morocco, and Bahrain). This suggests that, internationally, Start G5 testing was associated with some advantage relative to End G4 testing.

Across the selected reference countries, only Singapore and Ireland reported significant increases between 2016 and 2021, with mean achievement declining in Finland and Poland and remaining more or less static for other countries.

Achievement differences by gender

Girls significantly outperformed boys in reading in 51/57 PIRLS countries, including Ireland and all reference countries.[5]

In this report, gender is analysed on the basis of how pupils described themselves.[6] In Ireland, 50.6% selected the option *boy*, 47.5% selected *girl*, and 1.9% selected *other* (an option not presented in previous PIRLS cycles). Mean achievement is not reported for the group selecting *other* as the small number results in a large margin of error.

The mean advantage of girls over boys in Ireland was 11 points (rounded), with girls achieving a mean score of 583 compared to 573 for boys. This gap was small relative to the international average (17 points) and the gaps in many reference countries. It was similar in magnitude to the gap observed in Ireland in 2016 (Eivers et al., 2017), and mean

[5] No significant gender gap was observed in the remaining countries.

[6] This differs from the international report, which uses a binary variable based on school reports of pupils' gender (Mullis et al., 2023). It also differs from previous PIRLS reports for Ireland. However, the outcomes for boys versus girls are virtually identical whether the pupil self-report variable or the school-report variable is used for gender analysis.

achievement increased significantly between cycles for both boys (+12) and girls (+11). While caveats regarding trend comparisons prevent us from concluding that performance among either group has truly improved, it seems likely to have at least held stable for both.

Achievement differences by socioeconomic status

School DEIS status

Most PIRLS pupils in Ireland attended non-DEIS schools (78.3%), while 10.9% attended DEIS Urban Band 1 schools (designated as most disadvantaged), 6.9% attended DEIS Urban Band 2 schools, and 3.9% attended DEIS Rural schools.

Mean achievement in DEIS Band 1 schools and DEIS Band 2 schools was significantly and substantially lower than mean achievement in non-DEIS schools, by 56 points and 40 points respectively. This broadly replicates the pattern observed in PIRLS 2016 (Delaney et al., 2022), with the gaps somewhat wider in 2021, but not significantly so. Due to small numbers and resulting error margins, the estimate of mean achievement for DEIS Rural pupils must be treated cautiously, and no clear conclusions can be drawn about their relative performance.

Individual socioeconomic status (SES)

PIRLS 2021 includes a new scale that provides an individual measure of socioeconomic status (SES) based on books on the home, parents' education, and parents' occupation. Mean SES in Ireland was relatively high compared to many other countries, and there was a close association between individual SES and school DEIS status, as expected.

In Ireland and internationally, pupils with *higher* SES performed significantly and substantially better, on average, than peers with *middle* and *lower* SES. The mean advantage of pupils with *higher* SES over those with *lower* SES was larger in Ireland than in all reference countries except Singapore.

To better understand the association of SES with achievement in the Irish context, pupils in Ireland were divided into quartiles (four equally sized groups) based on their SES scale score, with Quartile 4 having the lowest SES and Quartile 1 the highest SES. Pupils in Quartile 1 achieved a mean reading score of 620, substantially outperforming those in Quartiles 2 (595), 3 (575), and 4 (536). The achievement gap between adjacent quartiles was largest between Quartiles 3 and 4, indicating that pupils in Quartile 4 (with lowest SES) are at a considerable disadvantage compared to their peers.[7]

Distribution of achievement (Chapter 4)

In addition to estimates of overall mean achievement, PIRLS allows us to examine the extent to which performance varies within countries and subpopulations. For example, we can compare performance at specific percentiles across countries, cycles, and subpopulations. Percentiles are interpreted as indicating that *a pupil at the xth percentile of a group performed as well as or better than x% of the pupils in that group*. For instance, pupils at the 5th percentile of a group are among the lowest-achieving of that group, while those at the 95th percentile are among the highest-achieving.

There was considerable variation among the reference countries in how their achievement was distributed. Singapore and New Zealand had the largest ranges (most variation), while Hong Kong and Croatia had the smallest (least variation). The range of Ireland's distribution is in the middle relative to this set of countries. The lowest-achieving pupils in Ireland (5th percentile) performed at a higher level than the lowest-achieving pupils in most reference countries, with the exception of Hong Kong. Ireland's highest-achieving pupils (95th percentile) also performed better than the highest-achieving pupils in many reference countries, although performance was higher in Singapore and similar in Northern Ireland.

The range of Ireland's distribution was slightly wider in 2021 than 2016. The main changes were observed at the higher end of the distribution, with achievement at the 95th percentile rising by 15 points in 2021. Although there was also an increase observed among the lowest-achieving pupils (5th percentile), this was smaller and non-significant.

[7] In subsequent analysis, SES rather than school DEIS status is used to analyse results by socioeconomic background, as SES quartiles capture individual circumstances and have the advantage of robust numbers. However, a limitation is that pupils whose parents did not complete the Home Questionnaire (just under 7%) do not have an SES scale score, and it is likely that lower-SES pupils are overrepresented in this group.

There was more variation in girls' achievement than boys' achievement in Ireland. While the advantage of the lowest-achieving girls over the lowest-achieving boys was small (a 5-point difference at the 5th percentile), the advantage of the highest-achieving girls over the highest-achieving boys was larger (16 points at the 95th percentile).

Each SES quartile had a distinct distribution of achievement, with pupils in Quartile 4 (lowest SES) achieving lower scores both at the lower and higher end of their distribution compared with peers at equivalent percentiles in other SES quartiles. For example, the gap between the achievement of pupils in the lowest- and highest-SES quartiles was over 100 points at the 5th percentile and over 70 points at the 95th percentile. There was more variation in the achievement of pupils in the lowest-SES Quartile 4 than other quartiles. Specifically, performance among the lowest-achieving pupils in Quartile 4 varied more than performance among the lowest-achieving pupils in other quartiles.

Performance at International Benchmarks (Chapter 5)

The PIRLS International Benchmarks provide another way to explore the distribution of pupils' achievement. Four benchmarks are defined relative to specific reading skills that pupils can apply successfully. Pupils who reach the Low Benchmark (400 points on the PIRLS achievement scale) can consistently demonstrate relatively limited reading comprehension skills when reading easier texts. Those who reach the Intermediate Benchmark (475 points) and the High Benchmark (550 points) can apply increasingly complex inferential and interpretative skills to increasingly complex texts. Finally, those who reach the Advanced Benchmark (625 points) demonstrate mastery of sophisticated critical skills when reading challenging texts.

In 2021, almost all of the Start G5 pupils in Ireland (98%) reached the Low Benchmark, and a large majority (91%) also reached the Intermediate Benchmark. Two-thirds (67%) reached the High Benchmark, while over a quarter (27%) reached the Advanced Benchmark. This compares favourably with performance at the benchmarks among the reference countries, with only Singapore reporting a higher percentage of pupils at the Advanced Benchmark.

The percentages reaching the Low and Intermediate Benchmarks in Ireland did not change significantly between 2016 and 2021. However, there were significant increases at the High Benchmark (5%) and the Advanced Benchmark (6%). The caveats associated with Start G5 testing in 2021 must be considered when interpreting these changes. Nevertheless, given that the skills required to meet the more challenging benchmarks typically develop over sustained periods, it seems likely that substantial proportions of pupils would still have achieved at these levels if tested in spring.

There was no significant difference between the percentages of boys and girls reaching the Low and Intermediate Benchmarks in 2021, which was also the case in 2016. At the High and Advanced Benchmarks, girls retained a significant advantage in 2021 (5% and 6%, respectively). At the High Benchmark (though not at the Advanced Benchmark), this represents a narrowing gender gap compared to previous PIRLS cycles.

Performance at the International Benchmarks differed by SES quartile, particularly at the more challenging benchmarks. Pupils in Quartile 4 (lowest SES) were significantly less likely than peers in Quartile 1 (highest SES) to meet all four benchmarks. While this gap was relatively small at the Low Benchmark (95% vs 100%), it became much wider at the High Benchmark (45% vs 88%) and the Advanced Benchmark (10% vs 48%).

Achievement by reading purpose and comprehension process (Chapter 6)

PIRLS texts are classified by the purpose for which they are read: *Literary or Informational*. We can describe pupils' reading achievement on two subscales based on these **purposes** for reading. PIRLS items are classified by the main reading comprehension process they require: focus on and retrieve explicitly stated information ("Retrieve"), make straightforward inferences ("Infer"), interpret and integrate ideas and information ("Interpret"), or evaluate and critique content and textual elements ("Evaluate"). Two further subscales are available based on reading comprehension **processes**: *Retrieve/Infer* and *Interpret/Evaluate*.

Within an international context, performance in Ireland was very high on all four subscales. Relative to their overall mean achievement of 577, Ireland's pupils demonstrated a relative strength on Literary texts (584) and a slight relative weakness on Informational texts (574), with both effects statistically significant. On the comprehension process subscales, there was a relative strength on Interpret/Evaluate (582) and a relative weakness on Retrieve/Infer (571), with both effects significant. This indicates that pupils in Ireland performed relatively better on items requiring an integrative,

critical approach than on items requiring a localised, detail-oriented focus. Similar patterns were observed in many reference countries, although Hong Kong was an exception, displaying relative strengths on Informational texts and Retrieve/Infer processes.

Between the 2016 and 2021 cycles, performance in Ireland increased more on Literary texts (+12) than Informational texts (+9), although both increases were significant. Performance also increased significantly on the Interpret/Evaluate process subscale (+13), while the increase on Retrieve/Infer was not significant (+5).

In Ireland, girls had a significant advantage over boys on Literary texts (+17), which was also the case in all reference countries. In contrast, the advantage of girls over boys on Informational texts was non-significant in Ireland (+6), although it was significant in all reference countries except Hong Kong. Girls significantly outperformed boys in Ireland on both process subscales, with a larger advantage on Interpret/Evaluate (+12) than Retrieve/Infer (+9).

Performance on the purpose and process subscales decreased consistently as SES decreased. On all four subscales, there were similarly-sized gaps (ranging from 80-85 points) between the achievement of pupils in the highest- and lowest-SES quartiles.

Contextual findings

Learning in Ireland during lockdown (Chapter 7)

The PIRLS questionnaires provide insights into what pupils typically experienced during periods of school closure/remote learning.

Home-based learning in Ireland during the COVID-19 school closures

Principals indicated that, by and large, their schools had provided a high level of support to pupils, parents, and teachers during the closure period of January-March 2021. Most pupils' principals reported providing Internet-based resources, digital devices for teachers, and recommendations for teachers and parents. Principals were a little less likely to report providing technical support for teachers and access to devices for pupils, although these were still common.

Most parents reported that schools had provided online activities and reading assignments during closure periods. However, parents were less likely to report that printed learning materials had been supplied by schools, which differed somewhat from principals' reports. Large majorities of parents indicated that they themselves had provided books, digital devices, and digitally-based learning activities to help their children to progress.

During closure periods, more than four-fifths of pupils had read daily as part of their assigned schoolwork, while half had read daily for non-school-related purposes, according to parents. Reading on a daily basis during lockdown (for any purpose) was associated with higher mean reading achievement in PIRLS. Pupils themselves indicated that during these periods, relative to their own "normal behaviour", they were more likely to have read *more than usual* than to have read *less than usual* (either on paper or on a screen). Reading *more than usual* on paper during closure periods was associated with higher mean PIRLS achievement, although this was not the case for reading *more than usual* on a screen.

Impact of COVID-19 pandemic on learning

Most parents in Ireland (58%) thought that their children's learning had been *somewhat* affected by pandemic-related disruptions, with smaller proportions indicating that their children's learning had been *not at all* affected (25%) or affected *a lot* (17%). Most Fifth Class teachers thought that literacy learning had been negatively affected for some proportion of the pupils in their classes, with the bulk of responses ranging between *about one quarter* and *about three quarters*. Pupils whose parents or teachers reported no or minimal impact achieved significantly higher mean PIRLS scores than those for whom some impact was reported.

Two-fifths of PIRLS pupils were in schools that had provided a DoE-funded summer programme in 2021, according to teachers. Where a programme was provided, it generally emphasised literacy at least *to some extent*, but teachers of most classes believed that relatively few PIRLS pupils had attended the programmes.

Teachers were asked whether, at the time of testing, their classes were involved in specific initiatives to counter the effects of the pandemic. Wellbeing initiatives were in place for more than half of pupils (58%), while physical education initiatives were in place for 37%. Initiatives focused on social interaction, literacy, and numeracy were each in place for roughly one-third of pupils.

Back in the classroom: Wellbeing and attitudes to reading after the lockdowns (Chapter 8)

Pupils' wellbeing

In autumn 2021 in Ireland, the proportion of pupils that felt tired *every day* or *almost every day* on arrival at school was higher than in spring 2016. The proportion that felt hungry *every day* or *almost every day* on arrival at school also increased between cycles, although by a smaller margin. On average, pupils who felt either tired or hungry *every day* achieved significantly lower mean PIRLS scores than their peers.

While almost three-quarters of pupils in Ireland reported *almost never* being bullied, 20% were bullied *about monthly* and 6% were bullied *about weekly* in 2021. The bullying behaviours experienced most often were being made fun of or called names, being physically attacked, and being excluded. There was an increase in the frequency with which bullying behaviours were reported between 2016 and 2021.

Teachers' occupational wellbeing

Large majorities of pupils in Ireland were taught by teachers who *very often* or *often* felt proud, enthusiastic, purposeful, content, and inspired in relation to their jobs. However, teachers were less likely to feel appreciated in their professional roles. Between 2016 and 2021, teachers' reports of their sense of professional wellbeing remained roughly stable overall, despite the many challenges of the pandemic.[8]

Pupils' reading behaviours and attitudes

Over two-fifths of pupils in Ireland (43%) spent less than half an hour per day reading outside of school, while 19% spent at least an hour doing so. This represents a slight overall decrease in daily reading time since PIRLS 2016. Similarly, the frequency of reading for fun declined a little between 2016 and 2021. On average, pupils who read for longer and more often performed better in PIRLS than those who read less.

In Ireland, 31% of pupils *very much liked* reading, 45% *somewhat liked* reading, and 23% *did not like* reading, and there was a positive association between liking reading and PIRLS achievement. When asked about reading on paper versus on a screen, pupils were more likely to indicate that they enjoyed reading on paper. Between 2016 and 2021, pupils became less enthusiastic overall in their attitudes to reading.

Just under half of pupils in Ireland (49%) were *very confident* about reading, while 34% were *somewhat confident* and 17% were *not confident*. There was a substantial positive assocation between reading confidence and PIRLS achievement. Reading confidence appeared to decline very slightly between 2016 and 2021, but changes were marginal to small.

Summary and conclusions

Overall reading achievement in Ireland

Broadly speaking, pupils in Ireland provided evidence of strong reading comprehension skills in PIRLS 2021. Although caveats about Start G5 testing prevent us from drawing strong conclusions about specific inter-country comparisons, it is clear that Ireland remains among a set of very high-achieving PIRLS countries.

[8] The item asking about feeling appreciated as a teacher was not administered in 2016, so trend comparisons on this are not available.

Similarly, while we cannot conclude that reading achievement in Ireland increased signficantly on a like-for-like basis between 2016 and 2021, the evidence suggests that reading achievement at least remained relatively stable between these time points. This is consistent with the outcomes of NAMER testing in spring 2021, when the reading achievement of Second Class pupils did not differ significantly from that of their counterparts in NAMER 2014, although a small, non-significant decrease was observed (Kiniry et al., 2023). Given the challenges faced by pupils, parents, and educators during the pandemic, as well as the significant declines in achievement between cycles in many PIRLS countries, this level of stability is to be welcomed.

The distribution of achievement in Ireland was slightly wider in 2021 than 2016, with larger gains between cycles for the highest-achieving pupils and smaller, non-significant gains for the lowest-achieving pupils. Regardless of the extent to which factors associated with autumn testing explain the overall increase observed between 2016 and 2021, it is of note that this increase did not manifest to the same extent among the lowest-achieving pupils.

The performance of Ireland's pupils at the PIRLS International Benchmarks indicates very widespread mastery of basic reading comprehension skills and relatively widespread mastery of more sophisticated strategies. In particular, the comparatively large proportions of pupils reaching the High and Advanced Benchmarks provide support for the argument that overall reading achievement would have been unlikely to drop very substantially if testing had gone ahead in spring, as the skills required to reach these benchmarks are typically developed over extended periods.

Pupils in Ireland performed very well across all four PIRLS subscales. However, it is of interest that they demonstrated significant relative strengths (on Literary texts and Interpret/Evaluate processes) and weaknesses (on Informational texts and Retrieve/Infer processes), given that a similar but less definitive pattern was observed in 2016 (Eivers et al., 2017). As there is no obvious reason that Start G5 testing would affect the pattern of *relative* strengths and weaknesses, it seems fair to conclude that there are probably larger disparities in 2021 than 2016.

In the context of the PIRLS process subscales, where a significant increase between cycles was observed on Interpret/Evaluate but not Retrieve/Infer, the introduction of the Primary Language Curriculum may be relevant as it places considerable emphasis on interpretative and evaluative skills (NCCA, 2019). The NAMER study of reading among Second Class pupils in spring 2021 also included process subscales, but similar evidence of overall strengths and weaknesses was not found at this grade level (Kiniry et al., 2023).

Differences by gender

While a gender gap in favour of girls was observed in Ireland (and most PIRLS countries), Ireland's gap was comparatively small and was similar in size to the gap observed in 2016. In NAMER 2021, a gender gap in favour of girls was also observed in the context of Second Class reading.

The advantage of girls over boys in Ireland in PIRLS 2021 manifested mainly as an advantage for girls in reading Literary texts, applying more advanced comprehension strategies, and performing at the highest levels of the distribution of achievement.

Differences by socioeconomic status

In 2021, as in 2016, pupils in urban DEIS schools achieved substantially lower mean PIRLS scores than pupils in non-DEIS schools, indicating a continuing gap between the reading literacy of pupils in more disadvantaged and less disadvantaged schools.

There was also a clear association between individual SES and achievement. Pupils in the lowest-SES quartile in Ireland achieved substantially lower mean scores than peers with higher SES, overall and on all PIRLS subscales. Additionally, the range of achievement within the lowest-SES quartile (specifically, among the lower-achieving pupils in this quartile) varied more than in other quartiles. Both low-achieving and high-achieving pupils within the lowest-SES quartile were at a considerable disadvantage compared to peers at equivalent percentiles of higher-SES groups. While pupils in the lowest-SES quartile were *somewhat* less likely to have mastered the basic reading skills required at the Low and Intermediate Benchmarks, they were *much* less likely to have mastered the more integrative and critical skills required at the High and Advanced Benchmarks. Overall, these findings point towards the continuing need for a sustained policy focus on improving equity in literacy outcomes in Ireland.

Pupils' experiences during and after school closures

Schools in Ireland generally provided a range of supports for remote learning during the closure period in early 2021, based on principals' and parents' reports. The evidence suggests that many pupils may have read more than usual during lockdown (for school and for themselves, on paper and on screens). It is possible that this could have contributed to the maintainance and/or advancement of their reading comprehension skills and thus to Ireland's strong overall performance in PIRLS.

A majority of parents felt that their children's learning had been affected to *some extent* by pandemic-related disruption. Similarly, a majority of teachers believed that literacy learning was negatively impacted for between one-quarter and three-quarters of pupils in their classes. Pupils whose parents perceived them as less affected, and pupils whose teachers perceived their classes as less affected, performed relatively better in PIRLS, on average. However, further research should explore the extent to which being perceived as negatively affected may interact with other variables (e.g. gender, SES, school DEIS status).

For a slight majority of pupils, a school-based summer programme was not available in 2021. For pupils whose schools ran a summer programme, there was usually some level of focus on literacy, but teachers indicated that relatively few PIRLS pupils attended. However, in autumn 2021 more than half of PIRLS pupils were in classes that were taking part in an initiative to foster wellbeing, while initiatives to promote physical education, social interaction, literacy, and numeracy were also relatively common. This suggests a generally high focus in schools on mitigating negative effects of the closure periods.

At the time of testing, pupils in Ireland reported higher levels of tiredness and hunger on arrival at school than the levels reported in spring 2016. They also reported a higher incidence of experiencing bullying behaviours. Together, these observations suggest that at least some aspects of pupils' wellbeing have declined between 2016 and 2021, and that a continued policy emphasis on supporting wellbeing is needed. Overall, teachers reported a remarkably high sense of occupational wellbeing despite the challenges created by COVID-19, although a substantial minority felt unappreciated on a regular basis.

Pupils appeared to like reading somewhat less than in 2016, and to spend a little less time reading outside school (not counting periods of remote learning). Given that mean achievement increased between cycles and that enjoyment of reading is positively associated with achievement, this seems counterintuitive. However, a similar pattern of increasing achievement and decreasing enjoyment has been observed at post-primary level in Ireland (McKeown et al., 2019; Shiel et al., 2022). It is important to understand how pupils engage in reading in their day-to-day lives, including their experiences with print versus screen-based reading, in order to support their enjoyment of reading throughout primary school and beyond.

Future reporting on PIRLS 2021

It is planned that further national reporting will include:

- Subgroup analysis of contextual variables.
- A focus on pupils for whom English is an additional language.
- An exploration of typical experiences during reading instruction.
- Multilevel analysis of how contextual variables may predict reading achievement.

As NAMER and PIRLS were administered during the same year, future reporting could combine insights from the two studies to provide a rich picture of the pandemic-era experiences of primary school pupils at three grade levels.

Chapter 1: Introduction

Introduction to PIRLS

The *Progress in International Reading Literacy Study* (PIRLS) is a comparative study which assesses the reading skills of primary school pupils in participating countries worldwide. It is overseen by the International Association for the Evaluation of Educational Achievement (IEA). Within each country, a national centre manages the administration of the study, in line with procedures set out by the IEA to ensure international comparability. In Ireland, PIRLS is managed by the Educational Research Centre (ERC) on behalf of the Department of Education (DoE).

PIRLS was first administered in 2001, with 35 countries taking part. Since then, the study has taken place every five years, with an increasing number of countries participating on each occasion. Ireland has taken part in three cycles to date: 2011, 2016, and 2021, with 57 countries taking part in the 2021 cycle.

PIRLS collects achievement data from pupils based on a test of reading comprehension. Questionnaires are used to collect contextual data from multiple sources: the pupils, their parents/guardians, their teachers, and their school principals.

Reading achievement in PIRLS is measured on a scale with a centrepoint of 500 (representing the average achievement across participating countries in the first cycle in 2001) and a standard deviation of 100. In 2011, pupils in Ireland achieved a mean reading score of 552, and were outperformed by pupils in five participating countries: Hong Kong, the Russian Federation, Finland, Singapore, and Northern Ireland (Eivers & Clerkin, 2012). In 2016, pupils in Ireland achieved a mean reading score of 567, which represented a significant improvement from 2011. This mean score was equivalent to that of pupils in Hong Kong, Finland, Poland, and Northern Ireland, with only the Russian Federation and Singapore significantly outperforming Ireland (Eivers et al., 2017).

The PIRLS test was fully paper-based up to and including 2011, but there has since been a movement towards exploring the possibilities of digital testing. A similar shift has occurred in other international large-scale assessments such as the Trends in International Mathematics and Science Study (TIMSS) (Mullis et al., 2020) and the Programme for International Student Assessment (PISA) (Organisation for Economic Cooperation and Development [OECD], 2016). In the 2016 cycle of PIRLS, an optional "add-on" assessment of digital literacy, called ePIRLS, was introduced. Fourteen countries, including Ireland, took part in ePIRLS as well as PIRLS. This meant that the same pupils who sat the paper-based PIRLS test (or, in Ireland's case, a random subsample of these)[9] also sat the computer-based ePIRLS test on a subsequent morning. The ePIRLS test required pupils to navigate through a hyperlinked network of multimodal texts that simulated an online environment. ePIRLS results were placed on the same scale as PIRLS results, meaning that a country's performance across the two tests could be directly compared. Pupils in Ireland achieved a mean score of 567 in ePIRLS, which was very similar to the mean score of the same pupils on the paper-based PIRLS test (Eivers et al., 2017).

What does the PIRLS test assess?

PIRLS assesses the proficiency of pupils in reading literacy. In the framework that guides the development of the PIRLS assessment (see http://pirls2021.org/frameworks/home/reading-assessment-framework/overview/), reading literacy is defined as:

[9] Due to the variable Information and Communications Technology (ICT) infrastructure in schools in Ireland, ePIRLS testing in 2016 was conducted on laptops supplied to schools by the ERC. As it was not practicable to supply and set up laptops for all PIRLS pupils in larger schools, a random subsample of up to 22 PIRLS pupils per school was selected to participate in ePIRLS. See Eivers et al. (2017) for details.

> the ability to understand and use those written language forms required by society and/or valued by the individual. Readers can construct meaning from texts in a variety of forms. They read to learn, to participate in communities of readers in school and everyday life, and for enjoyment. (Mullis & Martin, 2019a, p. 6)

This definition of reading literacy is operationalised through the inclusion of a range of text and item (question) types in the PIRLS assessment. In the 2021 cycle, some countries, including Ireland, administered PIRLS on paper, while others administered it on computer (this and other variations across countries in the administration of PIRLS 2021 are described in more detail later in this chapter). Eighteen texts were administered in the paper-based PIRLS assessment in 2021, with an additional five ePIRLS texts (or "projects") included in the rotation for countries administering the digital version. Each text was classified by the primary *purpose* for which it would be read – *for literary experience* ("Literary"), or *to acquire and use information* ("Informational"). Typically (although not invariably), Literary texts are fictional and narrative in form, while Informational texts may be factual and/or instructional articles, and are more likely to include non-continuous elements such as infographics, diagrams, or timelines. Of the 18 texts included in both paper-based and digital PIRLS in 2021, half were Literary and half were Informational. The five ePIRLS texts were all Informational, as online reading is most often undertaken for the purpose of gleaning information (Mullis & Martin, 2019a).

As well as being classified by reading purpose, each text was classified as *easy*, *medium*, or *difficult*, on the basis of its difficulty level across countries in previous cycles (for trend texts) or in the 2020 field trial (for new texts). The targeted average percent correct (across the international population of PIRLS pupils) was 80% for *easy* texts, 65% for *medium* texts, and 50% for *difficult* texts.

The PIRLS texts were arranged into 18 booklets, and every pupil who took the assessment on paper was assigned one of the 18 booklets.[10] Each booklet contained two texts and their items, and each text appeared in two of the booklets (paired with a different text each time). All booklets included one Literary and one Informational text. The Literary text appeared first in 10 booklets, while the Informational text appeared first in eight booklets.

Pupils had 40 minutes to read their first text and to respond to between 12 and 18 items based on it. After a short break, they had another 40 minutes to do the same with their second text. PIRLS items are classified by which of four comprehension processes they are most likely to require: *focus on and retrieve explicitly stated information* ("Retrieve"); *make straightforward inferences* ("Infer"); *interpret and integrate ideas and information* ("Interpret"); or *evaluate and critique content and textual elements* ("Evaluate"). PIRLS aims to present approximately 20% Retrieve, 30% Infer, 30% Interpret, and 20% Evaluate items (Mullis & Martin, 2019a).

Some items use a multiple-choice format. Most commonly, these items present the pupil with four response options, of which they are asked to select one. More rarely, items require the pupil to "tick all that apply" from a list of statements, or to assign each of a set of statements to one of two categories (e.g., true/false). Other items use a constructed-response format, requiring the pupil to write out their answer (or to type it, in countries administering digital PIRLS). Constructed-response items may be worth one, two, or three points, and pupils are advised to consider the points allocated for each item and adjust the length and detail of their response accordingly. For example, it may be possible to respond adequately to a one-point item by writing a word or short phrase, whereas several sentences are likely to be required to achieve full marks on a three-point item.

The PIRLS booklets varied by difficulty level. Booklets 1 – 9 were classified as *more difficult*. Of these, three booklets contained two *difficult* texts only, while six contained a *medium* text followed by a *difficult* text. Booklets 10 – 18 were classified as *less difficult*. Of these, six booklets contained an *easy* text followed by a *medium* text, while three booklets contained two *easy* texts only. Within countries, booklet assignment for individual pupils was random; in other words, any two pupils within the same country had an equal chance of receiving a particular booklet. However, as described in more detail later (see "Group adaptive testing", p. 5), different ratios were used in different countries to distribute the *more difficult* versus *less difficult* booklets, based on what was known from previous assessments about average reading

[10] The booklet rotation for countries administering digital PIRLS was somewhat more complex. The 18 booklets from the paper PIRLS rotation were included, but, in addition, there were ePIRLS-only booklets and "hybrid" booklets (containing one PIRLS Informational text and one ePIRLS text). For details of this rotation scheme, see http://pirls2021.org/frameworks/home/assessment-design-framework/group-adaptive-design/.

proficiency in each country. This was a new departure in PIRLS 2021 and meant that the difficulty of the assessment could be tailored, in a macro sense, to the needs of different populations.

The Resources section at the end of this report (p. 96) includes three sample PIRLS texts and their accompanying items:[11]

- *The Amazing Octopus* is an Informational text classified as *easy*.
- *The Empty Pot* is a Literary text classified as *medium* difficulty.
- *Where's the Honey?* is an Informational text classified as *difficult*.

What contextual information is collected?

As well as assessing pupils' reading literacy, PIRLS collects information about their demographic characteristics, opinions, and experiences, and about the home, classroom, school, and national contexts in which they learn. Contextual information can provide important insights into factors associated with reading achievement. It can also prove valuable in its own right – for example, by providing evidence about issues such as the prevalence of bullying among children, the level of job satisfaction among teachers, and the extent of school-level resourcing problems within and across countries.

The collection of contextual information is guided by the PIRLS 2021 Context Questionnaire Framework (Mullis et al., 2019 – see http://pirls2021.org/frameworks/home/context-questionnaire-framework/overview/). This describes in detail the various instruments administered and the rationale for the items used in each. Brief summary descriptions of the instruments are provided next.

A **Pupil Questionnaire** is administered to each pupil after they complete the PIRLS test (generally following a short break). This questionnaire collects demographic information (gender, age, frequency of speaking the test language at home), as well as information about pupils' attitudes to reading, confidence as readers, typical reading behaviours, and engagement in reading lessons. It also collects some information about pupils' school experiences (e.g., the frequency with which they arrive tired or hungry; the frequency with which they have been bullied) and home environments (e.g., approximate number of books in the home).

A **Home Questionnaire** is sent to pupils' parents/guardians to gather further information about pupils' home environments, including language(s) spoken, information about early literacy activities and skills, the extent to which parents/guardians like reading and spend time reading, and indicators of socioeconomic status (e.g., parental education level; parental occupation). In 2021, some questions were added to capture parents' views of their children's experiences during periods of school closure/remote learning necessitated by COVID-19.

A **Teacher Questionnaire** is provided to the class teachers of PIRLS pupils. This collects demographic information and asks about teachers' qualifications, professional development, classroom practices, and feelings about their profession. In 2021, additional questions asked about teachers' perspectives on the impact of COVID-19 in their classes.[12]

A **School Questionnaire** is provided to the principal of each school participating in PIRLS. This asks about principals' qualifications and experience, as well as the school's size, location, socioeconomic profile, and resources. It also asks about emphasis on academic success, discipline and safety, and the teaching of reading skills and strategies within each school. In 2021, some questions were added about the length of time during which school closures were in place and about school policies and practices relating to remote learning during these periods.

Finally, a **Curriculum Questionnaire** is completed by curriculum and education experts in each country. This captures information about national education systems as a whole – for example, about early childhood education, age of school entry, teacher and principal education, language(s) of instruction, and the language and reading curriculum. Each country also provides a chapter about its education system for the **PIRLS Encyclopedia** (Reynolds et al., 2022), which can be accessed at https://pirls2021.org/encyclopedia/. In Ireland, information for the Curriculum Questionnaire and Encyclopedia chapter (DoE et al., 2022) was provided by the DoE, the National Council for Curriculum and Assessment (NCCA), and the ERC PIRLS team.

[11] Please note that, while these texts and their items have been released from the PIRLS rotation (meaning that they will not be used in future cycles of the study), permission to reproduce them must be sought from the IEA. A permission form is available from www.iea.nl/copyrightnotice.

[12] In Ireland, the full PIRLS Teacher Questionnaire was administered to the Fifth Class teachers at the time of testing in 2021. A supplementary national Teacher Questionnaire was administered to the Fourth Class teachers from the previous year. This is further described in Chapter 2.

All data collected in PIRLS 2021, with their sources and instruments used, are summarised in Table 1.1. However, some modifications to data collection procedures were necessitated by the COVID-19 pandemic. These are described later in this chapter (in general terms) and in Chapter 2 (as they relate to Ireland specifically).

Table 1.1: Data collected for PIRLS 2021. with sources and instruments used

Data type		Source	Instrument
Achievement	Achievement in reading	Pupils	PIRLS test (paper or digital)
Context	Personal characteristics, opinions, experiences	Pupils	PIRLS Pupil Questionnaire
	Home environment	Parents/Guardians	PIRLS Home Questionnaire
	Classroom environment and teaching practices	Class teachers	PIRLS Teacher Questionnaire
	School environment and resources	Principals	PIRLS School Questionnaire
	National education system	National experts	PIRLS Curriculum Questionnaire
			PIRLS Encyclopedia

New features of PIRLS 2021

PIRLS 2021 included three notable changes relative to previous cycles. Two of these were planned: a further move towards digital test administration, and the introduction of a "group adaptive testing" approach to improve the quality of information collected in the lowest- and highest-achieving countries. The third was unplanned, as it stemmed from the need to adapt procedures to meet challenges posed all over the world by the COVID-19 pandemic. These three sets of changes are described next.

Test mode: paper-based versus digital

Each country could choose to administer the PIRLS test in either fully paper-based or fully digital format. The digital version could be administered via computer or tablet, and included on-screen versions of the same texts and items used in the paper-based version as well as additional ePIRLS tasks and items to assess literacy within a hyperlinked, online-like environment.

Countries that opted for digital administration were also required to administer some trend items on paper to an additional, smaller "bridge" sample. This allowed the IEA to examine any systematic differences in item difficulty across the test modes. During the scaling process, the data from digitalPIRLS countries were placed on the trend (paper-based) PIRLS scale by population-based linking, i.e. drawing on the assumption that the samples sitting the digital test and the paper-based bridge test within a given country were taken from the same population. A full description of this process is provided in the PIRLS 2021 technical report (see in particular Bezirhan et al., 2023). In general, although with some variation both across countries and items, the digital format of assessment tended to be somewhat more difficult, and this was adjusted for in the scaling (at international level, rather than for individual countries).

Ireland had planned for digital administration of PIRLS, following previous participation in the add-on ePIRLS assessment in 2016. However, due to logistical challenges associated with the COVID-19 pandemic, Ireland reverted to paper-based testing for the main data collection in 2021 (see Chapter 2).

Group adaptive testing

A test provides useful information when it is appropriately matched to the proficiency level of the target population. If a test is too difficult, many respondents will get few or no items correct, resulting in limited information about what they *can* do. If a test is too easy, many respondents will get most or all items correct, resulting in limited information about what they *cannot* do. In both instances, the test does not adequately capture how proficiency may vary within the target group (Martin et al., 2019; see also Appendix A of Mullis & Martin, 2019b).

It is a significant challenge for international assessments to target the difficulty level of tests to suit a wide range of national contexts simultaneously. In PIRLS, for example, a text that is appropriately pitched for pupils in a country with lower overall reading achievement may be too easy for most pupils in a country with higher overall achievement (a "ceiling effect"). On the other hand, a text that is appropriately pitched for pupils in the higher-achieving country may be too difficult for most pupils in the lower-achieving country (a "floor effect").

Previously, one solution deployed in PIRLS involved the creation of an easier assessment (called *prePIRLS* in 2011 and *PIRLS Literacy* in 2016) for countries in which most Fourth grade pupils were still developing basic reading skills. In 2016, several texts were shared across PIRLS and PIRLS Literacy (Mullis & Prendergast, 2017), which meant that results from the two assessments could be placed on the same scale.

In 2021, a new approach was adopted, to allow all countries to participate in the same assessment and to provide some tailoring of the difficulty level for the highest-achieving as well as the lowest-achieving countries. Under this approach, termed "group adaptive testing":[13]

- Half of the PIRLS booklets are designated as *more difficult* and half as *less difficult*, as described earlier.
- All countries administer all booklets, but in varying proportions. Specifically:
    - Higher-achieving countries assign *more difficult* booklets to 70% of pupils and *less difficult* booklets to 30% of pupils. In the 2021 cycle, countries with a mean score of 565 or higher in the previous PIRLS cycles were classed as higher-achieving.[14]
    - Middle-achieving countries (in 2021, those with previous mean PIRLS scores of 436-564)[15] assign equal proportions of *more difficult* and *less difficult* booklets.
    - Lower-achieving countries (in 2021, those with previous mean PIRLS scores of 435 or below) assign *more difficult* booklets to 30% of pupils and *less difficult* booklets to 70% of pupils.

As Ireland achieved a mean score of 567 in PIRLS 2016, it qualified as a higher-achieving country, along with six other countries. Therefore, in Ireland, the *more difficult* PIRLS 2021 booklets were assigned to proportionally more pupils (70%) than the *less difficult* booklets (30%).

The PIRLS scaling methodology, which is designed to estimate the distribution of reading proficiency for populations and subpopulations rather than individuals, controls for variations in difficulty across PIRLS passages so that there is no untoward advantage associated with higher incidence of the *less difficult* booklets. In Ireland, for example, the difference between the estimated mean achievement scores of pupils who were assigned *more difficult* versus *less difficult* booklets was negligible (less than one point on the PIRLS achievement scale). For further details, readers are referred to the PIRLS 2021 technical report (von Davier et al., 2023).

[13] Usually, a test can be described as adaptive if it assigns items tailored to the ability level of an individual test-taker. For example, a test-taker who gets several items incorrect may then be assigned an easier set of items, while one who gets several items correct may then be assigned a harder set of items. However, the PIRLS approach can be considered adaptive at group (whole-country) level, not at individual level.

[14] The PIRLS 2021 framework envisaged that the cut-point for higher-achieving countries would be 550 and the cut-point for lower-achieving countries would be 450 (Martin et al., 2019 – see http://pirls2021.org/frameworks/home/assessment-design-framework/group-adaptive-design/). Ultimately, a more conservative approach was adopted for this cycle.

[15] Countries that had not participated in PIRLS previously were generally assigned to the middle-achieving group.

Changes necessitated by COVID-19

The COVID-19 pandemic impacted on PIRLS 2021 in a number of ways. The most significant impacts internationally are outlined here, while specific impacts for Ireland are described in more detail in Chapter 2.

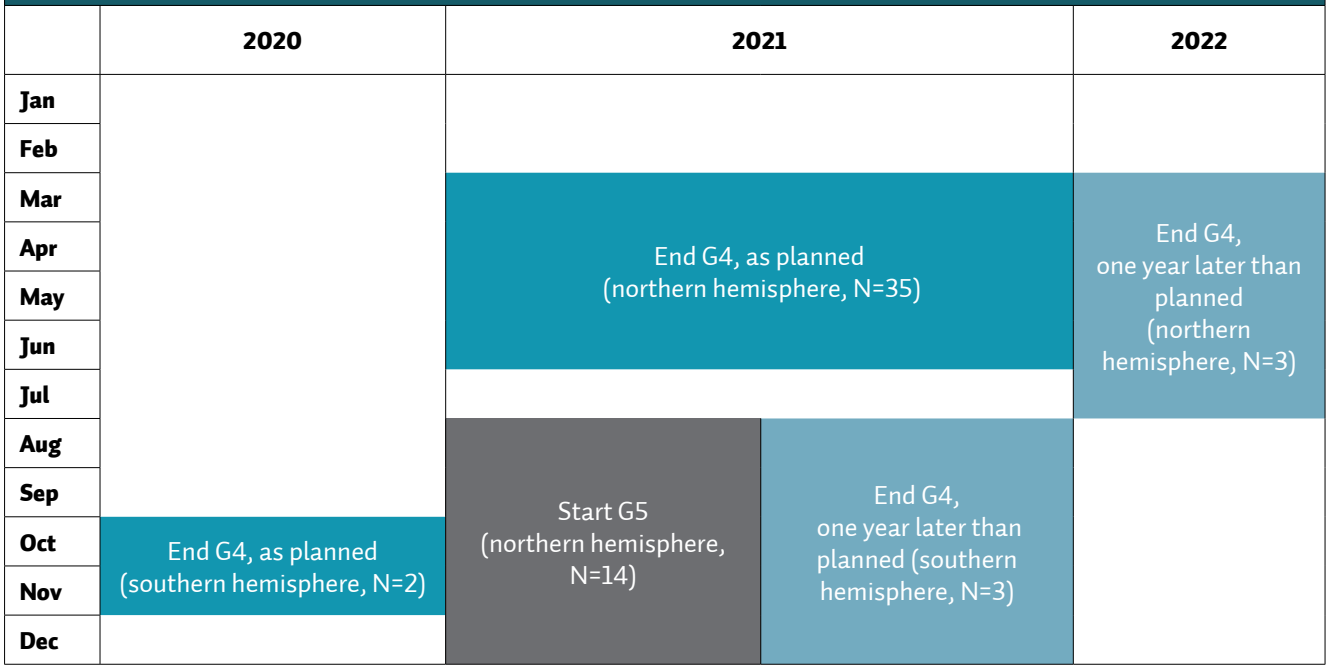
The year before a PIRLS data collection, a field trial is held to examine the performance of new text passages and items and to ensure that procedures work smoothly and reliably. In spring 2020, the field trial for northern hemisphere countries (including Ireland) was interrupted by near-global lockdowns, which included school closures, to combat the spread of COVID-19. Consequently, most countries collected either less field trial data than anticipated, as in Ireland's case, or no field trial data. The data from 22 countries that managed to participate to some extent were used to identify suitable passages and items for the main data collection (Wry & Mullis, 2023).

The pandemic caused the main data collection to be split across a number of test windows. Most countries administered the main study during the planned window. That is, they administered PIRLS to pupils approaching the end of the Fourth grade, either in autumn 2020 (southern hemisphere) or spring 2021 (northern hemisphere). However, for Ireland and 13 other northern hemisphere countries, it was not feasible to administer PIRLS during the planned window due to the impact of additional school closures in early 2021. These countries administered PIRLS to pupils at the beginning of Fifth grade the following school year. In Ireland, this meant that PIRLS was administered to pupils when they were starting Fifth Class in autumn 2021.

There were also a small number of countries that administered PIRLS to Fourth grade pupils one year later than planned. For southern hemisphere countries, this meant administering the test in autumn 2021. For northern hemisphere countries, this meant administering the test in spring 2022.

Therefore, the PIRLS 2021 cycle includes data collected across a much wider period than usual (Figure 1.1). It should be noted that this period was also one of extraordinary educational and social turmoil within many countries, due to the effects of the pandemic.

Figure 1.1: Test windows in the PIRLS 2021 cycle, with the number (N) of countries that tested in each window



Note. "End G4" indicates that pupils were tested when they were approaching the end of Fourth grade. "Start G5" indicates that pupils were tested when they were at the start of Fifth grade.

Who took part in PIRLS 2021?

In total, 57 countries took part in PIRLS 2021 (Table 1.2). At individual level, 320,542 pupils participated across these countries, along with their parents/guardians, teachers, and principals. A further 47,033 pupils took part on behalf of eight benchmarking participants.[16]

The PIRLS countries were divided relatively evenly between paper-based and digital test administration modes, with 32 countries administering PIRLS on paper and 25 countries administering PIRLS digitally (with a paper "bridge" sample added, to allow for analysis of any mode effects).[17] As noted, Ireland was among the countries that administered PIRLS on paper, as the planned digital administration was deemed high-risk when the additional complications of the pandemic were factored in. Participants that administered PIRLS on paper are shown in blue in Table 1.2, while those that administered digitally are shown in orange.

A majority of countries (37) administered PIRLS at the planned time (i.e., during their original test window, to pupils approaching the end of Fourth grade). Six countries administered PIRLS one year later than planned, although still to pupils near the end of Fourth grade. These are indicated with the symbol ⋈ in Table 1.2 (and it should be noted that, for the northern hemisphere countries in this group, testing took place in 2022 when schools had generally resumed operating more normally after the first two years of the pandemic). Finally, 14 countries, including Ireland, administered PIRLS to pupils at the start of Fifth grade in autumn 2021, and these are presented in the separate Start G5 column in Table 1.2.

Seven countries, including Ireland, had achieved mean scores of 565 or higher in PIRLS 2016 and consequently were advised to administer proportionally more of the *more difficult* booklets in PIRLS 2021. In Table 1.2, participants in this category are indicated with an asterisk (*).

[16] Benchmarking participants may be subnational regions or cities, or national entities that administer PIRLS to a population other than the target grade. For example, the United Arab Emirates (UAE) participated in PIRLS as a country, but also drew separate benchmarking samples to provide more detail on the performance of pupils in Abu Dhabi and Dubai. South Africa participated as a country at the target grade, but also administered PIRLS to a benchmarking sample of pupils at a higher grade level (Grade 6). In this report, the main focus is on country-level results, with overall results for benchmarking participants available in the e-Appendices.

[17] The United States administered PIRLS digitally, but opted to report only the results from its paper bridge study. Therefore, it is treated as a paper participant in this report, and its data are not discussed in detail given the smaller sample and wider error margin involved.

Table 1.2: Countries and benchmarking participants in PIRLS 2021

Countries			
End G4		**Start G5**	
Paper	**Digital**	**Paper**	**Digital**
Albania	Belgium (Flemish)	Bahrain	Croatia
Australia ⋈	Czech Republic	Georgia	Hungary
Austria	Denmark	Ireland*	Kazakhstan
Azerbajan	Finland*	Latvia	Lithuania
Belgium (French)	Germany	Morocco	Qatar
Brazil ⋈	Israel ⋈	Northern Ireland*	Saudi Arabia
Bulgaria	Italy	United States (US)#	United Arab Emirates (UAE)
Cyprus	Malta		
Egypt	New Zealand		
England ⋈	Norway (G5)˜		
France	Portugal		
Hong Kong SAR*	Russian Federation*		
Iran ⋈	Singapore*		
Jordan	Slovak Republic		
Kosovo	Slovenia		
Macao SAR	Spain		
Montenegro	Sweden		
Netherlands	Taiwan		
North Macedonia			
Oman			
Poland*			
Serbia			
South Africa ⋈			
Turkey			
Uzbekistan			

Benchmarking participants			
End G4		**Start G5**	
Paper	**Digital**	**Paper**	**Digital**
South Africa (Grade 6) ⋈	Alberta, Canada	(n/a)	Quebec, Canada
	British Columbia, Canada		Abu Dhabi, UAE
	Newfoundland & Labrador, Canada		Dubai, UAE
	Moscow City, Russian Federation*		

Note. The names used for countries in this report are the names expected to be most familiar to an Irish audience. Occasionally, countries are named differently in the international report (e.g., Taiwan is referred to as Chinese Taipei).
⋈ Participant tested one year later than planned (autumn 2021 for southern hemisphere, spring 2022 for northern hemisphere).
* Participant achieved a mean score of 565 or higher in 2016 and was advised to administer proportionally more of the *more difficult* booklets in 2021.
\# While the US administered PIRLS digitally, it opted to publish results from its paper bridging study rather than its main, digital data collection.
˜ Since 2016, Norway has administered PIRLS to pupils in the fifth rather than fourth grade of formal education, as this makes for a closer match in age-based terms with Fourth grade pupils in comparator countries.

Selected reference countries

For this report, a subset of participating countries has been selected as being of particular interest to readers in Ireland (Table 1.3). The education systems of these countries are considered likely to provide useful points of reference for Ireland, often because the countries have relatively high performance in PIRLS 2021 and/or share some linguistic or cultural similarities with Ireland. Additionally, all of the selected countries successfully met the PIRLS guidelines for sample participation.[18] **However, given that some of these countries tested at End G4 (and, in two cases, one year later than planned), and also that some administered the test digitally rather than on paper, considerable caution is needed when drawing comparisons between their experiences of PIRLS relative to Ireland's.** Northern Ireland is the selected participant that provides the most direct parallel for Ireland, having also tested its pupils at Start G5 and on paper.

Findings for the reference countries are generally presented (i) by time of testing and (ii) by test mode, with *italics* used to denote countries that tested on computer. Within each resulting subgroup, countries are listed alphabetically.

Table 1.3: Selected reference countries by time of testing, mode of assessment, and reason(s) for selection

Time of testing	Mode	Country	Reason(s) for selection
Start G5	Paper	Ireland	NA
		Northern Ireland	High performance; linguistic and cultural similarity; same time of testing; same mode
	Digital	*Croatia*	High performance; same time of testing
		Lithuania	High performance; same time of testing
End G4	Paper	Australia ⋈	Linguistic and some cultural similarity; same mode
		England ⋈	High performance; linguistic and some cultural similarity; same mode
		Hong Kong SAR	High performance; same mode
		Poland	High performance; some cultural similarity; same mode
	Digital	*Finland*	High performance
		New Zealand	Linguistic and some cultural similarity
		Singapore	High performance; linguistic similarity (tests in English)

⋈ Participant tested one year later than planned (autumn 2021 for southern hemisphere, spring 2022 for northern hemisphere).

[18] Countries that met the IEA's participation guidelines only after using replacement schools were considered for inclusion as reference countries. However, countries that did not meet the guidelines even after replacement were not considered.

Caveats when interpreting PIRLS 2021 data

There are a number of important caveats to be borne in mind when interpreting findings for PIRLS 2021. Some relevant considerations are discussed below, and the caveats are summarised in Box 1.1. They are further discussed at the start of Chapter 3, and are flagged throughout this report.

Testing at the end of Fourth grade (End G4) vs the start of Fifth grade (Start G5)

As described, PIRLS 2021 includes data collected from pupils at two different time points within their educational careers: at the end of Fourth grade (referred to in this report as "End G4") and at the start of Fifth grade ("Start G5"). There are some **important contextual differences** between PIRLS administrations at End G4 versus Start G5.

Age and achievement

Across all Start G5 countries, pupils were six months older, on average, than their counterparts in End G4 countries. For example, the Start G5 pupils who took part in PIRLS 2021 in Ireland were about six months older than they would have been if they had taken part in spring 2021, as originally planned. Their average age at the time of testing was 11.0 years, compared to 10.5 years for pupils in Ireland in previous PIRLS cycles.

The association of age with reading achievement at a given grade level is complex and can interact with characteristics of education systems (Martin et al., 2008). For instance, in a country where most children start school at a similar age, but where promotion to the next grade depends on academic performance, the older pupils at a particular grade level may tend to have lower achievement than their younger peers. In Ireland, limited large-scale research has been conducted on how pupils' age at a given grade may be associated with their reading achievement.

To better understand this association, we can examine the PIRLS 2016 data for Ireland by age. For the purposes of this analysis, PIRLS 2016 pupils are classified as being of *medium* age if their age was within ± one standard deviation (0.4 years) of the average (10.5 years) (65.7% of pupils). They are classified as *younger* if their age was more than one standard deviation below average (i.e., below 10.1 years) (19.7%). They are classified as *older* if their age was more than one standard deviation above average (i.e., above 10.9 years) (14.5%). Pupils in the *medium* age category performed significantly better in reading, on average, than those in either the *younger* or *older* categories (by about 13 score points, in each case). When the effects of home resources for learning (a rough proxy for socioeconomic status) and gender were controlled for, using a regression approach, being a *younger* pupil still significantly predicted lower achievement relative to the *medium* age group, although the achievement gap between *medium*-aged and *older* pupils was no longer significant (Appendix Table A1.1).

For the purposes of understanding PIRLS 2021 data, the fact that pupils of *medium* age outperformed *younger* pupils in 2016 is of interest. In 2021, virtually all of Ireland's PIRLS pupils (99.8%) had at least reached the lower threshold of what was the *medium* age bracket in 2016 (10.1 years). **We might therefore expect the reading performance of the PIRLS 2021 pupils in Ireland to exhibit some advantage associated with age/maturation, relative to:**

- **how they would have performed six months earlier.**
- **how pupils in End G4 countries performed in 2021.**
- **how previous PIRLS cohorts in Ireland performed at End G4.**

Time of year and achievement

In addition to being older, the Start G5 PIRLS pupils in 2021 had recently returned from a summer break to start a new grade level. In Ireland, this also meant that, in most cases, they were being taught by a teacher who was relatively new to them. In some cases, it also meant that they were part of a new (reconstituted) class group.

While any variation in achievement measured at different times of the school year *may* be explained by age/maturation, it is also possible that other factors had a bearing. In Ireland, one useful point of reference is a set of standardised reading tests normed for use with primary school pupils either in spring (at the end of one grade level), or in autumn (at the start of the next).[19] Consistently across five levels (from end of First Class/start of Second Class to end of Fifth Class/start of

[19] The tests referenced here are the predecessors of the current (2018-normed) Drumcondra Primary Reading Tests. The current versions are normed for spring only, and so do not facilitate a comparison between spring and autumn administrations.

Sixth Class), these tests were somewhat easier for the pupils who sat them in autumn than for the pupils who sat them in spring (ERC, 2007a, 2007b, 2007c). The cause of this pattern is not clearly identifiable. It could be to do with increased age/maturation; increased experience of reading gained between spring and autumn, including over the summer break; additional instruction in reading; and/or other factors. Whatever the cause(s), this pattern again suggests that the pupils who sat PIRLS 2021 at Start G5 in Ireland *probably* performed somewhat better, on average, than they would have if they had been tested during the preceding spring.

That said, it should not be assumed that testing at a different time of the school year impacts similarly on all pupils. Evidence has shown that pupils with fewer home resources are more likely to experience learning loss over the summer break, and this is particularly the case with reading (e.g., Alexander et al., 2007; Cooper et al., 1996). While not much is known about how the phenomenon of summer learning loss (or gain) manifests in the Irish context specifically, it is worth bearing in mind that an overall mean advantage associated with autumn testing does not rule out a possible disadvantage for some subgroups of pupils, such as those with lower socioeconomic status (SES).

Furthermore, comparing spring and autumn testing in 2021 is different to comparing spring and autumn testing in a "normal" (pre-pandemic) year. If pupils in Ireland had been tested in spring 2021, this would have taken place very soon after their return to in-person schooling following a period of remote learning, as was the case in many End G4 countries. On the other hand, countries had the opportunity to implement some mitigation measures between spring and autumn in response to the impact of school closures. For example, in Ireland, the resourcing of school-based summer programmes was expanded and some additional teaching hours were provided to schools in the autumn, with a focus on supporting pupils most at risk of educational disadvantage following the closures (described further in Chapter 2). Such mitigation measures could have benefited some of the Start G5 PIRLS pupils ahead of autumn testing.[20] Therefore, if we would expect some advantage to accrue to autumn testing in a "normal" year, it seems reasonable that this advantage might be a little larger in the unusual context of 2021.

Bearing all these factors in mind, considerable caution is needed when comparing data for Start G5 countries (such as Ireland) with data for End G4 countries or with their own trend data from previous cycles (when all countries participated during the planned window, i.e. at End G4).

Data collection and disruption to education

In almost all participating countries, irrespective of their test window, the PIRLS 2021 pupils experienced interruptions to normal school instruction that were not experienced by previous PIRLS cohorts. While End G4 pupils were tested when they were reaching the end of a school year, in many cases this had been a discontinuous school year characterised by building closures, remote learning, and other disruptions caused by COVID-19. Moreover, in most countries, the PIRLS pupils had also experienced protracted lockdowns during the previous (Third grade) school year.

The positioning of PIRLS testing relative to school closures within specific countries should be considered when interpreting the results of this unique study cycle. For example, while the effect of the summer break (and the possibility of associated learning loss, or gain, for some pupils) needs to be considered when interpreting data for Start G5 countries, the impact of unplanned disruption due to school closures also needs to be considered for End G4 countries, many of which administered PIRLS shortly after a return to in-person schooling. Additionally, during closure periods, countries' policies and the resources available to support remote learning varied widely.The PIRLS 2021 Encyclopedia (Reynolds et al., 2022) is a useful resource that includes summaries of how COVID-19 affected the education systems of all participating countries.

[20] In End G4 countries that tested a year later than planned, PIRLS pupils could also have benefited from any mitigation measures implemented from mid-2021 on.

Box 1.1: Caveats associated with international and trend comparisons using PIRLS 2021 data

CAVEATS

1. INTERNATIONAL COMPARISONS

End G4 vs Start G5

Great care should be taken when comparing the PIRLS 2021 data for Start G5 countries, such as Ireland, with the data for End G4 countries. Pupils that tested at Start G5 were, on average, six months older than those that tested at End G4. The Start G5 pupils were also in a different grade and at a different point in their school year, and had recently experienced the summer break. Importantly, too, more time had elapsed since COVID-19-related school closures for pupils in most Start G5 countries than for those in most End G4 countries.

Caution is also needed to interpret international comparisons involving End G4 countries that tested one year later than planned, particularly those in the northern hemisphere that tested in spring 2022 (generally, towards the end of a comparatively "normal" school year, without large-scale lockdowns).

Paper vs digital administration

While the scaling methodology in PIRLS 2021 took account of mode effects at international level and allowed for the placement of paper and digital PIRLS data on a single scale, it may be useful to bear in mind the different modes of administration when drawing international comparisons. For example, while all pupils were asked about the extent to which they liked reading as part of the Pupil Questionnaire, it seems probable that pupils who had just completed a paper test might think mainly about reading on paper, while those who had completed a digital test might be more likely to include reading on screens.

2. TREND COMPARISONS

Start G5 countries: change of age, grade, time of year

Comparisons between Ireland's PIRLS 2021 data and Ireland's data from previous cycles must be made with considerable caution. Because Ireland participated at Start G5 in 2021, participating pupils were, on average, six months older than those who took part in PIRLS in 2016. The 2021 pupils were also in a different grade, and took the test at a different time of the school year. This caveat also applies to the other 13 countries that tested at Start G5 in 2021.

Countries that tested one year later than planned: six-year trend

The six countries that tested one year later than planned (but at End G4) report on a six-year rather than a five-year trend relative to PIRLS 2016.

All countries: impact of COVID-19 on instruction

A general caveat that applies to trend comparisons with 2021 data relates to the impact of COVID-19 on pupils' experience of instruction. PIRLS 2021 pupils in many (though not all) countries had experienced protracted periods of school closures and remote learning, unlike their counterparts in earlier cycles. It is difficult to say to what extent these experiences have impacted on trends in PIRLS achievement, and to what extent such an impact may have varied across countries and between sub-populations within countries.

About this report

The primary focus of this report is on the reading achievement of PIRLS pupils in Ireland:

- Chapter 2 describes the administration of the study in Ireland.
- Chapter 3 presents overall achievement results.
- Chapter 4 examines the distribution of achievement (i.e., how achievement varied within Ireland and reference countries).
- Chapter 5 analyses performance at international benchmarks.
- Chapter 6 considers performance on subscales relating to different reading purposes and processes of comprehension.

Some preliminary contextual data are also presented, although these will be explored in greater detail in subsequent reporting:

- Chapter 7 looks at pupils' experiences during the COVID-19 pandemic, particularly during lockdowns, and particularly in relation to reading.
- Chapter 8 describes aspects of pupils' and teachers' wellbeing, and pupils' attitudes to reading, at the time of testing (i.e., post-lockdowns).

Finally, Chapter 9 provides a summary and conclusions.

For each chapter that includes analysis, an e-Appendix is available in Excel format. This includes unrounded data and details such as confidence intervals and test statistics. The e-Appendices can be downloaded from www.erc.ie/pirls/reports.

Understanding the analyses

The notes in this section can be used to help interpret the results in this report.

Achievement scores

PIRLS reports estimates of reading achievement on a scale set to a centrepoint of 500, which reflected average achievement during the **first** PIRLS cycle in 2001. The scale's standard deviation (SD) was set to 100. This means that, in 2001, approximately 95% of pupil scores internationally fell between 300 and 700 (i.e., 500 ± 2SD). While the scale centrepoint constitutes a reference point that remains constant across cycles of PIRLS, it does **not** reflect the international average for the 2021 cycle (or for any PIRLS cycle other than the first one). In all PIRLS cycles to date, a majority of participating countries have achieved mean scores significantly above the international centrepoint.[21] However, the centrepoint provides a stable point of reference against which to assess changes in achievement over time.

When interpreting achievement results on the PIRLS scale, as a rule of thumb, a difference of two or three points between the mean scores of different groups is unlikely to be statistically significant. In other words, we generally cannot say with confidence that a difference of this magnitude represents a "real" difference. (See the sections on statistical significance and confidence intervals, below, for further information about interpreting differences between mean scores.)

When a subgroup within a country comprises less than 2.5% of the population, their estimated mean achievement is not reported, as the error margins become large when small numbers are involved.

[21] Even in 2001, when 500 represented the average of the mean scores of participating countries, only 10 of the 35 participating countries scored significantly below the centrepoint, with some of these being outliers (Mullis et al., 2003).

Percentages

Percentages are reported for pupil demographics (e.g., the percentage of pupils in Ireland within each gender category). Percentages are also used to describe pupils' responses to questionnaire items, including to classify their outcomes on context questionnaire scales. For example, drawing on internationally-developed cut points on the PIRLS *Students Like Reading* scale, we can describe the percentages of pupils in Ireland that *very much liked*, *somewhat liked*, and *did not like* reading. In this report, percentages (and achievement scores) are **weighted** unless otherwise specified. This means that they are adjusted to be representative of the target population (all pupils at the relevant grade level in a country), not just the specific sample that participated.

Statistical significance

A difference between groups is considered statistically significant if we can be confident that it is unlikely to have occurred by chance. Where reference is made in this report to a significant or non-significant difference, a test of statistical significance has been conducted. For PIRLS, statistical significance tests are reported at the 95% confidence level and measurement and sampling error are accounted for in the statistical comparisons. Unless otherwise specified, where multiple comparisons are made in the course of one analysis, the critical value is adjusted using the Bonferroni procedure. For example, where performance of pupils in non-DEIS schools[22] is compared with that of pupils in DEIS Band 1, DEIS Band 2, and DEIS Rural schools, meaning that three comparisons are made, the alpha of .05 is divided by three to give an adjusted alpha of .0167.[23]

Statistical significance does not necessarily equate to substantive or meaningful significance. Readers should take the real-world context into consideration when interpreting reported differences.

Measures of uncertainty

Standard errors (SEs)

Estimates of group-level characteristics are affected by both sampling error and measurement error. To quantify this error, when a mean achievement score or percentage is estimated for a group (e.g., for all pupils in Ireland; for pupils in DEIS Urban Band 1 schools in Ireland), this value is accompanied by an estimated standard error (SE). The SE is a gauge of the level of uncertainty around our observed estimate. The smaller the SE, the more confident we can be that the observed value for the sample is likely to reflect that of the population. For example, while the SE around the estimate of achievement for all pupils in Ireland is relatively small, the SE around the estimate of achievement for pupils in DEIS Band 1 schools is larger, reflecting that fact that our sample of the pupils in this subset of schools is smaller and less representative.

Confidence intervals (CIs)

If we could test an infinite number of samples of a population on an infinite number of occasions, keeping test conditions constant, we would expect the observed mean scores to cluster around a "true" mean. On 95% of these test occasions, we would expect to observe mean scores that fall within ±1.96 SE of the "true" mean.

While this scenario is hypothetical, we can also say that there is a 95% chance that our observed mean score on our actual test occasion is one of those that falls within ±1.96 SE of the unobservable "true" mean. On this basis, we can create a 95% confidence interval (CI) around our observed mean score by (i) multiplying our estimated SE by 1.96, and (ii) subtracting and adding that result on either side of the observed mean. If we compare the observed mean scores for two populations and the CIs around these means overlap, we interpret this as meaning that the difference between the two means is not statistically significant.

For a quick approximation, the SE can be multiplied by 2 instead of 1.96. For example, if Country X has an observed mean score of 560, with SE of 3, the 95% CI around this score is roughly 554-566. In other words, we are roughly 95% confident that the "true" population mean is likely to fall within this range (on the assumption that this CI is one of the 95% that contain the "true'' mean).

[22] The DEIS (Delivering Equality of Opportunity in Schools) programme classifies schools according to the level of disadvantage of their population and allocates resources accordingly (Department of Education and Skills [DES], 2017).

[23] Note: analyses presented in the PIRLS 2021 International Report (Mullis et al., 2023) are not adjusted for multiple comparisons.

If we compare the mean score of Country X with that of Country Y (observed mean of 553, with SE of 1.5), we can say that the 95% CI around Country Y's observed mean is approximately 550-556. This overlaps with Country A's approximate CI of 554-566. Therefore, although Country X's mean score is 7 points higher than Country Y's, this difference is unlikely to be statistically significant.

Rounding

Achievement scores are presented rounded to whole numbers in this report. So are percentages (except for response rates and proportions in key demographic categories, which are presented to one decimal place). However, the difference between two mean scores, or two percentages, is calculated using unrounded data, and is then rounded itself. Therefore, the difference reported may not exactly match the difference between the rounded scores presented. (For example, a difference between mean scores of 560 and 570 might be reported as 11 points, if the unrounded mean scores are 559.6... and 570.4..., resulting in a difference of 10.8... points.) Similarly, reported percentages may not always sum to exactly 100% due to rounding. Unrounded data are available in the e-Appendices.

Chapter 2: PIRLS 2021 in Ireland

The context of PIRLS in Ireland

As outlined in Chapter 1, PIRLS 2021 in Ireland was originally intended to be administered as a digital assessment to Fourth Class pupils in spring 2021. However, due to the impact of the COVID-19 pandemic, PIRLS was ultimately conducted as a paper-and-pencil test in autumn 2021, with pupils in the originally sampled schools, who by then had progressed to Fifth Class.

Initial preparations for PIRLS between 2019 and 2020 were carried out on the basis that Ireland would be administering PIRLS as a digital assessment. At the request of the IEA, a small pre-pilot was implemented in autumn 2019 to generate sample responses to new constructed-response items, and a field trial was conducted in spring 2020 to pilot new materials and digital PIRLS procedures.

The field trial for digital PIRLS in Ireland was scheduled to take place during March and early April 2020. This period coincided with the onset of the COVID-19 pandemic, causing an abrupt halt to field trial data collection shortly after it had commenced. A blanket closure of all school buildings in Ireland was initiated from March 13 2020, and children did not return to in-person schooling for the remainder of the academic year (DoE et al., 2022) (see Box 2.1 for further details). Field trial data were therefore collected for only 10 out of the 40 sampled schools and these data were submitted to the IEA in May 2020. Not all countries participating in the PIRLS field trial were affected by the pandemic to the same extent and, overall, the IEA deemed that sufficient quality data had been collected internationally to allow for the selection of texts and items for the main study (Wry & Mullis, 2023). Following the field trial, planning for a digital PIRLS main study in spring 2021 in Ireland continued for a time, albeit in uncertain circumstances.

Changes for main data collection: from digital to paper-based PIRLS, and from spring to autumn testing

The pandemic remained a grave concern throughout 2020, with continued unpredictability regarding its impact on schools, pupils, and all education stakeholders. In light of this, the DoE, in consultation with the ERC, took the decision to return to paper administration for the PIRLS 2021 main study. This was to maximise the likelihood of schools and individual pupils being able to participate in the PIRLS assessment under a variety of circumstances that could arise because of the ongoing pandemic. Digital administration would have necessitated the use of sets of hired laptops transiting between participating schools, accompanied by visiting technical support personnel. Testing on paper was considered safer (as it minimised the risk of COVID-19 transmission) and less disruptive. Also, not having to coordinate test dates with technical support personnel allowed schools to have more flexibility about when they could carry out testing – for example, in the event of unanticipated closures or large-scale absences.

Following a spike in COVID-19 transmission levels during late 2020 to early 2021, a second blanket closure of school buildings took effect from January 2021 (see Box 2.1). The option of autumn testing had been offered to PIRLS countries by the IEA for this cycle due to the exceptional circumstances created by the pandemic. A decision was taken by the DoE in February 2021 to avail of this option and to move the PIRLS data collection in Ireland to the autumn, in light of continuing uncertainty about the duration of the closure and with a view to minimising stress for pupils and teachers.

The move to autumn meant that PIRLS pupils in Ireland would be tested when they were entering the start of Fifth Class rather than towards the end of Fourth Class, and as a consequence, they would also be approximately six months older. As outlined in Chapter 1, 13 other countries also delayed administration to autumn 2021 due to similar circumstances; we refer to countries that took this option as "Start G5", while other countries are referred to as "End G4".

PIRLS was one of two large-scale studies scheduled to take place in Irish primary schools that spring, the other being the National Assessments of Mathematics and English Reading (NAMER). The NAMER testing was able to proceed in spring after schools reopened, although with some adaptations to study design to reduce the burden for participants (for example, instead of assessing both reading and mathematics at two grade levels, reading was assessed at Second Class only and mathematics was assessed at Sixth Class only) (Kiniry et al., 2023). Therefore, the NAMER data provide a useful complement to the PIRLS data, as they provide an indication of what pupils' achievement levels were like at around the time of the originally scheduled PIRLS test window.

Between spring and autumn 2021, initiatives were implemented to attempt to mitigate negative effects of the closure periods in Ireland, particularly for pupils most at risk of educational disadvantage. Most notably:

- The option of running a school-based summer programme was expanded in 2021 so that all primary schools could choose to offer such a programme, although they did not have to do so.[24] Outside the context of special schools and classes,[25] the summer programme ran for two weeks with priority given to (i) pupils with complex special educational needs in mainstream classes, and (ii) pupils considered most at risk of educational disadvantage. The main aims were to foster pupils' sense of connection with their school, to improve their sense of wellbeing, and to increase their confidence to continue with their education, although teachers were also encouraged to consider key aspects of literacy and numeracy when creating the programme plan (DoE, 2021c). DEIS schools retained the additional option to run week-long summer camps with a specific focus on developing literacy and/or numeracy through playful learning activities (DoE, 2021e).
- In autumn 2021, the COVID Learning and Support Scheme (CLASS) was implemented. This provided a once-off allocation of additional teaching hours that schools could use to support the pupils they identified as being at greatest risk of learning loss (DoE, 2021a, 2021b).[26]

The PIRLS test window in Ireland ran from September 27 to October 21. Although the move to autumn testing was deemed the most pragmatic approach, the change to the age, grade level, and context of testing result in significant caveats being required for cross-country and trend comparisons, as explained in Chapter 1 and reiterated throughout this report.

[24] Previously, school-based summer programmes had been available only for pupils in special schools/classes and in schools designated as disadvantaged under the DEIS scheme.

[25] For pupils in special schools and special classes availing of school-based summer programmes, these programmes ran for between two and four weeks.

[26] As the hours could be used from October 11 2021 on and the PIRLS test window closed on October 21, it is unlikely that many PIRLS pupils benefited substantially from CLASS hours ahead of PIRLS testing, but some may have received first instalments of extra support in this period.

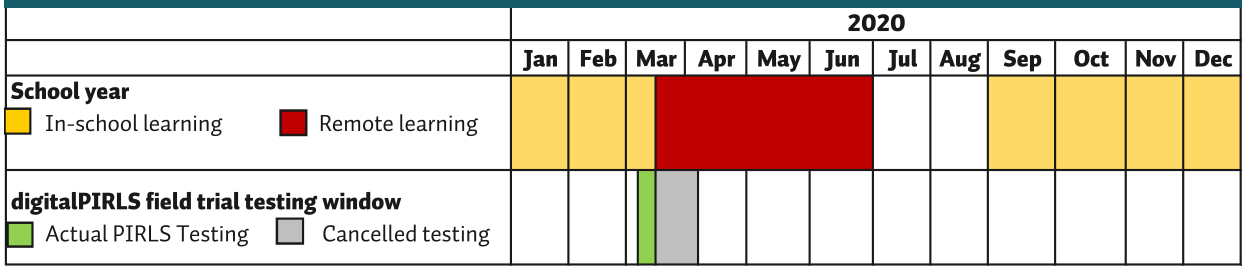
Box 2.1: Impact of COVID-19 on primary school provision and PIRLS test administration periods in Ireland (2020-2021)

Primary school pupils in Ireland experienced two prolonged periods of physical school closure, in March-June 2020 and in January-March 2021. With little implementation of remote teaching in Ireland prior to the pandemic, the initial spring/summer 2020 closure was a steep learning curve for educators, parents/guardians, and pupils themselves. Detailed information on evolving guidance provided by the DoE over this period, as well on as the types of learning supports available to schools, parents, and pupils, can be found in the PIRLS 2021 Encyclopedia entry for Ireland (DoE et al., 2022). The two periods of school closure and their impact on scheduled PIRLS 2021 testing periods are summarised in this box.

2019/2020 SCHOOL YEAR (PIRLS FIELD TRIAL):

All schools were closed as part of a national lockdown from March 13 2020 until the start of the new school year in September 2020. This represents a period of 17 weeks of home schooling/remote learning in place of in-person schooling, excluding approximately 3 weeks of scheduled school holidays during the academic year. The cohort of pupils who ultimately participated in the PIRLS main study were in Third Class during this initial period of closure. Figure 2.1 shows the period of closure in red, as well as the impact on the PIRLS field trial testing window.

Figure 2.1: Irish primary school closure period in 2020, with impact on the PIRLS field trial testing window

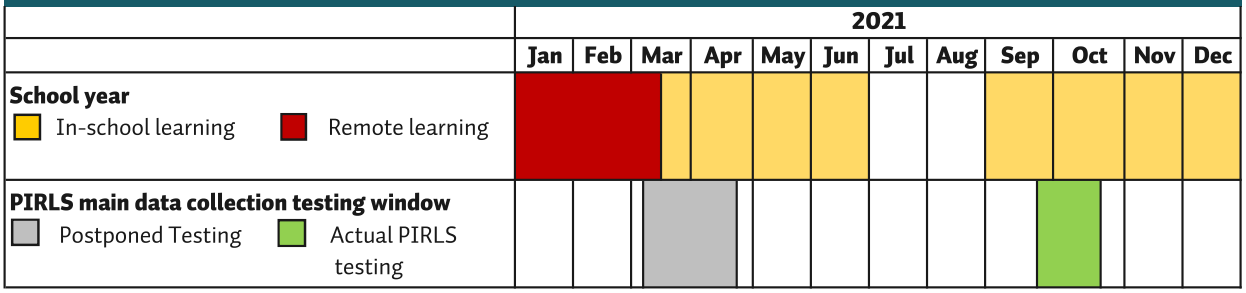


2020/2021 SCHOOL YEAR (MAIN PIRLS DATA COLLECTION):

After the standard two-month summer break, in-person primary schooling resumed in September 2020. The DoE issued guidance to schools to initially prioritise well-being (both physical and emotional), numeracy, and language during this period of acclimatisation (DoE, 2020c). However, a second return to remote learning ensued from January 2021 due to a spike in COVID-19 transmission levels around the winter holiday period. Pupils in the PIRLS cohort (now in Fourth Class) remained at home and engaged in remote learning for approximately nine weeks from January 6 to March 15.

This time, schools were required to have a digital communications/learning platform in place (DoE, 2020a) and more specific guidance was provided on teaching practices and materials (DoE, 2020b). For example, it was recommended that workbook and textbook tasks should be supplemented or replaced with other learning tasks. Figure 2.2 shows this period of closure in red, along with the impact on the PIRLS main data collection window, which was moved from spring 2021 to autumn 2021. Between spring and autumn, some measures aimed at mitigating the impact of the pandemic on learning were implemented, including the expansion of the summer programme and the introduction of the CLASS scheme.

Figure 2.2: Irish primary school closure period in 2021, with impact on the PIRLS main data collection testing window



Who took part in PIRLS 2021 in Ireland?

The PIRLS 2021 sample for Ireland was drawn by Statistics Canada, the agency tasked with drawing school samples for all participant countries, in consultation with the ERC. For Start G5 countries, including Ireland, the same *population* of Grade 4 pupils that had been due to participate in spring 2021 testing was assessed in autumn 2021 after they had transitioned to Grade 5. Following the decision to postpone testing in Ireland, it was agreed with Statistics Canada that the *sample* already drawn for spring testing in Ireland would be used wherever possible, albeit with the target pupils having progressed to Fifth Class prior to testing. The remainder of this section describes the selection of the original sample of schools and class groups of Fourth Class pupils in Ireland, and notes the changes necessitated by the move to autumn testing.

Sampling occurred in two stages. First, a representative sample of schools was drawn, and then class groups of Fourth Class pupils were selected within each participating school. To enable school selection, the ERC provided Statistics Canada with a list of all primary schools in Ireland. To avoid an excessive financial and logistical burden, schools with fewer than three pupils in the target grade and schools located on islands were excluded from sampling. Private schools and special schools were also excluded. In order not to over-burden schools with assessments, there was no overlap between schools participating in the PIRLS field trial and the PIRLS main study. Also, attempts were made to minimise the selection of schools that were known to be taking part in NAMER 2021. The sample of 151 schools drawn for the PIRLS 2021 main study was stratified by DEIS status (Urban Band 1, Urban Band 2, Rural, and non-DEIS), language of instruction (Gaeltacht school, Gaelscoil, and English-medium school), and gender intake (all boys, all girls, and mixed). Three of the 151 sampled schools were found to have no pupils at the target grade at the time of testing and, in line with IEA procedures, were not replaced. The remaining 148 schools all agreed to participate in the main study, giving a school response rate of 100%.

For the second stage of sampling, up to two Fourth Class groups within each participating school were selected. A list of all Fourth Class groups in each sampled school was received by the ERC from the DoE and these lists were verified by a teacher in the school. In schools with two or fewer Fourth Class groups, all pupils were selected to participate in PIRLS. In schools with three or more Fourth Class groups, two classes were randomly selected using sampling software provided by the IEA. The original sample drawn for the planned data collection in spring 2021 consisted of 227 sampled classes with 5,124 Fourth Class pupils in total. All participating schools were contacted before the summer break, and again when they returned to school at the beginning of the autumn term, to check whether these classes remained intact on progression to Fifth Class. Just over four-fifths (82%) of sampled classes remained intact. In the remaining instances, classes were reconstituted at the start of the new school year (i.e., pupils were reassigned into new class groups). In these schools, classes were re-sampled using the IEA's specialised software. The final sample for autumn 2021 testing consisted of 228 classes, comprising 5,160 pupils who had recently begun Fifth Class. All sampled classes took part, giving a class response rate of 100%.

Within selected classes, a small number of pupils (53) were excluded from the assessment by their teachers due to disabilities (intellectual, psychological/emotional, physical) that would preclude them from attempting the test, and/or due to limited English language proficiency. In the period between sampling and testing, 130 pupils had left their schools and so were no longer considered eligible for testing. There were 303 pupils absent on the test day and 11 pupils who did not participate as their parents chose to opt them out of the assessment. Thus, of the 4,977 pupils eligible to participate in the assessment, 4,663 pupils took the test, resulting in a weighted pupil response rate of 94.1%.[27] Almost all of these pupils (99.6%) also completed the Pupil Questionnaire (see Table 2.1). Eleven pupils received special accommodations in order to participate in the assessment.

Slightly more boys than girls participated (weighted: 50.6% boys vs 47.5% girls).[28] As noted in Chapter 1, the mean age of pupils taking part in PIRLS in Ireland was approximately six months older than in previous administrations of PIRLS in Ireland because of the move to autumn testing. The overall mean age of participants was 11.0 years, and girls were marginally younger, on average, than boys (by about 18 days).

[27] The unweighted pupil response rate was 93.7%.
[28] A small percentage of pupils (1.9%) selected *other* to describe their gender. This is described further in Chapter 3.

The response rate for all other context questionnaires was also very high, as also seen in previous administrations of PIRLS in Ireland (Eivers & Clerkin, 2012; Eivers et al., 2017). Table 2.1 shows the weighted response rates for questionnaire data available for just those pupils who participated in the assessment. Parents returned Home Questionnaire data for 93.2% of test participants, while Teacher Questionnaire data and School Questionnaire data are available for 97.2% and 99.2% of participating pupils, respectively.

Table 2.1: Response rates to PIRLS 2021 tests and questionnaires in Ireland (total eligible after exclusions = 4977)

	N	Weighted %
PIRLS test	4663	94.1
Pupil Questionnaire*	4643	99.6
Home Questionnaire* (Early Learning Survey)	4322	93.2
Teacher Questionnaire*	4520	97.2
School Questionnaire*	4610	99.2

*For questionnaires, this indicates the number of pupils who completed a test *and* whose teachers, principals, or parents completed the relevant questionnaire. Percentages are relative to the total achieved test-taking sample (N=4663). Pupils for whom there is questionnaire data but no test data are not included.

Overall, despite the challenges of COVID-19, the weighted pupil participation rate was only about 2% lower than that observed in PIRLS 2016 (Mullis et al., 2017). This small decrease was due to a higher absence rate among eligible pupils, as was to be expected given COVID-19 quarantine guidance at the time. Response rates for Home and Teacher Questionnaires were also slightly lower than in the previous PIRLS cycle, while almost 100% of School Questionnaires were returned on both occasions.[29] Considering the numerous pandemic-related demands on parents, pupils, and school staff during and leading up to the 2021 testing period, the achieved response rates highlight a strong commitment across these groups to participating as fully as possible in PIRLS 2021. This collective effort has ensured that the data collected can be considered representative of the wider population of pupils at the target grade level for this cycle of PIRLS in Ireland.

Test administration

Main data collection

All 148 schools that were sampled and eligible were contacted by the ERC in autumn 2020 and initially agreed to participate in digital PIRLS, scheduled for spring 2021. When the study reverted to paper-based administration and was subsequently postponed until autumn 2021, all schools obliged in accommodating these changes.

Each school nominated a designated PIRLS School Coordinator to liaise with the ERC in advance of testing. Materials, including test booklets, questionnaires, and manuals were sent to each School Coordinator at least two weeks before the test date in most cases. A training video produced by the ERC was also provided for Test Administrators. In previous cycles of PIRLS, the role of Test Administrator was usually filled by a teacher from the school who was *not* the pupils' usual class teacher (for example, in a school where two classes were sampled to take part in PIRLS, the class teachers

[29] The national report for PIRLS 2016 provides unweighted percentages of all eligible participants for whom responses to the various questionnaires are available (Eivers et al., 2017). Comparing these with the equivalent percentages for 2021, we see that the unweighted proportion of all Home Questionnaires returned dropped slightly from 92.3% to 90.6%, while the unweighted proportion of all Teacher Questionnaires returned dropped from 100% to 96.9%. The unweighted proportion of School Questionnaires returned was 98.6% in 2016 and 99.3% in 2021.

would often act as Test Administrators for one another's classes). However, due to requirements to minimise social contacts to reduce the risk of COVID-19 transmission, class teachers were permitted to act as Test Administrators for their own class for PIRLS 2021 if this was the school's preference.[30] Testing was carried out by the class teacher for the majority of pupils in Ireland (73%).

Pupils and parents were provided with information on the assessment in advance of testing. Informational videos for parents and pupils were made available on the ERC website several months before test administration and School Coordinators were asked to direct parents and pupils to these resources as necessary. Information letters for parents were also included with the questionnaires/questionnaire login details, which were distributed to parents at least one week in advance of testing. Parents were given the opportunity to opt their child out of the assessment by contacting the ERC using information contained in the letter. During test administration, pupils were provided with a child-friendly statement about data protection on a slip of paper attached to their questionnaire.

On the test day, as described in Chapter 1, pupils were asked to read two passages of text, one Literary and one Informational, and to answer questions based on each passage. Pupils were allocated 40 minutes for each passage and its associated questions, with a small break of approximately 15 minutes in between the two sections. Tests were conducted in the morning.

Where the pupil participation rate in a class was below the threshold of 85% (e.g., due to absences), schools were asked to consider conducting "make-up" sessions which gave previously absent pupils the opportunity to complete the assessment and questionnaire. Make-up sessions were held in seven schools.[31]

Questionnaire Administration

Pupil Questionnaire

In Ireland, the Pupil Questionnaire was, in most cases, completed directly after the assessment following a short break. Some national questions were added to capture information about pupils' reading experiences during lockdown and their feelings about print versus digital reading. Completion time for the questionnaire was about 30 minutes, but was not strictly timed.

Other questionnaires

Home (parent/guardian), Teacher, and School (principal) questionnaires were provided to School Coordinators to be distributed to relevant parties at least one week in advance of the assessment. In each case, the questionnaire was accompanied by a cover letter including a web address and login details allowing the respondent to complete the questionnaire online if this was preferred. Ten schools opted to offer *only* the online completion option for these questionnaires (no booklet was provided to these participants).[32] Irish-medium schools were provided with questionnaires in both Irish and English for each participant (with both booklets/sets of login details in the one envelope). Participants receiving paper questionnaires were provided with a return envelope in which to seal their completed questionnaire, which were returned to the ERC by the School Coordinator.

Home Questionnaire (Early Learning Survey)

The Home Questionnaire (Early Learning Survey) was to be completed by the parent(s)/guardian(s) of pupils. Again, some national questions were added to capture parents' recollections of their children's reading behaviours during periods of school closure.

[30] The decision to facilitate this departure from standard procedures in order to comply with schools' own policies regarding COVID-19 risk management was agreed between the ERC and the TIMSS & PIRLS International Study Center.

[31] Due to COVID-19 quarantine rules at the time, and a relatively short test window, it was not possible for some eligible pupils to participate even in make-up sessions.

[32] The schools that took this option did so in the interest of COVID-19 safety (e.g., due to having a policy in the school at the time whereby paper materials from homes were not brought back into school). Questionnaire response rates tended to be somewhat lower in these schools.

Teacher Questionnaire

In Ireland, the Teacher Questionnaire was completed by the pupils' Fifth Class teachers (i.e., their class teachers at the time of testing). Ireland's data from this instrument will not be included in the PIRLS 2021 International Database, as they are not directly comparable to the data from countries that administered this questionnaire to the Fourth grade teacher.[33] However, the data are available to the ERC and provide useful within-country information, including responses to some additional national questions about the effects of the pandemic on classroom practice.

As a national addition in Ireland, the teachers who had taught participating pupils in Fourth Class were also asked to complete a shorter, custom-built questionnaire, in order to gather some similar information about the school year in which PIRLS 2021 was originally intended to be carried out. The response rate was lower for this supplementary questionnaire, as some of the previous year's Fourth Class teachers had left the school or gone on leave by the time of the main study administration.

School questionnaire

The School Questionnaire was completed by the school principal or assigned deputy. Some small national additions were made to gather extra information about schools' provision for remote learning.

Quality Monitoring

As required for participation in PIRLS, all aspects of the study administration in Ireland were implemented in adherence to the IEA's international standard operating procedures. For example, all PIRLS countries carried out sampling systematically using the two-stage approach described earlier in this chapter. Also, during the process of instrument preparation, independent verification of all national adaptations and translations of instruments was carried out by international agencies.

Throughout the period of test administration, International Quality Control Monitors (IQCMs), employed and trained directly by the IEA, visited 10% of participating schools in Ireland to observe testing. Additionally, National Quality Control Monitors (NQCMs), who were members of the Department of Education's Inspectorate, observed testing in a further 10% of schools. NQCMs were provided with training by the ERC. The quality monitors observed PIRLS assessments being conducted in schools, interviewed the School Coordinators about their experiences, and evaluated levels of engagement and compliance with test procedures. Reports from the NQCMs in Ireland indicated that test administration generally went smoothly with international procedures being adhered to.

Following data collection, scoring of constructed-response test items was carried out in the ERC by a team of trained individuals. Quality control measures implemented during scoring included the following:

- To assess scorer reliability within each country, a proportion of each country's constructed-response PIRLS items were scored by multiple scorers.
- To assess trend scoring reliability (i.e., agreement between scorers in 2016 and 2021), scorers in Ireland scored a sample of responses collected in Ireland during PIRLS 2016.
- To assess cross-country scoring reliability (i.e., agreement between scorers in different countries), scorers in every country scored a common set of responses collected in other countries.

A series of quality control checks were conducted on all test and questionnaire data throughout the process of collating these data from paper instruments via data entry to eventual integration into a national dataset. Following data submission, the IEA conducted further checks to ensure quality of the data.

In PIRLS, minimum response rates for data must be reached, which Ireland met and exceeded. For countries where this was not achieved, data are annotated in the international report.

[33] Among Start G5 countries, there was variation in the approaches taken, with some countries opting to distribute the questionnaires to the Fourth grade teachers from the previous year and others administering them to the Fifth grade teachers who taught the sampled classes at the time of testing.

Chapter summary

The COVID-19 pandemic affected the administration of the PIRLS 2021 main study in Ireland and the ensuing data in two key ways. Firstly, the mode of the PIRLS assessment changed from digital to paper-based. Secondly, the timing of the administration changed from being an assessment in the latter part of Fourth Class (spring 2021) to an assessment at the start of Fifth Class (autumn 2021). These changes were felt to be the safest and the most pragmatic approach to ensuring that a representative sample of pupils in Ireland could participate in PIRLS 2021 without excessively burdening schools. Nevertheless, the changes to the typical age and grade level of pupils, as well as the general disruption caused by the pandemic, mean that significant caveats are required when interpreting PIRLS 2021 results for Ireland (as also discussed in Chapter 1).

As well impacting on the timing and mode of test administration, the pandemic affected the learning opportunities of the cohort of (Fifth Class) pupils in Ireland who participated in PIRLS in autumn 2021. Prior to participating in PIRLS, these pupils had experienced two extended periods of physical school closure totalling approximately six months – from March 2020 to the end of the school year while they were in Third Class, and from January to mid-March 2021 while they were in Fourth Class. During this time, many teachers, school leaders, and policy-makers, along with parents, worked to instigate and develop remote teaching and learning experiences for children. The DoE provided guidance that evolved iteratively as the pandemic progressed. For example, all schools were pre-emptively expected to have a digital communications/ learning platform in place by the time of the second school closure. When pupils were able to return to school for a period between the two lockdowns (September-December 2020), the DoE issued curriculum guidance that aimed to be mindful of the unknown but probably negative impact of the long period at home on pupils' development, by asking schools to prioritise the areas of wellbeing, physical education, literacy, and numeracy.

The sample of schools that participated in PIRLS 2021 was drawn by Statistics Canada to be representative of the population at the target grade level in Irish primary schools. The sample was stratified by school DEIS status, language of instruction, and gender intake. Out of the 151 schools that were sampled, 148 had eligible pupils at the target grade and all 148 participated. Originally, up to two Fourth Class groups in each school were randomly selected to participate in PIRLS. When COVID-19 necessitated a move to autumn testing, the same sampled Fourth Class groups that had by then progressed to Fifth Class were tested wherever possible.

There were 5,160 pupils selected to take part across all sampled classes. Of these, 94.1% of eligible pupils (weighted) were able to participate in the assessment. Almost all of these pupils (99.6%) also completed the Pupil Questionnaire. Of pupils who did not take part in the test, 183 were not eligible (130 had left their schools between sampling and the test date, while 53 were exempted by teachers). Among eligible pupils, 11 were withdrawn from the study by their parents, and 303 were absent from test sessions for other reasons.

Slightly more boys than girls participated (50.6% vs 47.5%). Due to the move to autumn testing, the mean age of pupils was approximately 6 months older than the typical PIRLS Grade 4 cohort, both in previous PIRLS cycles in Ireland and internationally among End G4 countries.

Some adjustments were made to test administration procedures, in order to minimise any risk of COVID-19 spread. PIRLS is normally administered to class groups by a teacher in the school who is not the class teacher. However, for this PIRLS cycle in Ireland, in order to comply with schools' policies on COVID-19, class teachers were permitted to carry out test administration if preferred, and the majority opted for this approach. Schools were also given the option to provide only online questionnaires to parents and teachers if they wished to avoid handling returned paper copies of questionnaires for COVID-prevention reasons, and 10 schools opted for this approach. Make-up sessions needed to be held in a small number of schools due to higher than usual absence rates on the original test dates.

Alongside high pupil participation in the test, the response rate for context questionnaires was also very high. Home Questionnaires were returned by parents of 93.2% of participating pupils, while School and Teacher Questionnaires were returned for 99.2% and 97.2% of participating pupils respectively (weighted percentages). Despite the challenges of COVID-19, the weighted pupil participation rate was only 2% lower than that observed in PIRLS 2016. Response rates for Home and Teacher Questionnaires declined by a similarly small magnitude, while almost 100% of School Questionnaires were returned, in line with the previous cycle.

The PIRLS 2021 study administration in Ireland met internationally-defined quality control standards across all aspects of the study. This was also the case for a majority of other countries, despite the challenges of the pandemic.

Chapter 3:
Overall results in reading

This chapter describes overall performance on the PIRLS 2021 reading test for pupils in Ireland and for all countries that administered the assessment. The performance of pupils in Ireland and other trend countries is presented in relation to that of previous cohorts in 2016 and (for selected countries of interest) 2011. Performance in Ireland and selected countries is then analysed by gender. Within Ireland, performance is further examined by two variables related to socioeconomic status: the group-level variable of school DEIS status, and a PIRLS-derived measure of individual socioeconomic status.

Interpreting results: Key caveats

Readers are reminded of the important caveats in relation to making cross-country and trend comparisons using PIRLS 2021 data. These caveats are described in more detail in Chapter 1.

Because of the differences between administration at the end of Fourth grade (End G4) and the start of Fifth grade (Start G5), **comparisons between achievement in End G4 vs Start G5 countries should be made with great caution and with attention to context.** The international report compares the extent to which achievement differs significantly among End G4 countries, but not for Start G5 countries (Mullis et al., 2023). In this national report, we present comparisons of achievement differences between all participating countries, while strongly advising readers to bear in mind that these are not like-for-like comparisons.

For example, if we say that Ireland's (Start G5) mean performance is statistically similar to that of Country X (End G4), we are saying that pupils *at the start of Fifth grade (Fifth Class) in Ireland* (with an average age of 11.0 years, and who had been attending in-person classes during the final months of Fourth grade) performed similarly to pupils *at the end of Fourth grade in Country X* (who were likely to be younger, on average, and to have taken the PIRLS test shortly after returning to in-person classes following a period of lockdown, although this varied by country).

Similarly, **comparisons between Start G5 countries' achievement in 2021 and the same countries' End G4 achievement in previous PIRLS cycles should be made cautiously.** In fact, there is an argument that trend comparisons for *all* countries that tested in 2021 require considerable caution, due to the unprecedented disruption to education systems worldwide. The international report signals this by using dotted rather than continuous lines between the 2016 and 2021 cycles in all its trend charts (Mullis et al., 2023). However, for Start G5 countries, there are additional caveats related to pupils being older and being tested at a different stage of the school year in 2021. This is signalled in the international report by fainter colouring of the dotted trend lines for Start G5 countries. We have followed these conventions in trend charts in this report, and we underline the importance of considering the full context when interpreting trend results.

For example, in Ireland's case, we can only say that pupils *at the start of Fifth Class in 2021* (who had an average age of 11.0, were tested relatively near the start of a new school year, had recently experienced the summer break, and had experienced periods of remote learning during the previous two school years) performed in a given way relative to pupils *at the end of Fourth Class in 2016* (who had an average age of 10.5, were tested near the end of a school year, and had not experienced any COVID-related disruptions).

We do not know how pupils in Ireland would have performed if they had been tested at the end of Fourth Class in spring 2021. However, as discussed in Chapter 1, available evidence suggests that they would *probably* have performed somewhat less well overall than they did in autumn 2021, although this effect would not necessarily hold for all subgroups.

Overall reading performance in PIRLS 2021

Table 3.1 shows the estimated mean reading achievement scores of PIRLS pupils in Ireland and all other participating countries, in descending order. Coloured highlighting is used to show whether mean scores were *significantly higher than*, *similar to* (i.e., not significantly different from), or *significantly lower than* Ireland's mean score.[34] Scores for End G4 countries and for Start G5 countries are shown in separate columns.

Reminder

Comparisons between the achievement of countries that tested at End G4 and those that tested at Start G5 (including Ireland) should be made **very cautiously**. Caution is also required to interpret comparisons involving countries that tested one year later than planned (for northern hemisphere countries, in spring 2022).

[34] In this section, no adjustment is made for multiple comparisons, in line with procedures followed to generate multiple comparisons of countries' achievement in the international PIRLS reports.

Table 3.1: Mean reading achievement of countries in PIRLS 2021, with standard error (SE), standard deviation (SD), and position relative to the scale centrepoint

Assessed at end of Fourth grade (End G4)					Assessed at start of Fifth grade (Start G5)				
Country	**Mean**	**SE**	**SD**	**Vs centrepoint**	**Country**	**Mean**	**SE**	**SD**	**Vs centrepoint**
Singapore	587	3.1	86	^					
					Ireland	577	2.5	77	^
Hong Kong SAR	573	2.7	67	^					
Russian Federation	567	3.6	71	^					
					Northern Ireland	566	2.5	81	^
England ⋈	558	2.5	76	^					
					Croatia	557	2.5	69	^
					Lithuania	552	2.3	71	^
Finland	549	2.4	74	^					
Poland	549	2.2	72	^					
					United States*	548	6.8	87	^
Taiwan	544	2.2	69	^					
Sweden	544	2.1	79	^					
Australia ⋈	540	2.2	82	^					
Bulgaria	540	3.0	88	^					
Czech Republic	540	2.3	73	^					
					Hungary	539	3.4	81	^
Denmark	539	2.2	73	^					
Norway (5)	539	2.0	74	^					
Italy	537	2.2	66	^					
Macao SAR	536	1.3	71	^					
Austria	530	2.2	69	^					
Slovak Republic	529	2.7	77	^					
					Latvia	528	2.6	75	^
Netherlands	527	2.5	67	^					
Germany	524	2.1	77	^					
New Zealand	521	2.3	89	^					
Spain	521	2.2	69	^					
Portugal	520	2.3	72	^					
Slovenia	520	1.9	70	^					
Malta	515	2.7	84	^					
France	514	2.5	71	^					
Serbia	514	2.8	74	^					
Albania	513	3.1	78	^					
Cyprus	511	2.9	78	^					
Belgium (Flemish)	511	2.3	67	^					
Israel ⋈	510	2.2	88	^					
					Kazakhstan	504	2.7	75	
PIRLS Scale Centrepoint (500)									

(Table 3.1 continues on the next page.)

Table 3.1, continued.

PIRLS Scale Centrepoint (500)									
Assessed at end of Fourth grade (End G4)					Assessed at start of Fifth grade (Start G5)				
Country	**Mean**	**SE**	**SD**	**Vs centrepoint**	**Country**	**Mean**	**SE**	**SD**	**Vs centrepoint**
Turkey	496	3.4	88						
Belgium (French)	494	2.7	73	v					
					Georgia	494	2.6	82	v
Montenegro	487	1.6	77	v					
					Qatar	485	3.7	98	v
					United Arab Emirates	483	1.8	127	v
					Bahrain	458	2.9	109	v
					Saudi Arabia	449	3.6	90	v
North Macedonia	442	5.3	90	v					
Azerbaijan	440	3.6	89	v					
Uzbekistan	437	2.9	81	v					
Oman	429	3.7	109	v					
Kosovo	421	3.1	84	v					
Brazil ⋈	419	5.3	123	v					
Iran ⋈	413	4.9	100	v					
Jordan	381	5.4	114	v					
Egypt	378	5.4	110	v					
					Morocco	372	4.5	106	v
South Africa ⋈	288	4.4	129	v					

Source: Appendix Table A3.1.
Note. Blue shading indicates that a mean score is significantly higher than Ireland's, while yellow shading indicates that a mean score is significantly lower than Ireland's. Comparisons across the two columns (End G4 vs Start G5) require great caution.
Countries in *italics* took the test on computer, while those not in italics took it on paper.
⋈ Country tested one year later than planned (autumn 2021 for southern hemisphere countries; spring 2022 for northern hemisphere countries).
* United States results are reported on the basis of its paper bridging study, which had a smaller sample than the main study as well as a relatively low response rate. The standard error around its estimate of achievement is accordingly larger.

Pupils in Ireland achieved a mean reading achievement score of 577, which was substantially above the scale centrepoint (by about three-quarters of a standard deviation). Ireland's score was significantly higher than the mean scores of the other 13 Start G5 countries, with Northern Ireland the next highest-achieving of this group (566). However, across all 57 participating countries, pupils in Singapore (End G4) achieved the highest mean score (587), which was significantly higher than Ireland's. Pupils in Hong Kong (End G4) achieved a mean score of 573, which was not significantly different to Ireland's.

Pupils in all other participating countries achieved mean scores significantly lower than Ireland's. However, the varying contexts of testing in different countries must be borne in mind when drawing these comparisons.

Internationally, 37 countries achieved mean scores significantly above the PIRLS centrepoint (i.e., above the international average from the 2001 cycle), while two countries achieved scores similar to the centrepoint and 18 countries achieved scores significantly below it.

Given the caveats required to interpret comparisons between the mean achievement of End G4 vs Start G5 countries, it is **not** possible to conclude strongly that pupils in Ireland are truly more proficient at reading than their peers in all other PIRLS countries except Singapore and Hong Kong. However, the evidence does suggest that Ireland retains its place among a set of very high-achieving countries in relation to primary school reading.

The estimated mean achievement of benchmarking participants (see Chapter 1) is provided in Appendix Table A3.2.

Trends in achievement

Reminder

All trend comparisons of countries' achievement in PIRLS 2021 versus previous cycles should be made cautiously, due to the disruption caused by COVID-19. However, this applies **particularly** to countries that tested at Start G5 in 2021, including Ireland.

Trends from 2016 to 2021

In Ireland, mean reading achievement in PIRLS was 11 points higher (rounded) in 2021 than in 2016, a statistically significant increase of about one-tenth of a standard deviation. Again, this must be interpreted in the context of relevant caveats: another way of describing this finding is that the average performance of the Start G5 pupils in autumn 2021 (average age 11.0) was 11 points higher than that of the End G4 pupils in spring 2016 (average age 10.5).

Table 3.2 presents the mean achievement in 2016 and 2021 of countries that participated in both cycles,[35] with significant changes indicated in **bold**.

[35] Eleven countries that participated in PIRLS 2021 did not participate in PIRLS 2016: Albania, Brazil, Croatia, Cyprus, Jordan, Kosovo, Montenegro, North Macedonia, Serbia, Turkey, and Uzbekistan. Malta participated in both cycles but trend comparisons are not available as the target population changed in 2021 with respect to language of the test.

Table 3.2: Mean reading achievement scores in 2016 and 2021 of countries that participated in both cycles, ordered by descending mean achievement in 2021

Assessed at end of Fourth grade (2021)				Assessed at start of Fifth grade (2021)			
Country	**Mean (SE)**		**Change**	**Country**	**Mean (SE)**		**Change**
	2016	**2021**			**2016**	**2021**	
Singapore	576 (3.2)	587 (3.1)	**+11**				
				Ireland	567 (2.5)	577 (2.5)	**+11**
Hong Kong SAR	569 (2.7)	573 (2.7)	+4				
Russian Federation	581 (2.2)	567 (3.6)	**-14**				
				Northern Ireland	565 (2.2)	566 (2.5)	+1
England ⋈	559 (1.9)	558 (2.5)	-1				
				Lithuania	548 (2.6)	552 (2.3)	+4
Finland	566 (1.8)	549 (2.4)	**-17**				
Poland	565 (2.1)	549 (2.2)	**-16**				
				United States*	549 (3.1)	548 (6.8)	-2
Taiwan	559 (2.0)	544 (2.2)	**-15**				
Sweden	555 (2.4)	544 (2.1)	**-12**				
Australia ⋈	544 (2.5)	540 (2.2)	-4				
Bulgaria	552 (4.2)	540 (3.0)	**-12**				
Czech Republic	543 (2.1)	540 (2.3)	-4				
				Hungary	554 (2.9)	539 (3.4)	**-15**
Denmark	547 (2.1)	539 (2.2)	**-8**				
Norway (5)	559 (2.3)	539 (2.0)	**-20**				
Italy	548 (2.2)	537 (2.2)	**-11**				
Macao SAR	546 (1.0)	536 (1.3)	**-10**				
Austria	541 (2.4)	530 (2.2)	**-11**				
Slovak Republic	535 (3.1)	529 (2.7)	-6				
				Latvia	558 (1.7)	528 (2.6)	**-30**
Netherlands	545 (1.7)	527 (2.5)	**-18**				
Germany	537 (3.2)	524 (2.1)	**-13**				
New Zealand	523 (2.2)	521 (2.3)	-1				
Spain	528 (1.7)	521 (2.2)	**-7**				
Portugal	528 (2.3)	520 (2.3)	**-8**				
Slovenia	542 (2.0)	520 (1.9)	**-23**				
France	511 (2.2)	514 (2.5)	+2				
Belgium (Flemish)	525 (1.9)	511 (2.3)	**-14**				
Israel ⋈	530 (2.5)	510 (2.2)	**-20**				
				Kazakhstan	536 (2.5)	504 (2.7)	**-32**
Belgium (French)	497 (2.6)	494 (2.7)	-3				
				Georgia	488 (2.8)	494 (2.6)	+6
				Qatar	442 (1.8)	485 (3.7)	**+42**
				United Arab Emirates	450 (3.2)	483 (1.8)	**+33**
				Bahrain	446 (2.3)	458 (2.9)	**+12**
				Saudi Arabia	430 (4.2)	449 (3.6)	**+18**
Azerbaijan	472 (4.2)	440 (3.6)	**-32**				
Oman	418 (3.3)	429 (3.7)	**+11**				
Iran ⋈	428 (4.0)	413 (4.9)	**-15**				
Egypt	330 (5.6)	378 (5.4)	**+48**				
				Morocco	358 (3.9)	372 (4.5)	**+15**
South Africa ⋈	320 (4.4)	288 (4.4)	**-31**				

Source: Appendix Table A3.3.
Note. Changes in **bold** are statistically significant.
Due to rounding, some differences may appear inconsistent.
Countries in *italics* took the test on computer, while those not in italics took it on paper.
⋈ Country tested one year later than planned (autumn 2021 for southern hemisphere countries; spring 2022 for northern hemisphere countries).
* United States 2021 results are reported on the basis of its paper bridging study, which had a smaller sample than the main study as well as a relatively low response rate. The standard error around its 2021 estimate of achievement is accordingly larger.

Trend data are available for 32 End G4 countries, of which a majority (21 countries) reported significant declines in achievement since 2016. For example, achievement fell by more than 30 points in Azerbaijan and South Africa, by more than 20 points in Slovenia, Israel, and Norway, and by between 15 and 18 points in countries including the Netherlands, Finland, Poland, and Taiwan. Eight of the End G4 countries reported no significant change in achievement since 2016, including Hong Kong and England (the latter having tested Fourth grade pupils one year later than planned, in spring 2022). Three of the End G4 countries reported significant gains in achievement. One of these was Singapore, the highest-scoring country overall, where reading achievement improved by 11 points between 2016 and 2021 (a gain similar in magnitude to Ireland's, but without Ireland's complicating factor of delayed testing). The other two were Egypt and Oman, where mean reading achievement remained well below the PIRLS centrepoint in both cycles but increased by 48 points and 11 points respectively.

Trend data are available for 13 Start G5 countries, and there is less of a clear pattern among these. Achievement declined significantly and substantially in three Start G5 countries: by more than 30 points in Kazakhstan and Latvia, and by 15 points in Hungary. There was no significant change in four countries, including Northern Ireland and Lithuania. Six countries reported significant gains in achievement from 2016. These were Ireland (+11 points) and five countries with overall achievement levels below the international centrepoint: Qatar (+42 points), United Arab Emirates (+33 points), Saudi Arabia (+18 points), Morocco (+15 points), and Bahrain (+12 points).

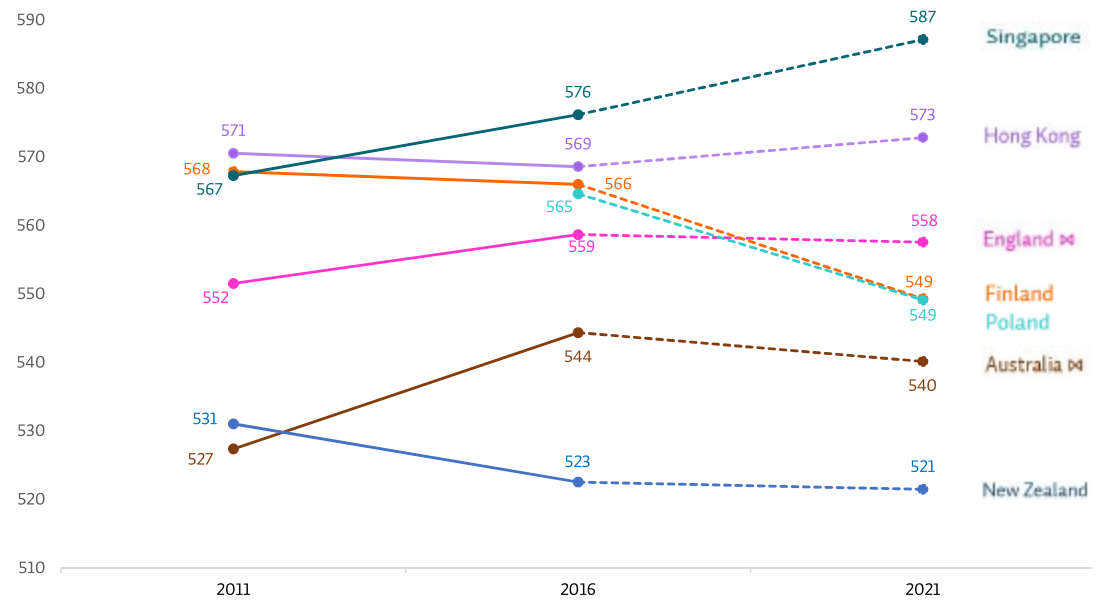
The fact that achievement declined in a majority of the End G4 countries, but that this was not the case among Start G5 countries, suggests that pupils tested at the start of Fifth grade had an advantage relative to those tested at the end of Fourth grade. Future analysis may shed light on the extent to which factors such as age/maturation, additional time in education, and a longer period of "recovery" between the return to in-person learning and the administration of the PIRLS test could have contributed to this, both across countries and within individual country contexts.

Trends across three cycles: Ireland and selected reference countries

For most of the selected reference countries, trend data are available for 2011, 2016, and 2021.[36] Figure 3.1 shows trends across these cycles for reference countries that tested at End G4 in the 2021 cycle. Figure 3.2 shows equivalent trends for Ireland and those reference countries that tested at Start G5.

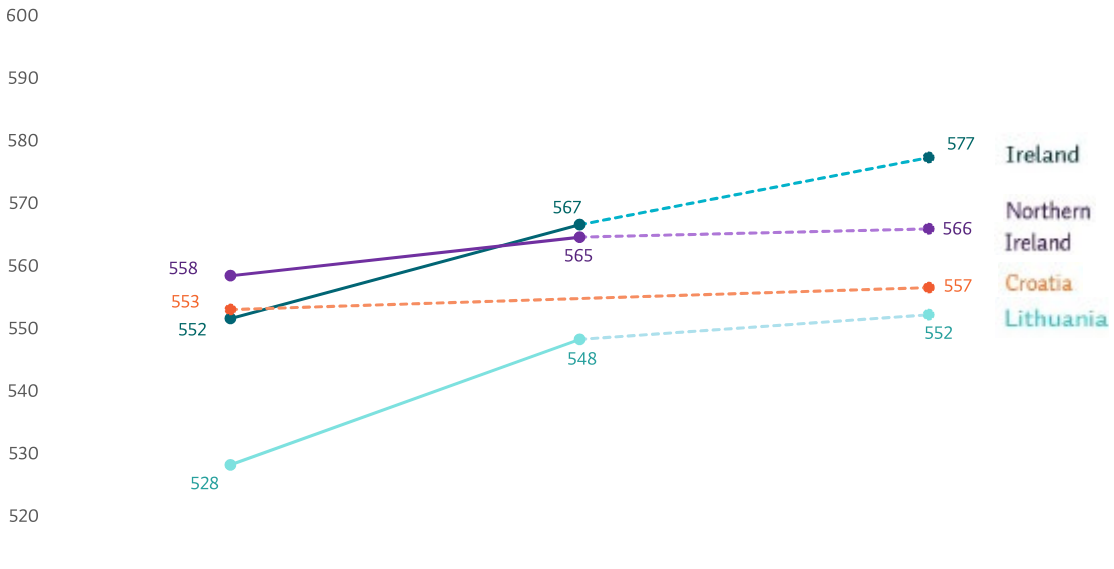
[36] Comparable data for Poland are not available for 2011. Data for Croatia are not available for 2016. Readers may note that mean achievement for Lithuania was reported slightly differently in the overall vs trend sections of the 2016 international report (548 vs 550), to account for a change in the language coverage of the target population (Mullis et al., 2017). As the impact of the change was very slight, this adjustment has been dropped in the trend section of the 2021 international report (Mullis et al., 2023), and also in the present report.

Figure 3.1: Mean achievement scores across three PIRLS cycles for selected reference countries that tested at the end of Fourth grade in the 2021 cycle



Source: Appendix Table A3.4.
Note. Due to rounding, some differences may appear inconsistent with those reported in text.
As 2021 ws an atypical cycle for all countries, trends to 2021 are indicated with dotted lines.
⋈ Country tested one year later than planned (autumn 2021 for southern hemisphere countries; spring 2022 for northern hemisphere countries).

Figure 3.2: Mean achievement scores across three PIRLS cycles for Ireland and selected reference countries that tested at the start of Fifth grade in the 2021 cycle



Source: Appendix Table A3.4.
Note. Due to rounding, some differences may appear inconsistent with those reported in text.
As additional caveats are required to interpret trend data for Start G5 countries, trends to 2021 are indicated with dotted lines and paler shading.

The figures show that, for most of the reference countries (excepting New Zealand), the trend was upward or static between 2011 and 2016. However, between 2016 and 2021, declines are evident for Finland and Poland (which, along with Northern Ireland and Hong Kong, achieved mean scores similar to Ireland's in 2016). There is a pattern of stasis for many other reference countries from 2016 to 2021, with only Singapore and Ireland showing consistent, significant gains across both moments of comparison.

Due to confounding variables such as the change in age of pupils and time of testing, it is **not** possible to conclude definitively that reading achievement in Ireland truly improved significantly between 2016 and 2021. However, while it is reasonable to assume that average performance would probably have been somewhat lower in spring, it also seems unlikely that this difference would have been extreme. In other words, a cautious interpretation suggests that average reading achievement in Ireland has at least remained roughly stable between 2016 and 2021.

Achievement differences by gender

In 51 of the 57 PIRLS countries, including Ireland, girls significantly outperformed boys in reading. Exceptions to this pattern were the Czech Republic, Iran, Israel, Malta, Spain, and the US, which reported no significant differences in overall reading performance by gender (Mullis et al., 2023).[37]

In this report, analysis is based on gender as reported by pupils themselves in the PIRLS Pupil Questionnaire.[38] About one-third of participating countries in 2021, including Ireland, offered pupils three options to describe themselves: *boy/girl/other.* In previous PIRLS cycles, gender was treated as a binary variable only, and the international report for 2021 still reports on gender differences using a binary variable only (*boy/girl*, as recorded on school records rather than as reported by pupils) (Mullis et al., 2023). Therefore, the estimates for gender subgroups reported in this section are slightly different from those reported in Exhibit 1.5 of the international report. However, the pattern of achievement for boys vs girls in Ireland is virtually identical whether the binary (school-report) variable or the self-report variable is used.[39] As only a small proportion of pupils in Ireland (1.9%) selected the *other* option, achievement is not reported for this group, as it comprises too few pupils to allow for a robust estimate of their average reading proficiency.

In Ireland, the average reading achievement score of girls was 583, 11 points higher (rounded) than that of boys (573). Table 3.3 shows the percentages and mean achievement of pupils in each gender category in Ireland, selected reference countries, and on average across all PIRLS countries in 2021.[40]

[37] This remains the case whether gender is analysed using a binary, school-reported variable or using a pupil-reported variable.

[38] This acknowledges the importance of respecting children's voices, a key strand of policy in Ireland in recent years (e.g., Department of Children and Youth Affairs [DCYA], 2014; DCYA, 2019).

[39] This can be seen if Table 3.3 is compared to Exhibit 1.5 of the international report (Mullis et al., 2023). Specifically, when the binary, school-reported variable is used instead, the mean achievement of boys in Ireland is about 0.6 of a score point lower (rounding to 572 rather than 573), while that of girls is about 0.2 of a score point lower (still rounding to 583).

[40] The *other* gender option was offered by Ireland, Northern Ireland, England, Hong Kong, Finland, and New Zealand, and not by other countries in this group. While percentages of pupils selecting this option were generally small (ranging from 0.2% in Hong Kong to 2.9% in Northern Ireland), an exception was New Zealand, where 8.2% of pupils selected *other*.

Table 3.3: Percentages and mean reading achievement of pupils in each gender category, in Ireland, selected reference countries, and on average across all PIRLS countries (2021)

		Boy		Girl		Other		Mean advantage of girls over boys
		%	Mean	%	Mean	%	Mean	
Start G5	Ireland	50.6	573	47.5	583	1.9	˜	**11**
	Northern Ireland	46.5	554	50.6	577	2.9	566	**23**
	Croatia	51.5	552	48.5	562	NA	NA	**10**
	Lithuania	50.2	542	49.8	563	NA	NA	**21**
End G4	Australia ⋈	50.2	532	49.8	550	NA	NA	**17**
	England ⋈	48.2	552	50.3	563	1.5	˜	**10**
	Hong Kong SAR	49.0	569	50.7	577	0.2	˜	**8**
	Poland	52.9	540	47.1	560	NA	NA	**20**
	Finland	48.9	542	48.8	558	2.3	˜	**17**
	New Zealand	47.9	513	43.9	532	8.2	521	**19**
	Singapore	51.3	579	48.7	596	NA	NA	**18**
	PIRLS	50.2	495	49.2	512	0.6*	˜	**17**

Source: Appendix Table A3.5.

Note. Mean advantages in **bold** are statistically significant.

˜ Mean achievement is not reported due to insufficient data.

Due to rounding, some differences may appear inconsistent.

* This is the average percent of pupils identifying as *other* with reference to all 57 countries. However, within the 18 countries that offered *other* as an option, an average 1.9% of pupils selected *other* to describe themselves.

⋈ Country tested one year later than planned (autumn 2021 for southern hemisphere countries; spring 2022 for northern hemisphere countries).

In a number of reference countries, the advantage of girls over boys was considerably larger than in Ireland. In particular, Northern Ireland reported a substantial gender gap (23 points). England and Croatia reported gender gaps of a magnitude similar to Ireland's (10 points in each case), while Hong Kong's gender gap was the smallest of this group (8 points).

Although pupils in Singapore achieved a significantly higher mean score than pupils in Ireland overall, the advantage of boys in Singapore over boys in Ireland (6 points) was not significant, while the advantage of girls in Singapore over girls in Ireland (13 points) was significant. There was no significant difference between the achievement of boys in Hong Kong vs boys in Ireland or between the achievement of girls in Hong Kong vs girls in Ireland. Boys in Ireland had a significant advantage over boys in Northern Ireland (18 points), but the advantage of girls in Ireland over girls in Northern Ireland was not significant (6 points) (Appendix Table A3.6).

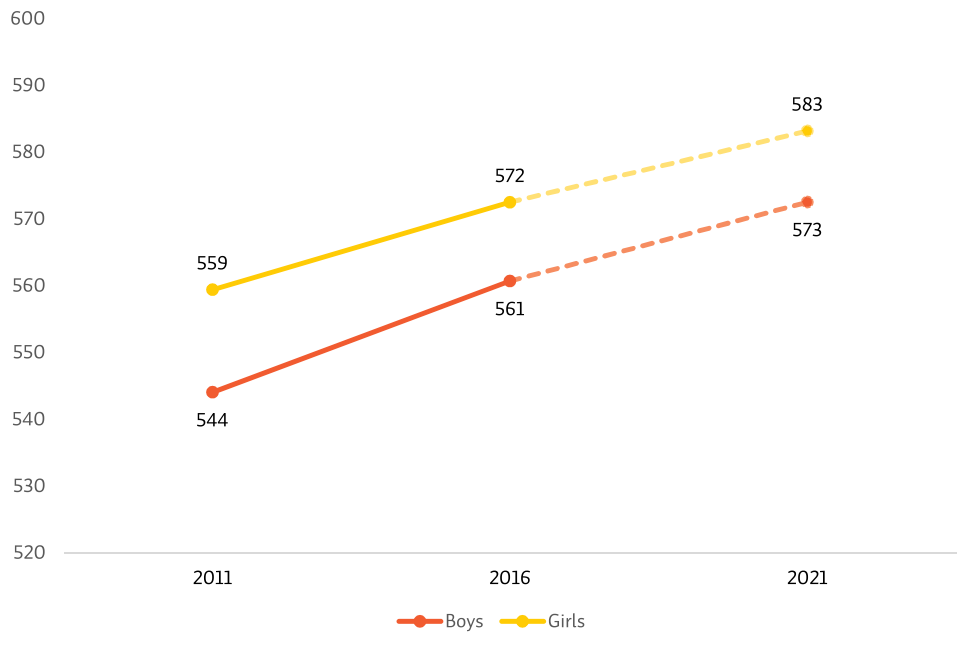
Trends in achievement, by gender

Reminder

All trend comparisons of countries' achievement in PIRLS 2021 versus previous cycles should be made cautiously, due to the disruption caused by COVID-19. However, this applies **particularly** to countries that tested at Start G5 in 2021, including Ireland.

Figure 3.3 shows the mean reading achievement of boys and girls in Ireland in PIRLS 2011, 2016, and 2021. The 2021 gender gap of 11 points is similar in magnitude to the gap observed in PIRLS 2016 (12 points) and somewhat smaller than the gap observed in PIRLS 2011 (15 points) (Eivers & Clerkin, 2012; Eivers et al., 2017). The mean achievement of boys and girls in Ireland improved between 2016 and 2021 by similar amounts (a 12-point increase for boys and an 11-point increase for girls). Caveats regarding trend comparisons for 2021 should be borne in mind. That is, boys at the start of Fifth Class in 2021, who had experienced the COVID-19 lockdowns, achieved a mean reading score 12 points higher than boys at the end of Fourth Class in 2016, who had, in general, experienced continuous in-person schooling throughout their time in primary school (and so on).[41]

Figure 3.3: Mean achievement of boys and girls in Ireland in three cycles of PIRLS



Source: Appendix Table A3.7.
Note. Due to rounding, some differences may appear inconsistent with those reported in text.
In 2011 and 2016, gender was treated as a binary variable and based on school reports. In 2021, the gender variable used was based on pupils' own reports.

[41] As noted above, the variable used for gender in 2021 is based on pupils' reports, while the variable used in previous cycles is a binary one based on school reports. However, this has no meaningful impact on the trend results for boys vs girls in Ireland. Figure 3.3 can be compared to Exhibit 2.4 of the international report (Mullis et al., 2023), which includes a virtually identical trend chart for Ireland using the binary school-report gender variable across all cycles.

Achievement differences by socioeconomic status

School DEIS status

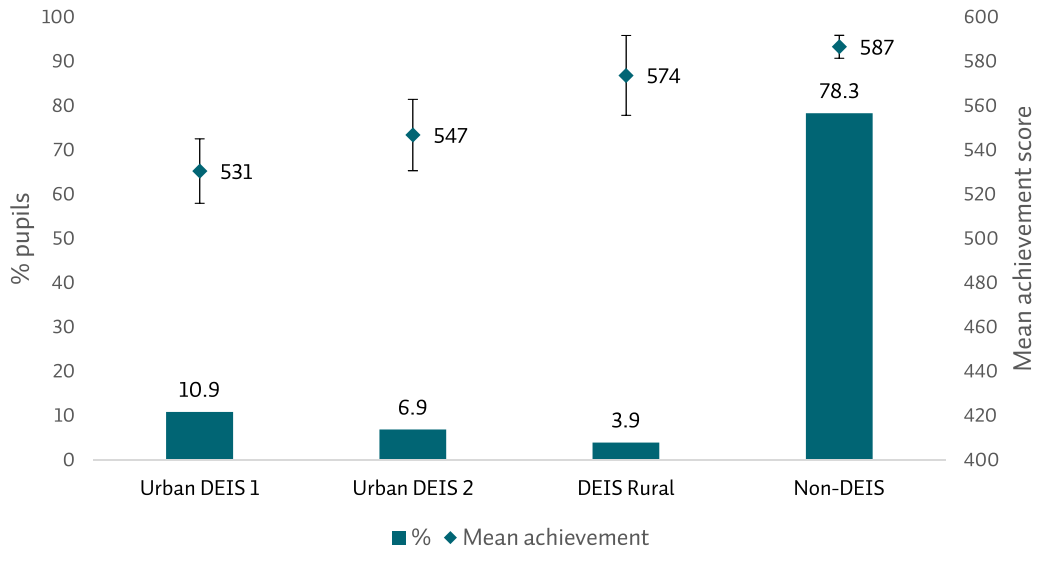
Of the PIRLS pupils in Ireland, 78.3% attended schools that did not have DEIS status at the time of testing ("non-DEIS"). Just over one-tenth of pupils (10.9%) attended DEIS Urban Band 1 schools (i.e., schools designated as experiencing the highest level of disadvantage). Smaller proportions attended DEIS Urban Band 2 schools (6.9%) and DEIS Rural schools (3.9%).

Pupils in DEIS Band 1 schools achieved an average reading score of 531, 56 points lower than pupils in non-DEIS schools (587). This gap corresponds to a more than half a standard deviation on the PIRLS scale, which is substantial and significant. Pupils in DEIS Band 2 schools achieved an average score of 547, also significantly lower (by 40 points) than that of their peers in non-DEIS schools. In a broad sense, this replicates the achievement pattern observed in 2016, when pupils in both DEIS Band 1 and DEIS Band 2 schools achieved lower mean scores, on average, than pupils in non-DEIS schools (Delaney et al., 2022). While the magnitude of the achievement gaps is wider in 2021 (increasing from 49 to 56 score points between DEIS Band 1 and non-DEIS, and from 25 to 40 score points between DEIS Band 2 and non-DEIS), these changes are not statistically significant. Readers may also note that the model of allocating schools to the DEIS programme changed between 2016 and 2021 (DoE, 2017).

Pupils in DEIS Rural schools achieved a mean score of 574 in 2021, but, due to the small proportion of pupils in this group, there is a large margin of error around this estimate. The 95% confidence interval around the estimate spans a wide range (36 score points) and overlaps with the confidence intervals around both the non-DEIS and the DEIS Band 2 estimates of achievement (Figure 3.4). In other words, although there was a substantial and significant difference between the mean achievement of pupils in DEIS Band 2 and non-DEIS schools, we cannot say that the mean achievement of DEIS Rural pupils was significantly different to that of either of these groups. Therefore, it is not advisable to extrapolate about the reading skills of pupils in DEIS Rural schools from the PIRLS results.

Figure 3.4 shows the percentages of pupils in each school category, along with estimates of their mean reading achievement, with confidence intervals (± SE x 1.96) around these estimates.

Figure 3.4: Percentages and mean reading achievement of pupils in Ireland by school DEIS category, with confidence intervals around estimates of achievement (PIRLS 2021)



Source: Appendix Table A3.8.
Note. Due to rounding, some differences may appear inconsistent with those reported in text.

Individual socioeconomic status (SES)

PIRLS 2021 includes a new scale that provides an individual measure of pupils' socioeconomic status (SES). This is based on parents' reports of the number of books and children's books in the home, and of their own education and occupation. The scale has an international centrepoint of 10.0 and a standard deviation of 2.0. In Ireland, the average SES score was 11.0, half a standard deviation above the international centrepoint.

Based on these scale scores, pupils were classified as having *lower, middle,* or *higher* socioeconomic status (SES).[42] In Ireland, 9% of pupils had *lower* SES, 42% had *middle* SES, and just under half (49%) had *higher* SES. This represents a high overall level of SES relative to the international average and to some of the other reference countries, although Finland, Northern Ireland, and Singapore reported broadly similar levels. Norway, Sweden, and Denmark, which are not among the reference countries, reported the highest SES overall.

In Ireland, and internationally, the achievement of pupils with *higher* SES was substantially and significantly higher than that of their peers with *middle* and *lower* SES. The mean advantage of pupils with *higher* SES over those with *lower* SES is shown, for Ireland, reference countries, and on average internationally, in Table 3.4. The achievement gap in Ireland (88 points, almost nine-tenths of a standard deviation) is similar to the average gap internationally. Of the reference countries, only Singapore reported a wider gap (110 points).

Table 3.4: Percentages and mean achievement of pupils with lower, middle, and higher SES, in Ireland, reference countries, and on average across all PIRLS countries (PIRLS 2021 *Home Socioeconomic Status* scale)

		Lower SES		Middle SES		Higher SES		Mean advantage of Higher SES over Lower SES
		%	Mean	%	Mean	%	Mean	
	Ireland	9	520	42	564	49	608	**88**
Start G5	Northern Ireland*	11	521	41	560	47	604	**83**
	Croatia	17	515	56	555	27	590	**75**
	Hong Kong SAR	18	545	46	572	36	592	**46**
End G4	Poland	9	505	49	536	43	576	**71**
	Finland	5	490	45	538	50	571	**81**
	Singapore	6	515	49	572	45	624	**110**
	PIRLS#	22	457	48	501	30	543	**86**

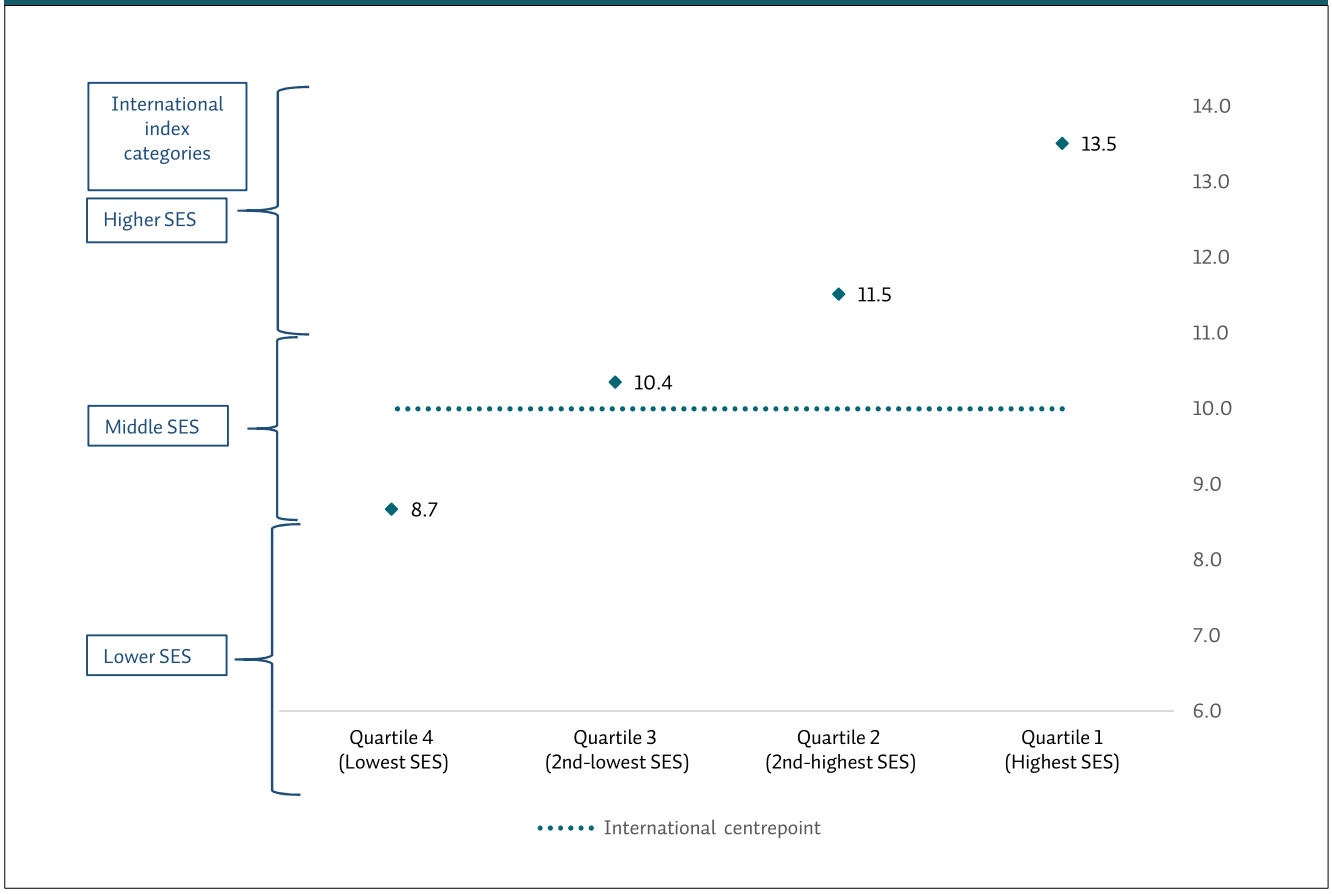
Source: Appendix Table A3.10.
Note. Mean advantages in **bold** are statistically significant.
Due to rounding, some differences may appear inconsistent.
Data are not available for Australia and England. Data for Lithuania and New Zealand are not presented as they are available for less than 50% of pupils.
* Limited data are available for Northern Ireland (less than 70% of pupils). It is likely that parents with lower socioeconomic status may have been disproportionately represented among non-respondents.
# The overall PIRLS average is calculated without including data from countries in which data are available for less than 50% of the pupils. This follows the approach taken in the international report (Mullis et al., 2023, Exhibit 5.1).

[42] Pupils with *lower* SES had a scale score of 8.5 or below, typically corresponding to having 25 or fewer books and 25 or fewer children's books at home, no parent who had proceeded beyond upper secondary education, and no parent working in a "professional", "clerical", or "business owning" occupation. Pupils with *higher* SES had a scale score of 11.1 or above, typically corresponding to having more than 25 books and more than 25 children's books at home, at least one parent who had completed university, and at least one parent in a "professional" occupation. Pupils with scores in between these two ranges were categorised as having *middle* SES. (See Mullis et al., 2023, Exhibit 5.1, for details of the scale.)

Achievement by SES quartiles within Ireland

To better understand the SES measure within the Irish context, pupils in Ireland were divided into quartiles (four equally sized groups) based on their SES score. Quartile 4 represents the 25% of pupils in Ireland with lowest SES, Quartile 3 represents the 25% with second-lowest SES, Quartile 2 represents the 25% with second-highest SES, and Quartile 1 represents the 25% with highest SES. The mean SES scale score of pupils in each quartile is shown in Figure 3.5, with the international scale centrepoint and the brackets of international *lower, middle*, and *higher* SES categories also presented for context.

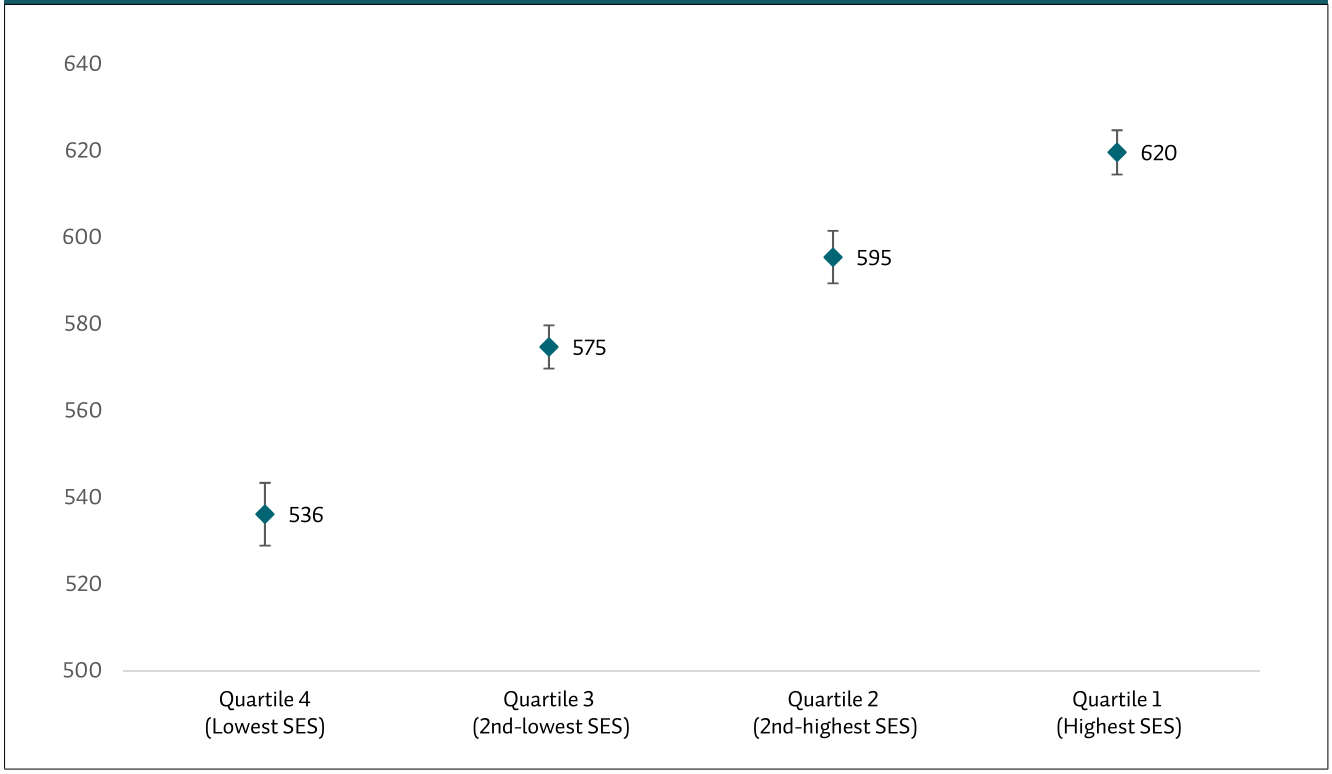
Figure 3.5: Mean SES scale score of pupils in each SES quartile in Ireland, with international scale centrepoint and international index categories presented for context (2021)



Source: Appendix Table A3.11.

The mean reading achievement of pupils in Ireland by SES quartile is shown in Figure 3.6. Pupils in the lowest-SES Quartile 4 had a mean score of 536, which was substantially and signifiantly lower, by 83 points, than the mean score of pupils in the highest-SES Quartile 1 (620). Pupils in Quartiles 3 (575) and 2 (595) respectively also scored significantly lower, on average, than those in Quartile 1. While there are achievement gaps of roughly similar magnitude between Quartiles 1 and 2 (24 points) and Quartiles 2 and 3 (21 points), the gap between Quartiles 3 and 4 is larger (39 points), indicating that pupils in Quartile 4 are at a considerable disadvantage relative to their peers. In Figure 3.6, confidence intervals (± SE x 1.96) are presented around estimates of achievement. It is clear that none of these confidence intervals overlap with one another, suggesting meaningful differences in average achievement between all four groups.

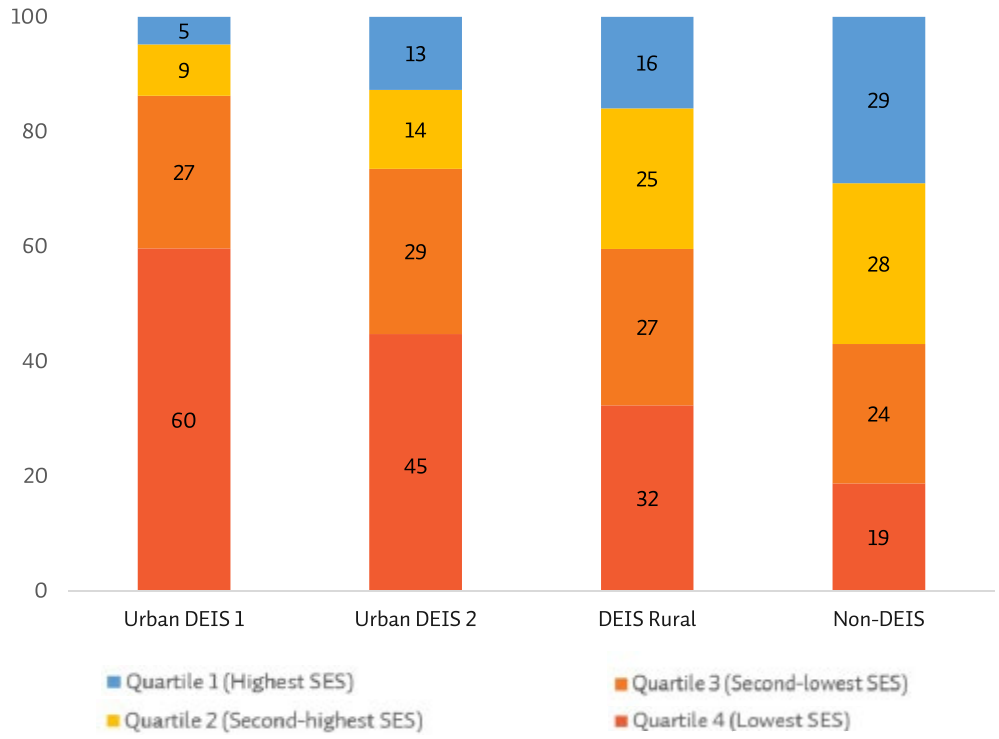
Figure 3.6: Mean reading achievement of pupils in Ireland by SES quartile, with confidence intervals around estimates of achievement (2021)



Source: Appendix Table A3.11.
Note. Due to rounding, some differences may appear inconsistent with those reported in text.

As might be expected, there is a close relationship between the individual measure of SES and school DEIS status. Figure 3.7 shows the distribution of PIRLS pupils by SES quartile within each DEIS-related school category. In DEIS Urban Band 1 schools, three-fifths of pupils (60%) are in Quartile 4, the lowest-SES quartile, while only 5% are in Quartile 1 and 9% in Quartile 2. In DEIS Urban Band 2 schools, slightly under half (45%) of pupils are in Quartile 4, while 13% are in Quartile 1 and 14% in Quartile 2. In contrast, in non-DEIS schools, just under one-fifth of pupils (19%) are in Quartile 4, while 29% are in Quartile 1 and 28% in Quartile 2.

Figure 3.7: Percentage breakdown by SES quartile within each DEIS-related school category (2021)



Source: Appendix Table A3.12.
Note. Due to rounding, reported percentages may not always sum to 100%.

For the remainder of this report, SES quartiles rather than school DEIS status are used to analyse Ireland's PIRLS results. Using the individual SES variable has two advantages. First, it provides an individual rather than a school-level measure (for example, enabling us to capture information about pupils in Quartile 4 who attend non-DEIS schools). Second, while we have seen that analysis by school DEIS status involves small groups with associated high error margins, this problem is much reduced when analysis by SES quartiles is conducted, as the numbers in each quartile are more robust. However, one limitation of this approach is that individual SES data are not available for PIRLS pupils whose parents did not complete the Home Questionnaire.[43]

Chapter summary

PIRLS 2021 data must be interpreted in the context of **important caveats**, described in Chapter 1 and at the start of this chapter. These are particularly relevant for countries that tested at Start G5 (including Ireland).

Pupils in Ireland achieved an estimated mean reading achievement score of 577, which is substantially above the PIRLS centrepoint and represents the highest mean score of the 14 countries that tested at Start G5. Across all PIRLS countries, Singapore's End G4 pupils had the highest mean achievement (significantly higher than Ireland's), while the mean score of Hong Kong's End G4 pupils was not significantly different from Ireland's. Due to the caveats required, we **cannot**

[43] Just under 7% of pupils had parents who did not complete the Home Questionnaire, and it seems likely that pupils with lower SES were disproportionately represented among them. Based on pupils' reports, 30% of this group had 10 or fewer books in their homes, compared to 11% of those whose parents completed the Home Questionnaire. Pupils whose parents did not complete the Home Questionnaire had substantially lower reading achievement, on average, than those whose parents completed the Home Questionnaire (520 vs 582) (Appendix Table A3.13).

conclude that reading proficiency in Ireland is truly higher than reading proficiency in all but two other countries. However, we **can** say that Ireland remains one of a small set of very high-achieving countries in PIRLS.

Internationally, there were declines in achievement in the majority of End G4 countries, although this was not as evident among Start G5 countries. It is likely that the pattern of widespread declines may be attributable at least in part to effects of the global pandemic. Ireland's mean score in 2021 was 11 points *higher* than in 2016 (and 26 points higher than in 2011). Due to the relevant caveats, we **cannot** conclude strongly that mean reading achievement in Ireland has truly improved significantly since 2016. It is likely that pupils in Ireland would have performed somewhat less well, on average, if they had been tested at the end of Fourth Class in spring 2021. However, based on their very strong performance in autumn, it also seems unlikely that a substantial drop relative to 2016 would have been observed. Therefore, we **can** suggest that mean reading achievement in Ireland has at least held more or less steady between the most recent PIRLS cycles.

In most countries, girls significantly outperformed boys in PIRLS 2021, as in previous cycles. In Ireland, girls had an average advantage of 11 points over boys. This represents a relatively small gender gap compared to those observed in some reference countries (including Northern Ireland) and on average internationally. The magnitude of Ireland's gender gap in 2021 is very similar to that observed in 2016, and there were similar significant increases in achievement for boys and girls between cycles (noting, again, the caveats that apply to trend comparisons).

Pupils in DEIS Urban Band 1 and (to a lesser extent) DEIS Urban Band 2 schools achieved mean scores that were substantially and significantly lower than that of their peers in non-DEIS schools. This pattern is similar to that observed in PIRLS 2016; the achievement gaps in 2021 are somewhat larger, but not to a significant extent. Due to the relatively small numbers of pupils in each DEIS category, findings must be interpreted with attention to error margins. In particular, there are too few pupils sampled in DEIS Rural schools to allow for robust conclusions about their reading proficiency.

On average, individual socioeconomic status (measured via parents' reports of books in the home, their education, and their occupation) was relatively high in Ireland (similar to Finland and Northern Ireland). Across participating countries, socioeconomic status was positively associated with reading achievement. Among the reference countries, Singapore reported the widest achievement gap between pupils with *higher* versus *lower* SES, followed by Ireland. Within Ireland, when pupils were divided into quartiles based on their SES scale score, there was a clear association with achievement: pupils in the lowest-SES quartile scored 83 points lower, on average, than those in the highest-SES quartile. The individual SES variable was closely correlated with school DEIS status, and the SES quartiles (which have the advantage of robust numbers) are used for analysis in later chapters of this report.

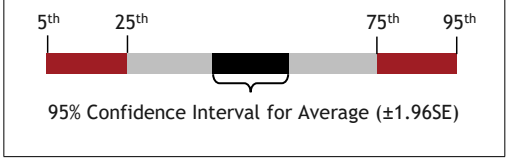
Chapter 4:
Distribution of Achievement

In addition to providing overall estimated mean achievement scores, PIRLS allows us to examine the extent to which performance varies within countries and subpopulations. One approach to this involves examining the estimated distribution of achievement for each country (or subpopulation), using percentiles, which are interpreted as indicating that *a pupil at the xth percentile of a given group performed as well as or better than x% of the pupils in that group.*

In the PIRLS 2021 international report (Mullis et al., 2023), the distribution of achievement presented for each country shows how achievement varies from the lowest-achieving pupils (operationalised as those at the 5th percentile) to the highest-achieving pupils (operationalised as those at the 95th percentile). This chapter presents achievement at various percentiles (5th, 25th, 75th, and 95th) for Ireland and for the selected reference countries. Also, within Ireland, the distribution of achievement is compared for subgroups based on gender and socioeconomic status.

The distribution of achievement is presented graphically throughout this chapter, as per the example below (Figure 4.1). The black band in the middle represents the 95% confidence interval around the estimated overall mean score (i.e., mean achievement ± 1.96 times the standard error [SE]), to take into account sampling and measurement error. The grey band on the left represents the range of achievement from the 25th percentile to the lower limit of the confidence interval, while the grey band on the right represents the range from the upper limit of the confidence internal to the 75th percentile. The red bands represent the range of achievement from the 5th to the 25th percentile (left) and from the 75th to 95th percentile (right).

Figure 4.1: Percentiles of performance



Distribution of achievement in Ireland and selected reference countries

Reminder

Comparisons between the achievement of countries that tested at End G4 and those that tested at Start G5 (including Ireland) should be made **very cautiously**. Caution is also required to interpret comparisons involving countries that tested one year later than planned (for northern hemisphere countries, in spring 2022).

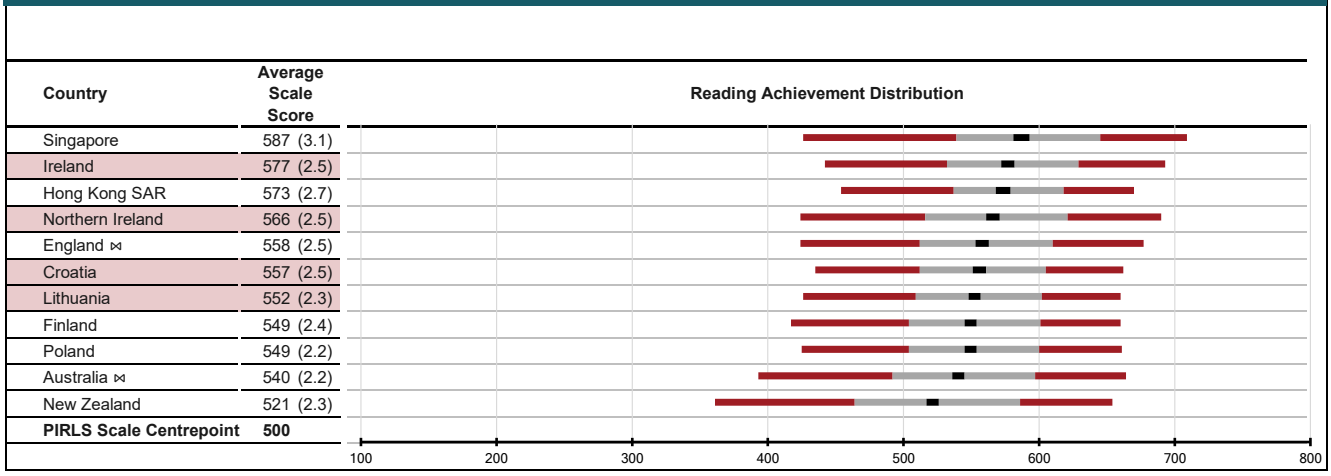
Figure 4.2 presents the distribution of achievement in Ireland and selected reference countries. There is considerable variation in the range of the distribution (i.e., the difference between mean scores at the 5th and 95th percentile) among

the countries presented here. There is a difference of 77 score points (more than three-quarters of a standard deviation) between the spread of scores in the country with the smallest range compared to that with the largest range. Singapore, which is the highest-ranked country for mean achievement, also has one of the largest ranges of distribution, with only New Zealand having a range which is ten score points larger. Hong Kong and Croatia have the smallest ranges. The range of Ireland's distribution is of mid-level magnitude among this set of countries. That is, reading achievement within Ireland varies more than in countries such as Hong Kong and Croatia, and less than in countries such as Singapore and New Zealand.

Achievement at the 5th percentile in Ireland is relatively higher than achievement at the 5th percentile in many of the reference countries. This means that our lowest-achieving pupils are achieving higher scores, on average, than the lowest-achieving pupils in these countries. The only exception is Hong Kong, where achievement at the 5th percentile is 12 score points higher than in Ireland.

The pattern for the highest-achieving pupils (95th percentile) is broadly in line with the expected pattern, whereby countries with higher mean achievement scores have higher scores at the 95th percentile. Ireland, which was outranked only by Singapore (End G4) in terms of overall mean achievement, also has the second-highest achievement at the 95th percentile. While Ireland and Hong Kong (End G4) did not differ significantly from one another in their overall mean achievement, the mean score of pupils at the 95th percentile in Ireland is 23 points higher than that of pupils at the 95th percentile in Hong Kong. So, while the lowest-achieving pupils in Hong Kong performed better than the lowest-achieving pupils in Ireland, the highest-achieving pupils in Ireland performed better than the highest-achieving pupils in Hong Kong. In Northern Ireland, which has an overall mean achievement score 11 points below Ireland's, achievement at the 95th percentile is only three points lower than that in Ireland, indicating that the highest-achieving pupils in Ireland and Northern Ireland are performing roughly comparably.

Figure 4.2: Distribution of achievement in Ireland and comparison countries (ordered by descending overall mean achievement)



⋈ Country tested one year later than planned (autumn 2021 for southern hemisphere countries; spring 2022 for northern hemisphere countries).
Tested at Start G5

Source: Appendix Table A4.1.
Note. Adapted from Exhibit 1.3 of the PIRLS 2021 international report (Mullis et al., 2023).

Trends in the distribution of achievement

Reminder

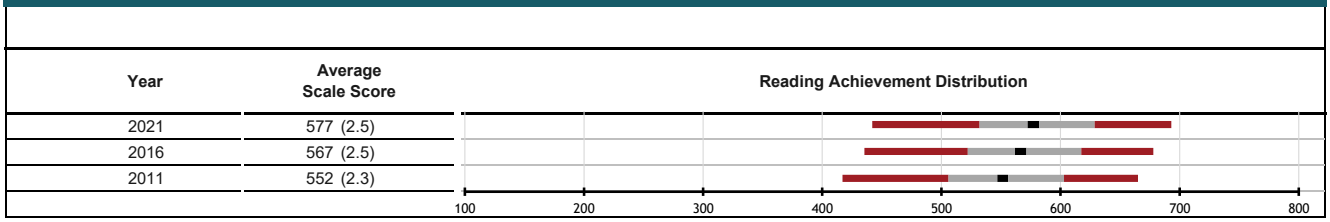
All trend comparisons of countries' achievement in PIRLS 2021 versus previous cycles should be made cautiously, due to the disruption caused by COVID-19. However, this applies **particularly** to countries that tested at Start G5 in 2021, including Ireland.

Figure 4.3 presents the distribution of achievement in Ireland for the three most recent cycles of PIRLS (2011, 2016, and 2021). In Ireland, the range between the 5th and 95th percentiles was broadly similar in 2011 and 2021 (248 and 251 points, respectively). Between 2011 and 2016, the range narrowed slightly (by 6 points), but it widened again by a roughly similar margin (9 points) between 2016 and 2021, indicating a slight increase in the variation of achievement within Ireland between these cycles.

Comparing 2021 with 2016, the main difference observed is at the higher end of the distribution. While the overall mean achievement score increased by 11 points from 2016 to 2021, the difference between scores at the 75th and 95th percentiles was larger by four points in 2021, resulting in a wider distribution at the higher end. Achievement at the 95th percentile was 15 points higher in 2021 than in 2016, a statistically significant difference. This indicates that the highest-achieving pupils in Ireland are achieving higher scores, on average, than in previous cycles of PIRLS. However, the older age profile of PIRLS pupils in Ireland in 2021 relative to previous cycles must be considered when interpreting this apparent change.

At the lower end of the distribution, on the other hand, the increase in achievement at the 5th percentile from 2016 to 2021 was 7 points, which is smaller than the overall increase in mean achievement and is not statistically significant. This indicates that the reading of the lowest-achieving pupils in Ireland has not increased between cycles in proportion to the overall increase observed.

Figure 4.3: Trends in distribution of achievement in Ireland



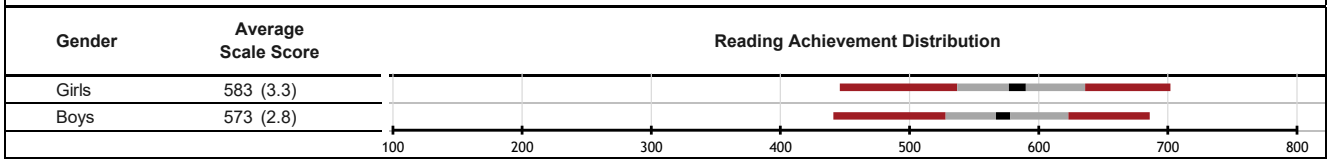
Source: Appendix Table A4.2.

Distribution of achievement, by gender

As described in Chapter 3, girls significantly outperformed boys in reading in Ireland, with a mean achievement score which was 11 points higher. Figure 4.4 presents the distribution of achievement for the subgroups of boys and girls in Ireland. At the 5th percentile of the respective groups, there was a mean difference of 5 score points between girls and boys. As the percentiles increase, the gap in favour of girls widens, with a gap of 16 score points at the 95th percentile.

There was a wider spread of achievement among girls than boys and this can be observed at both ends of the distribution. Overall, the range of the distribution of girls' achievement was 11 points wider than that of boys, and this difference is accounted for mainly between the 5th and 25th percentiles and between the 75th and 95th percentiles (illustrated by red bands in Figure 4.4).

Figure 4.4: Distribution of achievement by gender in Ireland



Source: Appendix Table A4.3.

Distribution of achievement, by socioeconomic status

Chapter 3 presented mean achievement in Ireland by quartiles of the PIRLS *Home Socioeconomic Status* (SES) scale, and highlighted that the 25% of pupils with highest SES (Quartile 1) had a mean reading score 83 points higher than the 25% of pupils with lowest SES (Quartile 4). There appears to be a clear linear relationship between SES and achievement.

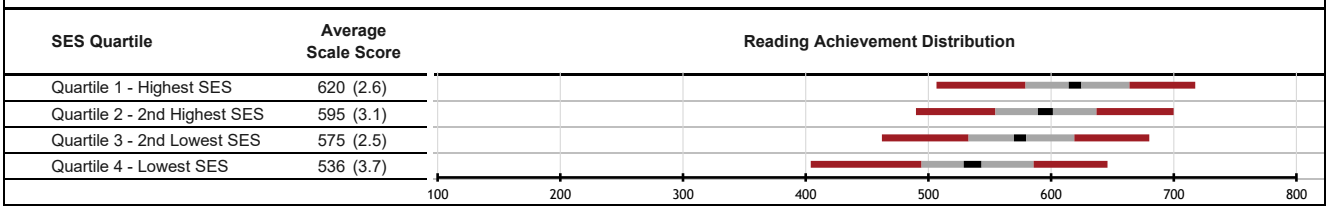
Figure 4.5 presents the distribution of achievement within each SES quartile. It should be noted that the standard errors around estimates of achievement at percentiles within quartiles are relatively large (due to the smaller numbers involved). Nevertheless, clear patterns of distribution in relation to SES can be observed. The range in the distribution of achievement is broadly similar for each of the quartiles, with the exception of the pupils in the lowest-SES quartile (Quartile 4), where the range is more than 20 score points wider than in any other quartile. This difference is observed at the left hand side of the Quartile 4 distribution, where the difference between mean achievement at the 5th and 25th percentiles is approximately 20 points larger than for the other quartiles. In other words, reading achievement varies more among the lower-achieving pupils in the lowest-SES quartile than among the lower-achieving pupils in other quartiles.

Achievement at the 5th percentile of Quartile 4 (lowest SES) was just over 400, substantially below the PIRLS scale centrepoint. In Quartile 1 (highest SES), achievement at the 5th percentile was just over 500, i.e. just above the PIRLS centrepoint. Observing achievement at the 5th percentile within each SES quartile, the size of the achievement gap between those in Quartile 1 and Quartile 2 almost doubles between Quartile 2 and Quartile 3, and almost doubles again between Quartile 3 and Quartile 4.

A similar pattern is present for the highest-achieving pupils (95th percentile) within each of the quartiles. The difference between achievement at the 95th percentile in the highest-SES quartile (well over 700) and achievement at the 95th percentile in the lowest-SES quartile (approaching 650) is substantial. Again, the magnitude of the achievement gap between each adjacent pair of quartiles increases as we move from the highest-SES quartile towards the lowest-SES quartile.

For both the lowest-achieving and highest-achieving pupils, then, the disadvantage associated with lower SES grows larger as SES decreases.

Figure 4.5: Distribution of achievement by SES quartile in Ireland



Source: Appendix Table A4.4.

Chapter summary

The distribution of reading achievement for a country or subpopulation describes the extent to which achievement varies within that group. The range in the distribution of achievement (difference between achievement at the 5th and 95th percentiles) among selected reference countries varies considerably. Singapore and New Zealand have the largest ranges, while Hong Kong and Croatia have the smallest ranges. Ireland falls in the middle of this set of countries as regards the range of its distribution, indicating a medium level of variation in the achievement of its pupils. In Ireland, the lowest-achieving pupils (5th percentile) achieved higher scores, on average, than the lowest-achieving pupils in the selected reference countries, with the exception of Hong Kong (End G4). Ireland's highest-achieving pupils (95th percentile) achieved higher scores, on average, than the highest-achieving pupils in many reference countries, although lower than Singapore (End G4) and similar to Northern Ireland (Start G5).

In 2016, the range of the distribution in Ireland had narrowed slightly from 2011. However, it widened again by a similar margin in 2021 and the magnitude of the 2021 range is broadly similar to that seen in 2011. The main difference in the distribution from 2016 to 2021 is at the higher end (between the 75th and 95th percentiles), where it has widened by 4 points. While there was also an increase in achievement observed among the lowest-achieving pupils (5th percentile), this was non-significant and was smaller than the overall increase in mean achievement from 2016 to 2021.

Girls had a wider range of achievement than boys and this difference was observed at both ends of the distribution. The difference between the achievement of girls and boys at the 5th percentile of their respective distributions (i.e., those who are lowest-achieving) was 5 points in favour of girls, but this increases to a 16-point advantage for the highest-achieving girls over the highest-achieving boys (95th percentile).

The differences between the distributions of achievement for pupils with different levels of socioeconomic status (represented by different SES quartiles) are clearly illustrated in Figure 4.5. The magnitude of the range of achievement is broadly similar for each of the quartiles, with the exception of the lowest-SES quartile which has a wider distribution (greater variation) at the lower end. There is a substantial gap (over 100 points) between the achievement of pupils at the 5th percentile within the lowest- and highest-SES quartiles respectively. At the 95th percentile, the achievement gap observed between pupils in the lowest- and highest-SES quartiles is also considerable (more than 70 points). The disadvantage associated with lower SES, for both the lowest- and highest-achieving pupils, becomes more noticeable as SES level decreases.

Chapter 5: Performance at International Benchmarks

This chapter focuses on the International Benchmarks used to describe the skills and strategies demonstrated by pupils at various levels of reading achievement. The cumulative percentages of pupils reaching each of the four benchmarks are described for Ireland, selected reference countries, and across all PIRLS countries. Also, Ireland's performance at the International Benchmarks is compared to that in previous PIRLS cycles (2016 and 2011), and analysed by gender and by socioeconomic status (SES).

As noted in Chapters 1 and 3, comparisons between countries in 2021 (especially comparisons between End G4 and Start G5 countries), and comparisons between data for Ireland in PIRLS 2021 and previous cycles, must be made with considerable caution.

PIRLS International Benchmarks

Table 5.1 describes the skills and knowledge required to meet each PIRLS International Benchmark. Benchmarks are designed to provide a method of interpreting country-level or subgroup performance on reading assessments. They are defined relative to thresholds on a continuous achievement scale and in terms of specific reading strategies that pupils meeting these thresholds can successfully apply. Pupils' skills and knowledge progress as they move from the Low towards the Advanced Benchmark, with pupils who reach a higher-level benchmark demonstrating the skills expected at that benchmark, as well as the skills associated with the lower levels. At each benchmark, separate descriptors are provided for what pupils can do when reading Literary and Informational texts, as these may require different sets of skills. (Note that, in countries that administered PIRLS digitally, the Informational texts included some simulated online [ePIRLS] tasks.)

Pupils who reach the Low Benchmark (400 points on the PIRLS scale) can consistently demonstrate a relatively limited set of reading skills when reading predominantly easy texts. For example, they can locate, retrieve, or reproduce explicitly stated information, or make straightforward inferences about characters' actions or the causes of events. Pupils who reach the Intermediate Benchmark (475 points) can demonstrate that when reading an easy or medium level text, they can apply all strategies needed for the Low Benchmark and can also interpret and integrate information to understand central ideas/reasons for characters' feelings or actions. The High Benchmark (550 points) requires pupils to demonstrate also that they can recognise the meaning of some figurative language and that they can evaluate content, describe how graphic features (e.g., diagrams and maps) function as part of a text, and recognise how words can be used to convey an author's point of view. Pupils reaching the Advanced Benchmark (625 points) show the skills associated with all lower benchmarks while also demonstrating sophisticated evaluative and critical skills. For example, when reading difficult Literary texts, they can recognise what the author intends to achieve through particular linguistic and stylistic choices. When reading difficult Informational texts, they can make inferences and integrate information across dense and complex textual settings (including across multiple "web pages", for countries administering PIRLS digitally), and can identify and provide evidence of the author's point of view.

Table 5.1: Summary descriptions of pupils' skills at each International Benchmark, by purpose for reading (Literary vs Informational)

	Literary	Informational (including online tasks)
	When reading difficult texts, pupils can:	
Advanced Benchmark (625 points)	▪ Interpret and integrate story events and character actions to describe reasons, motivations, feelings, and character development ▪ Evaluate the intended effect of the author's language, style, and composition choices	▪ Make inferences about complex information across different web pages and parts of text to recognise the relevant information in a list and use evidence in the text to support ideas ▪ Interpret and integrate multiple pieces of different information across text and web pages to present an overview of ideas in the text and provide comparisons and explanations ▪ Evaluate textual, visual, and interactive elements to explain their purpose, and identify the writer's point of view and provide supporting evidence
	When reading medium or difficult texts, pupils can:	
High Benchmark (550 points)	▪ Locate and identify significant actions and details embedded across the text ▪ Make inferences about relationships between intentions, actions, events, and feelings ▪ Interpret and integrate story events to give reasons for character actions and feelings ▪ Recognise the meaning of some figurative language (e.g., metaphor, imagery)	▪ Locate and identify relevant information in texts with a variety of features, such as diagrams and illustrations ▪ Make inferences to provide comparisons, descriptions, explanations, predictions, and choose a relevant website ▪ Interpret and integrate textual and visual information across texts and web pages to connect ideas, sequence events, identify characteristics, and provide explanations ▪ Evaluate the content to take and justify a position; describe how illustrations, diagrams, photographs, and maps convey and support content; and recognise the contribution of word choice in conveying the writer's point of view
	When reading easy or medium-difficulty texts, pupils can:	
Intermediate Benchmark (475 points)	▪ Locate, recognise, and reproduce explicitly stated actions, events, and feelings ▪ Make straightforward inferences about events and characters' actions ▪ Interpret reasons for characters' feelings or actions, identify supporting evidence	▪ Locate, recognise, and reproduce explicitly stated information across texts ▪ Make straightforward inferences to provide comparisons, descriptions, and explanations ▪ Interpret and integrate to provide information about central ideas and reasons for actions, events, and outcomes
	When reading predominantly easy texts, pupils can:	
Low Benchmark (400 points)	▪ Locate, retrieve, and reproduce explicitly stated information, actions, or ideas ▪ Make simple straightforward inferences about characters' actions	▪ Locate, retrieve, and reproduce explicitly stated information ▪ Make simple straightforward inferences to provide a reason for an outcome

Note. Content adapted from PIRLS 2021 international report (Mullis et al., 2023).

Achievement at the benchmarks

Reminder

Comparisons between the achievement of countries that tested at End G4 and those that tested at Start G5 (including Ireland) should be made **very cautiously**. Caution is also required to interpret comparisons involving countries that tested one year later than planned (for northern hemisphere countries, in spring 2022).

Table 5.2 shows the cumulative percentages of pupils that met or exceeded each of the four International Benchmarks, in Ireland, in selected countries of interest, and across all PIRLS countries. Almost all pupils in Ireland (98%), and in most of the reference countries, reached the threshold for the Low Benchmark. A large majority of pupils in Ireland (91%) also demonstrated the skills and strategies needed to reach the Intermediate Benchmark, and this was the case for at least four-fifths of pupils in most reference countries (New Zealand being an exception). There was more variation at the High Benchmark, which was reached by over two-thirds of pupils in Ireland (67%), a large percentage in comparison to many of the selected countries. Just over a quarter of pupils in Ireland (27%) demonstrated the critical skills necessary to reach the Advanced Benchmark, again among the highest percentages reported by countries.

Table 5.2: Mean PIRLS achievement and cumulative percentages of pupils reaching the International Benchmarks, in Ireland, selected reference countires, and across all PIRLS countries (2021)

		Overall Mean	Cumulative percent of pupils			
			Low (400 points)	Intermediate (475 points)	High (550 points)	Advanced (625 points)
Start G5	Ireland	577	98	91	67	27
	Northern Ireland	566	97	87	61	23
	Croatia	557	98	88	56	15
	Lithuania	552	97	86	54	14
End G4	Australia ⋈	540	94	80	48	14
	England ⋈	558	97	86	57	18
	Hong Kong SAR	573	98	92	68	21
	Poland	549	97	85	52	14
	Finland	549	96	84	53	14
	New Zealand	521	90	71	41	11
	Singapore	587	97	90	71	35
	PIRLS Median*		94	75	36	7

Source: Appendix Table A5.1.
Note. Countries in *italics* took the test on computer, while those not in italics took it on paper.
⋈ Country tested one year later than planned (autumn 2021 for southern hemisphere countries; spring 2022 for northern hemisphere countries).
* The value shown as the PIRLS median for each benchmark is the percentage that divides countries evenly. For example, the median value at the Advanced Benchmark is 7%. This means that in half of all participating countries, more than 7% of pupils reached the Advanced Benchmark, and in the other half, fewer than 7% did so.

Of the reference countries (and, indeed, of all PIRLS countries), Singapore (End G4) had the highest percentages of pupils reaching the High (71%) and the Advanced (35%) Benchmarks. The percentages of pupils achieving both of these benchmarks in Singapore were significantly higher than those in Ireland. Hong Kong (End G4), which reported overall mean achievement similar to Ireland's, also reported similar cumulative percentages of pupils reaching the Low, Intermediate, and High Benchmarks, although significantly more pupils in Ireland reached the Advanced Benchmark. In Northern Ireland (Start G5), the percentages of pupils reaching the High (61%) and Advanced (23%) Benchmarks respectively were slightly but significantly lower than those in Ireland.

Trends in performance at benchmarks

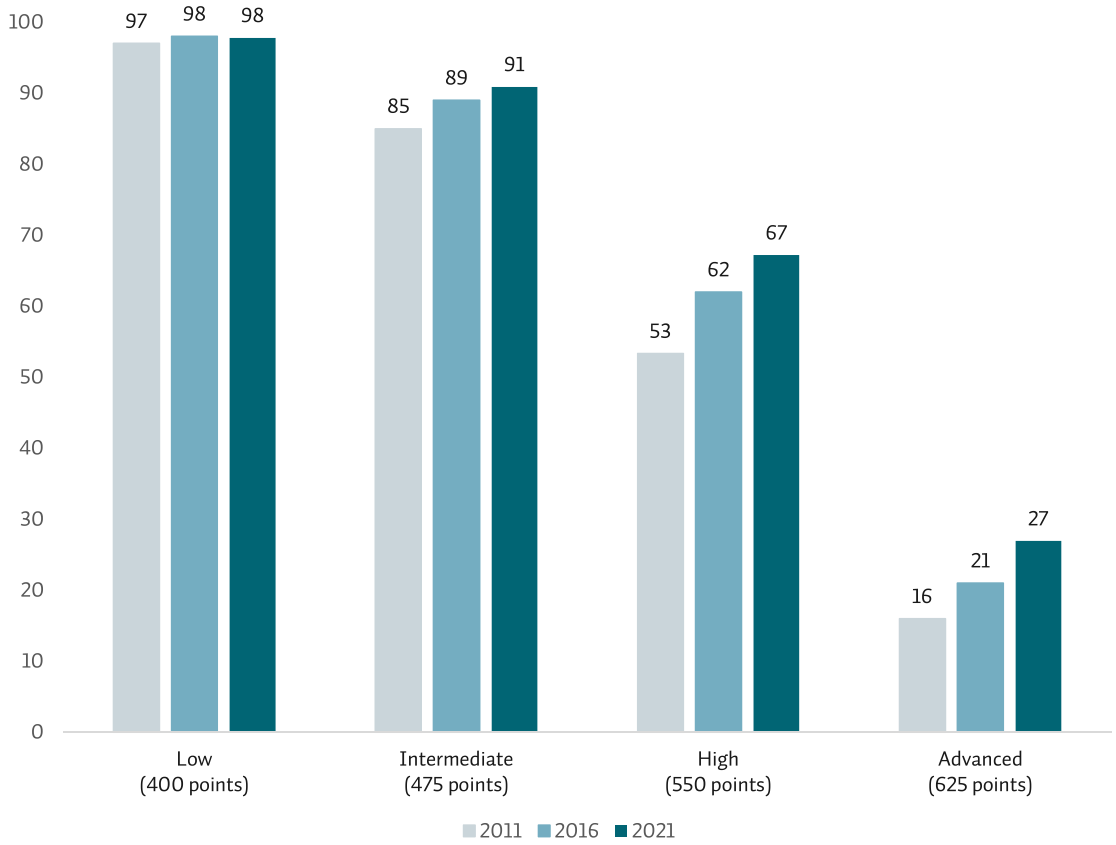
Reminder

All trend comparisons of countries' achievement in PIRLS 2021 versus previous cycles should be made cautiously, due to the disruption caused by COVID-19. However, this applies **particularly** to countries that tested at Start G5 in 2021, including Ireland.

The percentages of pupils in Ireland reaching each of the four benchmarks in PIRLS 2021, and in previous PIRLS cycles (2011 and 2016), are shown in Figure 5.1. In each cycle of PIRLS to date, almost all pupils in Ireland demonstrated the skills and strategies needed to reach the Low Benchmark. The proportion of pupils reaching the Intermediate Benchmark remained similar between 2016 and 2021, although significantly fewer had reached this benchmark in 2011. The percentage of pupils reaching the High Benchmark increased significantly across the last three cycles of PIRLS, with 5% more pupils in Ireland reaching this benchmark in 2021 than in 2016, and 14% more than in 2011. Across the three cycles, there has also been a steady and significant increase in the percentage of pupils demonstrating the skills and strategies needed to reach the Advanced Benchmark, with 6% more pupils in 2021 reaching this level than in 2016 and 11% more than in 2011.

Any apparent increases between previous cycles and 2021 may be due at least in part to the move to autumn testing, with the cohort in 2021 being six months older, on average, than pupils in the previous cycles. However, while it is likely that performance would have been slightly lower in general if spring testing had gone ahead, it is also fair to say that the skills required to achieve at the High and Advanced Benchmarks tend to be developed and honed over long periods of time. Therefore, while we **cannot** conclude that there have been definite increases in the proportion of pupils reaching the upper benchmarks at the end of Fourth Class, we **can** surmise that substantial proportions would probably have reached these benchmarks if tested in spring.

Figure 5.1: Cumulative percentages of pupils in Ireland reaching each International Benchmark across three PIRLS cycles (2011, 2016, 2021)



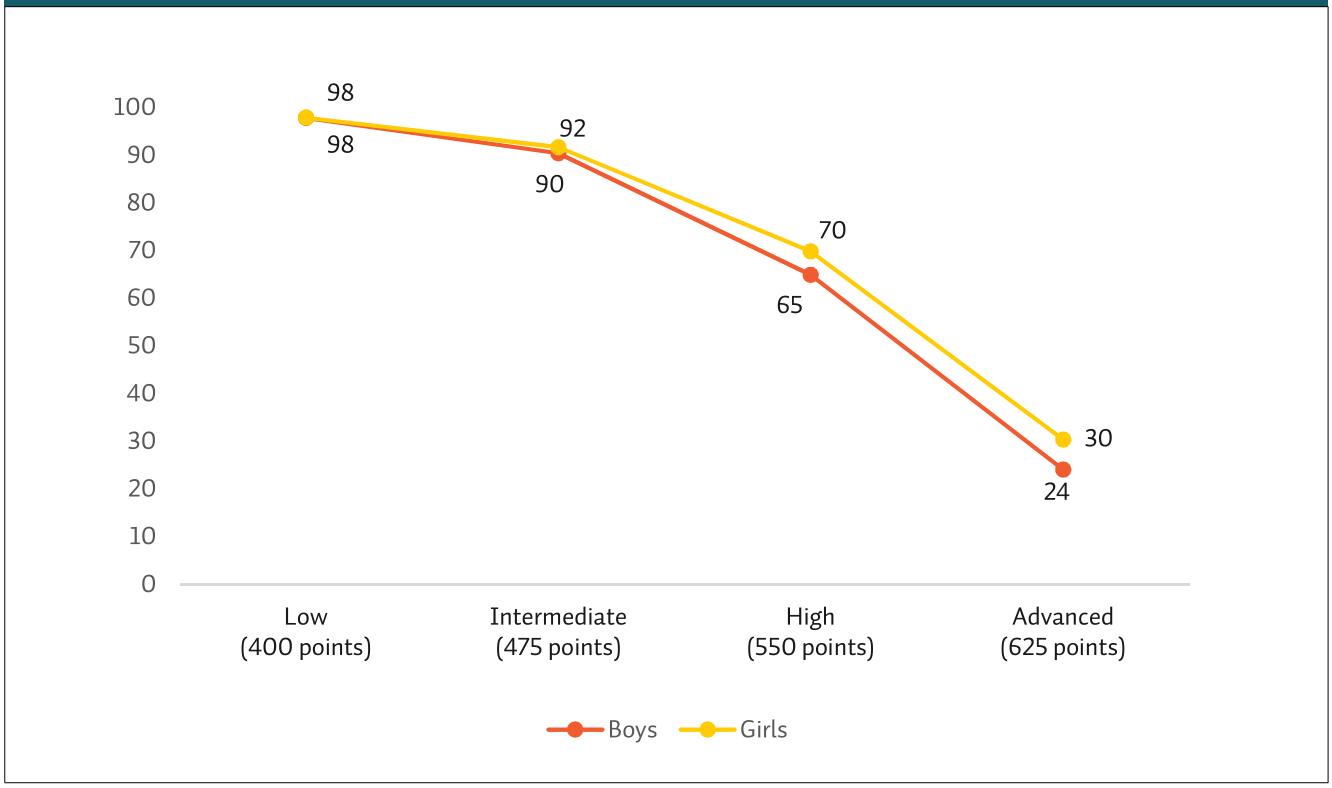
Source: Appendix Table A5.3.
Note. Due to rounding, some differences may appear inconsistent with those reported in text.

Performance at benchmarks, by gender

Figure 5.2 presents the cumulative percentages of boys and girls in Ireland that met or exceeded each International Benchmark in 2021.[44] An equal proportion of girls and boys reached the Low Benchmark (98%), which was the vast majority of pupils in Ireland. At the Intermediate Benchmark, the gender difference was not significant, with 92% of girls reaching this benchmark in comparison to 90% of boys. There was a slightly larger, and significant, gender difference at the High Benchmark with 5% more girls (70%) reaching this benchmark than boys (65%). The gap was marginally wider again at the Advanced Benchmark, where significantly more girls (30%) than boys (24%) demonstrated the skills and strategies required.

[44] See Chapter 3 for detail on the gender variable used. Achievement estimates for pupils that selected *other* to describe their gender are not reported due to insufficient data.

Figure 5.2: Cumulative percentages of boys and girls in Ireland reaching the PIRLS International Benchmarks (2021)



Source: Appendix Table A5.5.
Note. Due to rounding, some differences may appear inconsistent with those reported in text.

Table 5.3 shows the percentages of girls and boys reaching each International Benchmark, in Ireland, selected countries of interest, and on average across all PIRLS countries. The majority of both boys and girls in all selected countries (88% plus) reached the Low Benchmark. There was greater variation in the percentages of boys and girls reaching the more challenging benchmarks. At the High Benchmark, for example, reference countries that had the largest gender differences in favour of girls included Lithuania (+13%), Poland (+11%), and Northern Ireland (+11%). There were lesser, but still significant, gender differences in Singapore (+7%) and Ireland (+5%). Also, at the Advanced Benchmark there were significant differences in favour of girls in these countries, with 6% more girls in Ireland (as already seen) and 6% more girls in Singapore reaching this level. Hong Kong, which was similar to Ireland in terms of overall mean achievement, was also roughly similar in terms of the proportions of boys and girls achieving at the High Benchmark, but their gender gap is smaller and not statistically significant. Compared to Ireland, Northern Ireland reported slightly lower percentages of both boys and girls reaching the High and Advanced Benchmarks, but the advantage of girls over boys at the Advanced Benchmark was of similar magnitude in both jurisdictions (Appendix Table A5.6).

Table 5.3: Mean PIRLS achievement and cumulative percentages of pupils reaching the International Benchmarks, in Ireland, selected reference countries, and across all PIRLS countries (2021)

		Overall Mean	Cumulative percent of pupils							
			Low (400 points)		Intermediate (475 points)		High (550 points)		Advanced (625 points)	
			Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Start G5	Ireland	577	98	98	90	92	65	70	24	30
	Northern Ireland	566	96	98	84	91	55	66	20	26
	Croatia	557	98	98	87	89	53	60	13	18
	Lithuania	552	96	98	83	90	48	61	11	17
End G4	Australia ⋈	540	93	96	77	84	45	52	12	16
	England ⋈	558	96	98	85	88	54	59	16	20
	Hong Kong SAR	573	98	99	91	94	67	70	20	22
	Poland	549	96	98	83	89	46	57	11	17
	Finland	549	96	98	82	87	49	58	12	17
	New Zealand	521	88	92	68	76	38	45	10	14
	Singapore	587	95	98	87	92	68	75	33	38
	PIRLS Median*		93	95	70	77	35	38	6	8

Source: Appendix Table A5.5.
Note. Due to rounding, some differences may appear inconsistent with those reported in text.
Countries in *italics* took the test on computer, while those not in italics took it on paper.
⋈ Country tested one year later than planned (autumn 2021 for southern hemisphere countries; spring 2022 for northern hemisphere countries).
* The value shown as the PIRLS median for each benchmark is the percentage that divides all participating countries into two equally sized groups.

Trends in performance at benchmarks, by gender

Reminder

All trend comparisons of countries' achievement in PIRLS 2021 versus previous cycles should be made cautiously, due to the disruption caused by COVID-19. However, this applies **particularly** to countries that tested at Start G5 in 2021, including Ireland.

The percentages of boys and girls reaching each International Benchmark across the last three cycles of PIRLS in Ireland are shown in Table 5.4. The vast majority of both boys and girls reached the Low Benchmark consistently across all cycles and no significant gender differences were found at this level. In fact, gender differences are at their smallest in 2021 for the Low, Intermediate, and High Benchmarks, with the gender difference at the High Benchmark decreasing from 8% to 5%. This trend is not seen at the Advanced Benchmark, where the difference between genders increased marginally across each cycle, with 4% more girls reaching this level in 2011 than boys, 5% more in 2016, and 6% more girls attaining this benchmark in 2021. Overall, the performance of both boys and girls at the International Benchmarks has increased with each PIRLS cycle, and gender gaps appear to be reducing at most benchmarks, although girls retain a significant advantage at the highest ones (Appendix Table A5.8).

Table 5.4: Cumulative percentages of boys and girls in Ireland reaching the PIRLS International Benchmarks in 2011, 2016, and 2021

		Low (400 points)	Intermediate (475 points)	High (550 points)	Advanced (625 points)
2011	Boys	96	**82**	**49**	**14**
	Girls (R)	98	88	58	18
2016	Boys	97	88	**58**	19
	Girls (R)	98	90	66	24
2021	Boys	98	90	**65**	**24**
	Girls (R)	98	92	70	30

Source: Appendix Table A5.7.
Note. Percentages in **bold** indicate a significant difference relative to the reference group (R) within each cycle.
Due to rounding, some differences may appear inconsistent with those reported in text.

Performance at benchmarks, by socioeconomic status

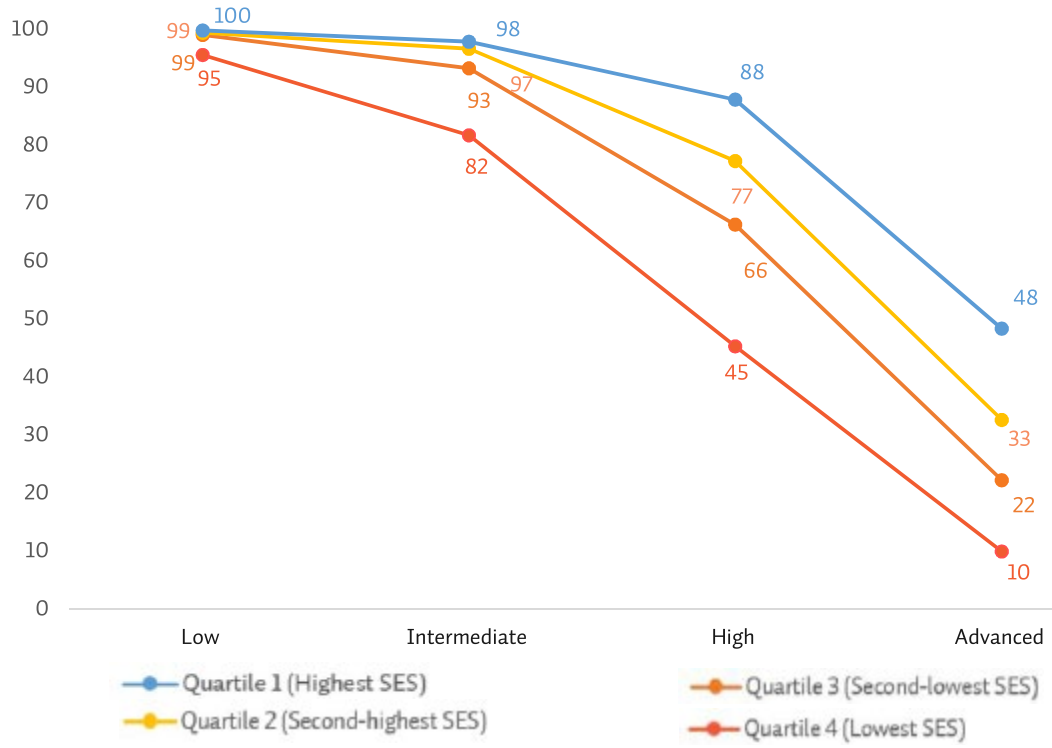
As described in Chapter 3, PIRLS 2021 included a new SES scale that aims to capture a measure of individual socioeconomic status. Figure 5.3 shows the cumulative percentages of pupils within each SES quartile in Ireland (from Quartile 4, with lowest SES, to Quartile 1, with highest SES) that met each International Benchmark.

Almost all pupils within each SES quartile reached the Low Benchmark. There was limited variation at this point, with 95% of pupils from the lowest-SES quartile demonstrating the requisite skills; however, this is still significantly lower than the percentage reaching this benchmark in the highest-SES quartile (100%).

At the Intermediate Benchmark, there is little difference between the percentages of pupils in the highest and second-highest SES quartiles reaching the benchmark. However, significantly fewer pupils from the both the second-lowest and lowest-SES quartiles reached this benchmark, in comparison to pupils from the highest-SES quartile.

At the High Benchmark, the gap between pupils in the different SES quartiles widens substantially, with pupils in the highest-SES quartile having a significant advantage over those in all other quartiles. In particular, twice as many pupils in the highest-SES quartile (88%) reached this benchmark in comparison to those in the lowest-SES quartile (45%). Almost half of pupils from the highest SES quartile (48%) also reached the Advanced Benchmark. This is a significantly higher proportion than in any other SES quartile, and is nearly five times larger than the proportion reaching this benchmark in the lowest-SES quartile (10%) (Appendix Table A5.10).

Figure 5.3: Cumulative percentages of pupils in Ireland reaching each PIRLS International Benchmark, by SES quartile



Source: Appendix Table A5.9.
Note. Due to rounding, some differences may appear inconsistent with those reported in text.

Chapter summary

In PIRLS 2021, large majorities of pupils in Ireland demonstrated the skills and strategies needed to reach both the Low (98%) and Intermediate (91%) Benchmarks. This is similar to the pattern in other high-achieving reference countries. Singapore had the highest percentage of pupils reaching the Advanced Benchmark (35%) across all PIRLS countries. In Ireland, just over a quarter of pupils (27%) reached this benchmark. While this was significantly lower than the percentage in Singapore (End G4), it was higher than the percentage in any other country, including Northern Ireland (Start G5) (23%) and Hong Kong (End G4) (21%). This must be interpreted cautiously, due to the caveats associated with Start G5 testing.

A large majority of pupils in Ireland consistently reached the Low Benchmark across the most recent cycles of PIRLS (2011, 2016, and 2021). There was an increase in the proportion of pupils reaching the Intermediate Benchmark from 2011 to 2021, although the increase between 2016 and 2021 was not significant. The largest increases across cycles were seen at the High and Advanced Benchmarks. The High Benchmark was reached by 5% more pupils in 2021 than in 2016 (and 14% more than in 2011). The Advanced Benchmark was reached by 6% more pupils in 2021 than in 2016 (and 11% more than in 2011). While all trend comparisons involving Ireland's 2021 data should be viewed with caution, it seems reasonable to expect that the proportions of pupils in Ireland reaching the High and Advanced Benchmarks would have been somewhat smaller, but still substantial, if pupils had been tested in spring, as the skills required typically develop over long periods of time.

In Ireland, similar large majorities of both girls and boys reached the Low (boys and girls 98%) and Intermediate (boys 90%; girls 92%) Benchmarks. A small but significant gender gap of 5% was observed at the High Benchmark, with 70% of girls reaching this in comparison to 65% of boys. A similar (marginally larger) difference was found at the Advanced Benchmark, with significantly more girls (30%) than boys (24%) demonstrating the necessary skills. The majority of boys and girls across the reference countries also reached the Low and Intermediate Benchmarks. More variation was found at the High Benchmark, with gender gaps of more than 10% in Lithuania, Poland, and Northern Ireland, and smaller gaps in Singapore and Ireland. At the Advanced Benchmark, there was no significant gender gap in Hong Kong, but significant differences in favour of girls were observed in most reference countries, which ranged in magnitude from 4% to 7%.

The PIRLS *Home Socioeconomic Status* scale was used to assign pupils in Ireland to SES quartiles, which were examined in relation to performance at International Benchmarks. While the vast majority of pupils in each quartile reached the Low Benchmark, this was true for slightly but significantly fewer pupils in the lowest-SES quartile (95%) compared to the highest-SES quartile (100%). The Intermediate Benchmark was reached by almost all pupils in the highest (98%) and second-highest (97%) SES quartiles. However, relative to the highest SES quartile, significantly fewer pupils in both the second-lowest (93%) and lowest (82%) SES quartiles reached the Intermediate Benchmark. The achievement gap between pupils in different SES quartiles widened substantially at the High Benchmark, with almost twice as many pupils in the highest-SES quartile (88%) as in the lowest-SES quartile (45%) demonstrating the relevant skills. Finally, just 10% of pupils in the lowest-SES quartile reached the Advanced Benchmark, while almost five times as many pupils from the highest-SES quartile (48%) reached this level. Overall, the percentage of successful pupils from the lowest-SES quartile drops sharply as the skills required for the High and then Advanced Benchmarks are added to those required for the Intermediate Benchmark, in comparison to more gradual declines for pupils with higher SES.

Chapter 6: Achievement by reading purpose and comprehension process

The PIRLS framework explores reading according to the *purposes* for which children read and the comprehension *processes* they use when reading. As outlined in Chapter 1, two different reading purposes are identified: "Literary" (reading for literary experience), and "Informational" (reading to acquire and use information). In general, each pupil is assessed using both a Literary and an Informational text in order to examine reading for both purposes.[45] Overall performance by purpose is reflected in separate Literary and Informational subscales.

As also described in Chapter 1, the PIRLS framework identifies four reading comprehension processes: focus on and retrieve explicitly stated information ("Retrieve"); make straightforward inferences ("Infer"); interpret and integrate ideas and information ("Interpret"); and evaluate and critique content and textual elements ("Evaluate"). Items across all texts are classified based on the process they are most likely to require. For reporting, the processes are combined to create two reading comprehension subscales: Retrieving and Straightforward Inferencing (referred to as Retrieve/Infer); and Interpreting, Integrating, and Evaluating (referred to as Interpret/Evaluate).

This chapter examines performance on reading purpose and process subscales for PIRLS 2021 pupils in Ireland and in selected countries of interest. Achievement on the various subscales is also compared with that in the previous cycle of PIRLS in 2016. The final two sections in this chapter look at differences in subscale performance by gender and (within Ireland) by socioeconomic status.

Overall performance on reading purpose and process subscales

Reminder

Comparisons between the achievement of countries that tested at End G4 and those that tested at Start G5 (including Ireland) should be made **very cautiously**. Caution is also required to interpret comparisons involving countries that tested one year later than planned (for northern hemisphere countries, in spring 2022).

In a broad sense, countries' performance on the various subscales tended to mirror their overall achievement. Nonetheless, differences in patterns of achievement by reading purpose and reading comprehension process can be seen when comparing countries' means on the various subscales with their overall mean achievement (Table 6.1). Some countries showed a relative strength in performance on either Literary or Informational texts, while others displayed a more even performance across both purposes.

[45] Readers may refer to the Resources section of this report (p. 96) for samples of Literary and Informational texts. It should be noted that, in countries that administered PIRLS digitally, a minority of pupils received two Informational texts (if their "booklet" included at least one ePIRLS text).

Ireland and two of the three other selected Start G5 countries displayed statistically significant advantages in favour of Literary texts. For example, in Ireland, pupils achieved a mean Literary subscale score of 584 (significantly higher than their overall mean score of 577), while the mean score of 574 for Informational reading was slightly but significantly lower than the overall mean. A similar pattern in performance can be seen for both Northern Ireland and Croatia, while pupils in Lithuania achieved relatively even mean scores on both subscales. Of the End G4 reference countries, only Singapore and Australia echoed the pattern of significantly higher performance on Literary texts, although differences were less substantial than for the Start G5 countries. In contrast, End G4 pupils in Hong Kong displayed a significant advantage on Informational reading (582), in comparison to their performance on Literary reading (564) which was significantly below the national mean of 573 points. The Literary mean score in Finland was marginally but significantly below the country's overall mean while the Informational mean score did not differ significantly from the overall mean. For all other End G4 reference countries, scores on reading purpose subscales did not display a bias towards either purpose.

Looking at performance on the two reading comprehension process subscales, most of the reference countries demonstrated significantly higher performance on the Interpret/Evaluate subscale relative to their overall means, with most Retrieve/Infer scores significantly below overall means. This was the case for Ireland and two of its Start G5 counterparts, Northern Ireland and Croatia. Among the End G4 countries, Australia, England, Poland and Singapore displayed a similar pattern. Hong Kong again bucked the general trend, with scores on the Retrieve/Infer subscale significantly above the overall mean while Interpret/Evaluate scores did not differ significantly from the overall mean. Process subscale scores in Finland (End G4) and Lithuania (Start G5) displayed no significant differences from the respective overall means.

Table 6.1: Mean PIRLS achievement scores on reading purpose and comprehension process subscales, in Ireland, selected reference countries, and on average across all PIRLS countries (2021)

		Overall Mean	Purpose		Process	
			Literary	Informational	Retrieve/ Infer	Interpret/Evaluate
Start G5	Ireland	577	**584**↑	**574**↓	**571**↓	**582**↑
	Northern Ireland	566	**573**↑	**562**↓	**558**↓	**573**↑
	Croatia	557	**567**↑	**553**↓	**552**↓	**561**↑
	Lithuania	552	552	553	554	551
End G4	Australia ⋈	540	**543**↑	539	**534**↓	**547**↑
	England ⋈	558	558	559	**554**↓	**561**↑
	Hong Kong SAR	573	**564**↓	**582**↑	**577**↑	572
	Poland	549	552	548	**545**↓	**552**↑
	Finland	549	**547**↓	550	550	549
	New Zealand	521	523	521	521	522
	Singapore	587	**591**↑	586	**584**↓	**591**↑
	PIRLS	503	504	502	502	503

Source: Appendix Table A6.1.
Note. Subscale scores in **bold** indicate a significant difference relative to the country's overall mean score.
Arrow denotes direction of significance (above or below) relative to the overall reading mean.
Countries in *italics* took the test on computer, while those not in italics took it on paper.
⋈ Country tested one year later than planned (autumn 2021 for southern hemisphere countries; spring 2022 for northern hemisphere countries).

Trends in performance on reading purpose and process subscales

This section compares performance on subscales between 2016 and 2021 for Ireland and selected countries. As noted throughout this report and in the reminder box below, it is not possible to engage in straightforward trend comparisons involving the PIRLS 2021 cycle, but what follows is an overview of patterns in subscale performance emerging across the cycles, to be interpreted with the relevant caveats in mind.[46]

Reminder

All trend comparisons of countries' achievement in PIRLS 2021 versus previous cycles should be made cautiously, due to the disruption caused by COVID-19. However, this applies **particularly** to countries that tested at Start G5 in 2021, including Ireland.

Start G5 countries were generally more likely to show an upward or static trend in overall scores between 2016 and 2021, compared to End G4 countries, as presented in Chapter 3. This trend is also reflected in the changes over time in reading purpose subscale scores (Table 6.2) and reading process subscale scores (Table 6.3), for Ireland and our selected countries of interest. The Start G5 countries for which trend data are available, Ireland, Northern Ireland, and Lithuania, all showed relative increases in performance on both the Literary and Informational purpose subscales in PIRLS 2021 (Table 6.2).[47] These upward trends were only significant for Ireland, with a 12-point mean increase on Literary reading and a 9-point mean increase on Informational reading, compared to 2016. The increases for all three countries were relatively smaller for the Informational subscale.

As has been seen, Singapore was an exception among End G4 countries in that it achieved a significant increase in its overall mean score compared to 2016. Singapore was the only End G4 reference country to show a significant increase on the Literary subscale since 2016 (17 points). Singapore's performance on the Informational subscale increased by a smaller and non-significant margin (8 points). This echoes the trend seen in the selected G5 countries of a greater improvement on the Literary subscale. In Hong Kong, mean scores on both purpose subscales were higher in 2021 than 2016, but not to a significant degree. Mirroring overall downward achievement patterns, a number of the selected End G4 countries showed declines on both purpose subscales in 2021. For Australia, declines were not significant, but scores on both subscales for Poland and Finland dropped substantially compared to 2016. The declines were similarly-sized for both reading purposes in each of these countries. England and New Zealand displayed slightly lower Literary achievement and slightly higher Informational achievement compared to the previous cycle of PIRLS, but these differences were not significant.

[46] See Chapter 1, pp. 10-12; Chapter 3, p. 24.
[47] Croatia did not take part in PIRLS 2016.

Table 6.2: Mean PIRLS achievement scores on reading **purpose** subscales, 2016 and 2021, in Ireland and selected reference countries

		Overall Mean (2021)	Literary			Informational		
			2016	2021	Change	2016	2021	Change
	Ireland	577↑	571	584	**+12**	565	574	**+9**
Start G5	Northern Ireland	566	570	573	+3	561	562	+1
	Lithuania	552	547	552	+5	551	553	+2
	Australia ⋈	540	547	543	-4	543	539	-3
	England ⋈	558	563	558	-4	556	559	+3
	Hong Kong SAR	573	562	564	+2	576	582	+6
End G4	Poland	549↓	567	552	**-15**	564	548	**-16**
	Finland	549↓	565	547	**-18**	569	550	**-18**
	New Zealand	521	525	523	-2	520	521	+1
	Singapore	587↑	575	591	**+17**	579	586	+8

Source: Appendix Table A6.2.
Note. Changes in **bold** are statistically significant.
Arrows beside overall mean scores indicate that 2021 overall means have changed significantly (in direction of arrow) since 2016.
Due to rounding, some differences may appear inconsistent.
Countries in *italics* took the test on computer, while those not in italics took it on paper.
⋈ Country tested one year later than planned (autumn 2021 for southern hemisphere countries; spring 2022 for northern hemisphere countries).

Patterns over time of performance on reading comprehension process subscales were more varied (Table 6.3). The Start G5 countries showed some increases across both the Retrieve/Infer and Interpret/Evaluate subscales, but the only significant (and largest) gain among these countries was Ireland's 13-point increase on the Interpret/Evaluate scale.

Singapore and Hong Kong were the only End G4 reference countries to display improvements on the process subscales. Both countries improved significantly on the Retrieve/Infer subscale (+11 and +10 respectively), and Singapore displayed a similarly substantial gain of 12 points on the Interpret/Evaluate subscale. Performance on both subscales dropped or remained the same for all other countries, with significant declines for both processes seen in Poland and Finland. The decreases were relatively even for both processes in Poland (-14 and -17), while in Finland, the drop was larger for the Retrieve/Infer subscale (-22 vs -13).

Table 6.3: Mean PIRLS achievement scores on reading **process** subscales, 2016 and 2021, in Ireland and selected reference countries

		Overall Mean (2021)	Retrieve/Infer			Interpret/Evaluate		
			2016	2021	Change	2016	2021	Change
	Ireland	577↑	566	571	+5	569	582	**+13**
Start G5	Northern Ireland	566	562	558	-4	567	573	+6
	Lithuania	552	549	554	+5	548	551	+3
	Australia ⋈	540	541	534	**-7**	549	547	-2
	England ⋈	558	556	554	-2	561	561	0
	Hong Kong SAR	573	568	577	**+10**	568	572	+4
End G4	Poland	549↓	560	545	**-14**	570	552	**-17**
	Finland	549↓	572	550	**-22**	562	549	**-13**
	New Zealand	521	521	521	0	525	522	-2
	Singapore	587↑	573	584	**+11**	579	591	**+12**

Source: Appendix Table A6.3.
Note. Changes in **bold** are statistically significant.
Arrows beside overall mean scores indicate that 2021 overall means have changed significantly (in direction of arrow) since 2016.
Due to rounding, some differences may appear inconsistent.
Countries in *italics* took the test on computer, while those not in italics took it on paper.
⋈ Country tested one year later than planned (autumn 2021 for southern hemisphere countries; spring 2022 for northern hemisphere countries).

Differences in performance on reading purpose and process subscales, by gender

Girls in Ireland and in all selected reference countries achieved higher mean scores than boys on both the Literary and Informational reading purpose subscales (Table 6.4). In Ireland and all these countries, the gender gap was larger for Literary than Informational reading, and all gender gaps on Literary reading were significant. All gender gaps on Informational reading were also significant apart from those in Ireland and Hong Kong, where differences between boys and girls were less substantial. The gender gaps for pupils in Ireland, of 17 points on the Literary subscale and 6 points on the Informational subscale, were both smaller than the PIRLS international mean gaps of 22 and 15 points respectively. Ireland's gaps were broadly similar in magnitude to those in England and Croatia. The other reference countries, including high-performing countries such as Singapore and Northern Ireland, had larger gender gaps, in line with or above the international average. In Australia, the gender gap for Literary reading was larger than the international average, while the gap for Informational reading was only about half of the international average.

Table 6.4: Mean achievement scores on PIRLS reading **purpose** subscales, in Ireland, selected reference countries, and on average across all PIRLS countries, by gender (2021)

			Literary			Informational		
		Overall Mean	Boys	Girls	Mean advantage of girls over boys	Boys	Girls	Mean advantage of girls over boys
	Ireland	577	576	593	**17**	571	577	6
Start G5	Northern Ireland	566	559	587	**28**	552	571	**19**
	Croatia	557	559	576	**17**	549	557	**7**
	Lithuania	552	540	566	**26**	543	562	**19**
	Australia ⋈	540	531	557	**26**	535	545	**9**
	England ⋈	558	551	565	**15**	555	563	**8**
	Hong Kong SAR	573	558	571	**12**	580	585	5
End G4	Poland	549	540	565	**25**	542	555	**14**
	Finland	549	538	558	**21**	544	558	**15**
	New Zealand	521	511	538	**27**	514	530	**15**
	Singapore	587	580	604	**24**	579	594	**15**
	PIRLS	503	493	515	**22**	495	510	**15**

Source: Appendix Table A6.4.
Note. Mean advantages in **bold** are statistically significant.
Due to rounding, some differences may appear inconsistent.
Countries in *italics* took the test on computer, while those not in italics took it on paper.
⋈ Country tested one year later than planned (autumn 2021 for southern hemisphere countries; spring 2022 for northern hemisphere countries).

Girls also outperformed boys on both reading comprehension process subscales across all reference countries (Table 6.5). These differences were significant for both subscales in all of these countries. However, the gender gaps for both process subscales in Ireland were lower than the respective international averages: 9 vs 18 points on the Retrieve/Infer subscale and 12 vs 17 points on the Interpret/Evaluate subscale. As was the case with the reading purpose subscales, England and Croatia displayed fairly similar gender gaps to Ireland for each process subscale. Hong Kong had the lowest gender gaps on both process subscales. Gender differences for most other reference countries were close to or larger than the international PIRLS mean on one or both subscales.

Table 6.5: Mean achievement scores on PIRLS reading **process** subscales, in Ireland, selected reference countries, and on average across all PIRLS countries, by gender (2021)

			Retrieve/Infer			Interpret/Evaluate		
		Overall Mean	Boys	Girls	Mean advantage of girls over boys	Boys	Girls	Mean advantage of girls over boys
Start G5	Ireland	577	567	577	**9**	576	588	**12**
	Northern Ireland	566	547	568	**21**	561	586	**24**
	Croatia	557	548	558	**10**	556	567	**10**
	Lithuania	552	543	566	**23**	542	561	**19**
End G4	Australia ⋈	540	526	543	**17**	538	557	**19**
	England⋈	558	549	560	**11**	556	567	**11**
	Hong Kong SAR	573	574	582	**8**	569	576	**7**
	Poland	549	537	555	**19**	543	564	**21**
	Finland	549	542	559	**17**	542	557	**15**
	New Zealand	521	513	532	**19**	514	534	**20**
	Singapore	587	575	593	**18**	583	599	**16**
	PIRLS	503	494	512	**18**	495	512	**17**

Source: Appendix Table A6.5.
Note. Mean advantages in **bold** are statistically significant.
Due to rounding, some differences may appear inconsistent.
Countries in *italics* took the test on computer, while those not in italics took it on paper.
⋈ Country tested one year later than planned (autumn 2021 for southern hemisphere countries; spring 2022 for northern hemisphere countries).

Differences in performance on reading purpose and process subscales, by socioeconomic status

Differences in performance on reading purposes and processes for pupils in Ireland were examined with reference to pupils' socioeconomic status, as indicated by SES quartile. Analysis in Chapter 3 indicates that there are significant differences in overall reading achievement for each SES quartile, with a downward progression from the highest- to the lowest-SES groupings. This trend is also apparent when looking at performance by reading purpose and process, as seen in Tables 6.6 and 6.7. The mean score on the Literary subscale for the highest-SES quartile (628) is significantly above corresponding scores for all other quartiles, with a substantial gap of 85 points between the mean scores of the highest- and lowest-SES quartiles. Similar patterns can be seen for Informational reading and both the reading process subscales, with gaps between the achievement of the highest- and lowest-SES quartiles ranging from 80 to 85 points across these subscales.

Table 6.6: Mean achievement on PIRLS **purpose** subscales in Ireland, by SES quartile (2021)

SES Quartile	Literary	Mean disadvantage compared to Quartile 1	Informational	Mean disadvantage compared to Quartile 1
Quartile 1 - Highest SES (R)	628	N/A	616	N/A
Quartile 2 - 2nd Highest SES	599	**-29**	592	**-24**
Quartile 3 - 2nd Lowest SES	582	**-46**	573	**-44**
Quartile 4 - Lowest SES	543	**-85**	532	**-85**

Source: Appendix Table A6.6.
Note. Mean disadvantages in **bold** are statistically significant relative to the reference group (R).

Table 6.7: Mean achievement on PIRLS **process** subscales in Ireland, by SES quartile (2021)

SES Quartile	Retrieve/ Infer	Mean disadvantage compared to Quartile 1	Interpret/ Evaluate	Mean disadvantage compared to Quartile 1
Quartile 1 - Highest SES (R)	612	N/A	623	N/A
Quartile 2 - 2nd Highest SES	588	**-24**	599	**-24**
Quartile 3 - 2nd Lowest SES	570	**-42**	580	**-43**
Quartile 4 - Lowest SES	532	**-80**	541	**-82**

Source: Appendix Table A6.6.
Note. Mean disadvantages in **bold** are statistically significant relative to the reference group (R).

Chapter summary

The performance of Ireland and selected countries on reading purpose and process subscales broadly mirrored overall achievement patterns described in Chapter 3, but relative strengths for some countries on specific purpose and process scales were evident. Ireland showed a relative strength in performance on Literary texts. The average score in Ireland on the Literary purpose subscale was significantly above Ireland's overall mean reading score, while the average Informational purpose score was significantly (although marginally) below it. A similar pattern for reading purpose scores was seen in two of the other Start G5 countries, Northern Ireland and Croatia. Ireland, and again Northern Ireland and Croatia, also displayed significant relative strengths on the Interpret/Evaluate reading comprehension process subscale, in comparison to the Retrieve/Infer subscale. Singapore was the only End G4 selected country to mirror this pattern of achievement to a significant extent on all four of the subscales. Hong Kong's performance on the subscales appeared to be the reverse of this, with achievement on the Informational subscale significantly above the overall mean and achievement on the Literary subscale significantly below it. Hong Kong was also the only selected country to display a significant advantage on the Retrieve/Infer subscale rather than the Interpret/Evaluate subscale relative to the overall mean.

Comparing subscale scores between 2016 and 2021, the direction of differences over time was generally reflective of trends in overall performance, as described in Chapter 3. Ireland, the only Start G5 country of the reference group for which overall performance improved significantly, was also the only Start G5 country to display any significant changes in subscale scores. There were improvements seen in performance on both purpose subscales relative to 2016, with a 12-point increase on Literary reading and a 9-point increase on Informational reading. Ireland's improvement of 13 points on the Interpret/Evaluate scale was the only significant change on process subscales among the Start G5 countries, with no significant change in performance on the Retrieve/Infer scale noted.

Pupils in Singapore, an End G4 country, achieved a substantial increase of 17 points on the Literary purpose subscale compared to 2016. Singapore also achieved significant gains on both process subscales while Hong Kong did so for the Retrieve/Infer scale. The positive trends on subscales in these countries are reflective of higher overall achievement in 2021 compared to 2016. In contrast, in countries such as Poland and Finland, where significant drops in overall performance in 2021 were reported, significant declines were noted across all four subscales.

Gender gaps in favour of girls were evident to varying degrees across all reading purpose and process subscales. Girls significantly outperformed boys on the Literary purpose subscale in Ireland and all selected countries. This was also the case for the Informational reading subscale, with exceptions in Ireland and Hong Kong where the mean performance of boys was closer to that of girls. The gender gaps in Ireland were smaller than on average internationally and similar in magnitude to those seen in England and Croatia for all four subscales. Hong Kong had the smallest gender gaps on all scales. Gender differences for most other selected countries tended to be close to or above the international PIRLS average across the subscales.

Examining the performance of pupils in Ireland on the four subscales according to socioeconomic status (SES quartiles), a clear pattern emerged of decreasing achievement on all four subscales in line with declining levels of socioeconomic advantage.

Chapter 7: Learning in Ireland during lockdown

As part of the PIRLS assessment in 2021, participating pupils, parents/guardians,[48] Fifth Class teachers,[49] and school principals[50] were each asked to complete a questionnaire, as described in Chapters 1 and 2. This chapter highlights their responses to questions relating to educational experiences during, and resulting from, periods of lockdown and remote learning due to COVID-19. In particular, a number of questions provided information about the period of school closures at a national level that occurred in Ireland during the academic year 2020/21, which preceded PIRLS testing in autumn 2021. The focus in this chapter is on Ireland only, and findings are reported at a high level rather than being split by subgroups (e.g., gender, SES).

First, the resources provided by schools to support remote learning are examined, from the perspectives of both school principals and parents. Additional resources sourced by parents are also considered, along with reading activities at home during closure periods, as reported by both parents and pupils. Finally, we present the overall reflections of parents and teachers about the impact of the COVID-19 pandemic on pupils' learning, as well as initiatives that were in place in schools to address this impact (as reported by teachers).

In this chapter and the next one, the reading achievement of pupils is sometimes explored in relation to their experiences and behaviours. Readers are reminded that it is not possible to draw conclusions about cause and effect from these analyses of cross-sectional data. In other words, while a particular experience may be *associated* with higher or lower reading achievement, we cannot say that the experience *causes* reading achievement to increase or decrease.

Home-based learning in Ireland during the COVID-19 school closures

School principals' perspectives

All schools that took part in PIRLS 2021 in Ireland were physically closed from January to early March of 2021 as part of the national response to the COVID-19 pandemic (see Chapter 2). With this in mind, school principals were asked to report the extent to which their schools supported remote methods of teaching and learning during these national closures, or during any shorter-term, school-level closures due to localised spread of COVID-19. These questions related to the previous academic year (2020/21) only. In other words, principals were not asked about what had happened during the first period of lockdown in spring-summer 2020.

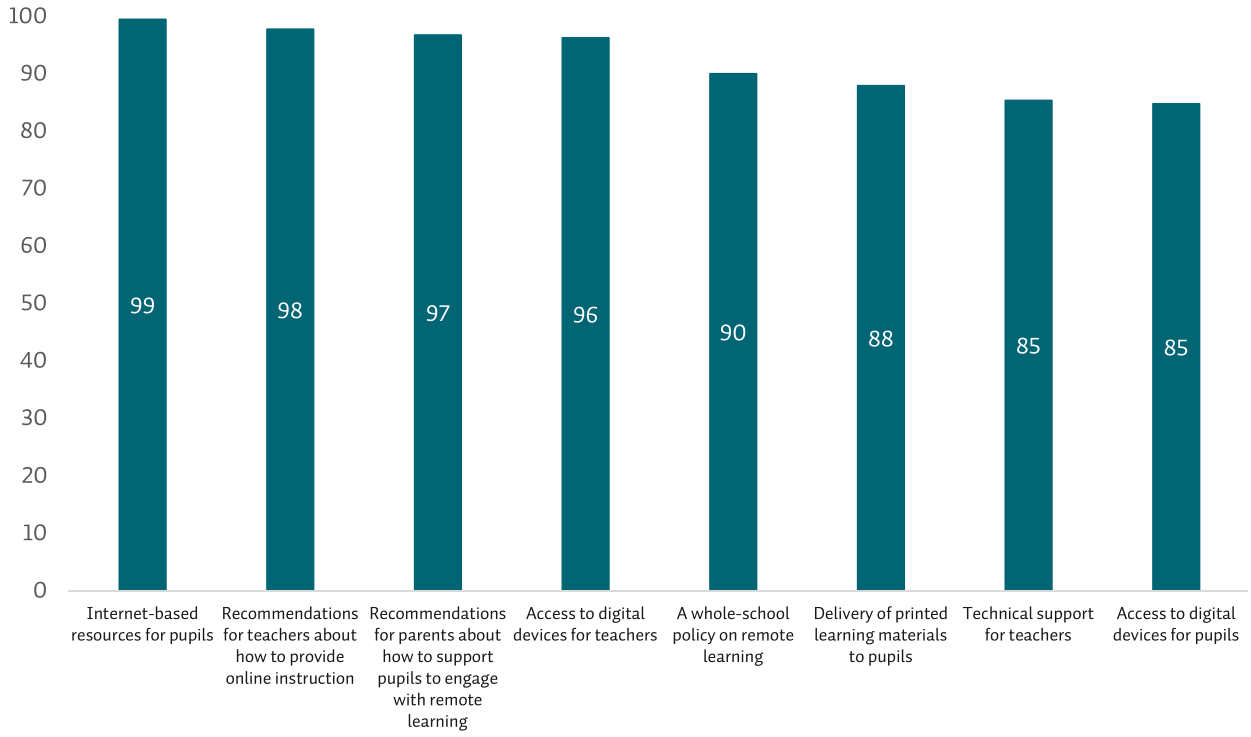
Overall, large percentages of pupils in Ireland had principals who reported the provision of various forms of school support for remote learning. Nine out of ten pupils (90%) had principals who reported that their schools had developed a whole-school policy on remote learning, while the principals of 88% reported that their schools provided printed materials for pupils when they were learning remotely. Almost all pupils had principals that reported their schools provided pupils with Internet-based resources during remote learning (99%), with principals of 85% reporting that they provided pupils with access to devices while they learned at home. Additionally, almost all pupils had principals who stated that their schools supplied teachers with recommendations on how to provide online instruction (98%) and with digital devices for teachers to use (96%). However, somewhat fewer pupils had principals who reported being able to provide technical support for teachers (85%). The vast majority of PIRLS pupils had principals who reported reaching out to parents and providing them with recommendations on how to support pupil engagement with remote learning (97%).

[48] Throughout the remainder of the chapter, the term "parents" is used to refer to both parents and guardians of pupils.

[49] In Ireland, Fifth Class teachers (who taught the pupils at the time of testing in autumn 2021) were asked to complete the main PIRLS Teacher Questionnaire. However, in End G4 countries and some other Start G5 countries, this questionnaire was administered to the Fourth grade teacher from the previous year.

[50] Data provided by principals and teachers are analysed at the pupil level . For example, we report that x% of pupils had principals who responded to a question in a particular way, rather than reporting that x% of principals responded in that way.

Figure 7.1: Percentages of pupils in Ireland whose schools provided various methods of support for remote learning (as reported by principals)



Source: Appendix Table A7.1.

Parents' perspectives

Parents of PIRLS pupils were asked to recall the ways in which schools had engaged with pupils during periods of home-based learning (Table 7.1). Almost three-quarters of parents reported that schools provided reading assignments for pupils during these periods (74%). This could either have been online or in print, as the mode of reading was not specified in the question. However, parents were also asked specifically whether schools provided either online or paper materials (not necessarily related to reading). A large majority of parents reported that schools provided online activities for pupils to engage with at home (94%). A much lower proportion (56%) reported that schools provided printed learning materials for pupils to use. This is substantially lower than school principals had indicated. It is also worth noting that public health advice at the time placed a general emphasis on limiting shared use of physical items, so this may have led to an emphasis on digital/non-physical educational resources (e.g., if there was a doubt as to whether teachers would be in a position to collect and correct hard copies).

Table 7.1: Percentages and mean PIRLS achievement of pupils in Ireland, by parents' reports of whether schools provided various resources during home-based learning

	Yes		No	
	%	Mean	%	Mean
Reading assignments	74	589	26	565
Online activities	94	584	6	559
Printed learning materials	56	587	44	576

Source: Appendix Table A7.2.
Note. Due to rounding, reported percentages may not always sum to 100%.

Parents were asked what resources they themselves provided for pupils during home-based learning. The majority of parents in Ireland reported that they provided physical resources, with similar proportions reporting that they provided books and that they provided digital devices (82% in each case). Digitally-based learning activities were also a popular resource in PIRLS pupils' homes, with 70% of parents reporting that they provided these, although there was no definition of what these activities might involve (e.g., games/exercises, watching videos) or what subject areas they might relate to (e.g., literacy, numeracy, etc.). Half of parents in Ireland (50%) reported that they provided pupils with online instruction or tutoring during home-based learning. However, this option was not defined further and it is likely that interpretations of it varied. In particular, it seems probable that some parents included online instruction offered by their children's school and that others did not.

Table 7.2: Percentages and mean PIRLS achievement of pupils in Ireland, by whether or not their parents provided various additional educational resources during school closures

	Yes		No	
	%	Mean	%	Mean
Books	82	586	18	566
Digital devices	82	586	18	562
Digitally-based learning activities	70	585	30	575
Online instruction or tutoring	50	581	50	583

Source: Appendix Table A7.3.
Note. Due to rounding, reported percentages may not always sum to 100%.

Parents in Ireland were also asked how often pupils read at home during school closures, both as part of their assigned schoolwork and in addition to this work (either by themselves or with an adult). Almost all parents reported that their children had engaged in reading as part of assigned schoolwork *at least once a week* (97%), with 82% doing so *every day or almost every day*. Outside of assigned schoolwork, parents reported that half of pupils read *every day or almost every day* (50%), with a further 37% of parents reporting that pupils did this *once or twice a week*. Pupils who read more frequently during lockdown (as reported by parents) tended to have higher mean reading achievement in PIRLS, regardless of whether reading took place as part of school work, or outside of this. For example, pupils who read *every day or almost every day* achieved significantly higher reading mean scores than pupils who read less often (Appendix Table A7.5).

Table 7.3: Percentages and mean PIRLS achievement of pupils in Ireland, by the frequency with which they read at home during school closures (as reported by parents)

	Every day or almost every day		Once or twice a week		Once or twice a month		Never or almost never		Not sure	
	%	Mean	%	Mean	%	Mean	%	Mean	%	Mean
Read as part of their assigned school work	82	587	15	565	1	~	1	~	0	~
Read in addition to assigned school work	50	599	37	574	8	558	5	552	1	~

Source: Appendix Table A7.4.
Note. Due to rounding, reported percentages may not always sum to 100%.
~ Mean achievement is not reported due to insufficient data.

Pupils' perspectives

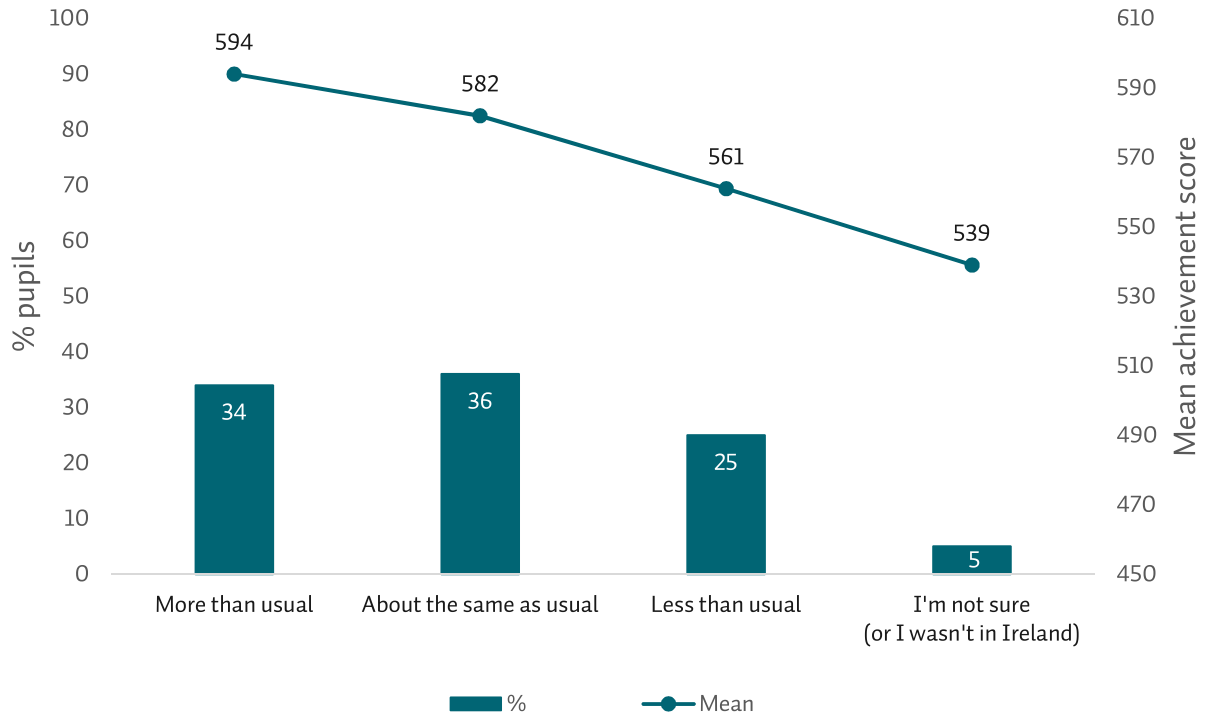
Pupils themselves were asked to think back to when their school was closed and to say how often during that time they had read in two ways: on paper (e.g., books, magazines), and using digital devices (e.g., computer, phone, e-reader). The answer options were presented as relative to what was "usual" for each pupil, meaning that there could have been considerable variation between pupils selecting each category, depending on what their "usual" reading involved.

Around a third of PIRLS pupils reported they read on paper *more than usual* (34%) when schools were closed, with a roughly similar proportion reporting that the time they spent reading on paper was *about the same as usual* (36%). However, some pupils reported a decrease in their frequency of print reading, with 25% reading *less than usual* on paper during this time (Figure 7.2).

About two-fifths of pupils in Ireland reported an increase in time spent reading via digital devices when schools were closed, with 40% reporting that they read on a screen *more than usual*. A third of pupils reported that the time they spent reading using digital devices was *about the same as usual* (33%), with just over one-fifth reporting they did this *less than usual* (21%) (Figure 7.3).

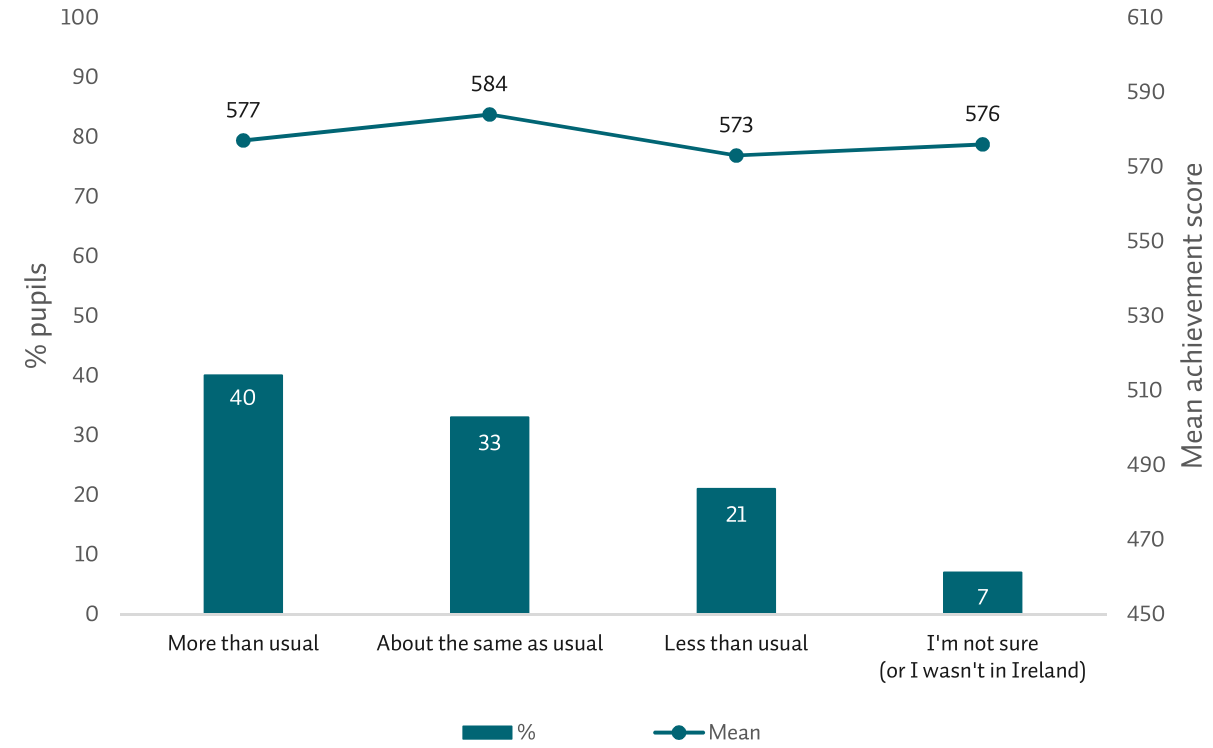
Examining pupils' reading achievement in PIRLS, those who read *more than usual* on paper during lockdown achieved significantly higher mean scores than those who did this *as much as*, or *less than usual*. However, for pupils reading via digital devices, there was no significant advantage for those who did this *more than usual*, compared to peers who did this either *about the same as* or *less than usual* (Appendix Table A7.7).

Figure 7.2: Percentages and mean PIRLS achievement of pupils in Ireland, by frequency of reading on **paper** during lockdown, relative to their own usual behaviour



Source: Appendix Table A7.6.
Note. Due to rounding, reported percentages may not always sum to 100%.

Figure 7.3: Percentages and mean PIRLS achievement of pupils in Ireland, by frequency of reading on a **screen** during lockdown, relative to their own usual behaviour



Source: Appendix Table A7.6.
Note. Due to rounding, reported percentages may not always sum to 100%.

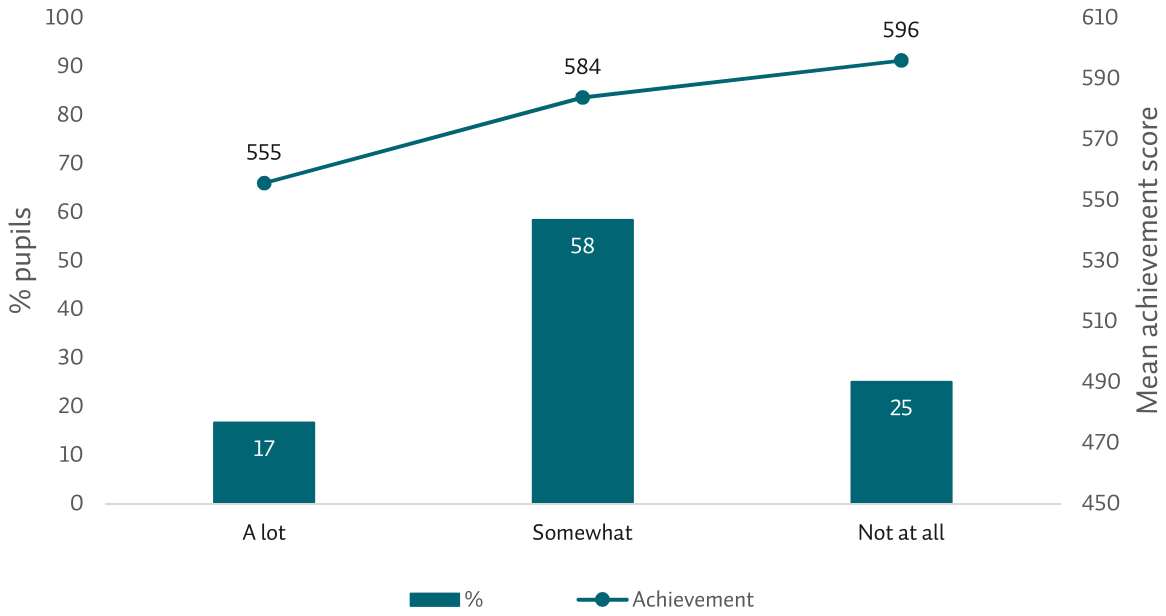
Impact of COVID-19 pandemic on learning

PIRLS 2021 took place in Ireland in the autumn of 2021. At this time, schools had reopened and COVID-19 restrictions were slowly easing nationally, although some protective measures remained in place in all schools and there was also variation between schools' policies. The Home and Teacher Questionnaires asked parents and Fifth Class teachers to reflect on the overall impact of the COVID-19 pandemic on pupils' learning.

Parents' perspectives

Parents were asked to report the extent to which they thought pupils' learning (in general) had been negatively affected by school closures (Figure 7.4). The majority of parents in Ireland reported that pupils' learning had been affected *somewhat* (58%), with just 17% reporting that pupils' learning had been affected *a lot*. A quarter of parents reported no effect at all (25%). Pupils whose parents reported that their learning was *not at all* affected had a significantly higher mean reading score in PIRLS (596) than pupils whose parents reported some level of impact (Appendix Table A7.9), with those whose parents reported that they had been affected *a lot* having the lowest mean score (555).

Figure 7.4: Percentages and mean PIRLS achievement of pupils in Ireland, by the extent to which their parents thought their learning had been negatively affected by school closures



Source: Appendix Table A7.8.
Note. Due to rounding, reported percentages may not always sum to 100%.

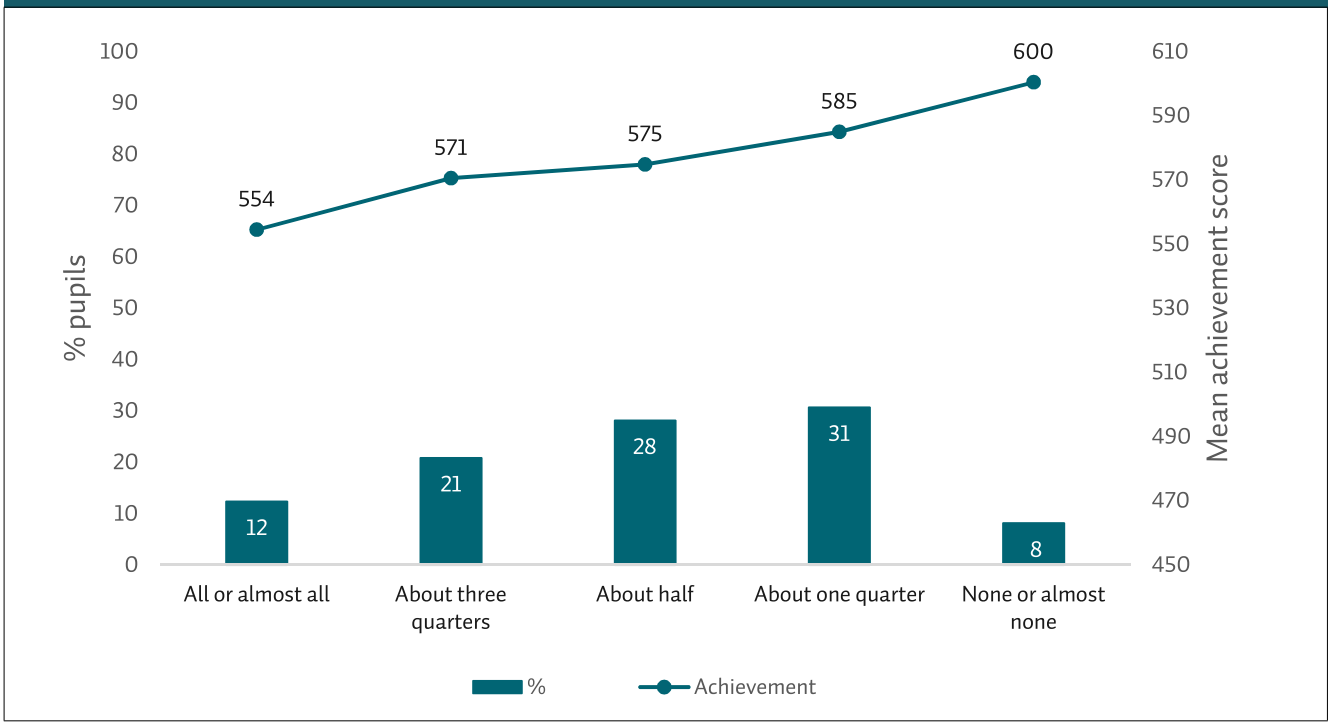
Teachers' perspectives

Fifth Class teachers of PIRLS pupils were asked to indicate what proportion of their class had been negatively affected by the challenges caused by the COVID-19 pandemic, in terms of *literacy* development specifically. However, it should be noted that, as PIRLS took place in autumn 2021 in Ireland, in most cases the Fifth Class teachers completing the questionnaires had only been teaching PIRLS pupils for a short time.

The vast majority of pupils were in classes where teachers thought that literacy had been affected to some degree, with only 8% of pupils having teachers who reported that *none or almost none* of their class had been affected. A majority of pupils (59%) were taught by teachers who reported that between *about one quarter* and *about half* their class had been negatively affected. Just over a fifth of pupils (21%) had teachers who thought that the literacy learning of *about three quarters* of their class was affected by the pandemic. A smaller proportion of pupils (12%) had teachers who reported that *all or almost all* of their class had been negatively affected by the pandemic in terms of literacy.

As the proportion of the class for which literacy was negatively affected increased (as reported by teachers), pupils' mean PIRLS reading scores decreased significantly. Pupils whose teachers reported an effect on *none or almost none* achieved a significantly higher mean score than pupils whose teachers reported that their classes were affected to any greater extent (Appendix Table A7.11).

Figure 7.5: Percentages and mean PIRLS achievement of pupils in Ireland, by the proportion of their class for which literacy development was negatively affected by the COVID-19 pandemic, according to teachers

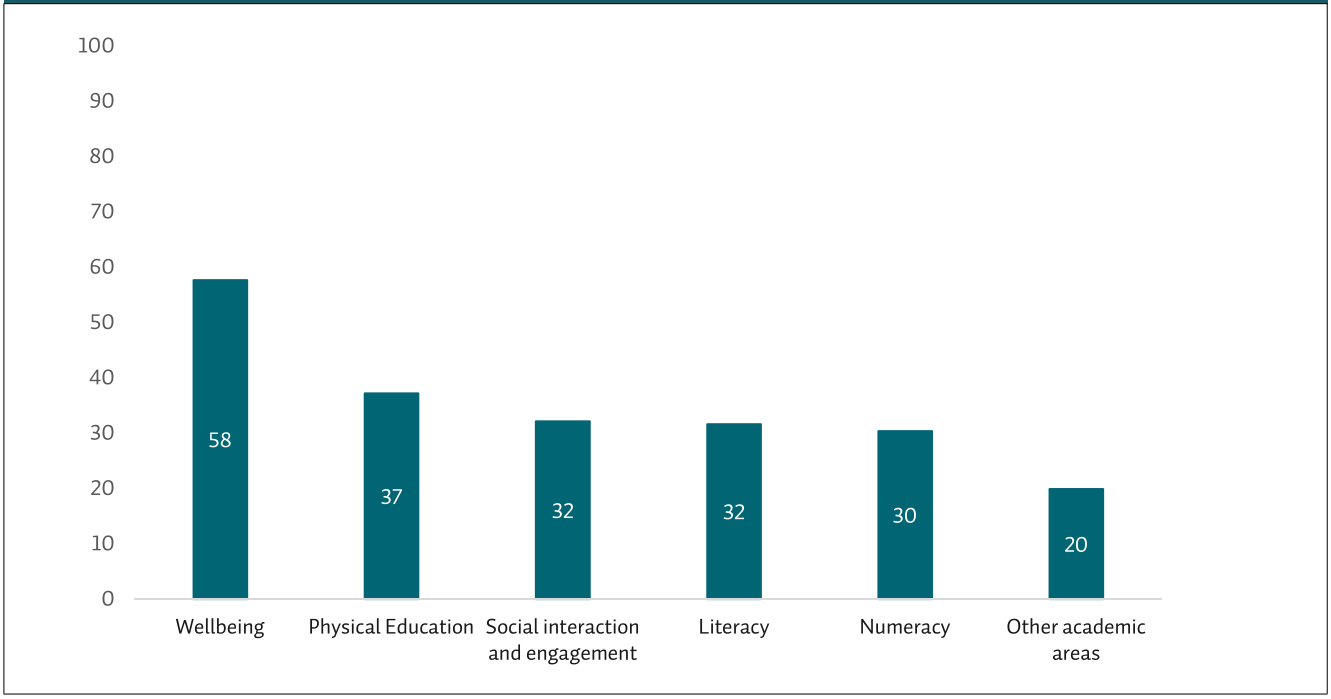


Source: Appendix Table A7.10.
Note. Due to rounding, reported percentages may not always sum to 100%.

Fifth Class teachers were asked whether their school had provided a DoE-funded summer programme in 2021 (Appendix Table A7.12). Two-fifths (40%) of pupils were in schools that had provided a summer programme, while three-fifths (60%) were not. Where schools had provided a programme, teachers generally indicated that the programmes had emphasised literacy at least *to some extent*. However, teachers also indicated that summer programmes had been attended by relatively few pupils in the PIRLS classes. Within the subgroup whose schools ran a programme, most (71%) were in classes where *none or almost none* had attended the programme, with 24% in classes where *about one quarter* had attended.

Fifth Class teachers were also asked whether, at the time of testing, their class was involved in any plans or initiatives that focused on addressing the impact of the COVID-19 pandemic on various aspects of pupils' development (Figure 7.6).[51] Over half of pupils had teachers who reported that there were initiatives focusing on pupils' wellbeing (58%), while over a third had teachers who reported that initiatives were in place to address physical education (37%). Just under a third of pupils had teachers who reported that there were plans in place to address social interaction and engagement (32%). Similar proportions of pupils were taught by teachers who reported that specific initiatives were in place to deal with any impact on pupils' literacy (32%) and numeracy (30%).

Figure 7.6: Percentages of pupils in Ireland whose classes were involved in initiatives or plans to address the impact of the COVID-19 pandemic on various areas of development, according to teachers



Source: Appendix Table A7.13.

Chapter summary

The aim of this chapter was to provide an insight into the environment of home-based learning that PIRLS pupils in Ireland experienced during school closures due to the COVID-19 pandemic. While pupils experienced nationwide closures both in 2020 (when they were in Third Class) and in 2021 (in Fourth Class), the PIRLS questionnaires focused more on the 2021 closures as these would have been most recent in participants' memories.

Principals in Ireland reported providing a variety of methods to accommodate home-based learning. The majority of pupils had principals whose schools provided resources to use during home-based learning, from Internet-based resources and printed materials, to devices for (at least some) pupils to use. Many pupils had principals who reported providing teachers with recommendations for online instruction, as well as assistance in the form of digital devices and technical support. Almost all pupils had principals who reported that their schools also provided parents with recommendations on how to develop remote learning in the home. Parents of PIRLS pupils were also asked to recall what schools had provided in relation to remote learning. The majority of parents reported that schools had provided pupils with online activities and, to a lesser extent, reading assignments (though the mode of reading assignments was unspecified). Fewer parents reported that printed learning materials were provided by the school.

[51] This could have included, but was not limited to, initiatives implemented under the CLASS scheme (described in Chapter 2).

Parents in Ireland were asked to report on the resources they themselves had provided to pupils during periods of remote learning. The majority of parents reported providing physical resources such as books and digital devices, as well as sourcing digitally-based learning activities for pupils to use. Fewer parents reported sourcing online instruction or tuition; however, it is possible that some parents included the online lessons provided by schools when answering this question, and that others did not. Parents also reported how frequently pupils read at home during remote learning, both as part of their schooling and outside of school work. Parents reported that the majority of pupils read quite frequently as part of their school work, with almost all doing this at least once a week and most (82%) doing this daily. Parents also reported that half of pupils read outside of their school work *every day or almost every day* during the closure period.

Pupils themselves were asked to recall how often during school closures, relative to their own "normal behaviour", they had read via different modes (paper or digital devices). Across both modes, more than a third of pupils reported reading *more than usual* during this period, and the proportion was higher for digital than paper reading. Around a third of pupils read *about the same* amount as usual (on both modes). Almost a quarter of pupils reported reading *less than usual* on each mode when schools were closed (with slightly more reporting this for paper than digital reading). Frequency of reading during lockdown had a different association with PIRLS achievement depending on the mode of reading. Specifically, pupils who had read more frequently than usual on paper had a significantly higher mean score that those who did so less frequently, but no significant differences in achievement were observed based on the relative frequency with which pupils had read on a screen.

Both parents and Fifth Class teachers were asked to what extent they thought the COVID-19 pandemic and related closures had negatively impacted pupils' learning. Most parents in Ireland stated that the pandemic did have some effect on their children's learning, with the majority reporting a moderate effect. However, a quarter of parents reported no negative effects at all on pupils' learning. Pupils whose parents reported that their learning was *not at all* affected achieved a significantly higher PIRLS mean score than their peers. This could indicate that parents' views reflect pupils' actual progress; however, further analysis is required to explore the possible interaction of this with other variables, such as SES. In relation to impacts on *literacy* learning at class level, the majority of pupils had a Fifth Class teacher who reported that some proportion of their class was indeed affected by the pandemic. A relatively small percentage of pupils (12%) were taught by a teacher who reported that literacy had been affected for *all or almost all* of the class. However, the majority of pupils had a teacher who reported that a moderate proportion of pupils in their class had been affected by the pandemic. The small percentage of pupils whose teachers reported that *none or almost none* of their class was affected, in terms of literacy learning, had a significantly higher mean PIRLS score than pupils whose teachers reported that some proportion of their class was affected.

Finally, Fifth Class teachers were asked about whether their schools had provided summer programmes and whether any initiatives or plans were in place at the time of testing to deal with the impact of the pandemic. Teachers of two-fifths of pupils reported that their schools had offered a summer programme, with most such programmes placing at least some emphasis on literacy. However, in schools where summer programmes were available, teachers generally indicated that these had been attended by relatively few pupils in the PIRLS classes. At the time of testing, according to teachers, over half of pupils were involved in a specific initiative to support their wellbeing, with over a third of pupils involved in an initiative to support their physical education. Slightly smaller proportions of pupils (still close to a third) had teachers who reported that specific plans were in place to support pupils' social interaction and engagement, as well as literacy and numeracy.

Chapter 8: Back in the classroom: Wellbeing and attitudes to reading after the lockdowns

While Chapter 7 considered pupils' experiences during periods of school closure/remote learning, Chapter 8 provides a contextual snapshot at the time of testing (autumn 2021), some months after the return to in-person education. Measures relating to pupils' and teachers' wellbeing, and to pupils' attitudes to reading and reading behaviour, are explored. Data for Ireland only are analysed here, and these are not broken down by subgroup (e.g., gender, SES).

Wellbeing

The wellbeing of pupils was a key concern in the education community during and after the 2020 and 2021 periods of school closure/remote learning. Wellbeing featured prominently in guidance provided to schools in Ireland about how to approach the return to in-person learning. The wellbeing of teachers was also of concern, as both the demands of adapting to remote teaching and the widespread uncertainty about the safety of returning to classrooms were widely acknowledged to be sources of stress.

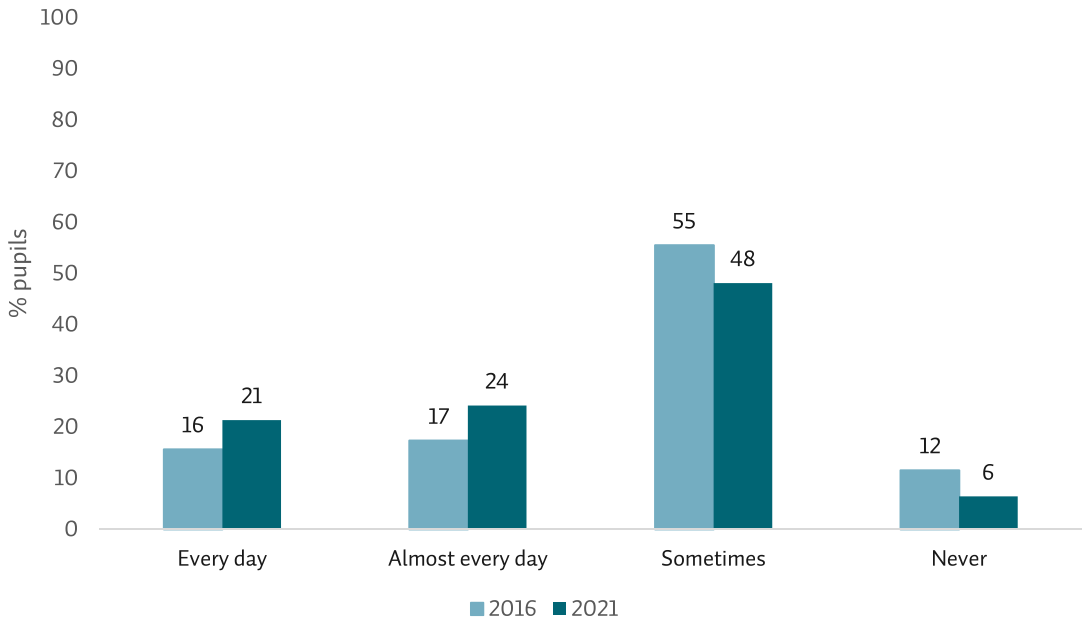
Pupils' wellbeing

Arriving at school tired and/or hungry

PIRLS pupils were asked to say how often they felt tired and felt hungry when they arrived at school. Feeling tired and/or hungry *every day* or *almost every day* suggests lower levels of physical wellbeing, and pupils who feel this way on a regular basis are likely to have less energy to expend on learning.

Most pupils in Ireland (94%) at least *sometimes* felt tired on arrival at school, with over one-fifth (21%) feeling tired *every day* and a further 24% feeling tired *almost every day* (Figure 8.1). This represents an increase in tiredness when compared to the figures from PIRLS 2016. While feeling tired at least *sometimes* was also common in that cycle (88%), significantly smaller percentages of pupils reported feeling tired *every day* (16%) or *almost every day* (17%). In both cycles, the reading achievement of pupils who reported feeling tired *every day* was substantially lower than that of their peers (Appendix Table A8.1).

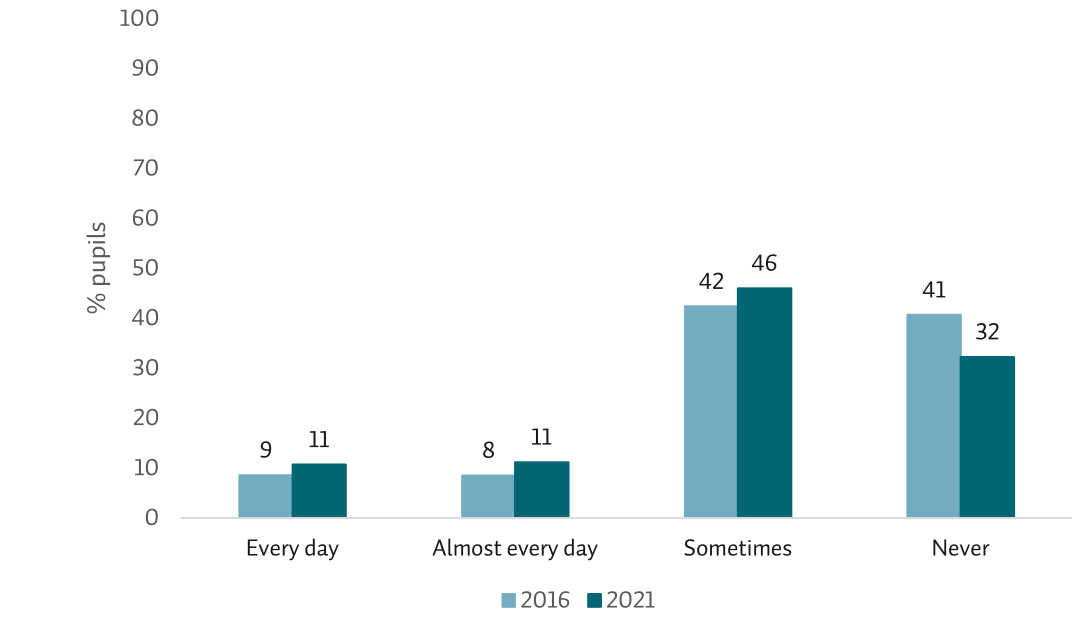
Figure 8.1: Percentages of pupils in Ireland in PIRLS 2016 and 2021, by the frequency with which they felt **tired** on arrival at school



Source: Appendix Table A8.1.
Note. Due to rounding, reported percentages may not always sum to 100%.

In 2021, just over one in 10 pupils in Ireland (11%) felt hungry *every day* on arrival at school, and a further 11% experienced this *almost every day* (Figure 8.2). This represents a slight but statistically significant increase in the prevalence of hunger from 2016. In both cycles, there was a negative association between the frequency of feeling hungry and reading achievement, with pupils who arrived hungry *every day* having the lowest mean achievement score and pupils who *never* arrived hungry having the highest (Appendix Table A8.2).

Figure 8.2: Percentages of pupils in Ireland in PIRLS 2016 and 2021, by the frequency with which they felt **hungry** on arrival at school



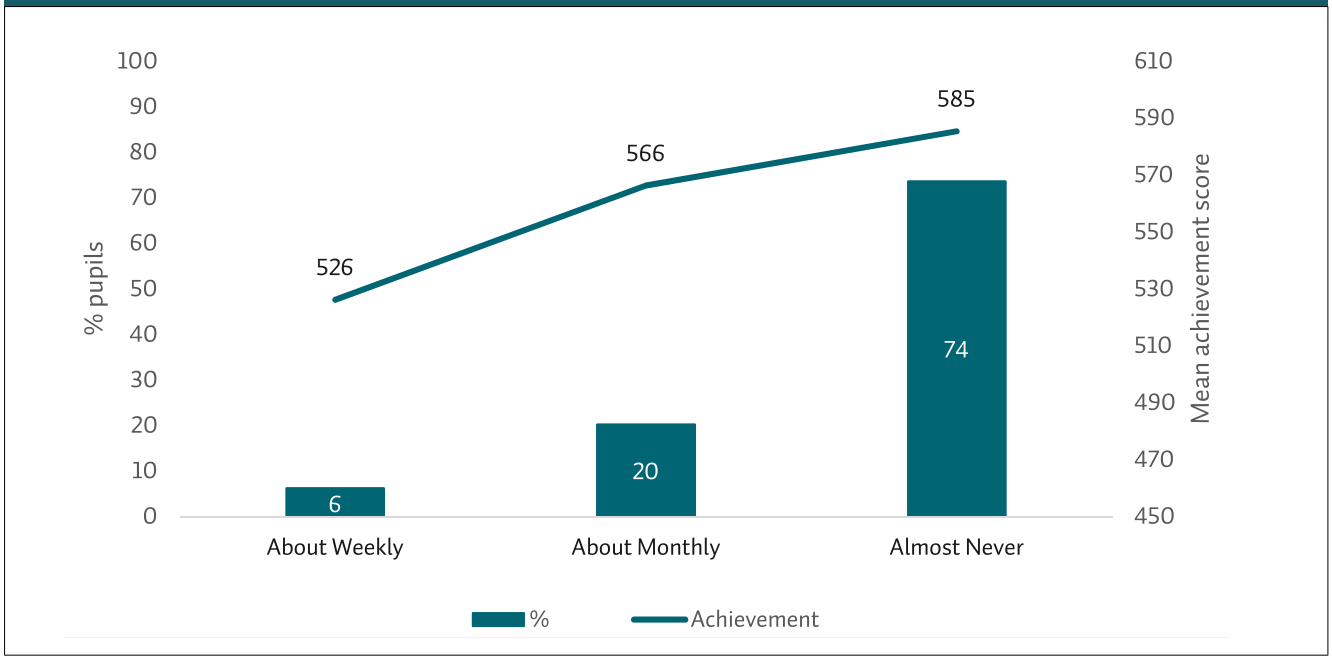
Source: Appendix Table A8.2.
Note. Due to rounding, reported percentages may not always sum to 100%.

Being bullied

Pupils were asked how often that year they had experienced a number of unkind or bullying behaviours from other children in their school.[52] Experiencing these behaviours on a more frequent basis is likely to contribute to lower physical, social, and/or emotional wellbeing. The PIRLS *Student Bullying* scale was created on the basis of pupils' responses, and classified pupils as experiencing bullying behaviour *almost never, about monthly,* or *about weekly*.

In Ireland, almost three-quarters (74%) of pupils in PIRLS 2021 indicated that they were *almost never* bullied. One-fifth (20%) were bullied *about monthly*, while 6% were bullied *about weekly*. The mean reading achievement of pupils who were bullied most often was substantially and significantly lower (by 59 points) than those who were *almost never* bullied (Figure 8.3).

Figure 8.3: Percentages and mean achievement of pupils in Ireland, by the frequency with which they experienced bullying behaviours (PIRLS 2021 *Student Bullying* scale)



Source: Appendix Table A8.3.
Note. Due to rounding, reported percentages may not always sum to 100%.

The specific bullying behaviours listed, and the frequency with which PIRLS 2021 pupils in Ireland experienced each, are presented in Table 8.1. The most common experience was being made fun of or called names, which was at least a weekly occurrence for 10% of pupils.[53] Physical aggression was the next most common, with 7% of pupils reporting that peers hit or hurt them at least once a week. Exclusion was the third most common bullying behaviour, with 6% of pupils being left out of games or activities on a weekly basis.

When answering all questions about bullying behaviours, pupils were asked to include things they had experienced through messaging or online, where relevant. However, two experiences were explicitly framed as Internet-related, and these were reported comparatively rarely: 3% of pupils received hurtful messages online *at least weekly*, and 2% had hurtful information about them shared online *at least weekly*.

[52] The question was phrased: "During this year, how often…". As PIRLS 2021 was administered near the start of Fifth Class in Ireland, some pupils may have only considered experiences they had had during the new school year (i.e., between the start of September and the test date in September/ October).

[53] During data entry checks, it was observed that notes had occasionally been written in beside this question part, for example: "but not in a mean way" / "but I like it :-)". It seems probable that at least a few pupils included affectionate teasing or welcome use of nicknames in their interpretation of "being made fun of or called names", although it is not possible to say how common this was.

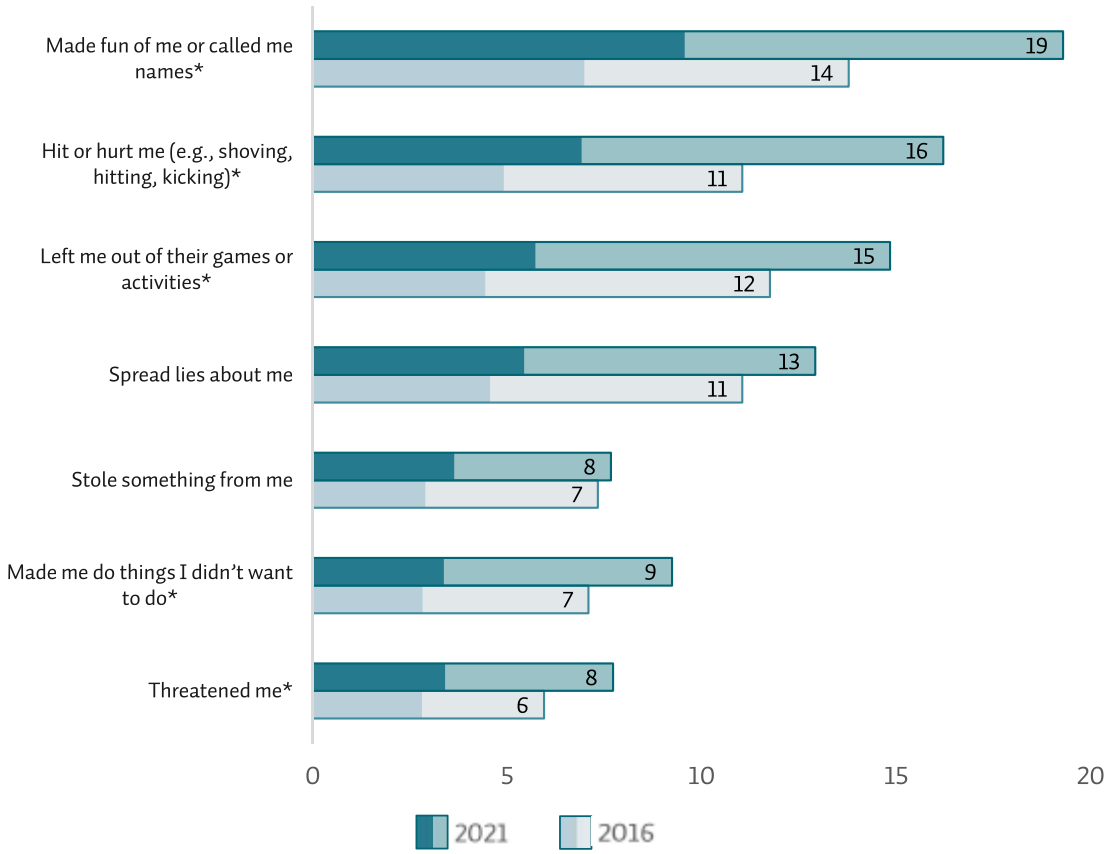
Table 8.1: Percentages of pupils in Ireland by the frequency with which they experienced various bullying behaviours (2021)

	At least once a week	Once or twice a month	A few times a year	Never
Made fun of me or called me names	10	10	22	59
Hit or hurt me (e.g., shoving, hitting, kicking)	7	9	20	64
Left me out of their games or activities	6	9	21	64
Spread lies about me	5	7	19	68
Stole something from me	4	4	16	77
Made me do things I didn't want to do	3	6	14	76
Damaged something of mine on purpose	3	4	12	82
Threatened me	3	4	10	82
Sent me nasty or hurtful messages online	3	3	7	87
Shared nasty or hurtful information about me online	2	2	4	93

Source: Appendix Table A8.4.
Note. Due to rounding, reported percentages may not always sum to 100%.

PIRLS 2016 and 2021 asked pupils about seven of the same experiences of bullying. There was an increase across the board in the frequency with which pupils reported experiencing these in 2021. Figure 8.4 illustrates this, with the label on each bar indicating the total percentage of pupils that experienced a given behaviour *at least weekly* or *at least monthly*, and the darker part of each bar showing the proportion that experienced it *at least weekly*. While some increases are marginal and non-significant, others are more substantial and significant, including the frequency of being physically attacked (which may seem counterintuitive given that the PIRLS 2021 pupils had spent several months of the previous year learning remotely).

Figure 8.4: Percentages of pupils in Ireland in 2016 and 2021 that experienced various bullying behaviours *at least monthly* (with darker sections of each bar showing the proportions that experienced these behaviours *at least weekly*)



Source: Appendix Table A8.4.
Note. Due to rounding, summed percentages may appear inconsistent with percentages reported in Table 8.1.
An asterisk (*) indicates that the change between cycles is statistically significant (with reference to the combined category *at least monthly*).

Teachers' occupational wellbeing

Teachers of the Fifth Class pupils in Ireland were asked several questions to gauge how they felt about being teachers (Table 8.2). These questions provide insights into some aspects of teachers' sense of occupational wellbeing.

Large majorities of pupils in Ireland had teachers who either *very often* or *often* felt proud of their work (95%), were enthusiastic about their job (94%), found their work meaningful and purposeful (91%), were content with their profession (88%), and were inspired by their work (86%). However, teachers were considerably less likely to feel appreciated as a teacher *very often* or *often* (64%), with teachers of 4% of pupils *never or almost never* feeling appreciated.

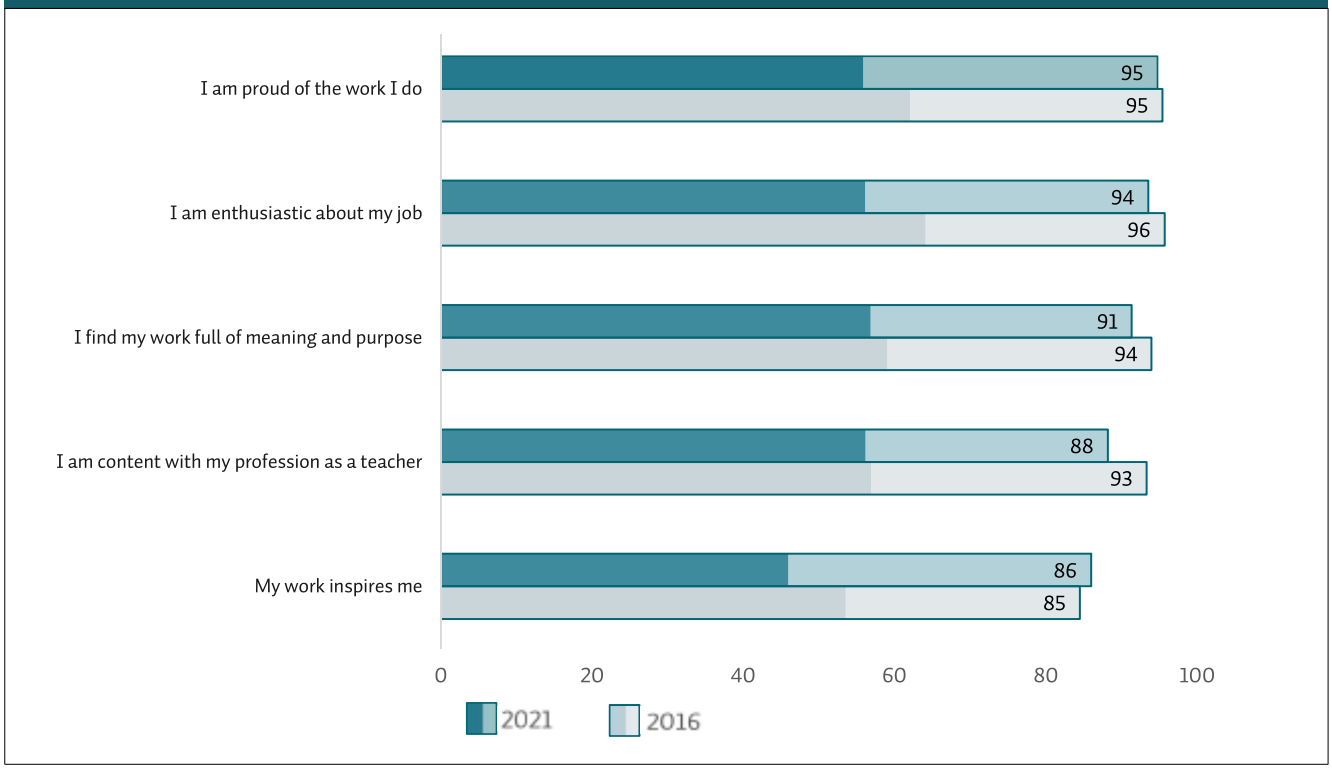
Table 8.2: Percentages of pupils in Ireland by the extent to which their teachers agreed with various statements about their professional lives (2021)

	Very often	Often	Sometimes	Never or almost never
I am proud of the work I do	56	39	5	0
I am enthusiastic about my job	56	37	6	0
I find my work full of meaning and purpose	57	35	8	0
I am content with my profession as a teacher	56	32	12	0
My work inspires me	46	40	14	0
I feel appreciated as a teacher	27	37	33	4

Source: Appendix Table A8.5.
Note. Due to rounding, reported percentages may not always sum to 100%.

Five of the same six questions were asked in 2016 (the question about feeling appreciated was not posed in that cycle). Despite the challenges of the pandemic, teachers' responses to the trend items remained relatively stable from 2016 to 2021 (Figure 8.5). There were slight declines in the extent to which teachers *very often* felt inspired by, enthusiastic about, and proud of their work. On the other hand, when the *very often* and *often* categories were combined, the largest decrease (5%) was in the percentage of pupils whose teachers felt content with their profession, and this was not statistically significant.

Figure 8.5: Percentages of pupils in Ireland in 2016 and 2021 whose teachers agreed with various statements about being a teacher *often* or *very often* (with darker sections of each bar showing the proportions whose teachers selected *very often*)



Source: Appendix Table A8.5.
Note. Due to rounding, summed percentages may appear inconsistent with percentages reported in Table 8.2.
An asterisk (*) indicates that the change between cycles is statistically significant (with reference to the combined category *often or very often*).

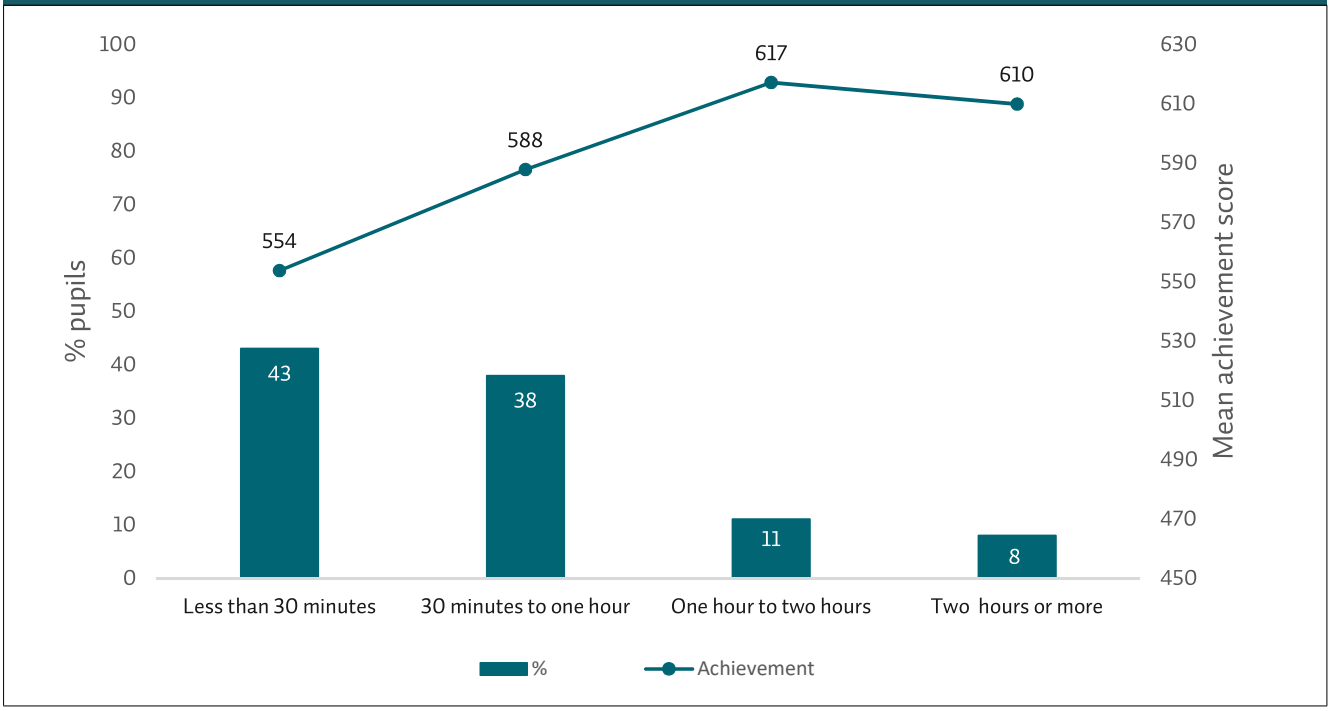
Pupils' reading behaviours and attitudes

Time spent reading outside school

Pupils were asked how much time they usually spent reading outside school on a typical school day.[54]

In Ireland, over two-fifths of pupils (43%) spent less than half an hour per day reading outside school. A slightly smaller proportion (38%) spent between 30 minutes and an hour reading, while much smaller proportions read for between one and two hours (11%) and two hours or more (8%). Mean reading achievement increased significantly with time spent reading outside school, although this association flattened out above one hour of reading, with no significant difference between the mean achievement of pupils in the two categories that spent most time reading (Figure 8.6).

Figure 8.6: Percentages and mean PIRLS achievement of pupils in Ireland, by time spent reading outside of school on a normal school day (2021)

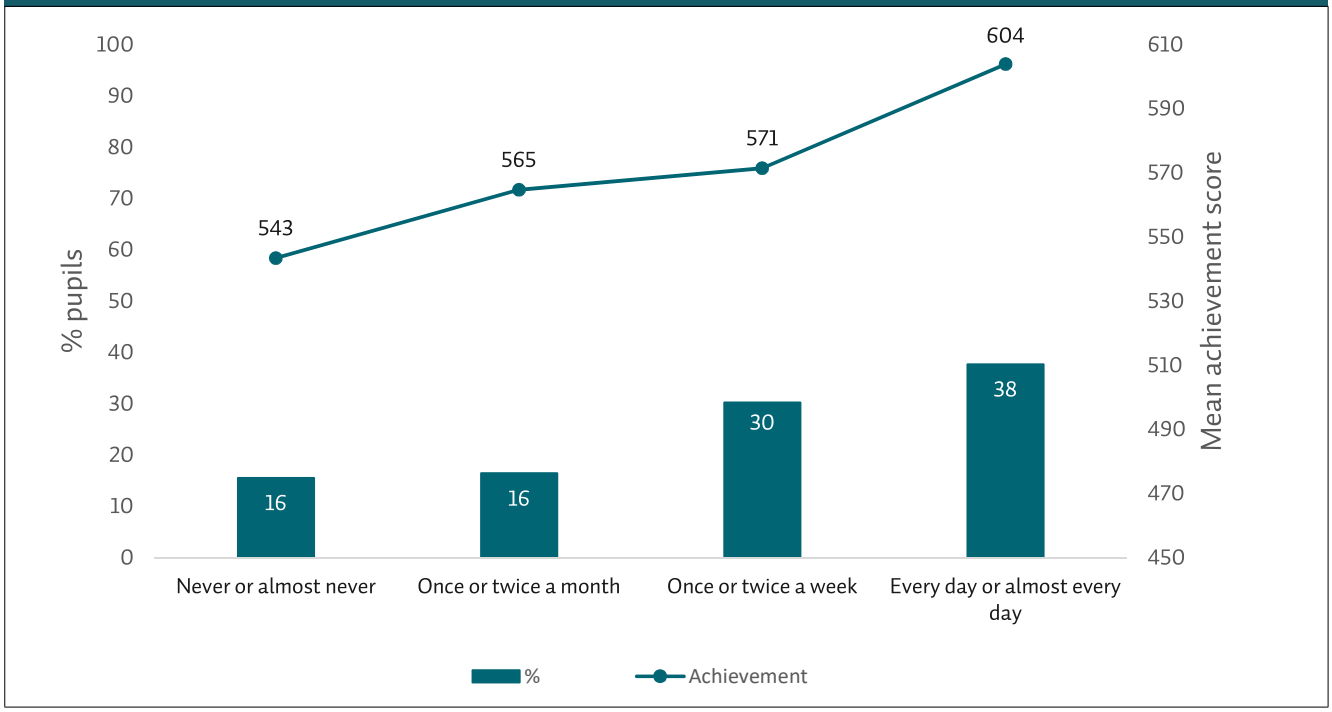


Source: Appendix Table A8.6.
Note. Due to rounding, reported percentages may not always sum to 100%.

While some pupils may have included reading they did for homework in their responses to the question above, another question explicitly asked about how often pupils read *for fun* outside school. In Ireland, about one in six pupils (16%) *never or almost never* read for fun, while a similar proportion did so only *once or twice a month* (16%). Just under one-third (30%) read for fun *once or twice a week*, with the largest proportion (38%) doing so *every day or almost every day*. As regards achievement in the PIRLS test, pupils who read for fun on a near-daily basis substantially and significantly outperformed peers in the other three categories (Figure 8.7).

[54] While Chapter 7 discussed some questions about pupils' reading behaviours during school closure periods, the questions considered here refer to pupils' ongoing reading habits as of autumn 2021.

Figure 8.7: Percentages and mean PIRLS achievement scores of pupils in Ireland by frequency of reading for fun outside school (2021)



Source: Appendix Table A8.7.
Note. Due to rounding, reported percentages may not always sum to 100%.

Comparing findings for PIRLS 2016 with those for PIRLS 2021, there was a slight decline between cycles in both the daily time spent reading outside school and the frequency of reading for fun outside school (Table 8.3). Given the fact that pupils who read for fun *every day or almost every day* had a substantial advantage in the PIRLS test, it is worth noting the 5% drop in this category across cycles, which is statistically significant although relatively small.

Table 8.3: Percentages of pupils in Ireland that spent least and most time reading outside school and reading for fun, in PIRLS 2016 and 2021

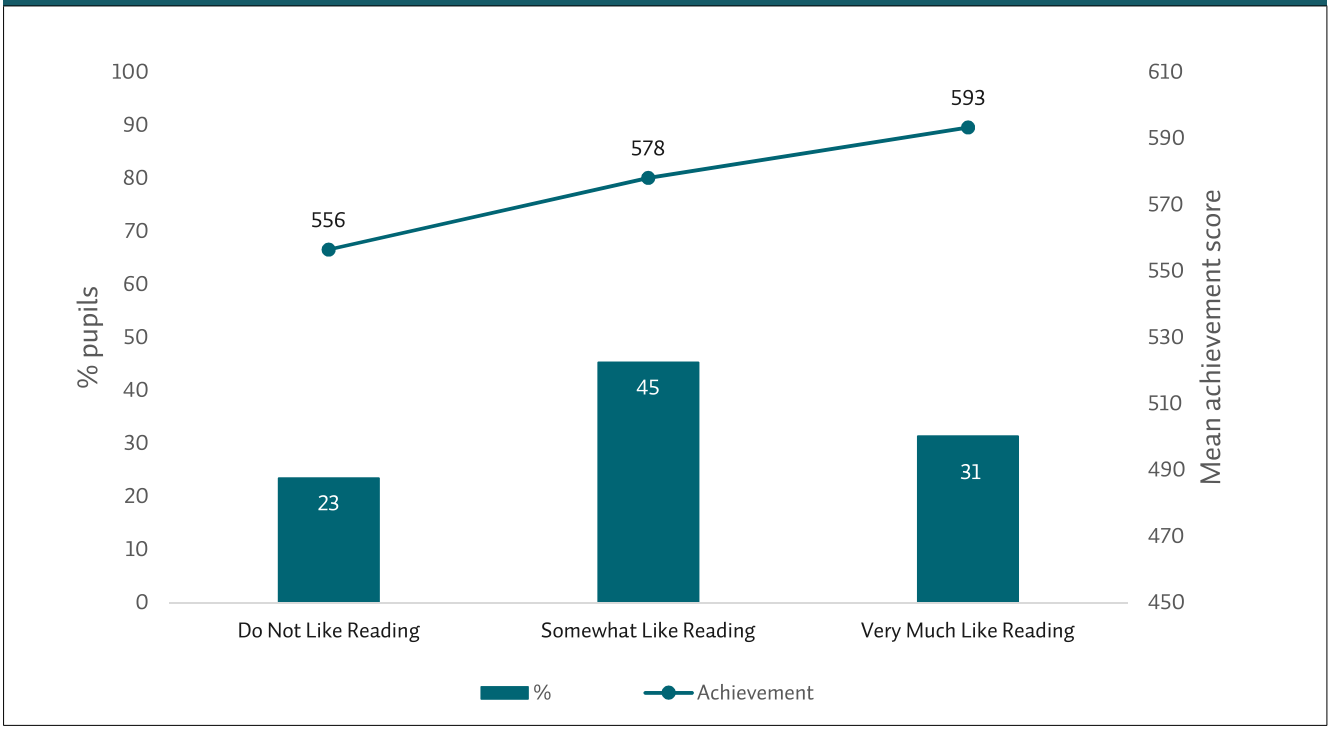
		2016	2021	Change
Daily time spent reading outside school	Less than 30 minutes	40	43	+3
	At least one hour	23	19	**-4**
Frequency of reading for fun	Never or almost never	13	16	**+3**
	Every day or almost every day	43	38	**-5**

Source: Appendix Tables A8.6 and A8.7.
Note. Changes in **bold** are statistically significant.
Due to rounding, some differences may appear inconsistent.

Liking reading

Pupils were asked a number of questions to capture the extent to which they enjoyed reading. Responses fed into the PIRLS *Students Like Reading* scale, which was used to classify pupils as *very much liking* reading, *somewhat liking* reading, or *not liking* reading. In Ireland, just under one-third of pupils (31%) *very much liked* reading, while just under one-quarter (23%) *did not like* reading. There was a positive association between enjoyment of reading and reading achievement: pupils who *very much liked* reading scored, on average, 37 points higher than those who *did not like* reading (Figure 8.8).

Figure 8.8: Percentages and mean PIRLS achievement of pupils in Ireland, by the extent to which they liked reading (PIRLS 2021 *Students Like Reading* scale)

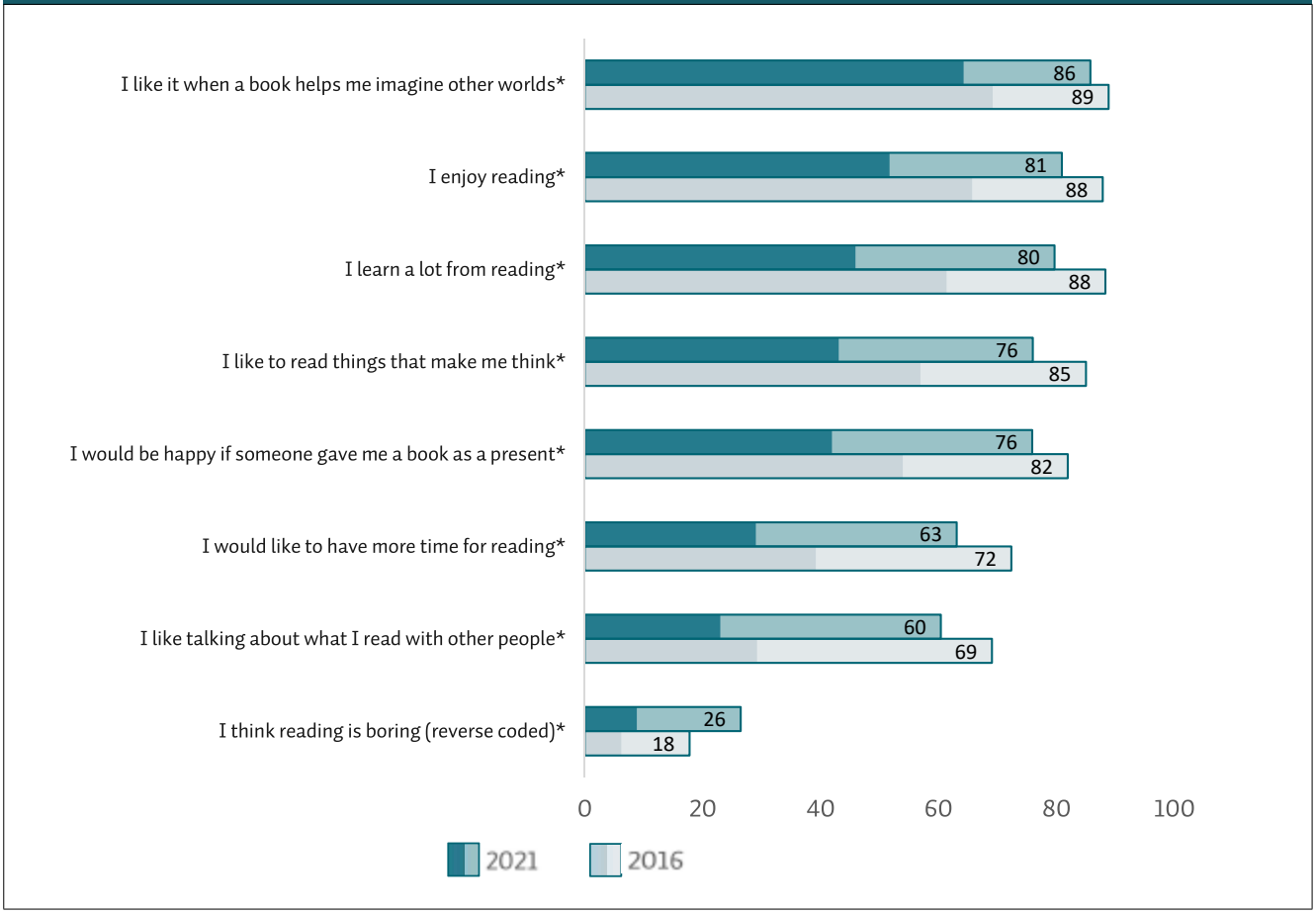


Source: Appendix Table A8.8.
Note. Due to rounding, reported percentages may not always sum to 100%.

Identical questions about liking reading were presented in 2016 and 2021. Figure 8.9 shows the percentages of pupils in Ireland that agreed with each statement in the two cycles. The pattern across all statements suggests a decline in pupils' enjoyment of reading between 2016 and 2021.

The percentage of pupils agreeing (*a lot* or *a little*) with the reverse-coded statement that *reading is boring* increased by 9% to more than one-quarter (26%). Agreement with the positive statements *I would like to have more time for reading*, *I like talking about what I read with other people*, *I like to read things that make me think*, and *I learn a lot from reading* decreased by a similar amount. The statement on which agreement changed the least, and which remained the most popular across cycles, was *I like it when a book helps me imagine other worlds*. Across all statements, changes between cycles were statistically significant.

Figure 8.9: Percentages of pupils in Ireland in 2016 and 2021 that agreed, *a lot* or *a little*, with various statements about liking reading (with darker sections of each bar showing the proportions that *agreed a lot*)



Source: Appendix Table A8.9.
Note. Due to rounding, some differences may appear inconsistent with those reported in text.
An asterisk (*) indicates that the change between cycles is statistically significant (with reference to the combined category *agreed [a lot or a little]*).

In Ireland, some national questions were added to the Pupil Questionnaire to capture pupils' opinions about reading in different modes: on paper vs on a screen (Table 8.4). Pupils were considerably more likely to agree *a lot* that they enjoyed reading on paper (52%) than that they enjoyed reading on a screen (34%). Pupils were also more likely to find it easy to remember things they read on paper than things they read on a screen (42% vs 31% agreed *a lot*). However, it should be noted that reading "on a screen" can encompass a multitude, with devices ranging from e-readers designed for the purpose to phones with very small screens. Moreover, we do not know how frequently pupils engaged voluntarily in digital reading of any kind. Finally, pupils had just completed a reading test (and were in the process of completing a questionnaire) in paper format, which could have influenced some responses.

Table 8.4: Percentages of pupils in Ireland by the extent to which they agreed or disagreed with statements about reading in different modes (2021)

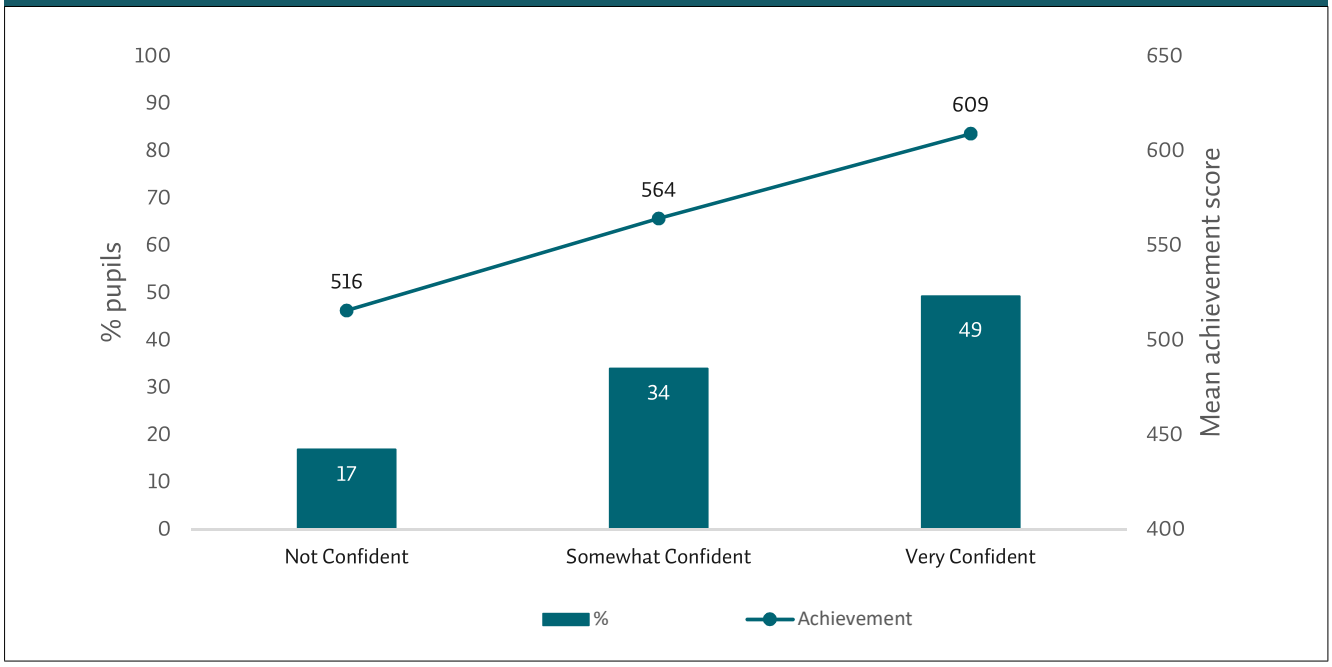
	Agree a lot	Agree a little	Disagree a little	Disagree a lot
I enjoy reading on paper	52	31	11	6
I enjoy reading on a screen	34	34	22	10
I find it easy to remember things I read on paper	42	34	16	8
I find it easy to remember things I read on a screen	31	35	23	12

Source: Appendix Table A8.10.
Note. Due to rounding, reported percentages may not always sum to 100%.

Confidence about reading

Pupils were asked how much they agreed with a number of statements about being competent and confident as readers. Responses were used to create the PIRLS *Students Confident in Reading* scale, on the basis of which pupils were described as *very confident*, *somewhat confident*, or *not confident* about reading. In Ireland, just under half of pupils (49%) were *very confident*, 34% were *somewhat confident*, and 17% were *not confident* readers. There was a positive correlation between reading confidence and reading achievement, which was stronger than the correlation between liking reading and reading achievement. Pupils who were *very confident* achieved a mean PIRLS score of 609, more than nine-tenths of a standard deviation higher than the mean score of the pupils who were *not confident* (516) (Figure 8.10).

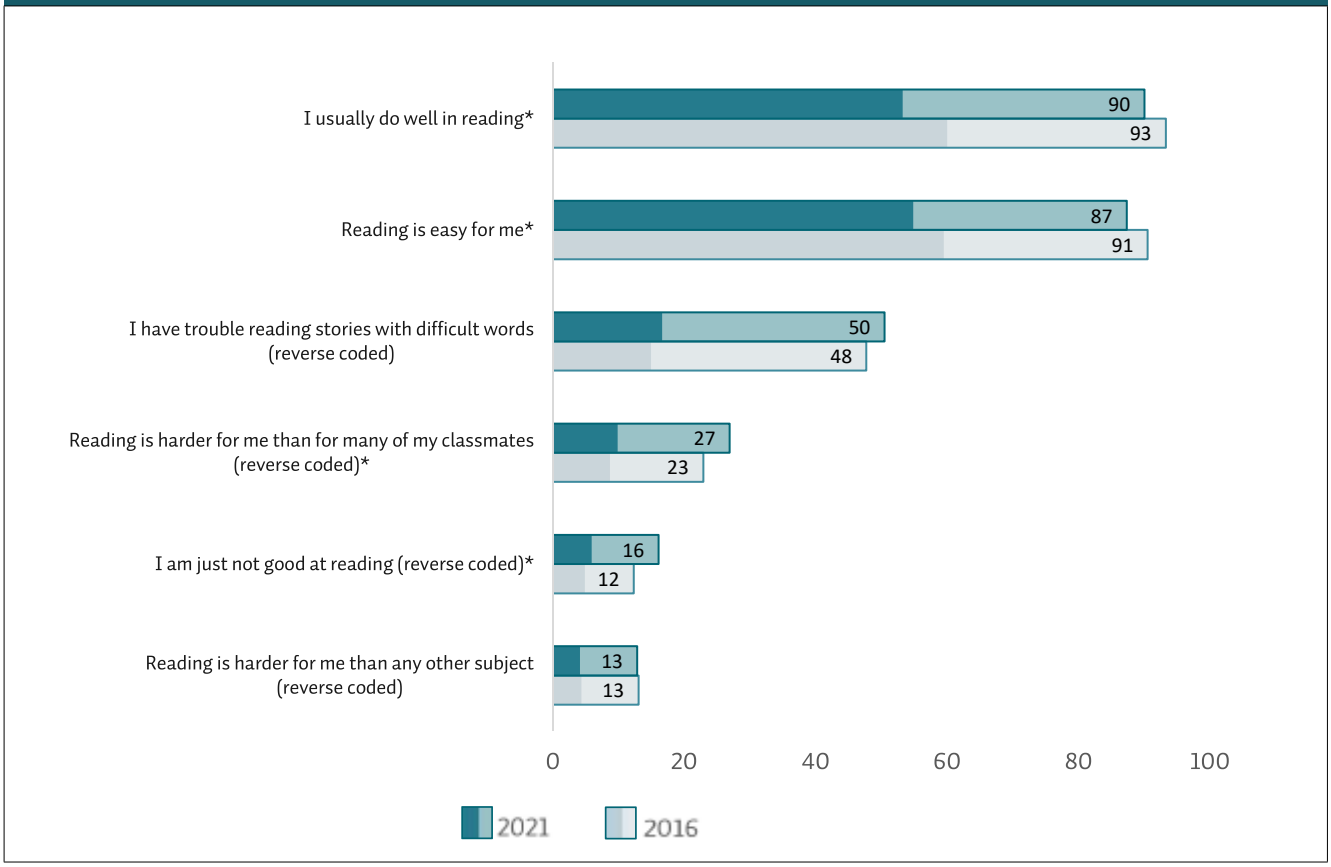
Figure 8.10: Percentages and mean PIRLS achievement of pupils in Ireland, by the extent to which they were confident about reading (PIRLS 2021 *Students Confident in Reading* scale)



Source: Appendix Table A8.11.
Note. Due to rounding, reported percentages may not always sum to 100%.

The same statements about reading confidence were presented to pupils in PIRLS 2016. Looking at all statements together, there appears to be a slight decline in reading confidence between 2016 and 2021 (Figure 8.11). That is, the 2021 pupils were less likely to agree with the positively-worded statements and more likely to agree with most of the negatively-worded (reverse coded) statements. However, these differences ranged from marginal to small, although several reached statistical significance. Overall, changes in reading confidence between 2016 and 2021 were less striking than changes in enjoyment of reading.

Figure 8.11: Percentages of pupils in Ireland in 2016 and 2021 that agreed, *a lot* or *a little*, with various statements about reading confidence (with darker sections of each bar showing the proportions that *agreed a lot*)



Source: Appendix Table A8.12.
An asterisk (*) indicates that the change between cycles is statistically significant (with reference to the combined category *agreed [a lot or a little]*).

Chapter summary

This chapter provided a snapshot of some important aspects of the lives of the PIRLS pupils in Ireland at the time of testing, about half a calendar year after the second period of nationwide school closures had ended. Aspects of wellbeing (of the pupils and their teachers) were explored, as well as pupils' reading behaviours and attitudes.

Pupils' wellbeing was examined in terms of the frequency with which they felt tired and/or hungry on arrival at school, and the frequency with which they were bullied. Substantial proportions of pupils in Ireland in 2021 felt tired *every day* (21%) or *almost every day* (24%) when they arrived at school, which represents an increased level of tiredness relative to PIRLS 2016. The proportions that reported feeling hungry *every day* (11%) or *almost every day* (11%) also increased since 2016, although more slightly. Pupils who felt tired *every day*, as well as those who felt hungry *every day*, achieved lower mean reading scores than peers.

In Ireland, 6% of pupils were bullied *about weekly*, 20% *about monthly*, and the remainder (74%) *almost never* (PIRLS *Student Bullying* scale). The bullying behaviours that were experienced most frequently included being made fun of or called names, being physically assaulted, and being excluded from activities. Pupils reported experiencing bullying behaviours more frequently in 2021 than in 2016, with the largest increases relating to being made fun of or called names and being physically assaulted.

Teachers were asked how much they agreed with a number of statements related to occupational wellbeing. In Ireland, teachers were very positive about their profession overall, with teachers of large majorities of pupils reporting that their work *very often* or *often* made them feel proud, enthusiastic, purposeful, content, and inspired. However, teachers were considerably less likely to agree that they felt appreciated for their work. While there were some slight declines in teachers' reports of their occupational wellbeing since 2016, these did not reach statistical significance.

In relation to reading behaviour, 43% of pupils spent less than half an hour reading outside school on a typical day. A majority of pupils in Ireland read for fun either on a roughly daily basis (38%) or a roughly weekly basis (30%), although 16% *never* or *almost never* read for fun. Pupils who spent more time reading each day, as well as those who read for fun more frequently, had higher mean PIRLS achievement than their peers. Both the daily time spent reading and the frequency of reading for fun declined slightly between 2016 and 2021.

Just under a third of pupils (31%) *very much liked* reading, while just under a quarter (23%) *did not like* it (PIRLS *Students Like Reading* scale). Those who liked reading more performed somewhat better on PIRLS, on average, than those who liked reading less. Pupils were more positive about paper-based than screen-based reading, in terms of both enjoyment and ease of remembering content. Overall, pupils in 2021 reported liking reading less than pupils in 2016.

Most pupils in Ireland were *very confident* (49%) or *somewhat confident* (34%) about reading, with 17% *not confident* (PIRLS *Students Confident in Reading* scale). Those who were *very confident* achieved substantially higher PIRLS scores, on average, than less confident peers. While reading confidence appeared to be a little lower in 2021 than in 2016, this difference was slight.

Chapter 9:
Summary and conclusions

The 2021 cycle of PIRLS was uniquely challenging on a number of levels. The design of the study incorporated a transition to digital testing for some, but not all, countries. A move towards "group adaptive testing" was also built in, whereby the difficulty level of the test could be tailored, in a broad sense, to the prior reading achievement level of a country's population. Alongside these planned developments, the PIRLS 2021 administration faced additional unanticipated challenges arising from the COVID-19 pandemic. Such challenges ranged from an interrupted and incomplete field trial, to a data collection that spanned a (globally eventful) year and a half, with the first countries managing to test in autumn 2020 and the last ones testing in spring 2022.

In Ireland, modifications to the planned PIRLS data collection included reverting from digital to paper-based testing; facilitating class teachers rather than other teachers in the school to administer the test if preferred; and, most significantly, postponing the testing from spring 2021 to autumn 2021, when the sampled pupils were at the start of Fifth Class (Start G5) rather than the end of Fourth Class (End G4). Despite the changing plans and the wider context of grave disruption to the education system, the staff, pupils, and parents in sampled schools in Ireland demonstrated great commitment and goodwill towards the study. This is reflected in response rates that are high by the standards of any PIRLS cycle, and remarkably high for a cycle conducted during the pandemic. Anecdotally, teachers in particular made it clear that they recognised the value of collecting large-scale data about pupils' reading skills at the critical juncture following prolonged periods of school closure and remote learning.

The administrative challenges of the 2021 data collection, both at international and national level, have created some major challenges in interpreting and understanding what the data signify. For Ireland and the 13 other countries that administered at Start G5, we have explored the particular caveats required when drawing comparisons with End G4 countries, and when drawing trend comparisons with data from previous cycles (collected at End G4). For *all* participating countries, however, the specific COVID-related context in which PIRLS 2021 was administered needs to be considered when interpreting results.

Aside from inter-country and trend comparisons, though, the PIRLS achievement data provide a reliable and rich snapshot description of the reading comprehension skills of Fifth Class pupils in Ireland in autumn 2021, and of subgroups within that population. The additional data collected in questionnaires situate the achievement findings in a broader context. For example, they provide insights into pupils' experiences during periods of remote learning, as well as after the return to the classroom.

In this chapter, key findings are drawn together, with a view to identifying what the PIRLS 2021 data can and cannot tell us about the reading achievement of pupils in Ireland following two atypical years of schooling. Where appropriate, the results of NAMER 2021 are also referenced, specifically as they relate to reading (at Second Class).

What can we say about overall reading achievement in Ireland?

International and trend comparisons

As described in Chapter 3, the overall mean achievement of the Start G5 pupils in Ireland was high relative to that in other Start G5 countries. It was also high relative to mean achievement in most End G4 countries, although Singapore achieved a significantly higher mean score and Hong Kong a statistically similar one to Ireland. Furthermore, the mean achievement of Ireland's Start G5 pupils in 2021 was significantly higher (by 11 points) than that of Ireland's End G4 pupils in 2016.

While these findings appear very positive at face value, it is necessary to interpret them with the different age and grade level of Ireland's PIRLS 2021 cohort in mind. By and large, relative to their own achievement in prior cycles, countries that

tested at Start G5 performed better than countries that tested at End G4, suggesting that there was an advantage associated with the move to Start G5 testing.

The extent to which such an advantage may be due to increased age, increased experience of reading, a greater length of time having elapsed since periods of remote learning, and/or other factors is an open question. However, as regards age within the Irish context, analysis of the PIRLS 2016 data for Ireland shows that pupils who were of medium age (within one standard deviation of the average age) achieved significantly higher reading scores, on average, than younger pupils, including when gender and SES were controlled for. This suggests that, in Ireland at least, even the maturation that accompanies a slight increase in age may confer an advantage in terms of reading achievement. Further evidence from the Irish context can be drawn from the fact that standardised tests of reading that were administered both in spring at the end of one grade level and in autumn at the start of the next consistently proved a little easier in autumn than spring (ERC, 2007a, 2007b, 2007c). Whatever the reason(s) behind this pattern, it points to the likelihood that the pupils in Ireland who took part in PIRLS 2021 in the autumn of Fifth Class *probably* performed somewhat better, on average, than they would have if they had been tested in spring.

A further complication is introduced by the fact that the 2020/21 school year was severely disrupted due to the pandemic. If spring testing had gone ahead in Ireland, it would have taken place shortly after pupils returned to classrooms following the closures of January-March. On the other hand, between spring and autumn 2021, pupils had a chance to settle back into the classroom, and at least some pupils engaged in initiatives such as school-based summer programmes intended to mitigate the effects of school closures. Thus, while we could expect to see some overall advantage associated with autumn testing in a "normal" year, this advantage might be larger in the unusual context of 2021.

Bearing all this in mind, there is **not** sufficient evidence to conclude that average reading achievement in Ireland is truly higher than that in all other participating countries except Singapore and Hong Kong. There is also **not** sufficient evidence to conclude that mean reading achievement in Ireland has improved significantly on a like-for-like basis since 2016. However, the findings do allow us to conclude that Ireland retains a place within a set of very high-achieving countries in PIRLS. Further, the results suggest that mean reading achievement in Ireland has at least remained relatively stable between 2016 and 2021, as it seems unlikely, given the results observed in autumn, that a large drop in trend performance would have been observed if testing had proceeded in spring.

These conclusions are consistent with the results of NAMER, which did test in spring 2021 and so provides a useful counterpoint to the PIRLS findings. The reading achievement of Second Class pupils in spring 2021 did not differ significantly from that of Second Class pupils in spring 2014 (the previous NAMER cycle), although a small, non-significant decrease was observed (Kiniry et al., 2023). Examining the outcomes of PIRLS and NAMER alongside one another provides support for the interpretation that average reading proficiency at primary level remains broadly comparable to where it was around the middle of the last decade, when significant improvements on previous performance were reported in NAMER 2014 and PIRLS 2016 respectively (Shiel et al., 2014; Eivers et al., 2017). In light of the unprecedented challenges faced by schools in 2020 and 2021, this stability is a welcome outcome.

Distribution of achievement

The distribution of achievement (described in Chapter 4) provides a way of describing the extent to which achievement varies within the population. In Ireland, the range between the scores of pupils at the 5th and 95th percentiles had become slightly smaller between 2011 and 2016, but it widened again (by a similar amount) between 2016 and 2021, indicating that there is more variation in pupils' achievement now than in the previous cycle. The range of Ireland's distribution in 2021 was larger than that of some reference countries (Hong Kong, Croatia), but smaller than that of others (Singapore, New Zealand).

Comparing Ireland's distribution in 2021 with that in 2016, the main difference is that the distribution has widened at the higher end. The highest-achieving Start G5 pupils in the 2021 cycle (i.e., those at the 95th percentile) performed significantly better than their End G4 counterparts at the 95th percentile in 2016. In contrast, while the performance of the lowest-achieving pupils (5th percentile) also increased between cycles, this increase was non-significant.

The increase in performance at the higher end of the distribution may be at least partly related to the move to autumn testing in 2021 (and associated changes regarding age/maturation, etc.). For comparison, in the NAMER assessment of

spring 2021, the reading performance of Second Class pupils at various percentiles of the distribution did not differ significantly from that of their counterparts at the same percentiles of the 2014 distribution (Kiniry et al., 2023). However, regardless of the extent to which the rise in overall achievement in PIRLS may be attributable to the move to autumn, it is important to note that this increase was not observed to the same extent among the lowest-achieving pupils.

Reading at the International Benchmarks

The PIRLS International Benchmarks (described in Chapter 5) provide a description of the kinds of reading skills and strategies that pupils at various levels of proficiency can deploy.

In Ireland, nearly all pupils in 2021 (98%) reached at least the Low Benchmark, indicating that they had mastered some basic reading comprehension skills such as locating explicitly stated information and making simple inferences. This was comparable to the percentages of End G4 pupils that had reached the Low Benchmark in previous cycles. More than nine out of 10 pupils in Ireland (91%) also reached the Intermediate Benchmark in 2021, indicating competence in using some additional inferencing and interpretative skills beyond those required for the Low Benchmark. Again, this percentage did not differ significantly from that observed in 2016 (among End G4 pupils).

More than two-thirds of pupils in Ireland (67%) reached the High Benchmark in 2021, demonstrating mastery of increasingly complex integrative and evaluative skills in addition to those required for the two lower benchmarks. This represents a substantial proportion of the population; internationally, the median percentage reaching the High Benchmark was 36%. More than a quarter of pupils in Ireland (27%) reached the Advanced Benchmark, indicating that they could conduct sophisticated critical appraisal of challenging texts as well as demonstrating the skills required for all lower benchmarks. Again, this is a comparatively substantial proportion; internationally, the median was 7%.

In Ireland, both the High and Advanced Benchmarks were reached by significantly more of the Start G5 pupils in 2021 than the End G4 pupils in 2016 (with increases of 5% and 6% respectively). The magnitude of these increases may be influenced at least in part by the move to autumn testing (and associated factors such as age/maturation). However, the holistic and nuanced comprehension strategies that characterise achievement at these benchmarks are likely to have developed over an extended period. Therefore, it seems reasonable to assume that many pupils who reached the High or Advanced Benchmark in the autumn would probably have been able to demonstrate much, if not all, of the requisite skillset if they had been tested in the spring.

Examining performance at the International Benchmarks grounds Ireland's PIRLS results in concrete descriptions of what pupils could do when reading, providing a broadly encouraging picture of the reading abilities of pupils starting Fifth Class in Ireland. The benchmark findings also support the suggestion that overall reading achievement in Ireland seems likely to have at least held steady between 2016 and 2021.

Purposes and processes in reading: Relative strengths and weaknesses

PIRLS subscales (described in Chapter 6) provide estimates of pupils' achievement:

- when they read for different *purposes*: for literary experience (Literary) vs to acquire and use information (Informational);
- when they engage in different kinds of reading comprehension *processes*: direct retrieval and straightforward inferencing (Retrieve & Infer) vs interpreting, integrating, evaluating, and critiquing (Interpret & Evaluate).

In 2021, pupils in Ireland demonstrated a relative strength when reading for Literary purposes (i.e., when reading predominantly narrative, fictional texts) and a relative weakness when reading for Informational purposes (i.e., when reading fact-based texts likely to include non-continuous elements such as diagrams, timelines, or graphs). Both effects were statistically significant with reference to overall mean achievement. This contrasts with 2016 (End G4), when the direction of effects was the same but only the relative strength in Literary reading was significant (Eivers et al., 2017).

On the process subscales, pupils in 2021 displayed a relative strength on the Interpret/Evaluate subscale and a relative weakness on the Retrieve/Infer subscale (i.e., they were more successful when taking integrative and critical approaches to whole texts than when paying detailed attention to localised text features). Again, both effects were statistically significant, whereas in 2016 (End G4), the same direction of effects was observed but differences were small and non-significant (Eivers et al., 2017).

Although pupils in 2021 tested at the start of Fifth Class, when they were six months older on average, it seems unlikely that this change would interfere greatly with the *relative* strengths and weaknesses of pupils' reading abilities.[55] Therefore, it seems fair to assume that, among pupils in Ireland, there are probably stronger disparities of achievement in 2021 than in 2016 between the two purpose subscales and between the two process subscales.

As regards the purpose subscales, it is interesting that, as described in Chapter 8, large majorities of pupils in both 2016 and 2021 agreed with the statement, "I like reading things that help me to imagine other worlds" (perhaps more commonly associated with Literary-type texts). While agreement with this did drop slightly between cycles, there were larger drops in the extent to which pupils agreed with the statements, "I like to read things that make me think" and "I learn a lot from reading" (perhaps more heavily associated with Informational texts). Further exploration of the types of texts that pupils are choosing to read for fun would be of interest.

As for the process subscales, it may seem counterintuitive that pupils would perform better on the typically higher-order skills of Interpret/Evaluate than on the typically lower-order ones of Retrieve/Infer. However, this pattern was also observed in a number of high-achieving reference countries, including Singapore and Northern Ireland. Within an Irish context, it is interesting that the Primary Language Curriculum, through which the PIRLS 2021 cohort (but not the 2016 cohort) received most of their education, places a strong emphasis on learning outcomes related to interpretative and evaluative skills (NCCA, 2019).

The NAMER assessment of spring 2021 used a roughly similar set of processes to classify Second Class reading items, but, in contrast to PIRLS, there was not clear evidence of relative strengths and weaknesses. Relative to NAMER 2014, there was a significant increase in achievement at the highest level (90th percentile) on the Interpret & Integrate subscale, which corresponds loosely to the Interpret & Evaluate subscale in PIRLS. However, this is not straightforward to understand, as achievement at some lower percentiles on the same subscale dropped between cycles (Kiniry et al., 2023).

Overall, while the PIRLS findings suggest that distinct aspects of reading are relatively easier or more challenging for pupils in Ireland, it is worth remembering that the Start G5 pupils in 2021 performed very well on all four subscales, with mean scores ranging from 571 (Retrieve/Infer) to 584 (Literary reading).

What does PIRLS tell us about equity in reading achievement?

Differences by gender

In Ireland, as in most other PIRLS countries, girls significantly outperformed boys in reading. The magnitude of Ireland's gender gap (11 points) was relatively small in an international context, and was very similar to the magnitude of the gap observed in 2016. For both boys and girls in Ireland, mean achievement was significantly higher in 2021 (Start G5) than in 2016 (End G4). While the NAMER reading assessment of younger Second Class pupils in spring 2021 also found a gender gap in favour of girls, there was no significant change across study cycles for either gender group in NAMER (although small, non-significant decreases were observed for both) (Kiniry et al., 2023).

In PIRLS 2021, the distribution of achievement was wider for girls than boys in Ireland, reflecting greater variation among girls' achievement than among boys' achievement. This manifested both as more variation among lower-achieving girls than lower-achieving boys (with girls having a larger score gap between the 5th and 25th percentile), and in more variation among higher-achieving girls than higher-achieving boys (with girls having a larger score gap between the 75th and 95th percentile). Examining performance at the 95th percentile in each group, we can observe that the highest-achieving girls performed notably better (by 16 points) than the highest-achieving boys.

[55] It is possible, of course, that pupils who engaged in self-directed reading during the summer (relatively shortly before PIRLS was administered) might have tended to choose more narrative fiction (Literary texts) than informational material. However, this is not known.

Comparing achievement at the PIRLS International Benchmarks by gender, the proportions of boys and girls reaching the Low Benchmark and the Intermediate Benchmark were similar, indicating that roughly equivalent large majorities in both groups had mastered the more fundamental reading comprehension skills. Girls were somewhat more likely than boys to demonstrate the more sophisticated reading strategies necessary to reach the High Benchmark (70% vs 65%) and the most challenging Advanced Benchmark (30% vs 24%). The gender gap at the High Benchmark was smaller than in previous cycles, although the gap at the Advanced Benchmark has remained similar in magnitude (increasing marginally across cycles).

Girls in Ireland had a significant and substantial advantage over boys when reading Literary texts (17 points), a pattern reflected in all the reference countries. In contrast, the gap in favour of girls on Informational texts was not significant in Ireland or Hong Kong, but was significant in the other reference countries. This suggests that the continuing gender gap in reading achievement in Ireland is largely explained by the very strong performance of girls, relative to boys, when reading narrative, fictional texts. On both the comprehension process subscales, girls significantly outperformed boys, a pattern which held across all reference countries. There was a slightly larger margin of advantage for girls in Ireland on the Interpret/Evaluate subscale (12 points) than on the Retrieve/Infer subscale (9 points).

Overall, while a gender gap in reading achievement persists in most PIRLS countries, this gap appears to be relatively small among pupils in Ireland, where it manifests mainly as an advantage for girls in reading Literary texts, applying more advanced comprehension strategies, and performing at the highest levels of the distribution of achievement.

Differences by socioeconomic status

In Chapter 3, mean reading achievement was examined by school DEIS status and by individual socioeconomic status (SES). In subsequent chapters, the individual SES variable was used for analysis.

School DEIS status

The mean reading achievement of pupils in DEIS Urban Band 1 schools and DEIS Urban Band 2 schools was substantially and significantly lower (by 56 and 40 points, respectively) than that of pupils in non-DEIS schools. This replicated the pattern observed in PIRLS 2016 (Delaney et al., 2022), with the 2021 gaps between DEIS and non-DEIS groups somewhat wider, although not significantly so. The revised DEIS allocation model that was applied in 2017 resulted in additional schools being designated as DEIS and some pre-designated DEIS schools moving from Band 2 to Band 1 (DoE, 2017). It seems likely that the DEIS classifications in 2021 more accurately reflected schools' true socioeconomic profiles than the classifications at the time of PIRLS 2016, and this should be borne in mind when interpreting comparisons of performance by DEIS status between the cycles.

Due to the small number of sampled pupils in DEIS Rural schools, there was a large margin of error around the estimate of their mean achievement. It is therefore not advisable to extrapolate from PIRLS data to draw conclusions about the reading skills of this group.

Individual SES

The PIRLS *Home Socioeconomic Status* scale was developed for the 2021 cycle, and provides an individual measure of pupils' SES (based on books in the home, parental education, and parental occupation). In Ireland, the overall SES profile of pupils was relatively high in an international context. Pupils within Ireland were divided into quartiles based on their SES scale score, with Quartile 4 comprising the 25% of pupils with lowest SES and Quartile 1 the 25% with highest SES. There was considerable overlap, as would be expected, between individual SES and school DEIS status. For example, 60% of pupils in DEIS Band 1 schools belonged to the lowest-SES Quartile 4, compared to just 19% of pupils in non-DEIS schools.

There was a clear positive association between individual SES and reading achievement, both in Ireland and internationally. In Ireland, pupils in Quartile 4 achieved a mean score 83 points lower than those in Quartile 1.

Examining the distribution of achievement in Ireland, we see that achievement varies more widely among pupils in Quartile 4 (lowest SES) than among those in other quartiles. At various percentiles of reading achievement, the performance gap between adjacent quartiles becomes larger as SES becomes lower. Thus, pupils in Quartile 4 – both

those who are relatively low-achieving and relatively high-achieving in the context of that quartile – are at a substantial disadvantage relative to their higher-SES peers.

Most pupils in all four SES quartiles reached the Low International Benchmark, although significantly fewer in Quartile 4 reached it (95%) compared to Quartile 1 (100%). Virtually all pupils in the two highest-SES quartiles also reached the Intermediate Benchmark, while this was somewhat less common for those in Quartiles 3 and 4 (93% and 82%, respectively). At the High and Advanced Benchmarks, there was more disparity across the quartiles. The High Benchmark was reached by 88% of pupils in Quartile 1, compared to about half that proportion (45%) in Quartile 4. The Advanced Benchmark was reached by 48% of pupils in Quartile 1, but only by 10% of pupils in Quartile 4. Therefore, while pupils with lower SES are *slightly* less likely to have developed the fundamental reading comprehension skills required at the Low and Intermediate Benchmarks, they are *much* less likely to have developed the more complex skills and strategies required at the High and Advanced Benchmarks.

On all four PIRLS purpose and process subscales, the pupils with highest SES (Quartile 1) achieved mean scores comfortably above 600, and maintained a significant advantage over pupils in all other quartiles. The mean achievement gap between pupils in the highest and lowest SES quartiles was of similar magnitude on all subscales, ranging from 80 points (Retrieve/Infer) to 85 points (Literary reading and Informational reading).

Overall, the analysis of PIRLS 2021 achievement in Ireland by both school DEIS status and individual SES highlights continuing challenges as regards equity in reading development. In particular, pupils in the lowest-SES quartile (Quartile 4), many of whom attend DEIS schools, need targeted support for literacy learning. The lowest-achieving pupils in Quartile 4 (including the 5% of this group not reaching the international Low Benchmark) merit particular attention. However, the distribution of achievement shows that even the highest-achieving pupils in this quartile are at a considerable disadvantage relative to the highest-achieving pupils in other quartiles.

While a snapshot of the association between SES and reading achievement in PIRLS 2021 is useful, it does not capture changes in this association over time. The question of whether and how the COVID-19 pandemic may have exacerbated inequities in education is an important one. Although the SES scale is new for PIRLS 2021, future analysis could explore the extent to which other SES-related variables have predicted reading achievement in Ireland across PIRLS cycles

Additionally, a report on the NAMER 2021 dataset includes detailed analysis of the outcomes of pupils in DEIS Urban schools (Nelis & Gilleece, 2023). Exploring the findings of recent NAMER and PIRLS cycles alongside one another may provide further insights into the relationship between SES and achievement in Ireland.

What does PIRLS tell us about pupils' experiences during and after school closures?

Learning during lockdowns

PIRLS 2021 provides an important opportunity to understand the variety of pupils' experiences during periods when schools were physically closed due to COVID-19.

Principals indicated that schools had generally provided resources and support for remote learning during the 2021 closure period. Based on principals' reports, almost all pupils were in schools that provided Internet-based resources for pupils, recommendations for teachers on remote instruction, and recommendations for parents about how to support pupils' home-based learning. Most pupils were also in schools that provided digital devices for (at least some) teachers. However, it was slightly rarer, although still common, to provide technical support for teachers and to provide access to devices for (at least some) pupils.

Parents were asked in more general terms about resources provided during closures (which could have included the lockdown in 2020 as well as the one in 2021). Like principals, parents reported that schools provided online activities for most pupils. Both principals and (especially) parents reported that it was rarer for printed learning materials to be supplied, which may have been at least partly to do with a focus on minimising virus transmission. Large majorities of parents reported that they themselves had supplied their children with books, digital devices, and digitally-based learning

activities to help with their educational development during closure periods.

Parents indicated that schools had provided reading assignments for just under three-quarters of pupils during closure periods, although there is no information as to what format these took. However, more parents than this reported that their children had read as part of their assigned schoolwork *every day or almost every day* during closure periods (82%). Pupils in this category had higher mean PIRLS achievement, on average, than those that read for schoolwork less often. Despite the disruption of the lockdowns, the high frequency of daily school-related reading during these periods may help to explain the strong overall performance of Ireland's pupils in PIRLS 2021.

In general, parents also reported that their children had engaged in non-school-related reading quite often during lockdown (50% *every day or almost every day*). In contrast, pupils themselves reported a lower frequency of reading for fun at the time of testing, when they were back in the classroom. While it is possible that recall bias could be at play, pupils provided additional evidence to support the idea that "extra" reading was somewhat common during lockdown. Just over one-third said they had read on paper *more than usual* at these times, while slightly more said they had read on a screen *more than usual*. Smaller proportions reported reading *less than usual* during lockdown, in both paper and digital modes. Pupils who read on paper *more than usual* during school closures performed significantly better on PIRLS than their peers. It is possible that high frequency of recreational (print-based) reading while pupils were at home could have further supported the maintenance and development of their reading comprehension skills.

The perceived impact of the pandemic

A quarter of parents in Ireland (25%) believed that their children's learning had been *not at all* affected by school closures. In contrast, a slight majority (58%) thought their children's learning had been *somewhat* affected, while 17% thought it had been affected *a lot*.

Teachers in Ireland were asked to estimate the proportion of pupils in their class for whom *literacy* learning had been negatively affected. Teachers of just 8% of pupils thought that this was the case for *none or almost none*. Options ranging from *about one quarter* to *about three-quarters* of pupils were selected by the majority. However, teachers of 12% believed that the literacy of *all or almost all pupils* in their class had been negatively impacted.

On average, pupils whose parents perceived them as more severely affected performed less well in PIRLS than those perceived as unaffected. Similarly, pupils whose teachers perceived that literacy within the class had been more severely affected achieved lower mean scores, on average, than those in classes perceived as unaffected. It is possible that both parents and teachers were very accurate in their assessment of the pandemic's impact. However, it is also possible that pupils (and class groups) that were already struggling more with literacy were perceived, not unreasonably, as being at greater risk. Further research could explore the extent to which being perceived as negatively affected may interact with other variables such as individual SES, school DEIS status, and gender.

Teachers indicated that 40% of pupils were in schools that had offered a summer programme, and most of these programmes placed at least some emphasis on literacy, as might be expected (DoE 2021c, 2021e). However, in most cases, teachers reported that the summer programmes were attended by few or no pupils in the PIRLS classes. As we do not know which individual pupils attended the programmes, it is not possible to say if and how attendance might be associated with reading achievement or other variables of interest.

Once back in the classroom, teachers reported that PIRLS pupils in Ireland were involved in a range of specific initiatives in different areas to mitigate effects of the closure periods. More than half of pupils (58%) were participating in an initiative to promote wellbeing, reflecting a key concern among educators. More than one-third (37%) were involved in an initiative targeting physical education, while slightly under one-third were taking part in initiatives to support social interaction, literacy, and numeracy. In broad terms, this spread of initiatives reflects the curriculum areas identified as priorities in guidance documents supplied to schools around this time (e.g., DoE, 2020c, 2021d). It may also indicate engagement by schools with the CLASS scheme that was in the process of being rolled out around the time of PIRLS testing (DoE, 2021a, 2021b).

Wellbeing after the return to the classroom

Pupils' wellbeing

The wellbeing of children in the wake of the COVID-19 school closures continues to be an area of significant concern, with limited large-scale data available on this in the Irish context. Although the PIRLS questionnaires have not, to date, asked about wellbeing as a main area of focus, they do include some relevant items that can be compared with data from 2016.

The PIRLS pupils in 2021 were more likely than their counterparts in 2016 to report feeling tired on arrival at school, with 21% feeling this way *every day* and a further 24% *almost every day*. The disruption to routine caused by the lockdowns could have had an impact on pupils' level of tiredness. That said, it is also possible that the move to autumn testing had some effect,[56] or that there was a combined effect from these factors. The likelihood of feeling hungry on arrival at school increased between cycles as well (with 11% of pupils in 2021 feeling hungry *every day* and a further 11% *almost every day*), although this increase was more marginal. Feeling either tired or hungry *every day* was associated with lower mean reading achievement in PIRLS.

A small percentage of pupils in Ireland (6%) experienced bullying behaviour *about weekly*, while 20% experienced this *about monthly* (and the remainder *almost never*). Pupils who were bullied more frequently achieved lower mean scores, on average, in the PIRLS reading test. The most common forms of bullying were being made fun of or called names, being physically attacked, and being excluded from games or activities. Forms of bullying that were explicitly Internet-based (sending hurtful messages online, sharing hurtful information online) were less commonly reported. This contrasts with the findings of some other studies which indicated that cyberbullying increased in prevalence during the pandemic (e.g., Milosevic et al., 2020). However, it is worth observing that just under half of Ireland's PIRLS pupils did not own their own smartphone (Appendix Table A9.1).

Bullying behaviours were more commonly reported in Ireland in 2021 than in 2016, with the largest increases relating to being made fun of or called names, and being physically assaulted. The latter is a particular cause for concern, with 16% of pupils in 2021 reporting that peers hit or hurt them on at least a monthly basis. It is possible that an increased prevalence of bullying could reflect difficulties with social interaction following the lockdowns.

Overall, the PIRLS data suggest that at least some aspects of pupils' wellbeing have declined since 2016. While we do not know to what extent this can be attributed to pandemic effects, it underscores the continued need for a policy emphasis on wellbeing in primary schools, including measures to counter tiredness, hunger, and bullying.

Teachers' occupational wellbeing

It was widely acknowledged that teachers in Ireland (and in most countries) faced extraordinary challenges in their professional lives during 2020 and 2021. The PIRLS Teacher Questionnaire provides some insight into how teachers felt about their roles in the aftermath of school closures and remote instruction.

Broadly speaking, teachers in Ireland in 2021 were remarkably positive in how they felt about their jobs and their professional identities. Although there were slight declines in the extent of teachers' positivity between 2016 and 2021, these were smaller than might have been expected and did not reach statistical significance. However, one new statement added for 2021 asked how often respondents felt appreciated as a teacher, and there was considerable variation in the response to this: 33% of pupils were taught by teachers who only *sometimes* felt appreciated, while 4% were taught by teachers who *never* felt appreciated.

Pupils' reading behaviours and attitudes after the return to the classroom

Daily time spent reading outside school, frequency of reading for fun outside school, liking reading, and being confident about reading were each positively associated with reading achievement in PIRLS. Despite the fact that overall mean achievement in Ireland was higher in 2021 (Start G5) than in 2016 (End G4), pupils in 2021 spent slightly less time reading per day, and read for fun less often, compared to pupils in 2016. They also reported liking reading less than their

[56] For example, pupils might feel more tired due to the stresses associated with starting a new school year and working at a new grade level.

2016 counterparts, while reading confidence decreased marginally between the cycles. In contrast, all these contextual variables had remained very stable between PIRLS 2011 and 2016 (Delaney et al., 2022).

At post-primary level, a similarly counterintuitive finding has been observed in Ireland between the 2009 and 2018 cycles of PISA. Reading was the major domain in both these cycles, and, while reading achievement improved significantly between cycles, enjoyment of reading and frequency of reading for fun declined significantly (McKeown et al., 2019; Shiel et al., 2022).

One challenge that arises when interpreting trends on these variables relates to the ways in which modes of reading are changing. We do not know to what extent pupils in 2021 (or indeed some earlier cycles) were thinking of reading in digital as well as print environments when answering questions about their reading behaviours and attitudes. However, we do know that pupils in Ireland in 2021 were more likely to agree *a lot* that they liked reading on paper than that they liked reading on a screen (52% vs 34%). They also reported finding it easier to remember things they read on paper than things they read on a screen. It is possible that there was a familiarity bias for pupils who were more used to reading in print format (and the paper-based presentation of the PIRLS test and questionnaire could have reinforced this). It is also possible that the extensive exposure to screens during lockdowns (with 40% of pupils having read on a screen *more than usual* during these periods) could have led to fatigue with digital reading. However, a further possibility is that there is a more deep-rooted preference for print reading among pupils at this grade level in Ireland.

It is worth noting that the statement that remained most popular across PIRLS cycles was *I like it when a book helps me imagine other worlds*, suggesting that the transportive power of stories or other texts has remained widely important to pupils where other aspects of reading may have lost some of their appeal.

Future reporting on PIRLS 2021

The current report has presented initial achievement findings for Ireland from PIRLS 2021, along with a small amount of contextual data focusing on pupils' experiences during and after the COVID-19 lockdowns of 2020 and 2021.

There is a rich database of additional contextual information collected as part of PIRLS. It is planned that further national reporting will include:

- Subgroup analysis of contextual variables and their relationship with achievement (for example, comparing experiences during the lockdowns and associated PIRLS achievement by gender and SES).
- A detailed description of the experiences of pupils for whom English is an additional language (an area of focus in light of schools' important role in welcoming and supporting children from migrant families).
- An exploration of teachers' and pupils' descriptions of what typically happened during reading instruction (of particular interest given the introduction of the Primary Language Curriculum between the 2016 and 2021 cycles, although the intervention of COVID-19 may also have had a bearing on classroom practice).
- Multilevel analysis of the extent to which contextual variables predict reading achievement in PIRLS 2021.

As NAMER and PIRLS were administered during the same year, together they provide information about the pandemic-era experiences of pupils across three grade levels: end of Second Class (NAMER), start of Fifth Class (PIRLS), and end of Sixth Class (NAMER). There is the potential for future reporting to combine insights from the two studies to develop a rich picture of the lives of primary school pupils in Ireland following two years of national and global disruption.

Resources

This section contains three texts used in PIRLS 2021, along with their accompanying items. The texts are:

- *The Amazing Octopus*, an Informational text classified as *easy*, administered in PIRLS 2021 only.
- *The Empty Pot*, a Literary text classified as *medium* difficulty, administered in PIRLS 2011, 2016, and 2021.
- *Where's the Honey?*, an Informational text classified as *difficult*, administered in PIRLS 2011, 2016, and 2021.

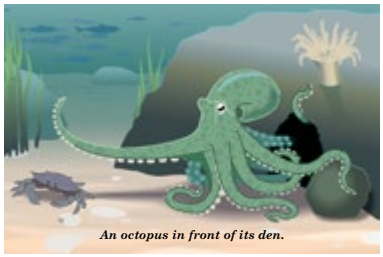
The passages and items are presented here as they were presented to pupils in Ireland, i.e. including any national adaptations to text that were agreed between the ERC and the IEA. Typically, national adaptations to test content are minimal and can include:

- adjustments to spelling (as American spelling is used in the international versions).
- adjustments to metrics (as the imperial system is used in the international versions).
- adjustments to phrasing where this is likely to cause confusion in the national context. For example, the instruction, "Check all that apply" is typically changed to "Tick all that apply" in Ireland.

While these passages and items will not appear in future cycles of PIRLS, they may not be reproduced without written permission from the IEA.

The Amazing Octopus – Informational text, classified as *easy*

The Amazing Octopus



An octopus in front of its den.

Octopuses are sea animals that have rounded bodies, bulging eyes, and eight long arms. Their arms are very strong and lined with powerful suction cups. They live in all the world's oceans but they especially like warm, tropical waters. They often stay on the ocean floor where they can find their favourite foods. They like to eat crabs, shrimp, and small fish. They capture their prey with their suction cups and then put the food into their mouths.

Octopuses often live alone in dens built from rocks. Octopuses sometimes even make rock "doors" for their dens that can be pulled closed to keep them safe.

An octopus shoots ink to escape danger.

An octopus scares away predators with its spots.

Escaping Danger

Octopuses can escape from danger because they are fast swimmers and can shoot a cloud of thick, dark ink at any attackers. This gives them enough time to speed away.

Octopuses are also experts in disguise. They can change their skin colour to pink, blue, brown, or green to blend into the rocks, sand, and coral around them and become invisible. Octopuses can look just like lumpy, seaweed-covered rocks. They can also create a variety of spots, stripes, and blotches in a matter of seconds to look like something else that would not be good to eat.

Octopuses can hide by slipping through cracks in rocks or coral. They have no backbones. In fact, they do not have any bones at all and are soft all over. Without bones, octopuses can flow like water and fit their whole body into very tiny places. They are famous for showing up in places you don't expect them. Octopuses have been found in shells, scientists' equipment, and bottles left in the sea.

Sometimes, octopuses even use shells to hide. They pick up shells with their suction cups. Then they wrap their arms around their bodies with the shells facing out. Passing predators think that the octopus is just an old pile of shells.

An octopus hiding itself under shells.

Frieda opens jars of food.

Squirt makes "art".

Learning to Do Things

An octopus named Frieda lived in an aquarium in Germany. After watching her keepers twist open the glass jars containing her food, she learned to open the jars herself. Pressing the lid against her body and grasping the jar with her arms, she twisted her boneless body to unscrew the lid. She only opened jars containing her favourite foods, such as crabs and shrimp. She ignored the jars with everyday fish.

At a marine centre in the United States, an octopus named Squirt learned to paint. He could do this by moving levers that sprayed the paint onto a canvas. The "art" was then sold to make money to help maintain the octopus tank.

Keeping Octopuses Busy

People like to watch octopuses in aquariums that show their natural environments. But octopuses are easily bored, so aquarium staff have to invent ways to keep their octopuses occupied. For example, they give octopuses puzzles and toys that can be taken apart.

At an aquarium in the United States, an octopus named Sammy enjoyed playing with a plastic ball that could be screwed together by twisting the two halves. His keeper would put food inside the ball, and Sammy would open the ball and then screw it back together when he was finished eating.

An octopus playing with a toy in its tank.

Recognising Their Keepers

Besides toys and puzzles, octopuses like it when their keepers spend time touching them and playing with them. When octopuses see their keepers coming to feed them and stroke their heads, they turn red to show that they are excited. They might also greet their keepers by standing up tall on their arms and leaning forward. Octopuses have been known to hop on their back "legs" while waving their arms to get the attention of their keepers.

Octopuses like the company as much as they like the food. When the octopuses finish eating, they will reach up with one arm and then another, curling them over their keepers' hands and arms. Octopuses and keepers will hold each other's arms, with the octopuses gently latching on to their keepers with their suction cups.

An octopus latching on to its keeper's arms.

Questions The Amazing Octopus

1. According to the article, which statements are true about octopuses?

   Tick **all** that apply.

   - They have round bodies. ☐
   - They have eight long arms. ☐
   - They only live in cold parts of the ocean. ☐
   - They like to eat crabs and small fish. ☐
   - They catch their food with their mouths. ☐

2. What do octopuses use to make doors for their dens?

   1 _____

3. The article says that octopuses are "experts in disguise".

   What does this mean?

   - (A) They can look like something else.
   - (B) They are very fast swimmers.
   - (C) They can shoot dark ink.
   - (D) They can be different shapes.

4. Octopuses do not have bones. What does this mean they can do?

   - (A) Hide with other octopuses
   - (B) Hold on to rocks
   - (C) Fit into very tiny places
   - (D) Look like seaweed

5. Octopuses are famous for showing up in unusual places.

   Give one example from the text.

   1 _____

6. Give two ways that octopuses escape from their predators.

   1 1. _____

   1 2. _____

7. What did Frieda the octopus learn to do?

   1 _____

   _____

8. What did Squirt the octopus learn to do?

(A) Draw pictures of the aquarium
(B) Move levers to shoot paint onto a canvas
(C) Spray his ink like paint onto a canvas
(D) Use his many arms like fingers to paint

9. Does the writer think that Squirt makes good paintings?

Tick your choice.

___ Yes

___ No

Give a reason from the text.

1 _____

_____

10. Why do aquarium staff give octopuses puzzles?

1 _____

_____

11. What toy did Sammy enjoy playing with?

1 _____

12. What are two things octopuses do to show they are happy to see their keepers?

1 1. _____

1 2. _____

13. Octopuses like their keepers to touch them. What do octopuses do that shows this?

(A) Work on puzzles with their keepers
(B) Hop up and down when they are hungry
(C) Reach up and latch on to their keepers' arms
(D) Eat all of their food

14. The writer thinks octopuses are "amazing". Give three examples of amazing things that octopuses in aquariums have learned to do.

1 1. _____

_____

1 2. _____

_____

1 3. _____

_____

15. Based on what you have read in the article, are aquariums good for octopuses?

Tick your choice.

___ Yes

___ No

Give one reason to explain your answer.

1 _____

_____

_____

_____

Text and illustrations by TIMSS & PIRLS International Study Center, Boston College. Photos obtained from Sea Life Scarborough, Monterey Bay Aquarium, and Deposit Photos.

The Empty Pot – Literary text, classified as *medium* difficulty

The Empty Pot

retold by Elaine L. Lindy
illustrated by Jennifer Moher

The Emperor of China announced a contest to decide the next heir to the throne. The Emperor was old and had no children. Because he loved plants, he declared that any child who wanted to be emperor should come to the palace to receive one royal seed. Whichever child could show the best results within six months would win the contest and become the next emperor.

You can imagine the excitement! On the day the seeds were to be handed out, crowds of hopeful children filled the palace. Each child returned home holding one precious possibility.

And so it was with the boy Jun. He was already considered the best gardener in the village. His neighbours loved to share the tomatoes, cabbage, and peas from his garden. Jun carefully carried the Emperor's seed home, sealing it securely in his hands so it wouldn't fall, but not so tightly that it might be crushed.

At home, he spread the bottom of a flowerpot with large stones, covered the stones with pebbles, then filled the pot with rich moist soil. He pressed the seed a few centimetres below the surface and covered it with light soil. Over the next few days Jun, along with every child he knew, watered his pot every day and watched for the first leaf to burst through the surface.

Cheun was the first child in Jun's village to announce that his seed was sprouting. This was met with whoops of congratulations. He bragged that he would surely be the next emperor and practised his royal skills by bossing the younger children around. Ming was the next child whose tiny plant had emerged from his pot, then it was Wong. Jun was puzzled—none of these boys could grow plants as well as him! But Jun's seed did not grow.

Soon sprouts emerged from pots all over the village. Children built fences around their pots and guarded them from those who might accidentally—or not so accidentally—topple them over. Soon, dozens of sprouts in pots throughout Jun's village were stretching out their first leaves. But Jun's seed did not grow. He was confused—what was wrong? Jun carefully replanted his seed into a new pot with the very best and richest black soil from his garden. He crumbled every ball of soil into tiny particles. He gently pressed in the seed, and kept the top moist and watched the pot every day. Still Jun's seed did not grow.

Strong, powerful stalks soon emerged from the pots cared for by other children in Jun's village. Jun was sad and defeated. The other children laughed at him.

Six months passed. The day approached when the children were supposed to bring their plants to the palace for judging. They cleaned their pots until they shone, gently wiped the great leaves, and dressed in their finest clothes. Some parents walked alongside their child as they carried the pot to the palace, holding the plant upright to keep it from tipping over.

"What will I do?" wailed Jun to his parents as he gazed out the window at the other children preparing for their triumphant return to the palace. "My seed wouldn't grow! My pot is empty!"

"You did the best you could," said his father, shaking his head.

"Jun, just bring the Emperor your pot," said his mother, "it was the best you could do."

Ashamed, Jun carried his empty pot on the road to the palace, while gleeful children carrying pots tottering with huge plants marched to his right and left.

At the palace, children lined up in rows with their blossoming plants and awaited judgement. The Emperor, wrapped in his silk robe, strode down the line of hopeful contestants, viewing each plant with a frown. When he came to Jun, he scowled even more and said, "What is this? You brought me an empty pot?"

It was all Jun could do to keep from crying. "If you please, Your Majesty," said Jun, "I tried my best. I planted your seed with the best soil I could find, I kept it moist and watched it every day. When the seed didn't grow I even replanted it in new soil. But it just didn't grow. I'm sorry." Jun hung his head.

"Hmm," said the Emperor. Turning so everyone could hear, he thundered, "I don't know where all these other children got their seeds. Nothing could grow from the seeds I gave you, because those seeds had all been boiled!"

And the Emperor smiled at Jun.

Questions The Empty Pot

1. Why did the Emperor hold the contest?
   - (A) to teach children about plants
   - (B) to choose the next emperor
   - (C) to show how grand he was
   - (D) to find the best kind of plant

2. What did each child receive from the Emperor?
   (1 point)
   _____

3. Why was each seed called a "precious possibility"?
   - (A) Each seed gave a chance to win the contest.
   - (B) Each seed was royal and very expensive.
   - (C) Each seed would grow into a beautiful plant.
   - (D) Each seed gave a chance to become the best gardener.

4. Find the part of the story next to this picture of a leaf:  .
   What shows that Jun was the best gardener in the village?
   (1 point)
   _____
   _____

5. Which of these looks most like Jun's flowerpot when he first planted the seed?
   - (A) 
   - (B) 
   - (C) 
   - (D) 

6. Find the part of the story next to this picture of a flower:  .
   What does this paragraph show about Jun?
   - (A) that he wondered what would grow
   - (B) that he felt he would win the competition
   - (C) that he planted the seed with care
   - (D) that he made mistakes when planting the seed

7. Why did the children build fences around their pots?
   - (A) to keep the leaves clean
   - (B) to keep their plants from being knocked over
   - (C) to keep the soil moist
   - (D) to keep other children from seeing their plants

8. What was the first thing Jun did when his seed did not grow?
   - (A) He built a fence around his pot.
   - (B) He watered the seed more often.
   - (C) He complained to his parents.
   - (D) He replanted his seed in a new pot.

9. Why did the other children laugh at Jun? Use what happened in the story to explain your answer.

Score 2

_____

_____

_____

10. Why do you think Jun's parents told him to take his empty pot to the palace?

Score 1

_____

_____

11. Which word best describes how Jun felt when he walked to the palace for the judging?

A ashamed

B puzzled

C hopeful

D excited

12. Why did the Emperor scowl while looking at Jun's pot?

A He was worried about the contest.

B He thought Jun's pot was not shiny enough.

C He was hiding what he was thinking.

D He did not know why Jun was there.

13. Why did Jun say, "I'm sorry" to the Emperor?

A He had cheated in the contest.

B He didn't want to become an Emperor.

C He thought he had disappointed the Emperor.

D He watered his seed too often.

14. Why did plants grow in other children's pots?

A The other children used better soil.

B The other children watched their pots.

C Their seeds were protected by fences.

D Their seeds were replaced with new ones.

15. What do you think the Emperor valued most in a person?

A having royal skills

B being an honest person

C having respect for their parents

D being a good gardener

16. Why did the Emperor smile at Jun?

Score 1

_____

_____

17. Jun had different feelings during the story. Use what you have read to explain why Jun had **each** of these feelings.

Score 1 — hopeful

_____

_____

Score 1 — puzzled

_____

_____

Score 1 — defeated

_____

_____

Stop

End of this part of the booklet.
Please stop working.

Empty Pot retold by Elaine L. Lindy, from *Absolutely Whootie: Stories to Grow By* (http://www.storiestogrowby.com). Illustrations by Jennifer Moher © 2010 IEA.

Where's the Honey? – Informational text, classified as *difficult*

Where's the Honey?

Can humans and wild birds work together? In East Africa, a bird called the honeyguide helps people find honey.

The honeyguide loves to eat beeswax and grubs (baby bees) and always knows where to find a good beehive. But the bird is too small to break open the hive to get at most of the delicious food inside. That's where the Boran people come in. They make all their own food, and every now and then they like a little fresh honey. To get honey, they have to find a wild beehive and take the honey out themselves. But beehives can be difficult to find in the wilderness. Luckily, the Boran have the honeyguide to help.

Wild bees make their hives inside tree trunks.

Meet the Honeyguide Bird

You would not guess that there is anything special about the honeyguide from looking at it. It is a dull brown-grey colour with white patches on its tail. It is about 20 centimetres long, with a small head and short beak. Since the honeyguide can't always get into hives, it also eats fruit, worms, and other insects.

A honeyguide perches on a branch.

Meet the Boran People

The Boran people live in East Africa. Their houses are made of branches covered with grass. The Boran are known for raising cattle, which give them meat and milk. The lands in East Africa are dry, and there is not enough fresh grass in one place for the cattle to live year-round. So, three or four times a year, the Boran move with their cattle to a new place. They take apart their houses into big sections and carry them with them. When they arrive at a new place, they re-build their houses. But their lands are becoming drier, and the Boran are having more trouble finding enough fresh grass. For this reason, some Boran are beginning to look for new lives in towns and cities.

The Honey Hunt

When either the bird or the Boran want to go honey hunting, they have a way of calling each other. The Boran have a special whistle that can be heard almost a kilometre away. The honeyguide calls to humans by sounding two notes over and over: *tirr-tirr, tirr-tirr!*

A Boran whistles for a honeyguide.

When both the Boran and the honeyguide are ready, the hunt begins. The bird flies out of sight. Then it returns and lands where it can be seen. As soon as the people get close, it flies ahead, showing its white tail feathers.

The honeyguide lets the Boran know the hive is near the ground by flying below the treetops. If it flies higher, that means the hive is in a tree.

Then it lands again and waits. The Boran make noise to let the bird know they're still following. They whistle, bang on wood, and talk loudly.

As they get closer to the hive, the honeyguide lands more often. It also starts perching closer to the ground. The Boran can tell that they're getting close.

Finally, when it reaches the beehive, the honeyguide makes a new noise. It tells the Boran, "Hey, we're here!" in a soft tone with long pauses between notes. Sometimes it flies in circles around the hive.

The Boran start a fire. With a piece of smoking wood, they flush the bees out. Then they break open the hive and gather the honey. They leave their honeyguide lots of wax and grubs.

Honeyguide Legend

The Boran tell a story about what happens if you don't leave the honeyguide food as a reward for showing you to a hive. The next time you follow it, the honeyguide will lead you to something really dangerous - like a leopard in a tree!

Both Win

Without help from the bird, the Boran say that it takes almost nine hours to find a beehive. Sometimes they can't find one at all. But with the honeyguide leading the way, the hunt takes three hours and they almost always find a hive. Without the Boran, the honeyguide can usually only peck a little at the front door of the hive. But with the help of humans, their smoke and their tools, the honeyguide can get into many more beehives!

All Alone

Honeyguides sometimes visit hives alone. When they do, they go on cloudy and cool mornings when the bees are drowsy. Then they can fly straight up to the hive, but they don't stay for long. They still might get stung by the bees, and they don't get much food.

Past and Future

The way humans and honeyguides work together is so effective that scientists believe they must have been doing it for a long time. Rock paintings tell us that Africans have been hunting honey for over 20,000 years.

But this partnership between bird and human is in danger. Many honeyguides now live in nature reserves where humans are not allowed. And the Boran are moving into cities, where it is easier to buy a bag of sugar from the shop than it is to hunt for beehives. The honeyguide has been seen calling to people in their gardens and getting no response.

Questions Where's the Honey?

1. What do the Boran and the honeyguide get to eat from the beehives?

(1) The Boran

(1) The honeyguide

2. What do the Boran and the honeyguide do to help each other?

(1) The Boran

(1) The honeyguide

3. Why do the Boran have to move three or four times a year?

(A) to find water
(B) to find honey
(C) to feed their cattle
(D) to sell meat and milk

4. Write **two** things the Boran's houses are made of.

(1) 1. _____

2. _____

5. Which of the following can be learned from the *Meet the Boran People* box?

(A) why the Boran are not allowed in nature reserves
(B) why the Boran have hunted honey for so long
(C) why the Boran are moving to the cities
(D) why the Boran have been studied by scientists

6. How do the Boran call the honeyguide?

(A) They use smoke signals.
(B) They bang on wood.
(C) They use a special whistle.
(D) They call the bird's name.

7. The honeyguide sends different messages to the Boran by doing different things. Fill in the blank spaces to complete the table.

What the Honeyguide Does	What It Means to the Boran
(1) Flies above the treetops	
(1)	They are getting close to the hive.
(1)	They have arrived at the hive.

8. Why do the Boran light a fire?

- (A) to lead the bird to the hive
- (B) to make the bees leave the hive
- (C) to break open the hive
- (D) to show they found the hive

9. What is the main message of the *Honeyguide Legend*?

- (A) You should reward the honeyguide.
- (B) The honeyguide is a very clever bird.
- (C) You should always follow the honeyguide.
- (D) The honeyguide can be dangerous.

10. Why does the honeyguide visit hives in the morning when it is alone?

- (A) It is easier to find the hives.
- (B) There are more grubs there.
- (C) The bees are not in the hive.
- (D) It is less likely to get stung.

11. What have people found that shows the Boran and honeyguide could have been working together for thousands of years?

1 _____

12. Why is the partnership between bird and human in danger?

- (A) The Boran may no longer need the honeyguide.
- (B) The honeyguide has stopped following the Boran.
- (C) The Boran may no longer like honey.
- (D) The honeyguide has found other kinds of food.

13. Use what you have read to explain what the honeyguide might need to do in the future if more of the Boran move to the cities.

1 _____

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