PIRLS 2021:

Exploring the contexts for reading of primary school pupils in Ireland

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CHAPTER 1

Chapter 1: Overview of PIRLS 2021

This report explores the contexts for the reading achievement of primary school pupils in Ireland, as captured by the *Progress in International Reading Literacy Study* (PIRLS) in 2021. Specifically, it describes the reading-related experiences, attitudes, and behaviours of pupils who participated in PIRLS 2021 in Ireland, along with relevant contextual information as provided by these pupils' parents/guardians[2], teachers, and school principals. In doing so, it examines the relationships of selected pupil, home, class/teacher, and school characteristics with the reading achievement of primary school pupils in Ireland.

This first chapter provides a brief overview of PIRLS and its implementation in Ireland in 2021 amidst the unique context of the COVID-19 pandemic. It highlights important caveats that need to be considered when interpreting PIRLS 2021 data due to COVID-19 impacts on the PIRLS administration both in Ireland and internationally. Next, a synopsis of key findings from the PIRLS 2021 national report by Delaney et al. (2023) is provided, to which readers are referred for further information about the study. Finally, the chapter outlines the scope and structure of the rest of this report and provides guidance on interpreting the data therein.

Introduction to PIRLS

PIRLS is a comparative study that assesses the reading skills of primary school pupils in participating countries worldwide and it is overseen by the International Association for the Evaluation of Educational Achievement (IEA). In Ireland, the Educational Research Centre (ERC) manages PIRLS on behalf of the Department of Education, adhering to IEA procedures to ensure international comparability.

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, while questionnaires are also used to collect contextual data from the pupils, their parents, their teachers, and their school principals.

Reading achievement in PIRLS is measured on a scale with a centrepoint of 500 (the average achievement across participating countries in the first cycle in 2001) and a standard deviation (*SD*) of 100. In 2011, pupils in Ireland achieved a mean PIRLS 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 PIRLS score of 567, which represented a statistically significant improvement from 2011. This mean score was equivalent to that of pupils in Hong Kong, Finland, and Northern Ireland, with only the Russian Federation and Singapore statistically significantly outperforming Ireland (Eivers et al., 2017). In 2021, pupils in Ireland achieved a mean PIRLS score of 577, which, again, represented a statistically significant improvement from 2016. As explained later in this chapter, though, all trend comparisons of countries' achievement in PIRLS 2021 to previous cycles should be made cautiously, due to the disruption caused by COVID-19. This is especially relevant for countries, including Ireland, that tested at the start of grade 5

2 Throughout the remainder of the report, the term "parents" is used to refer to both parents and guardians of pupils.

rather than at the end of grade 4 in 2021. While caution is warranted in comparing mean achievement across PIRLS 2021 participating countries, the data indicate that Ireland retains its place among a set of very high-achieving countries in relation to reading in primary school.

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 Co-operation 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)[3] 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 pupils' reading literacy. In the framework that guides the development of the PIRLS assessment, reading literacy is defined as:

> 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, 2019, p. 6)

This operationalisation of reading literacy in PIRLS encompasses various text and item (question) types. In the 2021 cycle, some countries, including Ireland, administered PIRLS entirely on paper, while others administered it entirely on computer. The paper-based assessment included 18 texts, while the digital version incorporated an additional five ePIRLS texts (or "projects"). Each text was classified based on the primary purpose for which it would be read: either for literary experience ("Literary"), or to acquire and use information ("Informational"). Literary texts are, typically, 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. Among the 18 texts included in both paper-based and digital PIRLS in 2021, an equal split between Literary and Informational was maintained. The five ePIRLS texts were all Informational, reflecting the prevalent online reading practices geared towards gleaning information (Mullis & Martin, 2019).

In addition to categorisation by reading purpose, each text was classified as easy, medium, or difficult, based on its difficulty level across countries in previous cycles (for trend texts) or in the 2020 field trial (for new texts). The targeted average percentage of correct responses, calculated across the international population of PIRLS pupils, was set at 80% for easy texts, 65% for medium texts, and 50% for difficult texts.

3 Due to the variable education technology 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. For additional information, please see Eivers et al. (2017).

The PIRLS texts were organised into 18 booklets, with each pupil assigned one of these booklets.[4] Each booklet comprised two texts and their items, and each text appeared in two different booklets, paired with a different text each time. All booklets included one Literary and one Informational text, with the Literary text positioned first in 10 booklets and the Informational text positioned first in the remaining 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 based on the primary comprehension processes 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"). PIRLS aims to distribute these items across the assessment, presenting approximately 20% Retrieve, 30% Infer, 30% Interpret, and 20% Evaluate items (Mullis & Martin, 2019).

Some items in the PIRLS assessment employ a multiple-choice format, where pupils are typically presented with four response options and asked to select the most appropriate 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). These constructed-response items may be worth varying points, ranging from one to three, and pupils are advised to consider the points allocated for each item and adjust the length and detail of their response accordingly.

The PIRLS booklets varied by difficulty level. Booklets 1 – 9 were classified as more difficult. Of these, three booklets contained two difficult texts, 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. Within each country, the assignment of booklets to individual pupils was random, ensuring an equal probability for any two pupils within the same country to receive a specific booklet. However, 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 proficiency in each country. This was a new approach for PIRLS 2021 and allowed for the difficulty of the assessment to be tailored, in a macro sense, to the needs of different populations. The PIRLS 2021 national report for Ireland (Delaney et al., 2023) includes sample PIRLS texts of varying purposes (Informational/Literary) and difficulty, along with their accompanying items.

What contextual information does PIRLS collect?

In addition to assessing pupils' reading literacy, PIRLS collects data on their demographic characteristics, attitudes, and experiences, and about the home, classroom, school, and national contexts in which they learn. Information about each of these contexts has been analysed for the purposes of this report as it 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.

4 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 Martin et al. (2019).

The collection of contextual information is guided by the PIRLS 2021 Context Questionnaire Framework (Mullis et al., 2019). This framework describes the various instruments administered and the rationale for the items used in each. Brief 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 towards reading, reading behaviours, and engagement in reading lessons. It also probes their school experiences (e.g., sense of school belonging; frequency with which they arrive at school tired or hungry; frequency with which they have been bullied) and home environments (e.g., approximate number of books in the home).[5]

A **home questionnaire** is sent to pupils' parents to gather further information about pupils' home environments, including language(s) spoken, information about early literacy activities and skills, the extent to which parents 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' perspectives on their children's experiences during periods of school closures and remote learning due to the COVID-19 pandemic.

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 levels of job satisfaction. In 2021, additional questions asked about teachers' perspectives on the impact of COVID-19 in their classes.[6]

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 due to COVID-19 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). In Ireland, information for the Curriculum Questionnaire and Encyclopedia chapter (Department of Education et al., 2022) was provided by the Department of Education, the National Council for Curriculum and Assessment (NCCA), and the ERC PIRLS 2021 team.

New features and the context of PIRLS 2021

PIRLS 2021 included three notable changes relative to previous cycles. Two of these were

5 Teachers were given the option to read the questionnaire aloud to the entire class or allow pupils to complete it independently, as they were best placed to decide what would work for their class. Additionally, they were allowed to read questionnaire items aloud to individual pupils upon request and provide clarifications if needed.

6 In Ireland, the full PIRLS teacher questionnaire was administered to the Fifth Class teachers at the time of testing in autumn 2021. A supplementary national teacher questionnaire was administered to the Fourth Class teachers from the previous year. This is further described in the *New features and the context of PIRLS 2021* section of this chapter.

planned: a further transition 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. Detailed information about each of these three changes both internationally and in Ireland are provided in the PIRLS 2021 national report (Delaney et al., 2023). A summary of the specific impacts for Ireland is provided below.

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 disruptions to education introduced by the COVID-19 pandemic, PIRLS was ultimately conducted as a paper-based 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.

The field trial for digital PIRLS in Ireland was scheduled to take place during March and early April 2020. This timeframe coincided with the onset of the COVID-19 pandemic in Ireland, leading to an abrupt halt to field trial data collection shortly after it had begun. A 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 school year (for additional information, see Department of Education et al., 2022 and Delaney et al., 2023). Consequently, field trial data could only be collected from 10 out of the 40 sampled schools, and these data were submitted to the IEA in May 2020. Despite the pandemic's varying impact across participating countries, 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, plans for a digital PIRLS main study in spring 2021 in Ireland continued for a time, albeit amidst uncertain circumstances.

The pandemic remained a significant concern throughout 2020, with continued unpredictability regarding its impact on schools, pupils, and all education stakeholders. In response, the Department of Education, in consultation with the ERC, decided to revert to paper administration for the PIRLS 2021 main study. This decision aimed to maximise the likelihood of schools and individual pupils being able to participate in the PIRLS assessment under various potential circumstances arising from the ongoing pandemic. Digital administration would have required sets of hired laptops to transit between participating schools, accompanied by visiting technical support personnel. Testing on paper was considered a safer option, as it minimised the risk of COVID-19 transmission and reduced disruptions. Additionally, not having to coordinate test dates with technical support personnel provided schools with greater flexibility in scheduling testing. This was particularly advantageous in the event of unexpected closures or large-scale absences.

Following a spike in COVID-19 transmission levels from late 2020 to early 2021, a second blanket closure of school buildings was implemented starting in January 2021. In response to the exceptional circumstances created by the pandemic, the IEA offered PIRLS countries the option of conducting PIRLS in the autumn. In February 2021, the Department of Education decided to avail of this option and moved the PIRLS data collection in Ireland to the autumn. This decision was made in light of ongoing uncertainty about the duration of school closures and with the aim of minimising stress for pupils and teachers.

The decision to move PIRLS to autumn meant that pupils in Ireland would be tested at the start of Fifth Class rather than towards the end of Fourth Class, making them approximately six

months older at the time of testing. Thirteen other northern hemisphere countries (Bahrain, Croatia, Georgia, Hungary, Kazakhstan, Latvia, Lithuania, Morocco, Northern Ireland, Qatar, Saudi Arabia, United Arab Emirates, United States) also delayed their administration to autumn 2021 due to similar circumstances. These countries are referred to as "Start G5", while other countries are referred to as "End G4". There were also a few countries (Australia, Brazil, England, Iran, South Africa, Israel) that administered PIRLS to fourth grade pupils one year later than planned (autumn 2021 for southern hemisphere countries; spring 2022 for northern hemisphere countries).

The PIRLS test window in Ireland spanned from September 27 to October 21, 2021. While the decision to move to autumn testing was considered the most practical course of action, the changes to the age, grade level, and context of testing result in significant caveats being required for cross-country and trend comparisons, as explained later in this chapter and reiterated throughout this report.

In Ireland, the teacher questionnaire was completed by the pupils' Fifth Class teachers (i.e., their class teachers at the time of testing). However, Ireland's data from this questionnaire have not been included in the PIRLS 2021 International Database, as they are not directly comparable to the data from countries that administered it to the fourth grade teachers.[7] Nonetheless, the data are available to the ERC and provide valuable within-country information, including responses to additional national questions concerning the pandemic's impact on classroom practices.

As a national addition in Ireland, teachers who had taught participating pupils in Fourth Class were also asked to complete a shorter, custom-built questionnaire. This aimed at collecting some similar information about the school year during which PIRLS 2021 was originally scheduled to take place. Expectedly, the response rate for this supplementary questionnaire was lower, 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.

Additional information about the PIRLS administration in Ireland, including the administration of the test and context questionnaires, and the quality monitoring procedures implemented can be found in the PIRLS 2021 national report (Delaney et al., 2023).

Who took part in PIRLS 2021?

In total, 57 countries participated in PIRLS 2021, involving 320,542 pupils along with their parents, teachers, and school principals. A further 47,033 pupils took part on behalf of eight benchmarking participants.[8] The majority of countries (37) adhered to the original testing schedule, assessing pupils approaching the end of fourth grade. Six countries delayed testing by one year but still evaluated fourth grade pupils, with the northern hemisphere countries in this group benefitting from more normalised schooling conditions in 2022. Fourteen countries, including Ireland, administered PIRLS to pupils at the start of fifth grade in autumn 2021.

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7 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.

8 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 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, while overall results for benchmarking participants can be found in the e-Appendices of the PIRLS 2021 national report (Delaney et al., 2023).

The PIRLS countries were divided relatively evenly between paper-based and digital test administration modes, with 32 countries opting for paper-based testing and 25 countries administering PIRLS digitally (with a paper "bridge" sample added, to allow for analysis of any mode effects).[9] 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.

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 like Ireland, the sample initially selected for spring 2021 testing, consisting of fourth grade (equivalent to Fourth Class in Ireland) pupils was assessed in autumn 2021 after transitioning to fifth grade (equivalent to Fifth Class in Ireland). 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 whenever possible, albeit with the target pupils having progressed to Fifth Class prior to testing.

Details regarding the selection of schools and class groups, the necessary adjustments due to the move to autumn testing, and response rates are outlined in the PIRLS 2021 national report (Delaney et al., 2023). Notably, despite the challenges posed by the pandemic to parents, pupils, and school staff during and leading up to the 2021 testing period, response rates for PIRLS 2021 remained commendably close to those achieved in PIRLS 2016, highlighting a strong commitment across these groups to participating as fully as possible in the study. This dedication ensured that the collected data can be considered representative of the wider population of pupils at the target grade level for this cycle of PIRLS in Ireland.

In total, 4,663 pupils from 148 schools participated in PIRLS 2021 in Ireland. Contextual data were available from the pupil questionnaire (4,643 pupils), home questionnaire (4,322 pupils), teacher questionnaire (4,520 pupils), and school questionnaire (4,610 pupils). It is important to note that where data from teachers who had taught participating pupils in Fourth Class are presented in this report, these refer to those Fourth Class teachers whose classes progressed intactly from Fourth to Fifth Class in 2021. Data from Fourth Class teachers whose classes did not progress intactly from Fourth to Fifth Class in 2021 have been excluded from the analysis. This means that of the 4,663 participating pupils, 3,317 had (at least some) data available from the national Fourth Class teacher questionnaire.

Caveats in the interpretation of PIRLS 2021 data

Several important caveats must be considered when interpreting the PIRLS 2021 data. These caveats are outlined in Table 1.1 and are reiterated throughout this report (for more information, see Delaney et al., 2023).

9 The United States administered PIRLS digitally but opted to report only the results from its paper bridge study.

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

1.	**International comparisons**
End G4 vs Start G5	Great caution is needed 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 school closures for pupils in most Start G5 countries than for those in most End G4 countries. Caution is also needed in the interpretation of international comparisons that involve 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 think about reading on screens.
2.	**Trend comparisons**
***Start G5 countries:* change of age, grade, and time of year**	Comparisons between Ireland's PIRLS 2021 data and Ireland's data from previous PIRLS 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 taking the test at a different time of the school year. This caveat also affects the other 13 countries that tested at Start G5 in 2021.
***Countries that tested one year later than planned:* six-year trend**	The 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.

Note. Adapted from *PIRLS 2021: Reading results for Ireland* (p. 12), by E. Delaney, S. McAteer, M. Delaney, G. McHugh, & B. O'Neill, 2023, Educational Research Centre. Reprinted with permission.

Synopsis of key findings from initial PIRLS 2021 report

This section provides a synopsis of key findings from the initial report by Delaney et al. (2023). Readers are encouraged to read the initial report should they require additional information. All findings presented here, as in the rest of this report, should be interpreted considering the caveats associated with Start G5 testing in 2021. In particular, Delaney et al. (2023) note that available evidence suggests that pupils in Ireland would probably have performed somewhat less well if they had been tested in spring.

In 2021, pupils in Ireland achieved a mean reading score of 577, which was statistically significantly higher than the mean scores of all other Start G5 countries and most End G4 countries. When comparing Ireland's results with those of End G4 countries, it is important to remember the above assumption; namely, that pupils in Ireland would probably have performed somewhat less well if they had been tested in spring. Therefore, while Ireland ranks high among PIRLS countries, caution is needed when comparing with End G4 countries.

Comparing mean achievement between 2016 and 2021, Start G5 pupils in Ireland in 2021 scored 11 points higher (rounded) than their End G4 peers 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 these time points.

Looking at the distribution of achievement, Ireland's lowest-achieving pupils (5th percentile) outperformed those in most reference countries, except Hong Kong. Similarly, Ireland's highest-achieving pupils (95th percentile) 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, with the main changes being 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 not statistically significant.

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. In 2021, almost all of the Start G5 pupils in Ireland (98%) reached the Low Benchmark (the lowest level comprised by pupils who can consistently demonstrate relatively limited reading comprehension skills when reading easier texts), 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 statistically significantly between 2016 and 2021. However, there were statistically significant increases at the High Benchmark (5%) and the Advanced Benchmark (6%).

Girls statistically significantly outperformed boys in Ireland in PIRLS 2021, with a mean advantage of 11 points (rounded) (583 vs 573).[10] This gap was small relative to the international average (17 points) and the gaps in many reference countries. It was also similar in magnitude to the gap observed in Ireland in 2016 (Eivers et al., 2017), and mean achievement increased statistically significantly between cycles for both boys (+12) and girls (+11). While caveats regarding trend comparisons do not allow for conclusions that performance among either group has truly improved, it seems likely to have at least held stable for both.

Most PIRLS pupils in Ireland attended non-DEIS (Delivering Equality of Opportunity in Schools)[11] 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

10 In the initial report by Delaney et al. (2023), gender is analysed on the basis of how pupils described themselves. 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). In the initial report, mean achievement is not reported for the group selecting other as the small number of pupils comprising the group results in a large margin of error. This is the approach also used in this report. This differs from the PIRLS 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.

11 The DEIS programme classifies schools according to the level of disadvantage of their population and allocates resources accordingly (Department of Education and Skills, 2017b).

Rural schools.[12] Mean achievement in DEIS Urban Band 1 schools and DEIS Urban Band 2 schools was statistically significantly lower than mean achievement in non-DEIS schools, by 56 points and 40 points, respectively. These echo the findings from PIRLS 2016 (Delaney et al., 2022), with the achievement gaps somewhat wider in 2021, but not statistically significantly so. Due to smaller sample sizes and resulting error margins, caution is warranted when interpreting the estimate of mean achievement of pupils attending DEIS Rural schools, and definitive conclusions about their relative performance cannot be drawn.

Using a new PIRLS scale that provides an individual measure of socioeconomic status based on books on the home, parents' education, and parents' occupation, it was found that mean socioeconomic status in Ireland was relatively high compared to many other countries, and there was a close association between individual socioeconomic status and school DEIS status, as expected. In Ireland and internationally, pupils with higher socioeconomic status performed statistically significantly and substantially better, on average, than their peers with middle and lower socioeconomic status. The mean advantage in Ireland of pupils with higher socioeconomic status over those with lower socioeconomic status was similar to the average gap internationally, but, notably, was larger than in all reference countries except Singapore.

Schools in Ireland generally provided a range of supports for remote learning during the closure period in early 2021, based on school principals' and parents' reports. Evidence also indicates that many pupils may have read more than usual during lockdown, both for educational purposes and personal enjoyment and both on paper and on screens. This relatively increased engagement with reading may be associated with sustaining and/or enhancing pupils' reading comprehension skills and, thus, with Ireland's strong overall performance in PIRLS.

A substantial portion of both parents and teachers acknowledged that pandemic-related disruptions had impacted PIRLS pupils' learning to varying degrees. Notably, pupils whose parents and teachers perceived them as less affected performed relatively better in PIRLS, on average. 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 typically some emphasis on literacy, although participation from PIRLS pupils was relatively low, according to teachers' reports. However, in autumn 2021, over 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. Despite the challenges posed by the COVID-19 pandemic, teachers generally reported a high sense of occupational wellbeing. However, it is worth noting that a notable minority expressed feelings of underappreciation on a regular basis.

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. Also, in 2021, pupils appeared to like reading somewhat less than in 2016, and to spend a little less time reading outside school.

12 While PIRLS sampling considered the four categories of DEIS to achieve representative samples of pupils, the percentages of pupils across these categories in the PIRLS sample differ slightly from those in the overall population due to changes in the school measure of size between the creation of the sampling frame and the time of testing.

While the initial report analysed only a selected few contextual variables, focusing on aspects of pupils' experience thought likely to have been impacted by the COVID-19 pandemic, the present report includes more in-depth analysis of a wider selection of contextual variables.

About this report

As mentioned earlier in this chapter, the primary focus of this report is on the contexts for the reading achievement of primary school pupils in Ireland, as captured by PIRLS 2021. Specifically, it describes the reading-related experiences, attitudes, and behaviours of participating pupils, along with relevant contextual information as provided by these pupils' parents, teachers, and school principals. In doing so, it examines the relationships of selected pupil, home, class/teacher, and school characteristics with the reading achievement of primary school pupils in Ireland.

The remainder of this report is structured as follows:

- **Chapter 2** sets the policy context, outlining the developments related to reading literacy before and during the PIRLS 2021 implementation, the results from other national and international assessments, and the COVID-19 context. Key questions of interest for this report are also delineated in this chapter.

Findings are presented in Chapters 3, 4, 5, 6, 7, and 8, where data for Ireland are generally examined: (i) in an international comparative context, (ii) in relation to the previous PIRLS cycles in 2011 and 2016, and (iii) by pupil, home, class, teacher, and school characteristics.

- **Chapters 3 through 5** focus on reading achievement by pupil and home characteristics (Chapter 3), class and teacher characteristics (Chapter 4), and school characteristics (Chapter 5)
- **Chapter 6** describes the profiles of low-, medium-, and high-achieving pupils in reading
- **Chapter 7** considers pupils' wellbeing, school-related experiences, reading attitudes and behaviours
- **Chapter 8** describes the educational experiences of pupils during the COVID-19 pandemic
- **Chapter 9** synthesises the findings from the preceding chapters in light of existing, relevant literature, discussing potential policy implications and provides recommendations for future research

For each chapter containing analyses, an e-Appendix is available in Excel format, providing unrounded data and additional details, such as confidence intervals and statistical test results. The e-Appendices can be downloaded from www.erc.ie/pirls/reports.

Selected reference countries

For this report, a subset of participating countries has been carefully selected as being of particular interest to readers in Ireland, mirroring the approach taken in the PIRLS 2021 national report (Delaney et al., 2023) (Table 1.2). The education systems of these countries are considered likely to provide useful points of reference for Ireland because they 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.[13] 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. Among the selected reference countries, Northern Ireland offers the most direct parallel for Ireland, as it also assessed pupils at Start G5 and on paper.

Findings for the reference countries are presented based on (i) the time of testing and (ii) the test mode. Countries are listed alphabetically within each subgroup, with italics used to denote those that tested on computer.

Table 1.2: 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	N/A
		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)

Note. Adapted from *PIRLS 2021: Reading results for Ireland* (p. 9), by E. Delaney, S. McAteer, M. Delaney, G. McHugh, & B. O'Neill, 2023, Educational Research Centre. Reprinted with permission.
⋈ Country tested one year later than planned (autumn 2021 for southern hemisphere countries; spring 2022 for northern hemisphere countries).

Understanding the analyses

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

Achievement scores

Reading achievement in PIRLS is measured on a scale with a centrepoint of 500 (the average achievement across participating countries in the first cycle in 2001) and a standard deviation (SD) of 100. This means that, in 2001, approximately 95% of pupil scores internationally fell between 300 and 700 (i.e., 500 ± 2*SD*). While the centrepoint remains constant across PIRLS cycles, it does not represent the international average for each cycle (other than the first one). In all PIRLS cycles to date, most participating countries have achieved mean scores statistically significantly above the international centrepoint.[14] 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

13 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.

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

significant. In simpler terms, 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. This decision is made because the error margins tend to be large when dealing with small sample sizes, making it challenging to draw accurate conclusions.

In this report, achievement scores are weighted. 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.

Percentages

Percentages are used to report various pupil, home, class/teacher, and school characteristics in this report (e.g., the percentage of pupils in Ireland within each category of the *pupil absence* variable). Percentages are also used to describe pupils' responses to individual questionnaire items, including to classify their outcomes on context questionnaire scales (which are computed based on responses to multiple questionnaire items). For example, drawing on internationally developed cut points on the PIRLS *Students Like Reading* scale, we can describe the percentages of pupils in Ireland who reported that they *very much like*, *somewhat like*, and *do not like reading*. It is important to note that when interpreting these percentages—especially when making comparisons across cycles—potential caveats arise due to variations in the questionnaire items used to compute these scale categories. Such variations are acknowledged within the report. As with achievement scores above, percentages in this report are also weighted. 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 statistically significant difference between groups indicates that it is unlikely to have occurred by chance. In this report, references to statistically significant or not statistically significant differences are based on statistical significance tests conducted using the 95% confidence level. These tests account for both measurement and sampling error in the statistical comparisons. When multiple comparisons are made within one analysis, adjustments are made to the critical value using the Bonferroni correction. For example, when performance of pupils in non-DEIS schools is compared with that of pupils in DEIS Urban Band 1, DEIS Urban Band 2, and DEIS Rural schools, meaning that three comparisons are made, the alpha level of .05 is divided by the number of comparisons (here, three), resulting in an adjusted alpha level of .0167.[15] Statistical significance does not necessarily imply substantive or meaningful significance. Readers are encouraged to consider the real-world context when interpreting reported differences.

Measures of uncertainty

Standard errors (SE): Estimates of group-level characteristics are influenced 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., all pupils in Ireland, pupils in DEIS Urban Band 1 schools in Ireland), this value is accompanied by an estimated *SE*. The *SE* serves as an indicator of the level of uncertainty around the observed estimate. A smaller *SE* indicates a higher level of confidence that the observed value for the sample accurately reflects that of the population.

15 Analyses presented in the PIRLS 2021 international report (Mullis et al., 2023) are not adjusted for multiple comparisons.

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 Urban Band 1 schools is larger, reflecting that the sample of pupils in this subset of schools is smaller and less representative. Due to spatial constraints, *SEs* are generally not presented in tables within the main body of this report, but can be found in the e-Appendices.

Confidence intervals (CI): If an infinite number of samples from a population were tested under constant test conditions on an infinite number of occasions, the observed mean scores would be expected to cluster around a "true" mean. Approximately 95% of these test occasions would yield mean scores falling within ±1.96 *SE* of the "true" mean. While this scenario is hypothetical, it can be inferred that there is a 95% chance that the observed mean score on an actual test occasion lies within ±1.96 *SE* of the unobservable "true" mean. Based on this principle, a 95% *CI* around the observed mean score can be created by (i) multiplying the estimated *SE* by 1.96 and (ii) subtracting and adding that result on either side of the observed mean. When comparing the observed mean scores for two populations, if the *CIs* around these means overlap, this is interpreted as indicating 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 an *SE* of 3, the 95% *CI* around this score are roughly 554-566. In essence, roughly 95% confidence can be attributed to the "true" population mean falling within this range (assuming that this *CI* is one of the 95% that contain the "true" mean). Comparing the mean score of Country X with that of Country Y (observed mean of 553, with *SE* of 1.5), Country Y's 95% *CI* around the observed mean is approximately 550-556. This overlaps with Country X's approximate *CI* of 554-566. Consequently, despite Country X's mean score being seven points higher than Country Y's, this difference is unlikely to be statistically significant.

Rounding

Achievement scores are rounded to whole numbers in this report, as are percentages. However, when calculating the difference between two mean scores or two percentages, unrounded data are used, and the difference is then rounded. Therefore, the reported difference 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.