

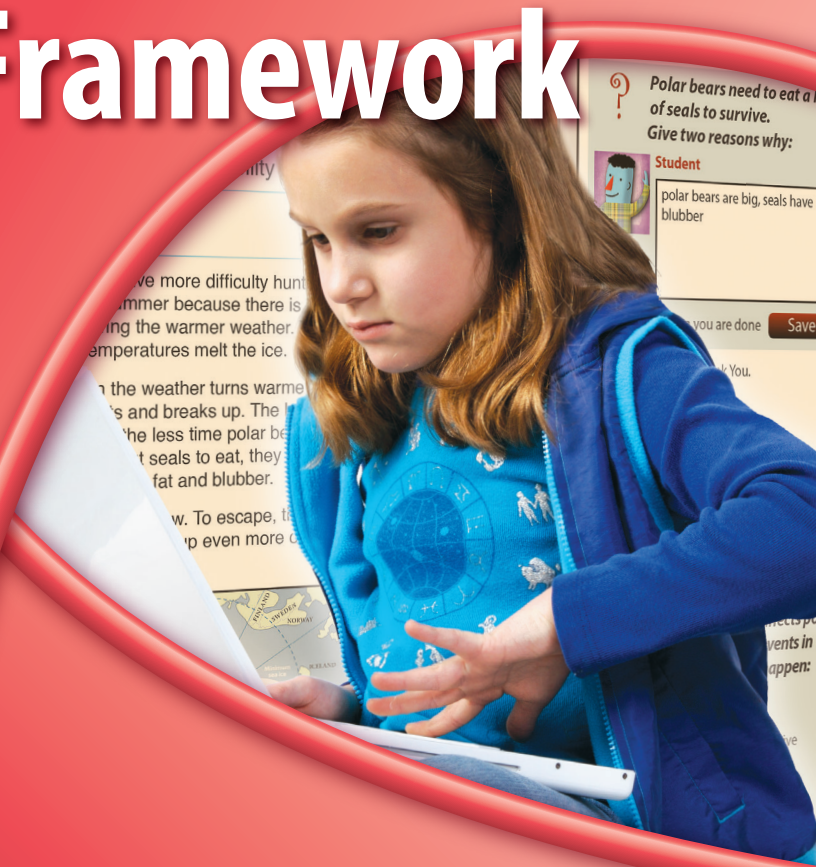
PROGRESS IN INTERNATIONAL READING LITERACY STUDY

PIRLS



PIRLS 2016 Assessment Framework

2nd Edition



Ina V.S. Mullis
Michael O. Martin, Editors



TIMSS & PIRLS
International Study Center
Lynch School of Education, Boston College

PIRLS 2016

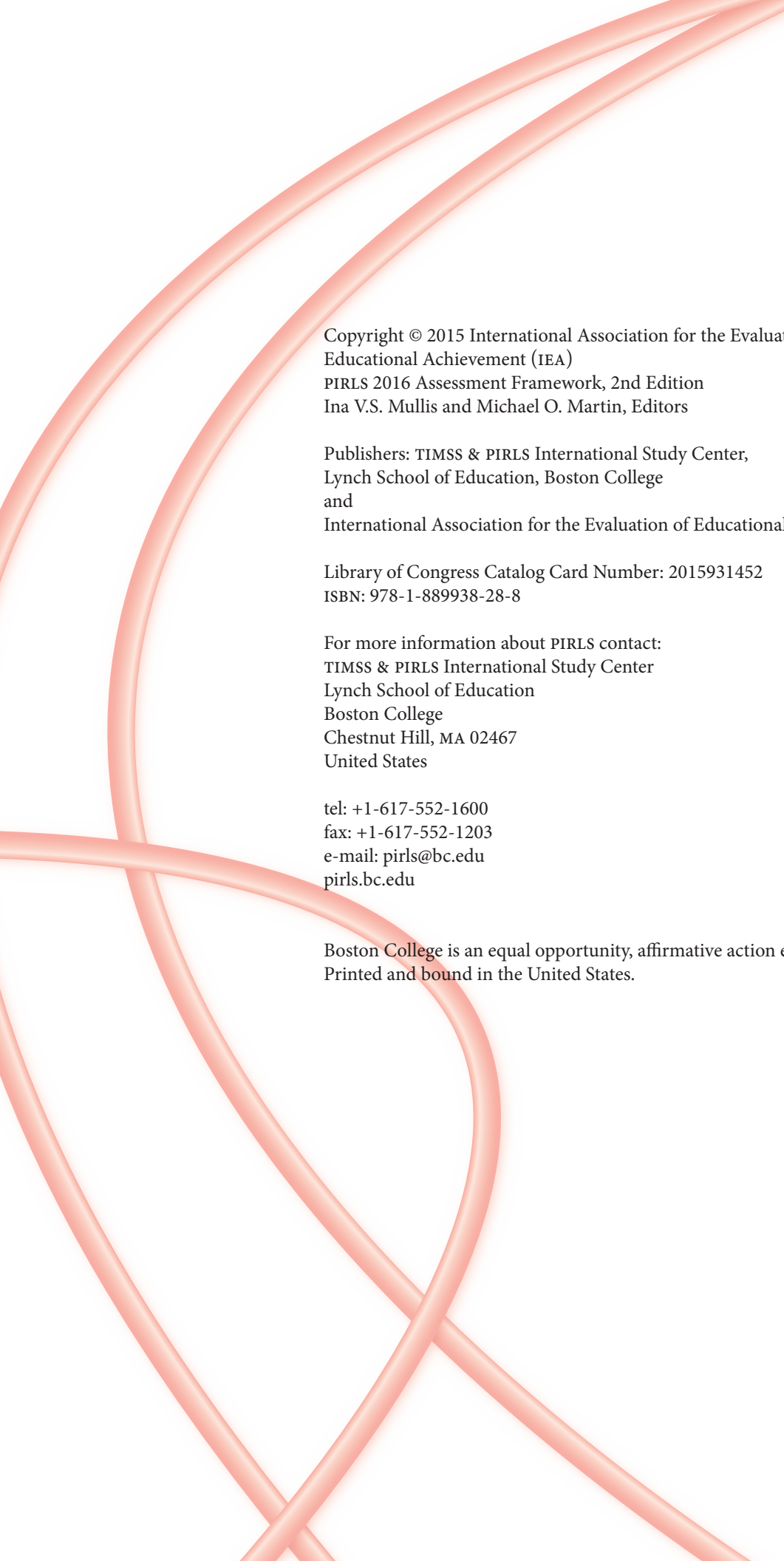
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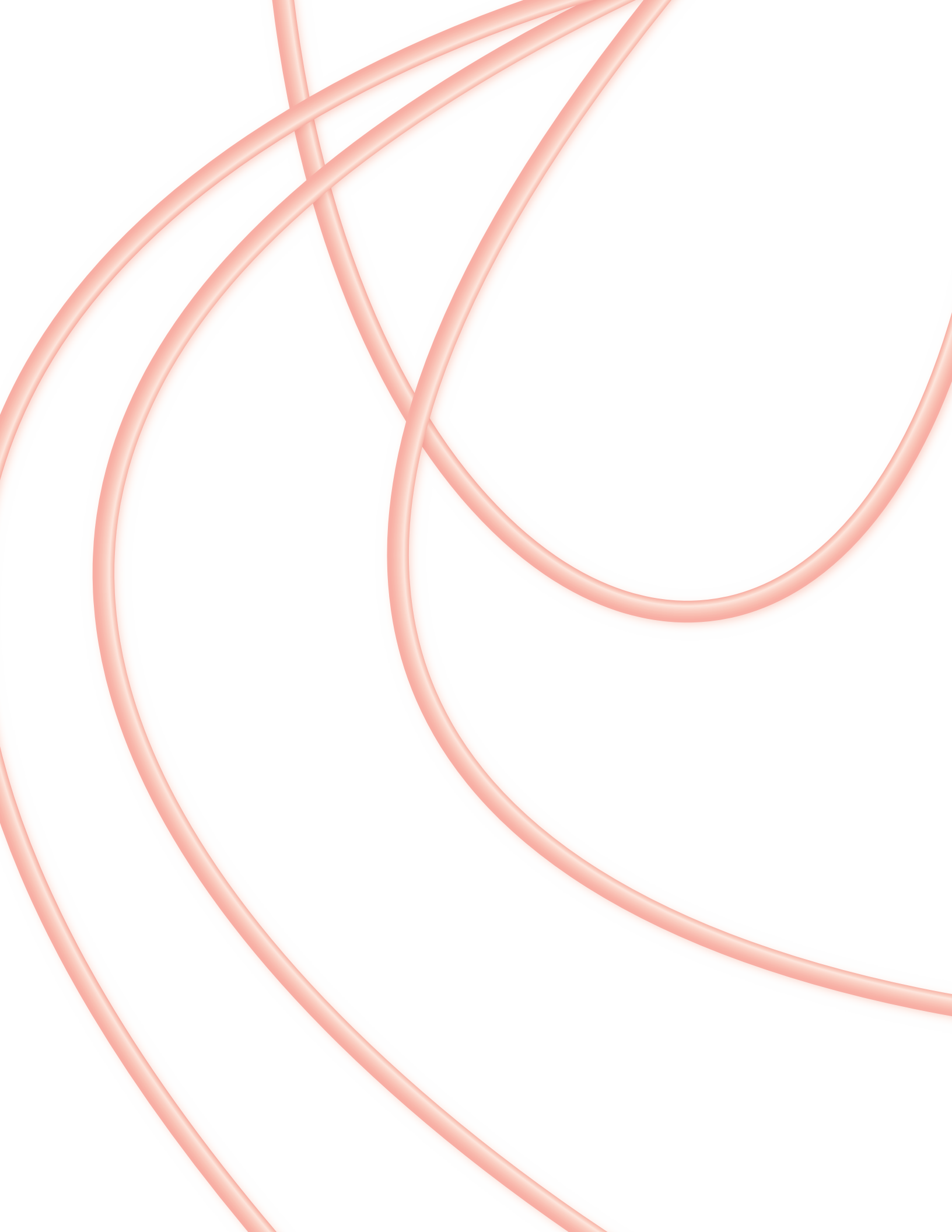
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Introduction

PIRLS 2016—Monitoring Trends in Reading Literacy Achievement

Because developing reading literacy ability is vital to every student's growth and maturation, the International Association for the Evaluation of Educational Achievement, more widely known as IEA, has been conducting regular international assessments of reading literacy and the factors associated with its acquisition in countries around the world for more than 50 years.

IEA is an independent international cooperative of national research institutions and government agencies that has been conducting studies of cross-national achievement since 1959. IEA pioneered international comparative assessment of educational achievement in the 1960s to gain a deeper understanding of policy effects across countries' different systems of education.

PIRLS (Progress in International Reading Literacy Study) was inaugurated in 2001 as a follow-up to IEA's 1991 Reading Literacy Study. Conducted every five years, PIRLS assesses the reading achievement of young students in their fourth year of schooling—an important transition point in children's development as readers. Typically, at this point in their schooling, students have learned how to read and are now reading to learn. PIRLS is designed to complement IEA's TIMSS assessments of mathematics and science at the fourth grade.

PIRLS 2016 is the fourth assessment in the current trend series, following PIRLS 2001, 2006, and 2011. Over 60 countries and sub-national, benchmarking entities are participating in PIRLS 2016, including many that have participated in previous assessment cycles since 2001. For countries with data since 2001, PIRLS 2016 will provide the fourth in a series of trend measures collected over 15 years. These countries will have the opportunity to evaluate progress in reading achievement across four time points: 2001, 2006, 2011, and 2016.

Since its inception, PIRLS has been a collaborative effort among the participating countries and IEA. PIRLS is directed by the TIMSS & PIRLS International Study Center at Boston College in close cooperation with the IEA Secretariat in Amsterdam and IEA's Data Processing and Research Center in Hamburg. Statistics Canada monitors and implements sampling activities,

the National Foundation for Educational Research (NFER) in England and the Australian Council for Educational Research (ACER) provide support for item development, and Educational Testing Service consults on psychometrics.

History of the PIRLS, PIRLS Literacy, and ePIRLS International Assessments

The number of countries participating in PIRLS has grown with each assessment cycle. All of the countries, institutions, and agencies involved in successive PIRLS assessments have worked collaboratively to improve PIRLS and build the most comprehensive and innovative measure of reading comprehension possible.

Participants have worked equally hard to provide information about the educational contexts for learning to read in each country so that PIRLS data are an extremely useful resource for policy relevant information about improving reading achievement. PIRLS always has included school, teacher, and student questionnaires, and PIRLS 2001 pioneered the Learning to Read Survey, completed by students' parents or caregivers, as well as the PIRLS Encyclopedia, comprised of chapters written by each participating country describing its reading curriculum and instruction.

In 2006, PIRLS was expanded to report results by comprehension processes in addition to literary and informational reading purposes. Also, greater emphasis was given to the PIRLS Curriculum Questionnaire completed by each participating country.

In 2011, the PIRLS and TIMSS assessment cycles came together, providing a unique opportunity for countries to collect reading, mathematics, and science achievement data on the same fourth grade students. Also in 2011, IEA broadened PIRLS to meet the needs of countries in which most children in the fourth grade are still developing fundamental reading skills. For example, if students are more likely to have developed the reading comprehension competencies necessary for success on PIRLS by the fifth or sixth grade, IEA began encouraging participation in PIRLS at those grades. Additionally, IEA provided a less difficult version of the PIRLS reading assessment for fourth grade students (called prePIRLS). The international results for the PIRLS 2011 assessments were published in two reports: *PIRLS 2011 International Results in Reading* (Mullis, Martin, Foy, & Drucker, 2013) and *TIMSS and PIRLS 2011: Relationships Among Reading, Mathematics, and Science Achievement at the Fourth Grade—Implications For Early Learning* (Martin & Mullis, 2013).

PIRLS 2016 represents the most significant changes in PIRLS to date, because it encompasses two new assessments of reading comprehension, PIRLS Literacy and ePIRLS, which are described in the following sections.

PIRLS Literacy

The PIRLS Literacy assessment is equivalent to PIRLS in scope and reflects the same conception of reading as PIRLS, except it is less difficult overall. PIRLS Literacy 2016 includes some passages and items that also are included in PIRLS 2016, but most of the assessment is based on shorter passages with higher proportions of more straightforward questions.

The purpose of the PIRLS Literacy assessment is to provide better measurement at the lower end of the scale. Countries whose fourth grade students are still developing fundamental reading skills can participate in the PIRLS Literacy assessment and still have their results reported on the PIRLS achievement scale. The reading passages and questions in common between the PIRLS Literacy and the PIRLS assessments will enable the two assessments to be linked, so that the PIRLS Literacy assessment results can be reported together with the PIRLS assessment results and directly compared to them (for details, see Chapter 3).

Depending on a country's educational development and the students' reading level, countries can participate in either or both PIRLS and PIRLS Literacy. One approach would be to participate in PIRLS Literacy at the fourth grade and PIRLS at the sixth grade. The goal is to provide the best policy-relevant information about how to improve teaching and learning and to help young students become accomplished and self-sufficient readers.

ePIRLS

ePIRLS is an innovative assessment of online reading, designed to be responsive to the information age and provide important information about how well students are developing 21st century skills. Internet reading increasingly is becoming one of the central ways students are acquiring information (Leu, Kinzer, Coiro, Castek, & Henry, 2013; Leu, O'Byrne, Zawilinski, McVerry, & Everett-Cacopardo, 2009; Murnane, Sawhill, & Snow, 2012). The Internet also is becoming the central source for students to gather additional information in their school subjects, such as science and social studies. As students have begun to rely on the Internet, reading curricula around the world are beginning to emphasize the importance of developing online reading skills and competencies such as reading for information (see *PIRLS 2011 Encyclopedia*).

For countries participating in PIRLS 2016, ePIRLS expands PIRLS to include computer-based reading assessment. ePIRLS uses an engaging, simulated Internet environment to present fourth grade students with authentic school-like assignments involving science and social studies topics. An Internet browser window provides students with websites containing information about their assignments, and students navigate through pages with a variety of features, such as photos, graphics, multiple tabs, and links. In an assessment window, a teacher avatar guides students through the ePIRLS assignments, prompting the students with questions about the online information. The development of the ePIRLS approach to assessing online reading benefited greatly from the work of ORCA (the Online Reading Comprehension Assessment), where students research science issues in an online environment (see Leu, Kulikowich, Sedansk, & Coiro, 2008).

Updating the PIRLS 2016 Framework for Assessing Reading Achievement

Based on reading purposes and comprehension processes, the PIRLS framework provides the foundation for the PIRLS, PIRLS Literacy, and ePIRLS assessments of students' reading achievement.

PIRLS assesses students' reading achievement within the two overarching purposes for reading that account for most of the reading done by young students both in and out of school:

- Reading for literary experience; and
- Reading to acquire and use information.

The PIRLS assessments integrate four types of comprehension processes within each of the two purposes for reading:

- Focus on and retrieve explicitly stated information;
- Make straightforward inferences;
- Interpret and integrate ideas and information; and
- Evaluate and critique content and textual elements.

Updating the PIRLS framework with each assessment cycle provides participating countries opportunities to introduce fresh ideas and current information about curricula, standards, frameworks, and instruction. This keeps the frameworks educationally relevant, creates coherence from assessment to

assessment, and permits the framework, instruments, and procedures to evolve gradually into the future.

For PIRLS 2016, the framework was updated using information provided by the National Research Coordinators (NRCs) from the participating countries in the *PIRLS 2011 Encyclopedia* (Mullis, Martin, Minnich, Drucker, & Ragan, 2012). In addition, the PIRLS 2016 reading expert committee (Reading Development Group) provided direction. Using an iterative process, the framework, under the direction of the committee, was once again reviewed by the NRCs and updated a final time prior to publication.

Policy Relevant Data about the Contexts for Learning to Read

In order to provide an important context for interpreting the reading achievement results, PIRLS collects considerable background information about how educational opportunities are provided to students as well as the factors that influence how students use these opportunities. These background data include information about the following: national curriculum policies in reading and how the educational system is organized to facilitate learning; students' home environment for learning; school climate and resources; and how instruction actually occurs in classrooms (see Chapter 2).

The PIRLS Encyclopedia has been published with each assessment cycle since 2001. Each PIRLS country prepares a chapter summarizing the structure of its education system, the language and reading curriculum in the primary grades, and overall policies related to reading instruction (e.g., teacher education, instructional materials, and assessment). The *PIRLS 2011 Encyclopedia* is a valuable compendium of information about how reading is taught around the world and provides an indispensable resource for policy and research in comparative education.

In order to obtain the background information that is published together with the PIRLS achievement results, PIRLS asks students, their parents, their teachers, and their school principals to complete questionnaires about their home, school, and classroom contexts for learning to read. In particular, the Learning to Read Survey, completed by students' parents and caregivers, has been an important component of each assessment cycle of PIRLS since 2001. It provides valuable information about students' home support for early literacy learning and reading experiences. Also, the student questionnaire contains

a series of questions about students' behaviors and attitudes toward reading literacy, because these are an important part of lifelong reading and contribute to the full realization of the individual's potential within a literate society (Organisation for Economic Cooperation and Development, 1995; 1997; 2000; 2005; 2010).

The upcoming PIRLS 2016 assessment will collect and report data on a variety of activities and experiences from the following range of learning to read contexts:

- National and community;
- Home;
- School;
- Classroom; and
- Student.

As a result, the assessments will provide a dynamic picture of reading educational policies and practices across the participating countries that can raise issues and indicate avenues relevant to educational improvement efforts.

Using PIRLS Data for Educational Improvement

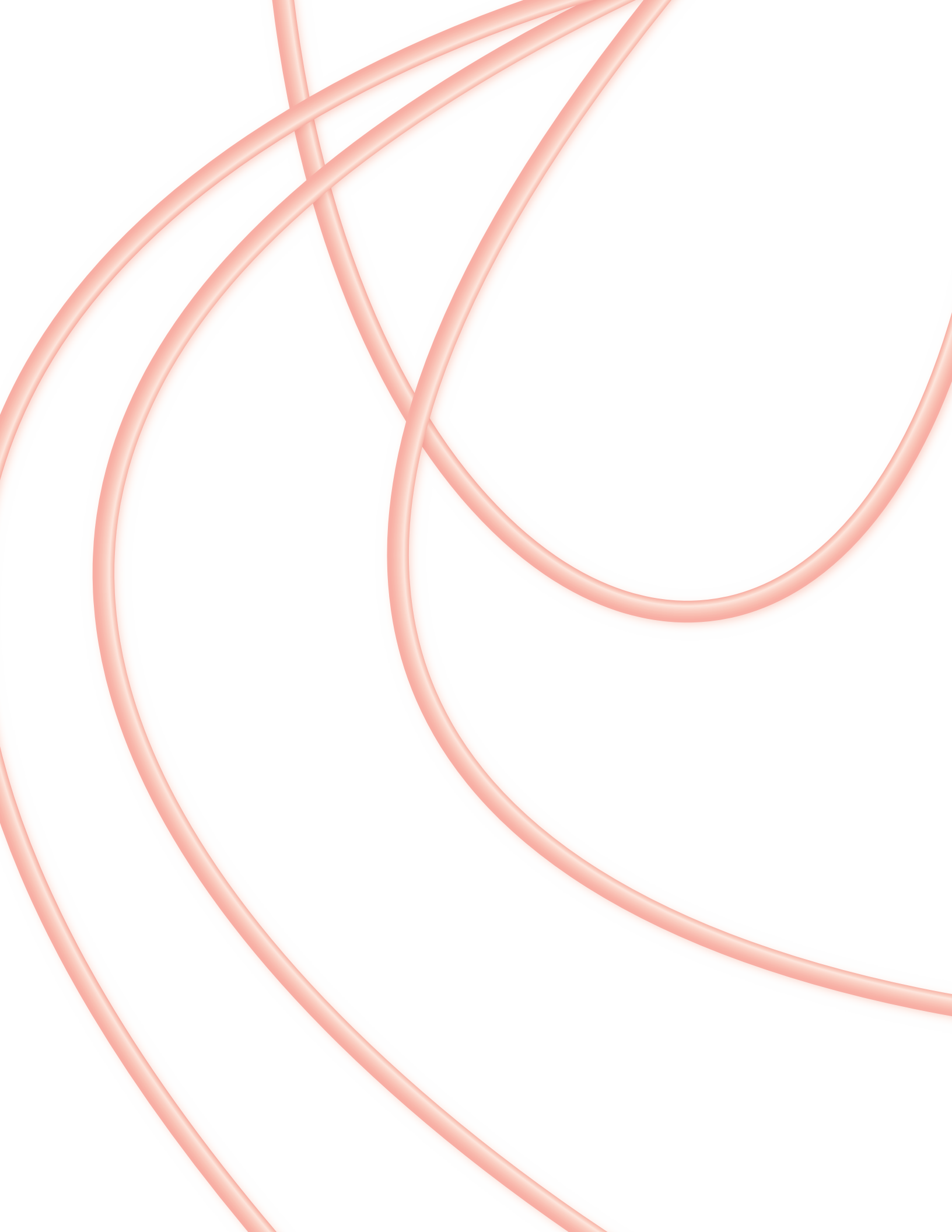
As reported in the *PIRLS 2011 Encyclopedia*, countries use PIRLS data for system-level monitoring of education achievement in a global context. They compare their reading achievement levels and contexts for learning with those of other countries, and monitor progress in reading achievement over time. Many countries reported initiating educational reforms when PIRLS achievement results were low compared to other countries, or lower than expected. That is, many countries also view the PIRLS results in the context of national goals.

Working to achieve equity provided another impetus for reform and a number of countries reported having made special efforts to reduce achievement disparities among ethnic, social, or regional groups. Countries implementing educational changes typically look to future PIRLS assessment cycles to monitor improvement.

PIRLS data, framework, released items, and scoring guides often are used as a basis for updating curriculum and textbooks, as well as for improving classroom instruction, primarily through teacher workshops and training programs. Many countries reported increased sponsorship of reading research

activity, including research using PIRLS data, and several have established national reading centers.

Introduced for the current TIMSS assessment cycle, TIMSS 2015 also includes a new, less difficult mathematics assessment called TIMSS Numeracy. Together, PIRLS Literacy and TIMSS Numeracy are intended to be responsive to the needs of the global education community and can support efforts that work toward universal primary education. As debates shift from *access* for all to *learning* for all, both assessments can provide a much-needed means for countries and international organizations to effectively measure and thereby improve reading and mathematics learning outcomes for young students worldwide.



CHAPTER 1

PIRLS 2016 Reading Framework

Ina V.S. Mullis, Michael O. Martin, and Marian Sainsbury

The PIRLS 2016 Reading Framework and the instruments developed to assess this framework reflect IEA's commitment to be forward thinking and incorporate the latest approaches to measuring the reading achievement of young students in their fourth year of schooling. PIRLS is based on the broad notion of what the ability to read means—a notion that includes the ability to reflect on written texts and to use these texts as tools for attaining individual and societal goals, also known as “reading to do” (Stiggins, 1982). This view is increasingly relevant in today's society, where greater emphasis continues to be placed on students' ability to use the information they gain from reading (Organisation for Economic Cooperation and Development, 1995; 1997; 2000; 2001; 2005; 2010). Emphasis is shifting from demonstrating fluency and basic comprehension to demonstrating the ability to apply what is read to new situations or projects (Coulombe, Trembly, & Marchand, 2004; Smith, Mikulecky, Kibby, & Dreher, 2000; see also *PIRLS 2011 Encyclopedia*).

The PIRLS framework for assessing reading achievement was initially developed for the first assessment in 2001, using IEA's 1991 Reading Literacy Study (Elley, 1992; 1994; Wolf, 1995) as the basis for the PIRLS definition of reading literacy and for establishing the aspects of reading comprehension to be assessed. Since then, the PIRLS assessment framework has been updated for each subsequent assessment cycle (Campbell, Kelly, Mullis, Martin, & Sainsbury, 2001; Mullis, Kennedy, Martin, & Sainsbury, 2006; Mullis, Martin, Kennedy, Trong, & Sainsbury, 2009).

A Definition of Reading Literacy

The PIRLS definition of reading literacy is grounded in IEA's 1991 study, in which reading literacy was defined as “the ability to understand and use those written language forms required by society and/or valued by the individual.”

With successive assessments, this definition has been elaborated so that it retains its applicability to readers of all ages and a broad range of written language forms, yet makes explicit reference to aspects of the reading experience of young students as they become proficient readers, highlights the widespread importance of reading in school and everyday life, and acknowledges the increasing variety of texts in today's technological world. Currently, the PIRLS definition of reading literacy is as follows:

Reading literacy is 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.

This view of reading reflects numerous theories of reading literacy as a constructive and interactive process (Anderson & Pearson, 1984; Chall, 1983; Kintsch, 1998; 2012; 2013; Ruddell & Unrau, 2004; Rumelhart, 1985). Meaning is constructed through the interaction between reader and text in the context of a particular reading experience (Britt, Goldman, & Rouet, 2012; Snow, 2002). Readers are regarded as actively constructing meaning as well as knowing effective reading strategies and how to reflect on reading (Afflerbach & Cho, 2009; Langer, 2011).

Before, during, and after reading, readers use a repertoire of linguistic skills, cognitive and metacognitive strategies, as well as background knowledge to construct meaning (Baker & Beall, 2009; Kintsch, 2012; 2013; Pressley & Gaskins, 2006; Rapp & van den Broek, 2005). In addition, the context of the reading situation can support the construction of meaning by promoting engagement and motivation to read, but the context also can place specific demands that might not support the construction of meaning (Christianson & Luke, 2011; Lorch, Lemarie, & Grant, 2011; Miller & Faircloth, 2009; Taboada, Tonks, Wigfield, & Guthrie, 2009).

In order to acquire knowledge of the world and themselves, readers can learn from a host of text types. Any given text type can take many forms and combinations of forms. These include traditional written forms, such as books, magazines, documents, and newspapers, as well as digital forms such as email, text messaging, and Internet websites where text often is integrated with various multimedia formats (Leu, Kinzer, Coiro, & Cammack, 2004; Leu, Kinzer, Coiro, Castek, & Henry, 2013; Rosell & Pahl, 2010; Reuda, 2013).

Throughout the framework, various sources that have provided a research and scholarly basis for the framework are referenced. These references are only a sample of the volumes of literature and research that have informed the PIRLS framework, including considerable research by countries participating in PIRLS.

Discussing what they have read with different groups of individuals allows young students to construct text meaning in a variety of contexts (Almasi & Garas-York, 2009; Murphy, Wilkinson, Soter, Hennessey, & Alexander, 2009). Social interactions about reading in one or more communities of readers can be instrumental in helping young students gain an understanding and appreciation of texts (Galda & Beach, 2001; Kucer, 2005). Socially constructed environments in the classroom or school library can give young students formal and informal opportunities to broaden their perspectives about texts and to see reading as a shared experience with their classmates and teachers (Alvermann & Moje, 2013; Guthrie, 1996). This can be extended to communities outside of school as young students talk with their families and friends about ideas and information acquired from reading.

Overview of the PIRLS Framework for Assessing Reading Achievement

Based on reading purposes and comprehension processes, the PIRLS framework provides the foundation for the PIRLS assessment of students' reading achievement in their fourth year of schooling, as well as for PIRLS Literacy, a literacy assessment that is an easier version of PIRLS, and ePIRLS, which extends PIRLS to assess online reading. As shown in Exhibit 1, the PIRLS framework focuses on the two overarching purposes for reading that account for most of the reading done by young students both in and out of school: for literary experience, and to acquire and use information. In addition, the PIRLS assessment integrates four broad-based comprehension processes within each of the two purposes for reading: focus on and retrieve explicitly stated information, make straightforward inferences, interpret and integrate ideas and information, and evaluate and critique content and textual elements.

Exhibit 1: The PIRLS Reading Purposes and Comprehension Processes

Purposes for Reading

Literary Experience

Acquire and Use Information

Processes of Comprehension

Focus on and Retrieve Explicitly Stated Information

Make Straightforward Inferences

Interpret and Integrate Ideas and Information

Evaluate and Critique Content and Textual Elements

It should be acknowledged that the purposes for reading and the processes of comprehension do not function in isolation from one another or from the context in which students live and learn.

PIRLS Framework Emphases in PIRLS, PIRLS Literacy, and ePIRLS

Although the two reading purposes and four comprehension processes form the basis for assessing PIRLS as well as PIRLS Literacy and ePIRLS, there are some differences in emphases across the assessments. Exhibit 2 presents the reading purposes and processes assessed by PIRLS and the percentages of the test devoted to each for PIRLS, PIRLS Literacy, and ePIRLS.

Exhibit 2: Percentages of the PIRLS, PIRLS Literacy, and ePIRLS Reading Assessments Devoted to Each Reading Purpose and Comprehension Process

	PIRLS	PIRLS Literacy	ePIRLS
Purposes for Reading			
Literary Experience	50%	50%	0%
Acquire and Use Information	50%	50%	100%
Processes of Comprehension			
Focus on and Retrieve Explicitly Stated Information	20%	50%	20%
Make Straightforward Inferences	30%	25%	30%
Interpret and Integrate Ideas and Information	30%	25%	30%
Evaluate and Critique Content and Textual Elements	20%		20%

Both PIRLS and PIRLS Literacy devote half of the assessment passages to each of the purposes for reading, while the ePIRLS online assessment focuses solely on reading to acquire and use information. The ePIRLS approach simulates websites from the Internet, through which students can navigate to accomplish school-based research projects or tasks. Because PIRLS Literacy is designed for students earlier in the process of learning to read, a larger percentage of items (50 percent of the assessment) are devoted to measuring foundational reading comprehension processes—the ability to focus on and retrieve explicitly stated information. Also, PIRLS Literacy has shorter reading passages with easier vocabulary and syntax.

Purposes for Reading

Throughout the world, reading literacy is directly related to the reasons people read; broadly, these reasons include reading for pleasure and personal interest, learning, and participation in society. The early reading of most young students centers on the first two reasons, and thus often includes reading of narrative texts that tell a story (e.g., storybooks or picture books) or informational texts that tell students about the world around them and answer questions. As young students develop their literacy abilities and are increasingly required to read in order to learn across the curriculum, reading to acquire information from books and other print materials becomes more important (Duke, 2004; Duke & Carlisle, 2011; Palincsar & Duke, 2004; Wharton-McDonald & Swiger, 2009).

Aligned with these reading purposes, both the PIRLS and PIRLS Literacy assessments focus on reading for interest or pleasure and reading to learn—that is, reading for literary experience and reading to acquire and use information. Because both purposes for reading are important for young students, the PIRLS and PIRLS Literacy assessments contain an equal proportion of material assessing each purpose. However, because much online reading is done for the purpose of acquiring information, ePIRLS specifically focuses on reading to acquire and use information.

The PIRLS and PIRLS Literacy assessment passages are classified by their primary purposes, and the accompanying questions address these purposes for reading. That is, passages classified as literary have questions addressing theme, plot events, characters, and setting, and those classified as informational are accompanied by questions about the information contained in the passages. Although the assessments distinguish between purposes for reading, the comprehension processes readers use are more similar than different for both purposes; therefore, the comprehension processes are evaluated across all passages, including the ePIRLS Internet-like texts.

Each purpose for reading often is associated with certain types of texts. For example, reading for literary experience often is accomplished through reading fiction, while reading to acquire and use information generally is associated with informative articles and instructional texts. However, the purposes for reading do not align strictly with text types. For example, biographies or autobiographies can be primarily informational or literary, but include characteristics of both purposes.

Texts often differ in the way in which ideas are organized and presented, eliciting a variety of ways to construct meaning (Goldman & Rakestraw, 2000; Kobayashi, 2002). Text organization and format can vary to a great degree, ranging from sequential ordering of written material to snippets of words and phrases arranged with pictorial and tabular data. The content, organization, and style that may be typical of a particular text genre have implications for the reader's approach to understanding the text (Alexander & Jetton, 2000; Graesser, Golding, & Long, 1996; Lorch, Lemarie, & Grant, 2011; Weaver & Kintsch, 1996).

As noted, it is in the interaction between reader and text that meanings are constructed and purposes are achieved. In selecting texts for the PIRLS assessments, the aim is to present a wide range of text types within each purpose for reading. The goal is to create a reading experience for students participating in each assessment that, as much as possible, is similar to authentic reading experiences they may have in and outside of school.

Reading for Literary Experience

In literary reading, readers engage with the text to become involved in events, settings, actions, consequences, characters, atmosphere, feelings, and ideas, and to enjoy language itself. In order to understand and appreciate literature, each reader must bring to the text his or her own experiences, feelings, appreciation of language, and knowledge of literary forms. For young readers, literature can offer the opportunity to explore situations and feelings they have not yet encountered.

Events, actions, and consequences depicted in narrative fiction allow readers to experience vicariously and reflect upon situations that, although they may be imagined, illuminate those of real life. The text may present the perspective of the narrator or a principal character, and a more complex text may even have several viewpoints. Information and ideas may be described directly or through dialogue and events. Short stories or novels sometimes narrate events chronologically, or sometimes make more complex use of time with flashbacks or time shifts.

The main form of literary texts used in the PIRLS and PIRLS Literacy assessments is narrative fiction. Given differences in curricula and cultures across the participating countries, it is difficult for PIRLS to include some forms of literary texts. For example, poetry is difficult to translate and plays are not widely taught in the primary grades.

Reading to Acquire and Use Information

Informational texts are both read and written for a wide variety of functions. While the primary function of informational text is to provide information, writers often address their subject matter with different objectives. Many informational texts are straightforward presentations of facts, such as biographical details or steps to accomplish a task; however, some informational texts are subjective. For example, authors may elect to convey facts and explanations through an expository summary, a persuasive essay, or a balanced argument. A reader must bring to these texts a critical mind in forming his or her own opinion.

In order to best address the various functions of texts, information can be presented differently, such as by varying the content, organization, and form. Young students may read informational texts that cover a range of content, including those that are scientific, historical, geographical, or social. These texts also may vary in the organization of the content conveyed. For example, historical facts may be organized chronologically, instructions or procedures sequenced step-by-step, and an argument presented logically (e.g., cause and effect, or compare and contrast).

Information can be presented in many different formats. Even informational pieces that are primarily presented via text may include a table to document facts or a picture to illustrate a description. Both print materials (e.g., manuals and newspapers) and websites present a considerable amount of information via lists, charts, graphs, and diagrams. In addition, words need not be in the form of continuous text, such as in advertisements or announcements, or in sidebars to the text that offer supplemental information such as definitions, lists, or timelines. As noted, different presentations of textual content can demand that readers apply different comprehension processes. Finally, it also should be emphasized that a piece of informational text often incorporates one or more methods of presenting information.

The informational texts used in the PIRLS assessments reflect students' authentic experiences with reading informational text in and out of school. Typically, these passages, as well as some of the ePIRLS websites, have been written by authors who understand writing for a young audience, and are provided by the participating countries as representative of the informational materials their students read.

Processes of Comprehension

Readers construct meaning in different ways. Therefore, PIRLS assesses four broad-based processes of comprehension typically used by fourth grade readers: focus on and retrieve explicitly stated information; make straightforward inferences; interpret and integrate ideas and information; and evaluate and critique content and textual elements. Transcending these processes are the metacognitive processes and strategies that allow readers to examine their understanding and adjust their approach (Baker & Beall, 2009; Kintsch & Kintsch, 2005; Paris, Wasik, & Turner, 1996; Perfetti, Landi, & Oakhill, 2005; Pressley, 2002; vanDijk & Kintsch, 1983). In addition, the knowledge and background experiences that readers bring to reading equip them with an understanding of language, texts, and the world, through which they filter their comprehension of the material (Alexander & Jetton, 2000; Beach & Hynds, 1996; Galda & Beach, 2001; Kintsch, 2012; 2013; Wolfe & Goldman, 2005).

In the PIRLS assessments, the four comprehension processes are used as a foundation for developing the comprehension questions which are based on each reading passage (or set of passages). Across each assessment, the variety of questions measuring the range of comprehension processes enables students to demonstrate a range of abilities and skills in constructing meaning from written texts. Along with each process and its components, examples of questions that may be used to assess that process are discussed.

In thinking about assessment questions, there is, of course, a substantial interaction between the length and complexity of the text and the sophistication of the comprehension processes required. Initially, it may seem that locating and extracting explicitly stated information would be less difficult than, for example, making interpretations across an entire text and integrating those with external ideas and experiences. However, all texts are not equal and can vary with regard to length, syntactic complexity, abstractness of ideas, and organizational structure. Thus, the nature of the text can impact the difficulty of the question asked, across and within the four types of comprehension processes.

Focus on and Retrieve Explicitly Stated Information

Readers vary the attention they give to explicitly stated information in the text (Flavell & Wellman, 1977; Schneider & Pressley, 1997). Some ideas in the text may elicit particular focus and others may not. For example, readers may focus on ideas that confirm or contradict predictions they have made about the text's meaning or that relate to their general purpose for reading. In

addition, readers often need to retrieve information explicitly stated in the text to answer a question they bring to the reading task, or to check their developing understanding of some aspect of the text's meaning.

In focusing on and retrieving explicitly stated information, readers use various ways to locate and understand content that is relevant to the question posed. Typically, this type of text processing requires the reader to focus on the text at the word, phrase, and sentence level in order to construct meaning (Perfetti, 2007; Perfetti & Adolf, 2012). The process also may require the reader to focus on and retrieve pieces of information from several locations.

Successful retrieval requires a fairly immediate or automatic understanding of the text (West & Stanovich, 2000). This process needs little or no inferring or interpreting—the meaning is evident and stated in the text. The reader must, however, recognize the relevance of the information or idea in relation to the information sought.

Reading tasks that may exemplify this type of text processing include the following:

- Identifying information that is relevant to the specific goal of reading;
- Looking for specific ideas;
- Searching for definitions of words or phrases;
- Identifying the setting of a story (e.g., time and place); and
- Finding the topic sentence or main idea (when explicitly stated).

Make Straightforward Inferences

As readers construct meaning from text, they make inferences about ideas or information not explicitly stated (Zwaan & Singer, 2003). Making inferences allows readers to move beyond the surface of texts and to resolve the gaps in meaning that often occur in texts. Some of these inferences are straightforward in that they are based primarily on information that is contained in the text—readers may merely need to connect two or more ideas or pieces of information. The ideas themselves may be explicitly stated, but the connection between them is not, and thus must be inferred. Furthermore, despite the inference not being explicitly stated in the text, the meaning of the text remains relatively clear.

Skilled readers often make these kinds of inferences automatically (West & Stanovich, 2000). They may immediately connect two or more pieces of information, recognizing a relationship even though it is not stated in the text.

In many cases, the author has constructed a text to lead readers to an obvious or straightforward inference. For example, the actions of a character across the story may clearly point to a particular character trait, and most readers would arrive at the same conclusion about that character's personality or viewpoint.

With this type of processing, readers typically focus on more than just word-, phrase-, or sentence-level meaning. While the focus may be on local meaning residing within one part of the text, the focus also may be on a more global meaning, representing the whole text. In addition, some straightforward inferences may require readers to connect local and global meanings.

Reading tasks that may exemplify this type of text processing include the following:

- Inferring that one event caused another event;
- Concluding what is the main point made by a series of arguments;
- Identifying generalizations made in the text; and
- Describing the relationship between two characters.

Interpret and Integrate Ideas and Information

As with the more straightforward inferences, readers who are engaged in interpreting and integrating ideas and information in text may focus on local or global meanings, or may relate details to overall themes and ideas. In any case, these readers are making sense of the author's intent and developing a more complete understanding of the entire text.

As readers interpret and integrate, they are attempting to construct a more specific or more complete understanding of the text by integrating personal knowledge and experience with meaning that resides within the text. For example, readers may draw on experience to infer a character's underlying motive or to construct a mental image of the information conveyed. They often need to draw on their understanding of the world, as well as their background knowledge and experiences, more than they do for straightforward inferences.

As readers engage in this interpretive process, they are making connections that are not only implicit, but that may be open to some interpretation based on their own perspective. Because of this, meaning that is constructed through interpreting and integrating ideas and information is likely to vary among readers, depending upon the experiences and knowledge they bring to the reading task.

Reading tasks that may exemplify this type of text processing include the following:

- Discerning the overall message or theme of a text;
- Considering an alternative to actions of characters;
- Comparing and contrasting text information;
- Inferring a story’s mood or tone; and
- Interpreting a real-world application of text information.

Evaluate and Critique Content and Textual Elements

As readers evaluate the content and elements of a text, the focus shifts from constructing meaning to critically considering the text itself. Readers engaged in this process step back from a text in order to examine and critique it.

The text content, or meaning, may be evaluated and critiqued from a personal perspective or with an objective view. This process may require readers to make a justified judgment, drawing on their interpretations and weighing their understanding of the text against their understanding of the world—rejecting, accepting, or remaining neutral to the text’s representation. For example, readers may counter or confirm claims made in the text or make comparisons with ideas and information found in other sources.

In evaluating and critiquing elements of text structure and language, readers draw upon their knowledge of language usage, presentational features, and general or genre-specific features of texts. The text is considered as a way to convey ideas, feelings, and information.

Readers may reflect on the author’s language choices and devices for conveying meaning and judge their adequacy. Relying on their understanding of language conventions, readers may find weaknesses in how the text was written or recognize the successful use of the author’s craft. Further, readers may evaluate the mode used to impart information—both visual and textual features—and explain their functions (e.g., text boxes, pictures, or tables). In evaluating the organization of a text, readers draw upon their knowledge of text genre and structure. The extent of past reading experience and familiarity with the language are essential to each piece of this process.

Reading tasks that may exemplify this type of text processing include the following:

- Judging the completeness or clarity of information in the text;
- Evaluating the likelihood that the events described could really happen;
- Evaluating how likely an author’s argument would be to change what people think and do;
- Judging how well the title of the text reflects the main theme;
- Describing the effect of language features, such as metaphors or tone; and
- Determining an author’s perspective on the central topic.

Introducing ePIRLS—An Assessment of Online Informational Reading

A new extension of PIRLS offered for the first time in 2016, ePIRLS is an innovative assessment of online reading that was developed in response to the explosion of information availability on the Internet. As previously described, ePIRLS is a computer-based assessment focusing on the informational reading purpose and designed to assess fourth grade students’ ability to use the Internet in a school context.

Particularly relevant to the PIRLS assessment, Internet reading is increasingly becoming a key component of school curricula and one of the central ways students are acquiring information (Leu, Kinzer, Coiro, Castek, & Henry, 2013; Leu, O’Byrne, Zawilinski, McVerry, & Everett-Cacopardo, 2009; Murnane, Sawhill, & Snow, 2012; Pew Research Center, 2012; 2013a; 2013b; Rowsell, Kress, Pahl, & Street, 2013; Tondeur, van Braak, & Valcke, 2007). New digital literacies are necessary to be a successful reader on the Internet, where a successful reader is one that can meet his or her reading goals by efficiently finding and comprehending the target information (Afflerbach & Cho, 2009; Bawden, 2008; Coiro & Kennedy, 2011; Leu, Kinzer, Coiro, Castek, & Henry, 2013; Leu, Kulikowich, Sedansk, & Coiro, 2008).

Essentially, reading for informational purposes on the Internet requires all of the reading comprehension skills and strategies assessed by PIRLS, but in a different environment containing much more information. Because of the complexity of the Internet, online reading involves being able to use reading comprehension skills and strategies in contexts that are very different from those encountered in reading traditional printed materials as regularly assessed by PIRLS (Britt & Rouet, 2012; Leu, Kinzer, Coiro, Castek, & Henry, 2013).

ePIRLS focuses on the reading skills and strategies needed to derive meaning from the variety of differing presentations of online text. For example, Internet web pages appear different than typical printed pages. Although much of the Internet is devoted to providing information of one type or another, online presentations often use text sparingly. Similar to printed texts, web pages can present information in various forms, such as photos, illustrations, graphs, charts, tables, maps, and timelines. However, web pages also tend to be multi-modal in the ways they present information and contain interactive, experiential features that are not possible to reproduce in a print format. For example, online text presentations typically integrate the following dynamic elements for visual interest or illustration: videos and audio clips; animated graphics; pop-up windows with information that only appears by clicking, “hovering” above, or “rolling over” it; and a variety of code-based features, such as information that appears and disappears, revolves, or changes color.

The Internet also is a network of texts that are distributed across multiple websites and pages in a non-linear fashion. Looking for and learning information from the Internet involves comprehension of information arranged within this complex reading environment. While traditional printed text usually is read in a linear fashion, online reading consists of searching through a network of multiple texts where readers are responsible for creating their own paths. Readers first must access the appropriate website, and then use navigation strategies (e.g., multiple navigation and sub-navigation menus, tabs, and links) to move efficiently within and across one web page or site to the next.

A fundamental component of successful Internet research and comprehension, therefore, is the ability to locate information that meets one’s needs. Readers need to be able to find and select the websites that will provide the target information, to navigate to the relevant web pages, and also to follow links to new websites. This may involve self-regulatory processes to maintain focus on the task at hand, so as not to be distracted by other interesting topics or advertising.

Further, Internet searches for information require the additional comprehension demands of inferring the potential usefulness of yet unseen texts (e.g., when evaluating search engine results or links). In order to begin the search for information, online readers must choose among websites to find the one most likely to contain the target information. Once on a given website or page, readers must continue to infer the relevance of the various types of information and texts presented, while ignoring a barrage of advertising.

ePIRLS—Assessing the PIRLS Comprehension Processes in the Context of Online Informational Reading

ePIRLS recognizes that online reading comprehension tasks require a blending of new digital literacies with traditional offline (i.e., print) reading comprehension processes as currently defined and assessed by PIRLS. Overall, the reading comprehension skills and strategies assessed in ePIRLS will parallel those assessed in PIRLS, with the distinction that the ePIRLS reading tasks are situated in a simulated Internet environment.

The goal of ePIRLS is to assess students' reading achievement when the notion of the PIRLS passages is greatly expanded to include a series of interconnected web pages with many different kinds of visual information, such as photos, graphs, charts, and maps, in addition to dynamic features such as videos, animations, links, and pop-up windows. The websites look very different from the typical PIRLS passages, and involve navigating between pages and sites.

The approach is based on using websites from the actual Internet as the basis for creating a closed Internet environment, through which fourth grade students can accomplish an online study of a science or social studies topic, similar to the types of projects or reports they might be asked to complete for school. Each task involves students working across approximately three different websites totaling about five to ten web pages, each containing a variety of textual presentations and visual displays, and including a variety of approaches to web navigation.

In its simulated environment, ePIRLS incorporates a set of navigation skills and strategies specifically required to locate and use information on the Internet. These include the following:

- Selecting websites that meet a particular information need; and
- Using online features to locate information within websites (e.g., content tabs, navigation bars, graphic icons, links, and scroll bars).

However, while ePIRLS is designed to simulate an authentic online reading experience, it is within a computer-based environment suitable to fourth grade reading levels and a timed assessment. In addition, although it is intended to reflect the types of online reading that students are asked to do as part of school-based projects, reports, and research assignments, the online

environment of the ePIRLS assessment is necessarily very limited in comparison to the entire world of the Internet.

While recognizing that being able to locate Internet information underlies all of the reading processes, the emphasis in ePIRLS is on assessing reading comprehension rather than navigation skills. Because students have a range of Internet experiences, ePIRLS begins with a brief set of directions that covers how to click on tabs and links as well as how to scroll, when necessary. Also, throughout the assessment, the teacher avatar points students toward particular websites and provides additional assistance when students have difficulty locating particular web pages. Students that have difficulty finding the correct web pages are automatically moved along to the pages by the teacher avatar after a certain amount of time, and this information is tracked by the ePIRLS computer-based assessment. Using the device of the teacher avatar, the ePIRLS assessment moves students through the web pages so that students have the opportunity to accomplish the reading tasks in the allotted assessment time.

Focus on and Retrieve Explicitly Stated Information

In reading a printed, linear text to retrieve specific information, the text is likely to be initially read and processed at a micro-level, focusing on individual phrases or sentences. In contrast, using online sources and search strategies can involve initial macro-processing. Readers need strategies for identifying the portion of the web page that contains the important information before they can focus on the sentence, phrase, or part of the graphic that has the information.

Online reading tasks that may exemplify this type of text processing include the following:

- Identifying the part of the web page that contains the information;
- Identifying the explicitly stated information related to a specific reading goal; and
- Identifying specific information on a graphic (e.g., graph, table, or map).

Make Straightforward Inferences

As explained previously, as readers construct meaning from text, they make inferences about ideas or information not explicitly stated. Online reading requires a considerable amount of inferencing, beginning with identifying those websites most likely to have the information of interest. Next, readers need

to process the information on a web page, making connections and inferring ideas or information not explicitly stated. Readers also may infer whether it is necessary or useful to follow a link to another page.

Online reading tasks that may exemplify this type of text processing include the following:

- Choosing among possible websites to identify the most appropriate, applicable, or useful one;
- Filtering the content of a web page for relevance to the topic;
- Summarizing the main intent of a web page;
- Describing the relationship between text and graphic(s); and
- Inferring the potential usefulness of links.

Interpret and Integrate Ideas and Information

Using the Internet requires the ability to read and digest information from multiple online sources. Integrating and synthesizing information across texts is very challenging, even offline, because readers need to comprehend not only one text, but consolidate information across two or more texts. In the Internet environment, this includes information presented via animation and videos as well as in pop-up windows and rollover text and graphics.

Online reading tasks that may exemplify this type of text processing include the following:

- Comparing and contrasting information presented within and across websites;
- Relating the information in one web page or site to information in another web page or site;
- Generalizing from information presented within and across web pages or sites;
- Relating details from different web pages to an overall theme; and
- Drawing conclusions from information presented in multiple websites.

Evaluate and Critique Content and Textual Elements

The skills required to evaluate and critique online texts in ePIRLS are very similar to those required for printed passages in PIRLS. However, because anyone can publish anything on the Internet, readers also must make judgments

about the credibility of the source of the information as well as determine the perspective, point of view, and bias in the text. In addition, the visual and textual features on the Internet tend to be much more varied.

Online reading tasks that may exemplify this type of text processing include the following:

- Critiquing the ease of finding information on a website;
- Evaluating how likely the information would be to change what people think;
- Describing the effect of the graphic elements on the website;
- Determining the point of view or bias of the website; and
- Judging the credibility of the information on the website.

Selecting PIRLS and PIRLS Literacy Passages and ePIRLS Online Texts

The PIRLS and PIRLS Literacy reading passages, as well as the ePIRLS online reading texts, undergo extensive review by the Reading Development Group and the National Research Coordinators. Considerable effort is expended to ensure that the texts have the following characteristics:

- Clarity and coherence;
- Appropriate content across countries and cultures;
- Interesting, engaging content for a wide range of students; and
- Adequate basis for assessing the full range of comprehension processes.

In order to reflect the goal of approximating an authentic reading experience in the assessment, the reading passages and online materials presented to students must be typical of those read by students in their everyday experiences and reflect students' authentic reading experiences, in and outside of school. In order to help achieve this goal, the texts are provided by the participating countries as representative of the literary and informational materials their students read. Texts that exist for students to read in and outside of school are more likely to reflect students' ongoing reading activities and challenges than those written specifically for a test.

The time constraints of the test situation place some limits on the length of texts, because students need time to read the entire passage and answer comprehension questions. Consistent with the difference in difficulty between

PIRLS and PIRLS Literacy, the passages for PIRLS generally average about 800 words and those for PIRLS Literacy about 400 words. However, length will vary somewhat because other text characteristics also affect rate of reading.

As an additional feature to help students locate information within the text, items in the PIRLS Literacy booklets are interspersed throughout each passage. When possible, items that require students to focus on a particular page of text are placed on the facing page, so that students can view both the items and the relevant text simultaneously. This distribution of items also helps to ensure that students can provide answers to some questions, even if they do not complete the entire passage.

The ePIRLS online informational reading tasks in science or social studies are adapted from Internet websites. As described previously, each task involves approximately three different websites totaling about five to ten web pages. Reflecting the fact that online reading often involves sorting through more information than is actually necessary to achieve one's goal, the texts contained in an ePIRLS assessment task average about 1000 words in total.

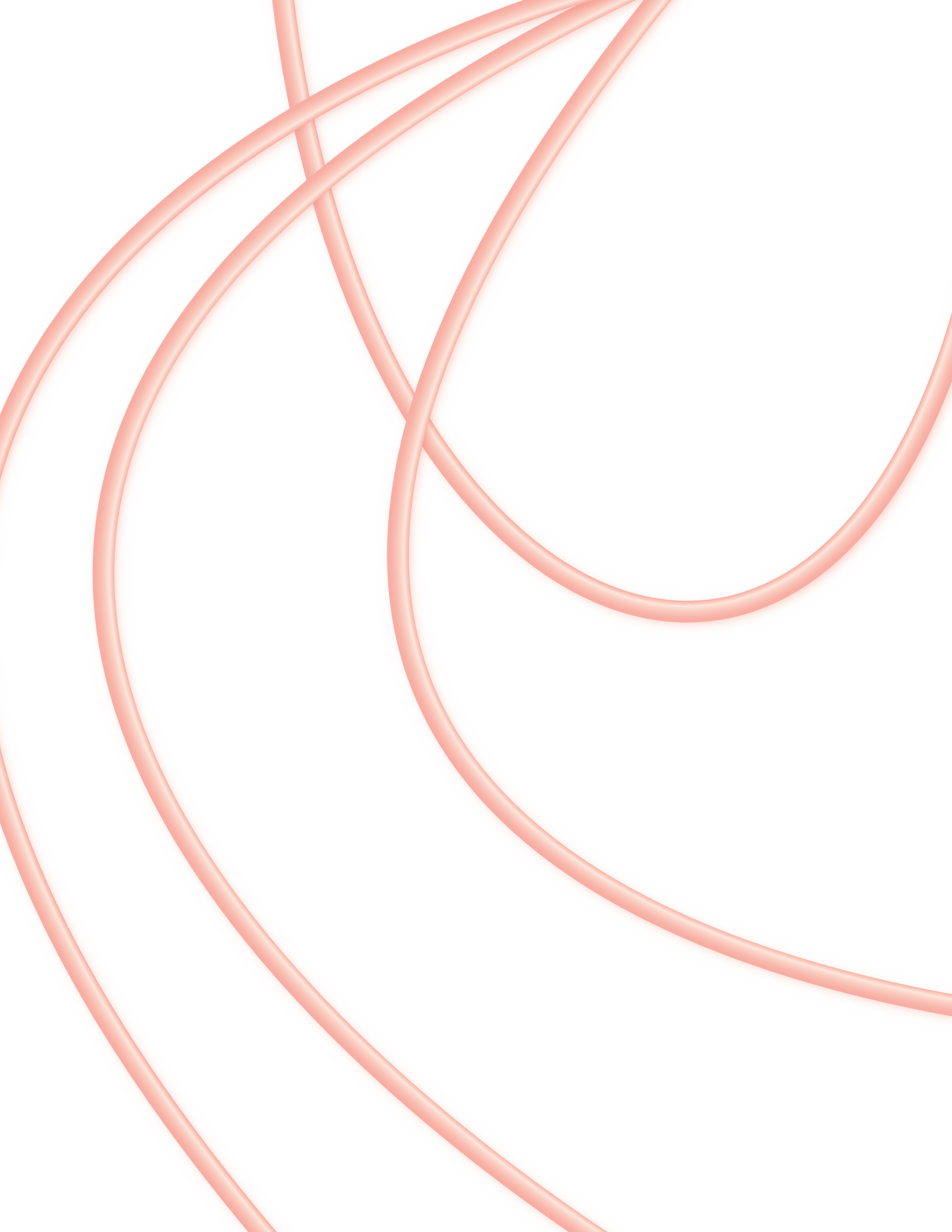
Clarity and coherence are essential criteria for PIRLS texts. Typically, the passages and websites have been written by successful authors who understand writing for a young audience, such that the texts have an appropriate level of linguistic features and density of information. In the context of an international study, attaining authenticity in assessment reading experience may be somewhat constrained by the need to translate the texts into numerous languages. Thus, care is taken to choose texts that can be translated without loss of clarity in meaning, or in potential for student engagement.

In selecting texts for use in international reading assessment, it is crucial to pay close attention to the potential for cultural bias. Texts that depend heavily on culture-specific knowledge are automatically excluded. Text selection thus involves collecting and considering texts from as many of the participating countries as possible. The goal is for the texts to be universally applicable across cultures, and for the set of texts in the assessment to range as widely as possible across nations and cultures, such that no country or culture is overrepresented in the assessment texts. The final selection of texts is based, in part, on the national and cultural representation of the entire set of assessment texts.

The appropriateness and readability of texts for the PIRLS assessments primarily is determined through iterative reviews by educators and curriculum specialists from countries participating in the assessments. Taking into account fairness and sensitivity to gender, racial, ethnic, and religious considerations,

every effort is made to select texts that are topic and theme appropriate for the grade level and that elicit the full range of comprehension processes.

Finally, it is extremely important for the texts to be interesting to the greatest number of students. As part of the field test, students routinely are asked how well they like each of the texts, and a high level of positive response is fundamental for a text to be selected for PIRLS.



CHAPTER 2

PIRLS 2016 Context Questionnaire Framework

Martin Hooper, Ina V.S. Mullis, and Michael O. Martin

PIRLS collects extensive information about the home and school contexts for learning to read, providing educational policy makers important insights into how educational systems can be improved to foster reading achievement. The PIRLS 2016 Context Questionnaire Framework establishes the foundation for the background information collected through the context questionnaires and the *PIRLS 2016 Encyclopedia*.

In order to collect the PIRLS background information, all students participating in PIRLS/PIRLS Literacy and their parents, teachers, and principals complete questionnaires to provide data about the students' home and school contexts for learning to read. Students also participating in ePIRLS complete a short supplementary questionnaire that focuses on student computer use. In addition, representatives from participating countries complete a curriculum questionnaire and contribute a chapter to the *PIRLS 2016 Encyclopedia*. The curriculum questionnaire and *PIRLS 2016 Encyclopedia* entries provide important information on each country's educational policy, reading curriculum, and other national contexts that shape reading instruction and student learning. Chapter 3 provides an overview of the procedures for collecting background information.

The context questionnaires that accompany the reading assessment are an essential component of PIRLS data collection. The questionnaires cover a wide array of policy-relevant information about the country's various contexts for teaching and learning reading. The data on home supports for learning as well as on educational system structure, school organization, curricula, teacher education, and classroom practices are considered in relation to student

achievement and compared across countries. This information can provide insight into effective educational strategies for development and improvement.

Students in the fourth year of schooling typically have gained most of their reading skills at school and at home. Community, school, classroom, and home environments that support each other can create extremely effective climates for learning. In order to reflect this situation, the PIRLS 2016 Context Questionnaire Framework encompasses five broad areas:

- National and community contexts;
- Home contexts;
- School contexts;
- Classroom contexts; and
- Student characteristics and attitudes toward learning.

National and Community Contexts

Cultural, social, political, and economic factors all contribute to the backdrop of a student's literacy acquisition. At the national and community level, key educational policy decisions are made about how best to implement the curriculum, given these contextual factors. The success a country has in providing effective reading instruction depends on a number of interrelated national characteristics and decisions:

- Language(s) and emphasis on literacy;
- Economic resources, population demographics, and geographic characteristics;
- Organization and structure of the educational system;
- Student flow;
- Reading curriculum in the primary grades;
- Teachers and teacher education; and
- Monitoring curriculum implementation.

Language(s) and Emphasis on Literacy

The historical background of language and literacy in a country can influence the challenges and instructional practices in teaching students to read. For example, some countries have one commonly spoken language, while others are historically multilingual. Immigration also can increase language diversity.

Multilingual countries across the world have different policies for educating their population. Thus, decisions about the language(s) of instruction and how to implement those decisions can be very complicated. Studies consistently have shown a learning gap associated with students who do not speak the language of instruction in the home (Entorf & Minoiu, 2005; Schnepf, 2007; Trong, 2009).

Economic Resources, Population Demographics, and Geographic Characteristics

A country's economic resources, demographic characteristics, and geographic characteristics can have a tremendous impact on the relative ease or difficulty of promoting literacy.

- **Economic Resources**—Countries have different levels of wealth and vary in how that wealth is distributed. At the national level, economic resources and socioeconomic equity tend to be linked to favorable contexts for fostering student achievement. Having economic resources enables better educational facilities and a greater number of well-trained teachers and administrators. Financial resources also provide the opportunity to invest in education through widespread community programs and by making materials and technology more readily available in classrooms.
- **Population Demographics**—The size and diversity of a country's population can increase the challenges involved in curriculum implementation. Some countries have a diversity of ethnic groups, cultures, and languages, and immigration movements can add to the diversity of the population. The curriculum and the educational system must be flexible enough to foster literacy acquisition for this heterogeneous population.
- **Geographic Characteristics**—The sheer size of a country can pose challenges to curriculum implementation. This is especially true if part of the population is isolated in remote parts of the country.

Organization and Structure of the Educational System

Some countries have highly centralized educational systems in which most policy-related decisions are made at the national or regional level. In these systems, often there is a great deal of educational uniformity in terms of curriculum, textbooks, and general policies. Other countries have more decentralized systems in which many important decisions are delegated to

local governments and schools. This decentralized structure results in greater variation in how schools operate and how students are taught. Research has found that the level of centralization of standardized assessments tends to be associated with greater educational equality (Van de Werfhorst & Mijs, 2010) and higher student outcomes (Bishop & Wößmann, 2004; Jürges, Schneider, & Büchel, 2005).

Student Flow

Student flow refers to how students in an educational system progress through school. For PIRLS 2016, the student flow themes that are highly relevant include preprimary education, age of entry, the prevalence of grade retention, and student grouping.

- **Preprimary Education**—Even before they begin formal primary school, children may receive considerable exposure to literacy as part of their preprimary educational experience. As described in the *PIRLS 2011 Encyclopedia* (Mullis, Martin, Minnich, Drucker, & Ragan, 2012), countries vary dramatically in their policies and practices with regard to early (preprimary) education. PIRLS 2011 supported research findings indicating that preprimary school can have a positive effect on academic achievement during primary school (Berlinski, Galiani, & Gertler, 2009; Tucker-Drob, 2012), with longer duration of preprimary education associated with higher achievement (Sammons et al., 2002).
- **Age of Entry**—Policies about the age of entry to formal education (first year of primary school, ISCED Level 1) are important for understanding the variation in students' ages across countries at the fourth grade (Martin, Mullis, & Foy, 2011), as are policies concerning promotion/retention (see below). Typically across the PIRLS countries, students enter school at ages 5 to 7. Students entering school at older ages may have an advantage at the fourth grade for several reasons. For example, they have had the opportunity for more years of preprimary education than those students beginning school at younger ages. Also, they may have had the opportunity for more reading instruction upon beginning the first grade of primary school because they are more mature and able to cope with the complex cognitive demands of reading instruction.
- **Grade Retention**—Grade retention practices differ among countries. This variation has been explained as an effect of differing educational policies, cultural norms, and diverging perspectives on the advantages

of holding students back (Goos et al., 2013). Because PIRLS is a grade-based study, the degree of grade retention can be an important factor to consider when evaluating achievement results. Research has shown that grade retention does not have a positive relationship with student achievement or the emotional wellbeing of the student (Hattie, 2009; Jimerson, 2001).

- **Grouping for Reading Instruction**—Generally, small-group instruction can improve reading ability (Lou, Abrami, & Spence, 2000; Puzio & Colby, 2010). For example, in the guided reading approach to small group reading instruction, teachers form small groups that are focused on instruction involving a specific skill or strategy rather than on reading ability alone. This type of flexible within-class grouping allows for differentiation in order to address the needs of each individual student.

Homogenous grouping by ability is thought to support students in learning at a pace that reflects their skills in the subject. However, research has found that grouping students by reading ability in elementary school is beneficial for high achieving students but has negative consequences for low performing students (Catsambis & Buttaro, 2012; Lleras & Rangel, 2009). In contrast, low ability students may perform best in heterogeneous groups (Lou et al., 1996).

Reading Curriculum in the Primary Grades

Whether formulated at the national, community, or school level, curricular documents define and communicate expectations for students in terms of the knowledge, skills, and attitudes to be developed or acquired through their formal reading instruction. Policies may range from those governing the grade in which formal reading instruction begins to those that prescribe the types of material and the methods to be used in teaching reading.

Curricular aspects and governing policies particularly relevant to the acquisition of reading literacy include standards or benchmarks established for reading development, prevalence of school and classroom libraries, instructional time, methods and materials, and ways of identifying students in need of remediation. Considerable research evidence indicates that students' academic achievement is closely related to the rigor of the curriculum. This involves a coherent progression of instruction and materials through the grade levels, including emphasis on decoding and comprehension strategies, and

access to a variety of reading materials. Effective methods for disseminating the curriculum to teachers, parents, and the general public are important, as are ways for making sure that revisions and updates are integrated into instruction.

Especially relevant to ePIRLS is the extent to which a country's curriculum emphasizes online reading, digital reading, and computer skills. Some countries have transformed their standards and curriculum in order to address new media, including teaching elementary school students basic computer skills, such as typing and using a mouse, as well as how to retrieve information via the Internet, and how to use the computer for learning. Other countries place less emphasis on teaching these skills to young students.

Teachers and Teacher Education

Policies on teacher education can facilitate the successful implementation of the intended curriculum, and PIRLS collects information about how countries educate teachers in the content and pedagogical approaches specified in the curriculum. As described in the *PIRLS 2011 Encyclopedia*, such preparation and training may be an integral part of the teacher education curriculum or it may be included in professional development programs for practicing teachers. The requirements to become a primary teacher may include certain types of academic preparation, passing an examination, or meeting other certification criteria. Some countries also have induction or mentoring programs for entering teachers and a number of opportunities for ongoing professional development in order to keep teachers apprised of current developments.

Monitoring Curriculum Implementation

Many countries have systems in place for monitoring and evaluating curriculum implementation, and for assessing student achievement. Commonly used methods include national or regional standardized tests, school inspections, audits, feedback from students and parents, and teaching observations.

Home Contexts

Much research has provided insight into the importance of home environments for reading literacy development. In order to better understand the effects of the home and intergenerational literacy transmission, PIRLS collects data through both the student questionnaire and the Learning to Read Survey, completed by the student's parents or caregivers. Through these two questionnaires, information is gathered on the following:

- Home resources for learning;
- Language(s) spoken in the home;
- Parental educational expectations and academic socialization;
- Early literacy activities and early numeracy activities; and
- Home reading support.

Home Resources for Learning

Home resources for learning encompass important socioeconomic characteristics of the parents, such as their education level, together with home supports for learning and emphasis on educational activities. In educational research, the most influential background factors on student achievement tend to be those that measure socioeconomic status of the parents or caregivers, often indicated through proxy variables such as parental level of education, income, occupational class, and, more generally, home resources such as access to technology, the Internet, and books, including children's books (Bradley & Corwyn, 2002; Dahl & Lochner, 2012; Davis-Kean, 2005; Sirin, 2005; Willms, 2006).

PIRLS has confirmed that there is a sizable association between students' home resources for learning and their reading achievement. For PIRLS 2011, the home resources for learning scale was comprised of the following indicators: parents' education, parents' occupation, the number of books in the home, the number of children's books in the home, and study supports including an Internet connection and the students having a room of their own (Mullis et al., 2012).

Students increasingly have access to new digital media such as ebooks, tablets, and smart phones (Gutnick, Robb, Takeuchi, & Kotler, 2011; Rideout, Foehr, & Roberts, 2010). Research has shown that parents generally are accepting of children spending their time playing on digital media, including certain video games, because they believe that such activities lead to proficiency with computers and technology—important skills for academic and career success (Takeuchi, 2011).

Research still is emerging on the relationship between access to new technology in the home and academic achievement in general, as well as increased reading literacy in particular. Research has shown general computer use to be associated with reading achievement (Lee, Brescia, & Kissinger, 2009). It is believed that, if used correctly, educational applications (apps) for mobile

and other new media devices also can be effective, supplementary early learning tools for young children (Chiong & Shuler, 2010; Lieberman, Bates, & So, 2009). As such, there is concern that students with less home access to these costly resources are further disadvantaged in the classroom environment, leading to greater inequity in educational systems (Leu et al., 2009).

Language(s) Spoken in the Home

Because learning to read is dependent on children's early language experiences, the language or languages spoken at home and how they are used are important factors in reading literacy development (Bialystok, 2006; Hoff & Elledge, 2005). If students are not fluent in the language of instruction, often there is at least an initial learning gap because students must learn the concepts and content of the curricula through a new language (Entorf & Minoiu, 2005; Schnepf, 2007; Trong, 2009), with language learners most disadvantaged in subjects with greater language demand, such as reading lessons (Abedi, 2002).

Parental Educational Expectations and Academic Socialization

Parents convey their expectations to their children and provide educational goals for them (Hong & Ho, 2005; Jeynes, 2005). Academic socialization is the process of stressing the importance of education, and includes parents and children talking about the value of education, discussing future educational and occupational expectations for the child, and helping children draw links between schoolwork and its real-world applications (Hill & Tyson, 2009; Taylor, Clayton, & Rowley, 2004).

Academic socialization also can be subject-specific. Research has found that parental socialization in reading is especially important in fostering student achievement in reading (Kloosterman, Notten, Tolsma, & Kraaykamp, 2010). Parents impart their own beliefs about reading that shape children's motivation to read (Baker & Scher, 2002). Socialization can be subtle (e.g., young children seeing adults reading or using texts in different ways learn to appreciate and use printed material) and this process can have long term effects on a student academic performance (Kloosterman et al., 2010).

Early Literacy Activities

In addition to academic socialization, early parental involvement in children's literacy activities can impact early literacy development and can have long-lasting effects on children's literacy as they age (Melhuish et al., 2008; Sénéchal & LeFevre, 2002). Perhaps the most common and important early literacy activity

involves adults and older children reading aloud with their young children (Federal Interagency Forum on Child and Family Statistics, 2013; Raikes et al., 2006). By reading with children, children are asked engage with the text and pictures in books; they learn that printed text conveys meaning and that being able to read is valuable and worthwhile, and this experience can increase student motivation to read (Sonnenschein & Munsterman, 2002). In addition, a young child's exposure to oral language is important for literacy acquisition (Hart & Risley, 2003). As children develop their capacity for oral language, they are learning the rules of language use, and this can facilitate the development of literacy skills.

PIRLS has found a positive relationship between early literacy activities in the home and student achievement at the fourth grade. PIRLS routinely asks parents how often they engaged their child in early literacy activities, including reading books, telling stories, singing songs, playing with alphabet toys, talking about things they had done, talking about what they read, playing word games, writing letters or words, and reading aloud signs and labels. For example, the PIRLS Early Literacy Activities Scale, based on these PIRLS 2011 items, was positively related to reading achievement in almost every country (Mullis et al., 2012).

A recent study based on based on TIMSS and PIRLS 2011 data from 34 countries, as measured by the PIRLS Early Literacy Activies Scale (Gustafsson, Hansen, & Rosén, 2013), also showed that engaging children in literacy activities was an important explanatory link in the relationship between parental education and later student achievement at the fourth grade.

Home Reading Support

After children enter formal schooling, reading activities in the home can complement what the child is learning in school (Darling & Westberg, 2004; Kim & Quinn, 2013). Parental intervention in reading has been found to be especially efficacious when educators train parents in specific activities that they can do with their child to promote literacy acquisition (Darling & Westberg, 2004; Sénéchal & Young, 2008; Van Steensel, McElvany, Kurvers, & Herppich, 2011). Parents also can assist their children in their literacy development by listening to their children when they read books aloud (Sénéchal & Young, 2008).

In some countries, it is also common for parents to enroll their children in shadow education programs, private tutoring or classes outside of formal schooling that supplement the academic instruction a child receives at school

(Bray, 1999; Stevenson & Baker, 1992). The purpose for enrolling students in this supplemental schooling varies. Some parents enroll students in programs for remedial work in order for the students to keep pace with their classmates. Other parents hope that additional instruction can make up for any shortcomings in the education provided by the child's school (Baker, Akiba, LeTendre, & Wiseman, 2001). Increasingly, parents enroll students in shadow education programs with the goal of having their children master the curriculum in order to excel on an important examination (Baker & LeTendre, 2005; Buchman, Condrón, & Roscigno, 2010), especially where students compete for limited educational opportunities in a tracked program (Baker & LeTendre, 2005).

School Contexts

A school's environment and organization can influence the ease and effectiveness of reaching curricular goals. Accepting that an effective school is not simply a collection of discrete attributes, but rather a well-managed integrated system where each action or policy directly affects all other parts, PIRLS focuses on a set of well-researched school quality indicators:

- School location;
- School composition by student socioeconomic background;
- Instruction affected by resource shortages;
- Teacher working conditions and job satisfaction;
- Principal leadership;
- School emphasis on academic success; and
- Safe, orderly, and disciplined school.

School Location

Depending on the country, schools in urban areas may have access to more resources (e.g., museums, libraries, bookstores) than schools in rural areas. In some countries, schools in urban areas may provide for a more supportive environment because of better staffing conditions and the student population coming from economically more advantaged backgrounds (Erberber, 2009; Johansone, 2009). In contrast, in other countries, schools in urban areas are located in neighborhoods with considerable poverty, little community support, and sometimes even in areas of considerable crime and violence (Milam, Furr-Holden, & Leaf, 2010).

School Composition by Student Socioeconomic Background

Since the Coleman report (Coleman et al., 1966), there has been a great emphasis on how the socioeconomic status of the collective students in the school can influence individual student achievement (Martin, Foy, Mullis, & O'Dwyer, 2013; Rumberger & Palardy, 2005; Sirin, 2005). The correlation between lower socioeconomic status and lower achievement may be able to be partially explained by other school factors. For example, in some countries, schools with students from lower socioeconomic status are taught by less qualified teachers (Akiba, LeTendre, & Scribner, 2007; Clotfelter, Ladd, & Vigdor, 2010). Another theory purports that some schools with many socioeconomically disadvantaged students can be overwhelmed by a culture of futility, in which education and schooling are viewed as an antagonistic exercise having little or no future value (Agirdag, Van Houtte, & Van Avermaet, 2012).

Instruction Affected by Resource Shortages

The extent and quality of school resources also are critical for quality instruction (Greenwald, Hedges, & Laine, 1996; Lee & Barro, 2001; Lee & Zuze, 2011). These may include resources as basic as well-trained teachers or adequate classroom space and other school facilities (Schneider, 2002). Results from PIRLS indicate that students in schools that are well resourced generally have higher achievement than those in schools where shortages of resources affect the capacity to implement the curriculum. Two types of resources—general and subject-specific—affect curriculum implementation. General resources include teaching materials, supplies, school buildings and grounds, heating/cooling and lighting systems, classroom space, audio-visual equipment such as electronic white boards and projectors, and computers, including tablets such as *iPads*. Subject-specific resources for reading include reading materials such as books and ebooks, magazines and periodicals, and digital resources such as educational software/applications (apps) and subscriptions to educational websites. With the importance of online reading for informational purposes, student access to computers, the Internet, and support for their online educational research are increasingly important to expanding literacy competencies.

For reading, a well-resourced school library or multi-media center promotes student reading. The variety and richness of the reading material available to students forms the core of students' reading experience in school. Research has shown that students use the library because there are books that

interest them; therefore, ensuring that there are a variety of reading materials that would be of interest to the students at each grade is essential to promoting reading achievement (Clark, 2010). Libraries also are becoming multi-media centers, providing ebooks, access to digital periodicals, and online resources that allow students to seek information on subjects of interest. While school libraries are common in most countries, some countries have moved towards classroom libraries, as is discussed in the Classroom Contexts section of this chapter. Regardless of where the library is located, research has indicated that the availability of books that students can choose from is positively related to reading achievement (Allington et al., 2010).

Teacher Working Conditions and Job Satisfaction

PIRLS 2011 results showed higher achievement for schools that provide good working conditions for teachers. A manageable workload, adequate facilities, and the availability of instructional materials are important ingredients to fostering productive working conditions and promoting teacher satisfaction (Johnson, 2006; Johnson, Kraft, & Papay, 2012).

In addition, a positive school environment can lead to greater job satisfaction and teacher self-efficacy, which in turn can increase student learning (Caprara, Barbaranelli, Steca, & Malone, 2006). Schools can support teachers and increase retention by providing competitive salaries, a reasonable number of teaching hours, adequate workspace, and good equipment. While the physical conditions of the school are important, the social conditions of the school can be essential to retaining teachers and fostering student achievement. Important social factors in a school include a positive school culture, collaboration among teaching staff, and the leadership of the principal (Johnson et al., 2012).

The transition from university to a school teaching position can be difficult. Consequently, in many countries a large percentage of new teachers leave the profession after only a few years of teaching (APPA, 2007; Guarino, Santibañez, & Daley, 2006; Hancock & Scherff, 2010). The extent to which schools take an active role in the acculturation and transition of new teachers may be important for maintaining a stable teaching force. Mentoring programs, modeling of good teacher practice by peers, and induction programs designed by experienced teachers within the school may be important aids to the beginning teacher (Moskowitz & Stephens, 1997; Tillmann, 2005).

Principal Leadership

Research has shown that a principal can affect student achievement. A characteristic of a successful principal is being able to articulate the mission of the school (Witziers, Bosker, & Krüger, 2003). As such, an effective school leader brings coherence to the “complexities of schooling” by aligning the structure and culture of a school with its core purpose (DuFour, Eaker, & DuFour, 2005). This includes guiding the school in setting directions and seeking future opportunities, monitoring that the school’s goals are met, as well as building and sustaining an effective learning environment and a positive school climate. Successful principals often are involved in guiding the teaching process as instructional leaders and ensuring that teachers receive the necessary training and development to produce high achievement among the students (Robinson, Lloyd, & Rowe, 2008). Within the constraints of the educational system, it is the principal’s responsibility to ensure that the instructional time, and in particular the time devoted to reading, is sufficient for the purposes of curriculum implementation. It is also the principal’s responsibility to oversee school-level instructional policies, such as grouping arrangements.

School Emphasis on Academic Success

Overall, the success of a school also can be attributable to a school’s emphasis on academic success, or the school’s expectation of academic excellence. PIRLS 2011 results, as well as a TIMSS and PIRLS 2011 school effectiveness study (Martin, Foy, Mullis, & O’Dwyer, 2013), have shown an association between academic achievement and the school emphasis on academic success, a construct based on the literature on academic optimism (Hoy, Tarter, & Hoy, 2006; McGuigan & Hoy, 2006; Wu, Hoy, & Tarter, 2013). Indicators of school emphasis on academic success include school administrators’ and teachers’ expectations for successful curriculum implementation and student achievement, parental support for student achievement, and the students’ desire to achieve.

Research also has found that teacher collaboration can increase student learning (Goddard, Goddard, & Tschannen-Moran, 2007; Wheelan & Kesselring, 2005). Teachers who discuss their work with colleagues and collaborate in planning and implementing lessons usually feel less isolated and are less likely to leave teaching (Johnson, Berg, & Donaldson, 2005). The collective education of a school’s teachers also can be essential to its academic success. From as early as first grade, research has linked the collective teacher education in a school

to student achievement (Croninger, Rice, Rathbun, & Nishio, 2007), suggesting that collaboration among teachers with strong educational backgrounds can create an emphasis on academic success within the school and facilitate the implementation of the curriculum.

Collective efficacy among the teachers of the school and general trust that faculty members have for parents and students are additional attributes of a well-functioning school (Hoy et al., 2006; McGuigan & Hoy, 2006; Wu et al., 2013). Schools that encourage and welcome parental involvement are more likely to have highly involved parents than schools that do not make an effort to keep parents informed and participating (Jeynes, 2005). High levels of parental involvement can improve student achievement, as well as students' overall attitude toward school (Dearing, Kreider, & Weiss, 2008; Jeynes, 2005; Jeynes, 2007; Taylor, Pearson, Clark, & Walpole, 2000).

In effective schools, the principal and teachers collaborate to ensure that the curriculum is appropriately implemented in the classrooms. In addition to testing and value-added models, research has found that classroom observations and student surveys can provide important information about the effectiveness of teaching practices (Bill & Melinda Gates Foundation, 2013).

Safe, Orderly, and Disciplined School

Respect for individual students and teachers, a safe and orderly environment, and constructive interactions among administrators, teachers, parents, and students all contribute to a positive school climate and lead to higher student achievement (Cohen, McCabe, Michelli, & Pickeral, 2009; Greenberg, Skidmore, & Rhodes, 2004; Konishi, Hymel, Zumbo, & Li, 2010; Martin, Foy, Mullis, & O'Dwyer, 2013). The sense of security that comes from having few behavioral problems and little or no concern about student or teacher safety at school promotes a stable learning environment. A general lack of discipline, especially if students and teachers are afraid for their safety, does not facilitate learning and is associated with lower academic achievement (Milam et al., 2010; Stanco, 2012). Schools where there are clear rules and more fairness have atmospheres of greater discipline and safety (Gottfredson, Gottfredson, Payne, & Gottfredson, 2005).

Bullying among students is a threat to the school learning environment. Bullying is aggressive behavior that is intended to harm students who are physically or psychologically less strong and takes a variety of forms ranging from name calling to inflicting physical harm. Bullying causes distress to victims, leads to low self-esteem, and makes victims feel like they do not

belong (Glew, Fan, Katon, & Rivara, 2008), and research shows that bullied students are less likely to achieve in school (Glew et al., 2008; Konishi et al., 2010; Rothon, Head, Klineberg, & Stansfeld, 2011). With the prevalence of the Internet, cyberbullying is a new form of bullying that unfortunately appears to be common among students; and, like other bullying, cyberbullying leads to low self-esteem, distress, and poor achievement (Mishna, Cook, Gadalla, Daciuk, & Solomon, 2010; Tokunaga, 2010). Unlike bullying, the process of cyberbullying can be shrouded in a cloud of anonymity for the Internet bully.

Classroom Contexts

Because most of the teaching and learning in school takes place in the classroom, successful learning is influenced by the classroom environment and instructional activities. PIRLS 2016 focuses on the following proven practices that improve teaching and learning:

- Teacher preparation and experience;
- Classroom resources;
- Instructional time;
- Instructional engagement;
- Instruction for online reading; and
- Classroom assessment.

This section benefitted especially from John Hattie's (2009) book, *Visible Learning: A Synthesis of Over 800 Meta-analyses Relating to Achievement*.

Teacher Preparation and Experience

The preparation and competence of teachers is critical (Darling-Hammond, 2000; Hill, Rowan, & Ball, 2005), and prospective teachers need coursework in order to gain knowledge in the subjects that they will teach, to understand about how students learn, and to learn about effective pedagogy in teaching reading.

In addition to teacher education and training, teacher experience is essential, and the first years of teaching experience are especially important for teacher development (Harris & Sass, 2011; Leigh, 2010). However, research also has found that teachers continue to develop after five years of experience, and that this development can positively affect student achievement (Harris et al., 2011).

Professional development through seminars, workshops, conferences, and professional journals can help teachers increase their effectiveness and broaden their knowledge (Blank & de las Alas, 2009; Yoon, Duncan, Lee, Scarloss, & Shapley, 2007). Professional development is especially important in order to train teachers in how to incorporate online reading into their classroom practices (Coiro, 2012).

With education, training, and experience, teachers should feel prepared and confident to teach reading literacy. Research has shown that teachers' confidence in their teaching skills not only is associated with their professional behavior, but also with students' performance and motivation (Bandura, 1997; Henson, 2002).

Classroom Resources

Another aspect of the classroom that is relevant for reading literacy includes the extent of the variety and richness of the reading material available to students. The reading material and technology that teachers use in reading instruction form the core of students' reading experience in school.

Students who have easy access to reading materials are more likely to read. For this reason, many countries have moved to creating classroom libraries that provide a wide variety of text and text types, including digital resources, as well as a special place for independent reading. It is believed that the presence of a classroom library can aid teachers in incorporating literature into instruction and foster positive reading habits and attitudes (Morrow, 2003; Routman, 2003; Young & Moss, 2006).

In the digital age, a growing aspect of reading instruction is how to incorporate new media into reading instruction; therefore, the use of technology in the classroom, and teachers' familiarity and comfort with technology, is increasingly important. Teachers' decisions to use technology in the classroom can result from their beliefs, attitudes, and comfort levels, as well as access to training and materials (Mueller, Wood, Willoughby, Ross, & Specht, 2008; Russell, Bebell, O'Dwyer, & O'Connor, 2003). Access to technology also is an important factor (Hsu, Wang, & Runco, 2013).

Instructional Time

At the school level, the relative emphasis and amount of time specified for reading instruction can greatly affect the opportunities to learn. Results from PIRLS show that there is variation between countries in the intended

instructional time prescribed by the curriculum and the actual time of implementation in the classroom. On average, however, there is very close agreement between the curriculum guidelines and teachers' reports about implementation. Research has shown that it is especially important that instructional time be used effectively toward the learning goals, and not be spent on secondary activities unrelated to the instructional content.

Homework is one way teachers can extend instruction and evaluate student learning. The types of homework assigned in reading classes regularly include independent reading, comprehension questions about what students have read, or some combination of the two. The amount of homework assigned for reading varies both within and across countries. In some countries, homework typically is assigned to students who need it the most. In other countries, students receive homework as an enrichment exercise. Strong students may spend less time on homework because they use their time more efficiently (Trautwein, 2007; Won & Han, 2010). For these reasons, it has been argued that the effect of homework may be better encapsulated by measures of homework frequency than homework time (Trautwein, 2007). In addition, there is evidence that homework is more effective for older students and higher achieving students (Hattie, 2009).

Instructional Engagement

TIMSS and PIRLS 2011 school effectiveness research has confirmed the importance of student engagement with instruction as an important factor in predicting reading achievement (Martin, Foy, Mullis, & O'Dwyer, 2013). According to McLaughlin et al. (2005), student engagement focuses the student's "in-the-moment" cognitive interaction with the content. "Learning occurs through the cognitive engagement of the learner with the appropriate subject matter knowledge" (McLaughlin et al., 2005, p.5). Engagement can take place when a student listens to the teacher, discusses texts with peers, or reads independently. Engagement has been conceptualized as the idea that a student's "in-the-moment" mindset is torn between engagement with instruction and distractions that are unrelated to the topics in the class (Yair, 2000). The challenge for the teacher is to use effective methods of instruction in order to maintain student engagement in the content, activating the students cognitively (Klieme, Pauli, & Reusser, 2009; Lipowsky et al., 2009). A well-managed classroom and a supportive classroom environment can facilitate this engagement process (Klieme et al., 2009; Lipowsky et al., 2009).

Effective classroom management allows for better engagement with teaching and learning, as well as higher achievement outcomes, because it focuses the class and instructional time on the topic (Fauth, Decristan, Rieser, Kleime, & Büttner, 2014; Lipowsky et al., 2009; Marzano, Marzano, & Pickering, 2003; Wang, Haertel, & Walberg, 1993). Effective teachers are strong classroom managers, who build trust with the students and limit disruptions to the instruction (Stronge, Ward, & Grant, 2011). Teachers can be strong classroom managers by ensuring that rules are clear, taking effective disciplinary action, building optimal student-teacher relationships, and maintaining an alert and objective mindset during instruction (Marzano et al., 2003).

Fostering student motivation in reading is fundamental for reading teachers, because students who are motivated to read more, especially at a young age, become better readers (Lewis & Samuels, 2003). Motivation can be facilitated, according to self-determination theory (Deci & Ryan, 1985), by creating a supportive environment that fosters a sense of *relatedness*, *competence*, and *autonomy*. A classroom environment that is overly controlling can stifle student motivation because it removes the student's sense of autonomy (Niemiec & Ryan, 2009). Effective teachers are able to create an optimal classroom environment by providing clear purpose and "strong guidance" for the classroom while encouraging cooperation among the students and an environment of respect between students as well as between students and the teacher (Marzano et al., 2003). Supportive teacher-student relationships are important not only in order to foster student motivation (Cornelius-White, 2007; Marzano et al., 2003), but also to increase student participation and student achievement (Cornelius-White, 2007; Fauth et al., 2014). A socially welcoming school environment or classroom also can provide a sense of relatedness by giving students a sense of belonging (Goodenow & Grady, 1993).

Additionally, teachers can nurture student motivation in reading by creating an environment that allows students to work autonomously, while providing support and guidance (Ryan & Deci, 2000; Reeve, Jang, Carrell, Jeon, & Barch, 2004). Autonomy can be fostered in reading instruction by allowing students the opportunity to choose their reading material (Guthrie, McRae, & Klauda, 2007).

An effective teacher ensures that students are actively involved in their own learning process. Students are more engaged in student-centered learning when they are working individually or with their peers rather than listening to a teacher lecture or watching a video (Shernoff, Csikszentmihalyi, Schneider, &

Shernoff, 2003; Yair, 2000). Peer-tutoring, small group work, and peer mentoring are effective strategies that promote student engagement and are linked to achievement (Hattie, 2009; Springer, Stanne, & Donovan, 1999).

Students also are more engaged when they are challenged and face greater cognitive demands (Shernoff et al., 2003; Yair, 2000). However, the challenges of the tasks should be perceived to be attainable for the students. In this respect, effective teaching is setting challenging yet attainable goals for each student and supporting the students in reaching the goals (Hattie, 2009; Klein, Wesson, Hollenbeck, & Alge, 1999). In setting goals, it is important that students understand the process of achievement, what outcome is expected, and why the goal is important for the learning process (Hattie, 2009; Martin, 2006). One way that students can be supported in reaching their goals is by linking the new material and concepts to the students' prior knowledge and understanding (Klieme et al., 2009; McLaughlin et al., 2005). Concept mapping (Nesbit & Adesope, 2006) and advance organizers (Hattie, 2009; Stone, 1983) are two proven strategies for linking prior learned concepts to new concepts.

Discussion-based instructional approaches have been shown to be effective in engaging and supporting students in their reading development (Applebee, Langer, Nystrand, & Gamoran, 2003; Murphy, Wilkinson, Soter, Hennessey, & Alexander, 2009). The specific discussion-based strategy implemented by the teacher (e.g. collaborative reading, questioning the author) can have a distinct effect on the development of a child's reading comprehension and critical thinking skills, and therefore the approach should be aligned with the goals of the lesson (Murphy et al., 2009).

Effective teachers also find means to emphasize the relevance of the learning task (Yair, 2000). By providing stimulating reading tasks around student interest and students' hands-on experiences, teachers can fuel student interest in reading, increasing motivation and reading comprehension (Guthrie et al., 2006).

Overall, research has shown that there are many strategies to teach reading and enhance comprehension. It is the educator's responsibility to understand the needs of the students and to incorporate the instructional techniques that can best foster student motivation to read and student achievement. Effective reading instruction provides a balanced program, integrating many components, including multiple texts, teacher- and student-led discussions, collaborative learning, time for independent reading, and a variety of assessment techniques (Gambrell, Malloy, & Mazzoni, 2011). Other proven instructional strategies

include repeated reading (Therrien, 2004), phonemic awareness instruction (Ehri et al., 2001), and vocabulary instruction (Elleman, Lindo, Morphy, & Compton, 2009).

Instruction for Online Reading

An emerging aspect of reading instruction is the teaching of online reading. Unlike traditional reading, students reading online must learn to negotiate their way through Internet features such as hypertexts, multi-modal texts, and interactive texts, in order to find the information they are seeking (Coiro, 2003). Informational searches begin with a question, and with this question in mind the student uses a search engine in order to locate the information, as well as to identify and evaluate the credibility of the search results and the sites visited (Leu et al., 2007). In addition, online readers often need to synthesize the information from multiple websites in order to answer the question (Leu et al., 2007). While traditional print-based offline reading informs online reading comprehension, the skills needed for successful online reading go beyond those needed for print reading (Coiro, 2011; Leu et al., 2007). From an instructor's point of view, for students to become strong online readers, they not only must know how to read, but they also must be able to locate, evaluate, and synthesize information in the online environment (Coiro, 2011; Leu et al., 2007), a process that assumes basic computer skills and the ability to use technology as a tool to find information (Tondeur, van Braak, & Valcke, 2007). Therefore, it is increasingly important for teachers to tailor lessons to this new form of reading (Leu et al., 2007).

In some circumstances, poor offline readers may be more skilled or engaged in the interactive nature of seeking information through online media, and therefore can compensate for weaknesses in reading with their online skills (Castek, Zawilinski, McVerry, O'Byrne, & Leu, 2010; Leu et al., 2007). For example, students using digital technology are more likely to use resources that aid comprehension, such as dictionaries (Wright, Fugett, & Caputa, 2013). It also has been shown that students with less prior knowledge in a topic are able to perform well on Internet-related tasks, because their Internet skills can help overcome knowledge deficits (Coiro, 2011).

Classroom Assessment

Teachers have a number of ways to monitor student progress and achievement. PIRLS results show that teachers devote a fair amount of time to student assessment, whether as a means of gauging what students have learned or for providing feedback to students, teachers, and parents. The frequency and

format of assessment are important indicators of teaching and school pedagogy, and research has shown that frequent testing can lead to improving student achievement (Başol & Johanson, 2009). Informal assessments during instruction help teachers identify needs of particular individuals, evaluate the pace of the presentation, and adapt the instruction. Formal tests, both teacher-made and standardized assessments, typically are used to make important decisions about students (e.g., grades) or schools for accountability purposes. Teachers use a variety of formats and test a wide range of contents and cognitive skills. The types of questions included in tests and quizzes can send strong signals to students about what is important.

Student Characteristics and Attitudes Toward Learning

An important topic in educational research is the relationship between student attitudes toward a subject and students' academic achievement. In educational research, there are numerous theories regarding how student motivation and confidence can lead to engagement and academic achievement. PIRLS 2016 includes information about the following:

- Student readiness to learn;
- Student motivation;
- Student self-concept; and
- Student reading literacy behaviors.

Student Readiness to Learn

In order for students to engage in a task or a goal, it is crucial that they are physiologically ready and possess the prerequisite knowledge to engage in the content (McLaughlin et al., 2005). Results from PIRLS 2011 indicated that many students, even in the most developed countries, struggle to pay attention in class due to hunger and sleep deprivation.

Research has identified nutritional problems to be a barrier to student learning, with school breakfast programs suggested as a possible solution (Taras, 2005). Likewise, sleep deprivation has been found to be related to lower achievement (Dewald, Meijer, Oort, Kerkhof, & Bögels, 2010), and may be associated with the early start times at certain schools (Perkinson-Gloor, Lemola, & Grob, 2013), as well as the socioeconomic status of the student (Buckhalt, 2011).

In addition to physiological readiness, students also need to have the prerequisite knowledge to engage with the content because “every new thing that a person learns must be attached to what the person already knows” (McLaughlin et al., 2005, p. 5). In other words, for students to learn, they need to be able to connect the new content to prior knowledge.

Student Motivation

In addition to students’ readiness to learn, their motivation is essential to success in reading (Anmarkrud & Bråten, 2009; Logan, Medford, & Hughes, 2011). The source of academic motivation and how it can be facilitated within the school, classroom, and home has been a recurrent area of research (Bandura, 1997; Csikszentmihalyi, 1990; Deci & Ryan, 1985). Students have different levels of motivation for each distinct task and subject area.

Most of the literature separates motivation into two distinct constructs: intrinsic motivation and extrinsic motivation. Intrinsic motivation is an “energizer of behavior” (Deci & Ryan, 1985, p.32). Students who are intrinsically motivated to read find it to be interesting and enjoyable (Deci & Ryan, 1985) and have a positive attitude towards reading. Although it is theorized that all human beings are born with intrinsic motivation to learn, contexts such as the home and school can either facilitate or suppress this inner motivation.

Extrinsic motivation refers to the drive that comes from external rewards like praise, career success, money, and other incentives. Research consistently shows that intrinsic motivation is more closely related to reading achievement than extrinsic motivation (Becker, McElvany, & Kortenbruck, 2010; Schiefele, Schaffner, Möller, & Wigfield, 2012; Vansteenkiste, Timmermans, Lens, Soenens, & Van den Broeck, 2008). Indeed, some research points to external rewards dampening a student’s intrinsic motivation (Deci, Koestner, & Ryan, 1999). Nevertheless, most students do not have an intrinsic motivation to learn all subjects, and therefore fostering motivation through extrinsic rewards may be a necessary course of action for a teacher or a parent. In these cases, research has found that successful students internalize their extrinsic motivation to increase performance, in an environment that cultivates feelings of relatedness, competence, and autonomy (Ryan & Deci, 2000; Deci & Moller, 2005).

Student Self-concept

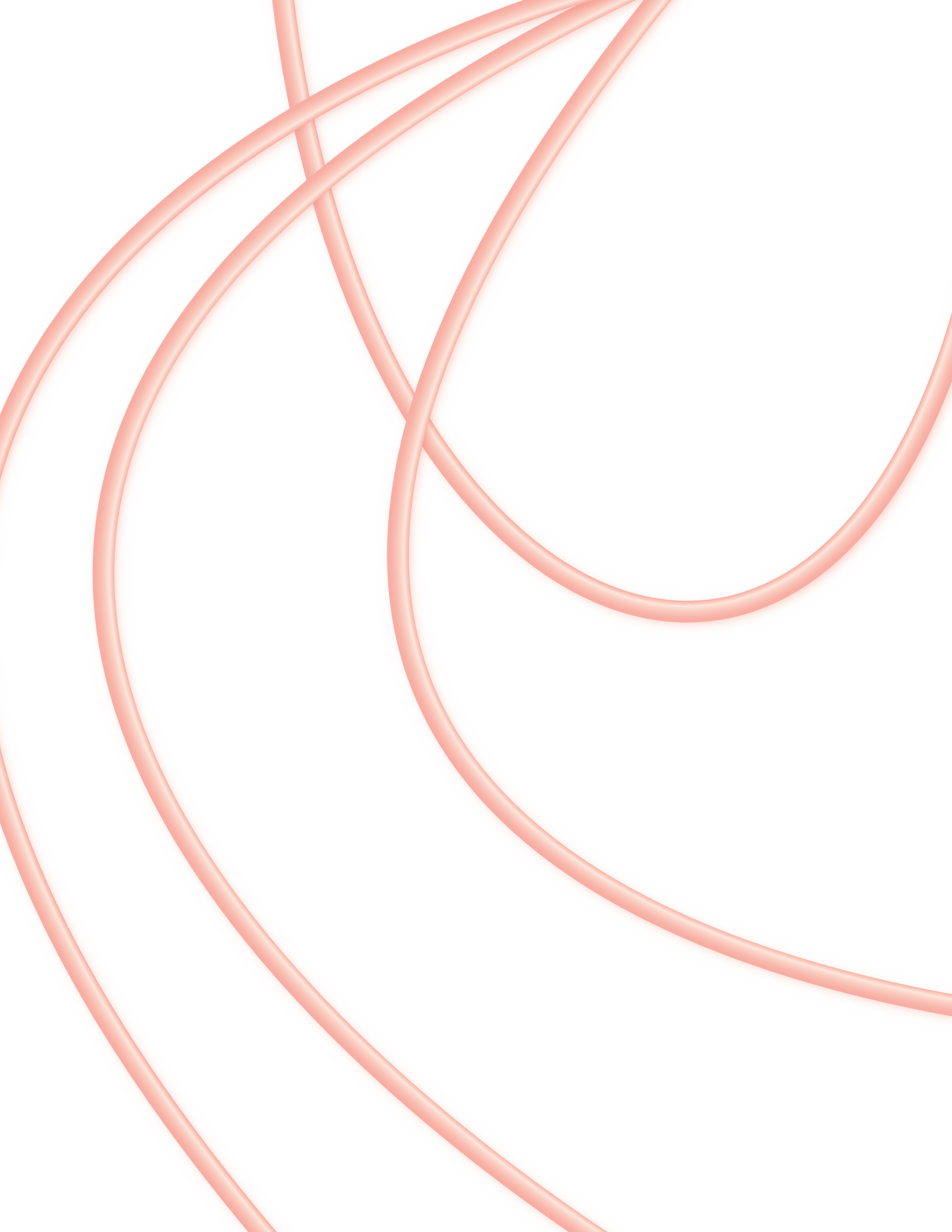
Students’ perceived competence in a subject is linked to their subject-specific self-concept. If students believe that reading tasks are outside the scope of what can be completed successfully, students will view the exercise as futile, and this

will affect their motivation. In contrast, if students are confident, they are more likely to persevere in order to successfully complete the school task (Bandura, 1997). Self-concept often is estimated relative to students' peers or experiences, and is a multi-dimensional construct (Marsh & Craven, 2006); that is, students reading self-concept is distinct from their mathematics or science self-concept.

Student Reading Literacy Behaviors

Students who are motivated to read and have a strong reading self-concept tend to read more than their peers and have better reading comprehension (De Naeghel, Van Keer, Vansteenkiste, & Rosseel, 2012). The process can be cyclical, because students who are good readers, with strong reading skills, tend to read recreationally (Leppänen, Aunola, & Nurmi, 2005; Mol & Bus, 2011), which contributes to consolidating their reading ability by improving vocabularies, spelling abilities, and so forth (Mol & Bus, 2011).

Recreational reading habits often are supported by the family and friends of young readers; thus, a supportive home environment can be influential in fostering children's reading habits. However, home support is not only important for children prior to their entry into primary school; home support also can be influential in promoting reading throughout children's schooling (Baker, 2003; Klauda & Wigfield, 2012).



CHAPTER 3

Assessment Design for PIRLS, PIRLS Literacy, and ePIRLS in 2016

Michael O. Martin, Ina V.S. Mullis, and Pierre Foy

PIRLS 2016 consists of three separate assessments of reading comprehension: PIRLS, PIRLS Literacy, and ePIRLS. PIRLS is a comprehensive assessment of fourth grade students' reading literacy achievement. Conducted on a regular five-year cycle, with each assessment linked to those that preceded it, PIRLS provides regular data on trends in students' reading literacy on a common achievement scale. Matching PIRLS for breadth of coverage but with less difficult reading passages and items, PIRLS Literacy extends the effective measurement of reading comprehension at the lower end of the PIRLS achievement scale. For countries participating in PIRLS, ePIRLS expands PIRLS to include the assessment of online reading to acquire and use information. The PIRLS assessments include a series of contextual questionnaires to gather information about community, home, and school contexts for developing reading literacy.

Student Population Assessed

PIRLS assesses the reading literacy of children in their fourth year of formal schooling. This population was chosen for PIRLS because it is an important transition point in children's development as readers. Typically, at this point, students have learned how to read and are now reading to learn. In many countries, this also is when students begin to have separate classes for different subjects, such as mathematics and science. The target population for PIRLS is defined as follows:

The PIRLS target grade should be the grade that represents four years of schooling, counting from the first year of ISCED Level 1.

ISCED is the International Standard Classification of Education developed by the UNESCO Institute for Statistics and provides an international standard for describing levels of schooling across countries (UNESCO, 2012). The ISCED system describes the full range of schooling, from early childhood education (Level 0) to doctoral study (Level 8). ISCED Level 1 corresponds to primary education, or the first stage of basic education. The PIRLS target grade is four years after the beginning of Level 1, which is the fourth grade in most countries. However, given the linguistic and cognitive demands of reading, PIRLS wants to avoid assessing very young children. Thus, if the average age of fourth grade students at the time of testing would be less than 9.5 years, PIRLS recommends that countries assess the next higher grade (i.e., fifth grade).

Reporting Reading Achievement

PIRLS and PIRLS Literacy are designed to provide a complete picture of the reading literacy achievement of the participating students in each country. This includes achievement by reading purpose and comprehension process as well as overall reading achievement. Consistent with the goal of a comprehensive view of reading comprehension, the entire PIRLS assessment consists of 12 reading passages and accompanying questions (known as items); similarly, the PIRLS Literacy assessment consists of 12 reading passages and accompanying questions, but the passages are less difficult. In each assessment, six passages assess reading for literary experience and six assess reading to acquire and use information. In order to keep the assessment burden on any one student to a minimum, each student is presented with just two passages according to a systematic booklet assembly and rotation procedure, as described in the next section. Following data collection, student responses for both the PIRLS and PIRLS Literacy assessments are placed on the PIRLS reading achievement scale using item response theory methods that provide an overall picture of the assessment results for each country.¹

Integration between PIRLS and PIRLS Literacy is maintained by including two PIRLS Literacy passages in the PIRLS assessment and two PIRLS passages in the PIRLS Literacy assessment. This provides a solid foundation for employing the PIRLS scaling and linking methodology to ensure that students taking the PIRLS Literacy assessment have their achievement reported on the PIRLS scale. Moreover, including the two less difficult PIRLS Literacy passages benefits PIRLS by providing more information about the reading accomplishments of students who participate in the PIRLS assessment and perform at the lower end of the

¹ The PIRLS scaling methodology is described in detail in Foy, Brossman & Galia (2012).

achievement scale. Conversely, including the more difficult PIRLS passages in the PIRLS Literacy assessment provides information about the accomplishments of higher performing students who participate in PIRLS Literacy.

The PIRLS assessments are designed from the outset to measure trends over time in reading achievement. Accordingly, the PIRLS reading achievement scale provides a common metric on which countries can compare their fourth grade students' progress in reading over time from assessment to assessment. The PIRLS achievement scale was established in 2001 so that 100 points on the scale corresponded to one standard deviation across all of the countries that participated in 2001, and the scale centerpoint of 500 corresponded to the international average across those countries. Using passages that were administered in both the 2001 and 2006 assessments as a basis for linking the two sets of assessment results, the PIRLS 2006 data also were placed on this scale so that countries could gauge changes in students' reading achievement since 2001. Following a similar procedure, the PIRLS 2011 data also were placed on the PIRLS scale, as will be the data from PIRLS 2016. This will enable countries that have participated in PIRLS since its inception to have comparable achievement data from 2001, 2006, 2011, and 2016, and to plot changes in performance over this 15-year period.

The PIRLS reading achievement scale is an overall measure of reading proficiency that includes both reading purposes and processes of comprehension. However, in addition to the overall scale, PIRLS and PIRLS Literacy also provide separate achievement scales on the same metric for purposes for reading and for processes of comprehension. More specifically, there are two scales for reading purposes:

- Reading for literary experience; and
- Reading to acquire and use information.

In addition to these, there also are two scales for processes of reading comprehension:

- Retrieval and straightforward inferencing; and
- Interpreting, integrating, and evaluating.²

Countries participating in ePIRLS also participate in PIRLS; so, in addition to the usual PIRLS overall reading achievement results and results by reading purpose and comprehension process, ePIRLS participants can report student

2 Retrieval and straightforward inferencing combines items from the Focus on and Retrieve Explicitly Stated Information and Make Straightforward Inferences comprehension processes. Similarly, interpreting, integrating, and evaluating is based on items from the Interpret and Integrate Ideas and Information and Examine and Critique Content and Textual Elements processes.

achievement in online reading for informational purposes. The ePIRLS online reading achievement scale enables countries to examine their students' online reading performance relative to their performance on the PIRLS reading achievement scales.

PIRLS and PIRLS Literacy Booklet Design

Given the broad coverage and reporting goals of the PIRLS framework and its emphasis on the use of a variety of authentic texts, the specifications for the pool of assessment items include extensive testing time. The PIRLS Reading Development Group found that a valid assessment of two purposes for reading—reading for literary experience and reading to acquire and use information—with reliable measures of two processes of comprehension required good coverage of the range of reading material that children encounter in school and their everyday lives.

With a total testing time for the assessment passages of eight hours, but far less time available to assess any individual student, the PIRLS assessment materials must be divided in some way. Therefore, because of the difficulties of scheduling student assessments and because young children cannot be subjected to long testing periods without suffering loss of concentration and fatigue, the testing time is limited to 80 minutes per student, with an additional 15–30 minutes for a student questionnaire.

To address this challenge, the PIRLS assessment design uses a matrix sampling technique: each reading passage and its accompanying items is assigned to a block, and the blocks are then systematically distributed among individual student booklets. Both PIRLS and PIRLS Literacy consist of 12 passages/blocks, each of which is expected to require 40 minutes of student testing time.

As shown in Exhibit 3, the five literary blocks developed specifically for PIRLS are labeled PRLit1 through PRLit5 and the five informational blocks PRInf1 through PRInf5. The two blocks from PIRLS Literacy are labeled PLLit3 and PLInf3. Six of the ten PIRLS blocks were included in previous PIRLS assessments: two in all three assessments (2001, 2006, and 2011), two in both PIRLS 2006 and PIRLS 2011, and two in PIRLS 2011 only. These “trend” blocks provide a foundation for measuring trends in reading achievement. In addition, the 2016 assessment includes four new PIRLS blocks developed for use for the first time.

Exhibit 3: PIRLS 2016 Matrix Sampling Blocks

Purpose for Reading	Block					
Literary Experience	PRLit1	PRLit2	PRLit3	PRLit4	PRLit5	PLLit3
Acquire and Use Information	PRInf1	PRInf2	PRInf3	PRInf4	PRInf5	PLInf3

The ten blocks developed specifically for PIRLS Literacy are shown in Exhibit 4, with the five blocks of literary passages labeled PLLit1 through PLLit5 and the five informational blocks PLInf1 through PLInf5. The two blocks from PIRLS are labeled PRLit1 and PRInf1. Four of the passage and item blocks were previously used in 2011 as part of prePIRLS. Because prePIRLS has been subsumed into PIRLS Literacy for the 2016 assessment cycle, these passages from 2011 provide the basis for measuring trends in 2016. The remaining six PIRLS Literacy blocks are newly developed for 2016.

Exhibit 4: PIRLS Literacy 2016 Matrix Sampling Blocks

Purpose for Reading	Block					
Literary Experience	PLLit1	PLLit2	PLLit3	PLLit4	PLLit5	PRLit1
Acquire and Use Information	PLInf1	PLInf2	PLInf3	PLInf4	PLInf5	PRInf1

The PIRLS 2016 booklet design shows how the blocks of passages and items are assembled into individual student booklets, each consisting of two 40-minute blocks of passages and items. Individual students respond to one assessment booklet and a student questionnaire.

The PIRLS booklet design (see Exhibit 5) includes the ten blocks of PIRLS passages and items described in Exhibit 3, as well as two of the PIRLS Literacy blocks from Exhibit 4 (PLLit3 and PLInf3). These 12 blocks are distributed across 16 booklets. Booklets 1–15 each consist of one literary passage and items and one informational passage and items. In order to present at least some passages in a more natural, authentic setting, one literary block (PRLit5) and one informational block (PRInf5) are presented in a magazine-type format with the questions in a separate booklet. This 16th booklet is referred to as the PIRLS “Reader.”

Exhibit 5: PIRLS 2016 Student Booklet Design

Booklet	Part 1	Part 2
1	PRInf2	PRLit1
2	PRLit3	PRInf2
3	PLInf3	PRLit3
4	PLInf3	PRLit4
5	PRLit4	PRInf1
6	PRLit2	PRInf1
7	PRInf3	PRLit2
8	PLLit3	PRInf3
9	PLLit3	PRInf4
10	PRInf4	PRLit1
11	PRLit3	PRInf1
12	PLInf3	PRLit2
13	PRInf3	PRLit1
14	PLLit3	PRInf2
15	PRInf4	PRLit4
Reader	PRLit5	PRInf5

The 16 PIRLS booklets are distributed among students in participating classrooms so that the groups of students completing each booklet are approximately equivalent in terms of student reading ability. PIRLS uses item response theory scaling methods to assemble a comprehensive picture of the reading achievement of a country’s entire fourth grade student population by pooling individual students’ responses to the booklets that they are assigned. This approach reduces to manageable proportions what otherwise would be an impossible student burden, albeit at the cost of greater complexity in booklet assembly, data collection, and data analysis.

In order to enable linking among booklets within PIRLS, and to maintain links between PIRLS and PIRLS Literacy, it is desirable that the student booklets contain as many block pair combinations as possible. However, because the number of booklets can become very large if each block is to be paired with all other blocks, it is necessary to choose judiciously among possible block combinations.

In the PIRLS 16-booklet design, each of five literary blocks (PRLit1–PRLit4 and PLLit3) and each of five informational blocks (PRInf1–PRInf4 and PLInf3) appear in three of the PIRLS booklets, each time paired with another, different block. For example, as shown in Exhibit 5, literary block PRLit1 appears with informational block PRInf2 in Booklet 1 and with informational blocks PRInf4 and PRInf3 in Booklets 10 and 13, respectively. Informational block PRInf2 appears not only with PRLit1 in Booklet 1, but also with literary block PRLit3 in Booklet 2 and with PIRLS Literacy literary block PLLit3 in Booklet 14. Each of the two PIRLS Literacy blocks (PLLit3 and PLInf3) appears in three PIRLS booklets. By design, the two PIRLS Literacy block passages are less demanding than the PIRLS passages. Accordingly, when a PIRLS Literacy block is paired with a PIRLS block the Literacy block always is in first position in the booklet. Including the two PIRLS Literacy blocks in the PIRLS booklet scheme ensures a link between PIRLS and PIRLS Literacy. This link is further strengthened by including two PIRLS blocks in the PIRLS Literacy booklet scheme (see below).

The blocks in the PIRLS Reader, PRLit5 and PRInf5, are not linked to any other blocks directly. However, because booklets are assigned to students using a randomized procedure, the group of students responding to the Reader is equivalent to those responding to the other booklets, within the margin of error of the sampling process. Because each block appears in three of Booklets 1 through 15, the Reader is assigned three times more frequently in the distribution procedure than these booklets, so that the same proportion of students respond to blocks PRLit5 and PRInf5 as to each of the other blocks in the PIRLS booklets.

Similar to the PIRLS booklet design, the PIRLS Literacy booklet design consists of Booklets 1–15 and a PIRLS Literacy Reader, with each booklet consisting of two 40-minute blocks of passages and items, and each student responding to one assessment booklet and a student questionnaire (see Exhibit 6). Each booklet contains one literary passage and one informational passage. The PIRLS Literacy design includes the ten blocks of PIRLS Literacy passages and items shown in Exhibit 4 (PLLit1–PLLit5 and PLInf1–PLInf5) together with two of the PIRLS blocks from Exhibit 3 (PRLit1 and PRInf1). The PIRLS Literacy Reader consists of literary block PLLit5 and informational block PLInf5.

Exhibit 6: PIRLS Literacy 2016 Student Booklet Design

Booklet	Part 1	Part 2
1	PLInf1	PRLit1
2	PLLit2	PLInf1
3	PLInf3	PLLit2
4	PLInf3	PLLit4
5	PLLit4	PRInf1
6	PLLit1	PRInf1
7	PLInf2	PLLit1
8	PLLit3	PLInf2
9	PLLit3	PLInf4
10	PLInf4	PRLit1
11	PLLit2	PRInf1
12	PLInf3	PLLit1
13	PLInf2	PRLit1
14	PLLit3	PLInf1
15	PLInf4	PLLit4
Reader	PLLit5	PLInf5

Also paralleling the PIRLS design, each of five literary blocks (PLLit1–PLLit4 and PRLit1) and five informational blocks (PLInf1–PLInf4 and PRInf1) appears in three of the 15 PIRLS Literacy booklets, each time paired with another, different, block. Each of the two PIRLS blocks (PRLit1 and PRInf1) appears in three PIRLS Literacy booklets. Because these PIRLS blocks are more difficult than the PIRLS Literacy blocks, they appear in the second position in the booklet when paired with a Literacy block.

Question Types and Scoring Procedures

Students' ability to comprehend text through the four PIRLS comprehension processes is assessed via comprehension questions that accompany each text. Two question formats are used in the PIRLS and PIRLS Literacy assessments: multiple-choice and constructed-response. Each multiple-choice question is worth one point. Constructed-response questions are worth one, two, or three

points, depending on the depth of understanding required. Up to half of the total number of points represented by all of the questions come from multiple-choice questions. In the development of comprehension questions, the decision to use either a multiple-choice or a constructed-response format is based on the process being assessed, and on which format best enables test takers to demonstrate their reading comprehension.

Multiple-choice Questions

Multiple-choice questions provide students with four response options, of which only one is correct. Multiple-choice questions can be used to assess any of the comprehension processes. However, because they do not allow for students' explanations or supporting statements, multiple-choice questions may be less suitable for assessing students' ability to make more complex interpretations or evaluations.

In assessing fourth grade students, it is important that linguistic features of the questions be developmentally appropriate. Therefore, questions are written clearly and concisely. Response options also are written succinctly in order to minimize the reading demand of the question. Incorrect options are written to be plausible, but not deceptive. For students who may be unfamiliar with this test question format, the instructions given at the beginning of the test include a sample multiple-choice item that illustrates how to select and mark an answer.

Constructed-response Questions

Constructed-response test items require students to provide a written response, rather than select a response from a set of options. The emphasis placed on constructed-response questions in the PIRLS assessments is consistent with the definition of literacy underlying the framework. It reflects the interactive, constructive view of reading—meaning is constructed through an interaction between the reader, the text, and the context of the reading task. This question type may be used to assess any of the four comprehension processes. However, it is particularly well suited for assessing aspects of comprehension that require students to provide support or that result in interpretations involving students' background knowledge and experiences.

In the PIRLS assessments, constructed-response questions may be worth one or two points (short-answer items), or three points (extended-response items), depending on the depth of understanding or the extent of textual support the question requires. In framing these questions, it is important to

provide enough information to help students clearly understand the nature of the response expected.

Each constructed-response question has an accompanying scoring guide that describes the essential features of appropriate and complete responses. Scoring guides focus on evidence of the type of comprehension the questions assess. The guides describe evidence of partial understanding and evidence of complete or extensive understanding. In addition, sample student responses at each level of understanding provide important guidance to scoring staff.

In scoring students' responses to constructed-response questions, the focus is solely on students' understanding of the text, not on their ability to write well. Also, scoring takes into account the possibility of various interpretations that may be acceptable, given appropriate textual support. Consequently, a wide range of answers and writing ability may appear in the responses that receive full credit to any one question.

Score Points

In developing the PIRLS and PIRLS Literacy assessments, the aim is to create blocks of passages and items that each provide, on average, at least 15 score points consisting of the following: approximately seven multiple-choice items (1 point each), two or three short-answer items (1 or 2 points each), and one extended-response item (3 points). Items in each block should address the full range of PIRLS comprehension processes. The exact number of score points and the exact distribution of question types per block will vary somewhat, because different texts yield different types of questions.

The PIRLS Literacy items use multiple-choice and constructed-response formats, as in PIRLS, though constructed-response items usually are worth only one or two points. However, there is a slightly higher percentage of constructed-response items in the PIRLS Literacy assessment, comprising up to 60 percent of the total score points. This decision was made because constructed-response items that require a very short response often are easier for early readers due to the lighter reading demand, as compared with multiple-choice items that require students to read and evaluate four response options. In addition, multiple-choice items may lose some of their effectiveness in passages as short as those used in PIRLS Literacy, because there are fewer plausible distracters that can be drawn from the text.

Releasing Assessment Materials to the Public

An essential aspect of the PIRLS design for measuring trends in reading achievement over time is that, with each cycle, PIRLS releases a number of passages and items into the public domain in order to help readers understand as much as possible about the content and approach of the assessment. At the same time, a number of passages and items are retained and kept confidential to be used in future assessments as the basis for measuring trends. As passages and items are released, new assessment materials are developed to take their place.

According to the PIRLS design, four blocks were released following the PIRLS 2011 data collection, two developed originally for the 2006 assessment, and two from the four developed for 2011. These released passages and items may be found in the *PIRLS 2011 International Results in Reading* (Mullis, Martin, Foy, & Drucker, 2012). Following the publication of the international report for PIRLS 2016, a further six blocks will be released: four that were used in both the 2011 and 2016 assessments, and two from those developed specifically for PIRLS 2016. Additionally, the two PIRLS passages that were included in the PIRLS Literacy booklet design will be released, along with two PIRLS Literacy blocks from 2011 and two from 2016.

ePIRLS 2016 Design

The ePIRLS computer-based assessment of online reading is designed as an extension to PIRLS that measures student informational reading in an online environment. ePIRLS is administered by computer, and requires students to use a mouse or other pointing device to navigate through the assessment and to use a computer keyboard to type their responses to the assessment questions. All students participating in ePIRLS also are expected to have participated in PIRLS. The complete ePIRLS assessment consists of four³ school-based online reading tasks, each of which involves 2–3 different websites totaling 5 to 10 web pages, together with a series of comprehension questions based on the task. Similar to the PIRLS and PIRLS Literacy passages, each task with accompanying questions takes 40 minutes to complete. In order to keep student response burden to a reasonable level, each individual student completes just two ePIRLS tasks, followed by 5 minutes for a short online questionnaire.

Because ePIRLS is administered by computer, it has greater flexibility than paper-based PIRLS in how the assessment tasks are paired for presentation to

3 Depending on the results of the ePIRLS field test, the number of assessment tasks may be increased to five or six. In that case, the matrix sampling design for task combinations will be extended. In general, if there are n tasks, the number of task combinations is n^2-n .

students. With each student taking two of the four assessment tasks, there are 12 possible task combinations based on task pair and order of administration (see Exhibit 7). ePIRLS uses IEA's WinW3S sampling software to randomly distribute all 12 task combinations across participating students so that approximately 1/12 of the student sample in each country responds to each task combination and these groups of students are approximately equivalent in terms of student ability.

Exhibit 7: ePIRLS 2016 Student Task Combinations—4 Tasks

Student Task Combination	First Task	Second Task
Task Combination #1	E01	E02
Task Combination #2	E01	E03
Task Combination #3	E01	E04
Task Combination #4	E02	E01
Task Combination #5	E02	E03
Task Combination #6	E02	E04
Task Combination #7	E03	E01
Task Combination #8	E03	E02
Task Combination #9	E03	E04
Task Combination #10	E04	E01
Task Combination #11	E04	E02
Task Combination #12	E04	E03

ePIRLS uses item response theory scaling methods to assemble a comprehensive picture of the online informational reading achievement of a country's fourth grade student population by pooling individual students' responses to the tasks that they have been assigned.

Because 2016 is the inaugural year for ePIRLS, all tasks are newly developed. After the 2016 assessment, two of the tasks will be released to the public and the remainder kept secure in order to measure trends in future ePIRLS assessment cycles.

Context Questionnaires and the PIRLS 2016 Encyclopedia

An important purpose of PIRLS 2016 is to study the home, community, school, and student factors associated with children’s reading literacy at the fourth grade. To accomplish this purpose, data about the contexts for learning to read are collected through questionnaires completed by students, as well as their parents, teachers, and principals. In addition, National Research Coordinators provide information on the national and community contexts for learning through the curriculum questionnaire and their country’s entry in the *PIRLS 2016 Encyclopedia*. Because PIRLS and PIRLS Literacy are reported together in order to assess students in their fourth year of schooling, the same set of questionnaires is used for all students.

PIRLS focuses on policy relevant topics that are generally considered to have a positive relationship with student achievement. Chapter 2 provides an overview of these topics and serves as the basis for item development. Many of the topics are measured through the use of scales—sets of items that measure the same construct. For purposes of reporting, scales are preferable over stand-alone items because they are generally more reliable and more suitable for trend measurement. For PIRLS 2011, 19 scales were reported using context questionnaire data, ranging from measures of parental attitude toward reading to measures of school climate.

Learning to Read Survey (Home Questionnaire)

The Home Questionnaire, entitled the *Learning to Read Survey*, is addressed to the parents or primary caregivers of each student taking part in the PIRLS 2016 data collection. This short questionnaire solicits information on the home context, such as languages spoken in the home, parents’ reading activities and attitudes toward reading, and parents’ education and occupation. The questionnaire also collects data on the students’ educational activities and experiences outside of school including early childhood education, early literacy and numeracy activities, and the child’s reading readiness at the beginning of primary school. This questionnaire is designed to take 10–15 minutes to complete.

Teacher Questionnaire

Students' reading teachers are asked to complete this questionnaire, which is designed to gather information about classroom contexts for reading instruction, such as characteristics of the class, reading instructional time, and instructional approaches. The questionnaire also asks about teacher characteristics, such as their career satisfaction, education, and recent professional development activities. This questionnaire requires about 35 minutes to complete.

School Questionnaire

The principal of each school is asked about school characteristics, such as student demographics, the school environment, and the availability of school resources and technology. The questionnaire also includes items focusing on the principal's leadership role, education, and experience. It is designed to take about 30 minutes.

Student Questionnaire

This questionnaire, given to each student once they have completed the reading assessment, collects information on students' home environment, such as languages spoken at home, books in the home, and other home resources for learning. This questionnaire also gathers information on student experiences in school, including feelings of school belonging and whether they are victims of bullying. Finally, the student questionnaire gathers data on out-of-school reading habits and attitudes toward reading, including whether they like reading, their confidence in reading, and their engagement in reading lessons. The student questionnaire requires 15–30 minutes to complete.

ePIRLS Student Questionnaire

In addition to the four questionnaires listed above, students also participating in ePIRLS complete a brief questionnaire as part of this computer-based assessment. The questionnaire asks students about their level of competency and experience using computers and finding information on the Internet. This questionnaire requires 5 minutes to complete.

PIRLS Encyclopedia

The *PIRLS 2016 Encyclopedia* profiles each country's education system, with a particular focus on reading education for primary school children. Each chapter provides an overview of the language/reading curriculum, as well as information on reading instruction in the primary grades. Each chapter also

includes information on the languages of instruction, teachers and teacher education, how the education system is organized, and assessment policies. In addition, each chapter provides information on the impact and use of PIRLS in the respective country.

Curriculum Questionnaire

The curriculum questionnaire complements the *PIRLS 2016 Encyclopedia* entries by collecting information from all countries about their national policies on reading curricula, goals and standards for reading instruction, and time specified for reading instruction, as well as information on preprimary education and teacher education policies.



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APPENDIX A

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The PIRLS Reading Development Group is a panel of internationally recognized experts in reading research, instruction, and assessment. The Reading Development Group is responsible for providing expert advice about the development of the PIRLS 2016 reading assessment, beginning with updating the assessment framework and then test development for PIRLS, PIRLS Literacy, and ePIRLS.

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