PROGRESS IN INTERNATIONAL READING LITERACY STUDY

PIRLS

ePIRLS 2016 International Results in Online Informational Reading

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ePIRLS 2016 INTERNATIONAL RESULTS IN ONLINE INFORMATIONAL READING

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FOREWORD

ePIRLS: An International Assessment of Reading for New Times

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We change the world when a child learns to read. Learning to read opens windows to the world and new opportunities for everyone. Despite our best efforts, far too many lack access to high quality reading instruction and many students continue to struggle, increasing the possibility that they will drop out of school. It is essential for all students to become fully prepared in reading so that they are able to succeed in school, fulfill individual goals, and make our world a better place through their accomplishments. Thus, reading has long been universally recognized as a core area of educational policy and instruction for every nation. Today, the Internet has changed what it means to become a reader. New educational policies and practices, based on data, are required to adapt to these changes.

The Changing Nature of Reading

The Internet is an inherently disruptive information and communication technology that has changed lives in profound ways in every nation. These changes affect both the nature of reading and the sources of information that we use for learning (Le Bigot & Rouet, 2007). In addition to being able to read traditional texts, we now require the skills, strategies, and practices that enable us to read and learn online. In response to this changing dynamic, IEA's TIMSS & PIRLS International Study Center has developed a new assessment of online reading, ePIRLS.

ePIRLS is a performance-based assessment of students' ability to read and learn online with school-based assignments in science and social studies. The ePIRLS assessment tasks are delivered on a computer and include lessons with webpages, information graphics, animations, multiple tabs, pop-up windows, and an avatar that guides students through the research tasks. The results from this new assessment of online reading and learning provide educators with needed information to guide policy in a rapidly changing area. Fourteen countries and two benchmarking participants joined ePIRLS 2016. As a result, they now have important data on how well their fourth grade students are prepared for the demands of online informational reading and learning.

The focus on students in their fourth year of schooling is a wise one, especially for the evaluation of online reading. A reasonably accurate aphorism that applies to reading is: "We *learn to read* in the first three to four years of school and we *read to learn* in subsequent years." By focusing on fourth grade students, ePIRLS is the only international assessment to provide us with data situated at this crucial, developmental nexus for reading. The grade cohort is perfectly positioned to inform us about both aspects of reading development, especially preparation for the important task of reading to learn from online sources.

In addition to a new assessment of online reading and learning, ePIRLS also includes surveys of teachers and school leaders in participating countries. This triad of data provides policy makers with information essential to developing appropriate public policies in this new area of reading, thereby improving the well-being of their citizens in a digital age of online information.

Why should anyone invest a tremendous amount of effort, time, and resources to develop and use an assessment of online reading? There are many reasons.

1. **First, between 40 and 50 percent of the world's population currently has access to the Internet (UNESCO, 2014). At the current rate of adoption, all, or nearly all, of the world's population will have access in just eight more years**. This means that children who are in fourth grade today will graduate from secondary school and enter a universal world of online information. To adequately prepare young students for this future requires that we gather information about the nature of their progress with reading in online contexts. This enables us to prepare them for the world of online information they will inherit.

2. **Second, students have increasing access to online information at home and on mobile devices and they use these often**. Data show that students in some countries spend more time on computing devices than in books. Outside of school, students in the United States from ages 8 to 18 spend three times more time reading on a computing device than they spend reading traditionally printed pages offline (Rideout, Foehr, & Roberts, 2010). This and other developing trends in online reading (see, for example, Bråten, McCrudden, Lund, Brante, & Stømsø, 2017; Leu, et al., 2016) present challenges for educators as we look to support learners in a digital age (cf. Goodman, Sands, & Coley, 2015; Kirsch, Braun, Yamamoto, & Sum, 2007; Larson & Dwyer, 2015). Students are telling us what their reading lives are like so nations and classrooms can either adapt to this new reality or else become less relevant to the lives of this generation.

3. **Third, students are unskilled with reading information online to learn**. With the development of ePIRLS, we recognize the need to plan for high levels of critical thinking in the reading of online texts, beginning with younger readers. Although today's students grow up in an online world and are developing skills in gaming, social networking, media creation, and texting, research is showing how limited students' skills are with online reading. They are not skilled at locating information online (Bilal, 2000; Guinee, Eagleton,

& Hall, 2003; Kuiper & Volman, 2008) or critically evaluating it (Walraven, Brand-Gruwel, & Boshuizen, 2008). Many students find it difficult to judge the accuracy, reliability, and bias of information that they encounter during online research (Bennett, Maton, & Kervin, 2008; Graham & Metaxas, 2003). In fact, adolescents overgeneralize their ability to read and evaluate online information effectively, a perception informed by their ability to engage successfully with online social networking, texting, and video games (Kuiper & Volman, 2008).

4. **Fourth, research indicates that online reading comprehension is not isomorphic with offline reading comprehension (Afflerbach & Cho, 2010; Coiro & Dobler, 2007)**. Thus, the argument is no longer sustainable that we do not require additional reading assessments because online and offline reading are identical. Recent studies have shown important differences between online and offline reading. Afflerbach and Cho reviewed 46 studies that focused on reading strategy use during Internet and hypertext reading. Their analysis showed evidence of strategies that "appear to have no counterpart in traditional reading" (p. 217). Many strategies centered around a reader's ability to apply methods to reduce their levels of uncertainty while navigating appropriate reading paths in a shifting problem space. Examples include the use of keywords and search engine results during reading and problem solving with online information. It also includes critically evaluating the reliability of online information using links and strategies not found with traditional text. By gathering information about the online reading ability of fourth grade students, we generate greater awareness and understanding of these differences and that allows us to introduce classroom experiences to develop proficiency in the additional areas required for online reading.
5. **Finally, issues of equity have become increasingly important and a separate online reading achievement gap is appearing**. This is essential to consider at a time when just 62 individuals own the same wealth as the lower half of the world's population (Oxfam, 2016). If we are to address issues of income inequality, appropriate performance data must be collected and equal opportunity for all students to learn to read online must be available in schools, even when access is not available at home. Data from ePIRLS will permit these important goals to be realized.

ePIRLS Results: 2016

The results from the first iteration of ePIRLS are already providing important direction for our work ahead in reading. They have provided us with an important new model for the assessment of online reading comprehension, one that according to students provides an engaging online simulation of school assignments in science and social studies. The use of a performance-based simulation is especially innovative and important. According to de Klerk, Veldkamp, and Eggen (2015), simulations have at least three advantages over other forms of assessment: engagement increases,

thereby increasing flow (Csikszentmihalyi, 1991) and avoiding anxiety; knowledge application, rather than simple knowledge replication, is emphasized; and richer data can be captured, including process data.

A simulation of online reading and learning has another important function. ePIRLS permits educators to see what online reading looks like in action and shows them the additional new skills that may be needed by students for successful learning. This will play an essential role in helping teachers to understand the nature of online reading and assist them in expanding the nature of classroom reading instruction to include the development of these skills.

Early analysis indicates a number of ePIRLS results are important to consider. These include:

- **Students liked taking the assessments**. The percentage of students who liked each assessment activity ranged from 83 to 93 percent. This may provide additional support for the use of simulations during assessment since we are able to assess students' optimal performance only when they are engaged.
- **Students had little difficulty in managing the assessment**. Students were able to navigate to a high percentage of the items, with almost all completing the assessment in the time allotted. Students reported a high degree of self-efficacy in computer use.
- **Countries that reported higher mean ePIRLS scores compared to PIRLS scores were countries that traditionally do better with assessments of offline reading**. This suggests that the benefits of good instructional contexts are likely to generalize to both types of reading.
- **Girls appear to do better than boys in ePIRLS at both levels of comprehension**. This suggests that technology advantages, often enjoyed by boys, may not apply to reading and learning with online information. There was no country where boys performed higher than girls in ePIRLS.

ePIRLS: New Opportunities and New Challenges

With the development of ePIRLS, combined with PIRLS, we now have a comprehensive set of tools to measure reading on an international scale and at an age point especially important to reading development, the fourth grade of schooling. The importance of this accomplishment needs to be highlighted. Being able to provide comprehensive information about reading performance in both online and offline contexts, at an important developmental point, is a major achievement and will continue to benefit policy decisions for nations. Thus, those countries participating in ePIRLS may be doubly advantaged in reading today as students must navigate in both online and offline reading contexts.

ePIRLS has also pointed us to new opportunities as nations consider ways in which to encourage greater uptake in technology and the sciences by girls and women. We have known that

girls generally perform at high levels and are highly motivated by reading. Finding that this pattern also appears in the reading of online information, especially in science, may provide us with a new direction for thinking about the delivery of science instruction in ways that support high levels of performance and engagement by girls. This would enable many nations to enhance their scientific workforce in important ways.

ePIRLS also points us to new opportunities to understand optimal patterns of classroom instruction and home use of the Internet at a crucial period in the development of children. As we begin to understand these relationships better, we will be able to craft even more insightful means to measure instruction in online reading and home use of the Internet, providing valuable information about how best to support development.

An especially important opportunity has been made possible with the development of a performance-based assessment in this area, which has provided us with a new model for the assessment of reading. This will likely lead to new approaches to the assessment of student learning. Especially important in this regard is the observation that students, both boys and girls, liked working on the ePIRLS tasks. By sustaining high levels of enjoyment during assessment we are able to evaluate optimal levels of performance.

There are several challenges that also come with the changing nature of reading and reading assessment. Recent events in the world remind us of the special importance of being able to read critically and evaluate online information carefully. The Internet includes a diverse set of voices and lacks traditional gatekeepers for information. As a result, it challenges readers by requiring an especially high level of critical evaluation.

Our inability to evaluate online information has already been demonstrated to have serious political, social, and economic consequences. Thus, it is important that we continue to consider tracking the important area of students' ability to critically evaluate the reliability of online information.

In addition, we will be challenged by the changes to reading that will continue to take place. The Internet changes the nature of what it means to read and learn online and it does so continuously. We have already seen that to be literate yesterday, in a world defined primarily by static book technologies, does not ensure that one is fully literate today. To be literate tomorrow will be defined by even newer technologies that have yet to appear and the new skills, strategies, and social practices these will require. ePIRLS has stepped boldly into this new, continually changing context, providing us with essential information about our future, the children who are in school today. It is a remarkable achievement and will be remembered as an important historical milestone.

References

Afflerbach, P.A., & Cho, B.Y. (2010). Determining and describing reading strategies: Internet and traditional forms of reading. In H.S. Waters & W. Schneider (Eds.), *Metacognition, strategy use, and instruction* (pp. 201–255). New York: Guilford.

Bennett, S. J., Maton, K., & Kervin, L. (2008). The 'digital natives' debate: A critical review of the evidence. *British Journal of Educational Technology*, *39*(5), 775-786.

Bilal, D. (2000). Children's use of the Yahooligans! Web search engine: I. Cognitive, physical, and affective behaviors on fact-based search tasks. *Journal of the American Society for Information Science*, *51*(7), 646-665.

Bråten, I., McCrudden, M.T., Lund, E.S., Brante, E.W., & Stømsø, H.I.(2017). Task-oriented learning with multiple documents: Effects of topic familiarity, author expertise, and content relevance on document selection, processing, and use. *Reading Research Quarterly*. Advance online publication. doi: 10.1002/rrq.197

Coiro, J., & Dobler, E. (2007). Exploring the online reading comprehension strategies used by sixth-grade skilled readers to search for and locate information on the Internet. *Reading Research Quarterly*, *42*(2), 214–257.

Csikzentmihaly, M. (1991). *Flow: The psychology of optimal experience*. New York: Harper Perennial.

de Klerk, S., Veldkamp, B.P., & Eggen, T.J. (2015). Psychometric analysis of the performance data of simulation based assessment: A systematic review and a Bayesian network example. *Computers & Education*, *85*, 23-34.

Goodman, M., Sands, A.M., & Coley, R.J. (2015). *America's skills challenge: Millennials and the future*. Princeton, NJ: The ETS Center for Research on Human Capital and Education. Retrieved from https://www.ets.org/s/research/30079/asc-millennials-and-the-future.pdf

Graham, L., & Metaxas, P. (2003). "Of course it's true, I saw it on the Internet!": Critical thinking in the Internet era. *Communications of the ACM, 46*(5), 70-75.

Guinee, K., Eagleton, M.B., & Hall, T.E. (2003). Adolescents' Internet search strategies: Drawing upon familiar cognitive paradigms when accessing electronic information sources. *Journal of Educational Computing Research*, Annual, 2003.

Kirsch, I., Braun, H., Yamamoto, K., & Sum, A. (2007). *America's perfect storm: Three forces changing our nation's future*. Princeton, NJ: Educational Testing Service. Retrieved from www.ets.org/Media/Research/pdf/PICSTORM.pdf

Kuiper, E., & Volman, M. (2008). The Web as a source of information for students in K–12 education. In J. Coiro, M. Knobel, C. Lankshear, & D. Leu (Eds.), *Handbook of research on new literacies* (pp. 241–246). Mahwah, NJ: Erlbaum.

Larson, L., & Dwyer, B. (2015). Digging deeper with reader response: Using digital tools to support comprehension of literary texts in online learning environments. In T. Rasinski, K.E. Pytash, & R.E. Ferdig (Eds.), *Using technology to enhance reading: Innovative approaches to literacy instruction* (pp. 121–130). Bloomington, IN: Solution Tree.

Le Bigot, L., & Rouet, J.F. (2007). The impact of presentation format, task assignment, and prior knowledge on students' comprehension of multiple online documents. *Journal of Literacy Research*, *39*, 445–470.

Leu, D.J., Forzani, E., Rhoads, C., Maykel, C., Kennedy, C., & Timbrell, N. (2016). The new literacies of online research and comprehension: Rethinking the reading achievement gap. *Reading Research Quarterly*, *50*(1), 1-23. Newark, DE: International Literacy Association. doi:10.1002/rrq.85. Retrieved from http://www.edweek.org/media/leu%20online%20reading%20study.pdf

Oxfam. (2016). *An economy for the 1%: How privilege and power in the economy drive extreme inequality and how this can be stopped*. Oxford, UK: Oxfam International. Retrieved from: https://www.oxfam.org/sites/www.oxfam.org/files/file_attachments/bp210-economy-one-percent-tax-havens-180116-en_0.pdf

Rideout, V., Foehr, U., & Roberts, D. (2010). *Generation M2: Media in the Lives of 8- to 18-Year-Olds*. Retrieved February 1, 2010 from http://www.kff.org/entmedia/mh012010pkg.cfm

UNESCO. (2014). *The state of broadband 2014: Broadband for all*. Geneva, Switzerland: United Nations. Retrieved from http://www.broadbandcommission.org/documents/reports/bb-annualreport2014.pdf

Walraven, A., Brand-Gruwel, S., & Boshuizen, H.P.A. (2009). How students evaluate information and sources when searching the World Wide Web for information. *Computers and Education*, *52*(1), 234-246.

ePIRLS Online Reading 2016

ABOUT ePIRLS 2016

ePIRLS 2016 INTERNATIONAL RESULTS IN ONLINE INFORMATIONAL READING

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About ePIRLS 2016

Overview

The Internet has become the primary source for obtaining information at work, at home, and for school. Because Internet reading increasingly is becoming one of the central ways students are acquiring information, in 2016, PIRLS was extended to include ePIRLS—an innovative assessment of online reading. ePIRLS is a computer-based assessment that uses an engaging, simulated Internet environment to present fourth grade students with authentic school-like assignments involving science and social studies topics. For examples, see Take the ePIRLS Assessment. An Internet browser window provides students with a website containing information about their assignments, and students navigate through pages with a variety of features, such as graphics, multiple tabs, links, pop-up windows, and animation. In an assessment window, a teacher avatar guides students through the ePIRLS assignments, prompting the students with questions about the online information.

Participating in PIRLS 2016 was a prerequisite for participating in ePIRLS, so that the countries and students participating in ePIRLS are subsets of those that participated in PIRLS 2016 (see About PIRLS). Like PIRLS 2016, the ePIRLS assessment was developed based on the *PIRLS 2016 Assessment Framework*, used the same quality assurance procedures, and was given to the same students who participated in the PIRLS assessment typically on the next day. Thus, as an extension of PIRLS, ePIRLS results can be considered in the context of the PIRLS results, including comparative achievement on PIRLS and in relation to the PIRLS context questionnaire data.

TIMSS and PIRLS are directed by IEA's TIMSS & PIRLS International Study Center at Boston College in close cooperation with IEA Amsterdam, IEA Hamburg, and Statistics Canada. IEA is an independent international cooperative of national research institutions and government agencies that pioneered international assessments of student achievement in the 1960s to gain a deeper understanding of policy effects across countries' different systems. IEA has been conducting international assessments of reading literacy and the factors associated with proficient reading comprehension in countries around the world for about 60 years.

The ePIRLS Tasks

The ePIRLS assessment consisted of five tasks with each task lasting up to 40 minutes. Each student was asked to complete two of the tasks according to a specific rotation plan. The assessments were administered via computer (typically PCs) and students entered their answers by clicking on options or typing words.

Because the idea of ePIRLS is new, two of the tasks are available on the reports website website—"Mars" and "Elizabeth Blackwell (the first woman doctor)." The ePIRLS 2016 Example Tasks video provides an overview of the two tasks, and Take the ePIRLS Assessment provides the two tasks in their entirety, so they can be viewed in the same way they were given to students. You can enter your answers and the scoring key is provided.

ePIRLS 2016 Results

The international results for ePIRLS are reported on the reports website and the results for PIRLS 2016 also can be accessed from here. The *ePIRLS 2016 International Results in Online Informational Reading* includes four chapters or sections providing numerous exhibits summarizing student achievement on ePIRLS compared to PIRLS overall and at the PIRLS 2016 International Benchmarks. Results also are presented in relation to students' home and school contexts for learning to read online. The exhibits can be downloaded and printed from the Download Center.

Exhibit 1: ePIRLS 2016 Countries

Exhibit 1 shows the ePIRLS 2016 countries and benchmarking participants, including 14 countries and 2 benchmarking entities.

ePIRLS Online Reading 2016 4th Grade

Exhibit 1: Countries Participating in ePIRLS 2016

Canada
Chinese Taipei
Denmark
Georgia
Ireland
Israel
Italy
Norway (5)
Portugal
Singapore
Slovenia
Sweden
United Arab Emirates
United States

Benchmarking Participants

Abu Dhabi, UAE
Dubai, UAE

Note: Norway chose to assess the fifth grade to obtain better comparisons with Sweden.

Exhibit 2: Percentages of Students Who Liked Working on the ePIRLS Tasks

Exhibit 2 shows the percentages of students who liked working on the ePIRLS tasks. In general, the students participating in ePIRLS liked working on the tasks (89% on average). The tasks were liked equally by girls and boys, with the exception of the Dr. Elizabeth Blackwell task (88% for girls and 78% for boys).

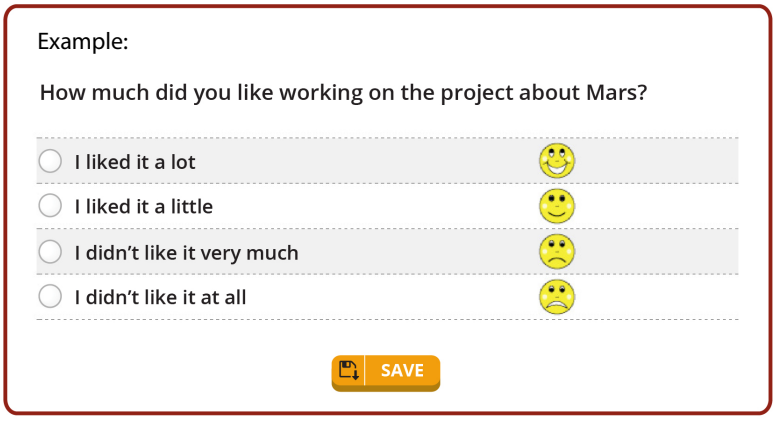
Exhibit 2: Percentages of Students Who Liked Working on the ePIRLS Tasks

Students' Reports

Note: Results based on students who participated in both PIRLS and ePIRLS.

ePIRLS Task	Percent of Students Who Liked the Task A Lot or A Little		
	Overall	Girls	Boys
Mars	88 (0.3)	87 (0.4)	89 (0.3)
Rainforests	93 (0.2)	94 (0.3)	92 (0.3)
Dr. Elizabeth Blackwell	83 (0.3)	88 (0.4)	78 (0.5)
Zebra and Wildebeest Migration	92 (0.2)	93 (0.3)	92 (0.3)
The Legend of Troy	89 (0.3)	89 (0.3)	90 (0.3)
Average Percent	89 (0.1)	90 (0.2)	88 (0.2)

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.



SOURCE: IEA's Progress in International Reading Literacy Study – PIRLS 2016

ePIRLS Online Reading 2016

CHAPTER 1: ePIRLS STUDENT ACHIEVEMENT

ePIRLS 2016 INTERNATIONAL RESULTS IN ONLINE INFORMATIONAL READING

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ONLINE READING – FOURTH GRADE

ePIRLS Online Reading 2016

ePIRLS Average Achievement

Singapore 588

Norway 568 Ireland 567

Sweden 559 Denmark 558 United States 557

Chinese Taipei 546 Canada 543

Israel 536 Italy 532

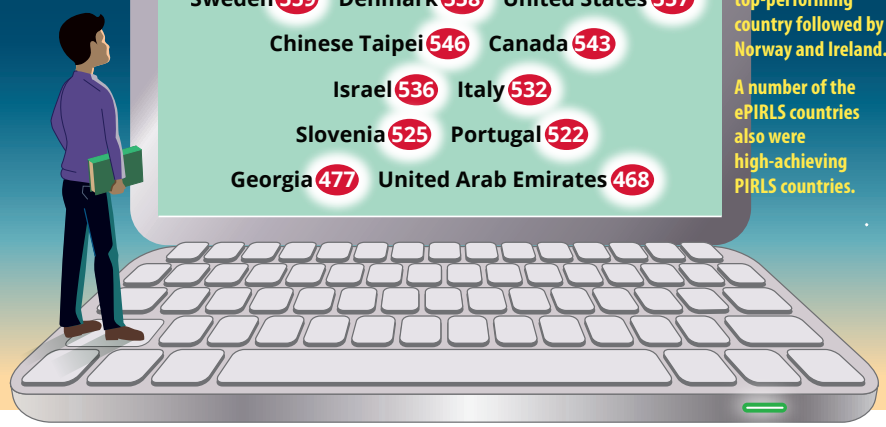
Slovenia 525 Portugal 522

Georgia 477 United Arab Emirates 468

14 of the PIRLS 2016 countries also participated in ePIRLS.

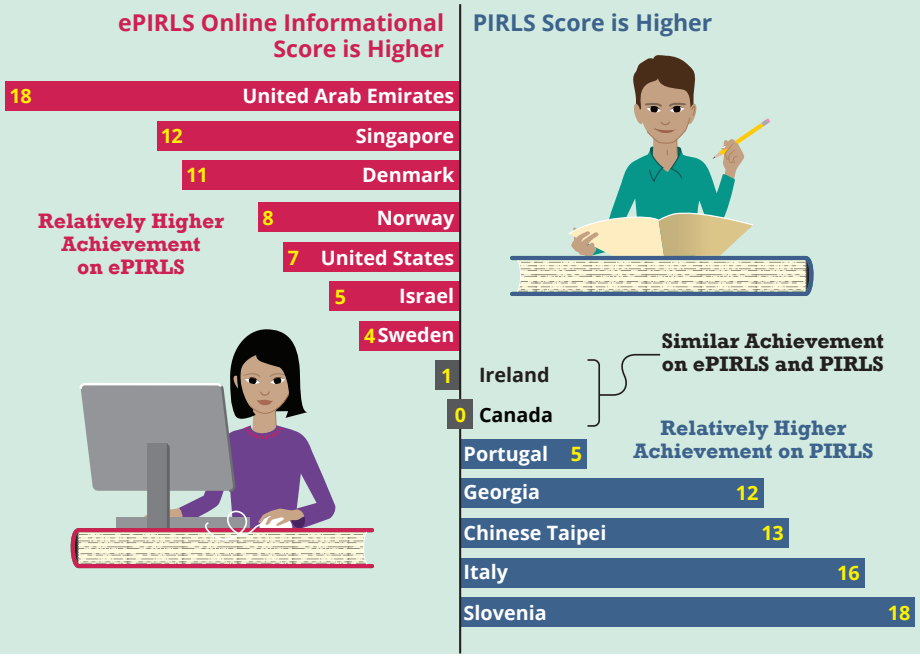
Singapore was the top-performing country followed by Norway and Ireland.

A number of the ePIRLS countries also were high-achieving PIRLS countries.



Relative Performance on ePIRLS and PIRLS

Difference in Achievement Score Points



In ePIRLS, Girls Had Higher Achievement Than Boys

11 Countries Girls Higher Average Achievement

United States, Canada, Chinese Taipei, Ireland, Israel, Slovenia, Sweden, Georgia, Norway, Singapore, United Arab Emirates

3 Countries Achievement Similar to Boys

Italy, Portugal, Denmark

No Countries Boys Higher Achievement

In **13** countries, girls performed better at retrieving information and straightforward inferencing.

They performed better in interpreting, integrating, and evaluating in **9** countries.

SOURCE: IEA's Progress in International Reading Literacy Study – PIRLS 2016
http://pirls2016.org/download-center/

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CHAPTER 1

ePIRLS Student Achievement

Exhibit 1.1: ePIRLS Average Achievement

Exhibit 1.1 shows average student achievement for the participants in ePIRLS 2016. The first column shows average achievement on the ePIRLS assessment, the second column shows the ePIRLS students' average achievement on PIRLS, and the third column shows the difference between the two. The ePIRLS achievement scale summarizes fourth grade students' reading achievement in a simulated online environment where each task was based on a series of interconnected webpages with many different kinds of visual information as well as texts. The webpages provided information about science and social studies topics, and students were guided through an online study similar to the types of projects or reports they might be asked to complete for school. The ePIRLS assessment included 5 informational online reading tasks, with 91 items.

The ePIRLS results are reported on the PIRLS reading achievement scale to facilitate comparisons of relative performance between ePIRLS and PIRLS. The resulting ePIRLS scores are directly comparable to PIRLS scores, so that students with higher scores on ePIRLS can be considered to have performed relatively better than on PIRLS, and students with lower ePIRLS scores to have performed relatively less well than on PIRLS.

> The definitive PIRLS 2016 achievement results for PIRLS are shown in Exhibit 1.1 of *PIRLS 2016 International Results in Reading*. The PIRLS 2016 results shown in ePIRLS Exhibit 1.1 are only provided for the purpose of comparing relative performance on PIRLS and ePIRLS 2016.

Although the plan was to have all PIRLS students participate in ePIRLS, this did not occur perfectly due to student absences and some issues with the computer equipment. As a result, somewhat fewer students participated in ePIRLS than PIRLS. For making comparisons, the PIRLS results shown in ePIRLS Exhibit 1.1 are based on only the students that participated in ePIRLS.

It also should be kept in mind that while ePIRLS assesses how well students can read information in an online environment that consists of using content tabs, navigation bars, graphic icons, links, and scroll bars, PIRLS is a more general measure of reading comprehension. The PIRLS achievement scale summarizes fourth grade students' performance answering questions designed to measure their reading comprehension across two overarching purposes for reading—literary and

informational purposes presented on paper in a linear format. PIRLS consisted of 6 literary passages with 90 items and 6 informational passages with 85 items.

Essentially, the students in all the countries participating in ePIRLS were good to excellent readers as evidenced by their performance on ePIRLS and PIRLS. Most countries participating in ePIRLS had average achievement on ePIRLS and PIRLS that was well above the PIRLS scale centerpoint of 500. Still, the ePIRLS achievement results show a range in performance from the top-performing to the lower-performing countries.

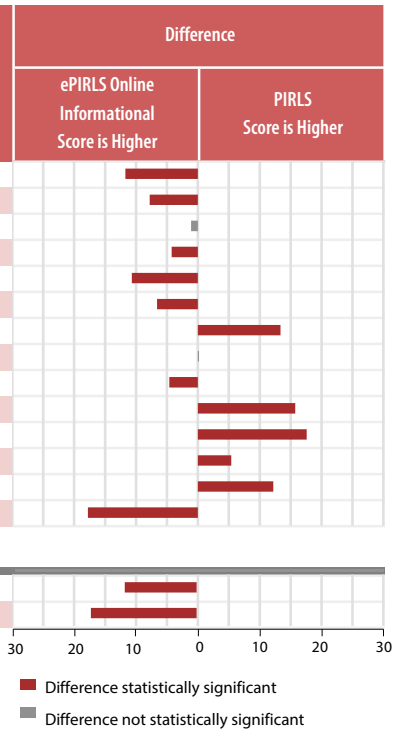
Singapore was the top-performing country on ePIRLS followed by Norway and Ireland. Also, some countries had relatively higher achievement on ePIRLS than PIRLS, and other countries had relatively higher achievement on PIRLS than ePIRLS. The graph included as part of Exhibit 1.1 indicates which countries had relatively higher achievement on ePIRLS and which had relatively higher achievement on PIRLS. Internationally, there was not a predominant pattern one way or the other. Singapore, Norway, Sweden, Denmark, the United States, Israel, and the United Arab Emirates had higher achievement on ePIRLS, whereas Chinese Taipei, Italy, Slovenia, Portugal, and Georgia had higher achievement on PIRLS. Ireland and Canada performed similarly on ePIRLS and PIRLS.

According to an informal exchange among the National Research Coordinators in the participating ePIRLS countries, a relative advantage in ePIRLS average achievement compared to PIRLS average achievement may be related to how familiar students are with using computers in school contexts, especially as part of classroom instructional activities or in assessment. The questionnaire data provide some support for these hypotheses. For example, as a whole, more students in the countries with relatively higher achievement on ePIRLS had high access to digital devices in the home (Exhibit 3.2) and attended schools not affected by digital resource shortages (Exhibit 3.3). Also in those countries, about one-third of the students—even more in Singapore (42%) and Israel (55%)—spent at least 30 minutes per day using computers to prepare reports (Exhibit 3.4). The exception was Sweden (21%). In the *PIRLS 2016 Encyclopedia*, all the countries with higher relative achievement on ePIRLS (except Norway) reported a priority on using online resources and computers in reading instruction. Singapore incorporates a number of non-print resources such as web-based texts into the teaching and learning of language and literacy. In the United States many literacy and reading textbooks use the Internet and instructional technologies as part of reading instruction.

Exhibit 1.1: ePIRLS Average Achievement

Note: Results based on students who participated in both PIRLS and ePIRLS.

Country	ePIRLS Online Informational Average Scale Score	PIRLS Average Scale Score	Difference
[3] Singapore	588 (3.0)	576 (3.1)	12 (0.8)
Norway (5)	568 (2.2)	560 (2.3)	8 (1.6)
Ireland	567 (2.5)	566 (2.8)	1 (1.2)
Sweden	559 (2.3)	555 (2.4)	4 (1.1)
≡ Denmark	558 (2.2)	548 (2.3)	11 (1.7)
† United States	557 (2.6)	550 (2.9)	7 (1.2)
Chinese Taipei	546 (2.0)	559 (2.0)	-13 (1.0)
[1 2] Canada	543 (3.2)	543 (3.3)	0 (1.5)
[3] Israel	536 (2.3)	532 (2.5)	5 (1.2)
Italy	532 (2.1)	548 (2.4)	-16 (1.7)
Slovenia	525 (1.9)	543 (2.0)	-18 (1.0)
[2] Portugal	522 (2.2)	528 (2.3)	-5 (1.2)
[1] Georgia	477 (3.3)	489 (3.1)	-12 (2.1)
United Arab Emirates	468 (2.2)	451 (2.7)	18 (1.2)
Benchmarking Participants			
Dubai, UAE	528 (1.6)	516 (1.9)	12 (1.0)
Abu Dhabi, UAE	431 (4.1)	414 (4.8)	17 (2.2)



SOURCE: IEA's Progress in International Reading Literacy Study – PIRLS 2016

To facilitate comparisons of relative performance on ePIRLS and PIRLS, the ePIRLS data are reported on the PIRLS achievement scale. The resulting ePIRLS scores are directly comparable to PIRLS scores, so that students with higher scores on ePIRLS can be considered to have performed relatively better than on PIRLS, and students with lower ePIRLS scores to have performed relatively less well than on PIRLS.

See Appendix B.1 for target population coverage notes 1, 2, and 3. See Appendix B.4 for sampling guidelines and sampling participation notes †, ‡, and ≡.

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

Exhibit 1.2: Multiple Comparisons of Average Achievement

Because there often were relatively small differences in achievement between countries, Exhibit 1.2 shows whether the differences in average achievement among the countries are statistically significant. The top part of the exhibit shows the results for ePIRLS. Singapore was the top-performing country, followed by Norway and Ireland, which had higher achievement than all the other participating countries except Singapore. Sweden, Denmark, and the United States also performed very well on ePIRLS.

For comparison purposes, the bottom part of the exhibit shows the PIRLS comparisons for the ePIRLS participants. In this case, Singapore was the top-performing country, followed by Ireland, Norway, Chinese Taipei, and Sweden.

Exhibit 1.2: Multiple Comparisons of Average Achievement

Note: Results based on students who participated in both PIRLS and ePIRLS.

Instructions: Read across the row for a country to compare performance with the countries listed along the top of the chart. The symbols indicate whether the average achievement of the country in the row is significantly lower than that of the comparison country, significantly higher than that of the comparison country, or if there is no statistically significant difference between the average achievement of the two countries.

ePIRLS Online Informational Reading

Country	Average ePIRLS Scale Score	Singapore	Norway (5)	Ireland	Sweden	Denmark	United States	Chinese Taipei	Canada	Israel	Italy	Slovenia	Portugal	Georgia	United Arab Emirates	Benchmarking Participants: Dubai, UAE	Benchmarking Participants: Abu Dhabi, UAE
Singapore	588 (3.0)		▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲
Norway (5)	568 (2.2)	▼			▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲
Ireland	567 (2.5)	▼			▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲
Sweden	559 (2.3)	▼	▼	▼				▲	▲	▲	▲	▲	▲	▲	▲	▲	▲
Denmark	558 (2.2)	▼	▼	▼				▲	▲	▲	▲	▲	▲	▲	▲	▲	▲
United States	557 (2.6)	▼	▼	▼				▲	▲	▲	▲	▲	▲	▲	▲	▲	▲
Chinese Taipei	546 (2.0)	▼	▼	▼	▼	▼	▼			▲	▲	▲	▲	▲	▲	▲	▲
Canada	543 (3.2)	▼	▼	▼	▼	▼	▼				▲	▲	▲	▲	▲	▲	▲
Israel	536 (2.3)	▼	▼	▼	▼	▼	▼	▼				▲	▲	▲	▲	▲	▲
Italy	532 (2.1)	▼	▼	▼	▼	▼	▼	▼	▼			▲	▲	▲	▲		▲
Slovenia	525 (1.9)	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼			▲	▲		▲
Portugal	522 (2.2)	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼			▲	▲		▲
Georgia	477 (3.3)	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼		▲	▼	▲
United Arab Emirates	468 (2.2)	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼		▼	▲
Benchmarking Participants																	
Dubai, UAE	528 (1.6)	▼	▼	▼	▼	▼	▼	▼	▼	▼				▲	▲		▲
Abu Dhabi, UAE	431 (4.1)	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	

PIRLS

Country	Average PIRLS Scale Score	Singapore	Ireland	Norway (5)	Chinese Taipei	Sweden	United States	Italy	Denmark	Canada	Slovenia	Israel	Portugal	Georgia	United Arab Emirates	Benchmarking Participants: Dubai, UAE	Benchmarking Participants: Abu Dhabi, UAE
Singapore	576 (3.1)		▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲
Ireland	566 (2.8)	▼				▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲
Norway (5)	560 (2.3)	▼					▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲
Chinese Taipei	559 (2.0)	▼					▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲
Sweden	555 (2.4)	▼	▼					▲	▲	▲	▲	▲	▲	▲	▲	▲	▲
United States	550 (2.9)	▼	▼	▼	▼						▲	▲	▲	▲	▲	▲	▲
Italy	548 (2.4)	▼	▼	▼	▼	▼						▲	▲	▲	▲	▲	▲
Denmark	548 (2.3)	▼	▼	▼	▼	▼						▲	▲	▲	▲	▲	▲
Canada	543 (3.3)	▼	▼	▼	▼	▼						▲	▲	▲	▲	▲	▲
Slovenia	543 (2.0)	▼	▼	▼	▼	▼	▼					▲	▲	▲	▲	▲	▲
Israel	532 (2.5)	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼			▲	▲	▲	▲
Portugal	528 (2.3)	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼			▲	▲	▲	▲
Georgia	489 (3.1)	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼		▲	▼	▲
United Arab Emirates	451 (2.7)	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼		▼	▲
Benchmarking Participants																	
Dubai, UAE	516 (1.9)	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▲	▲		▲
Abu Dhabi, UAE	414 (4.8)	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	

SOURCE: IEA's Progress in International Reading Literacy Study – PIRLS 2016

▲ Average achievement significantly higher than comparison country

▼ Average achievement significantly lower than comparison country

Significance tests were not adjusted for multiple comparisons. Five percent of the comparisons would be statistically significant by chance alone.

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

Exhibit 1.3: Average Achievement by Gender

In ePIRLS 2016, fourth grade girls had higher average achievement than boys in all countries except Italy, Portugal, and Denmark, where achievement was similar for boys and girls. The average advantage for girls was 12 points across the 14 ePIRLS countries. Essentially, for these countries, the gender gap was similar to that on PIRLS (14 points).

Exhibit 1.3: Average Achievement by Gender

Note: Results based on students who participated in both PIRLS and ePIRLS.

ePIRLS Online Informational Reading	Girls		Boys		Difference (Absolute Value)	Gender Difference	
Country	Percent of Students	ePIRLS Average Scale Score	Percent of Students	ePIRLS Average Scale Score		Girls Scored Higher	Boys Scored Higher
Italy	49 (0.8)	534 (2.6)	51 (0.8)	531 (2.4)	2 (2.6)		
[2] Portugal	49 (0.8)	524 (2.6)	51 (0.8)	521 (2.6)	3 (2.7)		
≡ Denmark	51 (0.9)	560 (2.9)	49 (0.9)	556 (2.9)	4 (3.8)		
† United States	50 (0.7)	560 (2.8)	50 (0.7)	554 (3.1)	6 (2.9)		
[1 2] Canada	50 (1.0)	547 (3.7)	50 (1.0)	539 (3.7)	8 (3.8)		
Chinese Taipei	48 (0.7)	551 (2.3)	52 (0.7)	541 (2.2)	9 (2.0)		
Ireland	51 (1.7)	572 (2.8)	49 (1.7)	561 (3.4)	11 (3.6)		
[3] Israel	51 (1.2)	542 (2.5)	49 (1.2)	530 (3.1)	11 (3.0)		
Slovenia	50 (0.8)	532 (2.5)	50 (0.8)	518 (2.5)	14 (3.3)		
Sweden	49 (1.1)	567 (2.6)	51 (1.1)	552 (2.7)	15 (2.5)		
[1] Georgia	49 (0.9)	485 (3.2)	51 (0.9)	469 (3.8)	15 (2.5)		
Norway (5)	51 (1.2)	576 (2.6)	49 (1.2)	558 (2.9)	18 (3.2)		
[3] Singapore	49 (0.6)	599 (3.2)	51 (0.6)	578 (3.3)	21 (2.8)		
United Arab Emirates	49 (1.9)	483 (3.4)	51 (1.9)	454 (4.1)	29 (6.3)		
International Avg.	50 (0.3)	545 (0.8)	50 (0.3)	533 (0.8)	12 (0.9)		
Benchmarking Participants							
Dubai, UAE	48 (3.1)	534 (2.7)	52 (3.1)	522 (2.8)	12 (4.7)		
Abu Dhabi, UAE	47 (3.5)	451 (6.6)	53 (3.5)	414 (6.5)	37 (10.6)		

PIRLS	Girls		Boys		Difference (Absolute Value)	Gender Difference	
Country	Percent of Students	PIRLS Average Scale Score	Percent of Students	PIRLS Average Scale Score		Girls Scored Higher	Boys Scored Higher
[2] Portugal	49 (0.8)	529 (2.7)	51 (0.8)	527 (2.6)	1 (2.7)		
Chinese Taipei	48 (0.7)	563 (2.2)	52 (0.7)	556 (2.3)	7 (1.9)		
Italy	49 (0.8)	552 (2.7)	51 (0.8)	545 (2.6)	7 (2.6)		
† United States	50 (0.7)	555 (3.0)	50 (0.7)	545 (3.4)	9 (3.0)		
[1 2] Canada	50 (1.0)	548 (3.6)	50 (1.0)	537 (3.7)	11 (3.4)		
Ireland	51 (1.7)	571 (3.3)	49 (1.7)	560 (3.6)	11 (4.1)		
≡ Denmark	51 (0.9)	554 (3.1)	49 (0.9)	541 (2.8)	13 (3.6)		
[3] Israel	51 (1.2)	538 (2.8)	49 (1.2)	524 (3.4)	14 (3.7)		
Sweden	49 (1.1)	563 (2.6)	51 (1.1)	547 (2.8)	16 (2.5)		
[3] Singapore	49 (0.6)	585 (3.5)	51 (0.6)	568 (3.4)	17 (3.1)		
Slovenia	50 (0.8)	552 (2.3)	50 (0.8)	534 (2.7)	18 (3.1)		
[1] Georgia	49 (0.9)	499 (3.0)	51 (0.9)	480 (3.7)	19 (3.0)		
Norway (5)	51 (1.2)	571 (2.8)	49 (1.2)	549 (2.6)	22 (2.8)		
United Arab Emirates	49 (1.9)	466 (4.0)	51 (1.9)	436 (4.6)	29 (6.8)		
International Avg.	50 (0.3)	546 (0.8)	50 (0.3)	532 (0.9)	14 (0.9)		
Benchmarking Participants							
Dubai, UAE	48 (3.1)	523 (3.4)	52 (3.1)	510 (3.0)	13 (5.5)		
Abu Dhabi, UAE	47 (3.5)	435 (7.4)	53 (3.5)	395 (6.6)	40 (10.7)		

SOURCE: IEA's Progress in International Reading Literacy Study – PIRLS 2016

See Appendix B.1 for target population coverage notes 1, 2, and 3. See Appendix B.4 for sampling guidelines and sampling participation notes †, ‡, and ≡.

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

Exhibit 1.4: Average Achievement on ePIRLS Compared to PIRLS Informational Reading

Exhibit 1.4 compares average achievement in ePIRLS informational online reading compared to only the PIRLS informational purpose for reading. The results are somewhat different than the comparison between ePIRLS and PIRLS overall (literary and informational reading). When comparing achievement in informational reading, the countries with higher achievement in ePIRLS included Denmark, the United States, Singapore, the United Arab Emirates, Norway, Israel, and Sweden. The countries with higher achievement in PIRLS informational reading included Portugal, Georgia, Italy, Slovenia, and Chinese Taipei. There was no difference in Ireland or Canada.

Exhibit 1.4: Average Achievement on ePIRLS Compared to PIRLS Informational Reading

Note: Results based on students who participated in both PIRLS and ePIRLS.

Country	ePIRLS Online Informational Average Scale Score	PIRLS Informational Average Scale Score	Difference
≡ Denmark	558 (2.2)	544 (2.7)	15 (1.9)
† United States	557 (2.6)	543 (2.9)	13 (1.4)
3 Singapore	588 (3.0)	579 (3.3)	9 (1.1)
United Arab Emirates	468 (2.2)	460 (2.7)	8 (1.3)
Norway (5)	568 (2.2)	560 (2.4)	8 (1.5)
3 Israel	536 (2.3)	530 (2.4)	6 (1.4)
Sweden	559 (2.3)	555 (2.6)	5 (1.4)
Ireland	567 (2.5)	564 (3.0)	3 (1.5)
1 2 Canada	543 (3.2)	540 (3.2)	3 (1.4)
2 Portugal	522 (2.2)	528 (2.4)	-6 (1.1)
1 Georgia	477 (3.3)	487 (3.4)	-10 (2.4)
Italy	532 (2.1)	549 (2.4)	-17 (1.9)
Slovenia	525 (1.9)	544 (2.1)	-19 (1.1)
Chinese Taipei	546 (2.0)	569 (2.2)	-24 (1.5)
Benchmarking Participants			
Abu Dhabi, UAE	431 (4.1)	422 (4.9)	9 (2.6)
Dubai, UAE	528 (1.6)	524 (2.1)	4 (1.0)

SOURCE: IEA's Progress in International Reading Literacy Study – PIRLS 2016

See Appendix B.1 for target population coverage notes 1, 2, and 3. See Appendix B.4 for sampling guidelines and sampling participation notes †, ‡, and ≡.
( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

Exhibit 1.5: Achievement Differences Between ePIRLS and PIRLS Informational for Girls and for Boys

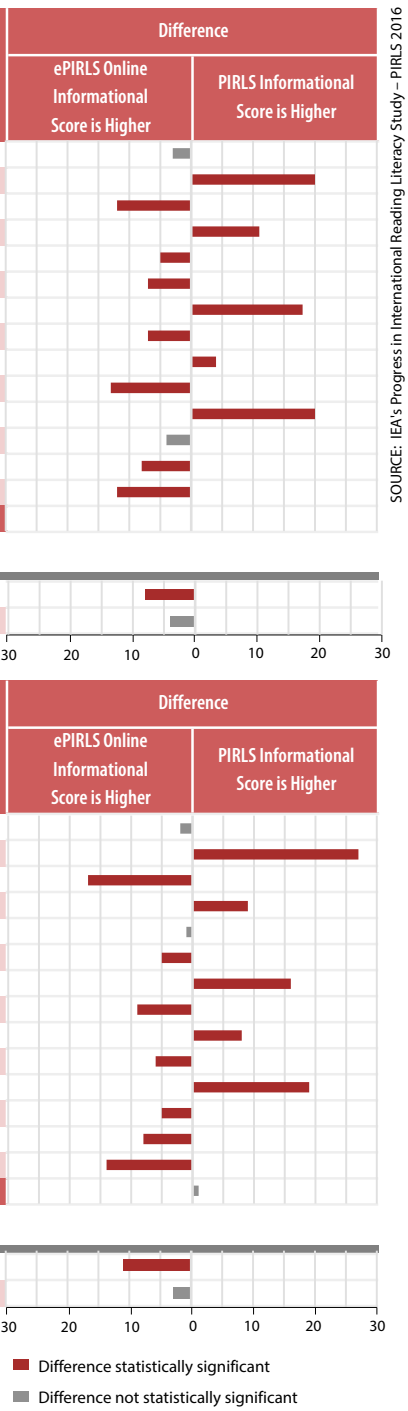
Exhibit 1.5 shows graphs of average achievement on ePIRLS and PIRLS informational reading by gender, with the top part of the exhibit presenting the results for girls and the bottom part the results for boys. The countries are presented in alphabetical order in both parts. In nearly all of the countries, the results for the girls and for the boys mirror the national results. Both girls and boys had higher achievement on ePIRLS than PIRLS informational reading in Denmark, Israel, Norway, Singapore, United Arab Emirates, and the United States, and higher achievement on PIRLS informational reading in Chinese Taipei, Georgia, Italy, Portugal, and Slovenia. The results by gender were different in Ireland, where the national difference was not significant but girls had an advantage in ePIRLS, and in Sweden where the national results showed a difference favoring ePIRLS that was only significant for boys.

Exhibit 1.5: Achievement Differences Between ePIRLS and PIRLS Informational for Girls and for Boys

Note: Results based on students who participated in both PIRLS and ePIRLS.

Girls Country	ePIRLS Online Informational Average Scale Score	PIRLS Informational Average Scale Score	Difference
[1] [2] Canada	547 (3.7)	543 (3.6)	3 (1.7)
Chinese Taipei	551 (2.3)	570 (2.7)	-20 (2.3)
≡ Denmark	560 (2.9)	548 (3.5)	12 (2.3)
[1] Georgia	485 (3.2)	496 (3.3)	-11 (2.9)
Ireland	572 (2.8)	568 (3.5)	5 (1.7)
[3] Israel	542 (2.5)	534 (2.8)	7 (1.5)
Italy	534 (2.6)	551 (2.7)	-18 (2.8)
Norway (5)	576 (2.6)	570 (3.0)	7 (1.7)
[2] Portugal	524 (2.6)	527 (2.9)	-4 (1.6)
[3] Singapore	599 (3.2)	586 (3.6)	13 (1.4)
Slovenia	532 (2.5)	552 (2.6)	-20 (2.3)
Sweden	567 (2.6)	562 (3.1)	4 (2.2)
United Arab Emirates	483 (3.4)	475 (4.0)	8 (1.6)
† United States	560 (2.8)	547 (3.0)	12 (1.5)
International Avg.	545 (0.8)	545 (0.9)	0 (0.5)
Benchmarking Participants			
Abu Dhabi, UAE	451 (6.6)	443 (7.4)	8 (2.3)
Dubai, UAE	534 (2.7)	530 (3.6)	4 (2.2)

Boys Country	ePIRLS Online Informational Average Scale Score	PIRLS Informational Average Scale Score	Difference
[1] [2] Canada	539 (3.7)	537 (3.8)	2 (2.2)
Chinese Taipei	541 (2.2)	568 (2.3)	-27 (1.5)
≡ Denmark	556 (2.9)	539 (3.0)	17 (2.4)
[1] Georgia	469 (3.8)	478 (4.3)	-9 (3.1)
Ireland	561 (3.4)	560 (3.8)	1 (1.9)
[3] Israel	530 (3.1)	526 (3.4)	5 (2.3)
Italy	531 (2.4)	547 (2.8)	-16 (1.7)
Norway (5)	558 (2.9)	549 (2.9)	9 (2.7)
[2] Portugal	521 (2.6)	529 (2.7)	-8 (1.7)
[3] Singapore	578 (3.3)	572 (3.7)	6 (1.7)
Slovenia	518 (2.5)	537 (2.7)	-19 (1.6)
Sweden	552 (2.7)	547 (2.9)	5 (1.6)
United Arab Emirates	454 (4.1)	446 (4.8)	8 (2.0)
† United States	554 (3.1)	540 (3.6)	14 (1.9)
International Avg.	533 (0.8)	534 (0.9)	-1 (0.6)
Benchmarking Participants			
Abu Dhabi, UAE	414 (6.5)	403 (7.3)	11 (4.2)
Dubai, UAE	522 (2.8)	519 (3.0)	3 (1.7)



SOURCE: IEA's Progress in International Reading Literacy Study – PIRLS 2016

See Appendix B.1 for target population coverage notes 1, 2, and 3. See Appendix B.4 for sampling guidelines and sampling participation notes †, ‡, and ≡.
( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

Exhibit 1.6: Achievement in Comprehension Processes – ePIRLS Online Informational Reading

PIRLS reports achievement according to two overarching comprehension processes:

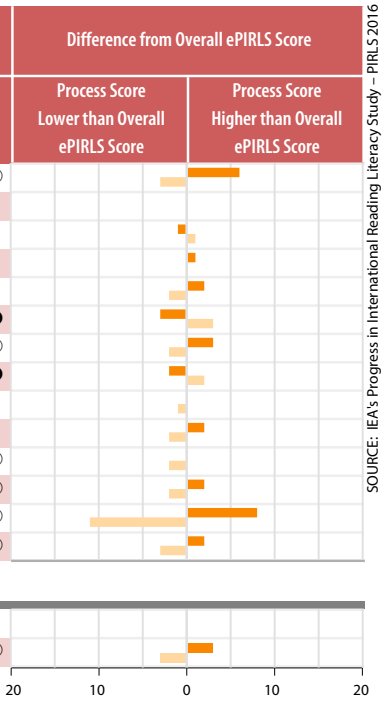
- Retrieving and straightforward inferencing
- Interpreting, integrating, and evaluating

Exhibit 1.6 shows the ePIRLS results for these two comprehension processes. Singapore, Chinese Taipei, Portugal, Georgia, and the United Arab Emirates had a relative advantage in retrieving and straightforward inferencing. Only the United States and Canada had a relative advantage in interpreting, integrating, and evaluating. The remaining countries essentially had no difference between the two processes.

Exhibit 1.6: Achievement in Comprehension Processes – ePIRLS Online Informational Reading

Note: Results based on students who participated in both PIRLS and ePIRLS.

Country	ePIRLS Online Informational Average Scale Score	Retrieving and Straightforward Inferencing		Interpreting, Integrating, and Evaluating		Difference from Overall ePIRLS Score	
		Average Scale Score	Difference from Overall ePIRLS Score	Average Scale Score	Difference from Overall ePIRLS Score	Process Score Lower than Overall ePIRLS Score	Process Score Higher than Overall ePIRLS Score
[3] Singapore	588 (3.0)	594 (3.3)	6 (0.7) ▲	585 (3.1)	-3 (0.8) ▼		
Norway (5)	568 (2.2)	567 (2.2)	0 (1.4)	568 (2.3)	0 (1.1)		
Ireland	567 (2.5)	566 (2.4)	-1 (0.9)	568 (2.5)	1 (0.8)		
Sweden	559 (2.3)	561 (2.2)	1 (0.8)	559 (2.5)	0 (1.1)		
≡ Denmark	558 (2.2)	560 (2.2)	2 (1.0)	556 (2.6)	-2 (1.3)		
† United States	557 (2.6)	553 (2.6)	-3 (0.8) ▼	560 (2.6)	3 (0.6) ▲		
Chinese Taipei	546 (2.0)	548 (2.1)	3 (0.6) ▲	544 (1.9)	-2 (0.8) ▼		
[1 2] Canada	543 (3.2)	541 (3.0)	-2 (0.8) ▼	545 (3.2)	2 (0.8) ▲		
[3] Israel	536 (2.3)	536 (2.5)	0 (1.3)	535 (2.4)	-1 (1.0)		
Italy	532 (2.1)	534 (2.1)	2 (0.9)	531 (2.3)	-2 (1.0)		
Slovenia	525 (1.9)	525 (1.8)	0 (1.1)	523 (2.0)	-2 (0.8) ▼		
[2] Portugal	522 (2.2)	525 (2.4)	2 (0.8) ▲	521 (2.1)	-2 (0.5) ▼		
[1] Georgia	477 (3.3)	485 (3.3)	8 (0.9) ▲	466 (3.7)	-11 (1.4) ▼		
United Arab Emirates	468 (2.2)	471 (2.1)	2 (0.6) ▲	465 (2.2)	-3 (0.4) ▼		
Benchmarking Participants							
Dubai, UAE	528 (1.6)	528 (1.7)	0 (1.4)	527 (1.6)	0 (1.0)		
Abu Dhabi, UAE	431 (4.1)	434 (4.1)	3 (1.4)	428 (4.0)	-3 (0.9) ▼		



SOURCE: IEA's Progress in International Reading Literacy Study – PIRLS 2016

▲ Subscale score significantly higher than overall ePIRLS score
▼ Subscale score significantly lower than overall ePIRLS score

Retrieving and Straightforward Inferencing
Interpreting, Integrating, and Evaluating

See Appendix B.1 for target population coverage notes 1, 2, and 3. See Appendix B.4 for sampling guidelines and sampling participation notes †, ‡, and ≡.
( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

Exhibit 1.7: ePIRLS Achievement in Comprehension Processes by Gender

Similar to the national results, girls had higher achievement than boys in retrieving and straightforward inferencing in every country except Portugal. However, the advantage for girls occurred in fewer countries in interpreting, integrating, and evaluating. There was no gender gap for this higher order process in Canada, Denmark, Italy, Portugal, and the United States.

Exhibit 1.7: Achievement in Comprehension Processes by Gender – ePIRLS Online Informational Reading

Note: Results based on students who participated in both PIRLS and ePIRLS.

Country	ePIRLS Comprehension Processes			
	Retrieving and Straightforward Inferencing		Interpreting, Integrating, and Evaluating	
	Girls	Boys	Girls	Boys
1 2 Canada	547 (3.5) ▲	534 (3.8)	547 (3.7)	543 (3.8)
Chinese Taipei	555 (2.7) ▲	542 (2.2)	548 (2.3) ▲	540 (2.0)
≡ Denmark	565 (3.0) ▲	555 (2.7)	556 (3.3)	556 (3.0)
1 Georgia	495 (3.3) ▲	475 (4.0)	471 (3.7) ▲	461 (4.2)
Ireland	572 (3.0) ▲	559 (3.4)	573 (3.0) ▲	563 (3.4)
3 Israel	544 (2.9) ▲	528 (3.0)	539 (2.5) ▲	531 (3.4)
Italy	537 (2.6) ▲	531 (2.4)	530 (2.6)	531 (2.8)
Norway (5)	578 (2.8) ▲	557 (2.9)	575 (2.8) ▲	560 (2.9)
2 Portugal	528 (2.7)	522 (3.0)	521 (2.3)	521 (2.7)
3 Singapore	606 (3.6) ▲	583 (3.5)	594 (3.5) ▲	575 (3.3)
Slovenia	535 (2.1) ▲	516 (2.4)	528 (2.2) ▲	519 (2.6)
Sweden	570 (2.5) ▲	551 (2.7)	565 (2.9) ▲	553 (3.2)
United Arab Emirates	487 (3.4) ▲	455 (4.1)	478 (3.6) ▲	453 (4.1)
† United States	558 (2.7) ▲	548 (3.1)	562 (2.8)	557 (3.2)
International Avg.	548 (0.8) ▲	533 (0.8)	542 (0.8) ▲	533 (0.9)
Benchmarking Participants				
Abu Dhabi, UAE	456 (6.6) ▲	415 (6.6)	446 (6.6) ▲	412 (6.7)
Dubai, UAE	535 (2.7) ▲	521 (3.0)	532 (2.8)	523 (2.8)

▲ Average significantly higher than other gender

SOURCE: IEA's Progress in International Reading Literacy Study – PIRLS 2016

See Appendix B.1 for target population coverage notes 1, 2, and 3. See Appendix B.4 for sampling guidelines and sampling participation notes †, ‡, and ≡.

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

ePIRLS Online Reading 2016

CHAPTER 2: PERFORMANCE AT INTERNATIONAL BENCHMARKS

ePIRLS 2016 INTERNATIONAL RESULTS IN ONLINE INFORMATIONAL READING

IEA
TIMSS & PIRLS International Study Center
Lynch School of Education
BOSTON COLLEGE

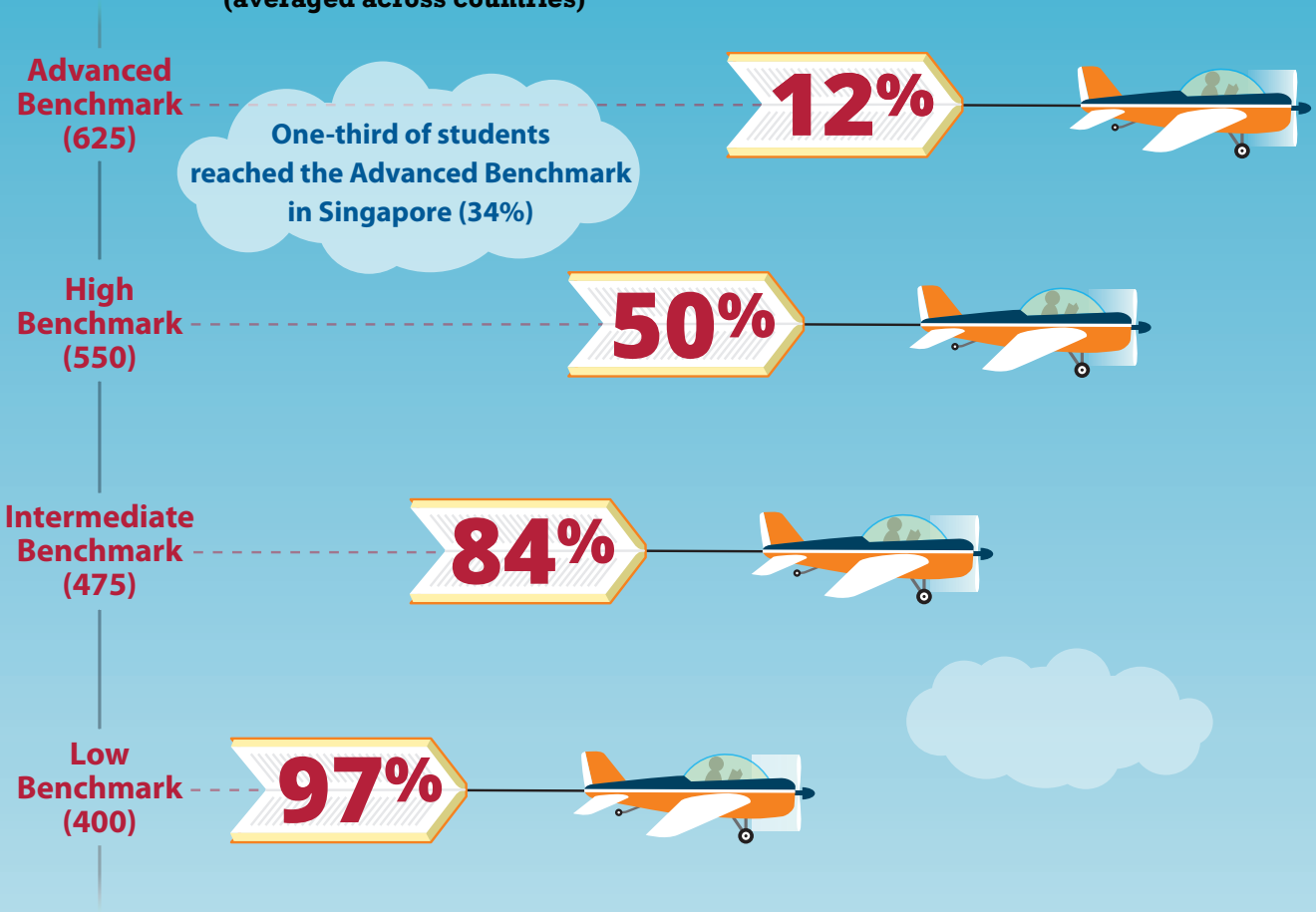
ePIRLS Online Reading 2016

ePIRLS Online Reading at the PIRLS International Benchmarks

ePIRLS describes achievement at four International Benchmarks:
Advanced, High, Intermediate, and Low

Percentage of Students Reaching Benchmarks

(averaged across countries)



In ePIRLS, Students Demonstrated Impressive Competence in Online Reading

Half the students reached the High International Benchmark (50% across countries)

Students reaching this benchmark can:

- Integrate information across webpages with interactive features
- Evaluate how graphic elements support content

Almost all students reached the Low International Benchmark (97% across countries)

Students reaching this benchmark can:

- Locate information on webpages with a variety of dynamic and navigable features

SOURCE: IEA's Progress in International Reading Literacy Study – PIRLS 2016
http://pirls2016.org/download-center/

IEA
TIMSS & PIRLS International Study Center
Lynch School of Education
BOSTON COLLEGE

CHAPTER 2

Performance at International Benchmarks

ePIRLS Benchmarking at the PIRLS International Benchmarks

To provide an interpretation of the results summarized on the PIRLS achievement scale for reading comprehension at the fourth grade, PIRLS describes achievement at four points along the scale as international benchmarks: Advanced International Benchmark (625), High International Benchmark (550), Intermediate International Benchmark (475), and Low International Benchmark (400). To develop the descriptions, the TIMSS & PIRLS International Study Center conducted a scale anchoring analysis together with the PIRLS 2016 Reading Development Group (RDG). The descriptions of achievement at the International Benchmarks are based on the reading skills and strategies demonstrated by fourth grade students achieving at each level of the scale, respectively. Further detail about the scale anchoring methodology is provided in Chapter 13 of *Methods and Procedures in PIRLS 2016*.

For PIRLS 2016, the scale anchoring analysis was conducted for ePIRLS as well as PIRLS. This enabled reporting descriptions of ePIRLS achievement at the Advanced, High, Intermediate, and Low Benchmarks.

Overview of the ePIRLS 2016 Tasks and Items

The ePIRLS tasks and items used in 2016 were selected and developed based on the *PIRLS 2016 Assessment Framework*. The framework describes the PIRLS view of reading as an interactive process between the text and the reader and describes the ways that PIRLS measures students' reading achievement. It specifies that the assessment texts and items should cover in equal amounts the two purposes that account for most of the reading done by young students in and out of school: literary and informational. The ePIRLS tasks assess reading for informational purposes, but on the Internet in an environment of interconnected webpages and a variety of visual and textual elements.

Just like PIRLS, the items accompanying the ePIRLS informational tasks measure four processes of comprehension: retrieving, straightforward inferencing, interpreting and integrating, and evaluating and critiquing. These are collapsed into two processes for reporting: retrieving and straightforward inferencing and interpreting, integrating, and evaluating.

Description of the ePIRLS Tasks Assessing Online Informational Reading

There were five ePIRLS tasks simulating online informational reading similar to what might be required for school projects and reports. They were about science or social studies topics, including: "Mars," "Elizabeth Blackwell (the first woman doctor)," "Rainforests," "Troy," and "Animal Migration." Two of the tasks—"Mars" and "Elizabeth Blackwell"—are released to provide examples of the ePIRLS tasks. To see the released examples, watch the ePIRLS 2016 Example Tasks video or Take the ePIRLS Assessment.Taking the ePIRLS test includes both released tasks in their entirety as they were given to students. You can type in your answers, and the scoring guides are provided at the end so you can check your answers.

An overview of the ePIRLS tasks is provided below.

ePIRLS Tasks

ePIRLS Online Reading 2016

The five online informational tasks each offered a simulated Internet environment on an informational topic, including scientific and historical subject matter. Each task was structured as a class project or report, with an avatar teacher who introduced the questions and guided the student through the task. The tasks were conceptually relatively demanding, some of them based on abstract or technical ideas and with a substantial number of embedded details. Each task involved students working across approximately three different websites totaling about five to ten webpages with an average of 1,000 words of text per task. In addition to the text, the tasks included different kinds of visual information such as photos, charts, and maps as well as many navigational and dynamic features such as animations, hyperlinks, tabs, and pop-up boxes.

Description of ePIRLS Achievement at the PIRLS International Benchmarks

The graphic shows the descriptions of ePIRLS achievement demonstrated by fourth grade students at each of the four International Benchmarks.

Advanced International Benchmark

625

When reading and viewing relatively complex Online Informational Texts, students can:

- Make inferences from complex information to support an explanation
- Interpret and integrate information from within and across webpages with interactive features to explain relationships, and show thorough understanding
- Evaluate the effects of textual, visual, and interactive elements and begin to consider the writer's point of view

High International Benchmark

550

When reading and viewing relatively complex Online Informational Texts, students can:

- Make inferences to distinguish relevant information and provide comparisons
- Interpret and integrate information within and across webpages with interactive features to provide examples and make contrasts
- Evaluate how graphic elements and language choices support content

Intermediate International Benchmark

475

When reading and viewing relatively complex Online Informational Texts, students can:

- Locate and reproduce information presented in various forms including independent use of navigation features
- Make straightforward inferences to recognize reasons and actions
- Interpret and integrate information across a webpage to recognize causes, comparisons, and explanations
- Begin to evaluate the use of interactive features to convey information

Low International Benchmark

400

When reading and viewing relatively complex Online Informational Texts, students can:

- Locate and reproduce explicitly stated information from webpages that contain text and a variety of dynamic, navigable features (e.g., timelines, pop-up boxes)
- Begin to make straightforward inferences about descriptions

SOURCE: IEA's Progress in International Reading Literacy Study – PIRLS 2016

Exhibit 2.1: ePIRLS Online Informational Reading Performance at the PIRLS International Benchmarks

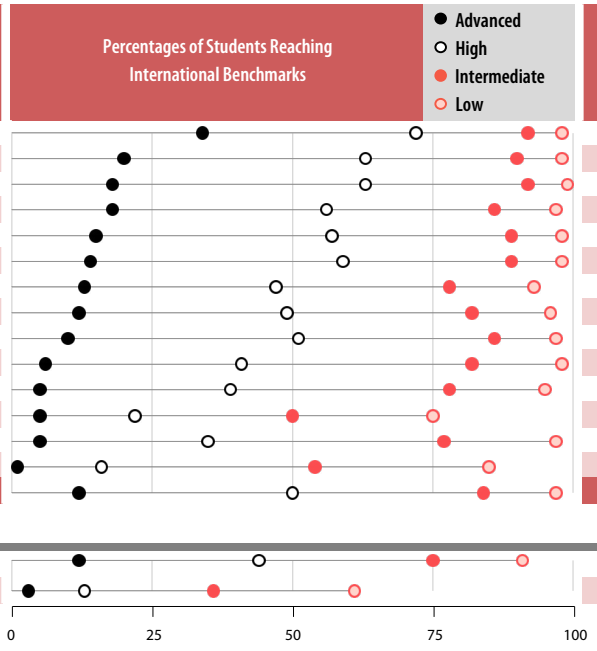
Exhibit 2.1 presents the percentage of ePIRLS students reaching each International Benchmark. The results are presented in descending order according to the percentage of students reaching the Advanced International Benchmark. The percentage of students reaching the Advanced Benchmark is indicated in the bar graph with a black dot. Because students who reached the Advanced Benchmark also reached the other benchmarks, the percentages illustrated in the exhibit and shown in the columns to the right are cumulative. About one-third of the fourth grade students reached the Advanced International Benchmark in Singapore (34%), with the next highest percentage in Ireland (20%).

As a point of reference, Exhibit 2.1 provides the median percentage of students reaching each benchmark at the bottom of the four right-hand columns. By definition, half the countries will have a percentage in that column above the median and half will be below the median. The median percentages of students reaching the International Benchmarks were as follows: Advanced—12 percent, High—50 percent, Intermediate—84 percent, and Low—97 percent. Most of the ePIRLS countries (12) had 93 percent or more of their students reaching the Low Benchmark.

Exhibit 2.1: ePIRLS Online Informational Reading Performance at the PIRLS International Benchmarks

Note: Results based on students who participated in both PIRLS and ePIRLS.

Country	Advanced Benchmark (625)	High Benchmark (550)	Intermediate Benchmark (475)	Low Benchmark (400)
[3] Singapore	34 (1.7)	72 (1.5)	92 (0.9)	98 (0.4)
Ireland	20 (1.3)	63 (1.6)	90 (0.9)	98 (0.4)
Norway (5)	18 (1.2)	63 (1.6)	92 (0.8)	99 (0.3)
† United States	18 (1.2)	56 (1.5)	86 (1.0)	97 (0.4)
≡ Denmark	15 (1.0)	57 (1.4)	89 (0.9)	98 (0.4)
Sweden	14 (1.0)	59 (1.7)	89 (0.8)	98 (0.3)
[3] Israel	13 (1.0)	47 (1.3)	78 (1.1)	93 (0.7)
[1 2] Canada	12 (1.0)	49 (2.1)	82 (1.3)	96 (0.5)
Chinese Taipei	10 (0.7)	51 (1.3)	86 (0.9)	97 (0.3)
Italy	6 (0.7)	41 (1.3)	82 (1.3)	98 (0.5)
Slovenia	5 (0.5)	39 (1.3)	78 (1.0)	95 (0.6)
United Arab Emirates	5 (0.3)	22 (0.8)	50 (1.1)	75 (0.9)
[2] Portugal	5 (0.6)	35 (1.4)	77 (1.3)	97 (0.5)
[1] Georgia	1 (0.4)	16 (1.3)	54 (2.1)	85 (1.4)
International Median	12	50	84	97
Benchmarking Participants				
Dubai, UAE	12 (0.5)	44 (0.9)	75 (0.8)	91 (0.4)
Abu Dhabi, UAE	3 (0.5)	13 (1.2)	36 (1.8)	61 (1.7)



SOURCE: IEA's Progress in International Reading Literacy Study – PIRLS 2016

See Appendix B.1 for target population coverage notes 1, 2, and 3. See Appendix B.4 for sampling guidelines and sampling participation notes †, ‡, and ≡.
( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

Exhibit 2.2: Low International Benchmark (400)

Exhibit 2.2 presents the description of ePIRLS students' achievement at the Low International Benchmark. Essentially, students could locate and reproduce information from webpages with a variety of dynamic and navigable features.

Exhibits 2.2.1 through 2.2.3 contain three example items. Each exhibit shows the webpage the item is based on together with the item. The exhibit shows the achievement results for the countries that participated in ePIRLS, with up and down arrows indicating a significantly higher or lower percentage of success than the international average. The reading comprehension process and scale anchoring description are provided above the item. For multiple-choice items, the correct response is indicated. Constructed response questions were worth 1, 2, or 3 points. Each constructed response item is shown with an illustrative student response and the amount of credit awarded the response is shown across the bottom of the exhibit, usually full credit.

Example Items 2.2.1 (multiple-choice) and 2.2.2 (constructed response) from the "Mars" task about space exploration show that students at the Low International Benchmark demonstrated that they could retrieve explicitly stated details from text and from a pop-up window. Students also were able to make an inference to select the correct search result to learn about Doctor Elizabeth Blackwell (Example Item 2.2.3).

Exhibit 2.2: ePIRLS 2016 Online Informational Reading at the Low International Benchmark (400)

Low International Benchmark

400

When reading and viewing relatively complex Online Informational Texts, students can:

- Locate and reproduce explicitly stated information from webpages that contain text and a variety of dynamic, navigable features (e.g., timelines, pop-up boxes)
- Begin to make straightforward inferences about descriptions

SOURCE: IEA's Progress in International Reading Literacy Study – PIRLS 2016

Exhibit 2.2.1: Low International Benchmark for ePIRLS Online Informational Reading – Example Item 1

Process: Focus on and Retrieve Explicitly Stated Information

Description: Locate and recognize an explicitly stated reason

SOURCE: IEA's Progress in International Reading Literacy Study – PIRLS 2016

Note: Results based on students who participated in both PIRLS and ePIRLS.

Country	Percent Correct	
Norway (5)	94 (0.6)	▲
Sweden	93 (0.8)	▲
3 Singapore	93 (0.7)	▲
Ireland	90 (1.1)	▲
† United States	89 (1.1)	▲
≡ Denmark	89 (1.1)	
Slovenia	88 (0.9)	
1 2 Canada	88 (1.2)	
3 Israel	87 (0.9)	
International Avg.	87 (0.3)	
2 Portugal	85 (1.0)	
Chinese Taipei	85 (1.0)	▼
Italy	83 (1.0)	▼
1 Georgia	80 (1.5)	▼
United Arab Emirates	76 (0.9)	▼
Benchmarking Participants		
Dubai, UAE	86 (0.9)	
Abu Dhabi, UAE	69 (1.6)	▼

▲ Percent significantly higher than international average
▼ Percent significantly lower than international average

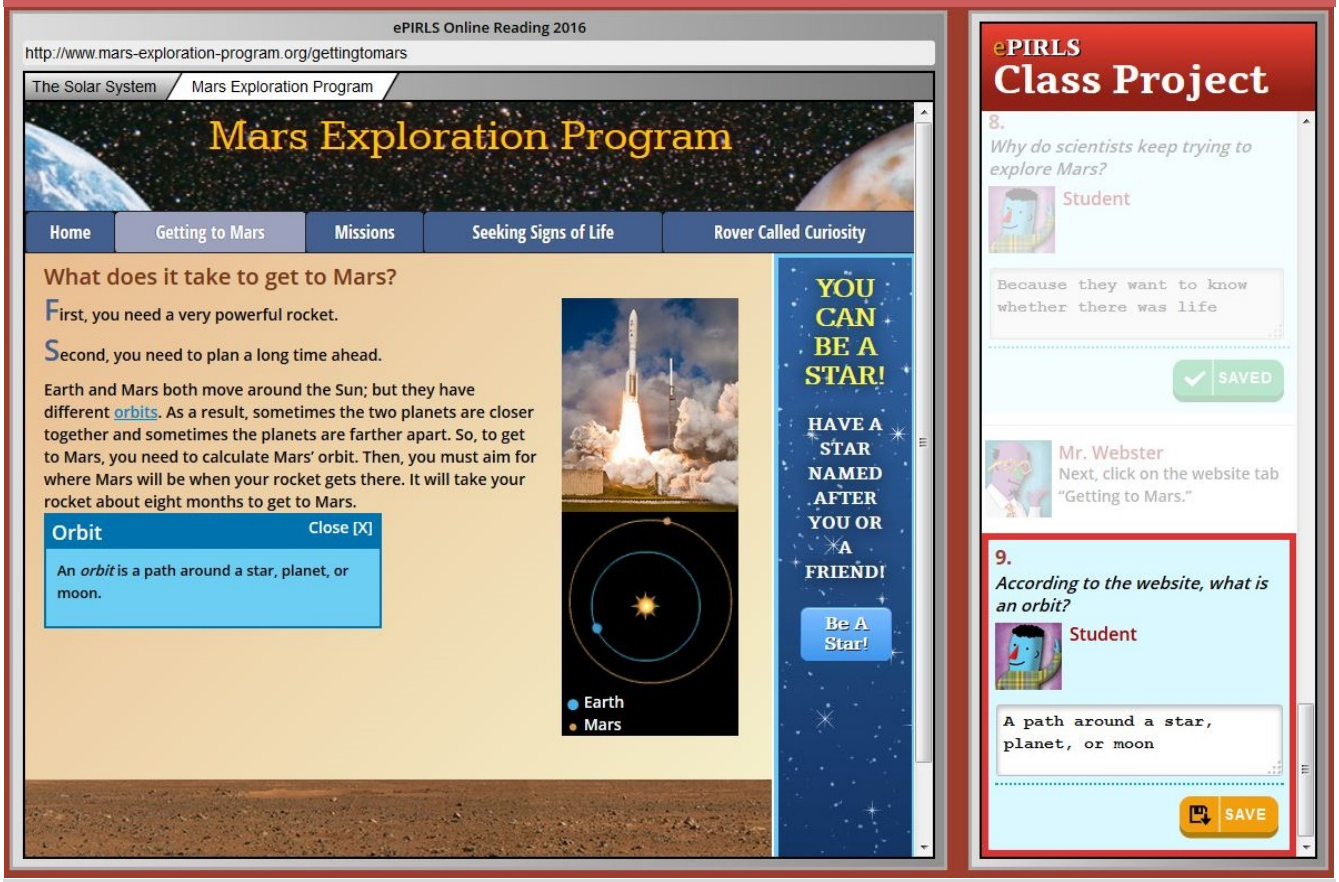
See Appendix B.1 for target population coverage notes 1, 2, and 3. See Appendix B.4 for sampling guidelines and sampling participation notes †, ‡, and ≡.

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

Exhibit 2.2.2: Low International Benchmark for ePIRLS Online Informational Reading – Example Item 2

Process: Focus on and Retrieve Explicitly Stated Information

Description: Retrieve and reproduce the definition of a term from a pop-up text box



The answer shown illustrates the type of student response that would receive full credit (1 point).

SOURCE: IEA's Progress in International Reading Literacy Study – PIRLS 2016

Note: Results based on students who participated in both PIRLS and ePIRLS.

Country	Percent Full Credit	
[3] Singapore	74 (1.1)	▲
Norway (5)	70 (1.5)	▲
Italy	68 (1.5)	▲
[1 2] Canada	68 (1.5)	▲
Ireland	64 (1.9)	▲
† United States	63 (1.5)	▲
≡ Denmark	62 (1.9)	▲
International Avg.	57 (0.4)	
[2] Portugal	56 (1.7)	
Chinese Taipei	55 (1.3)	
Slovenia	53 (1.6)	▼
Sweden	49 (1.8)	▼
[3] Israel	48 (1.3)	▼
United Arab Emirates	42 (0.9)	▼
[1] Georgia	28 (1.9)	▼
Benchmarking Participants		
Dubai, UAE	56 (0.9)	
Abu Dhabi, UAE	36 (1.7)	▼

▲ Percent significantly higher than international average
▼ Percent significantly lower than international average

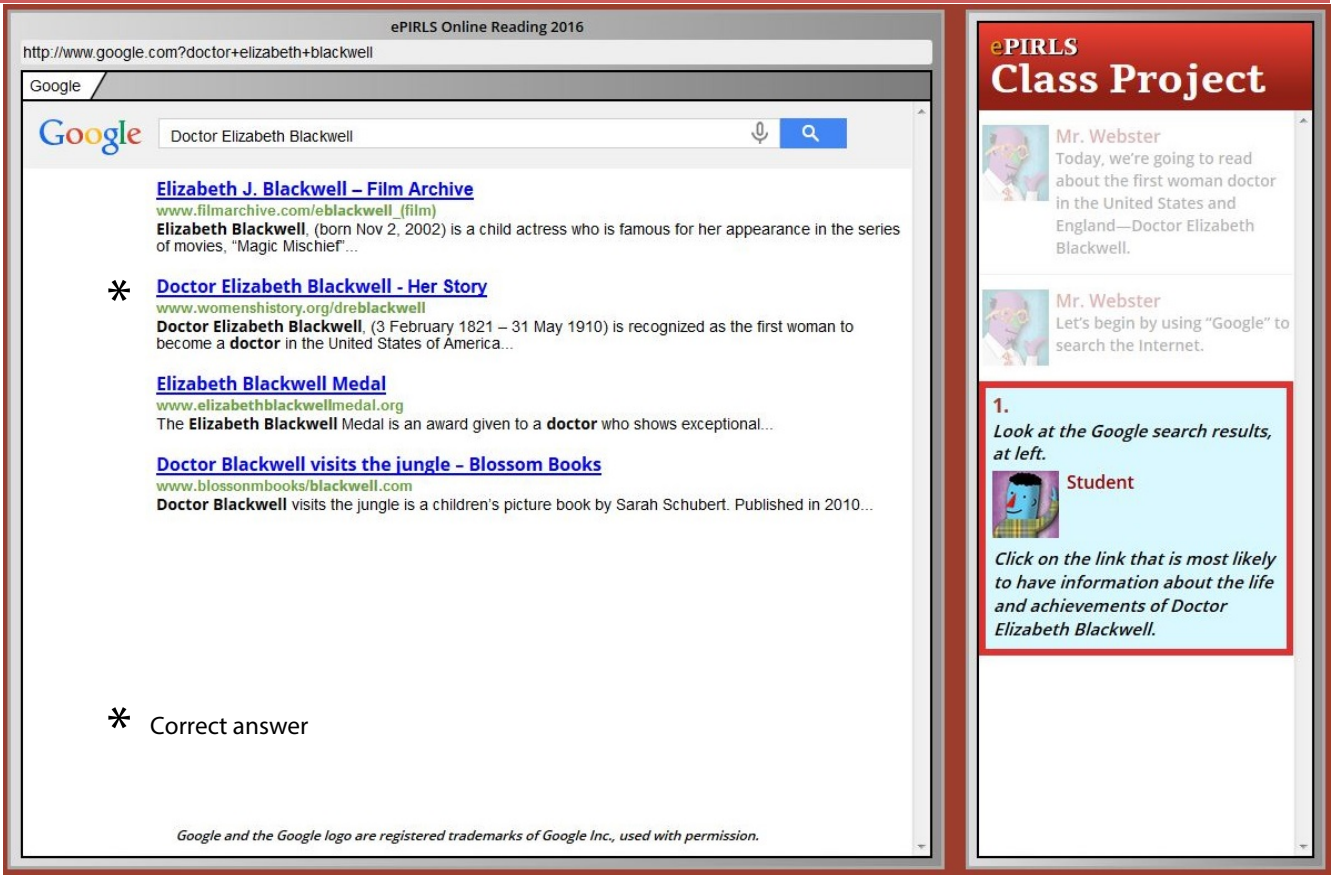
See Appendix B.1 for target population coverage notes 1, 2, and 3. See Appendix B.4 for sampling guidelines and sampling participation notes †, ‡, and ≡.

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

Exhibit 2.2.3: Low International Benchmark for ePIRLS Online Informational Reading – Example Item 3

Process: Make Straightforward Inferences

Description: Make a straightforward inference from a list of Internet search results to recognize the most relevant website



SOURCE: IEA's Progress in International Reading Literacy Study – PIRLS 2016

Note: Results based on students who participated in both PIRLS and ePIRLS.

Country	Percent Correct
Sweden	93 (0.9) ▲
≡ Denmark	93 (1.1) ▲
Norway (5)	88 (1.0) ▲
2 Portugal	87 (0.9) ▲
Italy	87 (0.9) ▲
Ireland	83 (1.4)
Chinese Taipei	83 (1.1)
International Avg.	82 (0.3)
1 2 Canada	81 (1.4)
Slovenia	79 (1.3) ▼
1 Georgia	78 (1.5) ▼
† United States	78 (1.1) ▼
3 Israel	76 (1.2) ▼
3 Singapore	73 (0.9) ▼
United Arab Emirates	65 (0.8) ▼

Benchmarking Participants

Dubai, UAE	73 (1.1) ▼
Abu Dhabi, UAE	62 (1.7) ▼

▲ Percent significantly higher than international average
▼ Percent significantly lower than international average

See Appendix B.1 for target population coverage notes 1, 2, and 3. See Appendix B.4 for sampling guidelines and sampling participation notes †, ‡, and ≡.

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

Exhibit 2.3: Intermediate International Benchmark (475)

Exhibit 2.3 presents the description of ePIRLS achievement at the Intermediate Benchmark. Because the scale anchoring descriptions are cumulative, with students' comprehension processes building on skills demonstrated at the lower levels, as anticipated students at the Intermediate Benchmark demonstrated greater facility in locating and reproducing explicitly stated information as well as skills in making inferences, interpreting and integrating information across webpages, and beginning to evaluate interactive features.

Exhibits 2.3.1 through 2.3.3 present three example items. Each exhibit shows achievement results, with up and down arrows indicating a significantly higher or lower percentage of success for the country compared to the international average on the item. The reading comprehension process and scale anchoring description are provided above the item. For multiple-choice items, the correct response is indicated. Constructed response questions were worth 1, 2, or 3 points. Each constructed response item is shown with an illustrative student response and the amount of credit awarded the response is shown across the bottom of the exhibit, usually full credit.

Example Item 2.3.1 shows that students were able to locate information about Elizabeth Blackwell by scrolling through a timeline and 2.3.2 shows they could provide a reason from the text—both were constructed response questions. Example 2.3.3 was one of the most difficult items in the ePIRLS assessment, based on drawing an inference from text and an animation showing the orbits of Earth and Mars around the Sun. Even students at the Advanced Benchmark did not provide a complete answer. However, it is interesting that readers at the Intermediate Benchmark understood some part of the difficulty in planning to get a rocket from Earth to Mars.

Exhibit 2.3: ePIRLS 2016 Online Informational Reading at the Intermediate International Benchmark (475)

Intermediate International Benchmark

475

When reading and viewing relatively complex Online Informational Texts, students can:

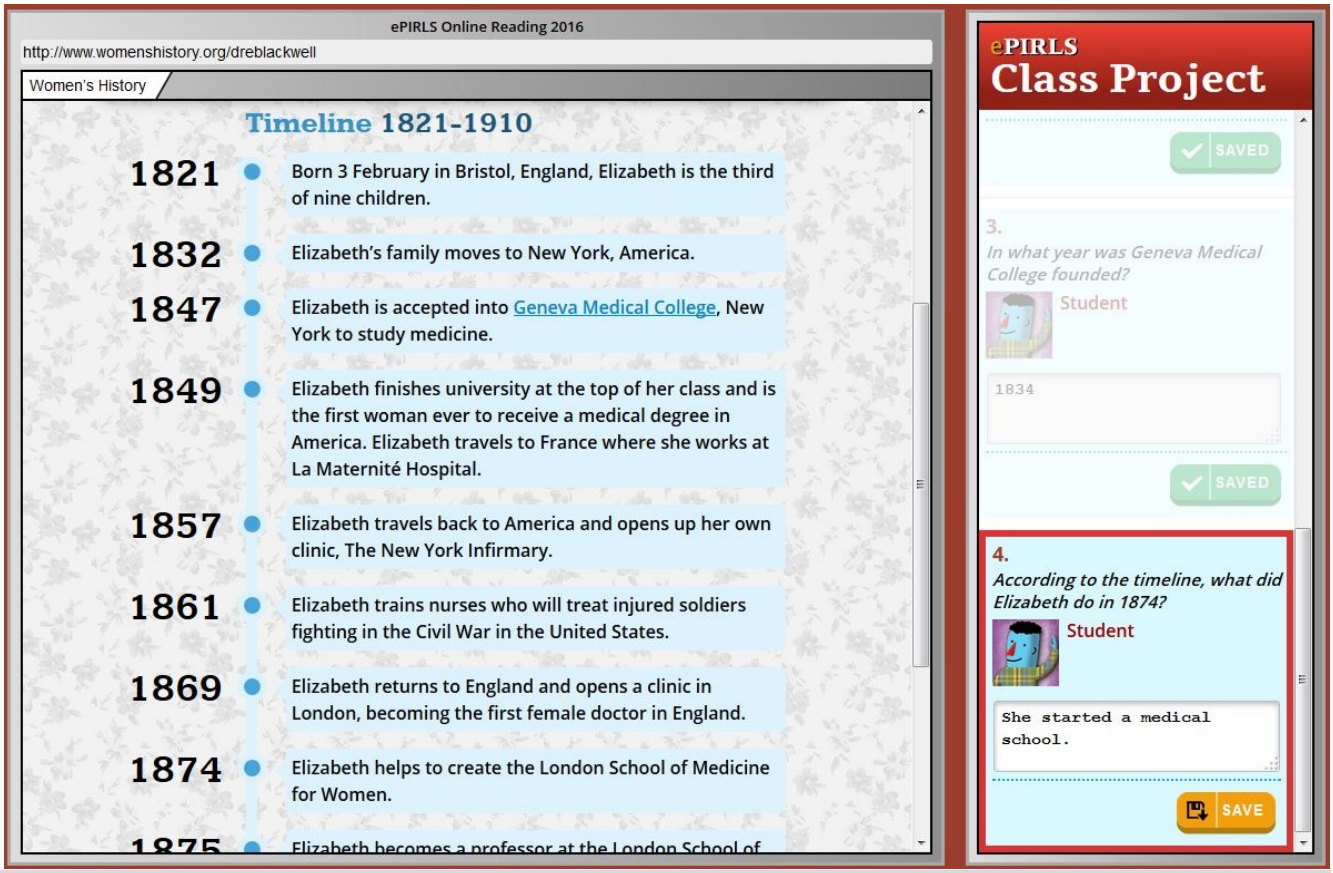
- Locate and reproduce information presented in various forms including independent use of navigation features
- Make straightforward inferences to recognize reasons and actions
- Interpret and integrate information across a webpage to recognize causes, comparisons, and explanations
- Begin to evaluate the use of interactive features to convey information

SOURCE: IEA's Progress in International Reading Literacy Study – PIRLS 2016

Exhibit 2.3.1: Intermediate International Benchmark for ePIRLS Online Informational Reading – Example Item 1

Process: Focus on and Retrieve Explicitly Stated Information

Description: Locate and reproduce explicitly stated information by scrolling through a timeline



The answer shown illustrates the type of student response that would receive full credit (1 point).

SOURCE: IEA's Progress in International Reading Literacy Study – PIRLS 2016

Note: Results based on students who participated in both PIRLS and ePIRLS.

Country	Percent Full Credit	
[2] Portugal	79 (1.3)	▲
Chinese Taipei	76 (1.2)	▲
Sweden	75 (1.6)	▲
[3] Singapore	75 (0.9)	▲
Italy	73 (1.5)	▲
Ireland	72 (1.6)	
[3] Israel	71 (1.2)	
≡ Denmark	70 (1.8)	
International Avg.	69 (0.4)	
Norway (5)	66 (1.7)	
Slovenia	65 (1.8)	▼
[1 2] Canada	65 (1.5)	▼
† United States	63 (1.6)	▼
United Arab Emirates	60 (0.9)	▼
[1] Georgia	59 (1.9)	▼
Benchmarking Participants		
Dubai, UAE	69 (1.0)	
Abu Dhabi, UAE	53 (1.8)	▼

▲ Percent significantly higher than international average
▼ Percent significantly lower than international average

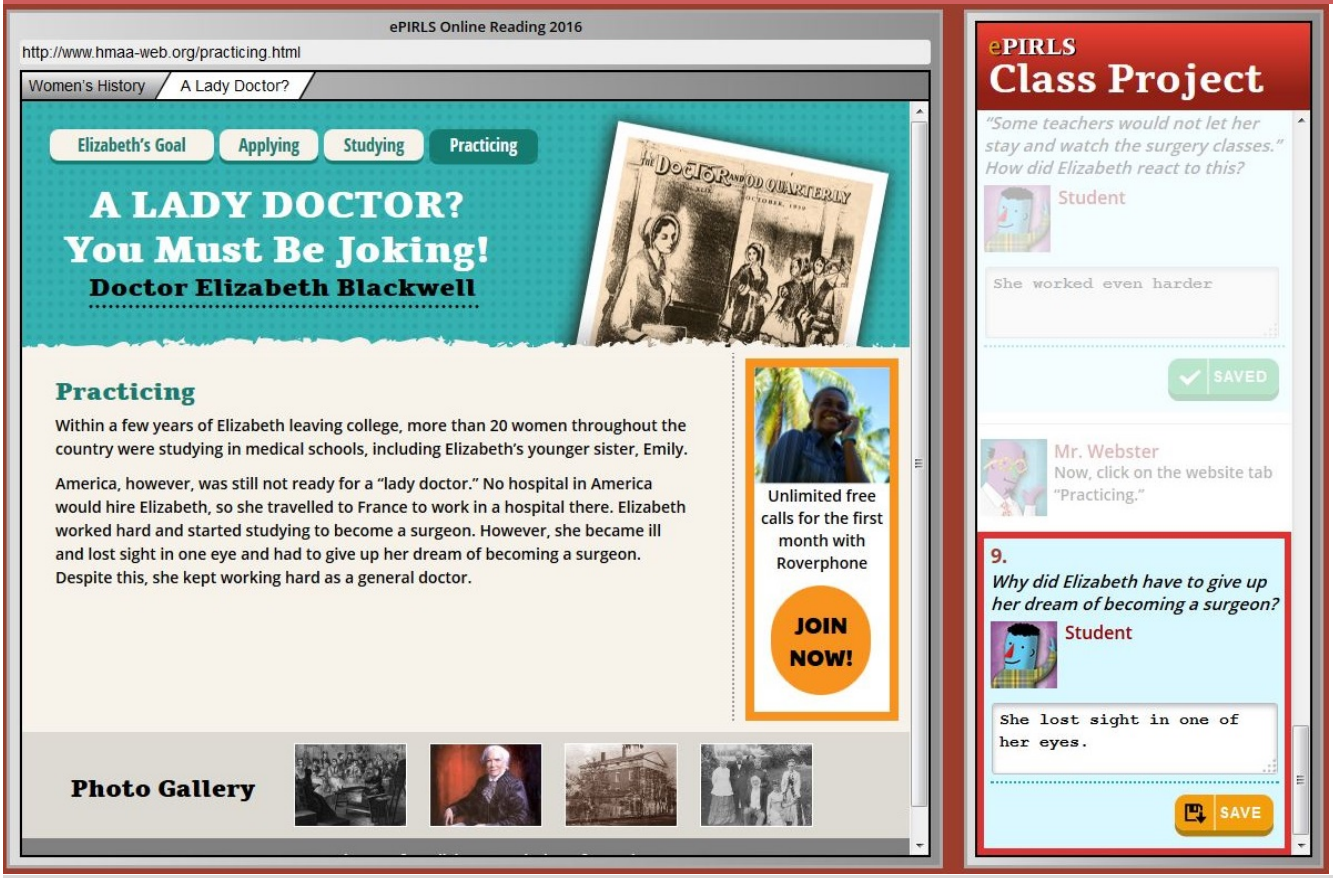
See Appendix B.1 for target population coverage notes 1, 2, and 3. See Appendix B.4 for sampling guidelines and sampling participation notes †, ‡, and ≡.

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

Exhibit 2.3.2: Intermediate International Benchmark for ePIRLS Online Informational Reading – Example Item 2

Process: Make Straightforward Inferences

Description: Make a straightforward inference to provide a reason



The answer shown illustrates the type of student response that would receive full credit (1 point).

SOURCE: IEA's Progress in International Reading Literacy Study – PIRLS 2016

Note: Results based on students who participated in both PIRLS and ePIRLS.

Country	Percent Full Credit
[3] Singapore	84 (1.1) ▲
Norway (5)	80 (1.4) ▲
≡ Denmark	79 (1.5) ▲
Sweden	77 (1.7) ▲
Ireland	76 (1.7) ▲
Chinese Taipei	73 (1.2) ▲
[1 2] Canada	69 (1.3)
International Avg.	67 (0.4)
† United States	67 (1.7)
[3] Israel	65 (1.4)
Slovenia	61 (1.3) ▼
[1] Georgia	60 (1.8) ▼
[2] Portugal	59 (1.5) ▼
Italy	47 (1.6) ▼
United Arab Emirates	46 (0.9) ▼
Benchmarking Participants	
Dubai, UAE	64 (1.5) ▼
Abu Dhabi, UAE	35 (1.7) ▼

▲ Percent significantly higher than international average
▼ Percent significantly lower than international average

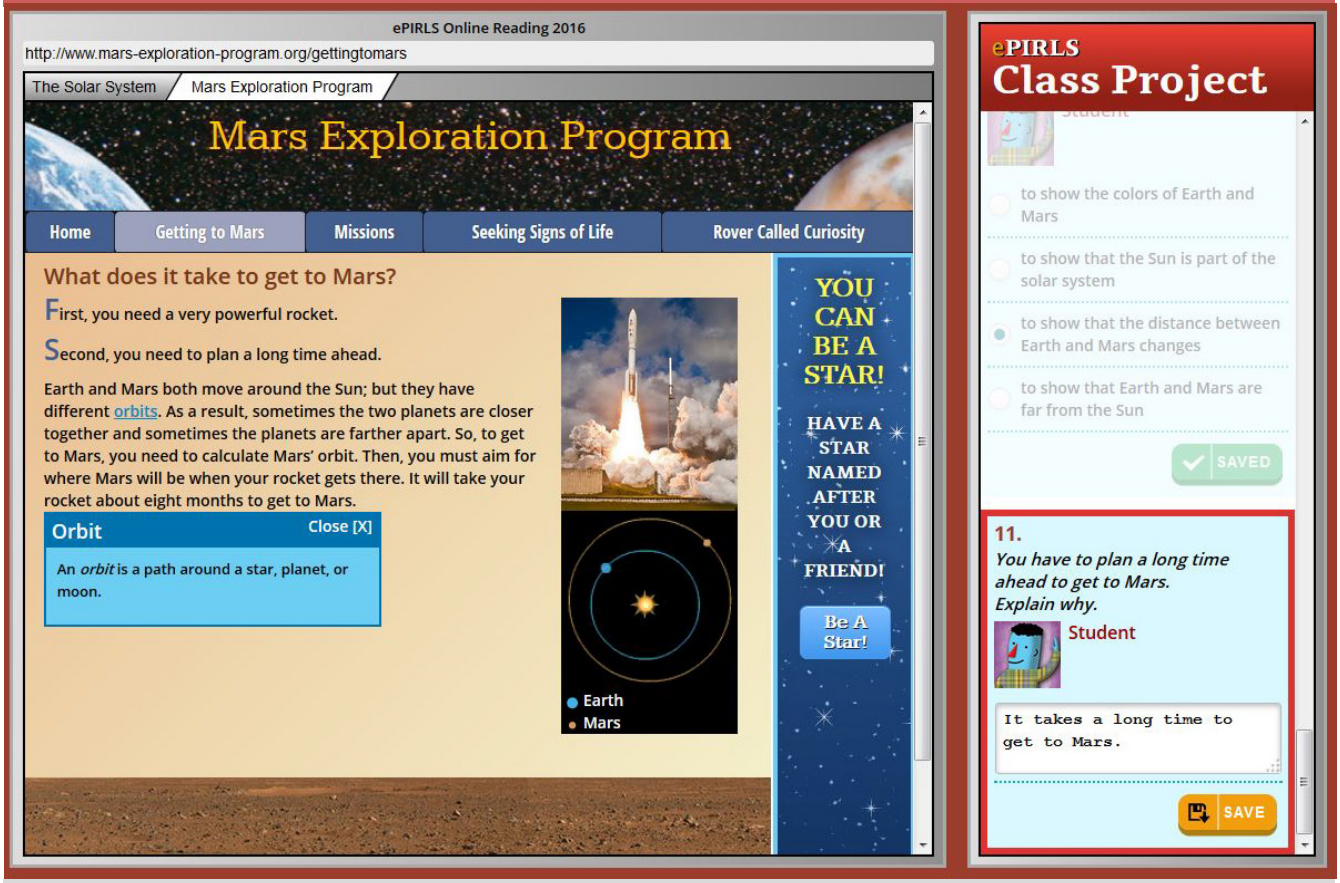
See Appendix B.1 for target population coverage notes 1, 2, and 3. See Appendix B.4 for sampling guidelines and sampling participation notes †, ‡, and ≡.

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

Exhibit 2.3.3: Intermediate International Benchmark for ePIRLS Online Informational Reading – Example Item 3

Process: Interpret and Integrate Ideas and Information

Description: Interpret complex information in text and an animated graphic to provide a partial explanation



SOURCE: IEA's Progress in International Reading Literacy Study – PIRLS 2016

The answer shown illustrates the type of student response that would receive partial credit (1 of 2 points).

Note: Results based on students who participated in both PIRLS and ePIRLS.

Country	Percent At Least 1 Point
[3] Singapore	83 (0.8) ▲
Norway (5)	64 (1.4) ▲
Chinese Taipei	64 (1.5) ▲
[1 2] Canada	62 (1.6) ▲
Ireland	60 (1.8)
[3] Israel	60 (1.4)
Sweden	58 (1.5)
† United States	58 (1.5)
Italy	58 (1.4)
International Avg.	57 (0.4)
≡ Denmark	57 (1.9)
Slovenia	48 (1.6) ▼
United Arab Emirates	44 (0.8) ▼
[1] Georgia	44 (1.8) ▼
[2] Portugal	40 (1.3) ▼

Benchmarking Participants

Dubai, UAE	59 (1.1)
Abu Dhabi, UAE	35 (1.3) ▼

▲ Percent significantly higher than international average
▼ Percent significantly lower than international average

See Appendix B.1 for target population coverage notes 1, 2, and 3. See Appendix B.4 for sampling guidelines and sampling participation notes †, ‡, and ≡.

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

Exhibit 2.4: High International Benchmark (550)

Exhibit 2.4 contains the description of comprehension skills and strategies demonstrated by ePIRLS students at the High International Benchmark. At the High International Benchmark, students demonstrated that they could distinguish relevant information to provide comparisons; interpret and integrate information across webpages to make contrasts; and evaluate how graphic elements and language choices support content.

Exhibits 2.4.1 through 2.4.4 contain examples of the types of items successfully answered by students achieving at the High International Benchmark. Each exhibit shows achievement results for the countries that participated in ePIRLS, with up and down arrows indicating a significantly higher or lower percentage of success than the international average. The reading comprehension process and scale anchoring description are provided above the item. For multiple-choice items, the correct response is indicated. Constructed response questions were worth 1, 2, or 3 points. Each constructed response item is shown with an illustrative student response and the amount of credit awarded the response is shown across the bottom of the exhibit, usually full credit.

Example Item 2.4.1 illustrates that students were able to make an inference to recognize a definition presented via text and images. In Example Item 2.4.2 they could provide either a positive or negative reason to live in New York in the 1850s. Example 2.4.3 is a complex example, where students demonstrated that they were able to navigate across four sets of images and text to describe the capabilities of different parts of a Mars rover. In Example 2.4.4, they evaluated the purpose of the animated diagram showing Earth and Mars orbiting around the Sun.

Exhibit 2.4: ePIRLS 2016 Online Informational Reading at the High International Benchmark (550)

High International Benchmark

550

When reading and viewing relatively complex Online Informational Texts, students can:

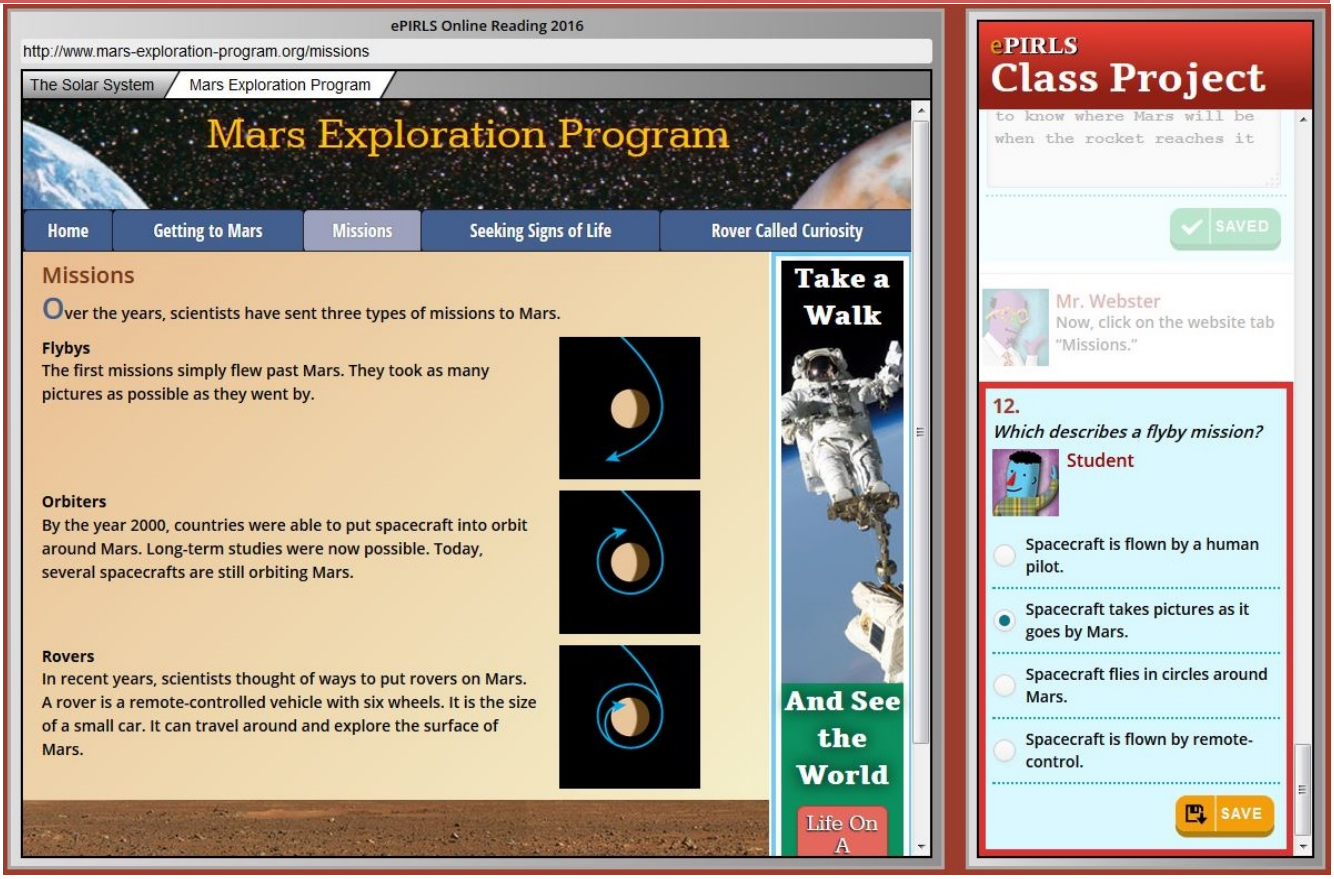
- Make inferences to distinguish relevant information and provide comparisons
- Interpret and integrate information within and across webpages with interactive features to provide examples and make contrasts
- Evaluate how graphic elements and language choices support content

SOURCE: IEA's Progress in International Reading Literacy Study – PIRLS 2016

Exhibit 2.4.1: High International Benchmark for ePIRLS Online Informational Reading – Example Item 1

Process: Make Straightforward Inferences

Description: Make a straightforward inference to recognize a definition from text and images



SOURCE: IEA's Progress in International Reading Literacy Study – PIRLS 2016

Note: Results based on students who participated in both PIRLS and ePIRLS.

Country	Percent Correct
Ireland	77 (1.5) ▲
≡ Denmark	76 (1.6) ▲
† United States	75 (1.2) ▲
3 Singapore	75 (1.0) ▲
Sweden	75 (1.5) ▲
Norway (5)	73 (1.4) ▲
1 2 Canada	71 (1.6) ▲
3 Israel	70 (1.3) ▲
Chinese Taipei	68 (1.1)
International Avg.	67 (0.4)
Italy	62 (1.3) ▼
Slovenia	61 (1.4) ▼
2 Portugal	60 (1.4) ▼
United Arab Emirates	56 (0.8) ▼
1 Georgia	42 (2.1) ▼
Benchmarking Participants	
Dubai, UAE	71 (1.1) ▲
Abu Dhabi, UAE	49 (1.7) ▼

▲ Percent significantly higher than international average
▼ Percent significantly lower than international average

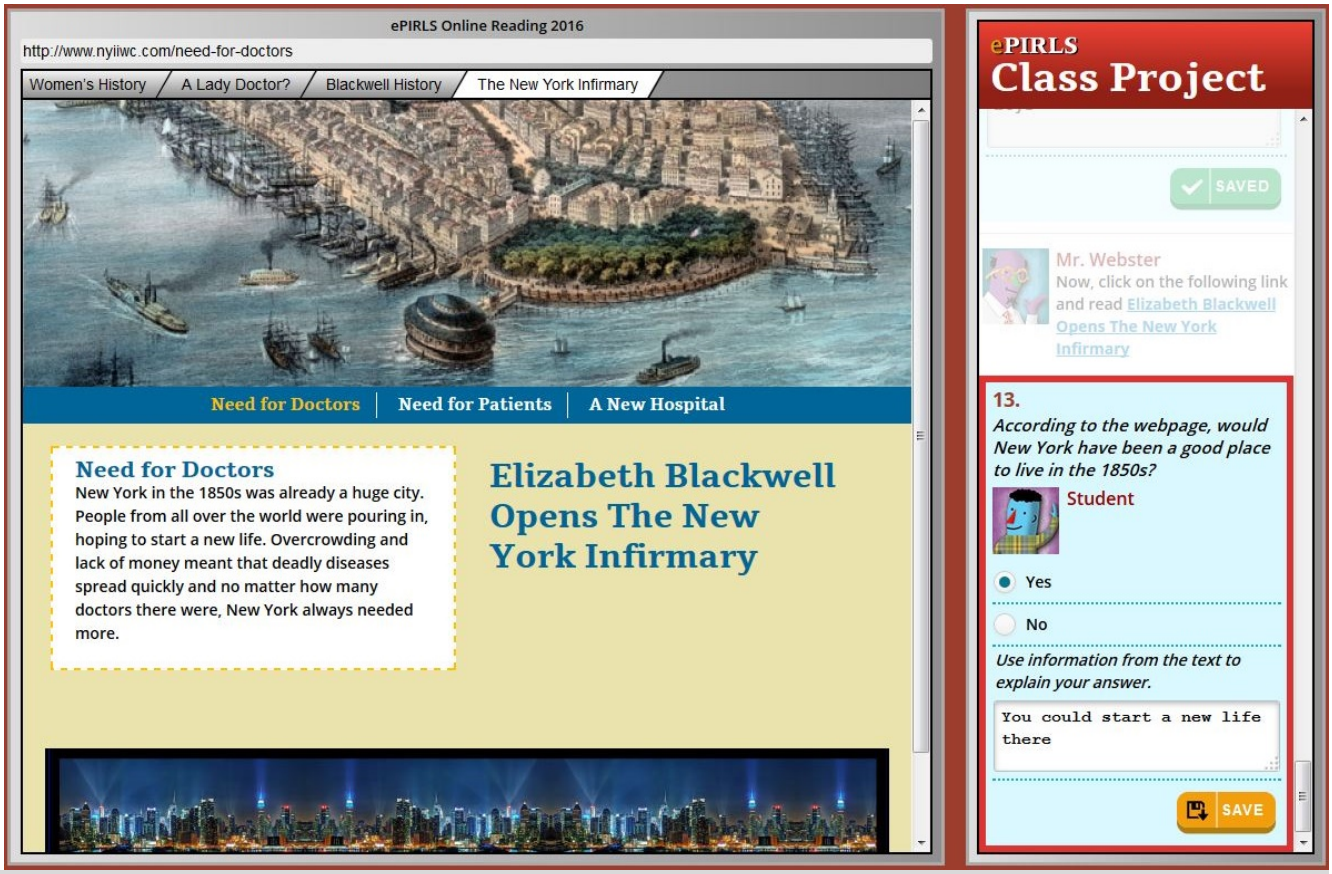
See Appendix B.1 for target population coverage notes 1, 2, and 3. See Appendix B.4 for sampling guidelines and sampling participation notes †, ‡, and ≡.

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

Exhibit 2.4.2: High International Benchmark for ePIRLS Online Informational Reading – Example Item 2

Process: Interpret and Integrate Ideas and Information

Description: Interpret and integrate information to draw a conclusion and support it with evidence



SOURCE: IEA's Progress in International Reading Literacy Study – PIRLS 2016

The answer shown illustrates the type of student response that would receive full credit (1 point).

Note: Results based on students who participated in both PIRLS and ePIRLS.

Country	Percent Full Credit	
Ireland	78 (1.4)	▲
Sweden	75 (1.4)	▲
Norway (5)	75 (1.6)	▲
≡ Denmark	74 (1.5)	▲
3 Singapore	74 (1.3)	▲
† United States	71 (1.6)	▲
1 2 Canada	70 (1.7)	▲
International Avg.	61 (0.4)	
Slovenia	59 (1.2)	
3 Israel	58 (1.3)	▼
Italy	57 (1.6)	▼
2 Portugal	52 (1.3)	▼
Chinese Taipei	41 (1.4)	▼
United Arab Emirates	36 (0.7)	▼
1 Georgia	35 (1.7)	▼
Benchmarking Participants		
Dubai, UAE	57 (0.7)	▼
Abu Dhabi, UAE	27 (1.3)	▼

▲ Percent significantly higher than international average
▼ Percent significantly lower than international average

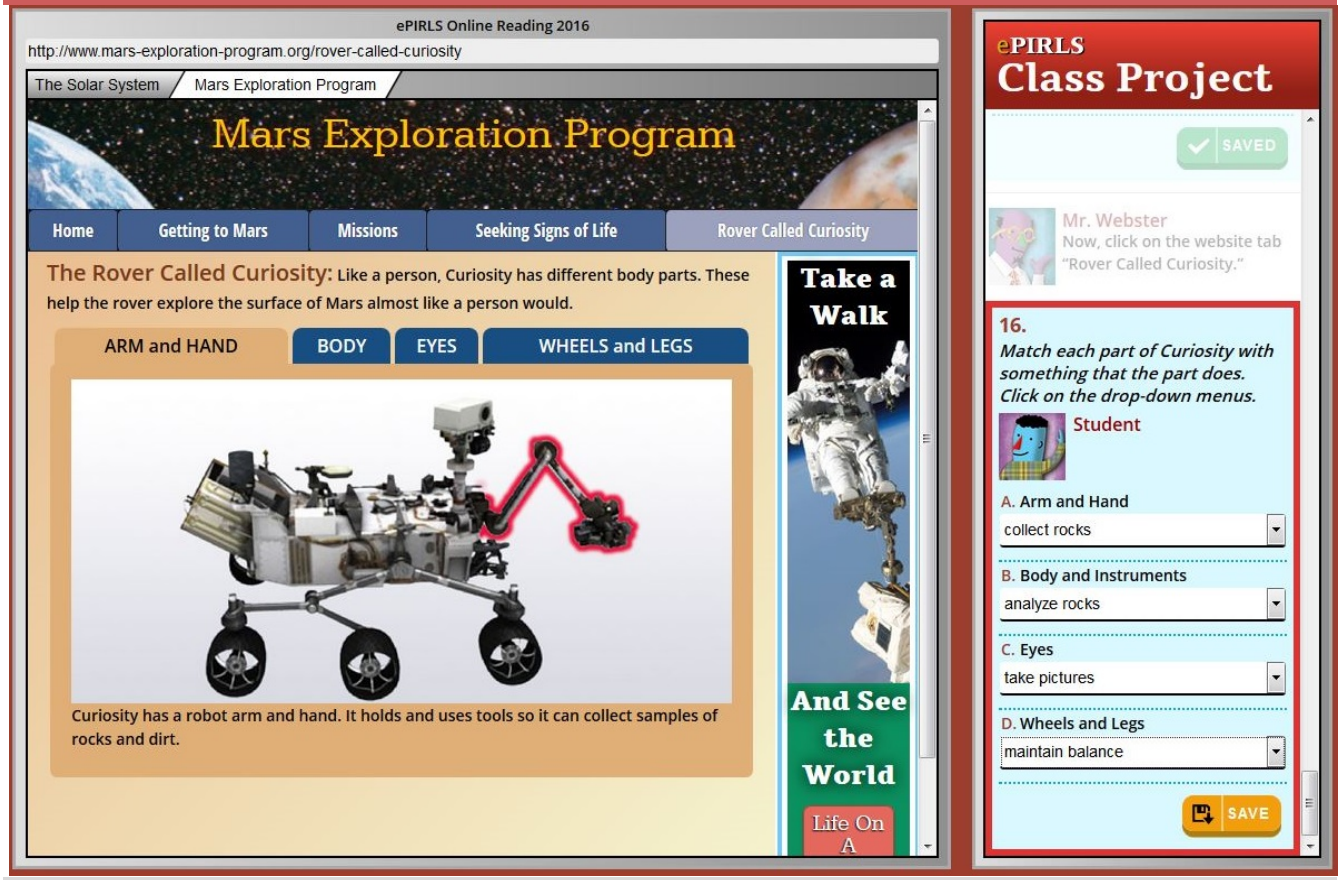
See Appendix B.1 for target population coverage notes 1, 2, and 3. See Appendix B.4 for sampling guidelines and sampling participation notes †, ‡, and ≡.

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

Exhibit 2.4.3: High International Benchmark for ePIRLS Online Informational Reading – Example Item 3

Process: Interpret and Integrate Ideas and Information

Description: Interpret and integrate textual and visual information from a web page to recognize 4 functions by navigating across interactive images



SOURCE: IEA's Progress in International Reading Literacy Study – PIRLS 2016

The answer shown illustrates the type of student response that would receive full credit (2 points).

Note: Results based on students who participated in both PIRLS and ePIRLS.

Country	Percent Full Credit
[3] Singapore	70 (1.3) ▲
Chinese Taipei	70 (1.2) ▲
Norway (5)	54 (2.0) ▲
† United States	54 (1.6) ▲
Ireland	53 (2.1) ▲
Sweden	50 (1.4) ▲
≡ Denmark	48 (1.8)
[1 2] Canada	48 (2.0)
Italy	47 (1.6)
International Avg.	47 (0.4)
[3] Israel	39 (1.4) ▼
Slovenia	37 (1.6) ▼
[2] Portugal	35 (1.6) ▼
United Arab Emirates	29 (0.9) ▼
[1] Georgia	16 (1.3) ▼
Benchmarking Participants	
Dubai, UAE	49 (1.0)
Abu Dhabi, UAE	21 (1.3) ▼

▲ Percent significantly higher than international average
▼ Percent significantly lower than international average

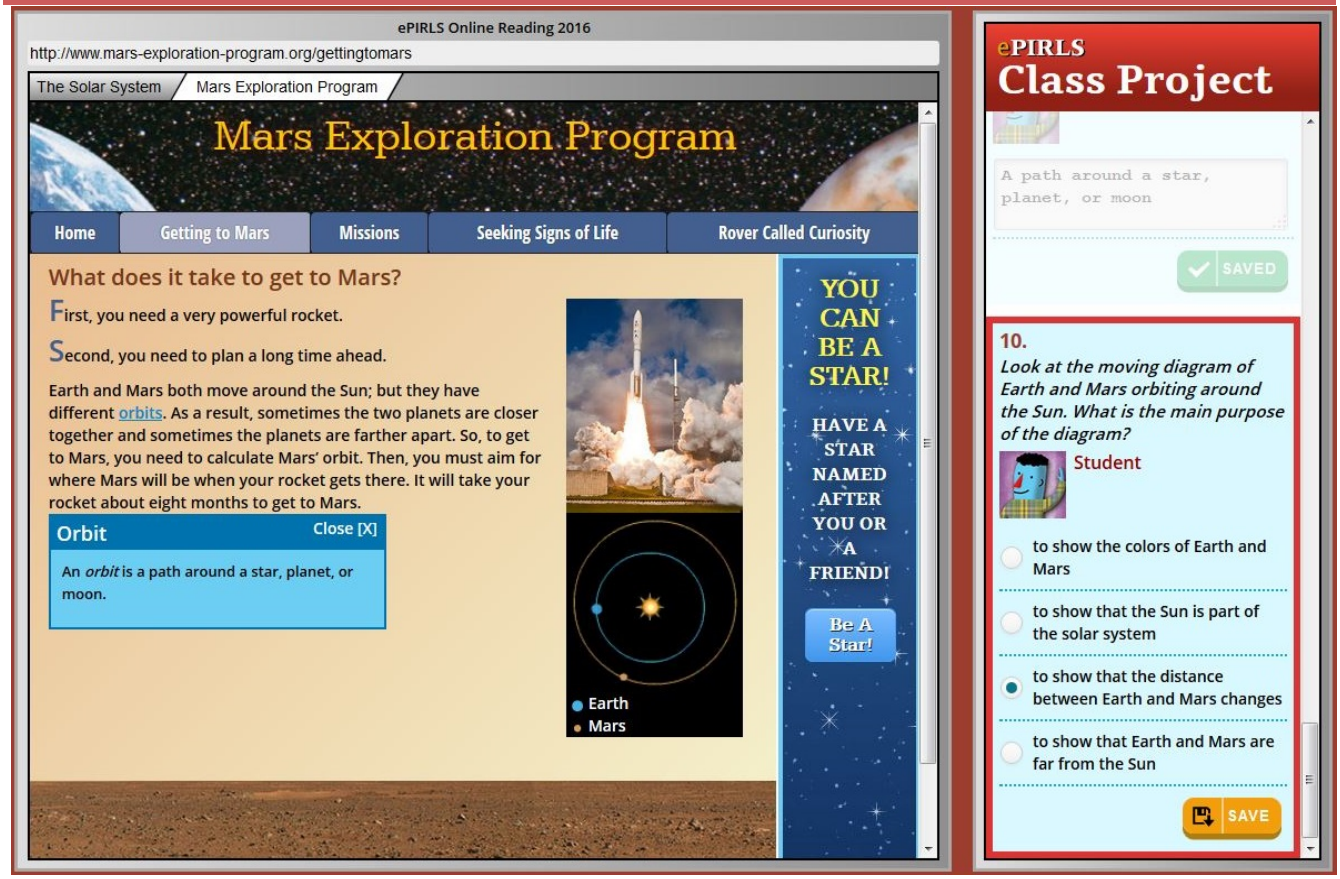
See Appendix B.1 for target population coverage notes 1, 2, and 3. See Appendix B.4 for sampling guidelines and sampling participation notes †, ‡, and ≡.

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

Exhibit 2.4.4: High International Benchmark for ePIRLS Online Informational Reading – Example Item 4

Process: Evaluate and Critique Content and Textual Elements

Description: Evaluate the use of an animated diagram to determine its purpose



SOURCE: IEA's Progress in International Reading Literacy Study – PIRLS 2016

Note: Results based on students who participated in both PIRLS and ePIRLS.

Country	Percent Correct	
Norway (5)	85 (1.0)	▲
Sweden	85 (1.4)	▲
≡ Denmark	84 (1.3)	▲
Ireland	78 (1.5)	▲
3 Singapore	77 (1.1)	▲
Slovenia	75 (1.5)	▲
† United States	75 (1.1)	▲
1 2 Canada	75 (1.3)	
International Avg.	72 (0.4)	
Chinese Taipei	70 (1.3)	
2 Portugal	70 (1.3)	▼
3 Israel	67 (1.2)	▼
Italy	66 (1.6)	▼
United Arab Emirates	52 (1.1)	▼
1 Georgia	50 (1.8)	▼
Benchmarking Participants		
Dubai, UAE	70 (1.1)	▼
Abu Dhabi, UAE	44 (2.1)	▼

▲ Percent significantly higher than international average
▼ Percent significantly lower than international average

See Appendix B.1 for target population coverage notes 1, 2, and 3. See Appendix B.4 for sampling guidelines and sampling participation notes †, ‡, and ≡.

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

Exhibit 2.5: Advanced International Benchmark (625)

Exhibit 2.5 describes the reading comprehension skills and strategies demonstrated by fourth grade students at the Advanced International Benchmark. Students at the Advanced International Benchmark could make inferences from complex information; interpret and integrate information within and across webpages to show thorough understanding; and evaluate the effects of features to begin to understand the writer's point of view.

Exhibits 2.5.1 through 2.5.6 contain six examples to demonstrate the range in the types of items successfully answered by students achieving at the Advanced International Benchmark. Each exhibit shows achievement results for the countries that participated in ePIRLS, with up and down arrows indicating a significantly higher or lower percentage of success than the international average. The reading comprehension process and scale anchoring description are provided above the item. For multiple-choice items, the correct response is indicated. Constructed response questions were worth 1, 2, or 3 points. Each constructed response item is shown with an illustrative student response and the amount of credit awarded the response is shown across the bottom of the exhibit, usually full credit.

Exhibits 2.5.1 and 2.5.2 show examples of students making inferences from relatively complex text to answer constructed response questions. Example Items 2.5.3 and 2.5.4 illustrate how students at the Advanced International Benchmark were able to interpret and integrate information across websites, Example 2.5.5 shows they could evaluate text to explain a writer's point of view, and Example 2.5.6 shows that they could evaluate the use of a timeline.

Exhibit 2.5: ePIRLS 2016 Online Informational Reading at the Advanced International Benchmark (625)

● Advanced International Benchmark

625

When reading and viewing relatively complex Online Informational Texts, students can:

- Make inferences from complex information to support an explanation
- Interpret and integrate information from within and across webpages with interactive features to explain relationships, and show thorough understanding
- Evaluate the effects of textual, visual, and interactive elements and begin to consider the writer's point of view

SOURCE: IEA's Progress in International Reading Literacy Study – PIRLS 2016

Exhibit 2.5.1: Advanced International Benchmark for ePIRLS Online Informational Reading – Example Item 1

Process: Make Straightforward Inferences

Description: Make an inference to provide an explanation

The answer shown illustrates the type of student response that would receive full credit (1 point).

SOURCE: IEA's Progress in International Reading Literacy Study – PIRLS 2016

Note: Results based on students who participated in both PIRLS and ePIRLS.

Country	Percent Full Credit
Norway (5)	65 (1.7) ▲
≡ Denmark	58 (1.6) ▲
Sweden	57 (1.9) ▲
3 Singapore	54 (1.3) ▲
1 2 Canada	49 (1.5) ▲
International Avg.	42 (0.4)
† United States	42 (1.5)
Italy	42 (1.7)
Slovenia	41 (1.6)
3 Israel	37 (1.2) ▼
Chinese Taipei	34 (1.6) ▼
Ireland	32 (1.9) ▼
2 Portugal	31 (1.1) ▼
1 Georgia	26 (1.6) ▼
United Arab Emirates	24 (0.7) ▼
Benchmarking Participants	
Dubai, UAE	36 (1.1) ▼
Abu Dhabi, UAE	21 (1.1) ▼

▲ Percent significantly higher than international average
▼ Percent significantly lower than international average

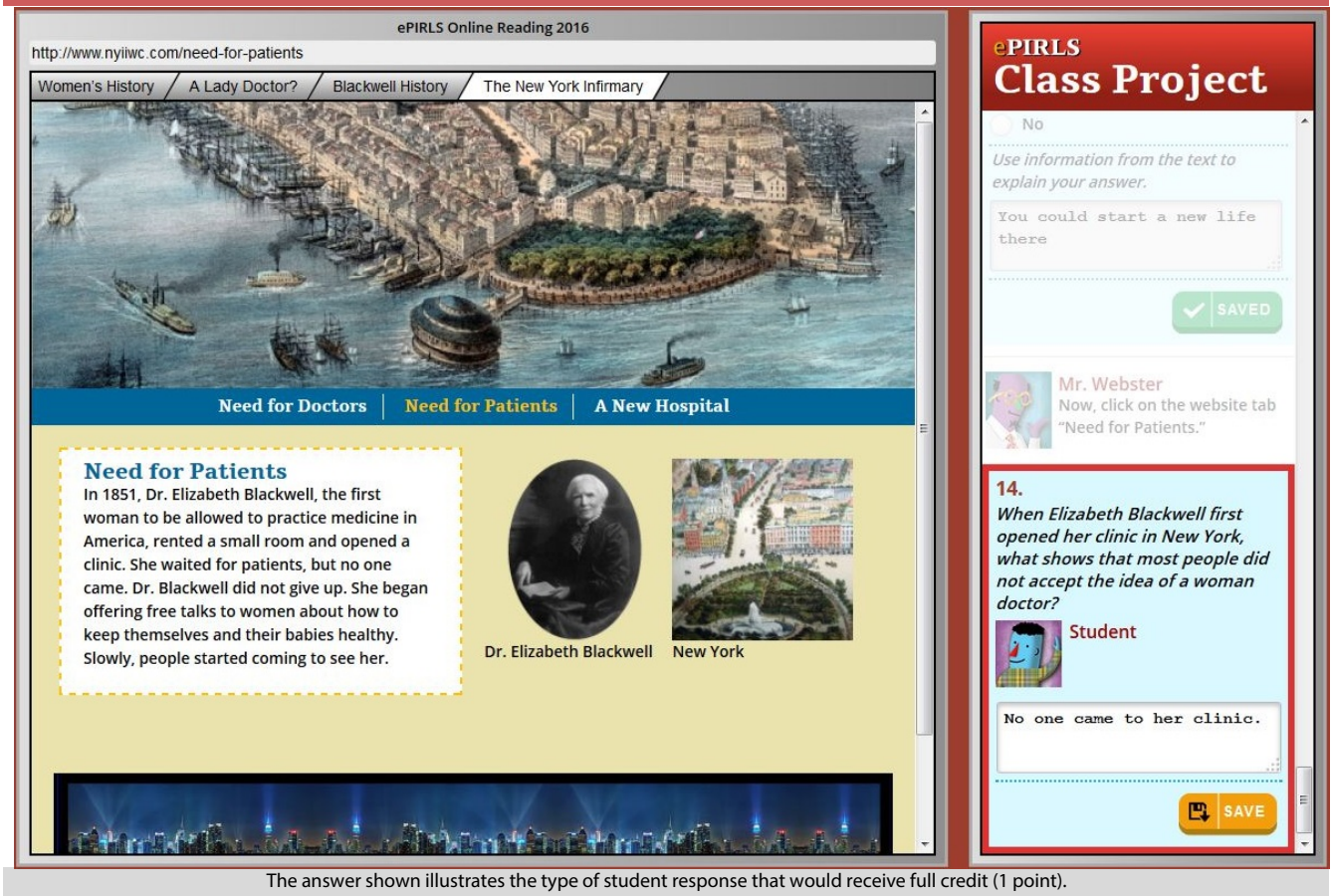
See Appendix B.1 for target population coverage notes 1, 2, and 3. See Appendix B.4 for sampling guidelines and sampling participation notes †, ‡, and ≡.

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

Exhibit 2.5.2: Advanced International Benchmark for ePIRLS Online Informational Reading – Example Item 2

Process: Make Straightforward Inferences

Description: Locate and reproduce textual evidence to support an inference



The answer shown illustrates the type of student response that would receive full credit (1 point).

SOURCE: IEA's Progress in International Reading Literacy Study – PIRLS 2016

Note: Results based on students who participated in both PIRLS and ePIRLS.

Country	Percent Full Credit
[3] Singapore	63 (1.3) ▲
Ireland	48 (1.7) ▲
Chinese Taipei	47 (1.6) ▲
[3] Israel	42 (1.3) ▲
† United States	40 (1.6) ▲
Norway (5)	39 (1.5)
Italy	38 (1.4)
International Avg.	37 (0.4)
[1 2] Canada	35 (1.7)
≡ Denmark	32 (1.6) ▼
Sweden	32 (1.5) ▼
United Arab Emirates	25 (0.9) ▼
[1] Georgia	24 (1.7) ▼
[2] Portugal	24 (1.1) ▼
Slovenia	23 (1.4) ▼

Benchmarking Participants

Dubai, UAE	37 (1.4)
Abu Dhabi, UAE	17 (1.0) ▼

▲ Percent significantly higher than international average
▼ Percent significantly lower than international average

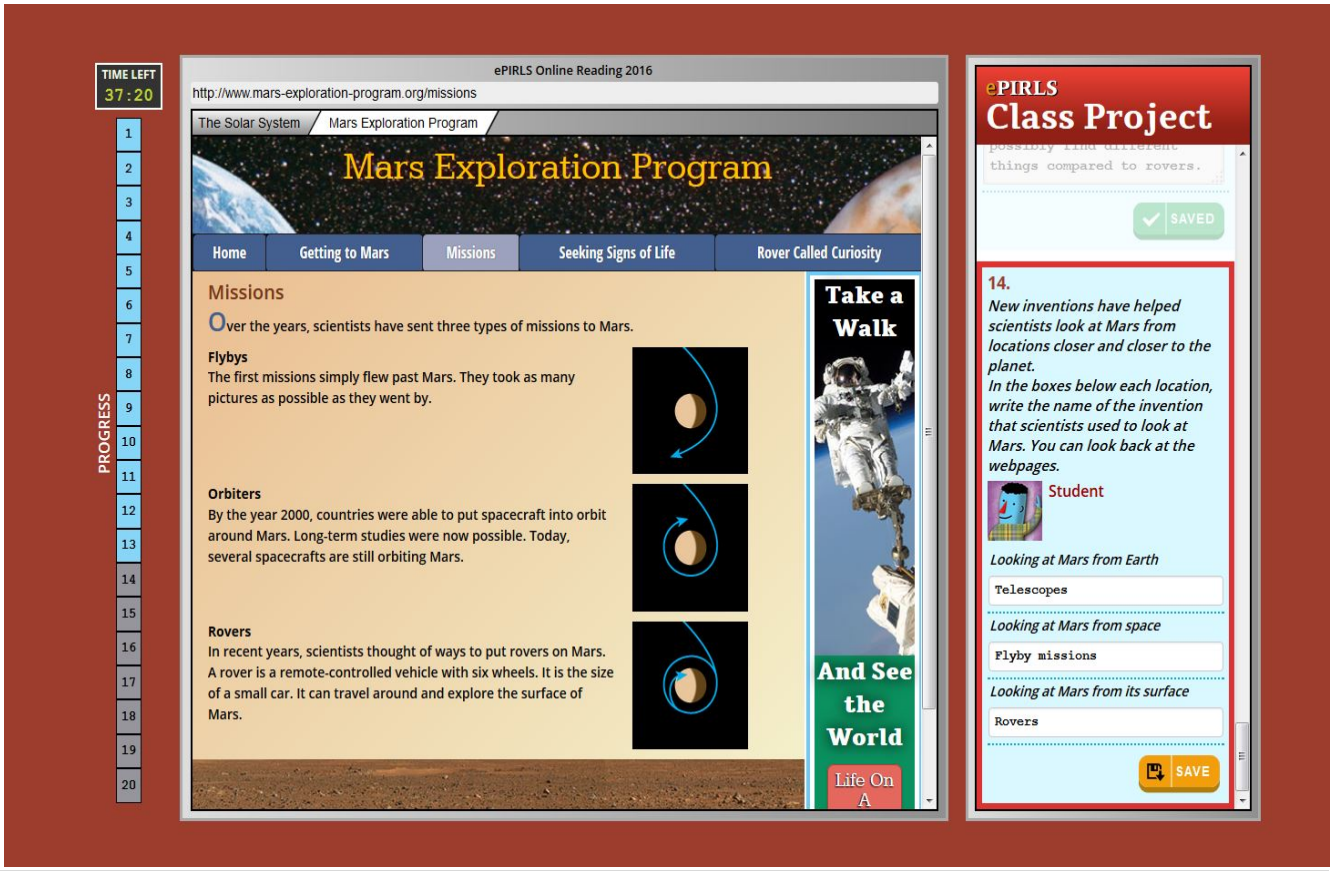
See Appendix B.1 for target population coverage notes 1, 2, and 3. See Appendix B.4 for sampling guidelines and sampling participation notes †, ‡, and ≡.

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

Exhibit 2.5.3: Advanced International Benchmark for ePIRLS Online Informational Reading – Example Item 3

Process: Interpret and Integrate Ideas and Information

Description: Integrate information from across multiple webpages to provide 3 objects matched to their functions



The answer shown illustrates the type of student response that would receive full credit (3 points).

Note: Results based on students who participated in both PIRLS and ePIRLS.

Country	Percent Full Credit
Ireland	37 (2.1) ▲
Sweden	33 (1.9) ▲
[3] Singapore	31 (1.4) ▲
Norway (5)	30 (1.2) ▲
† United States	26 (1.4) ▲
[1 2] Canada	26 (1.4) ▲
Slovenia	25 (1.5)
≡ Denmark	24 (1.8)
[2] Portugal	23 (1.3)
International Avg.	23 (0.4)
Italy	16 (1.2) ▼
[3] Israel	15 (1.2) ▼
Chinese Taipei	14 (1.0) ▼
United Arab Emirates	12 (0.6) ▼
[1] Georgia	8 (1.2) ▼
Benchmarking Participants	
Dubai, UAE	23 (0.7)
Abu Dhabi, UAE	7 (0.9) ▼

▲ Percent significantly higher than international average
▼ Percent significantly lower than international average

See Appendix B.1 for target population coverage notes 1, 2, and 3. See Appendix B.4 for sampling guidelines and sampling participation notes †, ‡, and ≡.

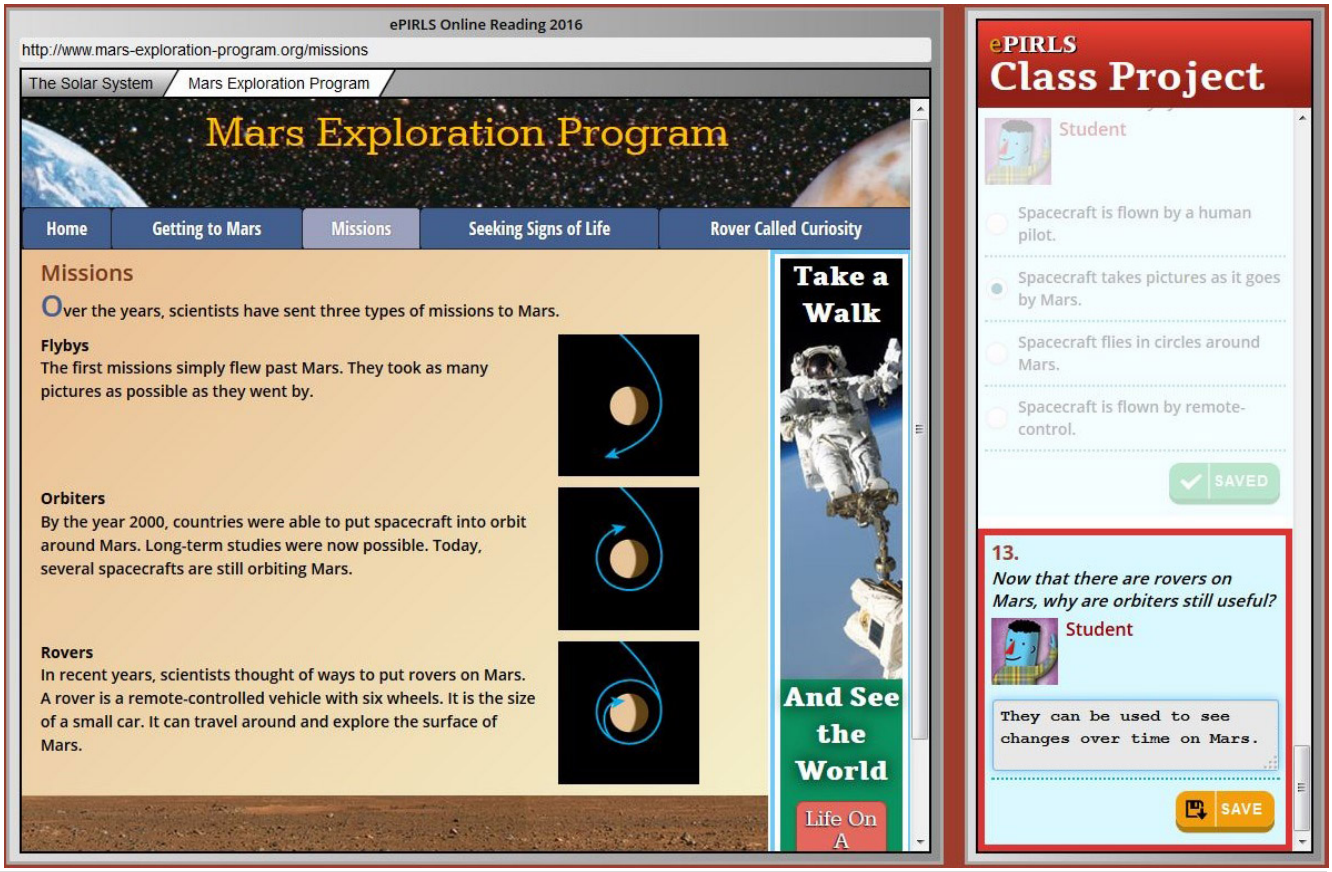
( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

SOURCE: IEA's Progress in International Reading Literacy Study – PIRLS 2016

Exhibit 2.5.4: Advanced International Benchmark for ePIRLS Online Informational Reading – Example Item 4

Process: Interpret and Integrate Ideas and Information

Description: Integrate information from a webpage to provide an explanation



The answer shown illustrates the type of student response that would receive full credit (1 point).

SOURCE: IEA's Progress in International Reading Literacy Study – PIRLS 2016

Note: Results based on students who participated in both PIRLS and ePIRLS.

Country	Percent Full Credit
Norway (5)	42 (1.7) ▲
[3] Singapore	38 (1.3) ▲
† United States	35 (1.7) ▲
Sweden	33 (1.6) ▲
Slovenia	33 (1.3) ▲
[3] Israel	30 (1.4) ▲
Ireland	27 (1.6)
International Avg.	27 (0.4)
[1 2] Canada	26 (1.6)
Italy	22 (1.2) ▼
≡ Denmark	19 (1.5) ▼
United Arab Emirates	19 (0.9) ▼
[1] Georgia	18 (1.7) ▼
[2] Portugal	16 (0.9) ▼
Chinese Taipei	13 (0.9) ▼

Benchmarking Participants

Dubai, UAE	28 (1.3)
Abu Dhabi, UAE	14 (1.4) ▼

▲ Percent significantly higher than international average
▼ Percent significantly lower than international average

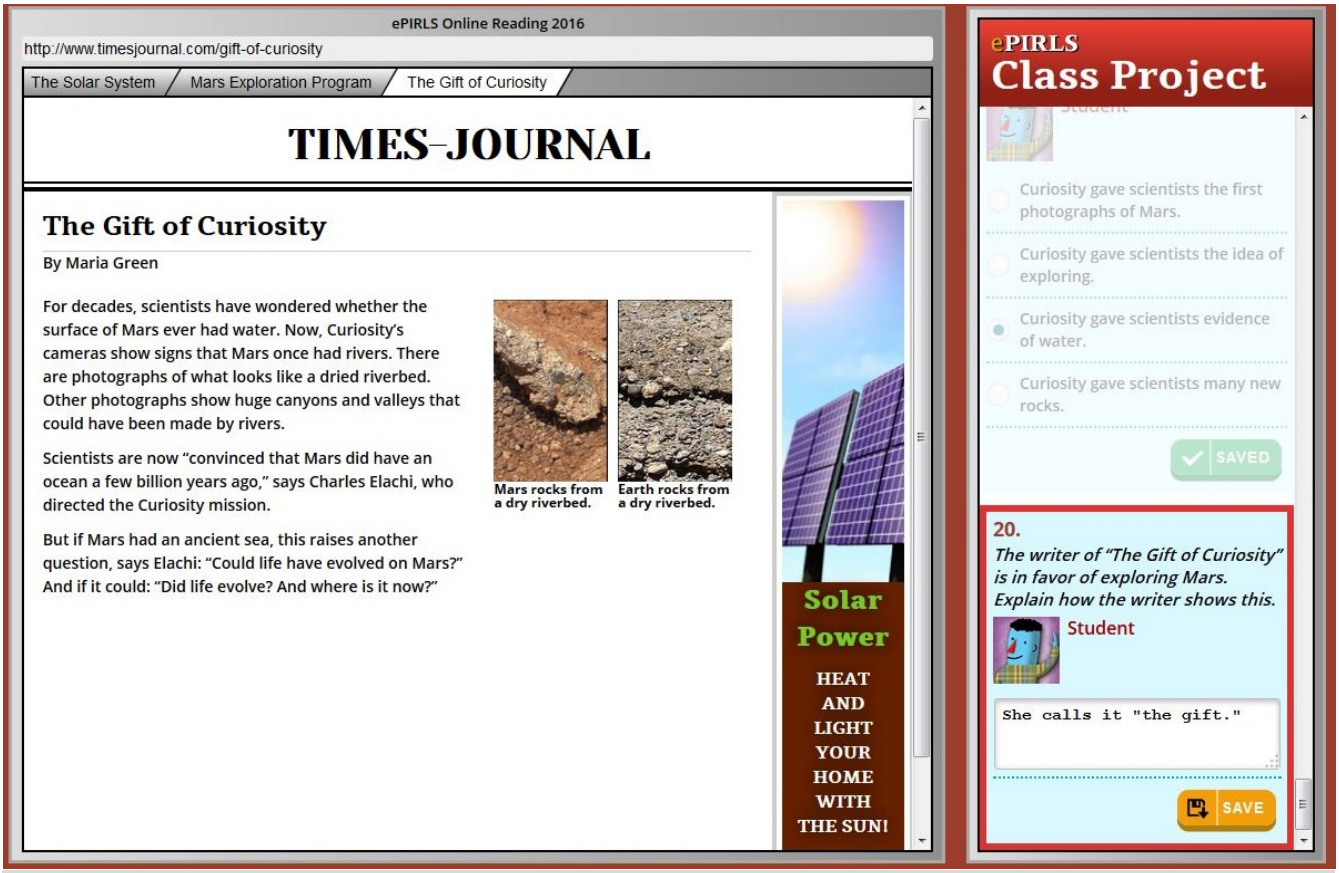
See Appendix B.1 for target population coverage notes 1, 2, and 3. See Appendix B.4 for sampling guidelines and sampling participation notes †, ‡, and ≡.

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

Exhibit 2.5.5: Advanced International Benchmark for ePIRLS Online Informational Reading – Example Item 5

Process: Evaluate and Critique Content and Textual Elements

Description: Evaluate textual elements and content to show how they exemplify the writer's point of view



The answer shown illustrates the type of student response that would receive full credit (1 point).

SOURCE: IEA's Progress in International Reading Literacy Study – PIRLS 2016

Note: Results based on students who participated in both PIRLS and ePIRLS.

Country	Percent Full Credit
Ireland	48 (1.8) ▲
Norway (5)	47 (1.4) ▲
† United States	45 (1.8) ▲
1 2 Canada	42 (1.6) ▲
Slovenia	27 (1.4) ▲
International Avg.	25 (0.3)
3 Israel	21 (1.3) ▼
Sweden	21 (1.3) ▼
3 Singapore	19 (0.9) ▼
≡ Denmark	19 (1.5) ▼
2 Portugal	18 (1.3) ▼
United Arab Emirates	13 (0.6) ▼
Italy	10 (0.9) ▼
1 Georgia	8 (0.7) ▼
Chinese Taipei	7 (0.8) ▼
Benchmarking Participants	
Dubai, UAE	25 (1.0)
Abu Dhabi, UAE	9 (1.1) ▼

▲ Percent significantly higher than international average
▼ Percent significantly lower than international average

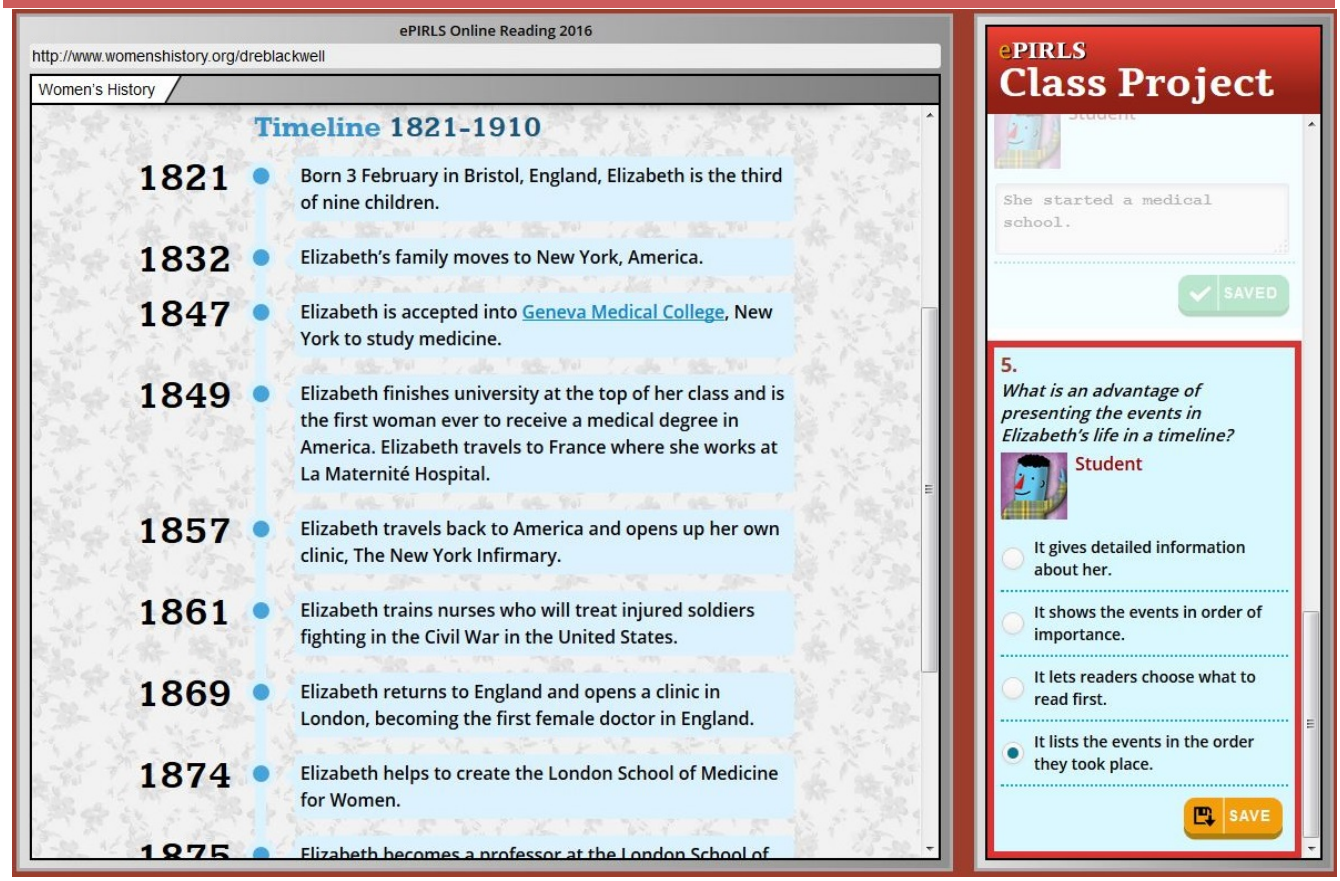
See Appendix B.1 for target population coverage notes 1, 2, and 3. See Appendix B.4 for sampling guidelines and sampling participation notes †, ‡, and ≡.

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

Exhibit 2.5.6: Advanced International Benchmark for ePIRLS Online Informational Reading – Example Item 6

Process: Evaluate and Critique Content and Textual Elements

Description: Evaluate the use of a timeline to convey information



SOURCE: IEA's Progress in International Reading Literacy Study – PIRLS 2016

Note: Results based on students who participated in both PIRLS and ePIRLS.

Country	Percent Correct	
Sweden	63 (1.8)	▲
Slovenia	62 (1.5)	▲
Italy	58 (1.5)	▲
[3] Israel	54 (1.4)	▲
≡ Denmark	52 (1.7)	▲
Ireland	52 (1.8)	▲
[3] Singapore	49 (1.4)	
International Avg.	47 (0.4)	
Chinese Taipei	47 (1.4)	
[1 2] Canada	47 (1.9)	
† United States	46 (1.7)	
Norway (5)	43 (1.7)	▼
[2] Portugal	43 (1.6)	▼
United Arab Emirates	29 (0.8)	▼
[1] Georgia	17 (1.2)	▼
Benchmarking Participants		
Dubai, UAE	37 (1.3)	▼
Abu Dhabi, UAE	23 (1.2)	▼

▲ Percent significantly higher than international average
▼ Percent significantly lower than international average

See Appendix B.1 for target population coverage notes 1, 2, and 3. See Appendix B.4 for sampling guidelines and sampling participation notes †, ‡, and ≡.

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

ePIRLS Online Reading 2016

CHAPTER 3: ACCESS AND EXPERIENCE WITH DIGITAL DEVICES

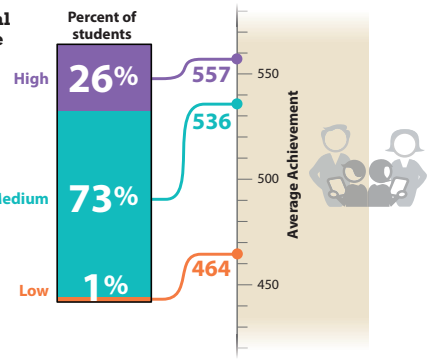
ePIRLS 2016 INTERNATIONAL RESULTS IN ONLINE INFORMATIONAL READING

IEA
TIMSS & PIRLS International Study Center
Lynch School of Education
BOSTON COLLEGE

Students in ePIRLS Familiar with Computers and the Internet

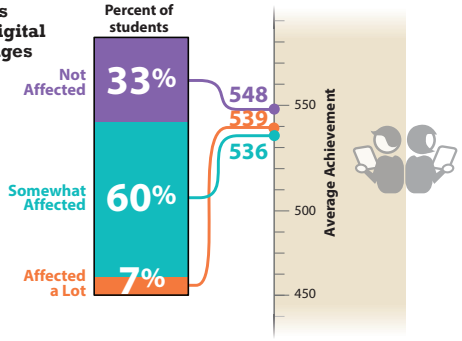
Had Access to Digital Devices in the Home

Students with access to digital devices at home had higher ePIRLS achievement.



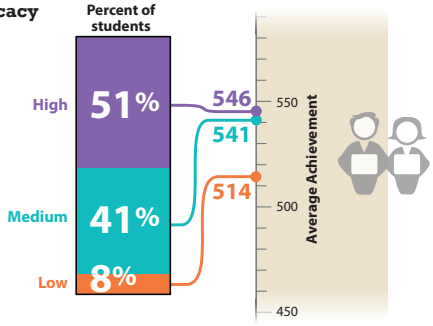
Attended Schools Unaffected by Digital Resource Shortages

Students in ePIRLS attended schools well-resourced with digital devices.



Reported Self-Efficacy in Computer Use

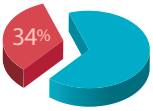
Students with self-efficacy had higher ePIRLS achievement.



Classroom Instruction Involving Computers to Prepare Reports

Using a Computer to Prepare Reports for Schoolwork

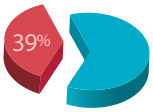
34%
OF STUDENTS SPEND MORE THAN
30 minutes per day
FOR AN AVERAGE ACHIEVEMENT SCORE OF
549



STUDENTS WHO SPEND
30 minutes or less per day
HAD AN AVERAGE ACHIEVEMENT SCORE OF
535

Using a Computer to Find and Read Information on the Internet

39%
OF STUDENTS SPEND MORE THAN
30 minutes per day
FOR AN AVERAGE ACHIEVEMENT SCORE OF
536



STUDENTS WHO SPEND
30 minutes or less per day
HAD AN AVERAGE ACHIEVEMENT SCORE OF
543

Using computers in school to prepare reports was associated with higher ePIRLS achievement, whereas finding and reading information on the Internet each day was not. It is not just the amount of time students use computers that makes a difference, but how they use them.

SOURCE: IEA's Progress in International Reading Literacy Study – PIRLS 2016
http://pirls2016.org/download-center/

IEA TIMSS & PIRLS International Study Center Lynch School of Education BOSTON COLLEGE

CHAPTER 3

Access and Experience with Digital Devices

Exhibit 3.1 and 3.2: Home Resources for Learning

The *Home Resources for Learning* scale combines data reported by students and their parents. The parents' data were collected using the PIRLS 2016 Learning to Read Survey in which students' parents were asked to provide information about their child's experiences learning to read. As explained in Exhibit 3.1, students provided information about the number of books in the home and other study supports, while the parents provided information about the number of children's books, the parents' levels of education, and their occupations. As also explained, students were assigned a score on the scale according to the availability of these five home resources for learning.

In Exhibit 3.1, ePIRLS countries are ordered by the percentage of students in the **Many Resources** category. However, on average, almost three-fourths of the students (71%) were assigned to the **Some Resources** category. Twenty-six percent were in the **Many Resources** category and only 3 percent in the **Few Resources** category. Students in the **Many Resource**s category had higher achievement on ePIRLS than the students in the **Some Resources** category (577 vs. 530).

Exhibit 3.2 presents information about students' access to digital devices in the home. The percentages of students with **High**, **Medium**, and **Low Access** and their associated average achievement mirror the percentages with **Many, Some**, and **Few Resources**.

Exhibit 3.1: Home Resources for Learning

Students Categorized by Parents' and Students' Reports

Note: Results based on students who participated in both PIRLS and ePIRLS.

Students were scored according to their own and their parents' responses concerning the availability of five resources on the *Home Resources for Learning* scale. Students with **Many Resources** had a score of at least 11.8, which is the point on the scale corresponding to students reporting they had more than 100 books in the home and two home study supports, and parents reporting that they had more than 25 children's books in the home, that at least one parent had finished university, and that at least one parent had a professional occupation, on average. Students with **Few Resources** had a score no higher than 7.5, which is the scale point corresponding to students reporting that they had 25 or fewer books in the home and neither of the two home study supports, and parents reporting that they had 10 or fewer children's books in the home, that neither parent had gone beyond upper-secondary education, and that neither parent was a small business owner or had a clerical or professional occupation, on average. All other students were assigned to the **Some Resources** category.

Country	Many Resources		Some Resources		Few Resources		Average Scale Score
	Percent of Students	Average ePIRLS Achievement	Percent of Students	Average ePIRLS Achievement	Percent of Students	Average ePIRLS Achievement	
Norway (5)	46 (1.3)	588 (2.3)	54 (1.3)	554 (2.3)	1 (0.1)	~ ~	11.5 (0.05)
Sweden	43 (1.5)	589 (2.4)	56 (1.5)	546 (2.6)	0 (0.1)	~ ~	11.4 (0.05)
Denmark	40 (1.7)	586 (2.5)	59 (1.7)	545 (2.3)	1 (0.2)	~ ~	11.3 (0.06)
Canada r	34 (1.5)	578 (3.6)	65 (1.5)	533 (2.7)	0 (0.2)	~ ~	11.2 (0.06)
Ireland	33 (1.5)	604 (2.4)	66 (1.6)	557 (2.4)	1 (0.3)	~ ~	11.0 (0.06)
Singapore	29 (0.9)	634 (3.5)	69 (0.8)	574 (3.2)	2 (0.2)	~ ~	10.9 (0.03)
Israel	22 (1.3)	586 (2.9)	76 (1.3)	529 (2.6)	2 (0.2)	~ ~	10.9 (0.05)
Slovenia	22 (1.1)	563 (2.8)	77 (1.1)	518 (2.1)	1 (0.2)	~ ~	10.6 (0.04)
Chinese Taipei	21 (1.3)	578 (2.4)	74 (1.2)	540 (1.9)	5 (0.4)	497 (6.3)	10.3 (0.06)
Portugal	18 (1.0)	561 (3.7)	76 (1.0)	518 (2.1)	6 (0.5)	483 (5.3)	10.1 (0.05)
United Arab Emirates	13 (0.5)	547 (4.0)	85 (0.5)	468 (2.2)	3 (0.3)	408 (9.9)	10.2 (0.03)
Georgia	12 (1.1)	510 (5.1)	82 (1.4)	476 (3.2)	6 (0.9)	439 (7.9)	10.0 (0.06)
Italy	8 (0.8)	575 (3.7)	86 (0.8)	535 (1.8)	6 (0.6)	496 (6.4)	9.7 (0.05)
United States	- -	- -	- -	- -	- -	- -	- -
International Avg.	26 (0.3)	577 (0.9)	71 (0.3)	530 (0.7)	3 (0.1)	465 (3.3)	
Benchmarking Participants							
Dubai, UAE	21 (0.5)	585 (2.2)	77 (0.5)	522 (1.8)	2 (0.1)	~ ~	10.7 (0.02)
Abu Dhabi, UAE r	10 (0.7)	513 (8.7)	87 (0.8)	436 (3.8)	3 (0.4)	358 (14.1)	10.0 (0.04)

This PIRLS questionnaire scale was established in 2011 based on the combined response distribution of all countries that participated in PIRLS 2011. To provide a point of reference for country comparisons, the scale centerpoint of 10 was located at the mean of the combined distribution. The units of the scale were chosen so that 2 scale score points corresponded to the standard deviation of the distribution.

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

A dash (-) indicates comparable data not available. A tilde (~) indicates insufficient data to report achievement.

An "r" indicates data are available for at least 70% but less than 85% of the students.

SOURCE: IEA's Progress in International Reading Literacy Study – PIRLS 2016

Number of books in the home (students):

1) 0-10
2) 11-25
3) 26-100
4) 101-200
5) More than 200

Number of children's books in the home (parents):

1) 0-10
2) 11-25
3) 26-50
4) 51-100
5) More than 100

Number of home study supports (students):

1) None
2) Internet connection or own room
3) Both

Highest level of education of either parent (parents):

1) Finished some primary or lower secondary or did not go to school
2) Finished lower secondary
3) Finished upper secondary
4) Finished post-secondary education
5) Finished university or higher

Highest level of occupation of either parent (parents):

1) Has never worked outside home for pay, general laborer, or semi-professional (skilled agricultural or fishery worker, craft or trade worker, plant or machine operator)
2) Clerical (clerk or service or sales worker)
3) Small business owner
4) Professional (corporate manager or senior official, professional, or technician or associate professional)

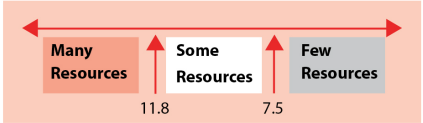


Exhibit 3.2: Digital Devices in the Home

Students Categorized by Parents' and Students' Reports

Note: Results based on students who participated in both PIRLS and ePIRLS.

Students were scored according to their own and their parents' responses concerning the availability of four items on the *Digital Devices in the Home* scale. Students with **High Access** had a score of at least 12.1, which is the point on the scale corresponding to students reporting that they had a computer and Internet connection, and parents reporting they had seven or more digital information devices in the home as well as a digital device for reading for both themselves and their child. Students with **Low Access** had a score no higher than 6.0, which is the scale point corresponding to students reporting that they did not have a computer or Internet connection, and parents reporting that they had less than four digital information devices in the home and no digital devices for reading for either themselves or their child. All other students were assigned to the **Medium Access** category.

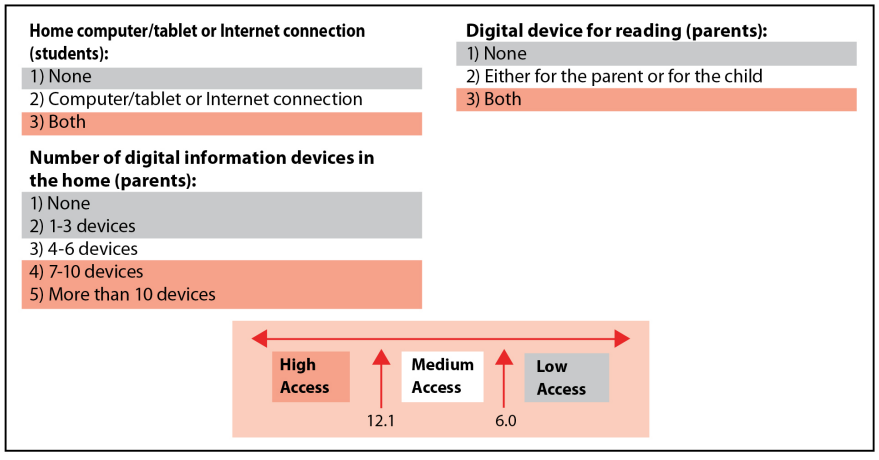
Country	High Access		Medium Access		Low Access		Average Scale Score
	Percent of Students	Average ePIRLS Achievement	Percent of Students	Average ePIRLS Achievement	Percent of Students	Average ePIRLS Achievement	
Norway (5)	58 (1.1)	574 (2.4)	42 (1.1)	561 (2.7)	0 (0.0)	~ ~	11.8 (0.04)
Denmark	49 (1.2)	565 (2.8)	51 (1.2)	557 (2.4)	0 (0.0)	~ ~	11.5 (0.05)
Sweden	43 (1.3)	572 (2.9)	57 (1.2)	557 (2.5)	0 (0.1)	~ ~	11.3 (0.05)
Canada r	27 (1.2)	564 (3.5)	72 (1.2)	542 (3.3)	0 (0.1)	~ ~	10.6 (0.05)
United Arab Emirates	26 (0.6)	492 (3.0)	73 (0.5)	469 (2.5)	1 (0.1)	~ ~	10.5 (0.03)
Ireland	25 (1.1)	584 (3.1)	75 (1.1)	566 (2.7)	0 (0.1)	~ ~	10.4 (0.04)
Singapore	24 (0.6)	619 (3.1)	76 (0.6)	582 (3.2)	1 (0.1)	~ ~	10.4 (0.03)
Israel	23 (0.9)	551 (3.5)	76 (0.9)	539 (2.7)	1 (0.3)	~ ~	10.3 (0.04)
Portugal	21 (0.9)	545 (4.0)	78 (0.9)	518 (2.1)	1 (0.2)	~ ~	10.4 (0.03)
Italy	14 (0.7)	551 (3.9)	85 (0.8)	534 (2.0)	2 (0.3)	~ ~	9.8 (0.04)
Slovenia	13 (0.7)	551 (3.6)	86 (0.6)	523 (2.0)	1 (0.2)	~ ~	9.9 (0.03)
Chinese Taipei	11 (0.5)	569 (3.8)	87 (0.5)	544 (2.1)	2 (0.2)	~ ~	9.7 (0.03)
Georgia	4 (0.3)	505 (6.3)	87 (1.0)	479 (3.1)	9 (1.0)	464 (9.4)	9.0 (0.06)
United States	- -	- -	- -	- -	- -	- -	- -
International Avg.	26 (0.2)	557 (1.0)	73 (0.3)	536 (0.7)	1 (0.1)	464 (9.4)	
Benchmarking Participants							
Dubai, UAE	30 (0.5)	544 (2.6)	70 (0.5)	528 (1.8)	0 (0.1)	~ ~	10.8 (0.02)
Abu Dhabi, UAE r	26 (1.0)	462 (5.6)	73 (1.0)	432 (4.2)	1 (0.1)	~ ~	10.5 (0.04)

This PIRLS questionnaire scale was established in 2016 based on the combined response distribution of all countries that participated in PIRLS 2016. To provide a point of reference for country comparisons, the scale centerpoint of 10 was located at the mean of the combined distribution. The units of the scale were chosen so that 2 scale score points corresponded to the standard deviation of the distribution.

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

A dash (-) indicates comparable data not available. A tilde (~) indicates insufficient data to report achievement.

An "r" indicates data are available for at least 70% but less than 85% of the students.



SOURCE: IEA's Progress in International Reading Literacy Study – PIRLS 2016

Exhibit 3.3: Instruction Affected by Digital Resources Shortages – Principals' Reports

Exhibit 3.3 presents the results for the *Digital Resource Shortages* scale, with the questions comprising the scale provided below the results. Countries are ordered according to the percentage of students (from most to least) in schools **Not Affected** by resource shortages, from a high of 57 to a low of 9 percent. On average, 33 percent of the ePIRLS students attended well-resourced schools and they had the highest average achievement (548). Sixty percent of the students were in schools **Somewhat Affected** by resource shortages and 7 percent in schools **Affected A Lot**. For ePIRLS, average reading achievement for these two groups was similar, 536 and 539.

Exhibit 3.3: Instruction Affected by Digital Resource Shortages – Principals' Reports

Students Categorized by Principals' Reports

Note: Results based on students who participated in both PIRLS and ePIRLS.

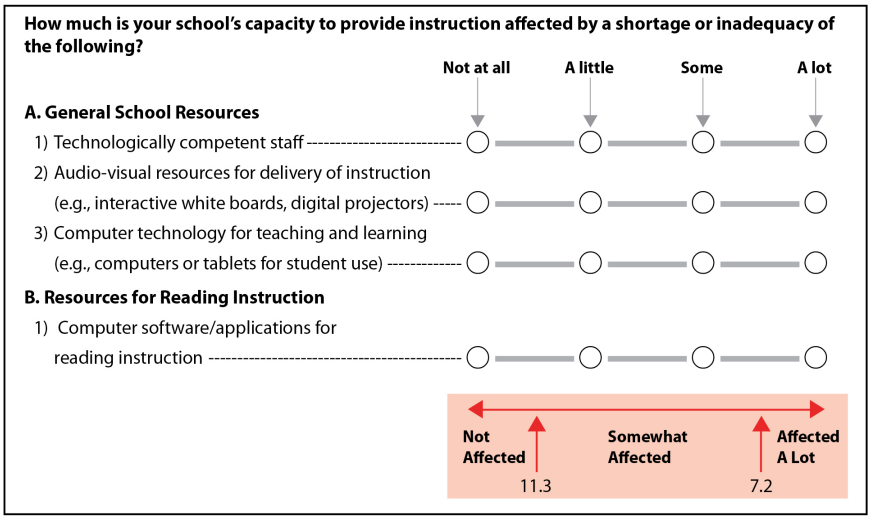
Students were scored according to their principals' responses concerning four school and classroom resources on the *Digital Resource Shortages* scale. Students in schools where instruction was **Not Affected** by resource shortages had a score on the scale of at least 11.3, which corresponds to their principals reporting that shortages affected instruction "not at all" for two of the four resources and "a little" for the other two resources, on average. Students in schools where instruction was **Affected A Lot** had a score no higher than 7.2, which corresponds to their principals reporting that shortages affected instruction "a lot" for two of the four resources and "some" for the other two resources, on average. All other students attended schools where instruction was **Somewhat Affected** by resource shortages.

Country	Not Affected		Somewhat Affected		Affected A Lot		Average Scale Score
	Percent of Students	Average ePIRLS Achievement	Percent of Students	Average ePIRLS Achievement	Percent of Students	Average ePIRLS Achievement	
Singapore	57 (0.0)	583 (4.2)	37 (0.0)	592 (5.6)	6 (0.0)	606 (11.6)	11.2 (0.00)
Sweden	52 (4.3)	566 (3.6)	47 (4.3)	552 (2.7)	1 (0.8)	~ ~	11.3 (0.16)
Slovenia	49 (5.2)	527 (3.3)	50 (5.1)	523 (3.0)	1 (0.4)	~ ~	11.1 (0.14)
Canada	46 (4.8)	546 (4.4)	49 (4.9)	540 (4.1)	5 (1.4)	539 (7.1)	10.8 (0.18)
United States	44 (4.7)	557 (4.3)	52 (4.9)	555 (4.4)	3 (1.0)	591 (17.7)	10.9 (0.17)
Denmark	43 (4.2)	561 (3.5)	56 (4.5)	555 (3.1)	1 (0.8)	~ ~	11.0 (0.13)
Norway (5)	35 (4.2)	572 (3.7)	62 (4.3)	565 (2.7)	3 (1.3)	567 (14.3)	10.7 (0.12)
United Arab Emirates	30 (1.7)	508 (5.1)	55 (2.3)	449 (3.6)	15 (1.7)	464 (8.1)	9.8 (0.10)
Ireland	26 (4.0)	575 (3.9)	69 (4.1)	565 (3.0)	5 (1.9)	543 (8.1)	10.2 (0.15)
Georgia	25 (3.1)	485 (6.5)	74 (3.1)	475 (4.2)	1 (0.7)	~ ~	10.1 (0.11)
Israel	17 (3.2)	555 (5.3)	69 (3.9)	539 (3.9)	14 (2.9)	499 (8.3)	9.3 (0.18)
Chinese Taipei	15 (3.2)	551 (4.7)	71 (4.3)	545 (2.4)	14 (3.1)	542 (5.7)	9.3 (0.14)
Portugal	10 (2.0)	546 (9.2)	75 (3.3)	521 (2.1)	15 (3.1)	513 (6.3)	9.1 (0.14)
Italy	9 (2.3)	540 (6.0)	78 (3.5)	532 (2.7)	13 (3.0)	531 (5.7)	8.9 (0.13)
International Avg.	33 (1.0)	548 (1.4)	60 (1.1)	536 (0.9)	7 (0.5)	539 (3.2)	
Benchmarking Participants							
Dubai, UAE	45 (0.3)	544 (2.4)	38 (0.3)	508 (2.2)	18 (0.3)	531 (4.5)	10.3 (0.02)
Abu Dhabi, UAE	27 (3.4)	479 (10.9)	62 (3.9)	416 (4.7)	11 (2.4)	405 (16.2)	9.8 (0.16)

This PIRLS questionnaire scale was established in 2016 based on the combined response distribution of all countries that participated in PIRLS 2016. To provide a point of reference for country comparisons, the scale centerpoint of 10 was located at the mean of the combined distribution. The units of the scale were chosen so that 2 scale score points corresponded to the standard deviation of the distribution.

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

A tilde (~) indicates insufficient data to report achievement.



SOURCE: IEA's Progress in International Reading Literacy Study – PIRLS 2016

Exhibit 3.4: Students Use Computers or Tablets for Finding and Presenting Information

Exhibit 3.4 presents the results for three questions students were asked about how they used computers and tablets more than 30 minutes a day. The first question pertained to using these devices to prepare reports and presentations. About one-third (34%) of the students reported that they spent more than 30 minutes a day using computers and tablets to prepare reports and presentations, and they had higher ePIRLS achievement than their counterparts (549 vs. 535). The next question was about using the devices for schoolwork to find information and read information, and only 19 percent reported that they did so. These 19 percent had somewhat lower achievement than their counterparts (534 v. 541), which is consistent with some research showing schools encourage more frequent tablet use for lower achieving students. Finally, the third question asked simply about reading information on the Internet each day. Here, 39 percent of the students responded affirmatively, but they also had somewhat lower ePIRLS achievement (536 vs. 543). It could be the case that students are reading on the Internet about many different types of information.

Exhibit 3.4: Students Use Computers or Tablets for Finding and Presenting Information

Students' Reports

Note: Results based on students who participated in both PIRLS and ePIRLS.

Country	Using a Computer or Tablet for Schoolwork on a Normal School Day to Prepare Reports and Presentations			Using a Computer or Tablet for Schoolwork on a Normal School Day to Find and Read Information			Finding and Reading Information on the Internet Each Day		
	Percent of Students Who Spend More Than 30 Minutes	Average ePIRLS Achievement for Students Who Spend More Than 30 Minutes	Average ePIRLS Achievement for Students Who Spend 30 Minutes or Less	Percent of Students Who Spend More Than 30 Minutes	Average ePIRLS Achievement for Students Who Spend More Than 30 Minutes	Average ePIRLS Achievement for Students Who Spend 30 Minutes or Less	Percent of Students Who Spend More Than 30 Minutes	Average ePIRLS Achievement for Students Who Spend More Than 30 Minutes	Average ePIRLS Achievement for Students Who Spend 30 Minutes or Less
Canada	39 (1.6)	554 (3.1)	537 (4.6)	22 (0.8)	540 (3.2)	544 (3.9)	36 (1.4)	538 (2.7)	548 (4.2)
Chinese Taipei	13 (0.6)	554 (3.9)	545 (2.1)	13 (0.7)	538 (3.9)	547 (2.1)	32 (1.0)	544 (2.7)	547 (2.1)
Denmark	34 (1.5)	566 (3.3)	555 (2.5)	15 (1.1)	548 (4.3)	561 (2.4)	27 (1.0)	552 (3.5)	561 (2.4)
Georgia	44 (1.5)	489 (3.1)	472 (3.6)	35 (1.4)	481 (3.7)	477 (3.5)	54 (1.2)	478 (3.3)	479 (4.2)
Ireland	24 (1.4)	577 (3.6)	566 (2.7)	11 (0.8)	554 (6.0)	569 (2.4)	34 (0.9)	562 (3.1)	570 (3.0)
Israel	55 (1.1)	551 (2.8)	521 (3.3)	30 (0.9)	534 (2.9)	538 (2.8)	48 (1.1)	531 (2.9)	544 (2.7)
Italy	20 (1.2)	530 (3.2)	534 (2.2)	11 (0.8)	521 (4.8)	535 (2.1)	40 (1.1)	530 (2.9)	536 (2.1)
Norway (5)	40 (2.0)	577 (2.8)	563 (2.5)	11 (0.7)	563 (4.2)	569 (2.2)	20 (0.8)	566 (3.4)	569 (2.2)
Portugal	33 (1.1)	527 (2.2)	521 (2.6)	16 (0.8)	519 (4.1)	523 (2.5)	44 (0.9)	521 (2.3)	525 (2.7)
Singapore	42 (0.8)	606 (2.9)	576 (3.4)	25 (0.6)	584 (3.7)	590 (3.0)	47 (0.8)	582 (3.2)	595 (3.2)
Slovenia	36 (1.7)	527 (2.8)	525 (2.4)	14 (0.7)	516 (4.4)	527 (1.9)	38 (1.5)	520 (2.6)	529 (2.0)
Sweden	21 (1.7)	567 (3.3)	560 (2.4)	16 (1.8)	555 (5.5)	561 (2.2)	24 (1.2)	558 (4.2)	562 (2.1)
United Arab Emirates	38 (0.7)	492 (2.3)	460 (2.7)	25 (0.5)	479 (2.7)	468 (2.4)	60 (0.5)	468 (2.7)	479 (2.3)
United States	35 (1.3)	570 (3.4)	554 (2.7)	21 (0.8)	542 (3.9)	561 (2.5)	38 (1.2)	550 (3.4)	563 (2.6)
International Avg.	34 (0.4)	549 (0.8)	535 (0.8)	19 (0.3)	534 (1.1)	541 (0.7)	39 (0.3)	536 (0.8)	543 (0.8)
Benchmarking Participants									
Abu Dhabi, UAE	37 (1.3)	458 (4.8)	424 (4.6)	25 (1.0)	441 (5.7)	433 (4.1)	60 (1.0)	429 (4.4)	447 (4.3)
Dubai, UAE	43 (0.7)	548 (2.0)	517 (1.9)	27 (0.6)	537 (2.4)	526 (1.6)	57 (0.8)	528 (1.8)	532 (2.1)

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

SOURCE: IEA's Progress in International Reading Literacy Study – PIRLS 2016

Exhibit 3.5: Self-Efficacy for Computer Use

Exhibit 3.5 presents the results for the ePIRLS 2016 *Self-Efficacy for Computer Use* scale, based on how good students reported that they were at 1) using computers, 2) typing, and 3) looking up information on the Internet. Internationally, on average, 51 percent of the ePIRLS students reported **High Self-Efficacy** in using computers, 41 percent reported having **Medium Self-Efficacy**, and 8 percent reported having **Low Self-Efficacy**. The **High** and **Medium Self-Efficacy** students had similar ePIRLS average achievement (546 vs. 541), but this was higher average achievement than the **Low Self-Efficacy** students (514).

Exhibit 3.5: Self-Efficacy for Computer Use

Students' Reports

Note: Results based on students who participated in both PIRLS and ePIRLS.

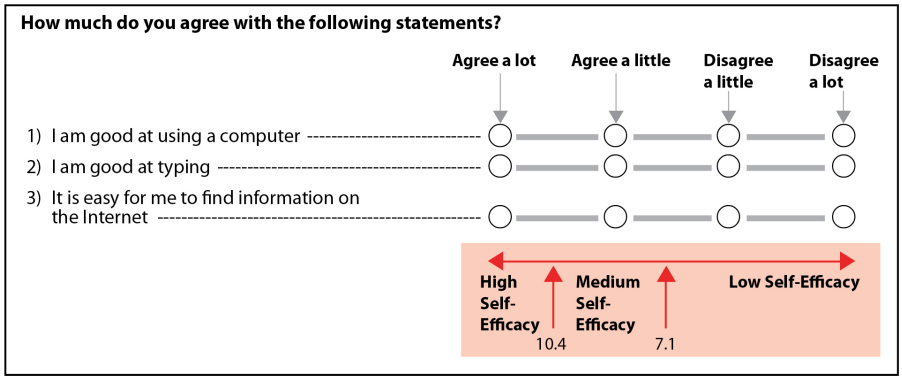
Students were scored on the *Self-Efficacy for Computer Use* scale according to their responses to three statements about how good they were at using a computer. Students who had **High Self-Efficacy** for computer use had a score on the scale of at least 10.4, which corresponds to "agreeing a lot" with two of the three statements and "agreeing a little" with the other one, on average. Students who had **Low Self-Efficacy** for using a computer had a score no higher than 7.1, which corresponds to students "disagreeing a little" to two of the three statements and "agreeing a little" with the other one, on average. All other students had **Medium Self-Efficacy** for using a computer.

Country	High Self-Efficacy		Medium Self-Efficacy		Low Self-Efficacy		Average Scale Score
	Percent of Students	Average ePIRLS Achievement	Percent of Students	Average ePIRLS Achievement	Percent of Students	Average ePIRLS Achievement	
Israel	65 (1.2)	544 (2.6)	30 (1.0)	534 (3.5)	5 (0.5)	496 (8.7)	10.6 (0.05)
Portugal	64 (1.1)	526 (2.3)	32 (1.0)	521 (2.5)	4 (0.4)	486 (8.7)	10.6 (0.04)
Slovenia	61 (1.2)	529 (2.1)	34 (1.1)	526 (2.6)	5 (0.4)	509 (7.8)	10.4 (0.05)
Denmark	55 (1.4)	567 (2.6)	39 (1.3)	554 (2.7)	5 (0.4)	525 (6.0)	10.2 (0.05)
Ireland	55 (1.3)	571 (2.8)	39 (1.2)	571 (3.1)	6 (0.6)	542 (7.4)	10.1 (0.06)
Norway (5)	54 (1.2)	573 (2.4)	42 (1.2)	568 (2.6)	4 (0.4)	534 (7.6)	10.2 (0.04)
Italy	52 (1.1)	534 (2.4)	40 (1.0)	536 (2.7)	8 (0.7)	522 (4.8)	10.1 (0.05)
United Arab Emirates	52 (0.6)	490 (2.7)	41 (0.5)	471 (2.4)	7 (0.3)	425 (4.5)	10.0 (0.03)
United States	51 (1.2)	563 (2.8)	42 (1.1)	560 (3.3)	7 (0.5)	536 (5.1)	10.0 (0.05)
Sweden	49 (1.3)	565 (2.7)	45 (1.1)	565 (2.4)	6 (0.6)	529 (5.5)	10.0 (0.05)
Georgia	45 (1.4)	493 (3.6)	45 (1.1)	479 (3.5)	10 (0.8)	462 (7.1)	9.7 (0.06)
Singapore	40 (0.7)	595 (2.9)	49 (0.6)	590 (3.3)	11 (0.5)	567 (5.0)	9.5 (0.03)
Canada	39 (0.8)	550 (3.5)	52 (0.9)	547 (3.7)	9 (0.9)	523 (8.4)	9.5 (0.04)
Chinese Taipei	35 (0.9)	550 (2.6)	46 (0.9)	548 (2.5)	19 (0.8)	536 (3.1)	9.1 (0.04)
International Avg.	51 (0.3)	546 (0.7)	41 (0.3)	541 (0.8)	8 (0.2)	514 (1.8)	
Benchmarking Participants							
Dubai, UAE	55 (0.8)	541 (1.5)	40 (0.7)	528 (2.3)	5 (0.3)	488 (5.5)	10.2 (0.03)
Abu Dhabi, UAE	51 (1.1)	458 (5.0)	41 (1.0)	437 (4.5)	9 (0.6)	388 (7.7)	9.9 (0.05)

SOURCE: IEA's Progress in International Reading Literacy Study – PIRLS 2016

This ePIRLS questionnaire scale was established in 2016 based on the combined response distribution of all countries that participated in ePIRLS 2016. To provide a point of reference for country comparisons, the scale centerpoint of 10 was located at the mean of the combined distribution. The units of the scale were chosen so that 2 scale score points corresponded to the standard deviation of the distribution.

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.



ePIRLS Online Reading 2016

CHAPTER 4: NAVIGATION THROUGH ePIRLS

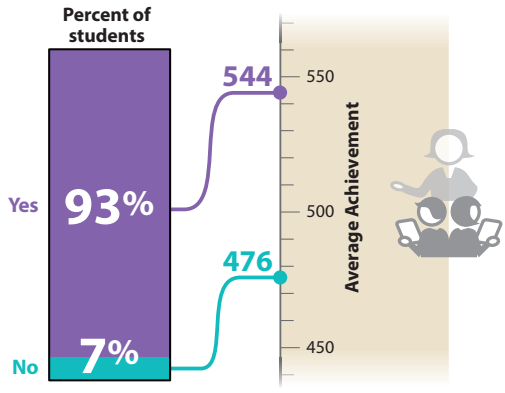
ePIRLS 2016 INTERNATIONAL RESULTS IN ONLINE INFORMATIONAL READING

IEA
TIMSS & PIRLS International Study Center
Lynch School of Education
BOSTON COLLEGE

Students in ePIRLS Successful in Webpage Navigation

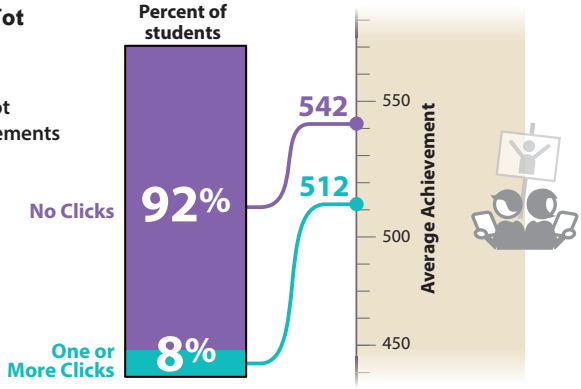
Followed Teacher Avatar's Instruction

Most students navigated to all required webpages.



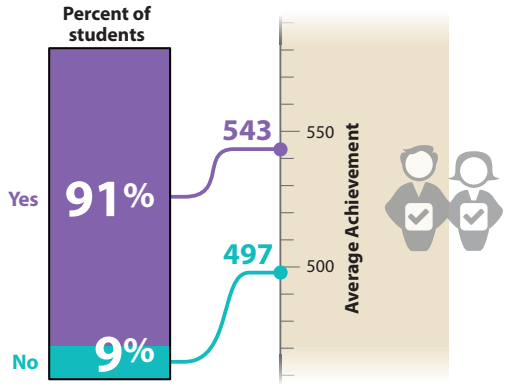
Students Were Not Distracted by Advertisements

Most students did not click on the advertisements embedded in the ePIRLS tasks.



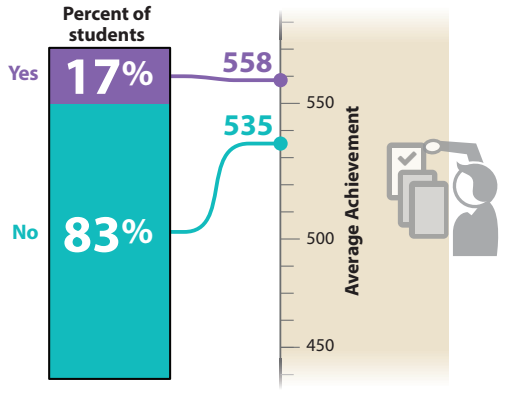
Students Completed All Questions

In ePIRLS, most students had no difficulty completing the assessment.



Looking Back Across Webpages to Integrate Information

Students who looked back had higher achievement, but most students did not look back.



SOURCE: IEA's Progress in International Reading Literacy Study – PIRLS 2016
http://pirls2016.org/download-center/

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CHAPTER 4

Navigation Through ePIRLS

Exhibit 4.1: Navigation to Required Webpages

To keep students on track, the teacher avatar gave periodic instructions about what webpage students should find. The results in Exhibit 4.1 indicate that students had little difficulty navigating using the ePIRLS tabs and links. Ninety-three percent followed the teacher avatar's instruction, clicking on these webpages on the first click. These students had substantially higher achievement than the students who could not navigate by themselves to the webpages (544 vs. 476). As a point of information, students who became lost were automatically supplied with the correct webpages.

Exhibit 4.1: Navigation to Required Webpages

Note: Results based on students who participated in both PIRLS and ePIRLS.

Country	Navigated to All Required Webpages		Did Not Navigate to All Required Webpages	
	Percent of Students	Average ePIRLS Achievement	Percent of Students	Average ePIRLS Achievement
Singapore	99 (0.1)	589 (3.0)	1 (0.1)	~ ~
Ireland	97 (0.4)	569 (2.5)	3 (0.4)	497 (7.1)
Sweden	97 (0.3)	561 (2.2)	3 (0.3)	493 (6.4)
Norway (5)	97 (0.3)	570 (2.2)	3 (0.3)	508 (5.5)
United States	97 (0.4)	559 (2.5)	3 (0.4)	478 (5.4)
Chinese Taipei	96 (0.3)	547 (2.0)	4 (0.3)	516 (5.6)
Canada	96 (0.3)	546 (3.0)	4 (0.3)	473 (5.6)
Denmark	95 (0.3)	561 (2.3)	5 (0.3)	502 (5.3)
Slovenia	94 (0.4)	528 (1.9)	6 (0.4)	467 (5.3)
Portugal	93 (0.4)	526 (2.2)	7 (0.4)	478 (3.2)
Italy	92 (0.5)	537 (2.1)	8 (0.5)	486 (3.5)
Israel	90 (0.5)	545 (2.2)	10 (0.5)	457 (4.6)
United Arab Emirates	84 (0.6)	483 (2.2)	16 (0.6)	397 (3.4)
Georgia	76 (1.1)	489 (3.2)	24 (1.1)	439 (3.9)
International Avg.	93 (0.1)	544 (0.6)	7 (0.1)	476 (1.4)
Benchmarking Participants				
Dubai, UAE	92 (0.3)	536 (1.5)	8 (0.3)	429 (4.1)
Abu Dhabi, UAE	80 (1.1)	448 (4.0)	20 (1.1)	369 (5.0)

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.
A tilde (~) indicates insufficient data to report achievement.

SOURCE: IEA's Progress in International Reading Literacy Study – PIRLS 2016

Exhibit 4.2: Navigation to Advertisements

Students working on a school assignment or research project will finish sooner if they focus on finding critical information and are not distracted. To collect information about this, a number of the webpages in ePIRLS contained advertisements. Almost identical to the results in Exhibit 4.1, 92 percent of the students remained focused and did not click on any advertisements (average achievement of 542). Eight percent did click on at least one advertisement and had lower average achievement (512).

Exhibit 4.2: Navigation to Advertisements

Note: Results based on students who participated in both PIRLS and ePIRLS.

Country	No Clicks on Advertisements		One or More Clicks on Advertisements	
	Percent of Students	Average ePIRLS Achievement	Percent of Students	Average ePIRLS Achievement
Sweden	96 (0.3)	560 (2.2)	4 (0.3)	542 (6.9)
Slovenia	95 (0.3)	526 (2.0)	5 (0.3)	509 (4.8)
Canada	95 (0.5)	545 (3.0)	5 (0.5)	507 (8.8)
Denmark	94 (0.4)	559 (2.2)	6 (0.4)	541 (5.0)
Ireland	94 (0.6)	568 (2.3)	6 (0.6)	550 (9.5)
Portugal	94 (0.4)	525 (2.2)	6 (0.4)	485 (5.1)
Italy	93 (0.4)	534 (2.1)	7 (0.4)	509 (4.7)
Norway (5)	93 (0.4)	568 (2.1)	7 (0.4)	557 (5.0)
United States	92 (0.6)	558 (2.4)	8 (0.6)	540 (6.2)
Singapore	91 (0.3)	588 (3.0)	9 (0.3)	588 (5.0)
Israel	90 (0.5)	543 (2.2)	10 (0.5)	477 (6.1)
Georgia	90 (0.5)	481 (3.1)	10 (0.5)	438 (6.0)
United Arab Emirates	86 (0.4)	481 (2.2)	14 (0.4)	391 (3.1)
Chinese Taipei	82 (0.7)	548 (2.0)	18 (0.7)	535 (3.3)
International Avg.	92 (0.1)	542 (0.6)	8 (0.1)	512 (1.6)
Benchmarking Participants				
Dubai, UAE	91 (0.3)	533 (1.4)	9 (0.3)	472 (4.7)
Abu Dhabi, UAE	82 (0.7)	448 (4.2)	18 (0.7)	357 (5.0)

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

SOURCE: IEA's Progress in International Reading Literacy Study – PIRLS 2016

Exhibit 4.3: Students Reaching All Items in ePIRLS Tasks

The results in Exhibit 4.3 show that ePIRLS provided about the right amount of time for most students. On average, 91 percent of the students reached all of the ePIRLS items. As might be anticipated, the 91 percent completing the assessment had higher average achievement than the 9 percent who did not (543 and 497, respectively).

Exhibit 4.3: Students Reaching All Items in ePIRLS Tasks

Note: Results based on students who participated in both PIRLS and ePIRLS.

Country	Reached All Items		Did Not Reach All Items	
	Percent of Students	Average ePIRLS Achievement	Percent of Students	Average ePIRLS Achievement
Singapore	98 (0.1)	589 (3.0)	2 (0.1)	~ ~
Norway (5)	96 (0.4)	570 (2.2)	4 (0.4)	519 (4.2)
Sweden	95 (0.4)	562 (2.3)	5 (0.4)	516 (4.6)
Ireland	95 (0.6)	569 (2.5)	5 (0.6)	513 (6.8)
United States	95 (0.4)	559 (2.5)	5 (0.4)	503 (5.3)
Chinese Taipei	95 (0.4)	547 (2.0)	5 (0.4)	524 (4.7)
Slovenia	93 (0.5)	528 (1.9)	7 (0.5)	489 (4.8)
Denmark	92 (0.5)	562 (2.2)	8 (0.5)	513 (3.9)
Canada	92 (0.6)	546 (3.1)	8 (0.6)	503 (5.5)
Italy	88 (0.7)	536 (2.3)	12 (0.7)	510 (3.0)
Portugal	87 (0.6)	525 (2.3)	13 (0.6)	503 (3.0)
Israel	86 (0.6)	545 (2.3)	14 (0.6)	483 (3.4)
United Arab Emirates	83 (0.7)	476 (2.4)	17 (0.7)	435 (2.8)
Georgia	71 (1.4)	485 (3.4)	29 (1.4)	457 (3.8)
International Avg.	91 (0.2)	543 (0.7)	9 (0.2)	497 (1.2)
Benchmarking Participants				
Dubai, UAE	91 (0.3)	534 (1.6)	9 (0.3)	467 (3.0)
Abu Dhabi, UAE	83 (1.2)	436 (4.5)	17 (1.2)	411 (4.0)

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.
A tilde (~) indicates insufficient data to report achievement.

SOURCE: IEA's Progress in International Reading Literacy Study – PIRLS 2016

Exhibit 4.4: Students Look Back at Prior Webpages when Answering Integrate Items

To collect information about how well students could integrate information across websites, there were six items that specifically required students to provide information from prior websites together with information from the current website. Exhibit 4.4 provides the averages in "looking back" navigation across the six items, and then three examples from the released tasks are provided in Exhibits 4.4.1 through 4.4.3.

Exhibit 4.4 contains a considerable amount of information, so it is accompanied by a diagram. The first set of columns in Exhibit 4.4 show that on average, only 17 percent of the students looked back when answering the integrate questions and their average achievement was 558. The "look back" students were among the better achieving ePIRLS students (referencing top-performing Singapore with average achievement of 588). Interestingly, of the 17 percent that looked back, 7 percent answered correctly on average and 10 percent did not. The achievement for these groups was 589 (similar to Singapore) for the students that answered correctly and 540 for the students who answered incorrectly despite looking back.

The second set of columns show that, on average, the 83 percent of the students that did not look back had average achievement of 535. This is lower than the students who did look back by 23 points. However, it is not low performance, so it is likely that some students either knew or could remember information across websites. Still, only 28 percent of the "did not look back" students answered these questions correctly, on average, and their average achievement was 572. It is clear, that looking back could have helped some students. In total, 55 percent of the students, on average, did not look back to prior webpages and did not answer correctly. These students had lower achievement than their counterparts (517).

In summary, the students that looked back and answered correctly, either because they were double checking or because they successfully found the answer, had the highest achievement (589) followed by the students who knew the answer without looking back (572). Next were the students who tried to look back but were not successful in answering correctly (540). Unfortunately, the majority of students did not look back when it may have helped. On average, the students who did not look back and answered incorrectly had the lowest average achievement on ePIRLS (517).

Example Item 4.4.1 is from the "Mars" task. Students needed to remember or look back to an earlier webpage to find that scientists were looking at Mars through telescopes, even in the days before space exploration. Perhaps most students thought they remembered, because hardly any of them "looked back"—only 6 percent. Ninety-four percent did not look back, but only 22 percent actually answered correctly.

On Example Item 4.4.2 from "Elizabeth Blackwell", one-third of the students "looked back" and it helped 8 percent answer correctly. This 8 percent had very high ePIRLS achievement (610). Of the

67 percent that did not look back, only 10 percent answered correctly. So once again, the majority (58%) did not look back and did not answer correctly.

Finally, results were similar on another item about Elizabeth Blackwell's accomplishments. Twenty-seven percent "looked back" and 7 percent answered correctly compared to 20 percent who did not (average achievement 597 and 545, respectively). Of the 73 percent who did not look back, 12 percent answered correctly (average achievement 575) and the remaining 60 percent did not (average achievement 522).

Exhibit 4.4: Students Look Back at Prior Webpages when Answering Integrate Items

Note: Results based on students who participated in both PIRLS and ePIRLS.

Country	Students Who Looked Back						Students Who Did Not Look Back					
	Percent of Students	Average ePIRLS Achievement	Answered Look Back Items Correctly		Answered Look Back Items Incorrectly		Percent of Students	Average ePIRLS Achievement	Answered Look Back Items Correctly		Answered Look Back Items Incorrectly	
			Percent of Students	Average ePIRLS Achievement	Percent of Students	Average ePIRLS Achievement			Percent of Students	Average ePIRLS Achievement	Percent of Students	Average ePIRLS Achievement
Canada	14 (0.6)	563 (4.9)	5 (0.3)	592 (4.9)	9 (0.4)	546 (5.6)	86 (0.6)	540 (3.1)	31 (0.6)	575 (2.9)	55 (0.8)	520 (2.9)
Chinese Taipei	37 (0.7)	560 (2.0)	16 (0.4)	581 (1.9)	21 (0.5)	544 (2.3)	63 (0.7)	536 (2.2)	17 (0.4)	568 (1.9)	46 (0.7)	523 (2.3)
Denmark	14 (0.5)	571 (3.3)	5 (0.4)	597 (3.8)	9 (0.4)	557 (4.0)	86 (0.5)	557 (2.3)	31 (0.8)	589 (2.1)	55 (0.8)	539 (2.4)
Georgia	9 (0.4)	500 (5.3)	3 (0.2)	547 (5.9)	6 (0.3)	481 (5.6)	91 (0.4)	475 (3.3)	18 (0.7)	522 (2.9)	73 (0.8)	464 (3.3)
Ireland	17 (0.6)	586 (3.7)	8 (0.4)	613 (3.3)	9 (0.4)	562 (4.5)	83 (0.6)	563 (2.7)	35 (0.7)	593 (2.4)	48 (0.8)	541 (2.8)
Israel	18 (0.5)	558 (2.9)	8 (0.4)	592 (3.4)	10 (0.4)	533 (3.4)	82 (0.5)	531 (2.4)	28 (0.6)	579 (2.3)	54 (0.8)	507 (2.5)
Italy	16 (0.7)	548 (2.6)	6 (0.3)	573 (3.0)	10 (0.4)	535 (2.9)	84 (0.7)	530 (2.2)	26 (0.5)	559 (1.9)	58 (0.8)	517 (2.3)
Norway (5)	16 (0.6)	586 (2.7)	6 (0.4)	607 (3.4)	9 (0.4)	571 (2.8)	84 (0.6)	564 (2.4)	34 (0.7)	591 (2.2)	51 (0.9)	546 (2.5)
Portugal	20 (0.5)	534 (2.9)	6 (0.2)	559 (2.7)	14 (0.4)	524 (3.4)	80 (0.5)	519 (2.3)	22 (0.5)	552 (2.6)	58 (0.6)	507 (2.1)
Singapore	23 (0.5)	619 (2.8)	13 (0.5)	641 (2.7)	10 (0.3)	591 (3.2)	77 (0.5)	579 (3.2)	34 (0.5)	612 (2.6)	43 (0.9)	552 (3.5)
Slovenia	17 (0.7)	540 (2.3)	5 (0.2)	567 (4.1)	12 (0.6)	530 (2.6)	83 (0.7)	521 (2.0)	23 (0.5)	557 (2.0)	60 (0.8)	507 (2.1)
Sweden	13 (0.6)	579 (2.5)	5 (0.3)	600 (3.1)	8 (0.4)	567 (3.0)	87 (0.6)	557 (2.4)	35 (0.7)	585 (2.1)	52 (1.0)	537 (2.4)
United Arab Emirates	13 (0.3)	497 (3.3)	4 (0.1)	569 (2.4)	9 (0.2)	467 (3.7)	87 (0.3)	464 (2.2)	18 (0.4)	538 (1.8)	69 (0.5)	445 (2.2)
United States	14 (0.5)	577 (3.6)	6 (0.4)	604 (4.0)	8 (0.3)	555 (4.0)	86 (0.5)	553 (2.6)	38 (0.7)	586 (2.1)	48 (0.9)	528 (2.6)
International Avg.	17 (0.2)	558 (0.9)	7 (0.1)	589 (1.0)	10 (0.1)	540 (1.0)	83 (0.2)	535 (0.7)	28 (0.2)	572 (0.6)	55 (0.2)	517 (0.7)
Benchmarking Participants												
Abu Dhabi, UAE	13 (0.4)	453 (6.1)	3 (0.2)	550 (6.0)	10 (0.3)	426 (5.9)	87 (0.4)	429 (4.0)	14 (0.5)	513 (4.3)	74 (0.7)	414 (3.7)
Dubai, UAE	17 (0.4)	559 (2.2)	7 (0.2)	595 (2.5)	10 (0.2)	533 (2.7)	83 (0.4)	522 (1.6)	27 (0.5)	568 (1.3)	56 (0.4)	499 (1.9)

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

SOURCE: IEA's Progress in International Reading Literacy Study – PIRLS 2016

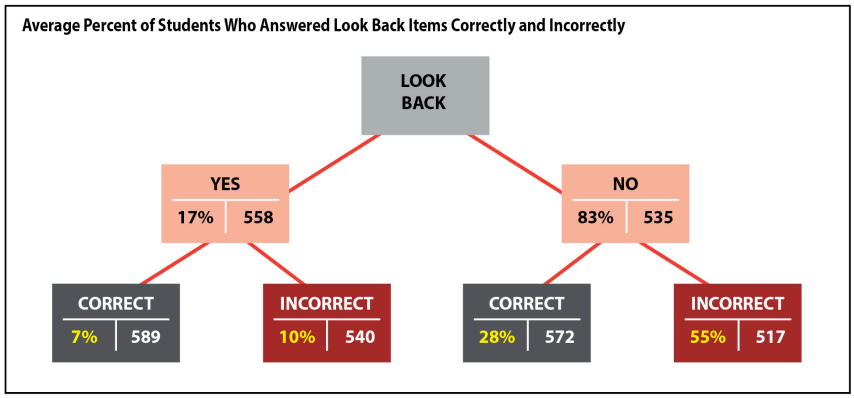

Exhibit 4.4.1: Students Look Back at Prior Webpages when Answering Integrate Items – Example Item 1

Note: Results based on students who participated in both PIRLS and ePIRLS.

Country	Students Who Looked Back						Students Who Did Not Look Back					
	Percent of Students	Average ePIRLS Achievement	Answered Look Back Item Correctly		Answered Look Back Item Incorrectly		Percent of Students	Average ePIRLS Achievement	Answered Look Back Item Correctly		Answered Look Back Item Incorrectly	
			Percent of Students	Average ePIRLS Achievement	Percent of Students	Average ePIRLS Achievement			Percent of Students	Average ePIRLS Achievement	Percent of Students	Average ePIRLS Achievement
Canada	3 (0.4)	554 (13.8)	1 (0.2)	611 (13.3)	2 (0.3)	539 (16.1)	97 (0.4)	542 (3.2)	25 (1.4)	598 (3.5)	71 (1.4)	523 (3.5)
Chinese Taipei	14 (1.2)	555 (4.3)	2 (0.4)	605 (5.6)	11 (1.0)	545 (4.4)	86 (1.2)	540 (2.5)	11 (0.9)	599 (3.6)	75 (1.4)	531 (2.4)
Denmark	9 (1.3)	559 (9.9)	2 (0.4)	618 (9.1)	7 (1.3)	544 (9.8)	91 (1.3)	556 (3.0)	22 (1.7)	612 (3.5)	69 (1.7)	538 (2.8)
Georgia	2 (0.3)	462 (15.3)	0 (0.2)	522 (16.9)	2 (0.3)	449 (17.5)	98 (0.3)	476 (3.8)	8 (1.2)	559 (7.1)	90 (1.2)	469 (3.5)
Ireland	4 (0.8)	570 (8.5)	1 (0.3)	612 (9.9)	3 (0.7)	557 (10.7)	96 (0.8)	569 (3.3)	36 (2.1)	613 (3.5)	60 (2.0)	541 (3.0)
Israel	2 (0.4)	557 (19.8)	0 (0.2)	621 (26.6)	1 (0.3)	534 (23.7)	98 (0.4)	534 (2.8)	15 (1.2)	600 (4.1)	83 (1.2)	523 (3.0)
Italy	4 (0.6)	555 (7.9)	0 (0.2)	604 (19.3)	3 (0.6)	548 (8.1)	96 (0.6)	532 (2.5)	16 (1.1)	582 (3.6)	80 (1.2)	522 (2.6)
Norway (5)	6 (0.8)	587 (6.2)	1 (0.3)	612 (9.1)	4 (0.7)	579 (7.2)	94 (0.8)	570 (2.7)	28 (1.3)	617 (3.3)	66 (1.4)	550 (2.8)
Portugal	7 (0.6)	525 (4.9)	2 (0.3)	564 (9.5)	6 (0.6)	513 (5.8)	93 (0.6)	522 (2.6)	22 (1.3)	571 (3.3)	71 (1.2)	508 (2.5)
Singapore	7 (0.6)	608 (5.6)	2 (0.4)	649 (6.4)	4 (0.5)	585 (6.0)	93 (0.6)	585 (3.3)	28 (1.3)	642 (2.8)	65 (1.4)	561 (3.5)
Slovenia	5 (0.7)	557 (7.7)	2 (0.4)	593 (9.7)	4 (0.6)	539 (8.2)	95 (0.7)	526 (2.7)	24 (1.4)	582 (2.9)	71 (1.6)	507 (2.8)
Sweden	6 (1.0)	578 (9.3)	2 (0.5)	629 (9.5)	4 (0.7)	546 (9.6)	94 (1.0)	560 (3.0)	31 (1.9)	607 (2.8)	63 (1.8)	536 (3.2)
United Arab Emirates	6 (0.5)	503 (7.9)	1 (0.2)	605 (7.1)	5 (0.4)	482 (8.7)	94 (0.5)	467 (2.5)	11 (0.6)	591 (3.1)	83 (0.6)	451 (2.7)
United States	3 (0.4)	572 (13.3)	1 (0.2)	647 (15.5)	2 (0.3)	547 (15.0)	97 (0.4)	556 (2.8)	26 (1.3)	613 (3.0)	72 (1.4)	535 (3.0)
International Avg.	6 (0.2)	553 (2.8)	1 (0.1)	606 (3.5)	4 (0.2)	536 (3.2)	94 (0.2)	538 (0.8)	22 (0.4)	599 (1.0)	73 (0.4)	521 (0.8)
Benchmarking Participants												
Abu Dhabi, UAE	6 (0.7)	463 (18.2)	1 (0.2)	588 (15.7)	5 (0.7)	440 (18.8)	94 (0.7)	428 (4.7)	6 (0.8)	580 (8.4)	89 (1.0)	419 (4.3)
Dubai, UAE	9 (0.7)	556 (6.1)	2 (0.3)	610 (8.1)	7 (0.6)	539 (7.0)	91 (0.7)	528 (2.0)	20 (0.8)	607 (2.5)	71 (0.8)	505 (2.7)

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

SOURCE: IEA's Progress in International Reading Literacy Study – PIRLS 2016

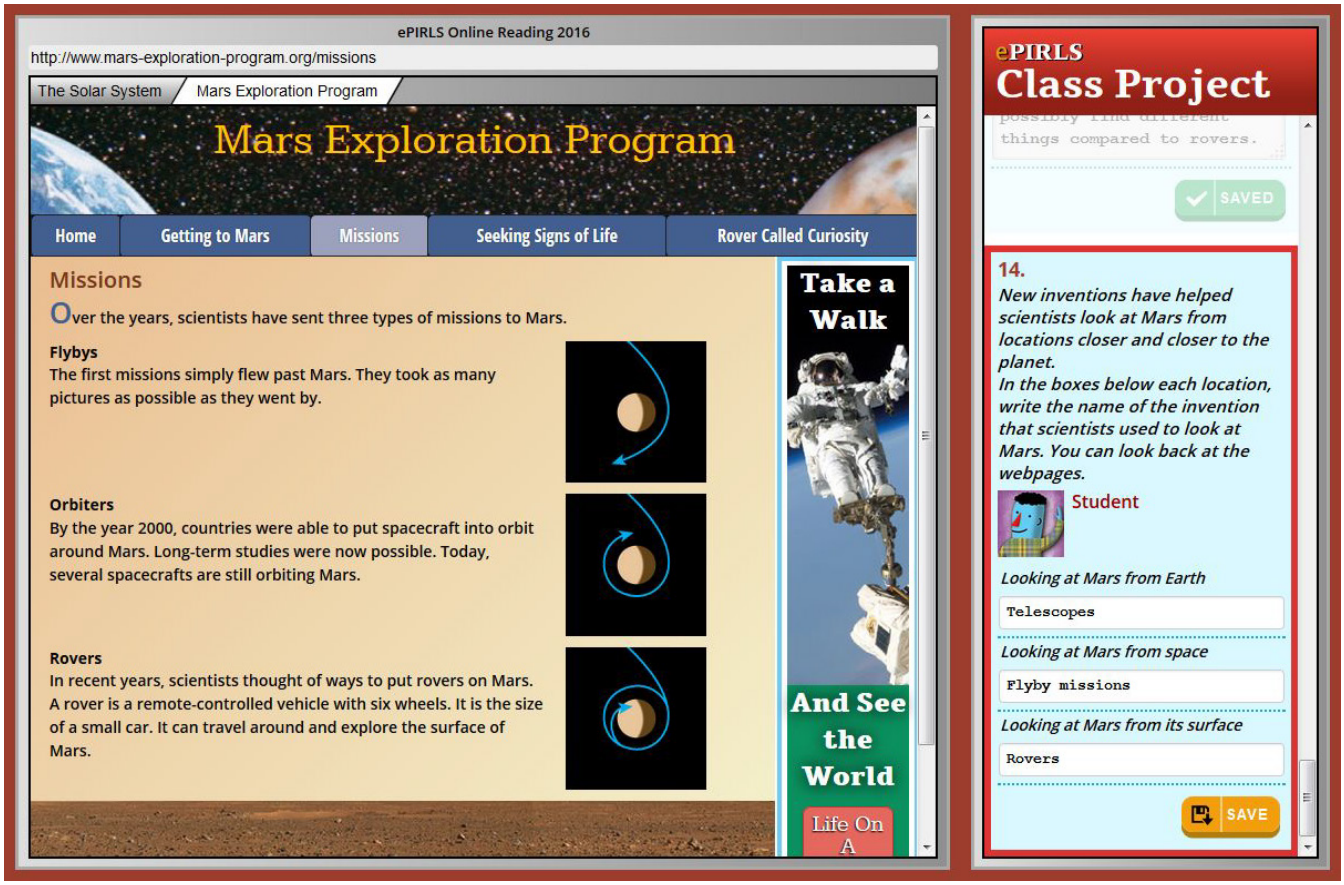

Exhibit 4.4.2: Students Look Back at Prior Webpages when Answering Integrate Items – Example Item 2

Note: Results based on students who participated in both PIRLS and ePIRLS.

Country	Students Who Looked Back						Students Who Did Not Look Back					
	Percent of Students	Average ePIRLS Achievement	Answered Look Back Item Correctly		Answered Look Back Item Incorrectly		Percent of Students	Average ePIRLS Achievement	Answered Look Back Item Correctly		Answered Look Back Item Incorrectly	
			Percent of Students	Average ePIRLS Achievement	Percent of Students	Average ePIRLS Achievement			Percent of Students	Average ePIRLS Achievement	Percent of Students	Average ePIRLS Achievement
Canada	31 (1.9)	572 (5.0)	8 (1.1)	607 (8.9)	22 (1.4)	559 (5.9)	69 (1.9)	531 (3.4)	11 (1.1)	601 (5.4)	59 (1.8)	518 (3.3)
Chinese Taipei	50 (1.6)	569 (2.4)	7 (0.6)	618 (5.0)	42 (1.5)	560 (2.8)	50 (1.6)	518 (3.2)	2 (0.3)	592 (13.1)	49 (1.6)	515 (3.2)
Denmark	31 (1.4)	578 (4.5)	7 (0.8)	612 (6.7)	24 (1.3)	569 (5.2)	69 (1.4)	551 (3.4)	12 (1.2)	607 (6.1)	57 (1.6)	539 (3.7)
Georgia	18 (1.2)	508 (5.6)	4 (0.6)	563 (10.3)	14 (1.1)	492 (6.3)	82 (1.2)	474 (4.4)	13 (1.3)	537 (5.3)	68 (1.8)	461 (4.4)
Ireland	28 (1.9)	600 (4.5)	9 (1.0)	638 (6.1)	19 (1.4)	584 (6.0)	72 (1.9)	557 (4.0)	13 (1.1)	615 (4.5)	59 (1.9)	544 (4.3)
Israel	37 (1.1)	569 (3.9)	15 (1.0)	609 (4.2)	22 (1.1)	542 (4.4)	63 (1.1)	515 (3.2)	14 (1.1)	593 (5.0)	49 (1.2)	492 (3.5)
Italy	27 (1.5)	554 (3.5)	5 (0.7)	593 (6.9)	22 (1.2)	545 (3.5)	73 (1.5)	526 (2.7)	11 (0.9)	569 (5.2)	63 (1.5)	519 (2.7)
Norway (5)	26 (1.4)	592 (4.3)	6 (0.8)	631 (7.8)	20 (1.2)	581 (4.1)	74 (1.4)	557 (3.4)	9 (0.7)	611 (4.5)	64 (1.4)	550 (3.6)
Portugal	44 (1.2)	539 (3.3)	5 (0.6)	584 (6.1)	38 (1.3)	533 (3.8)	56 (1.2)	506 (2.7)	7 (0.8)	560 (6.8)	49 (1.4)	499 (2.7)
Singapore	54 (1.5)	621 (2.6)	30 (1.2)	645 (2.6)	24 (1.0)	592 (3.3)	46 (1.5)	550 (4.1)	13 (0.6)	601 (4.4)	33 (1.6)	531 (4.4)
Slovenia	36 (1.8)	545 (3.3)	3 (0.4)	596 (9.1)	33 (1.7)	541 (3.5)	64 (1.8)	509 (2.3)	4 (0.7)	558 (10.5)	60 (1.6)	506 (2.3)
Sweden	23 (1.4)	585 (3.9)	2 (0.5)	625 (9.1)	21 (1.3)	581 (4.1)	77 (1.4)	551 (3.0)	4 (0.7)	623 (7.2)	72 (1.6)	547 (2.9)
United Arab Emirates	22 (0.6)	511 (4.0)	5 (0.4)	597 (4.4)	17 (0.6)	485 (4.7)	78 (0.6)	459 (2.7)	12 (0.6)	541 (3.3)	66 (0.8)	444 (2.6)
United States	32 (1.5)	581 (4.4)	10 (1.1)	617 (6.9)	22 (1.1)	564 (4.9)	68 (1.5)	542 (3.1)	13 (0.9)	600 (5.1)	55 (1.7)	529 (2.9)
International Avg.	33 (0.4)	566 (1.1)	8 (0.2)	610 (1.9)	24 (0.3)	552 (1.2)	67 (0.4)	525 (0.9)	10 (0.2)	586 (1.8)	58 (0.4)	514 (0.9)
Benchmarking Participants												
Abu Dhabi, UAE	21 (1.1)	472 (6.9)	4 (0.5)	586 (8.1)	17 (1.0)	444 (7.3)	79 (1.1)	424 (4.9)	9 (0.9)	527 (6.9)	70 (1.4)	411 (4.6)
Dubai, UAE	30 (0.7)	566 (3.5)	10 (0.8)	609 (4.2)	20 (0.8)	544 (5.0)	70 (0.7)	514 (2.2)	17 (1.2)	570 (3.9)	53 (1.0)	496 (2.0)

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

SOURCE: IEA's Progress in International Reading Literacy Study – PIRLS 2016

Exhibit 4.4.3: Students Look Back at Prior Webpages when Answering Integrate Items – Example Item 3

Note: Results based on students who participated in both PIRLS and ePIRLS.

Country	Students Who Looked Back						Students Who Did Not Look Back					
	Percent of Students	Average ePIRLS Achievement	Answered Look Back Item Correctly		Answered Look Back Item Incorrectly		Percent of Students	Average ePIRLS Achievement	Answered Look Back Item Correctly		Answered Look Back Item Incorrectly	
			Percent of Students	Average ePIRLS Achievement	Percent of Students	Average ePIRLS Achievement			Percent of Students	Average ePIRLS Achievement	Percent of Students	Average ePIRLS Achievement
Canada	22 (1.6)	566 (5.9)	4 (0.5)	605 (7.7)	18 (1.4)	557 (6.3)	78 (1.6)	537 (3.4)	12 (1.2)	581 (5.1)	66 (1.9)	529 (3.4)
Chinese Taipei	57 (1.4)	555 (2.6)	13 (0.9)	582 (4.4)	44 (1.3)	547 (3.0)	43 (1.4)	527 (3.4)	5 (0.6)	551 (5.4)	38 (1.4)	523 (3.6)
Denmark	17 (1.4)	567 (6.2)	3 (0.5)	606 (12.1)	14 (1.3)	558 (6.5)	83 (1.4)	558 (3.3)	17 (1.3)	593 (5.4)	65 (1.7)	548 (3.5)
Georgia	12 (1.1)	497 (11.8)	2 (0.6)	570 (16.0)	10 (0.8)	482 (10.7)	88 (1.1)	478 (3.9)	9 (1.1)	536 (6.2)	78 (1.1)	470 (4.2)
Ireland	32 (1.8)	588 (7.1)	13 (1.3)	623 (6.0)	19 (1.6)	564 (9.1)	68 (1.8)	560 (3.8)	19 (1.6)	601 (4.9)	49 (2.0)	545 (4.7)
Israel	27 (1.6)	561 (4.2)	8 (0.8)	595 (6.2)	18 (1.2)	545 (5.6)	73 (1.6)	526 (3.1)	13 (1.1)	591 (5.0)	60 (1.7)	512 (3.1)
Italy	26 (1.5)	544 (4.1)	6 (0.7)	575 (8.2)	21 (1.2)	535 (4.4)	74 (1.5)	529 (2.5)	12 (0.9)	564 (5.1)	62 (1.6)	523 (2.6)
Norway (5)	26 (1.6)	580 (4.7)	8 (1.0)	613 (6.9)	18 (1.3)	565 (4.7)	74 (1.6)	562 (3.2)	18 (1.1)	591 (4.1)	56 (1.7)	552 (3.5)
Portugal	31 (1.7)	536 (4.8)	4 (0.6)	574 (7.3)	27 (1.6)	530 (5.4)	69 (1.7)	514 (2.5)	5 (0.6)	565 (7.2)	64 (1.8)	510 (2.5)
Singapore	39 (1.3)	623 (3.2)	17 (0.9)	645 (4.6)	23 (1.0)	607 (3.7)	61 (1.3)	566 (3.6)	20 (0.9)	600 (3.4)	41 (1.2)	550 (4.2)
Slovenia	28 (1.4)	537 (3.8)	5 (0.6)	567 (9.3)	22 (1.4)	530 (4.4)	72 (1.4)	516 (2.5)	6 (0.7)	563 (6.5)	66 (1.5)	512 (2.5)
Sweden	22 (1.6)	579 (4.2)	3 (0.6)	613 (9.1)	18 (1.6)	573 (4.4)	78 (1.6)	554 (3.0)	9 (0.8)	594 (4.6)	69 (1.7)	549 (3.2)
United Arab Emirates	20 (0.7)	500 (4.7)	4 (0.3)	577 (5.4)	16 (0.7)	478 (5.4)	80 (0.7)	463 (2.5)	10 (0.5)	536 (4.6)	70 (0.8)	453 (2.6)
United States	22 (1.2)	577 (5.4)	7 (0.7)	615 (6.4)	15 (1.0)	561 (6.1)	78 (1.2)	548 (3.2)	19 (1.1)	586 (4.9)	59 (1.4)	536 (3.4)
International Avg.	27 (0.4)	558 (1.5)	7 (0.2)	597 (2.2)	20 (0.3)	545 (1.6)	73 (0.4)	531 (0.8)	12 (0.3)	575 (1.4)	60 (0.4)	522 (0.9)
Benchmarking Participants												
Abu Dhabi, UAE	19 (1.3)	448 (9.1)	3 (0.5)	545 (14.0)	16 (1.1)	430 (10.1)	81 (1.3)	431 (4.7)	7 (0.8)	495 (10.0)	74 (1.5)	424 (4.7)
Dubai, UAE	26 (1.0)	567 (2.7)	8 (0.6)	604 (4.4)	17 (0.8)	548 (3.6)	74 (1.0)	517 (2.3)	16 (0.9)	571 (3.4)	59 (1.1)	502 (2.7)

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

SOURCE: IEA's Progress in International Reading Literacy Study – PIRLS 2016

ePIRLS Online Reading 2016

APPENDICES

ePIRLS 2016 INTERNATIONAL RESULTS IN ONLINE INFORMATIONAL READING

IEA
TIMSS & PIRLS International Study Center
Lynch School of Education
BOSTON COLLEGE

Appendix A.1: Distribution of Assessment Items by Comprehension Process and Item Format

ePIRLS Assessment Items	Multiple-Choice Items		Constructed Response Items		Total Items		Percentage of Score Points
	Items	Points	Items	Points	Items	Points	
Comprehension Process							
Focus on and Retrieve Explicitly Stated Information	10	10	12	13	22	23	21%
Make Straightforward Inferences	12	12	15	19	27	31	28%
Interpret and Integrate Ideas and Information	7	11	16	27	23	38	34%
Evaluate and Critique Content and Textual Elements	11	11	8	9	19	20	18%
Total							
Items	40	44	51	68	91	112	100%
Percentage of Score Points	39%		61%				

SOURCE: IEA's Progress in International Reading Literacy Study – PIRLS 2016

Because of rounding some results may appear inconsistent.

Appendix B.1: Coverage of ePIRLS 2016 Target Population

Country	International Target Population		Exclusions from National Target Population		
	Coverage	Notes on Coverage	School-level Exclusions	Within-sample Exclusions	Overall Exclusions
[1] [2] Canada	74%	Students from the provinces of British Columbia, Newfoundland, Ontario, and Quebec	2.9%	3.6%	6.5%
Chinese Taipei	100%		0.0%	0.9%	0.9%
Denmark	100%		1.9%	8.0%	9.9%
[1] Georgia	96%	Students taught in Georgian and Azerbaijani	0.8%	3.0%	3.8%
Ireland	100%		2.3%	1.4%	3.7%
[3] Israel	100%		21.0%	3.9%	24.9%
Italy	100%		0.8%	4.1%	4.9%
Norway (5)	100%		2.0%	3.4%	5.3%
[2] Portugal	100%		1.0%	6.5%	7.5%
[3] Singapore	100%		10.6%	0.5%	11.1%
Slovenia	100%		1.5%	0.8%	2.4%
Sweden	100%		1.3%	3.9%	5.2%
United Arab Emirates	100%		2.0%	1.3%	3.3%
United States	100%		0.0%	4.9%	4.9%
Benchmarking Participants					
Abu Dhabi, UAE	100%		2.2%	1.7%	3.9%
Dubai, UAE	100%		1.6%	1.6%	3.2%

SOURCE: IEA's Progress in International Reading Literacy Study – PIRLS 2016

1 National Target Population does not include all of the International Target Population.

2 National Defined Population covers 90% to 95% of National Target Population.

3 National Defined Population covers less than 90% of the National Target population (but at least 77%).

Appendix B.2: School Sample Sizes

Country	Number of Schools in Original Sample	Number of Eligible Schools in Sample	Number of Schools in Original Sample that Participated	Number of Replacement Schools that Participated	Total Number of Schools that Participated
Canada	507	503	467	7	474
Chinese Taipei	150	150	150	0	150
Denmark	198	191	132	10	142
Georgia	201	201	197	2	199
Ireland	150	148	147	0	147
Israel	160	160	155	2	157
Italy	150	150	133	15	148
Norway (5)	153	152	138	4	142
Portugal	222	221	211	7	218
Singapore	177	177	177	0	177
Slovenia	172	170	159	0	159
Sweden	158	154	144	0	144
United Arab Emirates	482	475	464	1	465
United States	176	172	128	25	153
Benchmarking Participants					
Abu Dhabi, UAE	153	151	150	0	150
Dubai, UAE	178	175	174	0	174

SOURCE: IEA's Progress in International Reading Literacy Study – PIRLS 2016

Appendix B.3: Student Sample Sizes

Country	Within-school Student Participation (Weighted Percentage)	Number of Sampled Students in Participating Schools	Number of Students Withdrawn from Class/School	Number of Students Excluded	Number of Eligible Students	Number of Students Absent	Number of Students Assessed
Canada	93%	10,178	83	391	9,704	833	8,871
Chinese Taipei	98%	4,471	39	38	4,394	95	4,299
Denmark	87%	3,139	48	219	2,872	366	2,506
Georgia	95%	6,072	58	128	5,886	329	5,557
Ireland	91%	2,767	18	44	2,705	232	2,473
Israel	91%	4,315	14	105	4,196	398	3,798
Italy	92%	4,295	22	166	4,107	340	3,767
Norway (5)	88%	4,294	48	136	4,110	500	3,610
Portugal	92%	5,305	58	293	4,954	396	4,558
Singapore	95%	6,719	29	0	6,690	370	6,320
Slovenia	93%	4,676	10	35	4,631	328	4,303
Sweden	90%	4,528	34	170	4,324	445	3,879
United Arab Emirates	92%	17,208	89	232	16,887	1,321	15,566
United States	90%	4,884	155	175	4,554	464	4,090
Benchmarking Participants							
Abu Dhabi, UAE	92%	4,367	20	27	4,320	340	3,980
Dubai, UAE	92%	8,302	50	148	8,104	633	7,471

SOURCE: IEA's Progress in International Reading Literacy Study – PIRLS 2016

Students attending a sampled class at the time the sample was chosen but leaving the class before the assessment was administered were classified as "withdrawn."
Students with a disability or language barrier that prevented them from participating in the assessment were classified as "excluded."
Students not present when the assessment was administered, and not subsequently assessed in a make-up session, were classified as "absent."
In schools with 21 or fewer 4th grade students, all PIRLS students were selected to participate in ePIRLS; in larger schools, a subset of PIRLS students was randomly selected.

Appendix B.4: Participation Rates (Weighted)

Country	School Participation		Class Participation	Student Participation	Overall Participation	
	Before Replacement	After Replacement			Before Replacement	After Replacement
Canada	79%	85%	100%	93%	74%	79%
Chinese Taipei	100%	100%	100%	98%	98%	98%
≡ Denmark	67%	74%	100%	87%	58%	64%
Georgia	97%	99%	100%	95%	92%	94%
Ireland	99%	99%	100%	91%	91%	91%
Israel	97%	98%	100%	91%	88%	89%
Italy	89%	99%	100%	92%	82%	91%
Norway (5)	91%	93%	99%	88%	79%	81%
Portugal	97%	99%	100%	92%	90%	91%
Singapore	100%	100%	100%	95%	95%	95%
Slovenia	94%	94%	99%	93%	86%	86%
Sweden	93%	93%	99%	90%	83%	83%
United Arab Emirates	98%	98%	100%	92%	90%	90%
† United States	74%	89%	100%	90%	67%	80%
Benchmarking Participants						
Abu Dhabi, UAE	99%	99%	100%	92%	91%	91%
Dubai, UAE	99%	99%	99%	92%	91%	91%

SOURCE: IEA's Progress in International Reading Literacy Study – PIRLS 2016

PIRLS guidelines for sampling participation: The minimum acceptable participation rates were 85 percent of both schools and students, or a combined rate (the product of school and student participation) of 75 percent. Participants not meeting these guidelines were annotated as follows:

† Met guidelines for sample participation rates only after replacement schools were included.

‡ Nearly satisfied guidelines for sample participation rates after replacement schools were included.

≡ Did not satisfy guidelines for sample participation rates.

Appendix C.1: Average Percent Correct in the Comprehension Processes

Note: Results based on students who participated in both PIRLS and ePIRLS.

Country	Overall ePIRLS Online Informational Reading	Comprehension Processes	
		Retrieving and Straightforward Inferencing	Interpreting, Integrating, and Evaluating
Canada	59 (0.8)	64 (0.8)	51 (0.9)
Chinese Taipei	60 (0.5)	66 (0.5)	50 (0.5)
Denmark	62 (0.6)	69 (0.5)	53 (0.7)
Georgia	39 (0.8)	49 (0.9)	30 (0.8)
Ireland	65 (0.7)	70 (0.6)	58 (0.7)
Israel	56 (0.6)	63 (0.6)	48 (0.6)
Italy	55 (0.6)	63 (0.6)	46 (0.6)
Norway (5)	65 (0.6)	71 (0.5)	58 (0.7)
Portugal	52 (0.6)	60 (0.6)	43 (0.6)
Singapore	70 (0.7)	76 (0.7)	62 (0.8)
Slovenia	53 (0.5)	60 (0.5)	44 (0.5)
Sweden	63 (0.6)	69 (0.6)	54 (0.7)
United Arab Emirates	41 (0.5)	48 (0.5)	33 (0.5)
United States	62 (0.7)	67 (0.6)	56 (0.7)
International Avg.	57 (0.2)	64 (0.2)	49 (0.2)
Benchmarking Participants			
Abu Dhabi, UAE	34 (0.8)	40 (0.9)	26 (0.8)
Dubai, UAE	55 (0.3)	61 (0.4)	47 (0.3)

SOURCE: IEA's Progress in International Reading Literacy Study – PIRLS 2016

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

Appendix D.1: Percentiles of Online Informational Reading Achievement

Note: Results based on students who participated in both PIRLS and ePIRLS.

Country	5th Percentile	10th Percentile	25th Percentile	50th Percentile	75th Percentile	90th Percentile	95th Percentile
Canada	411 (5.8)	444 (5.3)	497 (4.6)	549 (3.6)	595 (3.0)	632 (3.5)	655 (4.9)
Chinese Taipei	424 (5.4)	457 (3.9)	508 (2.7)	552 (2.0)	591 (2.7)	624 (2.6)	642 (3.1)
Denmark	445 (6.8)	472 (3.8)	515 (3.0)	563 (3.2)	604 (3.4)	640 (3.2)	659 (3.8)
Georgia	349 (6.5)	380 (6.4)	430 (4.2)	482 (4.2)	530 (3.8)	567 (4.0)	587 (3.1)
Ireland	441 (7.7)	477 (5.6)	525 (3.4)	573 (2.6)	616 (2.9)	650 (2.7)	670 (4.9)
Israel	386 (7.9)	424 (5.8)	485 (4.2)	545 (2.4)	595 (2.2)	634 (3.7)	655 (3.8)
Italy	425 (4.7)	452 (3.9)	493 (3.0)	536 (2.4)	576 (2.0)	609 (2.9)	628 (3.5)
Norway (5)	459 (5.4)	485 (3.9)	528 (3.6)	571 (2.5)	610 (2.6)	645 (3.1)	665 (3.9)
Portugal	414 (4.7)	438 (3.4)	480 (2.8)	525 (2.4)	567 (2.0)	602 (2.7)	622 (3.8)
Singapore	447 (7.5)	486 (6.0)	541 (3.7)	596 (3.3)	643 (3.3)	681 (2.9)	702 (4.2)
Slovenia	402 (5.3)	433 (3.6)	482 (2.7)	531 (2.4)	573 (2.4)	606 (2.8)	627 (2.3)
Sweden	440 (5.9)	473 (3.7)	520 (3.3)	565 (2.5)	604 (2.5)	637 (2.9)	657 (2.4)
United Arab Emirates	291 (5.0)	327 (4.0)	398 (3.2)	476 (3.1)	542 (2.7)	595 (2.5)	625 (2.4)
United States	426 (5.4)	458 (4.3)	510 (3.7)	562 (3.1)	608 (3.1)	647 (2.6)	669 (3.7)
Benchmarking Participants							
Abu Dhabi, UAE	261 (5.2)	294 (6.1)	356 (6.2)	434 (5.0)	506 (4.7)	568 (6.2)	600 (5.5)
Dubai, UAE	360 (4.4)	407 (3.6)	475 (3.1)	538 (1.6)	590 (2.0)	633 (1.8)	657 (2.3)

SOURCE: IEA's Progress in International Reading Literacy Study – PIRLS 2016

Note: Percentiles are defined in terms of percentages of students at or below a point on the scale.
( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

Appendix D.2: Standard Deviations of Online Informational Reading Achievement

Note: Results based on students who participated in both PIRLS and ePIRLS.

Country	Overall		Girls		Boys	
	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
Canada	543 (3.2)	74 (1.6)	547 (3.7)	74 (2.2)	539 (3.7)	75 (1.8)
Chinese Taipei	546 (2.0)	66 (1.3)	551 (2.3)	63 (1.7)	541 (2.2)	68 (1.5)
Denmark	558 (2.2)	66 (1.3)	560 (2.9)	66 (2.1)	556 (2.9)	66 (1.9)
Georgia	477 (3.3)	73 (1.6)	485 (3.2)	70 (1.7)	469 (3.8)	75 (1.9)
Ireland	567 (2.5)	71 (1.8)	572 (2.8)	68 (2.0)	561 (3.4)	72 (2.7)
Israel	536 (2.3)	82 (1.9)	542 (2.5)	77 (2.2)	530 (3.1)	86 (2.2)
Italy	532 (2.1)	62 (1.2)	534 (2.6)	59 (1.4)	531 (2.4)	64 (1.5)
Norway (5)	568 (2.2)	63 (1.2)	576 (2.6)	60 (1.7)	558 (2.9)	65 (1.7)
Portugal	522 (2.2)	63 (1.2)	524 (2.6)	63 (1.2)	521 (2.6)	64 (1.6)
Singapore	588 (3.0)	78 (2.1)	599 (3.2)	74 (2.1)	578 (3.3)	80 (2.5)
Slovenia	525 (1.9)	68 (1.2)	532 (2.5)	65 (2.0)	518 (2.5)	70 (1.3)
Sweden	559 (2.3)	65 (1.1)	567 (2.6)	64 (1.3)	552 (2.7)	65 (1.7)
United Arab Emirates	468 (2.2)	101 (1.4)	483 (3.4)	92 (2.0)	454 (4.1)	108 (1.9)
United States	557 (2.6)	74 (1.3)	560 (2.8)	72 (1.5)	554 (3.1)	76 (1.7)
Benchmarking Participants						
Abu Dhabi, UAE	431 (4.1)	103 (2.5)	451 (6.6)	97 (3.0)	414 (6.5)	106 (2.9)
Dubai, UAE	528 (1.6)	89 (1.2)	534 (2.7)	84 (1.9)	522 (2.8)	93 (2.3)

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

SOURCE: IEA's Progress in International Reading Literacy Study – PIRLS 2016

APPENDIX E

Organizations and Individuals Responsible for ePIRLS 2016

Introduction

PIRLS (Progress in International Reading Literacy Study) is a collaborative effort involving hundreds of individuals around the world. This appendix acknowledges the individuals and organizations who contributed to the assessment. Given that work on PIRLS 2016 has spanned approximately five years and has involved so many people and organizations, this list may not include all who contributed. Any omission is inadvertent. PIRLS 2016 also acknowledges the students, parents, teachers, and school principals who contributed their time and effort to the study. It would not be possible without them.

Management and Coordination

PIRLS is a major undertaking of IEA, and together with TIMSS (Trends in International Math and Science Study), comprises the core of IEA's regular cycles of studies. The PIRLS assessment at the fourth grade complements TIMSS, which regularly assesses science and math achievement at the fourth and eighth grades.

PIRLS was conducted by IEA's TIMSS & PIRLS International Study Center at Boston College, which has responsibility for the overall direction and management of the TIMSS and PIRLS projects, including design, development, and implementation. Headed by Executive Directors Drs. Ina V.S. Mullis and Michael O. Martin, the study center is located in the Lynch School of Education. In carrying out the project, the TIMSS & PIRLS International Study Center worked closely with IEA Amsterdam, which managed country participation, was responsible for verification of all translations produced by the participating countries, and coordinated the school visits by International Quality Control Monitors. Staff at IEA Hamburg worked closely with participating countries to organize sampling and data collection operations and to check all data for accuracy and consistency within and across countries; Statistics Canada in Ottawa was responsible for school and student sampling activities; The Australian Council for Educational Research (ACER) participated in developing the ePIRLS tasks and items, and ACER and the National Foundation for Educational Research in England (NFER) participated in developing the PIRLS 2016 passages and items; and Educational

Testing Service in Princeton, New Jersey consulted on psychometric methodology, provided software for scaling the achievement data, and replicated the achievement scaling for quality assurance.

The Project Management Team, comprising the study directors and representatives from the TIMSS & PIRLS International Study Center, IEA Amsterdam and IEA Hamburg, Statistics Canada, and ETS met twice a year throughout the study to discuss the study's progress, procedures, and schedule. In addition, the study directors met with members of IEA's Technical Executive Group twice yearly to review technical issues.

To work with the international team and coordinate within-country activities, each participating country designates an individual to be the PIRLS National Research Coordinator (NRC). The NRCs have the challenging task of implementing PIRLS in their countries in accordance with the PIRLS guidelines and procedures. In addition, the NRCs provide feedback and contributions throughout the development of the PIRLS assessment. The quality of the PIRLS assessment and data depends on the work of the NRCs and their colleagues in carrying out the complex sampling, data collection, and scoring tasks involved. Continuing the tradition of exemplary work established in previous cycles of PIRLS, the PIRLS 2016 NRCs performed their many tasks with dedication, competence, energy, and goodwill.

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