

TIMSS and PIRLS in 2011

**Development Completed
– Into the Field!**

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51st IEA General Assembly

Gaborone, 4-7 October, 2010

Report in 3 Parts

Completing the Development of:

- TIMSS 2011 mathematics and science assessments
- PIRLS 2011 reading assessment
- TIMSS and PIRLS 2011 questionnaires
 - Parent, Student, Teacher, School, Curriculum

TIMSS 2011

- Mathematics and Science
- Grades 4 and 8
- Trends 1995, 1999, 2003, 2007, 2011
- Baseline for new countries

*63 countries, 14 benchmarking
participants!*

Planning to Participate



Armenia	Iran, Islamic Rep. of	Oman	United Arab Emirates
Australia	Ireland	Palestinian Nat'l Auth.	United States
Austria	Israel	Poland	Yemen
Azerbaijan	Italy	Portugal	
Bahrain	Japan	Qatar	<u>Benchmarking</u>
Belgium Fl.	Jordan	Romania	<u>Participants</u>
Botswana	Kazakhstan	Russian Federation	<i>Alberta, Canada</i>
Chile	Korea, Rep. of	Saudi Arabia	<i>Ontario, Canada</i>
Chinese Taipei	Kuwait	Serbia	<i>Quebec, Canada</i>
Czech Republic	Lebanon	Singapore	<i>Abu Dhabi, UAE</i>
Denmark	Libya	Slovak Republic	<i>Dubai, UAE</i>
England	Lithuania	Slovenia	<i>Alabama, US</i>
Finland	Malaysia	South Africa	<i>California, US</i>
Georgia	Malta	Spain	<i>Colorado, US</i>
Germany	Mongolia	Sweden	<i>Connecticut, US</i>
Ghana	Morocco	Syrian Arab Republic	<i>Florida, US</i>
Honduras	Netherlands	Thailand	<i>Indiana, US</i>
Hong Kong SAR	New Zealand	Tunisia	<i>Massachusetts, US</i>
Hungary	Northern Ireland	Turkey	<i>Minnesota, US</i>
Indonesia	Norway	Ukraine	<i>North Carolina, US</i>

63 countries, 14 benchmarking participants!

TIMSS 2011



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

Overview of TIMSS 2011 Schedule

2009 - Year of Instrument Development

2010 - Year of Field Test and Finalizing
Instruments – Southern Hemisphere

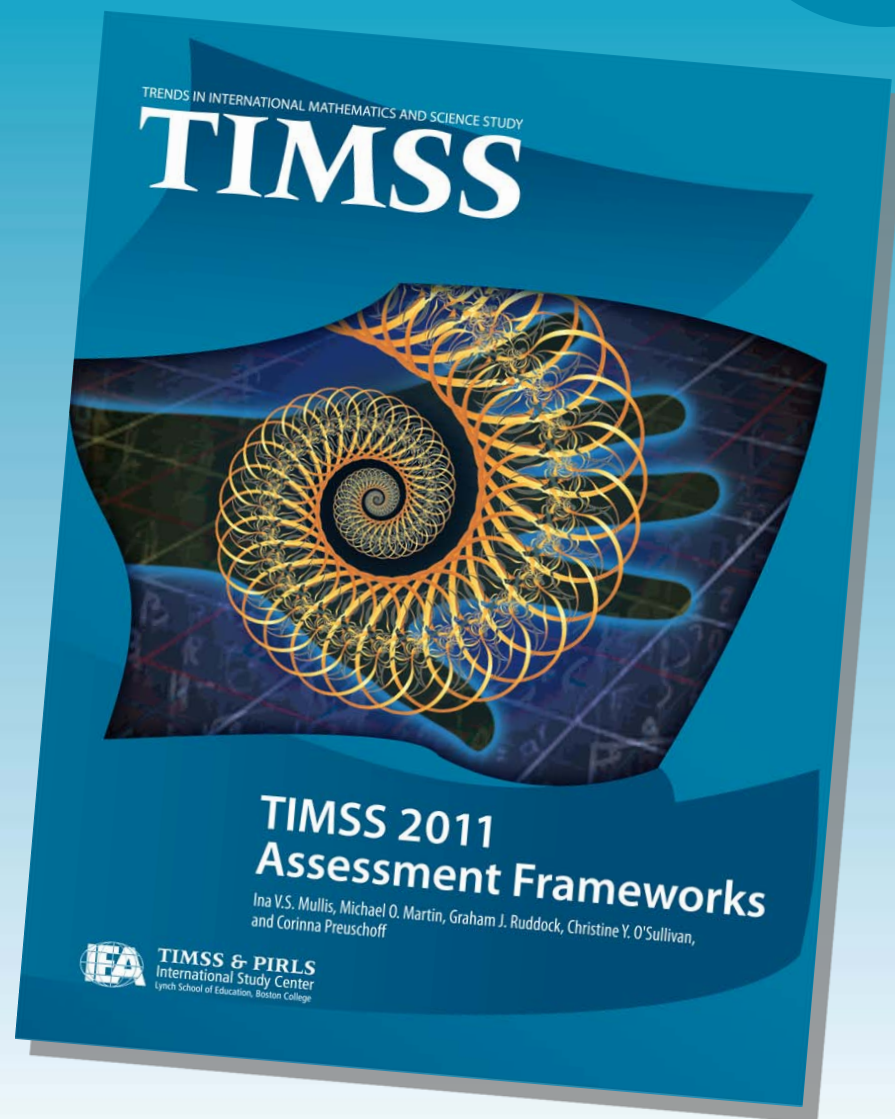
2011 - Year of Data Collection and Processing

2012 - Year of Data Analysis and Reporting

2013 - *Month* of the International Database

TIMSS 2011 Assessment Frameworks

Published,
September
2009



TIMSS 2011



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

TIMSS 2011 Item Block Design

Math Blocks	Source of Items	Science Blocks	Source of Items
M01	Trend Block from 2007	S01	Trend Block from 2007
M02	New Items for 2011	S02	New Items for 2011
M03	Trend Block from 2007	S03	Trend Block from 2007
M04	New Items for 2011	S04	New Items for 2011
M05	Trend Block from 2007	S05	Trend Block from 2007
M06	Trend Block from 2007	S06	Trend Block from 2007
M07	Trend Block from 2007	S07	Trend Block from 2007
M08	New Items for 2011	S08	New Items for 2011
M09	Trend Block from 2007	S09	Trend Block from 2007
M10	New Items for 2011	S10	New Items for 2011
M11	Trend Block from 2007	S11	Trend Block from 2007
M12	New Items for 2011	S12	New Items for 2011
M13	Trend Block from 2007	S13	Trend Block from 2007
M14	New Items for 2011	S14	New Items for 2011

TIMSS 2011 SMIRC

Mathematics Experts

- Kiril Bankov, Bulgaria
- Karen Priscilla Manriquez Riveros, Chile
- Christoph Selter, Germany
- Khattab Mohammad Ahmad Abu Libdeh, Jordan
- Bob Garden, New Zealand
- Liv Sissel Gronmo, Norway
- Fou-Lai Lin, Taiwan
- Mary Lindquist, United States
- Hung-Hsi Wu, United States

TIMSS 2011 SMIRC

Science Experts

- Martina Kekule, Czech Republic
- Jouni Viiri, Finland
- Saule Vingeliene, Lithuania
- Berenice Michels, Netherlands
- Mariam Mohammad Abdallah Ahmad, Qatar
- Gabriela Noveanu, Romania
- Galina Kovaleva, Russian Federation
- Maria Pilar Jimenez-Aleixandre, Spain
- Wolfgang Dietrich, Sweden
- Gerry Wheeler, United States

Preparing for the Field Test

Initial development steps:

- Updated Framework for 2011
 - NRC Sharm El-Sheikh, Feb 2009
- Reviewed and developed prototype items
 - SMIRC London, March 2009
- Developed field test items
 - NRC Washington, May 2009
- Reviewed field test items
 - SMIRC Amsterdam, August 2009

Preparing for the Field Test

Since last General Assembly:

- Finalized field test instruments
 - NRC Istanbul, November 2009
- Scoring training for field test
 - NRC Melbourne, March 2010
- Conducted field test to determine best items for each topic
 - NRCs, March - April 2010

Overview of TIMSS 2011 Field Test

Ambitious Field test

- Approximately 640 items - twice as many as needed
 - Grade 4: 283; Grade 8: 355
- Approximately 55 countries in field test
 - Grade 4: 46 + 5; Grade 8: 43 + 5
- Approximately 10,000 responses to each item

Solid basis for decision making!

Field-test Achievement Data Review Process

1. TIMSS & PIRLS International Study Center with Mathematics and Science Coordinators conducted initial review item statistics – June
2. SMIRC reviewed items and made recommendation for data collection - June
3. National Research Coordinators reviewed items recommended by SMIRC and approved final selection - August

TIMSS & PIRLS International Study Center Initial Review Field Test Data

- Focused on items that met the framework and performed well – the majority of the items
- Items not meeting measurement standards were eliminated (e.g., too difficult, discrimination too low)
- Some suggestions for slight revisions to items and scoring guides were made
- Assembled 24 blocks of items for SMIRC review

Considerations for Assembling Item Blocks

Balanced each block by:

- Content Domain
- Cognitive Domain
- Item Format (Constructed Response/Multiple Choice)
- Item Difficulty - Reference Group
- Coverage with trend item blocks

IEA 4th International Research Conference - Gothenburg

- PIRLS Equity Index
- Linking error in measuring trends
- Limits of measurement with low performing countries
- Curriculum coverage in TIMSS Advanced 2008
- Impact of home on gender differences in reading
- Factors influencing reading achievement in Latvia
- Global indicators of effective learning environments
- Measuring trends in TIMSS and PIRLS

SMIRC Meeting

Gothenburg - June 28-30, 2010

Reviewed item blocks and made recommendations for TIMSS 2011 mathematics and science assessments

NRC Meeting

Prague — August 8-13, 2010

Reviewed recommended item blocks and endorsed them with minor amendments

Finalized Assessment Materials

- Aug 26 TIMSS 2011 achievement booklets and questionnaires posted
- Sep 15 Translation and layout verification began
- Sep 21-24 IEA DPC conducted TIMSS & PIRLS Data Management training seminar - Hamburg
- Sep 23-24 Southern Hemisphere - International Quality Control Monitor training seminar for TIMSS and PIRLS - Amsterdam

Upcoming Schedule Highlights

2010

October-December

Southern Hemisphere

***** Data Collection *****

TIMSS 2011



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

Upcoming Schedule Highlights

2010

Nov 8-11 Southern Hemisphere – training for constructed response scoring – Wellington, New Zealand (after PIRLS)

2011

Jan 20-21 & 24-25 Northern Hemisphere Quality Control Monitor training – Amsterdam

Upcoming Schedule Highlights

2011

March-June

Northern Hemisphere

***** Data Collection *****

Upcoming Schedule Highlights

2011

- Mar 6-11 6th NRC meeting to conduct training for constructed response scoring (NH)
– Bangkok
- Apr-Nov Prepare draft exhibits for TIMSS 2011 International Reports
- *International Mathematics Report*
 - *International Science Report*
 - *TIMSS and PIRLS International Report*

Upcoming Schedule Highlights

2011

- Dec 4-9 7th NRC meeting to review individual country data and draft background data tables for International Reports – Vienna
- joint meeting with PIRLS NRCs

PIRLS 2011

- Assessment of reading comprehension
- Grade 4
 - 3rd PIRLS cycle; trends for 2006 and 2001 participants
 - Baseline data for new countries
- prePIRLS – less difficult version of PIRLS
 - To align with curricula and involve more countries

Countries Planning to Participate

Australia
Austria
Azerbaijan
Belgium (French)
Botswana
Bulgaria
Canada
Chinese Taipei
Colombia
Croatia
Czech Republic
Denmark
England
Finland
France
Georgia
Germany
Guatemala
Honduras
Hong Kong SAR
Hungary

Indonesia
Iran
Ireland
Israel
Italy
Kuwait
Libya
Lithuania
Luxembourg
Malta
Mongolia
Morocco
Netherlands
New Zealand
Northern Ireland
Norway
Oman
Poland
Portugal
Qatar
Romania

Russian Federation
Saudi Arabia
Singapore
Slovak Republic
Slovenia
South Africa
Spain
Sweden
Trinidad & Tobago
United Arab Emirates
United States

Benchmarking Participants

Alberta, Canada
Ontario, Canada
Quebec, Canada
Abu Dhabi, UAE
Dubai, UAE
Florida, US

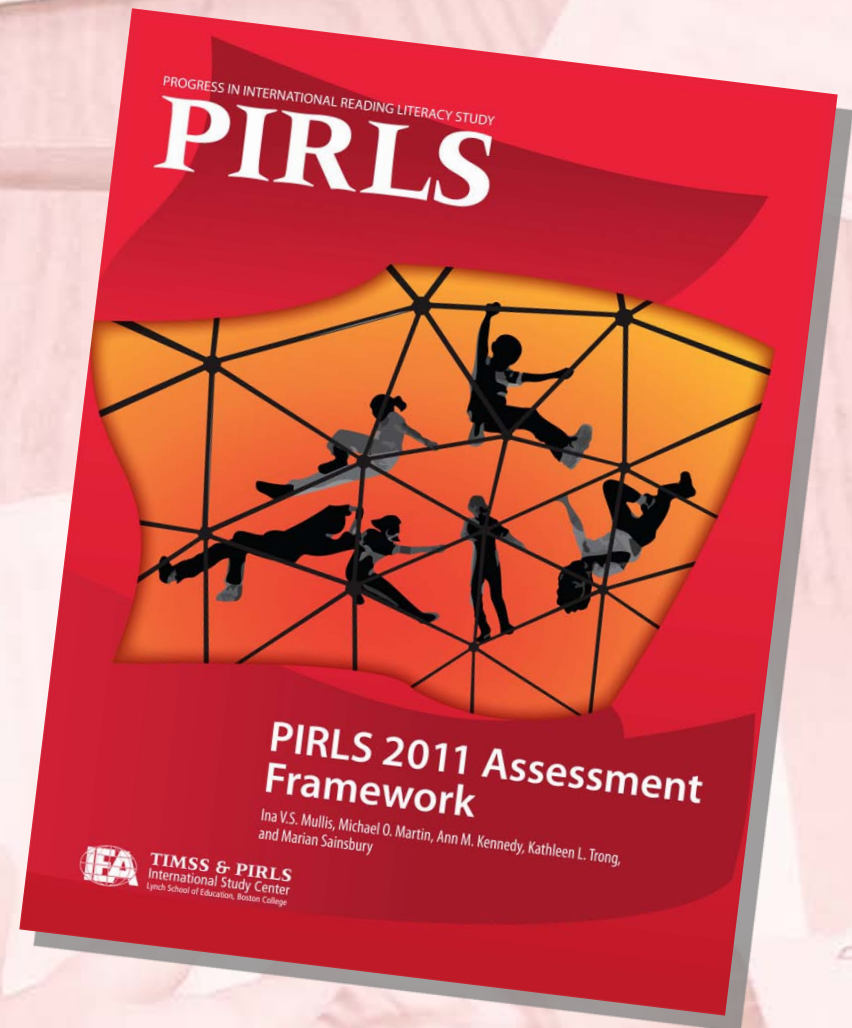
53 countries, 6 benchmarking participants!

Overview of PIRLS 2011 Schedule

- 2008 - Year of Identifying Passages
- 2009 - Year of Instrument Development
- 2010 - Year of Field Test and Finalizing Instruments – Southern Hemisphere
- 2011 - Year of Data Collection and Processing
- 2012 - Year of Data Analysis and Reporting
- 2013 - *Month* of the International Database

PIRLS 2011 Assessment Framework

Published,
August 2009



PIRLS 2011 Assessment

Literary Passages	Informational Passages
Trend Passage from 2001	Trend Passage from 2001
Trend Passage from 2006	Trend Passage from 2006
Trend Passage from 2006	Trend Passage from 2006
New Passage for 2011	New Passage for 2011
New Passage for 2011	New Passage for 2011

prePIRLS 2011 Assessment

Literary Passages	Informational Passages
New Passage for 2011	New Passage for 2011
New Passage for 2011	New Passage for 2011
New Passage for 2011	New Passage for 2011
New Passage for 2011	New Passage for 2011

RDG (Reading Development Group)

Jan Mejding (Denmark)

Sue Horner (England)

Elinor Saigh-Haddad (Israel)

Pierre Reding (Luxembourg)

Galina Zuckerman (Russian Federation)

Elizabeth Pang (Singapore)

Caroline Liberg (Sweden)

Elois Scott (United States)

Fatma Noorani (Oman)

Preparing for the Field Test

Initial development steps

- Updated Framework for 2011
 - NRC, Madrid, Feb 2008
- Reviewed framework and passages
 - RDG meeting, Amsterdam, Jul 2008
- Selected field-test passages; developed items
 - NRC meeting, Amsterdam, Nov 2008
- Reviewed field test items
 - RDG meeting, Singapore, Mar 2009

Preparing for the Field Test

- Finalized field test instruments
 - NRC Vilnius, Jun 2009

Since last General Assembly:

- Scoring training for field test
 - NRC London, Feb 2010
- Conducted field test to determine best passages for 2011
 - NRCs, Mar–Apr 2010

Field Test – March-April 2010

- 46 countries, 4 benchmarking participants
- Achievement data from 51,000 students
 - 125 PIRLS reading items; 8 reading passages
 - 152 prePIRLS reading items; 10 reading passages
- \approx 10,000 student responses to each item

Firm foundation for decision making!

Field-test Achievement Data Review Process

1. TIMSS & PIRLS International Study Center conducted initial review of item statistics
2. RDG reviewed and made recommendations for data collection
3. National Research Coordinators reviewed assessment blocks recommended by RDG and made final selection

TIMSS & PIRLS International Study Center Initial Review Field Test Data – June 2010

- Based on available data
 - 40 PIRLS countries
 - 2 prePIRLS countries (Botswana and Colombia)
- Focused on passages and items with good psychometric properties
- Two passages eliminated from further review - not meeting measurement standards (e.g., too difficult, too few high quality items)

RDG Meeting

Moscow - June 23-25, 2010

Reviewed PIRLS and prePIRLS passages and items and made recommendations for the 2011 reading assessments

NRC Meeting

Zagreb – July 18-23, 2010

Reviewed recommended passages and items and endorsed them with minor amendments

Finalized Assessment Materials

- Aug 12 PIRLS and prePIRLS 2011 achievement booklets posted
- Sep 15 Translation and layout verification began
- Sep 21-24 IEA DPC conducted TIMSS & PIRLS Data Management training seminar - Hamburg
- Sep 23-24 Southern Hemisphere - International Quality Control Monitor training seminar for TIMSS and PIRLS - Amsterdam

Upcoming Schedule Highlights

2010

October-December

Southern Hemisphere

***** Data Collection *****

Upcoming Schedule Highlights

2010

Nov 3-5 Southern Hemisphere training for constructed response scoring – Wellington, New Zealand (PIRLS - then TIMSS)

2011

Jan 20-21 & 24-25 Northern Hemisphere Quality Control Monitor training – Amsterdam

Feb 13-18 6th NRC meeting to conduct training for constructed response scoring (NH) – Rome

Upcoming Schedule Highlights

2011

March-June

Northern Hemisphere

***** Data Collection *****

Upcoming Schedule Highlights

2011

- Apr-Nov Prepare draft exhibits for PIRLS 2011 International Reports
- *PIRLS 2011 International Report*
 - *TIMSS and PIRLS International Report*
- Dec 4-9 7th NRC meeting to review individual country data and draft background data tables for International Report – Vienna
- joint meeting with TIMSS NRCs

A background image showing a student with long dark hair, wearing a white shirt, sitting at a desk and reading a book. The image is faded and serves as a backdrop for the title text.

TIMSS and PIRLS 2011

Questionnaires

TIMSS and PIRLS Participation – Grade 4

Australia
Austria
Azerbaijan
Botswana
Chinese Taipei
Czech Republic
Denmark
England
Finland
Georgia
Germany
Honduras
Hong Kong SAR
Hungary
Iran
Ireland
Italy
Kuwait
Lithuania
Malta

Mongolia
Morocco
Netherlands
New Zealand
Northern Ireland
Norway
Oman
Poland
Portugal
Qatar
Romania
Russian Federation
Saudi Arabia
Singapore
Slovak Republic
Slovenia
Spain
Sweden
United Arab Emirates
United States

Benchmarking
Participants
Alberta, Canada
Ontario, Canada
Quebec, Canada
Abu Dhabi, UAE
Dubai, UAE
Florida, US

40 countries, 6 benchmarking participants!

Approach for 2011

- Central organizing strategy: **joint effort** at fourth grade
- Same students for TIMSS and PIRLS in most countries
- Also need to address
 - PIRLS/prePIRLS only
 - TIMSS only
 - TIMSS eighth grade

Historical Perspective - Same Overarching Contextual Framework

TIMSS 2011

- National and Community Contexts
- School Contexts
- Classroom Contexts
- Student Characteristics and Attitudes

PIRLS 2011

- National and Community Contexts
- Home Contexts
- School Contexts
- Classroom Contexts
- Student Behaviors and Attitudes

Questionnaire Item Review Committee (QIRC)

Sue Thomson, Australia

Josef Basl, Czech Republic

Naima Hassan, Egypt

Linda Sturman, England

Wilfried Bos, Germany

Clara Anumel, Ghana

Frederick Leung, Hong Kong SAR

Martina Meelissen, Netherlands

Barbara Japelj, Slovenia

Peter Nystrom, Sweden

Patrick Gonzales, United States

Questionnaire Development Group (QDG)

Hwawei Ko (Chinese Taipei)

Jasminka Buljan Culej (Croatia)

Marc Colmant (France)

Knut Schwippert (Germany)

Megan Chamberlain (New Zealand)

Ragnar Solheim (Norway)

Abdessalem Bouslama (Qatar)

Sarah Howie (South Africa)

Valena Plisko (United States)

Enormous Effort to Improve Background Data

First QIRC/QDG joint meeting - Munich April 2009

Focused on **effective** contexts for teaching and learning

- Home and school factors related to achievement
- Concentrated on developing new scales
 - e.g., home numeracy activities, student engagement, principal leadership style, teacher career satisfaction
- NRCs reviewed at TIMSS and PIRLS meetings

The Field Test Instruments

Fourth grade – TIMSS and PIRLS

- Home questionnaire - same
- Student questionnaire
 - General, reading, mathematics, science
- School questionnaire - same
- Teacher questionnaire
 - General, reading, mathematics, science

Eighth grade - TIMSS

- Same as previous assessments

Field Test Data - Countries

Fourth grade

- TIMSS and PIRLS: 30 countries + 2 benchmarks
- TIMSS: 46 countries + 5 benchmarks
- PIRLS/prePIRLS : 46 countries + 5 benchmarks

Eighth grade

- TIMSS: 43 countries + 5 benchmarks

Data for Review

All questionnaire items individually:

- Country-by-country almanacs

New for 2011!

Data on scales for reporting questionnaire data:

- Properties of each proposed scale
 - Factor structure
 - Reliability
 - Relationship with achievement (R, M, S)

Process for Creating Scales

- Iterative process of analysis:
 - Factor analyses and reliability estimates for these scales
 - Distribution of scale values
 - Relationship with achievement
- Initial review by TIMSS & PIRLS International Study Center

Criteria for Evaluating Scales

- At least six items per scale
- Unidimensional (about 50% shared variance)
- Good reliability (0.7 Cronbach's Alpha)
- Strong item-scale correlation (0.5 factor loading)
- Positive relationship with achievement (achievement difference between quartiles)
- Consideration for TIMSS/PIRLS report

2011 Questionnaire Review

July 14-16, 2010

Joint QIRC/QDG meeting, Dubrovnik

July 18-23, 2010

PIRLS NRC meeting, Zagreb

August 8-13, 2010

TIMSS NRC meeting, Prague

Aug 26, 2010

Posted questionnaires for data collection

Background Questionnaire Scales

4th grade

- Home Questionnaire – 8
- Student Questionnaire – 11
- School Questionnaire – 8
- Teacher Questionnaire – 10

8th grade

- Student Questionnaire – 9
- School Questionnaire – 6
- Teacher Questionnaire – 18 (Math/Science)

Factors addressed by Background Questionnaire Scales

- Home environment supportive of learning
- Principals' reports of school climate and resources
- Teachers' reports of school working and learning environment
- Teachers' efforts to motivate students
- Teachers' coverage of the curriculum
- Students' motivation to learn
 - Self-confidence, engagement, attitudes

TIMSS and PIRLS - Issues and Analyses

- Relative effectiveness of countries' schooling policies and practices in reading, mathematics, and science
- Impact of reading proficiency on achievement in mathematics and science
- Profiles of high achieving students in reading, mathematics, and science
- Relative equity issues in reading, mathematics, and science – gender, language, social background

TIMSS and PIRLS in 2011

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