TIMSS and PIRLS 2011

Progress Report

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Executive Directors
TIMSS & PIRLS International Study Center
Boston College

52nd IEA General Assembly
October 2011, Dublin

Since last General Assembly…

Two major accomplishments:

- **Data Collection completed**
  - Southern Hemisphere: Oct-Dec
  - Northern Hemisphere: March-June
- **International Reports underway**

TIMSS 4th Grade - Participants

Armenia
Australia
Austria
Azerbaijan
Bahrain
Belgium Fl.
Botswana
Chile
Chinese Taipei
Croatia
Czech Republic
Denmark
England
Finland
Georgia
Germany
Honduras
Hong Kong SAR
Hungary
Iran, Islamic Rep. of
Ireland
Italy
Japan
Kazakhstan
Korea, Rep. of
Kuwait
Lithuania
Malta
Morocco
Netherlands
New Zealand
Northern Ireland
Norway
Oman
Poland
Portugal
Qatar
Romania
Russian Federation
Saudi Arabia
Serbia
Singapore
Slovak Republic
Slovenia
Spain
Sweden
Thailand
Tunisia
Turkey
United Arab Emirates
United States
Yemen

Benchmarking Participants

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

TIMSS 8th Grade - Participants

Armenia
Australia
Bahrain
Botswana
Chile
Chinese Taipei
England
Finland
Georgia
Ghana
Honduras
Hong Kong SAR
Hungary
Indonesia
Iran, Islamic Rep.
Israel
Italy
Japan
Jordan
Kazakhstan
Korea, Rep. of
Lebanon
Lithuania
Macedonia
Malaysia
Morocco
New Zealand
Norway
Oman
Palestinian Nat'l Auth.
Qatar
Romania
Russian Federation
Saudi Arabia
Singapore
Slovenia
South Africa
Sweden
Syrian Arab Republic
Thailand
Tunisia
Turkey
Ukraine
United Arab Emirates
United States

Benchmarking Participants

Alberta, Canada
Ontario, Canada
Quebec, Canada
Abu Dhabi, UAE
Dubai, UAE
Alabama, US
California, US
Colorado, US
Connecticut, US
Florida, US
Indiana, US
Massachusetts, US
Minnesota, US
North Carolina, US

PIRLS 4th Grade - Participants

Australia
Austria
Azerbaijan
Belgium (French)
Botswana *prePIRLS*
Bulgaria
Canada
Chinese Taipei
Colombia *also prePIRLS*
Croatia
Czech Republic
Denmark
England
Finland
France
Georgia
Germany
Honduras
Hong Kong SAR
Hungary
Indonesia
Iran
Ireland
Israel
Italy
Kuwait
Lithuania
Malta
Morocco
Netherlands
New Zealand
Northern Ireland
Norway
Oman
Poland
Portugal
Qatar
Romania
Russian Federation
Saudi Arabia
Singapore
Slovak Republic
Slovenia
South Africa *prePIRLS*
Spain
Sweden
Trinidad & Tobago
United Arab Emirates
United States

Benchmarking Participants

Alberta, Canada
Ontario, Canada
Quebec, Canada
Maltese – Malta
Eng/Afr – RSA (5th)
Andalusia, Spain
Abu Dhabi, UAE
Dubai, UAE
Florida, USA

Data Collection Activities

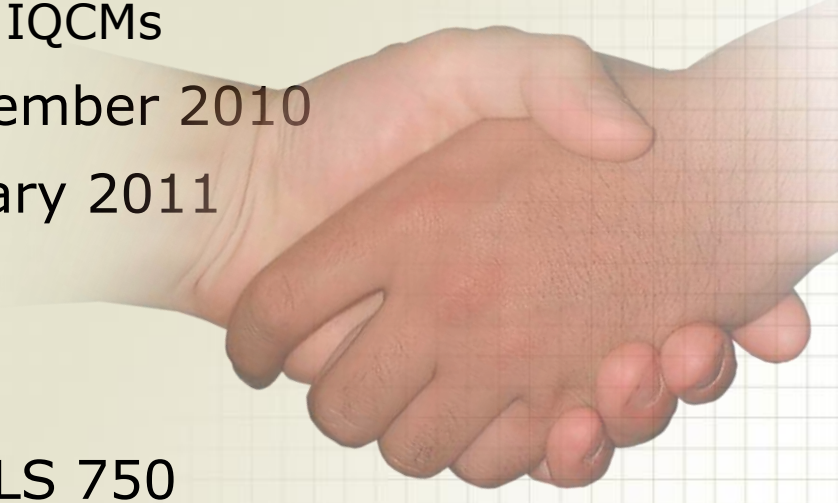
- Translation and translation verification
  - 215 sets of achievement materials
  - 170 sets of background questionnaires
  - 58 languages
- Layout verification
  - 215 sets of achievement booklets
  - 104 sets of background questionnaires

Data Collection Activities

- Scoring training
  - Southern Hemisphere
    - Wellington, New Zealand, Nov 2010
  - Northern Hemisphere
    - PIRLS – Rome, Italy, Feb 2011
    - TIMSS – Bangkok, Thailand, Mar 2011
- Operations manuals and software distributed

International Quality Assurance

- Training for International Quality Control Monitors
  - IEA Secretariat, Amsterdam
    - TIMSS 97 IQCMs; PIRLS 55 IQCMs
  - Southern Hemisphere: September 2010
  - Northern Hemisphere: January 2011
    - 2 training sessions
- Sessions observed
  - TIMSS 4th 800; 8th 700; PIRLS 750



Data Processing

- Data submitted to IEA DPC
  - Southern Hemisphere Feb 2011
  - Northern Hemisphere Aug 2011
- Quality checks for 205 assessment populations
  - 150 populations completed and sent to TIMSS & PIRLS International Study Center

Schedule for International Reports

TIMSS and PIRLS 2011 Encyclopedias

- October 2012

TIMSS and PIRLS 2011 International Reports

- December 2012

Methods and Procedures (Technical Report)

- Ongoing now through December 2012

TIMSS and PIRLS International Databases

- February 2013

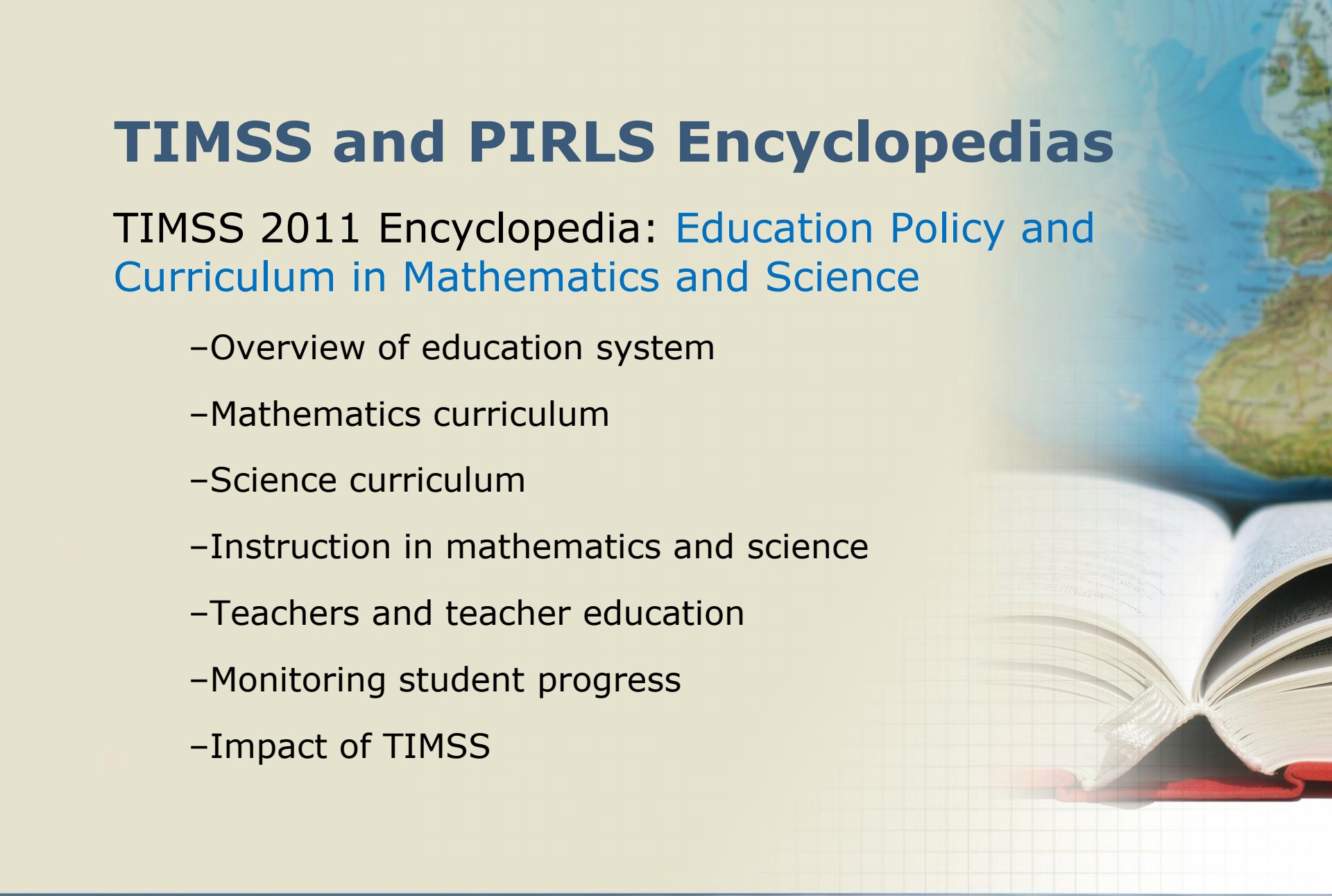
TIMSS and PIRLS Relationships Report

- October 2013

TIMSS and PIRLS Encyclopedias

TIMSS 2011 Encyclopedia: Education Policy and Curriculum in Mathematics and Science

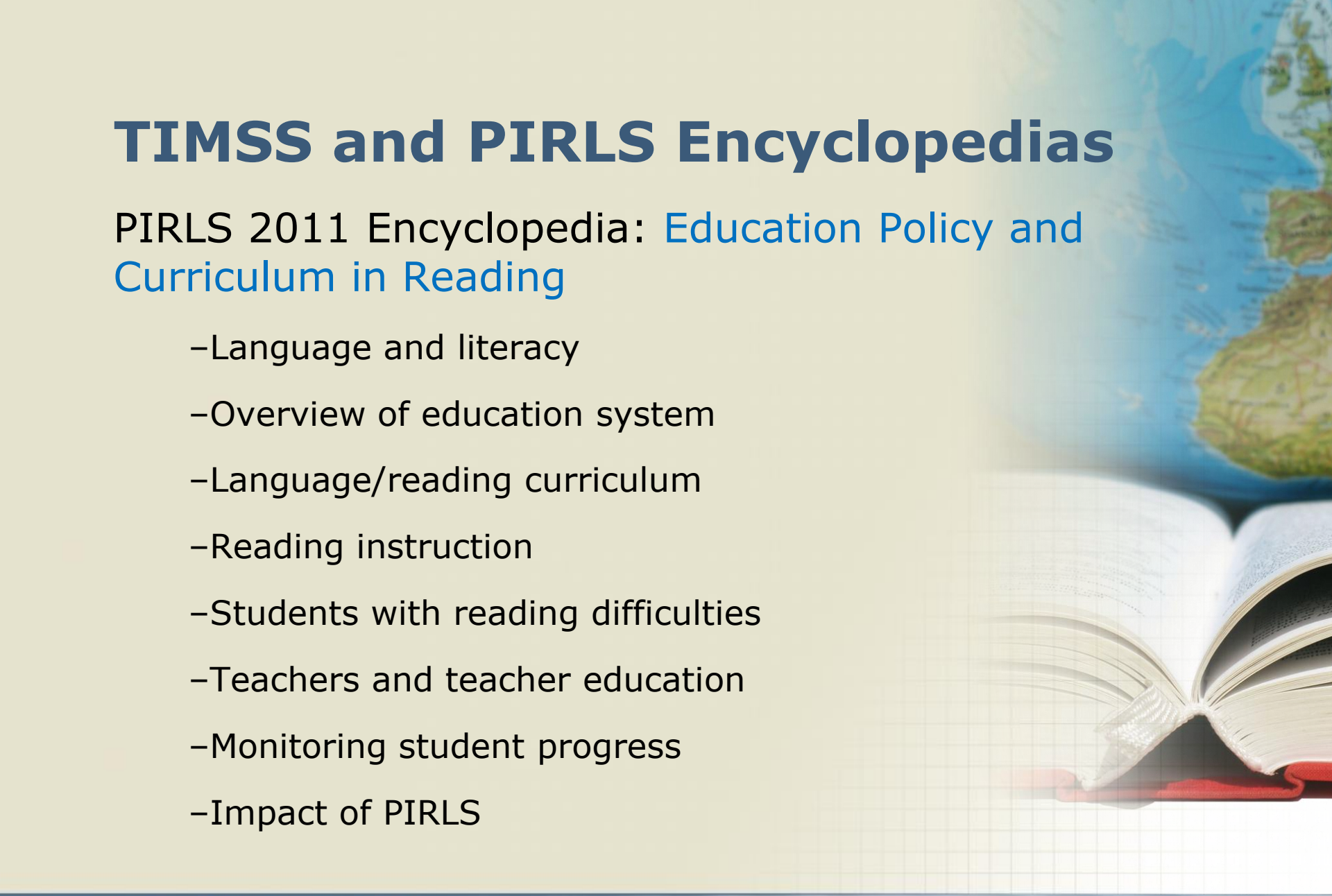
- Overview of education system
- Mathematics curriculum
- Science curriculum
- Instruction in mathematics and science
- Teachers and teacher education
- Monitoring student progress
- Impact of TIMSS



TIMSS and PIRLS Encyclopedias

PIRLS 2011 Encyclopedia: Education Policy and Curriculum in Reading

- Language and literacy
- Overview of education system
- Language/reading curriculum
- Reading instruction
- Students with reading difficulties
- Teachers and teacher education
- Monitoring student progress
- Impact of PIRLS

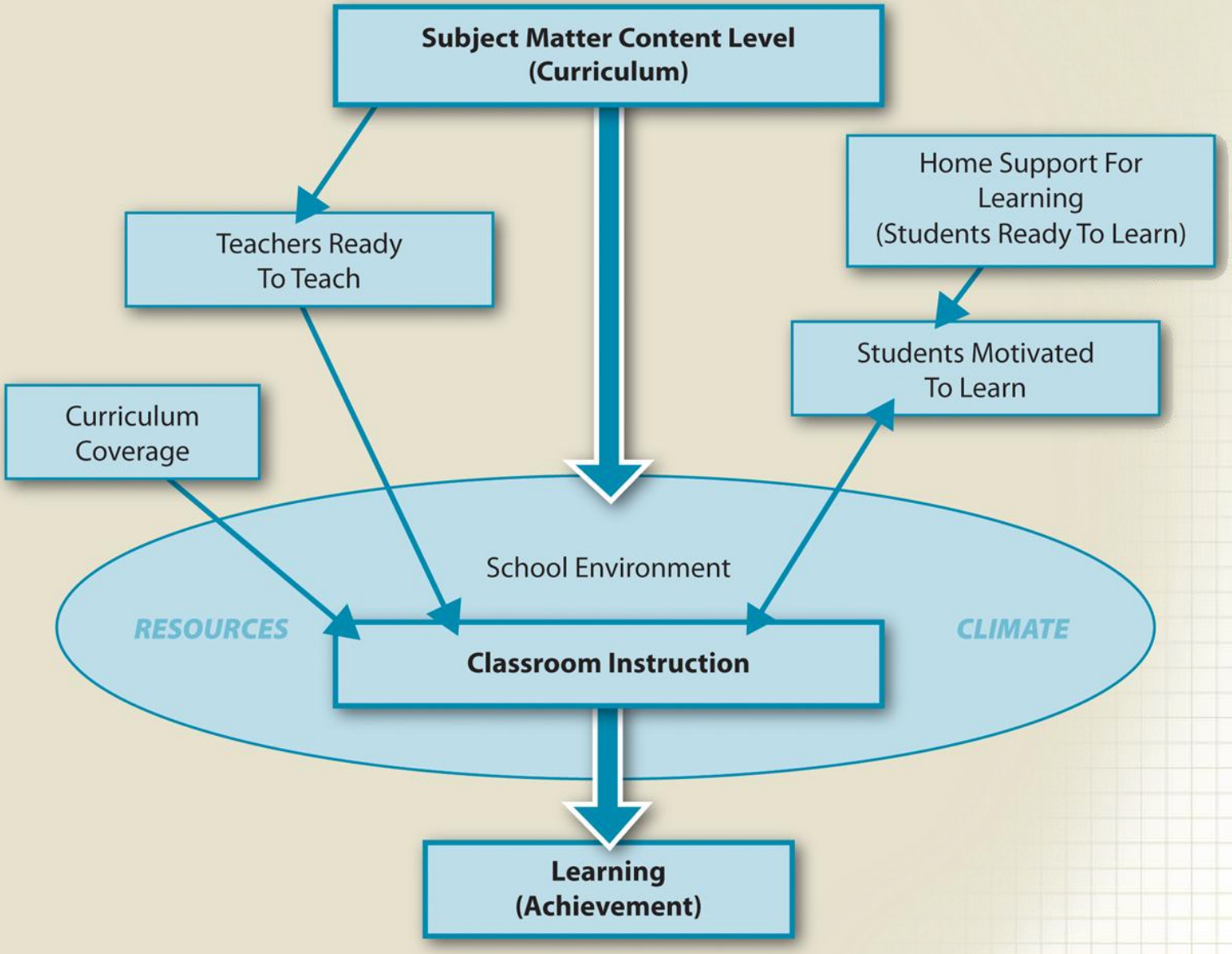


TIMSS and PIRLS 2011 International Reports

Similar to previous reports, but with enhancements

- PIRLS 2011 International Reading Report
- TIMSS 2011 International Mathematics Report
  - Fourth and eighth grades
- TIMSS 2011 International Science Report
  - Fourth and eighth grades

Framing the TIMSS and PIRLS 2011 International Reports



NEW! Context Questionnaire Scales

- Advance conceptually and empirically
- IRT scales of home, school, and classroom environments for learning
  - e.g., Home Resources for Learning, Teacher Career Satisfaction, Students Confident in Learning Mathematics, and Teachers Engage Students
- TIMSS and PIRLS International Reports include about 18 context questionnaire scales per subject per grade

Interpreting the Context Questionnaire Scales

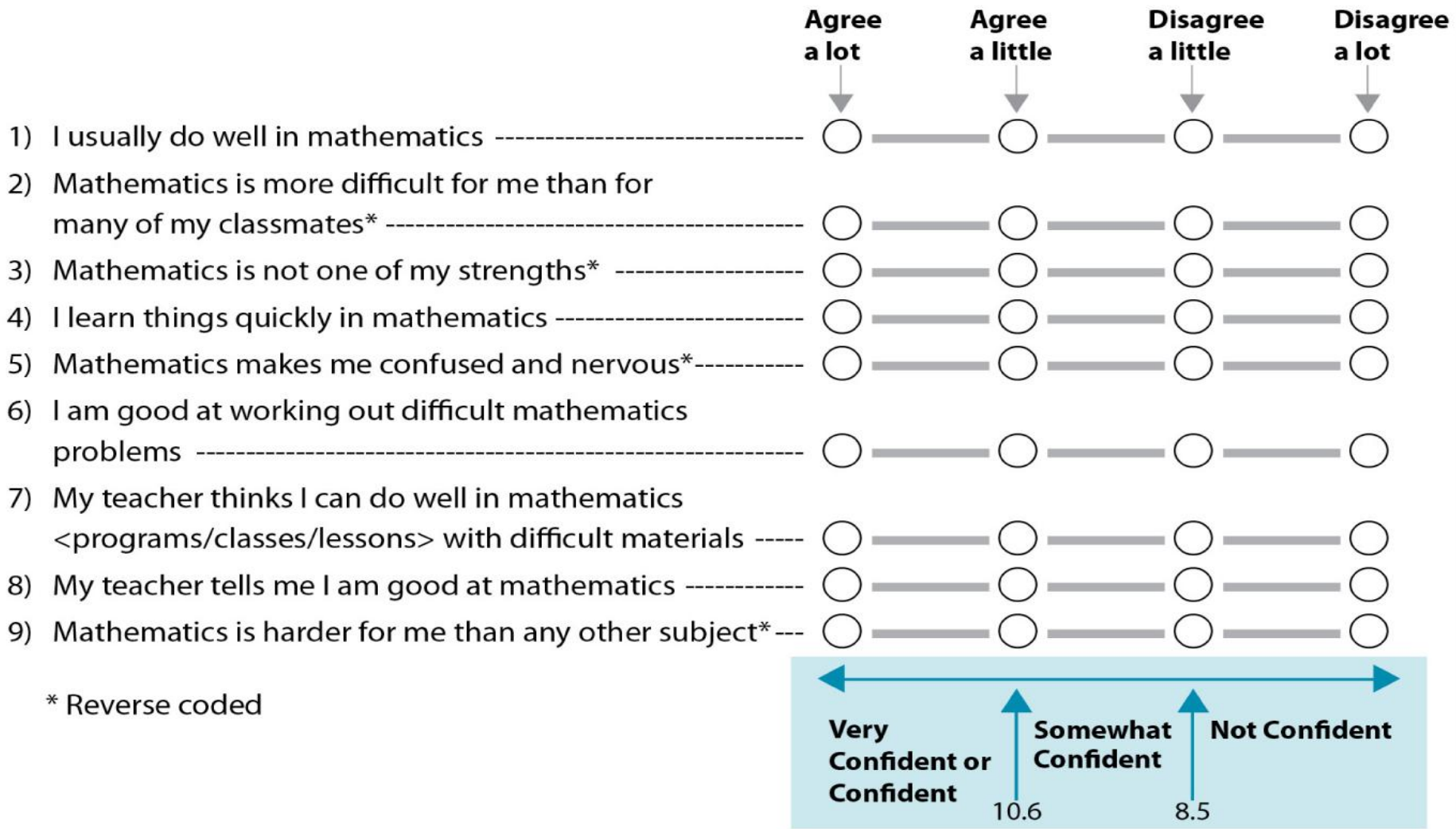
- As companion to International Achievement Benchmarks, defined high, medium, and low regions on each scale
- New procedure to establish cut points for regions
- Scales mostly based on Likert scale items
  - Agree a lot, Agree, Disagree, Disagree a lot

Procedure for Establishing Cutpoints

- Cutpoints chosen to correspond to response categories
  - High category: the point on the IRT scale corresponding to "Agree," on average
  - Low category: the point on the IRT scale corresponding to "Disagree," on average
- Scale score equivalents of raw scores corresponding to agreeing, on average, and disagreeing, on average

Students Confident in Learning Mathematics (SCM)

How much do you agree with these statements about mathematics?



* Reverse coded

Exhibit 8.5: Students Confident in Learning Mathematics (SCM)

The SCM scale summarizes students' responses to the nine questions shown on the next page. Students who were **Very Confident or Confident** in learning mathematics had a score of at least 10.6, which is the point on the scale corresponding to agreeing a little across the nine statements, on average. Students who were **Not Confident** in learning mathematics had scores no higher than 8.5, which is the point on the scale corresponding to disagreeing a little across the nine statements, on average. All other students were categorized as **Somewhat Confident** in learning mathematics.

Country	Very Confident or Confident		Somewhat Confident		Not Confident		Average SCM Scale Score
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Country 1	42 (0.9)	558 (3.6)	42 (0.8)	473 (3.0)	16 (0.7)	428 (4.6)	10.4 (0.05)
Country 2	40 (1.3)	542 (5.1)	50 (1.1)	475 (3.6)	10 (0.6)	461 (4.4)	10.5 (0.06)
Country 3	40 (1.0)	546 (3.1)	54 (0.9)	474 (2.3)	7 (0.4)	464 (4.6)	10.6 (0.04)
Country 4	37 (1.5)	542 (5.3)	53 (1.0)	476 (3.0)	11 (0.8)	481 (5.0)	10.4 (0.07)
Country 5	36 (0.8)	541 (2.7)	58 (0.7)	479 (1.9)	6 (0.3)	472 (5.2)	10.5 (0.03)
Country 6	34 (1.1)	548 (6.8)	51 (0.9)	477 (2.4)	15 (0.7)	471 (3.4)	10.2 (0.05)
Country 7	33 (1.0)	548 (3.5)	58 (0.8)	479 (2.5)	9 (0.5)	470 (3.3)	10.3 (0.04)
Country 8	32 (1.1)	560 (6.1)	49 (0.8)	483 (3.5)	19 (0.8)	450 (3.8)	10.0 (0.05)
Country 9	30 (0.9)	571 (4.6)	42 (0.7)	483 (4.0)	28 (0.8)	450 (3.8)	9.8 (0.05)
Country 10	30 (0.7)	546 (4.2)	49 (0.7)	491 (4.6)	21 (0.6)	455 (4.2)	9.9 (0.03)
Country 11	29 (0.9)	568 (4.1)	49 (0.8)	483 (2.9)	23 (0.9)	453 (3.0)	9.8 (0.05)
Country 12	26 (0.9)	579 (5.3)	48 (0.8)	477 (2.8)	26 (0.9)	466 (2.2)	9.6 (0.05)
Country 13	24 (0.8)	568 (4.3)	48 (0.7)	486 (2.1)	28 (0.8)	467 (2.5)	9.5 (0.04)
Country 14	11 (0.7)	572 (8.6)	64 (1.0)	493 (4.7)	24 (1.0)	487 (5.1)	9.2 (0.03)
Country 15	9 (0.6)	578 (8.0)	71 (0.8)	492 (4.1)	19 (0.7)	493 (4.3)	9.3 (0.03)

NEW! Trends in TIMSS Content and Cognitive Domains

- Content domains – algebra, geometry, chemistry, etc.
- Cognitive domains – knowing, applying, and reasoning
- Foundation in 2007 – sufficient items
- New scaling approach in 2011
- Trend measurement in the context of overall trend measurement

International Reports

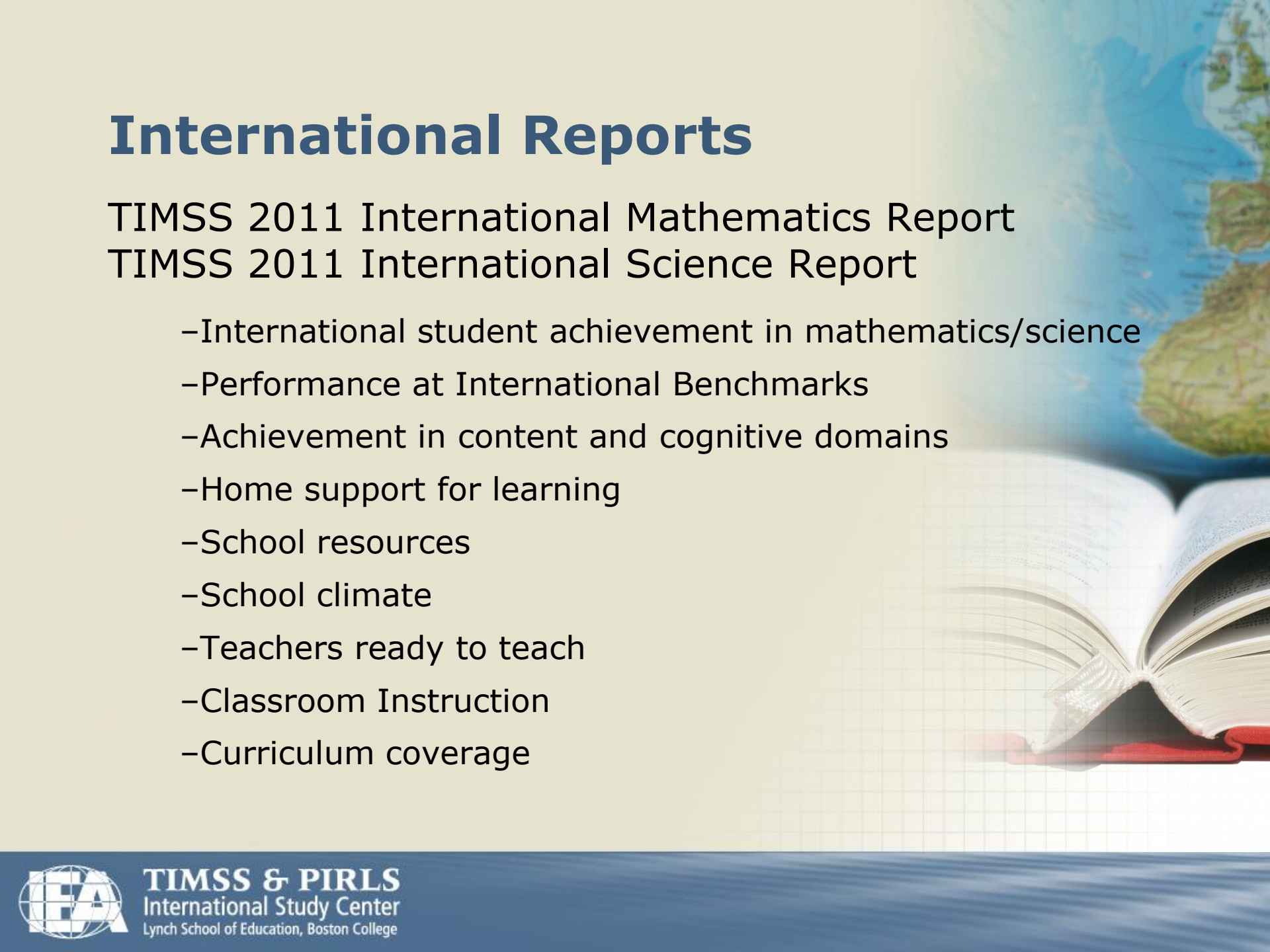
PIRLS 2011 International Reading Report: Student Learning in Relation to Curriculum, School Environment, Instruction, and Home Support

- International student achievement in reading
- Performance at International Benchmarks
- Achievement for reading purposes and processes
- Home support for learning
- School resources
- School climate
- Teachers ready to teach
- Classroom Instruction

International Reports

TIMSS 2011 International Mathematics Report
TIMSS 2011 International Science Report

- International student achievement in mathematics/science
- Performance at International Benchmarks
- Achievement in content and cognitive domains
- Home support for learning
- School resources
- School climate
- Teachers ready to teach
- Classroom Instruction
- Curriculum coverage



Methods and Procedures

New! web-based approach to Technical Report

- –Overview
- –Instrument development (*posted*)
- –Sample design and implementation
- –Translation and translation verification (*posted*)
- –Operations and quality assurance
- –Creating the International Databases
- –Scaling the achievement data
- –Constructing the context questionnaire scales

Assessing Same Students in TIMSS and PIRLS 4th Grade

Australia
Austria
Azerbaijan
Botswana
Chinese Taipei
Croatia
Czech Republic
Finland
Georgia
Germany
Honduras
Hong Kong SAR
Hungary
Iran
Ireland
Italy
Kuwait
Lithuania
Malta
Morocco
Northern Ireland
Norway
Oman
Poland
Portugal
Qatar
Romania
Russian Federation
Saudi Arabia
Singapore
Slovak Republic
Slovenia
Spain
Sweden
United Arab Emirates

Benchmarking Participants

Quebec, Canada
Abu Dhabi, UAE
Dubai, UAE

TIMSS/PIRLS Relationships Report

TIMSS and PIRLS 2011: Relationships among Reading, Mathematics, and Science Achievement—Implications for Early Learning

- Reading, mathematics, and science analyses conducted with same students – controlling extraneous factors
- Apply a variety of modeling techniques (e.g., HLM, SEM) to address important issues
- Analyses conducted country by country, to compare relationships across, as well as within, countries

TIMSS/PIRLS
Relationships Report – Issues

- Are primary schools providing a solid foundation in core subjects – reading, mathematics, and science?
  - Profiles and predictors of high-achieving students
- How do homes support literacy and numeracy?
  - Examining paths to higher achievement for boys and girls
  - Resources > activities > skills > achievement
- Are schools more effective in some subjects? What are the characteristics of effective schools in reading, mathematics, and science?
  - School effects, controlling for student home background

TIMSS/PIRLS
Relationships Report – Issues

- How does reading ability impact mathematics and science achievement?
  - Doing mathematics and science involve considerable reading and communication – reflected in the TIMSS Framework and assessment items
  - TIMSS items span a range of mathematics reading or science reading demands, from minimal to extensive
  - Implement a coding scheme to classify items into two or three reading demand levels and construct scales for each level
  - Examine relationship between reading achievement and performance on the 4-6 mathematics and science reading demand scales, overall and by gender

Joint TIMSS/PIRLS NRC Review December 2011 - Vienna, Austria

- Complete set of draft exhibits
  - TIMSS 2011 International Mathematics Report (~125)
  - TIMSS 2011 International Science Report (~125)
  - PIRLS 2011 International Reading Report (~64)
- Context questionnaire exhibits include data for review – home, school, teacher, student
- Draft Encyclopedia exhibits, with curriculum data

Joint TIMSS/PIRLS NRC Review June 2012 - Singapore

- Final drafts
  - TIMSS 2011 International Mathematics Report
  - TIMSS 2011 International Science Report
  - PIRLS 2011 International Reading Report
- Draft analyses and exhibits for TIMSS/PIRLS Relationships Report
- Confidential preview at General Assembly

Release International Reports

December 11, 2012

Thank You!

Ina V.S. Mullis and Michael O. Martin

Executive Directors
TIMSS & PIRLS International Study Center
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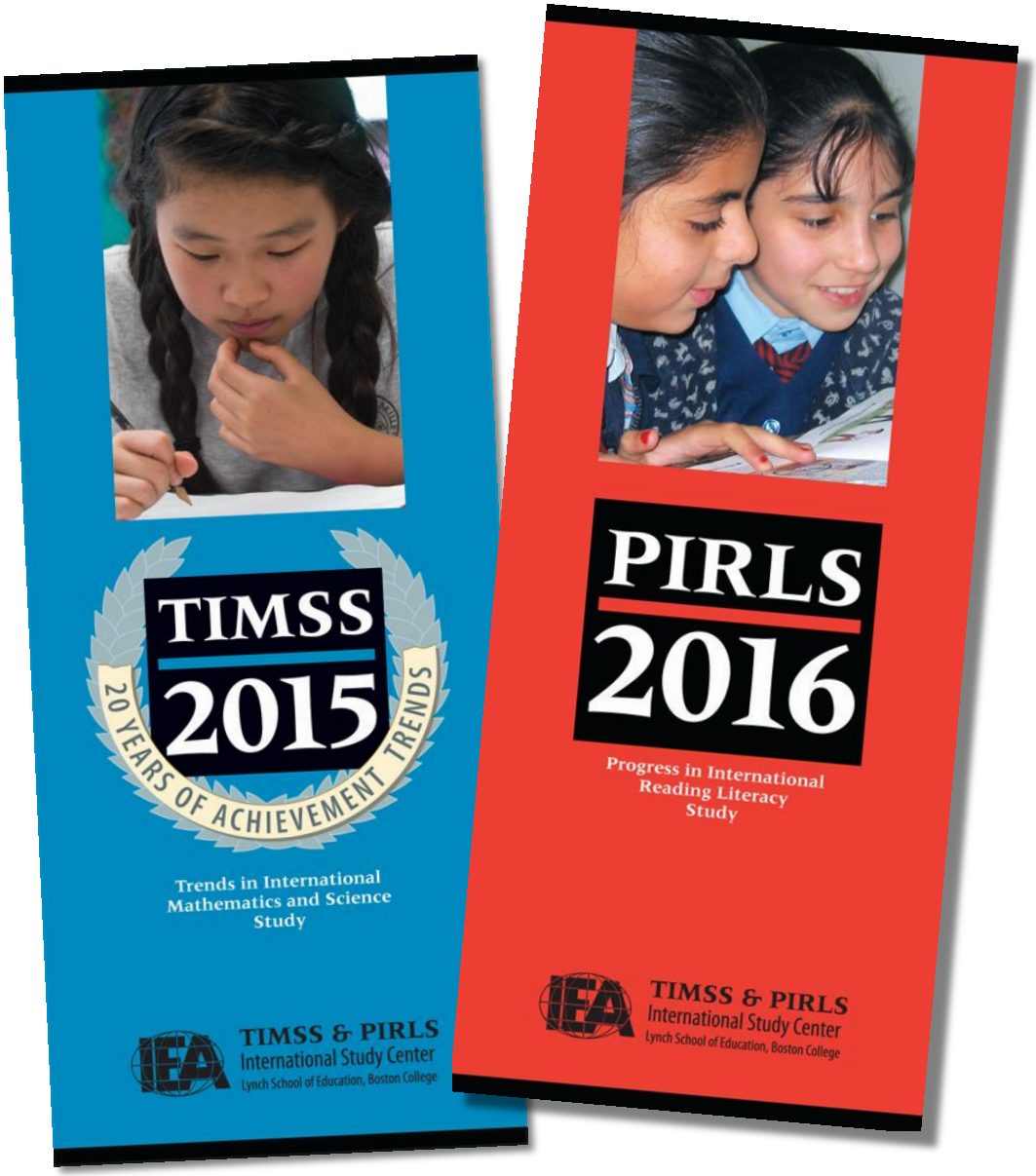
October 2011, Dublin

Announcing…

- **TIMSS 2015**
- **TIMSS Advanced 2015**
- **PIRLS 2016**
- **prePIRLS 2016**



TIMSS 2015—
20 Years of Trend Data

- Fourth and eighth grades
- Mathematics and Science
- Comprehensive frameworks
- Achievement results at International Benchmarks
- Extensive context data: curriculum, school, instruction
- Every four years since 1995

TIMSS Advanced 2015—Measuring Excellence

- Reunited with TIMSS
- Final year of secondary school
- Advanced mathematics—algebra, calculus, and geometry
- Physics—mechanics, electricity/magnetism, heat/temperature, atomic/nuclear physics
- Policy relevant data on curriculum emphasis, technology use, and teacher preparation and training

TIMSS Advanced 2015

PIRLS 2016—Assessing Reading Comprehension

- Fourth grade
- Literary and informational text
- Range of reading comprehension processes
- Achievement results at International Benchmarks
- Home supports for literacy and school environments for learning
- Every five years since 2001—15 years of trends

PIRLS 2016

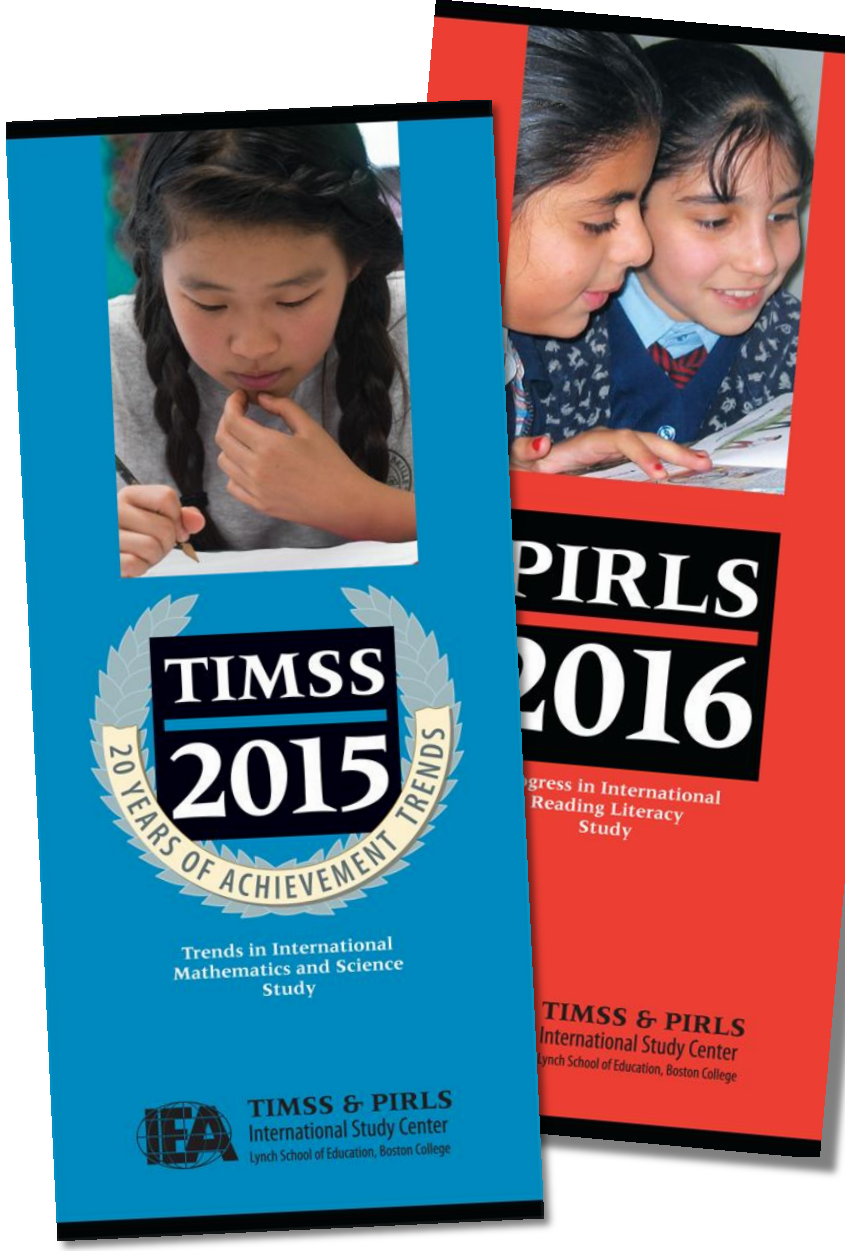
prePIRLS 2016—
Testing Basic Reading Skills

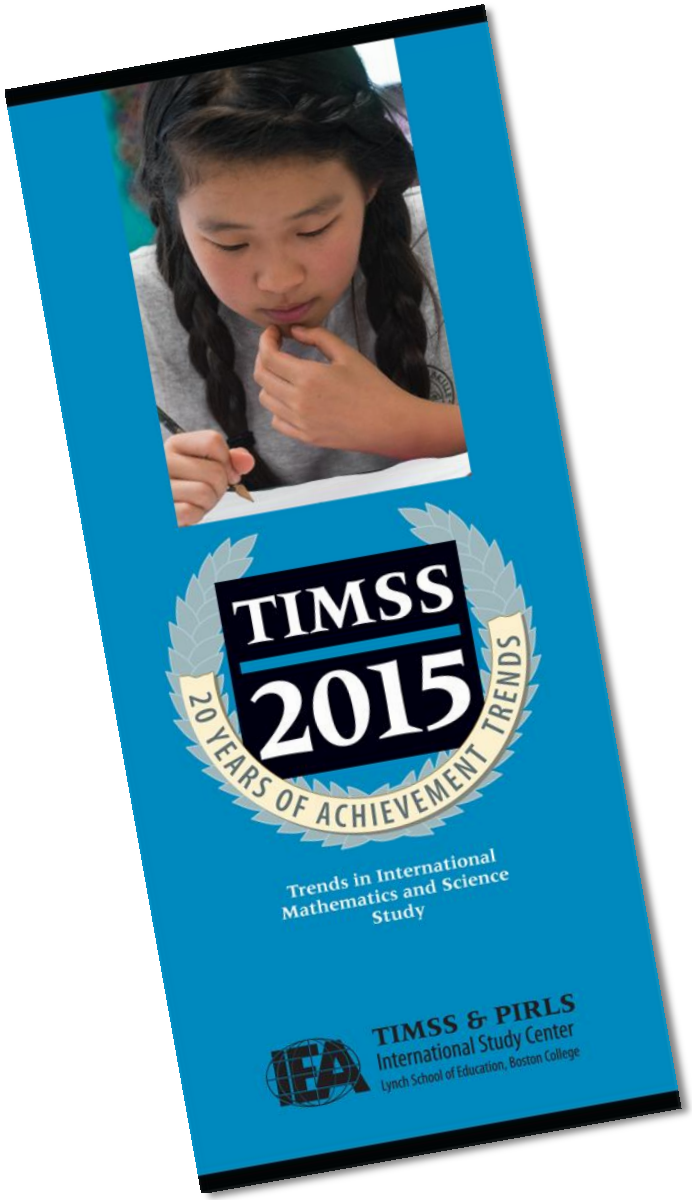
- End of primary school (4th,5th,6th)
- Same framework and context data as PIRLS
- Less difficult than PIRLS
  - Recognize words and phrases, understand simple sentences
  - Make straightforward inferences
  - Comprehend overall message
- Stepping stone to PIRLS

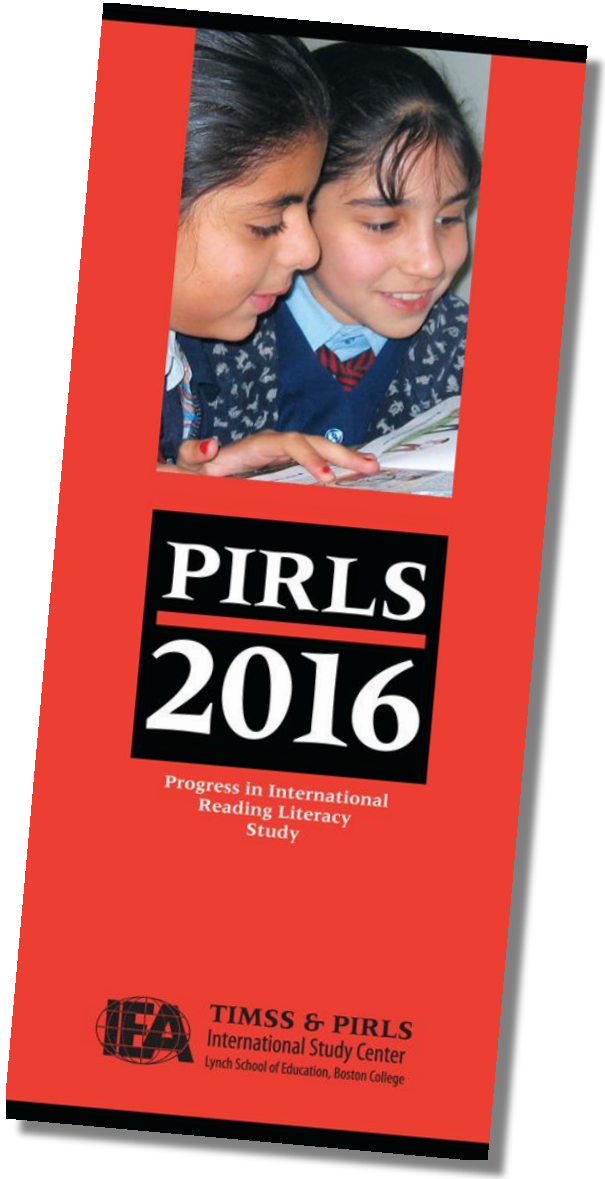
prePIRLS 2016

Benefits

- Monitor trends in global context
- Establish goals and standards for educational improvement
- Stimulate curriculum reform
- Improve teaching and learning
- Conduct related studies, such as monitoring equity, another grade
- Train researchers and teachers in assessment and evaluation
- Improve national assessments




TIMSS
2015
20 YEARS OF ACHIEVEMENT TRENDS
Trends in International Mathematics and Science Study
TIMSS & PIRLS
International Study Center
Lynch School of Education, Boston College


PIRLS
2016
Progress in International Reading Literacy Study
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