TIMSS 2015

Progress Report to the IEA General Assembly

September 2016

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

TIMSS 2015 and TIMSS Advanced 2015

PROGRESS REPORT TO THE IEA GENERAL ASSEMBLY

Prepared by the TIMSS & PIRLS International Study Center

Lynch School of Education

Boston College

September 2016

TIMSS for the past year has had a dual focus:

- Completing TIMSS and TIMSS Advanced 2015 as a celebration of 20 years of trend measurement in student achievement in mathematics and science: 1995-2015
- Positioning TIMSS for a tablet/computer-based future by developing new and engaging ways to address the TIMSS assessment frameworks while maintaining the TIMSS approach to trend measurement

Celebrating 20 Years of Trends

Completing the final year of its four-year cycle, the emphasis for TIMSS 2015 has been on preparing for reporting the TIMSS and TIMSS Advanced results. As a first step, and coinciding with the opening of the IEA General Assembly in Oslo, the *TIMSS 2015 Encyclopedia* will be published online on October 10, 2016. General Assembly members will be among the first to experience the new TIMSS online reporting system. The international achievement results will follow on November 29, 2016.

The international results will be reported through three online publications—*TIMSS 2015 International Results in Mathematics*, *TIMSS 2015 International Results in Science*, and *TIMSS Advanced 2015 Results in Advanced Mathematics and Physics*. The TIMSS 2015 release will

also include a policy report that highlights analysis on key policy issues across the 20 years of TIMSS reporting. The international reports and the *TIMSS 2015 Encyclopedia* will be online publications hosted by user-friendly websites that avail of the functionality of the web by including search functions, increased options for downloading and printing, and interactive features such as an interactive item map. The reports will also include infographics, which use colorful images, charts, and text to highlight key findings in each chapter.

TIMSS 2015, the sixth cycle of the IEA's Trends in International Mathematics and Science Study, has significantly expanded IEA's capacity to measure mathematics and science achievement across grade levels and ability groups. This cycle of TIMSS includes seven distinct assessments— fundamental mathematics skills at the fourth grade through TIMSS Numeracy, mathematics and science at the fourth and eighth grades through TIMSS, and advanced mathematics and physics at the end of secondary school through TIMSS Advanced. There are 57 countries and 7 benchmarking entities participating in TIMSS 2015 in one or more of the assessments, with 7 countries and 1 benchmarking participant administering TIMSS Numeracy, 48 countries and 7 benchmarking participants administering the fourth grade assessment, 40 countries and 7 benchmarking participants administering the eighth grade assessment, and 9 countries administering TIMSS Advanced.

eAssessment – The Future of TIMSS

IEA sees digital assessment as the future of TIMSS, with the 2019 TIMSS cycle marking the beginning of the transition to the digital world. The benefits of eTIMSS include improved measurement by assessing complex areas of the TIMSS assessment frameworks difficult to measure using pencil and paper, and stimulating student motivation through interactive and animated tasks. eTIMSS also offers increased operational efficiency through online item development, online translation and verification, automated data entry, and online scoring, while reducing printing and shipping costs. The goal is to have as many countries as possible switch to eTIMSS in 2019, although a paper version of TIMSS also will be offered.

During the past year the TIMSS & PIRLS International Study Center and the IEA Data Processing and Research Center (IEA DPC) have made great strides in developing eTIMSS 2019. eTIMSS is a computer/tablet-based version of the TIMSS fourth and eighth grade assessments that avails of the interactive functionality available through computers by including digitally-enhanced items and tasks. eTIMSS will also include digital versions of the paper-based TIMSS items. With support from the U.S. National Center for Education Statistics, staff at the TIMSS & PIRLS International Study Center has done extensive work developing new Problem Solving and Inquiry tasks (PSIs) as well as converting TIMSS 2019 trend items[1] to digital format. Staff at the IEA DPC also have made great progress developing the eTIMSS software system to enable online item development, online translation, test administration, data capture, and online scoring.

[1] Items that appear both in TIMSS 2015 and TIMSS 2019

Although still early in the eTIMSS 2019 development cycle, the transition to administering the digital study in the field is well underway. In September-October 2016, a prepilot is being administered Australia, Canada, and Singapore as a first tryout of PSI tasks in a classroom environment, and a pilot study to examine the impact of switching from paperTIMSS to eTIMSS will be administered in many of the participating countries in Spring 2017.

Accomplishments and Project Activities since September 2015

TIMSS 2015 Encyclopedia

One of the major accomplishments of the past year has been the completion of the *TIMSS 2015 Encyclopedia*, which is being published online on October 10, 2016. The *TIMSS 2015 Encyclopedia* is an extensive online compendium that profiles each country's education system, with a particular focus on mathematics and science education for primary and lower-secondary school students. The *Encyclopedia* contains 62 individual chapters authored by country representatives, 26 exhibits summarizing the national educational policy information collected through the Curriculum Questionnaire, and an Introduction that highlights themes in math and science education from around the world.

To increase accessibility and searchability, the *TIMSS 2015 Encyclopedia* is being made available for the first time through a user-friendly website. The website mirrors the structure of the *Encyclopedia*, with a side navigation bar presenting the introduction, curriculum questionnaire exhibits and the country chapters. A search function and sitemap assist the reader in finding information, and a download center facilitates downloading and printing the exhibits and chapters.

The TIMSS 2015 International Reports Release

The TIMSS & PIRLS International Study Center is in the final stages of preparing for the TIMSS 2015 International Reports Release, which will take place on November 29, 2016. Overall, there will be three online international reports for 2015: the *TIMSS 2015 International Results in Mathematics* will include mathematics results at fourth and eighth grades; the *TIMSS 2015 International Results in Science* will include science results at fourth and eighth grades; and the *TIMSS Advanced 2015 International Results in Advanced Mathematics and Physics* will include advanced mathematics and physics results at the final year of secondary school. In addition to reporting student achievement in mathematics and science in more than 60 countries and benchmarking participants, the TIMSS reports will include information about trends in mathematics and science achievement over six assessment cycles conducted across 20 years, and the TIMSS Advanced report will include trends in advanced mathematics and physics achievement over three assessment cycles conducted across 20 years.

At the heart of the international reports are a series of data exhibits, which provide detailed information for each country on student achievement and questionnaire responses.

Similar to the structure of the TIMSS 2011 reports, the proposed outline of these reports includes initial chapters focusing on overall national achievement, trends in achievement, achievement by content and cognitive domain subscales, and achievement at the TIMSS International Benchmarks. The achievement chapters are followed by chapters on student context for learning, with a specific focus on influences of the home environment, school composition and resources, school climate and safety, teacher preparation, classroom instruction, and student attitudes and engagement.

Like the Encyclopedia website, the report websites include a search function and a sitemap. The report websites also include a downloads page to facilitate downloading and printing, where the user can choose to download different combinations of exhibits in pdf or excel format. The design also facilitates navigation between the TIMSS and TIMSS Advanced reports, and links on each page point the user to other relevant TIMSS pages and publications.

In order to broaden access to the TIMSS and TIMSS Advanced results, staff at the TIMSS & PIRLS International Study Center created infographics that focus on the major findings of each chapter. Upon release, the infographics will be presented on the reports website to summarize key results from each chapter and will also be made available through social media.

Over the past year, the report review process was the major focus of by the 7th TIMSS and TIMSS Advanced National Research Coordinators meeting in Lisbon, Portugal, December 6-11, 2015, and the 8th meeting in Quebec City, Canada, June 19-24, 2016. At these meetings NRCs reviewed successive drafts of the data exhibits, and at the Quebec meeting NRCs participated in a hands-on exploration of a prototype of the new TIMSS online reporting system, including selected infographics and data exhibits. Overall, the NRCs were pleased with the exhibits and enthusiastic about the infographic and online reporting innovations.

To aid NRCs in the production of their national reports, staff at the TIMSS & PIRLS International Study Center made advance copies of the exhibits available to NRCs in both excel and pdf format on August 31, 2016. In addition, infographics were made available in pdf, Illustrator, and InDesign formats, and the draft international database was also made available.

The TIMSS 2015 Policy Report

Complementing the release of the international results report is a brief policy report that examines trend data across 20 years of TIMSS. The report is organized from macro to micro perspectives. The first chapter provides an overview of student achievement worldwide, with analyses of both long and short term trends. The second and third chapters explore curriculum and instruction. Chapter Two describes not only the evolution of mathematics and science curricula, but also how TIMSS itself has changed to stay in synch with curricular change. Chapter Three explores the context of instruction, in particular, the characteristics of schools, classrooms, and teachers in the local settings where instruction unfolds. The fourth and fifth chapters narrow the focus to two topics of interest among policy makers. Chapter Four examines

short and long term trends in the distribution of achievement within countries. Chapter Five investigates students' enjoyment of mathematics and self-confidence in studying the subject. The report is authored by Tom Loveless, Ina V. S. Mullis, and Michael O. Martin.

Processing and Analyzing the TIMSS/TIMSS Advanced 2015 Data

High-quality data is a cornerstone of results reporting, and the work of the IEA DPC ensures that TIMSS maintains its high standards of data quality. Upon receipt of each country's data, the IEA DPC works closely with national centers to clean data files and to document all national adaptations that countries made to the international background questionnaires. The process is iterative, with the IEA DPC providing countries with draft national data prior to the 7th NRC meeting in November 2015, and then asking countries to review the data and accompanying almanacs thereafter. A dialogue follows until all issues are resolved.

The IEA DPC provided countries with final versions of their data prior to the 8th NRC meeting in June 2016, and then countries received the international dataset on August 31, 2016.

In tandem with this work, the IEA DPC developed the National Adaptation Database, which documents all adaptations that countries made to the international background questionnaires as well as the resulting data recodes. This documentation will accompany the international database to assist users in data analysis.

As the TIMSS 2015 data were processed by the IEA DPC, Statistics Canada used these data to compute sampling weights. As of June 2016, this work was completed and all TIMSS 2015 and TIMSS Advanced 2015 sampling weights were finalized for countries and benchmarking participants. Statistics Canada and IEA DPC staff also have compiled and checked sampling documentation from all countries and completed all the individual country weighting reports. These reports describe all the key elements of the implemented national sampling design for each country and benchmarking participant.

An essential part of the sampling process is the Sampling Adjudication meeting. On February 9-10, 2016, the staff from the TIMSS & PIRLS International Study Center, in conjunction with the TIMSS Sampling Referee Dr. Keith Rust of Westat Inc. and staff from Statistics Canada, reviewed sampling participation data to adjudicate on compliance with the TIMSS sampling standards.

Following each iteration of data processing by the IEA DPC, updated versions of the TIMSS and TIMSS Advanced data were sent to the TIMSS & PIRLS International Study Center for scaling and analysis, and to incorporate the results into the exhibit development process. To produce TIMSS and TIMSS Advanced achievement results, the data analysis unit at the TIMSS & PIRLS International Study Center implemented the TIMSS method of concurrent item calibration to place the 2015 data on the existing TIMSS achievement scale. For TIMSS mathematics at the fourth grade, concurrent calibration also enabled placing TIMSS Numeracy

scores on the TIMSS fourth grade mathematics scale. As a quality control measure, the TIMSS and TIMSS Advanced achievement scaling was independently replicated by Educational Testing Service (ETS).

As was implemented in TIMSS 2011, key contextual information for TIMSS 2015 are summarized through the use of 1-parameter item response theory (IRT) scales, allowing students to be classified into regions on the scale (high, medium, low) based upon responses provided by students, teachers, school principals, and parents. For TIMSS 2015, this approach includes the additional feature that, for some of the scales reported in both TIMSS 2011 and TIMSS 2015, trend information will be reported—allowing policy makers to evaluate changes over time on background constructs.

Following scaling of both the achievement data and the background data, analysis was conducted for each exhibit and the results were incorporated into the TIMSS and TIMSS Advanced reports. Overall, the *TIMSS 2015 International Results in Mathematics* report includes 170 exhibits, the *TIMSS 2015 International Results in Science* report includes 170 exhibits, and the *TIMSS Advanced 2015 Results in Advanced Mathematics and Physics* report includes 173 exhibits.

Documenting the TIMSS Methods and Procedures

Documenting the technical aspects of developing, conducting, analyzing, and reporting the assessments is essential for users of the data to understand the steps taken to ensure high-quality, valid, and reliable data. This technical documentation will be made available through a *Methods and Procedures* online publication for TIMSS and a separate online publication for TIMSS Advanced. The publication of *Methods and Procedures* chapters is ongoing with 3 chapters already published for TIMSS and 2 chapters published for TIMSS Advanced. For TIMSS, all chapters will be published by December 2016 with the TIMSS Advanced Methods and Procedures to follow.

eTIMSS 2019 Development

eTIMSS 2019 development is well underway, and will include digitally-enhanced items and Problem Solving and Inquiry tasks (PSIs) as well as items from previous cycles of TIMSS to ensure reliable measurement of trends. This digitally-enhanced component of eTIMSS takes advantage of the computer/tablet interface to allow students to demonstrate what they know and can do in mathematics and science. The trend items (190 fourth grade mathematics and science items and 250 eighth grade items) have been entered into the Item Builder software to prepare them for online administration in the 2017 eTIMSS pilot.

The PSIs each include multiple items addressing an overarching problem or inquiry task. For example, students may be asked to design an experiment to test the effects of fertilizer on plant growth, which would require them to plan an experiment, implement the plan using virtual equipment (displayed on the computer/tablet), and explain their reasoning. Staff at the TIMSS &

PIRLS International Study Center have completed extensive development work on the PSIs with the support of consultants in mathematics and science.

To support the development and implementation of eTIMSS, the IEA Data Processing and Research Center is collaborating with the TIMSS & PIRLS International Study Center to develop the eTIMSS Assessment System. The eTIMSS eAssessment System has six components: the eTIMSS Assessment Builder for the construction of items and the assembling of these items into an assessment; the eTIMSS Player for delivering items to students and capturing their responses; the eTIMSS Online Translation System for supporting the translation of eTIMSS assessment items as well as the translation verification work performed by the IEA Secretariat; the eTIMSS Online Scoring System; the eTIMSS Online Data Monitor to view raw data and related statistics; and the eTIMSS System Check to ensure computers/tablets fulfill the minimum requirements for running eTIMSS.

The transition to eTIMSS includes a prePilot and Pilot, as well as the field test and data collection. The eTIMSS prePilot is being administered in Australia, Canada, and Singapore in September-October 2016 to try out eTIMSS in a classroom setting and to get preliminary data on the functioning of the PSIs

The eTIMSS Pilot, which will be administered in April 2017, will examine the effect of the mode of administration as well as try out eTIMSS systems such as the translation systems and the data monitor. To examine the mode effect, the Pilot will be administered through a counterbalanced design, where each student takes four blocks of trend items from the 2015 assessment in both print and digital formats. The pilot results will be analyzed to identify "strongly equivalent" items and the effect of mode of administration on student results.

For the TIMSS data collection in 2019, countries can administer TIMSS either electronically (eTIMSS) or in a paper format as before (paperTIMSS). eTIMSS countries will be asked to expand their sample by an additional 25%, and this additional group of students will be administered the trend items from 2015 in paper format. Administering the trend items in paper format to this subsample of students as well as electronically to the main sample will aid in the identification of "strongly equivalent" items and in building a bridge to link the eTIMSS and paperTIMSS results.

Developing the TIMSS 2019 Frameworks

In preparation for TIMSS 2019, staff at the TIMSS & PIRLS International Study Center has drafted preliminary mathematics and science framework chapters. The framework updates are based on a combination of information provided by country representatives through the TIMSS 2015 Encyclopedia chapters, data collected through the TIMSS 2015 Curriculum Questionnaires and the Test-Curriculum Matching Analysis (TCMA), and a review of country curricula. The frameworks will be reviewed by the TIMSS Mathematics Task Force, which meets to update the TIMSS 2019 September 20-22, 2016 in Boston, and the Science Task Force meeting in mid-October. The frameworks are being prepared for review by National Research Coordinators at their first meeting of the 2019 cycle, February 15-16, 2017, in Hamburg, Germany.

LaNA

Another new initiative is IEA's Literacy and Numeracy Assessment (LaNA). Staff at the TIMSS & PIRLS International Study Center designed LaNA for countries where TIMSS and PIRLS are too challenging for fourth grade students. LaNA provides participating countries with literacy and numeracy results that can be compared internationally. The assessment includes 4 passages and 43 literacy items and 90 numeracy items, as well as short student and school questionnaires. LaNA was piloted in Haiti in May 2016 and plans are underway to pilot it in other countries.

National Research Coordinators Meetings

- The 7th TIMSS/TIMSS Advanced NRC meeting was held in Lisbon, Portugal, December 6-11, 2015. The purpose of the meeting was to review proposed draft exhibits for the TIMSS 2015 International Results Reports and the TIMSS Advanced 2015 International Results Report. The meeting was attended by 120 TIMSS participants and 15 TIMSS Advanced participants, who reviewed 204 exhibits for the TIMSS 2015 reports and 102 exhibits for the TIMSS Advanced report.
- The 8th TIMSS/TIMSS Advanced NRC meeting was held in Quebec City, Canada, June 19-24, 2016. The purpose of the meeting was to review and finalize draft exhibits for the TIMSS 2015 International Results Reports and the TIMSS Advanced 2015 International Results Report. The meeting was attended by 81 TIMSS participants and 33 TIMSS Advanced participants, who reviewed 335 exhibits for the TIMSS 2015 reports and 171 exhibits for the TIMSS Advanced 2015 reports.
- Preparations are currently underway for the 9th TIMSS & TIMSS Advanced 2015 NRC meeting /1st TIMSS 2019 NRC meeting in Hamburg, Germany, February 12-17, 2017, and preparations are also underway for the 2nd TIMSS 2019 NRC meeting in Hamburg, Germany, April 23-28, 2017.

Major Milestones and Activities since October 2015

- National Research Coordinators submit TIMSS Encyclopedia chapters to TIMSS & PIRLS International Study Center; October 2015-July 2016.
- The 7th TIMSS/TIMSS Advanced NRC meeting to review proposed draft exhibits for the *TIMSS 2015 International Results Reports* and the *TIMSS Advanced 2015 International Results Report*; December 6-11, 2015.
- TIMSS Sampling Adjudication and TIMSS Advanced Sampling Adjudication; February 2, 2016.
- 4th TIMSS and TIMSS Advanced SMIRC meeting to conduct scale anchoring of achievement data; May 16-19, 2016.

- The 8th TIMSS/TIMSS Advanced NRC meeting to review and finalize draft exhibits for the *TIMSS 2015 International Results Reports* and the *TIMSS Advanced 2015 International Results Report*; June 19-24, 2016.
- IEA DPC delivers eTIMSS prePilot software to participating countries; August 2016.
- TIMSS & PIRLS International Study Center distributes International Report exhibits and draft International Databases to countries; August 31, 2016.

Upcoming Meetings and Milestones

- eTIMSS 2019 prePilot; September-October 2016.
- TIMSS Mathematics Working Group meets to update the TIMSS 2019 Mathematics Framework; September 20-22, 2016.
- *TIMSS 2015 Encyclopedia* published online; October 10, 2016.
- Science Working Group meeting to update the TIMSS 2019 Science Framework and to review eTIMSS 2019 prePilot data and draft new PSIs; November 8-10, 2016.
- Mathematics Working Group meeting to review eTIMSS 2019 prePilot data and draft new PSIs; November 15-18, 2016.
- TIMSS & PIRLS International Study Center publishes TIMSS International Reports and TIMSS Advanced International Reports on a password-protected web site for National Research Coordinators; November 15, 2016.
- TIMSS & PIRLS International Study Center conducts international press release with the IEA for TIMSS International Reports, post TIMSS International Reports online; November 29, 2016.
- TIMSS & PIRLS International Study Center distributes final TIMSS 2015 International Database and accompanying User Guides to countries; January 19, 2017.
- 9th TIMSS and TIMSS Advanced NRC meeting to conduct training in use of the TIMSS and TIMSS Advanced 2015 International Databases (Hamburg, Germany); February 13-14, 2017. 1st TIMSS 2019 NRC meeting to review and update frameworks and context questionnaires and to discuss sampling plans; February 15-16, 2017. Cultural tour on February 17, 2017.
- TIMSS & PIRLS International Study Center and IEA DPC post online survey of TIMSS 2019 frameworks to be completed by NRCs; March 2017.
- eTIMSS 2019 Pilot; April-May, 2017.
- 1st SMIRC meeting to review frameworks, develop prototype items, and review draft TIMSS 2019 Item Writing Guidelines; April 3-5, 2017.

- 2nd TIMSS NRC meeting to develop new items and scoring guides for TIMSS/eTIMSS 2019 and review questionnaires (Hamburg, Germany); April 23-28, 2017.
- 2nd SMIRC meeting to review proposed field test items and scoring guides; September 12-15, 2017.
- 1st QIRC meeting to review proposed questionnaires for field test; September 18-19, 2017.

Project Management Team Meetings since September 2014

- The 6th PMT meeting of the TIMSS 2015 cycle was held at the TIMSS & PIRLS International Study Center, Boston College, Boston, United States, September 29-30, 2015.
- The 7th PMT meeting of the TIMSS 2015 cycle was held at the TIMSS & PIRLS International Study Center, Boston College, Boston, United States, April 5-6, 2016.

Participants

The following countries are participating in TIMSS 2015:

Armenia (4 and 8)	Finland (4)	Kuwait (Num., 4, and 8)	Saudi Arabia (4 and 8)
Australia (4 and 8)	France (4)	Lebanon (8)	Serbia (4)
Bahrain (Num., 4, and 8)	Georgia (4 and 8)	Lithuania (4 and 8)	Singapore (4 and 8)
Belgium (Flemish) (4)	Germany (4)	Malaysia (8)	Slovak Republic (4)
Botswana (8)	Hong Kong SAR (4 and 8)	Malta (8)	Slovenia (4 and 8)
Bulgaria (4)	Hungary (4 and 8)	Morocco (Num., 4, and 8)	South Africa (Num. and 8)
Canada (4 and 8)	Indonesia (Num. and 4)	The Netherlands (4)	Spain (4)
Chile (4 and 8)	Iran, Islamic Rep. of (Num., 4, and 8)	New Zealand (4 and 8)	Sweden (4 and 8)
Chinese Taipei (4 and 8)	Ireland (4 and 8)	Northern Ireland (4)	Thailand (8)
Croatia (4)	Israel (8)	Norway (4 and 8)	Turkey (4 and 8)
Cyprus (4)	Italy (4 and 8)	Oman (4 and 8)	United Arab Emirates (4 and 8)
Czech Republic (4)	Japan (4 and 8)	Poland (4)	United States (4 and 8)
Denmark (4)	Jordan (Num. and 8)	Portugal (4)	
Egypt (8)	Kazakhstan (4 and 8)	Qatar (4 and 8)	
England (4 and 8)	Korea, Rep. of (4 and 8)	Russian Federation (4 and 8)	

The following Benchmarking Entities are participating in TIMSS 2015:

Buenos Aires, Arg. (Num.,4, and 8)	Quebec, Canada (4 and 8)	Dubai, UAE (4 and 8)	Florida, USA (4 and 8)
Ontario, Canada (4 and 8)	Abu Dhabi, UAE (4 and 8)		

Participants in TIMSS Advanced 2015

The following countries are participating in TIMSS Advanced 2015:

France	Norway	Russian Federation	Sweden
Italy	Portugal	Slovenia	United States
Lebanon			

Science and Mathematics Item Review Committee (SMIRC)

Mathematics and science experts from around the world serve as members of the TIMSS 2015/TIMSS Advanced 2015 Science and Mathematics Item Review Committee (SMIRC). The SMIRC is responsible for providing expert advice about the development of the TIMSS 2015 and the TIMSS Advanced 2015 assessments.

Mathematics Item Review Committee Members:
Kiril Bankov, Bulgaria
Sean Close, Ireland
Khattab M.A. Abulibdeh, Jordan
Sun Sook Noh, Korea
Liv Sissel Grønmo, Norway
Torgeir Onstad, Norway
Mary Lindquist, United States

Science Item Review Committee Members:
Jouni Viiri, Finland
Alice Wong, Hong Kong SAR
Berenice Michels, The Netherlands
Vitaly Gribov, Russian Federation
Galina Kovaleva, Russian Federation
Gorazd Planinšič, Slovenia
Wolfgang Dietrich, Sweden
Lee R. Jones, United States
Christopher Lazarro, United States
Gerald T. Wheeler, United States

Questionnaire Item Review Committee (QIRC)

The TIMSS 2015/TIMSS Advanced 2015 Questionnaire Item Review Committee (QIRC) is comprised of National Research Coordinators and other experts who have special responsibility for providing guidance in updating the TIMSS 2015 and TIMSS Advanced 2015 Context Questionnaire Framework and Context Questionnaires.

Sue Thomson, Australia
Josef Basl, Czech Republic
Wilfried Bos, Germany
Martina Meelissen, The Netherlands
Chew Leng Poon, Singapore
Peter Nyström, Sweden
Jack Buckley, United States

Assessment Development Consultants

The TIMSS Mathematics and Science Coordinators and Consultants work with the TIMSS & PIRLS International Study Center to develop the TIMSS 2015 mathematics and science assessment framework objectives and the TIMSS Advanced framework objectives for advanced mathematics and physics. The consultants also provide expert advice about the development of the TIMSS 2015 mathematics and science assessments and the TIMSS Advanced mathematics and physics assessments.

Mathematics

Liv Sissel Grønmo, Chief Mathematics Consultant
Mary Lindquist, Science and Mathematics Item Review Committee
Torgeir Onstad, Science and Mathematics Item Review Committee
Ray Philpot, Australian Council for Educational Research

Science

Lee R. Jones, Chief Science Consultant
Gerald T. Wheeler, Science and Mathematics Item Review Committee
Ron Martin, Australian Council for Educational Research

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