



Framework for Estimating National Costs eTIMSS 2023 - Grade 4 (April 2020)

The national budget for implementing the TIMSS study is very country specific and depends on each country's financial capacity. However, there are tasks that are mandatory for all participating countries that require certain equipment and staff.

TIMSS 2023 is the second cycle of the computerized version of TIMSS (eTIMSS). About half of the participating countries transferred from paper-pencil administered TIMSS to eTIMSS for the 2019 TIMSS cycle. The remaining countries are expected to transfer to eTIMSS for the 2023 assessment cycle. eTIMSS increases operational efficiency in printing, shipping, scoring, and data entry. eTIMSS compatible computers or tablets will be necessary for students to participate in the assessment.

eTIMSS 2023 will have a field test in March-April 2022 and the main data collection in October-December 2022 (Southern Hemisphere) and March-June 2023 (Northern Hemisphere). Countries transferring to eTIMSS for this study cycle, just like it was done for the 2019 cycle, also will administer paper-pencil based bridge booklets as part of the main data collection.

The major requirements you will need to budget for in order to implement the eTIMSS fourth-grade assessment in your country are described below. For additional information on the required roles and expertise, as well as the tasks to take place in a participating country, refer to the job description of the National Research Coordinator (NRC) and tasks of the National Study Center (NSC) for IEA's TIMSS and PIRLS.

National Study Center (NSC)

A TIMSS National Study Center (NSC) is established in each participating country. The TIMSS NSC is organized and led by the National Research Coordinator (NRC) and usually is staffed with an additional one or two full-time employees or several part-time employees, who fulfill the required roles and expertise (e.g., content and curriculum expert, sampling coordinator, data manager, and office staff). Additional temporary employees also will be necessary. These short term tasks and positions include but are not limited to:

- Translating and reviewing the assessment instruments and manuals;
- Ensuring that each participating student is provided with an eTIMSS compatible computer/tablet (school computers tested for eTIMSS compatibility or external computers/tablets tested and prepared);
- Preparing the assessment materials (install/copy software; print the paper materials, and label the materials) and providing them to the participating schools;
- School Coordinators/Test Administrators;
- National Quality Control Monitor(s) (NQCM);
- Scorers for scoring the constructed-response items; and

- Punchers and/or scanning personnel for data entry for any paper-pencil administered context questionnaires and for the paper bridge booklets, if applicable.

NSC may choose to outsource some or almost all tasks to an external agency (-ies).

Equipment

eTIMSS 2023 assessments (achievement test and student questionnaire) will be developed, translated, and administered via the Assessment Master software provided by the SoNET Systems/RM Results company.

The online translation system for preparing national versions of the achievement test and student questionnaire is designed to work with any compatible operating platform (Windows, Mac OS, Linux) and all major Internet browsers (Google Chrome, Internet Explorer, Microsoft Edge, Mozilla Firefox, Opera, Safari).

The assessments will be delivered to students via eTIMSS Player run by either one of the three delivery methods—online administration, Individual PCs/USBs Method, and/or Local PC Server Method. Tablets must have an external keyboard and use the online delivery method. The screen size minimum is 9.7 inches. However, especially for landscape position based devices, suggested to be at least 12 inches for optimal user experience. For online administration:

Each device used needs to be connected to the Internet. The player will be cross browser compatible for any OS that can run a modern browser (IE 11, Edge, Opera, Firefox, Chrome, Safari).

For Individual PC/USB administration:

No network or Internet connection is required for the assessment administration, as everything is contained on USB sticks. Each computer will need the Windows 8 or higher operating system (subject to change) with at least 2GB storage capacity and a USB 2.0 (preferably higher) port. It is crucial to use quality USB sticks. Data upload will require Internet connection; can be done from a single computer connected to the Internet.

For Local PC Server administration:

No Internet connection is required for this method and results can be uploaded after the testing session, when the server PC is connected to the Internet. Students' devices will be connected locally to the server appliance (WiFi or LAN) or can use portable hotspot devices rather than the school network. If using the server method, the requirements for the server are higher than those for the client devices. The following currently are the minimum requirements for the server PCs (subject to change):

- OS: Windows 8 or higher;
- Processor speed: 2.2 GHz;
- Memory: 8GB;
- Available Storage Space: 10GB on SSD drive; and Administrator rights.
- Client devices need to be able to run a modern browser (IE 11, Edge, Opera, Firefox, Chrome, Safari).

All paper-based instruments (context questionnaires for schools, teachers, parents/guardians and bridge booklets/student questionnaire) will be developed using the InDesign layout program via Adobe Creative Cloud. You will need to have an Adobe Creative Cloud account in order to access the necessary version of the InDesign software.

Systems provided by IEA (within-school sampling software, system for online school, teacher, and home questionnaire administration, online scoring system, data management software) are designed to work on PCs.

NCS should have Microsoft® Office® 2010 or above and Adobe Acrobat Reader available. An Internet connection is required. Communication with the international centers will be via email and materials will be exchanged by uploading/downloading to/from the IEA's and the TIMSS & PIRLS International Study Center's secure servers.

Traveling

Over the course of the assessment cycle, there are eight NRC meetings to attend. Each NRC meeting is held in a different participating country and is usually one week long. Additionally, there are two data management training seminars held by IEA Hamburg, in Hamburg, Germany, lasting three to four days. IEA provides training in using the IEA's software developed especially for the current TIMSS cycle. The data management training seminars should be attended by the data manager and/or the NRC.

Some domestic traveling within the country also needs to be budgeted for. This includes training School Coordinators/Test Administrators, monitoring schools during the field test and the main data collection (National Quality Assurance Program), coordinating the work with any outsourced agency (-ies), etc.

Sampling

Depending on the structure of educational/governmental systems within your country, costs may occur during the sampling frame preparation.

Assessment Instrument Preparation

For the field test and main data collection, the major undertaking is translating and/or adapting the assessment instruments and manuals into the language (-es) of instruction in your country. First, the instruments and manuals will need to be translated/adapted for field testing the newly developed items and then updated for the main data collection.

For the main data collection, trend countries also will need to transfer/confirm the existing translations of the TIMSS 2019 trend blocks and directions into the online translation system for eTIMSS 2023. New countries will need to translate/adapt the trend blocks. For bridge booklets, countries transferring to eTIMSS will need to transfer/confirm the existing translations of the TIMSS 2019 trend blocks into the InDesign booklet production folder structure for the paper-administration.

Your translated and/or adapted achievement test and student questionnaire will then be transferred from the online translation system into the eTIMSS Player to be administered to students, first for the field test and then again for the main data collection. Your responsibility will be to test the player. If you plan to use the Individual PCs/USBs method, you will need a USB stick with the eTIMSS Player installed for each participating student.

All eTIMSS achievement items and the student questionnaire will be administered in the electronic eTIMSS format. The school, teacher, and home questionnaires can be administered either on paper or online. Any paper administered context questionnaires, paper bridge booklets, and paper manuals

will need to be printed. Please note that for students receiving the paper bridge booklets for the main data collection, the student questionnaire also will be administered on paper.

All materials will need to be labeled, packed, and distributed to the participating schools.

The following are estimates on the scope of translating/adapting the assessment instruments and manuals for eTIMSS at the fourth grade. The numbers of any assessment instruments and manuals for printing will need to be adjusted based on the actual sample size in your country.

For the field test, you will need to prepare national versions of:

- 24 blocks of new items (~12-15 items in each block, including the interactive problem-solving and inquiry task (PSI) blocks)
- Four context questionnaires (equivalent to ~15 pages each)
- School Coordinator Manual (~25 pages)
- Preparing Computers/Tablets for eTIMSS instructions (~20 pages)
- Test Administrator Manual (~25 pages)
- National Quality Control Monitor Manual (~15 pages).

For the field test (a minimum of 1,200 students), unless administered online, you will need to print ~100 copies of the teacher questionnaire, ~50 copies of the school questionnaire, and 1,500 copies of the home questionnaire. At least one School Coordinator Manual and Test Administrator Manual will need to be printed for each participating school.

For the main data collection, you will need to prepare national versions of:

- 36 achievement item blocks, including PSI blocks
- Four context questionnaires
- School Coordinator Manual
- Preparing Computers/Tablets for eTIMSS instructions
- Test Administrator Manual
- National Quality Control Monitor Manual

Countries switching to eTIMSS during the 2023 study cycle also will need to prepare:

- Eight paper-based bridge booklets (eight mathematics and eight science trend item blocks rotated)
- Paper-based student questionnaire
- School Coordinator Manual and Test Administrator Manual for schools/classes administering the paper bridge booklets

With the minimum sample size of 150 schools and 5,500 students (4,000 students without the bridge booklet administration), plus some extra copies, you will need to print:

- 250 copies of each bridge booklet
- 1,650 student questionnaires for students receiving bridge booklets
- 6,000 copies of the home questionnaire (unless administered online)
- 250 copies of the teacher questionnaire (unless administered online)
- 200 copies of the school questionnaire (unless administered online)
- At least one School Coordinator Manual and Test Administrator Manual for each participating school.

Shipping/Mailing Costs

The assessment instruments/materials need to be shipped to the participating schools and back to the National Study Center. A safe and efficient shipping method needs to be selected for the materials to remain secure at all times. Additional mailing might be necessary between the NSC and the schools, such as communication on the test administration dates or providing any missing or damaged assessment materials.

NOTE: There are **two** rounds of shipping the assessment instruments/materials to and from the participating schools—first for the field test and then for the main data collection.

Scoring

Student responses to the constructed-response items will need to be scored in each participating country. In addition to the actual scoring, you will need to budget for training the scorers and supervising the scoring process.

The TIMSS & PIRLS International Study Center will provide an international scoring training and scoring guides for the field test and again for the main data collection. Attending the international scoring training is mandatory. Scoring guides may either be used in English or translated.

The following are estimates on the scope of scoring for eTIMSS at the fourth grade.

For the field test, based on the minimum sample size of 1,200 students, each country needs to score about 25,000 student responses. We estimate that this requires about 26 single-person working days. You will need a minimum of four scorers.

For the data collection, based on the minimum sample size of 4,000 students (5,500 students with the bridge booklet administration), each country needs to score about 85,000 TIMSS 2023 student responses. Bridge booklet scoring, Trend Reliability Scoring, and Cross-country Reliability Scoring adds about 62,000 student responses to score. We estimate that the whole scoring process requires about 130 single-person working days. You will need a minimum of eight scorers.

Data Entry

The eTIMSS achievement and student questionnaire data will be directly uploaded, so no manual data entry will be required for this. However, data from any paper questionnaires and from the paper bridge booklets must be entered into data files using the IEA's proprietary software. In addition to the actual data entry (punching), the punchers need to be trained.

The following are estimates on the scope of data entry for eTIMSS at the fourth grade.

For the field test, if all of the context questionnaires will be administered on paper, with the minimum sample size of 25 schools and 1,200 students, the data will need to be entered from a minimum of 1,200 home questionnaires (~25 questions each), 60 teacher questionnaires (~40 questions each), and 30 school questionnaires (~25 questions each). We estimate that this requires about 8 single-person working days.

For the data collection, with the minimum sample size of 150 schools and 4,000 students (5,500 students with the bridge booklet administration), the data will need to be entered from a minimum of:

- 1,500 bridge booklets (~45 items per booklet) and student questionnaire (~20 questions each)
- 5,500 home questionnaires (~25 questions each) (unless administered online)
- 200 teacher questionnaires (~40 questions each) (unless administered online)
- 150 school questionnaires (~25 questions each) (unless administered online)

We estimate that this requires about 30 single-person working days.

Scanning

If a country chooses to scan the paper instruments in order to capture data instead of the described manual data entry, the budget needs to be adjusted based on the scanning technology and staff available. All data, however, need to be submitted to IEA Hamburg in the required format.

Reporting

Each country needs to plan for producing a national report at the end of the assessment cycle. This includes the costs of preparation and publishing the report, a press conference for its release and/or any other form of the TIMSS results dissemination.



Framework for Estimating National Costs eTIMSS 2023 - Grade 8 (April 2020)

The national budget for implementing the TIMSS study is very country specific and depends on each country's financial capacity. However, there are tasks that are mandatory for all participating countries that require certain equipment and staff.

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eTIMSS 2023 will have a field test in March-April 2022 and the main data collection in October-December 2022 (Southern Hemisphere) and March-June 2023 (Northern Hemisphere). Countries transferring to eTIMSS for this study cycle, just like it was done for the 2019 cycle, also will administer paper-pencil based bridge booklets as part of the main data collection.

The major requirements you will need to budget for in order to implement the eTIMSS eighth-grade assessment in your country are described below. For additional information on the required roles and expertise, as well as the tasks to take place in a participating country, refer to the job description of the National Research Coordinator (NRC) and tasks of the National Study Center (NSC) for IEA's TIMSS and PIRLS.

National Study Center (NSC)

A TIMSS National Study Center (NSC) is established in each participating country. The TIMSS NSC is organized and led by the National Research Coordinator (NRC) and usually is staffed with an additional one or two full-time employees or several part-time employees, who fulfill the required roles and expertise (e.g., content and curriculum expert, sampling coordinator, data manager, and office staff). Additional temporary employees also will be necessary. These short term tasks and positions include but are not limited to:

- Translating and reviewing the assessment instruments and manuals;
- Ensuring that each participating student is provided with an eTIMSS compatible computer/tablet (school computers tested for eTIMSS compatibility or external computers/tablets tested and prepared);
- Preparing the assessment materials (install/copy software; print the paper materials, and label the materials) and providing them to the participating schools;
- School Coordinators/Test Administrators;
- National Quality Control Monitor(s) (NQCM);
- Scorers for scoring the constructed-response items; and

- Punchers and/or scanning personnel for data entry for any paper-pencil administered context questionnaires and for the paper bridge booklets, if applicable.

NSC may choose to outsource some or almost all tasks to an external agency (-ies).

Equipment

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Each device used needs to be connected to the Internet. The player will be cross browser compatible for any OS that can run a modern browser (IE 11, Edge, Opera, Firefox, Chrome, Safari).

For Individual PC/USB administration:

No network or Internet connection is required for the assessment administration, as everything is contained on USB sticks. Each computer will need the Windows 8 or higher operating system (subject to change) with at least 2GB storage capacity and a USB 2.0 (preferably higher) port. It is crucial to use quality USB sticks. Data upload will require Internet connection; can be done from a single computer connected to the Internet.

For Local PC Server administration:

No Internet connection is required for this method and results can be uploaded after the testing session, when the server PC is connected to the Internet. Students' devices will be connected locally to the server appliance (WiFi or LAN) or can use portable hotspot devices rather than the school network. If using the server method, the requirements for the server are higher than those for the client devices. The following currently are the minimum requirements for the server PCs (subject to change):

- OS: Windows 8 or higher;
- Processor speed: 2.2 GHz;
- Memory: 8GB;
- Available Storage Space: 10GB on SSD drive; and Administrator rights.
- Client devices need to be able to run a modern browser (IE 11, Edge, Opera, Firefox, Chrome, Safari).

All paper-based instruments (context questionnaires for schools and teachers; and bridge booklets/student questionnaire) will be developed using the InDesign layout program via Adobe Creative Cloud. You will need to have an Adobe Creative Cloud account in order to access the necessary version of the InDesign software.

Systems provided by IEA (within-school sampling software, system for online school and teacher questionnaire administration, online scoring system, data management software) are designed to work on PCs.

NCS should have Microsoft® Office® 2010 or above and Adobe Acrobat Reader available. An Internet connection is required. Communication with the international centers will be via email and materials will be exchanged by uploading/downloading to/from the IEA's and the TIMSS & PIRLS International Study Center's secure servers.

Traveling

Over the course of the assessment cycle, there are eight NRC meetings to attend. Each NRC meeting is held in a different participating country and is usually one week long. Additionally, there are two data management training seminars held by IEA Hamburg, in Hamburg, Germany, lasting three to four days. IEA provides training in using the IEA's software developed especially for the current TIMSS cycle. The data management training seminars should be attended by the data manager and/or the NRC.

Some domestic traveling within the country also needs to be budgeted for. This includes training School Coordinators/Test Administrators, monitoring schools during the field test and the main data collection (National Quality Assurance Program), coordinating the work with any outsourced agency (-ies), etc.

Sampling

Depending on the structure of educational/governmental systems within your country, costs may occur during the sampling frame preparation.

Assessment Instrument Preparation

For the field test and main data collection, the major undertaking is translating and/or adapting the assessment instruments and manuals into the language (-es) of instruction in your country. First, the instruments and manuals will need to be translated/adapted for field testing the newly developed items and then updated for the main data collection.

For the main data collection, trend countries also will need to transfer/confirm the existing translations of the TIMSS 2019 trend blocks and directions into the online translation system for eTIMSS 2023. New countries will need to translate/adapt the trend blocks. For bridge booklets, countries transferring to eTIMSS will need to transfer/confirm the existing translations of the TIMSS 2019 trend blocks into the InDesign booklet production folder structure for the paper-administration.

Your translated and/or adapted achievement test and student questionnaire will then be transferred from the online translation system into the eTIMSS Player to be administered to students, first for the field test and then again for the main data collection. Your responsibility will be to test the player. If you plan to use the Individual PCs/USBs method, you will need a USB stick with the eTIMSS Player installed for each participating student.

All eTIMSS achievement items and the student questionnaire will be administered in the electronic eTIMSS format. The school and teacher questionnaires can be administered either on paper or online. Any paper administered context questionnaires, paper bridge booklets, and paper manuals

will need to be printed. Please note that for students receiving the paper bridge booklets for the main data collection, the student questionnaire also will be administered on paper.

All materials will need to be labeled, packed, and distributed to the participating schools.

The following are estimates on the scope of translating/adapting the assessment instruments and manuals for eTIMSS at the eighth grade. The numbers of any assessment instruments and manuals for printing will need to be adjusted based on the actual sample size in your country.

For the field test, you will need to prepare national versions of:

- 24 blocks of new items (~13-15 items in each block, including the interactive problem-solving and inquiry task (PSI) blocks)
- Four context questionnaires (equivalent to ~15 pages each)
- School Coordinator Manual (~25 pages)
- Preparing Computers/Tablets for eTIMSS instructions (~20 pages)
- Test Administrator Manual (~25 pages)
- National Quality Control Monitor Manual (~15 pages).

For the field test, unless administered online, you will need to print ~100 copies of the mathematics teacher questionnaire, ~140 copies of the science teacher questionnaire, and ~50 copies of the school questionnaire. At least one School Coordinator Manual and Test Administrator Manual will need to be printed for each participating school.

For the main data collection, you will need to prepare national versions of:

- 36 achievement item blocks, including PSI blocks
- Four context questionnaires
- School Coordinator Manual
- Preparing Computers/Tablets for eTIMSS instructions
- Test Administrator Manual
- National Quality Control Monitor Manual

Countries switching to eTIMSS during the 2023 study cycle also will need to prepare:

- Eight paper-based bridge booklets (eight mathematics and eight science trend item blocks rotated)
- Paper-based student questionnaire
- School Coordinator Manual and Test Administrator Manual for schools/classes administering the paper bridge booklets

With the minimum sample size of 150 schools and 5,500 students (4,000 students without the bridge booklet administration), plus some extra copies, you will need to print:

- 250 copies of each bridge booklet
- 1,650 student questionnaires for students receiving bridge booklets
- 300 copies of the mathematics teacher questionnaire (unless administered online)
- 500 copies of the science teacher questionnaire (unless administered online)
- 200 copies of the school questionnaire (unless administered online)
- At least one School Coordinator Manual and Test Administrator Manual for each participating school.

Shipping/Mailing Costs

The assessment instruments/materials need to be shipped to the participating schools and back to the National Study Center. A safe and efficient shipping method needs to be selected for the materials to remain secure at all times. Additional mailing might be necessary between the NSC and the schools, such as communication on the test administration dates or providing any missing or damaged assessment materials.

NOTE: There are **two** rounds of shipping the assessment instruments/materials to and from the participating schools—first for the field test and then for the main data collection.

Scoring

Student responses to the constructed-response items will need to be scored in each participating country. In addition to the actual scoring, you will need to budget for training the scorers and supervising the scoring process.

The TIMSS & PIRLS International Study Center will provide an international scoring training and scoring guides for the field test and again for the main data collection. Attending the international scoring training is mandatory. Scoring guides may either be used in English or translated.

The following are estimates on the scope of scoring for eTIMSS at the eighth grade.

For the field test, based on the minimum sample size of 1,200 students, each country needs to score about 34,000 student responses. We estimate that this requires about 30 single-person working days. You will need a minimum of four scorers.

For the data collection, based on the minimum sample size of 4,000 students (5,500 students with the bridge booklet administration), each country needs to score about 95,500 TIMSS 2023 student responses. Bridge booklet scoring, Trend Reliability Scoring, and Cross-country Reliability Scoring adds about 70,000 student responses to score. We estimate that the whole scoring process requires about 145 single-person working days. You will need a minimum of eight scorers.

Data Entry

The eTIMSS achievement and student questionnaire data will be directly uploaded, so no manual data entry will be required for this. However, data from any paper questionnaires and from the paper bridge booklets must be entered into data files using the IEA's proprietary software. In addition to the actual data entry (punching), the punchers need to be trained.

The following are estimates on the scope of data entry for eTIMSS at the eighth grade.

For the field test, if all of the context questionnaires will be administered on paper, with the minimum sample size of 25 schools, the data will need to be entered from a minimum of 60 mathematics teacher questionnaires (~30-35 questions each), 100 science teacher questionnaires (~30-35 questions each), and 30 school questionnaires (~25 questions each). We estimate that this requires about 1-2 single-person working days.

For the data collection, with the minimum sample size of 150 schools and 4,000 students (5,500 students with the bridge booklet administration), the data will need to be entered from a minimum of:

- 1,500 bridge booklets (~45 items per booklet) and student questionnaire (~20 questions each)
- 250 mathematics teacher questionnaires (~30-35 questions each) (unless administered online)
- 450 science teacher questionnaires (~30-35 questions each) (unless administered online)
- 150 school questionnaires (~25 questions each) (unless administered online)

We estimate that this requires about 20 single-person working days.

Scanning

If a country chooses to scan the paper instruments in order to capture data instead of the described manual data entry, the budget needs to be adjusted based on the scanning technology and staff available. All data, however, need to be submitted to IEA Hamburg in the required format.

Reporting

Each country needs to plan for producing a national report at the end of the assessment cycle. This includes the costs of preparation and publishing the report, a press conference for its release and/or any other form of the TIMSS results dissemination.