

CHAPTER 5

TIMSS Systems and Instrument Verification

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Introduction

The international version of the TIMSS assessment instruments, including the achievement test and context questionnaires as well as procedural manuals, are originally developed in English. Using the international version of the instruments as a source, participating countries translate and adapt the materials to match their languages of instruction and cultural contexts. This process is referred to as translation and adaptation, or more generally as localization. Translation involves converting written text from one language into another, whereas localization employs multiple techniques to adapt content's full meaning and ensures the same level of complexity and difficulty for the new culture.

Ensuring the international comparability of the TIMSS national instruments is an essential part of the process of each TIMSS assessment cycle. This comparability is essential between countries during the same assessment cycle, and within countries across different cycles. To create a fair basis for comparing results across countries, languages, and contexts as well as over time, all participating countries follow a set of standardized procedures for translating and adapting their national assessment instruments and any related directions or administrative screens.

Preparing and checking the software and applications systems used by countries to translate, adapt, verify, and administer the instruments is a major undertaking for each TIMSS assessment cycle. TIMSS uses a digital assessment platform to implement, translate, adapt, and deliver the assessment. Once the development of the international version of the achievement instruments is completed, an online translation system is used for national instrument translation, localization, and verification. Following the verification of instruments and translations, a national TIMSS Player is developed for each language in each participating country to administer the TIMSS assessment to students. The online administration option for the TIMSS Context Questionnaires is also conducted using an online survey platform.

After translating and adapting the international source materials to the target language(s), each country's instruments undergo a formal review of the translations and adaptations by linguistic and assessment experts. This review process includes three stages: 1) translation verification, 2) layout and adaptations verification, and 3) creation and review of national TIMSS Players.

IEA Amsterdam manages the translation verification process, which involves external verifiers comparing each national version to the international text and providing detailed feedback for the National Research Coordinators (NRCs) to improve the accuracy and comparability of their national translations. After reviewing the feedback from the translation verifiers, revising materials as needed, and documenting changes, NRCs submit the instruments for a final layout and adaptations verification. Verifiers at the TIMSS & PIRLS International Study Center conduct layout and adaptations verification of national instruments, which includes checking that all national instruments match the international format and that any national adaptations to the instruments do not appear to affect their international comparability.

Once these two steps are concluded satisfactorily, the final TIMSS Players are created. The TIMSS & PIRLS International Study Center collaborates with NRCs as well as IEA Hamburg and the digital platform providers to create, review, and finalize the localized TIMSS Players. TIMSS uses two digital platforms to prepare national assessment instruments and deliver them to respondents (school principals, teachers, students, and their parents/guardians), one for the achievement test and one for context questionnaires.

This multi-stage verification and localization process is conducted once before the field test and then again prior to the main data collection. For the main data collection, the process involves verifying any changes made to field test materials and checking that the trend materials remained intact from the last TIMSS cycle.

In the interest of measuring trends in student achievement over time, the overall process of instrument translation and verification is implemented each TIMSS assessment, helping to maintain the quality and consistency of assessment content across cycles.

Providing Instruments, Support Materials, and Systems to Countries for Translation and Adaptation

National Research Coordinators (NRCs) are provided with the international versions of the TIMSS instruments for translation, along with detailed manuals to assist in the translation, adaptation, and verification processes. They are also provided technical manuals and attend webinars to learn about the functions and features of the translation systems. NRCs receive materials with guidelines for translation and adaptation, procedures for the instrument verification process, and PDF versions of the international source instruments reference. Before data collection, NRCs are provided with a list of changes made to the international versions of the field test instruments for reference in preparing their assessment instruments for the main data collection. This information helps minimize the translation burden by highlighting the necessary changes to the translations before data collection.

For the administration of any remaining paper instruments, NRCs receive electronic instrument production files in rich text format (RTF) and InDesign format, with full international PDF source versions as reference. NRCs also are provided with a manual and videos on using the provided files, translation and adaptation guidelines, and procedures for instrument verification. In addition to the instrument files, National Adaptations Forms (NAFs) are provided for documenting the translation and adaptations processes. Finally, additional InDesign support materials for right-to-left languages are provided.

Assessment Blocks to Measure Trends

To ensure the quality of the TIMSS trend measurement, the “trend blocks” of achievement items need to be identical to the same blocks administered in previous cycles. During the review of the trend translations, if a country determines that a change to their national trend materials is absolutely necessary due to a new specific grammar or language rule or to correct a mistranslation, the change is documented for review during the verification process. Sometimes countries note a change to correct a minor spelling error or typo. Changes made by countries to correct a major error in their national trend materials (e.g., missing text, misplaced text, or similar error making an item impossible to answer) are rare. However, when such a change is necessary, it is noted for the [item data review](#), and the corresponding item may be flagged for removal from the set of trend items for the affected country. Any other change to a trend item, whether documented by a country or found during the verification process, is requested to be reverted to match the version of the previous study cycle.

Guidelines for Translation and Adaptation

NRCs are provided guidelines for translating and adapting the TIMSS instruments for each assessment cycle. The purpose of these guidelines is to ensure that, when countries translate and adapt the TIMSS assessment instruments, the meaning and difficulty level of the national version of the instruments remains the same as the international version while following the rules of the target language and the country’s cultural context. The translated text should be appropriate as intended for the target population and reflect the language level of fourth- or eighth-grade students. Countries that share or collaborate to produce a common translation, or countries that borrow a translation prepared by another country, are required to revise and adapt the translation to their cultural context and language usage.

In accordance with the guidelines for translation and adaptation, translators and reviewers are asked to ensure the following:

- The translated text has the same register (language level and degree of formality) as the source text.
- The translated text has correct grammar and usage (e.g., subject/verb agreement, prepositions, verb tenses, etc.).
- The translated text does not clarify or add more information to the source text.

- The translated text has qualifiers and modifiers equivalent to the international version and appropriate for the target language.
- Idiomatic expressions are translated appropriately, using localized expressions rather than translating the source text word for word.
- Spelling, punctuation, and capitalization in the target text are appropriate for the target language and the country's national context.

National Adaptations Documentation

Preparing each set of national instruments requires extensive documentation of the complete history of the adaptation, translation, and verification stages. The translators, reviewers, and NRCs complete and review national adaptation documentation during various stages of the instrument preparation process.

In addition to facilitating the translation and adaptation process, this documentation provides important records of each country's final instruments and is used during achievement item review (see [Chapter 10](#)). National adaptations documentation also is referenced during data processing to prepare national and international database files (see [Chapter 8](#)). The National Adaptations Database for each TIMSS cycle, published with the User Guide for the International Database, contains a record of adaptations made to countries' questionnaire items to aid users of the data.

For achievement materials, all national adaptations and verification comments relating to the achievement materials are documented directly in the online translation system. For context questionnaires (and any paper-based instruments), the process for documenting the translation and adaptation process requires using a spreadsheet called the National Adaptations Form (NAF) for each set of national instruments. NRCs prepare one NAF per language for the instruments, noting all the changes that were made, including added national options for questionnaires. Translation and adaptation verifiers use the NAFs to ensure the correct documentation and implementation of the changes. After each stage of international verification, the NAF is updated and revised with comments from the verifiers and the NRC to produce a complete history of the changes made to the instruments.

When documenting an adaptation, the following information is recorded either in the online translation system or in the NAF: identifying information (location and/or question number), the adaptation itself, a back-translation in English of the adaptation, a brief explanation for the adaptation, and recoding instructions (if applicable for the context questionnaires). The NAF also specifies designated areas for the documentation at each stage of instrument preparation and verification to maintain a complete record of the process.

Digital Assessment Platform

The digital assessment platform is used to create the final international versions of the TIMSS achievement instruments, to conduct localization and verification of national instruments, and to build national TIMSS Player software for administering the assessment to students.

To begin translation and adaptation, international versions of the items are provided to countries in the online translation system used by NRCs and translators from participating countries and by translation and layout verifiers. The final product of the translation system is a national TIMSS Player for each language and grade within each participating country.

The online translation system ensures the appropriate workflow by assigning appropriate user rights at each stage of the process. This workflow consists of a series of status indicators, set by the various parties involved in the process, which communicate the progress of the translation and verification process. These status indicators include the following:

1. **In Translation & Adaptation:** the default status. Upon receiving the translation system, all contents have status “In Translation & Adaptation.”
2. **Ready for Translation Verification:** set by the national center after translation and adaptation to submit materials for translation verification.
3. **In Translation Verification:** set for the duration of translation verification. This locks the system and prevents national editing during the verification process.
4. **In NRC Translation Approval:** set when translation verification is completed. This unlocks the system for countries to edit their materials and to respond to the translation verifier’s feedback and finalize translations.
5. **Ready for Layout Verification:** set by the national center to submit materials for layout verification.
6. **In Layout Verification:** set for the duration of layout verification. This locks the system and prevents national editing during the verification process.
7. **In NRC Layout Approval:** set when layout verification is completed. This unlocks the system so that countries can edit their materials, respond to the layout verifier’s feedback, and finalize the materials.
8. **Instrument Finalized:** set by the national center to indicate their materials are ready for production. Once this is set, the system is locked to prevent any further edits and the national TIMSS Player is created.

Each user can leave comments to document the process at each step. Comments are labeled to indicate whether they concern translation, layout, or a national adaptation. NRCs can also pose questions to the reviewers or verifiers.

All users can use the preview feature. This feature allows users to display content as it would appear within the TIMSS Player. It is especially useful during layout verification, as the preview allows a comparison between the national TIMSS Player and the original international source version.

The online translation system is used for both the field test and the main data collection. After the field test, translations are carried over to the main data collection materials for each country, language, and grade. Countries are responsible for reviewing the materials and retranslating or newly translating them based on the provided international version and documentation.

Online Survey Platform

Countries use an online survey platform to prepare web-based versions of their national student, school, teacher, and home context questionnaires. The platform includes design, presentation, and monitoring components. The design component, known as the “Designer,” supports the preparation of the online questionnaires, data management, and data output. Through the Designer, countries can translate and adapt the international versions of the online questionnaires to their national language. To facilitate translation and adaptation, the Designer concurrently stores the original English question text and the translations or national adaptations. It also stores the variable names and data validation rules. If a national center decided not to administer a particular question or option, it could be disabled in the Designer and not be presented during the online questionnaire administration. The Designer also includes a preview function for NRCs to view the online versions of the questionnaires as the respondents would see them during the administration.

Translation and Translation Verification

When translating and adapting the instruments, all countries are required to follow the standard, internationally agreed-upon procedures for preparing their national instruments. In particular, countries are responsible for translating and adapting the international assessment instruments according to the international guidelines for TIMSS, reviewing their national translation’s quality and appropriateness, and documenting all national adaptations for reference at later stages. Although English-speaking countries do not need to translate the instruments, they are required to review and adapt the instruments, as needed, to accommodate their cultural contexts and variations in English.

Participating countries also are allowed to share or collaborate to produce common translations of their instruments to help reduce the time and workload allocated for instrument preparation.

Translators and Reviewers

All countries and benchmarking participants were advised to hire highly qualified translators and reviewers who were well-suited to the task of working with the TIMSS materials. The essential qualifications for both roles included:

- excellent knowledge of English
- excellent understanding of the target language
- experience of the country’s cultural context
- experience in translating text in the subject areas related to the TIMSS assessment (mathematics and science), preferably at the level of the target grade

The primary responsibility of the reviewer is assessing the readability and accuracy of the translation for the target population. In addition to excellent language skills and knowledge of

the country's cultural context, reviewers are expected to have experience with students in the target grade, preferably as a school teacher.

In cases where multiple translators or reviewers are needed to facilitate the process, NRCs are responsible for maintaining consistency of the translations within and across instruments. Countries that administered the assessment in more than one language are advised to employ translators and reviewers that are highly proficient in these languages to ensure the consistency of the translations and adaptations across different language versions.

Translating and Adapting the Achievement Instruments

One of the main challenges in translating TIMSS instruments is finding appropriate terms and expressions in the target language(s) of each country that convey the same meaning and difficulty level as intended by test developers in the international version. When adapting and translating expressions with contextually appropriate terms, translators are asked to ensure that the meaning and difficulty of the text remains the same as the international version. In particular, it is important that the translators do not simplify or clarify the questions in ways that would make questions easier or more difficult compared to the international version that was developed for the fourth- or eighth-grade target population. Translators are also asked to ensure the consistency of adaptations and translations from item to item. They are instructed to pay particular attention to the literal and synonymous text matches in the question stem and the answer options for selected-response items. Any matches in the international version must be maintained in the translated national version.

Although NRCs are strongly advised to keep adaptations to a minimum, some adaptations are necessary to prevent students from facing unfamiliar contexts or vocabulary that could hinder their ability to read and understand the questions. In some cases, it is necessary to make changes to follow national expressions of date and time, mathematical notation, or punctuation. For example, a reference to the working week as Monday to Friday might be adapted according to national customs. Similarly, a word such as “flashlight” in American English can be adapted to “torch” in British English. In addition, fictional names of characters and places can be modified to similar names in the target language. When adapting the names of fictional cities or towns, translators are instructed not to use real names of places in order to prevent student responses from being influenced by their perceptions and knowledge of the actual locations. For items involving currency, the TIMSS fictional currency “zed” is used in the source version and must be maintained across all national versions.

To aid countries with adaptations, countries are provided with a style guide where they document their national conventions regarding punctuation, form of address (formal or informal), mathematical notation, and units of measurement. Countries with right-to-left languages are asked to specify which items are to be written in the right-to-left format (e.g., equations, graphs, tables, and image sequences).

Translating and Adapting the Context Questionnaires

Translation procedures for the questionnaires differ somewhat from those for the achievement items. In addition to translating the instruments, participating countries are required to adapt some terms to ensure that questions are appropriate for the national context and education system. In the international version, terms requiring adaptation are listed in angle brackets containing a description of what country-specific information was needed. For example, <language of test> and <fourth grade> needs to be adapted to the actual language and grade in which the assessment is administered—in the Netherlands, these terms would be replaced by their equivalents, “Nederlands” (Dutch) and “groep 6” (grade 4). Items assessing levels of education use the current version of the International Standard Classification of Education (ISCED) system, ISCED 2011 (UNESCO Institute for Statistics, 2012), and require adaptation to the nationally equivalent educational terms for each participating country.

The guidelines for translation and adaptation provided to countries contain detailed descriptions of each required adaptation, including the intent of each adaptation, to help translators convey the intended meaning with an appropriate national term or expression. Translators also are instructed to focus on the clarity and appropriateness of the language for each addressed target group (e.g., parents, schools, teachers, or students).

Countries are permitted to add a limited number of questions of national interest to the questionnaires. To avoid influencing responses to the international questions, NRCs are advised to place any national questions at the end of the corresponding module or questionnaire and to ensure that these questions use the same format as the rest of the questionnaire. All national questions require approval by the TIMSS & PIRLS International Study Center before inclusion in the final questionnaires.

International Translation Verifiers

After the instruments are translated and adapted, they are submitted for translation verification. The international translation verifiers are responsible for reviewing and documenting the quality of the national instruments and their comparability to the international instruments. The required qualifications for international translation verifiers are as follows:

- fluency in English
- native proficiency in the target language
- formal credentials as translators working in English
- university-level education and (if possible) familiarity with the subject area (mathematics or science)
- residency in the target country or close contact with the country and its culture

The international translation verifiers are trained and provided with comprehensive instructional materials to support their work. Online training is conducted to provide verifiers with information about TIMSS, the assessment instruments, and the verification procedures. Each verifier receives a set of materials including a document containing the description of the

adaptation and translation guidelines, the relevant manuals and instruments, and instructions for reviewing the national instruments and documenting deviations from the international version.

For the verification of data collection instruments, verifiers receive a document listing the revisions made to the international instruments after the field test and the NAFs used during the field test.

Translation Verification

The instructions and training given to the verifiers emphasize the importance of maintaining the same meaning and difficulty level in the translations and adaptations as in the international versions of the assessment instruments. Verifiers also are instructed to ensure that translations and adaptations are adequate and consistent within and across national instruments. The translation verification process involves the following:

- checking the accuracy, linguistic correctness, and comparability of the translated and adapted achievement items and questionnaires
- documenting any deviations between the national and international versions, including additions, deletions, mistranslations, or changes of wording
- suggesting alternative translations/adaptations to improve the accuracy and comparability of the national instruments (where applicable)

During the verification before the data collection, verifiers check that all revisions made to the international instruments after the field test are implemented and that, unless otherwise documented, the adaptations from the field test are maintained in the data collection instruments.

For the achievement instruments, verifiers provide feedback on the quality of the translated and adapted items directly in the online translation system. If the translation needs revision, verifiers are instructed to correct the translation and add notes documenting the reason for the change. For the context questionnaires and any paper instruments, feedback from the verifiers is added to the accompanying NAFs. In addition, when RTF files are submitted for verification of the paper materials, verifiers can document their suggested changes in the RTF files directly.

All verifier comments are accompanied by a code to help NRCs understand the severity and type of deviation of the translated text from the international version. Descriptions of these codes are shown in Exhibit 5.1. Translation verifiers are also instructed to review all adaptations and check whether the adaptations are correctly documented and implemented before the final review.

Exhibit 5.1: Translation Verification Feedback Codes

Code 1	Indicates a major change or error that affects the meaning or difficulty of the text. Examples include mistranslations, change in the meaning or difficulty of a text, the omission or addition of information, incorrect order of questions or response options, and/or incorrectly implemented national adaptations.
Code 1?	If in any doubt, verifiers are instructed to use Code 1? and the error is referred for further consultation. Examples include undocumented or incorrect adaptations.
Code 2	Indicates a minor change or error that does not affect the comprehension of the text. Examples include spelling or grammar errors.
Code 3	Used by verifiers to suggest an alternative wording for an otherwise appropriate translation.
Code 4	Indicates that an adaptation was implemented as suggested by the NRC. This adaptation still must be reviewed and receive final approval.

Translation Verification of the Trend Assessment Blocks

For countries that participated in a previous TIMSS assessment, the international verification procedures include a “trend check” of the achievement instruments to ensure that the national trend items do not change from one study cycle to the next. As part of the trend check process for each country, translation verifiers check the national trend items used in the current TIMSS cycle against those administered in the previous cycle and document any differences in content or wording. Verifiers also revert any changes a country made to the trend items unless there was a specifically documented reason for the change. In the case that countries administered paper-based assessment in the previous cycle but are using the digital assessment in the current cycle, some minor changes to wording may be acceptable depending on the item. For example, “write” may be changed to “type.”

The verifiers are instructed to record any discrepancies in the trend items in the online translation system or NAF. NRCs are required to carefully review all discrepancies and discuss any proposed changes with the TIMSS & PIRLS International Study Center.

Review of International Translation Verification Feedback

Upon completion of international translation verification, the NRCs are ultimately responsible for responding to the translation verifiers’ feedback by accepting, modifying, or rejecting suggested changes to the adapted and/or translated text elements. There are many ways text may be translated, and the feedback from the verifiers is meant to aid NRCs in revising the materials and improving the quality of their national versions to be in line with the translation guidelines for the specific TIMSS assessment cycle.

Layout and Adaptations Verification

Following translation verification, all national instruments are required to undergo layout and adaptations verification. This is the second external review for each participating country's assessment instruments and corresponding documentation. During layout and adaptations verification, all national instruments are reviewed in their final form to ensure international comparability of adaptations and layout structure and proper documentation of any national adaptations.

In particular, layout verification focuses on the following:

- reviewing the national achievement materials and context questionnaires against the international versions for layout and functionality
- reviewing national adaptations made to the achievement materials and context questionnaires with respect to the international comparability of the data
- reviewing the online questionnaires against their corresponding paper versions (where applicable)
- reviewing trend materials against the previous national versions for consistency across cycles

Layout and Adaptations Verification of the Achievement Instruments

The primary goal of layout and adaptations verification of the achievement instruments is to ensure that students across different countries experience the assessment in the same way. Thus, the national versions of the assessment blocks are checked against the international version to identify any deviations from the international format or the international functionality. The verification process is conducted directly in the online translation system using the preview mode. This allows verifiers to compare each national item or screen to the corresponding international version.

Due to differences in language, the national assessment items may vary somewhat across countries in length and format. The international versions, however, are designed with this in mind. The layout of the items is designed to minimize scrolling in languages that tend to require longer texts or words (“longer languages”). In addition, specific layout adjustments are made to the national versions to accommodate the text as needed, including special characters, longer languages, and country-specific requirements for the right-to-left languages.

During layout verification, the verifiers review the layout and functionality of all items, directions, and administrative screens. The verifiers check the materials for comparability to the international versions, on-screen readability, consistent text formatting and graphics across languages, and functionality of item components. For languages using right-to-left scripts, the verifiers check that no elements are incorrectly altered and that conventions for graphics were implemented consistently throughout all the screens and items. Verifiers are instructed to correct as many issues as possible in the translation system. Any layout or functionality issues

that cannot be adjusted via the translation system are reported to the platform provider to be fixed before creating the national TIMSS Players.

Verifiers enter their comments regarding layout deviations or errors, as well as any concerns of international incomparability, directly in the translation system. Comments from the verifiers should include a reference to the text element, a classification of the comment (whether it was related to an adaptation or layout issue), and a button to “accept” or “reject” the comment. After the layout and adaptations verification, the NRCs are asked to review the verifier’s feedback and accept or reject each comment. If the NRC rejects a comment, they are required to provide a justification for not accepting the suggested change.

For layout and adaptation verification of any paper achievement instruments, verifiers review the pagination, page breaks, headers, footers, signs instructing students to stop work, question sequence, scoring boxes, response options, text formats, and graphics to ensure they match previous cycle versions. For countries with right-to-left layout languages, this includes ensuring that no elements were incorrectly altered in adjusting the alignment and that conventions for graphics were implemented consistently throughout all booklets. Any layout deviations or errors, as well as any differences from earlier versions, are documented by the verifiers in the NAFs. Following layout and adaptations verification, the NAFs containing the verifiers’ comments are returned to the NRCs for consideration. The NRCs are asked to revert any changes to match the materials in earlier versions or to justify the change.

Layout and Adaptations Verification of the Trend Assessment Blocks

For countries that participated in previous TIMSS assessments, the national TIMSS trend achievement blocks for the current cycle are also reviewed against the versions from the last cycle in which the country participated. During layout verification of trend blocks, the verifiers ensure that the layout structure and adaptations in the national instruments are consistent with countries’ trend versions and document any inconsistencies for review by NRCs. If a country needs to modify their trend materials due to an error in previous cycles or a change in curriculum, the TIMSS & PIRLS International Study Center documents approval of the change or requests more information. In the case that countries administered paper-based assessment in the previous cycle but are using the digital assessment in the current cycle, some minor changes to item layout are expected. For example, some paper-based black-and-white images may be colored digitally, or graphic labels may be moved to optimize on-screen readability.

Layout and Adaptations Verification of the Context Questionnaires

As with the achievement instruments, the context questionnaires are checked against the international versions to identify potential layout issues and ensure the international comparability of any adaptations. NAFs are used to document all national adaptations for the context questionnaires, whether they are administered digitally or on paper.

During layout verification, the verifiers consider any national adaptations documented in the NAFs by the NRCs. Instances of internationally incomparable adaptations or errors, along with

concerns about recoding or rewording, are recorded by the verifiers in the NAFs. The NRCs are asked to confirm that each suggested change was implemented or provide an explanation for not implementing the suggested change. Where countries administer any of the questionnaires on paper and online, the verifiers compare the paper version to the corresponding online version to ensure consistency across the two modes of administration.

The verifiers ensure that all items requiring adaptations are accompanied by back translations in English in the NAFs. The documentation for these universally adapted questionnaire items is intended for later use in the National Adaptations Database, published with the User Guide for the International Database for each TIMSS cycle.

Review of Final Translations and Adaptations

Upon completion of layout and adaptation verification, the NRCs are responsible for finalizing their national instruments. This includes making necessary adjustments to the materials and responding to all the feedback from the layout and adaptation verifiers.

Once the materials are reviewed and finalized, NRCs are required to submit their national materials to the TIMSS & PIRLS International Study Center for a final review. In the final review of the national achievement materials in the translation system, including achievement items and other aspects of the digital user interface such as administrative screens, the layout verifiers check that all issues have been addressed, all comments have been answered, and all materials have been set to the status “Instrument Finalized.” This status indicates that no further changes will be made to the materials, and the country is now ready to receive its first draft of the national TIMSS Player.

Context questionnaires and any paper instruments are checked to ensure that all issues have been addressed, all comments in the NAFs have been answered, and all of the final materials have been submitted. Once the TIMSS & PIRLS International Study Center confirms the materials have been finalized, online questionnaires are activated for administration, and the country is permitted to begin printing any paper instruments.

National TIMSS Player Production

After approval of the national translations and adaptations of digital achievement instruments, a customized national version of the TIMSS Player is produced for each country for each grade and assessment language. The third and final stage of the localization process for digital instruments, the national TIMSS Player production process, involves several extensive verification checks to ensure the proper functioning of the instruments and delivery software. This requires a joint effort from all organizations involved.

As the first step of the process, a draft TIMSS Player is produced for each country-language-grade combination. NRCs are provided a country-language-grade specific URL allowing them to access the online version of their national TIMSS Player, the application files necessary for installing the USB version, and NRC testing login credentials needed for their reviews

(see more information in [Chapter 4](#)). NRCs are instructed to review all assessment content and ensure that all translations and content appear correctly and that the items and interface navigation function as expected. If countries identify any errors in their national content, such as a mistranslation or layout issue, or experience any issues with the TIMSS Player software during their review, they are asked to report this feedback with screenshots for review by the TIMSS & PIRLS International Study Center, where staff review NRCs' feedback alongside the respective national Players, verify or replicate the issues identified, and apply fixes where possible. Issues that cannot be easily resolved are submitted to the platform provider through software request tickets.

As NRCs review their national content, data-saving functions are reviewed for each national Player. This process involves applying standardized semi-automated data-saving tests to check that the data was captured properly and to ensure consistency with the international TIMSS Player data-saving specifications.

After all issues are resolved, countries receive a new version of their national TIMSS Player for a second review. If no further issues are identified in the updated Player, it is considered final and ready for data collection.

Systems and Instrument Verification for TIMSS 2023

The TIMSS 2023 cycle marked the second and final phase of the transition to a fully digital administration of the TIMSS assessment. New assessment content was only developed for digital administration. Six new item blocks were developed for mathematics and six for science, and at each target grade, for a total of 24 new blocks. These 24 new blocks had to be translated and adapted across all participating countries, in addition to directions and additional interface elements such as administrative screens. The TIMSS 2023 assessment comprised 14 blocks each, for mathematics, science, and per grade, plus student, home, school, and teacher context questionnaires.

The following TIMSS 2023 instruments underwent verification:

- digital student achievement items, directions, and user interface elements (e.g., administrative screens)
- paper achievement booklets (for countries participating in paper assessment options)
- online context questionnaire items, covers, and directions
- paper context questionnaires, covers, and directions

TIMSS 2023 used a proprietary digital assessment platform owned by [RM](#) to build, translate, adapt, and deliver achievement instruments. Once the international version of the achievement instruments was developed, RM's Assessment Master (AM) Online Translation System was used

for national instrument translation, localization, and verification. After verifying instruments and translations, a national TIMSS Player was developed for each language in each participating country for administering the TIMSS 2023 assessment to students. The preparation of national paper instruments mirrored the procedures of [TIMSS 2019](#).

In TIMSS 2023, the student questionnaire was administered using IEA's Online SurveySystem (OSS) application. The online administration option for the school, teacher, and home questionnaires was also conducted using OSS.

TIMSS 2023 followed the stringent translation, adaptation, and verification procedures described above. Through the cooperation of NRCs and staff from IEA Amsterdam, IEA Hamburg, and the TIMSS & PIRLS International Study Center, the translation and verification processes facilitated the production of national versions of the TIMSS 2023 instruments that accommodated national languages and context while maintaining international comparability. The TIMSS & PIRLS International Study Center provided countries and benchmarking entities with comprehensive guidelines and procedural manuals outlining the various instrument preparation and verification steps.

The feedback from translation verification helped NRCs improve the quality and comparability of their national instruments by reviewing the translations and suggesting improvements where needed. Some of the typical errors identified by verifiers during translation verification included mistranslations, omissions/additions of text, inconsistent translations, minor linguistic or grammatical errors, and discrepancies in mathematical notations. The constructive feedback from the verifiers aided NRCs in revising the materials and in improving the quality of their national versions in line with the translation guidelines for TIMSS 2023.

The feedback from layout and adaptation verification helped NRCs ensure the international comparability of instruments across countries by reviewing the proposed adaptations and the corresponding documentation and addressing any layout issues.

For countries administering TIMSS 2023 digitally for the first time, the change in mode of administration necessitated slight changes in the text. For countries administering TIMSS 2023 digitally after also administering TIMSS 2019 digitally, the change from a portrait orientation to a landscape orientation for all the achievement items (see [Chapter 1](#)) may have meant small changes in the layout of the trend items. During layout and adaptations verification, the verifiers documented and accounted for any changes to the trend materials beyond these simple adjustments.

The final review for achievement materials focused on the functionality of the TIMSS Players. It provided another opportunity to correct any errors found in the translations or the use of the Players. Ultimately, the stringent procedures applied in TIMSS 2023 resulted in high-quality instruments that allowed for comparisons in student achievement across all participating countries and benchmarking entities.

Scope of Translation and Verification in TIMSS 2023

For the TIMSS 2023 assessment cycle, there were 65 participating countries and 6 benchmarking entities across both grades. At the fourth grade, the assessment instruments were translated into 92 language versions and the context questionnaires into 96 language versions. At the eighth grade, the assessment instruments were translated into 66 language versions and the context questionnaires into 65 language versions.

In most countries, identifying the language of administration (i.e., target language) was straightforward, as there was a single or predominant language used for instruction in the country's education system. In countries with more than one language of instruction, the instruments were translated into several languages. In countries where the language spoken at home varied from the language of instruction, the home questionnaire, administered to the parents or primary caregivers, was also translated into different languages.

The most common target language was English (21 countries and 5 benchmarking entities), followed by Arabic (11 countries and 3 benchmarking entities), French (5 countries and 2 benchmarking entities) and Russian (5 countries). Overall, 28 countries and 6 benchmarking entities administered their instruments in multiple languages.

As in previous cycles of TIMSS, some countries made agreements to use another participating country's translated instruments as their source version and adapt them to their own national context. In TIMSS 2023, countries that used other countries as their source versions included Cote d'Ivoire, which borrowed the French version from Canada; Finland, which borrowed the Swedish version from Sweden; and Kosovo, which borrowed Albanian from Albania.

Appendices 5A and 5B list the TIMSS 2023 countries, the target languages for each country, and the instruments administered in each country and language.

Reference

UNESCO. (2012). *International Standard Classification of Education (ISCED) 2011*. Montreal, Quebec: UNESCO Institute of Statistics. <http://uis.unesco.org/sites/default/files/documents/international-standard-classification-of-education-isced-2011-en.pdf>

Appendix 5A: Languages used for the TIMSS 2023 Assessment Instruments – Grade 4

Country	Language	Instruments				
		Achievement Test	Student Questionnaire	Teacher Questionnaire	School Questionnaire	Home Questionnaire
Albania	Albanian	●	●	●	●	●
Armenia	Armenian	●	●	●	●	●
Australia	English	●	●	●	●	
Azerbaijan	Azeri	●	●	●	●	●
	Russian	●	●	●		●
Bahrain	English	●	●	●	●	●
	Arabic	●	●	●	●	●
Belgium (Flemish)	Dutch	●	●	●	●	●
Belgium (French)	French	●	●	●	●	●
Bosnia & Herzegovina	Bosnia	●	●	●	●	●
	Croatian	●	●	●	●	●
	Serbian	●	●	●	●	●
Brazil	Portuguese	●	●	●	●	●
Bulgaria	Bulgarian	●	●	●	●	●
Canada ¹	English	●	●	●	●	●
	French	●	●	●	●	●
Chile	Spanish	●	●	●	●	●
Chinese Taipei	Traditional Chinese	●	●	●	●	●
Cyprus	Greek	●	●	●	●	●
	English	●	●	●	●	●
Czech Republic	Czech	●	●	●	●	●
Denmark	Danish	●	●	●	●	●
England	English	●	●	●	●	
Finland	Finnish	●	●	●	●	●
	Swedish	●	●	●	●	●

Country	Language	Instruments				
		Achievement Test	Student Questionnaire	Teacher Questionnaire	School Questionnaire	Home Questionnaire
France	French	●	●	●	●	●
Georgia	Georgian	●	●	●	●	●
Germany	German	●	●	●	●	●
Hong Kong SAR	English	●	●	●	●	●
	Traditional Chinese	●	●	●	●	●
Hungary	Hungarian	●	●	●	●	●
Iran, Islamic Rep. of	Farsi	●	●	●	●	●
Iraq	Arabic	●	●	●	●	●
Ireland	English	●	●	●	●	●
	Irish	●	●	●	●	●
Italy	Italian	●	●	●	●	●
Japan	Japanese	●	●	●	●	●
Jordan	Arabic	●	●	●	●	●
Kazakhstan	Kazakh	●	●	●	●	●
	Russian	●	●	●	●	●
Korea, Rep. of	Korean	●	●	●	●	●
Kosovo	Albanian	●	●	●	●	●
Kurdistan Region of Iraq	Badini	●	●	●	●	●
	Sorani	●	●	●	●	●
Kuwait	Arabic	●	●	●	●	●
	English	●	●	●	●	●
Latvia	Latvian	●	●	●	●	●
	Russian	●	●	●	●	●
Lithuania	Lithuanian	●	●	●	●	●
	Polish	●	●	●	●	●
	Russian	●	●	●	●	●

Country	Language	Instruments				
		Achievement Test	Student Questionnaire	Teacher Questionnaire	School Questionnaire	Home Questionnaire
Macao SAR	Chinese	●	●	●	●	●
	English	●	●	●	●	●
	Portuguese	●	●	●	●	●
Montenegro	Montenegrin	●	●	●	●	●
Morocco	Arabic	●	●	●	●	●
Netherlands	Dutch	●	●	●	●	
New Zealand	English	●	●	●	●	●
North Macedonia	Macedonian	●	●	●	●	●
	Albanian	●	●	●	●	●
Northern Ireland ²	English	●	●	●	●	●
Norway (5)	Bokmål	●	●	●	●	●
	Nynorsk	●	●			●
	English					●
Oman	Arabic	●	●	●	●	●
	English	●	●	●	●	●
Poland	Polish	●	●	●	●	●
Portugal	Portuguese	●	●	●	●	●
Qatar	Arabic	●	●	●	●	●
	English	●	●	●	●	●
Romania	Romanian	●	●	●	●	●
Saudi Arabia	Arabic	●	●	●	●	●
	English	●	●	●	●	●
Serbia	Serbian	●	●	●	●	●
Singapore	English	●	●	●	●	●
	Traditional Chinese					●
	Tamil					●
	Malay					●

Country	Language	Instruments				
		Achievement Test	Student Questionnaire	Teacher Questionnaire	School Questionnaire	Home Questionnaire
Slovak Republic	Slovak	●	●	●	●	●
	Hungarian	●	●			●
Slovenia	Slovene	●	●	●	●	●
South Africa (5)	Afrikaans	●	●	●	●	●
	English	●	●	●	●	●
Spain ³	Spanish	●	●	●	●	●
	Catalan	●	●	●	●	●
	Valencian	●	●	●	●	●
	Galician	●	●	●	●	●
	Basque	●	●	●	●	●
Sweden	Swedish	●	●	●	●	●
Türkiye (5)	Turkish	●	●	●	●	●
United Arab Emirates ⁴	Arabic	●	●	●	●	●
	English	●	●	●	●	●
United States	English	●	●	●	●	
Uzbekistan	Uzbek	●	●	●	●	●
	Karakalpak	●	●	●	●	●
	Russian	●	●	●	●	●

1 Canada's instruments were also used for the benchmarking provinces of Ontario and Quebec.

2 Northern Ireland prepared assessment materials but did not conduct data collection.

3 Spain translated the achievement test into Galician for science items only. The mathematics items were administered in Spanish.

4 United Arab Emirates' instruments were also used for the benchmarking emirates of Abu Dhabi, Dubai, and Sharjah.

Appendix 5B: Languages used for the TIMSS 2023 Assessment Instruments – Grade 8

Country	Language	Instruments			
		Achievement Test	Student Questionnaire	Teacher Questionnaire	School Questionnaire
Australia	English	●	●	●	●
Austria	German	●	●	●	●
Azerbaijan	Azeri	●	●	●	●
	Russian	●	●	●	●
Bahrain	English	●	●	●	●
	Arabic	●	●	●	●
Brazil	Portuguese	●	●	●	●
Chile	Spanish	●	●	●	●
Chinese Taipei	Traditional Chinese	●	●	●	●
Cyprus	Greek	●	●	●	●
	English	●	●	●	●
Czech Republic	Czech	●	●	●	●
England	English	●	●	●	●
Finland	Finnish	●	●	●	●
	Swedish	●	●	●	●
France	French	●	●	●	●
Georgia	Georgian	●	●	●	●
Hong Kong SAR	English	●	●	●	●
	Traditional Chinese	●	●	●	●
Hungary	Hungarian	●	●	●	●
Iran, Islamic Rep. of	Farsi	●	●	●	●
Ireland	English	●	●	●	●
	Irish	●	●	●	●
Israel	Arabic	●	●	●	●
	Hebrew	●	●	●	●

Country	Language	Instruments			
		Achievement Test	Student Questionnaire	Teacher Questionnaire	School Questionnaire
Italy	Italian	●	●	●	●
Cote d'Ivoire	French	●	●	●	●
Japan	Japanese	●	●	●	●
Jordan	Arabic	●	●	●	●
Kazakhstan	Kazakh	●	●	●	●
	Russian	●	●	●	●
Korea, Rep. of	Korean	●	●	●	●
Kuwait	Arabic	●	●	●	●
	English	●	●	●	●
Lithuania	Lithuanian	●	●	●	●
	Polish	●	●		
	Russian	●	●		
Malaysia	English	●	●	●	●
	Malay	●	●	●	●
Malta	English	●	●	●	●
Morocco	Arabic	●	●	●	●
	French	●			
New Zealand	English	●	●	●	●
Norway (9)	Bokmål	●	●	●	●
	Nynorsk	●	●		
Oman	Arabic	●	●	●	●
	English	●	●	●	●
Palestinian Nat'l Auth.	Arabic	●	●	●	●
	English	●	●	●	●
Portugal	Portuguese	●	●	●	●
Qatar	Arabic	●	●	●	●
	English	●	●	●	●
Romania	Romanian	●	●	●	●

Country	Language	Instruments			
		Achievement Test	Student Questionnaire	Teacher Questionnaire	School Questionnaire
Saudi Arabia	Arabic	●	●	●	●
	English	●	●	●	●
Singapore	English	●	●	●	●
South Africa (9)	Afrikaans	●	●	●	●
	English	●	●	●	●
Sweden	Swedish	●	●	●	●
Türkiye	Turkish	●	●	●	●
United Arab Emirates ¹	Arabic	●	●	●	●
	English	●	●	●	●
United States	English	●	●	●	●
Uzbekistan	Uzbek	●	●	●	●
	Karakalpak	●	●	●	●
	Russian	●	●	●	●

1 United Arab Emirates' instruments were also used for the benchmarking emirates of Abu Dhabi, Dubai, and Sharjah.