

# Trends in International Mathematics and Science Study International Data Explorer Help Guide

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# TIMSS International Data Explorer Help Guide

## I. Background on the Trends in International Mathematics and Science Study (TIMSS) and the TIMSS International Data Explorer

The TIMSS International Data Explorer (IDE) is a web-based application for accessing Trends in International Mathematics and Science Study (TIMSS) data supported by the U.S. National Center for Education Statistics (NCES). Developed and implemented at the international level by the International Association for the Evaluation of Educational Achievement (IEA), TIMSS is an international comparative study of the mathematics and science achievement of students.

TIMSS was first administered in 1995, and is used to measure over time the mathematics and science knowledge of fourth- and eighth-graders. Since 1995, TIMSS has been administered in 1999, 2003, and, most recently, in 2007 to fourth-grade students in 36 countries and eighth-grade students in 48 countries. TIMSS is also open to subnational entities, or education systems, which might be part of larger countries. For example, while the United States participated as a nation in TIMSS 2007, two states, Massachusetts and Minnesota, also elected to participate in this data collection. Eight subnational education systems, or “benchmarking entities,” participated in TIMSS 2007: the Canadian provinces of Alberta, British Columbia, Ontario, and Quebec; Dubai (United Arab Emirates); the Basque region of Spain; and the U.S. states of Massachusetts and Minnesota. [TIMSS 2007 results are now available](#), and the next TIMSS administration is scheduled for 2011.

Which aspect of mathematics achievement can I explore?

**TIMSS Math Scale: Overall Mathematics, Grade 4** – The TIMSS *mathematics* achievement scale summarizes student performance on test items designed to measure breadth of content in number, geometric shapes and measures, and data display, as well as a range of processes within the knowing, applying, and reasoning cognitive domains.

**TIMSS Mathematics Content Domains – Grade 4** – Three content domains are used for grade 4.

**TIMSS Math Scale: Number** – The *number* content domain for the fourth grade level includes understanding of place value, ways of representing numbers, and the relationships between numbers.

**TIMSS Math Scale: Geometric Shapes and Measures** – The *geometric shapes and measures* domain includes properties of geometrical figures such as lengths of sides, sizes of angles, areas, and volumes.

**TIMSS Math Scale: Data Display** – The *data display* content domain includes reading and interpreting displays of data, as well as understanding how to organize data with graphs and charts.

**TIMSS Math Scale: Overall Mathematics, Grade 8** – The TIMSS *mathematics* achievement scale summarizes student performance on test items designed to measure breadth of content in number, algebra, geometry, and data and chance, as well as a range of processes within the knowing, applying, and reasoning cognitive domains.

**TIMSS Mathematics Content Domains – Grade 8** – Four content domains are used for grade 8.

**TIMSS Math Scale: Number** – The *number* content domain at the eighth grade level includes understanding of numbers, ways of representing numbers, relationships among numbers, and number systems.

**TIMSS Math Scale: Algebra** – The *algebra* content domain includes recognizing and extending patterns, using algebraic symbols to represent mathematical situations, and developing fluency in producing equivalent expressions and solving linear equations.

**TIMSS Math Scale: Geometry** – The *geometry* content domain includes analyzing the properties and characteristics of a variety of two and three-dimensional geometric figures, including lengths of sides and sizes of angles, and providing explanations based on geometric relationships. In addition, this content area also includes using spatial visualization skills to move between two- and three-dimensional shapes and their representations.

**TIMSS Math Scale: Data and Chance** – The *data and chance* content domain includes knowing how to organize data and how to display data in useful graphs and charts. This content domain includes understanding issues related to misinterpretation of data.

**TIMSS Mathematics Cognitive Domains** – The three cognitive domains are used for both grades, but the balance of testing time differs, reflecting the difference in age and experience of students in the two grades.

**TIMSS Math Scale: Knowing** – The cognitive domain, *knowing*, covers the facts, procedures, and concepts students need to know.

**TIMSS Math Scale: Applying** – The cognitive domain, *applying*, focuses on the ability of students to apply knowledge and conceptual understanding to solve problems or answer questions.

**TIMSS Math Scale: Reasoning** – The cognitive domain, *reasoning*, goes beyond the solution of routine problems to encompass unfamiliar situations, complex contexts, and multi-step problems.

Which aspect of science achievement can I explore?

**TIMSS Science Scale: Overall Science, Grade 4** –The TIMSS *science* achievement scale summarizes student performance on test items designed to measure breadth of content in the life, physical, and earth sciences as well as a range of processes within the knowing, applying, and reasoning cognitive domains.

**TIMSS Science Content Domains – Grade 4** – Three content domains are used for grade 4.

**TIMSS Science Scale: Life Science** –The *life science* domain includes understandings of the characteristics and life processes of living things, the relationships between them, and their interaction with the environment.

**TIMSS Science Scale: Physical Science** –The *physical science* domain includes concepts related to matter and energy, and covers topics in the areas of both chemistry and physics. Since students in fourth grade have only a beginning knowledge of chemistry, the framework places more emphasis on physics concepts.

**TIMSS Science Scale: Earth Science** –*Earth science* is concerned with the study of Earth and its place in the solar system.

**TIMSS Science Scale: Overall Science, Grade 8** –The TIMSS overall *science* achievement scale summarizes student performance on test items designed to measure breadth of content in the biological, chemical, physical, and earth sciences as well as a range of processes within the knowing, applying, and reasoning cognitive domains.

**TIMSS Science Content Domains – Grade 8** – Four content domains are used for grade 8.

**TIMSS Science Scale: Biology** –The *biology* content domain emphasizes students' understandings of the structure, life processes, diversity, and interdependence of living organisms.

**TIMSS Science Scale: Chemistry** –The *chemistry* content domain assesses students' understanding of concepts related to the following topic areas: classification and composition of matter, properties of matter, and chemical change.

**TIMSS Science Scale: Physics** –The *physics* content domain assesses students' understandings of concepts related to energy and physical processes in the following topic areas: physical states and changes in matter; energy transformations, heat, and temperature; light; sound; electricity and magnetism; and forces and motion.

**TIMSS Science Scale: Earth Science** –The *earth science* content domain is concerned with the study of Earth and its place in the solar system and the universe. Topics covered draw on the fields of geology, astronomy, meteorology, hydrology, and oceanography, and are related to concepts in biology, physics, and chemistry.

***TIMSS Science Cognitive Domains*** – The three cognitive domains are used for both grades, but the balance of testing time differs, reflecting the difference in age and experience of students in the two grades.

**TIMSS Science Scale: Knowing**—The cognitive domain *knowing* covers the facts, procedures, and concepts students need to know.

**TIMSS Science Scale: Applying**—The cognitive domain *applying* focuses on the ability of students to apply knowledge and conceptual understanding to solve problems or answer questions.

**TIMSS Science Scale: Reasoning**—The cognitive domain *reasoning* goes beyond the solution of routine problems to encompass unfamiliar situations, complex contexts, and multi-step problems.

SOURCE: Mullis, I.V.S., Martin, M.O., Ruddock, G.J., O’Sullivan, C.O., Arora, A., and Erberber, E. (2005). [\*TIMSS 2007 Assessment Framework\*](#). Chestnut Hill, MA: TIMSS & PIRLS International Study Center, Lynch School of Education, Boston College.

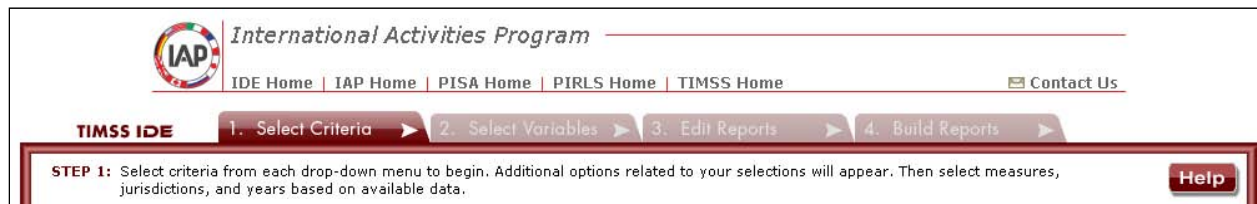
## II. General Overview

There are four general steps for exploring the Trends in International Mathematics and Science Study (TIMSS) data using the TIMSS International Data Explorer (IDE) (see exhibits 1 and 2). Each step is described in more detail starting on page 9.

### Exhibit 1. General overview for using the IDE

<p><b>1. Select Criteria:</b> Choose your subject, grade, measure(s), and jurisdiction(s).</p>	<p><b>2. Select Variables:</b> Select at least one variable from the selection of categories and subcategories.</p>	<p><b>3. Edit Reports:</b> Preview how your data will look and edit your report format options and statistics options as desired.</p>	<p><b>4. Build Reports:</b> Retrieve the data, make charts and graphs, save, and print reports.</p>
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### Exhibit 2. Introduction to the IDE environment



The screenshot shows the top navigation bar of the TIMSS IDE. It includes the IAP logo and the text "International Activities Program". Below this, there are links for "IDE Home", "IAP Home", "PISA Home", "PIRLS Home", and "TIMSS Home", along with a "Contact Us" link. The main navigation area features four steps: "1. Select Criteria", "2. Select Variables", "3. Edit Reports", and "4. Build Reports", each with a right-pointing arrow. Below the navigation bar, a red-bordered box contains the text: "STEP 1: Select criteria from each drop-down menu to begin. Additional options related to your selections will appear. Then select measures, jurisdictions, and years based on available data." A "Help" button is located in the bottom right corner of this box.

### III. Computer Requirements for the International Data Explorer (IDE)

- Screen resolution should be 1024 x 768.
- Browsers: Internet Explorer (IE) version 6 or higher (IE7 is recommended). For rendering and scrolling pages with large tables, Firefox 2.0 is faster than IE7 (Firefox 3.0 or higher is recommended).
- Enable JavaScript and pop-ups in your browser.
- TIMSS IDE requires Flash version 9.0.115 or higher (download Adobe Flash Player at <http://get.adobe.com/flashplayer/>).
- Exports of files to Microsoft Office require Office 2003 or later.
- Exports of files to PDF can be read with Adobe Acrobat Reader.
- Screen reader software should be Jaws 8.0 or higher.

If you encounter an error, please send us the details through **Contact Us** (located in the upper right portion of the screen on each page of the IDE website). When writing, include your browser version and operating system version, and as many other details as possible. Be sure to provide an e-mail address so that we can contact you.



## IV. Steps to Explore Data

To create your own custom tables, charts, graphs, and maps, follow these steps when using the TIMSS International Data Explorer (IDE).

1. Select Criteria
2. Select Variables
3. Edit Reports
4. Build Reports

### *1. Select Criteria*

#### **A. Overview**

Your data query in the IDE begins at the **Select Criteria** screen (see exhibit 3).

Choose one **Subject**, one **Grade**, and one or more **Measures** and **Jurisdictions** for the data you wish to view or compare.

Use the **Reset** button located in the upper right portion of the screen (just below the **Help** button) to erase your choices and begin again.

### Exhibit 3. Selecting criteria

**International Data Explorer**  
 IDE | IAP | PISA | PIRLS | TIMSS Contact Us

**TIMSS IDE** 1. Select Criteria ▶ 2. Select Variables ▶ 3. Edit Reports ▶ 4. Build Reports ▶

**STEP 1:** Select criteria from each drop-down menu to begin. Additional options related to your selections will appear. Then select measures, jurisdictions, and years based on available data. Help

**Subject:** Science **Grade:** Grade 4 Reset

Measure	All Years	2007
<input checked="" type="checkbox"/> TIMSS Science Scale: Overall Science	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/> TIMSS Science Scale: Life Science	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> TIMSS Science Scale: Physical Science	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> TIMSS Science Scale: Earth Science	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> TIMSS Science Scale: Knowing	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> TIMSS Science Scale: Applying	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> TIMSS Science Scale: Reasoning	<input type="checkbox"/>	<input type="checkbox"/>

Group	Jurisdiction	All Years	2007
<input type="checkbox"/> International	<input type="checkbox"/> International Average	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	<input type="checkbox"/> Average for Selected Countries	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> Country	<input type="checkbox"/> Algeria	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/> Armenia	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/> Australia	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/> Austria	<input type="checkbox"/>	<input type="checkbox"/>

#### B. Choose Subject

First, choose which **Subject**, mathematics or science, you would like to investigate.

#### C. Choose Grade

After selecting a subject, choose which **Grade**, fourth or eighth, you are interested in.

#### D. Choose Measure

Under **Measure**, you can choose the composite scale and/or any of the subscales within the subject and grade you have chosen (e.g., in Mathematics Grade 4 the subscales include: Number, Geometric shapes and measures, and Data display). See Note that the overall scale is the default. (For further information, see section V: TIMSS International Data Explorer (IDE) Definitions subsection 1. Criteria: B. Measures. pg. 39)

#### E. Choose Jurisdiction

With your measure selected, next choose at least one **Jurisdiction**.

Jurisdictions are found under the following **Groups**: **Country** and **Benchmarking jurisdictions**. There is also a Group category called **International**, with options to display the **International Average** and the **Average for Selected Countries**. Please note that selecting **International Average** or **Average for Selected Countries** increases the frequency of receiving an error message in the **Build Reports** step due to the high volume of information contained in these groups.

The general procedures for selecting one or more jurisdictions are as follows:

1. When the red arrow to the left of the group name is pointed down, the jurisdictions in that group are open (i.e., shown below) and can be selected. If you click the checkbox next to the group name (e.g., “Country”), you will select all the jurisdictions within that group. If desired, uncheck the group name to de-select all.
2. Click the checkboxes next to specific jurisdictions that you are interested in, or uncheck those jurisdictions that you wish to de-select.
3. If you want to close a group (for example, close the list of countries in order to readily see the benchmarking jurisdictions), click the red arrow next to the group name. For the closed group, the red arrow points to the right instead of pointing down and showing the group components (see exhibit 4).

#### Exhibit 4. Choosing jurisdictions

Group	Jurisdiction	All Years	2007
<input type="checkbox"/> International		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/> Country			
<input checked="" type="checkbox"/> Benchmarking jurisdictions	<input type="checkbox"/> Alberta, Canada		<input type="checkbox"/>
	<input type="checkbox"/> British Columbia, Canada		<input type="checkbox"/>
	<input type="checkbox"/> Dubai, UAE		<input type="checkbox"/>
	<input type="checkbox"/> Massachusetts, US		<input type="checkbox"/>
	<input type="checkbox"/> Minnesota, US		<input type="checkbox"/>
	<input type="checkbox"/> Ontario, Canada		<input type="checkbox"/>
	<input type="checkbox"/> Quebec, Canada		<input type="checkbox"/>

Be advised that closing the group will not de-select your choices.

To continue in the IDE, click the **Select Variables** button at the bottom right of the page or the tab at the top of the page to go to the next screen.

## 2. Select Variables

### A. Overview

Step 2, **Select Variables**, can only be accessed after choosing criteria at step 1, **Select Criteria**.

To continue your data query and edit a report, *you must choose at least one variable on this screen*. You can browse for variables using the **Category** and **Sub Category** lists, or by using the **Search** function (see exhibit 5). You can return to this screen to change variable selections at any time.

## Exhibit 5. Selecting variables overview

The screenshot displays the TIMSS Science Scale interface for selecting variables. At the top, it shows the selected criteria: Subject: Science, Grade: 4, Jurisdictions: Alberta, Canada, Massachusetts, US, Minnesota, US, Measure: TIMSS Science Scale: Science, and Year: 2007. A 'Reset' button is located in the top right corner. Below this, there are two tabs: 'View All (154)' and 'View Selected (0)'. A search bar with a 'Go' button is also present. The main area is a table with columns for 'Category', 'Sub Category', 'Variable', 'All Years', and '2007'. The 'Total' row is selected, showing a checkbox for 'All students' and a 'details' link. The 'Category' column lists several options with red arrows indicating they can be expanded or collapsed: 'Student and Family Characteristics', 'Student Computer Use', 'Student Activities Outside of School', 'Student Engagement in Mathematics/Science', and 'Teacher Background Characteristics, Formal Education'.

### B. Search Using Category and Subcategory Lists

Choose at least one variable on this screen for your report. One way to do this is to search for variables using the **Category** and **Sub Category** lists. If you don't wish to choose from any of the specified categories and subcategories, then select **Total – All students**.

The variables shown are tied to the criteria you selected at step 1 (subject, grade, measure, and jurisdiction), which are indicated at the top of the screen. To change any of these criteria, return to step 1, **Select Criteria**. Going back to step 1 won't de-select your choices unless you uncheck those boxes yourself.

To browse for variables, get details about them, select them, and view them:

1. Click the red arrows to open and close categories and subcategories of variables (see exhibit 6).
2. Click **details** or **hide details** to show or hide the full title of a given variable, the TIMSS ID, and the values (i.e., variable labels). Note that some variables have the same or similar short titles, but comparing details will show you how the variables differ. See the example in exhibit 6 below, which shows the variable of parents born in country (BSDGBORN) and mother born in country (BS4GMBRN).
3. Click the checkbox left of the variable to select it for your analysis/report. You will see the count increase next to **View Selected**.
4. Click the **View Selected** tab to see the variables you have chosen. To return to the full list of variables by category, click the **View All** link.

## Exhibit 6. Select variables using category and subcategory lists

Category	Sub Category	Variable	All Years	2007
▼ Student and Family Characteristics	▶ Sex		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	▶ Age			
	▶ Race/Ethnicity			
	▶ Language at Home			
	▶ Home Resources			
	▶ Place of Birth			
	▼ Parents' Place of Birth	<input type="checkbox"/> Parents born in country <a href="#">hide details</a> <b>Full Title:</b> Parents born in country <b>ID:</b> BSDGBORN <b>Values:</b> Both parents born in country, Only one parent born in country, Neither parent born in country		<input type="checkbox"/>
		<input type="checkbox"/> Gen\mother born in [country] <a href="#">hide details</a> <b>Full Title:</b> Was your mother (or stepmother or female guardian) born in [country]? <b>ID:</b> BS4GMBRN <b>Values:</b> Yes, No		<input type="checkbox"/>
		<input type="checkbox"/> Gen\father born in [country] <a href="#">details</a>		<input type="checkbox"/>

When you have selected the variable(s) you want to include, continue by clicking the **Edit Reports** button at the bottom right of the page or the tab at the top of the page to go to the next screen.

### C. Search Function

The second way to search for variables is to use the **Search** function on the **Select Variables** screen.

Type a term in the **Search** box and click **Go** (or hit 'Enter' on your keyboard) to find variables by keywords in the question and/or details for the variable (see exhibit 7). If you use multiple keywords, "and" is assumed. Also, narrow your search using "or," "not," "and not," or "near." The search function operates on an exact phrase if it is contained in quotes. The variable(s) that include the search term(s) in the question or its details will be listed.

See section B. Select Variables: Search Using Category and Subcategory Lists for information on how to get details about variables, selecting variables, and viewing variables.

## Exhibit 7. Select variables using the search function

Category	Sub Category	Variable	All Years	2007
▼ School Climate and Safety	▼ Index of Teachers' Perception of School Safety	<input type="checkbox"/> Idx tch perceptn school safety (tpss) <a href="#">details</a>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

View All (154)      View Selected (0)      Search: (1) safety      Go

When you have selected the variables you want to include, continue by clicking the **Edit Reports** button at the bottom right of the page or the tab at the top of the page to go to the next screen.

### *3. Edit Reports*

#### **A. Overview**

You can access step 3, **Edit Reports**, after choosing criteria at step 1, **Select Criteria**, and choosing variables at step 2, **Select Variables**.

At this step, you can

- preview and edit the layout of your reports;
- copy reports or create new reports based on the variables selected;
- change formatting options, such as number of decimal places to display, for all reports (these may also be changed in individual reports, but format options can overwrite previous edits);
- change statistics options, such as average scale scores and benchmarks, for all reports (may also be changed in individual reports, but statistics options can overwrite previous edits);
- select reports to be built into tables and charts at step 4, **Build Reports**; and
- delete reports.

Using your chosen criteria, the IDE will return a separate data report for each variable you have chosen. If you have selected two or three variables (not counting **All students**), you will also see a cross-tabulated report that crosses these two or three variables. If your selected criteria include more than one measure (e.g., overall science scale and one or more science subscales), a separate set of data reports will be generated for each measure (see exhibit 8).

## Exhibit 8. Edit reports overview

**TIMSS IDE** 1. Select Criteria ▶ 2. Select Variables ▶ 3. Edit Reports ▶ 4. Build Reports ▶

**STEP 3:** Preview and edit existing reports using the action links next to each report name. Create new reports, set format and statistic options. (New and copied reports will appear at the bottom of the report list.) Help

**Subject, Grade:** Science, Grade 4  
**Jurisdictions:** United States , Alberta, Canada , Massachusetts, US , Minnesota, US  
**Measures:** TIMSS Science Scale: Science, TIMSS Science Scale: Life Science  
**Variables:** All students, Sex of student, Parents born in country  
**Year:** 2007 Reset

Create New Report | Format Options | Statistics Options

Report	All	Action	Measure	Variable	Year	Jurisdiction	Statistic
Report 1	<input checked="" type="checkbox"/>	<a href="#">Preview</a>   <a href="#">Delete</a>   <a href="#">Edit</a>   <a href="#">Copy</a>	TIMSS Science Scale: Science	All students	2007	United States , Alberta, Canada , Massachusetts, US , Minnesota, US	Average scale scores
Report 2	<input checked="" type="checkbox"/>	<a href="#">Preview</a>   <a href="#">Delete</a>   <a href="#">Edit</a>   <a href="#">Copy</a>	TIMSS Science Scale: Science	Sex of student	2007	United States , Alberta, Canada , Massachusetts, US , Minnesota, US	Average scale scores
Report 3	<input checked="" type="checkbox"/>	<a href="#">Preview</a>   <a href="#">Delete</a>   <a href="#">Edit</a>   <a href="#">Copy</a>	TIMSS Science Scale: Science	Parents born in country	2007	United States , Alberta, Canada , Massachusetts, US , Minnesota, US	Average scale scores
Cross-Tabulated Report 1	<input checked="" type="checkbox"/>	<a href="#">Preview</a>   <a href="#">Delete</a>   <a href="#">Edit</a>   <a href="#">Copy</a>	TIMSS Science Scale: Science	Sex of student, Parents born in country	2007	United States , Alberta, Canada , Massachusetts, US , Minnesota, US	Average scale scores
Report 4	<input checked="" type="checkbox"/>	<a href="#">Preview</a>   <a href="#">Delete</a>   <a href="#">Edit</a>   <a href="#">Copy</a>	TIMSS Science Scale: Life Science	All students	2007	United States , Alberta, Canada , Massachusetts, US , Minnesota, US	Average scale scores
Report 5	<input checked="" type="checkbox"/>	<a href="#">Preview</a>   <a href="#">Delete</a>   <a href="#">Edit</a>   <a href="#">Copy</a>	TIMSS Science Scale: Life Science	Sex of student	2007	United States , Alberta, Canada , Massachusetts, US , Minnesota, US	Average scale scores
Report 6	<input checked="" type="checkbox"/>	<a href="#">Preview</a>   <a href="#">Delete</a>   <a href="#">Edit</a>   <a href="#">Copy</a>	TIMSS Science Scale: Life Science	Parents born in country	2007	United States , Alberta, Canada , Massachusetts, US , Minnesota, US	Average scale scores
Cross-Tabulated Report 2	<input checked="" type="checkbox"/>	<a href="#">Preview</a>   <a href="#">Delete</a>   <a href="#">Edit</a>   <a href="#">Copy</a>	TIMSS Science Scale: Life Science	Sex of student, Parents born in country	2007	United States , Alberta, Canada , Massachusetts, US , Minnesota, US	Average scale scores

4. Build Reports ▶

### B. Preview Report

Click the **Preview** link under the column Action to see how your report will be laid out. The preview will not provide actual data, but will show how the data will be arranged in rows and columns (see exhibit 9).

### Exhibit 9. Using preview report

		Parents born in country					
		Both parents born in country		Only one parent born in country		Neither parent born in country	
Jurisdictions	Years	Average scale scores	Standard Errors	Average scale scores	Standard Errors	Average scale scores	Standard Errors
United States	2007						
Alberta, Canada	2007						
Massachusetts, US	2007						
Minnesota, US	2007						

### C. Edit Report

You can edit your report by clicking the **Edit** link under the column Action on the **Edit Reports** main screen. (You can click **Preview** at any time to see how your changes will affect the report's



final layout.) Another way to edit a report is to click the **Edit** tab when you are previewing a report. The following can be done using this function (see exhibit 10):

1. Name your report. You have the option to give each report a distinctive name, up to a limit of 50 characters using only letters, numbers, spaces, underscores, and hyphens. (Otherwise, the default is Report 1, Report 2, etc., and Cross-Tabulated Report 1, Cross-Tabulated Report 2, etc.)
2. Select a measure. You can choose a measure if more than one was selected at step 1, **Select Criteria**.
3. Select jurisdictions, variables, years (if applicable), and statistics to include (out of the selections previously made at steps 1 and 2). You can also create new variables out of the ones already chosen (for further information, see step 3: Edit Reports section D. Create New Variables). You can select up to two statistics options from the following: average scale scores; percentages; benchmarks—discrete; benchmarks—cumulative; percentiles; and standard deviations. (For further information, see step 3: Edit Reports section G. Edit Reports: Statistics Options.)

### Exhibit 10. Editing reports

**1. Create a name and select a measure for the new report.** Help

Name:  Measure:

**2. Select available options from each of the columns below, then preview results.**

Jurisdiction	Variable <a href="#">Create new...</a>	Year	Statistic
<input type="checkbox"/> Select All <input checked="" type="checkbox"/> Algeria <input checked="" type="checkbox"/> Armenia <input checked="" type="checkbox"/> Australia <input checked="" type="checkbox"/> Austria <input checked="" type="checkbox"/> Sweden <input checked="" type="checkbox"/> Tunisia <input checked="" type="checkbox"/> Ukraine	<input type="checkbox"/> All students <input checked="" type="checkbox"/> Sex of student <input checked="" type="checkbox"/> Parents born in country	<input type="checkbox"/> Select All <input checked="" type="checkbox"/> 2007	<input checked="" type="checkbox"/> Average scale scores <input type="checkbox"/> Percentages <input type="checkbox"/> Benchmarks - discrete <input type="checkbox"/> Benchmarks - cumulative <input type="checkbox"/> Percentiles <input type="checkbox"/> Standard deviations

**3. Drag and drop header elements between Row and Column to custom design the report.**

TABLE LAYOUT	
Row	Column
Jurisdictions	Sex of student
Years	
Parents born in country	

4. Change the table layout by dragging elements to determine which items will appear in rows and which will appear in columns. Some of the arrangements will not be permissible, but a pop-up alert will explain this.

To save changes, make sure to click **Done** in the right portion of the screen; doing so will also close the **Edit Report** window.

#### D. Create New Variables

This tab can be reached only from within the **Edit report** window or **Create New Report** window. To create a new variable, you can combine values that make up an existing variable. The steps are as follows:

1. Click **Create new...** under the **Variable** heading in the **Edit** window or the **Create New Report** window.
2. Select the variable for which you wish to combine values.
3. Select the values you want to combine by checking the boxes to the left of the values (see exhibit 11).
4. Create a name for the new value, and click **Create**. See how the collapsed values appear in gray.
5. Wait for the screen to refresh, and click **Done** in the lower right portion of the screen.

#### Exhibit 11. Creating new variables

1. Select a Variable group: Help

Parents born in country

2. Select values to create new Variable:

Both parents born in country

Only one parent born in country

Neither parent born in country

3. Create a name for the new Value:

Name:  Create

Reset Cancel Done

6. The new variable will appear in the **Variable** list in the **Edit** window or **Create New Report** window, with the new variable name designated as "(Collapsed)." You will need

to check the box next to the new (collapsed) variable for it to appear in the report. You can click **Preview** to see how the table will be laid out before retrieving data.

A new variable that you create is applicable to that specific report; it does not apply to the other reports appearing in the **Edit Reports** screen. For example, if you selected multiple **Measures** of science for analysis, then you would need to create the new variable for each measure, or create a copy of the report and edit it accordingly. To do the latter, click on **Copy** report in the **Edit Reports** screen (copied reports appear at the end of the list of reports) and then **Edit** the new copy (using the above example, you can change the measure and give the report a new name).

You can repeat the process and combine different values of a variable to create additional new variables. Using the **Create New Report** function, you can create a new report for each new variable that you create. (For further information, see step 3: Edit Reports section E. Create New Report).

If you selected two or three variables to create new variables from, you can repeat the process for each of these variables. Using the **Create New Report** or **Edit** report function, these collapsed variables will be listed and available for cross-tabulation (see exhibit 12). You can click **Preview** to see how the table will be laid out before retrieving data.

### Exhibit 12. Edit reports with collapsed variables

**Edit** Preview Cancel Done

1. Create a name and select a measure for the new report.

Name: Parents - new Measure: TIMSS Science Scale: Life Science Help

2. Select available options from each of the columns below, then preview results.

Jurisdiction	Variable <a href="#">Create new...</a>	Year	Statistic
<input type="checkbox"/> Select All	<input type="checkbox"/> All students	<input type="checkbox"/> Select All	<input checked="" type="checkbox"/> Average scale scores
<input checked="" type="checkbox"/> Algeria	<input checked="" type="checkbox"/> Sex of student	<input checked="" type="checkbox"/> 2007	<input type="checkbox"/> Percentages
<input checked="" type="checkbox"/> Armenia	<input type="checkbox"/> Parents born in country		<input checked="" type="checkbox"/> Benchmarks - discrete
<input checked="" type="checkbox"/> Australia	<input checked="" type="checkbox"/> Parents born in country (Collapsed)		<input checked="" type="checkbox"/> Benchmarks - cumulative
<input checked="" type="checkbox"/> Austria			<input type="checkbox"/> Percentiles
<input checked="" type="checkbox"/> Sweden			<input type="checkbox"/> Standard deviations
<input checked="" type="checkbox"/> Tunisia			
<input checked="" type="checkbox"/> Ukraine			

3. Drag and drop header elements between Row and Column to custom design the report.

TABLE LAYOUT	
Row	Column
Jurisdictions	Parents born in country (Collapsed)
Years	
Sex of student	

### E. Create New Report

From the main **Edit Reports** screen, clicking on **Create New Report** brings up the same options as **Edit** report, but with no checkboxes marked and without any new variables you may have

created. Thus, **Create New Report** provides a "clean slate" for your selections from the first two steps, **Select Criteria** and **Select Variables** (see exhibit 13). Each new report you create will appear at the end of the list of reports. If you do not give the report a specific name, it will be called "New Report."

### Exhibit 13. Creating new reports

**New Report**

**Edit** **Preview** **Cancel** **Done**

1. Create a name and select a measure for the new report.

Name:  Measure:

2. Select available options from each of the columns below, then preview results.

Jurisdiction	Variable <a href="#">Create new...</a>	Year	Statistic
<input type="checkbox"/> Select All	<input type="checkbox"/> All students	<input type="checkbox"/> Select All	<input type="checkbox"/> Average scale scores
<input type="checkbox"/> Algeria	<input type="checkbox"/> Sex of student	<input type="checkbox"/> 2007	<input type="checkbox"/> Percentages
<input type="checkbox"/> Armenia	<input type="checkbox"/> Computer use		<input type="checkbox"/> Benchmarks - discrete
<input type="checkbox"/> Australia	<input type="checkbox"/> Gen\ask parents\ensure complete homew		<input type="checkbox"/> Benchmarks - cumulative
<input type="checkbox"/> Austria	<input type="checkbox"/> Nat\language at home		<input type="checkbox"/> Percentiles
<input type="checkbox"/> Sweden			<input type="checkbox"/> Standard deviations
<input type="checkbox"/> United States			
<input type="checkbox"/> Yemen			

3. Drag and drop header elements between Row and Column to custom design the report.

**TABLE LAYOUT**

Row	Column
<input type="text" value="Jurisdictions"/>	
<input type="text" value="Years"/>	

## F. Format Options

From the main **Edit Reports** screen, clicking on **Format Options** will allow you to make formatting changes applicable to all the reports listed. The following formatting options are available using this function (see exhibit 14):

1. **Variable Labels (Long)** displays a more detailed description of the variables selected in a query than the default short label. For variables from questionnaires, the full text of the question is displayed. Be advised that the length of the extra detail may sometimes interfere with table formatting.
2. **Show data for values categorized as Missing** will include the percentage of students in the total sample or in a reporting group for whom membership in a particular response category is unknown because no response was given by the student, their teacher, or their

school. The percentage of “missing” will be shown in the right-most table column. Missing data are available only for queries that involve percentages as the statistic type. Unless you check this option, the default is for missing responses not to be included in the percentage distribution shown.

3. **Decimal Places** allow you to specify a greater level of precision for a particular statistic (one or two decimal places) as opposed to the default, which is whole numbers. Note that only integer-level precision is allowed for percentages; that is, the number of decimal places is fixed at none for percentages. Also, standard errors will be shown to one more decimal place than what is shown for a particular statistic. For example, if you request that the achievement scores be displayed to one decimal place, the corresponding standard errors will be displayed to two decimal places. If you export to Excel, you will be able to increase the number of decimal places in most cases.
4. **Include** gives you the options to show or not show standard errors and parentheses surrounding the standard errors. Unless you indicate otherwise, the default is to show standard errors with parentheses surrounding the standard errors. You can preview the effects of your selection in the **Sample Display** area (see blue-shaded box in exhibit 14).

#### Exhibit 14. Format options

Format Options

Choose options that will apply to all reports.  
View selected format in Sample Display. **Help**

**Variable Labels:**

Short (e.g. Gender)

Long (e.g. Gender of student as taken from school records)

Show data for values categorized as Missing (this applies only when percentages are displayed).

**Decimal Places:**  None  1  2

(For row percents, the number of decimal places is fixed at "None")

**Include:**

Standard Errors  None

Use parentheses/brackets

**Sample Display:** ### (#. #)

**Cancel** **Done**

Be advised that choices in the **Format Options** window will apply to all reports and cannot be changed for individual reports. Use the **Reset** button located in the upper right portion of the screen (just below the **Help** button) to restore the **Format Options** to the default settings (though caution is recommended, as using the **Reset** button will also delete any new reports that you created).

## G. Statistics Options

Available on the main **Edit Reports** screen, clicking on **Statistics Options** allows you to designate up to two statistics. The selections made are applicable to *all* the reports listed, although you can also change the statistics for an individual report when you edit that report. (For further information, see step 3: Edit Reports section C. Edit Report).

The following **Statistics Options** are available (see exhibit 15):

1. **Average scale scores.** For the TIMSS assessment, student performance is reported on scales that range from 0 to 1,000. TIMSS reports the average scale score for a variety of demographic samples of the student population (e.g., the average scale score in mathematics for female students). By default, the standard errors of the scale scores are shown in parentheses.
2. **Percentages.** This statistic shows the percentage of students as a row percentage. For example, if the table cell for Black female students in the United States is 9 percent, then Black females composed 9 percent of U.S. fourth-graders. By default, percentage distributions do not include those with missing data. For information on how to show data for values categorized as missing, see step 3: Edit Reports section F. Format Options.

**Exhibit 15. Statistics options**

Statistics Options

included in every report.

**Select Options:**  
(maximum of two)

- Average scale scores
- Percentages
- Benchmarks - discrete
  - Below 400
  - 400 to 474
  - 475 to 549
  - 550 to 624
  - At or above 625
- Benchmarks - cumulative
  - At or above 400
  - At or above 475
  - At or above 550
  - At or above 625
- Percentiles
- Standard deviations

3. **Benchmarks – discrete.** Discrete levels are reported as the percentage of students performing at four benchmarks: Low, Intermediate, High, and Advanced, with an additional category created for those students scoring below the Low benchmark (Below Low). There is simply too little information to know what students scoring below the Low benchmark can actually do. This statistic shows the percentage of students performing in the following categories:
  - *Below low – below 400*
  - *At low – 400 to 474*
  - *At intermediate – 475 to 549*
  - *At high – 550 to 624*
  - *At advanced – at or above 625*
4. **Benchmarks – cumulative.** Cumulative levels are reported as the percentage of students performing *at or above* each international benchmark:
  - *At or above low – at or above 400*
  - *At or above intermediate – at or above 475*
  - *At or above high – at or above 550*
  - *At advanced – at or above 625*
5. **Percentiles.** This statistic shows the threshold (or cutpoint) score for the following:
  - *10<sup>th</sup> percentile – the bottom 10 percent of students*
  - *25<sup>th</sup> percentile – the bottom quarter of students*
  - *50<sup>th</sup> percentile – the median (half the students scored below the cutpoint and half scored above it)*
  - *75<sup>th</sup> percentile – the top quarter of students*
  - *90<sup>th</sup> percentile – the top 10 percent of students*
6. **Standard deviations.** The standard deviation is a measure of how widely or narrowly dispersed scores are for a particular dataset. Under general normality assumptions, 95 percent of the scores are within two standard deviations of the mean. For example, if the average score of a dataset is 500 and the standard deviation is 100, it means that 95 percent of the scores in this dataset fall between 300 and 700.

The selections you make in **Statistics Options** will be applied automatically to all reports, although you can change the statistics for an individual report when you edit that report. Be advised that if you use **Statistics Options** after editing the statistics in one or more of your individual reports, the **Statistics Options** selected will overwrite your previously edited selections. If you wish to use the same criteria and variables in a report with a different selection of statistics, consider using the **Create New Report** function to generate a new report with different statistics. (For further information, see step 3: Edit Reports section E. Create New Report). You can also make a copy of an individual report.

You can use the **Reset** button located in the upper right portion of the **Edit Reports** screen (just below the **Help** button) to restore the **Statistics Options** to the default setting, which is average scale scores for all reports (though caution is recommended, as using the **Reset** button will also delete any new reports that you created).



Not all statistics are available for all reports. Availability depends on other selections you have made to define the content and format of your report:

- Percentages will not display if jurisdictions or years appear in columns.
- Benchmark results cannot be displayed in both columns and rows.
- Benchmark results are available only for the composite, or overall, scale.
- If benchmarks are selected as a variable, only percentages will be displayed.

Please note that statistics produced by the IDE may not match the statistics shown in reports published by the International Association for the Evaluation of Educational Achievement (IEA) due to differences in certain statistical standards. In particular, organizations differ in the minimum sample sizes required for publishing student scores. Further, in IEA reports, if a student has more than one teacher, estimates for teacher variables are calculated as an average of data reported by all of the teachers. By comparison, in the IDE, a student is randomly assigned one teacher, and the teacher estimate represents the data reported by the teacher assigned to the student.

## H. Select Reports to Build

As you edit your reports, you can give them distinct names (up to 50 characters) to differentiate them, as well as make changes to the jurisdictions and variables previously selected, the statistics, and the layout of the rows and columns. (For further information, see step 3: Edit Reports section C. Edit Report). You may also have made copies of reports with these changes. In order to proceed to step 4, **Build Reports**, each report for which you want to retrieve data should be previewed/inspected using the **Preview** function. To decrease processing time as you move to step 4, you can uncheck any reports for which you do not wish to retrieve data. By default, all reports are checked. To uncheck one or more reports, you can either uncheck the reports individually or click on the **All** box. Doing the latter will uncheck all of the reports and allow you to check only those that you wish to retrieve data for. In the example that follows (see exhibit 16), data will be retrieved only for the overall mathematics measure and only for the frequency of speaking the language of the test at home variable (see “Report 3” in exhibit 16). For this report, the statistics have been edited to show both average scale scores and percentages.

## Exhibit 16. Selecting reports to build

**TIMSS IDE** 1. Select Criteria ▶ 2. Select Variables ▶ 3. Edit Reports ▶ 4. Build Reports ▶

**STEP 3:** Preview and edit existing reports using the action links next to each report name. Create new reports, set format and statistic options. (New and copied reports will appear at the bottom of the report list.) **Help**

**Subject, Grade:** Mathematics, Grade 4  
**Jurisdictions:** International Average, Algeria, Australia, Austria, Chinese Taipei, England, Germany, Hong Kong SAR, Italy, Japan, Russian Federation, Scotland, Sweden, United States, Yemen  
**Measure:** TIMSS Math Scale: Mathematics  
**Variables:** All students, Sex of student, Gen\often speak [langua of test] at home, Parents born in country  
**Year:** 2007 **Reset**

Create New Report		Format Options		Statistics Options			
Report	All <input type="checkbox"/>	Action	Measure	Variable	Year	Jurisdiction	Statistic
Report 1	<input type="checkbox"/>	<a href="#">Preview</a>   <a href="#">Delete</a>   <a href="#">Edit</a>   <a href="#">Copy</a>	TIMSS Math Scale: Mathematics	All students	2007	International Average, Algeria, Australia, Austria, Chinese Taipei, England, Germany, Hong Kong SAR, Italy, Japan, Russian Federation, ...	Average scale scores, Percentages
Report 2	<input type="checkbox"/>	<a href="#">Preview</a>   <a href="#">Delete</a>   <a href="#">Edit</a>   <a href="#">Copy</a>	TIMSS Math Scale: Mathematics	Sex of student	2007	International Average, Algeria, Australia, Austria, Chinese Taipei, England, Germany, Hong Kong SAR, Italy, Japan, Russian Federation, ...	Average scale scores, Percentages
Report 3	<input checked="" type="checkbox"/>	<a href="#">Preview</a>   <a href="#">Delete</a>   <a href="#">Edit</a>   <a href="#">Copy</a>	TIMSS Math Scale: Mathematics	Gen\often speak [langua of test] at home	2007	International Average, Algeria, Australia, Austria, Chinese Taipei, England, Germany, Hong Kong SAR, Italy, Japan, Russian Federation, ...	Average scale scores, Percentages
Report 4	<input type="checkbox"/>	<a href="#">Preview</a>   <a href="#">Delete</a>   <a href="#">Edit</a>   <a href="#">Copy</a>	TIMSS Math Scale: Mathematics	Parents born in country	2007	International Average, Algeria, Australia, Austria, Chinese Taipei, England, Germany, Hong Kong SAR, Italy, Japan, Russian Federation, ...	Average scale scores, Percentages
Cross-Tabulated Report 1	<input type="checkbox"/>	<a href="#">Preview</a>   <a href="#">Delete</a>   <a href="#">Edit</a>   <a href="#">Copy</a>	TIMSS Math Scale: Mathematics	Sex of student, Gen\often speak [langua of test] at home, Parents born in country	2007	International Average, Algeria, Australia, Austria, Chinese Taipei, England, Germany, Hong Kong SAR, Italy, Japan, Russian Federation, ...	Average scale scores, Percentages

**4. Build Reports** ▶

About TIMSS IDE Accessible Version

If you wish to delete a report from the list of reports, click **Delete** in the **Action** column. Use the **Reset** button located in the upper right portion of the screen (just below the **Help** button) to restore the deleted reports (though caution is recommended, as this will also delete any new reports that you created and restore the **Format Options** and **Statistics Options** to the default settings).

To continue to the last step in the IDE, click the **Build Reports** button at the bottom of the page or the tab at the top of the page to go to the next screen.

## 4. Build Reports

### A. Overview

You can access step 4, **Build Reports**, after choosing criteria at step 1, **Select Criteria**, in which case the default report built will provide data for just average scale scores and for the **Total (All students)** variable. In most cases, you will proceed to step 4, **Build Reports**, not only after completing step 1, but also after choosing different or additional variables at step 2, **Select Variables**, and editing the reports at step 3, **Edit Reports**.

In Build Reports, you can do the following:

1. Generate a data table for each report selected in step 3, **Edit Reports** (see exhibit 17). By default, all reports are checked, though you can uncheck any reports for which you do not wish to retrieve data. (For further information, see step 3: Edit Reports section H. Select Reports to Build).
2. Export and save data tables into various formats using the **Export Reports** button. The output formats include HTML (print-friendly), Microsoft Word, Microsoft Excel, and Adobe PDF.
3. Click the **Chart** tab to create and customize charts of the data for each report and save them for export in the above formats.
4. Click the **Significance Test** tab to run a significance test on your results, customize it and export it.

## Exhibit 17. Building reports overview

**TIMSS IDE** 1. Select Criteria 2. Select Variables 3. Edit Reports 4. Build Reports

**STEP 4:** View each report table by selecting the report name from the drop-down menu. Create report types to edit and preview, each tab created represents one report type to export. Double-click report tabs to rename. **Help**

**Subject, Grade: Mathematics, Grade 4**  
**Jurisdictions:** Algeria, Armenia, Australia, Austria, Sweden, United States, Yemen  
**Measure:** TIMSS Math Scale: Mathematics  
**Variables:** All students, Sex of student, Computer use, Gen\ask parents\ensure complete homew, Nat\language at home  
**Year:** 2007

Select Report: Report 5 **Export Reports**

Table Chart Significance Test

94% **Cancel**

**PROCESSING DATA**

Some queries may take up to two minutes to process.

Please do not hit the "Back" button while processing.

### B. View Reports as Data Tables

Once the IDE processes the data for the reports you selected to be built, you will be able to see the data table for the first report (see exhibit 18). Go to **Select Report** to choose the table of interest from the drop-down menu. To change the formatting or statistics options of a table or to generate a table from a report not included in your selection, return to step 3, **Edit Reports**.

## Exhibit 18. Viewing reports as data tables

Select Report: Report 1 Export Reports

Table Chart Significance Test

Average scale scores and percentages for mathematics, grade 4, by year, jurisdiction, and Gen\often speak [language of test] at home [AS4GOLAN]: 2007

Year	Jurisdiction	Always			Almost always				Sometimes				Never			Sta
		Average scale score	Standard error	Percentage	Standard error	Average scale score	Standard error	Percentage	Standard error	Average scale score	Standard error	Percentage	Standard error	Average scale score	Standard error	
2007	International Average	477	(0.7)	69	(0.2)	480	(1.1)	15	(0.1)	447	(1.4)	12	(0.2)	404	(2.5)	4
	Australia	515	(3.3)	78	(1.3)	549	(5.6)	12	(0.9)	498	(11.5)	8	(1.0)	#	(+)	1
	England	542	(3.0)	77	(1.3)	561	(4.8)	16	(1.0)	493	(7.8)	6	(0.6)	#	(+)	1
	Germany	535	(2.3)	76	(0.9)	518	(3.6)	16	(0.6)	483	(4.7)	7	(0.6)	#	(+)	1
	Hong Kong SAR	621	(3.4)	61	(1.2)	594	(4.0)	21	(0.6)	582	(4.9)	15	(0.9)	542	(8.6)	3
	Italy	508	(3.2)	93	(0.5)	490	(6.3)	4	(0.3)	477	(8.2)	3	(0.2)	#	(+)	#
	Japan	572	(2.2)	92	(0.5)	542	(6.1)	7	(0.4)	#	(+)	1	(0.1)	#	(+)	#
	Russian Federation	544	(5.2)	80	(1.4)	565	(6.4)	12	(0.8)	524	(16.7)	7	(1.2)	#	(+)	2
	United States	534	(2.3)	73	(1.1)	540	(3.9)	14	(0.6)	493	(4.4)	12	(0.8)	469	(8.1)	2

† Not applicable.  
# Rounds to zero.  
\* Reporting standards not met.

NOTE: Population coverage and/or sample participation rates for Denmark, Georgia, Kazakhstan, Latvia, Lithuania, the Netherlands, Scotland, the United States, Dubai (UAE), Massachusetts (USA), and all participating Canadian provinces deviated from international standards, as described in the TIMSS 2007 International Report (Martin, Mullis & Foy, 2008). The Mathematics scale ranges from 0 to 1000. Detail may not sum to totals because of rounding. Some apparent differences between estimates may not be statistically significant. SOURCE: International Association for the Evaluation of Educational Achievement, Trends in International Mathematics and Science Study (TIMSS), 2007.

## C. Charts

Go to **Select Report** to choose the report of interest from the drop-down menu, and then click the **Chart** tab (see exhibit 19).

## Exhibit 19. Viewing reports as charts

**TIMSS IDE** 1. Select Criteria ▶ 2. Select Variables ▶ 3. Edit Reports ▶ 4. Build Reports ▶

**STEP 4:** View each report table by selecting the report name from the drop-down menu. Create report types to edit and preview, each tab created represents one report type to export. Double-click report tabs to rename. Help

**Subject, Grade:** Mathematics, Grade 4  
**Jurisdictions:** Algeria, Armenia, Australia, Austria, Sweden, United States, Yemen  
**Measure:** TIMSS Math Scale: Mathematics  
**Variables:** All students, Sex of student, Computer use, Gen\ask parents\ensure complete homework, Nat\language at home  
**Year:** 2007

Select Report: Report 2 Export Reports

Table Chart Significance Test

You will be able to create many types of charts, and customize them. Exhibit 20 provides a summary of the custom features:

## Exhibit 20. Chart Options

Actions	Description
<b>Chart Options</b>	Select display type (bars, columns, or lines) with your cursor. For data on benchmarks, you also have the option of selecting a discrete or cumulative chart. Customize the chart and preview it.
<b>Preview</b>	Change the jurisdiction and other variables as applicable. Also change the pattern and color in your chart.
<b>Color</b>	Change the color of the chart by clicking on one of each type bar so that a small square appears. Click on the small square, and a custom color grid will appear; click on the color of choice.
<b>Pattern</b>	Click the bars to change the pattern.
<b>Grayscale</b>	Available for the discrete or cumulative (benchmark) chart; it will format the chart or map to print in black and white.
<b>Click here to edit this chart</b>	Edits will overwrite your previous version once you click <b>Done</b> . If you wish to produce a different chart based on the same report, begin by clicking <b>Chart</b> again.
<b>Export Reports</b>	After clicking <b>Done</b> for the last report, click the Export Results button.

If you complete one chart and wish to try a different type of chart, you will need to **Preview** the chart and click **Done** in order to save the chart to export.

### D. Create Charts – Data Options

When you click **Chart**, your screen will present **Data Options** pertaining to **Statistic**, **Year**, and **Jurisdiction**. All are selected by default, except that you can have only one statistic (see exhibit 21). Uncheck any of the criteria that you do not wish to chart, as long as you have one selected in each category.

## Exhibit 21. Data options for charts

Select Report: Report 2

Table Chart 1 X

Chart Significance Test

### Data Options

Select a single statistic and any combination of jurisdictions and years. Continue to Chart Options.

Statistic	Year	Jurisdiction
<input checked="" type="radio"/> Average scale scores <input type="radio"/> Percentages <input type="radio"/> Benchmarks - cumulative <input type="radio"/> Benchmarks - discrete <input type="radio"/> Percentiles	<input checked="" type="checkbox"/> Year <input checked="" type="checkbox"/> 2007	<input checked="" type="checkbox"/> Country <input checked="" type="checkbox"/> Algeria <input checked="" type="checkbox"/> Armenia <input checked="" type="checkbox"/> Australia <input checked="" type="checkbox"/> Austria <input checked="" type="checkbox"/> Sweden <input checked="" type="checkbox"/> United States <input checked="" type="checkbox"/> Yemen

Chart Options

### E. Create Charts – Chart Options

Once finished with the **Data Options**, click the **Chart Options** button in the lower right corner.

In the **Chart Options** screen, select **Bar Chart**, **Column Chart**, or **Line Chart**. For data on benchmarks, you also have the option of selecting a discrete or cumulative chart.

After selecting a chart type, change any data dimensions from the drop-down menus for **Bar**, **Column**, or **Line Values** and **Values Grouped by**. Any new variables that you created at step 3, **Edit Reports**, should be available for selection, but only if you selected the variables (i.e., check mark next to them) and clicked **Done** when you edited the report.

Enter a **Chart Name** limited to 25 characters, using only letters, numbers, spaces, underscores, and hyphens (otherwise, the default is “Chart 1”) (see exhibit 22).

Preview your chart by clicking the **Preview** button in the lower right corner, or go back to the data options and make different selections by clicking the **Data Options** button in the lower left corner.



## Exhibit 22. Chart options

Select Report: Report 2 Export Reports

Table **Chart 1** X

**Chart** Significance Test

**Chart Options**

Choose an available chart type based on selected data. Choose data dimensions from the drop-down menus and name the chart, then preview the chart. To select different data return to Data Options.

Bar Chart Column Chart Line Chart Discrete Chart

Bar Values: Sex of student

Values Grouped by: None

Chart Name: Chart 1

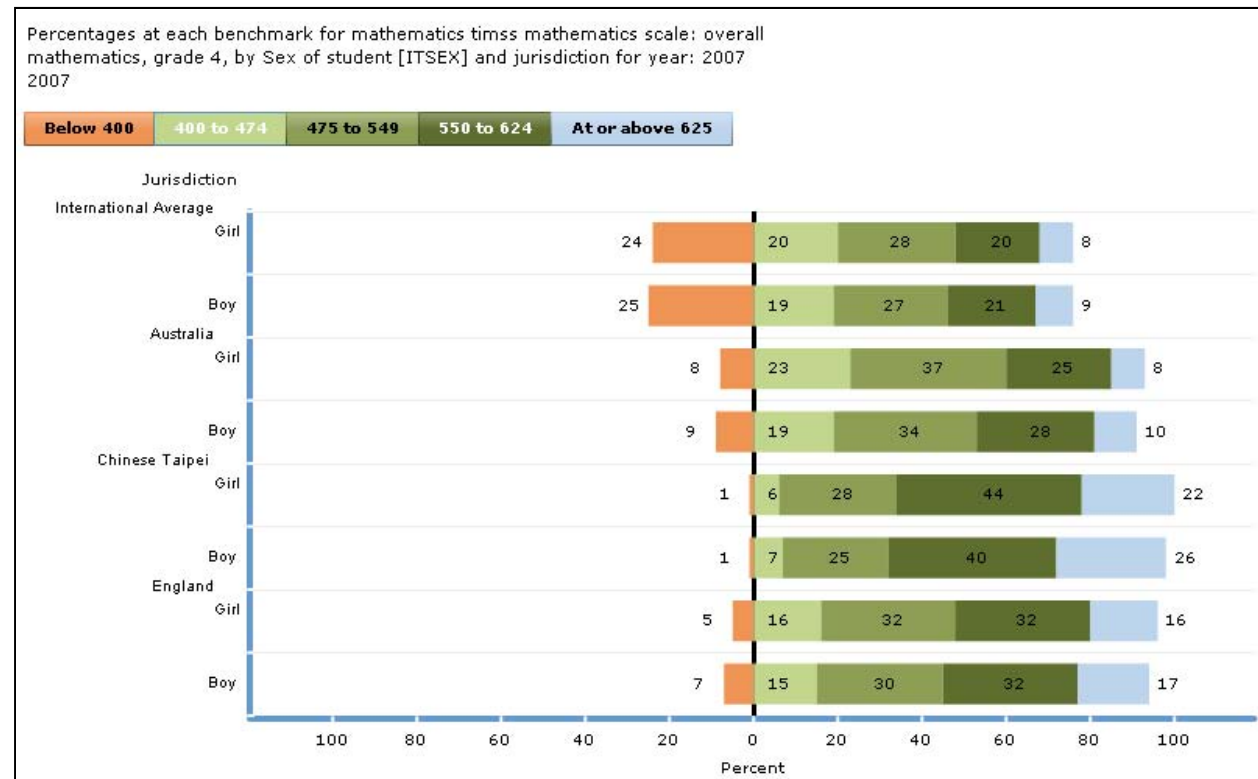
Data Options Preview

While previewing your chart, you can do the following (see exhibit 23 as an example of a **Discrete Chart** and exhibit 24 as an example of a **Bar Chart**):

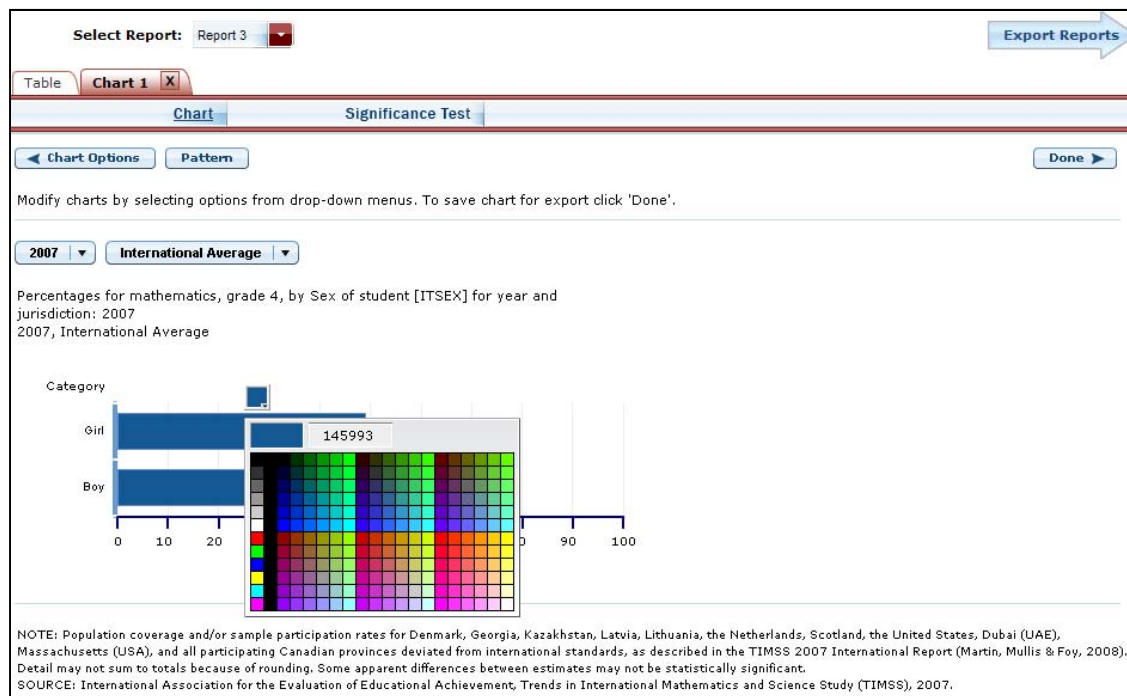
1. Use the drop-down menus to change the jurisdiction and other variables as applicable. Notice that when you change your selection, the change occurs slowly enough that you get a sense of the size and direction of the change—especially if you didn't previously specify in the data dimensions how you want your values grouped.
2. For the **Discrete Chart**, you can select where you want the divider by clicking one of the benchmark buttons above the bars. This makes it much easier to compare the percentages at a given benchmark(s). In the example shown in exhibit 23, the percentages of students at the high and advanced benchmarks are only shown to the right of the divider.
3. Place your cursor over the bars of the chart to see the data points and value label(s).
4. Choose between using colors or patterns for the bars by clicking the alternating **Pattern** or **Color** button located just below the **Chart** tab in the upper left portion of the screen. For the **Discrete Chart** and **Cumulative Chart**, choose between **Color** or **Grayscale**.



### Exhibit 23. Preview of discrete chart



## Exhibit 24. Preview of bar chart



5. Change the color of the bars with a single click on each level in the bars. That click brings a thumbnail of a color chart. Click on the thumbnail to reveal a color grid, and then select the color you desire.
6. Change the pattern of the bars with a single click on each level in the bars. Continuous clicking brings up many patterns to choose from.

Click the **Done** button located on the right side of the screen, or click back to **Chart Options** and/or **Data Options** to change your selection criteria. You must click **Done** if you wish to later save and/or print your chart via the Export Wizard.

Clicking **Done** takes you to the exportable version of the chart, but you can subsequently “**Click here to edit this chart**” (located in the upper left corner, below the **Chart** tab) to make more changes. Alternatively, the entire chart area, if clicked, will take you to the edit screen.

To make an additional chart from the same report/table, click the **Chart** tab to begin a new chart. It is recommended that you provide a new **Chart Name** (the default is Chart 1, Chart 2, etc.). If you don't start the chart process again by clicking the **Chart** tab, the new chart will overwrite the previous one.

If you wish to make charts using other reports or additional ones, go back to step 3, **Edit Reports**, and check the ones you want. When you then advance to step 4, **Build Reports**, the

reports will appear in the **Select Report** drop-down list. If you need to create new reports, go back to step 1, **Select Criteria**, and/or step 2, **Select Variables**. Remember to export any completed charts you want to save by clicking **Done** and using the **Export Reports** function before leaving the **Build Reports** screen. (For further information, see step 4: Build Reports section G. Export Reports).

## F. Significance Tests

Tests for statistical significance indicate whether observed differences between assessment results occur because of sampling error or chance. "Significance" here does not imply any judgment about absolute magnitude or educational relevance. It refers only to the statistical nature of the difference and whether that difference likely reflects a true difference in the population.

With your report of interest selected, click the **Significance Test** tab, which is located towards the middle of the screen, to the right of the **Chart** tab. You first need to decide which variable you want to test and the criterion by which you want to test that variable. You will compare or "look across" the criterion's range of values, so it must have more than one value. For example, you can look across jurisdictions for a variable, that is, compare between two or more jurisdictions. You can look across the values within a variable, such as "male" and "female" within gender. Once the primary criterion is chosen, all other criteria must be restricted to a single value.

The general steps for running significance tests are as follows (see exhibit 25):

1. In the **Significance Test** window select either **Between Jurisdictions** or **Within Variables**. Select **Jurisdiction(s)**, **Variable(s)**, and **Statistic(s)**. For **Between Jurisdictions**, you must select at least two jurisdictions. For **Within Variables**, you select one or more jurisdictions.
2. Enter a **Name** limited to 25 characters, using only letters, numbers, spaces, underscores, and hyphens (otherwise, the default is "Sig Test 1").
3. Located under the test **Name**, you can check **Show Score Details** to display the estimates and standard errors for the table cells.
4. Click the **Preview** tab located in the upper left corner, or the Preview button located in the bottom left corner.
5. Click the **Edit** tab in the upper left corner of the screen if you wish to go back and make changes to the selections you made for running the significance tests.
6. Click the **Done** button in the right corner of the screen to run the significance tests.

## Exhibit 25. Significance tests options

**Significance Test**

Edit Preview Cancel Done

1. Select one category to compare significance from the choices available below. Help

Between Jurisdictions Within Variables Across Years

2. Create a name for this significance test. Name: Sig Test 1

3. Select additional options.  Show score details

4. Select available options from each of the columns below, then preview results.

Jurisdiction	Variable	Year	Statistic
<input checked="" type="checkbox"/> All Jurisdictions <input checked="" type="checkbox"/> International Average <input checked="" type="checkbox"/> Australia <input checked="" type="checkbox"/> Chinese Taipei <input checked="" type="checkbox"/> England <input checked="" type="checkbox"/> Germany <input checked="" type="checkbox"/> Hong Kong SAR	<input checked="" type="checkbox"/> Sex of student <input checked="" type="checkbox"/> Girl <input checked="" type="checkbox"/> Boy	<input checked="" type="checkbox"/> 2007	<input checked="" type="checkbox"/> Percentages at or above e <input type="checkbox"/> At or above 400 <input type="checkbox"/> At or above 475 <input type="checkbox"/> At or above 550 <input checked="" type="checkbox"/> At or above 625

Preview Cancel Done

In the significance test matrix, you will see the differences and  $p$ -values. As shown in the legend of the matrix, it is indicated whether one estimate is significantly lower or higher than another estimate, or if there is no significant difference between them (see exhibit 26). Most comparisons are independent with an alpha level of 0.05, except for within-variable tests for gender where a dependent methodology is used. Note that the TIMSS IDE follows the IEA policy of using independent t-tests even between a country and a subjurisdiction that is participating as a benchmarking entity, such as for comparing scores between United States and Massachusetts or Minnesota, since they each have an independent sample.

## Exhibit 26. Significance test output

Table		Sig Test 1	X
Chart		Significance Test	
<p>To read the results of these significant tests, read across the rows for each variable in the respective column. The symbol displayed in each cell indicates whether the variable in the respective column is significantly higher, significantly lower, or not significantly different from the variable in the respective column. Empty cells indicate that a variable is not significantly different from the variable in the respective column.</p>			
<p>Mathematics, grade 4, timss mathematics scale: overall mathematics scale            Difference in 625 or Greater Between jurisdictions            for Sex of student [ITSEX] = Girl            2007</p>			
		Australia	United States
Australia			x Diff = -1 P-value = 0.4314
United States		x Diff = 1 P-value = 0.4314	
<b>LEGEND:</b>			
<	Significantly lower.		
>	Significantly higher.		
x	No significant difference.		
<p>NOTE: Most comparisons are independent with an alpha level of 0.05, except for within variable tests for gender where a dependent methodology is used. Population coverage and/or sample participation rates for Denmark, Georgia, Kazakhstan, Latvia, Lithuania, the Netherlands, Scotland, the United States, as well as for the benchmarking jurisdictions of Dubai (UAE), Massachusetts (USA), and all participating Canadian provinces deviated from international standards, as described in the TIMSS 2007 International Report (Martin, Mullis &amp; Foy, 2008). See the <i>Statistical Notations and other Notes</i> section in the Help Guide for additional information.            SOURCE: International Association for the Evaluation of Educational Achievement, Trends in International Mathematics and Science Study (TIMSS), 2007.</p>			

## G. Export Reports

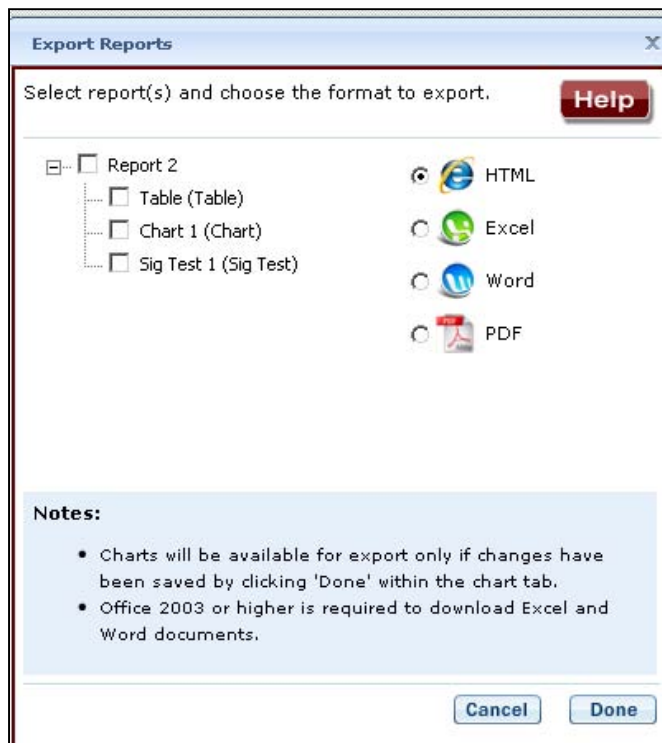
Click on the **Export Reports** button/arrow located on the right side of the screen to save or print your tables, charts, and significance tests. The report names that appear in the **Export Reports** window are those that were checked off at step 3, **Edit Reports**.

Check the files you want to export, and select one of the file formats: **HTML** (print-friendly), **Excel**, **Word**, and **PDF** (see exhibit 27). All reports that you select at the same time will be exported in one file. In the Excel format, you will be able to increase the decimal places visible (wherever more precision is available in the database). Because there are many different

operating systems in use, you may get an error message with Excel or one of the other formats. Usually, this will not affect your ability to export, so please wait for software "errors" to resolve themselves.

Charts for each report will only be available on this menu if you saved them by clicking **Done** on the last screen when you created them. If a chart that you wish to save or print is grayed out (not available for selection), cancel the **Export Reports** tool, go back to your chart, and be sure to click **Done** on the last screen. After that, it will be available for export.

### Exhibit 27. Export report options



If you edited report tables or completed charts that you wish to save or print, remember to do this via the **Export Reports** function before leaving the **Build Reports** screen. Returning to prior screens to edit the report table formats or change variables or criteria will overwrite the report tables and charts.

## V. TIMSS International Data Explorer (IDE) Definitions

This section describes the kinds of criteria and variables that are used to form data queries, as well as the kinds of data available and statistical methods to assess them.

These topics include the following:

- Criteria
  - Subject
  - Grade
  - Measures
  - Jurisdictions
- Variables
- Statistics Options
  - Average scale scores
  - Percentages
  - Benchmarks (discrete and cumulative)
  - Percentiles
  - Standard deviations
- Cross-tabulations
- Statistical Notations and Other Notes

### 1. Criteria

Each data query must include at least one selection from four criteria choices: subject, grade, measure(s), and jurisdiction(s). Shown below is an outline of these selection criteria followed by a brief description.

1. Subject: Mathematics or Science
2. Grade: Fourth or Eighth
3. Measure:
  - Mathematics: Grade 4
    1. TIMSS Math Scale: Overall Mathematics
    2. TIMSS Math Scale: Number
    3. TIMSS Math Scale: Geometric Shapes and Measures
    4. TIMSS Math Scale: Data Display
  - Mathematics: Grade 8
    1. TIMSS Math Scale: Overall Mathematics
    2. TIMSS Math Scale: Number
    3. TIMSS Math Scale: Algebra
    4. TIMSS Math Scale: Geometry
    5. TIMSS Math Scale: Data and Chance
  - Science: Grade 4
    1. TIMSS Science Scale: Overall Science
    2. TIMSS Science Scale: Life Science



- 3. TIMSS Science Scale: Physical Science
- 4. TIMSS Science Scale: Earth Science
- Science: Grade 8
  - 1. TIMSS Science Scale: Overall Science
  - 2. TIMSS Science Scale: Biology
  - 3. TIMSS Science Scale: Chemistry
  - 4. TIMSS Science Scale: Physics
  - 5. TIMSS Science Scale: Earth Science
- Mathematics and Science Grades 4 & 8: Cognitive Domains
  - 1. Knowing
  - 2. Applying
  - 3. Reasoning
- 4. Jurisdiction:
  - International Average
  - Average for Selected Countries
  - Country
  - Benchmarking jurisdiction

### A. Subject

TIMSS is a study of mathematics and science, and those are the subjects that can be selected.

### B. Measures

TIMSS focuses on overall mathematics and science knowledge, but within these broad categories a variety of subscales are available. Within mathematics at the fourth-grade level, the available subscales are number, geometric shapes and measures, and data display. In the eighth grade, the subscales are number, algebra, geometry, and data and chance. For science at the fourth-grade level, the available subscales are life science, physical science, and Earth science. In the eighth grade the subscales are biology, chemistry, physics, and Earth science. Subscales are constituent parts of the composite subject scale for an assessment, and are specified by the assessment framework. The weighted average of these is the basis for the mathematics and science composite scales, as described in the TIMSS framework.

If you need results for one or more subscales, realize that there are not as many data for them because the student samples are smaller.

### C. Jurisdictions

In 2007, 36 countries, as well as 7 subnational education systems—the Canadian provinces of Alberta, British Columbia, Ontario, and Quebec; Dubai (United Arab Emirates); and the U.S. states of Massachusetts and Minnesota—participated in TIMSS at the fourth-grade level. At the eighth-grade level, 48 countries, along with 8 subnational education systems—the Canadian provinces of British Columbia, Ontario, and Quebec; Dubai (United Arab Emirates); the Basque region of Spain; and the U.S. states of Massachusetts and Minnesota—participated. All listed



jurisdictions can be selected for any analyses. However, the IDE contains a few U.S.-specific background variables (e.g., race/ethnicity) that, when selected, will not yield information for any other non-U.S. jurisdictions.

## 2. Variables

In the TIMSS IDE, questions from three types of questionnaires (student, teacher, and school) as well as variables that are derived from background information are organized into categories that have shared characteristics and can be selected as a group when examining and generating tables.

The categories are listed below and described briefly as an overall guide to the content in each category. Content category and subcategory titles may overlap, but specific variables appear only once in a subcategory. Use **Search** in the **Select Variables** step to locate variables.

## 3. Statistics Options

The IDE reports TIMSS data with several statistics options:

- Average scale scores
- Percentages
- Benchmarks – discrete
- Benchmarks – cumulative
- Percentiles
- Standard deviations

### A. Average scale scores

For the TIMSS assessment, student performance is reported on scales that range from 0 to 1,000, with the TIMSS scale average fixed at 500 and a standard deviation of 100.

Scale scores can show the standard error (in parentheses) and are often accompanied by data showing percentages and standard deviations.

TIMSS scales are produced using Item Response Theory (IRT) to estimate average scores for mathematics and science for each jurisdiction. IRT identifies patterns of response and uses statistical models to predict the probability of answering an item correctly as a function of the students' proficiency in answering other questions. That is, student responses to the assessment questions are analyzed to determine the percentage of students responding correctly to each multiple-choice question and the percentage of students achieving each of the score categories for constructed-response questions.

### B. Percentages

Percentages show the percentage of students as a row percentage. For example, if the table cell for Black female students in the United States is 9 percent, then Black females composed 9

percent of U.S. sample. By default, percentage distributions do not include those with missing data, though there is an option to include the missing data.

### C. Benchmarks (discrete and cumulative)

In addition to average scale scores, achievement results for TIMSS are also reported using benchmarks. The benchmarks are internationally set levels based on collective judgments about what students should know and be able to do relative to the body of content reflected in each subject-area assessment.

- Discrete levels are reported as the percentage of students performing at four benchmarks: Low, Intermediate, High, and Advanced, with an additional category created for those students scoring below the Low benchmark (Below Low). Descriptions were developed to characterize typical student performance at each benchmark. Note that there is simply too little information to know what students scoring below the Low benchmark can actually do. This statistic shows the percentage of students performing in the following categories:
  - *Below low – Below 400*
  - *At low – 400 to 474*
  - *At intermediate – 475 to 549*
  - *At high – 550 to 624*
  - *At advanced – At or above 625*

Descriptions of competencies at the 2007 TIMSS international benchmarks appear in the following table:

### Description of TIMSS international benchmarks: 2007

Benchmark	Cutpoint	Grade 4 Mathematics skills and strategies
<b>Low</b>	<b>400</b>	<ul style="list-style-type: none"> <li>• Basic mathematical knowledge of whole numbers, triangles, informal coordinate systems, and simple graphs</li> </ul>
<b>Intermediate</b>	<b>475</b>	<ul style="list-style-type: none"> <li>• Apply basic mathematical knowledge to whole numbers, and simple numeric and geometric patterns</li> <li>• Familiar with a range of two-dimensional shapes</li> <li>• Read and interpret different representations of the same data</li> </ul>
<b>High</b>	<b>550</b>	<ul style="list-style-type: none"> <li>• Apply knowledge and understanding to solve multi-step word problems with whole numbers</li> <li>• Understand division, place values, and simple fractions</li> <li>• Extend patterns and identify the relationship between ordered pairs</li> <li>• Basic geometric knowledge</li> </ul>
<b>Advanced</b>	<b>625</b>	<ul style="list-style-type: none"> <li>• Understanding of a variety of relatively complex situations and ability to explain reasoning</li> <li>• Apply proportional reasoning in a variety of contexts</li> <li>• Developing understanding of fractions and decimals</li> <li>• Apply geometric knowledge of a range of two- and three-dimensional shapes in a variety of situations</li> <li>• Organize, interpret, and represent data to solve problems</li> </ul>

NOTE: Information about the procedures used to set the international benchmarks is available in the [TIMSS 2007 Technical Report](#).

SOURCE: Martin, M.O., Mullis, I.V.S., & Foy, P. (2008). [TIMSS 2007 International Mathematics Report: Findings from IEA's Trends in International Mathematics and Science Study at the Fourth and Eighth Grades](#). Chestnut Hill, MA: TIMSS & PIRLS International Study Center, Boston College.

<b>Benchmark</b>	<b>Cutpoint</b>	<b>Grade 8 Mathematics skills and strategies</b>
<b>Low</b>	<b>400</b>	<ul style="list-style-type: none"> <li>• Knowledge of whole numbers and decimals, operations, and basic graphs</li> </ul>
<b>Intermediate</b>	<b>475</b>	<ul style="list-style-type: none"> <li>• Apply basic mathematical knowledge in straightforward situations</li> <li>• Add and multiply to solve one-step word problems involving whole numbers, decimals, and simple algebraic relationships</li> <li>• Understand the properties of triangles and basic geometric concepts</li> <li>• Read and interpret graphs and tables</li> </ul>
<b>High</b>	<b>550</b>	<ul style="list-style-type: none"> <li>• Understanding and knowledge in a variety of relatively complex situations</li> <li>• Compute with fractions, decimals, percents, negative integers, and proportions</li> <li>• Work with algebraic expressions and linear equations</li> <li>• Knowledge of geometric properties to solve problems, including area, volume, and angles</li> <li>• Interpret data in a variety of graphs and tables</li> <li>• Solve simple problems involving probability</li> </ul>
<b>Advanced</b>	<b>625</b>	<ul style="list-style-type: none"> <li>• Organize and draw conclusions from information, make generalizations, and solve nonroutine problems</li> <li>• Solve a variety of ratio, proportion, and percent problems</li> <li>• Express generalizations algebraically and model situations</li> <li>• Knowledge of geometry in complex problem situations</li> <li>• Derive and use data from several sources to solve multi-step problems</li> </ul>

NOTE: Information about the procedures used to set the international benchmarks is available in the [TIMSS 2007 Technical Report](#).

SOURCE: Martin, M.O., Mullis, I.V.S., & Foy, P. (2008). TIMSS 2007 International Mathematics Report: [Findings from IEA's Trends in International Mathematics and Science Study at the Fourth and Eighth Grades](#). Chestnut Hill, MA: TIMSS & PIRLS International Study Center, Boston College.

<b>Benchmark</b>	<b>Cutpoint</b>	<b>Grade 4 Science skills and strategies</b>
<b>Low</b>	<b>400</b>	<ul style="list-style-type: none"> <li>• Elementary knowledge of life science and physical science</li> </ul>
<b>Intermediate</b>	<b>475</b>	<ul style="list-style-type: none"> <li>• Basic knowledge and understanding of practical situations in the sciences</li> <li>• Recognize some basic information related to characteristics of living things and their interaction with the environment</li> <li>• Understanding of human biology and health</li> <li>• Know some basic facts about the solar system</li> <li>• Ability to interpret information in pictorial diagrams and apply factual knowledge to practical situations</li> </ul>
<b>High</b>	<b>550</b>	<ul style="list-style-type: none"> <li>• Demonstrate some understanding of plant and animal structure, life processes, and the environment and some knowledge of properties of matter and physical phenomena</li> <li>• Knowledge of the solar system, and of Earth's structure, processes, and resources</li> <li>• Demonstrate beginning scientific inquiry knowledge and skills</li> <li>• Provide brief descriptive responses combining knowledge of science concepts with information from everyday experience of physical and life processes</li> </ul>
<b>Advanced</b>	<b>625</b>	<ul style="list-style-type: none"> <li>• Communicate understanding of characteristics and life processes of organisms as well as of factors relating to human health</li> <li>• Demonstrate understanding of relationships among various physical properties of common materials and have some practical knowledge of electricity</li> <li>• Demonstrate some understanding of the solar system and Earth's physical features and processes</li> <li>• Ability to interpret the results of investigations and draw conclusions as well as ability to evaluate and support an argument</li> </ul>

NOTE: Information about the procedures used to set the international benchmarks is available in the [TIMSS 2007 Technical Report](#).

SOURCE: Martin, M.O., Mullis, I.V.S., & Foy, P. (2008). [TIMSS 2007 International Science Report: Findings from IEA's Trends in International Mathematics and Science Study at the Fourth and Eighth Grades](#). Chestnut Hill, MA: TIMSS & PIRLS International Study Center, Boston College.

<b>Benchmark</b>	<b>Cutpoint</b>	<b>Grade 8 Science skills and strategies</b>
<b>Low</b>	<b>400</b>	<ul style="list-style-type: none"> <li>• Recognize some basic facts from the life and physical sciences</li> </ul>
<b>Intermediate</b>	<b>475</b>	<ul style="list-style-type: none"> <li>• Recognize and communicate basic scientific knowledge across a range of topics</li> <li>• Understand the characteristics of animals, food webs, and the effect of population changes in ecosystems</li> <li>• Acquainted with some aspects of sound and force and have elementary knowledge of chemical change</li> <li>• Elementary knowledge of the solar system, Earth's processes, and resources and the environment</li> </ul>
<b>High</b>	<b>550</b>	<ul style="list-style-type: none"> <li>• Conceptual understanding of some science cycles, systems, and principles</li> <li>• Understand biological concepts including human biology and the interrelationship of plants and animals in ecosystems</li> <li>• Knowledge of situations related to light and sound, as well as heat and forces</li> <li>• Understand the structure of matter, and chemical and physical properties and changes</li> <li>• Understand the solar system, Earth's processes and resources, and some basic understanding of major environmental issues</li> </ul>
<b>Advanced</b>	<b>625</b>	<ul style="list-style-type: none"> <li>• Grasp of some complex and abstract concepts in biology, chemistry, physics, and Earth science</li> <li>• Understand the complexity of living organisms and how they relate to their environment</li> <li>• Understand the properties of magnets, sound, and light</li> <li>• Understand the structure of matter and physical and chemical properties and changes</li> <li>• Knowledge of the solar system and of Earth's features and processes, and apply understanding of major environmental issues</li> <li>• Understand some fundamentals of scientific investigation and apply basic physical principles to solve some quantitative problems</li> </ul>

NOTE: Information about the procedures used to set the international benchmarks is available in the [TIMSS 2007 Technical Report](#).

SOURCE: Martin, M.O., Mullis, I.V.S., & Foy, P. (2008). [TIMSS 2007 International Science Report: Findings from IEA's Trends in International Mathematics and Science Study at the Fourth and Eighth Grades](#). Chestnut Hill, MA: TIMSS & PIRLS International Study Center, Boston College.

Benchmark data are presented in a discrete or cumulative format. Discrete format means that the percentage of students performing within each international benchmark is counted separately from the other benchmarks. These categories are the percentages of students scoring *below low*, *at low*, *at intermediate*, *at high*, and *at advanced*. Cumulative format shows the percentage of students performing *at or above* each international benchmark. These categories are the percentages of students scoring *at or above low*, *at or above intermediate*, *at or above high*, and *at advanced*. Scoring below *low* indicates that the students' abilities could not be accurately described based on their responses.

#### D. Percentiles

This statistic shows the threshold (or cutpoint) score for the following:

- 10<sup>th</sup> percentile – the bottom 10 percent of students
- 25<sup>th</sup> percentile – the bottom quarter of students
- 50<sup>th</sup> percentile – the median (half the students scored below the cutpoint and half scored above it)
- 75<sup>th</sup> percentile – the top quarter of students
- 90<sup>th</sup> percentile – the top 10 percent of students

#### E. Standard deviations

The standard deviation is a measure of how widely or narrowly dispersed scores are for a particular dataset. Under general normality assumptions, 95 percent of the scores are within two standard deviations of the mean. For example, if the average score of a dataset is 500 and the standard deviation is 100, it means that 95 percent of the scores in this dataset fall between 300 and 700.

In the IDE, you may obtain **Standard Deviations** as one of your two choices for **Statistics Options** in **Edit Reports**.

### 4. Cross-tabulations

Cross-tabulation is a method of combining separate variables into a single table. Normally each variable has its own table. If you have selected two or three variables (not counting **All students**), when you go to the **Edit Reports** step, you will automatically get one table for each variable (including one for **All students**); at the end of that list, you will get one cross-tabulation for the two or three variables selected.

If you have chosen four or more variables (not counting **All students**), you will get tables for each variable, but you won't get the cross-tabulation.

Be advised that if you go back to add another variable without subtracting one to keep the total under four, you will lose any edits you might have made to the cross-tabulation.

## 5. Statistical Notations and Other Notes

Statistical notations and other notes are found at the end of a data table, as applicable to that table:

- — Not available.
- † Not applicable. (For instance, the statistic does not meet reporting standards, so the standard error for that statistic cannot be reported.)
- # The statistic rounds to zero.
- ‡ Reporting standards not met. (For instance, the sample size is insufficient to permit a reliable estimate.)
- NOTE: A general note pertains to any special characteristics of the data in the table.
- SOURCE: Source information is listed for all TIMSS data and should be cited when data are used in a publication or presentation.

Morocco participated in TIMSS 2007 at both the fourth and eighth grades, but due to sampling difficulties, its grade eight data are not shown in this report. Mongolia also participated in TIMSS 2007, but could not complete the steps necessary to have its data included in the report.

Results shown in the IDE may differ slightly from the International Association for the Evaluation of Educational Achievement (IEA) TIMSS 2007 International Report because of a slightly different procedure used in linking teacher data to the students. Some students (mostly for eighth grade) may be assigned more than one science or mathematics teacher. Each teacher is asked to complete the teacher questionnaire and the IEA TIMSS 2007 report presents results that are based on averaged data for these teachers. For the IDE, if a student has more than one teacher for each subject, a student is linked to data from a single teacher for mathematics and science. The teacher is chosen randomly from the group of teachers (mathematics or science) who answered the questionnaire for each student.

## 6. Glossary

This glossary should serve as an aid to understanding the indices used in TIMSS. Each index is listed along with the variables from which it is derived. In the IDE, indices are listed by category with their associated variables following directly after them. Please note that variables that are not included in an index are still included in the IDE categorical listings, but after the indices and their associated variables.

### A. Student and Family Characteristics

**Language of testing** – This question asks students how often they speak the language of the test at home. Students had four response options: *Always*, *Almost always*, *Sometimes*, and *Never*. Students who responded anything other than *Always* were asked what other language they spoke at home. Language options vary by country, but in the United States in 2007, students could select Spanish, or write in any other language. For additional



details about country-specific language options, see the TIMSS 2007 User Guide Supplement 2.<sup>1</sup>

**Home Resources** – Within the home resource category, five items were consistent across countries and up to four country-specific items could be included. Across countries students were asked whether they had the following at home: calculator; computer (not including PlayStation®, GameCube®, Xbox®, or other TV/video game computers); study desk/table for personal use; dictionary; and Internet connection. In 2007, the United States used four country-specific variables: encyclopedia (book or CD-ROM); PlayStation®, GameCube®, Xbox®, or other TV/video game system; VHS or DVD player; and three or more cars, small trucks, or sport utility vehicles. For additional details about country-specific adaptations, see the TIMSS 2007 User Guide Supplement 2 (see footnote 1).

**Level of education attainment** – The International Standard Classification of Education (ISCED) is an internationally comparable method for describing levels of education across countries created by the United Nations Educational, Scientific, and Cultural Organization (UNESCO). ISCED levels are defined as follows:

**Level 0** – The initial stage of organized instruction, designed primarily to introduce very young children to a school-type environment. ISCED level 0 programs can either be center or school based. Preschool and kindergarten programs in the United States fall into the level 0 category.

**Level 1** – Consists of primary education, which usually lasts 4 to 6 years. ISCED level 1 typically begins between ages 5 and 7, and is the stage where students begin to study basic subjects, such as reading, writing, and mathematics. In the United States, elementary school (grades 1 through 6) is classified as level 1.

**Level 2** – Also known as lower secondary education, students continue to learn the basic subjects taught in level 1, but this level is typically more subject-specific than level 1 and may be taught by specialized teachers. ISCED level 2 usually lasts between 2 and 6 years, and begins around the age of 11. Middle school and junior high (grades 7 through 9) in the United States are classified as level 2. These programs are primarily designed to prepare students for ISCED level 3.

**Level 3** – Also known as upper secondary education, student coursework is generally subject-specific and often taught by specialized teachers. Students often enter upper secondary education at the age of 15 or 16 and attend anywhere from 2 to 5 years. ISCED level 3 can prepare students for postsecondary education or the labor force. Senior high school (grades 10 through 12) is considered level 3 in the United States. These programs are primarily designed to prepare students for ISCED levels 5A and 5B.

**Level 4** – Consists of primarily vocational education, and courses are taken after the completion of secondary school, though the content is not more advanced than the content of secondary school courses. ISCED level 4 programs in the United

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<sup>1</sup> Foy, P., & Olson, J.F. (Eds.). (2009). Chestnut Hill, MA: TIMSS & PIRLS International Study Center, Boston College.

States are often in the form of 1-year certificate programs. These programs can prepare students for ISCED levels 5A and 5B.

**Level 5** – Divided into levels 5A and 5B, this level refers to tertiary (postsecondary) education and usually lasts 3 to 6 years. ISCED level 5A refers to academic higher education below the doctoral level. Level 5A programs are intended to provide sufficient qualifications to gain entry into advanced research programs and professions with high skill requirements. In the United States, bachelor's, master's, and first-professional degree programs are classified as ISCED level 5A. ISCED level 5B refers to vocational postsecondary education. Level 5B programs provide a higher level of career and technical education and are designed to prepare students for the labor market. In the United States, associate's degree programs are classified at this level.

**Level 6** – Refers to the doctoral level of academic higher education. Level 6 programs usually require the completion of a research thesis or dissertation.

## B. Student Activities Outside of School

### **Index of Time Spent on Mathematics/Science Homework (TMH/TSH)**

[ASDMTMH, ASDSTSH, BSDMTMH, BSDSTSH] – This index is based on two questions given to students about the frequency with which they are assigned homework and the amount of time they spend doing it. Responses to the frequency of homework assignment are coded on a 5-point scale for each item as follows: *Every day* = 1; *3 or 4 times a week* = 2; *1 or 2 times a week* = 3; *Less than once a week* = 4; *Never* = 5. Responses to the amount of time spend on homework are coded for each item as follows: *Zero minutes* = 1; *1–15 minutes* = 2; *16–30 minutes* = 3; *31–60 minutes* = 4; *61–90 minutes* = 5; *More than 90 minutes* = 6. Responses are categorized for the index variable such that *High* = students report that they receive homework at least 3 or 4 times a week and spend more than 30 minutes on each assignment; *Low* = students report that they receive homework no more than twice a week and spend 30 minutes or less on each assignment; *Medium* = all other combinations of answers. Items used for the fourth-grade mathematics index are [AS4MOHWG and AS4MSHWM]. Please note that the same coding process is used for the fourth-grade **Index of Time Spent on Science Homework (TSH)** [AS4SOHWG and AS4SSHWM], as well as the eighth-grade mathematics index [BS4MOHWG and BS4MSHWM]. The eighth-grade science indexes follow a similar pattern, but are separated by subject.

## C. Student Engagement in Mathematics/Science

### **Index of Students' Positive Affect towards Mathematics/Science (PATM/PATS)**

[ASDMPATM, ASDSPATS, BSDMPATM, BSDSPATS] – This index is based on three statements directed at students' feelings towards mathematics/science: I enjoy learning mathematics/science; Mathematics/science is boring; I like mathematics/science. Student responses were coded on a 4-point scale for each item as follows: *Agree a lot* = 1; *Agree a little* = 2; *Disagree a little* = 3; *Disagree a lot* = 4. After reverse-coding

relevant items, the index is categorized by averaging the responses to the three source questions such that *High* = average is less than or equal to 2; *Medium* = average is greater than 2 and less than 3; and *Low* = average is greater than or equal to 3. Items used for the fourth-grade mathematics index are [AS4MAENJ, AS4MABOR, AS4MALIK]. Please note that the same process is used to create the fourth-grade **Index of Students' Positive Affect towards Science (PATS)** [AS4SAENJ, AS4SABOR, AS4SALIK], as well as the eighth-grade mathematics index [BS4MAENJ, BS4MABOR, BS4MALIK]. The eighth-grade science indexes follow a similar pattern, but are separated by subject.

#### **Index of Self-Confidence in Learning Mathematics/Science (SCM/SCS)**

[ASDMSCM, ASDSSCS, BSDMSCM, BSDSSCS] – This index is composed of four statements regarding students' self-confidence in learning mathematics/science: I usually do well in mathematics/science; Mathematics/science is harder for me than for many of my classmates; I am just not good at mathematics/science; I learn things quickly in mathematics/science. Student responses were averaged on a 4-point scale as follows: *Agree a lot* = 1; *Agree a little* = 2; *Disagree a little* = 3; *Disagree a lot* = 4. After reverse-coding relevant items, the responses were averaged such that *High* = average is less than or equal to 2; *Medium* = average is greater than 2 and less than 3; and *Low* = average is greater than or equal to 3. Items used for the fourth-grade mathematics index are [AS4MAWEL, AS4MACLM, AS4MANOT, AS4MAQKY]. Please note that the same process is used to create the fourth-grade **Index of Self-Confidence in Learning Science (SCS)** [AS4SAWEL, AS4SACLM, AS4SANOT, AS4SAQKY], as well as the eighth-grade mathematics index [BS4MAWEL, BS4MACLM, BS4MANOT, BS4MAQKY]. The eighth-grade science indexes follow a similar pattern, but are separated by subject.

#### **Index of Students' Valuing Mathematics/Science (SVM/SVS) [BSDMSVM**

**BSDSSVS]** – This index is based on students' responses to statements regarding the value of mathematics/science in their lives: I think learning mathematics/science will help me in my daily life; I need mathematics/science to learn other school subjects; I need to do well in mathematics/science to get into the university of my choice; I need to do well in mathematics/science to get the job I want. Student responses were coded on a 4-point scale for each item as follows: *Agree a lot* = 1; *Agree a little* = 2; *Disagree a little* = 3; *Disagree a lot* = 4. Responses are categorized for the index variable such that *High* = average is less than or equal to 2; *Medium* = average is greater than 2 and less than 3; and *Low* = average is greater than or equal to 3. Items used for the eighth-grade mathematics index are [BS4MAHDL, BS4MAOSS, BS4MAUNI, BS4MAGET]. Please note that the same process is used to create the eighth-grade **Index of Students' Valuing Science (SVS)** [BS4SAHDL, BS4SAOSS, BS4SAUNI, BS4SAGET], and there are no comparable fourth-grade indexes.

### **D. Teacher Preparation and Collaboration**

**Frequency of Collaboration among Teachers** – This index asks teachers how often they have the following types of interactions with other teachers: discussions about how to teach a particular concept; working on preparing instructional materials; visits to another teacher's classroom to observe his/her teaching; and informal observations of

their classroom by another teacher. Teacher responses were coded on a 4-point scale for each item as follows: *Never or almost never* = 1; *2 or 3 times per month* = 2; *1-3 times per week* = 3; *Daily or almost daily* = 4. Responses are averaged for the index variable such that *Never or almost never* = average is less than or equal to 1.4; *2 or 3 times per month* = average is greater than 1.4 and less than or equal to 2.4; *At least weekly* = average is more than 2.4. Items used for the fourth-grade mathematics and science indexes are [AT4GOTDC, AT4GOTPM, AT4GOTVT, AT4GOTAT]. Please note that same coding processes are used to create the eighth-grade indexes for the **Frequency of Collaboration among Mathematics/Science Teachers** [BT4GOTDC, BT4GOTPM, BT4GOTVT, BT4GOTAT]. Items for the eighth-grade indexes share the same variable names, but separate questionnaires are given to mathematics and science teachers at the eighth grade.

### E. Classroom Characteristics

**Index of Teachers' Reports on Mathematics/Science Classes without Limiting Factors (MCFL/SCFL)** [ATDMCFL, ATDSCFL, BTDMCFL, BTDSCFL] – This index is based on teachers' responses about the instructional impact of five characteristics of their students: differing academic abilities, a wide range in backgrounds, students with special needs, uninterested students, and disruptive students. Responses were coded on a 4-point scale for each item as follows: *Not applicable* = 1; *Not at all* = 2; *A little* = 3; *Some* = 4; *A lot* = 5. Responses were averaged for the index variable such that *High* = average is less than or equal to 2; *Medium* = average is greater than 2 and less than 3; *Low* = average is greater than or equal to 3. Items used for the fourth-grade mathematics index are [AT4MVMSA, AT4MVMSW, AT4MVMSS, AT4MVMUS, AT4MVMS]. Please note that the same process is used to create the fourth-grade **Index of Teachers' Reports on Science Classes without Limiting Factors (SCFL)** [AT4SVSSA, AT4SVSSW, AT4SVSSS, AT4SVSUS, AT4SVSDS], the eighth-grade mathematics index [BT4MLI01-BT4MLI05], and the eighth-grade science index [BT4SLI01-BT4SLI05].

### F. Classroom Instruction

**Fourth-grade** – One target population for TIMSS 2007 was students enrolled in the fourth grade of formal schooling, counting from the first year of primary school as defined by UNESCO's International Standard Classification of Education (ISCED) system. Accordingly, the fourth year of formal schooling should be the fourth grade in most countries. However, to avoid testing very young children, TIMSS has a policy that the average age of children in the grade tested should not be below 9.5 years old so some countries participate with students in the fifth grade.

**Eighth-grade** – One target population for TIMSS 2007 was students enrolled in the eighth grade of formal schooling, counting from the first year of primary school as defined by UNESCO's International Standard Classification of Education (ISCED) system, providing that the mean age at the time of testing is at least 13.5 years.

Accordingly, the eighth year of formal schooling should be the eighth grade in most countries.

## G. Role of Homework

### **Index of Teachers' Emphasis on Mathematics/Science Homework (EMH/ESH) [ATDMEMH, ATDSESH, BTDMEMH, BTDSESH]**

This index is based on teachers' responses to three questions about assigning homework: whether they assign homework; how often they assign it; and how many minutes are usually assigned. Teachers can respond *Yes* or *No* to whether or not they assign homework. A 3-point scale is used to code how often homework is assigned: *Every or almost every lesson* = 1; *About half the lessons* = 2; *Some lessons* = 3. Response options for the typical length of time usually assigned include: *Fewer than 15 minutes* = 1; *15-30 minutes* = 2; *31-60 minutes* = 3; *61-90 minutes* = 4; *More than 90 minutes* = 5. Responses are categorized for the index variable such that *High* = responded other than *No* to assigning homework, responded *Every or almost every lesson* or *About half the lessons* to frequency of assigning homework, and responded *31-60 minutes* or *61-90 minutes* or *More than 90 minutes* to length of assignment; *Low* = responded *No* to assigning homework, or responded other than *No* to assigning homework, responded *About half the lessons* or *Some lessons* to frequency of assigning homework, and responded *Fewer than 15 minutes* or *15-30 minutes* to length of assignment; and *Medium* = all other response combinations. Items used for the fourth-grade mathematics index are [AT4MHMWO, AT4MHWMC, AT4MHWKM]. Please note that the same process is used to create the fourth-grade **Index of Teachers' Emphasis on Science Homework (ESH)** [AT4SHMWO, AT4SHWMC, AT4SHWKM], the eighth-grade mathematics index [BT4MHMWO, BT4MHWMC, BT4MHWKM], and the eighth-grade science index [BT4SHMWO, BT4SHWMC, BT4SHWKM].

## H. School Resources

### **Index of Availability of School Resources for Mathematics/Science Instruction (ASRMI/ASRSI) [ACDSRMI, ACDSRSI, BCDSRMI, BCDSRSI]**

This index is based on principals' responses about the availability of general school resources: instructional materials (e.g., textbook), budget for supplies (e.g., paper, pencils), school buildings and grounds, heating/cooling and lighting systems, instructional space (e.g., classrooms); and instructional materials for mathematics/science: computers for mathematics/science instruction, computer software for mathematics/science instruction, calculators for mathematics/science instruction, library materials relevant to mathematics/science instruction, and audio-visual resources for mathematics/science instruction. Responses were coded on a 4-point scale for each item as follows: *None* = 1; *A little* = 2; *Some* = 3; *A lot* = 4. Responses were categorized for the index variable such that *High* = the average of general materials is less than 2, and the average of mathematics/science-specific materials is less than 2; *Low* = average of general materials is greater than or equal to 3, and the average of mathematics/science-specific materials is greater than or equal to 3; *Medium* = all other response combinations. Items used for the fourth-grade mathematics index are [AC4GST01-AC4GST05] for general materials, and

[AC4MST07-AC4MST11] for mathematics-specific materials. Please note that the same general material questions are used for the fourth-grade **Index of Availability of School Resources for Science Instruction (ASRSI)**, and the same averaging process is used with comparable science-specific questions [AC4SST12-AC4SST17]. Further, the same pattern is followed for the eighth-grade indexes with [BC4GST01-BC4GST05] common to both indexes and [BC4MST07- BC4MST11], and [BC4SST12-BC4SST17] used for mathematics- and science-specific items, respectively.

**Index of Adequate Working Conditions for Mathematics/Science Teachers (M-TAWC/S-TAWC) [ATDMTAWC, ATDSTAWC, BTDMTAWC, BTDSTAWC]** – This index is based on teachers’ responses about the severity of three school conditions: the school building needs significant repair; classrooms are overcrowded; and teachers do not have adequate workspace outside their classroom. Responses are coded on a 3-point scale for each item as follows: *Not a problem* = 1; *Minor problem* = 2; *Serious problem* = 3. Responses are averaged such that *High* = average value is equal to 1; *Medium* = average value is greater than 1 and less than or equal to 2; *Low* = average value is more than 2. Items used for the fourth-grade mathematics index are [AT4GSPBR, AT4GSPCO, AT4GSPWO]. Please note that the same items are used for the fourth-grade **Index of Adequate Working Conditions for Science Teachers (S-TAWC)**, and one extra question is added: materials are not available to conduct experiments or investigations [AT4GSPME]. A similar pattern is followed for the eighth-grade indexes with three items common to both indexes [BT4GSPBR, BT4GSPCO, BT4GSPWO], and one more included in the science index [BT4GSPME].

## I. School Climate and Safety

**Index of Students' Perception of Being Safe in School (SPBSS) [ASDGPBSS, BSDGPBSS]** – This index is based on students’ *Yes* and *No* responses to statements about safety in school: Something of mine was stolen; I was hit or hurt by other student(s) (e.g., shoving, hitting, kicking); I was made to do things I didn’t want to do by other students; I was made fun of or called names; I was left out of activities by other students. Responses were categorized for the index variable such that *High* = *No* responses to all five statements; *Low* = *Yes* responses to three or more statements; and *Medium* = all other response combinations. Items used for the fourth-grade index are [AS4GSTOL, AS4GHURT, AS4GMADE, AS4GMFUN, AS4GLEFT]. Please note that the same process was used for the eighth-grade index [BS4GSTOL, BS4GHURT, BS4GMADE, BS4GMFUN, BS4GLEFT].

**Index of Teachers' Perception of School Safety (TPSS) [ATDGTPSS, BTDMTPSS, BTDSTPSS]** – This index is based on teachers’ responses to three questions regarding their sense of safety within the school where they work: This school is located in a safe neighborhood; I feel safe at this school; This school’s security policies and practices are sufficient. Responses are coded on a 4-point scale for each item as follows: *Agree a lot* = 1; *Agree* = 2; *Disagree* = 3; *Disagree a lot* = 4. Responses were categorized for the index variable such that *High* = responded *Agree a lot* or *Agree* to all three statements; *Medium*



= all other combinations; *Low* = responded *Disagree* or *Disagree a lot* to all three statements. The index is coded as missing if there are 2 or more source questions with invalid data. Items used for the fourth-grade index are [AT4GCUSN, AT4GCUSA, AT4GUAS]. Please note that the same process was used for the eighth-grade indexes **Index of Mathematics/Science Teachers' Perception of School Safety (M-TPSS/S-TPSS)** [BT4GCUSN, BT4GCUSA, BT4CUAS]. Items for the eighth-grade indexes share the same variable names, but separate questionnaires are given to mathematics and science teachers at the eighth-grade.

**Index of Teachers' Perception of School Climate (TPSC) [ATDGTPSC, BTDMTPSC, BTDSTPSC]** – This index is based on teachers' responses to questions about various aspects of their school environment: Teachers' job satisfaction; Teachers' understanding of the school's curricular goals; Teachers' degree of success in implementing the school's curriculum; Teachers' expectations for student achievement; Parental support for student achievement; Parental involvement in school activities; Students' regard for school property; Students' desire to do well in school. Responses are coded on a 5-point scale for each item as follows: *Very high* = 1; *High* = 2; *Medium* = 3; *Low* = 4; *Very low* = 5. Responses were categorized for the index variable such that *High* = average value is less than or equal to 2; *Medium* = average value is greater than 2 and less than or equal to 3; *Low* = average value is greater than 3. The index is coded as missing if there are 3 or more source questions with invalid data. Items used for the fourth-grade index are [AT4GCHTS, AT4GCHTU, AT4GCHTC, AT4GCHES, AT4GCHPS, AT4GCHPI, AT4GCHSR, AT4GCHSD]. Please note that the same process was used for the eighth-grade indexes **Index of Mathematics/Science Teachers' Perception of School Climate (TPSC)** [BT4GCHTS, BT4GCHTU, BT4GCHTC, BT4GCHES, BT4GCHPS, BT4GCHPI, BT4GCHSR, BT4GCHSD]. Items for the eighth-grade indexes share the same variable names, but separate questionnaires are given to mathematics and science teachers at the eighth grade.

**Index of Principals' Perception of School Climate (PPSC) [ACDGPPSC, BCDGPPSC]** – This index is based on principals' responses to questions about various aspects of their school environment: Teachers' job satisfaction; Teachers' understanding of the school's curricular goals; Teachers' degree of success in implementing the school's curriculum; Teachers' expectations for student achievement; Parental support for student achievement; Parental involvement in school activities; Students' regard for school property; Students' desire to do well in school. Responses are coded on a 5-point scale for each item as follows: *Very high* = 1; *High* = 2; *Medium* = 3; *Low* = 4; *Very low* = 5. Responses were categorized for the index variable such that *High* = average value is less than or equal to 2; *Medium* = average value is greater than 2 and less than or equal to 3; *Low* = average value is greater than 3. The index is coded as missing if there are 3 or more source questions with invalid data. Items used for the fourth-grade index are [AC4GCHTS, AC4GCHTU, AC4GCHTC, AC4GCHES, AC4GCHPS, AC4GCHPI, AC4GCHSR, AC4GCHSD]. Please note that the same coding process was used for the eighth-grade index [BC4GCHTS, BC4GCHTU, BC4GCHTC, BC4GCHES, BC4GCHPS, BC4GCHPI, BC4GCHSR, BC4GCHSD].

**Index of Good Attendance at School (GAS) [ACDGAS, BCDGAS]** – This index is based on principals’ responses to questions about the frequency and severity of attendance issues in their school: Arriving late at school; absenteeism (i.e., unjustified absences); and skipping class. Responses about the frequency of these events were coded as follows for each item: *Never* = 1; *Rarely* = 2; *Monthly* = 3; *Weekly* = 4; *Daily* = 5. Responses to questions about the severity of these issues were coded on a 3-point scale for each item: *Not a problem* = 1; *Minor problem* = 2; *Serious problem* = 3. Responses were categorized for the index variable such that schools at the *High* level of the index reported that all three behaviors never occurred or were not a problem; schools at the *Low* level of the index indicated that two or more of the behaviors were a serious problem, one was a serious problem and the other two were minor problems, or one variable value was missing and two others were coded as serious problem; and the *Medium* category includes all other combinations of responses. Items used for the fourth-grade index are [AC4GFP01-AC4GFP03, AC4GSP01-AC4GSP03]. Please note that the same coding process was used for the eighth-grade index [BC4GFP01-BC4GFP03, BC4GSP01-BC4GSP03].