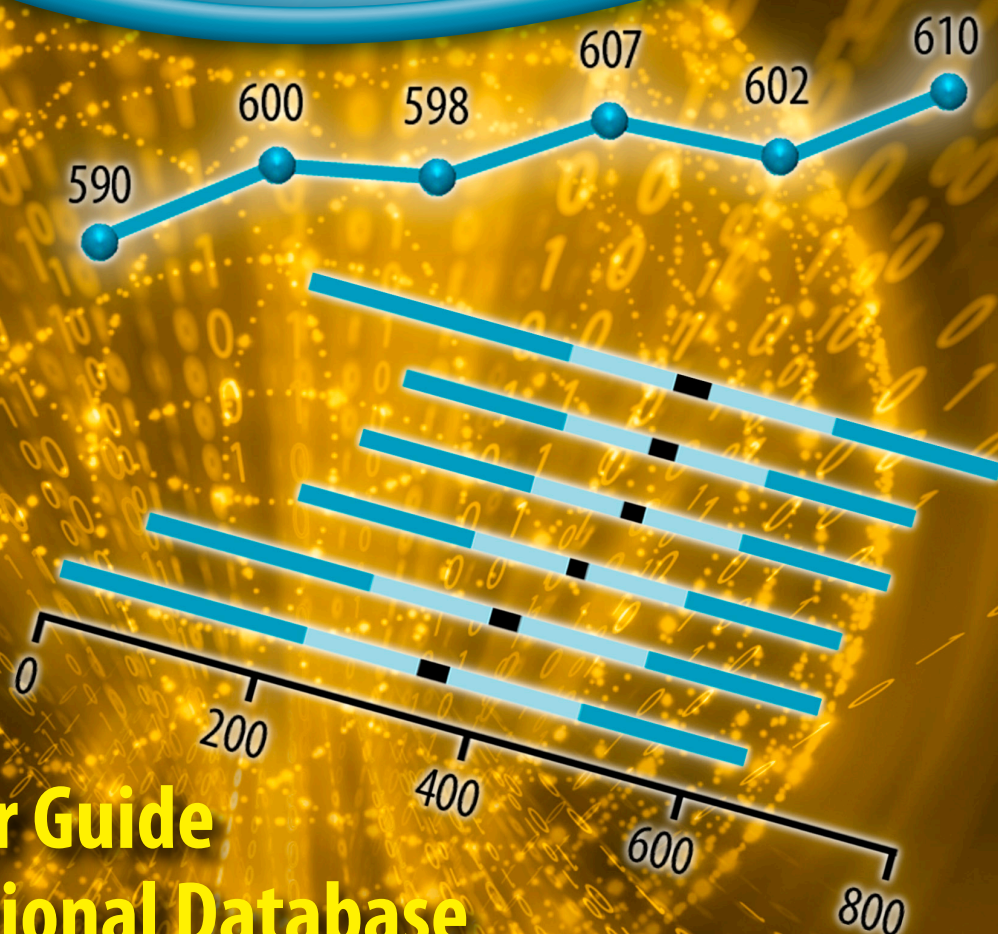
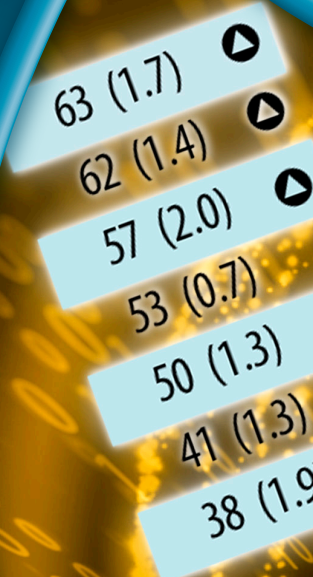


TRENDS IN INTERNATIONAL MATHEMATICS AND SCIENCE STUDY

# TIMSS



## TIMSS 2015 User Guide for the International Database

# SUPPLEMENT 3

Variables Derived from the Student, Home,  
Teacher, and School Questionnaire Data



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

# Supplement 3

## *Variables Derived from the Student, Home, Teacher, and School Questionnaire Data*

### Overview

This supplement contains documentation on all the derived variables contained in the TIMSS 2015 data files. These variables were used to report background data in the *TIMSS 2015 International Results in Mathematics* and *TIMSS 2015 International Results in Science* reports, and are made available as part of this database to be used in secondary analyses. This supplement has eight sections corresponding to the eight context questionnaires administered to collect these background data.

Section 1:	Fourth Grade Student Questionnaire
Section 2:	Fourth Grade Home Questionnaire
Section 3:	Fourth Grade Teacher Questionnaire
Section 4:	Fourth Grade School Questionnaire
Section 5:	Eighth Grade Student Questionnaires
Section 6:	Eighth Grade Mathematics Teacher Questionnaire
Section 7:	Eighth Grade Science Teacher Questionnaire
Section 8:	Eighth Grade School Questionnaire

The following information is provided for each derived variable:

- Derived Variable Name
- Variable Label
- Title of International Report Exhibit
- Report Location
- A procedural description of how the derived variable was computed, including missing data rules if different from the general missing data rule described below
- Information about whether the variable was available in the previous cycle

## Derived Variable Naming Convention

The derived variables are named according to the variable-naming convention in the TIMSS 2015 International Database (see Chapter 4 of the User Guide). Exhibits 1 and 2 display the naming conventions and data sources for the derived variables for fourth and eighth grades.

**Exhibit 1 Variables Derived from Fourth Grade Data**

Variable Naming Convention	Data Source
ASDG****	Variables derived from student background data
ASDH****	Variables derived from home background data
ATDG****	Variables derived from general teacher background data
ATDM****	Variables derived from teacher background data related to mathematics
ATDS****	Variables derived from teacher background data related to science
ACDG****	Variables derived from school background data

**Exhibit 2 Variables Derived from Eighth Grade Data**

Variable Naming Convention	Data Source
BSDG****	Variables derived from general student background data
BSDM****	Variables derived from student background data related to mathematics
BSDS****	Variables derived from student background data related to science (These variables contain data only for countries administering the general/integrated version of the student questionnaire.)
BSDB****	Variables derived from student background data related to separate science subjects (biology, chemistry, physics, and earth science);
BSDC****	(These variables contain data only for countries administering the separate science subjects version of the student questionnaire.)
BDSP****	
BSDE****	
BTDG****	Variables derived from general teacher background data
BTDM****	Variables derived from teacher background data related to mathematics
BTDS****	Variables derived from teacher background data related to science
BCDG****	Variables derived from school background data

## Missing Rule for Derived Variables

When calculating derived variables, students were only included if they had valid responses for at least 2/3 of the source variables. Students who did not have responses for 2/3 of the source variables were considered missing for the derived variable.



**SECTION 1:**  
**FOURTH GRADE –**  
**STUDENT**  
**QUESTIONNAIRE**

TIMSS 2015 USER GUIDE FOR THE  
INTERNATIONAL DATABASE



**IEA**

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



Derived Variable Name: ASDG05S

Variable Label: Number of Home Study Supports

Fourth Grade

**Title of International Report Exhibit**

Home Resources for Learning

**Report Location**

Mathematics 4.1;

Science 4.1

**Procedure**

Based on responses to the following question in the Student Questionnaire:

SQG-05d,e: Do you have any of these things in your home?

"Your own room" (ASBG05D)

"Internet connection" (ASBG05E)

Response options: 1 = "Yes"; 2 = "No"

Derive ASDG05S:

0 (ASBG05D = 2 AND ASBG05E = 2) = "Neither own room nor Internet connection"

1 ((ASBG05D = 1 AND ASBG05E = 2) OR (ASBG05D = 2 AND ASBG05E = 1)) = "Either own room or Internet connection but not both"

2 (ASBG05D = 1 AND ASBG05E = 1) = "Both own room and Internet connection"

Set ASDG05S to missing if either source variable is missing.

0 = "Neither Own Room nor Internet Connection", 1 = "Either Own Room or Internet Connection", 2 = "Both Own Room and Internet Connection"

**Trend Comments**

See ASDG05S in TIMSS 2011



# **SECTION 2:** **FOURTH GRADE –** **HOME** **QUESTIONNAIRE**

TIMSS 2015 USER GUIDE FOR THE  
INTERNATIONAL DATABASE



**IEA**

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

Derived Variable Name: ASDHOCCP

Variable Label: Parents' Highest Occupation Level

Fourth Grade

**Title of International Report Exhibit**

Home Resources for Learning

**Report Location**

Mathematics 4.1;

Science 4.1

**Procedure**

Based on responses to the following question in the Home Questionnaire:

HQ-23a,b: What kind of work do the child's father (or stepfather or male guardian) and mother (or stepmother or female guardian) do for their main jobs?

"Child's father" (ASBH23A)

"Child's mother" (ASBH23B)

Response options: 1 = "Has never worked for pay"; 2 = "Small business owner"; 3 = "Clerk"; 4 = "Service or sales worker"; 5 = "Skilled agricultural or fishery worker"; 6 = "Craft or trade worker"; 7 = "Plant or machine operator"; 8 = "General laborers"; 9 = "Corporate manager or senior official"; 10 = "Professional"; 11 = "Technician or associate professional"; 12 = "Not applicable"

Recode ASBH23A as follows:

If ASBH23A = 9, 10, or 11: Recode to 1 ("Professional")

If ASBH23A = 2: Recode to 2 ("Small Business Owner")

If ASBH23A = 3 or 4: Recode to 3 ("Clerical")

If ASBH23A = 5, 6, or 7: Recode to 4 ("Skilled Worker")

If ASBH23A = 8: Recode to 5 ("General Laborer")

If ASBH23A = 1: Recode to 6 ("Never Worked Outside Home")

If ASBH23A = 12: Recode to 7 ("Not Applicable")

Recode ASBH23B in the same way.

Derive ASDHOCCP:

Using these categories, the smaller value of the recoded variables ASBH23A and ASBH23B becomes ASDHOCCP.

For purposes of creating ASDHOCCP, treat the value of 7 = "Not Applicable" for recoded ASBH23A and ASBH23B as missing.

After scoring, if student does not have valid response of 1, 2, 3, 4, 5, or 6 on either of the recoded variables ASBH23A or ASBH23B, then set ASDHOCCP to missing.

1 = "Professional", 2 = "Small Business Owner", 3 = "Clerical", 4 = "Skilled Worker", 5 = "General Laborer", 6 = "Never Worked Outside Home", 7 = "Not Applicable"

**Trend Comments**

See ASDHOCCP in TIMSS 2011



Derived Variable Name: ASDHEDUP

Variable Label: Parents' Highest Education Level

Fourth Grade

**Title of International Report Exhibit**

Home Resources for Learning

**Report Location**

Mathematics 4.1;

Science 4.1

**Procedure**

HQ-20: Based on responses to the following question in the Home Questionnaire:

What is the highest level of education completed by the child's father (or stepfather or male guardian) and mother (or stepmother or female guardian)?

"Child's father" (ASBH20A)

"Child's mother" (ASBH20B)

Response options: 1 = "Did not go to school"; 2 = "Some <Primary education - ISCED Level 1 or Lower secondary education - ISCED Level 2>"; 3 = "<Lower secondary education - ISCED Level 2>"; 4 = "<Upper secondary education - ISCED Level 3>"; 5 = "<Post-secondary, non-tertiary education - ISCED Level 4>"; 6 = "<Short-cycle tertiary education - ISCED Level 5>"; 7 = "<Bachelor's or equivalent level - ISCED Level 6>"; 8 = "<Postgraduate degree: Master's - ISCED Level 7 or Doctor - ISCED Level 8>"; 9 = "Not applicable"

Recode ASBH20A as follows:

If ASBH20A = 7 or 8: Recode to 1 ("Finished University or higher")

If ASBH20A = 5 or 6: Recode to 2 ("Finished Post-Secondary Education")

If ASBH20A = 4: Recode to 3 ("Finished Upper Secondary")

If ASBH20A = 3: Recode to 4 ("Finished Lower Secondary")

If ASBH20A = 1 or 2: Recode to 5 ("Finished Some Primary or Lower Secondary or Did Not Go to School")

If ASBH20A = 9: Recode to 6 ("Not Applicable")

Recode ASBH20B in the same way.

Derive ASDHEDUP:

Using these categories, the smaller value of the recoded variables ASBH20A and ASBH20B becomes ASDHEDUP.

For purposes of creating ASDHEDUP, treat the value of 6 = "Not Applicable" for recoded ASBH20A and ASBH20B as missing.

After scoring, if student does not have valid response of 1, 2, 3, 4, or 5 on either ASBH20A or ASBH20B, then set ASDHEDUP to missing.

1 = "Finished University or higher", 2 = "Finished Post-Secondary Education", 3 = "Finished Upper Secondary", 4 = "Finished Lower Secondary", 5 = "Finished Some Primary or Lower Secondary or Did Not Go to School", 6 = "Not Applicable"

**Trend Comments**

See ASDHEDUP in TIMSS 2011

Derived Variable Name: ASDHAPS

Variable Label: Student Attended Preschool

Fourth Grade

**Title of International Report Exhibit**

Students Attended Preprimary Education; Early Preparation for School

**Report Location**

Mathematics 4.7, 4.8;

Science 4.7, 4.8

**Procedure**

Based on responses to the following questions in the Home Questionnaire:

HQ-05aa,ab: Did your child attend the following before &lt;first grade&gt;?

"&lt;Early childhood educational development - ISCED Level 0&gt; program for children under age 3" (ASBH05AA),

"&lt;Pre-primary education - ISCED Level 0&gt; program including &lt;Kindergarten&gt; for children age 3 or

older" (ASBH05AB)

Response options: 1 = "Yes"; 2 = "No".

HQ-05b: Approximately, how long was your child in these programs altogether? (ASBH05B)

Response options: 1 = "Did not attend", 2 = "Less than 1 year", 3 = "1 year", 4 = "2 years", 5 = "3 years", 6 = "4 years or more".

Derive ASDHAPS:

0 ((ASBH05Aa = 2 AND ASBH05Ab = 2) OR ASBH05B = 1) = "Did not attend"

1 (ASBH05B = 2 OR 3) = "1 year or less"

2 (ASBH05B = 4) = "2 years"

3 (ASBH05B = 5 OR 6) = "3 years or more"

Set ASDHAPS to missing if any source variable is missing.

0 = "Did not attend", 1 = "1 year or less", 2 = "2 years", 3 = "3 years or more"

**SECTION 3:**  
**FOURTH GRADE –**  
**TEACHER**  
**QUESTIONNAIRE**

TIMSS 2015 USER GUIDE FOR THE  
INTERNATIONAL DATABASE



**IEA**

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



Derived Variable Name: ATDM05

Variable Label: Teachers Majored in Ed and Math

Fourth Grade

**Title of International Report Exhibit**

Teachers Majored in Education and Mathematics

**Report Location**

Mathematics 8.3

**Procedure**

Based on responses to the following questions in the Teacher Questionnaire:

TQG-04: What is the highest level of formal education you have completed? (ATBG04)

Response options: 1 = "Did not complete <Upper secondary education—ISCED Level 3>", 2 = "<Upper secondary education—ISCED Level 3>", 3 = "<Post-secondary, non-tertiary education—ISCED Level 4>", 4 = "<Short-cycle tertiary education—ISCED Level 5>", 5 = "<Bachelor's or equivalent level—ISCED Level 6>", 6 = "<Master's or equivalent level—ISCED Level 7>", 7 = "<Doctor or equivalent level—ISCED Level 8>"

TQG-05Aa,b,c,d,e,f: During your &lt;post-secondary&gt;education, what was your major or main area(s) of study?

"Education- primary/elementary" (ATBG05AA)

"Education- secondary" (ATBG05AB)

"Mathematics" (ATBG05AC)

"Science" (ATBG05AD)

"&lt;Language of test&gt;" (ATBG05AE)

"Other" (ATBG05AF)

Response options: 1 = "Yes", 2 = "No"

TQG-05Ba,b,c,d: If your major or main area of study was education, did you have a &lt;specialization&gt; in any of the following?

"Mathematics" (ATBG05BA)

"Science" (ATBG05BB)

"Language/reading" (ATBG05BC)

"Other" (ATBG05BD)

Response options: 1 = "Yes", 2 = "No"

Derive ATDM05:

1 (ATBG05AA=1 AND (ATBG05AC=1 OR ATBG05BA=1)) = "Major in primary education and major (or specialization) in mathematics"

2 (ATBG05AA=1 AND ATBG05AC=2 AND ATBG05BA=2) = "Major in primary education but no major (or specialization) in mathematics"

3 (ATBG05AA=2 AND (ATBG05AC=1 OR ATBG05BA=1)) = "Major in mathematics but no major in primary education"

4 (ATBG05AA=2 AND ATBG05AC=2 AND ATBG05BA=2) = "All other majors"

5 (ATBG04 = 1 OR 2) = "No formal education beyond upper-secondary"

Otherwise, set to missing.

1 = "Major in primary education and major (or specialization) in mathematics", 2 = "Major in primary education but no major (or specialization) in mathematics", 3 = "Major in mathematics but no major in primary education", 4 = "All other majors", 5 = "No formal education beyond upper-secondary"

**Trend Comments**

See ATDM05 in TIMSS 2011

Derived Variable Name: ATDS05

Variable Label: Teachers Majored in Ed and Science

Fourth Grade

**Title of International Report Exhibit**

Teachers Majored in Education and Science

**Report Location**

Science 8.3

**Procedure**

Based on responses to the following questions in the Teacher Questionnaire:

TQG-04: What is the highest level of formal education you have completed? (ATBG04)

Response options: 1 = "Did not complete <Upper secondary education—ISCED Level 3>", 2 = "<Upper secondary education—ISCED Level 3>", 3 = "<Post-secondary, non-tertiary education—ISCED Level 4>", 4 = "<Short-cycle tertiary education—ISCED Level 5>", 5 = "<Bachelor's or equivalent level—ISCED Level 6>", 6 = "<Master's or equivalent level—ISCED Level 7>", 7 = "<Doctor or equivalent level—ISCED Level 8>"

TQG-05Aa,b,c,d,e,f: During your &lt;post-secondary&gt;education, what was your major or main area(s) of study?

"Education- primary/elementary" (ATBG05AA)

"Education- secondary" (ATBG05AB)

"Mathematics" (ATBG05AC)

"Science" (ATBG05AD)

"&lt;Language of test&gt;" (ATBG05AE)

"Other" (ATBG05AF)

Response options: 1 = "Yes", 2 = "No"

TQG-05Ba,b,c,d: If your major or main area of study was education, did you have a &lt;specialization&gt; in any of the following?

"Mathematics" (ATBG05BA)

"Science" (ATBG05BB)

"Language/reading" (ATBG05BC)

"Other" (ATBG05BD)

Response options: 1 = "Yes", 2 = "No"

Derive ATDS05:

1 (ATBG05AA=1 AND (ATBG05AD=1 OR ATBG05BB=1)) = "Major in primary education and major (or specialization) in science"

2 (ATBG05AA=1 AND ATBG05AD=2 AND ATBG05BB=2) = "Major in primary education but no major (or specialization) in science"

3 (ATBG05AA=2 AND (ATBG05AD=1 OR ATBG05BB=1)) = "Major in science but no major in primary education"

4 (ATBG05AA=2 AND ATBG05AD=2 AND ATBG05BB=2) = "All other majors"

5 (ATBG04 = 1 OR 2) = "No formal education beyond upper-secondary"

Otherwise, set to missing.

1 = "Major in primary education and major (or specialization) in science", 2 = "Major in primary education but no major (or specialization) in science", 3 = "Major in science but no major in primary education", 4 = "All other majors", 5 = "No formal education beyond upper-secondary"

**Trend Comments**

See ATDS05 in TIMSS 2011

Derived Variable Name: ATDM06NU

Variable Label: Pct Students Taught Number Topics

Fourth Grade

**Title of International Report Exhibit**

Percentage of Students Taught the TIMSS Mathematics Topics\*

**Report Location**

Mathematics 9.3

**Procedure**

Based on the responses to the following questions in the Teacher Questionnaire:

TQ-M07Aa,b,c,d,e,f,g,h: The following list includes the main topics addressed by the TIMSS mathematics test. Choose the response that best describes when the students in this class have been taught each topic. If a topic was in the curriculum before the <fourth grade>, please choose "Mostly taught before this year." If a topic was taught half this year but not yet completed, please choose "Mostly taught this year." If a topic is not in the curriculum, please choose "Not yet taught or just introduced."

"Concepts of whole numbers, including place value and ordering" (ATBM06AA)

"Adding, subtracting, multiplying and/or dividing with whole numbers" (ATBM06AB)

"Concepts of multiples and factors; odd and even numbers" (ATBM07AC)

"Concepts of fractions (fractions as parts of a whole or of a collection, or as a location on a number line)" (ATBM06AD)

"Adding and subtracting with fractions, comparing and ordering fractions" (ATBM07AE)

"Concepts of decimals, including place value and ordering, adding and subtracting with decimals" (ATBM07AF)

"Number sentences (finding the missing number, modeling simple situations with number sentences)" (ATBM07AG)

"Number patterns (extending number patterns and finding missing terms)" (ATBM07AH)

Response options: 1 = "Mostly taught before this year", 2 = "Mostly taught this year", 3 = "Not yet taught or just introduced"

Derive ATDM06NU:

For each topic, compute the percent of students whose teachers selected 1 = "Mostly taught before this year" OR 2 = "Mostly taught this year".

Then compute the average across the percentages of students taught the content domain.

Set ATDM06NU to missing if more than one-third of the source variables are missing.



Derived Variable Name: ATDM06GE | Variable Label: Pct Students Taught Geo and Meas Topics | Fourth Grade

**Title of International Report Exhibit**

Percentage of Students Taught the TIMSS Mathematics Topics\*

**Report Location**

Mathematics 9.3

**Procedure**

Based on the responses to the following questions in the Teacher Questionnaire:

TQM-06Ba,b,c,d,e,f,g: The following list includes the main topics addressed by the TIMSS mathematics test. Choose the response that best describes when the students in this class have been taught each topic. If a topic was in the curriculum before the fourth grade, please choose "Mostly taught before this year." If a topic was taught half this year but not yet completed, please choose "Mostly taught this year." If a topic is not in the curriculum, please choose "Not yet taught or just introduced."

"Lines: measuring, estimating length of; parallel and perpendicular lines" (ATBM06BA)

"Comparing and drawing angles" (ATBM06BB)

"Using informal coordinate systems to locate points in a plane (e.g., in square B4)" (ATBM06BC)

"Elementary properties of common geometric shapes" (ATBM06BD)

"Reflections and rotations" (ATBM06BE)

"Relationships between two-dimensional and three-dimensional shapes" (ATBM06BF)

"Finding and estimating areas, perimeters and volumes" (ATBM06BG)

Response options: 1 = "Mostly taught before this year", 2 = "Mostly taught this year", 3 = "Not yet taught or just introduced"

Derive ATDM06GE:

For each topic, compute the percent of students whose teachers selected 1 = "Mostly taught before this year" OR 2 = "Mostly taught this year".

Then compute the average across the percentages of students taught the content domain.

Set ATDM06GE to missing if more than one-third of the source variables are missing.

**Trend Comments**

See ATDM07GE in TIMSS 2011

Derived Variable Name: ATDM06DT

Variable Label: Pct Students Taught Data Display Topics

Fourth Grade

**Title of International Report Exhibit**

Percentage of Students Taught the TIMSS Mathematics Topics\*

**Report Location**

Mathematics 9.3

**Procedure**

Based on the responses to the following questions in the Teacher Questionnaire:

TQM-07Ca,b: The following list includes the main topics addressed by the TIMSS mathematics test. Choose the response that best describes when the students in this class have been taught each topic. If a topic was in the curriculum before the fourth grade, please choose "Mostly taught before this year." If a topic was taught half this year but not yet completed, please choose "Mostly taught this year." If a topic is not in the curriculum, please choose "Not yet taught or just introduced."

"Reading and representing data from tables, pictographs, bar graphs, or pie charts" (ATBM06CA)

"Drawing conclusions from data displays" (ATBM06CB)

Response options: 1 = "Mostly taught before this year"; 2 = "Mostly taught this year"; 3 = "Not yet taught or just introduced"

Derive ATDM06DT:

For each topic, compute the percent of students whose teachers selected 1 = "Mostly taught before this year" OR 2 = "Mostly taught this year".

Then compute the average across the percentages of students taught the content domain.

Set ATDM06DT to missing if more than one-third of the source variables are missing.

Derived Variable Name: ATDS05LI

Variable Label: Pct Students Taught Life Science Topics

Fourth Grade

**Title of International Report Exhibit**

Percentage of Students Taught the TIMSS Science Topics\*

**Report Location**

Science 9.3

**Procedure**

Based on the responses to the following questions in the Teacher Questionnaire:

TQS-05Aa,b,c,d,e,f,g: The following list includes the main topics addressed by the TIMSS science test. Choose the response that best describes when the students in this class have been taught each topic. If a topic was in the curriculum before the fourth grade, please choose "Mostly taught before this year." If a topic was taught half this year but not yet completed, please choose "Mostly taught this year." If a topic is not in the curriculum, please choose "Not yet taught or just introduced."

"Characteristics of living things and the major groups of living things (e.g., mammals, birds, insects, flowering plants)" (ATBS05AA)

"Major body structures and their functions in humans, other animals, and plants" (ATBS05AB)

"Life cycles of common plants and animals (e.g., humans, butterflies, frogs, flowering plants)" (ATBS05AC)

"Understanding that some characteristics are inherited and some are the result of the environment" (ATBS05AD)

"How physical features and behaviors help living things survive in their environments" (ATBS05AE)

"Relationships in communities and ecosystems (e.g., simple food chains, predator-prey relationships, human impacts on the environment)" (ATBS05AF)

"Human health (transmission and prevention of diseases, symptoms of health and illness, importance of a healthy diet and exercise)" (ATBS05AG)

Response options: 1 = "Mostly taught before this year", 2 = "Mostly taught this year", 3 = "Not yet taught or just introduced"

Derive ATDS05LI:

For each topic, compute the percent of students whose teachers selected 1 = "Mostly taught before this year" OR 2 = "Mostly taught this year".

Then compute the average across the percentages of students taught the content domain.

Set ATDS05LI to missing if more than one-third of the source variables are missing.



Derived Variable Name: ATDS05PH | Variable Label: Pct Students Taught Physical Science Topics | Fourth Grade

### Title of International Report Exhibit

Percentage of Students Taught the TIMSS Science Topics\*

### Report Location

Science 9.3

### Procedure

Based on the responses to the following questions in the Teacher Questionnaire:

TQS-05Ba,b,c,d,e,f,g,h,i: The following list includes the main topics addressed by the TIMSS science test. Choose the response that best describes when the students in this class have been taught each topic. If a topic was in the curriculum before the fourth grade, please choose "Mostly taught before this year." If a topic was taught half this year but not yet completed, please choose "Mostly taught this year." If a topic is not in the curriculum, please choose "Not yet taught or just introduced."

"States of matter (solid, liquid, gas) and properties of the states of matter (volume, shape); how the state of matter changes by heating or cooling" (ATBS05BA)

"Classifying materials based on physical properties (e.g., weight/mass, volume, conducting heat, conducting electricity, magnetic attraction)" (ATBS05BB)

"Mixtures and how to separate a mixture into its components (e.g., sifting, filtering, evaporation, using a magnet)" (ATBS05BC)

"Chemical changes in everyday life (e.g., decaying, burning, rusting, cooking)" (ATBS05BD)

"Common sources of energy (e.g., the Sun, electricity, wind) and uses of energy (heating and cooling homes, providing light)" (ATBS05BE)

"Light and sound in everyday life (e.g., understanding shadows and reflection, understanding that vibrating objects make sound)" (ATBS05BF)

"Electricity and simple circuits (e.g., identifying materials that are conductors, recognizing that electricity can be changed to light or sound, knowing that a circuit must be complete to work correctly)" (ATBS05BG)

"Properties of magnets (e.g., knowing that like poles repel and opposite poles attract, recognizing that magnets can attract some objects)" (ATBS05BH)

"Forces that cause objects to move (e.g., gravity, pushing/pulling)" (ATBS05BI)

Response options: 1 = "Mostly taught before this year", 2 = "Mostly taught this year", 3 = "Not yet taught or just introduced"

Derive ATDS05PH:

For each topic, compute the percent of students whose teachers selected 1 = "Mostly taught before this year" OR 2 = "Mostly taught this year".

Then compute the average across the percentages of students taught the content domain.

Set ATDS05PH to missing if more than one-third of the source variables are missing.

Derived Variable Name: ATDS05ES | Variable Label: Pct Students Taught Earth Science Topics | Fourth Grade

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**Title of International Report Exhibit**

Percentage of Students Taught the TIMSS Science Topics\*

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**Report Location**

Science 9.3

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**Procedure**

Based on the responses to the following questions in the Teacher Questionnaire:

TQS-05Ca,b,c,d,e,f,g: The following list includes the main topics addressed by the TIMSS science test. Choose the response that best describes when the students in this class have been taught each topic. If a topic was in the curriculum before the fourth grade, please choose "Mostly taught before this year." If a topic was taught half this year but not yet completed,

"Common features of the Earth's landscape (e.g., mountains, plains, deserts, rivers, oceans) and their relationship to human use (farming, irrigation, land development)" (ATBS05CA)

"Where water is found on the Earth and how it moves in and out of the air (e.g., evaporation, rainfall, cloud formation, dew formation)" (ATBS05CB)

"Understanding that weather can change from day to day, from season to season, and by geographic location" (ATBS05CC)

"Understanding what fossils are and what they can tell us about past conditions on Earth" (ATBS05CD)

"Objects in the solar system (the Sun, the Earth, the Moon, and other planets) and their movements (the Earth and other planets revolve around the Sun, the Moon revolves around the Earth)" (ATBS05CE)

"Understanding how day and night result from the Earth's rotation on its axis and how the Earth's rotation results in changing shadows throughout the day" (ATBS05CF)

"Understanding how seasons are related to the Earth's annual movement around the Sun" (ATBS05CG)

Response options: 1 = "Mostly taught before this year", 2 = "Mostly taught this year", 3 = "Not yet taught or just introduced"

Derive ATDS05ES:

For each topic, compute the percent of students whose teachers selected 1 = "Mostly taught before this year" OR 2 = "Mostly taught this year".

Then compute the average across the percentages of students taught the content domain.

Set ATDS05ES as missing if more than one-third of the source variables are missing.

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**SECTION 4:**  
**FOURTH GRADE –**  
**SCHOOL**  
**QUESTIONNAIRE**

TIMSS 2015 USER GUIDE FOR THE  
INTERNATIONAL DATABASE



**IEA**

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

Derived Variable Name: ACDG03

Variable Label: School Composition by Std Background

Fourth Grade

**Title of International Report Exhibit**

School Composition by Economic Background of the Student Body

**Report Location**

Mathematics 5.1;

Science 5.1

**Procedure**

Based on responses to the following questions in the School Questionnaire:

SCQ-3: Approximately what percentage of students in your school have the following backgrounds?

"Come from economically disadvantaged homes" (ACBG03A)

"Come from economically affluent homes" (ACBG03B)

Response options: 1 = "0 to 10%", 2 = "11 to 25%", 3 = "26 to 50%", 4 = "More than 50%"

Derive ACDG03:

1 (ACBG03A &lt;=2 AND ACBG03B &gt;= 3) = "Schools With More Affluent Than Disadvantaged Students"

3 (ACBG03A &gt;=3 AND ACBG03B &lt;= 2) = "Schools With More Disadvantaged Than Affluent Students"

2 (All other combinations of ACBG03A and ACBG03B) = "Schools with Neither More Affluent nor More Disadvantaged Students"

Set ACDG03 to missing if either source variable is missing.

1 = "Schools With More Affluent Than Disadvantaged Students", 2 = "Schools with Neither More Affluent nor More Disadvantaged Students", 3 = "Schools With More Disadvantaged Than Affluent Students"

**Trend Comments**

See ACDG03 in TIMSS 2011



Derived Variable Name: ACDG08HY

Variable Label: Total Instructional Hours per Year

Fourth Grade

**Title of International Report Exhibit**

Instructional Time Spent on Mathematics; Instructional Time Spent on Science

**Report Location**

Mathematics 9.1;

Science 9.1

**Procedure**

Based on responses to the following questions in the School Questionnaire:

SCQ-08A: How many days per year is your school open for instruction? (ACBG08A)  
(Open-response item)

SCQ-08B: What is the total instructional time, excluding breaks, in a typical day? (ACBG08B)  
(Open-response item; response is in terms of minutes)

Derive ACDG08HY:

Step 1: Compute instructional hours per day:

Divide ACBG08B by 60.

Step 2: Compute hours of school per year:

Multiply the result of Step 1 by ACBG08A.

Set ACDG08HY to missing if either source variable is missing.

**Trend Comments**

See ACDG06HY in TIMSS 2011

**SECTION 5:**  
**EIGHTH GRADE –**  
**STUDENT**  
**QUESTIONNAIRES**

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Derived Variable Name: BSDG06S

Variable Label: Number of Home Study Supports

Eighth Grade

**Title of International Report Exhibit**

Home Educational Resources

**Report Location**

Mathematics 4.2;

Science 4.2

**Procedure**

Based on responses to the following question in the Student Questionnaire:

SQIS-06d,e/SQSS-06d,e: Do you have any of these things in your home?

"Your own room" (BSBG06D)

"Internet connection" (BSBG06E)

Response options: 1 = "Yes"; 2 = "No"

Derive BSDG06S:

0 (BSBG06D = 2 AND BSBG06E = 2) = "Neither own room nor Internet connection"

1 ((BSBG06D = 1 AND BSBG06E = 2) OR (BSBG06D = 2 AND BSBG06E = 1)) = "Either own room or Internet connection but not both"

2 (BSBG06D = 1 AND BSBG06E = 1) = "Both own room and Internet connection"

Set BSDG06S to missing if either source variable is missing.

0 = "Neither Own Room nor Internet Connection", 1 = "Either Own Room or Internet Connection", 2 = "Both Own Room and Internet Connection"

**Trend Comments**

See BSDG05S in TIMSS 2011

Derived Variable Name: BSDGEDUP

Variable Label: Parents' Highest Education Level

Eighth Grade

**Title of International Report Exhibit**

Home Educational Resources

**Report Location**

Mathematics 4.2;

Science 4.2

**Procedure**

Based on responses to the following questions in the Student Questionnaire:

SQIS-07A/SQSS-07A: What is the highest level of education completed by your mother (or stepmother or female guardian)? (BSBG07A)

SQIS-07B/SQSS-07B: What is the highest level of education completed by your father (or stepfather or male guardian)? (BSBG07B)

Response options: 1 = "Some <Primary education—ISCED Level 1 or Lower secondary education—ISCED Level 2> or did not go to school", 2 = "<Lower secondary education—ISCED Level 2>", 3 = "<Upper secondary education—ISCED Level 3>", 4 = "<Post-secondary, non-tertiary education—ISCED Level 4>", 5 = "<Short-cycle tertiary education—ISCED Level 5>", 6 = "<Bachelor's or equivalent level—ISCED Level 6>", 7 = "<Postgraduate degree: Master's—ISCED Level 7 or Doctor—ISCED Level 8>", 8 = "I don't know"

Recode BSBG07A as follows:

If BSBG07A = 6 OR 7: Recode to 1 ("Finished University or higher")

If BSBG07A = 4 OR 5: Recode to 2 ("Finished Post-Secondary Education")

If BSBG07A = 3: Recode to 3 ("Finished Upper Secondary")

If BSBG07A = 2: Recode to 4 ("Finished Lower Secondary")

If BSBG07A = 1: Recode to 5 ("Finished Some Primary or Lower Secondary or Did Not Go to School")

If BSBG07A = 8: Recode to 6 ("Not Applicable")

Recode BSBG07B in the same way.

Derive BSDGEDUP:

Using these categories, the smaller value of the recoded variables BSBG07A and BSBG07B becomes BSDHEDUP.

For purposes of creating BSDGEDUP, treat the response of 6 = "Not Applicable" to recoded BSBG07A and BSBG07B as missing.

After scoring, if student does not have valid response of 1, 2, 3, 4, or 5 on either of the recoded variables BSBG07A or BSBG07B, then set BSDGEDUP to missing.

1 = "Finished University or higher", 2 = "Finished Post-Secondary Education", 3 = "Finished Upper Secondary", 4 = "Finished Lower Secondary", 5 = "Finished Some Primary or Lower Secondary or Did Not Go to School", 6 = "Not Applicable"

**Trend Comments**

See BSDGEDUP in TIMSS 2011

Derived Variable Name: BSDMWKHW

Variable Label: Weekly Time Spent on Math Homework

Eighth Grade

**Title of International Report Exhibit**

Weekly Time Students Spend on Assigned Mathematics Homework

**Report Location**

Mathematics 9.8

**Procedure**

Based on responses to the following questions from the Student Questionnaire:

SQIS-25Aa/SQSS-38Aa: How often does your teacher give you homework in each of the following subjects?

Mathematics (BSBM25AA/BSBM38AA)

Response options: 1 = "Every day", 2 = "3 or 4 times a week", 3 = "1 or 2 times a week", 4 = "Less than once a week", 5 = "Never"

SQIS-25Ba/SQSS-38Ba: When your teacher gives you homework in each of the following subjects, about how many minutes do you usually spend on your homework?

Mathematics (BSBM25BA/BSBM38BA)

Response options: 1 = "My teacher never gives me homework in mathematics", 2 = "1–15 minutes", 3 = "16–30 minutes", 4 = "31–60 minutes", 5 = "61–90 minutes", 6 = "More than 90 minutes"

Recode BSBM25AA/BSBM38AA as follows:

If BSBM25AA/BSBM38AA = 1: recode to 5

If BSBM25AA/BSBM38AA = 2: recode to 3.5

If BSBM25AA/BSBM38AA = 3: recode to 1.5

If BSBM25AA/BSBM38AA = 4: recode to 0.5

If BSBM25AA/BSBM38AA = 5: recode to 0

Recode BSBM25BA/BSBM38BA as follows:

If BSBM25BA/BSBM38BA = 1: recode to 0

If BSBM25BA/BSBM38BA = 2: recode to 8

If BSBM25BA/BSBM38BA = 3: recode to 23

If BSBM25BA/BSBM38BA = 4: recode to 45

If BSBM25BA/BSBM38BA = 5: recode to 75

If BSBM25BA/BSBM38BA = 6: recode to 105

Derive BSDMWKHW:

Multiply recoded BSBM25AA/BSBM38AA and recoded BSBM25BA/BSBM38BA to compute weekly time students spend on homework.

Assign students to three categories:

1 (Product of recoded BSBM25AA/BSBM38AA and recoded BSBM25BA/BSBM38BA  $\geq 180$ ) = "3 Hours or More"2 (Product of recoded BSBM25AA/BSBM38AA and recoded BSBM25BA/BSBM38BA  $> 45$  AND  $< 180$ ) = "More Than 45 Minutes But Less Than 3 Hours"3 (Product of recoded BSBM25AA/BSBM38AA and recoded BSBM25BA/BSBM38BA  $\leq 45$ ) = "45 Minutes or Less"

If either source variable is missing, set BSDMWKHW to missing.

If BSBM25BA/BSBM38BA is "Not Applicable", then set BSDMWKHW to 0.

1 = "3 Hours or More", 2 = "More Than 45 Minutes But Less Than 3 Hours", 3 = "45 Minutes or Less"

**Trend Comments**

See BSDMWKHW in TIMSS 2011



Derived Variable Name: BSDSWKHS | Variable Label: Weekly Time Spent on Science Homework | Eighth Grade

**Title of International Report Exhibit**

Weekly Time Students Spend on Assigned Science Homework

**Report Location**

Science 9.12

**Procedure**

Based on responses to the following questions from the Student Questionnaire:

SQIS-25Ab: How often does your teacher give you homework in each of the following subjects?

Science (BSBS25AB)

Response options: 1 = "Every day", 2 = "3 or 4 times a week", 3 = "1 or 2 times a week", 4 = "Less than once a week", 5 = "Never"

SQIS-25Bb: When your teacher gives you homework in each of the following subjects, about how many minutes do you usually spend on your homework?

Science (BSBS25BB)

Response options: 1 = "My teacher never gives me homework in science", 2 = "1–15 minutes", 3 = "16–30 minutes", 4 = "31–60 minutes", 5 = "61–90 minutes", 6 = "More than 90 minutes"

Recode BSBS25AB as follows:

If BSBS25AB = 1: recode to 5

If BSBS25AB = 2: recode to 3.5

If BSBS25AB = 3: recode to 1.5

If BSBS25AB = 4: recode to 0.5

If BSBS25AB = 5: recode to 0

Recode BSBS25BB as follows:

If BSBS25BB = 1: recode to 0

If BSBS25BB = 2: recode to 8

If BSBS25BB = 3: recode to 23

If BSBS25BB = 4: recode to 45

If BSBS25BB = 5: recode to 75

If BSBS25BB = 6: recode to 105

Derive BSDSWKHS:

Multiply recoded BSBS25AB and recoded BSBS25BB to compute weekly time students spend on homework.

Assign students to three categories:

1 (Product of recoded BSBS25AB and recoded BSBS25BB  $\geq$  180) = "3 Hours or More"

2 (Product of recoded BSBS25AB and recoded BSBS25BB  $> 45$  AND  $< 180$ ) = "More Than 45 Minutes But Less Than 3 Hours"

3 (Product of recoded BSBS25AB and recoded BSBS25BB  $\leq 45$ ) = "45 Minutes or Less"

If either source variable is missing, set BSDSWKHS to missing.

If BSBS25BB is "Not Applicable", then set BSDSWKHS to 0.

1 = "3 Hours or More", 2 = "More Than 45 Minutes But Less Than 3 Hours", 3 = "45 Minutes or Less"

**Trend Comments**

See BSDSWKHW in TIMSS 2011

Derived Variable Name: BSDBWKHB | Variable Label: Weekly Time Spent on Biology Homework | Eighth Grade

**Title of International Report Exhibit**

Weekly Time Students Spend on Assigned Science Homework

**Report Location**

Science 9.12

**Procedure**

Based on responses to the following questions from the Student Questionnaire:

SQSS-38Ab: How often does your teacher give you homework in each of the following subjects?

Biology (BSBB38AB)

Response options: 1 = "Every day", 2 = "3 or 4 times a week", 3 = "1 or 2 times a week", 4 = "Less than once a week", 5 = "Never"

SQSS-38Bb: When your teacher gives you homework in each of the following subjects, about how many minutes do you usually spend on your homework?

Biology (BSBB38BB)

Response options: 1 = "My teacher never gives me homework in science", 2 = "1–15 minutes", 3 = "16–30 minutes", 4 = "31–60 minutes", 5 = "61–90 minutes", 6 = "More than 90 minutes"

Recode BSBB38AB as follows:

If BSBB38AB = 1: recode to 5

If BSBB38AB = 2: recode to 3.5

If BSBB38AB = 3: recode to 1.5

If BSBB38AB = 4: recode to 0.5

If BSBB38AB = 5: recode to 0

Recode BSBB38BB as follows:

If BSBB38BB = 1: recode to 0

If BSBB38BB = 2: recode to 8

If BSBB38BB = 3: recode to 23

If BSBB38BB = 4: recode to 45

If BSBB38BB = 5: recode to 75

If BSBB38BB = 6: recode to 105

Derive BSDBCWKHC:

Multiply recoded BSBB38AB and recoded BSBB38BB to compute weekly time students spend on homework.

1 (Product of recoded BSBB38AB and recoded BSBB38BB  $\geq 180$ ) = "3 Hours or More"

2 (Product of recoded BSBB38AB and recoded BSBB38BB  $> 45$  AND  $< 180$ ) = "More Than 45 Minutes But Less Than 3 Hours"

3 (Product of recoded BSBB38AB and recoded BSBB38BB  $\leq 45$ ) = "45 Minutes or Less"

If either source variable is missing, set BSDBWKHB to missing.

If BSBB38BB is "Not Applicable", then set BSDBWKHB to 0.

1 = "3 Hours or More", 2 = "More Than 45 Minutes But Less Than 3 Hours", 3 = "45 Minutes or Less"

**Trend Comments**

See BSDBWKHW in TIMSS 2011

Derived Variable Name: BSDCWKHC | Variable Label: Weekly Time Spent on Chemistry Homework | Eighth Grade

**Title of International Report Exhibit**

Weekly Time Students Spend on Assigned Science Homework

**Report Location**

Science 9.12

**Procedure**

Based on responses to the following questions from the Student Questionnaire:

SQSS-38Ad: How often does your teacher give you homework in each of the following subjects?

Chemistry (BSBC38AD)

Response options: 1 = "Every day", 2 = "3 or 4 times a week", 3 = "1 or 2 times a week", 4 = "Less than once a week", 5 = "Never"

SQSS-38Bd: When your teacher gives you homework in each of the following subjects, about how many minutes do you usually spend on your homework?

Chemistry (BSBC38BD)

Response options: 1 = "My teacher never gives me homework in science", 2 = "1–15 minutes", 3 = "16–30 minutes", 4 = "31–60 minutes", 5 = "61–90 minutes", 6 = "More than 90 minutes"

Recode BSBC38AD as follows:

If BSBC38AD = 1: recode to 5

If BSBC38AD = 2: recode to 3.5

If BSBC38AD = 3: recode to 1.5

If BSBC38AD = 4: recode to 0.5

If BSBC38AD = 5: recode to 0

Recode BSBC38BD as follows:

If BSBC38BD = 1: recode to 0

If BSBC38BD = 2: recode to 8

If BSBC38BD = 3: recode to 23

If BSBC38BD = 4: recode to 45

If BSBC38BD = 5: recode to 75

If BSBC38BD = 6: recode to 105

Derive BSDCWKHC:

Multiply recoded BSBC38AD and recoded BSBC38BD to compute weekly time students spend on homework.

1 (Product of recoded BSBC38AD and recoded BSBC38BD  $\geq 180$ ) = "3 Hours or More"

2 (Product of recoded BSBC38AD and recoded BSBC38BD  $> 45$  AND  $< 180$ ) = "More Than 45 Minutes But Less Than 3 Hours"

3 (Product of recoded BSBC38AD and recoded BSBC38BD  $\leq 45$ ) = "45 Minutes or Less"

If either source variable is missing, set BSDCWKHC to missing.

If BSBC38BD is "Not Applicable", then set BSDCWKHC to 0.

1 = "3 Hours or More", 2 = "More Than 45 Minutes But Less Than 3 Hours", 3 = "45 Minutes or Less"

**Trend Comments**

See BSDCWKHW in TIMSS 2011

Derived Variable Name: BSDPWKHP

Variable Label: Weekly Time Spent on Physics Homework

Eighth Grade

**Title of International Report Exhibit**

Weekly Time Students Spend on Assigned Science Homework

**Report Location**

Science 9.12

**Procedure**

Based on responses to the following questions from the Student Questionnaire:

SQSS-38Ae: How often does your teacher give you homework in each of the following subjects?

Physics (BSBP38AE)

Response options: 1 = "Every day", 2 = "3 or 4 times a week", 3 = "1 or 2 times a week", 4 = "Less than once a week", 5 = "Never"

SQSS-38Be: When your teacher gives you homework in each of the following subjects, about how many minutes do you usually spend on your homework?

Physics (BSBP38BE)

Response options: 1 = "My teacher never gives me homework in science", 2 = "1–15 minutes", 3 = "16–30 minutes", 4 = "31–60 minutes", 5 = "61–90 minutes", 6 = "More than 90 minutes"

Recode BSBP38AE as follows:

If BSBP38AE = 1: recode to 5

If BSBP38AE = 2: recode to 3.5

If BSBP38AE = 3: recode to 1.5

If BSBP38AE = 4: recode to 0.5

If BSBP38AE = 5: recode to 0

Recode BSBP38BE as follows:

If BSBP38BE = 1: recode to 0

If BSBP38BE = 2: recode to 8

If BSBP38BE = 3: recode to 23

If BSBP38BE = 4: recode to 45

If BSBP38BE = 5: recode to 75

If BSBP38BE = 6: recode to 105

Derive BSDPWKHP:

Multiply recoded BSBP38AE and recoded BSBP38BE to compute weekly time students spend on homework.

1 (Product of recoded BSBP38AE and recoded BSBP38BE  $\geq 180$ ) = "3 Hours or More"2 (Product of recoded BSBP38AE and recoded BSBP38BE  $> 45$  AND  $< 180$ ) = "More Than 45 Minutes But Less Than 3 Hours"3 (Product of recoded BSBP38AE and recoded BSBP38BE  $\leq 45$ ) = "45 Minutes or Less"

If either source variable is missing, set BSDPWKHP to missing.

If BSBP38BE is "Not Applicable", then set BSDPWKHP to 0.

1 = "3 Hours or More", 2 = "More Than 45 Minutes But Less Than 3 Hours", 3 = "45 Minutes or Less"

**Trend Comments**

See BSDPWKHW in TIMSS 2011

Derived Variable Name: BSDEWKHE | Variable Label: Weekly Time Spent on Earth Sci Homework | Eighth Grade

**Title of International Report Exhibit**

Weekly Time Students Spend on Assigned Science Homework

**Report Location**

Science 9.12

**Procedure**

Based on responses to the following questions from the Student Questionnaire:

SQSS-38Ac: How often does your teacher give you homework in each of the following subjects?

Chemistry (BSBE38AC)

Response options: 1 = "Every day", 2 = "3 or 4 times a week", 3 = "1 or 2 times a week", 4 = "Less than once a week", 5 = "Never"

SQSS-38Bc: When your teacher gives you homework in each of the following subjects, about how many minutes do you usually spend on your homework?

Chemistry (BSBE38BC)

Response options: 1 = "My teacher never gives me homework in science", 2 = "1–15 minutes", 3 = "16–30 minutes", 4 = "31–60 minutes", 5 = "61–90 minutes", 6 = "More than 90 minutes"

Recode BSBE38AC as follows:

If BSBE38AC = 1: recode to 5

If BSBE38AC = 2: recode to 3.5

If BSBE38AC = 3: recode to 1.5

If BSBE38AC = 4: recode to 0.5

If BSBE38AC = 5: recode to 0

Recode BSBE38BC as follows:

If BSBE38BC = 1: recode to 0

If BSBE38BC = 2: recode to 8

If BSBE38BC = 3: recode to 23

If BSBE38BC = 4: recode to 45

If BSBE38BC = 5: recode to 75

If BSBE38BC = 6: recode to 105

Derive BSDEWKHE:

Multiply recoded BSBE38AC and recoded BSBE38BC to compute weekly time students spend on homework.

1 (Product of recoded BSBE38AC and recoded BSBE38BC  $\geq$  180) = "3 Hours or More"

2 (Product of recoded BSBE38AC and recoded BSBE38BC  $> 45$  AND  $< 180$ ) = "More Than 45 Minutes But Less Than 3 Hours"

3 (Product of recoded BSBE38AC and recoded BSBE38BC  $\leq 45$ ) = "45 Minutes or Less"

If either source variable is missing, set BSDEWKHE to missing.

If BSBE38BC is "Not Applicable", then set BSDEWKHE to 0.

1 = "3 Hours or More", 2 = "More Than 45 Minutes But Less Than 3 Hours", 3 = "45 Minutes or Less"

**Trend Comments**

See BSDEWKHW in TIMSS 2011

**SECTION 6:**  
**EIGHTH GRADE –**  
**MATHEMATICS TEACHER**  
**QUESTIONNAIRE**

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Derived Variable Name: BTDM05

Variable Label: Teachers Majored in Math and Math Ed

Eighth Grade

**Title of International Report Exhibit**

Teachers Majored in Education and Mathematics

**Report Location**

Mathematics 8.4

**Procedure**

Based on responses to the following questions in the Teacher Questionnaire:

TQG-04: What is the highest level of formal education you have completed? (TBG04)

Response options: 1 = "Did not complete <Upper secondary education—ISCED Level 3>", 2 = "<Upper secondary education—ISCED Level 3>", 3 = "<Post-secondary, non-tertiary education—ISCED Level 4>", 4 = "<Short-cycle tertiary education—ISCED Level 5>", 5 = "<Bachelor's or equivalent level—ISCED Level 6>", 6 = "<Master's or equivalent level—ISCED Level 7>", 7 = "<Doctor or equivalent level—ISCED Level 8>"

TQG-05Aa,b,c,d,e,f,g,h,i: During your &lt;post-secondary&gt;education, what was your major or main area(s) of study?

"Mathematics" (BTBG05A)

"Biology" (BTBG05B)

"Physics" (BTBG05C)

"Chemistry" (BTBG05D)

"&lt;Earth Science&gt;" (BTBG05E)

"Education - Mathematics" (BTBG05F)

"Education - Science" (BTBG05G)

"Education - General" (BTBG05H)

"Other" (BTBG05I)

Response options: 1 = "Yes", 2 = "No"

Derive BTDM05:

1 (BTBG05A=1 AND BTBG05F=1) = "Major in Mathematics and Mathematics Education"

2 (BTBG05A=1 AND BTBG05F=2) = "Major in Mathematics but No Major in Mathematics Education"

3 (BTBG05A=2 AND BTBG05F=1) = "Major in Mathematics Education but No Major in Mathematics"

4 (BTBG05A=2 AND BTBG05F=2) = "All Other Majors"

5 (BTBG04 = 1 OR 2) = "No Formal Education Beyond Upper-secondary"

Otherwise, set BTDM05 to missing.

1 = "Major in Mathematics and Mathematics Education", 2 = "Major in Mathematics but No Major in Mathematics Education", 3 = "Major in Mathematics Education but No Major in Mathematics", 4 = "All Other Majors", 5 = "No Formal Education Beyond Upper-secondary"

**Trend Comments**

See BTDM05 in TIMSS 2011

Derived Variable Name: BTDM21NU

Variable Label: Pct Std Taught Number Topics

Eighth Grade

**Title of International Report Exhibit**

Percentage of Students Taught the TIMSS Mathematics Topics\*

**Report Location**

Mathematics 9.4

**Procedure**

Based on responses to the following questions in the Teacher Questionnaire:

TQM-21Aa,b,c,d,e: The following list includes the main topics addressed by the TIMSS mathematics test. Choose the response that best describes when the students in this class have been taught each topic. If a topic was in the curriculum before the <eighth grade>, please choose "Mostly taught before this year." If a topic was taught half this year but not yet completed, please choose "Mostly taught this year." If a topic is not in the curriculum, please choose "Not yet taught or just introduced."

"Computing with whole numbers" (BTBM21AA)

"Comparing and ordering rational numbers" (BTBM21AB)

"Computing with rational numbers (fractions, decimals, and integers)" (BTBM21AC)

"Concepts of irrational numbers" (BTBM21AD)

"Problem solving involving percents or proportions" (BTBM21AE)

Response options: 1 = "Mostly taught before this year", 2 = "Mostly taught this year", 3 = "Not yet taught or just introduced"

Derive BTDM21NU:

For each topic, compute the percent of students whose teachers selected 1 = "Mostly taught before this year" OR 2 = "Mostly taught this year".

Then compute the average across the percentages of students taught the content domain.

Set BTDM21NU to missing if more than one-third of the source variables are missing.

Derived Variable Name: BTDM21AL

Variable Label: Pct Std Taught Algebra Topics

Eighth Grade

**Title of International Report Exhibit**

Percentage of Students Taught the TIMSS Mathematics Topics\*

**Report Location**

Mathematics 9.4

**Procedure**

Based on responses to the following questions in the Teacher Questionnaire:

TQM-21Ba,b,c,d,e,f: The following list includes the main topics addressed by the TIMSS mathematics test. Choose the response that best describes when the students in this class have been taught each topic. If a topic was in the curriculum before the <eighth grade>, please choose "Mostly taught before this year." If a topic was taught half this year but not yet completed, please choose "Mostly taught this year." If a topic is not in the curriculum, please choose "Not yet taught or just introduced."

"Simplifying and evaluating algebraic expressions" (BTBM21BA)

"Simple linear equations and inequalities" (BTBM21BB)

"Simultaneous (two variables) equations" (BTBM21BC)

"Numeric, algebraic, and geometric patterns or sequences (extension, missing terms, generalization of patterns)" (BTBM21BD)

"Representation of functions as ordered pairs, tables, graphs, words, or equations" (BTBM21BE)

"Properties of functions (slopes, intercepts, etc.)" (BTBM21BF)

Response options: 1 = "Mostly taught before this year", 2 = "Mostly taught this year", 3 = "Not yet taught or just introduced"

Derive BTDM21AL:

For each topic, compute the percent of students whose teachers selected 1 = "Mostly taught before this year" OR 2 = "Mostly taught this year".

Then compute the average across the percentages of students taught the content domain.

Set BTDM21AL to missing if more than one-third of the source variables are missing.

Derived Variable Name: BTDM21GE

Variable Label: Pct Std Taught Geometry Topics

Eighth Grade

**Title of International Report Exhibit**

Percentage of Students Taught the TIMSS Mathematics Topics\*

**Report Location**

Mathematics 9.4

**Procedure**

Based on responses to the following questions in the Teacher Questionnaire:

TQM-21Ca,b,c,d,e,f: The following list includes the main topics addressed by the TIMSS mathematics test. Choose the response that best describes when the students in this class have been taught each topic. If a topic was in the curriculum before the <eighth grade>, please choose "Mostly taught before this year." If a topic was taught half this year but not yet completed, please choose "Mostly taught this year." If a topic is not in the curriculum, please choose "Not yet taught or just introduced."

"Geometric properties of angles and geometric shapes (triangles, quadrilaterals, and other common polygons)" (BTBM21CA)

"Congruent figures and similar triangles" (BTBM21CB)

"Relationship between three-dimensional shapes and their two-dimensional representations" (BTBM21CC)

"Using appropriate measurement formulas for perimeters, circumferences, areas, surface areas, and volumes" (BTBM21CD)

"Points on the Cartesian plane" (BTBM21CE)

"Translation, reflection, and rotation" (BTBM21CF)

Response options: 1 = "Mostly taught before this year", 2 = "Mostly taught this year", 3 = "Not yet taught or just introduced"

Derive BTDM21GE:

For each topic, compute the percent of students whose teachers selected 1 = "Mostly taught before this year" OR 2 = "Mostly taught this year".

Then compute the average across the percentages of students taught the content domain.

Set BTDM21GE to missing if more than one-third of the source variables are missing.

**Trend Comments**

See BTDM23GE in TIMSS 2011

Derived Variable Name: BTDM21DT

Variable Label: Pct Std Taught Data Topics

Eighth Grade

**Title of International Report Exhibit**

Percentage of Students Taught the TIMSS Mathematics Topics\*

**Report Location**

Mathematics 9.4

**Procedure**

Based on responses to the following questions in the Teacher Questionnaire:

TQM-21Da,b,c: The following list includes the main topics addressed by the TIMSS mathematics test. Choose the response that best describes when the students in this class have been taught each topic. If a topic was in the curriculum before the <eighth grade>, please choose "Mostly taught before this year." If a topic was taught half this year but not yet completed, please choose "Mostly taught this year." If a topic is not in the curriculum, please choose "Not yet taught or just introduced."

"Characteristics of data sets (mean, median, mode, and shape of distributions)" (BTBM21DA)

"Interpreting data sets (e.g., draw conclusions, make predictions, and estimate values between and beyond given data points)" (BTBM21DB)

"Judging, predicting, and determining the chances of possible outcomes" (BTBM21DC)

Response options: 1 = "Mostly taught before this year", 2 = "Mostly taught this year", 3 = "Not yet taught or just introduced"

Derive BTDM21DT:

For each topic, compute the percent of students whose teachers selected 1 = "Mostly taught before this year" OR 2 = "Mostly taught this year".

Then compute the average across the percentages of students taught the content domain.

Set BTDM21DT to missing if more than one-third of the source variables are missing.

**SECTION 7:**  
**EIGHTH GRADE –**  
**SCIENCE TEACHER**  
**QUESTIONNAIRE**

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Lynch School of Education, Boston College



Derived Variable Name: BTDS05

Variable Label: Teachers Majored in Science and Science Ed | Eighth Grade

**Title of International Report Exhibit**

Teachers Majored in Education and Science

**Report Location**

Science 8.4

**Procedure**

Based on responses to the following questions in the Teacher Questionnaire:

TQG-04: What is the highest level of formal education you have completed? (TBG04)

Response options: 1 = "Did not complete <Upper secondary education—ISCED Level 3>", 2 = "<Upper secondary education—ISCED Level 3>", 3 = "<Post-secondary, non-tertiary education—ISCED Level 4>", 4 = "<Short-cycle tertiary education—ISCED Level 5>", 5 = "<Bachelor's or equivalent level—ISCED Level 6>", 6 = "<Master's or equivalent level—ISCED Level 7>", 7 = "<Doctor or equivalent level—ISCED Level 8>"

TQG-05Aa,b,c,d,e,f,g,h,i: During your &lt;post-secondary&gt; education, what was your major or main area(s) of study?

"Mathematics" (BTBG05A)

"Biology" (BTBG05B)

"Physics" (BTBG05C)

"Chemistry" (BTBG05D)

"&lt;Earth Science&gt;" (BTBG05E)

"Education - Mathematics" (BTBG05F)

"Education - Science" (BTBG05G)

"Education - General" (BTBG05H)

"Other" (BTBG05I)

Response options: 1 = "Yes", 2 = "No"

Derive BTDS05:

1 ((BTBG05B=1 OR BTBG05C=1 OR BTBG05D=1 OR BTBG05E=1) AND BTBG05G=1) = "Major in Science and Science Education"

2 ((BTBG05B=1 OR BTBG05C=1 OR BTBG05D=1 OR BTBG05E=1) AND BTBG05G=2) = "Major in Science but No Major in Science Education"

3 ((BTBG05B=2 AND BTBG05C=2 AND BTBG05D=2 AND BTBG05E=2) AND BTBG05G=1) = "Major in Science Education but No Major in Science"

4 (BTBG05B=2 AND BTBG05C=2 AND BTBG05D=2 AND BTBG05E=2 AND BTBG05G=2) = "All Other Majors"

5 (BTBG04 = 1 OR 2) = "No Formal Education Beyond Upper-secondary"

Otherwise, set BTDS05 to missing.

1 = "Major in Science and Science Education", 2 = "Major in Science but No Major in Science Education", 3 = "Major in Science Education but No Major in Science", 4 = "All Other Majors", 5 = "No Formal Education Beyond Upper-secondary"

**Trend Comments**

See BTDS05 in TIMSS 2011

Derived Variable Name: BTDBHW

Variable Label: Biology Instructional Hours per Week

Eighth Grade

**Title of International Report Exhibit**

Instructional Time Spent on Science

**Report Location**

Science 9.2

**Procedure**

Based on responses to the following question in the Teacher Questionnaire:

TQS-16: In a typical week, how much time do you spend teaching science to the students in this class? (BTBS16)  
(Open-response item; response in terms of minutes)

Compute biology instructional hours per week:

Divide BTBS16 by 60.

Filter by teachers who teach biology (ITCOURSE = 3, 9, 10, 11).

**Trend Comments**

See BTDBHW in TIMSS 2011.

Derived Variable Name: BTDCHW

Variable Label: Chemistry Instructional Hours per Week

Eighth Grade

**Title of International Report Exhibit**

Instructional Time Spent on Science

**Report Location**

Science 9.2

**Procedure**

Based on responses to the following question in the Teacher Questionnaire:

TQS-16: In a typical week, how much time do you spend teaching science to the students in this class? (BTBS16)  
(Open-response item; response in terms of minutes)

Compute chemistry instructional hours per week:

Divide BTBS16 by 60.

Filter by teachers who teach chemistry (ITCOURSE = 4, 8, 10, 13).

**Trend Comments**

See BTDCHW in TIMSS 2011.

Derived Variable Name: BTDPHW

Variable Label: Physics Instructional Hours per Week

Eighth Grade

**Title of International Report Exhibit**

Instructional Time Spent on Science

**Report Location**

Science 9.2

**Procedure**

Based on responses to the following question in the Teacher Questionnaire:

TQS-16: In a typical week, how much time do you spend teaching science to the students in this class? (BTBS16)  
(Open-response item; response in terms of minutes)

Compute physics instructional hours per week:

Divide BTBS16 by 60.

Filter by teachers who teach physics (ITCOURSE = 2, 8, 11, 12).

**Trend Comments**

See BTDPHW in TIMSS 2011.

Derived Variable Name: BTDEHW

Variable Label: Earth Sci Instructional Hours per Week

Eighth Grade

**Title of International Report Exhibit**

Instructional Time Spent on Science

**Report Location**

Science 9.2

**Procedure**

Based on responses to the following question in the Teacher Questionnaire:

TQS-16: In a typical week, how much time do you spend teaching science to the students in this class? (BTBS16)  
(Open-response item; response in terms of minutes)

Compute earth science instructional hours per week:

Divide BTBS16 by 60.

Filter by teachers who teach earth science (ITCOURSE = 5, 9, 12, 13).

**Trend Comments**

See BTDEHW in TIMSS 2011.

Derived Variable Name: BTDS20BI

Variable Label: Pct Std Taught Biology Topics

Eighth Grade

**Title of International Report Exhibit**

Percentage of Students Taught the TIMSS Science Topics\*

**Report Location**

Science 9.4

**Procedure**

Based on the responses to the following questions in the Teacher Questionnaire:

TQS-20Aa,b,c,d,e,f,g: The following list includes the main topics addressed by the TIMSS science test. Choose the response that best describes when the students in this class have been taught each topic. If a topic was in the curriculum before the <eighth grade>, please choose "Mostly taught before this year." If a topic was taught half this year but not yet completed, please choose "Mostly taught this year." If a topic is not in the curriculum, please choose "Not yet taught or just introduced."

"Differences among major taxonomic groups of organisms (plants, animals, fungi, mammals, birds, reptiles, fish, amphibians)" (BTBS20AA)

"Major organs and organ systems in humans and other organisms (structure/function, life processes that maintain stable bodily conditions)" (BTBS20AB)

"Cells, their structure and functions, including respiration and photosynthesis as cellular processes" (BTBS20AC)

"Life cycles, sexual reproduction, and heredity (passing on of traits, inherited versus acquired/learned characteristics)" (BTBS20AD)

"Role of variation and adaptation in survival/extinction of species in a changing environment (including fossil evidence for changes in life on Earth over time)" (BTBS20AE)

"Interdependence of populations of organisms in an ecosystem (e.g., energy flow, food webs, competition, predation) and factors affecting population size in an ecosystem" (BTBS20AF)

"Human health (causes of infectious diseases, methods of infection, prevention, immunity) and the importance of diet and exercise in maintaining health" (BTBS20AG)

Response options: 1 = "Mostly taught before this year", 2 = "Mostly taught this year", 3 = "Not yet taught or just introduced"

Derive BTDS20BI:

For each topic, compute the percent of students whose teachers selected 1 = "Mostly taught before this year" OR 2 = "Mostly taught this year".

Then compute the average across the percentages of students taught the content domain.

Set BTDS20BI to missing if more than one-third of the source variables are missing.



Derived Variable Name: BTDS20CH

Variable Label: Pct Students Taught Chemistry Topics

Eighth Grade

**Title of International Report Exhibit**

Percentage of Students Taught the TIMSS Science Topics\*

**Report Location**

Science 9.4

**Procedure**

Based on responses to the following questions in the Teacher Questionnaire:

TQS-20Ba,b,c,d,e,f: The following list includes the main topics addressed by the TIMSS science test. Choose the response that best describes when the students in this class have been taught each topic. If a topic was in the curriculum before the <eighth grade>, please choose "Mostly taught before this year." If a topic was taught half this year but not yet completed, please choose "Mostly taught this year." If a topic is not in the curriculum, please choose "Not yet taught or just introduced."

"Classification, composition, and particulate structure of matter (elements, compounds, mixtures, molecules, atoms, protons, neutrons, electrons)" (BTBS20BA)

"Physical and chemical properties of matter" (BTBS20BB)

"Mixtures and solutions (solvent, solute, concentration/dilution, effect of temperature on solubility)" (BTBS20BC)

"Properties and uses of common acids and bases" (BTBS20BD)

"Chemical change (transformation of reactants, evidence of chemical change, conservation of matter, common oxidation reactions – combustion, rusting, tarnishing)" (BTBS20BE)

"The role of electrons in chemical bonds" (BTBS20BF)

Response options: 1 = "Mostly taught before this year", 2 = "Mostly taught this year", 3 = "Not yet taught or just introduced"

Derive BTDS20CH:

For each topic, compute the percent of students whose teachers selected 1 = "Mostly taught before this year" OR 2 = "Mostly taught this year".

Then compute the average across the percentages of students taught the content domain.

Set BTDS20CH to missing if more than one-third of the source variables are missing.

Derived Variable Name: BTDS20PH

Variable Label: Pct Std Taught Physics Topics

Eighth Grade

**Title of International Report Exhibit**

Percentage of Students Taught the TIMSS Science Topics\*

**Report Location**

Science 9.4

**Procedure**

Based on responses to the following questions in the Teacher Questionnaire:

TQS-20Ca,b,c,d,e: The following list includes the main topics addressed by the TIMSS science test. Choose the response that best describes when the students in this class have been taught each topic. If a topic was in the curriculum before the <eighth grade>, please choose "Mostly taught before this year." If a topic was taught half this year but not yet completed, please choose "Mostly taught this year." If a topic is not in the curriculum, please choose "Not yet taught or just introduced."

"Physical states and changes in matter (explanations of properties in terms of movement and distance between particles; phase change, thermal expansion, and changes in volume and/or pressure)" (BTBS20CA)

"Energy forms, transformations, heat, and temperature" (BTBS20CB)

"Basic properties/behaviors of light (reflection, refraction, light and color, simple ray diagrams) and sound (transmission through media, loudness, pitch, amplitude, frequency)" (BTBS20CC)

"Electric circuits (flow of current; types of circuits - parallel/series) and properties and uses of permanent magnets and electromagnets" (BTBS20CD)

"Forces and motion (types of forces, basic description of motion, effects of density and pressure)" (BTBS20CE)

Response options: 1 = "Mostly taught before this year", 2 = "Mostly taught this year", 3 = "Not yet taught or just introduced"

Derive BTDS20PH:

For each topic, compute the percent of students whose teachers selected 1 = "Mostly taught before this year" OR 2 = "Mostly taught this year".

Then compute the average across the percentages of students taught the content domain.

Set BTDS20PH to missing if more than one-third of the source variables are missing.

**Trend Comments**

See BTDS22PH in TIMSS 2011.

Derived Variable Name: BTDS20ES

Variable Label: Pct Std Taught Earth Sci Topics

Eighth Grade

**Title of International Report Exhibit**

Percentage of Students Taught the TIMSS Science Topics\*

**Report Location**

Science 9.4

**Procedure**

Based on responses to the following questions in the Teacher Questionnaire:

TQS-20Da,b,c,d: The following list includes the main topics addressed by the TIMSS science test. Choose the response that best describes when the students in this class have been taught each topic. If a topic was in the curriculum before the <eighth grade>, please choose "Mostly taught before this year." If a topic was taught half this year but not yet completed, please choose "Mostly taught this year." If a topic is not in the curriculum, please choose "Not yet taught or just introduced."

"Earth's structure and physical features (Earth's crust, mantle, and core; composition and relative distribution of water, and composition of air)" (BTBS20DA)

"Earth's processes, cycles, and history (rock cycle; water cycle; weather versus climate; major geological events; formation of fossils and fossil fuels)" (BTBS20DB)

"Earth's resources, their use and conservation (e.g., renewable/nonrenewable resources, human use of land/soil, water resources)" (BTBS20DC)

"Earth in the solar system and the universe (phenomena on Earth - day/night, tides, phases of moon, eclipses, seasons; physical features of Earth compared to other bodies)" (BTBS20DD)

Response options: 1 = "Mostly taught before this year", 2 = "Mostly taught this year", 3 = "Not yet taught or just introduced"

Derive BTDS20ES:

For each topic, compute the percent of students whose teachers selected 1 = "Mostly taught before this year" OR 2 = "Mostly taught this year".

Then compute the average across the percentages of students taught the content domain.

Set BTDS20ES to missing if more than one-third of the source variables are missing.

**Trend Comments**

See BTDS22ES in TIMSS 2011.

**SECTION 8:**  
**EIGHTH GRADE –**  
**SCHOOL**  
**QUESTIONNAIRE**

TIMSS 2015 USER GUIDE FOR THE  
INTERNATIONAL DATABASE



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International Study Center  
Lynch School of Education, Boston College

Derived Variable Name: BCDG03

Variable Label: School Composition by Std Background

Eighth Grade

**Title of International Report Exhibit**

School Composition by Economic Background of the Student Body

**Report Location**

Mathematics 5.2;

Science 5.2

**Procedure**

Based on responses to the following questions in the School Questionnaire:

SCQ-3: Approximately what percentage of students in your school have the following backgrounds?

"Come from economically disadvantaged homes" (BCBG03A)

"Come from economically affluent homes" (BCBG03B)

Response options: 1 = "0 to 10%", 2 = "11 to 25%", 3 = "26 to 50%", 4 = "More than 50%"

Derive BCDG03:

1 (BCBG03A  $\leq$  2 AND BCBG03B  $\geq$  3) = "Schools With More Affluent Than Disadvantaged Students"3 (BCBG03A  $\geq$  3 AND BCBG03B  $\leq$  2) = "Schools With More Disadvantaged Than Affluent Students"

2 (All other combinations of BCBG03A and BCBG03B) = "Schools with Neither More Affluent nor More Disadvantaged Students"

Set BCDG03 to missing if either source variable is missing.

1 = "Schools With More Affluent Than Disadvantaged Students", 2 = "Schools with Neither More Affluent nor More Disadvantaged Students", 3 = "Schools With More Disadvantaged Than Affluent Students"

**Trend Comments**

See BCDG03 in TIMSS 2011.

Derived Variable Name: BCDG07HY

Variable Label: Total Instructional Hours per Year

Eighth Grade

**Title of International Report Exhibit**

Instructional Time Spent on Mathematics; Instructional Time Spent on Science

**Report Location**

Mathematics 9.2;

Science 9.2

**Procedure**

Based on responses to the following questions in the School Questionnaire:

SCQ-07A: How many days per year is your school open for instruction? (BCBG07A)

(Open-response item)

SCQ-07B: What is the total instructional time, excluding breaks, in a typical day? (BCBG07B)

(Open-response item; response is in terms of minutes)

Derive BCDG07HY:

Step 1: Compute instructional hours per day:

Divide BCBG07B by 60.

Step 2: Compute hours of school per year:

Multiply the result of Step 1 by BCBG07A.

Set BCDG07HY to missing if either source variable is missing.

**Trend Comments**

See BCDG06HY in TIMSS 2011.





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