

## DERIVED CONTEXT VARIABLES

# Mathematics Teacher Questionnaire – Grade 8

Derived Variable Name:

Variable Label:

BTDMMME

Teachers Majored in Mathematics and Mathematics Education

### International Report Exhibits

Exhibits 5.1.8 – 5.1.9: Teachers Majored in Mathematics and Mathematics Education – Teachers' Reports

### Procedure

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

TQG-04: What is the highest level of formal education you have completed? (BTBG04)

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-05a-i: During your <post-secondary> education, what was your major or main area(s) of study?

"Mathematics" (BTBG05A)

"Education—Mathematics" (BTBG05F)

Response options: 1 = "Yes"

2 = "No"

Derive BTDMMME:

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

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

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

4 = "All other majors" = IF (BTBG05A = 2 AND BTBG05F = 2)

5 = "No formal education beyond upper-secondary" = IF (BTBG04 = 1 OR 2)

Otherwise, set 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 BTDMMME in TIMSS 2019.

## Derived Variable Name:

BTDMNUM

## Variable Label:

Percent of Students Taught Number Topics

### Procedure

Based on responses to the following questions in the Mathematics Teacher Questionnaire:  
TQM-19Aa-Ag: The following list includes topics addressed by the TIMSS mathematics test. Choose the response that best describes when each topic is taught for students in this class.

If a topic was in the curriculum before <eighth grade>, choose “Mostly taught before this year.” If you have taught a topic this year, choose “Mostly taught this year.” If a topic is not in the <eighth grade> curriculum for this year or you have not yet taught a topic, choose “Not yet taught.”

“Add and subtract positive and negative numbers” (BTBM19AA)

“Find and use factors, multiples, positive powers, or square roots of positive whole numbers” (BTBM19AB)

“Compare fractions and decimals” (BTBM19AC)

“Add, subtract, and multiply with fractions and decimals” (BTBM19AD)

“Divide fractions and decimals by a whole number” (BTBM19AE)

“Determine proportions and ratios” (BTBM19AF)

“Find percentages and convert between percentages and fractions/decimals” (BTBM19AG)

Response options: 1 = “Mostly taught before this year”

2 = “Mostly taught this year”

3 = “Not yet taught”

Derive BTDMNUM:

Step 1: Compute average percent for each topic area:

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

Step 2: Compute average percent for content domain:

Compute average across the topic area percentages from Step 1.

Set BTDMNUM to missing if two or more source variables are missing.

### Trend Comments

See BTDMNUM in TIMSS 2019. Modifications were made to source variables in TIMSS 2023.

## Derived Variable Name:

BTDMALG

## Variable Label:

Percent of Students Taught Algebra Topics

### Procedure

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

TQM-19Ba-Bh: The following list includes topics addressed by the TIMSS mathematics test. Choose the response that best describes when each topic is taught for students in this class.

If a topic was in the curriculum before <eighth grade>, choose “Mostly taught before this year.” If you have taught a topic this year, choose “Mostly taught this year.” If a topic is not in the <eighth grade> curriculum for this year or you have not yet taught a topic, choose “Not yet taught.”

“Simplify and compare algebraic expressions” (BTBM19BA)

“Solve simple linear equations” (BTBM19BB)

“Solve simple linear inequalities” (BTBM19BC)

“Solve simultaneous linear equations (two variables)” (BTBM19BD)

“Write expressions, equations, or inequalities to represent problems” (BTBM19BE)

“Interpret linear functions in graphs, tables, or words” (BTBM19BF)

“Interpret simple non-linear functions (e.g., quadratic, cubic) in graphs, tables, or words” (BTBM19BG)

“Generalize linear and non-linear pattern relationships or sequences” (BTBM19BH)

Response options: 1 = “Mostly taught before this year”

2 = “Mostly taught this year”

3 = “Not yet taught”

Derive BTDMALG:

Step 1: Compute average percent for each topic area:

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

Step 2: Compute average percent for content domain:

Compute average across the topic area percentages from Step 1.

Set BTDMALG to missing if three or more source variables are missing.

### Trend Comments

See BTDMALG in TIMSS 2019. Modifications were made to source variables in TIMSS 2023.

## Derived Variable Name:

BTDMGEO

## Variable Label:

Percent of Students Taught Geometry and Measurement Topics

## Procedure

Based on responses to the following questions in the Mathematics Teacher Questionnaire:  
TQM-19Ca-Cf: The following list includes topics addressed by the TIMSS mathematics test. Choose the response that best describes when each topic is taught for students in this class.

If a topic was in the curriculum before <eighth grade>, choose “Mostly taught before this year.” If you have taught a topic this year, choose “Mostly taught this year.” If a topic is not in the <eighth grade> curriculum for this year or you have not yet taught a topic, choose “Not yet taught.”

“Read and plot points in the Cartesian plane” (BTBM19CA)

“Recognize and draw different types of angles and lines” (BTBM19CB)

“Use geometric properties of polygons to calculate lengths, perimeter, and area” (BTBM19CC)

“Determine the results of geometric translation, reflection, and rotation” (BTBM19CD)

“Use properties of similar and congruent figures” (BTBM19CE)

“Calculate surface area and volume of common three-dimensional shapes” (BTBM19CF)

Response options: 1 = “Mostly taught before this year”

2 = “Mostly taught this year”

3 = “Not yet taught”

Derive BTDMGEO:

Step 1: Compute average percent for each topic area:

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

Step 2: Compute average percent for content domain:

Compute average across the topic area percentages from Step 1.

Set BTDMGEO to missing if three or more source variables are missing.

## Trend Comments

See BTDMGEO in TIMSS 2019. Modifications were made to source variables in TIMSS 2023.

## Derived Variable Name:

BTDMDAT

## Variable Label:

Percent of Students Taught Data and Probability Topics

## Procedure

Based on responses to the following questions in the Mathematics Teacher Questionnaire:  
TQM-19Da-Dd: The following list includes topics addressed by the TIMSS mathematics test. Choose the response that best describes when each topic is taught for students in this class.

If a topic was in the curriculum before <eighth grade>, choose “Mostly taught before this year.” If you have taught a topic this year, choose “Mostly taught this year.” If a topic is not in the <eighth grade> curriculum for this year or you have not yet taught a topic, choose “Not yet taught.”

“Interpret data from one or more data sources” (BTBM19DA)

“Represent data in graphs, charts, or plots” (BTBM19DB)

“Calculate and interpret the mean or median of a data distribution” (BTBM19DC)

“Calculate probabilities of simple and compound events” (BTBM19DD)

Response options: 1 = “Mostly taught before this year”

2 = “Mostly taught this year”

3 = “Not yet taught”

Derive BTDMDAT:

Step 1: Compute average percent for each topic area:

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

Step 2: Compute average percent for content domain:

Compute average across the topic area percentages from Step 1.

Set BTDMDAT to missing if three or more source variables are missing.

## Trend Comments

See BTDMDAT in TIMSS 2019. Modifications were made to source variables in TIMSS 2023.

Derived Variable Name:

Variable Label:

BTDMHW

Mathematics Instruction Hours per Week

#### Procedure

Based on responses to the following question in the Teacher Questionnaire:  
 TQM-14: In a typical week, how much time do you spend teaching mathematics to the students in this class? (BTBM14)  
 (Open-response item; response in terms of minutes)

Derive BTDMHW:  
 Step 1: Divide BTBM14 by 60.

Set BTDMHW to missing if source variable is missing.