# DERIVED CONTEXT VARIABLES

# Teacher Questionnaire – Grade 4

| Derived Variable Name: | Variable Label: |
|---|---|
| ATDMMEM | Teachers Majored in Primary Education and Mathematics |

## International Report Exhibits

Exhibits 5.1.6 – 5.1.7: Teachers Majored in Primary Education and Mathematics – Teachers' Reports

## 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-Af: During your <post-secondary> education, what was your major or main area(s) of study?
"Education—Primary/Elementary" (ATBG05AA)
"Mathematics" (ATBG05AC)
Response options: 1 = "Yes"
       2 = "No"
TQG-05Ba-Bd: If your major or main area of study was education, did you have a <specialization> in any of the following?
"Mathematics" (ATBG05BA)
Response options: 1 = "Yes"
       2 = "No"

Derive ATDMMEM:
1 = "Major in primary education and major (or specialization) in mathematics" = IF (ATBG05AA = 1 AND (ATBG05AC = 1 OR ATBG05BA = 1))
2 = "Major in primary education but no major (or specialization) in mathematics" = IF (ATBG05AA = 1 AND ATBG05AC = 2 AND ATBG05BA = 2)
3 = "Major in mathematics but no major in primary education" = IF (ATBG05AA = 2 AND (ATBG05AC = 1 OR ATBG05BA = 1))
4 = "All other majors" = IF (ATBG05AA = 2 AND ATBG05AC = 2 AND ATBG05BA = 2)
5 = "No formal education beyond upper-secondary" = IF (ATBG04 = 1 OR 2)
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 ATDMMEM in TIMSS 2019.

| Derived Variable Name: | Variable Label: |
|---|---|
| ATDSMES | Teachers Majored in Primary Education and Science |

## International Report Exhibits

Exhibit 5.1.10 – 51.11: Teachers Majored in Primary Education and Science – Teachers' Reports

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

"Education—Primary/Elementary" (ATBG05AA)
"Science" (ATBG05AD)

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

TQG-05Ba-Bd: If your major or main area of study was education, did you have a <specialization> in any of the following?

"Science" (ATBG05BB)

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

Derive ATDSMES:

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

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

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

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

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

Otherwise, set to missing.

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

## Trend Comments

See ATDSMES in TIMSS 2019.

| Derived Variable Name: | Variable Label: |
|---|---|
| ATDMNUM | Percent of Students Taught Number Topics |

## Procedure

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

TQM-06Aa-Al: 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 <fourth 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 <fourth grade> curriculum for this year or you have not yet taught a topic, choose "Not yet taught."

"Recognize place value and order whole numbers (ATBM06AA)
"Add and subtract up to 4-digit numbers" (ATBM06AB)
"Multiply up to 3-digit by 1-digit and 2-digit by 2-digit numbers" (ATBM06AC)
"Divide up to 3-digit by 1-digit numbers" (ATBM06AD)
"Solve problems with odd/even numbers, multiples, or factors" (ATBM06AE)
"Round or make estimations with whole numbers" (ATBM06AF)
"Find the missing number or operation in a number sentence" (ATBM06AG)
"Extend a number pattern or find the missing number in a pattern" (ATBM06AH)
"Represent, compare, and order fractions" (ATBM06AI)
"Add and subtract simple fractions" (ATBM06AJ)
"Represent, compare, and order decimals up to two decimal places" (ATBM06AK)
"Add and subtract with decimals up to two decimal places" (ATBM06AL)
Response options: 1 = "Mostly taught before this year"
　　　　　　　　　 2 = "Mostly taught this year"
　　　　　　　　　 3 = "Not yet taught"

Derive ATDMNUM:
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 ATDMNUM to missing if three or more source variables are missing.

## Trend Comments

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

| Derived Variable Name: | Variable Label: |
|---|---|
| ATDMGEO | Percent of Students Taught Measurement and Geometry Topics |

## Procedure

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

TQM-06Ba-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 <fourth 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 <fourth grade> curriculum for this year or you have not yet taught a topic, choose "Not yet taught."

"Measure, estimate, add, and subtract lengths" (ATBM06BA)

"Add and subtract mass, volume, or time in appropriate units" (ATBM06BB)

"Find perimeters of polygons" (ATBM06BC)

"Find areas of shapes covered with squares or volumes of shapes filled with cubes" (ATBM06BD)

"Recognize and draw parallel and perpendicular lines" (ATBM06BE)

"Compare and draw angles" (ATBM06BF)

"Describe and draw common two-dimensional shapes (e.g., circles, triangles, quadrilaterals)" (ATBM06BG)

"Describe and draw common three-dimensional shapes (e.g., cubes, rectangular solids, cones, cylinders, spheres)" (ATBM06BH)

Response options: 1 = "Mostly taught before this year"
                  2 = "Mostly taught this year"
                  3 = "Not yet taught"

Derive ATDMGEO:

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 ATDMGEO to missing if three or more source variables are missing.

## Trend Comments

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

| Derived Variable Name: | Variable Label: |
|---|---|
| ATDMDAT | Percent of Students Taught Data Topics |

## Procedure

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

TQM-06Ca-Cc: 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 <fourth 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 <fourth grade> curriculum for this year or you have not yet taught a topic, choose "Not yet taught."

"Read and interpret data displays" (ATBM06CA)
"Create or complete data displays" (ATBM06CB)
"Draw conclusions from two or more data sources" (ATBM06CC)

Response options: 1 = "Mostly taught before this year"
 2 = "Mostly taught this year"
 3 = "Not yet taught"

Derive ATDMDAT:
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 ATDMDAT to missing if two or more source variables are missing.

## Trend Comments

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

| Derived Variable Name: | Variable Label: |
|---|---|
| ATDSLIF | Percent of Students Taught Life Science Topics |

## Procedure

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

TQS-09Aa-Ak: The following list includes topics and concepts addressed by the TIMSS science test. Choose the response that best describes when each topic or concept is taught for the students in this class.

If a topic or concept was in the curriculum before <fourth 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 <fourth grade> curriculum for this year or you have not yet taught a topic, choose "Not yet taught."

"Basic differences between living and nonliving things" (ATBS09AA)
"Defining characteristics of major groups of living things" (ATBS09AB)
"Functions of major structures in living things (e.g., roots in plants)" (ATBS09AC)
"Life cycle stages of common plants and animals (e.g., flowering plants, frogs)" (ATBS09AD)
"Inherited characteristics of living things" (ATBS09AE)
"How living things survive in their environments (e.g., physical characteristics, behaviors)" (ATBS09AF)
"How human actions impact the environment" (ATBS09AG)
"Common ecosystems and their organisms (e.g., forest, desert)" (ATBS09AH)
"Interpreting simple food chains" (ATBS09AI)
"Competition within ecosystems" (ATBS09AJ)
"Ways for humans to maintain good health and avoid illness" (ATBS09AK)

Response options:  1 = "Mostly taught before this year"
                   2 = "Mostly taught this year"
                   3 = "Not yet taught"

Derive ATDSLIF:
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 ATDSLIF to missing if three or more source variables are missing.

## Trend Comments

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

| Derived Variable Name: | Variable Label: |
|---|---|
| ATDSPHY | Percent of Students Taught Physical Science Topics |

## Procedure

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

TQS-09Ba-Bn: The following list includes topics and concepts addressed by the TIMSS science test. Choose the response that best describes when each topic or concept is taught for the students in this class.

If a topic or concept was in the curriculum before <fourth 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 <fourth grade> curriculum for this year or you have not yet taught a topic, choose "Not yet taught."

"Solids, liquids, gases, and how their shapes and volumes differ" (ATBS09BA)
"Grouping objects based on their physical properties" (ATBS09BB)
"Examples of mixtures and how they can be separated (e.g., filtration, evaporation)" (ATBS09BC)
"Magnetic attraction and repulsion" (ATBS09BD)
"Examples of physical and chemical changes in everyday life" (ATBS09BE)
"How to make solids dissolve faster in liquids (e.g., stirring, heating)" (ATBS09BF)
"Concentration of solutions" (ATBS09BG)
"Sources of energy (e.g., the Sun, wind, water, coal, oil, and gas)" (ATBS09BH)
"How light is related to shadows, reflections, and rainbows" (ATBS09BI)
"How vibrations are related to sound" (ATBS09BJ)
"Movement of heat from hotter to cooler objects" (ATBS09BK)
"Simple electrical circuits" (ATBS09BL)
"How motion is affected by forces (e.g., gravity, pushing, pulling, friction)" (ATBS09BM)
"Examples of simple machines (e.g., levers, ramps)" (ATBS09BN)

Response options: 1 = "Mostly taught before this year"
2 = "Mostly taught this year"
3 = "Not yet taught"

Derive ATDSPHY:

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 ATDSPHY to missing if five or more source variables are missing.

## Trend Comments

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

**Derived Variable Name:**

ATDSEAR

**Variable Label:**

Percent of Students Taught Earth Science Topics

## Procedure

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

TQS-09Ca-Ck: The following list includes topics and concepts addressed by the TIMSS science test. Choose the response that best describes when each topic or concept is taught for the students in this class.

If a topic or concept was in the curriculum before <fourth 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 <fourth grade> curriculum for this year or you have not yet taught a topic, choose "Not yet taught."

"Composition of Earth's surface (i.e., land, fresh water, salt water)" (ATBS09CA)
"Earth's resources and their use by humans" (ATBS09CB)
"Renewable and nonrenewable resources" (ATBS09CC)
"How wind and water change Earth's surface over time" (ATBS09CD)
"What fossils can show about Earth's history" (ATBS09CE)
"How weather changes day to day and with geographic location" (ATBS09CF)
"Effects of increasing temperatures on Earth" (ATBS09CG)
"Composition of the Solar System (the Sun, Earth, Moon, and other planets)" (ATBS09CH)
"How the Moon's movement around the Earth changes its appearance" (ATBS09CI)
"How Earth's rotation causes day and night" (ATBS09CJ)
"How Earth's annual movement around the Sun causes seasons or seasonal change" (ATBS09CK)

Response options: 1 = "Mostly taught before this year"
  2 = "Mostly taught this year"
  3 = "Not yet taught"

Derive ATDSEAR:

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 ATDSEAR to missing if three or more source variables are missing.

## Trend Comments

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

| Derived Variable Name: | Variable Label: |
|---|---|
| ATDMHW | Mathematics Instruction Hours per Week |

## Procedure

Based on responses to the following question in the Teacher Questionnaire:
TQM-01: In a typical week, how much time do you spend teaching mathematics to the students in this class? (ATBM01)
(Open-response item; response in terms of minutes)


Derive ATDMHW:
Step 1: Divide ATBM01 by 60.

Set ATDMHW to missing if source variable is missing.

## Derived Variable Name:

ATDSHW

## Variable Label:

Science Instruction Hours per Week

## Procedure

Based on responses to the following question in the Teacher Questionnaire:
TQS-01B: Please estimate the time that you spend on science topics with students in this class.
(ATBS01B)
(Open-response item; response in terms of minutes)

Derive ATDSHW:
Step 1: Divide ATBS01B by 60.

Set ATDSHW to missing if source variable is missing.