Trends in International Mathematics and Science Study

TIMSS 2007

IEA
TIMSS
2007

Teacher Questionnaire

MATHEMATICS
<Grade 8>

<TIMSS National Research Center Name>
<Address>

General Directions

Your school has agreed to participate in TIMSS 2007, a large international study of student learning in mathematics and science in more than 60 countries around the world. Sponsored by the International Association for the Evaluation of Educational Achievement (IEA), TIMSS (for Trends in International Mathematics and Science Study) is measuring trends in student achievement and studying differences in national education systems in order to help improve the teaching and learning of mathematics and science worldwide.

As part of the study, students in a nationwide sample of <eighth-grade> classes in <country> will complete the TIMSS mathematics and science tests. This questionnaire is addressed to teachers who teach mathematics to these students, and seeks information about teachers' academic and professional background, instructional practices, and attitudes toward teaching mathematics. As a teacher of mathematics to students in one of these sampled classes, your responses to these questions are very important in helping to describe mathematics education in <country>.

Some of the questions in this questionnaire refer specifically to students in the "TIMSS class." This is the class that is identified on the cover of this questionnaire, and that will be tested as part of TIMSS 2007 in your school. It is important that you answer each question carefully so that the information that you provide reflects your situation as accurately as possible.

Please identify a time and place where you will be able to complete this questionnaire without being interrupted. This should require no more than 45 minutes. To make it as easy as possible for you to respond, most questions may be answered simply by checking or filling in the appropriate circle.

Once you have completed the questionnaire, place it in the return envelope provided and return it to: <Country Specific Information>

Thank you very much for the time and effort you have put into responding to this questionnaire.

Background Information

Preparation to Teach

1

How old are you?

*Fill in **one** circle only*

Under 25 - ◯
25–29 - ◯
30–39 - ◯
40–49 - ◯
50–59 - ◯
60 or older - ◯

2

Are you female or male?

*Fill in **one** circle only*

Female - ◯
Male - ◯

3

By the end of this school year, how many years will you have been teaching altogether?

_____
Number of years you have taught

4

What is the highest level of formal education you have completed?

*Fill in **one** circle only*

Did not complete <ISCED 3> - - - - - - - - - - - - - - - - - - ◯
Finished <ISCED 3> - ◯
Finished <ISCED 4> - ◯
Finished <ISCED 5B> - ◯
Finished <ISCED 5A, first degree> - - - - - - - - - - - - - ◯
Finished <ISCED 5A, second degree> or higher - ◯

5

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

*Fill in **one** circle for each row*

		Yes	No
a)	Mathematics -	◯	◯
b)	Education - Mathematics - - - - - - - - - - - -	◯	◯
c)	Science -	◯	◯
d)	Education - Science - - - - - - - - - - - - - - - -	◯	◯
e)	Education - General - - - - - - - - - - - - - - - -	◯	◯
f)	Other -	◯	◯

6

Do you have a teaching license or certificate?

	Yes	No
*Fill in **one** circle only* -	◯	◯

Preparation to Teach (Continued)

7

How well prepared do you feel you are to teach the following topics?

*Fill in **one** circle in each row*

Column headers (right to left): Not well prepared | Somewhat prepared | Very well prepared | Not applicable

A. Number

Topic	Not applicable	Very well prepared	Somewhat prepared	Not well prepared
a) Computing, estimating or approximating with whole numbers	○	○	○	○
b) Representing decimals and fractions using words, numbers, or models (including number lines)	○	○	○	○
c) Computing with fractions and decimals	○	○	○	○
d) Representing, comparing, ordering, and computing with integers	○	○	○	○
e) Problem solving involving percents and proportions	○	○	○	○

B. Algebra

Topic	Not applicable	Very well prepared	Somewhat prepared	Not well prepared
a) Numeric, algebraic, and geometric patterns or sequences (extension, missing terms, generalization of patterns)	○	○	○	○
b) Simplifying and evaluating the algebraic expressions	○	○	○	○
c) Simple linear equations and inequalities, and simultaneous (two variables) equations	○	○	○	○
d) Equivalent representations of functions as ordered pairs, tables, graphs, words, or equations	○	○	○	○

C. Geometry

Topic	Not applicable	Very well prepared	Somewhat prepared	Not well prepared
a) Geometric properties of angles and geometric shapes (triangles, quadrilaterals, and other common polygons)	○	○	○	○
b) Congruent figures and similar triangles	○	○	○	○
c) Relationship between three–dimensional shapes and their two-dimensional representation	○	○	○	○
d) Using appropriate measurement formulas for perimeters, circumferences, areas of circles, surface areas and volumes	○	○	○	○
e) Cartesian plane - ordered pairs, equations, intercepts, intersections, and gradient	○	○	○	○
f) Translation, reflection, and rotation	○	○	○	○

D. Data and Chance

Topic	Not applicable	Very well prepared	Somewhat prepared	Not well prepared
a) Reading and displaying data using tables, pictographs, bar graphs, pie charts and line graphs	○	○	○	○
b) Interpreting data sets (e.g., draw conclusions, make predictions, and estimate values between and beyond given data points)	○	○	○	○
c) Judging, predicting, and determining the chances of possible outcomes	○	○	○	○

Professional Development

Your School

8

How often do you have the following types of interactions with other teachers?

Fill in one circle for each row

Daily or almost daily
1-3 times per week
2 or 3 times per month
Never or almost never

a) Discussions about how to teach a particular concept - - ○ - - ○ - - ○ - - - ○

b) Working on preparing instructional materials - - - - - ○ - - ○ - - ○ - - - ○

c) Visits to another teacher's classroom to observe his/her teaching - - - - - - - - - - ○ - - ○ - - ○ - - - ○

d) Informal observations of **my** classroom by another teacher - - - - - - - - - - ○ - - ○ - - ○ - - - ○

10

Thinking about your current school, indicate the extent to which you agree or disagree with each of the following statements.

Fill in one circle for each row

Disagree a lot
Disagree
Agree
Agree a lot
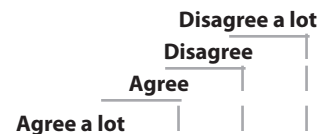
a) This school is located in a safe neighborhood - - - - - - ○ - - ○ - - ○ - - - ○

b) I feel safe at this school - - - - ○ - - ○ - - ○ - - - ○

c) This school's security policies and practices are sufficient - ○ - - ○ - - ○ - - - ○

9

In the past two years, have you participated in professional development in any of the following?

Fill in one circle for each row

No
Yes

a) Mathematics content - - - - - - - - - - - - - - - - ○ - - - ○

b) Mathematics pedagogy/instruction - - - - ○ - - - ○

c) Mathematics curriculum - - - - - - - - - - - - ○ - - - ○

d) Integrating information technology into mathematics - - - - - - - - - - - - - - - - - - ○ - - - ○

e) Improving students' critical thinking or problem solving skills - - - - - - - - - - - - - ○ - - - ○

f) Mathematics assessment - - - - - - - - - - - - ○ - - - ○

11

In your current school, how severe is each problem?

Fill in one circle for each row

Serious problem
Minor Problem
Not a problem
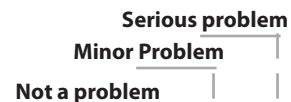
a) The school building needs significant repair - - - - - - - - - - - - - - - ○ - - ○ - - - ○

b) Classrooms are overcrowded - - - - - - - - - - - - - - - - - - ○ - - ○ - - - ○

c) Teachers do not have adequate workspace outside their classroom - - - - - - - - - ○ - - ○ - - - ○

12

How would you characterize each of the following within your school?

*Fill in **one** circle for each row*
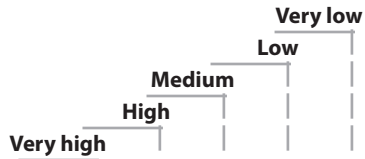
	Very high	High	Medium	Low	Very low
a) Teachers' job satisfaction	○	○	○	○	○
b) Teachers' understanding of the school's curricular goals	○	○	○	○	○
c) Teachers' degree of success in implementing the school's curriculum	○	○	○	○	○
d) Teachers' expectations for student achievement	○	○	○	○	○
e) Parental support for student achievement	○	○	○	○	○
f) Parental involvement in school activities	○	○	○	○	○
g) Students' regard for school property	○	○	○	○	○
h) Students' desire to do well in school	○	○	○	○	○

The TIMSS Class

The remaining questions refer to the TIMSS class. Remember, "the TIMSS class" is the class which is identified on the cover of this questionnaire, and which will be tested as part of TIMSS 2007 in your school.

13

How many students are in the TIMSS class?

_____

Write in the number of students

14

How many minutes per week do you teach mathematics to the TIMSS class?

_____

Write in the number of minutes per week

15

A. Do you use a textbook(s) in teaching mathematics to the TIMSS class?

Yes   No

*Fill in **one** circle only* - - - - - - - - - - - - - - - - - - ◯ - - - ◯

*If **No**, please go to question **16**➡*

B. How do you use a textbook(s) in teaching mathematics to the TIMSS class?

*Fill in **one** circle only*

As the primary basis for my lessons - - - - - - - - - - - - - ◯

As a supplementary resource - - - - - - - - - - - - - - - - - ◯

16

In a typical week of mathematics lessons for the TIMSS class, what percentage of time do students spend on each of the following activities?

Write in the percent
The total should add to 100%

a)   Reviewing homework ------------------------ _____%

b)   Listening to lecture-style presentations ----------------------------------- _____%

c)   Working problems with your guidance --------------------------- _____%

d)   Working problems on their own without your guidance ----------------- _____%

e)   Listening to you re-teach and clarify content/procedures ------------- _____%

f)   Taking tests or quizzes------------------------ _____%

g)   Participating in classroom management tasks not related to the lesson's content/purpose (e.g., interruptions and keeping order)--------------------------------- _____%

h)   Other student activities ---------------------- _____%

Total -- 100%

Teaching Mathematics to the TIMSS Class

17

In teaching mathematics to the students in the TIMSS class, how often do you usually ask them to do the following?

*Fill in **one** circle for each row*

Columns: Every or almost every lesson | About half the lessons | Some lessons | Never

	Every or almost every lesson	About half the lessons	Some lessons	Never
a) Practice adding, subtracting, multiplying, and dividing without using a calculator	○	○	○	○
b) Work on fractions and decimals	○	○	○	○
c) Use knowledge of the properties of shapes, lines and angles to solve problems	○	○	○	○
d) Interpret data in tables, charts or graphs	○	○	○	○
e) Write equations and functions to represent relationships	○	○	○	○
f) Memorize formulas and procedures	○	○	○	○
g) Apply facts, concepts and procedures to solve routine problems	○	○	○	○
h) Explain their answers	○	○	○	○
i) Relate what they are learning in mathematics to their daily lives	○	○	○	○
j) Decide on their own procedures for solving complex problems	○	○	○	○
k) Work on problems for which there is no immediately obvious method of solution	○	○	○	○
l) Work together in small groups	○	○	○	○

18

In your view, to what extent do the following limit how you teach the TIMSS class?

*Fill in **one** circle for each row*

Columns: Not applicable | Not at all | A little | Some | A lot

Students

	Not applicable	Not at all	A little	Some	A lot
a) Students with different academic abilities	○	○	○	○	
b) Students who come from a wide range of backgrounds (e.g., economic, language)	○	○	○	○	
c) Students with special needs (e.g., hearing, vision, speech impairment, physical disabilities, mental or emotional/psychological impairment)	○	○	○	○	
d) Uninterested students	○	○	○	○	
e) Disruptive students	○	○	○	○	

Resources

	Not applicable	Not at all	A little	Some	A lot
f) Shortage of computer hardware	○	○	○	○	
g) Shortage of computer software	○	○	○	○	
h) Shortage of support for using computers	○	○	○	○	
i) Shortage of textbooks for student use	○	○	○	○	
j) Shortage of other instructional equipment for students' use	○	○	○	○	
k) Shortage of equipment for your use in demonstrations and other exercises	○	○	○	○	
l) Inadequate physical facilities	○	○	○	○	
m) High student/teacher ratio	○	○	○	○	

19

By the end of this school year, approximately what percentage of teaching time will you have spent during this school year on each of the following mathematics content areas for the TIMSS class?

Write in the percent
The total should add to 100%

a) Number (e.g., whole numbers, fractions, decimals, ratio, proportion and percent) ---------------------- _____%

b) Algebra (e.g., patterns, equations, formulas and relationships) ------------------ _____%

c) Geometry (e.g., lines and angles, shapes, congruence and similarity, spatial relationships, symmetry and transformations) ------------------------------- _____%

d) Data and Chance (e.g., reading, organizing and representing data, data interpretation and chance) ----------- _____%

e) Other, please specify:

_____ ----------- _____%

Total -- 100%

20

The following list includes the main topics addressed by the TIMSS mathematics test. Choose the response that best describes when students in the TIMSS class have been taught each topic. 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."

*Fill in **one** circle for each row*

	Mostly taught before this year	Mostly taught this year	Not yet taught or just introduced

A. Number

a) Whole numbers including place value, factorization, and the four operations — ○ -- ○ -- ○

b) Computations, estimations, or approximations involving whole numbers — ○ -- ○ -- ○

c) Common fractions including equivalent fractions and ordering of fractions — ○ -- ○ -- ○

d) Decimal including place value, ordering, and converting to common fractions (and vice versa) — ○ -- ○ -- ○

e) Representing decimals and fractions using words, numbers, or models (including number lines) — ○ -- ○ -- ○

f) Computations with fractions — ○ -- ○ -- ○

g) Computations with decimals — ○ -- ○ -- ○

h) Representing, comparing, ordering, and computing with integers — ○ -- ○ -- ○

i) Ratios (equivalence, division of a quantity by a given ratio) — ○ -- ○ -- ○

j) Conversion of percents to fractions or decimals and vice versa — ○ -- ○ -- ○

B. Algebra

a) Numeric, algebraic, and geometric patterns or sequences (extension, missing terms, generalization of patterns) — ○ -- ○ -- ○

b) Sums, products, and powers of expressions containing variables — ○ -- ○ -- ○

c) Evaluating expressions for given numeric value — ○ -- ○ -- ○

d) Simplifying or comparing algebraic expressions — ○ -- ○ -- ○

e) Modeling situations using expressions — ○ -- ○ -- ○

f) Evaluating functions/formulas for given values of the variables — ○ -- ○ -- ○

g) Simple linear equations and inequalities, and simultaneous (two variables) equations — ○ -- ○ -- ○

h) Equivalent representations of functions as ordered pairs, tables, graphs, words, or equations — ○ -- ○ -- ○

20 Continued

The following list includes the main topics addressed by the TIMSS mathematics test. Choose the response that best describes when students in the TIMSS class have been taught each topic. 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."

*Fill in **one** circle for each row*

Not yet taught or just introduced

Mostly taught this year

Mostly taught before this year

C. Geometry

		Mostly taught before this year	Mostly taught this year	Not yet taught or just introduced
a)	Angles - acute, right, straight, obtuse, reflex	○	○	○
b)	Relationships for angles at a point, angles on a line, vertically opposite angles, angles associated with a transversal cutting parallel lines, and perpendicularity	○	○	○
c)	Properties of geometric shapes: triangles, quadrilaterals, and other common polygons	○	○	○
d)	Construct or draw triangles and rectangles of given dimensions	○	○	○
e)	Congruent figures (triangles, quadrilaterals) and their corresponding measures	○	○	○
f)	Similar triangles and recall their properties	○	○	○
g)	Relationships between two-dimensional and three-dimensional shapes	○	○	○
h)	Pythagorean theorem (not proof) to find length of a side	○	○	○
i)	Measurement, drawing, and estimation of the size of angles, the lengths of lines, areas, and volumes	○	○	○
j)	Measurement formulas for perimeters, circumferences, areas of circles, surface areas, and volumes	○	○	○
k)	Measures of irregular or compound areas (e.g., by covering with grids or dissecting and rearranging pieces)	○	○	○
l)	Cartesian plane - ordered pairs, equations, intercepts, intersections, and gradient	○	○	○
m)	Line and rotational symmetry for two-dimensional shapes	○	○	○
n)	Translation, reflection, and rotation	○	○	○

D. Data and Chance

		Mostly taught before this year	Mostly taught this year	Not yet taught or just introduced
a)	Reading data from tables, pictographs, bar graphs, pie charts, and line graphs	○	○	○
b)	Organizing and displaying data using tables, pictographs, bar graphs, pie charts, and line graphs	○	○	○
c)	Characteristics of data sets including mean, median, range, and shape of distribution (in general terms)	○	○	○
d)	Interpreting data sets (e.g., draw conclusions, make predictions, and estimate values between and beyond given data points)	○	○	○
e)	Data displays that could lead to misinterpretation (e.g., inappropriate grouping and misleading or distorted scales)	○	○	○
f)	Using data from experiments to predict chances of future outcomes	○	○	○
g)	Using the chances of a particular outcome to solve problems	○	○	○

Calculators and Computers in the TIMSS Class

21

Are the students in the TIMSS class permitted to use calculators during mathematics lessons?

*Fill in **one** circle only*

Yes, with unrestricted use - ○

Yes, with restricted use - ○

No, calculators are not permitted - - - - - - - - - - - - - ○

*If **No**, please go to question **23*** ➡

22

How often do students in the TIMSS class use calculators in their mathematics lessons for the following activities?

*Fill in **one** circle for each row*

		Every or almost every lesson	About half the lessons	Some lessons	Never
a)	Check answers	○	○	○	○
b)	Do routine computations	○	○	○	○
c)	Solve complex problems	○	○	○	○
d)	Explore number concepts	○	○	○	○

23

A. Do students in the TIMSS class have computer(s) available to use during their mathematics lessons?

*Fill in **one** circle only* - ○ Yes - - - ○ No

*If **No**, please go to question **25*** ➡

B. Do any of the computer(s) have access to the Internet?

*Fill in **one** circle only* - ○ Yes - - - ○ No

24

In teaching mathematics to the TIMSS class, how often do you have students use a computer for the following activities?

*Fill in **one** circle for each row*

		Every or almost every lesson	About half the lessons	Some lessons	Never
a)	Discover mathematics principles and concepts	○	○	○	○
b)	Practice skills and procedures	○	○	○	○
c)	Look up ideas and information	○	○	○	○
d)	Process and analyze data	○	○	○	○

Homework

25

Do you assign mathematics homework to the TIMSS class?

Fill in **one** *circle only* - ○ - - - ○
                                            Yes No

If **No,** *please go to question* **30**

26

How often do you usually assign mathematics homework to the TIMSS class?

Fill in **one** *circle only*

Every or almost every lesson - - - - - - - - - - - - - - - - - - ○

About half the lessons - ○

Some lessons - ○

27

When you assign mathematics homework to the TIMSS class, about how many minutes do you usually assign? (Consider the time it would take an average student in your class.)

Fill in **one** *circle only*

Fewer than 15 minutes - ○

15-30 minutes - ○

31-60 minutes - ○

61-90 minutes - ○

More than 90 minutes - ○

28

How often do you assign the following kinds of mathematics homework to the TIMSS class?

Fill in **one** *circle for each row*

	Always or almost always	Sometimes	Never or almost never
a) Doing problem/question sets	○	○	○
b) Gathering data and reporting	○	○	○
c) Finding one or more applications of the content covered	○	○	○

29

How often do you do the following with the mathematics homework assignments for the TIMSS class?

Fill in **one** *circle for each row*

|	Always or almost always	Sometimes	Never or almost never
a) Monitor whether or not the homework was completed	○	○	○
b) Correct assignments and then give feedback to students	○	○	○
c) Have students correct their own homework in class	○	○	○
d) Use the homework as a basis for class discussion	○	○	○
e) Use the homework to contribute towards students' grades or marks	○	○	○

Assessment

30

How much emphasis do you place on the following sources to monitor students' progress in mathematics?

*Fill in **one** circle for each row*

No emphasis
Little emphasis
Some emphasis
Major emphasis
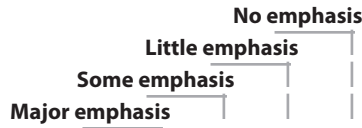
a) Classroom tests (for example, teacher made or textbook tests) - - - - - - - - ◯ - - ◯ - - ◯ - - - ◯

b) National or regional achievement tests - - - - - - - - ◯ - - ◯ - - ◯ - - - ◯

c) Your professional judgement - - - - - - - - - - - - - ◯ - - ◯ - - ◯ - - - ◯

31

How often do you give a mathematics test or examination to the TIMSS class?

*Fill in **one** circle only*

About once a week - ◯

About every two weeks - ◯

About once a month - ◯

A few times a year - ◯

Never - - - - - - - - - - - - ◯

*If **Never**, you have completed the questionnaire* ●

32

**What item formats do you typically use in your mathematics tests or examinations?**

*Fill in **one** circle only*

Only constructed-response - ◯

Mostly constructed-response - - - - - - - - - - - - - - - - - - ◯

About half constructed-response and half objective (e.g., multiple-choice) - ◯

Mostly objective - ◯

Only objective - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - ◯

33

How often do you include the following types of questions in your mathematics tests or examinations?

*Fill in **one** circle for each row*

Never or almost never
Sometimes
Always or almost always
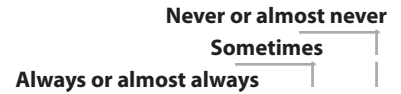
a) Questions based on recall of facts and procedures - - - - - - - - ◯ - - ◯ - - - ◯

b) Questions involving application of mathematical procedures - - - - - - - - - - - - - - - - - - ◯ - - ◯ - - - ◯

c) Questions involving searching for patterns and relationships - - - - - - - - - - - - - ◯ - - ◯ - - - ◯

d) Questions requiring explanations or justifications - - - - - - - - - - - - - - - - - - ◯ - - ◯ - - - ◯

Thank You

for completing this questionnaire

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

Teacher Questionnaire

MATHEMATICS
<Grade 8>