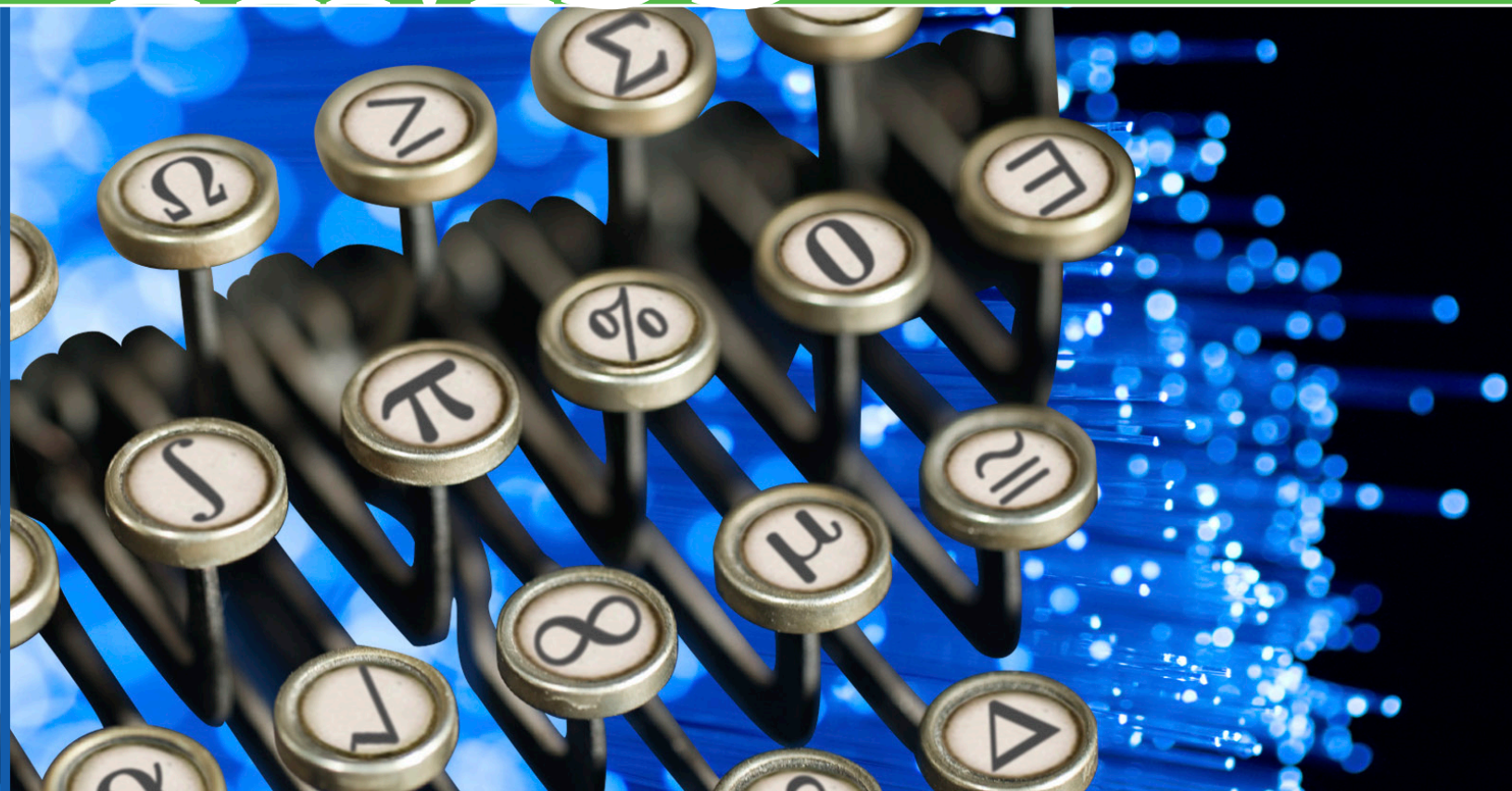


TRENDS IN INTERNATIONAL MATHEMATICS AND SCIENCE STUDY

TIMSS



TIMSS Advanced 2008 User Guide

for the International Database

Supplement 1

International Version of the TIMSS Advanced 2008
Background and Curriculum Questionnaires



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

Copyright © 2009 International Association for the Evaluation of Educational Achievement (IEA)

TIMSS Advanced 2008 User Guide for the International Database

Edited by Pierre Foy and Alka Arora

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

Library of Congress Catalog Card Number: 2009902654

ISBN: 1-889938-57-2

For more information about TIMSS contact:

TIMSS & PIRLS International Study Center

Lynch School of Education

Boston College

Chestnut Hill, MA 02467

United States

tel: +1-617-552-1600

fax: +1-617-552-1203

e-mail: timss@bc.edu

<http://timssandpirls.bc.edu>

Boston College is an equal opportunity, affirmative action employer.

Supplement 1

International Version of the TIMSS Advanced 2008 Background and Curriculum Questionnaires

Overview

The TIMSS Advanced 2008 international database includes data for all questionnaires administered as part of the TIMSS Advanced 2008 assessment. This supplement contains the international version of the TIMSS Advanced 2008 background questionnaires and curriculum questionnaires in the following seven sections:



- Section 1: Advanced Mathematics Student Questionnaire
- Section 2: Physics Student Questionnaire
- Section 3: Advanced Mathematics Teacher Questionnaire
- Section 4: Physics Teacher Questionnaire
- Section 5: School Questionnaire
- Section 6: Advanced Mathematics Curriculum Questionnaire
- Section 7: Physics Curriculum Questionnaire

Each section contains a table that lists detailed information for each question, followed by the international version of the questionnaire with variable names labeled in the margin. Although there was only one school questionnaire for TIMSS Advanced 2008, there are two sets of variables included—one for advanced mathematics and one for physics—since the international database includes separate school files for both populations.

The TIMSS Advanced 2008 questionnaires were designed to provide an opportunity for individual countries to make modifications to some questions or response options. This allowed countries to include the appropriate

wording or options most consistent with their own national systems. In the international version of the questionnaires, such questions contain instructions to the National Research Coordinators (NRCs) to substitute the appropriate wording for their country and to modify or delete any inappropriate questions or options. These instructions were indicated in the questionnaires by text inserted within carets (<country-specific>). The NRC was to substitute, if necessary, an appropriate national adaptation that would retain the same basic interpretation as the text within carets. These national adaptations of the background questionnaires are documented in Supplement 2.

STUDENT QUESTIONNAIRE – ADVANCED MATHEMATICS

<p style="text-align: center; font-size: small;">TRENDS IN INTERNATIONAL MATHEMATICS AND SCIENCE STUDY</p> <h1 style="text-align: center; margin: 0;">TIMSS Advanced</h1> <div style="background-color: #cccccc; width: 150px; height: 50px; display: flex; align-items: center; justify-content: center; font-size: 48px; font-weight: bold; color: white;">2008</div> <div style="text-align: center; margin-top: 20px;"><p style="font-size: 24px; margin: 0;">$x \rightarrow \infty$</p><p style="font-size: 24px; margin: 0;">π</p><p style="font-size: 24px; margin: 0;">$1)(x^2 - 2x) + (1 - x^2)(x^3 +$</p></div>	<p>Identification Label _____</p> <div style="border: 1px solid black; padding: 5px; margin-top: 5px;"><p>Student ID: <input style="width: 100%;" type="text"/></p><p>Student Name: <input style="width: 100%;" type="text"/></p></div>
<p style="font-size: 18px; font-weight: bold; margin: 0;">Student Questionnaire</p> <p style="font-size: 18px; font-weight: bold; margin: 0;">Advanced Mathematics</p> <p style="font-size: 12px; margin-top: 20px;"><TIMSS Advanced National Research Center Name> <Address></p>	
<div style="display: flex; justify-content: space-between; align-items: center;"><div style="text-align: center;"><p style="font-size: 10px;">International Association for the Evaluation of Educational Achievement © Copyright IEA, 2008</p></div><div style="text-align: center;"></div></div>	

STUDENT QUESTIONNAIRE – ADVANCED MATHEMATICS

General Directions

In this questionnaire, you will find questions about yourself. Some questions ask for facts while other questions ask for your opinions.

Read each question carefully and answer as accurately as possible. You may ask for help if you do not understand something or are not sure how to respond.

Each question is followed by a number of answers. Fill in the circle next to the answer of your choice as shown in the example below.

Example

How often do you do these things?

Fill in **one** circle for each line

	Every day ↓	At least once a week ↓	Once or twice a month ↓	A few times a year ↓	Never ↓
a) I listen to music -----	① -----	② -----	● -----	④ -----	⑤ -----
b) I talk with my friends -----	● -----	② -----	③ -----	④ -----	⑤ -----
c) I play sports -----	① -----	● -----	③ -----	④ -----	⑤ -----

Read each question carefully, and pick the answer you think is best. Fill in the circle next to or below your answer. If you decide to change an answer to a question, put an “x” over your first choice, and then fill in the circle for your new choice. Ask for help if you do not understand something or are not sure how to answer.

Thank you for your time, effort, and thought in completing this questionnaire.

STUDENT QUESTIONNAIRE – ADVANCED MATHEMATICS

About You

1

When were you born?

A. Fill in the circle next to the year you were born

Year

1986 - ☐

1987 - ☐

1988 - ☐

1989 - ☐

1990 - ☐

1991 - ☐

1992 - ☐

1993 - ☐

Other - ☐

B. Fill in the circle next to the month you were born

Month

January - ☐

February - ☐

March - ☐

April - ☐

May - ☐

June - ☐

July - ☐

August - ☐

September - ☐

October - ☐

November - ☐

December - ☐

2

Are you a female or a male?

Fill in **one** circle only

Female - ①

Male - ②

STUDENT QUESTIONNAIRE – ADVANCED MATHEMATICS

MS2GOLAN

3

How often do you speak <language of test> at home?

Fill in **one** circle only

Always ----- ①

Almost always ----- ②

Sometimes ----- ③

Never ----- ④

MS2GBOOK

4

About how many books are there in your home? (Do not count magazines, newspapers, or your school books.)

Fill in **one** circle only

None or very few
(0-10 books)----- ①

Enough to fill one shelf
(11-25 books)----- ②

Enough to fill one bookcase
(26-100 books)----- ③

Enough to fill two bookcases
(101-200 books)----- ④

Enough to fill three or more bookcases
(more than 200 books)----- ⑤

STUDENT QUESTIONNAIRE – ADVANCED MATHEMATICS

About You (Continued)

5

Do you have any of these things at your home?

Fill in **one** circle for each line

Yes No
↓ ↓

MS2GTH01

a) Computer (do not include PlayStation®, GameCube®, Xbox®, or other TV/video game computers) - ① ----- ②

MS2GTH02

b) Internet connection ----- ① ----- ②

MS2GTH03

c) Your own computer ----- ① ----- ②

MS2GTH04

d) Your own graphing calculator ----- ① ----- ②

MS2GTH05

e) Study desk/table for your use ----- ① ----- ②

MS2GTH06

f) <country-specific> ----- ① ----- ②

MS2GTH07

g) <country-specific> ----- ① ----- ②

MS2GTH08

h) <country-specific> ----- ① ----- ②

MS2GTH09

i) <country-specific> ----- ① ----- ②

STUDENT QUESTIONNAIRE – ADVANCED MATHEMATICS

MS2GHLEM

6

A. What is the highest level of education completed by your mother (or stepmother or female guardian)?

Fill in **one** circle only

- Some <ISCED Level 1 or 2 > or did not
go to school ----- ①
- <ISCED 2>----- ②
- <ISCED 3>----- ③
- <ISCED 4>----- ④
- <ISCED 5B> ----- ⑤
- <ISCED 5A, first degree> ----- ⑥
- Beyond <ISCED 5A, first degree> ----- ⑦
- I don't know ----- ⑧

MS2GHLEF

B. What is the highest level of education completed by your father (or stepfather or male guardian)?

Fill in **one** circle only

- Some <ISCED Level 1 or 2 > or did not
go to school ----- ①
- <ISCED 2>----- ②
- <ISCED 3>----- ③
- <ISCED 4>----- ④
- <ISCED 5B> ----- ⑤
- <ISCED 5A, first degree> ----- ⑥
- Beyond <ISCED 5A, first degree> ----- ⑦
- I don't know ----- ⑧

STUDENT QUESTIONNAIRE – ADVANCED MATHEMATICS

About You (Continued)

7

MS2GMBRN

A. Was your mother (or stepmother or female guardian) born in <country>?

Yes

No

Fill in **one** circle only ----- ① ----- ②

MS2GFBRN

B. Was your father (or stepfather or male guardian) born in <country>?

Yes

No

Fill in **one** circle only ----- ① ----- ②


8

MS2GBORN

A. Were you born in <country>?

Yes

No

Fill in **one** circle only ----- ① ----- ②If Yes, please go to question 9 

MS2GBRNC

B. If you were not born in <country>, how old were you when you came to <country>?

Fill in **one** circle only

Older than 10 years old ----- ①

5 to 10 years old ----- ②

Younger than 5 years old ----- ③

STUDENT QUESTIONNAIRE – ADVANCED MATHEMATICS

MS2GITCE

9

After <secondary school>, do you intend to continue your education?

Fill in **one** circle only

- Yes ----- ①
 Yes, but not immediately ----- ②
 No ----- ③

If **No**, please go to question 11 →

MS2GIAOS

10

If you plan to continue your education, which of the following comes closest to the area you intend to study most?

Fill in **one** circle only

- a) SCIENCE (e.g., physics, chemistry, biological, earth sciences) ----- ①
 b) HEALTH SCIENCES (e.g., dentistry, medicine, pharmacy, veterinary medicine) ----- ②
 c) ENGINEERING (e.g., chemical engineering, civil engineering, electrical engineering, mechanical engineering) ----- ③
 d) BUSINESS (e.g., accounting, marketing, finance, administration, management) ----- ④
 e) COMPUTER and INFORMATION SCIENCES (e.g., systems analyst) --- ⑤
 f) MATHEMATICS (e.g., calculus, statistics) ----- ⑥
 g) SOCIAL SCIENCES (e.g., psychology, economics, sociology, law) ----- ⑦
 h) OTHER FIELD OF STUDY ----- ⑧

STUDENT QUESTIONNAIRE – ADVANCED MATHEMATICS

Using Computers

11

MS2GTUSC

A. How much time each day, on average, do you spend using a computer? (Do not include PlayStation®, GameCube®, Xbox®, or other TV/video game computers.)

	No time	Less than 1 hour	1-2 hours	More than 2 but less than 4 hours	4 or more hours
	↓	↓	↓	↓	↓
Fill in one circle only -----	① -----	② -----	③ -----	④ -----	⑤ -----

If **No Time**, please go to question 12 →

B. Where do you use a computer?

Fill in **one** circle for each line

MS2GCHOM

MS2GCSCCH

MS2GCELS

	A lot	Sometimes	Never
	↓	↓	↓
a) At home -----	① -----	② -----	③ -----
b) At school -----	① -----	② -----	③ -----
c) Elsewhere (e.g., public library, friend's home, Internet café) -----	① -----	② -----	③ -----

C. When you use a computer for your schoolwork, what do you use it for?

Fill in **one** circle for each line

MS2GCSRI

MS2GCSWP

MS2GCSAD

MS2GCSSP

MS2GCSOT

	Yes	No
	↓	↓
a) Researching information from the Internet -----	① -----	② -----
b) Word processing -----	① -----	② -----
c) Analyzing and presenting data (e.g., spreadsheets, graphing) -----	① -----	② -----
d) Using specialized programs (e.g., simulations, algebra programs) -----	① -----	② -----
e) Other -----	① -----	② -----

STUDENT QUESTIONNAIRE – ADVANCED MATHEMATICS

Things You Do Outside of School

12

On a normal school day, how much time, on average, do you spend before or after school doing each of these things?

Fill in **one** circle for each line

No time	Less than 1 hour	1-2 hours	More than 2 but less than 4 hours	4 or more hours
↓	↓	↓	↓	↓

MS2GSTSW

a) I do schoolwork (study or homework) ----- ① ----- ② ----- ③ ----- ④ ----- ⑤

MS2GSTAC

b) I take part in organized activities (e.g., sports, music, clubs, community service, etc.) ----- ① ----- ② ----- ③ ----- ④ ----- ⑤

MS2GSTUC

c) I use a computer for things other than schoolwork (e.g., messaging, email, gaming, music, etc.) ----- ① ----- ② ----- ③ ----- ④ ----- ⑤

MS2GSTFR

d) I spend time with friends ----- ① ----- ② ----- ③ ----- ④ ----- ⑤

MS2GSTPJ

e) I work at a paid job ----- ① ----- ② ----- ③ ----- ④ ----- ⑤

MS2GSTTV

f) I watch movies or television ----- ① ----- ② ----- ③ ----- ④ ----- ⑤

STUDENT QUESTIONNAIRE – ADVANCED MATHEMATICS

Mathematics in School

13

Why are you studying advanced mathematics?

Please indicate how important each reason was for you.

Fill in **one** circle for each line

Very important	Important	Unimportant	Very unimportant
↓	↓	↓	↓

MS2MWSEC

a) I enjoy solving mathematical problems----- ① ----- ② ----- ③ ----- ④

MS2MWSWM

b) I usually do well in mathematics ---- ① ----- ② ----- ③ ----- ④

MS2MWSMI

c) Advanced mathematics lessons are interesting ----- ① ----- ② ----- ③ ----- ④

MS2MWSLT

d) Studying or doing mathematics homework does not take me a lot of time ----- ① ----- ② ----- ③ ----- ④

MS2MWSPC

e) I need advanced mathematics to pursue the career of my choice ----- ① ----- ② ----- ③ ----- ④

MS2MWSGT

f) Advanced mathematics has good teachers ----- ① ----- ② ----- ③ ----- ④

MS2MWSPA

g) My parents advised me to study advanced mathematics ----- ① ----- ② ----- ③ ----- ④

MS2MWSEP

h) I expect that I will easily pass the tests ① ----- ② ----- ③ ----- ④

MS2MWSWT

i) I like the way advanced mathematics is taught in my school ----- ① ----- ② ----- ③ ----- ④

MS2MWSMO

j) Studying advanced mathematics will give me more options after finishing <secondary school> ----- ① ----- ② ----- ③ ----- ④

MS2MWSTA

k) A teacher advised me to study advanced mathematics ----- ① ----- ② ----- ③ ----- ④

MS2MWSFA

l) My friends also are studying advanced mathematics ----- ① ----- ② ----- ③ ----- ④

MS2MWSMA

m) The <study coordinator/mentor> of my school advised me to study advanced mathematics ----- ① ----- ② ----- ③ ----- ④

STUDENT QUESTIONNAIRE – ADVANCED MATHEMATICS

14

MS2MHMMW

A. How much time do you spend in mathematics class each week?

Write in the number of **minutes**

Please convert the number of classes/periods into minutes.

MS2MPHCO

B. Are you taking or have you taken <the physics track/course that defines the physics population>?

Yes

No

Fill in **one** circle only ----- ① ----- ②

15

How often do you do these activities in your mathematics lessons?

Fill in **one** circle for each line

Every or
almost
every
lesson

About
half the
lessons

Some
lessons

Never

MS2MACLT

a) We listen to the teacher present new material ----- ① ----- ② ----- ③ ----- ④

MS2MACWP

b) We work problems on our own ----- ① ----- ② ----- ③ ----- ④

MS2MACWT

c) We work on problems together with other students ----- ① ----- ② ----- ③ ----- ④

MS2MACRT

d) We review what has been taught ----- ① ----- ② ----- ③ ----- ④

MS2MACRH

e) We review homework ----- ① ----- ② ----- ③ ----- ④

MS2MACTQ

f) We have oral or written tests or quizzes ----- ① ----- ② ----- ③ ----- ④

STUDENT QUESTIONNAIRE – ADVANCED MATHEMATICS

Mathematics in School (Continued)

16

How often do you do the following in your mathematics lessons?

Fill in **one** circle for each line

Every or almost every lesson	About half the lessons	Some lessons	Never
↓	↓	↓	↓

MS2MDL01

a) We memorize formulas and procedures ----- ① ----- ② ----- ③ ----- ④

MS2MDL02

b) We solve problems like the examples
in our textbook ----- ① ----- ② ----- ③ ----- ④

MS2MDL03

c) We use mathematical terms to
represent relationships ----- ① ----- ② ----- ③ ----- ④

MS2MDL04

d) We discuss problem-solving strategies ----- ① ----- ② ----- ③ ----- ④

MS2MDL05

e) We decide on our own procedures for solving
complex problems ----- ① ----- ② ----- ③ ----- ④

MS2MDL06

f) We communicate our arguments ----- ① ----- ② ----- ③ ----- ④

MS2MDL07

g) We watch the teacher demonstrate
mathematics on a computer ----- ① ----- ② ----- ③ ----- ④

STUDENT QUESTIONNAIRE – ADVANCED MATHEMATICS

17

A. How often do you use the following in your mathematics lessons?

Fill in **one** circle for each line

Every or almost every lesson	About half the lessons	Some lessons	Never
↓	↓	↓	↓

- | | | | | |
|-------------------------------------|---|---|---|---|
| a) Calculator ----- | ① | ② | ③ | ④ |
| b) Computer ----- | ① | ② | ③ | ④ |
| c) Other computing technology ----- | ① | ② | ③ | ④ |

B. If you use a calculator in your mathematics lessons, what kind of calculator do you usually use?

Fill in **one** circle only

- | | |
|--------------------------------------------------------------------------------------------------------------------------------------|---|
| Simple calculator – basic functions only
(+, −, ×, ÷, %, or $\sqrt{}$), without functions
like log, sin, cos ----- | ① |
| Scientific calculator – basic functions
(+, −, ×, ÷, %, or $\sqrt{}$) and also functions
like log, sin, cos ----- | ② |
| Graphing calculator – scientific and also
able to display some graphs ----- | ③ |
| Symbolic calculator – graphing and also
able to solve expressions in symbolic terms ----- | ④ |

STUDENT QUESTIONNAIRE – ADVANCED MATHEMATICS

Homework

18

MS2MHTIM

A. How much time do you spend doing mathematics homework assignments each week?

Write in the number of **minutes**

Please convert the number of hours into minutes.

B. When doing mathematics homework, how often do you do each of the following?

Fill in **one** circle for each line

Always or
almost
always
↓

Sometimes
↓

Never or
almost
never
↓

MS2MHPQS

a) Problem/question sets ----- ① ----- ② ----- ③

MS2MHRTB

b) Read the textbook ----- ① ----- ② ----- ③

MS2MHMFP

c) Memorize formulas and
procedures ----- ① ----- ② ----- ③

19

MS2MUCOC

How often do you use a computer to work on mathematics outside of class?

Fill in **one** circle only

Almost every day ----- ①

Once or twice a week ----- ②

About once a month ----- ③

Never or almost never ----- ④

STUDENT QUESTIONNAIRE – ADVANCED MATHEMATICS

MS2MWTUT

20

How often do you work with a mathematics tutor?

Fill in **one** circle only

More than once a week -----

About once a week -----

About once a month -----

Once in a while when I need extra help ---

Never -----

①

②

③

④

⑤

MS2MPRET

21

How often do you prepare for a mathematics test or examination?

Fill in **one** circle only

About once a week -----

About once a month -----

About 5 times a year -----

About twice a year -----

Never -----

①

②

③

④

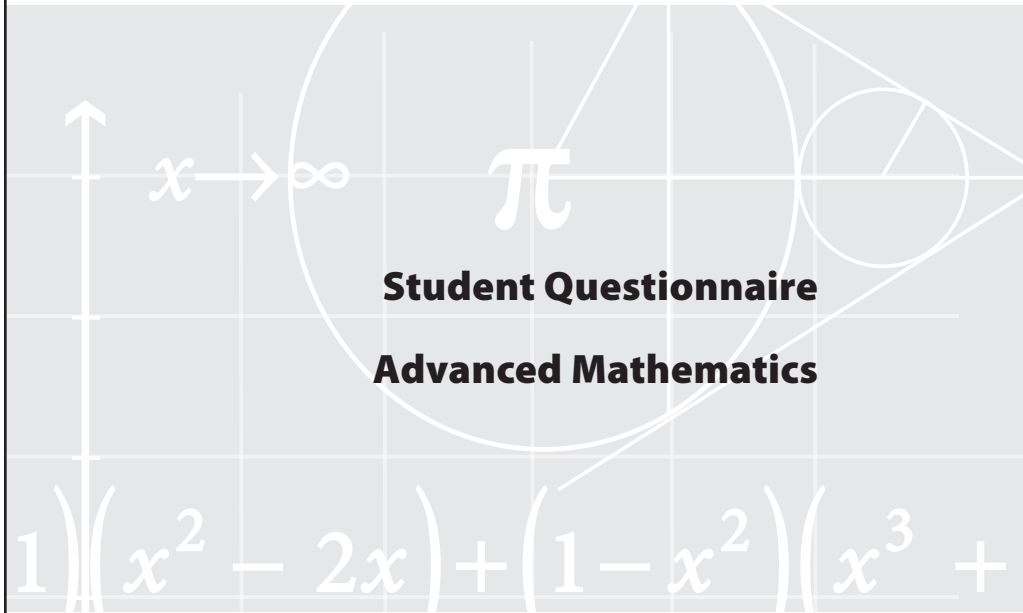
⑤

Thank You
for completing
this questionnaire

STUDENT QUESTIONNAIRE – ADVANCED MATHEMATICS



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



STUDENT QUESTIONNAIRE – PHYSICS

<p style="text-align: center; font-size: small;">TRENDS IN INTERNATIONAL MATHEMATICS AND SCIENCE STUDY</p> <h1 style="text-align: center; margin: 0;">TIMSS Advanced</h1> <h1 style="text-align: center; margin: 0; background-color: #cccccc; color: white; padding: 5px 20px;">2008</h1> <p style="text-align: center; font-weight: bold; margin-top: 20px;">Student Questionnaire</p> <hr/> <p style="text-align: center; font-weight: bold;">Physics</p>	<p>Identification Label _____</p> <p>Student ID: <input style="width: 150px;" type="text"/></p> <p>Student Name: <input style="width: 150px;" type="text"/></p>
------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------

<TIMSS Advanced National Research Center Name>
<Address>

International Association for the Evaluation
of Educational Achievement
© Copyright IEA, 2008

STUDENT QUESTIONNAIRE – PHYSICS

General Directions

In this questionnaire, you will find questions about yourself. Some questions ask for facts while other questions ask for your opinions.

Read each question carefully and answer as accurately as possible. You may ask for help if you do not understand something or are not sure how to respond.

Each question is followed by a number of answers. Fill in the circle next to the answer of your choice as shown in the example below.

Example

How often do you do these things?

Fill in **one** circle for each line

	Every day ↓	At least once a week ↓	Once or twice a month ↓	A few times a year ↓	Never ↓
a) I listen to music -----	① -----	② -----	● -----	④ -----	⑤ -----
b) I talk with my friends -----	● -----	② -----	③ -----	④ -----	⑤ -----
c) I play sports -----	① -----	● -----	③ -----	④ -----	⑤ -----

Read each question carefully, and pick the answer you think is best. Fill in the circle next to or below your answer. If you decide to change an answer to a question, put an “x” over your first choice, and then fill in the circle for your new choice. Ask for help if you do not understand something or are not sure how to answer.

Thank you for your time, effort, and thought in completing this questionnaire.

STUDENT QUESTIONNAIRE – PHYSICS

About You

1

When were you born?

A. Fill in the circle next to the
year you were born

Year

1986 - ☐1987 - ☐1988 - ☐1989 - ☐1990 - ☐1991 - ☐1992 - ☐1993 - ☐Other - ☐B. Fill in the circle next to the
month you were born

Month

January - ☐February - ☐March - ☐April - ☐May - ☐June - ☐July - ☐August - ☐September - ☐October - ☐November - ☐December - ☐

2

Are you a female or a male?

Fill in **one** circle only

Female ----- ①

Male----- ②

PS2GBRTY

PS2GBRTM

PS2GSEX

STUDENT QUESTIONNAIRE – PHYSICS

PS2GOLAN

3

How often do you speak <language of test> at home?

Fill in **one** circle only

- Always ----- ①
 Almost always ----- ②
 Sometimes ----- ③
 Never ----- ④

PS2GBOOK

4

About how many books are there in your home? (Do not count magazines, newspapers, or your school books.)

Fill in **one** circle only

- None or very few
 (0-10 books)----- ①
 Enough to fill one shelf
 (11-25 books)----- ②
 Enough to fill one bookcase
 (26-100 books)----- ③
 Enough to fill two bookcases
 (101-200 books)----- ④
 Enough to fill three or more bookcases
 (more than 200 books)----- ⑤

STUDENT QUESTIONNAIRE – PHYSICS

About You (Continued)

5

Do you have any of these things at your home?

Fill in **one** circle for each line

Yes	No
↓	↓

PS2GTH01

a) Computer (do not include PlayStation®, GameCube®, XBox®, or other TV/video game computers) - ① ----- ②

PS2GTH02

b) Internet connection ----- ① ----- ②

PS2GTH03

c) Your own computer ----- ① ----- ②

PS2GTH04

d) Your own graphing calculator ----- ① ----- ②

PS2GTH05

e) Study desk/table for your use ----- ① ----- ②

PS2GTH06

f) <country-specific> ----- ① ----- ②

PS2GTH07

g) <country-specific> ----- ① ----- ②

PS2GTH08

h) <country-specific> ----- ① ----- ②

PS2GTH09

i) <country-specific> ----- ① ----- ②

STUDENT QUESTIONNAIRE – PHYSICS

PS2GHLEM

6

A. What is the highest level of education completed by your mother (or stepmother or female guardian)?

Fill in **one** circle only

- Some <ISCED Level 1 or 2 > or did not
go to school ----- ①
- <ISCED 2>----- ②
- <ISCED 3>----- ③
- <ISCED 4>----- ④
- <ISCED 5B> ----- ⑤
- <ISCED 5A, first degree> ----- ⑥
- Beyond <ISCED 5A, first degree> ----- ⑦
- I don't know ----- ⑧

PS2GHLEF

B. What is the highest level of education completed by your father (or stepfather or male guardian)?

Fill in **one** circle only

- Some <ISCED Level 1 or 2 > or did not
go to school ----- ①
- <ISCED 2>----- ②
- <ISCED 3>----- ③
- <ISCED 4>----- ④
- <ISCED 5B> ----- ⑤
- <ISCED 5A, first degree> ----- ⑥
- Beyond <ISCED 5A, first degree> ----- ⑦
- I don't know ----- ⑧

STUDENT QUESTIONNAIRE – PHYSICS

About You (Continued)

7

PS2GMBRN

A. Was your mother (or stepmother or female guardian) born in <country>?

Yes

No

Fill in **one** circle only ----- ① ----- ②

PS2GFBRN

B. Was your father (or stepfather or male guardian) born in <country>?

Yes

No

Fill in **one** circle only ----- ① ----- ②


8

PS2GBORN

A. Were you born in <country>?

Yes

No

Fill in **one** circle only ----- ① ----- ②If **Yes**, please go to question 9 

PS2GBRNC

B. If you were not born in <country>, how old were you when you came to <country>?

Fill in **one** circle only

Older than 10 years old ----- ①

5 to 10 years old ----- ②

Younger than 5 years old ----- ③

STUDENT QUESTIONNAIRE – PHYSICS

PS2GITCE

9

After <secondary school>, do you intend to continue your education?

Fill in **one** circle only

- Yes ----- ①
 Yes, but not immediately ----- ②
 No ----- ③

If **No**, please go to question 11 →

PS2GIAOS

10

If you plan to continue your education, which of the following comes closest to the area you intend to study most?

Fill in **one** circle only

- a) SCIENCE (e.g., physics, chemistry, biological, earth sciences) ----- ①
 b) HEALTH SCIENCES (e.g., dentistry, medicine, pharmacy, veterinary medicine) ----- ②
 c) ENGINEERING (e.g., chemical engineering, civil engineering, electrical engineering, mechanical engineering) ----- ③
 d) BUSINESS (e.g., accounting, marketing, finance, administration, management) ----- ④
 e) COMPUTER and INFORMATION SCIENCES (e.g., systems analyst) --- ⑤
 f) MATHEMATICS (e.g., calculus, statistics) ----- ⑥
 g) SOCIAL SCIENCES (e.g., psychology, economics, sociology, law) ----- ⑦
 h) OTHER FIELD OF STUDY ----- ⑧

STUDENT QUESTIONNAIRE – PHYSICS

Using Computers

11

PS2GTUSC

A. How much time each day, on average, do you spend using a computer? (Do not include PlayStation®, GameCube®, Xbox®, or other TV/video game computers.)

	No time	Less than 1 hour	1-2 hours	More than 2 but less than 4 hours	4 or more hours
	↓	↓	↓	↓	↓
Fill in one circle only -----	①	②	③	④	⑤

If **No Time**, please go to question 12 →

B. Where do you use a computer?

Fill in **one** circle for each line

PS2GCHOM

PS2GCSCH

PS2GCELS

	A lot	Sometimes	Never
	↓	↓	↓
a) At home -----	①	②	③
b) At school -----	①	②	③
c) Elsewhere (e.g., public library, friend's home, Internet café) -----	①	②	③

C. When you use a computer for your schoolwork, what do you use it for?

Fill in **one** circle for each line

PS2GCSRI

PS2GCSWP

PS2GCSAD

PS2GCSSP

PS2GCSOT

	Yes	No
	↓	↓
a) Researching information from the Internet -----	①	②
b) Word processing -----	①	②
c) Analyzing and presenting data (e.g., spreadsheets, graphing) -----	①	②
d) Using specialized programs (e.g., simulations, algebra programs) -----	①	②
e) Other -----	①	②

STUDENT QUESTIONNAIRE – PHYSICS

Things You Do Outside of School

12

On a normal school day, how much time, on average, do you spend before or after school doing each of these things?

Fill in **one** circle for each line

No time	Less than 1 hour	1-2 hours	More than 2 but less than 4 hours	4 or more hours
↓	↓	↓	↓	↓

PS2GSTSW

a) I do schoolwork (study or homework) ----- ① ----- ② ----- ③ ----- ④ ----- ⑤

PS2GSTAC

b) I take part in organized activities (e.g., sports, music, clubs, community service, etc.) ----- ① ----- ② ----- ③ ----- ④ ----- ⑤

PS2GSTUC

c) I use a computer for things other than schoolwork (e.g., messaging, email, gaming, music, etc.) ----- ① ----- ② ----- ③ ----- ④ ----- ⑤

PS2GSTFR

d) I spend time with friends ----- ① ----- ② ----- ③ ----- ④ ----- ⑤

PS2GSTPJ

e) I work at a paid job ----- ① ----- ② ----- ③ ----- ④ ----- ⑤

PS2GSTTV

f) I watch movies or television ----- ① ----- ② ----- ③ ----- ④ ----- ⑤

STUDENT QUESTIONNAIRE – PHYSICS

Physics in School

13

Why are you studying physics?

Please indicate how important each reason was for you.

Fill in **one** circle for each line

Very important	Important	Unimportant	Very unimportant
↓	↓	↓	↓

PS2PWSEC

a) I enjoy conducting experiments or investigations for physics ----- ① ----- ② ----- ③ ----- ④

PS2PWSWP

b) I usually do well in physics ----- ① ----- ② ----- ③ ----- ④

PS2PWSPi

c) Physics lessons are interesting ----- ① ----- ② ----- ③ ----- ④

PS2PWSLT

d) Studying or doing physics homework does not take me a lot of time----- ① ----- ② ----- ③ ----- ④

PS2PWSPC

e) I need physics to pursue the career of my choice----- ① ----- ② ----- ③ ----- ④

PS2PWSGT

f) Physics has good teachers----- ① ----- ② ----- ③ ----- ④

PS2PWSPA

g) My parents advised me to study physics ----- ① ----- ② ----- ③ ----- ④

PS2PWSEP

h) I expect that I will easily pass the tests----- ① ----- ② ----- ③ ----- ④

PS2PWSWT

i) I like the way physics is taught in my school ----- ① ----- ② ----- ③ ----- ④

PS2PWSMO

j) Studying physics will give me more options after finishing <secondary school> ----- ① ----- ② ----- ③ ----- ④

PS2PWSTA

k) A teacher advised me to study physics ① ----- ② ----- ③ ----- ④

PS2PWSFA

l) My friends also are studying physics - ① ----- ② ----- ③ ----- ④

PS2PWSMA

m) The <study coordinator/mentor> of my school advised me to study physics----- ① ----- ② ----- ③ ----- ④

STUDENT QUESTIONNAIRE – PHYSICS

14

PS2PHMMW

A. How much time do you spend in physics class each week?

Write in the number of **minutes**

Please convert the number of classes/periods into minutes.

PS2PPHCO

B. Are you taking or have you taken <the advanced mathematics track/course that defines the advanced mathematics population>?

Yes
↓

No
↓

Fill in **one** circle only ----- ① ----- ②

15

How often do you do these activities in your physics lessons?

Fill in **one** circle for each line

Every or
almost
every
lesson
↓

About
half the
lessons
↓

Some
lessons
↓

Never
↓

PS2PACLT

a) We listen to the teacher present new material ----- ① ----- ② ----- ③ ----- ④

PS2PACWP

b) We work problems on our own ----- ① ----- ② ----- ③ ----- ④

PS2PACWT

c) We work on problems together with other students-- ① ----- ② ----- ③ ----- ④

PS2PACRT

d) We review what has been taught ----- ① ----- ② ----- ③ ----- ④

PS2PACRH

e) We review homework----- ① ----- ② ----- ③ ----- ④

PS2PACTQ

f) We have oral or written tests or quizzes ----- ① ----- ② ----- ③ ----- ④

STUDENT QUESTIONNAIRE – PHYSICS

Physics in School (Continued)

16

How often do you do the following in your physics lessons?

Fill in **one** circle for each line

Every or almost every lesson	About half the lessons	Some lessons	Never
↓	↓	↓	↓

- | | | | | | |
|----------|--------------------------------------------------------------------------|---|---|---|---|
| PS2PDL01 | a) We watch the teacher demonstrate an experiment or investigation ----- | ① | ② | ③ | ④ |
| PS2PDL02 | b) We conduct an experiment or investigation ----- | ① | ② | ③ | ④ |
| PS2PDL03 | c) We use laws and formulas of physics to solve problems ----- | ① | ② | ③ | ④ |
| PS2PDL04 | d) We give explanations about what we are studying --- | ① | ② | ③ | ④ |
| PS2PDL05 | e) We relate what we are learning in physics to our daily lives ----- | ① | ② | ③ | ④ |
| PS2PDL06 | f) We memorize formulas and procedures of physics -- | ① | ② | ③ | ④ |
| PS2PDL07 | g) We read our physics textbooks and other resource materials ----- | ① | ② | ③ | ④ |
| PS2PDL08 | h) We watch the teacher demonstrate physics on a computer----- | ① | ② | ③ | ④ |

STUDENT QUESTIONNAIRE – PHYSICS

17

A. How often do you use the following in your physics lessons?

Fill in **one** circle for each line

Every or almost every lesson	About half the lessons	Some lessons	Never
↓	↓	↓	↓

- | | | | | |
|-------------------------------------|---|---|---|---|
| a) Calculator ----- | ① | ② | ③ | ④ |
| b) Computer ----- | ① | ② | ③ | ④ |
| c) Other computing technology ----- | ① | ② | ③ | ④ |

B. If you use a calculator in your physics lessons, what kind of calculator do you usually use?

Fill in **one** circle only

- Simple calculator – basic functions only
(+, −, ×, ÷, %, or $\sqrt{\quad}$), without functions
like log, sin, cos ----- ①
- Scientific calculator – basic functions
(+, −, ×, ÷, %, or $\sqrt{\quad}$) and also functions
like log, sin, cos ----- ②
- Graphing calculator – scientific and also
able to display some graphs ----- ③
- Symbolic calculator – graphing and also
able to solve expressions in symbolic terms ----- ④

PS2PULCA
PS2PULCO
PS2PULOT

PS2PULKC

STUDENT QUESTIONNAIRE – PHYSICS

Homework

18

PS2PHTIM

A. How much time do you spend doing physics homework assignments each week?

Write in the number of **minutes**

Please convert the number of hours into minutes.

B. When doing physics homework, how often do you do each of the following?

Fill in **one** circle for each lineAlways or
almost
always
↓Sometimes
↓Never or
almost
never
↓

PS2PHPQS

a) Problem/question sets ----- ① ----- ② ----- ③

PS2PHRTB

b) Read the textbook ----- ① ----- ② ----- ③

PS2PHMFP

c) Memorize formulas and procedures - ① ----- ② ----- ③

19

PS2PUCOC

How often do you use a computer to work on physics outside of class?

Fill in **one** circle only

Almost every day ----- ①

Once or twice a week ----- ②

About once a month ----- ③

Never or almost never ----- ④

STUDENT QUESTIONNAIRE – PHYSICS

PS2PWTUT

20

How often do you work with a physics tutor?

Fill in **one** circle only

- More than once a week ----- ①
 About once a week ----- ②
 About once a month ----- ③
 Once in a while when I need extra help --- ④
 Never ----- ⑤

PS2PPRET

21

How often do you prepare for a physics test or examination?

Fill in **one** circle only

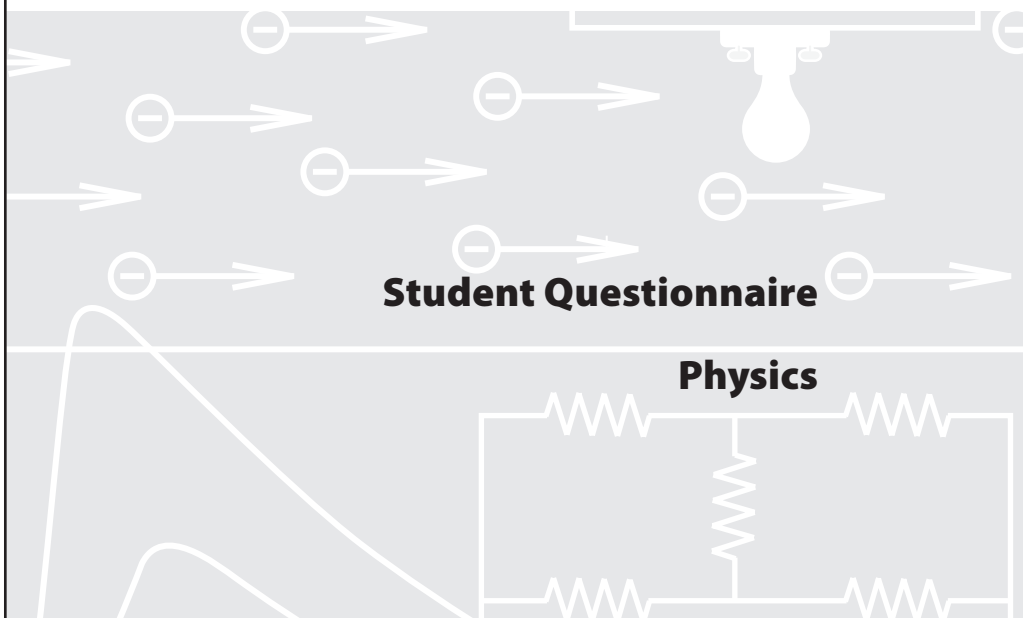
- About once a week ----- ①
 About once a month ----- ②
 About 5 times a year ----- ③
 About twice a year ----- ④
 Never ----- ⑤

Thank You
 for completing
 this questionnaire

STUDENT QUESTIONNAIRE – PHYSICS



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



Student Questionnaire

Physics

TEACHER QUESTIONNAIRE – ADVANCED MATHEMATICS

Identification Label _____

Teacher Name: _____

Class Name: _____

Teacher ID: _____ Teacher Link # _____

TRENDS IN INTERNATIONAL MATHEMATICS AND SCIENCE STUDY

TIMSS 2008 Advanced

Teacher Questionnaire

Advanced Mathematics

$$1) \left((x^2 - 2x) + (1 - x^2) \right) (x^3 +$$

<TIMSS Advanced National Research Center Name>

<Address>



International Association for the Evaluation
of Educational Achievement
© Copyright IEA, 2008



TEACHER QUESTIONNAIRE – ADVANCED MATHEMATICS

General Directions

Your school has agreed to participate in TIMSS Advanced 2008. 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 teaching and learning worldwide.

As part of the study, students in a nationwide sample of <twelfth-grade> classes in <country> will complete the TIMSS Advanced mathematics and/or physics tests. This questionnaire is addressed to the teachers of these students. As a teacher of one of the sampled classes, your responses to these questions are very important in helping to describe 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 will be tested as part of TIMSS Advanced 2008 in your school. It is important that you answer each question carefully so that the information 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 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.

TEACHER QUESTIONNAIRE – ADVANCED MATHEMATICS

Background Information

Preparation to Teach

MT2GAGE

1 **How old are you?**

Fill in **one** circle only

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

MT2GSEX

2 **Are you female or male?**

Fill in **one** circle only

- Female -----○
 Male -----○

MT2GTAUT

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

Number of years you have taught

MT2MTMAT

B. How many years will you have taught mathematics at the advanced level?

Number of years taught advanced mathematics

MT2MPCTM

4 **How long do you plan to continue teaching advanced mathematics?**

Fill in **one** circle only

- I plan to continue teaching as long as I can -----○
 I plan to continue teaching until the opportunity for a better job in education comes along -----○
 I plan to continue teaching for awhile but probably will leave the field of education -----○
 I am undecided at this time -----○

5 **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 -----○

MT2GFEDC

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

Fill in **one** circle for each row

- | | Yes | No |
|-----------------------------------|-----|----|
| a) Mathematics -----○ | ○ | ○ |
| b) Education - Mathematics -----○ | ○ | ○ |
| c) Physics -----○ | ○ | ○ |
| d) Education - Science -----○ | ○ | ○ |
| e) Engineering -----○ | ○ | ○ |
| f) Education - General -----○ | ○ | ○ |
| g) Other -----○ | ○ | ○ |

MT2GPSMA
 MT2GPSEM
 MT2GPSPH
 MT2GPSES
 MT2GPSEN
 MT2GPSEG
 MT2GPSOT

7 **Do you have a teaching license or certificate?**

Yes No

Fill in **one** circle only -----○

MT2GTLCE

TEACHER QUESTIONNAIRE – ADVANCED MATHEMATICS

Preparation to Teach (Continued)

8

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

Fill in **one** circle for each row

Not well prepared
Somewhat prepared
Very well prepared

A. Algebra

- a) Operations with complex numbers ☐ -- ☐ -- ☐
- b) The n^{th} term of numeric and algebraic series and the sums to n terms or infinity of series ☐ -- ☐ -- ☐
- c) Problems involving permutations, combinations, and probability ☐ -- ☐ -- ☐
- d) Linear, simultaneous, and quadratic equations and inequalities; surd (radical) equations, logarithmic, and exponential equations ☐ -- ☐ -- ☐
- e) Equivalent representations of functions as ordered pairs, tables, graphs, formulas, or words ☐ -- ☐ -- ☐
- f) Values of functions, including rational functions for given values and ranges of the variables; function of a function ☐ -- ☐ -- ☐

B. Calculus

- a) Limits of functions including rational functions; conditions for continuity and differentiability of functions ☐ -- ☐ -- ☐
- b) Differentiation of functions (including polynomial, exponential, logarithmic, trigonometric, rational, radical, composite, and parametric functions); differentiation of products and quotients ☐ -- ☐ -- ☐
- c) Using derivatives to solve problems (e.g., in kinematics, optimization, and rates of change) ☐ -- ☐ -- ☐
- d) Using first and second derivatives to determine gradient, turning points, and points of inflection of functions ☐ -- ☐ -- ☐
- e) Integrating functions (including polynomial, exponential, trigonometric, and rational functions); evaluating definite integrals ☐ -- ☐ -- ☐

C. Geometry

- a) Properties of geometric figures; proving geometric propositions in two and three dimensions ☐ -- ☐ -- ☐
- b) Gradients, y-axis intercepts, and points of intersection of straight lines in the Cartesian plane ☐ -- ☐ -- ☐
- c) Equations and properties of circles in the Cartesian plane; tangents and normals to given points on a circle ☐ -- ☐ -- ☐
- d) Trigonometric properties of triangles (sine, cosine, and tangent); solving equations involving trigonometric functions ☐ -- ☐ -- ☐
- e) Properties of vectors and their sums and differences ☐ -- ☐ -- ☐

TEACHER QUESTIONNAIRE – ADVANCED MATHEMATICS

Professional Development

9

In your school, 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 ----- ☐ -- ☐ -- ☐ -- ☐ -- ☐

MT2GOTDC

MT2GOTPM

MT2GOTVT

MT2GOTIO

11

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

Fill in **one** circle for each row

Yes No

- 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 ----- ☐ -- ☐

MT2MPDMT

MT2MPDMP

MT2MPDMC

MT2MPDIT

MT2MPDCT

MT2MPDMA

10

A. Are you a member of <professional organization for mathematics teachers>?

Yes No

Fill in **one** circle only ----- ☐ -- ☐

MT2MMPOM

B. In the past two years, have you regularly participated in activities sponsored by <professional organization for mathematics teachers>?

Yes No

Fill in **one** circle only ----- ☐ -- ☐

MT2MRPPO

12

In the past two years, have you taken part in any of the following activities in mathematics?

Fill in **one** circle for each row

Yes No

- a) I attended a workshop or conference --- ☐ -- ☐
- b) I gave a presentation at a workshop or conference ----- ☐ -- ☐
- c) I published an article in a journal or magazine for teachers (print or online) -- ☐ -- ☐
- d) I took part in an innovative project for curriculum and instruction ----- ☐ -- ☐
- e) I exchanged information online about how to teach mathematics (e.g., email, forums, website) ----- ☐ -- ☐

MT2MACWO

MT2MACPR

MT2MACPU

MT2MACIP

MT2MACEX

TEACHER QUESTIONNAIRE – ADVANCED MATHEMATICS

Your School

13

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 - ○ -- ○ -- ○ -- ○ -- ○

14

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 - ○ -- ○ -- ○ -- ○ -- ○

15

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) Support for teachers' professional development ----- ○ -- ○ -- ○ -- ○ -- ○
- f) Parental support for student achievement - ○ -- ○ -- ○ -- ○ -- ○
- g) Parental involvement in school activities --- ○ -- ○ -- ○ -- ○ -- ○
- h) Students' regard for school property ----- ○ -- ○ -- ○ -- ○ -- ○
- i) Students' desire to do well in school ----- ○ -- ○ -- ○ -- ○ -- ○

MT2GCUSN

MT2GCUSA

MT2GCUSP

MT2GCHTS

MT2GCHTU

MT2GCHDS

MT2GCHTE

MT2GCHPD

MT2GCHPS

MT2GCHPI

MT2GCHSR

MT2GCHSD

MT2GSPBR

MT2GSPCO

MT2GSPWO

TEACHER QUESTIONNAIRE – ADVANCED MATHEMATICS

The TIMSS Class

The remaining questions refer to the <TIMSS class>. Remember, the "TIMSS class" refers to students you are teaching in the mathematics group, which is identified on the cover of this questionnaire and will be tested as part of TIMSS Advanced 2008 in your school.

MT2MSTUD

16 _____
How many students are in the <TIMSS class>?

Write in the number of students

MT2MTIMT

17 _____
How many minutes per week do you teach mathematics to the <TIMSS class>?

Write in the number of *minutes* per week

Please convert the number of instructional hours or periods into minutes.

MT2MTIPM

18 _____
How many minutes per week do you usually spend preparing to teach the <TIMSS class>?

Write in the number of *minutes* per week

Please convert the number of hours into minutes.

19 _____
A. Do you use a textbook as the basis for instruction in teaching mathematics to the <TIMSS class>?

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

MT2MTBTC

B. Does each student have his or her own textbook?

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

MT2MOTXB

C. How often do you require students to do the following?

Fill in **one** circle for each row

	Every or almost every lesson	About half the lessons	Some lessons	Never
a) Do problems or exercises from their textbooks	-----○--○--○--○			
b) Read the textbook examples of how to do problems or exercises	-----○--○--○--○			
c) Read about mathematical theory from their textbooks	-----○--○--○--○			

MT2MRDPE

MT2MRDRT

MT2MRDMT

TEACHER QUESTIONNAIRE – ADVANCED MATHEMATICS

Teaching Mathematics to the TIMSS Class

20

In a typical week of mathematics lessons for the <TIMSS class>, what percentage of time is spent on each of the following activities?

Write in the percent
The total should add to 100%

a) Teaching new material to the whole class

%

b) Students working problems on their own or with other students

%

c) Reviewing and summarizing what has been taught for the whole class

%

d) Reviewing homework

%

e) Re-teaching and clarifying content/procedures for the whole class

%

f) Oral or written tests or quizzes

%

g) Classroom management tasks not related to the lesson's content/purpose (e.g., interruptions and keeping order)

%

h) Other activities

%

Total

100%

21

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

Never

Some lessons

About half the lessons

Every or almost every lesson

a) Memorize formulas and procedures

☐

☐

☐

☐

☐

b) Solve problems like the examples in their textbooks

☐

☐

☐

☐

☐

c) Use mathematical terms to represent relationships

☐

☐

☐

☐

☐

d) Discuss problem-solving strategies

☐

☐

☐

☐

☐

e) Decide on their own procedures for solving complex problems

☐

☐

☐

☐

☐

f) Communicate their arguments

☐

☐

☐

☐

☐

MT2MHOMF
MT2MHOSP
MT2MHOMT
MT2MHODP
MT2MHODE
MT2MHOCA

TEACHER QUESTIONNAIRE – ADVANCED MATHEMATICS

22

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

Fill in **one** circle for each row

Not at all
A little
Some
A lot

Students

- 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 or learning disabilities) ----- ○ -- ○ -- ○ -- ○ -- ○
- d) Uninterested students ----- ○ -- ○ -- ○ -- ○ -- ○
- e) Disruptive students ----- ○ -- ○ -- ○ -- ○ -- ○

Resources

- f) Shortage of graphing calculators ----- ○ -- ○ -- ○ -- ○ -- ○
- g) Shortage of computer hardware ----- ○ -- ○ -- ○ -- ○ -- ○
- h) Shortage of computer software ----- ○ -- ○ -- ○ -- ○ -- ○
- i) Shortage of support for using computers ----- ○ -- ○ -- ○ -- ○ -- ○
- j) Shortage of textbooks for students' use ----- ○ -- ○ -- ○ -- ○ -- ○
- k) Shortage of other instructional equipment for students' use ----- ○ -- ○ -- ○ -- ○ -- ○
- l) Shortage of equipment for your use in demonstrations and other exercises ----- ○ -- ○ -- ○ -- ○ -- ○
- m) Inadequate physical facilities ----- ○ -- ○ -- ○ -- ○ -- ○
- n) High student/teacher ratio - ○ -- ○ -- ○ -- ○ -- ○

23

For <the advanced mathematics track/course that defines the advanced mathematics population> you are teaching the <TIMSS class>, approximately what percentage of teaching time will you have spent on each of the following mathematics content areas by the end of this school year?

Write in the percent
The total should add to 100%

- a) Algebra (e.g., patterns, equations, relationships, and functions) ----- %
- b) Calculus (e.g., limits of functions, first and second derivatives, and evaluating integrals) ----- %
- c) Geometry (e.g., geometric figures, straight lines and circles in the Cartesian plane, trigonometry, and properties of vectors) ----- %
- d) Other, please specify: _____ %

Total ----- 100%

MT2MPTAL

MT2MPTCA

MT2MPTGE

MT2MPTOT

TEACHER QUESTIONNAIRE – ADVANCED MATHEMATICS

Teaching Mathematics to the TIMSS Class (Continued)

24

The following list includes the main topics addressed by the TIMSS advanced 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

A. Algebra

- a) Operations with complex numbers ----- ☐ -- ☐ -- ☐
- b) The n^{th} term of numeric and algebraic series and the sums to n terms or infinity of series ----- ☐ -- ☐ -- ☐
- c) Problems involving permutations, combinations, and probability ----- ☐ -- ☐ -- ☐
- d) Linear, simultaneous, and quadratic equations and inequalities; surd (radical) equations, logarithmic, and exponential equations ----- ☐ -- ☐ -- ☐
- e) Equivalent representations of functions as ordered pairs, tables, graphs, formulas, or words ----- ☐ -- ☐ -- ☐
- f) Values of functions, including rational functions, for given values and ranges of the variable; function of a function ----- ☐ -- ☐ -- ☐

B. Calculus

- a) Limits of functions including rational functions; conditions for continuity and differentiability of functions ----- ☐ -- ☐ -- ☐
- b) Differentiation of functions (including polynomial, exponential, logarithmic, trigonometric, rational, radical, composite, and parametric functions); differentiation of products and quotients ----- ☐ -- ☐ -- ☐
- c) Using derivatives to solve problems (e.g., in kinematics, optimization, and rates of change) ----- ☐ -- ☐ -- ☐
- d) Using first and second derivatives to determine gradient, turning points, and points of inflection of functions ----- ☐ -- ☐ -- ☐
- e) Integrating functions (including polynomial, exponential, trigonometric, and rational functions); evaluating definite integrals ----- ☐ -- ☐ -- ☐

C. Geometry

- a) Properties of geometric figures; proving geometric propositions in two and three dimensions ----- ☐ -- ☐ -- ☐
- b) Gradients, y-axis intercepts, and points of intersection of straight lines in the Cartesian plane ----- ☐ -- ☐ -- ☐
- c) Equations and properties of circles in the Cartesian plane; tangents and normals to given points on a circle ----- ☐ -- ☐ -- ☐
- d) Trigonometric properties of triangles (sine, cosine, and tangent); solving equations involving trigonometric functions ----- ☐ -- ☐ -- ☐
- e) Properties of vectors and their sums and differences ----- ☐ -- ☐ -- ☐

TEACHER QUESTIONNAIRE – ADVANCED MATHEMATICS

Calculators and Computers in the TIMSS Class

25

During mathematics lessons, how often do you use a computer to demonstrate mathematics for the whole class?

Never
Some lessons
About half the lessons
Every or almost every lesson

Fill in **one** circle only: ☐ ☐ ☐ ☐

26

A. Do the students in the <TIMSS class> use any of the following during mathematics lessons?

No
Yes

Fill in **one** circle for each row

- a) Calculators ☐ ☐ ☐ ☐
- b) Computers ☐ ☐ ☐ ☐
- c) Other computing technology ☐ ☐ ☐ ☐

B. If the students use calculators, what kind of calculators do most of them use?

No
Yes

Fill in **one** circle only

- Simple calculators – basic functions only (+, −, ×, ÷, %, or $\sqrt{\quad}$), without functions like log, sin, cos ☐
- Scientific calculators – basic functions (+, −, ×, ÷, %, or $\sqrt{\quad}$) and also functions like log, sin, cos ☐
- Graphing calculators – scientific and also able to display some graphs ☐
- Symbolic calculators – graphing and also able to solve expressions in symbolic terms ☐

C. If the students use computers, do any of the computers have access to the Internet?

No
Yes

Fill in **one** circle only: ☐ ☐

27

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

Never
Some lessons
About half the lessons
Every or almost every lesson

Fill in **one** circle for each row

- a) Drawing graphs of functions ☐ ☐ ☐ ☐
- b) Solving equations ☐ ☐ ☐ ☐
- c) Manipulating algebraic expressions ☐ ☐ ☐ ☐
- d) Modeling and simulation ☐ ☐ ☐ ☐
- e) Numerical integration ☐ ☐ ☐ ☐
- f) Processing and analyzing data ☐ ☐ ☐ ☐

MT2MHOU

MT2MSUCA
MT2MSUCO
MT2MSUOT

MT2MKCAL

MT2MCOAI

MT2MCADG
MT2MCASE

MT2MCAME
MT2MCAMS
MT2MCANI

MT2MCAPD

TEACHER QUESTIONNAIRE – ADVANCED MATHEMATICS

MT2MHMWM

MT2MHOAM

MT2MHWKM

Homework

28

Do you assign mathematics homework to the <TIMSS class>?

Yes

No

Fill in **one** circle only-----○-----○

If **No**, please go to question 32

29

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 -----○

30

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

30 minutes or less -----○

31-60 minutes -----○

61-90 minutes -----○

More than 90 minutes -----○

31

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

Fill in **one** circle for each row

Never or almost never

Sometimes

Always or almost always

a) Doing problem/question sets -----○--○--○

b) Reading the textbook -----○--○--○

c) Memorizing formulas and procedures -----○--○--○

d) Gathering, analyzing, and reporting data -----○--○--○

e) Finding one or more applications of the content covered -----○--○--○

MT2MKMHP
MT2MKMHR

MT2MKMHM
MT2MKMHG
MT2MKMHF

TEACHER QUESTIONNAIRE – ADVANCED MATHEMATICS

Assessment

32

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 (e.g., teacher-made or textbook tests) ----- ○ -- ○ -- ○ -- ○
- b) Informal assessment ----- ○ -- ○ -- ○ -- ○
- c) <Other test> ----- ○ -- ○ -- ○ -- ○

MT2MEPCT

MT2MEPIA

MT2MEPOT

34

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 ----- ○

MT2MWFTU

33

How often does the <TIMSS class> take a mathematics test or examination for a grade?

Fill in **one** circle only

- At least once a month ----- ○
- About every other month ----- ○
- About 2 or 3 times a year ----- ○
- Never ----- ○

MT2MTEEX

35

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 primarily 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 ----- ○ -- ○ -- ○

MT2MTQRF

MT2MTQAP

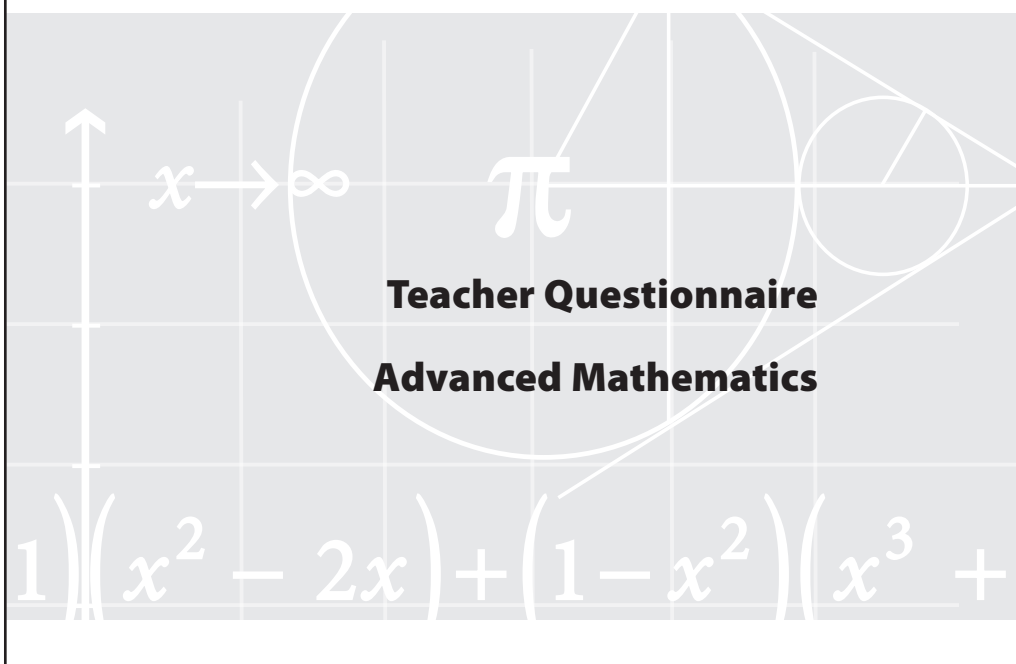
MT2MTQSP

MT2MTQRE

TEACHER QUESTIONNAIRE – ADVANCED MATHEMATICS



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



TEACHER QUESTIONNAIRE – PHYSICS

Identification Label _____

Teacher Name: _____

Class Name: _____

Teacher ID: _____ Teacher Link #: _____

TRENDS IN INTERNATIONAL MATHEMATICS AND SCIENCE STUDY

TIMSS 2008


Advanced

Teacher Questionnaire


Physics

<TIMSS Advanced National Research Center Name>

<Address>



International Association for the Evaluation
of Educational Achievement
© Copyright IEA, 2008



TEACHER QUESTIONNAIRE – PHYSICS

General Directions

Your school has agreed to participate in TIMSS Advanced 2008. 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 teaching and learning worldwide.

As part of the study, students in a nationwide sample of <twelfth-grade> classes in <country> will complete the TIMSS Advanced mathematics and/or physics tests. This questionnaire is addressed to the teachers of these students. As a teacher of one of the sampled classes, your responses to these questions are very important in helping to describe 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 will be tested as part of TIMSS Advanced 2008 in your school. It is important that you answer each question carefully so that the information 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 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.

TEACHER QUESTIONNAIRE – PHYSICS

Background Information

Preparation to Teach

PT2GAGE

- 1** _____
- How old are you?**
- Fill in one circle only*
- Under 25 -----○
- 25–29 -----○
- 30–39 -----○
- 40–49 -----○
- 50–59 -----○
- 60 or older -----○

PT2GSEX

- 2** _____
- Are you female or male?**
- Fill in one circle only*
- Female -----○
- Male -----○

PT2GTAUT

- 3** _____
- A. By the end of this school year, how many years will you have been teaching altogether?**
- _____
- Number of years you have taught*

PT2PTPHY

- B. How many years will you have taught physics?**
- _____
- Number of years taught physics*

PT2PPCTP

- 4** _____
- How long do you plan to continue teaching physics?**
- Fill in one circle only*
- I plan to continue teaching as long as I can -----○
- I plan to continue teaching until the opportunity for a better job in education comes along -----○
- I plan to continue teaching for awhile but probably will leave the field of education -----○
- I am undecided at this time -----○

PT2GFEDC

- 5** _____
- 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 -----○

- 6** _____
- During your <post-secondary> education, what was your major or main area(s) of study?**
- Fill in one circle for each row*
- | | Yes | No |
|-----------------------------------|-----|----|
| a) Physics -----○ | ○ | ○ |
| b) Chemistry -----○ | ○ | ○ |
| c) Biology -----○ | ○ | ○ |
| d) Engineering -----○ | ○ | ○ |
| e) Education - Science -----○ | ○ | ○ |
| f) Mathematics -----○ | ○ | ○ |
| g) Education - Mathematics -----○ | ○ | ○ |
| h) Education - General -----○ | ○ | ○ |
| i) Other -----○ | ○ | ○ |

PT2GPSPH

PT2GPSCH

PT2GPSBI

PT2GPSEN

PT2GPSES

PT2GPSMA

PT2GPSEM

PT2GPSEG

PT2GPSOT

PT2GTLCE

- 7** _____
- Do you have a teaching license or certificate?**
- Fill in one circle only*
- | | Yes | No |
|--------|-----|----|
| -----○ | ○ | ○ |

TEACHER QUESTIONNAIRE – PHYSICS

Preparation to Teach (Continued)

8

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

Fill in **one** circle for each row

Not well prepared
Somewhat prepared
Very well prepared

A. Mechanics

- a) The conditions for equilibrium and the dynamics of different types of movement ----- ○ -- ○ -- ○
- b) Kinetic and potential energy; conservation of mechanical energy ----- ○ -- ○ -- ○
- c) Mechanical wave phenomena in sound, water, and strings; the relationship between speed, frequency, and wavelength; refraction ----- ○ -- ○ -- ○
- d) Forces, including frictional force, acting on a moving body ----- ○ -- ○ -- ○
- e) Forces acting on a body moving in a circular path; the body's centripetal acceleration, speed, and circling time; the law of gravitation in relation to the movement of planets ----- ○ -- ○ -- ○
- f) Elastic and inelastic collision; the law of conservation of momentum and the law of conservation of mechanical (i.e., kinetic) energy ----- ○ -- ○ -- ○
- g) Aspects of relativity (e.g., length contraction and time dilatation for an object moving with constant speed in relation to the observer) ----- ○ -- ○ -- ○

B. Electricity and Magnetism

- a) Electrostatic attraction or repulsion between isolated charged particles – Coulomb's law ----- ○ -- ○ -- ○
- b) Electrical circuits – Ohm's law and Joule's law for complex electrical circuits ----- ○ -- ○ -- ○
- c) Charged particles in a magnetic field; relationship between magnetism and electricity; Faraday's and Lenz' laws of induction ----- ○ -- ○ -- ○
- d) Electromagnetic radiation; wavelength and frequency of various types of waves (e.g., radio, infrared, x-rays, light) ----- ○ -- ○ -- ○

C. Heat and Temperature

- a) Difference between heat and temperature; heat transfer and specific heat capacities; evaporation and condensation ----- ○ -- ○ -- ○
- b) Expansion of solids and liquids in relation to temperature change; the law of ideal gases; the first law of thermodynamics ----- ○ -- ○ -- ○
- c) Heat ("black body") radiation and temperature ----- ○ -- ○ -- ○

D. Atomic and Nuclear Physics

- a) The structure of the atom and its nucleus in terms of electrons, protons, and neutrons; atomic number and atomic mass number ----- ○ -- ○ -- ○
- b) Light emission and absorption and the behavior of electrons; the photoelectric effect ----- ○ -- ○ -- ○
- c) Types of nuclear reactions (i.e., fission, fusion, and radioactive decay) and their role in nature (e.g., in stars) and society (e.g., reactors, bombs); radioactive isotopes ----- ○ -- ○ -- ○

TEACHER QUESTIONNAIRE – PHYSICS

Professional Development

9

In your school, 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 ----- ☐ -- ☐ -- ☐ -- ☐ -- ☐

PT2GOTDC

PT2GOTPM

PT2GOTVT

PT2GOTIO

11

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

Fill in **one** circle for each row

Yes No

- a) Physics content ----- ☐ -- ☐
- b) Physics pedagogy/instruction ----- ☐ -- ☐
- c) Physics curriculum ----- ☐ -- ☐
- d) Integrating information technology into physics ----- ☐ -- ☐
- e) Improving students' critical thinking or inquiry skills ----- ☐ -- ☐
- f) Physics assessment ----- ☐ -- ☐

PT2PPDPT

PT2PPDPP

PT2PPDPC

PT2PPDPI

PT2PPDIM

PT2PPDPA

10

A. Are you a member of <professional organization for physics teachers>?

Yes No

Fill in **one** circle only ----- ☐ -- ☐

PT2PMPOP

B. During the past two years, have you regularly participated in activities sponsored by <professional organization for physics teachers>?

Yes No

Fill in **one** circle only ----- ☐ -- ☐

PT2PRPPO

12

In the past two years, have you taken part in any of the following activities in physics?

Fill in **one** circle for each row

Yes No

- a) I attended a workshop or conference --- ☐ -- ☐
- b) I gave a presentation at a workshop or conference ----- ☐ -- ☐
- c) I published an article in a journal or magazine for teachers (print or online) -- ☐ -- ☐
- d) I took part in an innovative project for curriculum and instruction ----- ☐ -- ☐
- e) I exchanged information online about how to teach physics (e.g., email, forums, website) ----- ☐ -- ☐

PT2PACWC

PT2PACGP

PT2PAPPA

PT2PAPIP

PT2PACEX

TEACHER QUESTIONNAIRE – PHYSICS

Your School

13

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 - ○ -- ○ -- ○ -- ○ -- ○

14

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 ----- ○ -- ○ -- ○ -- ○ -- ○
- d) Materials are not available to conduct physics experiments or investigations ----- ○ -- ○ -- ○ -- ○ -- ○

15

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) Support for teachers' professional development ----- ○ -- ○ -- ○ -- ○ -- ○
- f) Parental support for student achievement - ○ -- ○ -- ○ -- ○ -- ○
- g) Parental involvement in school activities --- ○ -- ○ -- ○ -- ○ -- ○
- h) Students' regard for school property ----- ○ -- ○ -- ○ -- ○ -- ○
- i) Students' desire to do well in school ----- ○ -- ○ -- ○ -- ○ -- ○

PT2GCUSN

PT2GCUSA

PT2GCUSP

PT2GCHTS

PT2GCHTU

PT2GCHDS

PT2GCHTE

PT2GCHPD

PT2GCHPS

PT2GCHPI

PT2GCHSR

PT2GCHSD

PT2GSPBR

PT2GSPCO

PT2GSPWO

PT2GSPME

TEACHER QUESTIONNAIRE – PHYSICS

The TIMSS Class

The remaining questions refer to the <TIMSS class>. Remember, the “TIMSS class” refers to students you are teaching in the physics group, which is identified on the cover of this questionnaire and will be tested as part of TIMSS Advanced 2008 in your school.

16 _____
How many students are in the <TIMSS class>?

Write in the number of students

17 _____
How many minutes per week do you teach physics to the <TIMSS class>?

Write in the number of *minutes* per week

Please convert the number of instructional hours or periods into minutes.

18 _____
How many minutes per week do you usually spend preparing to teach the <TIMSS class>?

Write in the number of *minutes* per week

Please convert the number of hours into minutes.

19 _____
A. Do you use a textbook as the basis for instruction in teaching physics to the <TIMSS class>?

Yes _____ No _____
Fill in **one** circle only - - - - - ☐ - - - - - ☐

B. Does each student have his or her own textbook?

Yes _____ No _____
Fill in **one** circle only - - - - - ☐ - - - - - ☐

C. How often do you require students to do the following?

Fill in **one** circle for each row

	Every or almost every lesson	About half the lessons	Some lessons	Never
a) Do problems or exercises from their textbooks	- - - - - <input type="radio"/>	- - - - - <input type="radio"/>	- - - - - <input type="radio"/>	- - - - - <input type="radio"/>
b) Read the textbook examples of how to do problems or exercises	- - - - - <input type="radio"/>	- - - - - <input type="radio"/>	- - - - - <input type="radio"/>	- - - - - <input type="radio"/>
c) Read about physics theory from their textbooks	- - - - - <input type="radio"/>	- - - - - <input type="radio"/>	- - - - - <input type="radio"/>	- - - - - <input type="radio"/>

TEACHER QUESTIONNAIRE – PHYSICS

Teaching Physics to the TIMSS Class

20

In a typical week of physics lessons for the <TIMSS class>, what percentage of time is spent on each of the following activities?

Write in the percent
The total should add to 100%

a) Teaching new material to the whole class

%

b) Students working problems on their own or with other students

%

c) Reviewing and summarizing what has been taught for the whole class

%

d) Reviewing homework

%

e) Re-teaching and clarifying content/procedures for the whole class

%

f) Oral or written tests or quizzes

%

g) Classroom management tasks not related to the lesson's content/purpose (e.g., interruptions and keeping order)

%

h) Other activities

%

Total

100%

21

In teaching physics 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

Never

Some lessons

About half the lessons

Every or almost every lesson

a) Watch me demonstrate an experiment or investigation

b) Conduct experiments or investigations

c) Use laws and formulas of physics to solve routine problems

d) Give explanations about something they are studying

e) Relate what they are learning in physics to their daily lives

f) Have students memorize formulas and procedures

g) Read their textbooks or other resource materials

PT2PTPWE

PT2PTPCE

PT2PTPSP

PT2PTPGE

PT2PTPDL

PT2PTPMF

PT2PTPRT

TEACHER QUESTIONNAIRE – PHYSICS

22

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

Fill in **one** circle for each row

Not at all A little Some A lot

Students

- 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 or learning disabilities) ----- ○ -- ○ -- ○ -- ○ -- ○
- d) Uninterested students ----- ○ -- ○ -- ○ -- ○ -- ○
- e) Disruptive students ----- ○ -- ○ -- ○ -- ○ -- ○

Resources

- f) Shortage of graphing calculators ----- ○ -- ○ -- ○ -- ○ -- ○
- g) Shortage of computer hardware ----- ○ -- ○ -- ○ -- ○ -- ○
- h) Shortage of computer software ----- ○ -- ○ -- ○ -- ○ -- ○
- i) Shortage of support for using computers ----- ○ -- ○ -- ○ -- ○ -- ○
- j) Shortage of textbooks for students' use ----- ○ -- ○ -- ○ -- ○ -- ○
- k) Shortage of other instructional equipment for students' use ----- ○ -- ○ -- ○ -- ○ -- ○
- l) Shortage of equipment for your use in demonstrations and other exercises ----- ○ -- ○ -- ○ -- ○ -- ○
- m) Inadequate physical facilities ----- ○ -- ○ -- ○ -- ○ -- ○
- n) High student/teacher ratio - ○ -- ○ -- ○ -- ○ -- ○

23

For <the physics track/course that defines the physics population> you are teaching the <TIMSS class>, approximately what percentage of teaching time will you have spent on each of the following physics content areas by the end of this school year?

Write in the percent
The total should add to 100%

- a) Mechanics (e.g., conditions for equilibrium and dynamics of movement, kinetic and potential energy, mechanical waves, forces on moving bodies, conservation of energy, and aspects of relativity) ----- %
- b) Electricity and Magnetism (e.g., Coulomb's law, Ohm's law, Joule's law, charged particles in magnetic fields, Faraday's and Lenz' laws of induction, and electromagnetic radiation) ----- %
- c) Heat and Temperature (e.g., heat transfer and specific heat, expansion of solids and liquids, the ideal gas laws, the first law of thermodynamics, heat radiation and temperature) ----- %
- d) Atomic and Nuclear Physics (e.g., structure of the atom and its nucleus, atomic number and atomic mass number, the photoelectric effect and the behavior of electrons, types of nuclear reaction and their role in nature and society) ----- %
- e) Other, please specify: _____ %

Total ----- 100%

PT2GLI01

PT2GLI02

PT2GLI03

PT2GLI04

PT2GLI05

PT2GLI06

PT2GLI07

PT2GLI08

PT2GLI09

PT2GLI10

PT2GLI11

PT2GLI12

PT2GLI13

PT2GLI14

PT2PPTME

PT2PPTEL

PT2PPTHE

PT2PPTAT

PT2PPTOT

TEACHER QUESTIONNAIRE – PHYSICS

Teaching Physics to the TIMSS Class (Continued)

24

The following list includes the main topics addressed by the TIMSS physics 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

A. Mechanics

- a) The conditions for equilibrium and the dynamics of different types of movement ----- ○ -- ○ -- ○
- b) Kinetic and potential energy; conservation of mechanical energy ----- ○ -- ○ -- ○
- c) Mechanical wave phenomena in sound, water, and strings; the relationship between speed, frequency, and wavelength; refraction ----- ○ -- ○ -- ○
- d) Forces, including frictional force, acting on a moving body ----- ○ -- ○ -- ○
- e) Forces acting on a body moving in a circular path; the body's centripetal acceleration, speed, and circling time; the law of gravitation in relation to the movement of planets ----- ○ -- ○ -- ○
- f) Elastic and inelastic collision; the law of conservation of momentum and the law of conservation of mechanical (i.e., kinetic) energy ----- ○ -- ○ -- ○
- g) Aspects of relativity (e.g., length contraction and time dilatation for an object moving with constant speed in relation to the observer) ----- ○ -- ○ -- ○

B. Electricity and Magnetism

- a) Electrostatic attraction or repulsion between isolated charged particles – Coulomb's law ----- ○ -- ○ -- ○
- b) Electrical circuits – Ohm's law and Joule's law for complex electrical circuits ----- ○ -- ○ -- ○
- c) Charged particles in a magnetic field; relationship between magnetism and electricity; Faraday's and Lenz' laws of induction ----- ○ -- ○ -- ○
- d) Electromagnetic radiation; wavelength and frequency of various types of waves (e.g., radio, infrared, x-rays, light) ----- ○ -- ○ -- ○

C. Heat and Temperature

- a) Difference between heat and temperature; heat transfer and specific heat capacities; evaporation and condensation ----- ○ -- ○ -- ○
- b) Expansion of solids and liquids in relation to temperature change; the law of ideal gases; the first law of thermodynamics ----- ○ -- ○ -- ○
- c) Heat ("black body") radiation and temperature ----- ○ -- ○ -- ○

D. Atomic and Nuclear Physics

- a) The structure of the atom and its nucleus in terms of electrons, protons, and neutrons; atomic number and atomic mass number ----- ○ -- ○ -- ○
- b) Light emission and absorption and the behavior of electrons; the photoelectric effect ----- ○ -- ○ -- ○
- c) Types of nuclear reactions (i.e., fission, fusion, and radioactive decay) and their role in nature (e.g., in stars) and society (e.g., reactors, bombs); radioactive isotopes ----- ○ -- ○ -- ○

TEACHER QUESTIONNAIRE – PHYSICS

Calculators and Computers in the TIMSS Class

25

During physics lessons, how often do you use a computer to demonstrate physics for the whole class?

Never
Some lessons
About half the lessons
Every or almost every lesson

Fill in **one** circle only: ☐ ☐ ☐ ☐

26

A. Do the students in the <TIMSS class> use any of the following during physics lessons?

Fill in **one** circle for each row

No
Yes

a) Calculators ☐ ☐

b) Computers ☐ ☐

c) Other computing technology ☐ ☐

B. If the students use calculators, what kind of calculators do most of them use?

Fill in **one** circle only

Simple calculators – basic functions only (+, −, ×, ÷, %, or $\sqrt{\quad}$), without functions like log, sin, cos ☐

Scientific calculators – basic functions (+, −, ×, ÷, %, or $\sqrt{\quad}$) and also functions like log, sin, cos ☐

Graphing calculators – scientific and also able to display some graphs ☐

Symbolic calculators – graphing and also able to solve expressions in symbolic terms ☐

C. If the students use computers, do any of the computers have access to the Internet?

No
Yes

Fill in **one** circle only: ☐ ☐

27

How often do students in the <TIMSS class> use calculators or computers in their physics lessons for the following activities?

Fill in **one** circle for each row

Never
Some lessons
About half the lessons
Every or almost every lesson

a) Doing scientific procedures or experiments ☐ ☐ ☐ ☐

b) Modeling and simulations ☐ ☐ ☐ ☐

c) Solving equations ☐ ☐ ☐ ☐

d) Processing and analyzing data ☐ ☐ ☐ ☐

PT2PHOUC

PT2PSUCA
PT2PSUCO
PT2PSUOT

PT2PKCAL

PT2PCOAI

PT2PCASP
PT2PCAMS
PT2PCASE
PT2PCAAD

TEACHER QUESTIONNAIRE – PHYSICS

Homework

28

Do you assign physics homework to the
<TIMSS class>?

Yes ☐ No ☐
Fill in **one** circle only

If **No**, please go to question 32

29

How often do you usually assign physics
homework to the <TIMSS class>?

Fill in **one** circle only
Every or almost every lesson ☐
About half the lessons ☐
Some lessons ☐

30

When you assign physics 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
30 minutes or less ☐
31-60 minutes ☐
61-90 minutes ☐
More than 90 minutes ☐

31

How often do you assign the following kinds of
physics homework to the <TIMSS class>?

Fill in **one** circle for each row
Never or almost never
Sometimes
Always or almost always
a) Doing problem/question sets ☐ ☐ ☐ ☐
b) Reading the textbook ☐ ☐ ☐ ☐
c) Memorizing formulas and
procedures ☐ ☐ ☐ ☐
d) Gathering, analyzing, and
reporting data ☐ ☐ ☐ ☐
e) Finding one or more applications
of the content covered ☐ ☐ ☐ ☐
f) Working on projects ☐ ☐ ☐ ☐

PT2PKPHS
PT2PKPHR

PT2PKPHM

PT2PKPHG

PT2PKPHF
PT2PKPHP

TEACHER QUESTIONNAIRE – PHYSICS

Assessment

32

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

Fill in **one** circle for each row

No emphasis
Little emphasis
Some emphasis
Major emphasis

- a) Classroom tests (e.g., teacher-made or textbook tests) ----- ○ -- ○ -- ○ -- ○
b) Informal assessment ----- ○ -- ○ -- ○ -- ○
c) <Other test> ----- ○ -- ○ -- ○ -- ○

PT2PEPCT
PT2PEPIA
PT2PEPOT

34

A. What item formats do you typically use in your physics 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 ----- ○

PT2PWFTU

B. How often do your physics tests or examinations include a practical examination or laboratory problems?

Fill in **one** circle only

- Always or almost always ----- ○
Sometimes ----- ○
Never or almost never ----- ○

PT2PPTPE

33

How often does the <TIMSS class> take a physics test or examination for a grade?

Fill in **one** circle only

- At least once a month ----- ○
About every other month ----- ○
About 2 or 3 times a year ----- ○
Never ----- ○

PT2PTEEX

35

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

Fill in **one** circle for each row

Never or almost never
Sometimes
Always or almost always

- a) Questions based on knowing facts and concepts ----- ○ -- ○ -- ○
b) Questions based on the application of knowledge and understanding ----- ○ -- ○ -- ○
c) Questions involving developing hypotheses and designing scientific investigations ----- ○ -- ○ -- ○
d) Questions requiring explanations or justifications ----- ○ -- ○ -- ○

PT2PTEBF

PT2PTEBA

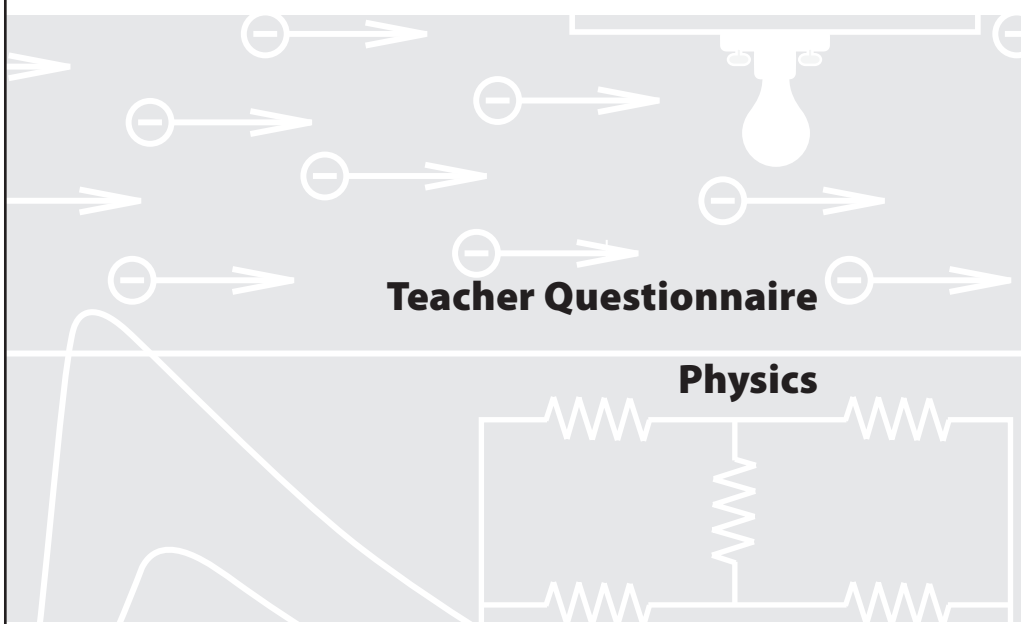
PT2PTEDH

PT2PTEEJ

TEACHER QUESTIONNAIRE – PHYSICS



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



Teacher Questionnaire

Physics

SCHOOL QUESTIONNAIRE

Identification Label _____

School ID:

School Name:

TRENDS IN INTERNATIONAL MATHEMATICS AND SCIENCE STUDY

TIMSS


Advanced

2008


School Questionnaire

<TIMSS Advanced National Research Center Name>

<Address>



International Association for the Evaluation
of Educational Achievement
© Copyright IEA, 2008



SCHOOL QUESTIONNAIRE

General Directions

Your school has agreed to participate in TIMSS Advanced 2008. 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 teaching and learning worldwide.

This questionnaire is addressed to school principals and department heads who are asked to supply information about their schools. Since your school has been selected as part of a nationwide sample, your responses are very important in helping to describe the school system in <country>.

It is important that you answer each question carefully so that the information provided reflects the situation in your school as accurately as possible. Some of the questions will require that you look up school records, so you may wish to arrange for the assistance of another staff member to help provide this information.

Please identify a time and place where you will be able to complete this questionnaire without being interrupted. This should require no more than 30 minutes. To make it as easy as possible for you to respond, most questions may be answered simply by 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.

SCHOOL QUESTIONNAIRE

School Characteristics

- 1** _____
A. What is the total school enrollment (number of students) in all grades?

Number of students: _____

- B. What is the enrollment in the <twelfth-grade>?**

Number of students: _____

- 4** _____
Approximately what percentage of students in your school have <language of test> as their native language?

Fill in **one** circle only

More than 90% -----○
 76 to 90% -----○
 50 to 75% -----○
 Less than 50% -----○

- 2** _____
How many people live in the city, town, or area where your school is located?

Fill in **one** circle only

More than 500,000 people -----○
 100,001 to 500,000 people -----○
 50,001 to 100,000 people -----○
 15,001 to 50,000 people -----○
 3,001 to 15,000 people -----○
 3,000 people or fewer -----○

- 5** _____
What percentage of <twelfth-grade> students in your school are taking each of the following?

Write in the percent

a) <Advanced Mathematics> ----- %
 b) <Physics> ----- %

- 3** _____
Approximately what percentage of students in your school have the following background?

Fill in **one** circle for each row

	0 to 10%	11 to 25%	26 to 50%	More than 50%
a) Come from economically disadvantaged homes -----○	○	○	○	○
b) Come from economically affluent homes -----○	○	○	○	○

- 6** _____
Does your school have a special policy to encourage students to choose the following courses?

Fill in **one** circle for each row

	No	Yes, only for girls	Yes, only for boys	Yes, for all students
a) <Advanced Mathematics> -----○	○	○	○	○
b) <Physics> -----○	○	○	○	○

SCHOOL QUESTIONNAIRE

Your Role as Principal

7

By the end of this school year, approximately what percentage of time in your role as principal will you have spent on these activities?

Write in the percent
The total should add to 100%

- a) Administrative duties (e.g., hiring, budgeting, scheduling, meetings) ----- %
- b) Instructional leadership (e.g., developing curriculum and pedagogy) ----- %
- c) Supervising and evaluating teachers and other staff ----- %
- d) Issues related to student discipline ----- %
- e) Teaching ----- %
- f) Public relations and fundraising ----- %
- g) Other ----- %
- Total** ----- 100%

School Climate for Learning

8

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' opportunities for professional development ----- ○ -- ○ -- ○ -- ○ -- ○
- c) Teachers' understanding of the school's curricular goals ----- ○ -- ○ -- ○ -- ○ -- ○
- d) Teachers' degree of success in implementing the school's curriculum ----- ○ -- ○ -- ○ -- ○ -- ○
- e) Teachers' expectations for student achievement ----- ○ -- ○ -- ○ -- ○ -- ○
- f) Parental support for student achievement ----- ○ -- ○ -- ○ -- ○ -- ○
- g) Parental involvement in school activities ----- ○ -- ○ -- ○ -- ○ -- ○
- h) Students' regard for school property ----- ○ -- ○ -- ○ -- ○ -- ○
- i) Students' desire to do well in school ----- ○ -- ○ -- ○ -- ○ -- ○

MC2GPAAD, PC2GPAAD

MC2GPALS, PC2GPALS

MC2GPASU, PC2GPASU

MC2GPASD, PC2GPASD

MC2GPATE, PC2GPATE

MC2GPAPR, PC2GPAPR

MC2GPAOT, PC2GPAOT

MC2GCHTS, PC2GCHTS

MC2GCHPD, PC2GCHPD

MC2GCHTU, PC2GCHTU

MC2GCHDS, PC2GCHDS

MC2GCHES, PC2GCHES

MC2GCHPS, PC2GCHPS

MC2GCHPI, PC2GCHPI

MC2GCHSR, PC2GCHSR

MC2GCHSD, PC2GCHSD

SCHOOL QUESTIONNAIRE

<Twelfth-grade> Teachers in Your School

9

In your school, are any of the following used to evaluate the practice of <twelfth-grade> mathematics teachers?

Fill in **one** circle for each row

Yes No

- a) Observations by the principal or senior staff -----○---○
- b) Observations by inspectors or other persons external to the school -----○---○
- c) Student achievement -----○---○
- d) Teacher peer review -----○---○

11

How difficult was it to fill <twelfth-grade> teaching vacancies for this school year for the following subjects?

Fill in **one** circle for each row

Very difficult
Somewhat difficult
Easy to fill vacancies
Were no vacancies in this subject

- a) Mathematics -----○--○--○--○
- b) Physics -----○--○--○--○
- c) Computer science / information technology -----○--○--○--○

10

In your school, are any of the following used to evaluate the practice of <twelfth-grade> physics teachers?

Fill in **one** circle for each row

Yes No

- a) Observations by the principal or senior staff -----○---○
- b) Observations by inspectors or other persons external to the school -----○---○
- c) Student achievement -----○---○
- d) Teacher peer review -----○---○

12

Does your <school> currently use any incentives (e.g., pay, housing, signing bonus, smaller classes) to recruit or retain <twelfth-grade> teachers in the following fields?

Fill in **one** circle for each row

Yes No

- a) Mathematics -----○---○
- b) Physics -----○---○
- c) Other -----○---○

MC2GPMT1, PC2GPMT1

MC2GPMT2, PC2GPMT2

MC2GPMT3, PC2GPMT3

MC2GPMT4, PC2GPMT4

MC2MVAMA, PC2MVAMA
MC2PVAPH, PC2PVAPH
MC2GVACS, PC2GVACS

MC2GPPT1, PC2GPPT1

MC2GPPT2, PC2GPPT2

MC2GPPT3, PC2GPPT3

MC2GPPT4, PC2GPPT4

MC2GINMA, PC2GINMA
MC2GINPH, PC2GINPH
MC2GINOT, PC2GINOT

SCHOOL QUESTIONNAIRE

Student Behavior

13

How often does each of the following problem behaviors occur among <twelfth-grade> students in your school?

If the behavior occurs, how severe a problem does it present?

A. Frequency in your school

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

Never Rarely Monthly Weekly Daily

B. Severity of problem in your school

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

Not a problem Minor problem Serious problem

MC2GBF01, PC2GBF01
MC2GBF02, PC2GBF02

MC2GBF03, PC2GBF03
MC2GBF04, PC2GBF04
MC2GBF05, PC2GBF05
MC2GBF06, PC2GBF06
MC2GBF07, PC2GBF07
MC2GBF08, PC2GBF08

MC2GBF09, PC2GBF09
MC2GBF10, PC2GBF10

MC2GBF11, PC2GBF11

- | | | |
|------------------------------------------------------|-----------------------|--------------|
| a) Arriving late at school | -----○--○--○--○--○--○ | -----○--○--○ |
| b) Absenteeism (i.e., unjustified absences) | -----○--○--○--○--○--○ | -----○--○--○ |
| c) Skipping class <hours/periods> | -----○--○--○--○--○--○ | -----○--○--○ |
| d) Classroom disturbance | -----○--○--○--○--○--○ | -----○--○--○ |
| e) Cheating | -----○--○--○--○--○--○ | -----○--○--○ |
| f) Vandalism | -----○--○--○--○--○--○ | -----○--○--○ |
| g) Theft | -----○--○--○--○--○--○ | -----○--○--○ |
| h) Intimidation or verbal abuse of other students | -----○--○--○--○--○--○ | -----○--○--○ |
| i) Physical injury to other students | -----○--○--○--○--○--○ | -----○--○--○ |
| j) Intimidation or verbal abuse of teachers or staff | -----○--○--○--○--○--○ | -----○--○--○ |
| k) Physical injury to teachers or staff | -----○--○--○--○--○--○ | -----○--○--○ |

MC2GBS01, PC2GBS01
MC2GBS02, PC2GBS02

MC2GBS03, PC2GBS03
MC2GBS04, PC2GBS04
MC2GBS05, PC2GBS05
MC2GBS06, PC2GBS06
MC2GBS07, PC2GBS07
MC2GBS08, PC2GBS08

MC2GBS09, PC2GBS09
MC2GBS10, PC2GBS10

MC2GBS11, PC2GBS11

SCHOOL QUESTIONNAIRE

Resources and Technology

14

Is your school's capacity to provide instruction affected by a shortage or inadequacy of any of the following?

Fill in **one** circle for each row

A little
Some
A lot

No
A little
Some
A lot

MC2GSC01, PC2GSC01

a) Instructional materials (e.g., textbook) ----- ○ -- ○ -- ○ -- ○ -- ○

MC2GSC02, PC2GSC02

b) Budget for supplies (e.g., paper, pencils) ----- ○ -- ○ -- ○ -- ○ -- ○

MC2GSC03, PC2GSC03

c) School buildings and grounds ----- ○ -- ○ -- ○ -- ○ -- ○

MC2GSC04, PC2GSC04

d) Heating/cooling and lighting systems ----- ○ -- ○ -- ○ -- ○ -- ○

MC2GSC05, PC2GSC05

e) Instructional space (e.g., classrooms) ----- ○ -- ○ -- ○ -- ○ -- ○

MC2GSC06, PC2GSC06

f) Special equipment for students with disabilities --- ○ -- ○ -- ○ -- ○ -- ○

MC2MSC07, PC2MSC07

g) Computers for mathematics instruction ----- ○ -- ○ -- ○ -- ○ -- ○

MC2MSC08, PC2MSC08

h) Computer software for mathematics instruction --- ○ -- ○ -- ○ -- ○ -- ○

MC2MSC09, PC2MSC09

i) Calculators for mathematics instruction ----- ○ -- ○ -- ○ -- ○ -- ○

MC2MSC10, PC2MSC10

j) Library materials relevant to mathematics instruction - ○ -- ○ -- ○ -- ○ -- ○

MC2MSC11, PC2MSC11

k) Audio-visual resources for mathematics instruction --- ○ -- ○ -- ○ -- ○ -- ○

Fill in **one** circle for each row

A little
Some
A lot

No
A little
Some
A lot

l) Physics laboratory equipment and materials --- ○ -- ○ -- ○ -- ○ -- ○

MC2PSC12, PC2PSC12

m) Computers for physics instruction ----- ○ -- ○ -- ○ -- ○ -- ○

MC2PSC13, PC2PSC13

n) Computer software for physics instruction ----- ○ -- ○ -- ○ -- ○ -- ○

MC2PSC14, PC2PSC14

o) Calculators for physics instruction ----- ○ -- ○ -- ○ -- ○ -- ○

MC2PSC15, PC2PSC15

p) Library materials relevant to physics instruction ----- ○ -- ○ -- ○ -- ○ -- ○

MC2PSC16, PC2PSC16

q) Audio-visual resources for physics instruction ----- ○ -- ○ -- ○ -- ○ -- ○

MC2PSC17, PC2PSC17

r) Teachers ----- ○ -- ○ -- ○ -- ○ -- ○

MC2GSC18, PC2GSC18

s) Computer support staff ---- ○ -- ○ -- ○ -- ○ -- ○

MC2GSC19, PC2GSC19

SCHOOL QUESTIONNAIRE

Resources and Technology (Continued)

15

A. Does your school have a physics laboratory?

Yes ☐ No ☐

Fill in **one** circle only-----○--○

B. Do teachers usually have assistance available when students are conducting physics experiments?

Yes ☐ No ☐

Fill in **one** circle only-----○--○

16

Is anyone available to help your teachers use information and communication technology for teaching and learning?

Yes ☐ No ☐

Fill in **one** circle only-----○--○

17

A. What is the total number of computers in your school that can be used for educational purposes by <twelfth-grade> students?

Number of computers:_____

B. How many of these computers have access to the Internet (email or World Wide Web) for educational purposes?

Fill in **one** circle only

All -----○

Most-----○

Some-----○

None-----○

MC2PPLAB, PC2PPLAB

MC2GTNCO, PC2GTNCO

MC2PASPH, PC2PASPH

MC2GINCO, PC2GINCO

MC2GHTCT, PC2GHTCT

SCHOOL QUESTIONNAIRE

Thank You

**for completing
this questionnaire**

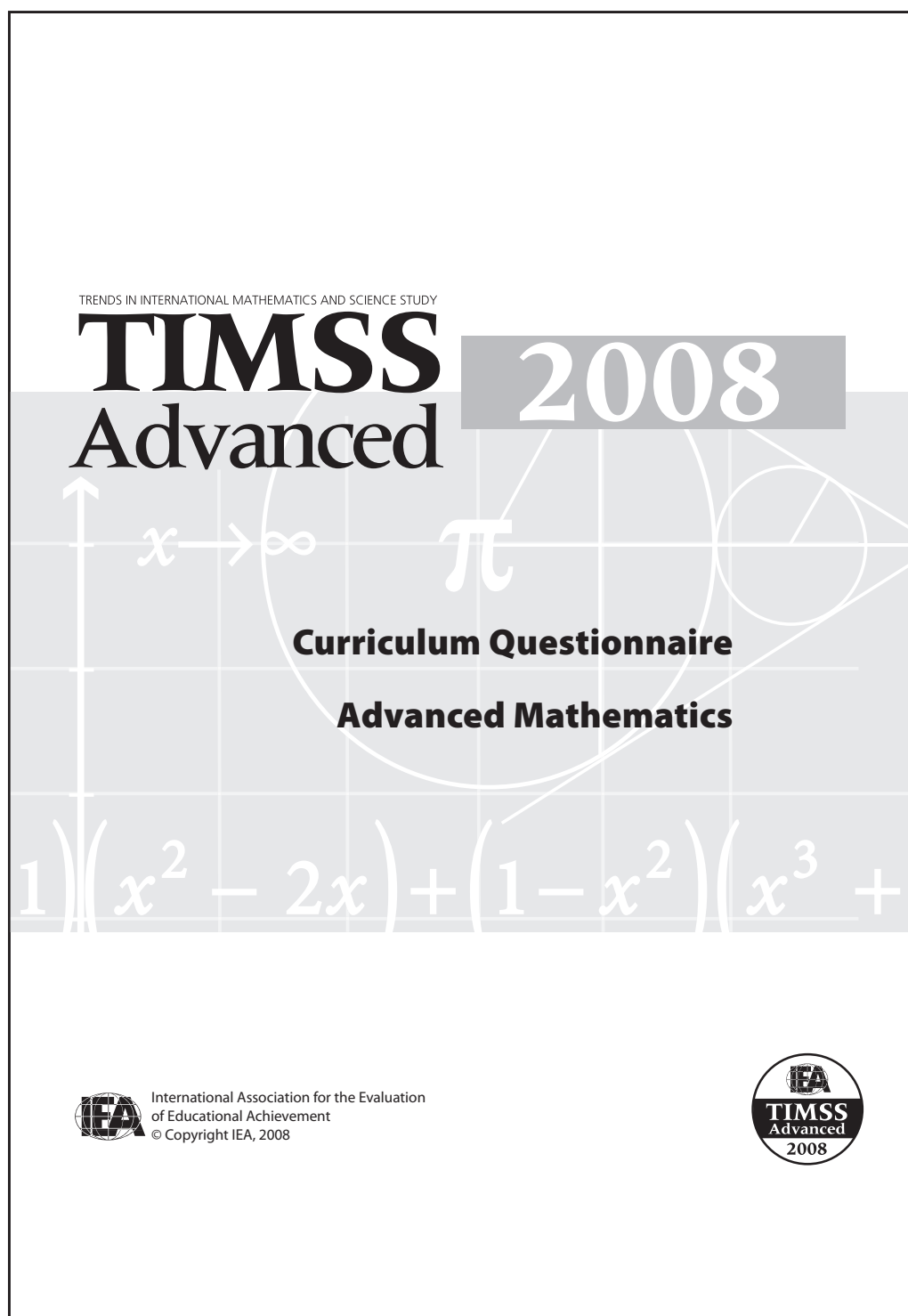
SCHOOL QUESTIONNAIRE



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

School Questionnaire

CURRICULUM QUESTIONNAIRE – ADVANCED MATHEMATICS



CURRICULUM QUESTIONNAIRE – ADVANCED MATHEMATICS

General Directions

The TIMSS Advanced 2008 Curriculum Questionnaire for Advanced Mathematics is designed to collect information about the organization, content, and implementation of the intended advanced mathematics curriculum in each country. The questionnaire should be completed by the National Research Coordinator, drawing on the expertise of curriculum specialists and educators.

Your responses are very important for us in interpreting the student achievement and background information collected in other parts of the study. Thank you very much for the time and effort you have put into responding to this questionnaire.

Contact Information

Country: _____

Name of Person
Completing This
Questionnaire: _____

Position: _____

Address: _____

Email: _____

Phone: _____

Fax: _____

CURRICULUM QUESTIONNAIRE – ADVANCED MATHEMATICS

Advanced Mathematics Curriculum and Instruction

CQM3-01a

1. a) In what year was the current curriculum implemented? (i.e., the curriculum that covers the advanced mathematics track or course being assessed in TIMSS Advanced)

CQM3-01aCOM

Comments:

CQM3-01b

- b) Is that curriculum currently being revised?

*Check **one** circle only.*

Yes--- ☐

No--- ☐

CQM3-01bCOM1

If Yes...
Please explain:

CQM3-01bCOM2

If No...
Comments:

CURRICULUM QUESTIONNAIRE – ADVANCED MATHEMATICS

CQM3-02a

2. a) Are there any prerequisite courses for students taking the advanced mathematics track or course being assessed in TIMSS Advanced?

Check **one** circle only.

Yes--- ☐

No--- ☐

CQM3-02aCOM

If Yes...

Please explain:

CQM3-02b

- b) Regardless of whether or not the students currently are enrolled in the advanced mathematics track or course being assessed in TIMSS Advanced, what percentage of students fulfilled the prerequisites?

 %

CQM3-02c

- c) Is taking the advanced mathematics track or course being assessed in TIMSS Advanced a prerequisite for further study (e.g., in university or higher education fields)?

CQM3-02cCOM

If Yes...

Please explain:

CURRICULUM QUESTIONNAIRE – ADVANCED MATHEMATICS

CQM3-03a

3. a) Does the national curriculum contain statements/policies about the use of calculators by students in the advanced mathematics track or course being assessed in TIMSS Advanced?

*Check **one** circle only.*

Yes--- ☐

No--- ☐

CQM3-03aCOM1

If Yes...

What are the statements/policies?

CQM3-03aCOM2

If No...

Comments:

CQM3-03b

b) *If Yes...*

Does the policy address requirements for the types of calculators that may be used?

*Check **one** circle only.*

Yes--- ☐

No--- ☐

CURRICULUM QUESTIONNAIRE – ADVANCED MATHEMATICS

CQM3-03bCOM1

If Yes...

Describe the types of calculators (e.g., graphing, symbolic):

CQM3-03bCOM2

If No...

Comments:

CQM3-03c

c) Are students permitted to use calculators in national examinations?

Check **one** circle only.Yes--- ☐No--- ☐

CQM3-03cCOM

If Yes...

Describe the policy and the types of calculator(s) allowed (e.g., graphing, symbolic):

CQM3-03d

d) Who pays for the calculators?

CURRICULUM QUESTIONNAIRE – ADVANCED MATHEMATICS

CQM3-04

4. Does the national curriculum contain statements/policies about the use of computers by students in the advanced mathematics track or course being assessed in TIMSS Advanced?

Check **one** circle only.

Yes--- ☐

No--- ☐

CQM3-04COM1

If Yes...

What are the statements/policies?

CQM3-04COM2

If No...

Comments:

CURRICULUM QUESTIONNAIRE – ADVANCED MATHEMATICS

5. According to the curriculum, should the students in the advanced mathematics track or course being assessed in TIMSS Advanced have been taught each of the following topics by the end of the year (in the current course or before)?

If part of a topic does not apply (e.g., permutations in topic (c) below), please cross out that part and answer for the major part of the topic.

*Check **one** circle for each line.*

Yes **No**

A. Algebra

- | | | |
|--------------------------------------------------------------------------------------------------------|-----------------------|-----------------------|
| a) Operations with complex numbers----- | <input type="radio"/> | <input type="radio"/> |
| b) The n th term of numeric and algebraic series and the sums to n terms or infinity of series---- | <input type="radio"/> | <input type="radio"/> |
| c) Problems involving permutations and combinations----- | <input type="radio"/> | <input type="radio"/> |
| d) Probability----- | <input type="radio"/> | <input type="radio"/> |
| e) Linear, simultaneous, and quadratic equations and inequalities----- | <input type="radio"/> | <input type="radio"/> |
| f) Logarithmic and exponential equations----- | <input type="radio"/> | <input type="radio"/> |
| g) Surd (radical) equations----- | <input type="radio"/> | <input type="radio"/> |
| h) Equivalent representations of functions as ordered pairs, tables, graphs, formulas, or words----- | <input type="radio"/> | <input type="radio"/> |
| i) Values of functions, including rational functions for given values and ranges of the variables----- | <input type="radio"/> | <input type="radio"/> |
| j) Function of a function----- | <input type="radio"/> | <input type="radio"/> |

B. Calculus

- | | | |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|-----------------------|
| a) Limits of functions including rational functions ----- | <input type="radio"/> | <input type="radio"/> |
| b) Conditions for continuity and differentiability of functions----- | <input type="radio"/> | <input type="radio"/> |
| c) Differentiation of functions (including polynomial, exponential, logarithmic, trigonometric, rational and radical functions); differentiation of products and quotients----- | <input type="radio"/> | <input type="radio"/> |
| d) Differentiation of composite and parametric functions----- | <input type="radio"/> | <input type="radio"/> |
| e) Using derivatives to solve problems (e.g., in kinematics, optimization, and rates of change)----- | <input type="radio"/> | <input type="radio"/> |

CURRICULUM QUESTIONNAIRE – ADVANCED MATHEMATICS

		Yes	No
CQM3-05Bf	f) Using first derivatives to determine gradient and turning points-----	<input type="radio"/>	<input type="radio"/>
CQM3-05Bg	g) Using second derivatives to determine maxima, minima, and points of inflection of functions-----	<input type="radio"/>	<input type="radio"/>
CQM3-05Bh	h) Integrating functions (including polynomial, exponential, trigonometric, and rational functions)-----	<input type="radio"/>	<input type="radio"/>
CQM3-05Bi	i) Evaluating definite integrals-----	<input type="radio"/>	<input type="radio"/>
CQM3-05C	C. Geometry		
CQM3-05Ca	a) Properties of geometric figures; proving geometric propositions in two dimensions-----	<input type="radio"/>	<input type="radio"/>
CQM3-05Cb	b) Proving geometric proposition in three dimensions-----	<input type="radio"/>	<input type="radio"/>
CQM3-05Cc	c) Gradients, y-axis intercepts, and points of intersection of straight lines in the Cartesian plane-----	<input type="radio"/>	<input type="radio"/>
CQM3-05Cd	d) Equations and properties of circles in the Cartesian plane;	<input type="radio"/>	<input type="radio"/>
CQM3-05Ce	e) Tangents and normals to given points on a circle-----	<input type="radio"/>	<input type="radio"/>
CQM3-05Cf	f) Trigonometric properties of triangles (sine, cosine, and tangent)-----	<input type="radio"/>	<input type="radio"/>
CQM3-05Cg	g) Solving equations involving trigonometric functions-----	<input type="radio"/>	<input type="radio"/>
CQM3-05Ch	h) Properties of vectors and their sums and differences-----	<input type="radio"/>	<input type="radio"/>

CQM3-05COM

Comments:

CURRICULUM QUESTIONNAIRE – ADVANCED MATHEMATICS

6. In what form is the advanced mathematics curriculum made available?

*Check **one** circle for each line.*

Yes No

CQM3-06a

a) Official publication containing the curriculum----- ☐ Yes ☐ No

CQM3-06b

b) Ministry notes and directives----- ☐ Yes ☐ No

CQM3-06c

c) Mandated or recommended textbooks----- ☐ Yes ☐ No

CQM3-06d

d) Instructional or pedagogical guide----- ☐ Yes ☐ No

CQM3-06e

e) Specifically developed or recommended instructional activities---- ☐ Yes ☐ No

CQM3-06f

f) Prescribed syllabus for public examination----- ☐ Yes ☐ No

CQM3-06g

g) Other----- ☐ Yes ☐ No

CQM3-06gOTH

Please specify:

CQM3-06COM

Comments:

CURRICULUM QUESTIONNAIRE – ADVANCED MATHEMATICS

CQM3-07a

7. a) Are textbooks that are used in the advanced mathematics track or course being assessed in TIMSS Advanced certified by an education authority?

Check **one** circle only.

Yes--- ☐

No--- ☐

CQM3-07aCOM

Comments:

CQM3-07b

- b) Who pays for the textbooks?

Please describe:

CURRICULUM QUESTIONNAIRE – ADVANCED MATHEMATICS

CQM3-08a

8. a) Does your country have a nationally mandated number of school days per year for the students in the advanced mathematics track or course being assessed in TIMSS Advanced?

Check **one** circle only.

Yes--- ☐

No--- ☐

CQM3-08aCOM

Please describe:

CQM3-08b

- b) What is the total amount of class time in advanced mathematics prescribed by the curriculum for the students in the advanced mathematics track?

hours per year (1 hour = 60 minutes)

CQM3-08bCOM

Comments:

CURRICULUM QUESTIONNAIRE – ADVANCED MATHEMATICS

CQM3-09

9. Is there an official policy on encouraging students to choose advanced mathematics courses?

Check **one** circle only.

Yes--- ☐

No--- ☐

CQM3-09COM

If Yes...
Please explain:

CURRICULUM QUESTIONNAIRE – ADVANCED MATHEMATICS

CQM3-10

10. Describe the national requirements for being a teacher of the advanced mathematics track or course being assessed in TIMSS Advanced.

CQM3-10COM

Comments:

CURRICULUM QUESTIONNAIRE – ADVANCED MATHEMATICS

11. If changes were made to the advanced mathematics curriculum, how would a teacher be informed about them?

Check **one** circle for each line.

	Yes	No
CQM3-11a a) Special conferences/seminars on curriculum-----	<input type="radio"/>	<input type="radio"/>
CQM3-11b b) Ministry (department of education, government, board of education) website-----	<input type="radio"/>	<input type="radio"/>
CQM3-11c c) Printed copies of curriculum distributed to schools-----	<input type="radio"/>	<input type="radio"/>
CQM3-11d d) Teachers receive own printed copy-----	<input type="radio"/>	<input type="radio"/>
CQM3-11e e) Professional development/in-service education-----	<input type="radio"/>	<input type="radio"/>
CQM3-11f f) Ministry notes-----	<input type="radio"/>	<input type="radio"/>
CQM3-11g g) Professional association newsletter-----	<input type="radio"/>	<input type="radio"/>
CQM3-11h h) Education journals-----	<input type="radio"/>	<input type="radio"/>
CQM3-11i i) Other educational authorities-----	<input type="radio"/>	<input type="radio"/>
CQM3-11j j) Other-----	<input type="radio"/>	<input type="radio"/>

CQM3-11OTH

Please specify:

CQM3-11COM

Comments:

CURRICULUM QUESTIONNAIRE – ADVANCED MATHEMATICS

12. How is the advanced mathematics curriculum implementation evaluated?

*Check **one** circle for each line.*

Yes No

CQM3-12a

a) Visits by inspectors----- ☐ ☐

CQM3-12b

b) Research programs----- ☐ ☐

CQM3-12c

c) School self-evaluation----- ☐ ☐

CQM3-12d

d) National examinations----- ☐ ☐

CQM3-12e

e) TIMSS Advanced----- ☐ ☐

CQM3-12f

f) Other----- ☐ ☐

CQM3-12OTH

Please specify:

CQM3-12COM

Comments:

CURRICULUM QUESTIONNAIRE – ADVANCED MATHEMATICS

CQM3-13

13. Does an education authority in your country (e.g., national ministry of education) administer examinations in mathematics that have consequences for individual students, such as determining grade promotion, entry to a higher school system, entry to a university, and/or exiting or graduating from upper secondary school?

Check **one** circle only.

Yes--- ☐

No--- ☐

CQM3-13COM1

If Yes...

Please describe the authority which administers examinations in mathematics, and list the grades at which they are given:

CQM3-13COM2

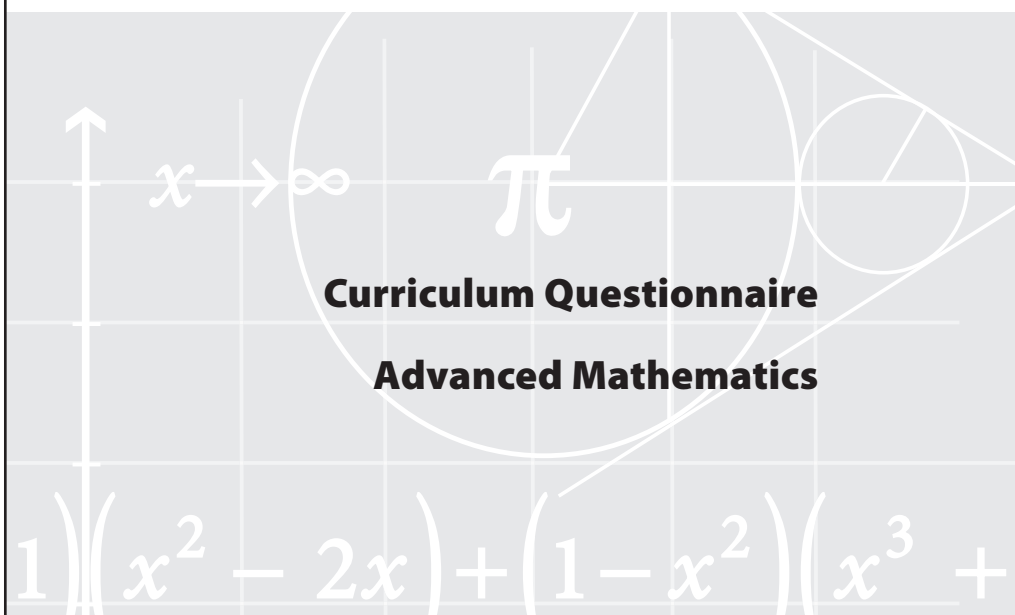
If No...

Comments:

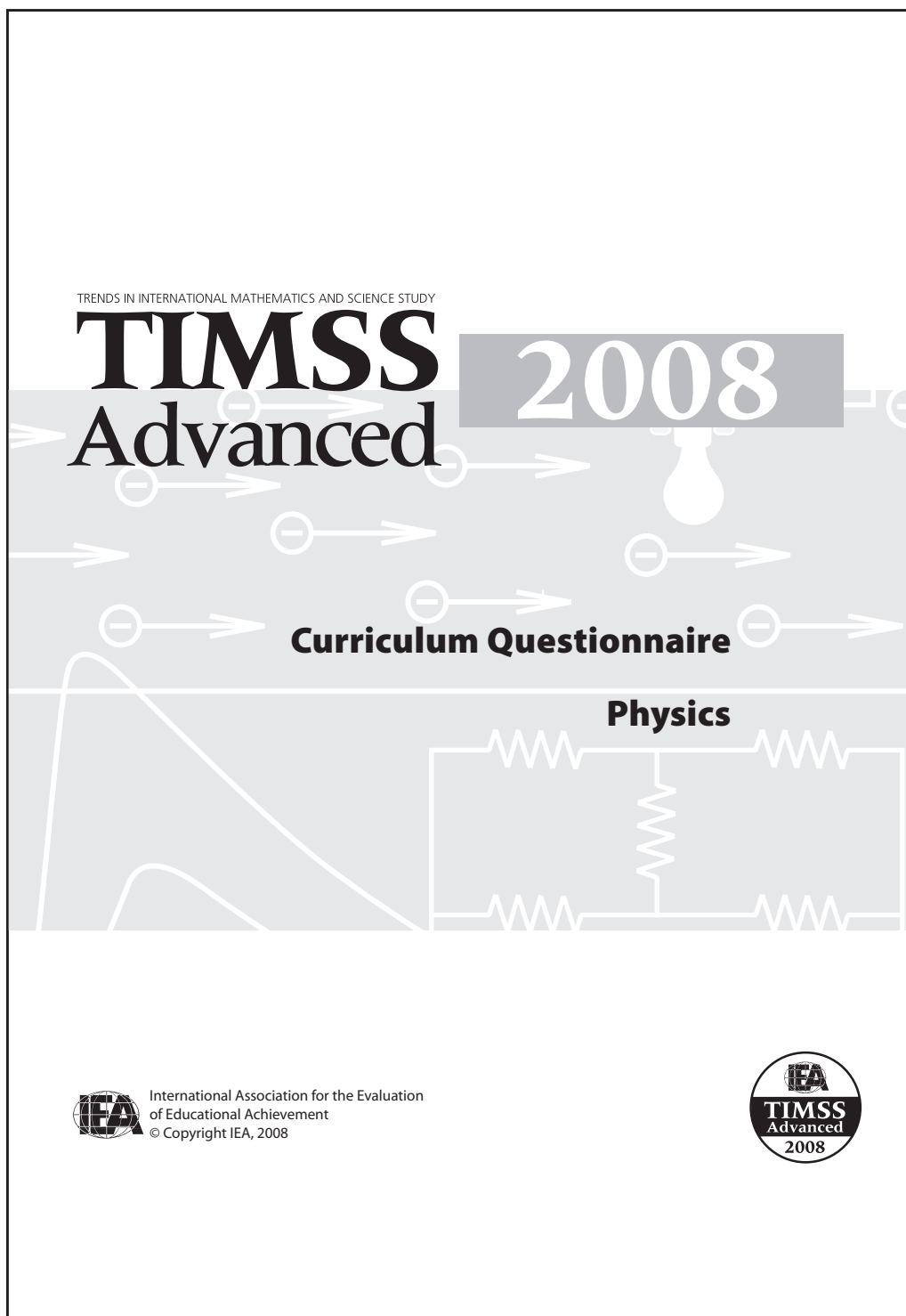
CURRICULUM QUESTIONNAIRE – ADVANCED MATHEMATICS



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



CURRICULUM QUESTIONNAIRE – PHYSICS



CURRICULUM QUESTIONNAIRE – PHYSICS

General Directions

The TIMSS Advanced 2008 Curriculum Questionnaire for physics is designed to collect information about the organization, content, and implementation of the intended physics curriculum in each country. The questionnaire should be completed by the National Research Coordinator, drawing on the expertise of curriculum specialists and educators.

Your responses are very important for us in interpreting the student achievement and background information collected in other parts of the study. Thank you very much for the time and effort you have put into responding to this questionnaire.

Contact Information

Country: _____

Name of Person
Completing this
Questionnaire: _____

Position: _____

Address: _____

Email: _____

Phone: _____

Fax: _____

CURRICULUM QUESTIONNAIRE – PHYSICS

Physics Curriculum and Instruction

CQP3-01a

1. a) In what year was the current curriculum implemented? (i.e., the curriculum that covers the physics track or course being assessed in TIMSS Advanced)

CQP3-01aCOM

Comments:

CQP3-01b

- b) Is that curriculum currently being revised?

*Check **one** circle only.*

Yes--- ☐

No--- ☐

CQP3-01bCOM1

If Yes...

Please explain:

CQP3-01bCOM2

If No...

Comments:

CURRICULUM QUESTIONNAIRE – PHYSICS

CQP3-02a

2. a) Are there any prerequisite courses for students taking the physics track or course being assessed in TIMSS Advanced?

Check **one** circle only.

Yes--- ☐

No--- ☐

CQP3-02aCOM

If Yes...

Please explain:

CQP3-02b

- b) Regardless of whether or not the students currently are enrolled in the physics track or course being assessed in TIMSS Advanced, what percentage of students fulfilled the prerequisites?

 %

CQP3-02c

- c) Is taking the physics track or course being assessed in TIMSS Advanced a prerequisite for further study (e.g., in university or higher education fields)?

CQP3-02cCOM

If Yes...

Please explain:

CURRICULUM QUESTIONNAIRE – PHYSICS

CQP3-03a

3. a) Does the national curriculum contain statements/policies about the use of calculators by students in the physics track or course being assessed in TIMSS Advanced?

*Check **one** circle only.*

Yes--- ☐

No--- ☐

CQP3-03aCOM1

If Yes...

What are the statements/policies?

CQP3-03aCOM2

If No...

Comments:

CQP3-03b

b) *If Yes...*

Does the policy address requirements for the types of calculators that may be used?

*Check **one** circle only.*

Yes--- ☐

No--- ☐

CURRICULUM QUESTIONNAIRE – PHYSICS

CQP3-03bCOM1

If Yes...

Describe the types of calculators (e.g., graphing, symbolic):

CQP3-03bCOM2

If No...

Comments:

CQP3-03c

c) Are students permitted to use calculators in national examinations?

*Check **one** circle only.*Yes--- ☐No--- ☐

CQP3-03cCOM

If Yes...

Describe the policy and the types of calculator(s) allowed (e.g., graphing, symbolic):

CQP3-03d

d) Who pays for the calculators?

CURRICULUM QUESTIONNAIRE – PHYSICS

CQP3-04

4. Does the national curriculum contain statements/policies about the use of computers by students in the physics track or course being assessed in TIMSS Advanced?

Check **one** circle only.

Yes--- ☐

No--- ☐

CQP3-04COM1

If Yes...

What are the statements/policies?

CQP3-04COM2

If No...

Comments:

CURRICULUM QUESTIONNAIRE – PHYSICS

5. According to the curriculum, should the students in the physics track or course being assessed in TIMSS Advanced have been taught each of the following topics by the end of the year (in the current course or before)?

If part of a topic does not apply (e.g., refraction in topic (c) below), please cross out that part and answer for the major part of the topic.

Check **one** circle for each line.

Yes No

A. Mechanics

a) The conditions for equilibrium and the dynamics of different types of movement-----

☐ ☐

b) Kinetic and potential energy; conservation of mechanical energy----

☐ ☐

c) Mechanical wave phenomena in sound, water, and strings; the relationship between speed, frequency, and wavelength; refraction-----

☐ ☐

d) Forces, including frictional force, acting on a moving body-----

☐ ☐

e) Forces acting on a body moving in a circular path; the body's centripetal acceleration, speed, and circling time; the law of gravitation in relation to the movement of planets-----

☐ ☐

f) Elastic and inelastic collision; the law of conservation of momentum and the law of conservation of mechanical (i.e., kinetic) energy-----

☐ ☐

g) Aspects of relativity (e.g., length contraction and time dilatation for an object moving with constant speed in relation to the observer)-----

☐ ☐

B. Electricity and Magnetism

a) Electrostatic attraction or repulsion between isolated charged particles — Coulomb's law-----

☐ ☐

b) Electrical circuits — Ohm's law and Joule's law for complex electrical circuits-----

☐ ☐

CURRICULUM QUESTIONNAIRE – PHYSICS

		Yes	No
CQP3-05Bc	c) Charged particles in a magnetic field, relationship between magnetism and electricity; Faraday's and Lenz' laws of induction-----	<input type="radio"/>	<input type="radio"/>
CQP3-05Bd	d) Electromagnetic radiation; wavelength and frequency of various types of waves (e.g., radio, infrared, x-rays, light)-----	<input type="radio"/>	<input type="radio"/>
CQP3-05C	C. Heat and Temperature		
CQP3-05Ca	a) Difference between heat and temperature; heat transfer and specific heat capacities; evaporation and condensation-----	<input type="radio"/>	<input type="radio"/>
CQP3-05Cb	b) Expansion of solids and liquids in relation to temperature change; the law of ideal gas; the first law of thermodynamics-----	<input type="radio"/>	<input type="radio"/>
CQP3-05Cc	c) Heat ("black body") radiation and temperature-----	<input type="radio"/>	<input type="radio"/>
CQP3-05D	D. Atomic and Nuclear Physics		
CQP3-05Da	a) The structure of the atom and its nucleus in terms of electrons, protons, and neutrons; atomic number and atomic mass number-----	<input type="radio"/>	<input type="radio"/>
CQP3-05Db	b) Light emission and absorption and the behavior of electrons; the photoelectric effect-----	<input type="radio"/>	<input type="radio"/>
CQP3-05Dc	c) Types of nuclear reactions (i.e., fission, fusion, and radioactive decay) and their role in nature (e.g., in stars) and society (e.g., reactors, bombs); radioactive isotopes-----	<input type="radio"/>	<input type="radio"/>
CQP3-05COM	Comments:		
	<div style="border: 1px solid black; height: 40px; width: 360px;"></div>		

CURRICULUM QUESTIONNAIRE – PHYSICS

6. In what form is the physics curriculum made available?

Check **one** circle for each line.

Yes No

CQP3-06a

a) Official publication containing the curriculum----- ☐ ☐

CQP3-06b

b) Ministry notes and directives----- ☐ ☐

CQP3-06c

c) Mandated or recommended textbooks----- ☐ ☐

CQP3-06d

d) Instructional or pedagogical guide----- ☐ ☐

CQP3-06e

e) Specifically developed or recommended instructional activities---- ☐ ☐

CQP3-06f

f) Prescribed syllabus for public examination----- ☐ ☐

CQP3-06g

g) Other----- ☐ ☐

CQP3-06gOTH

Please specify:

CQP3-06COM

Comments:

CURRICULUM QUESTIONNAIRE – PHYSICS

CQP3-07a

7. a) Are textbooks that are used in the physics track or course being assessed in TIMSS Advanced certified by an education authority?

Check **one** circle only.

Yes--- ☐

No--- ☐

CQP3-07aCOM

Comments:

CQP3-07b

- b) Who pays for the textbooks?

Please describe:

CURRICULUM QUESTIONNAIRE – PHYSICS

CQP3-08a

8. a) Does your country have a nationally mandated number of school days per year for the students in the physics track or course being assessed in TIMSS Advanced?

Check **one** circle only.

Yes--- ☐

No--- ☐

CQP3-08aCOM

Please describe:

CQP3-08b

- b) What is the total amount of class time in physics prescribed by the curriculum for the students in the physics track?

hours per year (1 hour = 60 minutes)

CQP3-08bCOM

Comments:

CURRICULUM QUESTIONNAIRE – PHYSICS

CQP3-09

9. Is there an official policy on encouraging students to choose physics courses?

Check **one** circle only.

Yes--- ☐

No--- ☐

CQP3-09COM

If Yes...

Please explain:

CURRICULUM QUESTIONNAIRE – PHYSICS

CQP3-10

10. Describe the national requirements for being a teacher of the physics track or course being assessed in TIMSS Advanced.

CQP3-10COM

Comments:

CURRICULUM QUESTIONNAIRE – PHYSICS

11. If changes were made to the physics curriculum, how would a teacher be informed about them?

Check **one** circle for each line.

Yes No

- | | | |
|----------|------------------------------------------------------------------------------------|---------------------------------------------|
| CQP3-11a | a) Special conferences/seminars on curriculum----- | <input type="radio"/> <input type="radio"/> |
| CQP3-11b | b) Ministry (department of education, government, board of education) website----- | <input type="radio"/> <input type="radio"/> |
| CQP3-11c | c) Printed copies of curriculum distributed to schools----- | <input type="radio"/> <input type="radio"/> |
| CQP3-11d | d) Teachers receive own printed copy----- | <input type="radio"/> <input type="radio"/> |
| CQP3-11e | e) Professional development/in-service education----- | <input type="radio"/> <input type="radio"/> |
| CQP3-11f | f) Ministry notes----- | <input type="radio"/> <input type="radio"/> |
| CQP3-11g | g) Professional association newsletter----- | <input type="radio"/> <input type="radio"/> |
| CQP3-11h | h) Education journals----- | <input type="radio"/> <input type="radio"/> |
| CQP3-11i | i) Other educational authorities----- | <input type="radio"/> <input type="radio"/> |
| CQP3-11j | j) Other----- | <input type="radio"/> <input type="radio"/> |

CQP3-11OTH

Please specify:

CQP3-11COM

Comments:

CURRICULUM QUESTIONNAIRE – PHYSICS

CQP3-12a
CQP3-12b
CQP3-12c
CQP3-12d
CQP3-12e
CQP3-12f
CQP3-12OTH

CQP3-12COM

12. How is the physics curriculum implementation evaluated?
*Check **one** circle for each line.*

	Yes	No
a) Visits by inspectors-----	<input type="radio"/>	<input type="radio"/>
b) Research programs-----	<input type="radio"/>	<input type="radio"/>
c) School self-evaluation-----	<input type="radio"/>	<input type="radio"/>
d) National examinations-----	<input type="radio"/>	<input type="radio"/>
e) TIMSS Advanced-----	<input type="radio"/>	<input type="radio"/>
f) Other-----	<input type="radio"/>	<input type="radio"/>

Please specify:

Comments:

CURRICULUM QUESTIONNAIRE – PHYSICS

CQP3-13

13. Does an education authority in your country (e.g., national ministry of education) administer examinations in physics that have consequences for individual students, such as determining grade promotion, entry to a higher school system, entry to a university, and/or exiting or graduating from upper secondary school?

Check **one** circle only.

Yes--- ☐

No--- ☐

CQP3-13COM1

If Yes...

Please describe the authority which administers examinations in physics, and list the grades at which they are given:

CQP3-13COM2

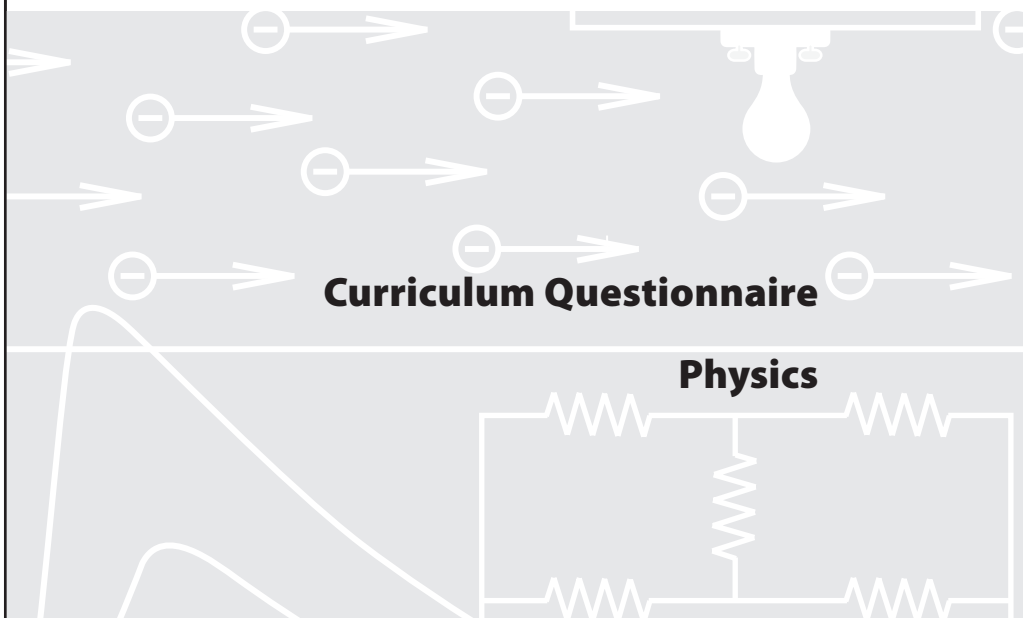
If No...

Comments:

CURRICULUM QUESTIONNAIRE – PHYSICS



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





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

ISBN 1-889938-57-2



**BOSTON
COLLEGE**



timssandpirls.bc.edu
Copyright © 2009 International Association for the
Evaluation of Educational Achievement (IEA)