Identification Label

Student ID:

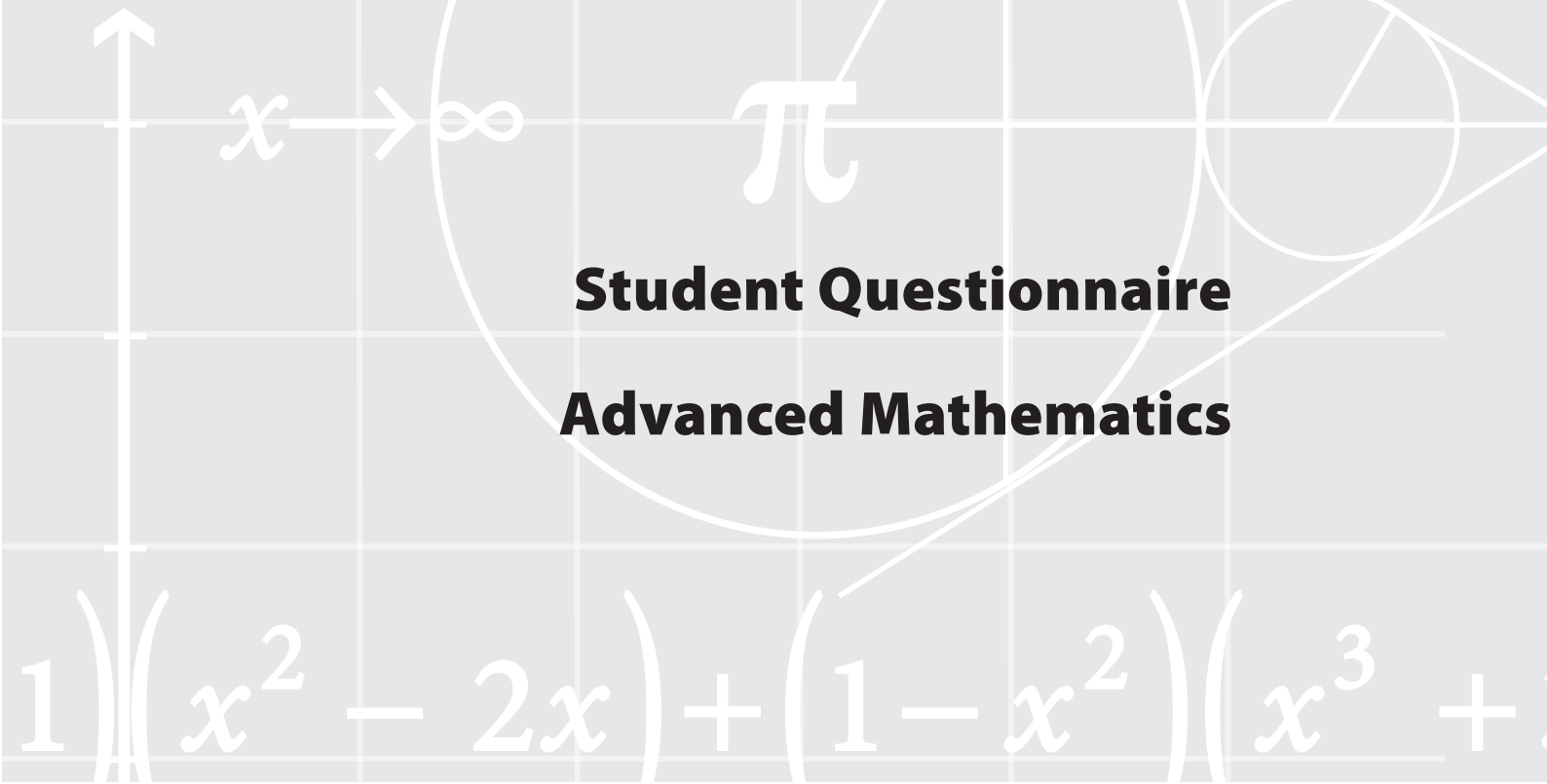
Student Name:

TRENDS IN INTERNATIONAL MATHEMATICS AND SCIENCE STUDY

TIMSS Advanced 2008

Student Questionnaire

Advanced Mathematics



<TIMSS Advanced National Research Center Name>
<Address>

International Association for the Evaluation
of Educational Achievement

TIMSS Advanced 2008

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.

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

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

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

5

Do you have any of these things at your home?

*Fill in **one** circle for each line*

		Yes	No
a)	Computer (do not include PlayStation®, GameCube®, XBox®, or other TV/video game computers)	①	②
b)	Internet connection	①	②
c)	Your own computer	①	②
d)	Your own graphing calculator	①	②
e)	Study desk/table for your use	①	②
f)	<country-specific>	①	②
g)	<country-specific>	①	②
h)	<country-specific>	①	②
i)	<country-specific>	①	②

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

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

About You (Continued)

7

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

	Yes	No
Fill in ***one*** circle only	①	②

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

	Yes	No
Fill in ***one*** circle only	①	②

8

A. Were you born in <country>?

	Yes	No
Fill in ***one*** circle only	①	②

*If **Yes**, please go to question **9***

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

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** →

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

Using Computers

11

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*

	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*

	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

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
a)	I do schoolwork (study or homework)	①	②	③	④	⑤
b)	I take part in organized activities (e.g., sports, music, clubs, community service, etc.)	①	②	③	④	⑤
c)	I use a computer for things other than schoolwork (e.g., messaging, email, gaming, music, etc.)	①	②	③	④	⑤
d)	I spend time with friends	①	②	③	④	⑤
e)	I work at a paid job	①	②	③	④	⑤
f)	I watch movies or television	①	②	③	④	⑤

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
a)	I enjoy solving mathematical problems	①	②	③	④
b)	I usually do well in mathematics	①	②	③	④
c)	Advanced mathematics lessons are interesting	①	②	③	④
d)	Studying or doing mathematics homework does not take me a lot of time	①	②	③	④
e)	I need advanced mathematics to pursue the career of my choice	①	②	③	④
f)	Advanced mathematics has good teachers	①	②	③	④
g)	My parents advised me to study advanced mathematics	①	②	③	④
h)	I expect that I will easily pass the tests	①	②	③	④
i)	I like the way advanced mathematics is taught in my school	①	②	③	④
j)	Studying advanced mathematics will give me more options after finishing <secondary school>	①	②	③	④
k)	A teacher advised me to study advanced mathematics	①	②	③	④
l)	My friends also are studying advanced mathematics	①	②	③	④
m)	The <study coordinator/mentor> of my school advised me to study advanced mathematics	①	②	③	④

14

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.

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
a)	We listen to the teacher present new material	①	②	③	④
b)	We work problems on our own	①	②	③	④
c)	We work on problems together with other students	①	②	③	④
d)	We review what has been taught	①	②	③	④
e)	We review homework	①	②	③	④
f)	We have oral or written tests or quizzes	①	②	③	④

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
a)	We memorize formulas and procedures	①	②	③	④
b)	We solve problems like the examples in our textbook	①	②	③	④
c)	We use mathematical terms to represent relationships	①	②	③	④
d)	We discuss problem-solving strategies	①	②	③	④
e)	We decide on our own procedures for solving complex problems	①	②	③	④
f)	We communicate our arguments	①	②	③	④
g)	We watch the teacher demonstrate mathematics on a computer	①	②	③	④

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

Homework

18

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
a) Problem/question sets	①	②	③
b) Read the textbook	①	②	③
c) Memorize formulas and procedures	①	②	③

19

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

20

How often do you work with a mathematics 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

21

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

*Fill in **one** circle only*

About once a week ---------- ①

About once a month ---------- ②

About 5 times a year ---------- ③

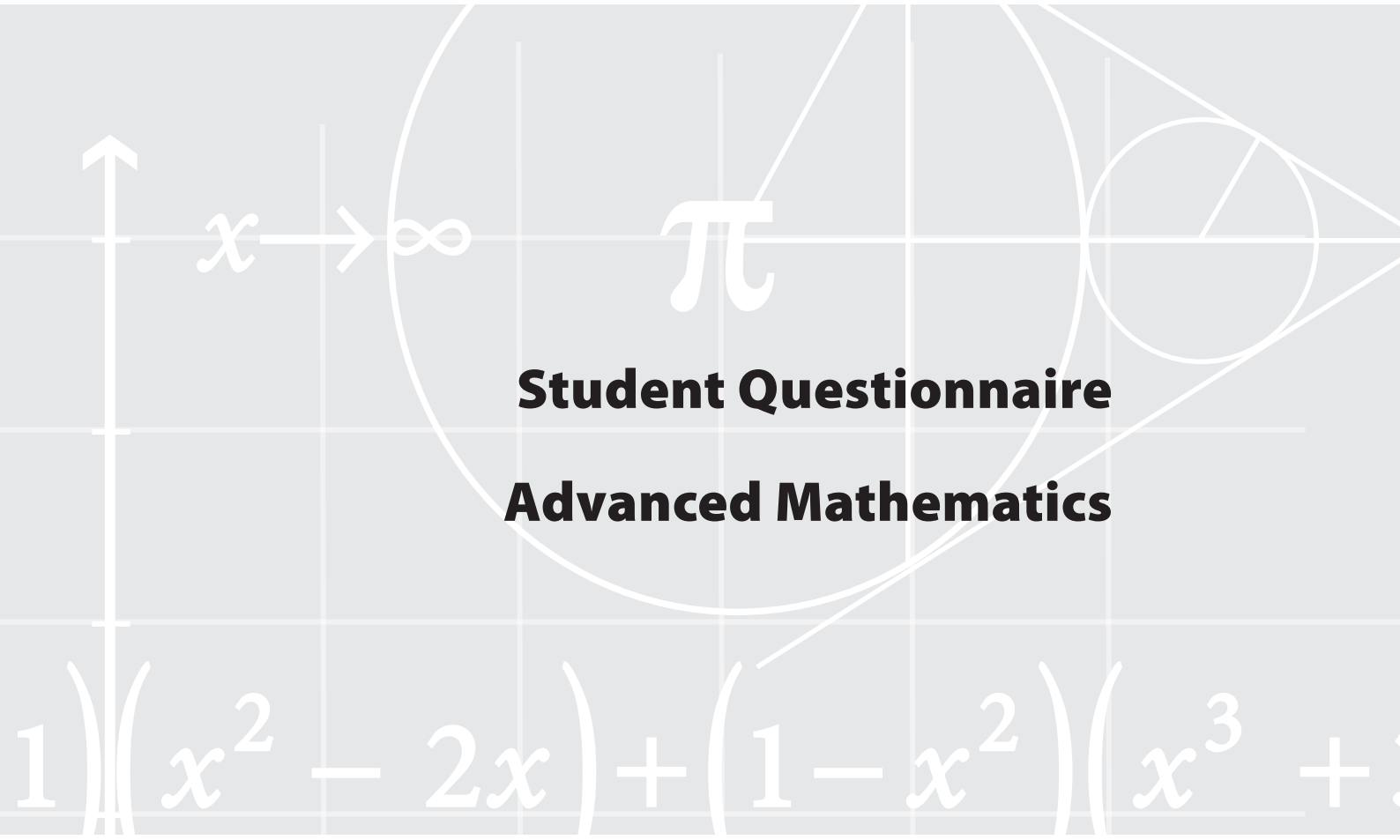
About twice a year ---------- ④

Never ---------- ⑤

Thank You

for completing this questionnaire

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



Student Questionnaire

Advanced Mathematics

Identification Label

Student ID:

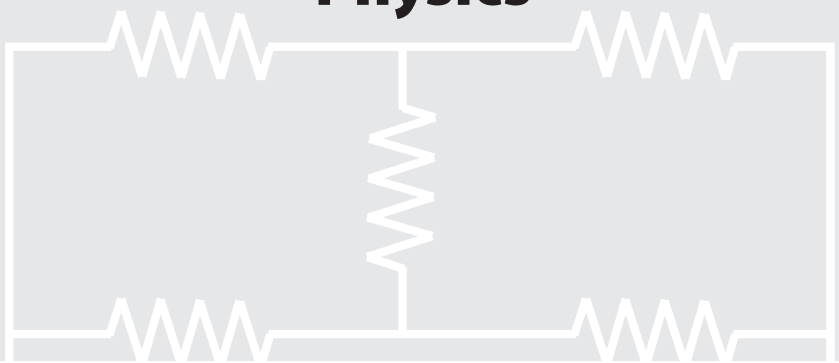
Student Name:

TRENDS IN INTERNATIONAL MATHEMATICS AND SCIENCE STUDY

TIMSS Advanced 2008

Student Questionnaire

Physics



<TIMSS Advanced National Research Center Name>
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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.

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

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

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

5

Do you have any of these things at your home?

*Fill in **one** circle for each line*

		Yes	No
a)	Computer (do not include PlayStation®, GameCube®, XBox®, or other TV/video game computers)	①	②
b)	Internet connection	①	②
c)	Your own computer	①	②
d)	Your own graphing calculator	①	②
e)	Study desk/table for your use	①	②
f)	<country-specific>	①	②
g)	<country-specific>	①	②
h)	<country-specific>	①	②
i)	<country-specific>	①	②

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

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

About You (Continued)

7

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

	Yes	No
Fill in ***one*** circle only	①	②

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

	Yes	No
Fill in ***one*** circle only	①	②

8

A. Were you born in <country>?

	Yes	No
Fill in ***one*** circle only	①	②

*If **Yes**, please go to question **9***

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

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** 

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

Using Computers

11

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*

	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*

	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

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
a)	I do schoolwork (study or homework)	①	②	③	④	⑤
b)	I take part in organized activities (e.g., sports, music, clubs, community service, etc.)	①	②	③	④	⑤
c)	I use a computer for things other than schoolwork (e.g., messaging, email, gaming, music, etc.)	①	②	③	④	⑤
d)	I spend time with friends	①	②	③	④	⑤
e)	I work at a paid job	①	②	③	④	⑤
f)	I watch movies or television	①	②	③	④	⑤

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
a)	I enjoy conducting experiments or investigations for physics	①	②	③	④
b)	I usually do well in physics	①	②	③	④
c)	Physics lessons are interesting	①	②	③	④
d)	Studying or doing physics homework does not take me a lot of time	①	②	③	④
e)	I need physics to pursue the career of my choice	①	②	③	④
f)	Physics has good teachers	①	②	③	④
g)	My parents advised me to study physics	①	②	③	④
h)	I expect that I will easily pass the tests	①	②	③	④
i)	I like the way physics is taught in my school	①	②	③	④
j)	Studying physics will give me more options after finishing <secondary school>	①	②	③	④
k)	A teacher advised me to study physics	①	②	③	④
l)	My friends also are studying physics	①	②	③	④
m)	The <study coordinator/mentor> of my school advised me to study physics	①	②	③	④

14

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.

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
a) We listen to the teacher present new material	①	②	③	④
b) We work problems on our own	①	②	③	④
c) We work on problems together with other students	①	②	③	④
d) We review what has been taught	①	②	③	④
e) We review homework	①	②	③	④
f) We have oral or written tests or quizzes	①	②	③	④

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

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 $\sqrt{}$), 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

Homework

18

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 line*

	Always or almost always	Sometimes	Never or almost never
a) Problem/question sets	①	②	③
b) Read the textbook	①	②	③
c) Memorize formulas and procedures	①	②	③

19

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

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

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

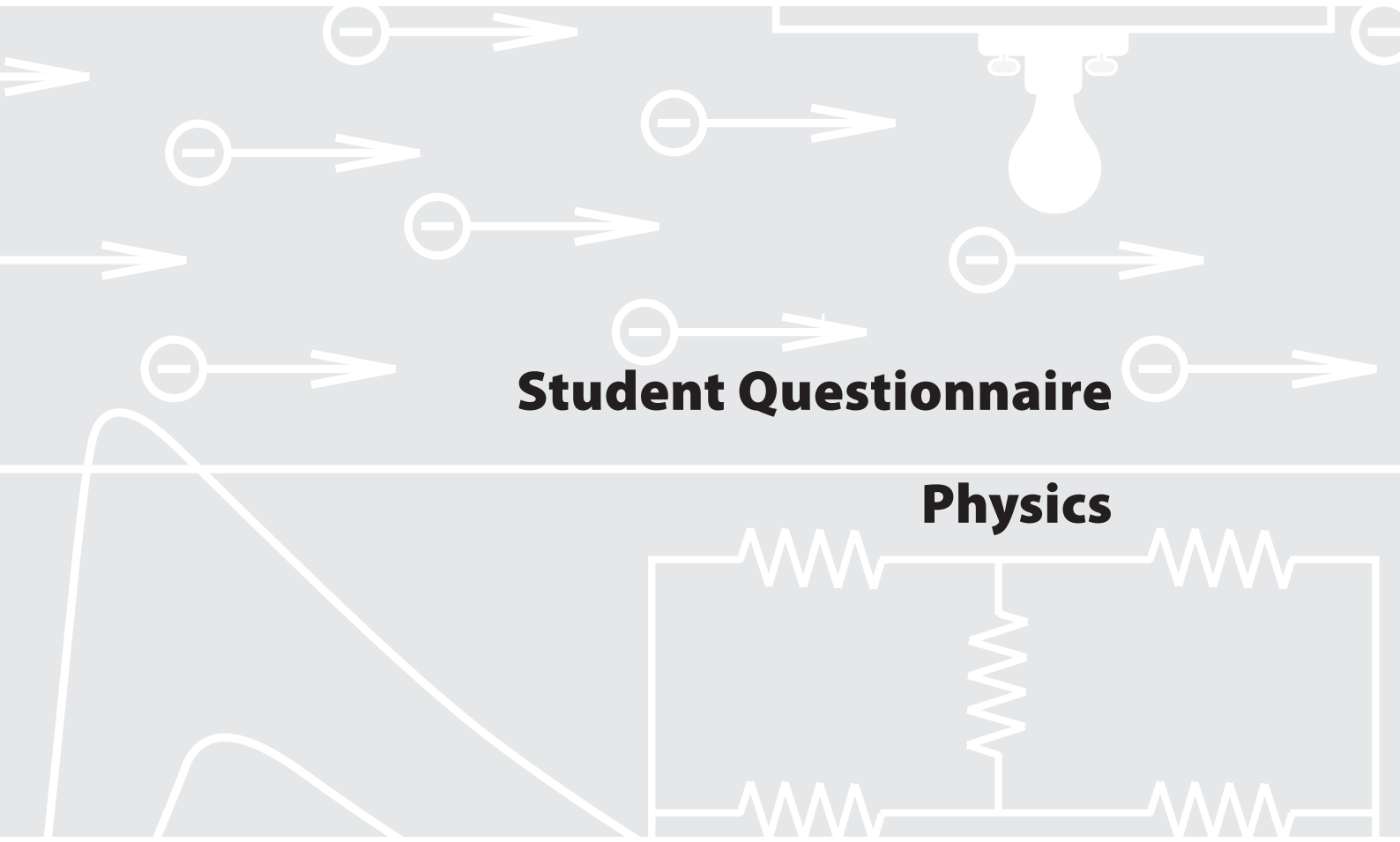
About twice a year ---------- ④

Never ---------- ⑤

Thank You

for completing this questionnaire

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



Student Questionnaire

Physics

Identification Label

Teacher Name: _____

Class Name:_____

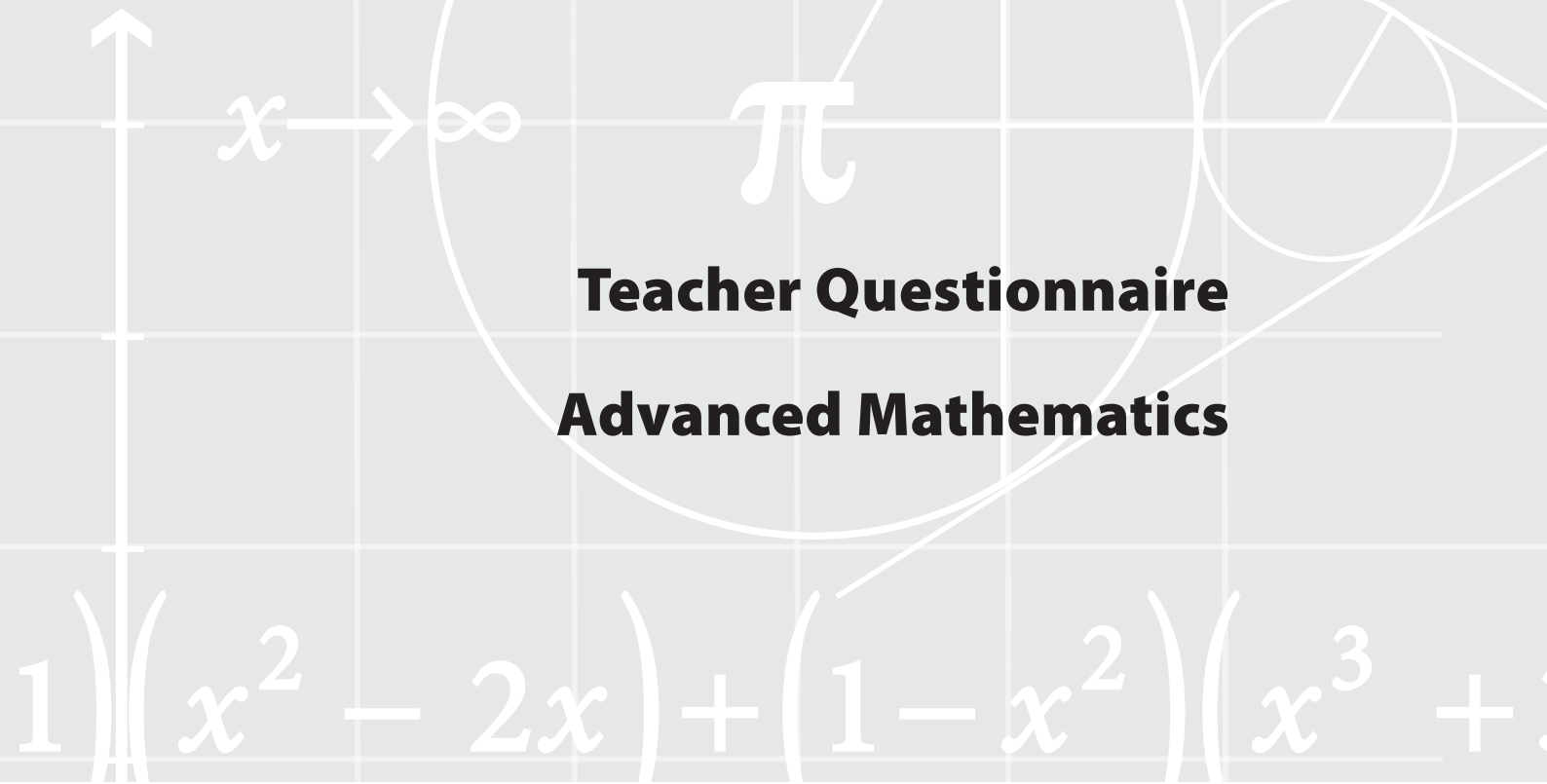
Teacher ID: _____ Teacher Link #_____

TRENDS IN INTERNATIONAL MATHEMATICS AND SCIENCE STUDY

TIMSS Advanced 2008

Teacher Questionnaire

Advanced Mathematics



<TIMSS Advanced National Research Center Name>
<Address>

International Association for the Evaluation
of Educational Achievement

TIMSS Advanced 2008

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.

Background Information

1

How old are you?

*Fill in **one** circle only*

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

2

Are you female or male?

*Fill in **one** circle only*

- Female ○
- Male ○

3

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

_____

Number of years you have taught

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

_____

Number of years taught advanced mathematics

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 ○

Preparation to Teach

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 <u>major or main</u> 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	○	○

7

Do you have a teaching license or certificate?

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

8

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

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

		Very well prepared	Somewhat prepared	Not 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	○	○	○

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	○	○	○	○

10

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

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

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*	○	○

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	○	○

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)	○	○

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*

	Agree a lot	Agree	Disagree	Disagree 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*

	Not a problem	Minor Problem	Serious 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	○	○	○	○	○

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.

16

How many students are in the <TIMSS class>?

_____

Write in the number of students

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.

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*	○	○

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	○	○	○	○
b) Read the textbook examples of how to do problems or exercises	○	○	○	○
c) Read about mathematical theory from their textbooks	○	○	○	○

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*

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

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%

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*

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

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?

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

		Yes	No
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 $\sqrt{}$), without functions like log, sin, cos ○
- Scientific calculators – basic functions (+, –, ×, ÷, %, or $\sqrt{}$) 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?

	Yes	No
*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?

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

		Never	Some lessons	About half the lessons	Every or almost every lesson
a)	Drawing graphs of functions	○	○	○	○
b)	Solving equations	○	○	○	○
c)	Manipulating algebraic expressions	○	○	○	○
d)	Modeling and simulation	○	○	○	○
e)	Numerical integration	○	○	○	○
f)	Processing and analyzing data	○	○	○	○

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	○	○	○

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>	○	○	○	○

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 ○

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 ○

35

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

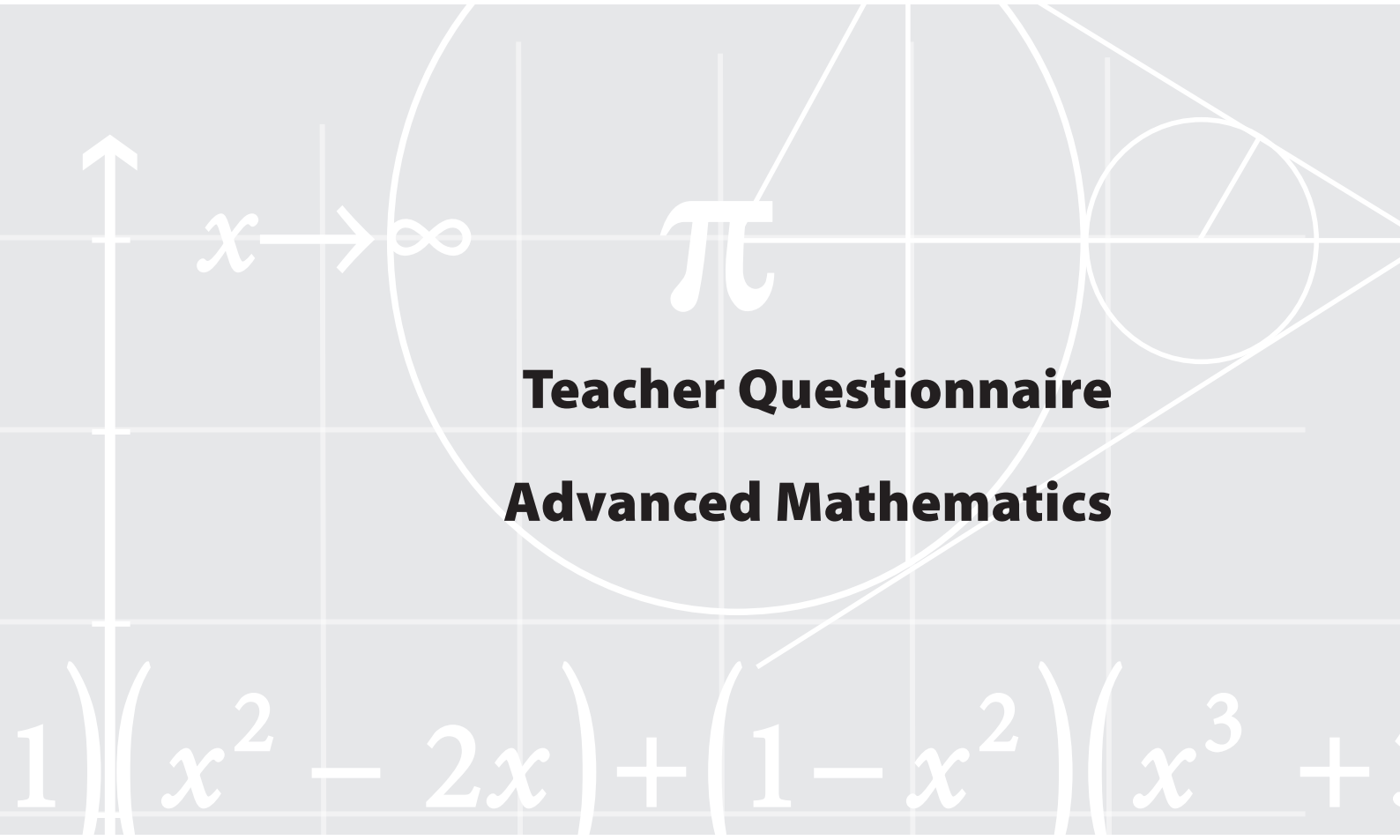
*Fill in **one** circle for each row*

	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	○	○	○

Thank You

for completing
this questionnaire

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



Teacher Questionnaire

Advanced Mathematics

Identification Label

Teacher Name: _____

Class Name:_____

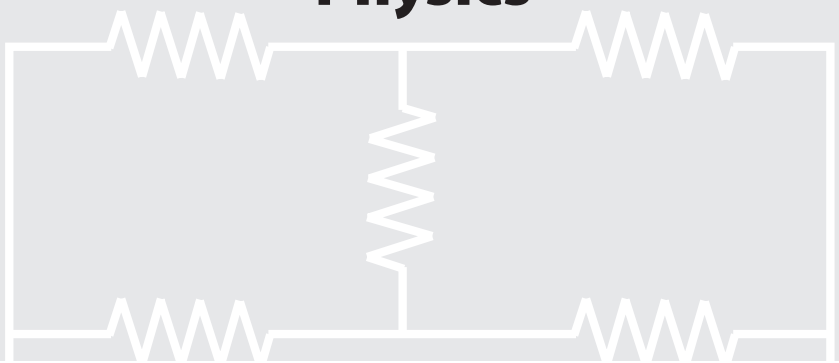
Teacher ID: _____ Teacher Link #_____

TRENDS IN INTERNATIONAL MATHEMATICS AND SCIENCE STUDY

TIMSS Advanced 2008

Teacher Questionnaire

Physics



<TIMSS Advanced National Research Center Name>
<Address>

TIMSS Advanced 2008

General Directions

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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.

Background Information

1

How old are you?

*Fill in **one** circle only*

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

2

Are you female or male?

*Fill in **one** circle only*

- Female ○
- Male ○

3

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

_____

Number of years you have taught

B. How many years will you have taught physics?

_____

Number of years taught physics

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 ○

Preparation to Teach

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	○	○

7

Do you have a teaching license or certificate?

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

8

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

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

		Very well prepared	Somewhat prepared	Not 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	○	○	○

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	○	○	○	○

10

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

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

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*	○	○

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	○	○

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)	○	○

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*

	Agree a lot	Agree	Disagree	Disagree 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*

	Not a problem	Minor problem	Serious 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	○	○	○	○	○

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	○	○	○	○
b) Read the textbook examples of how to do problems or exercises	○	○	○	○
c) Read about physics theory from their textbooks	○	○	○	○

20

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

Write in the percent
The total should add to 100%

a) 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	○	○	○	○

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%

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*

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

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*

		Yes	No
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 $\sqrt{}$), without functions like log, sin, cos ○

Scientific calculators – basic functions (+, –, ×, ÷, %, or $\sqrt{}$) 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?

	Yes	No
*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	○	○	○	○

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*

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

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>	○	○	○	○

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 ○

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 ○

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 ○

35

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

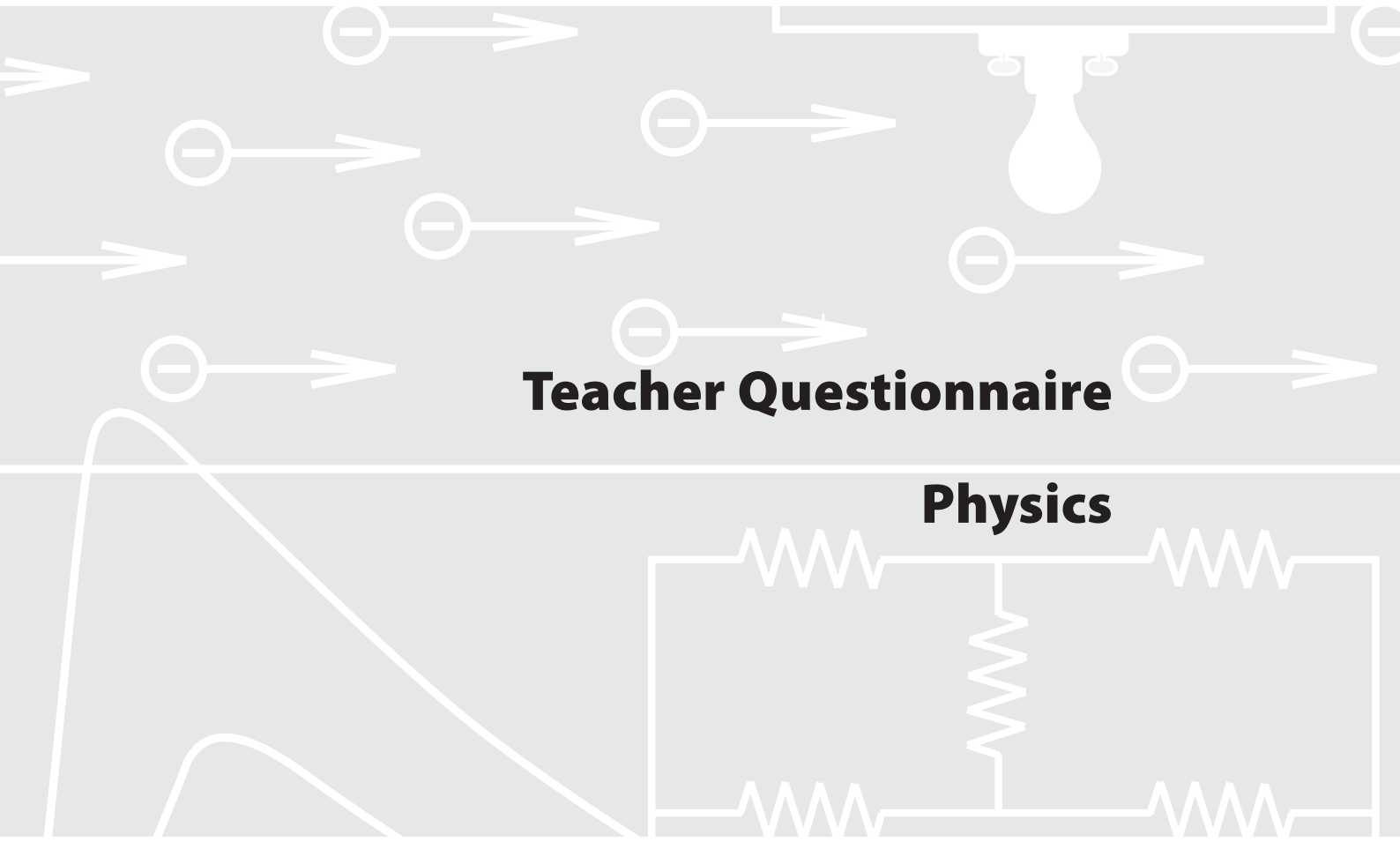
*Fill in **one** circle for each row*

	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	○	○	○

Thank You

for completing
this questionnaire

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



Teacher Questionnaire

Physics

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>

TIMSS Advanced 2008

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 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:*_____

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 ○

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	○	○	○	○

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% ○

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> _____%

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>	○	○	○	○

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	○	○	○	○	○

<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	○	○

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	○	○

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*

		Were no vacancies in this subject	Easy to fill vacancies	Somewhat difficult	Very difficult
a)	Mathematics	○	○	○	○
b)	Physics	○	○	○	○
c)	Computer science / information technology	○	○	○	○

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	○	○

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*

B. Severity of problem in your school

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

		Never	Rarely	Monthly	Weekly	Daily	Not a problem	Minor problem	Serious problem
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	○	○	○	○	○	○	○	○

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*

		No	A little	Some	A lot
a)	Instructional materials (e.g., textbook)	○	○	○	○
b)	Budget for supplies (e.g., paper, pencils)	○	○	○	○
c)	School buildings and grounds	○	○	○	○
d)	Heating/cooling and lighting systems	○	○	○	○
e)	Instructional space (e.g., classrooms)	○	○	○	○
f)	Special equipment for students with disabilities	○	○	○	○
g)	Computers for mathematics instruction	○	○	○	○
h)	Computer software for mathematics instruction	○	○	○	○
i)	Calculators for mathematics instruction	○	○	○	○
j)	Library materials relevant to mathematics instruction	○	○	○	○
k)	Audio-visual resources for mathematics instruction	○	○	○	○

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

		No	A little	Some	A lot
l)	Physics laboratory equipment and materials	○	○	○	○
m)	Computers for physics instruction	○	○	○	○
n)	Computer software for physics instruction	○	○	○	○
o)	Calculators for physics instruction	○	○	○	○
p)	Library materials relevant to physics instruction	○	○	○	○
q)	Audio-visual resources for physics instruction	○	○	○	○
r)	Teachers	○	○	○	○
s)	Computer support staff	○	○	○	○

15

A. Does your school have a physics laboratory?

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

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

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

16

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

	No	Yes
*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?

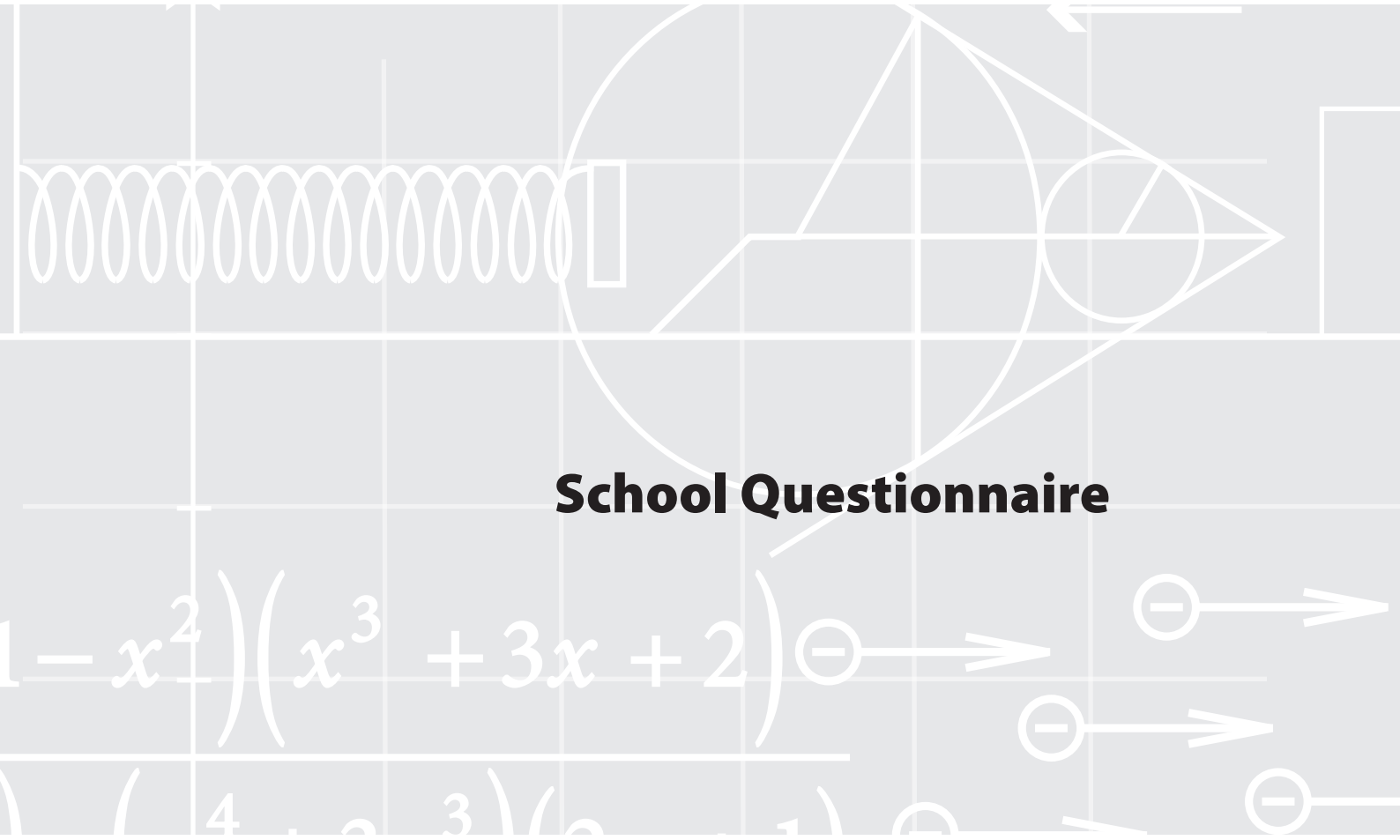
*Fill in **one** circle only*

- All ○
- Most ○
- Some ○
- None ○

Thank You

for completing this questionnaire

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



School Questionnaire

TRENDS IN INTERNATIONAL MATHEMATICS AND SCIENCE STUDY

TIMSS Advanced 2008

Curriculum Questionnaire

Advanced Mathematics

International Association for the Evaluation
of Educational Achievement

TIMSS Advanced 2008

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: _____

Advanced Mathematics Curriculum and Instruction

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)

Comments:

b) Is that curriculum currently being revised?

*Check **one** circle only.*

Yes--- ○

No--- ○

If Yes…
Please explain:

If No…
Comments:

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--- ○

If Yes…
Please explain:

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?

_____ %

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)?

If Yes…
Please explain:

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--- ○

If Yes…
What are the statements/policies?

If No…
Comments:

b) *If Yes…*
Does the policy address requirements for the types of calculators that may be used?

*Check **one** circle only.*

Yes--- ○

No--- ○

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

If No…
Comments:

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

*Check **one** circle only.*

Yes--- ○
No--- ○

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

d) Who pays for the calculators?

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--- ○

If Yes…
What are the statements/policies?

If No…
Comments:

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----------	○	○
b) The *n*th term of numeric and algebraic series and the sums to *n* terms or infinity of series----	○	○
c) Problems involving permutations and combinations----------	○	○
d) Probability----------	○	○
e) Linear, simultaneous, and quadratic equations and inequalities----------	○	○
f) Logarithmic and exponential equations---------	○	○
g) Surd (radical) equations----------	○	○
h) Equivalent representations of functions as ordered pairs, tables, graphs, formulas, or words----------	○	○
i) Values of functions, including rational functions for given values and ranges of the variables----------	○	○
j) Function of a function----------	○	○
B. Calculus		
a) Limits of functions including rational functions ----------	○	○
b) Conditions for continuity and differentiability of functions----------	○	○
c) Differentiation of functions (including polynomial, exponential, logarithmic, trigonometric, rational and radical functions); differentiation of products and quotients--------	○	○
d) Differentiation of composite and parametric functions----------	○	○
e) Using derivatives to solve problems (e.g., in kinematics, optimization, and rates of change)----------	○	○

	Yes	No
f) Using first derivatives to determine gradient and turning points----------		
g) Using second derivatives to determine maxima, minima, and points of inflection of functions----------		
h) Integrating functions (including polynomial, exponential, trigonometric, and rational functions)----------		
i) Evaluating definite integrals----------		
C. Geometry		
a) Properties of geometric figures; proving geometric propositions in two dimensions------		
b) Proving geometric proposition in three dimensions----------		
c) Gradients, *y*-axis intercepts, and points of intersection of straight lines in the Cartesian plane----------		
d) Equations and properties of circles in the Cartesian plane;		
e) Tangents and normals to given points on a circle----------		
f) Trigonometric properties of triangles (sine, cosine, and tangent)----------		
g) Solving equations involving trigonometric functions----------		
h) Properties of vectors and their sums and differences----------		

Comments:

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

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

	Yes	No
a) Official publication containing the curriculum----------	○	○
b) Ministry notes and directives----------	○	○
c) Mandated or recommended textbooks----------	○	○
d) Instructional or pedagogical guide----------	○	○
e) Specifically developed or recommended instructional activities----	○	○
f) Prescribed syllabus for public examination----------	○	○
g) Other----------	○	○

Please specify:

_____

Comments:

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--- ○

Comments:

b) Who pays for the textbooks?

Please describe:

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--- ○

Please describe:

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)

Comments:

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

*Check **one** circle only.*

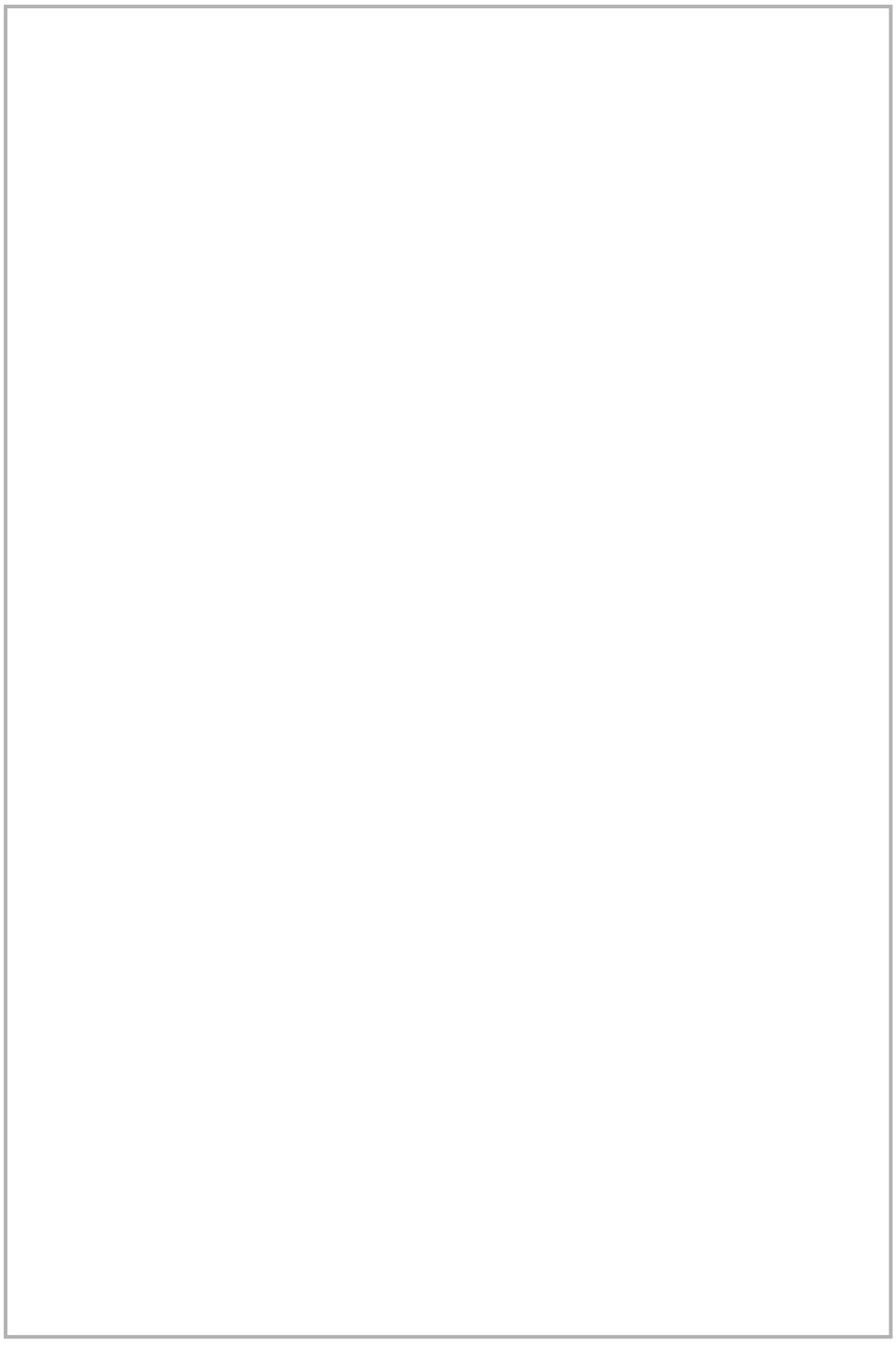
Yes--- ○

No--- ○

If Yes…
Please explain:

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

Comments:



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

Please specify:

_____

Comments:

12. How is the advanced mathematics curriculum implementation evaluated?

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

	Yes	No
a) Visits by inspectors----------	○	○
b) Research programs----------	○	○
c) School self-evaluation----------	○	○
d) National examinations----------	○	○
e) TIMSS Advanced----------	○	○
f) Other----------	○	○

Please specify:

_____

Comments:

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--- ○

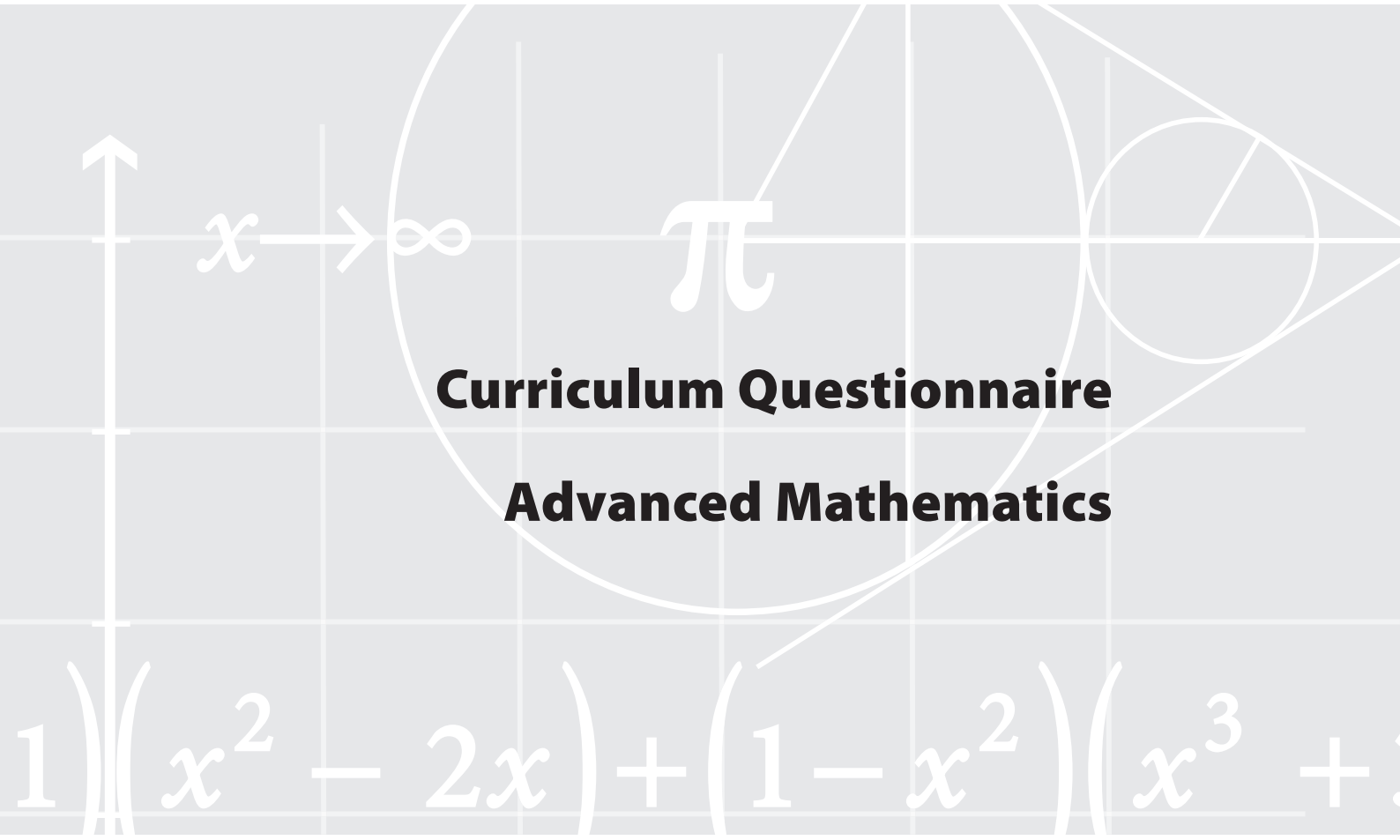
If Yes…
Please describe the authority which administers examinations in mathematics, and list the grades at which they are given:

If No…
Comments:

Thank You

for completing this questionnaire

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



Curriculum Questionnaire

Advanced Mathematics

TRENDS IN INTERNATIONAL MATHEMATICS AND SCIENCE STUDY

TIMSS Advanced 2008

Curriculum Questionnaire

Physics

International Association for the Evaluation
of Educational Achievement

TIMSS Advanced 2008

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: _____

Physics Curriculum and Instruction

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)

Comments:

b) Is that curriculum currently being revised?

*Check **one** circle only.*

Yes--- ○

No--- ○

If Yes…
Please explain:

If No…
Comments:

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--- ○

If Yes…
Please explain:

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?

_____ %

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)?

If Yes…
Please explain:

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--- ○

If Yes…
What are the statements/policies?

If No…
Comments:

b) *If Yes…*
Does the policy address requirements for the types of calculators that may be used?

*Check **one** circle only.*

Yes--- ○

No--- ○

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

If No…
Comments:

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

*Check **one** circle only.*

Yes---
No---

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

d) Who pays for the calculators?

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--- ○

If Yes…
What are the statements/policies?

If No…
Comments:

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----------	○	○

	Yes	No
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 gas; 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----------		

Comments:

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

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

	Yes	No
a) Official publication containing the curriculum----------	○	○
b) Ministry notes and directives----------	○	○
c) Mandated or recommended textbooks----------	○	○
d) Instructional or pedagogical guide----------	○	○
e) Specifically developed or recommended instructional activities----	○	○
f) Prescribed syllabus for public examination----------	○	○
g) Other----------	○	○

Please specify:

_____

Comments:

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--- ○

Comments:

b) Who pays for the textbooks?

Please describe:

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--- ○

Please describe:

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)

Comments:

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

*Check **one** circle only.*

Yes--- ○

No--- ○

If Yes…
Please explain:

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

    Comments:

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

Please specify:

_____

Comments:

12. How is the physics curriculum implementation evaluated?

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

	Yes	No
a) Visits by inspectors----------	○	○
b) Research programs----------	○	○
c) School self-evaluation----------	○	○
d) National examinations----------	○	○
e) TIMSS Advanced----------	○	○
f) Other----------	○	○

Please specify:

_____

Comments:

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--- ○

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

If No…
Comments:

Thank You

for completing this questionnaire

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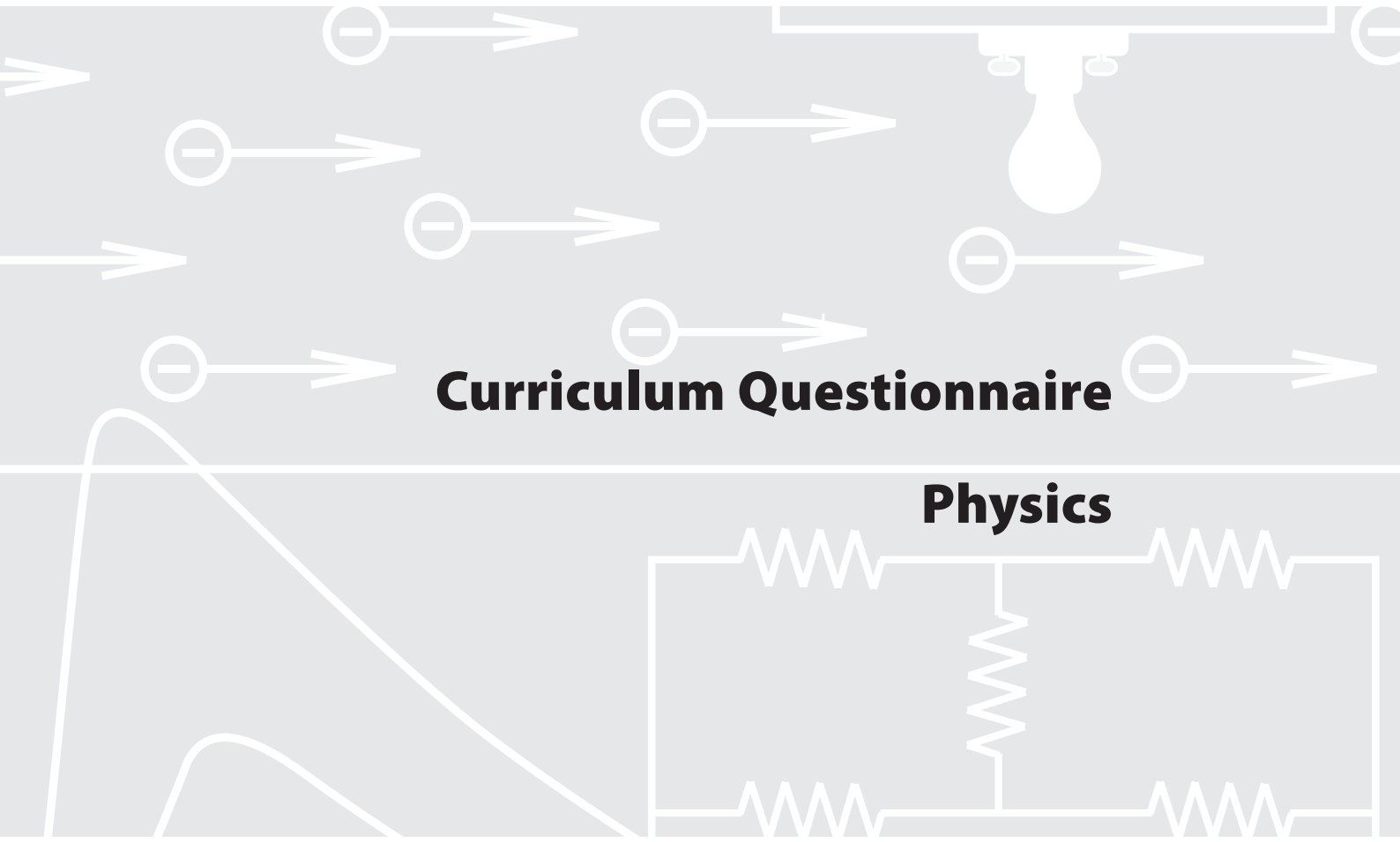

Curriculum Questionnaire

Physics