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

b) I talk with my friends

c) I play sports

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*

<table>
<thead>
<tr>
<th>Year</th>
<th>Month</th>
</tr>
</thead>
<tbody>
<tr>
<td>1986</td>
<td>January - ○</td>
</tr>
<tr>
<td>1987</td>
<td>February - ○</td>
</tr>
<tr>
<td>1988</td>
<td>March - ○</td>
</tr>
<tr>
<td>1989</td>
<td>April - ○</td>
</tr>
<tr>
<td>1990</td>
<td>May - ○</td>
</tr>
<tr>
<td>1991</td>
<td>June - ○</td>
</tr>
<tr>
<td>1992</td>
<td>July - ○</td>
</tr>
<tr>
<td>1993</td>
<td>August - ○</td>
</tr>
<tr>
<td>Other</td>
<td>September - ○</td>
</tr>
<tr>
<td></td>
<td>October - ○</td>
</tr>
<tr>
<td></td>
<td>November - ○</td>
</tr>
<tr>
<td></td>
<td>December - ○</td>
</tr>
</tbody>
</table>

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

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
Do you have any of these things at your home?

*Fill in one circle for each line*

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Computer (do not include PlayStation®, GameCube®, XBox®, or other TV/video game computers)</td>
<td>![Circle 1]</td>
<td>![Circle 2]</td>
</tr>
<tr>
<td>b) Internet connection</td>
<td>![Circle 1]</td>
<td>![Circle 2]</td>
</tr>
<tr>
<td>c) Your own computer</td>
<td>![Circle 1]</td>
<td>![Circle 2]</td>
</tr>
<tr>
<td>d) Your own graphing calculator</td>
<td>![Circle 1]</td>
<td>![Circle 2]</td>
</tr>
<tr>
<td>e) Study desk/table for your use</td>
<td>![Circle 1]</td>
<td>![Circle 2]</td>
</tr>
<tr>
<td>f) &lt;country-specific&gt;</td>
<td>![Circle 1]</td>
<td>![Circle 2]</td>
</tr>
<tr>
<td>g) &lt;country-specific&gt;</td>
<td>![Circle 1]</td>
<td>![Circle 2]</td>
</tr>
<tr>
<td>h) &lt;country-specific&gt;</td>
<td>![Circle 1]</td>
<td>![Circle 2]</td>
</tr>
<tr>
<td>i) &lt;country-specific&gt;</td>
<td>![Circle 1]</td>
<td>![Circle 2]</td>
</tr>
</tbody>
</table>
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
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*

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.)

Fill in one circle only

<table>
<thead>
<tr>
<th>Time</th>
<th>Circle</th>
</tr>
</thead>
<tbody>
<tr>
<td>No time</td>
<td>1</td>
</tr>
<tr>
<td>Less than 1 hour</td>
<td>2</td>
</tr>
<tr>
<td>1-2 hours</td>
<td>3</td>
</tr>
<tr>
<td>More than 2 but less than 4 hours</td>
<td>4</td>
</tr>
<tr>
<td>4 or more hours</td>
<td>5</td>
</tr>
</tbody>
</table>

If No Time, please go to question 12

B. Where do you use a computer?

Fill in one circle for each line

<table>
<thead>
<tr>
<th>Location</th>
<th>Circle</th>
</tr>
</thead>
<tbody>
<tr>
<td>A lot</td>
<td>1</td>
</tr>
<tr>
<td>Sometimes</td>
<td>2</td>
</tr>
<tr>
<td>Never</td>
<td>3</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Activity</th>
<th>Circle</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td></td>
</tr>
</tbody>
</table>

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

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

<table>
<thead>
<tr>
<th></th>
<th>No time</th>
<th>Less than 1 hour</th>
<th>1-2 hours</th>
<th>More than 2 but less than 4 hours</th>
<th>4 or more hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) I do schoolwork (study or homework)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b) I take part in organized activities (e.g., sports, music, clubs, community service, etc.)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c) I use a computer for things other than schoolwork (e.g., messaging, email, gaming, music, etc.)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d) I spend time with friends</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>e) I work at a paid job</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>f) I watch movies or television</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Why are you studying advanced mathematics?

Please indicate how important each reason was for you.

*Fill in one circle for each line*

<table>
<thead>
<tr>
<th>Reason</th>
<th>Very important</th>
<th>Important</th>
<th>Unimportant</th>
<th>Very unimportant</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) I enjoy solving mathematical problems</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>b) I usually do well in mathematics</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>c) Advanced mathematics lessons are interesting</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>d) Studying or doing mathematics homework does not take a lot of time</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>e) I need advanced mathematics to pursue the career of my choice</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>f) Advanced mathematics has good teachers</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>g) My parents advised me to study advanced mathematics</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>h) I expect that I will easily pass the tests</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>i) I like the way advanced mathematics is taught in my school</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>j) Studying advanced mathematics will give me more options after finishing &lt;secondary school&gt;</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>k) A teacher advised me to study advanced mathematics</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>l) My friends also are studying advanced mathematics</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>m) The &lt;study coordinator/mentor&gt; of my school advised me to study advanced mathematics</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>
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
How often do you do the following in your mathematics lessons?

*Fill in one circle for each line*

<table>
<thead>
<tr>
<th></th>
<th>Every or almost every lesson</th>
<th>About half the lessons</th>
<th>Some lessons</th>
<th>Never</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) We memorize formulas and procedures</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>b) We solve problems like the examples in our textbook</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>c) We use mathematical terms to represent relationships</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>d) We discuss problem-solving strategies</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>e) We decide on our own procedures for solving complex problems</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>f) We communicate our arguments</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>g) We watch the teacher demonstrate mathematics on a computer</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>
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

b) Computer

c) Other computing technology

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

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

Graphing calculator – scientific and also able to display some graphs

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

<table>
<thead>
<tr>
<th>Always or almost always</th>
<th>Sometimes</th>
<th>Never or almost never</th>
</tr>
</thead>
</table>

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  
About once a week  
About once a month  
Once in a while when I need extra help  
Never

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

Thank You for completing this questionnaire
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>
<Address>

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

<table>
<thead>
<tr>
<th></th>
<th>Every day</th>
<th>At least once a week</th>
<th>Once or twice a month</th>
<th>A few times a year</th>
<th>Never</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) I listen to music</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b) I talk with my friends</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c) I play sports</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Year</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1986</td>
<td>○</td>
</tr>
<tr>
<td>1987</td>
<td>○</td>
</tr>
<tr>
<td>1988</td>
<td>○</td>
</tr>
<tr>
<td>1989</td>
<td>○</td>
</tr>
<tr>
<td>1990</td>
<td>○</td>
</tr>
<tr>
<td>1991</td>
<td>○</td>
</tr>
<tr>
<td>1992</td>
<td>○</td>
</tr>
<tr>
<td>1993</td>
<td>○</td>
</tr>
<tr>
<td>Other</td>
<td>○</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Month</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>January</td>
<td>○</td>
</tr>
<tr>
<td>February</td>
<td>○</td>
</tr>
<tr>
<td>March</td>
<td>○</td>
</tr>
<tr>
<td>April</td>
<td>○</td>
</tr>
<tr>
<td>May</td>
<td>○</td>
</tr>
<tr>
<td>June</td>
<td>○</td>
</tr>
<tr>
<td>July</td>
<td>○</td>
</tr>
<tr>
<td>August</td>
<td>○</td>
</tr>
<tr>
<td>September</td>
<td>○</td>
</tr>
<tr>
<td>October</td>
<td>○</td>
</tr>
<tr>
<td>November</td>
<td>○</td>
</tr>
<tr>
<td>December</td>
<td>○</td>
</tr>
</tbody>
</table>

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
About You (Continued)

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
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
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.)

<table>
<thead>
<tr>
<th>No time</th>
<th>Less than 1 hour</th>
<th>1-2 hours</th>
<th>More than 2 but less than 4 hours</th>
<th>4 or more hours</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

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*

<table>
<thead>
<tr>
<th></th>
<th>No time</th>
<th>Less than 1 hour</th>
<th>1-2 hours</th>
<th>More than 2 but less than 4 hours</th>
<th>4 or more hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) I do schoolwork (study or homework)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>b) I take part in organized activities (e.g., sports, music, clubs, community service, etc.)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>c) I use a computer for things other than schoolwork (e.g., messaging, email, gaming, music, etc.)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>d) I spend time with friends</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>e) I work at a paid job</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>f) I watch movies or television</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>
Why are you studying physics?
Please indicate how important each reason was for you.

*Fill in one circle for each line*

<table>
<thead>
<tr>
<th>Reason</th>
<th>Very important</th>
<th>Important</th>
<th>Unimportant</th>
<th>Very unimportant</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) I enjoy conducting experiments or investigations for physics</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b) I usually do well in physics</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c) Physics lessons are interesting</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d) Studying or doing physics homework does not take me a lot of time</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>e) I need physics to pursue the career of my choice</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>f) Physics has good teachers</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>g) My parents advised me to study physics</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>h) I expect that I will easily pass the tests</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>i) I like the way physics is taught in my school</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>j) Studying physics will give me more options after finishing</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>k) A teacher advised me to study physics</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>l) My friends also are studying physics</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>m) The &lt;study coordinator/mentor&gt; of my school advised me to study physics</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
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
**Physics in School (Continued)**

16

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

*Fill in one circle for each line*

<table>
<thead>
<tr>
<th></th>
<th>Every or almost every lesson</th>
<th>About half the lessons</th>
<th>Some lessons</th>
<th>Never</th>
</tr>
</thead>
<tbody>
<tr>
<td>a)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>e)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>f)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>g)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>h)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a) We watch the teacher demonstrate an experiment or investigation

b) We conduct an experiment or investigation

c) We use laws and formulas of physics to solve problems

d) We give explanations about what we are studying

e) We relate what we are learning in physics to our daily lives

f) We memorize formulas and procedures of physics

g) We read our physics textbooks and other resource materials

h) We watch the teacher demonstrate physics on a computer
A. How often do you use the following in your physics lessons?

*Fill in one circle for each line*

<table>
<thead>
<tr>
<th></th>
<th>Every or almost every lesson</th>
<th>About half the lessons</th>
<th>Some lessons</th>
<th>Never</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Calculator</td>
<td>![Circle]</td>
<td>![Circle]</td>
<td>![Circle]</td>
<td>![Circle]</td>
</tr>
<tr>
<td>b) Computer</td>
<td>![Circle]</td>
<td>![Circle]</td>
<td>![Circle]</td>
<td>![Circle]</td>
</tr>
<tr>
<td>c) Other computing technology</td>
<td>![Circle]</td>
<td>![Circle]</td>
<td>![Circle]</td>
<td>![Circle]</td>
</tr>
</tbody>
</table>

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 √), without functions like log, sin, cos - ![Circle]
- Scientific calculator – basic functions (+, −, ×, ÷, %, or √) and also functions like log, sin, cos - ![Circle]
- Graphing calculator – scientific and also able to display some graphs - ![Circle]
- Symbolic calculator – graphing and also able to solve expressions in symbolic terms - ![Circle]
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

a) Problem/question sets

b) Read the textbook

c) Memorize formulas and procedures

Sometimes

Never or almost never

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

Once or twice a week

About once a month

Never or almost never
20

How often do you work with a physics 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  

21

How often do you prepare for a physics 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  

Thank You for completing this questionnaire
Teacher Questionnaire
Advanced Mathematics
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. By the end of this school year, how many years will you have been teaching altogether?
   
   Number of years you have taught

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 major or main area(s) of study?
   
   Fill in one circle for each row
   
   No  Yes
   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?
   
   Fill in one circle only
   
   No  Yes
How well prepared do you feel you are to teach the following topics?

<table>
<thead>
<tr>
<th>Topic</th>
<th>Not well prepared</th>
<th>Somewhat prepared</th>
<th>Very well prepared</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A. Algebra</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a) Operations with complex numbers</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b) The $n^{th}$ term of numeric and algebraic series and the sums to $n$ terms or infinity of series</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c) Problems involving permutations, combinations, and probability</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d) Linear, simultaneous, and quadratic equations and inequalities; surd (radical) equations, logarithmic, and exponential equations</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>e) Equivalent representations of functions as ordered pairs, tables, graphs, formulas, or words</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>f) Values of functions, including rational functions for given values and ranges of the variables; function of a function</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>B. Calculus</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a) Limits of functions including rational functions; conditions for continuity and differentiability of functions</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b) Differentiation of functions (including polynomial, exponential, logarithmic, trigonometric, rational, radical, composite, and parametric functions); differentiation of products and quotients</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c) Using derivatives to solve problems (e.g., in kinematics, optimization, and rates of change)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d) Using first and second derivatives to determine gradient, turning points, and points of inflection of functions</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>e) Integrating functions (including polynomial, exponential, trigonometric, and rational functions); evaluating definite integrals</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>C. Geometry</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a) Properties of geometric figures; proving geometric propositions in two and three dimensions</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b) Gradients, $y$-axis intercepts, and points of intersection of straight lines in the Cartesian plane</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c) Equations and properties of circles in the Cartesian plane; tangents and normals to given points on a circle</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d) Trigonometric properties of triangles (sine, cosine, and tangent); solving equations involving trigonometric functions</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>e) Properties of vectors and their sums and differences</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
In your school, how often do you have the following types of interactions with other teachers?

Fill in one circle for each row

<table>
<thead>
<tr>
<th>Daily or almost daily</th>
<th>1-3 times per week</th>
<th>Never or almost never</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Discussions about how to teach a particular concept</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>b) Working on preparing instructional materials</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>c) Visits to another teacher’s classroom to observe his/her teaching</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>d) Informal observations of my classroom by another teacher</td>
<td>O</td>
<td>O</td>
</tr>
</tbody>
</table>

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

Fill in one circle for each row

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Mathematics content</td>
<td>O</td>
</tr>
<tr>
<td>b) Mathematics pedagogy/instruction</td>
<td>O</td>
</tr>
<tr>
<td>c) Mathematics curriculum</td>
<td>O</td>
</tr>
<tr>
<td>d) Integrating information technology into mathematics</td>
<td>O</td>
</tr>
<tr>
<td>e) Improving students’ critical thinking or problem-solving skills</td>
<td>O</td>
</tr>
<tr>
<td>f) Mathematics assessment</td>
<td>O</td>
</tr>
</tbody>
</table>

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

Fill in one circle only

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
</table>

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

Fill in one circle only

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
</table>

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

Fill in one circle for each row

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) I attended a workshop or conference</td>
<td>O</td>
</tr>
<tr>
<td>b) I gave a presentation at a workshop or conference</td>
<td>O</td>
</tr>
<tr>
<td>c) I published an article in a journal or magazine for teachers (print or online)</td>
<td>O</td>
</tr>
<tr>
<td>d) I took part in an innovative project for curriculum and instruction</td>
<td>O</td>
</tr>
<tr>
<td>e) I exchanged information online about how to teach mathematics (e.g., email, forums, website)</td>
<td>O</td>
</tr>
</tbody>
</table>
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*

<table>
<thead>
<tr>
<th>Disagree a lot</th>
<th>Disagree</th>
<th>Agree</th>
<th>Agree a lot</th>
</tr>
</thead>
</table>

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*

<table>
<thead>
<tr>
<th>Serious problem</th>
<th>Minor Problem</th>
<th>Not a problem</th>
</tr>
</thead>
</table>

a) The school building needs significant repair
b) Classrooms are overcrowded
c) Teachers do not have adequate workspace outside their classroom

d) Teachers’ job satisfaction

15

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

*Fill in one circle for each row*

<table>
<thead>
<tr>
<th>Very low</th>
<th>Low</th>
<th>Medium</th>
<th>High</th>
<th>Very high</th>
</tr>
</thead>
</table>

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>? 

Fill in one circle only

No
Yes

B. Does each student have his or her own textbook?
Fill in one circle only

No
Yes

C. How often do you require students to do the following?
Fill in one circle for each row

Never

Some lessons

About half the lessons

Every or almost every lesson

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
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

---

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

<table>
<thead>
<tr>
<th></th>
<th>Never</th>
<th>Some lessons</th>
<th>About half the lessons</th>
<th>Every or almost every lesson</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Memorize formulas and procedures</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>b) Solve problems like the examples in their textbooks</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>c) Use mathematical terms to represent relationships</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>d) Discuss problem-solving strategies</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>e) Decide on their own procedures for solving complex problems</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>f) Communicate their arguments</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>
In your view, to what extent do the following limit how you teach the <TIMSS class>?

Fill in one circle for each row

<table>
<thead>
<tr>
<th></th>
<th>A lot</th>
<th>Some</th>
<th>A little</th>
<th>Not at all</th>
</tr>
</thead>
</table>

**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

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%
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*

<table>
<thead>
<tr>
<th>Not yet taught or just introduced</th>
<th>Mostly taught this year</th>
<th>Mostly taught before this year</th>
</tr>
</thead>
</table>

**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?

<table>
<thead>
<tr>
<th></th>
<th>Never</th>
<th>Some lessons</th>
<th>About half the lessons</th>
<th>Every or almost every lesson</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>[25]</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**26**
A. Do the students in the <TIMSS class> use any of the following during mathematics lessons?

<table>
<thead>
<tr>
<th></th>
<th>No</th>
<th>Yes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>[26]</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a) Calculators
b) Computers
c) Other computing technology

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

<table>
<thead>
<tr>
<th></th>
<th>Simple calculators – basic functions only (+, −, ×, ÷, %, or √), without functions like log, sin, cos</th>
<th>Scientific calculators – basic functions (+, −, ×, ÷, %, or √) and also functions like log, sin, cos</th>
<th>Graphing calculators – scientific and also able to display some graphs</th>
<th>Symbolic calculators – graphing and also able to solve expressions in symbolic terms</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>[27]</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th></th>
<th>No</th>
<th>Yes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>[27]</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**27**
How often do students in the <TIMSS class> use calculators or computers in their mathematics lessons for the following activities?

<table>
<thead>
<tr>
<th></th>
<th>Never</th>
<th>Some lessons</th>
<th>About half the lessons</th>
<th>Every or almost every lesson</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>[27]</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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>?

- Every or almost every lesson
- About half the lessons
- Some lessons

Fill in one circle only.

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.)

- 30 minutes or less
- 31-60 minutes
- 61-90 minutes
- More than 90 minutes

Fill in one circle only.

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

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

Fill in one circle for each row.

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

<table>
<thead>
<tr>
<th>No emphasis</th>
<th>Little emphasis</th>
<th>Some emphasis</th>
<th>Major emphasis</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>At least once a month</th>
<th>About every other month</th>
<th>About 2 or 3 times a year</th>
<th>Never</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>○</td>
</tr>
</tbody>
</table>

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

Fill in one circle only

<table>
<thead>
<tr>
<th>Only constructed response</th>
<th>Mostly constructed response</th>
<th>About half constructed response and half objective (e.g., multiple choice)</th>
<th>Mostly objective</th>
<th>Only objective</th>
</tr>
</thead>
<tbody>
<tr>
<td>○</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

Fill in one circle for each row

<table>
<thead>
<tr>
<th>Never or almost never</th>
<th>Sometimes</th>
<th>Always or almost always</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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
Teacher Questionnaire
Advanced Mathematics
Identification Label

Teacher Name: ______________
Class Name: __________________
Teacher ID: ____________  Teacher Link #: ____________
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?**
   
   - Under 25
   - 25–29
   - 30–39
   - 40–49
   - 50–59
   - 60 or older

2. **Are you female or male?**
   
   - 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?**
   
   - 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?**
   
   - 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?**
   
   - 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?**
   
   - No
   - Yes
How well prepared do you feel you are to teach the following topics?

Fill in one circle for each row

<table>
<thead>
<tr>
<th>Not well prepared</th>
<th>Somewhat prepared</th>
<th>Very well prepared</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**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

#### In your school, how often do you have the following types of interactions with other teachers?

*Fill in one circle for each row*

<table>
<thead>
<tr>
<th>Daily or almost daily</th>
<th>1-3 times per week</th>
<th>2 or 3 times per month</th>
<th>Never or almost never</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Discussions about how to teach a particular concept</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>b) Working on preparing instructional materials</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>c) Visits to another teacher’s classroom to observe his/her teaching</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>d) Informal observations of my classroom by another teacher</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
</tbody>
</table>

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

*Fill in one circle for each row*

<table>
<thead>
<tr>
<th>No</th>
<th>Yes</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Physics content</td>
<td>O</td>
</tr>
<tr>
<td>b) Physics pedagogy/instruction</td>
<td>O</td>
</tr>
<tr>
<td>c) Physics curriculum</td>
<td>O</td>
</tr>
<tr>
<td>d) Integrating information technology into physics</td>
<td>O</td>
</tr>
<tr>
<td>e) Improving students’ critical thinking or inquiry skills</td>
<td>O</td>
</tr>
<tr>
<td>f) Physics assessment</td>
<td>O</td>
</tr>
</tbody>
</table>

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

*Fill in one circle only*

<table>
<thead>
<tr>
<th>No</th>
<th>Yes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>O</td>
</tr>
</tbody>
</table>

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

*Fill in one circle only*

<table>
<thead>
<tr>
<th>No</th>
<th>Yes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>O</td>
</tr>
</tbody>
</table>

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

*Fill in one circle for each row*

<table>
<thead>
<tr>
<th>No</th>
<th>Yes</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) I attended a workshop or conference</td>
<td>O</td>
</tr>
<tr>
<td>b) I gave a presentation at a workshop or conference</td>
<td>O</td>
</tr>
<tr>
<td>c) I published an article in a journal or magazine for teachers (print or online)</td>
<td>O</td>
</tr>
<tr>
<td>d) I took part in an innovative project for curriculum and instruction</td>
<td>O</td>
</tr>
<tr>
<td>e) I exchanged information online about how to teach physics (e.g., email, forums, website)</td>
<td>O</td>
</tr>
</tbody>
</table>
### 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*

<table>
<thead>
<tr>
<th>Disagree a lot</th>
<th>Disagree</th>
<th>Agree</th>
<th>Agree a lot</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

#### 15
How would you characterize each of the following within your school?

*Fill in one circle for each row*

<table>
<thead>
<tr>
<th>Very high</th>
<th>High</th>
<th>Medium</th>
<th>Low</th>
<th>Very low</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

#### 14
In your current school, how severe is each problem?

*Fill in one circle for each row*

<table>
<thead>
<tr>
<th>Serious problem</th>
<th>Minor problem</th>
<th>Not a problem</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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
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>?

No
Yes

Fill in one circle only

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

No
Yes

Fill in one circle only

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

Fill in one circle for each row

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

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
### Teaching Physics to the TIMSS Class

#### 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%*

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Teaching new material to the whole class</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b) Students working problems on their own or with other students</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c) Reviewing and summarizing what has been taught for the whole class</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d) Reviewing homework</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>e) Re-teaching and clarifying content/procedures for the whole class</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>f) Oral or written tests or quizzes</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>g) Classroom management tasks not related to the lesson's content/purpose (e.g., interruptions and keeping order)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>h) Other activities</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td></td>
<td>100%</td>
</tr>
</tbody>
</table>

#### 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*

<p>| | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Watch me demonstrate an experiment or investigation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b) Conduct experiments or investigations</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c) Use laws and formulas of physics to solve routine problems</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d) Give explanations about something they are studying</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>e) Relate what they are learning in physics to their daily lives</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>f) Have students memorize formulas and procedures</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>g) Read their textbooks or other resource materials</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
In your view, to what extent do the following limit how you teach the <TIMSS class>?

*Fill in one circle for each row*

<table>
<thead>
<tr>
<th>A lot</th>
<th>Some</th>
<th>A little</th>
<th>Not at all</th>
</tr>
</thead>
</table>

**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 - ○ ○ ○ ○ ○ ○

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:

f) ------

g) ------

**Total** - 100%
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**

<table>
<thead>
<tr>
<th>Not yet taught or just introduced</th>
<th>Mostly taught this year</th>
<th>Mostly taught before this year</th>
</tr>
</thead>
</table>

**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?

<table>
<thead>
<tr>
<th></th>
<th>Never</th>
<th>Some lessons</th>
<th>About half the lessons</th>
<th>Every or almost every lesson</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fill in one circle only</strong></td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
</tbody>
</table>

26

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

<table>
<thead>
<tr>
<th></th>
<th>No</th>
<th>Yes</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Calculators</td>
<td>-</td>
<td>O</td>
</tr>
<tr>
<td>b) Computers</td>
<td>-</td>
<td>O</td>
</tr>
<tr>
<td>c) Other computing technology</td>
<td>-</td>
<td>O</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th></th>
<th>Fill in one circle only</th>
</tr>
</thead>
<tbody>
<tr>
<td>Simple calculators – basic functions only (+, −, ×, ÷, %, or √), without functions like log, sin, cos</td>
<td>O</td>
</tr>
<tr>
<td>Scientific calculators – basic functions (+, −, ×, ÷, %, or √) and also functions like log, sin, cos</td>
<td>O</td>
</tr>
<tr>
<td>Graphing calculators – scientific and also able to display some graphs</td>
<td>O</td>
</tr>
<tr>
<td>Symbolic calculators – graphing and also able to solve expressions in symbolic terms</td>
<td>O</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th></th>
<th>No</th>
<th>Yes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fill in one circle only</strong></td>
<td>O</td>
<td>O</td>
</tr>
</tbody>
</table>
Do you assign physics homework to the <TIMSS class>?

Fill in one circle only

[ ] No
[ ] Yes

If No, please go to question 32

---

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

Fill in one circle for each row

<table>
<thead>
<tr>
<th>Activity</th>
<th>Every or almost every lesson</th>
<th>About half the lessons</th>
<th>Some lessons</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Doing problem/question sets</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
<tr>
<td>b) Reading the textbook</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
<tr>
<td>c) Memorizing formulas and procedures</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
<tr>
<td>d) Gathering, analyzing, and reporting data</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
<tr>
<td>e) Finding one or more applications of the content covered</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
<tr>
<td>f) Working on projects</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
</tbody>
</table>

---

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

---

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
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 - ○

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
   ○ ○ ○ ○ ○

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 - ○

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.
Identification Label

School ID:

School Name:

School Questionnaire

<TIMSS Advanced National Research Center Name>
<Address>
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.
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

   More than 50%
   26 to 50%
   11 to 25%
   0 to 10%

   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

   Yes, for all students
   Yes, only for boys
   Yes, only for girls
   No

   a) <Advanced Mathematics> - ○ - ○ - ○ - ○ - ○
   b) <Physics> - ○ - ○ - ○ - ○ - ○
7 Your Role as Principal

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 %
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*

<table>
<thead>
<tr>
<th></th>
<th>No</th>
<th>Yes</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Observations by the principal or senior staff</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b) Observations by inspectors or other persons external to the school</td>
<td></td>
<td></td>
</tr>
<tr>
<td>c) Student achievement</td>
<td></td>
<td></td>
</tr>
<tr>
<td>d) Teacher peer review</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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*

<table>
<thead>
<tr>
<th></th>
<th>No</th>
<th>Yes</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Observations by the principal or senior staff</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b) Observations by inspectors or other persons external to the school</td>
<td></td>
<td></td>
</tr>
<tr>
<td>c) Student achievement</td>
<td></td>
<td></td>
</tr>
<tr>
<td>d) Teacher peer review</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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*

<table>
<thead>
<tr>
<th></th>
<th>Very difficult</th>
<th>Somewhat difficult</th>
<th>Easy to fill vacancies</th>
<th>Were no vacancies in this subject</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Mathematics</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b) Physics</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c) Computer science / information technology</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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*

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Mathematics</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b) Physics</td>
<td></td>
<td></td>
</tr>
<tr>
<td>c) Other</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
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

<table>
<thead>
<tr>
<th>Behavior</th>
<th>Daily</th>
<th>Weekly</th>
<th>Monthly</th>
<th>Rarely</th>
<th>Never</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Arriving late at school</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b) Absenteeism (i.e., unjustified absences)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c) Skipping class &lt;hours/periods&gt;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d) Classroom disturbance</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>e) Cheating</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>f) Vandalism</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>g) Theft</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>h) Intimidation or verbal abuse</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
   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|       |        |         |        |       |

B. Severity of problem in your school

<table>
<thead>
<tr>
<th>Severe problem</th>
<th>Minor problem</th>
<th>Not a problem</th>
</tr>
</thead>
<tbody>
<tr>
<td>----------------</td>
<td>---------------</td>
<td>---------------</td>
</tr>
<tr>
<td>----------------</td>
<td>---------------</td>
<td>---------------</td>
</tr>
<tr>
<td>----------------</td>
<td>---------------</td>
<td>---------------</td>
</tr>
<tr>
<td>----------------</td>
<td>---------------</td>
<td>---------------</td>
</tr>
<tr>
<td>----------------</td>
<td>---------------</td>
<td>---------------</td>
</tr>
<tr>
<td>----------------</td>
<td>---------------</td>
<td>---------------</td>
</tr>
<tr>
<td>----------------</td>
<td>---------------</td>
<td>---------------</td>
</tr>
<tr>
<td>----------------</td>
<td>---------------</td>
<td>---------------</td>
</tr>
<tr>
<td>----------------</td>
<td>---------------</td>
<td>---------------</td>
</tr>
<tr>
<td>----------------</td>
<td>---------------</td>
<td>---------------</td>
</tr>
<tr>
<td>----------------</td>
<td>---------------</td>
<td>---------------</td>
</tr>
<tr>
<td>----------------</td>
<td>---------------</td>
<td>---------------</td>
</tr>
<tr>
<td>----------------</td>
<td>---------------</td>
<td>---------------</td>
</tr>
<tr>
<td>----------------</td>
<td>---------------</td>
<td>---------------</td>
</tr>
<tr>
<td>----------------</td>
<td>---------------</td>
<td>---------------</td>
</tr>
<tr>
<td>----------------</td>
<td>---------------</td>
<td>---------------</td>
</tr>
<tr>
<td>----------------</td>
<td>---------------</td>
<td>---------------</td>
</tr>
<tr>
<td>----------------</td>
<td>---------------</td>
<td>---------------</td>
</tr>
<tr>
<td>----------------</td>
<td>---------------</td>
<td>---------------</td>
</tr>
<tr>
<td>----------------</td>
<td>---------------</td>
<td>---------------</td>
</tr>
<tr>
<td>----------------</td>
<td>---------------</td>
<td>---------------</td>
</tr>
<tr>
<td>----------------</td>
<td>---------------</td>
<td>---------------</td>
</tr>
</tbody>
</table>
**Resources and Technology**

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

<table>
<thead>
<tr>
<th></th>
<th>A lot</th>
<th>Some</th>
<th>A little</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Instructional materials (e.g., textbook)</td>
<td>- - - - - -</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b) Budget for supplies (e.g., paper, pencils)</td>
<td>- - - - - -</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c) School buildings and grounds</td>
<td>- - - - - -</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d) Heating/cooling and lighting systems</td>
<td>- - - - - -</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>e) Instructional space (e.g., classrooms)</td>
<td>- - - - - -</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>f) Special equipment for students with disabilities</td>
<td>- - - - - -</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>g) Computers for mathematics instruction</td>
<td>- - - - - -</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>h) Computer software for mathematics instruction</td>
<td>- - - - - -</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>i) Calculators for mathematics instruction</td>
<td>- - - - - -</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>j) Library materials relevant to mathematics instruction</td>
<td>- - - - - -</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>k) Audio-visual resources for mathematics instruction</td>
<td>- - - - - -</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>l) Physics laboratory equipment and materials</td>
<td>- - - - - -</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>m) Computers for physics instruction</td>
<td>- - - - - -</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>n) Computer software for physics instruction</td>
<td>- - - - - -</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>o) Calculators for physics instruction</td>
<td>- - - - - -</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>p) Library materials relevant to physics instruction</td>
<td>- - - - - -</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>q) Audio-visual resources for physics instruction</td>
<td>- - - - - -</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>r) Teachers</td>
<td>- - - - - -</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>s) Computer support staff</td>
<td>- - - - - -</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Fill in one circle for each row**
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
School Questionnaire
Advanced Mathematics

Curriculum Questionnaire
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.*

<table>
<thead>
<tr>
<th>A. Algebra</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Operations with complex numbers----------</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>b) The ( n )th term of numeric and algebraic series and the sums to ( n ) terms or infinity of series---</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>c) Problems involving permutations and combinations------------------------</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>d) Probability-----------------------------</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>e) Linear, simultaneous, and quadratic equations and inequalities-------------</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>f) Logarithmic and exponential equations--------</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>g) Surd (radical) equations-------------------</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>h) Equivalent representations of functions as ordered pairs, tables, graphs, formulas, or words---------------------------------</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>i) Values of functions, including rational functions for given values and ranges of the variables----------------------------</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>j) Function of a function----------------------</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>B. Calculus</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Limits of functions including rational functions --------------------------</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>b) Conditions for continuity and differentiability of functions----------------</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>c) Differentiation of functions (including polynomial, exponential, logarithmic, trigonometric, rational and radical functions); differentiation of products and quotients-------</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>d) Differentiation of composite and parametric functions-----------------------</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>e) Using derivatives to solve problems (e.g., in kinematics, optimization, and rates of change)-------------------------------------------------</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>f) Using first derivatives to determine gradient and turning points</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>g) Using second derivatives to determine maxima, minima, and points of inflection of functions</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>h) Integrating functions (including polynomial, exponential, trigonometric, and rational functions)</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>i) Evaluating definite integrals</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

**C. Geometry**

| a) Properties of geometric figures; proving geometric propositions in two dimensions | Yes | No |
| b) Proving geometric proposition in three dimensions | Yes | No |
| c) Gradients, y-axis intercepts, and points of intersection of straight lines in the Cartesian plane | Yes | No |
| d) Equations and properties of circles in the Cartesian plane | Yes | No |
| e) Tangents and normals to given points on a circle | Yes | No |
| f) Trigonometric properties of triangles (sine, cosine, and tangent) | Yes | No |
| g) Solving equations involving trigonometric functions | Yes | No |
| h) Properties of vectors and their sums and differences | Yes | No |

Comments:


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

*Check one circle for each line.*

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Official publication containing the curriculum</td>
<td></td>
</tr>
<tr>
<td>b) Ministry notes and directives</td>
<td></td>
</tr>
<tr>
<td>c) Mandated or recommended textbooks</td>
<td></td>
</tr>
<tr>
<td>d) Instructional or pedagogical guide</td>
<td></td>
</tr>
<tr>
<td>e) Specifically developed or recommended instructional activities</td>
<td></td>
</tr>
<tr>
<td>f) Prescribed syllabus for public examination</td>
<td></td>
</tr>
<tr>
<td>g) Other</td>
<td></td>
</tr>
</tbody>
</table>

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:

    [Blank Space]

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

    [Blank Space] hours per year (1 hour = 60 minutes)

    Comments:

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

*Check one circle only.*

- Yes--- ○
- No--- ○

*If Yes...*

Please explain:

[Box for explanation]
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.*

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Special conferences/seminars on curriculum</td>
<td>O</td>
</tr>
<tr>
<td>b) Ministry (department of education, government, board of education) website</td>
<td>O</td>
</tr>
<tr>
<td>c) Printed copies of curriculum distributed to schools</td>
<td>O</td>
</tr>
<tr>
<td>d) Teachers receive own printed copy</td>
<td>O</td>
</tr>
<tr>
<td>e) Professional development/in-service education</td>
<td>O</td>
</tr>
<tr>
<td>f) Ministry notes</td>
<td>O</td>
</tr>
<tr>
<td>g) Professional association newsletter</td>
<td>O</td>
</tr>
<tr>
<td>h) Education journals</td>
<td>O</td>
</tr>
<tr>
<td>i) Other educational authorities</td>
<td>O</td>
</tr>
<tr>
<td>j) Other</td>
<td>O</td>
</tr>
</tbody>
</table>

Please specify:

__________________________________________________________________________

Comments:

__________________________________________________________________________
12. How is the advanced mathematics curriculum implementation evaluated?

*Check one circle for each line.*

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Visits by inspectors</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b) Research programs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>c) School self-evaluation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>d) National examinations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>e) TIMSS Advanced</td>
<td></td>
<td></td>
</tr>
<tr>
<td>f) Other</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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
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
© Copyright IEA, 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?

   [Blank]

   If No...
   Comments:

   [Blank]

   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.*

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A. Mechanics</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a) The conditions for equilibrium and the dynamics of different types of movement</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b) Kinetic and potential energy; conservation of mechanical energy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>c) Mechanical wave phenomena in sound, water, and strings; the relationship between speed, frequency, and wavelength; refraction</td>
<td></td>
<td></td>
</tr>
<tr>
<td>d) Forces, including frictional force, acting on a moving body</td>
<td></td>
<td></td>
</tr>
<tr>
<td>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</td>
<td></td>
<td></td>
</tr>
<tr>
<td>f) Elastic and inelastic collision; the law of conservation of momentum and the law of conservation of mechanical (i.e., kinetic) energy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>g) Aspects of relativity (e.g., length contraction and time dilatation for an object moving with constant speed in relation to the observer)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>B. Electricity and Magnetism</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a) Electrostatic attraction or repulsion between isolated charged particles — Coulomb’s law</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b) Electrical circuits — Ohm’s law and Joule’s law for complex electrical circuits</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Topic</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>----------------------------------------------------------------------</td>
<td>-----</td>
<td>----</td>
</tr>
<tr>
<td>c) Charged particles in a magnetic field, relationship between magnetism and electricity; Faraday’s and Lenz’ laws of induction</td>
<td></td>
<td></td>
</tr>
<tr>
<td>d) Electromagnetic radiation; wavelength and frequency of various types of waves (e.g., radio, infrared, x-rays, light)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C. Heat and Temperature</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a) Difference between heat and temperature; heat transfer and specific heat capacities; evaporation and condensation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b) Expansion of solids and liquids in relation to temperature change; the law of ideal gas; the first law of thermodynamics</td>
<td></td>
<td></td>
</tr>
<tr>
<td>c) Heat (“black body”) radiation and temperature</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D. Atomic and Nuclear Physics</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a) The structure of the atom and its nucleus in terms of electrons, protons, and neutrons; atomic number and atomic mass number</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b) Light emission and absorption and the behavior of electrons; the photoelectric effect</td>
<td></td>
<td></td>
</tr>
<tr>
<td>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</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

*Check one circle for each line.*

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Official publication containing the curriculum</td>
<td>○</td>
</tr>
<tr>
<td>b) Ministry notes and directives</td>
<td>○</td>
</tr>
<tr>
<td>c) Mandated or recommended textbooks</td>
<td>○</td>
</tr>
<tr>
<td>d) Instructional or pedagogical guide</td>
<td>○</td>
</tr>
<tr>
<td>e) Specifically developed or recommended instructional activities</td>
<td>○</td>
</tr>
<tr>
<td>f) Prescribed syllabus for public examination</td>
<td>○</td>
</tr>
<tr>
<td>g) Other</td>
<td>○</td>
</tr>
</tbody>
</table>

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.*

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

Please specify:

________________________________________________________________________

Comments:

________________________________________________________________________
12. How is the physics curriculum implementation evaluated?

Check one circle for each line.

<table>
<thead>
<tr>
<th>Option</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Visits by inspectors</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b) Research programs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>c) School self-evaluation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>d) National examinations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>e) TIMSS Advanced</td>
<td></td>
<td></td>
</tr>
<tr>
<td>f) Other</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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