General Directions

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

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

Contact Information

Country: ________________________________

Name of Person Completing this Questionnaire: ________________________________

Position: ________________________________

Address: ________________________________________________________________

Email: ________________________________

Phone: ________________________________

Fax: ________________________________
Physics Curriculum and Instruction

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

Comments:

b) Is that curriculum currently being revised?

   Check one circle only.

   Yes---
   No---

If Yes...
Please explain:

If No...
Comments:
2. a) Are there any prerequisite courses for students taking the physics track or course being assessed in TIMSS Advanced?

*Check one circle only.*

Yes---

No---

*If Yes...*

Please explain:

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

% 

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

*If Yes...*

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

Check one circle only.

Yes---

No---

If Yes...

What are the statements/policies?

If No...

Comments:

b) If Yes…

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

Check one circle only.

Yes---

No---
If Yes…
Describe the types of calculators (e.g., graphing, symbolic):

If No…
Comments:

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

Check one circle only.

Yes---  ○
No---    ○

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

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

*Check one circle only.*

Yes--- ○

No--- ○

*If Yes…*
What are the statements/policies?


*If No…*
Comments:


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

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

*Check one circle for each line.*

**A. Mechanics**

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
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<tbody>
<tr>
<td>a) The conditions for equilibrium and the dynamics of different types of movement</td>
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<tr>
<td>b) Kinetic and potential energy; conservation of mechanical energy</td>
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<tr>
<td>c) Mechanical wave phenomena in sound, water, and strings; the relationship between speed, frequency, and wavelength; refraction</td>
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<tr>
<td>d) Forces, including frictional force, acting on a moving body</td>
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<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>
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</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>
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<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>
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</tbody>
</table>

**B. Electricity and Magnetism**

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<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
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</thead>
<tbody>
<tr>
<td>a) Electrostatic attraction or repulsion between isolated charged particles — Coulomb’s law</td>
<td>[ ]</td>
<td>[ ]</td>
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<tr>
<td>b) Electrical circuits — Ohm’s law and Joule’s law for complex electrical circuits</td>
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</table>
### Physics Page 8

<table>
<thead>
<tr>
<th>c) Charged particles in a magnetic field, relationship between magnetism and electricity; Faraday’s and Lenz’ laws of induction</th>
<th>Yes</th>
<th>No</th>
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</thead>
<tbody>
<tr>
<td>d) Electromagnetic radiation; wavelength and frequency of various types of waves (e.g., radio, infrared, x-rays, light)</td>
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</tbody>
</table>

### C. Heat and Temperature

<table>
<thead>
<tr>
<th>a) Difference between heat and temperature; heat transfer and specific heat capacities; evaporation and condensation</th>
<th>Yes</th>
<th>No</th>
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</thead>
<tbody>
<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>Yes</td>
<td>No</td>
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<tr>
<td>c) Heat (“black body”) radiation and temperature</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

### D. Atomic and Nuclear Physics

<table>
<thead>
<tr>
<th>a) The structure of the atom and its nucleus in terms of electrons, protons, and neutrons; atomic number and atomic mass number</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>b) Light emission and absorption and the behavior of electrons; the photoelectric effect</td>
<td>Yes</td>
<td>No</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>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

Comments:

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

Check one circle for each line.

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
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<tbody>
<tr>
<td>a)</td>
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<td>b)</td>
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<tr>
<td>c)</td>
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<td>f)</td>
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<td>g)</td>
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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:

[Blank space for explanation]
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>
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<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>
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<tr>
<td>c) Printed copies of curriculum distributed to schools</td>
<td></td>
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<tr>
<td>d) Teachers receive own printed copy</td>
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<tr>
<td>e) Professional development/in-service education</td>
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<tr>
<td>f) Ministry notes</td>
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<td>g) Professional association newsletter</td>
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<td>h) Education journals</td>
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<tr>
<td>i) Other educational authorities</td>
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<tr>
<td>j) Other</td>
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</table>

Please specify:

__________________________________________________________________________

Comments:

__________________________________________________________________________
12. How is the physics curriculum implementation evaluated?

*Check one circle for each line.*

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
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<td><img src="circle" alt="TIMSS Advanced" /></td>
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</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
Curriculum Questionnaire

Physics