

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?

*If No...*

Comments:

b) *If Yes...*

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

*Check **one** circle only.*

Yes---

No---

*If Yes...*

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

*If No...*

Comments:

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

*Check **one** circle only.*

Yes---

No---

*If Yes...*

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

d) Who pays for the calculators?

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

*Check **one** circle only.*

Yes---

No---

*If Yes...*

What are the statements/policies?

*If No...*

Comments:

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

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

Check **one** circle for each line.

	Yes	No
<b>A. Mechanics</b>		
a) The conditions for equilibrium and the dynamics of different types of movement-----	<input type="radio"/>	<input type="radio"/>
b) Kinetic and potential energy; conservation of mechanical energy-----	<input type="radio"/>	<input type="radio"/>
c) Mechanical wave phenomena in sound, water, and strings; the relationship between speed, frequency, and wavelength; refraction-----	<input type="radio"/>	<input type="radio"/>
d) Forces, including frictional force, acting on a moving body-----	<input type="radio"/>	<input type="radio"/>
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-----	<input type="radio"/>	<input type="radio"/>
f) Elastic and inelastic collision; the law of conservation of momentum and the law of conservation of mechanical (i.e., kinetic) energy-----	<input type="radio"/>	<input type="radio"/>
g) Aspects of relativity (e.g., length contraction and time dilatation for an object moving with constant speed in relation to the observer)-----	<input type="radio"/>	<input type="radio"/>
<b>B. Electricity and Magnetism</b>		
a) Electrostatic attraction or repulsion between isolated charged particles — Coulomb's law-----	<input type="radio"/>	<input type="radio"/>
b) Electrical circuits — Ohm's law and Joule's law for complex electrical circuits-----	<input type="radio"/>	<input type="radio"/>

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

Comments:

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

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

	Yes	No
a) Official publication containing the curriculum-----	<input type="radio"/>	<input checked="" type="radio"/>
b) Ministry notes and directives-----	<input type="radio"/>	<input checked="" type="radio"/>
c) Mandated or recommended textbooks-----	<input type="radio"/>	<input checked="" type="radio"/>
d) Instructional or pedagogical guide-----	<input type="radio"/>	<input checked="" type="radio"/>
e) Specifically developed or recommended instructional activities----	<input type="radio"/>	<input checked="" type="radio"/>
f) Prescribed syllabus for public examination-----	<input type="radio"/>	<input checked="" type="radio"/>
g) Other-----	<input type="radio"/>	<input checked="" type="radio"/>
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:

A large, empty rectangular box with a thin black border, intended for the respondent to provide comments on the national requirements for being a teacher of the physics track or course.

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

Check **one** circle for each line.

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

Please specify:

---

Comments:

12. How is the physics curriculum implementation evaluated?

Check **one** circle for each line.

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

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:

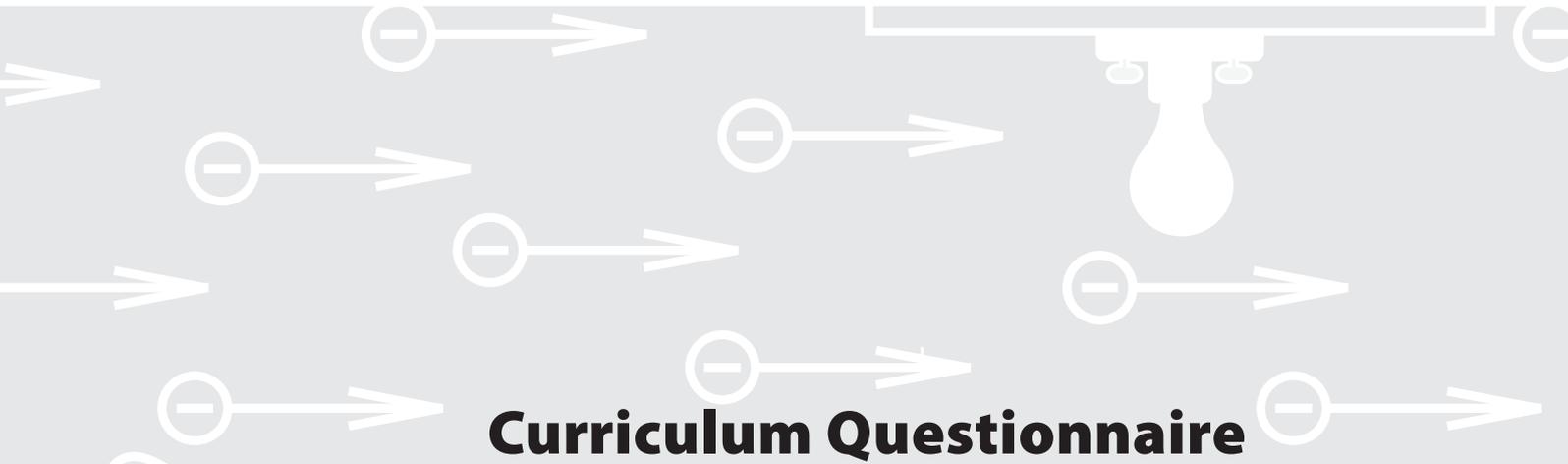
*If No...*

Comments:

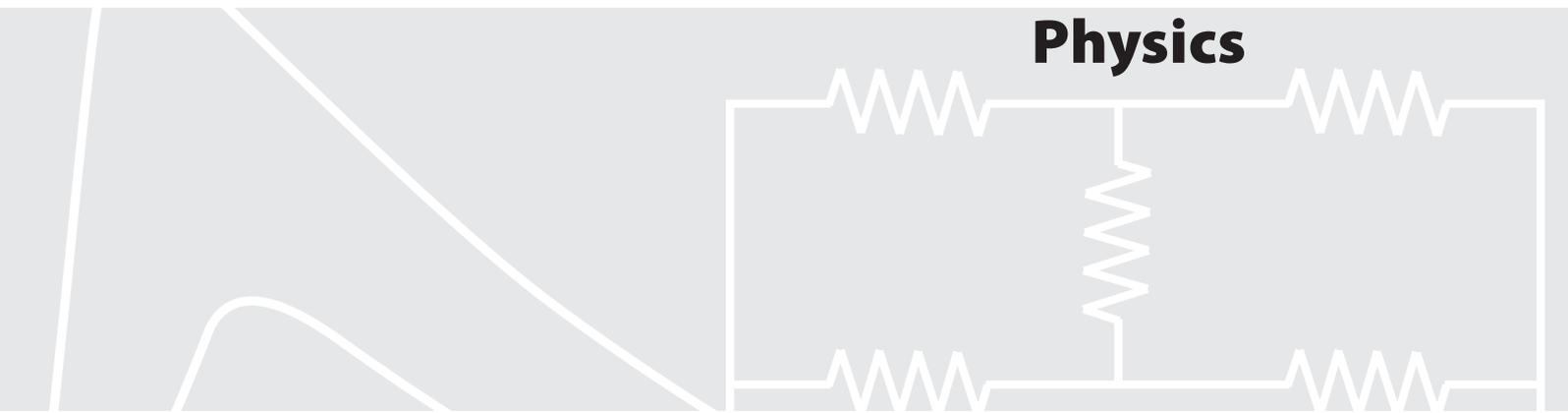
**Thank You**  
**for completing**  
**this questionnaire**



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



# Curriculum Questionnaire



# Physics