

IEA Trends in International Mathematics and Science Study

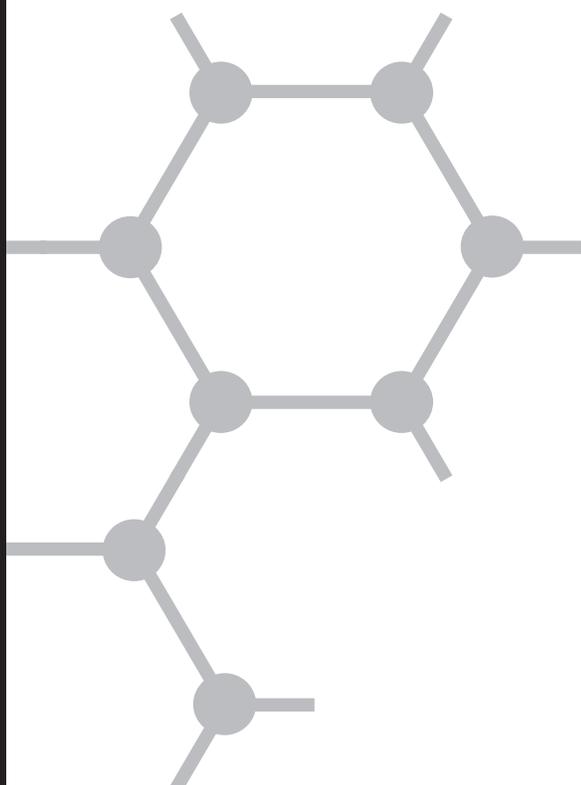
TIMSS

2003

Main Survey

**Curriculum
Questionnaire**

Science
<Grade 8>



General Directions

This questionnaire is addressed to National Research Coordinators, who are asked to supply information about their nation's intended curriculum in science. This will help provide background information for interpretation of the school and achievement data collected in other parts of the TIMSS 2003 study. Your responses are very important in helping to provide a better understanding of the study results.

We ask that you or your nominee complete this questionnaire, working with others as necessary (e.g., curriculum supervisors of science representative of those at the <grade 8> level in your country). It is important that you answer each question carefully and provide additional information where requested so that as accurate a picture as possible of your country's curriculum is presented in the final reports.

●Your cooperation in completing this questionnaire is greatly appreciated●

Contact Information

Country: _____

Name of Individual
Completing Report: _____

Position of Individual
Completing Report: _____

Address: _____

Email: _____

Phone: _____

Fax: _____

Others (and positions) involved in providing information in completing questionnaire:

National Curriculum

IMPORTANT: Throughout this questionnaire, the term “national curriculum” is intended to include any centrally-supported curriculum. The curriculum need not be mandated but it should be strongly recommended or at least widely used.

This curriculum may not necessarily be articulated in a formal document, or different aspects of the curriculum may appear in different documents.

1

A. Does your country have a national curriculum that includes science at <grade 8>?

No
_____ |
Yes
_____ |

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

Note: If **No**, please complete the remainder of the questionnaire based on your best informed judgment of the intended science curriculum for the majority of <grade 8> students in your country. If it is impossible to answer a particular question, just make a note and move to the next question.

B. If there is not a national curriculum, what is the highest level of decision-making authority that provides a curriculum for <grade 8> science?

C. In what year was the current intended science curriculum for <grade 8> introduced?

D. Is the intended science curriculum that includes <grade 8> currently being revised?

No
_____ |
Yes
_____ |

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

2

A. By <grade 8> are different science courses offered in separate subjects (e.g., biology, chemistry, physics, earth science)?

No
_____|
Yes

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

If **No**, please go to question 3 

B. If YES, please list the science subjects taught as separate courses and all grades in which they are taught, up to and including <grade 8>.

<u>Subject</u>	<u>Grades</u>
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

3

A. Across grades K-12, does an education authority in your country (e.g., National Ministry of Education) administer examinations in science that have consequences for individual students, such as determining grade promotion, entry to a higher school system, entry to university, and/or exiting or graduating from high school?

Yes No

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

If **No**, please go to question **4** 

B. If YES, please describe the authority which administers examinations in science, and list the grades at which they are given.

If examinations in separate science subjects such as biology, earth science, chemistry and physics are given at different grades, please indicate this.

4

Are any of the following methods used to help implement the national science curriculum at <grade 8>?

Fill in **one** circle for each row

Yes No

- a) Mandated or recommended textbook(s) -----○ ---○
- b) Instructional or pedagogical guide -----○ ---○
- c) Ministry notes and directives -----○ ---○
- d) Curriculum evaluation during or after implementation -----○ ---○
- e) Specifically developed or recommended instructional activities -----○ ---○
- f) National assessments based on student samples -----○ ---○
- g) A system of school inspection or audit -----○ ---○
- h) Other -----○ ---○
(Please specify: _____)

Comments: _____

5

Does the national curriculum specify the amount of instructional time that should be devoted to science?

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

_____ **No**
_____ **Yes**

a) at <grade 4> -----○ --- ○

If **Yes**, what percentage of total instructional time is supposed to be devoted to the science? ----- _____

b) at <grade 6> -----○ --- ○

If **Yes**, what percentage of total instructional time is supposed to be devoted to science? ----- _____

c) at <grade 8> -----○ --- ○

If **Yes**, what percentage of total instructional time is supposed to be devoted to science? ----- _____

If different science courses are offered in separate subjects at <grade 8>, please give the percentage of total instructional time that is supposed to be devoted to each science course at <grade 8>.

<u>Subject</u>	<u>Percentage</u>

6

Which best describes how the national science curriculum at <grade 8> addresses the issue of students with different levels of ability?

Fill in one circle only

The same curriculum is prescribed for all students -----○

The same curriculum is prescribed for students of different ability levels, but at different levels of difficulty -----○

Different curricula are prescribed for students of different ability levels -----○

Comments: _____

7

How much emphasis does the national science curriculum at <grade 8> place on the following?

Fill in one circle for each row

	A lot	
	Some	
	Very little	
	None	

- a) Knowing basic science facts - ○ ---○ ---○ ---○
- b) Understanding science concepts ----- ○ ---○ ---○ ---○
- c) Writing explanations about what was observed and why it happened ----- ○ ---○ ---○ ---○
- d) Formulating hypotheses or predictions to be tested -- ○ ---○ ---○ ---○
- e) Designing and planning experiments or investigations ----- ○ ---○ ---○ ---○
- f) Conducting experiments or investigations ----- ○ ---○ ---○ ---○
- g) Learning about the nature of science and inquiry ----- ○ ---○ ---○ ---○
- h) Integrating science with other subjects ----- ○ ---○ ---○ ---○
- i) Learning about technology and its impact on society --- ○ ---○ ---○ ---○
- j) Understanding human impact on the environment - ○ ---○ ---○ ---○
- k) Incorporating the experiences of different ethnic/cultural groups ----- ○ ---○ ---○ ---○

Comments: _____

8

A. Does the national curriculum contain statements/policies about the emphasis that should be placed on scientific inquiry in <grade 8> science?

Yes No

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

If **No**, please go to question **9** 

B. If YES, what are the statements/policies?

9

A. Does the national curriculum contain statements/policies about the use of computers in <grade 8> science?

Yes No

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

If **No**, please go to question **10** 

B. If YES, what are the statements/policies?

Teacher and Education Certification

10

A. Do <grade 8> science teachers receive specific preparation in how to teach the intended science curriculum at <grade 8>?

Fill in **one** circle for each row

No
|
Yes

- a) As part of pre-service education -----○ ---○
 b) As part of in-service education -----○ ---○

B. If you answered YES to either (a) or (b), describe the nature of the preparation.

11

Which are the current requirements for being a science teacher at <grade 8>?

Fill in **one** circle for each row

No
|
Yes

- a) Pre-practicum and supervised practicum in the field -----○ ---○
 b) Passing an examination -----○ ---○
 c) <ISCED 5A, first degree> -----○ ---○
 d) Completion of a probationary teaching period -----○ ---○

If **Yes**, how long is this period? _____

- e) Completion of a mentoring or induction program -----○ ---○
 f) Other -----○ ---○
 (Please specify: _____)

12

A. Is there a process to license or certify <grade 8> science teachers?

No
|
Yes

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

If **No**, please go to question **13** 

B. If YES, who certifies/licenses <grade 8> science teachers?

Fill in **one** circle for each row

No
|
Yes

- a) Minister/Ministry of Education -----○ ---○
 b) National/state licensing board -----○ ---○
 c) Universities/colleges -----○ ---○
 d) Teacher organization/union -----○ ---○
 e) Other -----○ ---○

(Please specify: _____)

Comments: _____

Grade 8 Science Topics

13

According to the national science curriculum, what proportion of <grade 8> students should have been taught each of the following topics or skills by the end of <grade 8>?

Across grades K-12, at what grade(s) are the topics primarily intended to be taught?

Be sure to include curriculum expectations for all grades up to and including <grade 8>. If there are not any specifications to this detail, please indicate national expectations to the best of your ability.

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

	Proportion of <grade 8> students expected to be taught topic			Grade(s) topic is expected to be taught K-12
	<i>Fill in one circle for each row</i>			
	Not included in the curriculum through <grade 8>			
	Only the more able students (top track)			
	All or almost all students			
A. Biology				
a) Classification of organisms on the basis of a variety of physical and behavioral characteristics -----	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	_____
b) The major organ systems in humans and other organisms -----	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	_____
c) How the systems function to maintain stable bodily conditions -----	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	_____
d) Cell structures and functions -----	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	_____
e) Photosynthesis and respiration as processes of cells and organisms, including substances used and produced -----	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	_____
f) Life cycles of organisms, including humans, plants, birds, insects -----	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	_____
g) Reproduction (sexual and asexual), and heredity (passing on of traits), inherited versus acquired/learned characteristics -----	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	_____
h) The role of variation and adaptation in survival/extinction of species in a changing environment -----	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	_____
i) The interaction of living organisms in an ecosystem (energy flow, food chains and food webs, food pyramids, and the effects of changes upon the system) ---	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	_____
j) Cycling of materials in nature (water, carbon/oxygen cycle, decomposition of organisms) -----	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	_____
k) Causes of common infectious diseases, methods of infection/transmission, prevention, and the body's natural resistance and healing capabilities -----	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	_____
l) Preventive medicine methods (diet, hygiene, exercise and lifestyle) -----	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	_____

	Proportion of <grade 8> students expected to be taught topic			Grade(s) topic is expected to be taught K-12
	<i>Fill in one circle for each row</i>			
	Not included in the curriculum through <grade 8>			
	Only the more able students (top track)			
	All or almost all students			
B. Chemistry				
a) Classification and composition of matter (physical and chemical characteristics, pure substances and mixtures, separation techniques)-----	○	---○	---○	_____
b) Properties of solutions (solvents, solutes, effects of temperature on solubility)-----	○	---○	---○	_____
c) Particulate structure of matter (molecules, atoms, protons, neutrons, and electrons) -----	○	---○	---○	_____
d) Properties and uses of water (composition, melting/boiling points, changes in density/volume) -----	○	---○	---○	_____
e) The properties and uses of common acids and bases -----	○	---○	---○	_____
f) Chemical change (transformation of reactants, evidence of chemical change, conservation of matter) -----	○	---○	---○	_____
g) The need for oxygen in common oxidation reactions (combustion, rusting) and the relative tendency of familiar substances to undergo these reactions-----	○	---○	---○	_____
h) Classification of familiar chemical transformations as releasing or absorbing heat/energy -----	○	---○	---○	_____



13 continued

According to the national science curriculum, what proportion of <grade 8> students should have been taught each of the following topics or skills by the end of <grade 8>?

Across grades K-12, at what grade(s) are the topics primarily intended to be taught?

Be sure to include curriculum expectations for all grades up to and including <grade 8>. If there are not any specifications to this detail, please indicate national expectations to the best of your ability.

If part of a topic does not apply, please cross out that part and answer for the major part of the topic.

	Proportion of <grade 8> students expected to be taught topic			Grade(s) topic is expected to be taught K-12
	<i>Fill in one circle for each row</i>			
	Not included in the curriculum through <grade 8>			
	Only the more able students (top track)			
	All or almost all students			
C. Physics				
a) Physical states and changes in matter (explanations of properties including volume, shape, density and compressibility in terms of movement/distance between particles) -----	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	_____
b) The processes of melting, freezing, evaporation, and condensation (phase change by supplying/removing heat; melting/boiling points; effects of pressure and purity of substances) -----	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	_____
c) Energy types, sources, and conversions, including heat transfer -----	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	_____
d) Thermal expansion and changes in volume and/or pressure -----	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	_____
e) Basic properties/behavior of light (reflection, refraction, light and color, simple ray diagrams) -----	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	_____
f) Properties of sound (production by vibration, transmission through media, ways of describing sound (intensity, pitch), relative speed) -----	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	_____
g) Electric circuits (flow of current, types of circuits – open/closed, parallel/series) and relationship between voltage and current -----	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	_____
h) Properties of permanent magnets and electromagnets -----	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	_____
i) Forces and motion (types of forces, basic description of motion), use of distance/time graphs -----	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	_____
j) Effects of density and pressure -----	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	_____

Proportion of <grade 8> students expected to be taught topic

Grade(s) topic is expected to be taught K-12

Fill in **one** circle for each row

Not included in the curriculum through <grade 8>

Only the more able students (top track)

All or almost all students

D. Earth Science

- | | | | | | | |
|--|---|-----|---|-----|---|--|
| | | | | | | |
| | | | | | | |
| | | | | | | |
| a) Earth's structure and physical features
(Earth's crust, mantle, and core; topographic maps) ----- | ○ | --- | ○ | --- | ○ | |
| b) The physical state, movement, composition, and relative
distribution of water on the Earth ----- | ○ | --- | ○ | --- | ○ | |
| c) The Earth's atmosphere and the relative abundance of its main components --- | ○ | --- | ○ | --- | ○ | |
| d) Earth's water cycle (steps, role of sun's energy, circulation/renewal
of fresh water) ----- | ○ | --- | ○ | --- | ○ | |
| e) Processes in the rock cycle and the formation of igneous, metamorphic,
and sedimentary rock ----- | ○ | --- | ○ | --- | ○ | |
| f) Weather data/maps, and changes in weather patterns
(e.g., seasonal changes, effects of latitude, altitude and geography) ----- | ○ | --- | ○ | --- | ○ | |
| g) Geological processes occurring over billions of years (e.g., erosion, mountain
building, plate movement) ----- | ○ | --- | ○ | --- | ○ | |
| h) Formation of fossils and fossil fuels ----- | ○ | --- | ○ | --- | ○ | |
| i) Explanation of phenomena on Earth based on position/movement of bodies in
the solar system and universe (e.g., day/night, tides, year, phases of the moon,
eclipses, seasons, appearance of sun, moon, planets, and constellations) ----- | ○ | --- | ○ | --- | ○ | |
| j) The physical features of Earth compared with the moon and other planets
(e.g., atmosphere, temperature, water, distance from sun,
period of revolution/rotation, ability to support life) ----- | ○ | --- | ○ | --- | ○ | |
| k) The sun as a star ----- | ○ | --- | ○ | --- | ○ | |



13 continued

According to the national science curriculum, what proportion of <grade 8> students should have been taught each of the following topics or skills by the end of <grade 8>?

Across grades K-12, at what grade(s) are the topics primarily intended to be taught?

Be sure to include curriculum expectations for all grades up to and including <grade 8>. If there are not any specifications to this detail, please indicate national expectations to the best of your ability.

If part of a topic does not apply, please cross out that part and answer for the major part of the topic.

	Proportion of <grade 8> students expected to be taught topic			Grade(s) topic is expected to be taught K-12
	<i>Fill in one circle for each row</i>			
	Not included in the curriculum through <grade 8>			
	Only the more able students (top track)			
	All or almost all students			
E. Environmental Science				
a) Trends in human population and its effects on the environment -----	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	_____
b) Use and conservation of natural resources (renewable/nonrenewable resources, human use of land/soil and water resources)-----	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	_____
c) Changes in environments (role of human activity, effects/prevention of pollution, global environmental concerns, impact of natural hazards) -----	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	_____

Thank You

**for completing
this questionnaire**



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