PLACE LABEL HERE

Checksum

School ID | Class ID | Teacher ID | Link Number | Grade | # of Students | Participation Status

Trends in International Mathematics and Science Study

TIMSS 2007

TIMSS USA

Teacher Questionnaire

SCIENCE
Grade 8

National Center for Education Statistics
Institute of Education Sciences
U.S. Department of Education
1990 K St., N.W.
Washington, D.C. 20006-5650

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General Directions

Your school has kindly agreed to participate in TIMSS 2007, a large international study of student learning in mathematics and science in more than 60 countries around the world. Sponsored by the International Association for the Evaluation of Educational Achievement (IEA), TIMSS (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 the teaching and learning of mathematics and science worldwide.

As part of the study, students in a nationwide sample of eighth-grade classes in the United States will complete the TIMSS mathematics and science tests. This questionnaire is addressed to teachers who teach science to these students, and seeks information about teachers' academic and professional background, instructional practices, and attitudes toward teaching science. As a teacher of science to students participating in TIMSS, your responses to these questions are very important in helping to describe science education in the United States.

Some of the questions in this questionnaire ask about a particular science class that you teach. This is the class which is identified on the cover of this questionnaire, and which includes students who will be tested as part of TIMSS 2007 in your school.

Please set aside 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 checking or filling in the appropriate circle.

Once you have completed the questionnaire, place it in the return envelope provided and return it to: The School Coordinator

Thank you very much for the time and effort you have put into responding to this questionnaire.

If you have already completed Questions 1 through 12 in another TIMSS Science Teacher Questionnaire, please **skip to Question 13** in this Questionnaire.

Background Information

1

How old are you?

*Fill in **one** circle only*

- Under 25 ①
- 25–29 ②
- 30–39 ③
- 40–49 ④
- 50–59 ⑤
- 60 or older ⑥

2

Are you female or male?

*Fill in **one** circle only*

- Female ①
- Male ②

3

By the end of this school year, how many years will you have been teaching altogether? Do not include substitute or student teaching.

_____

Number of years you have taught full time

_____

Number of years you have taught part time

Preparation to Teach

4

What is the highest level of formal education you have completed?

*Fill in **one** circle only*

- Did not complete high school ①
- Completed high school ②
- Completed a vocational/technical certificate after high school ③
- Completed an Associate's degree (AA) in a vocational/technical program ④
- Completed an academic Associate's or Bachelor's degree ⑤
- Completed an academic Master's degree, post-graduate certificate program (e.g., teaching) or first professional degree (e.g., law, medicine, dentistry) ⑥
- Completed a doctorate (Ph.D. or Ed.D) ⑦

5

During your college or university education, what was your <u>major or main</u> area(s) of study?

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

		Major	Minor	No
a)	Biology	①	②	③
b)	Physics	①	②	③
c)	Chemistry	①	②	③
d)	Earth Science (e.g. Geochemistry, Geophysics, Astronomy)	①	②	③
e)	Education - Science	①	②	③
f)	Mathematics	①	②	③
g)	Education - Mathematics	①	②	③
h)	Education - Other	①	②	③
i)	Other	①	②	③

6

Do you have a teaching license or certificate?

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

7

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

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

	Not well prepared	Somewhat prepared	Very well prepared	Not applicable
A. Biology				
a) Major organs and organ systems in humans and other organisms (structure/function, life processes that maintain stable bodily conditions)	①	②	③	④
b) Cells and their functions, including respiration and photosynthesis as cellular processes	①	②	③	④
c) Reproduction (sexual and asexual) and heredity (passing on of traits, inherited versus acquired/learned characteristics)	①	②	③	④
d) Role of variation and adaptation in survival/extinction of species in a changing environment	①	②	③	④
e) Interaction of living organisms and the physical environment in an ecosystem (energy flow, food webs, effect of changes, cycling of materials)	①	②	③	④
f) Trends in human population and its effects on the environment	①	②	③	④
g) Impact of natural hazards on humans, wildlife, and the environment	①	②	③	④
B. Chemistry				
a) Classification and composition of matter (properties of elements, compounds, mixtures)	①	②	③	④
b) Particulate structure of matter (molecules, atoms, protons, neutrons, and electrons)	①	②	③	④
c) Solutions (solvent, solute, concentration/dilution, effect of temperature on solubility)	①	②	③	④
d) Properties and uses of common acids and bases	①	②	③	④
e) Chemical change (transformation of reactants, evidence of chemical change, conservation of matter, common oxidation reactions - combustion and rusting)	①	②	③	④
C. Physics				
a) Physical states and changes in matter (explanations of properties in terms of movement/distance between particles; phase change, thermal expansion and changes in volume and/or pressure)	①	②	③	④
b) Energy forms, transformations, heat, and temperature	①	②	③	④
c) Basic properties/behaviors of light (reflection, refraction, light and color, simple ray diagrams) and sound (transmission through media, loudness, pitch, amplitude, frequency, relative speed of light and sound)	①	②	③	④
d) Electric circuits (flow of current; types of circuits - parallel/series; current/voltage relationship)	①	②	③	④
e) Properties of permanent magnets and electromagnets	①	②	③	④
f) Forces and motion (types of forces, basic description of motion, use of distance/time graphs, effects of density and pressure)	①	②	③	④

7 Continued

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

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

	Not well prepared	Somewhat prepared	Very well prepared	Not applicable
D. Earth Science				
a) Earth's structure and physical features (Earth's crust, mantle and core; use of topographic maps)	①	②	③	④
b) Earth's processes, cycles and history (rock cycle; water cycle; weather patterns; major geological events; formation of fossils and fossil fuels)	①	②	③	④
c) Environmental concerns (e.g., pollution, global warming, acid rain)	①	②	③	④
d) Use and conservation of Earth's natural resources (renewable/non-renewable resources, human use of land/soil and water resources)	①	②	③	④
e) Earth in the solar system and the universe (phenomena on Earth - day/night, tides, phases of moon, eclipses, seasons; physical features of Earth compared to other bodies; the Sun as a star)	①	②	③	④

Professional Development

8

How often do you have the following types of interactions with other teachers?

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

	Never or almost never	2 or 3 times per month	1-3 times per week	Daily or almost daily
a) Discussions about how to teach a particular concept	①	②	③	④
b) Working on preparing instructional materials	①	②	③	④
c) Visits to another teacher's classroom to observe his/her teaching	①	②	③	④
d) Informal observations of **my** classroom by another teacher	①	②	③	④

9

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

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

	Yes	No
a) Science content	①	②
b) Science pedagogy/instruction	①	②
c) Science curriculum	①	②
d) Integrating information technology into science	①	②
e) Improving students' critical thinking or inquiry skills	①	②
f) Science assessment	①	②

Your School

10

Thinking about your current school, indicate the extent to which you agree or disagree with each of the following statements about your school.

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

	Agree a lot	Agree	Disagree	Disagree a lot
a) This school is located in a safe neighborhood	①	②	③	④
b) I feel safe at this school	①	②	③	④
c) This school's security policies and practices are sufficient	①	②	③	④

11

In your current school, how severe is each problem?

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

	Not a problem	Minor problem	Serious problem
a) The school building needs significant repair	①	②	③
b) Classrooms are overcrowded	①	②	③
c) Teachers do not have adequate workspace outside their classroom	①	②	③
d) Materials are not available to conduct science experiments or investigations	①	②	③

12

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

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

	Very high	High	Medium	Low	Very low
a) Teachers' job satisfaction	①	②	③	④	⑤
b) Teachers' understanding of the school's curricular goals	①	②	③	④	⑤
c) Teachers' degree of success in implementing the school's curriculum	①	②	③	④	⑤
d) Teachers' expectations for student achievement	①	②	③	④	⑤
e) Parental support for student achievement	①	②	③	④	⑤
f) Parental involvement in school activities	①	②	③	④	⑤
g) Students' regard for school property	①	②	③	④	⑤
h) Students' desire to do well in school	①	②	③	④	⑤

The TIMSS Class

In this section, many of the questions refer to a **particular science class that you teach**. Please remember that this is the class which is identified on the cover of this questionnaire.

13

A. How many students are in the class with the TIMSS students?

_____

Write in the number of students

B. How many students in Question 13A are in the eighth grade ?

_____

Write in the number of eighth grade students

14

How many minutes per week do you teach science to the class with the TIMSS students?

_____

Write in the number of minutes per week

15

A. Do you use a textbook(s) in teaching science to the class with the TIMSS students?

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

*If **No**, please go to question* **16**

B. How do you use a textbook(s) in teaching science to the class with the TIMSS students?

*Fill in **one** circle only*

As the primary basis for my lessons ①

As a supplementary resource ②

16

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

Write in the percent
The total should add to 100%

a) Reviewing homework _____%

b) Listening to lecture-style presentations _____%

c) Working problems with your guidance _____%

d) Working problems on their own without your guidance _____%

e) Listening to you re-teach and clarify content/procedures _____%

f) Taking tests or quizzes _____%

g) Participating in classroom management tasks not related to the lesson's content/purpose (e.g., interruptions and keeping order) _____%

h) Other student activities _____%

Total 100%

17

Which best describes the science course you are teaching to the class with the TIMSS students?

*Fill in **one** circle only.*

a) General science (several content areas of science taught separately) ①

b) Integrated science (several content areas of science combined and taught together throughout the year) ②

c) Life science (e.g., biology, ecosystems, human health) ③

d) Physical science (e.g., physics or chemistry) ④

e) Earth science (e.g., geology, earth and the solar system, fossils) ⑤

18

In teaching science to the students in the class with the TIMSS students, how often do you usually ask them to do the following?

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

	Never	Some lessons	About half the lessons	Every or almost every lesson
a) Observe natural phenomena and describe what they see	①	②	③	④
b) Watch me demonstrate an experiment or investigation	①	②	③	④
c) Design or plan experiments or investigations	①	②	③	④
d) Conduct experiments or investigations	①	②	③	④
e) Work together in small groups on experiments or investigations	①	②	③	④
f) Read their textbooks or other resource materials	①	②	③	④
g) Have students memorize facts and principles	①	②	③	④
h) Use scientific formulae and laws to solve routine problems	①	②	③	④
i) Give explanations about something they are studying	①	②	③	④
j) Relate what they are learning in science to their daily lives	①	②	③	④

19

In your view, to what extent do the following limit how you teach the class with the TIMSS students?

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

	A lot	Some	A little	Not at all	Not applicable
Students					
a) Students with different academic abilities	①	②	③	④	⑤
b) Students who come from a wide range of backgrounds (e.g., economic, language)	①	②	③	④	⑤
c) Students with special needs (e.g., hearing, vision, speech impairment, physical disabilities, mental or emotional/psychological impairment)	①	②	③	④	⑤
d) Uninterested students	①	②	③	④	⑤
e) Disruptive students	①	②	③	④	⑤
Resources					
f) Shortage of computer hardware	①	②	③	④	⑤
g) Shortage of computer software	①	②	③	④	⑤
h) Shortage of support for using computers	①	②	③	④	⑤
i) Shortage of textbooks for student use	①	②	③	④	⑤
j) Shortage of other instructional equipment for students' use	①	②	③	④	⑤
k) Shortage of equipment for your use in demonstrations and other exercises	①	②	③	④	⑤
l) Inadequate physical facilities	①	②	③	④	⑤
m) High student/teacher ratio	①	②	③	④	⑤

20

By the end of this school year, approximately what percentage of teaching time will you have spent during this school year on each of the following science content areas for the class with the TIMSS students?

Write in the percent
The total should add to 100%

a) Biology (e.g., structure/function; life processes, reproduction/heredity, natural selection; ecosystems, human health) - _____%

b) Chemistry (e.g., classification, composition and properties of matter; chemical change) - - - - - - - - - - _____%

c) Physics (e.g., physical states/ changes in matter; energy; light; sound; electricity and magnetism; forces and motion) - - - - - - - - - - - - - - - - - - _____%

d) Earth science (e.g., Earth's structure, processes, and resources; the solar system and universe) - - - - - - - - _____%

e) Other, please specify:

___________________________ - - - - - - - - _____%

Total - 100%

21

The following list includes the main topics addressed by the TIMSS science test. Choose the response that best describes when students in the class with the TIMSS students have been taught each topic. If a topic was taught half this year but not yet completed, please choose "Mostly taught this year." If a topic is not in the curriculum, please choose "Not yet taught or just introduced."

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

		Mostly taught before this year	Mostly taught this year	Not yet taught or just introduced
A. Biology				
a)	Classification of organisms on the basis of a variety of physical and behavioral characteristics	①	②	③
b)	Major organ systems in humans and other organisms	①	②	③
c)	How the systems function to maintain stable bodily conditions	①	②	③
d)	Cell structures and functions	①	②	③
e)	Photosynthesis and respiration (including substances used and produced) as processes of cells and organisms	①	②	③
f)	Life cycles of organisms, including humans, plants, birds, insects	①	②	③
g)	Reproduction (sexual and asexual), and heredity (passing on of traits, inherited versus acquired/learned characteristics)	①	②	③
h)	Role of variation and adaptation in survival/extinction of species in a changing environment	①	②	③
i)	Interaction of living organisms in an ecosystem (energy flow, food chains and food webs, food pyramids, and the effects of change upon the system)	①	②	③
j)	Cycling of materials in nature (water, carbon/oxygen cycle, decomposition of organisms)	①	②	③
k)	Trends in human population and its effects on the environment	①	②	③
l)	Impact of natural hazards on humans, wildlife, and the environment	①	②	③
m)	Causes of common infectious diseases, methods of infection/transmission, prevention, and the body's natural resistance and healing capabilities	①	②	③
n)	Preventive medicine methods (diet, hygiene, exercise, and lifestyle)	①	②	③

21 Continued

The following list includes the main topics addressed by the TIMSS science test. Choose the response that best describes when students in the class with the TIMSS students have been taught each topic. If a topic was taught half this year but not yet completed, please choose "Mostly taught this year." If a topic is not in the curriculum, please choose "Not yet taught or just introduced."

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

		Mostly taught before this year	Mostly taught this year	Not yet taught or just introduced
B. Chemistry				
a)	Classification and composition of matter (physical and chemical properties, pure substances and mixtures, separation techniques)	①	②	③
b)	Particulate structure of matter (molecules, atoms, protons, neutrons, and electrons)	①	②	③
c)	Solutions (solvents, solutes, effect of temperature on solubility)	①	②	③
d)	Properties and uses of water (composition, melting/boiling points, changes in density/volume)	①	②	③
e)	Properties and uses of common acids and bases	①	②	③
f)	Chemical change (transformation of reactants, evidence of chemical change, conservation of matter)	①	②	③
g)	Common oxidation reactions (combustion, rusting), the need for oxygen and the relative tendency of familiar substances to undergo these reactions	①	②	③
h)	Classification of familiar chemical transformations as releasing or absorbing heat/energy	①	②	③

21 Continued

The following list includes the main topics addressed by the TIMSS science test. Choose the response that best describes when students in the class with the TIMSS students have been taught each topic. If a topic was taught half this year but not yet completed, please choose "Mostly taught this year." If a topic is not in the curriculum, please choose "Not yet taught or just introduced."

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

		Mostly taught before this year	Mostly taught this year	Not yet taught or just introduced
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, conservation of mass during physical changes)	①	②	③
b)	Processes of melting, freezing, evaporation, and condensation (phase change; melting/boiling points; effects of pressure and purity of substances)	①	②	③
c)	Energy forms, transformations, heat and temperature, including heat transfer	①	②	③
d)	Temperature changes related to changes in volume and/or pressure and to changes in movement or speed of particles	①	②	③
e)	Basic properties/behavior of light (reflection, refraction, light and color, simple ray diagrams)	①	②	③
f)	Properties of sound (transmission through media, ways of describing sound (loudness, pitch, amplitude, frequency), relative speed)	①	②	③
g)	Electric circuits (flow of current, types of circuits – parallel/series) and relationship between voltage and current	①	②	③
h)	Properties of permanent magnets and electromagnets	①	②	③
i)	Forces and motion (types of forces, basic description of motion), use of distance/time graphs	①	②	③
j)	Effects of density and pressure	①	②	③

21 Continued

The following list includes the main topics addressed by the TIMSS science test. Choose the response that best describes when students in the class with the TIMSS students have been taught each topic. If a topic was taught half this year but not yet completed, please choose "Mostly taught this year." If a topic is not in the curriculum, please choose "Not yet taught or just introduced."

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

		Mostly taught before this year	Mostly taught this year	Not yet taught or just introduced
D. Earth Science				
a)	Earth's structure and physical features (Earth's crust, mantle, and core; topographic maps)	①	②	③
b)	The physical state, movement, composition, and relative distribution of water on Earth	①	②	③
c)	Earth's atmosphere and the relative abundance of its main components	①	②	③
d)	Earth's water cycle (steps, role of sun's energy, circulation/renewal of fresh water)	①	②	③
e)	Processes in the rock cycle and the formation of igneous, metamorphic, and sedimentary rock	①	②	③
f)	Weather data/maps and changes in weather patterns (e.g., seasonal changes, effects of latitude, altitude, and geography)	①	②	③
g)	Geological processes occurring over millions of years (e.g., erosion, mountain building, plate movement)	①	②	③
h)	Formation of fossils and fossil fuels	①	②	③
i)	Environmental concerns (e.g., pollution, global warming, acid rain)	①	②	③
j)	Earth's resources (renewable/nonrenewable, conservation, waste management)	①	②	③
k)	Relationship of land management (e.g., pest control) to human use (e.g., farming)	①	②	③
l)	Supply and demand of fresh water resources	①	②	③
m)	Explanation of phenomena on Earth based on position/movement of bodies in the solar sytem and universe (e.g., day/night, tides, year, phases of the moon, eclipses, seasons, appearance of sun, moon, planets, and constellations)	①	②	③
n)	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)	①	②	③

Computers in the TIMSS Class

22

A. Do students in the class with the TIMSS students have computer(s) available to use during their science lessons? Do not include calculators.

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

*If **No**, please go to question* **24** ➡

B. Do any of the computer(s) have access to the Internet?

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

23

In teaching science to the class with the TIMSS students, how often do you have students use a computer for the following activities?

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

	Every or almost every lesson	About half the lessons	Some lessons	Never
a) Do scientific procedures or experiments	①	②	③	④
b) Study natural phenomena through simulations	①	②	③	④
c) Practice skills and procedures	①	②	③	④
d) Look up ideas and information	①	②	③	④
e) Process and analyze data	①	②	③	④

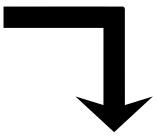
Homework

24

Do you assign science homework to the class with the TIMSS students?

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

*If **No**, please go to question* **29**



25

How often do you usually assign science homework to the class with the TIMSS students?

*Fill in **one** circle only*

- Every or almost every lesson ①
- About half the lessons ②
- Some lessons ③

26

When you assign science homework to the class with the TIMSS students, about how many minutes do you usually assign? (Consider the time it would take an average student in your class to complete the assignment.)

*Fill in **one** circle only*

- Fewer than 15 minutes ①
- 15-30 minutes ②
- 31-60 minutes ③
- 61-90 minutes ④
- More than 90 minutes ⑤

27

How often do you assign the following kinds of science homework to the class with the TIMSS students?

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

		Never or almost never	Sometimes	Always or almost always
a)	Doing problem/question sets	①	②	③
b)	Finding one or more applications of the content covered	①	②	③
c)	Reading from a textbook or supplementary materials	①	②	③
d)	Writing definitions or other short writing assignments	①	②	③
e)	Working on projects	①	②	③
f)	Working on small investigations or gathering data	①	②	③
g)	Preparing reports	①	②	③

28

How often do you do the following with the science homework assignments for the students in the class with the TIMSS students?

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

		Never or almost never	Sometimes	Always or almost always
a)	Monitor whether or not the homework was completed	①	②	③
b)	Correct assignments and then give feedback to students	①	②	③
c)	Have students correct their own homework in class	①	②	③
d)	Use the homework as a basis for class discussion	①	②	③
e)	Use the homework to contribute towards students' grades or marks	①	②	③

29

How much emphasis do you place on the following sources to monitor students' progress in science?

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

		No emphasis	Little emphasis	Some emphasis	Major emphasis
a)	Classroom tests (for example, teacher made or textbook tests)	①	②	③	④
b)	State or district achievement tests	①	②	③	④
c)	Your professional judgement	①	②	③	④

30

How often do you give a science test or examination to the class with the TIMSS students? Do not include quizzes.

*Fill in **one** circle only*

- About once a week ①
- About every two weeks ②
- About once a month ③
- A few times a year ④
- Never ⑤

*If **Never**, you have completed the questionnaire*

Thank You

31

What item formats do you typically use in your science tests or examinations? Do not include quizzes.

*Fill in **one** circle only*

- Only constructed-response ①
- Mostly constructed-response ②
- About half constructed-response and half objective (e.g., multiple-choice) ③
- Mostly objective ④
- Only objective ⑤

32

How often do you include the following types of questions in your science tests or examinations? Do not include quizzes.

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

		Never or almost never	Sometimes	Always or almost always
a)	Questions based on knowing facts and concepts	①	②	③
b)	Questions based on the application of knowledge and understanding	①	②	③
c)	Questions involving developing hypotheses and designing scientific investigations	①	②	③
d)	Questions requiring explanations or justifications	①	②	③

for completing this questionnaire

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

Teacher Questionnaire

SCIENCE
Grade 8