



Place Label Here

School ID: \_\_\_\_\_

Class ID: \_\_\_\_\_

Teacher ID: \_\_\_\_\_

Link #: \_\_\_\_\_ Subject: \_\_\_\_\_

Checksum: \_\_\_\_\_

TRENDS IN INTERNATIONAL MATHEMATICS AND SCIENCE STUDY

# Teacher Questionnaire

## Grade 4

National Center for Education Statistics  
U.S. Department of Education  
1990 K St. NW  
Washington, DC 20006-5650



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

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*U.S. participation in this study is sponsored by the National Center for Education Statistics (NCES), U.S. Department of Education, and authorized by the Education Sciences Reform Act of 2002 (20 U.S.C., § 9543). Your responses are protected by federal statute (20 U.S.C., § 9573) and may be used only for statistical purposes and may not be disclosed, or used, in identifiable form for any other purpose except as required by law.*

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869860 Printed in the USA by Pearson ISD10746

# Teacher Questionnaire

Your school has agreed to participate in TIMSS 2015 (Trends in International Mathematics and Science Study), an educational research project sponsored by the International Association for the Evaluation of Educational Achievement (IEA). TIMSS measures trends in student achievement in mathematics and science and studies differences in national education systems in almost 60 countries in order to help improve teaching and learning worldwide.

This questionnaire is addressed to teachers of fourth-grade students and seeks information about teachers' academic and professional backgrounds, classroom resources, instructional practices, and attitudes toward teaching. Since your class has been selected as part of a nationwide sample, your responses are very important in helping to describe fourth-grade education in the United States.

Some of the questions in the questionnaire refer to the "**TIMSS class**" or "**this class**." This is the class that is identified on the front of this booklet and that will be tested as part of TIMSS in your school. If you teach some but not all of the students in the TIMSS class, please think only of the students that you teach when answering these class-specific questions. It is important that you answer each question carefully so that the information that you provide reflects your situation as accurately as possible.

Since TIMSS is an international study and all countries are using the same questionnaire, you may find that some of the questions seem unusual or are not entirely relevant to you or schools in the United States. Nevertheless, it is important that you do your best to answer all of the questions so comparisons can be made across countries in the studies.

It is estimated that you will need approximately 30 minutes to complete this questionnaire. We appreciate the time and effort that this takes and thank you for your cooperation and contribution.

When you have completed the questionnaire, please place it in the accompanying envelope and return it to the TIMSS school coordinator.

NCES is authorized to collect information from the questionnaire under the Education Science Reform Act of 2002 (ESRA 2002), 20 U.S. Code, § 9543. You do not have to provide the information requested. However, the information you provide will help the U.S. Department of Education's ongoing efforts to understand better how the educational system in the United States compares to that in other countries. There are no penalties should you choose not to participate in this study. Your answers may be used only for statistical purposes and may not be disclosed, or used, in identifiable form for any other purpose except as required by law (20 U.S. Code, § 9573). Your response will be combined with those from other participants to produce summary statistics and reports.

This survey is estimated to take an average of 30 minutes, including time for reviewing instructions, and completing and reviewing the collection of information. An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing burden, to: Stephen Provasnik, National Center for Education Statistics, U.S. Department of Education, 1990 K Street NW, Room 8123, Washington, DC 20006-5650. Do not return the completed form to this address.

Thank you.

# TIMSS 2015

# About You

## 1

What year did you start teaching?

\_\_\_\_\_ years  
Please write in a year.

## 2

At the end of this school year, how many years will you have taught altogether?

\_\_\_\_\_ years  
Please **round** to the nearest whole number.

## 3

Are you female or male?

Fill in **one** circle only.

Female --- (1)

Male --- (2)

## 4

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 more --- (6)

## 5

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

Fill in **one** circle only.

Did not complete high school --- (1)

High school graduate --- (2) 

**(If you have not completed more than high school, go to question 7)**

Associate's degree  
(2-year college program) --- (3)

Bachelor's degree  
(4-year college program) --- (4)

Master's degree or professional  
degree (MD, DDS, lawyer, minister) --- (5)

Doctorate (Ph.D., or Ed.D.) --- (6)

## 6

**A. During your college or university education, what was your major or main area(s) of study?**

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

- |                                       | Yes   | No  |
|---------------------------------------|-------|-----|
| a) Education—Primary/Elementary ----- | (1) — | (2) |
| b) Education—Secondary -----          | (1) — | (2) |
| c) Mathematics -----                  | (1) — | (2) |
| d) Science -----                      | (1) — | (2) |
| e) English -----                      | (1) — | (2) |
| f) Other -----                        | (1) — | (2) |

**B. If your major or main area of study was education, did you have a specialization in any of the following?**

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

- |                           | Yes   | No  |
|---------------------------|-------|-----|
| a) Mathematics -----      | (1) — | (2) |
| b) Science -----          | (1) — | (2) |
| c) Language/reading ----- | (1) — | (2) |
| d) Other subject -----    | (1) — | (2) |

## 7

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

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

- 
- a) Teachers' understanding of the school's curricular goals --- (1) --- (2) --- (3) --- (4) --- (5)
- b) Teachers' degree of success in implementing the school's curriculum ----- (1) --- (2) --- (3) --- (4) --- (5)
- c) Teachers' expectations for student achievement ----- (1) --- (2) --- (3) --- (4) --- (5)
- d) Teachers working together to improve student achievement ----- (1) --- (2) --- (3) --- (4) --- (5)
- e) Teachers' ability to inspire students ----- (1) --- (2) --- (3) --- (4) --- (5)
- f) Parental involvement in school activities ----- (1) --- (2) --- (3) --- (4) --- (5)
- g) Parental commitment to ensure that students are ready to learn ----- (1) --- (2) --- (3) --- (4) --- (5)
- h) Parental expectations for student achievement ----- (1) --- (2) --- (3) --- (4) --- (5)
- i) Parental support for student achievement ----- (1) --- (2) --- (3) --- (4) --- (5)
- j) Parental pressure for the school to maintain high academic standards ----- (1) --- (2) --- (3) --- (4) --- (5)

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

- 
- k) Students' desire to do well in school ----- (1) --- (2) --- (3) --- (4) --- (5)
- l) Students' ability to reach school's academic goals ----- (1) --- (2) --- (3) --- (4) --- (5)
- m) Students' respect for classmates who excel in school ----- (1) --- (2) --- (3) --- (4) --- (5)
- n) Clarity of the school's educational objectives ----- (1) --- (2) --- (3) --- (4) --- (5)
- o) Collaboration between school leadership and teachers to plan instruction --- (1) --- (2) --- (3) --- (4) --- (5)
- p) Amount of instructional support provided to teachers by school leadership ----- (1) --- (2) --- (3) --- (4) --- (5)
- q) School leadership's support for teachers' professional development ----- (1) --- (2) --- (3) --- (4) --- (5)

## 8

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

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

- Agree a lot** \_\_\_\_\_  
**Agree a little** \_\_\_\_\_  
**Disagree a little** \_\_\_\_\_  
**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
- d) The students behave in an orderly manner ----- ① — ② — ③ — ④
- e) The students are respectful of the teachers ----- ① — ② — ③ — ④
- f) The students respect school property ----- ① — ② — ③ — ④
- g) This school has clear rules about student conduct ----- ① — ② — ③ — ④
- h) This school's rules are enforced in a fair and consistent manner ----- ① — ② — ③ — ④

## 9

In your current school, how severe is each problem?

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

- Not a problem** \_\_\_\_\_  
**Minor problem** \_\_\_\_\_  
**Moderate problem** \_\_\_\_\_  
**Serious problem** \_\_\_\_\_
- a) The school building needs significant repair ----- ① — ② — ③ — ④
- b) Teachers do not have adequate workspace (e.g., for preparation, collaboration, or meeting with students) ---- ① — ② — ③ — ④
- c) Teachers do not have adequate instructional materials and supplies ----- ① — ② — ③ — ④
- d) The school classrooms are not cleaned often enough ----- ① — ② — ③ — ④
- e) The school classrooms need maintenance work ----- ① — ② — ③ — ④
- f) Teachers do not have adequate technological resources ----- ① — ② — ③ — ④
- g) Teachers do not have adequate support for using technology ----- ① — ② — ③ — ④

## 10

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

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

- |  | Very often | Often | Sometimes | Never or almost never |
|--|------------|-------|-----------|-----------------------|
| a) Discuss how to teach a particular topic -----                               | ①          | ②     | ③         | ④                     |
| b) Collaborate in planning and preparing instructional materials -----         | ①          | ②     | ③         | ④                     |
| c) Share what I have learned about my teaching experiences -----               | ①          | ②     | ③         | ④                     |
| d) Visit another classroom to learn more about teaching -                      | ①          | ②     | ③         | ④                     |
| e) Work together to try out new ideas -----                                    | ①          | ②     | ③         | ④                     |
| f) Work as a group on implementing the curriculum -----                        | ①          | ②     | ③         | ④                     |
| g) Work with teachers from other grades to ensure continuity in learning ----- | ①          | ②     | ③         | ④                     |

## 11

How often do you feel the following way about being a teacher?

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

- |   | Very often | Often | Sometimes | Never or almost never |
|---|------------|-------|-----------|-----------------------|
| a) I am content with my profession as a teacher -----       | ①          | ②     | ③         | ④                     |
| b) I am satisfied with being a teacher at this school ----- | ①          | ②     | ③         | ④                     |
| c) I find my work full of meaning and purpose -----         | ①          | ②     | ③         | ④                     |
| d) I am enthusiastic about my job -----                     | ①          | ②     | ③         | ④                     |
| e) My work inspires me -----                                | ①          | ②     | ③         | ④                     |
| f) I am proud of the work I do ---                          | ①          | ②     | ③         | ④                     |
| g) I am going to continue teaching for as long as I can --- | ①          | ②     | ③         | ④                     |

**12**

Indicate the extent to which you agree or disagree with each of the following statements.

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

- 
- Agree a lot  
Agree a little  
Disagree a little  
Disagree a lot
- a) There are too many students in the classes ----- ① — ② — ③ — ④
- b) I have too much material to cover in class ----- ① — ② — ③ — ④
- c) I have too many teaching hours ----- ① — ② — ③ — ④
- d) I need more time to prepare for class ----- ① — ② — ③ — ④
- e) I need more time to assist individual students ----- ① — ② — ③ — ④
- f) I feel too much pressure from parents ----- ① — ② — ③ — ④
- g) I have difficulty keeping up with all of the changes to the curriculum ----- ① — ② — ③ — ④
- h) I have too many administrative tasks ----- ① — ② — ③ — ④

**13**

**A. How many students are in this class?**

\_\_\_\_\_ students  
Write in the number.

**B. How many of the students in question 13A are in fourth grade?**

\_\_\_\_\_ fourth-grade students  
Write in the number.

**14**

**How many fourth-grade students experience difficulties understanding spoken English?**

\_\_\_\_\_ students in this class  
Write in the number.

# 15

**How often do you do the following in teaching this class?**

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

- |  |   |
|--|---|
|  | <b>Every or almost every lesson</b><br>-----<br><b>About half the lessons</b><br>-----<br><b>Some lessons</b><br>-----<br><b>Never</b><br>----- |
| a) Relate the lesson to students' daily lives -----  | (1) — (2) — (3) — (4)   |
| b) Ask students to explain their answers -----   | (1) — (2) — (3) — (4)   |
| c) Bring interesting materials to class -----  | (1) — (2) — (3) — (4)   |
| d) Ask students to complete challenging exercises that require them to go beyond the instruction ----- | (1) — (2) — (3) — (4)   |
| e) Encourage classroom discussions among students -----  | (1) — (2) — (3) — (4)   |
| f) Link new content to students' prior knowledge -----   | (1) — (2) — (3) — (4)   |
| g) Ask students to decide their own problem solving procedures -----                                   | (1) — (2) — (3) — (4)   |
| h) Encourage students to express their ideas in class -----  | (1) — (2) — (3) — (4)   |

# 16

**In your view, to what extent do the following limit how you teach this class?**

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

- |   |   |
|---|---|
|   | <b>Not at all</b><br>-----<br><b>Some</b><br>-----<br><b>A lot</b><br>----- |
| a) Students lacking prerequisite knowledge or skills -----              | (1) — (2) — (3)   |
| b) Students suffering from lack of basic nutrition -----                | (1) — (2) — (3)   |
| c) Students suffering from not enough sleep -----                       | (1) — (2) — (3)   |
| d) Disruptive students -----  | (1) — (2) — (3)   |
| e) Uninterested students -----  | (1) — (2) — (3)   |
| f) Students with physical disabilities -----                            | (1) — (2) — (3)   |
| g) Students with mental, emotional, or psychological disabilities ----- | (1) — (2) — (3)   |



Questions 17 - 19 ask about mathematics instruction for the fourth-grade students in the TIMSS class.

## 17

In a typical week, how much time do you spend teaching mathematics to the students in this class?

\_\_\_\_\_ minutes per week  
 Write in the number of minutes per week.  
 Please convert the number of hours into minutes.

## 18

In teaching mathematics to this class, how would you characterize your confidence in doing the following?

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

- 
- Very high  
High  
Medium  
Low
- Inspiring students to learn mathematics ----- (1) — (2) — (3) — (4)
  - Showing students a variety of problem solving strategies ---- (1) — (2) — (3) — (4)
  - Providing challenging tasks for the highest achieving students ----- (1) — (2) — (3) — (4)
  - Adapting my teaching to engage students' interest ---- (1) — (2) — (3) — (4)
  - Helping students appreciate the value of learning mathematics ----- (1) — (2) — (3) — (4)
  - Assessing student comprehension of mathematics ----- (1) — (2) — (3) — (4)
  - Improving the understanding of struggling students ----- (1) — (2) — (3) — (4)
  - Making mathematics relevant to students ----- (1) — (2) — (3) — (4)
  - Developing students' higher-order thinking skills ----- (1) — (2) — (3) — (4)

## 19

In teaching mathematics to this class, how often do you ask students to do the following?

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

- 
- Every or almost every lesson  
About half the lessons  
Some lessons  
Never
- Listen to me explain new mathematics content ----- (1) — (2) — (3) — (4)
  - Listen to me explain how to solve problems ----- (1) — (2) — (3) — (4)
  - Memorize rules, procedures, and facts ----- (1) — (2) — (3) — (4)
  - Work problems (individually or with peers) with my guidance- (1) — (2) — (3) — (4)
  - Work problems together in the whole class with direct guidance from me ----- (1) — (2) — (3) — (4)
  - Work problems (individually or with peers) while I am occupied by other tasks ----- (1) — (2) — (3) — (4)
  - Take a written test or quiz ---- (1) — (2) — (3) — (4)
  - Work in mixed ability groups -- (1) — (2) — (3) — (4)
  - Work in same ability groups -- (1) — (2) — (3) — (4)

Questions 20 - 21 ask about resources for teaching mathematics to the fourth-grade students in the TIMSS class.

**20**

**Are the students in this class permitted to use calculators during mathematics lessons?**

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

- Yes, with unrestricted use --- ①
- Yes, with restricted use --- ②
- No, calculators are not permitted --- ③

**21**

**A. Do the students in this class have computers (including tablets) available to use during their mathematics lessons?**

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

Yes --- ①

No --- ②

**(If No, go to question 22)**

**If Yes,**

**B. What access do the students have to computers?**

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

- |  | Yes | No |
|--|-----|----|
| a) Each student has a computer -----                               | ①   | ②  |
| b) The class has computers that students can share -----           | ①   | ②  |
| c) The school has computers that the class can use sometimes ----- | ①   | ②  |

**C. How often do you have the students do the following activities on computers during mathematics lessons?**

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

- |  | Every or almost every day | Once or twice a week | Once or twice a month | Never or almost never |
|--|---------------------------|----------------------|-----------------------|-----------------------|
| a) Explore mathematics principles and concepts ----- | ①                         | ②                    | ③                     | ④                     |
| b) Practice skills and procedures -                  | ①                         | ②                    | ③                     | ④                     |
| c) Look up ideas and information -----               | ①                         | ②                    | ③                     | ④                     |

# Mathematics Topics Taught to the TIMSS Class

Question 22 asks about the topics taught and the content covered in teaching mathematics to the fourth-grade students in the TIMSS class.

**22**

The following list includes the main topics addressed by the TIMSS mathematics test. Choose the response that best describes when the students in this class have been taught each topic. If a topic was in the curriculum before the fourth grade, please choose “Mostly taught before this year.” 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 only **one** circle for each row.



**A. Number**

- a) Concepts of whole numbers, including place value and ordering ----- ① — ② — ③
- b) Adding, subtracting, multiplying, and/or dividing with whole numbers ----- ① — ② — ③
- c) Concepts of multiples and factors; odd and even numbers ----- ① — ② — ③
- d) Concepts of fractions (fractions as parts of a whole or of a collection, or as a location on a number line) ----- ① — ② — ③
- e) Adding and subtracting with fractions, comparing and ordering fractions ----- ① — ② — ③
- f) Concepts of decimals, including place value and ordering, adding and subtracting with decimals ----- ① — ② — ③
- g) Number sentences (finding the missing number, modeling simple situations with number sentences) ----- ① — ② — ③
- h) Number patterns (extending number patterns and finding missing terms) ----- ① — ② — ③

**B. Geometric Shapes and Measures**

- a) Lines: measuring, estimating length of; parallel and perpendicular lines ----- ① — ② — ③
- b) Comparing and drawing angles ----- ① — ② — ③
- c) Using informal coordinate systems to locate points in a plane (e.g., in square B4) ----- ① — ② — ③
- d) Elementary properties of common geometric shapes ----- ① — ② — ③
- e) Reflections and rotations ----- ① — ② — ③
- f) Relationships between two-dimensional and three-dimensional shapes ----- ① — ② — ③
- g) Finding and estimating areas, perimeters, and volumes ----- ① — ② — ③

**C. Data Display**

- a) Reading and representing data from tables, pictographs, bar graphs, or pie charts ----- ① — ② — ③
- b) Drawing conclusions from data displays ----- ① — ② — ③

Question 23 asks about mathematics homework for the fourth-grade students in the TIMSS class.

Question 24 asks about mathematics assessment for the fourth-grade students in the TIMSS class.

**23**


**24**

**A. How often do you usually assign mathematics homework to the students in this class?**

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

Fill in **one** circle only.

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

I do not assign mathematics homework --- (1) 

(Go to question 24)

Less than once a week --- (2)

1 or 2 times a week --- (3)

3 or 4 times a week --- (4)

Every day --- (5)



- a) Assessment of students' ongoing work ----- (1) --- (2) --- (3)
- b) Classroom tests (for example, teacher-made or textbook tests) ----- (1) --- (2) --- (3)
- c) State or district achievement tests ----- (1) --- (2) --- (3)

**B. When you assign mathematics homework to the students in this 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.

15 minutes or less --- (1)

16–30 minutes --- (2)

31–60 minutes --- (3)

More than 60 minutes --- (4)

**C. How often do you do the following with the mathematics homework assignments for this class?**

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



- a) Correct assignments and give feedback to students ----- (1) --- (2) --- (3)
- b) Discuss the homework in class ----- (1) --- (2) --- (3)
- c) Monitor whether or not the homework was completed ----- (1) --- (2) --- (3)

**25**

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

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

- |   | Yes | No |
|---|-----|----|
| a) Mathematics content -----  | ①   | ②  |
| b) Mathematics pedagogy/instruction -----                                   | ①   | ②  |
| c) Mathematics curriculum -----   | ①   | ②  |
| d) Integrating information<br>technology into mathematics -----             | ①   | ②  |
| e) Improving students' critical thinking or<br>problem solving skills ----- | ①   | ②  |
| f) Mathematics assessment -----   | ①   | ②  |
| g) Addressing individual students' needs -----                              | ①   | ②  |

**26**

**In the past two years, how many hours in total have you spent in formal in-service/professional development (e.g., workshops, seminars) for mathematics?**

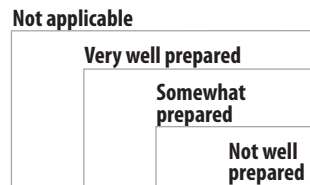
*Fill in **one** circle only.*

- None --- ①
- Less than 6 hours --- ②
- 6–15 hours --- ③
- 16–35 hours --- ④
- More than 35 hours --- ⑤

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

**If a topic is not in the fourth-grade curriculum or you are not responsible for teaching this topic, please choose "Not applicable."**

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



**A. Number**

- a) Concepts of whole numbers, including place value and ordering ----- ① — ② — ③ — ④
- b) Adding, subtracting, multiplying, and/or dividing with whole numbers ----- ① — ② — ③ — ④
- c) Concepts of multiples and factors; odd and even numbers ----- ① — ② — ③ — ④
- d) Concepts of fractions (fractions as parts of a whole or of a collection, or as a location on a number line) ----- ① — ② — ③ — ④
- e) Adding and subtracting with fractions, comparing and ordering fractions ----- ① — ② — ③ — ④
- f) Concepts of decimals, including place value and ordering, adding and subtracting with decimals ----- ① — ② — ③ — ④
- g) Number sentences (finding the missing number, modeling simple situations with number sentences) ----- ① — ② — ③ — ④
- h) Number patterns (extending number patterns and finding missing terms) ----- ① — ② — ③ — ④

**B. Geometric Shapes and Measures**

- a) Lines: measuring, estimating length of; parallel and perpendicular lines ----- ① — ② — ③ — ④
- b) Comparing and drawing angles ----- ① — ② — ③ — ④
- c) Using informal coordinate systems to locate points in a plane (e.g., in square B4) ----- ① — ② — ③ — ④
- d) Elementary properties of common geometric shapes ----- ① — ② — ③ — ④
- e) Reflections and rotations ----- ① — ② — ③ — ④
- f) Relationships between two-dimensional and three-dimensional shapes ----- ① — ② — ③ — ④
- g) Finding and estimating areas, perimeters, and volumes ----- ① — ② — ③ — ④

**C. Data Display**

- a) Reading and representing data from tables, pictographs, bar graphs, or pie charts ----- ① — ② — ③ — ④
- b) Drawing conclusions from data displays ----- ① — ② — ③ — ④

Questions 28 - 30 ask about science instruction for the fourth-grade students in the TIMSS class.

**28**

**A. Is science taught mainly as a separate subject (i.e., not integrated with other subjects) to the students in this class?**

Fill in **one** circle only.

Yes --- (1)

No --- (2)

**B. Please estimate the time that you spend on science topics with students in this class.**

\_\_\_\_\_ minutes per week

Write in the number of minutes per week.

Please convert the number of hours into minutes.

**29**

**In teaching science to this class, how would you characterize your confidence in doing the following?**

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

Very high  
High  
Medium  
Low

a) Inspiring students to learn science ----- (1) — (2) — (3) — (4)

b) Explaining science concepts or principles by doing science experiments ----- (1) — (2) — (3) — (4)

c) Providing challenging tasks for the highest achieving students ----- (1) — (2) — (3) — (4)

d) Adapting my teaching to engage students' interest ----- (1) — (2) — (3) — (4)

e) Helping students appreciate the value of learning science ----- (1) — (2) — (3) — (4)

f) Assessing student comprehension of science ----- (1) — (2) — (3) — (4)

g) Improving the understanding of struggling students ----- (1) — (2) — (3) — (4)

h) Making science relevant to students ----- (1) — (2) — (3) — (4)

i) Developing students' higher-order thinking skills ----- (1) — (2) — (3) — (4)

j) Teaching science using inquiry methods ----- (1) — (2) — (3) — (4)

30

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

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

- |  |  |                              |                        |              |       |
|--|--|------------------------------|------------------------|--------------|-------|
|  |  | Every or almost every lesson |                        |              |       |
|  |  |                              | About half the lessons |              |       |
|  |  |                              |                        | Some lessons |       |
|  |  |                              |                        |              | Never |
- a) Listen to me explain new science content ----- (1) — (2) — (3) — (4)
- b) Observe natural phenomena such as the weather or a plant growing and describe what they see ----- (1) — (2) — (3) — (4)
- c) Watch me demonstrate an experiment or investigation --- (1) — (2) — (3) — (4)
- d) Design or plan experiments or investigations ----- (1) — (2) — (3) — (4)
- e) Conduct experiments or investigations ----- (1) — (2) — (3) — (4)
- f) Present data from experiments or investigations - (1) — (2) — (3) — (4)
- g) Interpret data from experiments or investigations - (1) — (2) — (3) — (4)
- h) Use evidence from experiments or investigations to support conclusions ----- (1) — (2) — (3) — (4)
- i) Read their textbooks or other resource materials ----- (1) — (2) — (3) — (4)
- j) Have students memorize facts and principles ----- (1) — (2) — (3) — (4)
- k) Do field work outside the class (1) — (2) — (3) — (4)
- l) Take a written test or quiz ----- (1) — (2) — (3) — (4)
- m) Work in mixed ability groups -- (1) — (2) — (3) — (4)
- n) Work in same ability groups -- (1) — (2) — (3) — (4)

31

Question 31 asks about resources for teaching science to the fourth-grade students in the TIMSS class.

**A. Do the students in this class have computers (including tablets) available to use during their science lessons?**

Fill in **one** circle only.

Yes --- (1)

No --- (2) →

(If No, go to question 32)

**If Yes,**

**B. What access do the students have to computers?**

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

- |  |  |     |  |    |  |
|--|--|-----|--|----|--|
|  |  | Yes |  |    |  |
|  |  |     |  | No |  |
- a) Each student has a computer ----- (1) — (2)
- b) The class has computers that students can share ----- (1) — (2)
- c) The school has computers that the class can use sometimes ----- (1) — (2)

**C. How often do you have the students do the following activities on computers during science lessons?**

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

- |  |  |                           |                      |                       |                       |
|--|--|---------------------------|----------------------|-----------------------|-----------------------|
|  |  | Every or almost every day |                      |                       |                       |
|  |  |                           | Once or twice a week |                       |                       |
|  |  |                           |                      | Once or twice a month |                       |
|  |  |                           |                      |                       | Never or almost never |
- a) Practice skills and procedures - (1) — (2) — (3) — (4)
- b) Look up ideas and information ----- (1) — (2) — (3) — (4)
- c) Do scientific procedures or experiments ----- (1) — (2) — (3) — (4)
- d) Study natural phenomena through simulations ----- (1) — (2) — (3) — (4)



## Science Topics Taught to the TIMSS Class

Question 32 asks about the topics taught and the content covered in teaching science to the fourth-grade students in the TIMSS class.

32

The following list includes the main topics addressed by the TIMSS science test. Choose the response that best describes when the students in this class have been taught each topic. If a topic was in the curriculum before the fourth grade, please choose "Mostly taught before this year." 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 only **one** circle for each row.

Mostly taught before this year  
Mostly taught this year  
Not yet taught or just introduced

### A. Life Science

- a) Characteristics of living things and the major groups of living things (e.g., mammals, birds, insects, flowering plants) ----- (1) — (2) — (3)
- b) Major body structures and their functions in humans, other animals, and plants ----- (1) — (2) — (3)
- c) Life cycles of common plants and animals (e.g., humans, butterflies, frogs, flowering plants) ----- (1) — (2) — (3)
- d) Understanding that some characteristics are inherited and some are the result of the environment ----- (1) — (2) — (3)
- e) How physical features and behaviors help living things survive in their environments ----- (1) — (2) — (3)
- f) Relationships in communities and ecosystems (e.g., simple food chains, predator-prey relationships, human impacts on the environment) ----- (1) — (2) — (3)
- g) Human health (transmission and prevention of diseases, symptoms of health and illness, importance of a healthy diet and exercise) ----- (1) — (2) — (3)

### B. Physical Science

- a) States of matter (solid, liquid, gas) and properties of the states of matter (volume, shape); how the state of matter changes by heating or cooling ----- (1) — (2) — (3)
- b) Classifying materials based on physical properties (e.g., weight/mass, volume, conducting heat, conducting electricity, magnetic attraction) ----- (1) — (2) — (3)
- c) Mixtures and how to separate a mixture into its components (e.g., sifting, filtering, evaporation, using a magnet) ----- (1) — (2) — (3)
- d) Chemical changes in everyday life (e.g., decaying, burning, rusting, cooking) ----- (1) — (2) — (3)
- e) Common sources of energy (e.g., the Sun, electricity, wind) and uses of energy (heating and cooling homes, providing light) ----- (1) — (2) — (3)
- f) Light and sound in everyday life (e.g., understanding shadows and reflection, understanding that vibrating objects make sound) ----- (1) — (2) — (3)
- g) Electricity and simple circuits (e.g., identifying materials that are conductors, recognizing that electricity can be changed to light or sound, knowing that a circuit must be complete to work correctly) ----- (1) — (2) — (3)
- h) Properties of magnets (e.g., knowing that like poles repel and opposite poles attract, recognizing that magnets can attract some objects) ----- (1) — (2) — (3)
- i) Forces that cause objects to move (e.g., gravity, pushing/pulling) ----- (1) — (2) — (3)

Choose the response that best describes when the students in this class have been taught each topic. If a topic was in the curriculum before the fourth grade, please choose "Mostly taught before this year." 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 only **one** circle for each row.



**C. Earth Science**

- a) Common features of the Earth's landscape (e.g., mountains, plains, deserts, rivers, oceans) and their relationship to human use (farming, irrigation, land development) ----- ① — ② — ③
- b) Where water is found on the Earth and how it moves in and out of the air (e.g., evaporation, rainfall, cloud formation, dew formation) ----- ① — ② — ③
- c) Understanding that weather can change from day to day, from season to season, and by geographic location ----- ① — ② — ③
- d) Understanding what fossils are and what they can tell us about past conditions on Earth----- ① — ② — ③
- e) Objects in the solar system (the Sun, the Earth, the Moon, and other planets) and their movements (the Earth and other planets revolve around the Sun, the Moon revolves around the Earth)----- ① — ② — ③
- f) Understanding how day and night result from the Earth's rotation on its axis and how the Earth's rotation results in changing shadows throughout the day ----- ① — ② — ③
- g) Understanding how seasons are related to the Earth's annual movement around the Sun ----- ① — ② — ③


Question 33 asks about science homework for the fourth-grade students in the TIMSS class.

Question 34 asks about science assessment for the fourth-grade students in the TIMSS class.

**33**

**A. How often do you usually assign science homework to the students in this class?**

Fill in **one** circle only.

- I do not assign science homework --- (1) 
- (Go to question 34)
- Less than once a week --- (2)
- 1 or 2 times a week --- (3)
- 3 or 4 times a week --- (4)
- Every day --- (5)

**B. When you assign science homework to the students in this 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.

- 15 minutes or less --- (1)
- 16–30 minutes --- (2)
- 31–60 minutes --- (3)
- More than 60 minutes --- (4)

**C. How often do you do the following with the science homework assignments for this class?**

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

- |  | Always or almost always | Sometimes | Never or almost never |
|--|-------------------------|-----------|-----------------------|
| a) Correct assignments and give feedback to students | (1)                     | (2)       | (3)                   |
| b) Discuss the homework in class                     | (1)                     | (2)       | (3)                   |
| c) Monitor whether or not the homework was completed | (1)                     | (2)       | (3)                   |

**34**

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

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

- |  | Major emphasis | Some emphasis | Little or no emphasis |
|--|----------------|---------------|-----------------------|
| a) Assessment of students' ongoing work                          | (1)            | (2)           | (3)                   |
| b) Classroom tests (for example, teacher-made or textbook tests) | (1)            | (2)           | (3)                   |
| c) State or district achievement tests                           | (1)            | (2)           | (3)                   |

## 35

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

Fill in only **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<br>technology into science -----                        | ①   | ②  |
| e) Improving students' critical thinking or<br>inquiry skills -----                | ①   | ②  |
| f) Science assessment -----  | ①   | ②  |
| g) Addressing individual students' needs -----                                     | ①   | ②  |
| h) Integrating science with other subjects<br>(e.g., mathematics, technology)----- | ①   | ②  |

## 36

In the past two years, how many hours in total have you spent in formal in-service/professional development (e.g., workshops, seminars) for science?

Fill in **one** circle only.

- None --- ①
- Less than 6 hours --- ②
- 6–15 hours --- ③
- 16–35 hours --- ④
- More than 35 hours --- ⑤

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

**If a topic is not in the fourth-grade curriculum or you are not responsible for teaching this topic, please choose "Not applicable."**

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

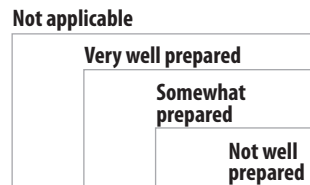
	Not applicable	Very well prepared	Somewhat prepared	Not well prepared
<b>A. Life Science</b>				
a) Characteristics of living things and the major groups of living things (e.g., mammals, birds, insects, flowering plants)-----	①	②	③	④
b) Major body structures and their functions in humans, other animals, and plants-----	①	②	③	④
c) Life cycles of common plants and animals (e.g., humans, butterflies, frogs, flowering plants)-----	①	②	③	④
d) Understanding that some characteristics are inherited and some are the result of the environment-----	①	②	③	④
e) How physical features and behaviors help living things survive in their environments-----	①	②	③	④
f) Relationships in communities and ecosystems (e.g., simple food chains, predator-prey relationships, human impacts on the environment)-----	①	②	③	④
g) Human health (transmission and prevention of diseases, symptoms of health and illness, importance of a healthy diet and exercise)-----	①	②	③	④
<b>B. Physical Science</b>				
a) States of matter (solid, liquid, gas) and properties of the states of matter (volume, shape); how the state of matter changes by heating or cooling-----	①	②	③	④
b) Classifying materials based on physical properties (e.g., weight/mass, volume, conducting heat, conducting electricity, magnetic attraction)-----	①	②	③	④
c) Mixtures and how to separate a mixture into its components (e.g., sifting, filtering, evaporation, using a magnet)-----	①	②	③	④
d) Chemical changes in everyday life (e.g., decaying, burning, rusting, cooking)-----	①	②	③	④
e) Common sources of energy (e.g., the Sun, electricity, wind) and uses of energy (heating and cooling homes, providing light)-----	①	②	③	④
f) Light and sound in everyday life (e.g., understanding shadows and reflection, understanding that vibrating objects make sound)-----	①	②	③	④
g) Electricity and simple circuits (e.g., identifying materials that are conductors, recognizing that electricity can be changed to light or sound, knowing that a circuit must be complete to work correctly)-----	①	②	③	④
h) Properties of magnets (e.g., knowing that like poles repel and opposite poles attract, recognizing that magnets can attract some objects)-----	①	②	③	④
i) Forces that cause objects to move (e.g., gravity, pushing/pulling)-----	①	②	③	④

37 (continued)

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

If a topic is not in the fourth-grade curriculum or you are not responsible for teaching this topic, please choose "Not applicable."

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



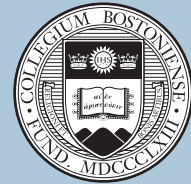
**C. Earth Science**

- a) Common features of the Earth's landscape (e.g., mountains, plains, deserts, rivers, oceans) and their relationship to human use (farming, irrigation, land development) ----- ① — ② — ③ — ④
- b) Where water is found on the Earth and how it moves in and out of the air (e.g., evaporation, rainfall, cloud formation, dew formation) ----- ① — ② — ③ — ④
- c) Understanding that weather can change from day to day, from season to season, and by geographic location ----- ① — ② — ③ — ④
- d) Understanding what fossils are and what they can tell us about past conditions on Earth----- ① — ② — ③ — ④
- e) Objects in the solar system (the Sun, the Earth, the Moon, and other planets) and their movements (the Earth and other planets revolve around the Sun, the Moon revolves around the Earth)----- ① — ② — ③ — ④
- f) Understanding how day and night result from the Earth's rotation on its axis and how the Earth's rotation results in changing shadows throughout the day ----- ① — ② — ③ — ④
- g) Understanding how seasons are related to the Earth's annual movement around the Sun ----- ① — ② — ③ — ④

# Thank You

**Thank you for the thought, time, and effort you have put into completing this questionnaire.**

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BOSTON  
COLLEGE

**TIMSS**  
**2015**

TRENDS IN INTERNATIONAL MATHEMATICS AND SCIENCE STUDY

# Teacher Questionnaire

Grade 4



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