Identification Label

National Center for Education Statistics
U.S Department of Education
1990 K St., NW
Washington, D.C. 20006

Teacher Name: _____

Class Name: _____

Teacher ID: _____ Teacher Link # _____

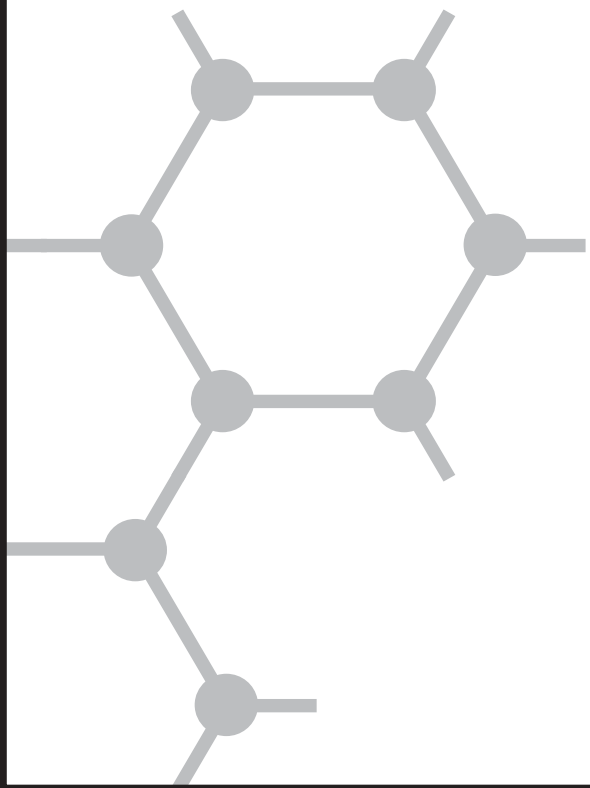
IEA Trends in International Mathematics and Science Study

T I M S S 2003

Main Survey

Teacher Questionnaire

Mathematics
Grade 8



General Directions

Your school has agreed to participate in TIMSS 2003, a large international study of student learning in mathematics and science in more than 50 countries around the world. Sponsored by the International Association for the Evaluation of Educational Achievement (IEA), TIMSS (for 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 mathematics to these students, and seeks information about teachers' academic and professional backgrounds, instructional practices, and attitudes toward teaching mathematics. As a teacher of mathematics to students in one of these sampled classes, your responses to these questions are very important in helping to describe mathematics education in the United States.

Some of the questions in this questionnaire refer specifically to students in the "TIMSS class." This is the class that is identified on the cover of this questionnaire and that will be tested as part of TIMSS 2003 in your school. It is important that you answer each question carefully so that the information that you provide reflects your situation as accurately as possible.

Please identify a time and place where you will be able to complete this questionnaire without being interrupted. Filling out the questionnaire 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 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.

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 teaching as a substitute or student teacher.

_____

*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 (e.g., cosmetology, welding) ---------- 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, postgraduate 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

How many years of preservice teacher training did you have (e.g., time spent in a teacher education program such as student teaching or a mentorship)? Please round to the nearest whole number.

*Fill in **one** circle only*

0 years ---------- ①

1 year ---------- ②

2 years ---------- ③

3 years ---------- ④

4 years ---------- ⑤

5 years ---------- ⑥

More than 5 years ---------- ⑦

6

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

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

	No	Minor	Major
a) Education - Mathematics	①	②	③
b) Mathematics	①	②	③
c) Education - Science	①	②	③
d) Science	①	②	③
e) Education - Other	①	②	③
f) Other	①	②	③

7

What requirements did you have to satisfy in order to become a mathematics teacher in grade 8?

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

	No	Yes
a) Complete bachelor's degree	①	②
b) Complete a probationary period	①	②
c) Complete a minimum number of education courses	①	②
d) Complete a minimum number of mathematics courses	①	②
e) Pass a licensing examination	①	②

8

A. Do you have a teaching license or certificate?

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

*If **No**, please go to question **9** on next page* ➡

B. What type of license or certificate do you hold?

*Fill in **one** circle only*

- Regular or standard state certificate or advanced professional certificate ①
- Probationary certificate (the initial certificate issued after satisfying all requirements except the completion of a probationary period) ②
- Provisional or other type given to persons who are still participating in what the state calls an "alternative certification program" ③
- Temporary certificate (requires some additional college coursework and /or student teaching before regular certification can be obtained) ④
- Emergency certificate or waiver (issued to persons with insufficient teacher preparation who must complete a regular certification program in order to continue teaching) ⑤

9

Considering your training and experience in both mathematics content and instruction, how ready do you feel you are to teach these topics in the eighth grade?

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

	Very ready	Ready	Not ready
A. Number			
a) Representing decimals and fractions using words, numbers, or models (including number lines)	①	②	③
b) Integers represented by words, numbers, or models (including number lines); ordering integers; and addition, subtraction, multiplication, and division with integers	①	②	③
B. Algebra			
a) Numeric, algebraic, and geometric patterns or sequences (extension, missing terms, generalization of patterns)	①	②	③
b) Simple linear equations and inequalities, and simultaneous (two variables) equations	①	②	③
c) Equivalent representations of functions as ordered pairs, tables, graphs, words, or equations	①	②	③
d) Attributes of a graph such as intercepts on axes, and intervals where the function increases, decreases, or is constant	①	②	③
C. Measurement			
a) Estimations of length, circumference, area, volume, weight, time, angle, and speed in problem situations (e.g., circumference of a wheel, speed of a runner)	①	②	③
b) Computations with measurements in problem situations (e.g., add measures, find average speed on a trip, find population density)	①	②	③
c) Measures of irregular or compound areas (e.g., by using grids or dissecting and rearranging pieces)	①	②	③
d) Precision of measurements (e.g., upper and lower bounds of a length reported as 8 centimeters to the nearest centimeter)	①	②	③
D. Geometry			
a) Pythagorean theorem (not proof) to find length of a side	①	②	③
b) Congruent figures (triangles, quadrilaterals) and their corresponding measures	①	②	③
c) Cartesian plane - ordered pairs, equations, intercepts, intersections, and gradient	①	②	③
d) Translation, reflection, rotation, and enlargement	①	②	③
E. Data			
a) Sources of error in collecting and organizing data (e.g., bias, inappropriate grouping)	①	②	③
b) Data collection methods (e.g., survey, experiment, questionnaire)	①	②	③
c) Characteristics of data sets including mean, median, range, and shape of distribution (in general terms)	①	②	③
d) Simple probability including using data from experiments to estimate probabilities	①	②	③

Teaching Time

10

A. In one typical calendar week from Monday to Sunday, what is the total number of single periods for which you are formally scheduled? Count a double period as two periods.

_____

Write in the number of periods

B. Of these formally scheduled periods, for how many are you assigned to do each of the following?

Write in the number of periods

a) Teach mathematics ---------- _____

b) Teach science ---------- _____

c) Teach other subjects ---------- _____

d) Perform other duties ---------- _____

Total ---------- _____

Should match number in 10A

C. How many minutes are in a typical single period?

_____

Write in the number of minutes

11

Outside the formal school day, approximately how many hours per week do you normally spend on each of these activities? Do not include the time already accounted for in Question 10. Please round to the nearest whole number.

Write in the number of hours per week

a) Grading student tests, exams, or other student work ---------- _____

b) Planning lessons ---------- _____

c) Administrative and recordkeeping tasks including staff meetings ----- _____

d) Other ---------- _____

Professional Development

12

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

13

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) Mathematics content	②	①
b) Mathematics pedagogy/instruction	②	①
c) Mathematics curriculum	②	①
d) Integrating information technology into mathematics	②	①
e) Improving students' critical thinking or problem-solving skills	②	①
f) Mathematics assessment	②	①

Attitudes Toward Mathematics

14

To what extent do you agree or disagree with each of the following statements?

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

	Agree a lot	Agree	Disagree	Disagree a lot
a) More than one representation (picture, concrete material, symbols, etc.) should be used in teaching a mathematics topic	①	②	③	④
b) Mathematics should be learned as sets of algorithms or rules that cover all possibilities	①	②	③	④
c) Solving mathematics problems often involves hypothesizing, estimating, testing, and modifying findings	①	②	③	④
d) Learning mathematics mainly involves memorizing	①	②	③	④
e) There are different ways to solve most mathematical problems	①	②	③	④
f) Few new discoveries in mathematics are being made	①	②	③	④
g) Modeling real-world problems is essential to teaching mathematics	①	②	③	④

Your School

15

Thinking about your 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 facility (building and grounds) is in need of significant repair	①	②	③	④
b) This school is located in a safe neighborhood	①	②	③	④
c) I feel safe at this school	①	②	③	④
d) This school's security policies and practices are sufficient	①	②	③	④

16

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

The remaining questions refer to the TIMSS class. Remember, "the TIMSS class" is the class which is identified on the cover of this questionnaire and which will be tested as part of TIMSS 2003 in your school.

17

How many students are in the TIMSS class?

_____

Write in the number of students

18

How many minutes per week do you teach mathematics to the TIMSS class?

_____

Write in the number of minutes per week

19

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

	No
Yes	

*Fill in **one** circle only* ---------- ① --- ②

*If **No**, please go to question* **20**

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

*Fill in **one** circle only*

As the primary basis for my lessons ---------- ①

As a supplementary resource ---------- ②

20

In a typical week of mathematics lessons for the TIMSS class, 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%

21

In teaching mathematics to the students in the TIMSS class, 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) Practice adding, subtracting, multiplying, and dividing without using a calculator	①	②	③	④
b) Work on fractions and decimals	①	②	③	④
c) Work on problems for which there is no immediately obvious method of solution	①	②	③	④
d) Interpret data in tables, charts, or graphs	①	②	③	④
e) Write equations and functions to represent relationships	①	②	③	④
f) Work together in small groups	①	②	③	④
g) Relate what they are learning in mathematics to their daily lives	①	②	③	④
h) Explain their answers	①	②	③	④
i) Decide on their own procedures for solving complex problems	①	②	③	④

22

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

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

	Not applicable	Not at all	A little	Some	A lot
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) Low morale among students		①	②	③	④ ⑤
f) Disruptive students		①	②	③	④ ⑤
Resources					
g) Shortage of computer hardware		①	②	③	④ ⑤
h) Shortage of computer software		①	②	③	④ ⑤
i) Shortage of support for using computers		①	②	③	④ ⑤
j) Shortage of textbooks for student use		①	②	③	④ ⑤
k) Shortage of other instructional equipment for students' use		①	②	③	④ ⑤
l) Shortage of equipment for your use in demonstrations and other exercises		①	②	③	④ ⑤
m) Inadequate physical facilities		①	②	③	④ ⑤
n) High student/teacher ratio		①	②	③	④ ⑤

23

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 mathematics content areas for the TIMSS class?

Write in the percent
The total should add to 100%

a) Number (e.g., whole numbers, fractions, decimals, ratio, proportion, percent) ---------- _____%

b) Geometry (e.g., lines and angles, shapes, congruence and similarity, spatial relationships, symmetry and transformations) ---------- _____%

c) Algebra (e.g., patterns, equations and formulas, relationships) ---------- _____%

d) Data (e.g., data collection and organization, data representation, data interpretation, probability) -------- _____%

e) Measurement (e.g., attributes and units, tools, techniques and formulas) _____%

f) Other, please specify:

_____ ----- _____%

Total ---------- 100%

24

The following list includes the main topics addressed by the TIMSS mathematics test. Choose the response that best describes when students in the TIMSS class have been taught each topic. If a topic was taught half this year and half before this year, please choose "Mostly taught this year."

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

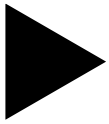
		Not yet taught or just introduced	Mostly taught this year	Mostly taught before this year
A. Number				
a)	Whole numbers including place value, factorization, and the four operations	①	②	③
b)	Computations, estimations, or approximations involving whole numbers	①	②	③
c)	Common fractions including equivalent fractions, and ordering of fractions	①	②	③
d)	Decimal fractions including place value, ordering, rounding, and converting to common fractions (and vice versa)	①	②	③
e)	Representing decimals and fractions using words, numbers, or models (including number lines)	①	②	③
f)	Computations with fractions	①	②	③
g)	Computations with decimals	①	②	③
h)	Integers represented by words, numbers, or models (including number lines), ordering integers, addition, subtraction, multiplication, and division with integers	①	②	③
i)	Ratios (equivalence, division of a quantity by a given ratio)	①	②	③
j)	Conversion of percents to fractions or decimals, and vice versa	①	②	③

24 continued

The following list includes the main topics addressed by the TIMSS mathematics test. Choose the response that best describes when students in the TIMSS class have been taught each topic. If a topic was taught half this year and half before this year, please choose "Mostly taught this year."

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

	Not yet taught or just introduced	Mostly taught this year	Mostly taught before this year
B. Algebra			
a) Numeric, algebraic, and geometric patterns or sequences (extension, missing terms, generalization of patterns)	①	②	③
b) Sums, products, and powers of expressions containing variables	①	②	③
c) Simple linear equations and inequalities, and simultaneous (two variables) equations	①	②	③
d) Equivalent representations of functions as ordered pairs, tables, graphs, words, or equations	①	②	③
e) Proportional, linear, and nonlinear relationships (travel graphs and simple piecewise functions included)	①	②	③
f) Attributes of a graph such as intercepts on axes, and intervals where the function increases, decreases, or is constant	①	②	③
C. Measurement			
a) Standard units for measures of length, area, volume, perimeter, circumference, time, speed, density, angle, mass/weight	①	②	③
b) Relationships among units for conversions within systems of units, and for rates	①	②	③
c) Use standard tools to measure length, weight, time, speed, angle, and temperature	①	②	③
d) Estimations of length, circumference, area, volume, weight, time, angle, and speed in problem situations (e.g., circumference of a wheel, speed of a runner)	①	②	③
e) Computations with measurements in problem situations (e.g., add measures, find average speed on a trip, find population density)	①	②	③
f) Measurement formulas for perimeter of a rectangle, circumference of a circle, areas of plane figures (including circles), surface area and volume of rectangular solids, and rates	①	②	③
g) Measures of irregular or compound areas (e.g., by using grids or dissecting and rearranging pieces)	①	②	③
h) Precision of measurements (e.g., upper and lower bounds of a length reported as 8 centimeters to the nearest centimeter)	①	②	③



24 continued

The following list includes the main topics addressed by the TIMSS mathematics test. Choose the response that best describes when students in the TIMSS class have been taught each topic. If a topic was taught half this year and half before this year, please choose "Mostly taught this year."

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

		Not yet taught or just introduced	Mostly taught this year	Mostly taught before this year
D. Geometry				
a)	Angles - acute, right, straight, obtuse, reflex, complementary, and supplementary	①	②	③
b)	Relationships for angles at a point, angles on a line, vertically opposite angles, angles associated with a transversal cutting parallel lines, and perpendicularity	①	②	③
c)	Properties of angle bisectors and perpendicular bisectors of lines	①	②	③
d)	Properties of geometric shapes: triangles and quadrilaterals	①	②	③
e)	Properties of other polygons (regular pentagon, hexagon, octagon, decagon)	①	②	③
f)	Construct or draw triangles and rectangles of given dimensions	①	②	③
g)	Pythagorean theorem (not proof) to find length of a side	①	②	③
h)	Congruent figures (triangles, quadrilaterals) and their corresponding measures	①	②	③
i)	Similar triangles and recall their properties	①	②	③
j)	Cartesian plane - ordered pairs, equations, intercepts, intersections, and gradient	①	②	③
k)	Relationships between two-dimensional and three-dimensional shapes	①	②	③
l)	Line and rotational symmetry for two-dimensional shapes	①	②	③
m)	Translation, reflection, rotation, and enlargement	①	②	③
E. Data				
a)	Organizing a set of data by one or more characteristics using a tally chart, table, or graph	①	②	③
b)	Sources of error in collecting and organizing data (e.g., bias, inappropriate grouping)	①	②	③
c)	Data collection methods (e.g., survey, experiment, questionnaire)	①	②	③
d)	Drawing and interpreting graphs, tables, pictographs, bar graphs, pie charts, and line graphs	①	②	③
e)	Characteristics of data sets including mean, median, range, and shape of distribution (in general terms)	①	②	③
f)	Interpreting data sets (e.g., draw conclusions, make predictions, and estimate values between and beyond given data points)	①	②	③
g)	Evaluating interpretations of data with respect to correctness and completeness of interpretation	①	②	③
h)	Simple probability including using data from experiments to estimate probabilities	①	②	③

Calculators and Computers in the TIMSS Class

25

Are the students in the TIMSS 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

*If **No,** please go to question **30** on next page* 

26

How many students in the TIMSS class have calculators available to use during mathematics lessons?

*Fill in **one** circle only*

All ---------- ①

Most ---------- ②

About half ---------- ③

Some ---------- ④

None ---------- ⑤

27

How many students in the TIMSS class have <u>graphing</u> calculators available to use during mathematics lessons?

*Fill in **one** circle only*

All ---------- ①

Most ---------- ②

About half ---------- ③

Some ---------- ④

None ---------- ⑤

28

How often do students in the TIMSS class use calculators in their mathematics lessons for the following activities?

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

		Never	**Some lessons**	**About half the lessons**	**Every or almost every lesson**
a)	Check answers	①	②	③	④
b)	Do routine computations	①	②	③	④
c)	Solve complex problems	①	②	③	④
d)	Explore number concepts	①	②	③	④

29

How often are students in the TIMSS class permitted to use calculators during tests or examinations?

*Fill in **one** circle only*

Always ---------- ①

Sometimes ---------- ②

Never ---------- ③

30

A. Do students in the TIMSS class have computers available to use during their mathematics lessons? Do not include calculators.

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

*If **No,** please go to question **32** on next page* 

B. Do any of the computers have access to the Internet?

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

31

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

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

	Never	Some lessons	About half the lessons	Every or almost every lesson
a) Discover 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
d) Process and analyze data	①	②	③	④

Homework

32

Do you assign mathematics homework to the TIMSS class?

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

*If **No,** please go to question **37** on next page* 

33

How often do you usually assign mathematics homework to the TIMSS class?

*Fill in **one** circle only*

Every or almost every lesson ---------- ①

About half the lessons ---------- ②

Some lessons ---------- ③

34

When you assign mathematics homework to the TIMSS class, 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

35

How often do you assign the following kinds of mathematics homework to the TIMSS class?

*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) Gathering data and reporting	①	②	③
c) Finding one or more applications of the content covered	①	②	③

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How often do you do the following with the mathematics homework assignments?

*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

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How often do you give a mathematics test or examination to the TIMSS class? 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*

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What item formats do you typically use in your mathematics 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

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How often do you include the following types of questions in your mathematics 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 involving application of mathematical procedures	①	②	③
b)	Questions involving searching for patterns and relationships	①	②	③
c)	Questions requiring explanations or justifications	①	②	③

Thank You

for completing this questionnaire

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